

**Republic of the Philippines
Department of Trade and Industry/
Board of Investments**

**Project for Elaboration of
Industrial Promotion Plans Using
Value Chain Analysis in the
Republic of the Philippines**

Final Report

May 24, 2019

Japan International Cooperation Agency (JICA)

**Nomura Research Institute, Ltd
IMG Inc.**

IL
JR
19-050

**Republic of the Philippines
Department of Trade and Industry/
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A. Overview of Project Activities

1. Overview of the Project
2. Phase I: Working Group Activities
3. Phase II: Working Group Activities
4. Other Activities: Overseas Training, Workshops, Consultation, etc
5. Capacity Development Results

B. Automotive Industry Promotion Plan

1. One Million Unit per Year Production in the Philippines
2. Specific Measures and Action Plans for Five Policy Domains
 - a. Policy and System Development
 - b. Investment Promotion
 - c. Local Supplier Development
 - d. Industry Human Resource and Technology Development
 - e. Infrastructure Development
3. Implementation Schedule of AIPP

C. Recommendations

1. For the Achievement of the Automotive Industry Promotion Plan
2. Recommendations/Implications to the Next Project

Abbreviations

Abbreviations	Definition
2WD/4WD	Two-Wheel Drive / Four-Wheel Drive
5S	Sort/ <i>Seiri</i> , Straighten/ <i>Seiton</i> , Shine/ <i>Seiso</i> , Standardize/ <i>Seiketsu</i> , Sustain/ <i>Shitsuke</i> ,
A/T	Automatic Transmission
ABS	Anti-lock Braking System
ACEA	European Automobile Manufacturers' Association
ADAS	Advanced Driver-Assistance System
ADB	Asia Development Bank
ADM	Astra Daihatsu Motor
AEC	ASEAN Economic Community
AFP	Aichi Forge Philippines, Inc.
AICO	ASEAN Industrial Cooperation Scheme
AIPP	Automotive Industry Promotion Plan
APEC	Asia-Pacific Economic Cooperation
APQP	Advanced Product Quality Planning
ASEAN	Association of South-East Asian Nations
ASEC	Assistant Secretary
ATC	Asian Transmission Corporation
ATI	Asian Terminals Inc.
ATIGA	ASEAN Trade in Goods Agreement
AUV	Asian Utility Vehicle (10-seater car)
AVID	Association of Vehicle Importers and Distributors, Inc
AWD	All Wheel Drive (same as 4WD)
BAU	Business as Usual
BBB	Build-Build-Build Program
BCT	Batangas Container Terminal
BEV	Battery Electric Vehicle
BOI	Board of Investments (Philippines) Board of Investment (Thailand)
BPM	Balance of Payments Manual
BSP	Bangko Sentral ng Pilipinas / Central Bank of the Philippines
C.A.S.E.	<u>C</u> ar connectivity, <u>A</u> utonomous or assisted driving, new mobility or car <u>S</u> haring, <u>E</u> lectrified powertrains and components
C/P	Counterpart
CAFÉ	Corporate Average Fuel Efficiency
CAGR	Compound Annual Growth Rate
CALABARZON	Administrative Region IV-A (<u>C</u> avite, <u>L</u> aguna, <u>B</u> atangas, <u>R</u> izal, and <u>Q</u> uezon)
CALAX	Cavite – Laguna Expressway
CAMPI	The Chamber of Automotive Manufacturers of the Philippines, Inc.
CARS Program	Comprehensive Automotive Resurgence Strategy Program
CAVITEX	Cavite, Manila – Cavite Expressway
CBU	Completely Build Up
CHED	Commission on Higher Education
CKD	Completely Knock Down

Abbreviations	Definition
CMC	China Motor Corporation
CNIS	Comprehensive National Industrial Strategy
COD	Center of Development
COE	Center of Excellence
COMPETE	Advancing Philippine Competitiveness Project (by USAID)
COP	Conference of the Parties
CPI	Consumer Price Index
CV	Commercial Vehicle
CVJ	Constant Velocity Joint
CVT	Continuously Variable Transmission
DA	Department of Agriculture
DAP	Development Academy of the Philippines
DENR	Department of Environment and Natural Resources
DFA	Department of Foreign Affairs
DICT	Department of Information, Communication, and Technology
DILG	Department of the Interior and Local Government
DOE	Department of Energy
DOF	Department of Finance
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DOTr	Department of Transportation
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
DTS	Dual Training System
DepEd	Department of Education
E&E	Electrical and Electric
ECU	Electronic Control Units
EEP	Energy Efficiency Plan
EEV	Energy Efficient Vehicles
EGR	Exhaust Gas Recirculation
EMS	Electronics Manufacturing Service
EO	Executive Order
EOJ	Embassy of Japan
EPS	Electric Power Steering
ESO	Engineering Service Outsourcing
ETC	Electronic Throttle Control
EV	Electronic Vehicle
e-VAP	Electric Vehicle Association of the Philippines
FAIP	Federation of Automotive Industries of the Philippines, Inc.
FDI	Foreign Direct Investment
FEAP	Furukawa Electric Autoparts (Philippines) Inc.
FF	Front-Engine, Front Wheel Drive
FHI	Fuji Heavy Industries
FR	Front-Engine, Rear Wheel Drive
FTCP	Fujitsu Ten (currently Denso Ten) Corporations of the Philippines

Abbreviations	Definition
GAA	General Appropriation Act
GAIKINDO	Indonesian Auto Manufacturers Associations
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GM	General Motors
GMAW	Gas Metal Arc Welding
GMR	Giant Magnet Resistance
GVA	Gross Value Added
GVC	Global Value Chain
HARI	Hyundai Asia Resources Incorporated
HCPI	Honda Cars Philippines, Inc.
HEI	Higher Education Institutions
HEV	Hybrid Electric Vehicle
HQ	Headquarters
HS Codes	Harmonized System Codes
HV	Hybrid Vehicles
HVAC	Heating, Ventilation, and Air Conditioning
I-O	Input-Output
IAC	Inter-Agency Committee
IB	Inclusive Business
IC	Integrated Circuit
ICE	Internal Combustion Engine
ICQCC	International Convention of Quality Control Circles
ICT	Information and Communication Technologies
ICTSI	International Container Services, Inc
IDC	Industry Development Council
IDE	Institute of Development Economies
IHRD	Industrial Human Resources Development
IMG	International Management Group Inc.
IMI	Integrated Micro-Electronics, Inc. (Ayala Group)
IMIP	Indonesia Morowali Industrial Park
IMV	Innovative International Multi-Purpose Vehicle
IPA	Investment Promotion Agency
IPC	Isuzu Philippines Corporation
IPP	Investments Priorities Plan
ITC	International Trade Center
i ³ S	Inclusive Innovation Industrial Strategy
JAMA	Japan Automobile Manufacturers Association, Inc
JBIC	Japan Bank for International Cooperation
JCC	Joint Coordinating Committee
JCCIP	Japanese Chamber of Commerce and Industry in the Philippines
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
JV	Joint Venture

Abbreviations	Definition
KPI	Key Performance Indicator
LAMCOR	Laguna Autoparts Manufacturing Corporation of the Philippines
LCCC	Low Cost Compact Crossover
LCD	Liquid Chrystal Display
LCEV	Low Carbon Emission Vehicle
LCGC	Low Cost Green Car
LCV	Light Commercial Vehicle
LGU	Local Government Unit
M/M	Minutes of Meeting
M/T	Manual Transmission
MCSF	Multilevel Car Storage Facility
ME	Micro Enterprises
MELCO	Mitsubishi Electric Corporation
METI	Ministry of Economy, Trade and Industry
MIR	Manufacturing Industry Roadmap
MIRDC	Metals Industry Research and Development Center
MMPC	Mitsubishi Motors Philippines Corporation
MMV	Mitsubishi Motors Vietnam Company Limited
MOU	Memorandum of Understanding
MPMT	Mazda Powertrain Manufacturing Co., Ltd
MPV	Multi-Purpose Vehicle
MRP	Manufacturing Resurgence Program
MSME	Micro, Small and Medium Enterprises
MUV	Multi-Utility Vehicle
MVDP	Motor Vehicle Development Program (Philippines)
MY	Model Year
NAP	National Automotive Policy
NC	National Certificate
NCC	National Competitiveness Council
NCR	National Capital Region
NEDA	National Economic and Development Authority
NGO	Non-Governmental Organization
NGV	Natural Gas Vehicle
NRI	Nomura Research Institute Ltd.
NTR	No Training Regulation
NWPC	National Wages and Productivity Commission
OEM	Original Equipment Manufacturer
OJT	On-the-Job-Training
OTOP	One Town, One Product
PBR	Philippine Business Registry
PCB	Printed Circuit Board
PDCA	Plan-Do-Check-Act
PDP	Philippine Development Plan
PEZA	Philippine Economic Zone Authority

Abbreviations	Definition
PHEV	Plug-in Hybrid Electric Vehicle
PIDS	Philippine Institute for Development Studies
PIMS	Philippine International Motor Show
PIPP	Philippine Investment Promotion Plan
PKB	Parking Brake
PNR	Philippine National Railways
PPA	Philippine Port Authority
PPAP	Production Part Approval Process
PPMA	Philippines Parts Maker Association, Inc.
PPP	Public-Private Partnership
PSA	Philippine Statistics Authority
PSE	Philippine Stock Exchange
PSG	Policies, Standards and Guidelines
PSIC	Philippine Standard Industrial Classification
PUV	Public Utility Vehicles
PV	Passenger Vehicle
PVC	Polyvinyl Chloride
PhilAPEX	Philippine Autoparts Expo
Php	Philippine Peso
QCD	Quality, Cost and Delivery
QPAP	Quality and Productivity Center of the Philippines
R&D	Research and Development
R/D	Record of Discussions
RA	Republic Act
RORO	Roll-On Roll-Out
SC	Supply Chain
SEC	Securities and Exchange Commission
SEI	Science Education Institute
SEIPI	Semiconductor and Electronics Industries in the Philippines Foundation Inc
SET-UP	Small Enterprise Technology Upgrading Program
SIAM	Society of Indian Automobile Manufacturers
SLEX	South Luzon Expressway
SMAW	Shielded Metal Arc Welding
SME	Small and Medium-sized Enterprise
SMT	Surface Mount Technology
SOP	Start of Production
SRC	Steering Roll Connectors
SSF	Shared Service Facilities
STAR	South Tagalog Arterial Road
STEM	Science, Technology, Engineering and Mathematics
SUV	Sports Utility Vehicle
SWOT	Strength, Weakness, Opportunity, and Threat
T/A	Transaxle
T/M	Transmission

Abbreviations	Definition
TAP	Toyota Autoparts Philippines, Inc
TCS	Traction Control System
TESDA	Technical Education and Skills Development Authority
TEU	Twenty-foot Equivalent Unit
TIMSS	Trends in International Mathematics and Science Study
TMP	Toyota Motor Philippines Corporation
TOR	Terms of Reference
TPP	Trans-Pacific Partnership
TPS	Toyota Production System
TR	Training Regulation
TRABAHO	Tax Reform for Attracting Better and High-Quality Opportunities
TRAIN	Tax Reform for Acceleration and Inclusion
TRC	Toyota Traction Control System
TRP	Tokai Rika Philippine
TVET	Technical and Vocational Education and Training
TVL	Technical Vocational Livelihood Track
TiVA	Trade in Value Added
UA&P	University of Asia and the Pacific
UP	University of the Philippines
US\$	United States Dollar
USAID	United States Agency for International Development
VC	Value Chain
VDC	Vehicle Dynamic Control
WG	Working Group
WTR	With Training Regulation

Chapter 1 Outline of the Project

1.1 Background of the Project

With its out and forward-looking policies in place, the Philippines' economy has been showing strong signs of recovery from a long-term setback due to its political instability and delay in infrastructure development. With the inflow of foreign direct investments (FDI) pouring to the country at the annual average rate of over US\$ 5 billion from 2010 to 2015². During the same period, the Philippines sustained a high annual GDP growth rate of 6.3% in average; the manufacturing sector's share in GDP stayed average of 20.7%, a slight decrease from 21.4% in 2010 to 20.0% in 2015.

Under such circumstances, the Philippine government has been making efforts to further promote FDIs and to develop its manufacturing industry for employment generation and small- and medium-sized enterprise (SME) development. While the automotive industry, i.e. the main target of the Project, is identified as one of the Philippine government's priority sectors in its efforts to develop the manufacturing industry, three following issues concerning external and internal business environments need to be addressed for industry promotion.

Issue 1. Increase in the Local Procurement Rate and Value Addition of Auto Parts

While the automotive industry in the Philippines has a 4% share in the country's GDP and has been selected as a priority sector for its employment generation potential, it is reported that only 300 out of about 30,000 auto parts (1%) can be domestically procured as of date. For the manufacturing industry as a whole, especially the automotive industry, including car-electronics, the manufacturing of parts with a higher level of value addition and the expansion of available local parts are the challenges that need to be addressed.

Issue 2. Strengthening of the Philippines' Competitiveness in the International Market

The launching of the ASEAN Economic Community (AEC) is expected to reduce tariff and abolish non-tariff barriers. AEC is also expected to accelerate the regional trade of intermediate materials and further facilitate "globalization and streamlining of value chain". This will open a wider market for companies in the ASEAN region and simultaneously, intensify competition. This change of economic framework of the region will place more importance on competitiveness of the manufacturing industry, which can be realized through improvements in technology and productivity.

Issue 3. Development of Supporting Industries

In the Philippines, supporting industries have not fully matured compared to other ASEAN countries because 1) less proactive policy measures have been taken to link foreign investments with local industries, 2) investments by local industrial conglomerates have been made in industries other than manufacturing, and 3) SMEs have had limited access to capital and

² Philippine Statistics Authority (PSA)

technology. Against this background, there is a growing need to implement appropriate policy measures (action plans) for the development of supporting industries in particular and the country's manufacturing industry in general, as well as to strengthen, expand, and develop the presence and positioning of the Philippine automotive industry in the global value chain (GVC).

With the viewpoint discussed above, the Department of Trade and Industry (DTI) requested the Japanese government a technical cooperation project to formulate industrial promotion plans through GVC analysis, draft policy measures (action plans), and strengthen the capacity of DTI staff in this policy formulation process. Upon receiving the request, the Japan International Cooperation Agency (JICA) dispatched a mission to formulate the detailed design of the *Project for Elaboration of Industrial Promotion Plans using Value Chain Analysis in the Republic of the Philippines* (hereinafter the Project) from October to November 2015. The Minutes of Meeting (M/M) for the Project was signed and exchanged between JICA and DTI during the said mission and the Record of Discussions (R/D) for the Project was signed and exchanged between the two agencies in May 2016.

1.2 Objectives, Expected Outputs, and Activities

(1) Objectives

The objectives of the Project are to identify segments in the automotive industry that need to be strengthened and factors that are hindering the industry's development through GVC analysis and to formulate the automotive industrial promotion plan (hereinafter "the Industrial Promotion Plan"). The Industrial Promotion Plan is aimed to 1) increase foreign and domestic investments, 2) generate employments, and 3) strengthen the SMEs' linkage with the GVC of the automotive industry.

(2) Expected Outputs

- 1) The position of the Philippines in GVC becomes clear as a result of analysis of the target industries.
- 2) Industrial Promotion Plans with concrete action plans for the target industries are formulated with a consensus among the relevant stakeholders.
- 3) Some action plans of the formulated Industrial Promotion Plans are implemented.
- 4) The capacity of policy making by DTI staff is enhanced through GVC analysis and formulation of Industrial Promotion Plans.

In order to produce the abovementioned four outputs, the Project conducted 1) study of the Philippine automotive industry's positioning in the ASEAN region; 2) analysis of the value chains and supply chains of the Philippine automotive industry, and 3) preparation of the Philippine Automotive Industry Promotion Plan. Furthermore, as a part of capacity development activities of Philippine government staff and other stakeholders who are involved in the automotive industry promotion, thematic working groups, comprised of representatives from relevant government agencies and industry associations, were formed and planned activities in each thematic working groups, Japan training, third country training, and thematic workshops

were carried out in the Project. (See Annex A for the overview of project activities).

Study results were summarized in this report as follows:

- Chapter 2: Study results of the Philippine automotive industry's positioning in the ASEAN region
- Chapter 3: Analysis results of the Philippine automotive industry's supply and value chains
- Chapter 4: Philippine Automotive Industry Promotion Plan that is derived from the findings discussed in earlier two chapters (The earlier half of the chapter is dedicated in discussing the background of the automotive industry promotion plan and strategies, and the latter half of the chapter is dedicated in discussing the actual plan itself.)

The Project also outlined action plans (specific policy measures) that should be implemented to achieve the target set in the plan and the implementation plan of each action plan. They are summarized in Annex B of this report. The JICA Expert Team also provides recommendations for the achievement of the plan, which are summarized in Annex C.

1.3 Scope

(1) Target Industry

Automotive industry (assembly and parts manufacturing)³

(2) Target Area

Republic of the Philippines (including research activities in the ASEAN region, etc.)

1.4 Implementing Agencies

Department of Trade and Industry / Board of Investments

(See Annex A for JCC members and the Project's organizational chart)

1.5 Project Period

From September 2016 to June 2019⁴

³ Including car electronics

⁴ The original project period was from September 2016 to August 2018. The Project was extended for nine months to accommodate the time necessary to conduct monitoring activities of pilot activities, reflect monitoring results into the Automotive Industry Promotion Plan's action plans, and continue to provide ad-hoc policy consultancy services to the Philippine Government. The Record of Discussion was amended accordingly in July 2018

Chapter 2 Positioning of the Philippine Automotive Industry among ASEAN Countries

2.1 Present Situation of the Automotive Industry in the ASEAN Region

2.1.1 Foreign Direct Investments in the Automotive Industry⁵

According to the balance of international payments reported by the Ministry of Finance of Japan, FDIs from the manufacturing industry in Japan to Asia grew more than three times in less than ten years, from JPY 7.3 trillion (approx. US\$ 62 billion⁶) at the end of 2005 to JPY 17.9 trillion (approx. US\$ 200 billion) by the end of 2017. As for the investment balance of manufacturing industries to Asia per product type, the field of transportation equipment had the largest share, comprising 30% of the entire manufacturing industry, followed by electrical equipment with 23%.

From 2010 to 2017, China was the top recipient of investments from Japan in the field of transportation equipment with the total investment amounting to US\$ 12,520 million (see Table 1). In the ASEAN region, Japanese investments to Thailand and Indonesia were US\$ 8,805 million and US\$ 6,153 million respectively, comprising nearly 80% of the entire investment in the region. As the recent trend indicates, Japanese companies continue to focus on Thailand and Indonesia – the two largest motor vehicle production hubs in the ASEAN - in addition to China.

Table 1 Foreign Direct Investments from Japan to Asia (Transportation Equipment)

Unit: US\$ million

	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017
China	963.3	1,476.9	2,836.1	1,600.1	1,131.8	590.6	1,813.4	2,107.8	12,520.0
Thailand	977.5	930.2	923.8	1,435.5	1,660.8	752.5	615.5	1,509.4	8,805.2
Indonesia	197.9	885.3	1,217.9	1,143.5	1,019.4	789.0	683.9	215.8	6,152.7
India	583.8	97.2	990.6	574.7	767.1	476.1	1132.2	1183.2	5,804.9
Singapore	17.1	91.9	79.4	113.5	326.9	833.5	133.5	-48.6	1,547.2
Vietnam	17.9	172.1	198.8	229	103.9	117.2	216.5	204.9	1,260.3
Malaysia	64.8	21.7	86.4	94.6	78.4	59.4	136.4	132.3	674.0
Philippines	14.1	56	55.4	22.5	61.4	59.2	220.0	164.4	653.0
ASEAN 10	1,289.4	2,157.2	2,561.7	3,041.7	3,251.8	2,463.0	2,005.8	2,178.1	18,948.7

Note:

1. BPM 5 standard is being adopted until 2013; however, the investment from affiliates to the holding company accounts as the return on investment.
 2. All figures are converted from JPY to US\$ using annual average exchange rate
- Source: Ministry of Finance, Direct Investment Flow by Region

Japanese OEMs' investments have been pouring intensively to the ASEAN region. Along with the "*Thailand- Plus-One*" phenomenon (a phenomenon of Japanese companies moving some parts of its production from Thailand to its neighboring countries, such as Cambodia, Laos, and Myanmar), growing investments have also been heading to Indonesia. The Philippines has also benefited from this trend in parts by its government's efforts to promote investment through

⁵ Also refer to Reference Document B-1) for the report on industrial statistics and manufacturing industry development policies in the ASEAN Region and Reference Document A-2) for presentations materials on comparative analysis of auto industry promotion policies.

⁶ Currency conversion rate used: US\$1 = JPY118 (at the end of 2005) and JPY111 (2017)

launching of programs such as the Comprehensive Automotive Resurgence Strategy (CARS) program.

Table 2 shows that for the automotive industry in the ASEAN region, Japan is the biggest investor, followed by countries such as Germany, U.S., Sweden, France, and South Korea.

Table 2 Automotive Suppliers in the ASEAN Region and the Origin of Their Shareholders

	Philippines	Thailand	Indonesia	Malaysia	Vietnam	Singapore	Myanmar	Cambodia	Laos
Total	343	2,123	789	627	274	246	12	9	5
(Total-FDI companies)	201	1223	490	246	250	142	6	9	5
Shareholder of FDI companies									
Japan	178	1059	454	187	233	100	6	9	5
China	1	23	3	1	1	6	0	0	0
South Korea	4	12	8	5	11	1	0	1	0
India	0	12	2	0	0	0	0	0	0
U.S.	6	52	11	17	5	20	0	0	0
Canada	0	2	0	1	0	0	0	0	0
Germany	8	42	12	25	4	13	0	0	0
France	2	15	3	1	0	1	0	0	0
Spain	0	2	0	0	0	0	0	0	0
Italy	0	1	1	3	0	0	0	0	0
UK	0	10	1	4	0	2	0	0	0
Sweden	2	2	3	4	0	1	0	0	0

Source: Marklines, as of 2019 February

*This number does not completely match the number of local companies

**The filter only accounts for shareholding companies with at least a 20% ownership stake.

Table 3 shows new investments in the ASEAN region by Japanese OEMs since 2015.

Table 3 New Investments in the ASEAN Region by Japanese OEMs after 2015

OEM	Country	Outline of New Investment
Toyota	Malaysia	On Jan. 2019, the new Toyota Vios was launched by UMW Toyota Motor from the company's new manufacturing plant in Kawasan Perindustrian Bukit Raja Klang. UMWTT has invested about RM 2 billion. The new plant is capable of producing 50,000 vehicles per year at the moment (initial phase).
	Philippines	On Jan. 2019, Toyota Motor Corp's Philippine subsidiary announced it will invest around one billion pesos (\$19 million) to increase the local content this year for the production of its small sedan Vios, seeking to save business taxes further under the Comprehensive Automotive Resurgence Strategy (CARS) program. They will increase the proportion of Vios parts to be procured locally from the current 52 percent to 58 percent by the end of the year.
	Thailand	In April 2018, Toyota Motor announced plans to build a production base in Thailand for battery packs for hybrid vehicles. A new facility is scheduled to start operations at the beginning of 2020 in the industrial Chachoengsao province as the Japanese carmaker looks to lift hybrid vehicle production in the country.

OEM	Country	Outline of New Investment
Honda	Philippines	At the 2018 Philippine International Motor Show (PIMS), Honda Cars Philippines (HCPI) announced that its seven-seater subcompact SUV (BR-V) will now also be made in the Philippines.
	Vietnam	Honda Vietnam is planning to increase its two wheeler production capacity by 10% by October 2018. The expansion will increase capacity to 275M units per year.
Mazda	Thailand	Mazda Motor Corporation has invested around P10.1-billion in its factory in Thailand, aiming to increase its manufacturing capability of engines and transmissions. The new assembly plant, which is under Mazda Powertrain Manufacturing Co., Ltd. (MPMT), will raise production from 30,000 to 100,000 engine units per year. It will also house the production of the new SKYACTIV-G 2.0 mill, which will be sent to other facilities in Vietnam and Malaysia.
	Malaysia	Mazda Malaysia spent an additional 2.3 billion yen (about RM87 million) to upgrade its facility at the Inokom manufacturing complex in Kulim. The facility in Kulim assembles vehicles for the Malaysian market as well as for export. The current CX-5 has been exported to Thailand and the new one, which will also be assembled in lefthand drive form, will also be exported to the Philippines, Indonesia, Cambodia and Myanmar.
Mitsubishi	Philippines	In Feb. 2018, Mitsubishi Motors Philippines opened a new stamping facility in Santa Rosa, Laguna. The stamping plant will now enable MMPC to produce a maximum 35,000 units of the Mirage and the Mirage G4 per year.
	Indonesia	In Oct. 3, 2018, Mitsubishi Motors has announced to increase the production capacity at Bekasi, Indonesia in response to strong demand for the XPANDER crossover MPV in Indonesia and export markets. The expansion will increase capacity to 220,000(*) units from the current 160,000(*) units by fiscal year 2020. The expansion represents an investment of around 4 billion Yen and will see an extra 800 people employed at the Bekasi plant, taking the total number of staff to 4,100.
	Vietnam	On January 23, Mitsubishi Motors Vietnam Company Limited (MMV) commenced production of the Outlander midsize SUV for the Vietnamese market. The Outlander will be assembled at MMV's Binh Duong plant and sold throughout Vietnam.
Subaru	Thailand	Fuji Heavy Industries (FHI) – the manufacturer of Subaru vehicles – has announced plans to establish a production base and start production in Thailand in 2019.
Suzuki	Myanmar	January 2018, Suzuki expanded its Myanmar operations by opening a new assembly plant dedicated to passenger vehicles in the Thilawa Special Economic Zone. The facility recently doubled its workforce to 200, while annual production capacity jumped from 5,000 vehicles to 12,000 vehicles. Up to that point, the carmaker had invested \$60 million in Myanmar.
Nissan	Thailand	Nissan was granted privileges by the Board of Investment (BoI) on July 25, 2018 to make hybrid EVs based on its e-Power technology and batteries at its plant in Samut Prakan, with an investment worth 10.96 billion baht. Also Nissan plans to localize manufacturing of the new Terra pickup passenger vehicle (PPV) at the Japanese carmaker's plant in Samut Prakan, expecting to serve Southeast Asian demand Nissan's combined production capacity in Thailand is 370,000 units per year.

Source: JICA Expert Team prepared based on press release and JAMA information

2.1.2 Automotive Production and Sales

(1) Overview of Japanese-Affiliated Auto Plants Overseas

About 60 percent of the total number of assembly plants of major Japanese four-wheeled vehicle manufacturers are in Asia (109 out of the total 187 plants around the world). Among the 109 plants, 57 are in the ASEAN region, up from 47 in 2012 (additional 10 plants in only five years), followed by 23 in China, and 12 in India. The Philippines has seven 4-wheel vehicle companies (i.e. Toyota, Mitsubishi, Nissan, Honda, Isuzu, Hino, and Fuso). Many of the manufacturers' assembly plants are in countries, such as Malaysia, Vietnam, and the Philippines. The growing number of plants in these countries indicate that the complementary auto parts supply chain is quickly developing in the ASEAN region.

Table 4 Number of Japanese OEMs' Assembling Factories by Country

Region/Country	4-wheel vehicle	Motorbike	4-wheel vehicle/motorbike	Auto parts
Asia	109 (97)	45 (34)	4 (3)	56 (44)
ASEAN	57 (47)	20 (19)	3 (2)	34 (26)
Thailand	15	4	-	9
Indonesia	15	7	1	15
Malaysia	12	2	-	4
Philippines	7	4	-	4
Vietnam	8	3	2	2
China	23	8	-	19
India	12	7	-	2
Others	17	10	1 (1)	1
Europe	19 (19)	2 (4)	-	4 (5)
Africa	19 (16)	3 (2)	-	-
North America	19 (19)	1 (1)	-	14 (13)
Central & South America	19 (16)	10 (10)	2 (2)	4 (1)
Middle East	2 (1)	-	-	-
Oceania	-	-	-	1 (1)
World Total	187 (169)	61 (51)	6 (5)	79 (64)

Note: Figures in parentheses indicate the number of production factory as of 2012. Some "four-wheel vehicle" and "Motorbike" factories also produce auto parts, while "Auto parts" factory manufactures only auto parts.

Date as of 2017

Source: prepared based on JAMA information.

(2) General Trend of Automotive Production and Sales in Asia

Table 5 Production/Sales Volume of Motor Vehicles by Country

[Passenger Cars + Commercial Vehicles]

(1,000 units)

	2010	2011	2012	2013	2014	2015	2016	2017	CAGR*	
Japan	9,629	8,399	9,943	9,630	9,725	9,176	9,081	9,566	▲ 0.1%	
China	18,265	18,419	19,272	22,117	23,723	24,503	28,119	29,015	6.8%	
India	3,535	3,936	4,145	3,882	3,842	4,126	4,489	4,780	4.4%	
South Korea	4,272	4,657	4,558	4,521	4,525	4,556	4,229	4,115	▲ 0.5%	
ASEAN	Thailand	1,645	1,458	2,454	2,457	1,880	1,913	1,944	1,989	2.7%
	Indonesia	703	838	966	1,117	1,290	1,093	1,103	1,217	8.2%
	Malaysia	568	534	570	601	596	615	545	500	▲ 1.8%
	Philippines	66	54	55	52	97	102	97	127	9.8%
	Viet Nam	106	100	74	94	121	172	236	196	9.1%

Production	2010	2011	2012	2013	2014	2015	2016	2017	CAGR*	
Japan	4,953	4,206	5,365	5,370	5,556	5,039	4,961	5,226	0.8%	
China	18,062	18,505	19,306	21,984	23,492	24,598	28,028	28,879	6.9%	
India	3,040	3,294	3,587	3,242	3,177	3,425	3,669	4,019	4.1%	
South Korea	1,556	1,580	1,542	1,540	1,660	1,833	1,825	1,793	2.0%	
ASEAN	Thailand	778	777	1,415	1,264	843	771	725	872	1.6%
	Indonesia	742	869	1,080	1,196	1,192	954	1,008	1,003	4.4%
	Malaysia	605	600	628	656	666	665	582	577	▲ 0.7%
	Philippines	168	142	157	181	235	311	361	456	15.3%
	Viet Nam	112	111	80	97	134	209	272	251	12.2%

* CAGR: 2010-2017

Source: Marklines, **ASEAN Automotive Federation (Production for Viet Nam Only)

The following section summarizes the general trend of automotive production and sales in key automotive manufacturing countries in Asia: 1) China & India, 2) Thailand, and 3) Indonesia, and the Philippines.

1) China and India

Being the first and second most populated countries in the world with the population of 1.4 billion and 1.3 billion respectively and having experienced a strong economic growth in more than 20 years, China and India have had a steady increase in automotive production and sales. In China, both auto production and sales (including both passenger cars and commercial vehicles) increased from 18 million units in 2010 to 29 million units in 2017 with compound CAGR of 6.8% and 6.9% respectively. Meanwhile, the production in India increased from 3.5 million to 4.8 million and the sales increased from 3.0 million to 4.0 million with 4.4% and 4.1% annual growth rates. In 2016, the India's production volume exceeded that of South Korea.

2) Thailand

With the production volume of 2.0 million units in 2017, Thailand is the leading country for auto manufacturing and auto exports in the ASEAN region. Its production peaked in 2.5 million in 2013 and have seen a drop since then. (For Thailand's trade situation, see 3.2.4). For domestic sales, Thailand is affected by the tightening of credit screening (auto loans) in addition to

stagnating consumer confidence caused by its sluggish domestic economy. Against the production of 2.0 million units, the country’s domestic consumption (sales) is 0.9 million units in 2017, which indicates that Thailand exports slightly more than half of vehicles produced in the country. As discussed in the latter section (see 3.2.4), the Philippines is one of the top export destinations of Thailand; the second major destination for passenger cars and the fourth major destination for commercial vehicles based of export value in 2017.

3) Indonesia

Out of 639 million people living in the ASEAN region, about 260 million people are from Indonesia. Having about 40% share in ASEAN population, Indonesia has an attractive and sizeable domestic market. Indonesia’s automotive production has seen a relatively steady growth over the years; however, its sales has seen a slight drop since 2014. While it was widely believed when the domestic sales that the domestic automotive demand of Indonesia was saturated like that of Thailand, Indonesia’s production continued to expand to cater to the export market. In 2017, the Philippines was the top export destination of passenger vehicles from Indonesia. Noting that the Philippines’ share in the Indonesia’s passenger car exports amounted close to 40%, it is not an understatement that the Philippines’ auto promotion policy may directly affect the course of future for the Indonesia’s auto production.

4) Philippines

The number of vehicles produced domestically in the Philippines have not had a substantial growth despite that the vehicle sales have been rapidly growing from approx. 125,000 in 2008 to 470,000 in 2017. The Philippines now only produces 20% of the total vehicles sold in the country. Despite the slight slow-down of the sales in 2018 after the last-minute purchase rush in 2017 before the introduction of the exercise tax, the automotive sales are expected to continuously increase. It is estimated that the total number of car sales will be between 643,733 and 731,571 by 2022. The Philippines will achieve the grand mark of one million annual car sales sometime between 2025 and 2028.

Table 6 Auto Market Trends in the Philippines (incl. Trucks and Buses)⁷

[Volume of Automotive CKD Sales vs. CBU Imports]

	2008	2009	2010	2011	2012	2013*	2014	2015	2016	2017	2018**
CKD	61,513	64,498	74,984	67,742	71,562	79,169	88,845	98,768	116,868	141,252	79,763
CBU	62,936	67,946	95,283	97,451	111,217	133,112	180,996	225,160	287,183	332,089	322,040
Total	124,449	132,444	170,267	165,193	182,779	212,281	269,841	323,928	404,051	473,341	401,803

[Percentage of Automotive CKD Sales vs. CBU Imports]

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CKD	49%	49%	44%	41%	39%	37%	33%	30%	29%	30%	20%
CBU	51%	51%	56%	59%	61%	63%	67%	70%	71%	70%	80%

Source: CAMPI, AVID, MarkLines Note: * It includes Association of Vehicle Importers and Distributors, Inc (AVID) data from year 2013 onwards ** The production drop in 2018 was due to the stoppage of L-300 (Mitsubishi) and Crosswind (Isuzu), and the sale drop on the same year was due to the introduction of exercise tax.

⁷ The figures of vehicle production and sales are different between Table 5 and Table 6 due to the difference in information sources.

**Box 1 Car Sale Projection and Effects of Excise Tax in the Philippines:
Annual Sales of One Million between 2025 and 2028**

The Project projected car sales trends in the Philippines after the introduction of a new tax system (increase in excise tax and decrease in income tax). Multiple linear regression analysis was applied. Due to data limitation, the data from the last 12 years were used as the base data for the analysis. While noting that the on-linear regression model is useful when using specific explanatory variables for analysis, it should be used to analyze the data covering an extended period, rather than for a short period as in this case (i.e. 12 years). Several OEMs provided the confidential data on their car sales for this analysis. The procedure of analysis is shown in Figure 2.

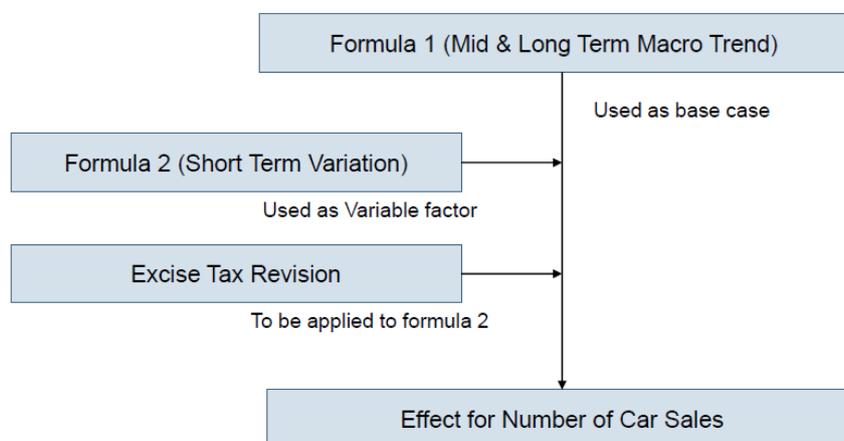


Figure 1 Analysis Flow

- **Formula:** In order to estimate mid- and long- term trends in car sales, the JICA Expert Team created Formula 1, applying constant GDP, percentage of the population ages 15-64, and pump price for gasoline as explanatory variables.

Formula 1		Effect for car sales by each explanatory variable	
Number of Car Sales =		Constant GDP	If constant GDP is increased, average income of employee is also increased which leads positive effect on car sales.
-1,333,586.5	t=-1.3820	Percentage of population ages 15-64	If production population ratio is increased, number of people who have driving license is also increased which leads positive effect on car sales.
+64.4 × GDP (constant, 1 billion peso)	t=3.9680	pump price for gasoline	If gasoline price become higher, car maintenance cost is also become higher which leads negative effect on car sales.
+21,306.3 × Population ages 15-64 (% of total)	t=1.1743		
-189,078.4 × Pump price for gasoline (US\$ per liter)	t=-2.5501		
R2=0.982403739			

- **Formula 2:** In order to estimate the short- term variable factor, the JICA Expert Team created Formula 2 applying compensation of employees, consumer price index, and average car price with current excise tax as explanatory variables.

Formula 2		Effect for car sales by each explanatory variable	
Number of Car Sales =			
888,401.3		t=2.20150	
+2,274.6 × Compensation of employees (current, 1 billion peso)		t=3.36642	Compensation of employees: If Compensation of employee is increased, purchasing power of employee also increased which leads positive effect on car sales.
-14,247.4 × Consumer price index (2010 = 100)		t=-2.32493	Consumer price index: IF CPI increased, desire to purchase luxury goods will decline which leads negative effect on car sales
-283.7 × Ave.CarPrice('000 peso) with Current Excise Tax		t=-1.56551	Average Car Price: If average car price become higher, income tier where cars can be purchased is to be narrowed which leads negative effect on car sales
R2= 0.918345			

As Figure 3 shows, the total number of car sales in 2022 is estimated between 643,733 and 731,571. In case the revised excise tax is applied in 2018 and average unit price of car increases by 9.7% compared to the price with the current excise tax, the number of car sales will decrease to 697,017. In this respect, the effect of excise tax revision is projected to be the decrease in car sales by 340,000 units.

The negative effect of “increase in excise tax” may be balanced out with “reduction of income tax”. Multi-regression analysis results, however, shows that the balancing out by income tax reduction will happen on a limited scale, because as shown in “Formula 2”, the coefficient of “excise tax” is much smaller than those of “compensation of employees” and “CPI”.

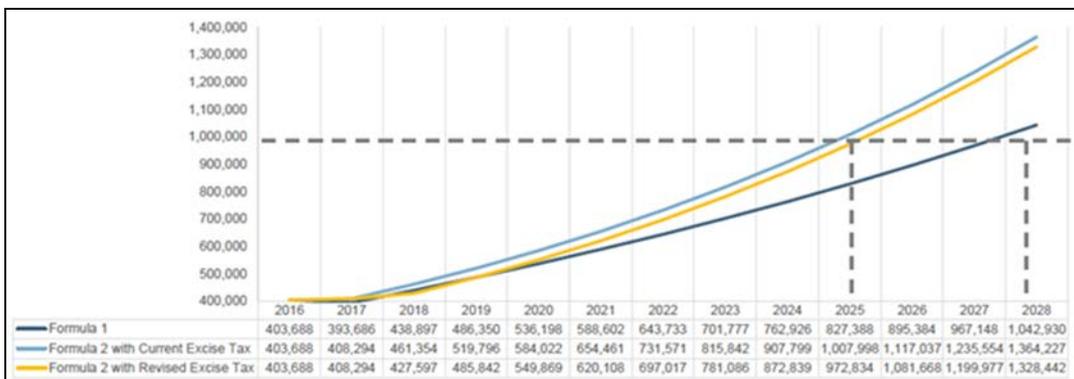


Figure 2 Comparison of Car Sales Estimation based on Formulas 1 and 2

One million annual car sales will be achieved from 2025 to 2028 based on Formulas 1 and 2 and with the aforementioned precondition.

(3) Weak Supporting Industry Issue Affecting the Philippine Auto Industry

It is reported that one of the factors for the Philippines' heavy reliance on imported vehicles is the underdevelopment of supporting industries or the difficulty in purchasing necessary parts and components domestically. According to a survey conducted by the Japan External Trade Organization (JETRO) in 2018, the local procurement rate of the Philippines (28.6%) (manufacturing in general) is lower than not only that of Thailand (57.2%), but also those of Indonesia (42.0%), Malaysia (36.1%), and Viet Nam (36.3%)⁸. Meanwhile, the import percentage of the Philippines (40.2%) from Japan is one of the highest among all countries including non-ASEAN countries (see Table 7).

Table 7 Materials and Parts Procurement by Japanese Companies in Asia and Oceania

(Manufacturing, general)

Country/Region	Number of Answered Companies	Local (%)	Japan (%)	ASEAN (%)	China (%)	Other (%)
Total	1,903	46.9	30.1	8.1	7.5	7.3
China	387	66.3	25.3	3.2	-	5.2
New Zealand	24	65.0	11.4	4.5	6.0	13.0
Thailand	291	57.2	27.0	4.0	5.9	6.0
Taiwan	45	51	35.8	1.6	8.3	3.3
Australia	25	56.0	17.6	3.0	12.4	11.1
India	157	55.6	25.4	7.6	4.2	7.2
South Korea	37	36.5	46.4	3.1	8.2	5.8
Indonesia	204	42.0	30.5	11.5	7.1	8.9
Sri Lanka	10	26.1	26.1	11.4	27.3	9.1
Pakistan	16	36.6	17.3	19.9	11.4	14.8
Singapore	62	22.2	43.2	15.6	9.3	9.8
Malaysia	126	36.1	35.9	11.5	9.1	7.4
Vietnam	383	36.3	34.6	10.3	11.2	7.7
Philippines	55	28.6	40.2	12.4	5.8	13.2
Laos	15	14.0	19.9	35.1	25.3	5.7
Bangladesh	21	24.3	31.5	10.6	22.2	11.4
Hong Kong, Macau	23	15.1	32.7	4.2	35.3	12.7
Cambodia	22	5.8	28.1	33.5	29.6	3.1

Source: "2018 Survey on Business Conditions of Japanese Companies in Asia and Oceania" JETRO

Focusing on the procurement rate of transport equipment (includes automotive), that of the Philippines is still lower than the industrial average; however, there has been a slight increase from a couple years ago. According to a JETRO survey in 2013, the procurement rate in the Philippines was only 23.6%⁹ (Thailand 59.8%, Indonesia 40.0%).

The Project used JETRO's definition or calculation method of local procurement to calculate the local content rate during company visits as a part of GVC analysis. Interview results indicate

⁸ It should be noted that Table 6 prepared by JETRO indicate all kinds of manufacturing.

⁹ "JETRO Sensor" Issue August, 2014, p.59 (In Japanese)

that the local content rate at “purchasing base” ranges from 10 to 50% by company. The average (based on the mode [value that occurs most often]) of their answers was at 50-60% and the local content rate would be lower around 20 to 40% if deeper considerations (i.e. most of lower-level materials are imported) are allowed for. The findings from company visits still need to be refined by comparing to the JETRO survey’s results mentioned above.

In order to assess the issue of low local procurement, the size of local industry was also analyzed. According to Marklines, the number of automotive parts suppliers in the Philippines is 335 companies (including local, Japanese and other FDI or JV companies) (see Tables 8). This number, however, is much smaller compared to Thailand (2,123¹⁰), Indonesia (789) and Malaysia (627). It is also worth noting that the number of suppliers in the Philippines is close to that in Turkey, Hungary and South Africa, even though the production number of CKD in the Philippines is much smaller than these countries (automotive production data¹¹ in 2016; the Philippines: 94,018, Turkey: 1,046,178 Hungary: 490,743, South Africa: 570,890). This suggests that in order to address the issue of underdevelopment in the supporting industry, more comprehensive actions need to be taken, rather than simply working to increase the number of suppliers.

Table 8 Number of Automotive Parts Suppliers in ASEAN and Other Countries

ASEAN		Global (except ASEAN)	
Thailand	2,123	China	17,465
Indonesia	789	Japan	7,837
Malaysia	627	USA	3,762
Philippines	343	India	3,487
Vietnam	274	Germany	2,625
Singapore	246	Mexico	1,336
Myanmar	12	South Korea	1,196
Cambodia	9	UK	967
Laos	5	Brazil	896
		Taiwan	863
		Spain	775
		France	761
		Poland	580
		Czech Republic	496
		Italy	489
		Canada	424
		Turkey	355
		Hungary	328
		Austria	323
		Belgium	307
		Russia	281
		Sweden	255
		South Africa	221
		Australia	201
		Holland	161
		Portugal	146
		Pakistan	133
		Argentina	133

Source: Marklines
(as of February 2019)

¹⁰ The number of automotive parts suppliers in Thailand is the sixth largest in the world.

¹¹ Source: Marklines

2.1.3 Complementary Relationship among ASEAN Countries

According to a 2015 JETRO survey, 42 Japanese transportation equipment companies (55.3%) in Thailand responded that they have alternative production/supply bases outside of Thailand. Out of the 42, 37 companies responded that their alternative production/supply bases are in Japan, 16 in China, and 13 in Indonesia. This result indicates that the production/supply bases in Japan still play important roles and functions in risk distribution and complementary production. It also indicates that alternative production/supply sites have been set up within the ASEAN region in varying degrees; the regional risk distribution structure for the production and supply of parts has been established to some extent.

Table 9 Alternative Production/Supplier Sites by Japanese Automotive/parts Manufacturers

		Outside Country									Other site in the locating country
		Thailand	Indonesia	Malaysia	Vietnam	Philippines	India	China	Japan	USA	
Country of respondent	Thailand	-	13	1	4	2	12	16	37	6	-
	Indonesia	16	-	1	3	3	4	5	22	2	1
	Malaysia	7	6	-	2	0	1	2	9	-	-
	Vietnam	10	11	1	-	1	1	5	20	1	1
	India	32	20	3	3	6	-	15	36	5	-
	China	27	10	3	3	2	8	-	52	18	3

Note: The data shows the number of companies which has "Replaceable production/supply sites".

Source: "2016 Survey on Business Conditions of Japanese Companies in Asia and Oceania," JETRO

According to the same survey, some Japanese parts manufacturers have started positioning India as an export base of the global market for parts. India can benefit from this thrust toward large-scale production, especially in parts where it has a competitive advantage in terms of raw material procurement. There is a possibility that India will increase its significance as a strategic base for exports to the Middle East and Africa alongside the further expansion of its domestic market and development of key infrastructure such as ports and roads.

The growth of auto industries in ASEAN countries and inter-regional auto trade that has expanded in the last 20 years are analyzed in depth in Chapter 3.2.

2.1.4 Auto Electronics Manufacturing¹²

Since it was first mainstreamed in the 1970s, the use of electronic control system in vehicles had increasingly gained its popularity among car makers to improve security, comfort, and basic performance (i.e. driving, turning and stopping) of cars. The figure below shows the three conceptual elements in circles with associated electrical and electronic parts and components indicated above the circles.

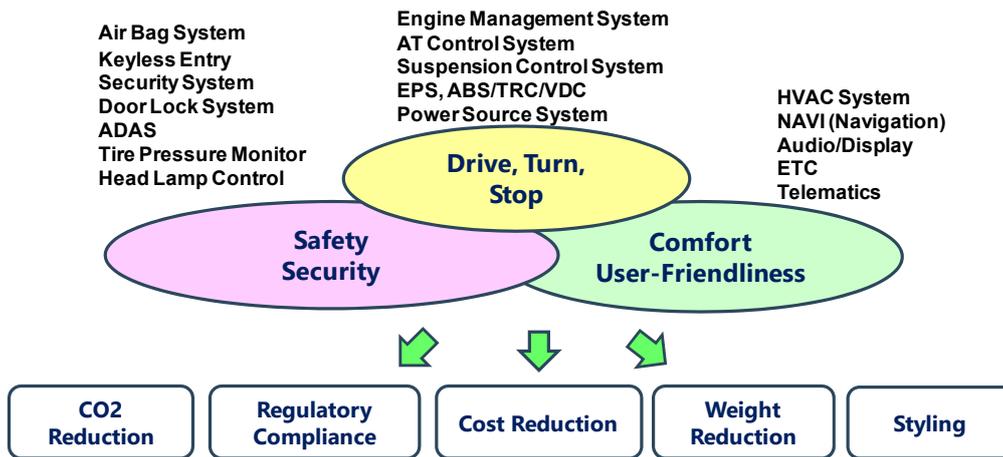


Figure 3 Function and Purpose of Automotive Electronics Parts

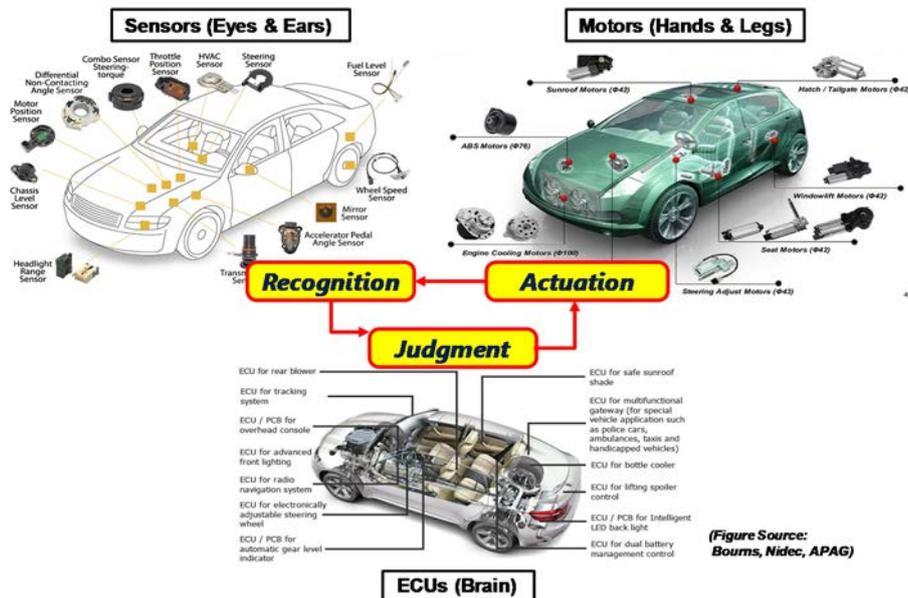


Figure 4 Type of Car Electronics Parts and Their Function

¹² For the detailed discussion of the Present Situation of Autotmovie Electronics and Electrification, refer to Reference Document A-3) and B-2). The reports and presentation materilas which were used in workshops and roudtable discussions held in the Project, further explore the history of auto electronics, the global and regional trend of EV production, and the potential of the Philippines in producing auto electronics products and EVs.

The key functions of automotive electronic components are recognition, judgment and actuation, just like how a human being recognizes certain motion through one of his/her five senses (touch, taste, hearing, eyesight, smell), judges the situation using his/her brain, and reacts to the motion by, for example, using his/her hands.

Generally speaking, the purpose of using electronic parts has two folds: meeting regulations (such as CO₂ reduction, regulatory compliance, etc.), and achieving technical requirements (cost reduction, weight reduction, improvement of styling, etc.). As environmental regulations are increasingly becoming tighter around the world and consumers seek new types of comfort and a greater safety and security, the demand for auto electronic parts are expanding in types and variety. In recent years, in this field, a “mega-supplier” which can produce the total system package has already become a global business leader (i.e. Denso, Aisin, Continental, Robert Bosch, ZF, etc.). Meanwhile, the procurement and manufacturing of individual electronic parts are ordered from electronics manufacturing service (EMS) companies.

Most electronic parts can be mass-produced at one factory in units of million. Since they are small and light, it can be easily distributed and shipped in mass remote locations. Furthermore, many auto electronic parts are manufactured in relatively labor-intensive operation. These characteristics of auto electronics manufacturing suits the Philippines’ conditions. The Philippines is known as one of the leading manufacturers of wire harness and has becoming a strong base for EMS services and manufacturing other electronic parts and components, such as power discrete package, communication modules, and ceramic capacitor.



Source: Bosch Website

Figure 5 Bosch Multipurpose Automotive Camera Made in the Philippines

2.1.5 Recent Policies and Programs on the Automotive Industry by Country¹³

The automotive industry policies of selected ASEAN countries (i.e. Thailand, Indonesia, Malaysia, Viet Nam and the Philippines) are summarized by country in Table 10. In short, the policy directions of Thailand and Indonesia (leading countries in automotive production in the ASEAN region) and the Philippines are as follows: 1) Thailand aims to dominate the ASEAN eco-car market, following its success with pick-up trucks; 2) Indonesia focuses on low cost cars, and 3) the Philippines aims to become a hub for specific models¹⁴.

¹³ See Reference Document B-1) for the detailed discussion on manufacturing industry development policies in the ASEAN Region and Reference Document A-2) for presentations materials on comparative analysis of auto industry promotion policies.

¹⁴ Specific models are promoted by the CARS Program (Vios: Toyota, Mirage & Mirage G4: Mitsubishi)

Under the policies several programs are set in each country. The Philippines is trying to squeeze for the 3rd automotive production hub in ASEAN so that the CARS Program is practically working as the national flagship project spending 1.7% of GDP equivalent finance.

Table 10 Major Programs to Support Industrial Policy by Country

[Thailand]		
<u>Investment promotion project toward auto parts manufacturing in Thailand</u>		
<p>In 2015, Thailand’s Board of Investment (BOI) announced the revision of auto-parts areas that can benefit from investment promotion incentives (No. Sor. 1/2558 on Oct. 27, 2015). The new areas (transmission parts, fuel system, etc.) that investment incentives target are summarized in the table below. The BOI has further classified the parts among each category and added incentives. The aim of this program is to attract auto parts suppliers, which have a wider range of production and a higher grade of technology. By doing so, Thailand aims to further strengthen its automotive industry’s competitive edge.</p>		
<p>Added Incentives Related to Auto Parts Manufacturing (figure indicates project number of BOI's investment promotion program)</p>		
4.8.6	Manufacturing of Transmission parts Sun gear, Ling Gear, Shift Gear, Power Transfer etc.	Exemption of Corporate Tax (5 years)
4.8.5	Manufacturing of Fuel system Fuel pump, Injection Pump, Injector etc..	Exemption of Corporate Tax (5 years)
4.8.7	Manufacturing of Engine system/parts Turbo Charger etc.	Exemption of Corporate Tax (5 years)
4.8.7.2	Manufacturing of Turbo Charger parts Cylinder Head, Cylinder Block, Clunk shaft, Cum Shaft, Connecting Rod, Engine Bulb, Piston etc.	Exemption of Corporate Tax (3 years)
4.8.8	Manufacturing of Safty parts Airbag etc.	Exemption of Corporate Tax (3 years)
4.8.9	Manufacturing of Brake system/parts Blake Booster, Blake Caliper, Blake Master Cylinder etc.	Exemption of Corporate Tax (3 years)
<u>First Car Program</u>		
<p>As the sales promotion program to end users, the "First-car program" has been implemented. The program exempts first-time car buyers from paying taxes. Since the program is about to close, the last-minute demand seems to increase the new car sales.</p>		
<u>xEV related visions and targets</u>		
<ul style="list-style-type: none"> • The government targets Thailand to become the regional hub for electronic vehicles. • According to the Energy Efficiency Plan (EEP) in 2015 by energy ministry, the country targets to sell sum total of 120M units of BEV (Battery Electric Vehicle) /PHEV (Plug-in Hybrid Vehicle) and install 690 charging stations. 		
<u>COP21 (Greenhouse Gas agreement)</u>		
<ul style="list-style-type: none"> • Reduce greenhouse gas (GHG) emission by 20% (Business as Usual: BAU) by 2030 		
<u>Policies</u>		
<ul style="list-style-type: none"> • The government promotes investments to the next generation auto industry (x-EV) as one of the 10 “Thailand 4.0” industries. 		

- BOI announced incentives for investing on xEV. The government has granted tax exemptions on corporation taxes with condition that major parts will be manufactured locally within three years.
- Applications to be made to BOI by 2017 for hybrid (HEV) investment and by 2018 for PHEV/EV investment.
- Tax reduction on commodity tax: 2% reduction for EV, 5% reduction for PHEV&HEV (if the Co2 emission meets under 100g/km)

[Indonesia]

There is no special program to incentivize car manufacturers/ auto parts suppliers. On the buyer's side, there is an incentive system for promoting eco-cars as discussed below:

Tax Reduction for Low Cost Green Cars (LCGCs)

The Indonesian government launched incentives for low cost and low fuel consuming car (Low Cost Green Car) in May 2013. The following are necessary conditions for a vehicle to be recognized as an LCGC.

- Exhaust Volume: less than 1, 200 cc (Gasoline), less than 1,500 cc (diesel)
- Fuel Efficiency: >20km/l
- Mobility: < 4.6m of minimum turning radius
- Local Contents ratio: >80%
- Others: Extravagance sale tax at 10% will be deducted if a vehicle is approved as an LCGC. After the deduction, the sales price will be less than 95 million rupiah without safety facilities such as airbags.

The generous incentives are intended to expand the automotive consumer market base. Through the implementation of the LCGC program, the minimum price of a car became 75% of its original price. In 2017, major rules and regulations on the CO2 emission program and automotive industry promotion will be ratified. These moves by the Indonesian government clearly suggests that the country will continue to target low-cost, green cars as the direction of its short- and medium-term automotive industry development implies.

xEV related visions and targets

- The government announced Low Carbon Emission Vehicle (LCEV) program on August 2018 and made it clear that they will promote xEV including HEV.
- The government is targeting that by 2025, electric cars make up an estimated 20% (400,000 units) of around 2 million units of cars produced domestically.
- Indonesia will ban sale of fossil-fueled vehicles by 2040

Conference of the Parties (COP) 21(GHG agreement)

- Reduce GHG emission by 29% (BAU) by 2030

Policies

- The government announced “Making Industry 4.0” in March 2018 and aims to become a production hub for internal combustion engine vehicles & xEV.
- Import duties on EVs (BEV) parts will be reduced to 5% from current 50%
- The government plans to announce official tax rate for LCEV in the beginning of 2019 (Issue of presidential regulation was extended)
- Chinese makers are planning to invest on a nickel refiner plant and a battery plant in Indonesia Morowali Industrial Park (IMIP).

[Malaysia]

Through the introduction of the National Automotive Policy (NAP) in 2014, the Malaysian government targets Malaysia to become the regional hub for energy efficient vehicles (EEV). The government also envisions that about 85% of vehicles produced in Malaysia will be EEVs by 2020. To achieve this goal, the Malaysian government offers incentives for: 1) domestic assembly/manufacturing of EEVs, 2) sales of locally manufactured EEVs, and 3) domestic manufacturing of EEV parts.

1) Incentives for the domestic assembly/manufacturing of EEVs

Target car type: HVs and EVs

<Incentives>

- No tax for 10 years toward capital expenses
- No corporate income tax for 10 years
- Subsidy on job training and R&D programs the company implements
- Exemption of import duty (the maximum taxation rate at 10%)
- Exemption of excise tax (the maximum taxation rate at 10%)

2) Sales of locally manufactured EEVs

Target car type: Locally manufactured HV and EV

<Incentives>

- Exemption from excise tax by 50%
- Subsidy from the Industrial Adjustment Fund

3) Manufacturing of EEV parts

<Target parts>

- Electric motor
- Battery for HV/EV
- Battery management system
- Inverter
- Air conditioner
- Air Compressor

<Incentives>

- No tax for 10 years toward capital expenses or
- No corporate income tax for 5 years

Upon purchase of a vehicle, the commodity service and excise taxes are levied and the latter accounts for larger percentage. Accordingly, a 50% deduction of excise tax has a rather significant impact resulting in the proliferation of cheap EEVs in the country. From a rate of 60-105%, excise taxes were reduced to 10-55%, reducing car prices by about 25-30%.

EV related visions and targets

The government announced Electric Mobility Blueprint in 2020 and targets to become the regional hub for EEV.

- Introduce 100,000 units of BEV
- Introduce 100,000 units of E bikes

<ul style="list-style-type: none"> • Install 1250 charging stations <p><u>COP 21(GHG agreement)</u></p> <ul style="list-style-type: none"> • Reduce GHG emission by 35-45% (BAU) by 2030 <p><u>Policies</u></p> <ul style="list-style-type: none"> • 100% tax exemption on commodity and import taxes (This tax exemption will end in 2014 for imported models, in 2015 for HEV, 2017 for locally manufactured EV) • The third national car project was announced in June 2018 by the new government. Negotiation with Qatar to invest in this project has started.
[Philippines]
CARS Program (See Box 2 for the Cars Program)
[Viet Nam]
<p>Preparation of road map (master plan) on automotive industry development until 2035</p> <p>The government of Viet Nam approved “1168/QD-TTg Development Strategy of the Automotive Industry in Viet Nam until 2025 and its Vision until 2035.” The Vision indicates the policy to tie up with world-famous automotive manufacturing groups in order to fulfill the demand of strategic vehicles with high development priority as transportation infrastructure. As for passenger vehicles, the Vision indicates that the industry would focus on small and low fuel-consuming cars.</p>

Box 2 CARS Program in the Philippines

The CARS program grants Php 27 billion worth of incentives to three auto companies to boost domestic vehicle production to 700,000 units by 2022 and steer the industry away from importing CBU units in favor of CKD units which are assembled locally, providing jobs and income for workers.

The first two slots in the CARS program, which is designed to encourage local manufacturing of cars, have been awarded to Mitsubishi Motors Philippines Corporation (MMPC) and Toyota Motors Philippines Corporation (TMP) Mitsubishi and Toyota with their respective participating parts makers have put in over Php 11.2 billion in new assembly facilities, mandatory body shell and large plastic parts (making facilities). Of this amount, Php 9.1 billion is eligible for fixed investment support, subject to audit.

In December 2018, Toyota has announced plans to invest another Php 1 billion in 2019 to increase the local content of Vios. This investment is expected to increase body shell localization to 57% through the local production of side member panels. In addition, Toyota is in the process of acquiring production equipment and capabilities for complex plastic parts such as instrument panel and central console. Meanwhile, Mitsubishi Motors has committed to exploring options to export its CARS-enrolled vehicle, Mirage/G4, as well as the L300, in the ASEAN region.

To further push the automotive industry's resurgence, DTI has decided to shift the unsubscribed third slot budget under the program to support the local manufacturing of replacement vehicles for DOTr's Public Utility Vehicle Modernization Program. This is because the market volume requirement of over 200,000 replacement PUV units presents an opportunity to jumpstart the development of the country's commercial vehicle sector.

In the wake of this decision, the proposed eco-PUV program will feature some 15 prototypes developed by potential participants that adhere to Philippine National Standards and those were exhibited to the Philippine Autoparts Expo (PhilAPEX¹⁵) held in November 2017.

The DOTr requested candidate companies to produce 150 units of modern PUV prototypes by December 2017, the N04C, which is compliant with the Euro 4 emission standard (model N04C). However, it might be difficult for the candidate to accommodate to this request; viz. 20 -30 units seem to be the Max for them to prepare by due date.

The DOTr's PUV Modernization Program is seeking to phase out traditional jeepneys in favor of more eco-friendly alternatives featuring global positioning systems, closed- circuit television systems to monitor passengers and the driver, and speed limiters.

Some candidates have its own plant in Laguna (e.g. Hino motors). Its prototypes are expected to cost Php 1.4 million-Php 1.6 million. Right now, the jeepneys are probably owned by the operators or by the drivers themselves. Obviously, the financial support will be necessary because of their financial limitations otherwise the program will not be successful.

The government is showing an intention that they will support the Development Bank of the Philippines, with financing schemes that will feature a 5% down payment and a 6% interest rate, payable within seven years. There are schemes that will make the transformation lighter, obviously to make it more acceptable but it is the drivers themselves.

¹⁵ PhilAPEX, a joint project of the Board of Investments and the Philippine Parts Makers Association, Inc. (PPMA), showcased local manufacturers of auto parts and about 16 prototypes of modernized PUVs from various auto companies.

Table 11 Automotive Industry Policy of Selected ASEAN Countries

	Current Major Policy	Description of the Policy	Notes on the Current Situation
Thailand	Second Term Eco-Car Policy (2013)	6-year exemption on corporate income tax etc if the party complies with Euro 5 (European emission standard); satisfies certain fuel efficiency (23.3Km / liter); has 1300cc low lower displacement gasoline car/1500cc or lower diesel car; starts production by the end of 2019; and reaches 100,000 units/year or more production after 4 years from the start of production.	Japanese manufacturers have completed the 1st and 2nd rounds of the investment applications. It is expected that the investment in this area will continue, including the auto parts industry. Despite strict conditions, a total of 10 companies including 6 Japanese applied for the incentive by the application deadline (end of March 2014).
	Industry Cluster Policy (2015)	Incentives include max. of 13 year of income tax cut (tax exemption for the first 8 years and 50% tax reduction for the next 5 years) and import tax exemption on machinery and equipment. To qualify for the incentives, one must apply within 2016 and fulfill the conditions set by the Board of Investment of Thailand.	Selective auto-parts industry (e.g. engines, safety systems, tires) located in seven provinces near Bangkok (incl. Ayutthaya and Chonbur) were targeted in the Super Cluster Policy that can qualify for the incentives.
Indonesia	Low Cost Green Car (LCCG) Policy (2013)	Exemption d from the luxury tax (10% for small cars below 1500cc displacement), if the vehicle satisfies standards such as: price requirement (95 million rupiah (approx. 790 thousand yen at 1 rupiah + 0.0083 yen)); fuel efficiency (20km or more per 1 liter), and displacement (1200cc or lower for gasoline car, 1500cc or lower for diesel car). Unlike the Eco-car policy of Thailand, there is no defined standard for exhaust gas in Indonesia.	The local content requirement of parts is set at 80%. Indonesia targets to become a major location for low cost cars including parts production.
Malaysia	National Automotive Policy (NAP 2014)	The Policy sets pillars such as the country to become a regional base for Energy Efficient Vehicle (EEV) production as well as to expand its automobile and auto parts exports at a large scale. * For EEV production promotion, it sets an ambitious target of having 85% of locally produced vehicles to be EEV by 2020. One of the main measure include extending tax exemptions on import and commodity taxes for locally assembled EVs (this incentive was originally applied to HV and EVs until the end of 2013) * For export promotion, the policy targets to increase the exports of automobiles to 250,000 units (10 Billion Ringgit) by 2020, from 20,000 units in 2013. It also targets to increase the total car production to 1,250,000 units by 2020.	The Malaysian Government identifies that the protection of the domestic automotive industry and the provision of incentives for national car manufacturers as policy priorities. For example, while the discussion to abolish the Approved Permit System that limits the volume of car imports has been underway, its enforcement has been postponed time to time; the situation of Bumi (Malay) dealers being practically the only ones who can have the AP permit is continuing. Moreover, commodity tax rates of vehicles are determined based on local procurement rates of parts and materials used; for imported vehicles, the commodity tax, which ranges from 60% to 105%, is levied on top of the import tax.
Philippines	Comprehensive Automotive Resurgence Strategy (CARS Program 2015)	Max. of 2.7 million pesos (approx 64.8 billion JPY Yen, 1 peso = 24 JPY) in 6 years to support manufacturers. The program aims to expand the domestic production of vehicles to 600,000 units during its support period (six years).	The incentives under the program are available for three models. For three slots, Toyota Vios and Mitsubishi Mirage have already been selected.
Vietnam	Vietnam Automotive Development Strategy towards 2025 and Vision for 2035 (2014) Action Plan for Automobile and Auto-Parts Development (2015)	These policies provide: stabilizing of automobile-related taxes and fees, streamlining of special consumption taxes for locally produced and imported cars, and reduction of tariff on auto-parts and accessories that cannot be locally produced. Furthermore, in order to promote local production, these policies have added the production of automobiles and auto parts production in the government's investment priority item list and simplify procedures for export processing suppliers to export/import/transport parts and accessories.	Specifies of taxation and procedural changes and details of the incentives are yet to be announced.

2.1.6 Moves of Industry Players by Country

Under above-discussed policies and programs in each country, there are various moves by OEMs, auto parts suppliers and car buyers in response to the government's incentive packages shown above. The following is the summary of market responses. The significant movement of industries are elaborated by country as the followings.

- Thailand : Manufacturing of labor-intensive parts will be transferred to neighboring countries.
- Indonesia: Increase in auto exports is on par with Thailand.
- The Philippines and Viet Nam: affected by the moves of these two countries

(1) Thailand

Since 2007, Thailand has been providing incentives (e.g. corporate income tax reduction and exemption) for the production of eco-cars. In 2013, it started accepting applications for the second round of incentives with stricter performance criteria in areas such as exhaust gas emission. Auto manufacturers, such as the General Motors (GM), are reviewing their investment plans. If revised investments are carried out, Thailand has the potential to become a key regional export base for small eco-friendly economy cars (in addition to pick-up trucks). Since 2012, companies operating in Thailand have started transferring labor-intensive processes and parts production to neighboring countries such as Cambodia and Laos. As mentioned earlier, this trend is called "Thailand plus One". Some of the major companies that followed suit include wire harness manufacturers (Yazaki and GS Eletech), seat covers (Toyota Boshoku) and sensors (Denso).

(2) Indonesia

Considering the medium to long-term growth of domestic demand, automobile manufacturers have been strengthening their local production capacities. The growth of the local market, however, has hit a plateau and it is expected that the production capacity has surpassed the demand for the meantime. Meanwhile, automobile exports are growing in major destinations such as Saudi Arabia and the Philippines. Parts manufacturers have started production for both domestic and export markets using the same factories. For example, Denso is producing 10 types of products to fulfill both domestic and overseas demands at its third plant, built in 2014. Products produced include spark plugs, which are considered as strategic export items, and other products which used to be produced in Thailand but are now being produced locally¹⁶.

According to the Indonesian Auto Manufacturers Associations (GAIKINDO), the domestic market is projected to reach sales of two million units by 2020. This projection may be difficult to achieve given that the market has shrunk in the past two to three years. Meanwhile, automobile exports have been steadily increasing, and Indonesia has been positioned as one of major OEMs' export bases. (For example, Toyota considers its production plants in Indonesia for both domestic and export production.) The Philippines is the second largest export destination for auto exports from Indonesia after Saudi Arabia.

¹⁶ Products competing with Thailand are directed toward domestic demand in Indonesia, reducing its dependence on factories in Thailand.

(3) Viet Nam and the Philippines

For Japanese auto parts manufacturers, labor-intensive manufacturing processes from Japan and China may be transferred to countries with low labor costs, such as Viet Nam and the Philippines. These countries are seen as good options to transfer labor-intensive manufacturing processes as well as bases to supply parts to Thailand and Indonesia, where major automobile manufacturing plants are located. It appears that Viet Nam will strengthen its position as an export base for labor-intensive parts manufacturers as the Trans-Pacific Partnership (TPP) is expected to take effect.

Among Viet Nam's exports to the ASEAN region, 80% went to Thailand. Another notable characteristic is that Vietnamese auto parts exports to the U.S. and Mexico are relatively high (10%). In 2017, 34% of the Philippines' auto parts were exported to key ASEAN countries (Thailand, Indonesia, Malaysia, and Viet Nam), mostly to Thailand (16%) and Indonesia (7%). Meanwhile, 40% of Vietnamese auto parts exports were to Japan (top export partner) and only 10% were to the ASEAN 10. In the Philippines, the biggest auto parts export item is wire harness; however, the exported volume of wire harness peaked in 2013 and has seen a slight decline since. This trend is continuing; labor intensive industries are seeking countries with cheaper labor costs than the Philippines. (see 3.2.3 for detailed discussion on the Philippines' auto parts trade).

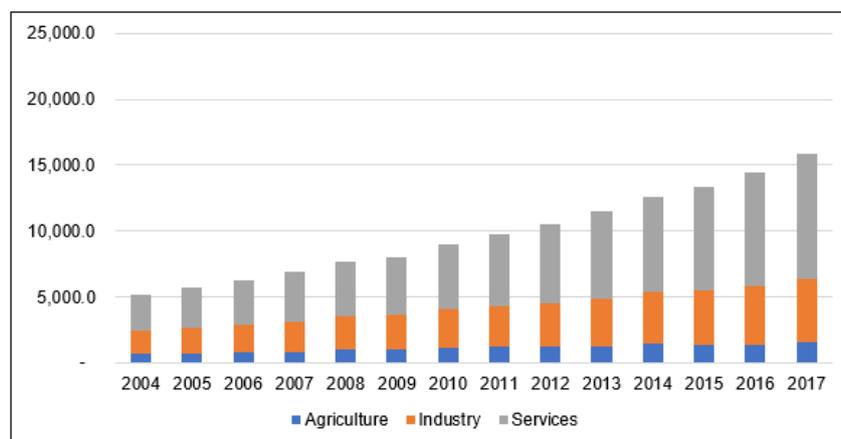
2.2 Present Situation and Challenge for the Philippine Automotive Industry

2.2.1 Socio-economic Conditions of the Philippines

(1) Overview of the Economic Situation in the Philippines

1) GDP and GDP per Sector

In 2017, the Philippines' GDP reached Php 15.8 billion. The industry sector (wherein the manufacturing sector is accounted for) contributes to 31% of the total GDP as of 2018. Over the 2006-2017 period, the country's industry sector recorded the fastest growth of 7.2%. Manufacturing is still expected to grow at a constant pace, coming from the electronics industry (for exports).

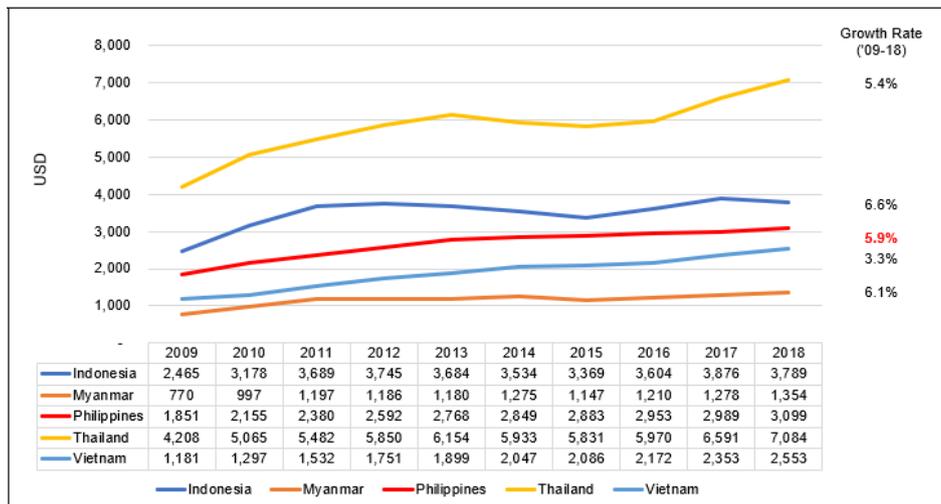


Source: PSA

Figure 6 GDP of the Philippines by Sector
(in Php billion, 2004-2017, current values)

2) GDP per Capita

The Philippines' GDP per capita in 2018 almost reached US\$ 3,100, with a CAGR of 5.3% from 2009 to 2018. GDP per capita is foreseen to grow at 3.5% on medium-term and 4.0% on long-term. It is said as a famous quotation that per capita US\$ 3,000 is turning point of sales from commercial vehicle to passenger vehicle and a sign of popularization of automotive.



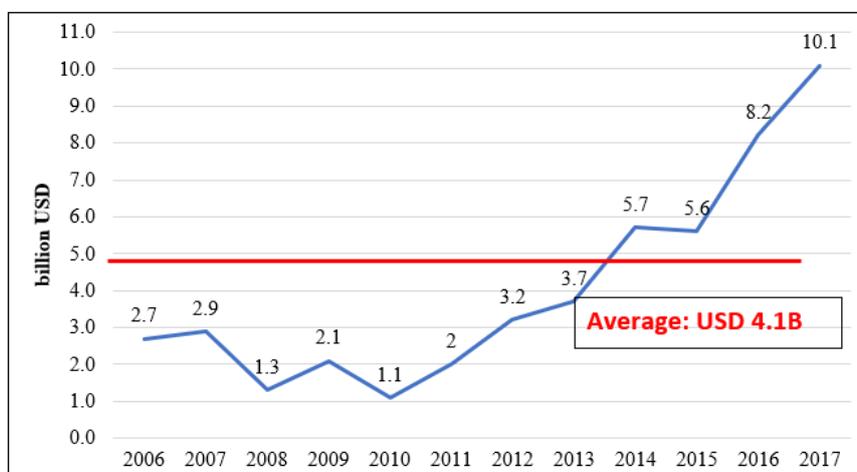
Source: IMF, NEDA,

Note: Forecast is based on NEDA's GDP growth rate forecast with 2018 contribution ratio per industry.

Figure 7 Comparison of GDP per Capita among ASEAN Neighboring Countries (in US\$)

3) Foreign Direct Investments

The average amount of approved FDIs from 2006 to 2017 is US\$ 4.1 billion. As seen in the figure below, the FDI inflow to the Philippines decreased significantly in 2008, which could be a result of the US budgetary crisis for that year; however, it had a quick recovery in 2009 and recorded a high figure of US\$ 3.2 billion in 2012. In this year, FDIs came from the US, Australia, the Netherlands, and the British Virgin Islands; in terms of industries, the FDI inflows directed primarily toward the manufacturing (55% of total FDI in 2012).



Source: World Bank Data

Figure 8 FDI Influx to the Philippines (in US\$ billion, 2006-2017)

The accumulated FDI inflow to the Philippines is smaller than other ASEAN countries; it is about one third (1/3) of Thailand, Malaysia and Viet Nam. Several factors have contributed to this outcome, such as the perception of unstable governance, insufficient infrastructure to supporting industries, foreign capital regulations, and restrictive laws and regulations among others.

Table 12 Comparison of Actual Inflow of FDI among Neighboring ASEAN Countries

Country	FDI Actual Inflow (accumulated from 2006-2017, US\$ billion)	Philippines = 1
Singapore	623	13.0
Indonesia	177	3.7
Malaysia	114	2.4
Vietnam	107	2.2
Thailand	103	2.1
Philippines	48	1

Source: IMF, NEDA

(2) Overview of Social Improvement and Conditions

1) Labor Force in the Philippines

The Philippines' population exceeded the 100 million-mark in 2014; the country has the second largest population in ASEAN and the 12th largest in the world. As the country's population continues to grow, the Philippines faces a demographic window of opportunity for economic growth or so-called demographic dividend. The window of opportunity will continue to present an opportunity for the Philippines until 2062, compared to 2031 for Thailand, 2044 for Indonesia, and 2034 for China¹⁷.

Table 13 Demographic Dividend

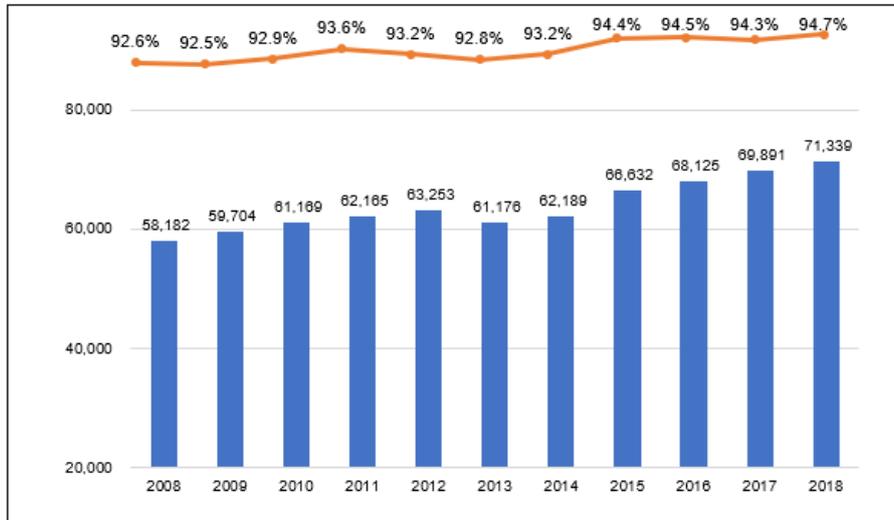
Country	Population (2015, million)	Ending Year of Demographic Dividend	
		1) and 2)	2)
Philippines	101.8	2050	2062
Thailand	67.4	2014	2031
Indonesia	255.7	2026	2044
Malaysia	30.7	2040	2050
Vietnam	93.4	2016	2041
China	1,401.60	2010	2034
Japan	126.8	1992	2005

Source: JETRO Sensor (2015)

Among slightly over 100 million people in the Philippines, those who belong to the working-age group is approx. 71.4 million. The Philippines's unemployment rate improving from 7.4% in 2008 to 5.3% in 2018. Underemployment is, however, still a challenge with 16.4% of the working

¹⁷ Kohei Shiino, "World: Promising Market based on Demographic Dividend" JETRO Sensor, March 2015

population is reported to be underemployed.

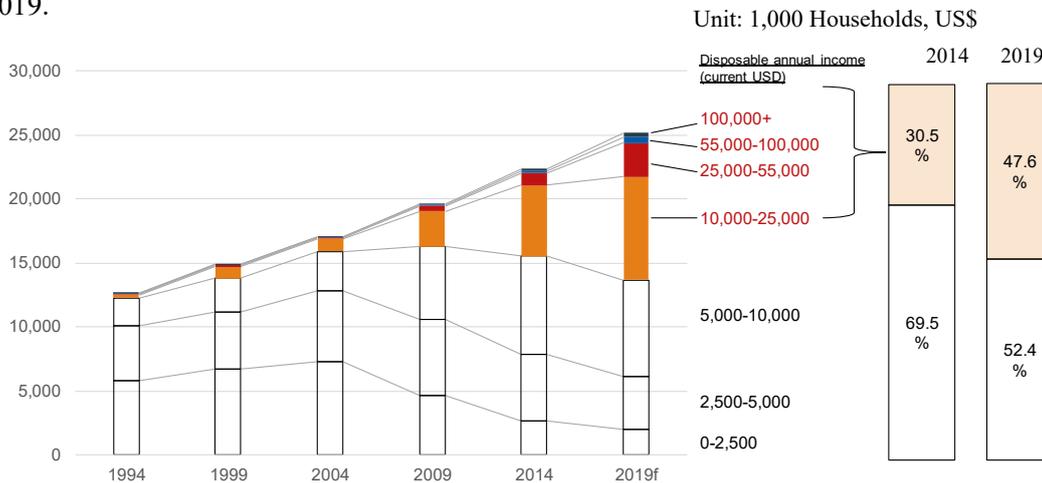


Source: World Bank

Figure 9 Labor Force Population¹⁸ and Employment Ratio (in thousands, 2008-2018)

2) Middle-Class Population

Middle-class population greatly affects the domestic auto sales; thus, it is important to understand the future forecast of the middle-class population increase. For this purpose, *middle class* refers to household with more than US\$ 10,000 disposable annual income, and it amounts to 30.5% of the total households in 2014. Over the 1994-2014 period, the number of middle-class households increased by 12.3% in CAGR. It is foreseen to grow to 47.6% of the total households by 2019.



Source: Euromonitor; Presentation of figures are based on NRI analysis

Figure 10 Middle Class Population and Disposable Annual Income

¹⁸ PSA had a change in methodology in computing for the labor force population in 2005, which affected the figures starting 2006. Labor force participation and other labor indicators will be comparable post-2005. In addition, starting January 2007, PSA's estimates were based on 2000 Census-based projections. Appendix contains the notes on methodologies of PSA census and survey reports.

2.2.2 Automotive Production and Sales Trends

In the ASEAN region, all OEMs tend to promote intensive production of specific models in each country (i.e. Thailand: pickup trucks and passenger cars, Indonesia: minivans etc.); however, the models produced in the Philippines are also manufactured in other ASEAN countries.

Table 14 Production Number of Vehicles in the Philippines by Model

Brand	Model Name	Units	Production countries <i>(Country name with underline is the production hub for each model)</i>
Toyota	Vios	33,173	Philippines, <u>Thailand</u> , <u>Indonesia</u> , Viet Nam, Taiwan, China
Toyota	Innova	17,011	Philippines, <u>Indonesia</u> , Malaysia, Viet Nam, Taiwan, India
Mitsubishi	Mirage	No data ^{1/}	Philippines, <u>Thailand</u>
Mitsubishi	L300	9,841	Now produced in the Philippines and Indonesia (In the past: <u>Japan</u>)
Mitsubishi	Adventure	6,981	Now produced in the Philippines only ^{2/}
Honda	City	8,732	<u>Japan</u> , Philippines, <u>Thailand</u> , <u>Indonesia</u> , Malaysia, Taiwan, China, Brazil
Isuzu	Crosswind	4,096	Philippines, <u>Indonesia</u> , Malaysia, India, Russia
Isuzu	D-Max	3,116	Philippines, <u>Thailand</u> , Malaysia, China, Turkey, India, South Africa
Nissan	Almera	1,739	Philippines, <u>Thailand</u> , Indonesia, Malaysia
Nissan	X-Trail	691	<u>Japan</u> , Philippines, <u>Thailand</u> , Indonesia, Malaysia, China, Taiwan, Russia, South Korea
Nissan	Patrol	173	<u>Japan</u> , Philippines, Morocco, Pakistan, South Africa

^{1/} Production started in 2017 ^{2/} In the past: Indonesia, Malaysia, Taiwan, China, South Africa ** Production unit data: in 2015

Source: JICA Expert Team

Toyota remains the most popular vehicle brand in the Philippines; it accounted for seven of the top ten best-selling vehicles in 2017. In contrast to previous years, however, Toyota Fortuner was the best-selling model, ending Vios' decade long dominance of top spot. The reason for this was the looming increase in automotive excise tax, which took effect in January 2018. Moreover, the increased excise tax proved to be the biggest market driver in 2017; light commercial vehicles (SUVs, MUVs, Vans and Pick-Ups) were eight of the top ten best-selling vehicles of the year. To preempt incurring higher prices, many consumers rushed to purchase their vehicles, particularly LCV's, before the imposition of new excise taxes.

Notably absent among bestselling vehicles is Mitsubishi Mirage/G4. Consumers likely preferred to purchase Mitsubishi's SUV, Montero Sport, over Mirage/G4 to again avoid higher prices due to excise tax increase on that year.



Source: Figure: Autoindustriya 2018 Statistical data: CAMPI, AVID

<https://www.autoindustriya.com/auto-industry-news/philippines-10-best-selling-cars-in-2017.html>

Figure 11 Top 10 Sales Models and its Origin Countries of the Philippine Market in 2017



Photos (Left: Personal Use, Right: Taxi): taken by the JICA Expert Team

Figure 12 Mitsubishi Mirage G4 in the Philippines

MMPC, the other beneficiary of the CARS program, had started the production of Mirage G4 (target model of the CARS program) in February 2017. MMPC plans to switch all production of Mirage for the Philippine market from Thailand. At this moment, MMPC imports most Mirage parts from Thailand; however, the company plans to increase domestically produced parts step by step¹⁹. MMPC will discontinue the production of Adventure because this model does not conform to the Philippine new Euro 4 emissions regulation.

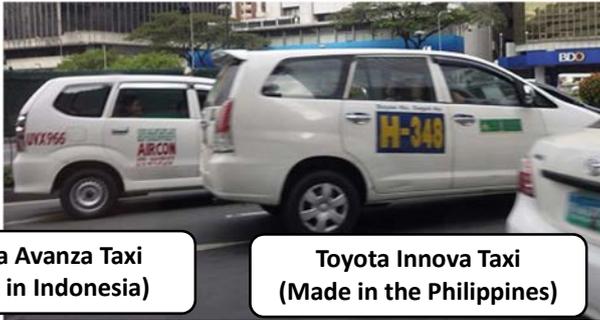
Currently, most Philippines domestic production models are used as “people mover”, such as taxis and minibuses: Toyota Vios (passenger car and taxi), Mitsubishi L300 (1-ton truck, mainly used as a minibus in the Philippines), Mitsubishi Adventure, and Isuzu Crosswind (Asian Utility Vehicle: AUV) is mainly used for minibus in the Philippines. Honda and Nissan²⁰ are mainly producing passenger cars.

¹⁹ According to the interview of MMPC in October 2016.

²⁰ Nissan's Philippine plant is operated by a Taiwanese company, Yulon Motor. Yulon Motor has a group company namely, China Motor Corporation (CMC) in Taiwan. Yulon is affiliated with Nissan, while CMC is affiliated with Mitsubishi Motors. Mitsubishi Adventure was produced in the CMC plant in Taiwan as “Mitsubishi Freeca” until 2008.



**Toyota Vios Taxi
(Made in the Philippines)**



**Toyota Avanza Taxi
(Made in Indonesia)**

**Toyota Innova Taxi
(Made in the Philippines)**



**Mitsubishi L300 Minibus
(Made in the Philippines)**

Photo: Taken by the JICA Expert Team

Figure 13 Examples of Philippine-made Vehicles used as “People Mover”



Photo: Taken by the JICA Expert Team

Figure 14 Example of Philippine-made Honda City as Personal Use

2.2.3 Automotive and Auto Parts Trade

The structure of the Philippines' auto and auto parts trade has gone through a dynamic transformation in the last 20 years. The majority of vehicles sold in the Philippines was once assembled domestically; however, only 20% of the cars sold in the Philippines are now assembled domestically. The reversal of CKD and CBU ratio in the last two decades and the growth of the car sales has transformed the Philippine auto industry from once a trade surplus industry into a trade deficit industry.

The Philippines' auto trade has had a moderate expansion in the last 20 years; its exports increased from US\$ 1.4 billion in 2001 to US\$ 4.2 billion in 2017 and its imports increased from US\$ 0.9 billion in 2001 to US\$ 8.0 billion in 2017. The CAGR of the Philippines' auto exports during the period was 7.2%, while it is slightly higher than the world's average 6.4%, it is much lower compared to countries such as Thailand (16.5%), Indonesia (10.7%), and Viet Nam (28.9%).

The Philippines still has trade surplus in the auto parts segment since certain auto parts such as wire harness and manual transmission produced in the Philippines are well linked to the auto global supply chain and they are exported in a large quantity to production hubs in the ASEAN region, Japan, and the USA. With the expansion of the domestic auto market, the imports of auto parts are also growing at a much faster speed than that of exports. As many auto companies, especially Japanese manufacturers, set up their production sites closer to the ASEAN market, auto supply chains have become more complicated and the share of ASEAN countries in the Philippines' exports and imports have increased drastically. The detailed analysis of the Philippines auto trade is discussed in Chapter 3.2.

2.2.4 Tax System

Passed in December 2017, Republic Act (RA) 10963, or Tax Reform for Acceleration and Inclusion (TRAIN), reformed automotive excise as well as the selling price brackets that corresponds to each respective excise tax. New excise taxes are shown in Table 15.

Under the new tax system, more affordable vehicles will experience increased post-excise tax prices as opposed to luxury vehicles. For instance, a vehicle priced at Php 1 million will have post-tax prices of Php 1,092,000 and Php 1,100,000 under the old and new systems, respectively. Post-tax figures show roughly a 2% price increase. On the other hand, a luxury vehicle priced at Php 3 million will have post-tax prices of Php 4,052,000 and Php 3,600,000 under the old and new systems, respectively. In contrast to the previous case, application of the new tax systems shows an 11% decrease on post-tax price of luxury vehicle. Thus, consumers of the more affordable vehicle segments will bear majority of tax burden relative to automotive excise taxes.

Pick-Ups, trucks, jeepneys/jeepney substitutes and purely electric vehicles are exempted from excise taxes. Hybrid vehicles, meanwhile, are only subject to 50% of applicable excise taxes.

TRAIN does not include any provision for increases in 2019 automotive excise tax. As of January 2019, DOF continues to lobby Congress to finalize and pass the second tranche of automotive excise tax increases.

Table 15 Comparison of the Current and New Excise Tax on Automobiles

Current System		New System (RA 10963: Effective 1 January 2018)	
Up to Php 600,000	2%	Up to Php 600,000	4%
Php 600,000 to Php 1,100,000	Php 12,000 + 20% in excess of Php 600,000	Over Php 600,000 to Php 1,000,000	10%
Php 1,100,000 to Php 2,100,000	Php 112,000+ 40% in excess of Php 1,100,000	Over Php 1,000,000 to Php 4,000,000	20%
Above Php 2,100,000	Php 512,000 + 60% in excess of Php 2,100,000	Over Php 4,000,000	50%

2.2.5 Debate on the Present PEZA System

Concerning the tax system in the Philippines, the current regulations on PEZA companies have more detrimental effects on the Philippine automotive industry. PEZA companies are legal bound to supply most of their products for overseas markets; they can only supply up to 30% of their total sales to the Philippine domestic market. This limitation negatively affects the development of the domestic auto-parts supply chain in the Philippines. Most PEZA companies do not have expansion plans to cater to the domestic markets even though there has been increasing domestic demands for auto parts.

The following are some of the cases illustrating how this limitation has affected the Philippine automotive industry.

(1) Company A (Japanese supplier to a major semiconductor manufacturer in the Philippines)

Company A is a PEZA registered exporter/manufacturer that produce supporting parts for electrical component manufacturers. One of its major clients is planning to increase its production capacity of electrical components for the automotive industry and Company A is also considering increasing its production capacity. Company A has little interest in the automotive manufacturing industry in the Philippines as its clients are pure exporters registered to PEZA.

(2) Company B (local suppliers outside of PEZA)

Company B is a local supplier outside of PEZA. When it attended the Manufacturing Summit, Company B in its capacity as a representative of the local manufacturers association commented that the current incentive system puts too much weight on exports and foreign investments, although the domestic market sales by PEZA companies are increasing dramatically. Its comment was followed by a request to the Philippine government to consider some of the incentives given to PEZA companies to be also applicable to local manufactures.

(3) Company C (Japanese wire harness manufacturer)

Company C is a Japanese wire harness manufacturer, as a PEZA manufacturer. When its local sales had been over 30% of their total sales for some years, it had to restrain its local sales in order to comply with the 30% domestic sale condition and avail itself to the incentives given to PEZA companies.

As of May 20, 2019, the congress has been discussing on another tranche of tax reform bill,

which is known as “TRABAHO Bill (Tax Reform for Attracting Better and High-Quality Opportunities)”, also known as TRAIN 2. Trabaho bill cuts corporate income tax to 20% while rationalizes fiscal incentives. As for the latter, the bill is proposing the removal of the preferential 5% gross income earned currently offered by Investment Promotion Agencies such as the Philippine Economic Zone Authority (PEZA).

In a survey conducted by the Japanese Chamber of Commerce and Industry of Cebu, Inc in May-June 2018, 27% of its PEZA registered members may consider closing down their businesses, 17% of them may relocate to other countries, or 29% of them may scale down their production. Also, 85% of them may stop or consider stopping their investment. On the other hand, if the incentives are retained, 85% of the respondents will still choose the Philippines as a venue for expansion.

Considering its strong negative impact on the sentiment of Foreign Direct Investment, it is advisable to the Philippines government for their careful discussion and communication on possible amendments of their fiscal incentives.

2.2.6 Development of Micro, Small and Medium Enterprises (MSME)

(1) Current State of MSMEs in the Philippines

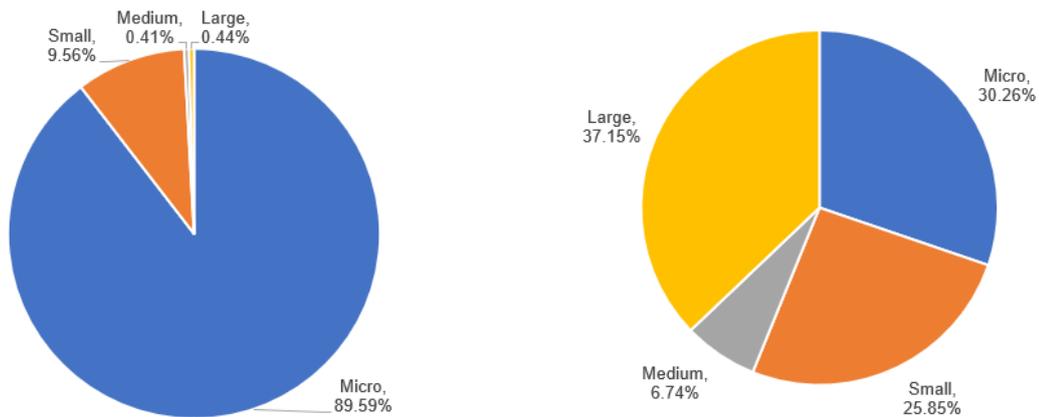
The Philippines has two definitions for MSMEs: based on employment size and asset size. Currently, government agencies (e.g. PSA) have been using employment size as the main barometer in classifying enterprises. However, there are efforts to shift the classification according to asset size, since this will be more reflective of the state of SMEs in the Philippines.

Table 16 Two Definitions of MSMEs in the Philippines

	Employment Size	Assets Size
Micro enterprises	1-9 employees	Php 3 million or less
Small enterprises	10-99 employees	Php 3 million to Php 15 million
Medium enterprises	100-199 employees	Php 15 million to Php 100 million
Large enterprises	200 or more employees	Php 100 million and above

Source: Magna Carta of SMEs in the Philippines

Based on the List of Establishments in 2017, MSMEs comprised 99.6% of the total number of registered establishments in the Philippines. As seen in the figure below, micro enterprises account for 828,436 enterprises (or 89.5% of the total business establishments), while 88,412 are small enterprises (9.6%) and only 3,829 are considered as medium enterprises (0.4%). In terms of employment, 62.9% of the total employees (or approx. five million people) are employed by MSMEs.

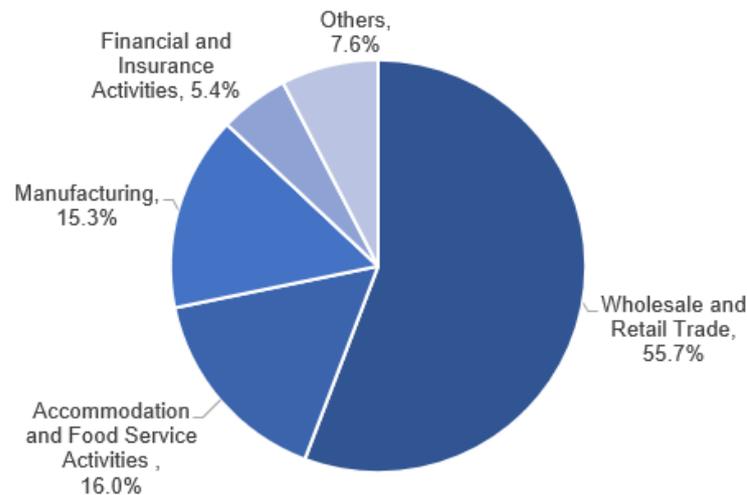


Source: PSA List of Establishments, 2017 (Figures are sourced through DTI’s MSME Development Plan 2017-2022)

Figure 15 Number of MSMEs and Share of Employment (2017)

In terms of regional distribution, majority of the MSMEs are in the National Capital Region (NCR), CALABARZON, Central Luzon and, Central and Western Visayas. This is a testament to the contribution of MSMEs as among the more economic vibrant regions in the Philippines.

As seen in the figure below, MSMEs are leaning toward the service sector, particularly in the “Wholesale and Retail Trade and Accommodation and Food Service” segment. Only 15.3% of MSMEs are in the manufacturing industry. This could indicate a challenge for MSMEs in providing gainful and better paying employment activities for the people. Types of jobs done by MSMEs may not be high value-added work and employment is only based on contractual service.



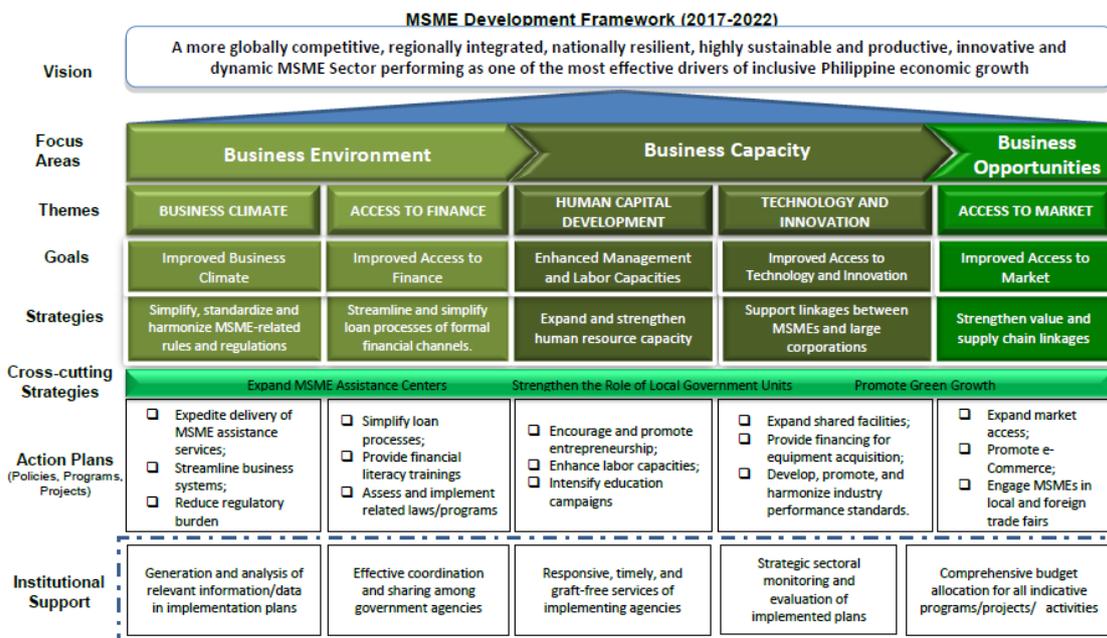
Source: PSA List of Establishments, 2017 (Figures are sourced through DTI’s MSME Development Plan 2017-2022)

Figure 16 MSMEs Industry Distribution (2017)

Such a predicament calls for improving the competitiveness of MSMEs and empowering them to create a higher economic value. Given the current state, MSMEs may have significant challenge of being included in value chain systems. This requires intensive government supports. At present, there is no statistical data on specific involvement of MSMEs in the auto industry.

(2) MSME Development Plan 2017-2022

Prevailing MSME Development Plan 2017-2022 continues to build on the success of its precedent. Aside from competitiveness, the themes of resiliency, sustainability, productivity and innovation are part of the current MSME development plan.



Source: DTI MSME Development Plan 2017-2022

Figure 17 Overview of MSME Development Framework (2017-2022)

A notable development of the MSME Development Plan 2017-2022 is its consideration of AmBisyon Nation 2040²¹ (Executive Order [EO]. No. 5s. 2016). This also considered the current administration's 0+10 Point Socioeconomic Agenda in bringing economic development; other policy documents such as the Philippine Development Plan 2017-2022, ASEAN Strategic Action Plan for SME Development 2016-2025, and APEC (Asia-Pacific Economic Cooperation) Strategy for SME Development 2017-2022 also places an emphasis on MSME development.

As summarized in the figure above, the current vision of the MSME Development Framework call for MSMEs to move up the value chain—in terms of competitiveness with overseas SMEs, sustainability in operations, and innovation in products and services.

(3) Specific Programs for MSMEs

The government has also implemented specific programs for MSMEs. Among these, four are notable for manufacturing industry.

1) Shared Service Facility Program

Shared service facilities (SSF) are used to improve the quality and productivity of MSMEs and

²¹ Manufacturing is one of priority sectors in the document. Transportation facility, including automotive/auto parts industries is the sub-segment of the sector specified in the vision.

the establishment of business resource centers. SSFs would be implemented to address the gaps and bottlenecks in the value chain, particularly in the manufacturing industry. SSFs encourage the graduation of MSMEs to next level to enable their integration in the global supply chain.

Implemented in 2013, the SSF project of DTI received a large funding (Php 770 million for FY 2013 and FY 2014), as seen in the table below. However, the appropriated budget decreased to only Php 70 million in 2017.

Table 17 DTI’s Appropriated Budget for Shared Service Facilities

Fiscal Year	Appropriated Budget
2013	Php 770,000,000
2014	Php 770,000,000
2015	<i>No appropriation</i>
2016	Php 10,000,000
2017	Php 70,000,000

Source: Department of Budget and Management

Eligible projects should meet the following criteria²²:

The proposed SSF Project must address processing and manufacturing gaps or bottlenecks of the industry cluster brought about by any of the following: (1) absence of needed facility, (2) lack of capacity of an existing facility, (3) cost of services of an existing facility is not affordable, and (4) inadequate technical and administrative services that will promote and facilitate the growth of MSMEs within the priority industry clusters.

- a. The proposed SSF Project will increase the productivity of the industry cluster in terms of: (1) Product improvement/Quality enhancement/Marketability, (2) price competitiveness, (3) conformity to standards.
- b. The proposed SSF Project will support microenterprises within the priority industry clusters.
- c. SSF Projects that will improve the products of the One-Town One-Product (OTOP) project.

The results of a preliminary assessment report of the PIDS for shared service facilities in the Philippines²³ proved to be promising. Based on the study, the project costs are very little, but there is a high impact on jobs and production capacities²⁴.

2) SET-UP Program

The Small Enterprise Technology Upgrading Program (SET-UP) is implemented by DOST. The objective of the SET-UP program is to provide MSME with equipment and technical assistance for enhancing sales, and more importantly production.

²² DTI Website. *Shared Service Facilities*.

²³ Philippine Institute for Development Studies. *Preliminary Assessment of the Shared Service Facilities*. May 2016.

²⁴ Several recommendations to hasten SSF’s effectiveness include more efficient project selection process, ease of procurement guidelines, and coordination with other SME-oriented government programs.

Priority industries or sectors under SET-UP includes electronics and ICT, metals and engineering. SET-UP aims to provide technology upgrading and acquisition, technology trainings, packaging and labeling, testing and calibration services, and technology consultancy services.

According to DOST, about 3,000 small businesses were benefitting annually from the program. From January to June 2015, the program had already created 20,985 jobs²⁵. Until 2015, about US\$ 57.1 million was funded under the program; moreover, 3,869 core projects were founded.²⁶

3) Negosyo Centers

“Negosyo” was implemented under RA No. 10644, or the Go Negosyo Act. This Act mandates the establishment of Negosyo Centers in all cities, municipalities and provinces to promote the ease of doing business for MSMEs.

As of December 2016, there were 448 Negosyo Centers that assist micro and small business owners set up and grow their economic ventures. About 52% of Negosyo Centers are found in Luzon, 23% in Visayas, and 25% in Mindanao. In a news release, DTI reported that Negosyo Centers had already assisted over 311,000 aspiring and established entrepreneurs, as of June 2017²⁷.

“Negosyo Centers” plays a vital role in business matching (SMEs to customers), accessing lending and credit markets, and tapping potential suppliers for SMEs.

4) Kapatid Mentor ME

A recent MSME development program is Kapatid Mentor ME (micro enterprises). This program fosters a sustainable and inclusive growth for MSMEs. Launched in August 2016, Kapatid Mentor ME continually runs seminar sessions to facilitate knowledge transfer from larger businesses to MSMEs and to provide trainings for organizational development.

A key aspect in Kapatid Mentor ME project is its “Adopt-an-SSF” component, which aims to help micro-entrepreneurs by providing them access to SSF in their respective communities.

2.2.7 Other Aspects surrounding the Philippine Automotive Industry

(1) Industrial Human Resources

As discussed in the previous section, the Philippines holds potential for its auto industry’s growth and expansion. The quality of human resources, however, has been cited one of the key management challenges faced by Japanese affiliated-manufacturing companies in the Philippines²⁸.

²⁵ The Manila Times. *DOST tech upgrade program helps 3,000 MSMEs yearly*. Online news article.

²⁶ DOST Presentation.

²⁷ The Entrepreneur Philippines. *Conference Highlights Growing Role of Negosyo Centers in Promoting Entrepreneurship*.

²⁸ 2017 JETRO Survey on Business Conditions of Japanese Companies in Asia and Oceania

1) Labor Intake by the Auto Industry

The total number of those who are directly employed in the automotive manufacturing sector is around 50,000 to 60,000. In 2017, approximately 17,000 were employed by the motor vehicle manufacturing segment, 4,000 by the manufacturing of bodies, trailers, and semi trailers segment, and remaining 25,000 by the auto parts manufacturing segment. Since the domestic production of vehicles in the country in 2017 was about 127,000, in a rough calculation, two to three cars are made every person employed. In comparison, for the Japanese auto industry, the ratio is 12:1 and for the European auto industry, it is 8 to 1. The difference can be attributed to the fact that there is a greater concentration of labor-intensive manufacturing in the Philippines and the introduction of robotics in the manufacturing sector has not progressed as much in the Philippines, compared to Japan and European countries.

Table 18 Direct Employment of the Auto Industry

Items	2016	2017
Motor Vehicles	20,665	17,097
Bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	6,517	4,221
Parts and accessories for motor vehicles (incl. brakes, gearboxes, axles, road wheels, suspension shock absorbers, radiators silencers, exhaust pipes, catalyzers, clutches, steering wheels, steering columns and steering boxes; safety belts, airbags, doors, bumpers, car seats, motor vehicle electrical equipment [generators, alternators, spark plugs, ignition wiring harnesses, power window and door systems, assembly of purchased gauges into instrument panels, voltage regulators], electric ignition or starting equipment for internal combustion engines, and other parts of accessories)	30,583	24,760
Total	57,765	46,078

Source: PSA

The number of indirect employments by the auto industry is difficult to calculate as the detailed statistics of the indirect manufacturing for the auto industry is not available²⁹. Table 19, nonetheless, provides an interesting perspective of the scale of indirect employment by the Philippine auto industry. The biggest employment is under the Transportation and Storage segment (especially under other passenger land transport sub-segment, which includes taxi, jeepney, and PUV drivers), followed by the Automotive Use segment (i.e. sales and maintenance). The other passenger land transport sub-segment alone is more than two million, accounting for 5% of the working population. The second biggest employment is the sales and maintenance of motor vehicles (excluding tricycles), which account for about 500,000 employment. Another 500,000 employments are born in auto related sectors such as other manufacturing, road construction, and non-life insurance.

²⁹ The PSA data is available upto four-digit level of Philippines Standards Industrial Classification. The smallest classification is five-digit level. Some items (for example, materials, components and other auto parts that are not included in the direct employment categories) included in the other manufacturing section of indirect employment are not exclusive for the auto industry.

Table 19 Indirect Employment of the Auto Industry

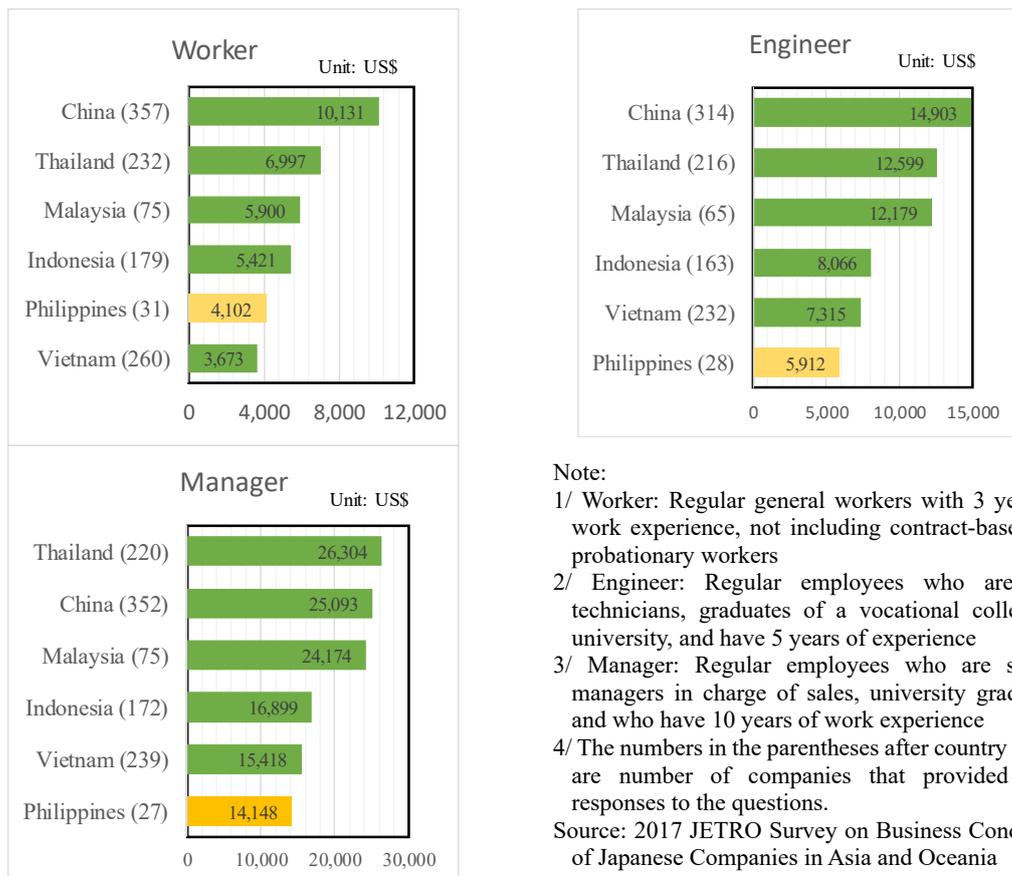
Items (Reference Code)	2016	2017
Automotive Use (Not including tricycles)	534,333	426,046
Sale of motor vehicles (4510)	83,782	79,893
Maintenance and repair of motor vehicles (4520)	365,190	287,953
Sales of motor vehicles parts and accessories (4530)	85,362	58,110
Transportation and Storage	2,706,615	2,597,087
Transport via buses (4920)	86,935	83,022
Other passenger land transport (taxi, jeepny, rental cars, tricycles, PUVs, and trucks etc) (4932)	2,343,543	2,248,132
Freight transport by road (4933)	276,137	265,934
Other Manufacturing Activities (NOT Exclusive to the Auto Sector)	193,101	220,216
Manufacture of refined petroleum products (incl. production of motor fuel) (1920)	6,567	5,545
Manufacture of tires (2211)	15,245	26,826
Manufacture of rubber hoses and belts and other rubber products (2219)	6,645	10,100
Operation of blast furnaces and steel making furnaces (2411)	9,100	8,922
Operation of steel works and rolling mills (2412)	37,520	28,779
Non-ferrous smelting and refining except precious metals (2422)	1,341	2,767
Non-ferrous rolling drawing and extrusion metals (2423)	172	47
Manufacture of pipe fittings of non-ferrous metals (2424)	699	1,612
Manufacture of basic precious and other non-ferrous metals (2429)	182	992
Casting of iron and steel (2431)	4,074	13,168
Casting of non-ferrous metals (2432)	2,325	232
Forging pressing stamping and roll-forming of metal (2591)	7,858	5,533
Treatment and coating of metals; machining (2592)	6,452	5,211
Manufacture of other fabricated metal products nec (2599)	24,313	39,596
Manufacture of consumer electronics (incl. electronics for motor vehicles) (2640)	53,769	53,141
Manufacture of measuring testing navigating and control equipment (incl. Manufacture of Automotive emissions testing eqpt) (2651)	416	1,010
Manufacture of batteries for vehicle (2720)	6,035	5,096
Manufacture of electric lighting equipment (manufacture of lighting equipment for transport equip) (2740)	3,357	2,609
Manufacture of engine and turbine (incl. manufacture of pistons piston rings carburetors and such for all internal combustion engines diesel engines) (2811)	4,965	2,665
Manufacture of other gen-purpose machinery (incl. manufacture of air conditioning machines for motor vehicles) (2819)	2,069	6,365
Others (NOT Exclusive to the Auto Sector)	290,307	375,550
Construction of roads and railways (4210)	164,375	197,260
Wholesale of solid liquid and gaseous fuels and related products (4661)	16,712	28,323
Retail sale of automotive fuel in specialized stores (4730)	72,566	57,142
Service activities incidental to land transportation (5221)	18,032	78,025
Non-life insurance (6512)	18,622	14,800

Source: Philippines Statistics Authority

2) Industry Human Resources in the Philippines from the Demand Side's Perspective

a. General Description

For potential investors to the Philippines' manufacturing sector, one of key location factors that appeals for setting up a production base in the Philippines is an abundance of young, cost-effective (=English speaking, educated, low-cost) human resources. A JETRO Survey in 2017 reveals that the annual salary of engineers and managers in the manufacturing sector in the Philippines³⁰ is the lowest and workers is the second lowest among the ASEAN 5 countries plus China (see Figure 19).



Note:

- 1/ Worker: Regular general workers with 3 years of work experience, not including contract-based and probationary workers
- 2/ Engineer: Regular employees who are core technicians, graduates of a vocational college or university, and have 5 years of experience
- 3/ Manager: Regular employees who are section managers in charge of sales, university graduates, and who have 10 years of work experience
- 4/ The numbers in the parentheses after country names are number of companies that provided valid responses to the questions.

Source: 2017 JETRO Survey on Business Conditions of Japanese Companies in Asia and Oceania

Figure 18. Comparison of Annual Salaries in the Manufacturing Sector

Many Japanese management of auto manufacturing companies interviewed by the Project also commented that people in the Philippines are easy to work with as most speak English and follow instructions well.

³⁰ According to the Philippines Statistics Authority, the 2016 average monthly salaries in the Manufacture of Motor Vehicles, Trailers, Semi-Trailers segment are as follows: Production Supervisors and General Foremen (Php 34,648 /month [US\$ 7,970/year]), Mechanical Engineers (Php 27,121/month [US\$ 6,238/year]), Mechanical Engineering Technicians 1 (Php 17,678 /month [US\$ 4,066/year]), Quality Inspectors (Php 14,624/month [US\$ 3,364/year]), Accounting and Bookkeeping Clerks (Php 22,124/month [US\$ 5,089/year]), Sheet-Metal Workers (Php 21,001/month [US\$ 4,831/year]), Motor Vehicle Mechanics and Related Trades Workers (Php 31,505/month [US\$ 7,247/year]), Mechanical Machinery Assemblers (Php 13,376/month [US\$ 3,077/year]), and Unskilled Workers except Janitors, Messengers and Freight Handlers (Php 10,324/month [US\$ 2,375/year]). Wage Statistics, PSA

b. Challenges

The cost-cutting that can be achieved through competitive wages is an advantage to the Philippines; however, when it comes to the quality of human resources that can bring the company to the next level up of the value addition ladder, companies in the Philippines have reported challenges. The JETRO survey mentioned earlier also points out that 50% of 72 companies (Japanese-affiliated companies in the Philippines that provided valid answers to this survey question) consider that quality of employees is a management issue³¹ and 50% of 46 companies find recruiting engineering staff difficult. The labor quality issue, difficulty in recruiting engineering staff, and difficulty in quality control were ranked as the second common management issue among the survey companies, after the difficulty in local procurement of raw materials and parts (54%). The Philippines is the only country among ASEAN 5 that the difficulty in recruitment engineering staff was ranked within the top 5.

Table 20. Top Five Management Issues faced by Japanese Companies Overseas

Philippines		2017	2016
1	Difficulty in local procurement of raw materials and parts (n=46)	54%	62%
2	Difficulty in recruiting engineering staff (n=46)	50%	37%
2	Quality of employees (n=72)	50%	57%
2	Difficulty in quality control (n=46)	50%	54%
5	Wage increase (n=72)	46%	45%

Thailand		2017	2016
1	Wage increase (n=594)	63%	59%
2	Difficulty in quality control (n=339)	54%	59%
3	Competitors' market shares are growing (cost competition) (n=594)	51%	47%
4	Quality of employees (n=594)	51%	49%
5	Major clients requesting lower prices (n=595)	44%	41%

Viet Nam		2017	2016
1	Wage increase (n=640)	75%	76%
2	Difficulty in local procurement of raw materials and parts (n=376)	65%	65%
3	Difficulty in quality control (n=376)	57%	59%
4	Quality of employees (n=640)	47%	43%
4	Complicated customs clearance procedures (n=634)	47%	48%

Malaysia		2017	2016
1	Difficulty in quality control (n=121)	71%	64%
2	Wage increase (n=226)	68%	68%
3	Increase in financing costs (n=121)	60%	42%
4	Volatility of the local currency's exchange rate against the USD (n=223)	56%	57%
5	Quality of employees (n=226)	52%	54%

Indonesia		2017	2016
1	Wage increase (n=427)	89%	82%
2	Difficulty in local procurement of raw materials and parts (n=238)	64%	56%
3	Complicated customs clearance procedures (n=424)	60%	49%
4	Tax burdens (i.e. corporate taxes and transfer pricing taxes) (n=428)	59%	51%
5	Time-consuming customs procedures (n=424)	57%	46%

Others	
<ul style="list-style-type: none"> • China: wage increase (76%), growing market shares of competitors (cost competition) (55%), increase in financing costs (50%), difficulty in quality control (50%), no more room for cost-cutting (46%) • Myanmar: difficulty in local procurement of raw materials parts (82%), power shortage or blackout (82%), difficulty in quality control (65%), inadequate logistic infrastructure (65%), wage increase (60%) 	

Source: 2017 JETRO

Table 21 summarizes more specific challenges with industry human resources reported by companies operating in the Philippines.

³¹ It should be noted that the it was not as high as Indoneisa (57%), Malaysia (52%), and Thailand (51%). The rating went down from 57.3% in the previous year (=less companies perceive it as a managemnt issue).

Table 21 Industry Human Resource Challenges by the Demand Side

Labor Pool (Difficulty in hiring)	<ul style="list-style-type: none"> • Management /engineer level: somewhat difficult (in terms of finding qualified candidates) <ul style="list-style-type: none"> ➤ Top engineering universities in the Philippines are located in Metro Manila. Since most auto related companies are located in Region 4 A, students are hesitant to do OJT or seek job opportunities there. • Worker Level: not so much
Technical Skills	<ul style="list-style-type: none"> • Management (and engineer) level <ul style="list-style-type: none"> ➤ The PDCA capacity, analytical skills (including data analysis), and critical thinking skills need improvements. • Engineer level: <ul style="list-style-type: none"> ➤ Employees tend to have received in-class oriented courses at higher education institutes; however, they have not had sufficient work experience and knowledge of the industry. It takes a while for them to fully ready for their assigned tasks. • Engineer level / Technician Level: <ul style="list-style-type: none"> ➤ Weak math skills (trigonometric functions, metric systems, etc.) ➤ Their education background does not fully equip them for the job in terms of the quality of education and the topic they learned. For example, applied mechanics, such as mechanics of materials, metal corrosions, thermal designing, need to be covered. ➤ Some of them have not learned how to use software/tools/equipment used in designing, developing, or producing products. Due to knowledge gap, companies need to spend more time conducting in-plant training. • Technician level <ul style="list-style-type: none"> ➤ Most of them are hired after the completion of OJT programs; however, some still have insufficient understanding their jobs (machine operation).
Soft skills	<ul style="list-style-type: none"> • Communication skills (consultation, reporting, and advice-seeking) needs to be improved at all levels. • Weak teamwork (or little friendly rivalry) among colleges to improve their work (production process or quality of products) • These issues make it difficult to have, for example, the designing work done, which requires continuous problem solving, and fine-tuning of products.
Turnover / retention rate	<ul style="list-style-type: none"> • Some companies experience a high turn-over (e.g. 15%). • Due to their proficiency in English, engineers tend to move to the next job abroad once they gain some work experience. One company reports that engineers only stay for two years before moving to the next job.
Other	<ul style="list-style-type: none"> • The recent Philippine Government's efforts to enforce stricter regulation on hiring contract workers increase in the production costs and increase in the time required for the hiring process (more rigid and long selection process.)

Source: JICA Reports (May 2015, February 2017), the JICA Expert Team's interviews to companies in the auto sector

3) Human Resources in the Philippines from the Supply Side's Perspective

In the Philippines, key government agencies responsible for preparing the Filipino youth for work are as follows³²:

- 1 Technical Education and Skills Development Authority (TESDA) for technical-vocational middle-level education;
- 2 Commission on Higher Education (CHED) for tertiary and graduate education; and
- 3 Department of Education (DepEd) for basic education.

³² Detailed analysis of these agencies are covered in the Industrial Human Resources Development Organization Profiling Survey (February 2019), which was prepared as a part of this Project's Industrial Human Resources Development Working Group activities.

In addition to above, DOST and its attached agencies, such as the Metals Industry Research and Development Center (MIRDC) and Science Education Institute (SEI), and the Department of Labor and Employment (DOLE) and its attached agencies, such as the National Wages and Productivity Commission (NWPC), provide training programs and other support for those who are already in the auto industry and to those who are seeking employment in the manufacturing sector.

a. TESDA: Technical-Vocational and Middle-Level Education

The mandate of TESDA is to manage and supervise technical education and skills development in the Philippines. TESDA has promulgated 272 training regulations under 23 economic sectors. It has accredited a total of 4,609 institution-based providers offering 20,329 different programs. In the recent years, there are over two million enrollees in TVET programs a year. About 50% of TVET graduates are high school graduates, 19% are in college, 13% are college graduates and beyond, and 6% are other technical vocation school graduates³³.

The courses related to automotive manufacturing are classified under the Automotive and Land Transportation, Metals Engineering Sector, and Electrical and Electronics sectors. In 2017, approximately 110,000, 100,000, and 130,000 students were certified in these sectors respectively.

Table 22 TESDA Courses Related to the Automotive Sector

	Sector	No. of TR*	Certified in 2017	Note on the Certification Situation in 2017
1	Automotive and Land Transportation	37	107,536	• Approx. 65% of all students certified in the sector were certified in automotive servicing courses (including motorcycle servicing) and 30% were in driving courses.
2	Metals Engineering	28	100,016	• Approx. 90% of all students certified in the segment were certified in Shielded Metal Arc Welding (SMAW) courses (NC** II 58%, NCI 31%, and NC II 1%) and 6% were in Gas Metal Arc Welding (GMAW).
3	Electrical and Electronics	19	129,586	• Electrical Installation and Maintenance NC II (share 43%) and Computer System Servicing NC II (32%), and Electronics/Semiconductor Production Line Machine Servicing (19%) were the most popular courses in the sector.

* TR: Training Regulations (=qualification promulgated by TESDA) **NC: National Certificate

Source: JICA Study Team based on the data provided by TESDA

TESDA is working with industry associations to revise TR in accordance with the industry’s needs. For example, in 2018, Automotive Servicing NC I was amended and the Trainers Methodology Level I (In-Company Trainer) was newly promulgated. TESDA’s challenges lay in catching up with the speed of new technological advancement as well as addressing the issues of non-utilized or underutilized qualification courses. For example, in the Automotive and Land Transportation sector, among all 37 TR courses, students were accessed and certified only in 10 courses in 2017. For the auto sector, TESDA programs are catering more to the aftersales segment (e.g. sales, maintenance and driving), rather than to the manufacturing segment that produce more sustainable employments.

³³ Jesus. L. R. Mateo, “Senior High School Tech-Voc Education and Training in the Philippines,” DepEd, ICE 2017

b. CHED: Tertiary and Graduate Education

CHED is the government body responsible for tertiary and graduate education. CHED is tasked to, *inter alia*, promote relevance and quality of higher education or to ensure that higher education institutions and programs are at par with international standards, graduates and professionals are highly competent and recognized in the international arena.

As of 2017/18, there are 1,906 higher education institutions (HEIs) in the Philippines, up from 1,701 a decade ago. Among which, 233 (12%) are public institutions and 1,673 are private (88%). There are 3.0 million students enrolled in HEIs in 2017/18³⁴.

CHED identifies Engineering and Technology as one of its priority disciplines. In this discipline, the number of enrollment and graduates were 370,000 and 87,000 respectively. For IT related disciplines, there were approximately 316,000 students enrolled and 87,000 students graduated on that year. The table below shows detailed classification of engineering students.

Table 23 Higher Education Graduates in Engineering Program

	Program Name	2015/16
ME	Mechanical Engineering	4,823
IE	Industrial Engineering	2,724
	Manufacturing/Production Engineering	105
	Industrial and Management Engineering	95
	Management Engineering	366
E&E	Electronics Engineering/Technology	4,202
	Electronics and Communications Engineering	1,925
	Electrical Engineering	4,242
Materials	Materials Science and Engineering	83
	Metallurgical Engineering	64
	Ceramics Engineering	21
	Chemical Engineering	1,006
Aero	Aeronautical Engineering	215
	Aerospace Engineering	16
General	Basic Engineering	172
	Engineering Technology	150
	Technology/Engineering	1,496
IT	Computer Engineering	4,531
	Information Technology	43,219
	Software Engineering/Technology	19
	Others (Agricultural, Civil, Environmental and Sanitary, Food, Geodetic, Geothermal, Mining, Petroleum, Sanitary Engineering)	11,500
Total		80,974

Note: Includes baccalaureate programs Source: CHED

CHED encourages industry-academia linkage to enhance the quality of education offered by colleges and universities. The level of engagement with the industry greatly varies by university

³⁴ This is down from 4.1 million in 2015/16. The decline of enrollment is due to the K-12 program.

and discipline. CHED stipulates that on-the-job (OJT) experience at related study fields is a part of requirements and suggests 240 hours to be the minimum engagement hours for industry immersion for most engineering programs. Students who are enrolled in the Industrial Technology take one-year of OJT (1,200 hours). Efforts to coordinate/collaborate with the industry are being made by all schools; however, many of them struggle to do it effectively and efficiently. For example, some rely on personal connections (e.g. friends from high schools and colleges, family connection, etc) to form industry linkages. Some find it difficult to approach FDI companies in industrial parks.

c. DepEd: Basic Education

DepEd is responsible for the elementary and secondary education in the Philippines. As of 2018, the number of students under DepEd (from kindergarten to Grade 12) is 27.7 million³⁵. The education system in the Philippines, especially the segment under DepEd's responsibility, has been undergoing a drastic change in recent years. A typical span of education in the Philippines used to be 14 years, comprised of 6 years of primary school education, 4 years of secondary school education, and 4 years of higher education; however, with the approval of RA 10157 (Kindergarten Education Act) in 2012 and RA 10533 (Enhanced Basic Education Act) in 2013, the K to 12 program was introduced, institutionalizing kindergarten a mandatory and compulsory component of basic education and adding two years of senior high school to secondary education.

With the introduction of K-12 program, four types of tracks, i.e. academic track, technical vocational livelihood track (TVL), sports track, and art & design track, have begun to be offered to students. The TVL track have four strands: Agriculture and Fishery Arts, Home Economics, Information and Communications Technology, and Industrial Arts. Industrial Arts covers automotive servicing; upon completing the track, students gain the National Certificate (NC) I in automotive servicing. The effects of the K-12 program for the job market is too early to be assessed at this moment.

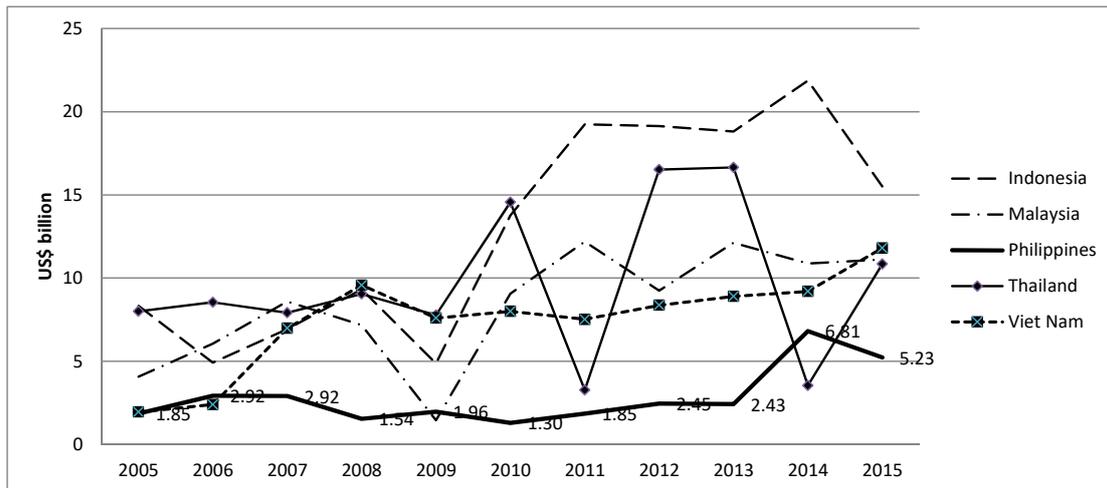
Traditionally, the DepEd's most important contribution to industry human resources development is creating the basic skill foundation. One aspect is simple math and science skills. The need to strengthen math and science education in the Philippines is voiced by many Japanese-affiliated manufacturing companies in the Philippines. The Philippines' quality of math and education has been rated poorly by international agencies. For example, the Philippines ranked 76th out of 137 countries in the segment of the quality of math and science education in the Global Competitiveness Report 2017-2018 by the World Economic Forum. It should be noted; however, efforts have been made to address this issue. The Philippines enrolled in itself in the Trends in International Mathematics and Science (TIMSS) for 2017³⁶. Many programs and projects to improve math education, including the implementation of Science, Technology, Engineering and Mathematics (STEM) programs, have been conducted by DepEd and DOST's attached agencies such as the Science Education Institute and the Philippine Science High School System.

³⁵ <http://pia.gov.ph/news/articles/1008563>, <https://www.manilatimes.net/27-7m-students-expected-at-school-opening-in-june/401177/>

³⁶ The Philippines did not partake in this assesment for almost 15 years; the country's last participation was in 2003.

(2) Investment Promotion Activities

The Philippines has improved its overall investment climate in recent years. The country's sovereign credit ratings stand at the lower medium grade range (Baa2 [stable] by Moody's and BBB-[positive] by Fitch in 2017), due to the country's robust economic performance, continued fiscal and debt consolidation, and improved governance. Greater improvements are still needed to attract more investors that the country needs. The Philippines lags behind most of the ASEAN countries in attracting FDI (the Philippines was ranked 9 of 10 ASEAN countries on FDI as a percentage of GDP in 2015).



Source: UNCTAD Stat

Figure 19 Foreign Direct Investments by Country

The Philippines actively seeks foreign investments to generate employment and promote economic development. BOI and PEZA are the lead agencies that provide incentives and special investment packages to investors. Noteworthy advantages of the Philippine investment landscape include free trade zones, including PEZA zones, and the large, educated, English-speaking, relatively low-cost Filipino labor. Philippine law treats foreign investors the same as their domestic counterparts, except in sectors reserved for Filipinos by the Philippine Constitution and Foreign Investment Act. In the Philippines, there are 19 investment promotion agencies (IPAs)³⁷ set by region and forming an integrated organization namely, the Philippine Investment Promotion Plan (PIPP).

The PIPP is powered by Team Invest Philippines, which is composed of all IPAs put together to broaden locational assistance and obtain the best capital returns for potential investors. The steering committee governs the team and it is composed of the heads of each IPA. A key function of the committee is designing and taking key strategic decisions. Below the steering committee there is a technical working group that supports the steering committee and is composed of the

³⁷ Nineteen (19) IPAs are Aurora Pacific Economic Zone and Freeport Area, Bases Conversion and Development Authority, Clark International Airport Corp. , John Hay Management Corp. , Mindanao Development Authority, Philippine Retirement Authority, Phividec Industrial Authority, Poro Point Management Corp., Subic Clark Alliance for Development Council, Tourism Infrastructure and Enterprise Zone Authority, Tourism Promotions Board, and Zamboanga City Special Economic Zone Authority.

operational heads of the IPAs offices concentrated on investment promotions/marketing. The BOI acts as the secretariat.

The IPAs are grouped into three main clusters to better assist the foreign investors coming to the Philippines: 1) manufacturing and logistics, 2) tourism, and 3) agribusiness. By working together under the same cluster group, IPAs avoids sending mixed signals to investors. As part of the effort to improve investment promotion, the Philippines government stripped the BOI of its regulatory responsibilities in 2012, transferring them to another government agency, thus refocusing the BOI as a dedicated IPA for investor outreach, investment facilitation, and aftercare.

The Philippines' Investment Priorities Plan (IPP) enumerates investment activities entitled to incentives facilitated by BOI, such as an income tax holiday. Non-fiscal incentives include employment of foreign nationals; simplified customs procedures; importation of consigned equipment; and operation of a bonded manufacturing warehouse.

The latest IPP, updated in 2017, provides incentives to: manufacturing (e.g. agro-processing, modular housing components, machinery, and equipment), creative industries/knowledge-based services (e.g. IT-Business Process Management services for the domestic market, repair/maintenance of aircraft, telecommunications, etc.), infrastructure and logistics (e.g. airports, seaports and PPP projects), energy (development of energy sources, power generation plants, and ancillary services), innovation drivers (e.g. fabrication laboratories); environment (e.g. climate change-related projects) and so on.

Large-scale investment may entail long time for companies to get returns. The capital efficiency rate of the entire company may be lowered until such time that the business gets on the right track. For this, there is a high possibility that the subsidy for capital investment or tax exemption for a few years after investment may improve deterioration of financial and management index and encourage the decision for investment. In the Philippines, there is already a defined policy for investment incentive. There is a concern, raised from a part of the international organizations that Philippine is missing the opportunity for tax collection by generous incentives, however, the survey of investment incentive effectiveness in the Philippines³⁸ indicates that there are more merits than such administrative cost needed for tax collection.

The law of the Philippines provides incentives for multinational enterprises to establish regional or area headquarters in the Philippines. Multinational entities that establish regional warehouses for the supply of spare parts, manufactured components, or raw materials for foreign markets also enjoy incentives on imports that are re-exported, including exemption from customs duties, internal revenue taxes, and local taxes. Due to complexity of various incentive system, BOI task force (under the Inclusive Innovation Industrial Strategy: i³S) is working to rationalize it, however, this effort is limited to BOI related incentives only and not include PEZA's rule.

Since the CARS Program approved the model of two Japanese-makers (i.e. Mitsubishi and Toyota), the investment by auto parts and the associated industry is increasing³⁹. For example, Daido DM Solution established the local corporation in April 2016, which processes and sells the

³⁸ Surveyed by Nomura Research Institute, Ltd. (2015)

³⁹ Number of investment projects by OEM and auto parts manufacturers are roughly 3-7 annually.

steel tool. Sytecs, which produces the plastic products, established the local corporation in June 2016 and started business with auto parts manufacturers. The ITO SEISAKUSHO established the new factory in April 2017, which produces progressive mold for Japanese auto parts manufacturers in Southeast Asia.

Despite efforts by Philippine Government agencies, there are still many issues to overcome, starting from common challenges such as restrictions on foreign ownership, inadequate public investment in infrastructure, and lack of transparency hinder foreign investment⁴⁰. In addition, the following challenges are raised as the specific issues related to the investment promotion on automotive sector.

- PEZA's regulation on more than 70% export of company's produce is sometimes an obstacle for promotion of domestic industry, especially in the automotive and auto-parts sectors.
- Nearly the same incentives are given to BOI-registered enterprises and makes entire system complex⁴¹.
- Investment promotion activities focusing on wide range of industrial sectors were so far common. Sector-focused or company-focused promotion was not conducted yet, which resulted in mismatch between target industry and players that entered. The case of Thailand indicates that the top officials directly invite target companies to attract investment, which generates deep sense of honor in the companies.
- Tools on investment promotion are too general to attract pin-pointed sectors and companies. There are many investment promotion activities were held in Japan by many countries but there is few outstanding promotion tools among them.
- The adoption of incentives has lessor flexibility. Likewise, the determination of exceptional request takes long time in the Philippines. Flexible adoption of incentives is much smooth and is commonly done in Thailand.
- The number of members who composes PIPP are too many to make difficult conducting collective investment promotion.

⁴⁰ US Department of State, <https://www.state.gov/e/eb/rls/othr/ics/2017/eap/269846.htm>

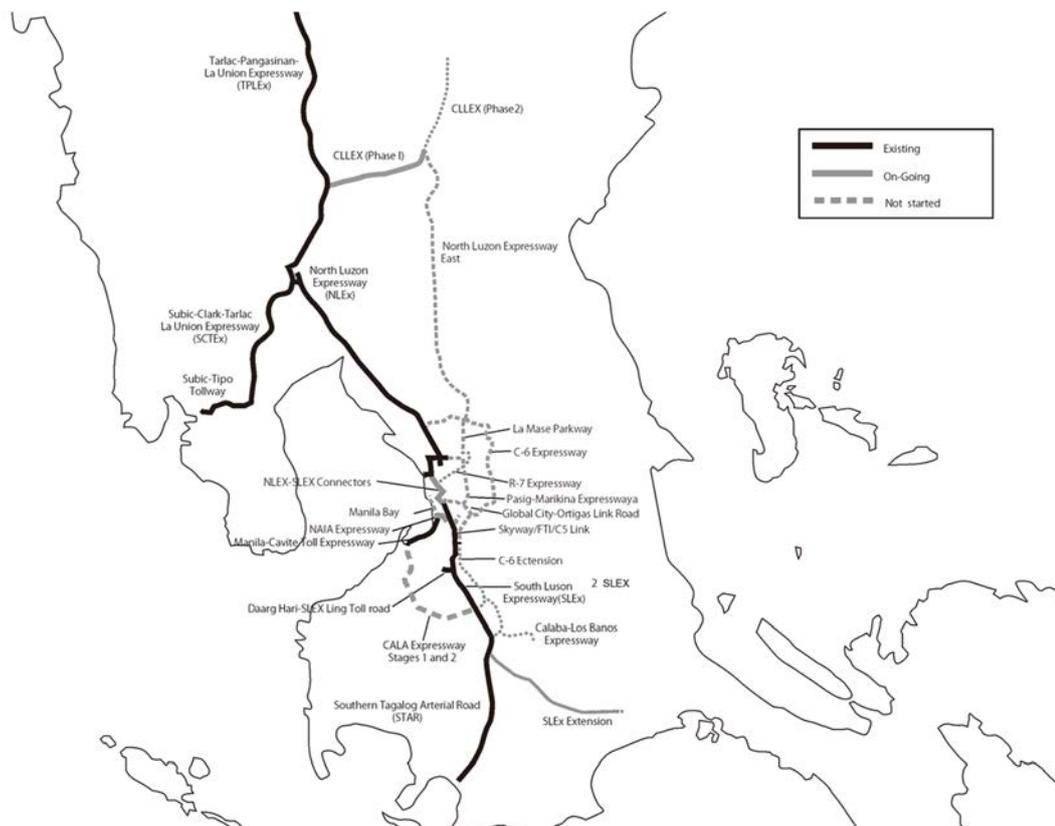
⁴¹ An enterprise with more than 40 percent foreign equity that exports at least 70 percent of its production may be entitled to incentives even if the activity is not listed in the IPP. Export-oriented firms with at least 50 percent of their revenues derived from exports may register for additional incentives under the 1994 Export Development Act.

(3) Infrastructure Development

The automotive sector in the Philippines concentrates mostly in the CALABARZON region. The physical infrastructure of the region is facing issues of congestion which causes cost problems for automotive production. This section briefly overviews the current situation and challenges to infrastructure development for the automotive industry.

1) Road network

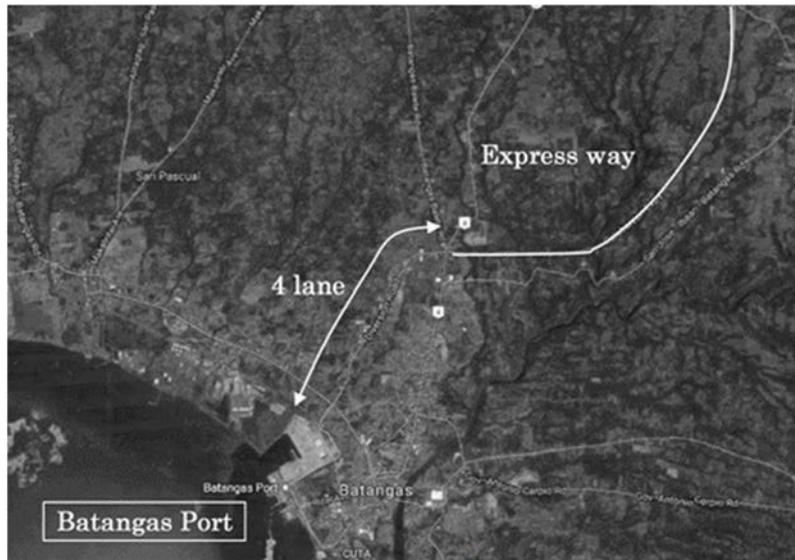
The arterial road network (highways) in NCR and CALABARZON has been developed mostly by public and private partnership (PPP) scheme. The highways connecting the two regions, South Luzon Expressway (SLEX) and South Tagalog Arterial Road (STAR), extend from Manila to Batangas. For Cavite, Manila – Cavite Expressway (CAVITEX) also has been developed. Cavite – Laguna Expressway (CALAX) is under construction.



Source: JICA Expert Team

Figure 20 Logistics Infrastructure Project in Region III, IV-A and NCR

The capacity of SLEX and STAR are enough for the current volume of traffic. However, it does not directly reach Batangas seaport. Cargo trucks have to run through the local road between the terminal of STAR and Batangas port. This could be a bottleneck for logistics in the future.



Source: JICA Expert Team

Figure 21 Missing Link of Road Network to Batangas Port

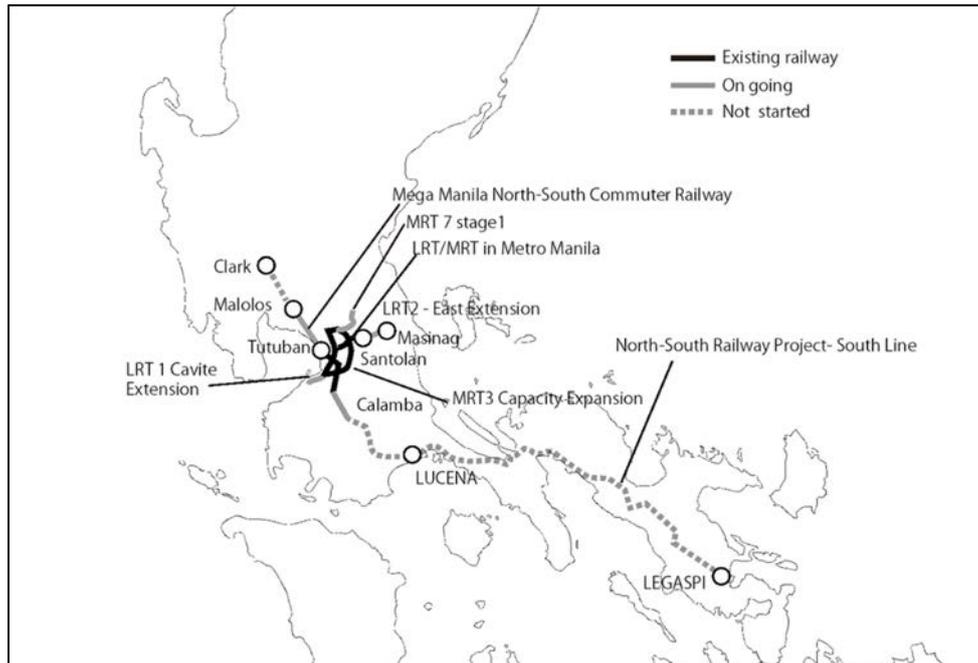
In general, industry tends to be located in areas easily accessible from Manila. Major industrial estates are located near the exits of major highways. There are still plans of large industrial estates along with the major highways which will have enough capacity for future investments.

However, for further development of the road network, the government has to judge whether necessary parts of road will be developed by PPP scheme. Private companies invest only profitable areas for their operations and the rest will be left out.

2) Railway Network

The railway transportation system of the Philippines is divided into two: the Philippine National Railways (PNR), a long-distance transportation between Metro Manila and Southern Luzon, and commuting transportation lines within Metro Manila.

ICTSI (International Container Services, Inc.) used to operate cargo trains transporting containers from the Port of Manila to Laguna using the PNR tracks from 1998; however, their cargo train operations stopped in 2003. Heeding the call of importers and exporters for efficient movement of goods, MRail (a subsidiary of Manila Electric Co. and ICTSI), submitted its proposal on railway cargo system project in 2015 to the previous administration. The project aimed to revive connectivity between the Port of Manila and ICTSI's inland container terminal facility in Laguna. This proposal was put on hold due to right of way issues. To address this, MRail signed a memorandum of understanding with the Batangas provincial government to conduct its feasibility study in 2017.



Source: JICA Expert Team

Figure 22 Logistics Infrastructure Project (Rail)

The railway projects that the government mainly develops are under the PPP scheme, except those projects developed under a Yen-loan scheme. At present, many projects will be taken through PPP scheme. These PPP projects are developed with related private projects, resident, commercial, and industrial development through private funding.

The present administration also introduced the Build, Build Build (BBB) program, which is to promote accelerated infrastructure spending. It prioritizes key infrastructure projects such as the Subic-Clark railway, and North-South railway.

3) Seaports⁴²

Currently, the burden with the Manila Port is soaring due to the economic concentration into the Metropolitan Manila. On the other hand, the cargo handling volume in the Batangas Port tends to increase, but the increase rate does not meet the cargo demand that has been supposed in the feasibility study in the past. With the aim of mitigating the excessive concentration into the Manila Port, the decentralization of the cargo handling volume in the Manila Port is needed.

In handling cargo in the Manila Port, raw materials and intermediate goods should better shift from the Manila Port to the Batangas and Subic Port, and then the Manila Port should specialize in consumption goods, which are needed by the residents of Manila Metropolitan area.

The site of the Batangas Port is developed in two phases, known as the Phase I-ATIB (Asian Terminals Inc., Batangas) and Phase II-BCT (Batangas Container Terminal). Phase I-ATIB is 22

⁴² For further discussion on Batangas Port, which is a key port for the growth of the auto industry, see Reference Document B-3) (Study on Logistics Infrastructure Requirement [for Exporting 500,000 Automobiles] in Batangas International Ports).

hectares with 16 berths (5-10 m water depth), including a Multilevel Car Storage Facility (MCSF). Other than agricultural products, the main export and import items are vehicles, iron, steel, heavy products, cement, ore, etc. The annual handling capacity of the Phase II-BCT is 300,000 TEU (twenty-foot equivalent unit), and it has increased steadily to approx. 250,000 TEU in 2018. It has good access from industrial estates along with SLEX and STAR, however, majority of manufacturers tend to use the Manila Port where more shipping services are concentrated.

The challenge is to redirect cargo from the Manila Port to Batangas port. Because cargos are concentrated in the Manila Port, shipping service is also concentrated there. But major developments in Batangas Port in the recent years has translated to reduction of trips along Metro Manila since shippers has already the option of docking in Batangas Port.

Table 24 Batangas Port – Comparative Containerized Cargo Volume

(Unit:TEU)

		2011	2012	2013	2014	2015	2016	2017	2018
Domestic	Phase I	1,114	5,824	11,843	36,467	54,784	12,017	12,736	15,763
	Phase II	8,257	2,206	381	949	304	0	0	0
Foreign	Phase I	2,513	503	6	250	28	1	1	2
	Phase II	2,245	6,251	11,020	97,361	132,958	157,229	197,312	248,609
Total		14,129	14,784	23,249	135,027	188,074	169,246	210,049	264,373

Source: Philippine Ports Authority Annual Report

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Chapter 3 Value Chain Analysis on the Philippine Automotive Industry

3.1 Methodology and Workflow of GVC Analysis

The methodology and work flow of the GVC (global value chain) analysis was set through discussions between the JICA Expert Team and DTI/BOI as well as through consultation with other relevant stakeholders, such as representatives from the and the University of the Philippines (UP), consultants from the Advancing Philippine Competitiveness (COMPETE) Project by USAID, and an Input-Output (I-O) Table Analysis expert from the University of Asia and the Pacific (UA&P). The GVC analysis methodology and workflow developed as a result is summarized in Figure 23. In designing the methodology, two items were taken into consideration: 1) the use of analysis results by USAID/COMPETE as a basis for the Project's GVC analysis and elaboration of the analysis and 2) the GVC analysis works as a capacity development activity for DTI/BOI and other relevant stakeholders.

(1) Characteristics of GVC Analysis Conducted in the Project

1) Analysis Results by USAID/COMPETE as a Basis for the Project's GVC Analysis

USAID carried out GVC analysis for several key sectors (including the auto sector) of the Philippines prior to this Project. The Project used to the USAID project's output⁴³ as a basis for the Project's GVC analysis and elaborated the analysis.

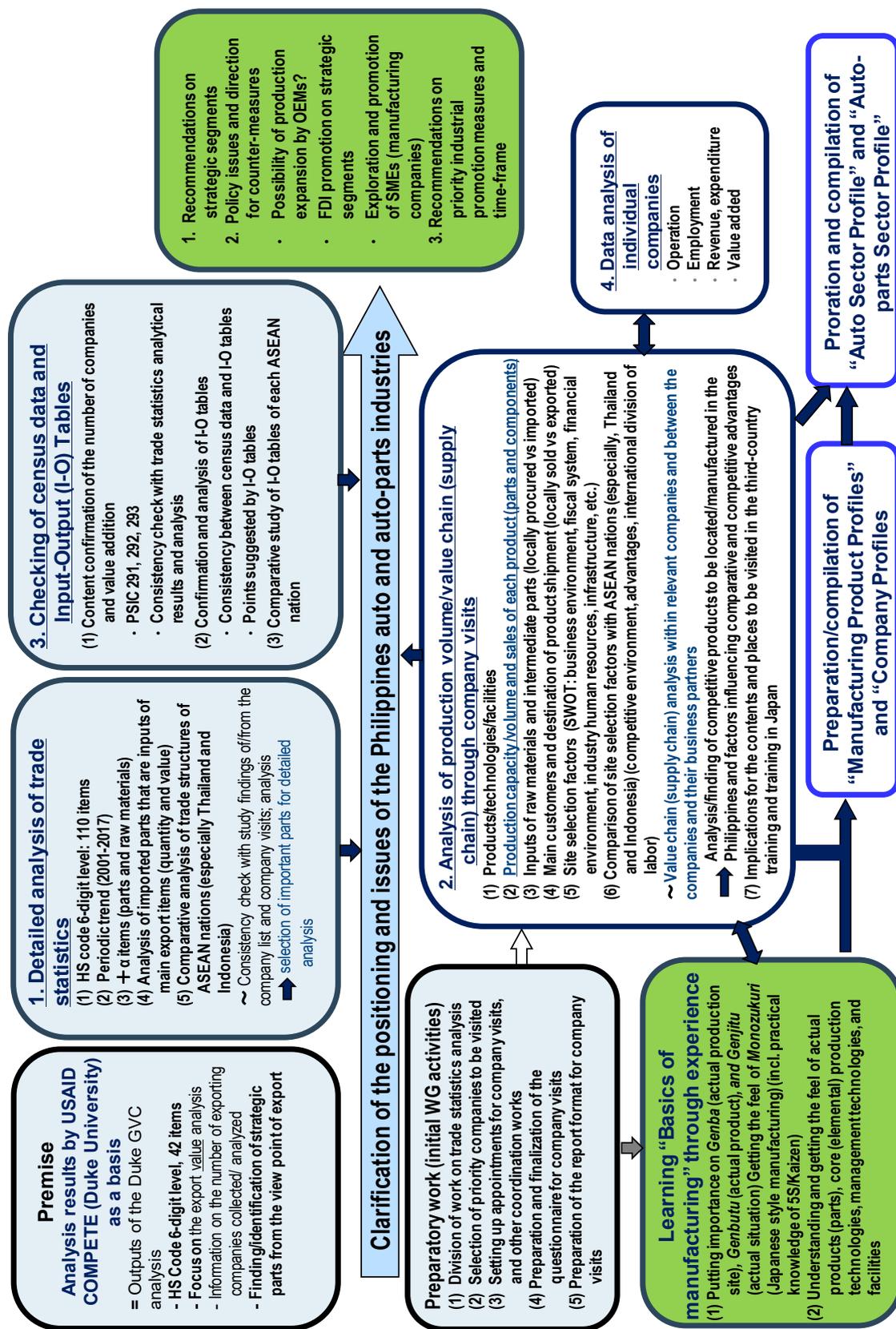
More specifically, one of the main methodologies for GVC analysis by the USAID project was the trade statistical analysis of the Philippine's export value data based on 42 six-digit level HS codes⁴⁴. From the 42 HS code items, the Project expanded the range of items for analysis to 103 HS codes in passenger car, commercial vehicle and auto parts segments. Details of analyzed commodities in the Project are described in Chapter 3.2.

For main export items, the value and volume data were collected and analyzed, and unit price was calculated based on the collected export data (value/volume). From these data, the Project clarified the basic trade structure of the Philippines' auto industry for key segments/items in terms of their export, import, and net export (trade balance) trends and structural changes that occurred from 2001 to 2017. Basic trade structures of other ASEAN countries' auto industries particularly that of Thailand and Indonesia were also analyzed to compare with the Philippines' situations⁴⁵. This comprehensive analysis of trade statistics was also supported by the insights from the observations and findings from company visits in the Philippines, Thailand and Japan.

⁴³ "The Philippines – In the Automotive Global Value Chain (May 2016)"

⁴⁴ HS: Harmonization Code (Harmonized Commodity Description Coding System)

⁴⁵ It should be noted that trade statistics are based on each government's customs data; therefore, statistical discrepancy between different nations is very common for trade data. For example, the Philippines' export value to Thailand on a certain HS code may not be the same value as the Thailand's import value from the Philippines on the same code.



Source: JICA Expert Team

Figure 23 Methodology and Flow of GVC Analysis in the Project

2) GVC Analysis as Capacity Development Activities

In Phase 1 of the Project, GVC Analysis WG, composed of representatives from DTI/BOI, other relevant government agencies, private sector organizations and the JICA Expert Team, was set up to conduct GVC analysis (see more discussion on capacity development activities in Chapter 5). With two expected outputs of GVC analysis in mind, which are 1) clarification of the Philippines auto industry's positioning in the view of the global auto value chain and 2) capacity development of stakeholders, the Project first analyzed characteristics, advantages, and disadvantages of different methodologies used for GVC analysis as shown in the table below. .

Table 25 Different Methodologies for GVC Analysis

Methodology	Characteristics	Advantages (Pros)	Disadvantages (Cons)
1. Analysis using <u>Trade Statistics (HS Code Data Analysis)</u>	<ol style="list-style-type: none"> 1. Use of the ITC Trade data based on customs data of each country 2. The USAID Project used this methodology for automobile GVC analysis in 2016. 	<ol style="list-style-type: none"> 1. Easy to retrieve old and recent data (both value and volume) through website 2. Detailed classification on auto-related industrial products 3. Widely used as a basic methodology among economists and policy makers for trade/investment issues 	<ol style="list-style-type: none"> 1. Mixed data of new and other (second-hand) products in each classification 2. No specific classification for auto-use in many products 3. No information on value addition of products
2. Value Chain Analysis by Interviews (<u>Company Visits</u>)	Survey of detailed inputs/outputs of value chain activities of each company by direct interview	<ol style="list-style-type: none"> 1. If successful, be able to get detailed information on inputs (materials) and outputs (products) in the company's value chains. 2. Be able to clarify various factors that influence a company's investment decision 	<ol style="list-style-type: none"> 1. Time consuming 2. Requires a close coordination with interviewed companies 3. Requires a good level of knowledge and expertise of interviewers in order to obtain/ clarify qualified data/information.
3. Analysis using <u>TiVA (Trade in Value Added)</u>	Newly developed methodology since 2013, using trade statistics based on added value, provided by OECD.	Be able to get information on flow of value added in international trade (US\$) in each industrial sector (such as manufacturing and services)	<ol style="list-style-type: none"> 1. No detailed industrial classification (i.e. automotive industry is one classification, C34: motor vehicles, trailers & semi-trailers). 2. Only data on value (no data on volume) 3. The most recent data is of 2011.
4. Analysis using the <u>I-O Tables</u>	Analysis of the industrial sector in relation to other industrial sectors in the	Be able to understand the positioning of the industry in relation to other industrial sectors	<ol style="list-style-type: none"> 1. No detailed industrial classification 2. Only data on value (not on volume) 3. The most recent data is of 2006.
5. Value Chain Analysis using <u>Firm-level Financial Data</u>	Calculation of value added of each company using financial report	Be able to get detailed information on value addition of the company, if the company reports financial data to the relevant authority.	<ol style="list-style-type: none"> 1. Not applicable to all companies 2. Time consuming 3. Requires careful data clarification

Source: JICA Expert Team

After comparing the different methodologies, the Project identified methodologies that are most applicable and practical for analyzing not only the auto industry but also other manufacturing sectors as well as ones that lead to learning about the actual reality of manufacturing in the Philippines (e.g. products, process, and technology). Upon taking all these matters into consideration, it was decided that trade statistics analysis (HS code analysis) and interviews to industry players through plant visits were to be utilized as central analytical tools, and companies' financial data analysis and the I-O table and census data analysis were to be utilized as supporting tools for the Project.

(2) Analyzed Commodities in the Project

1) Value Chain and Supply Chain of the Automotive Industry

In the automotive industry, there is a long chain of various value chain activities starting from product planning, one of important upstream functions in the research and development (R&D) segment, to downstream functions such as aftersales and services (maintenance). Along the value chain, a myriad of players (manufacturing companies) exist: starting from automakers (vehicle assembly makers or OEMs), OEM parts makers (Tier 1 companies), and parts/subcomponents makers (Tier 2 companies), material suppliers, and to processing and tooling manufacturers as supporting industry. As explained in Chapter 3.1, the Project placed the focus on the supply chain analysis of the automotive assembly (OEMs) and auto parts manufacturing or the midstream portion of the long value chain of the automotive industry. Issues surrounding other value chain functions, such as R&D and marketing, were also indirectly examined mainly through interviews (company visits).

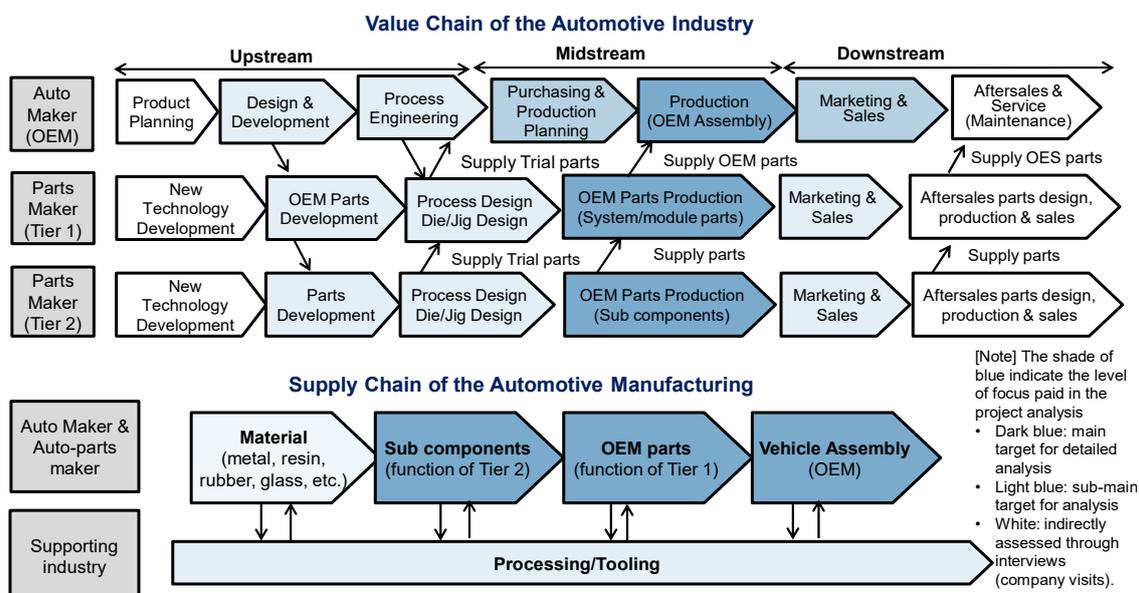


Figure 24 Analyzed Value Chain and Supply Chain in the Project

2) Classification of Auto Parts to be Analyzed in the Project

The Project collected data and analyzed 110 six-digit level HS codes in passenger car, commercial vehicle and auto parts segments⁴⁶. The auto parts segment, comprised of 89 six-digit level HS codes, was further classified into nine detailed sub-segments: 1) engines and engine parts, 2) drivetrain parts, 3) chassis, 4) body, 5) body parts, 6) control parts, 7) exterior, 8) interior, and 9) electric/electronics parts (E&E). The purpose of the classification was to identify which parts are produced with comparative/competitive advantages for the Philippines.

⁴⁶ See Reference Document C for the list of 110 HS Codes.

Table 26 Nine Sub-Segments of Auto Parts Analyzed

Parts Category	Parts (example)	Parts Classification in		Number of HS Code
1. Engines and engine parts	Cyl. Block, Cyl. Head, Crank Shaft, Cam Shaft, Connecting Rod, Piston, Piston Ring, Int-Manifold, Exh-Manifold, Water Pump, Oil Pump, Catalyzer, Radiator, Fuel Injector, Air Filter, Oil Filter, Exhaust Gas Recirculation (EGR) Valve, Battery, St/Motor, Alternator	100.	Engines and engine parts	36
2. Drivetrain parts	Transmission (M/T, A/T), Torque Converter, Clutch, Continuously Variable Transmission (CVT), Differential Gear, Constant Velocity Joint (CVJ), Drive Shaft, Propeller Shaft, Tire, Wheel, Rear Axle, Universal Joint	200.	Drivetrain parts	11
		300.	Automotive tires/ wheels	6
3 Chassis	Coil Spring, S/Absorber, Stabilizer, R&P Steering, Steering Column, electric power steering (EPS), Steering Lock, Brake Caliper, Brake Rotor, Exhaust Muffler, Fuel Tank	400.	Steering and parts thereof	1
		500.	Suspension and parts thereof	2
4. Body	Hood, Fender, Roof, Door, Trunk Lid, Sill, Front Pillar, Center Pillar, Front Roof rail, Side Roof Rail, Side Member, Floor, Small Body Parts	700.	Bodies and parts	13
5. Body Parts	Window Regulator, Outside Handle, Door Weather Strip, Door Lock, Windshield Glass, Door Glass, Glass Run, Check Link, T/Lid W/Strip	700.	Bodies and parts	
6 Control Parts	Transmission Control, PKB Control, Brake Pedal, Accel. Pedal, Clutch Pedal, Hood Control Cable, T/Lid Control Cable	600.	Brake and parts thereof	6
		900.	Other parts	2
7 Exterior	Bumper, Head Lump, Rear Combination Lump, Radiator Grill, Wiper, Door Mirror, Air Spoiler, Side Marker Lump, Lic., Plate Finisher	700.	Bodies and parts	13
		900.	Other parts	2
8 Interior	HVAC, Instrument Panel, Steering Wheel, Center Console, Seats, Head Lining, Pillar Garnish, Door Trim, Sun Visor, Air Bag, Seat Belt	700.	Bodies and parts	13
		900.	Other parts	2
9. Electrical and electric parts	Wiring Harness, Comb. SW., Horn, NAVI, Ignition Coil, Meter, Audio, Fuel Sender, Printed Circuit Board (PCB), Electronic Control Units (ECU), SENSORS, Actuators	800.	Electrical and electric Component	12
Total HS Codes				89

Source: JICA Expert Team

3.2 Trade Statistics Analysis

3.2.1 Procedure of the HS Code Analysis

As described in 3.1.2, the detailed analysis of trade statistics (HS code analysis), comprised of the following four components, was conducted.

- Analysis of 110 items in the three segments: passenger cars, commercial vehicles, and auto parts
- Analysis of the periodic trend (from 2001 to 2017) and changes in trade partners of each segment and sub-segment
- Comparative analysis with ASEAN Countries, mainly Thailand and Indonesia
- Analysis of main imported parts that are used to produce major export items

3.2.2 Key Findings and Implications

The followings are the summary of key findings and implications from HS code analysis. The analysis results of each sub-segment are discussed in detail in a later section.

Table 27 Growth of the Auto Trade in Japan, China, and ASEAN Countries

[2017, US\$ million]		Total		Passenger Cars		Comemrcial Vehicles		Auto Parts	
		Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Japan		174,658	37,514	93,372	11,113	8,861	288	72,424	26,114
China		108,750	105,755	7,177	49,946	3,401	491	98,172	55,318
ASEAN	Philippines	4,189	8,007	7	4,571	8	1,493	4,173	1,942
	Thailand	39,138	15,011	10,874	824	7,304	208	20,960	13,979
	Indonesia	9,697	9,001	3,096	1,047	85	992	6,516	6,963
	Viet Nam	6,105	7,313	2	744	2	982	6,102	5,587
	Malaysia	4,057	8,619	241	1,486	18	830	3,798	6,304
	Total*:	63,186	47,951	14,220	8,672	7,417	4,505	41,549	34,774
[2001, US\$ million]		Total		Passenger Cars		Comemrcial Vehicles		Auto Parts	
		Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Japan		95,418	13,351	52,989	6,253	5,114	90	37,316	7,008
China		5,800	7,963	36	1,266	61	180	5,703	6,517
ASEAN	Philippines	1,369	892	2	146	0	115	1,368	631
	Thailand	3,735	3,135	674	192	1,235	57	1,826	2,886
	Indonesia	1,296	2,392	6	183	11	227	1,279	1,983
	Viet Nam	106	529	0	143	0	150	106	237
	Malaysia	963	2,593	49	897	5	228	908	1,467
	Total*:	7,469	9,541	731	1,561	1,251	777	5,487	7,204
[2001-2017, CAGR, %]		Total		Passenger Cars		Comemrcial Vehicles		Auto Parts	
		Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Japan		3.9%	6.7%	3.6%	3.7%	3.5%	7.5%	4.2%	8.6%
China		20.1%	17.5%	39.2%	25.8%	28.5%	6.5%	19.5%	14.3%
ASEAN	Philippines	7.2%	14.7%	9.4%	24.0%	30.2%	17.4%	7.2%	7.3%
	Thailand	15.8%	10.3%	19.0%	9.5%	11.7%	8.4%	16.5%	10.4%
	Indonesia	13.4%	8.6%	47.5%	11.5%	13.9%	9.7%	10.7%	8.2%
	Viet Nam	28.8%	17.8%	14.7%	10.9%	30.9%	12.5%	28.9%	21.8%
	Malaysia	9.4%	7.8%	10.4%	3.2%	8.1%	8.4%	9.4%	9.5%
	Total*:	14.3%	10.6%	20.4%	11.3%	11.8%	11.6%	13.5%	10.3%

* Total amount of five countries in the ASEAN region: the Philippines, Thailand, Indonesia, Viet Nam, and Malaysia

Source: JICA Expert Team based on ITC Trade Map

- 1) According to ITC Data, from 2001 to 2017, the size of global auto trade (including auto parts) tripled from US\$ 677.4 billion to US\$ 1,817 billion. The global trade expansion occurred at a rate of 6.4% a year in average. Against the global average of 6.4% a year from 2001 to 2017, auto exports from Japan has expanded at 3.9% a year (from US\$ 95 billion to US\$ 175 billion). The average annual growth was more significant in countries like China (20.1%, from US\$ 6 billion to US\$ 109 billion), Thailand (15.8%, from US\$ 4 billion to US\$ 39 billion), and Indonesia (13.4%, from US\$ 1 billion to US\$ 10 billion).
- 2) The auto exports from Japan to the world have declined since 2012, while exports from Thailand, Indonesia, and other ASEAN key countries have steadily increased in the recent years. For example, one in two cars imported to the Philippines in 2001 was from Japan; three in four cars imported to the Philippine now comes from Thailand or Indonesia.
- 3) The first and second points discussed above indicate that the automotive industry, particularly Japanese OEMs and Tier 1s, has accelerated the regional supply chain development in the East Asia and ASEAN regions by fortifying their production capacities in China, Thailand and other ASEAN countries.
- 4) The Philippines' exports increased from US\$ 1.4 billion in 2001 to US\$ 4.2 billion in 2017. The Philippines' CAGR of the auto parts exports (2001-2017) was relatively modest at 7.2%, compared to those of Thailand (16.5%), Indonesia (10.7%), and Viet Nam (28.9%). Compared to other ASEAN countries, the Philippines has not been able to fully take advantage of business changes that are born from the growing regional auto supply chain and expansion of the auto ASEAN market.
- 5) The auto industry has significantly increased its importance in key ASEAN countries' trade. In Thailand, the share of the auto industry in the country's entire exports has increased from 6% in 2001 to 16% in 2017; the total export value of the industry has expanded more than 10 folds from US\$ 3.7 billion to US\$ 38.8 billion during the same period. In the Philippines, the increase in the share is from 4% to 7% and the increase in the export value is from US\$ 1.4 billion to US\$ 4.1 billion.
- 6) The Philippine automotive industry was a trade surplus industry until 2015. With the sharp increase in passenger and commercial vehicles since 2010, especially in the last two years, the industry shifted to the trade deficit industry. In 2016, the trade deficit was US\$ 2.8 billion; the deficit mushroomed to US \$ 3.8 billion in the following year.
- 7) Contrary to the case of the Philippines, the imports are decreasing in all auto segments in Thailand and Indonesia in the last five years. The growth of auto exports and decline in imports indicate not only there has been a rapid expansion of OEM assembly and Tier 1 capacities, but also there has been a strong growth of supporting industries in these countries.
- 8) Wire harness is the largest export item for the Philippines. The exported value quadrupled from US\$ 0.5 billion in 2001 to US\$ 2.1 billion in 2017. Japan is the Philippines' top

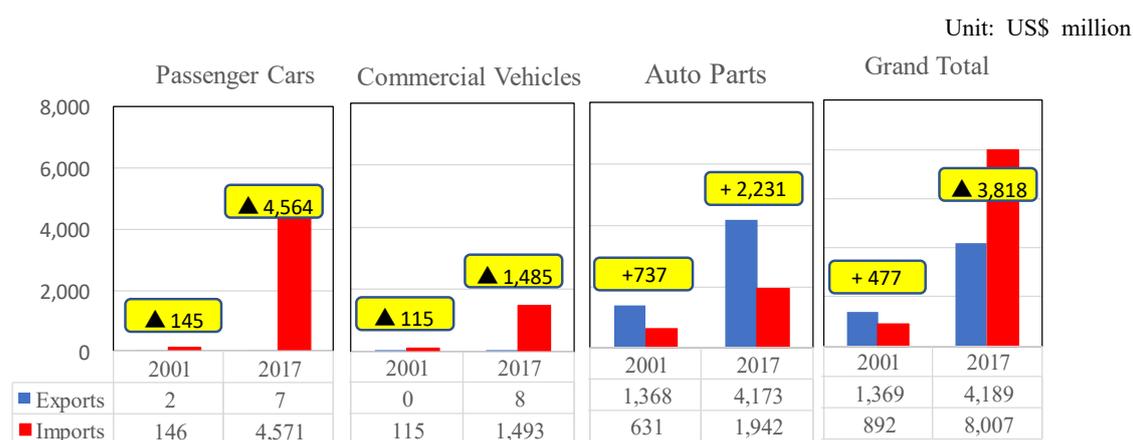
export destination for wire harness. While the imports of wire harness from the Philippines to Japan have increased, the Philippines' share in Japanese wire harness import market has declined from 26% in 2001 to 21% in 2017. This is partly due to a fast growth of the wire harness industry in other ASEAN countries, especially Viet Nam and Cambodia. For example, Viet Nam's wire harness exports grew from 0.05 billion to US\$ 2.3 billion; the Viet Nam's exports of wire harness to Japan exceeded that of the Philippines to Japan in 2013.

- 9) Japan and the USA maintained their positions as major export destinations for the Philippines; their share in the Philippines' auto exports are 34% and 20% respectively in 2017. This implies that the Philippines functions as an important production base (gateway) of the automotive global supply chain in the Pacific Rim, particularly for these two countries
- 10) Other than wire harness, auto parts sub-segments that have high export values for the Philippines are drivetrain parts (manual transmission and parts thereof), and engine parts (e.g. alternator, starter, motors and air filters). Since the ASEAN Industrial Cooperation Scheme (AICO scheme) in 1996, some of drivetrain parts have become the Philippines' traditionally strong export items. With the growth of auto demands and regionalization of supply chains, other ASEAN countries have strengthened their production capacities in these segments. From 2001 to 2017, Thailand and Indonesia's exports of transmission and parts increased from barely nothing to US\$ 1,034 million and 722 million respectively. Viet Nam also exceeded the Philippines' exports of drive train parts and engine parts in the last ten years.

3.2.3 Automotive Trade of the Philippines

(1) Overview

The basic trade structure of the Philippines' automotive industry in the three segments (i.e. passenger cars, commercial vehicles and auto parts) and salient structural changes of the industry from 2001 to 2017 are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

Figure 25 Overview of the Philippines' Automotive Trade in 2001 and 2017

- 1) The Philippine automotive industry was a trade surplus industry until 2015. With the sharp increase in passenger and commercial vehicles since 2010, especially in the last two years, the industry shifted to the trade deficit industry. In 2016, the trade deficit was US\$ 2.8 billion; the deficit mushroomed to US\$ 3.8 billion in the following year.
- 2) Compared to other ASEAN countries, such as Thailand, Indonesia, and Viet Nam, the Philippines only a moderate growth of auto exports in the last 17 years. From 2001 to 2017, the total auto exports in the Philippines increased from US\$ 1.4 billion to US\$ 4.2 billion with a CAGR of 7.2%, while that of Thailand increased from US\$ 3.7 billion to US\$ 39.1 billion with a CAGR of 15.8%, that of Indonesia increased from US\$ 1.3 billion to US\$ 9.7 billion with a CAGR of 13.4%, and that of Viet Nam increased from US\$ 0.1 billion to US\$ 6.1 billion with a CAGR of 28.8%.
- 3) The imports grew at a much faster pace than the exports. The Philippines' total auto imports increased from US\$ 0.9 billion in 2001 to US\$ 8.0 billion in 2017 with a CAGR of 14.7%. The auto industry's share in the country's total imports significantly increased from 2.6 % to 8.1%.
- 4) The passenger car segment had a biggest change in the last 17 years. The Philippines' imports increased dramatically from US\$ 0.15 billion in 2001 to US\$ 4.6 billion in 2017 with a CAGR of 24%. During this period, the major origin of CBU imports shifted from Japan to Thailand and Indonesia.

- 5) In the commercial vehicle segment, the Philippines' imports increased with a CAGR of 17.4% from 2001 to 2017. The increase was especially significant in the last two years from US\$ 0.5 billion in 2014 to US\$ 1.5 billion in 2017. The sales expansion of pick-up trucks and other commercial vehicles in the Philippine market, mainly supplied by CBU imports, has accelerated this trend.
- 6) In the Philippines, the auto parts segment is a trade surplus segment. A great majority of trade surplus comes from the E&E Component segment. In 2017, the segment had a trade surplus of US\$ 2.2 billion, out of which US\$ 2.0 billion was from wire harness. This was brought about by a steady increase in production and exports of wire harness and other E&E components by global (mainly Japanese) Tier 1s.
- 7) From 2001 to 2017, the auto parts exports and imports of the Philippines grew at 7.2% and 7.3% per year respectively. In recent years (from 2012 to 2017), with drastic increase in CBU imports, auto parts imports are also growing at a fast pace of 11.5 %. Since exports have expanded at 3.0% a year, it may not take a long before the auto parts segment also become a trade deficit segment.
- 8) In the last five years, almost all auto parts sub-segments recorded the increase in imports in the Philippines, while the opposite trend was being observed in Thailand and Indonesia. The decline of auto parts imports in these countries indicate the growth and expansion of supporting industries as they continue to establish their positions as production hubs in the ASEAN region. It is reported that there are about 2,100 auto suppliers in Thailand, 800 in Indonesia, and 600 in Malaysia, compared to 350 in the Philippines.
- 9) The increase in the Philippines' auto parts trade among ASEAN countries, China, and Japan shows an increasing interdependence of the global auto parts trade. The automotive industry, particularly Japanese OEMs and Tier 1s, has accelerated the regional supply chain development in the East Asia and ASEAN regions by fortifying their production capacities in China, Thailand, Indonesia and other ASEAN countries that are deemed as destinations of China-Plus-One and Thailand-Plus-One strategies. This move has also facilitated the Philippines to strengthen its position as the export base of several auto parts sub-segments.

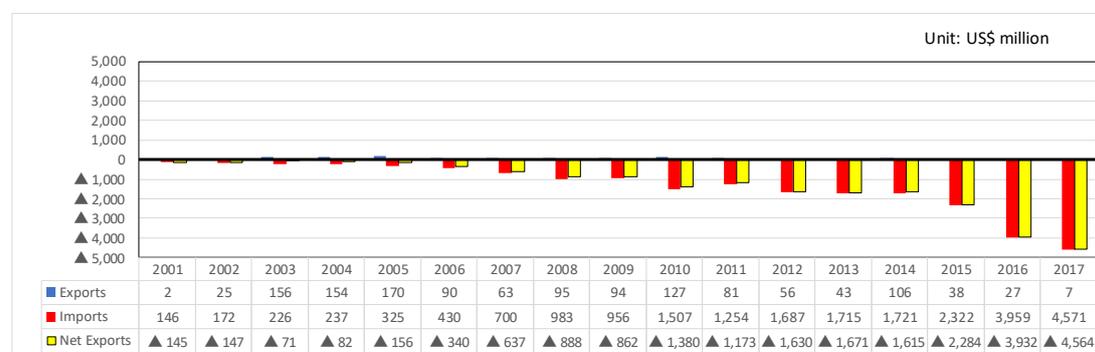
Table 28 Structural Changes of the Philippines' Automotive Trade

[Philippines]	HS code	Exports					Imports					Net Exports (US\$ mill)	
		Value (US\$ mill)		Share (2017)	CAGR		Value (US\$ mill)		Share (2017)	CAGR		2001	2017
		2001	2017		01-17	12-17	2001	2017		01-17	12-17		
Passenger Car	(14 items)	2	7	100%	9.4%	▲ 33.8%	146	4,571	100%	24.0%	22.1%	▲ 145	▲ 4,564
Gasoline engine (<= 1l)	870321	0	1	7.0%	-	129.1%	0	164	3.6%	59.6%	34.7%	▲ 0	▲ 163
ibid (1.0 l < xx <= 1.5 l)	870322	0	0	1.1%	-	20.4%	1	196	4.3%	38.0%	317.9%	▲ 1	▲ 196
ibid (1.5 l < xx)	870323	1	2	23.2%	2.7%	▲ 47.8%	36	1,703	37.3%	27.2%	4.5%	▲ 35	▲ 1,701
Commercial Vehicle	(7 items)	0	8	100%	30.2%	41.1%	115	1,493	100%	17.4%	25.4%	▲ 115	▲ 1,485
(semi-) Diesel (<= 5 t)	870421	0	0	0.1%	-	▲ 18.0%	14	794	53.2%	28.8%	24.3%	▲ 14	▲ 794
Gasoline (<= 5 t)	870431	0	0	0.5%	-	-	8	3	0.2%	▲ 6.8%	73.3%	▲ 8	▲ 3
Auto Parts	(89 items)	1,368	4,173	100%	7.2%	3.0%	631	1,942	100%	7.3%	11.5%	+737	+2,231
100 Engines & parts	36	65	341	8.2%	11.0%	0.8%	223	722	37.2%	7.6%	13.4%	▲ 158	▲ 381
200 Drivetrain parts	11	121	488	11.7%	9.1%	3.9%	76	344	17.7%	9.9%	22.6%	+44	+144
300 Tires/ Wheels	6	51	185	4.4%	8.4%	▲ 7.4%	60	239	12.3%	9.0%	9.3%	▲ 9	▲ 54
400 Steering & parts	1	6	100	2.4%	19.8%	84.6%	3	14	0.7%	11.5%	75.7%	+3	+86
500 Suspension & parts	2	0	0	0.0%	▲ 17.3%	4.8%	3	25	1.3%	13.7%	54.0%	▲ 3	▲ 25
600 Brake & Parts	6	225	13	0.3%	▲ 16.3%	▲ 34.0%	7	12	0.6%	3.4%	28.1%	+218	+1
700 Bodies and Parts	13	2	296	7.1%	36.9%	15.7%	25	120	6.2%	10.3%	17.1%	▲ 23	+176
800 E&E Components	12	636	2,390	57.3%	8.6%	8.8%	46	192	9.9%	9.3%	20.7%	+590	+2,198
900 Others	2	263	322	7.7%	1.3%	▲ 16.1%	188	228	11.7%	1.2%	▲ 7.1%	+75	+95
Grand Total of the Auto Industry	(110 items)	1,369	4,189	-	7.2%	2.8%	892	8,007	-	14.7%	19.4%	+477	▲ 3,818
Reference: Philippines' Total Trade in Value		32,150	63,233	-	4.3%	4.0%	34,943	98,484	-	6.7%	8.5%	▲ 2,793	▲ 35,251
(Auto Industry's Share)		4.3%	6.6%	-	-	-	2.6%	8.1%	-	-	-		

Source: JICA Expert Team based on ITC Trade Map

(2) Passenger Cars

Although the Philippines produces passenger cars domestically, it is also one of the major car-importing country in ASEAN. Key changes that occurred in the passenger car segment of the Philippines are summarized as follow:



Source: JICA Expert Team based on ITC Trade Map

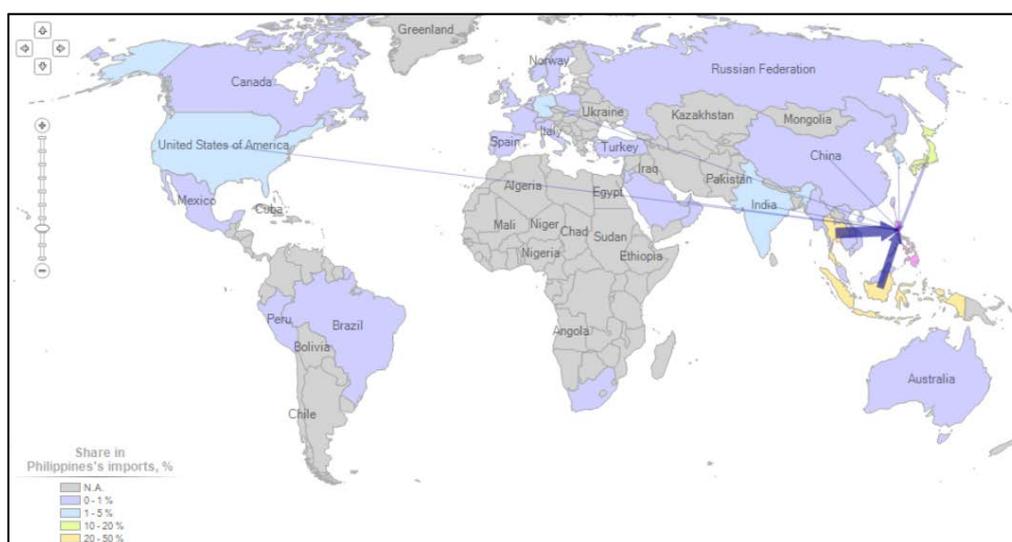
Figure 26 Passenger Car Trade in the Philippines

- 1) The most significant change in the Philippines' passenger car trade is the game-changing growth of its imports. As shown in the graph above, the imported value skyrocketed in the last three years, from US\$ 0.15 billion in 2001 to US\$ 4.6 billion in 2017.
- 2) In 2001, one in two cars imported into the Philippines was from Japan. As the ASEAN region developed and Japanese OEMs set up their plants in the region, three in four cars imported in the Philippines are now from ASEAN countries (44.7% from Thailand and 30.1% from Indonesia).

Table 29 Changes of Import Origins of Passenger Cars to the Philippines

2001				2017				
	Country	Value (US\$ mill)	Share (%)		Country	Value (US\$ mill)	Share (%)	
1	Japan	67	45.6	➔	1	Thailand	2,044	44.7
2	Taipei	19	13.0		2	Indonesia	1,377	30.1
3	Thailand	18	12.2		3	Japan	516	11.3
4	USA	17	11.4		4	South Korea	216	4.7
5	Germany	9	6.0		5	Germany	113	2.5
		146	100		Total	4,571	100	

Source: JICA Expert Team based on ITC Trade Map



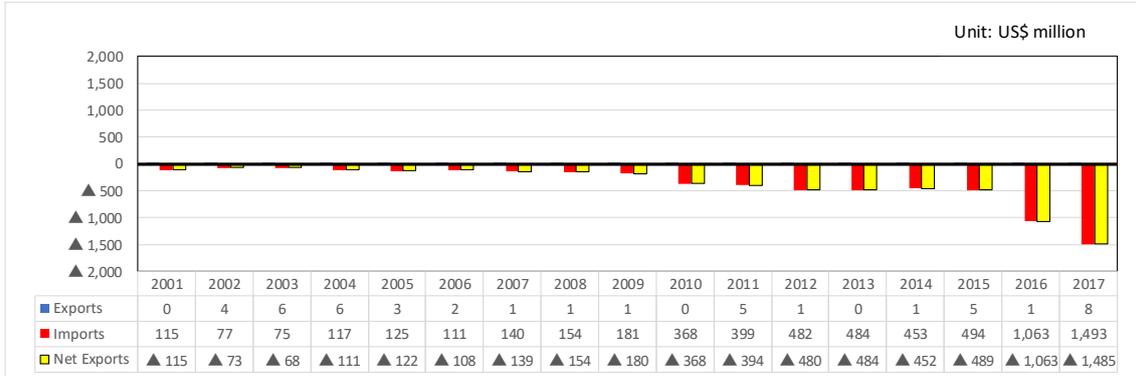
Source: JICA Expert Team based on ITC Trade Map

Figure 27. Import Origins of Passenger Cars to the Philippines (2017)

- 3) The type of passenger vehicles being imported to the Philippines are mostly 1) passenger cars with a cylinder capacity > 1,500 cm³ but ≤ 3,000 cm³ (HS 870323) (e.g. Toyota Vios, Mitsubishi Mirage) and 2) diesel or semi-diesel engine" of a cylinder capacity > 1.500 cm³ but ≤ 2.500 cm³ (HS 870322) (Toyota Fortuner, Toyota Innova, Mitsubishi Pajero Sport).
- 4) In December 2018, it was announced that Mitsubishi Motors Philippines Corp. (MMPC) would start exporting locally produced vehicles (e.g Mirage) to various countries in ASEAN from the next year onwards.

(3) Commercial Vehicles

The Philippines' imports of commercial vehicles also took the jump, especially in the last two years. Key changes that occurred in the passenger car segment of the Philippines are summarized as follow:



Source: JICA Expert Team based on ITC Trade Map

Figure 28 Commercial Vehicle Trade in the Philippines

- 1) Commercial vehicle imports increased from US\$ 0.1 billion in 2001 to US\$ 1.5 billion in 2017 (CAGR: 17%). In the last two years, the country's imports increased from US\$ 0.5 billion in 2015, US\$ 1.0 billion in 2016, and US\$ 1.5 billion in 2017. The Philippines does not export commercial vehicles.
- 2) The top country of origin of commercial vehicle imported to the Philippines used to be Japan (share: 62% in 2001). Since 2007 when the import value of commercial vehicles from Thailand exceeded that from Japan, Thailand has become the number one origin of commercial vehicles to the Philippines. In 2017, one in two vehicles imported into the Philippines were from Thailand.

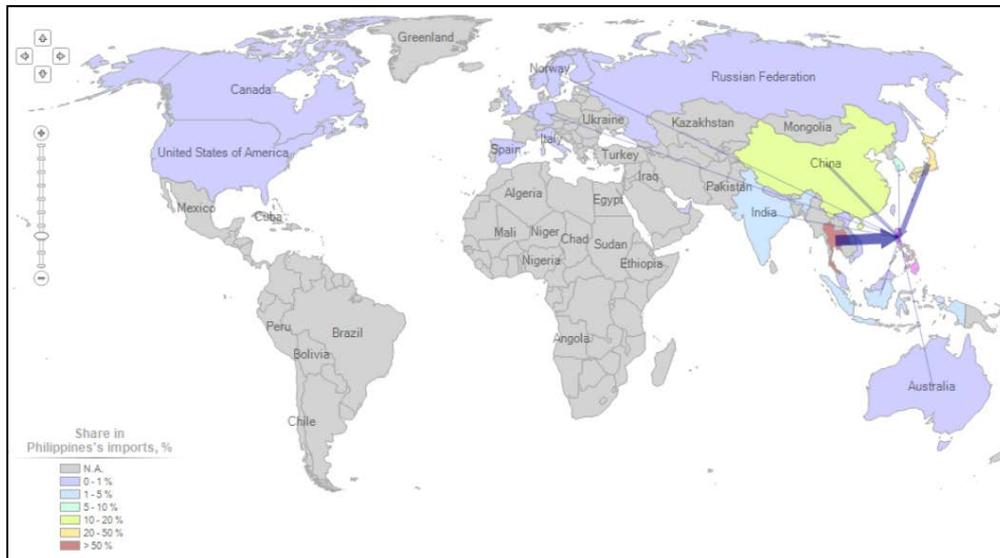
Table 30 Changes of Import Origins of Commercial Vehicle to the Philippines

2001				2017			
	Country	Value (US\$ mill)	Share (%)		Country	Value (US\$ mill)	Share (%)
1	Japan	71	62.1	1	Thailand	749	50.2
2	USA	17	14.6	2	Japan	397	26.6
3	Thailand	10	8.5	3	China	188	12.6
4	Taipei	6	5.1	4	South Korea	84	5.6
5	UK	5	4.6	5	Indonesia	29	2.0
		115	100		Total	1,493	100

Source: JICA Expert Team based on ITC Trade Map

- 3) The other main countries that Philippines import commercial vehicles from are China, South Korea, Indonesia, and India.
- 4) More than 50% of commercial vehicles imported into the Philippines are vehicles weighting less than five ton. As with the case of passenger car trade, Japanese OEM plants in Thailand, particularly of pick-up trucks, increased their production volumes and

expanded CBU imports from Thailand to the Philippines due to a steadily increasing demand for pick-up trucks in the Philippines.



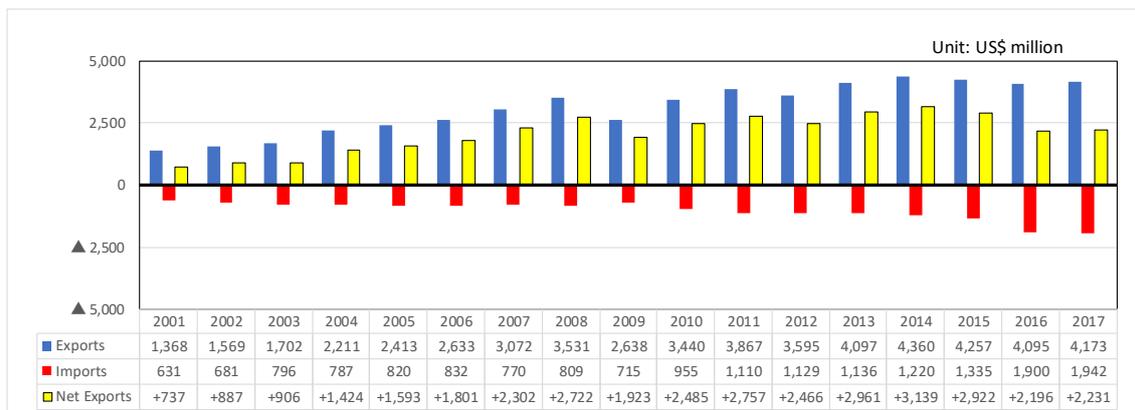
Source: JICA Expert Team based on ITC Trade Map

Figure 29 Import Origins of Commercial Vehicles to the Philippines (2017)

(4) Auto Parts

As discussed above, the auto parts segment is one of the key export-led manufacturing sectors for the Philippines as well as one of most important contributors to its economy from the viewpoint of foreign currency acquisition and employment generation. Structural changes of auto parts trade of the Philippines are summarized as follows:

- 1) The Philippines' exports increased from US\$ 1.4 billion in 2001 to US\$ 4.2 billion in 2017. The Philippines' CAGR of the auto parts exports (2001-2017) was relatively modest at 7.2%, compared to those of Thailand (16.5%), Indonesia (10.7%), and Viet Nam (28.9%).



Source: JICA Expert Team based on ITC Trade Map

Figure 30 Auto Parts Trade in the Philippines

- 2) Considering that in 2001 the Philippines was the second largest exporter of auto parts among Thailand, Malaysia, Indonesia, and Viet Nam, despite its growth, it appears that it has not taken a full advantage of business chances that are born from the growing ASEAN auto market and fast-expanding regional auto supply chain.
- 3) As regionalization of automotive production excels in South East Asia centering Thailand and Indonesia, the Philippines has been importing more from its ASEAN neighbors. The share of ASEAN in the Philippines' auto parts imports have increased from 11% in 2001 to 34% in 2017. Japan still remains the Philippines' top import partner; however, its share has declined from 54% to 24%.
- 4) The Philippines's top export partners are Japan and the USA with their shares in the country's exports being 34% and 20%.
- 5) The Philippines' auto parts exports to Thailand and China have significantly increased (to Thailand from US\$ 128 million in 2001 to US\$ 460 million in 2017, to China from US\$ 8 million to US\$181 million during the same period) .

Table 31 Top 12 Export Items in Auto Parts of the Philippines (2017)

No.	Classification (Segment)	Exported Products	HS Code	Value (2017)		Volume (2017) (ton)	Value (2001)		CAGR	No. 1 Destination *
				US\$ mill	Share		US\$ mill	Share		
1	E&E component	Wire harness	854430	2,051	49.2%	154,207	483	35.3%	9.5%	Japan
2	Other parts	Other parts and accessories	870899	310	7.4%	NA	263	19.2%	1.0%	Germany
3	Drive train	Transmission and parts	870840	269	6.4%	26,913	106	7.7%	6.0%	Thailand
4	Bodies and Parts	Air bags and parts thereof	870895	186	4.5%	12,720	0	0.0%	-	Japan
5	Automotive Tires/ Wheels	New tyres (cars)	401110	176	4.2%	55,676	30	2.2%	11.7%	USA
6	E&E component	Parts of air conditioning machines	841590	166	4.0%	9,468	19	1.4%	14.4%	Japan
7	Engines and engine parts	Engine battery (Lead-acid accumulators)	850710	133	3.2%	53,556	15	1.1%	14.8%	Malaysia
8	Steering and parts thereof	Steering wheels, steering columns and steering boxes, and parts thereof	870894	100	2.4%	10,401	6	0.4%	19.8%	Japan
9	Drivetrain parts	Drive axles	870850	90	2.1%	8,707	0	0.0%	59.5%	Thailand
10	E&E component	Parts of electrical lighting or signalling equipment,	851290	86	2.1%	8,113	0	0.0%	46.7%	USA
11	E&E component	Electrical sound signalling equipment	851230	77	1.8%	5,044	0	0.0%	40.3%	Japan
12	Drivetrain parts	Transmission shafts, incl. cam shafts and crank shafts, and cranks	848310	73	1.8%	5,467	0	0.0%	36.8%	Indonesia
Top 12 Items		Total:		3,716	89.1%	-	922	67.4%	9.1%	
Total (89 Items)				4,172	100%	-	1,368	100%	7.2%	

* No 1 destination based on value

Source: JICA Expert Team based on ITC Trade Map

- 6) The intensification of regional trade suggests that the production capacities of Japanese OEMs and Tier 1s in ASEAN countries (mainly Thailand) and China have expanded, which led to structural changes in the automotive global supply chain. This has contributed to accelerating the interdependence of different players involved in auto parts manufacturing by increasing mutual trade among Japan, China and ASEAN countries including the Philippines.
- 7) At the same time, several major Japanese Tier 1s in the Philippines are functioning as large-scale sub-component manufacturers for their mother factories in Japan and/or group Tier 1 factories in the USA and other advanced auto-market countries. It is speculated that these companies are contributing to the increases in both imports of parts/materials for their production and exports of sub-components supplied to their Tier 1 factories outside the Philippines.
- 8) The total value of the top 12 export items based on six-digit HS codes amounts to 89% of the Philippines' total auto parts export value. It is significantly larger compared to that of Thailand (64%) and Indonesia (76%). This indicates that while auto parts produced in Thailand and Indonesia are more diverse, the Philippines' auto parts exports are concentrated on a limited number of segment or parts.
- 9) Wire harness (HS 854430) is the biggest export item of the Philippines (see Box 3 on the wire harness trade). The item occupy 3.2% of the country's entire exports and about 50% of the country entire auto parts exports. The unit consumption of wire harness per one passenger car is generally said to be around 30 kg. Since the Philippines exported 154 thousand tons of wire harness in 2017, it is roughly estimated that the country exported the product for assembling around 5.1 million units of passenger cars.
- 10) Following wire harness, several sub-components in drivetrain, engines and engine parts, and E&E components are leading export sub-segments. Main destinations of these 12 products are Japan, Thailand, Germany, USA, Indonesia, and Malaysia. This suggests that large-scale producers and exporters of auto parts in the Philippines supply their sub-components to the countries that have large automotive markets and/or OEM/Tier 1 production facilities for their final assembly and system/module components production in the exported countries.

Box 3 Wire Harness Trade

The Philippines has retained its position as a relatively low-cost, labor-intensive parts manufacturing base. The exports of wire harness, the largest export item, from the Philippines quadrupled from US\$ 0.5 billion in 2001 to US\$ 2.1 billion in 2017. The below section summarized the overview of global wire harness trade with the focus on the Philippines' position.

- On the global scale, the Philippines was ranked as the number five exporter of wire harness after Mexico, China, Romania, Viet Nam in 2017. The Philippines recorded a steadfast growth of exports from 2001 to 2017 with a CAGR of 9 %, resulting in an increase in its global share from 4% in 2001 to 6% in 2017.
- In 2001, the biggest exporters of wire harness were Mexico (global share of 37%), USA (13%), Germany (8%) and the Philippines (4%). In the last two decades, the production sites have shifted towards countries such as China, Romania, Viet Nam, Ukraine, and Morocco that have cost effective labor and are close to final assembly sites. From 2001 to 2017, the exported value of Morocco, Ukraine, and Viet Nam increased 121%, 28%, and 27%.
- With the increase in wages in recent years, the production of wire harness in China are on decline. The countries with high wages such as the USA, Germany and Poland, while the export amount have shown no increase, suggesting that while plants in these countries are simply retaining its current operations.

Table 32 Top 12 Exporters of Wire Harness (Value)

	Country	Exports (Value, US\$ bill)			Share (%)		CAGR (%)	
		2001	2012	2017	2001	2017	01-17	12-17
1	Mexico	4.2	5.4	7.3	37%	20%	4%	2%
2	China	0.3	3.3	2.8	2%	8%	16%	▲ 1%
3	Romania	0.2	2.2	2.7	2%	8%	17%	1%
4	Viet Nam	0.1	1.6	2.3	0%	6%	27%	2%
5	Philippines	0.5	1.4	2.1	4%	6%	9%	2%
6	USA	1.4	1.9	2.0	13%	6%	2%	0%
7	Morocco	0.0	1.0	1.6	0%	4%	121%	3%
8	Germany	0.9	1.2	1.3	8%	3%	2%	0%
9	Ukraine	0.0	0.8	1.2	0%	3%	28%	3%
10	Czech Republic	0.2	0.9	1.1	2%	3%	9%	1%
11	Poland	0.4	0.9	0.9	3%	3%	6%	0%
12	Indonesia	0.1	0.6	0.9	1%	2%	15%	3%
World		11.2	28.5	36.4	100%	100%	8%	2%

Source: JICA Expert Team based on ITC Trade Map

- The Philippines exported 154,207 tons of wire harness in 2017. The Philippines' wire harness is most inexpensive among 12 top exporters when the unit value is calculated based on the exported value and quantity.

Table 33 Top 12 Exporters of Wire Harness (Quantity and Unit Value)

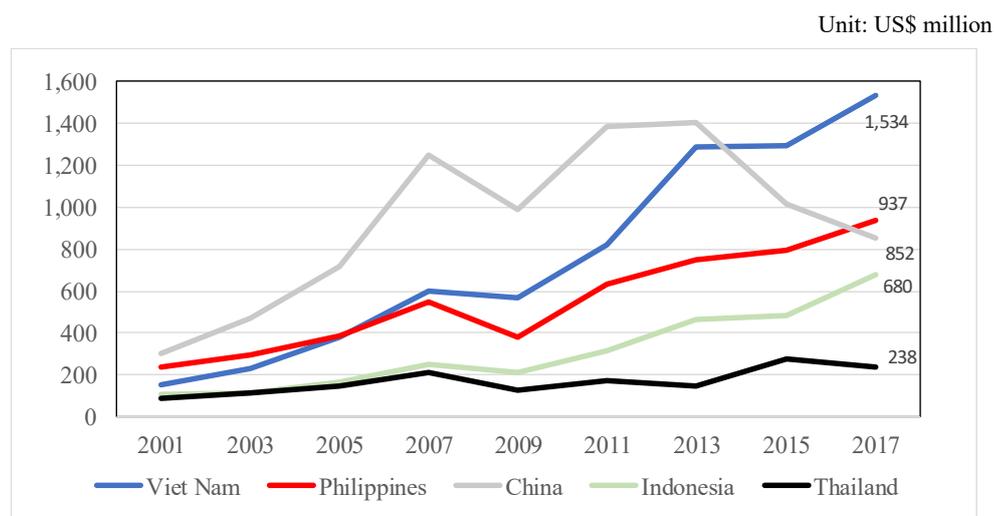
	Country	Exported Value (US\$ mill, 2017)	Quantity (1,000 ton, 2017)	Unit Value (US\$ / kg)
1	Mexico	7.3	372	19.6
2	China	2.8	162	17.4
3	Romania	2.7	155	17.7
4	Viet Nam	2.3	*	*
5	Philippines	2.1	154	13.3
6	USA	2.0	*	*
7	Morocco	1.6	84	19.1
8	Germany	1.3	42	29.9
9	Ukraine	1.2	58	20.9
10	Czech Republic	1.1	57	18.5
11	Poland	0.9	47	20.0
12	Indonesia	0.9	36	25.5
	World	36.4	-	-

* Information not available

Source: JICA Expert Team based on ITC Trade Map

- The Philippines' leading export destinations are Japan, USA, Canada, and Thailand; their shares in the country's exports are 45%, 27%, 13%, and 5% in 2017.
- The Japan's share in the Philippines' exports has increased from 34% to 46%; the US's share in the country's wire harness declined from 53% to 27%. To both countries, the Philippines' exports have increased, from 164 million in 2001 to US\$ 934 million in 2017 to Japan and from 258 million in 2001 to US\$ 554 million in 2017 to the USA.
- Another structural change that occurred during the period is the increases in the shares of the Philippines' wire harness exports to ASEAN 4 countries and Canada, which indicate the de-centralization / regionalization of manufacturing bases at the global scale with manufacturing plants moving closer to the customer base.
- Japan's imports of wire harness have more than quadrupled from US\$ 933 million in 2001 to US\$ 4,405 million in 2017, indicating that Japan is undergone the process of moving labor-intensive manufacturing to other countries with more cost-effective labor forces.
- While the imports of wire harness from the Philippines have increased, its share in Japanese wire harness import market has declined from 26% in 2001 to 21% in 2017. This is partly due to a fast growth of the wire harness industry in other ASEAN

countries, especially Viet Nam. Viet Nam's exports of wire harness increased from US\$ 150 million in 2001 to US\$ 1,534 million in 2017; Viet Nam had the top market share in Japan for the wire harness in 2017. While still relatively at a small scale, Cambodia's wire harness industry has also started to be developed in the last few years. In the low-cost, labor-intensive segment, there are always fierce competitions; even though the Philippines's wire harness industry has made a firm footprint in the global auto supply chain, it will continue to face competitions with newly emerging economies.



Source: JICA Expert Team based on ITC Trade Map

Figure 31 Japan's Imports of Wire Harness from Top 5 Partners

- 11) In addition to wire harness, key E&E export items for the Philippines are: 1) parts of air conditioning (HS 841590, e.g. flap actuator), 2) parts of electrical lighting and signaling equipment (HS 851290, e.g. cover assy, holder assy brush), and 3) electrical sound signaling equipment (HS 851230, e.g. horn assy). They are included among the top 12 items.
- 12) The second major exporting segment, after the E&E component segment is the drivetrain parts segment. Under this segment, the Philippines mainly exports 1) transmission and parts thereof (HS 870840), 2) drive axles with differential (HS 870850), and 3) transmission shafts including cam shafts and crank shafts and cranks (HS 848310). (See Box 4 Drive Train Segment Trade for more analysis)
- 13) The Philippines imports other transmission items, such as clutches and parts thereof, bearing housing, flywheels and tooth wheels, are mainly imported from Japan, China, and Thailand.

Box 4 Drive Train Segment Trade

Since the AICO scheme in 1996, some of drivetrain parts have become the Philippines' traditionally strong export items. The below section summarized the overview of the global transmission trade with the focus on the Philippines' position.

- On the global scale, top exporters of transmission and parts are still traditional auto production countries, such as Japan (global share in 2017: 27%), Germany (23%), and USA (12%).

Table 34 Transmission and Parts Exports

	Country	Exports (Value, US\$ mill)			Share (%)		CAGR (%)	
		2001	2012	2017	2001	2017	01-17	12-17
1	Japan	4,633	18,118	18,047	29%	27%	9%	0%
2	Germany	2,505	11,185	15,170	16%	23%	12%	2%
3	USA	3,288	5,794	7,825	21%	12%	6%	2%
4	South Korea	4	2,529	3,425	0%	5%	52%	2%
5	Mexico	147	1,408	3,123	1%	5%	21%	5%
6	France	1,640	2,428	2,740	10%	4%	3%	1%
7	Romania	10	217	2,122	0%	3%	40%	15%
8	China	23	1,291	1,661	0%	2%	31%	2%
9	Italy	275	1,131	1,283	2%	2%	10%	1%
10	Sweden	230	904	1,068	1%	2%	10%	1%
[ASEAN Countries]								
11	Thailand	1	122	1,034	0%	2%	54%	14%
15	Indonesia	1	431	722	0%	1%	55%	3%
24	Viet Nam	0	241	361	0%	1%	-	3%
28	Philippines	106	363	269	1%	0%	6%	▲ 2%
World		15,898	53,746	67,081	100%	100%	9%	1%

Source: JICA Expert Team based on ITC Trade Map

- In the last 20 years, the overall automotive market have expanded, which led to the expansion of global supply chain of the drivetrain segment. New production sites have emerged such as ones in Thailand and Indonesia and. From 2001 to 2017, Thailand and Indonesia's exports of transmission and parts increased from barely nothing to US\$ 1,034 million and 722 million respectively. Viet Nam also exceeded the Philippines' exports in the last ten years.
- The Philippines was the 16th biggest exports of transmissions and parts (HS 870840) in 2001; however, its place in the global export market of transmissions and parts dropped to 28th. While the Philippines has retained its position as an export hub of manual transmissions and their parts (for mainly SUVs and pick-up trucks), it has not been able to supply for a growing market for compact vehicles with automatic transmission as the country does not have production facilities for automatic transmission yet.

Table 35 Drivetrain Segment Trade by the Philippines and Thailand

		Philippines (2017)				Thailand (2017)			
		US\$ mill	1,000 T	US\$ /kg	Partners	US\$ mill	1,000 T	Unit /kg	Partners
Clutch and parts thereof (HS 870893)	Exports	3.2	0.2	14.3	USA (60%), Thailand (12%), India (11%)	158.0	12.7	12.5	Japan (20%), Indonesia (12%), Malaysia (9%), Brazil (8%)
	Imports	21.9	5.8	3.7	Japan (49%), Thailand (35%), China (5%)	170.5	17.4	9.8	Japan (40%), Indonesia (23%), Mexico (15%), China (6%)
Transmission and parts thereof (HS 870840)	Exports	268.6	26.9	10.0	Thailand (47%), South Africa (19%), Argentina (19%), Japan (5%)	1,034.5	73.8	14.0	China (42%), USA (10%), Mexico (9%), Philippines (5%)
	Imports	72.0	11.4	6.3	Japan (75%), Indonesia (14%), Thailand (8%)	2,385.8	155.5	15.3	Japan (52%), USA (10%), Indonesia (10%), Philippines (8%)
Drive axles (HS 870850)	Exports	89.6	8.7	10.3	Thailand (78%), Indonesia (14%), Japan (6%)	546.8	74.8	7.3	Indonesia (20%), South Africa (18%), USA (7%), Malaysia (7%)
	Imports	15.8	23.4	0.7	Japan (41%), China (13%), S. Korea (10%), Thailand (8%)	517.3	77.9	6.6	Japan (50%), China (11%), S. Korea (10%), Thailand (8%)
Other power transmission devices* (HS 8483, 7 codes)	Exports	132.8	8.8	15.0	Indonesia (29%), Thailand (2%), USA (13%), Japan (10%)	357.8	- (NA)	-	Japan (18%), Indonesia (13%), Malaysia (9%), India (7%)
	Imports	248.6	37.9	6.6	Japan (33%), China (14%), Thailand (11%), Indonesia (6%)	1,050.4	-	-	Japan (38%), China (19%), Germany (10%), S Korea (5%)
Total	Exports	494.2	44.7	11.1		2,097.1	-	-	
	Imports	358.3	78.5	4.6		4,124.0	-	-	

* Transmission shafts, incl. camshafts and crankshafts, and cranks; bearing housings and plain shaft bearings for machines; gears and gearing; ball or roller screws, gear boxes and other speed changers, incl. torque converters; flywheels and pulleys, incl. pulley blocks, clutches and shaft couplings, incl. universal joints; parts thereof

Source: JICA Expert Team based on ITC Trade Map

- In 2017, the Philippines has the export surplus of US\$ 197 million for the transmission and parts. Under the drivetrain segment, the Philippines has significant trade surplus for drive axles with differential (HS 870850) and transmission shafts including cam shafts and crank shafts and cranks (HS 848310).
- In 2017, the Philippines' key export partners for transmission and parts were Thailand (47%), South Africa (19%), Argentina (19%), and Japan (5%). Its key partners for drive axles were Thailand (78%), Indonesia (14%), and Japan (6%). Lastly, key partners for transmission shafts were Indonesia (42%), Thailand (31%), and India (10%).
- Japan is still the leading partners of drive train parts for ASEAN countries including Thailand, Indonesia and the Philippines.
- In Thailand the drivetrain parts segment is the fastest growing export segment in the last five years and is the second largest import segment. Within the segment, Thailand exports of transmission and parts increased from US\$ 122 million in 2012 to US\$ 1,034 million in 2017.
- ASEAN countries' drive train supply chains are also well connected to North and South America markets. For example, 19% of transmission and parts exported by the Philippines was to Argentina, 8% of clutches and parts exported by Thailand was to Brazil, 19% of transmission and parts exported by Thailand was to USA and Mexico, and 16% of transmission and parts exported by Indonesia was to Brazil.

- 14) In the Philippines, several main items under the engine parts segment are exported by PEZA companies. The exports of engines and engine parts had grown from US\$ 65 million in 2001 to US\$ 341 million in 2017 with a CAGR of 11%. Engine parts that the Philippines exported significant amounts and recorded high growth rates are: engine batteries (starter batteries [HS 850710]), ignition device for engine (distributors and ignition coils [HS 851130]) and turbocharger and parts thereof [HS 841459/841490]).
- 15) As the imports of passenger cars and commercial vehicles drastically increased in the last five years, so did the imports of auto parts, not just only for manufacturing but also to be used for spare parts of models not produced in the Philippines.
- 16) From 2012 to 2017, the Philippines' auto parts imports expanded 11.5% a year, which is high of itself but more so when compared to 3.0% a year for exports.

Table 36 Top 12 Import Items in Auto Parts of the Philippines

No.	Classification (Segment)	Imported Products	HS Code	Value (2017)		Volume (2017) (ton)	Value (2001)		CAGR	No. 1 Origin *
				US\$ mill	Share		US\$ mill	Share		
1	Other Parts	Parts and accessories	870899	182	9.4%	44,148	187	29.6%	▲ 0.2%	Japan
2	Automotive Tires/Wheels	New tyres (buses)	401120	126	6.5%	80,113	38	6.1%	7.7%	Thailand
3	Engine and engine parts	Lead acid accumulators	850720	105	5.4%	32,122	11	1.8%	15.1%	Viet Nam
4	Automotive Tires/Wheels	New tyres (cars)	401110	100	5.2%	75,110	14	2.2%	-	Thailand
5	E&E Component	Parts of air conditioning machines	841590	75	3.9%	9,358	23	3.6%	7.8%	China
6	Drivetrain parts	Transmission and parts thereof	870840	72	3.7%	11,355	38	6.0%	4.1%	Japan
7	Drivetrain parts	Gears and gearing for machinery	848340	65	3.4%	6,023	7	1.2%	14.6%	Japan
8	E&E Component	Wire harness	854430	58	3.0%	6,275	9	1.4%	12.7%	Hong Kong
9	Drivetrain parts	Transmission shafts, incl. cam and crank shafts	848310	56	2.9%	9,709	5	0.8%	16.0%	Japan
10	Engines and engine parts	Diesel Engine	840820	55	2.8%	11,865	24	3.9%	5.2%	Japan
11	Engines and engine parts	Filtering machinery Parts	842199	54	2.8%	6,161	19	3.0%	6.7%	China
12	Engines and engine parts	Engine battery (Lead-acid accumulators)	850710	52	2.7%	NA	6	0.9%	14.6%	Viet Nam
Top 12 Items		Total:		1,001	51.5%	-	382	60.5%	6.2%	
Total (89 Items)				1,942	100%	-	631	100%	7.3%	

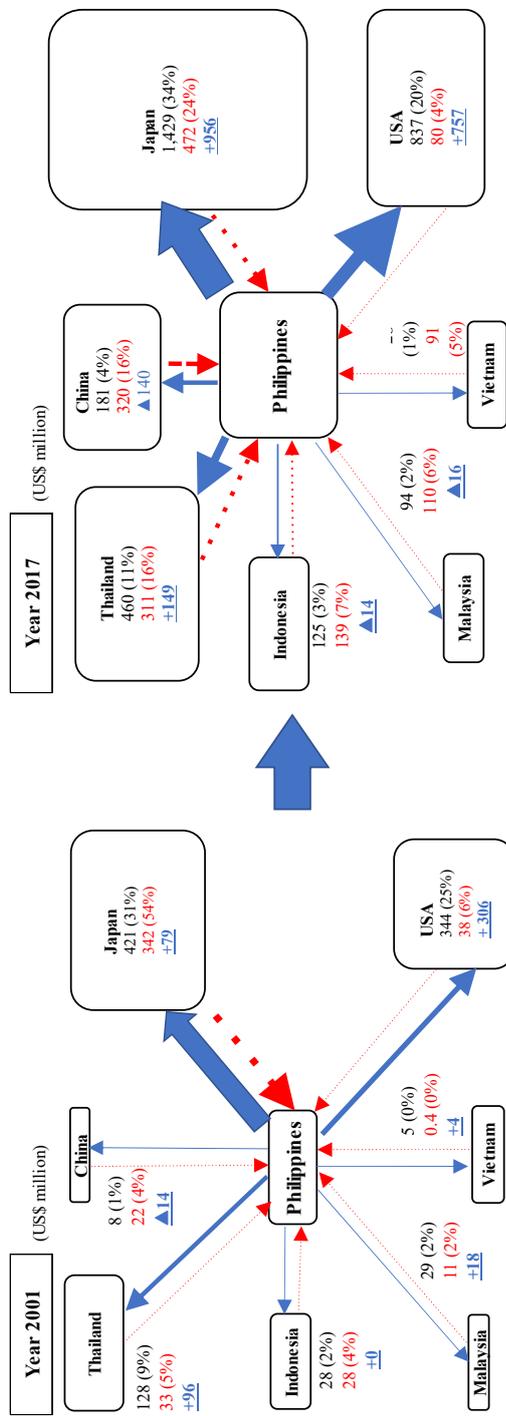
* No 1 Origin based on value

Source: JICA Expert Team based on ITC Trade Map

- 17) The top 12 auto part items in the Philippines auto parts import is 52%. In the case of Thailand and Indonesia, the top 12 imported items' share in these countries' total auto part imports amount to 63% and 57%, respectively. These numbers indicate that the Philippines

import wider range of auto parts than Thailand and Indonesia as the supporting industries are not well developed.

- 18) Major auto parts for automotive assembly, such as new tires, engines/engine parts, drivetrain parts were main imported auto parts. This supports the claim by OEMs in the Philippines that they rely their main auto parts on imports.
- 19) Major origins of imports are Japan (share in the Philippines auto parts imports: 24%), China (16%), and Thailand (16%).
- 20) The share of ASEAN countries (Thailand, Indonesia, Malaysia, and Viet Nam) in the Philippines increased from 11% in 2001 to 36% in 2017 (CAGR 15%).



	Year 2001		Year 2017		Share (%)	CAGR
Philippines' Auto Parts Trade in Total	Exports: 1,368	Imports: 631	Exports: 4,173	Imports: 1,942	100%	7.2%
Philippines' Auto Parts Trade with ASEAN 4 ^{1/}	Exports: 190	Imports: 72	Exports: 707	Imports: 651	16.9%	8.6%
	Net Export: +737	Net Export: +118	Net Export: +2,231	Net Export: +56	100%	14.8%

Country	Thailand		Indonesia		Malaysia		Vietnam		China		Japan		USA		Total (ASEAN 4) ^{1/}		Total (World)		
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	
Value (US\$ mil)	460	311	125	139	94	110	91	5	181	320	1,429	472	837	80	707	651	4,173	1,942	
Net Export	+149	-96	+14	+0	+16	+18	+62	+4	+140	+79	+956	+757	+56	+2,231	-	-	+737	+631	
Share (%)	11%	5%	3%	2%	2%	4%	1%	0%	4%	31%	54%	25%	6%	14%	11%	11%	14%	72	14.8%

Country	Thailand		Indonesia		Malaysia		Vietnam		China		Japan		USA		Total (ASEAN 4) ^{1/}		Total (World)		
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	
Value (US\$ mil)	460	311	125	139	94	110	91	5	181	320	1,429	472	837	80	707	651	4,173	1,942	
Net Export	+149	-96	+14	+0	+16	+18	+62	+4	+140	+79	+956	+757	+56	+2,231	-	-	+737	+631	
Share (%)	11%	5%	3%	2%	2%	4%	1%	0%	4%	31%	54%	25%	6%	14%	11%	11%	14%	72	14.8%
CAGR	8%	15%	10%	11%	8%	16%	12%	42%	21%	18%	8%	2%	6%	5%	9%	15%	7%	7%	9%
Difference ^{2/}	+332	+279	+97	+111	+65	+99	+24	+90	+173	+298	+1,008	+42	+42	+517	+579	+2,805	+1,311	-	-

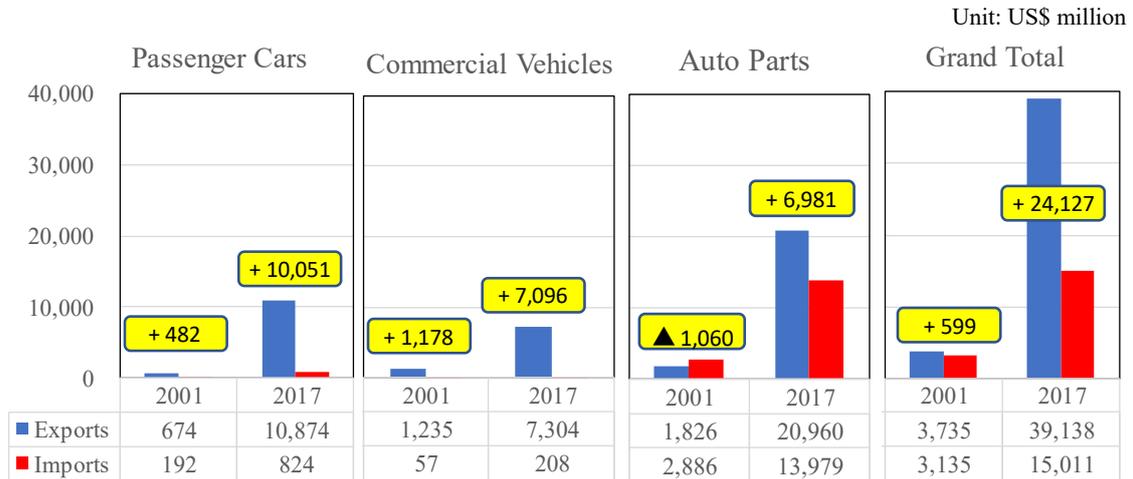
^{1/} ASEAN 4 = Thailand, Indonesia, Malaysia, Viet Nam.
^{2/} Difference (US\$ million); 2017 export (import) value - 2001 export (import) value

Source: JICA Expert Team based on ITC Trade Map
Figure 32 Structural Changes in the Philippines's Auto Parts Trade

3.2.4 Automotive Trade of Thailand

(1) Overview

The basic trade structure of the Thailand's automotive industry in the three segments and salient structural changes of the industry from 2001 to 2017 are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

Figure 33 Overview of the Thailand's Automotive Trade in 2001 and 2017

- (1) Thailand has fortified its position as the production hub in the ASEAN region over the last two decades. The country's automotive exports increased from US\$ 3.7 billion in 2001 to US\$ 39.1 billion in 2017 with a high CAGR of 15.8%, and its total imports increased from US\$ 3.1 billion to US\$ 15.0 billion with a high CAGR of 10.0%. The significant growth can be observed in the exports of all three segments.
- (2) In Thailand, the automotive industry has largely increased its importance in its economy. The auto industry became the country's leading export-oriented industry, occupying 16.6% of its total exports, 6.7% of its total imports in 2017. It also brought in the net export surplus of US\$ 23.8 billion against the country's overall trade surplus of US\$ 10.9 billion in 2017. Thailand has been one of the most popular investment destinations among Japanese OEMs and Tier 1s in the ASEAN region.
- (3) Thailand's exports of passenger cars had sharply increased from US\$ 0.7 billion in 2001 to US\$ 10.9 billion in 2017. During the period, the annual growth of passenger car exports was 19.0%, much higher than that of imports (9.5%). As a result, the country's net export surplus in the segment widened from US\$ 0.5 billion in 2001 to US\$ 10.1 billion in 2017.
- (4) In 2017, Thailand produced about two million vehicles and domestically sold 900,000 vehicles, exporting more than a half of vehicles produced.
- (5) From 2001 to 2017, Thailand's exports of commercial vehicle segment had also substantially expanded from US\$ 1.2 billion to US\$ 7.3 billion.

(6) In the auto parts segment, its exports increased more rapidly from US\$ 1.8 billion to US\$ 21.0 billion with a CAGR of 16.5%. The Thailand's growth of auto parts exports is much bigger than that of Indonesia (10.7%) and the Philippines (7.2%). The imports of auto parts peaked at 2012 and have been declining. The growth of auto parts and CBU exports and decline of imports combined indicate more parts are domestically being produced in variety and volume.

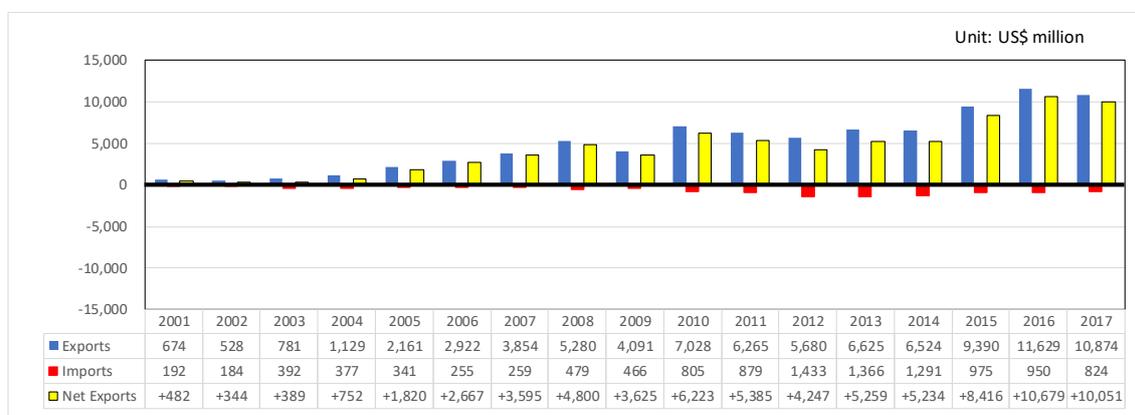
Table 37 Structural Changes of Automotive Trade of Thailand

[Thailand]	HS code	Exports					Imports					Net Exports (US\$ mill)	
		Value (US\$ mill)		Share (2017)	CAGR		Value (US\$ mill)		Share (2017)	CAGR		2001	2017
		2001	2017		01-17	12-17	2001	2017		01-17	12-17		
Passenger Car (Total)	(14 items)	674	10,874	100%	19.0%	13.9%	192	824	100%	9.5%	▲ 10.5%	+482	+10,051
Gasoline engine (<= 1l)	870321	8	106	1.0%	17.8%	▲ 12.9%	0	1	0.1%	15.3%	▲ 23.4%	+8	+105
ibid (1.0 l < xx <=1.5 l)	870322	24	2,485	22.8%	33.8%	3.7%	2	89	10.8%	27.8%	▲ 24.4%	+22	+2,396
ibid (1.5 l < xx)	870323	421	3,266	30.0%	13.7%	15.6%	148	328	39.8%	5.1%	▲ 14.7%	+273	+2,939
Commercial Vehicle (Total)	(7 items)	1,235	7,304	100%	11.7%	▲ 7.0%	57	208	100%	8.4%	▲ 11.8%	+1,178	+7,096
(semi-) Diesel (<= 5 t)	870421	1,054	6,668	91.3%	12.2%	▲ 2.8%	26	97	46.6%	8.5%	▲ 8.1%	+1,028	+6,571
Gasoline (<= 5 t)	870431	158	359	4.9%	5.3%	▲ 33.4%	7	20	9.6%	6.6%	▲ 22.0%	+151	+339
Auto Parts (Total)	(89 items)	1,826	20,960	100%	16.5%	4.8%	2,886	13,979	100%	10.4%	▲ 4.0%	▲ 1,060	+6,981
100 Engines & parts	36 items	488	5,747	27.4%	16.7%	5.1%	937	4,788	34.3%	10.7%	▲ 3.9%	▲ 450	+959
200 Drivetrain parts	11 items	75	2,097	10.0%	23.2%	19.4%	302	4,124	29.5%	17.8%	▲ 2.3%	▲ 227	▲ 2,027
300 Tires/ Wheels	6 items	331	4,476	21.4%	17.7%	6.3%	38	529	3.8%	17.9%	▲ 1.6%	+293	+3,947
400 Steering & parts	1 item	15	508	2.4%	24.5%	▲ 0.1%	6	260	1.9%	26.1%	3.9%	+9	+249
500 Suspension & parts	2 items	15	203	1.0%	17.5%	4.2%	6	150	1.1%	21.8%	5.0%	+9	+53
600 Brake & Parts	6 items	24	530	2.5%	21.2%	11.5%	19	364	2.6%	20.3%	▲ 9.4%	+6	+165
700 Bodies and Parts	13 items	182	2,559	12.2%	17.9%	6.3%	204	1,324	9.5%	12.4%	▲ 2.2%	▲ 21	+1,235
800 E&E Components	12 items	509	2,464	11.8%	10.4%	0.5%	131	1,153	8.2%	14.5%	4.8%	+377	+1,311
900 Others	2 items	187	2,377	11.3%	17.2%	▲ 2.2%	1,242	1,288	9.2%	0.2%	▲ 14.0%	▲ 1,056	+1,089
Grand Total	(110 items)	3,735	39,138	-	15.8%	3.6%	3,135	15,011	-	10.3%	▲ 4.6%	+599	+24,127
Ref: Thailand's Total Trade		64,919	236,006	-	8.4%	0.6%	61,961	225,131	-	8.4%	▲ 1.9%	+2,959	+10,875
Auto Industry's Share		5.8%	16.6%	-	-	-	5.1%	6.7%	-	-	-	-	-

Source: JICA Expert Team based on ITC Trade Map

(2) Passenger Cars

In the last 20 years, Thailand has solidified its position as a production hub of passenger cars. Other salient changes of the passenger car trade of Thailand are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

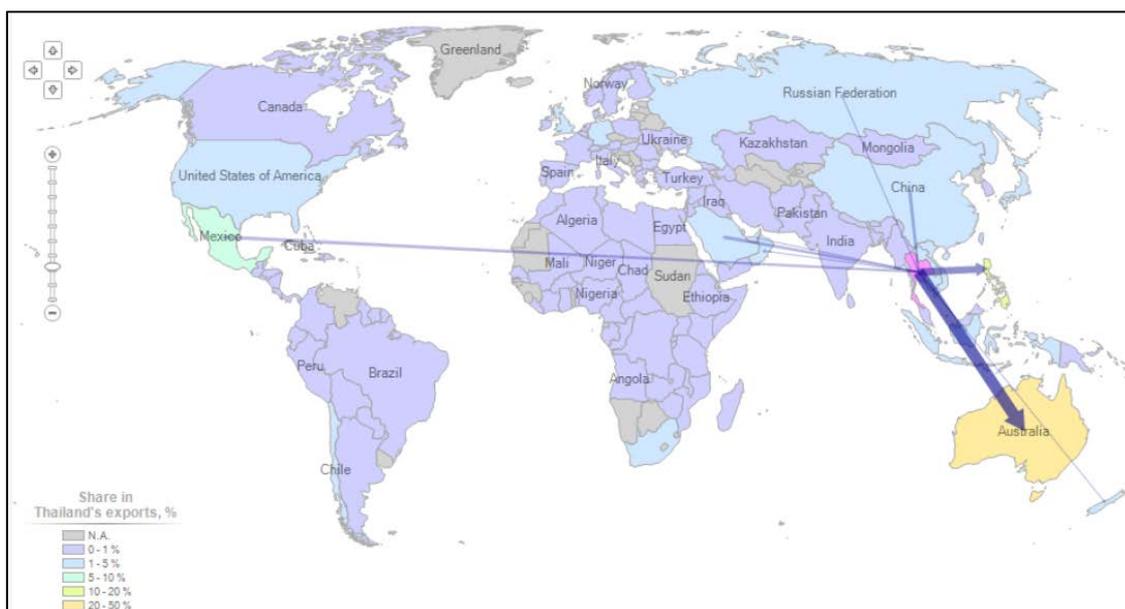
Figure 34 Passenger Car Trade of Thailand from 2001 to 2017

- 1) Thailand has gained the recognition as one of key vehicle production sites in the world. In 2017, Thailand's exports of passenger cars represent 1.5% of world exports in the segment ; Thailand is the 16th largest exporter of passenger cars in the world.
- 2) Approximately 55% of passenger cars exported by Thailand in 2017 were cars with gasoline engines and 40% were cars with diesel engines.
- 3) The country had a 5% global share in the passenger car with diesel engine sized over 2500 cc segment (HS Code 870333, 7th in the world's ranking) and 2.5% global share in the passenger car with gasoline engine sized 1000 cc - 1500 cc (HS Code 870322, 15th in the world's ranking).
- 4) The exports of passenger cars exported from Thailand to the ASEAN market (i.e. Indonesia, Malaysia, the Philippines and Viet Nam) expanded significantly from US\$ 13 million in 2001 to US\$ 2,331 million in 2017. The combined share of these countries in the Thailand's passenger car exports also expanded from 2.0% to 21.4% over the 17 years.
- 5) As Thailand has fortified its position as a production hub, it has strengthened its presence not only in the Australia, New Zealand, and ASEAN markets but also in the Middle Eastern markets. As shown in the table below, 4.8% of the country's passenger car exports were to Saudi Arabia, 2.5 % to UAE, and 2.3 % to Oman in 2017.

Table 38 Top 10 Export Destinations of Passenger Cars from Thailand

	Country	Value (US\$ mill)	Share	Quantity (units)		Country	Value (US\$ mill)	Share	Quantity (units)
1	Australia	2,790	25.7%	154,518	6	Indonesia	390	3.6%	N/A
2	Philippines	1,738	16.0%	112,982	7	New Zealand	383	3.5%	19,452
3	Mexico	659	6.1%	74,587	8	Russia	288	2.6%	12,121
4	Saudi Arabia	517	4.8%	35,271	9	UAE	276	2.5%	N/A
5	China	493	4.5%	N/A	10	Oman	247	2.3%	13,861

* Share in the Thailand's Passenger Car Trade Source: JICA Expert Team based on ITC Trade Map



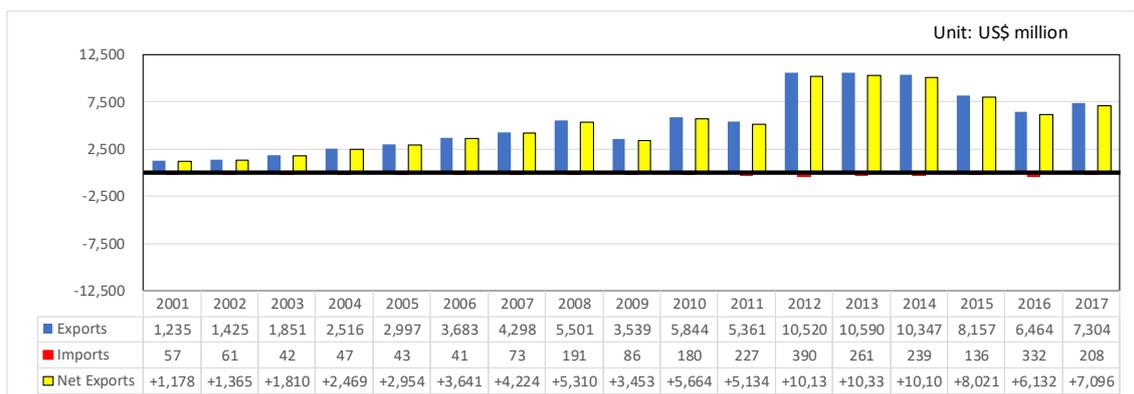
Source: JICA Expert Team based on ITC Trade Map

Figure 35 Export Destinations of Passenger Cars from Thailand (2017)

- 6) In 2017, Thailand exported 41,269 units (US\$ 365 million) of hybrid electric vehicles, among which about 50% are to the European market, 19% to the Australian market, and 13% to the Philippines. Thailand is the tenth biggest exporter in the world for hybrid EV (HS code 870340), occupying 1.6% of the world's share.
- 7) The main importing partners of passenger cars are Japan, Malaysia, Germany and Indonesia. The imports from these four countries amount to more than 80%.

(3) Commercial Vehicles

In 2017, Thailand was the fifth biggest exporter of commercial vehicles in the world (global share: 5.6%), following Mexico (19%), USA (12%), Germany (8%), Japan (7%). Thailand's commercial vehicle exports increased from US\$ 1.2 billion in 2001 to US\$ 10.6 billion in 2012 and declined since to 7.3 billion in 2017. Structural changes of the commercial vehicle trade of Thailand are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

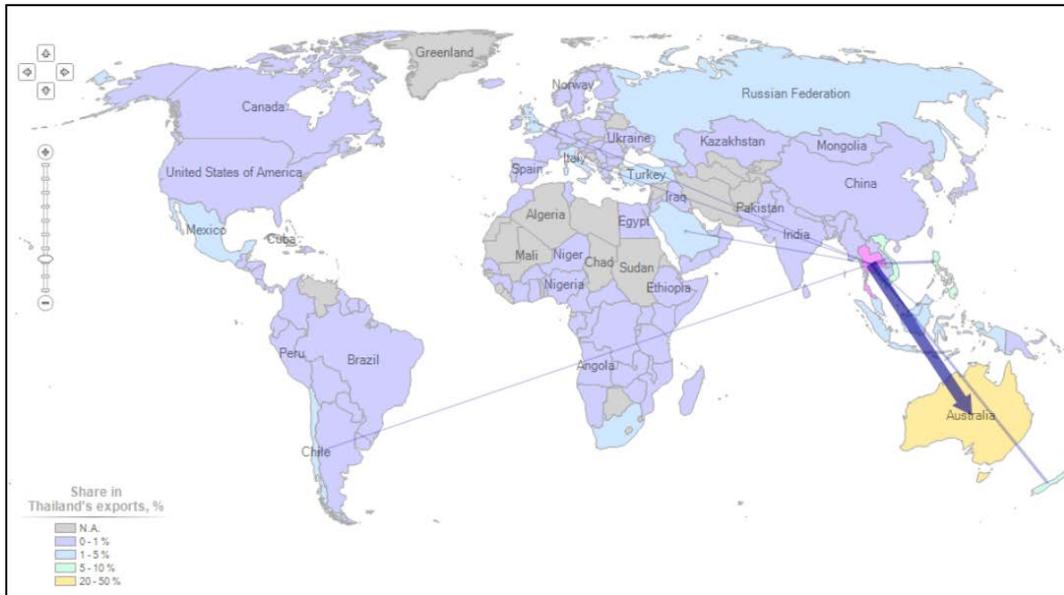
Figure 36 Commercial Vehicle Trade of Thailand from 2001 to 2017

- 1) For the sub-segment of light commercial vehicle (diesel/semi-diesel, under 5 tons, HS code 870421), Thailand had the top world share of 13% in 2017. Among commercial vehicles exported by Thailand, 91% fell under the light diesel truck category and 5% under the light gasoline truck category.
- 2) Australia and New Zealand are the main export destinations of commercial vehicles from Thailand. Combined these countries occupy 45% of Thailand's commercial vehicle exports. It is estimated that more than 300,000 vehicles were exported from Thailand to Thailand and New Zealand in 2017.

Table 39 Top 10 Export Destinations of Commercial Vehicles from Thailand

	Country	Value (US\$ mill)	Share	Quantity (units)
1	Australia	2,738	37.5%	N/A
2	New Zealand	520	7.1%	N/A
3	Viet Nam	454	6.2%	N/A
4	Philippines	413	5.7%	25,150
5	Malaysia	302	4.1%	N/A
6	Chile	267	3.7%	N/A
7	United Kingdom	247	3.4%	14,568
8	Indonesia	245	3.4%	17,134
9	Saudi Arabia	202	2.8%	17,584
10	Italy	191	2.6%	11,683

* Share in the Thailand's Commercial Vehicle Trade Source: JICA Expert Team based on ITC Trade Map



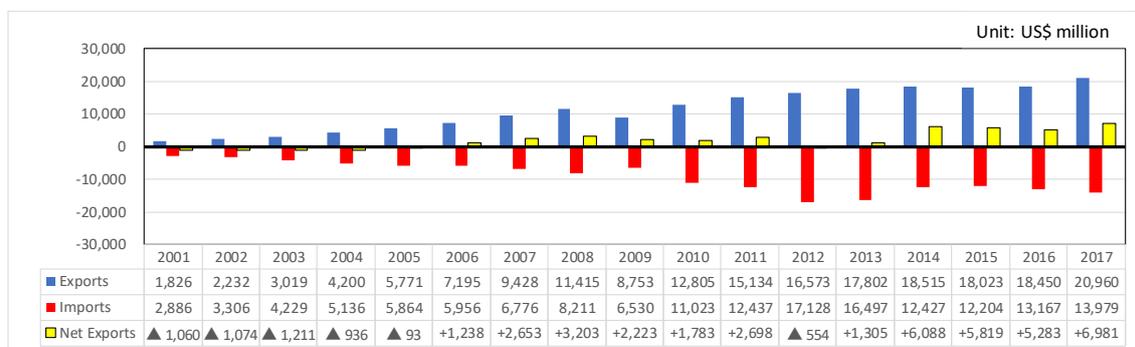
Source: JICA Expert Team based on ITC Trade Map

Figure 37 Export Destinations of Commercial Vehicles from Thailand (2017)

- 3) The share of ASEAN countries in Thailand’s exports of commercial vehicles increased from 5% to 19%. Viet Nam and the Philippines are major export destinations. Especially, the exports to Viet Nam increased drastically from US\$ 22 million in 2010 to US\$ 453 million in 2017 at a CAGR of 54 % during this period. The export value of commercial vehicles from Thailand to Viet Nam exceeded that of the export amount to the Philippines in 2016.
- 4) As with the case of the passenger car segment, Thailand firmly established its position as an export hub of commercial vehicles, particularly of pick-up trucks, to Australia and ASEAN countries.

(4) Auto Parts

Thailand's auto parts exports have had a steady growth over the past two decades. The imports had expanded until 2012 and have been on the decline since then. Structural changes of Thailand's auto parts trade are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

Figure 38 Auto Parts Trade of Thailand from 2001 to 2017

- 1) Thailand's exports of auto parts had a remarkable increase from US\$ 1.8 billion to US\$ 21.0 billion in 2017 (9.9 times). The export value in 2017 was close to 5 times larger than that of the Philippines. The growth in Thailand's auto parts exports between the periods was 16.5%.
- 2) In the last few years, there has been a gradual decrease of imports. Coupled with the gradual increase in exports, this indicates the steady expansion of supporting industries. The drastic increase in the imports in 2012 is presumed to be due to the massive flood that hit the country in the previous year.
- 3) The most important trade partner for Thailand has been Japan. In 2001, 21.3 % of Thailand's auto parts exports were to Japan and 59.3% of all imports were from Japan. In 2017, the numbers have declined to 9.9% and 39.4% respectively. This indicates that over the two decades Japan's production sites have moved to countries like Thailand, China, and Indonesia. The parts that Thailand still heavily imports from Japan are those that are closely linked to performance and safety, such as 1) engine and engine parts, 2) drive train parts and, 3) brake parts.
- 4) During the period, the share of ASEAN countries (Philippines, Indonesia, Viet Nam, and Malaysia) in Thailand's auto parts imports increased from 7.9% (US\$ 229 million) in 2001 to 14.8% (US\$ 2,063 million) in 2017. China's share in the Thailand's auto parts imports increased from 1.7% to 15.1%. As with the case for the Philippines' auto parts segment, the acceleration of regional interdependence in the supply of auto parts is evident from the increasing mutual trade among Japan, China and ASEAN countries.
- 5) As shown in Table 40, the top 12 export items based on six-digit level HS codes occupied 64 % share of the total value of Thailand's auto parts exports. The figure is smaller than that of Thailand two years ago in 2015 (69%), suggesting that the variety of auto parts

exported by Thailand is expanding. It is also much smaller than those of other ASEAN countries.

- 6) The engine and engine parts segment is the biggest auto part export segment, occupying about 27% of its entire auto parts export value. Within this segment, Thailand has significant trade surpluses with diesel or semi diesel engines (HS 840820), gasoline engine parts (HS 840991), internal combustion engine starter motors and dual-purpose starter-generators (HS 851140), filtering machinery (HS 8421), turbocharger and parts thereof (HS 841459, 841490), exhaust device and parts thereof (HS 870892), and radiator and parts thereof (HS 870891).
- 7) The drivetrain parts segment is the fastest growing export segment in the last five years. It is also the only segment that Thailand marked trade deficit in 2017.

Table 40 Top 12 Export Items in Auto Parts of Thailand

No.	Classification (Segment)	Exported Products	HS Code	Value (2017)		Volume (2017) (ton)	Value (2001)		CAGR	No. 1 Destination *
				US\$ mill	Share		US\$ mill	Share		
1	Automotive Tires/Wheels	New tyres (for cars)	401110	2,604	12.4%	69,540,291	71	3.9%	25.3%	USA
2	Other Parts	Parts and accessories	870899	2,362	11.3%	331,194	184	10.1%	17.3%	Malaysia
3	Engines and engine parts	Diesel or semi-diesel engine	840820	1,496	7.1%	-	119	6.5%	17.1%	South Africa
4	Automotive Tires/Wheels	Tyres, of a kind used for buses and lorries	401120	1,327	6.3%	-	157	8.6%	14.3%	USA
5	Bodies and Parts	Other body parts	870829	1,173	5.6%	159,573	81	4.4%	18.2%	Indonesia
6	Drivetrain parts	Transmission and parts thereof	870840	1,034	4.9%	73,790	1	0.1%	53.6%	China
7	Engines and engine parts	Gasoline Engine Parts	840991	725	3.5%	40,809	87	4.8%	14.2%	Indonesia
8	E&E Component	Parts of air conditioning machines,	841590	616	2.9%	42,876	128	7.0%	10.3%	Japan
9	Drivetrain parts	Drive-axles with differential	870850	547	2.6%	74,757	6	0.3%	32.9%	Indonesia
10	Engines and engine parts	Diesel Engine Parts	840999	519	2.5%	37,168	14	0.8%	25.1%	Japan
11	Brake and parts thereof	Brakes and servo-brakes and their parts	870830	509	2.4%	58,139	0	0.0%	-	Indonesia
12	Steering and parts thereof	Steering wheels, steering columns and steering boxes	870894	508	2.4%	38,944	15	0.8%	24.5%	Malaysia
Top 12 Items		Total:		13,421	64.0%	-	507	27.8%	22.7%	
Total (89 Items)				20,960	100%	-	1,826	100.0%	16.5%	

* No 1 destination based on value

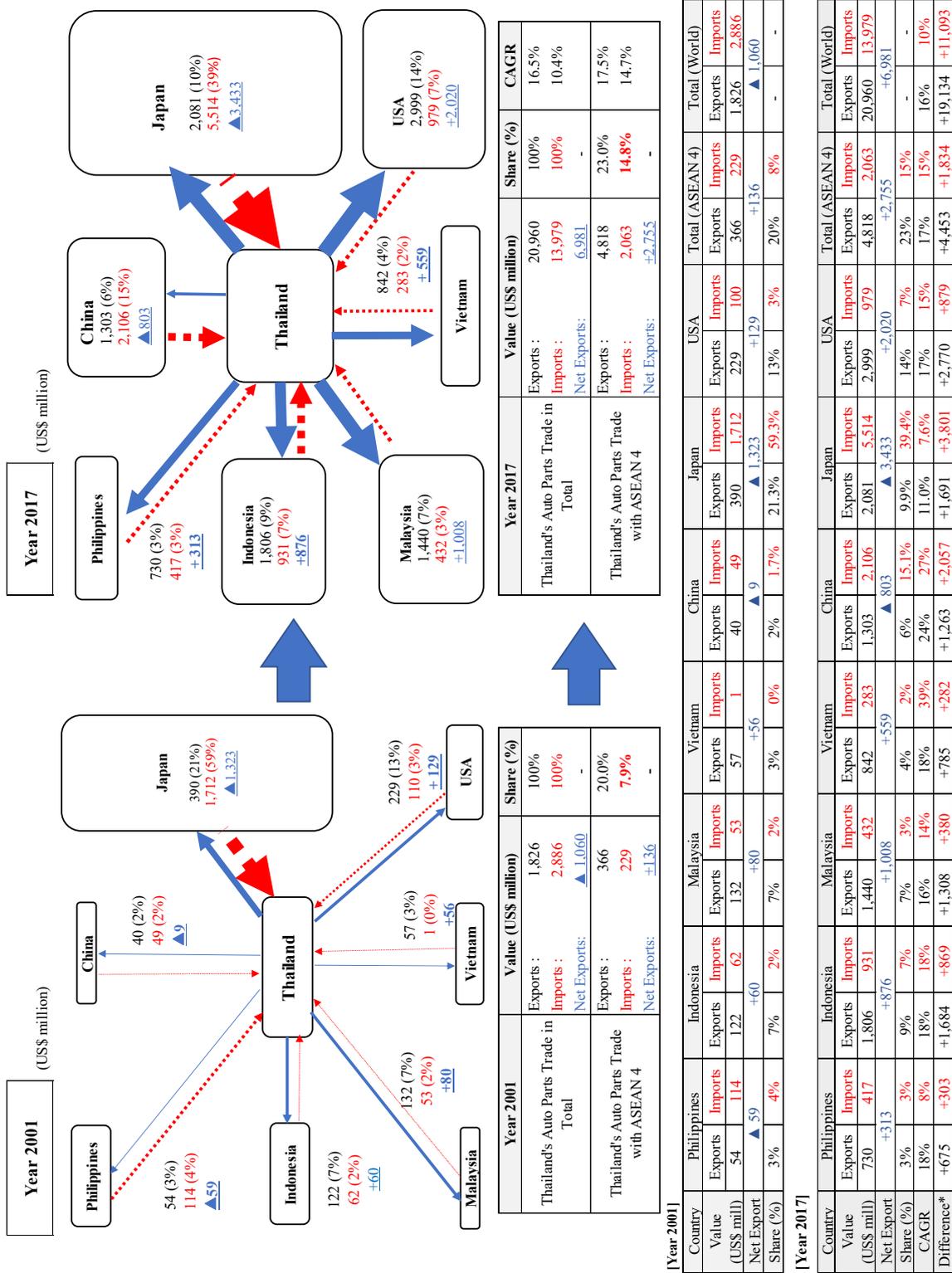
Source: JICA Expert Team based on ITC Trade Map

Table 41 Top 12 Import Items in Auto Parts of Thailand

No.	Classification (Segment)	Imported Products	HS Code	Value (2017)		Volume (2017) (ton)	Value (2001)		CAGR	No. 1 Origin *
				US\$ mill	Share		US\$ mill	Share		
1	Drivetrain parts	Transmission and parts thereof	870840	2,386	17.1%	155,481	68	2.4%	24.9%	Japan
2	Other parts	Other parts	870899	1,241	8.9%	151,594	1,233	42.7%	0.0%	Japan
3	Engines and engine parts	Diesel Engine Parts	840999	1,160	8.3%	105,641	286	9.9%	9.2%	Japan
4	Bodies and Parts	Other body parts	870829	643	4.6%	79,441	68	2.3%	15.1%	Japan
5	Engines and engine parts	Gasoline Engine Parts	840991	595	4.3%	41,356	109	3.8%	11.2%	Japan
6	Drivetrain parts	Drive-axles with differential	870850	517	3.7%	77,860	1	0.0%	49.2%	Japan
7	Engines and engine parts	Diesel Engine	840820	476	3.4%	-	46	1.6%	15.7%	Japan
8	Engines and engine parts	Turbocharger and parts thereof	841490	403	2.9%	-	40	1.4%	15.5%	Japan
9	E&E Component	Wire harness	854430	358	2.6%	17,266	23	0.8%	18.7%	Philippines
10	Brake and parts thereof	Brakes and servo-brakes and their parts	870830	344	2.5%	31,481	0	0.0%	-	Japan
11	Drivetrain parts	Toothed wheels, chain sprockets and others	848390	339	2.4%	24,276	15	0.5%	21.4%	Japan
12	Drivetrain parts	Transmission shafts	848310	283	2.0%	-	96	3.3%	7.0%	Japan
Top 12 Items		Total:		8,745	62.6%	-	1,986	68.8%	9.7%	
Total (89 Items)				13,979	100%	-	2,886	100%	10%	

* No 1 origin based on value

Source: JICA Expert Team based on ITC Trade Map



^{2/} Difference (US\$ million) : 2017 export (import) value - 2001 export (import) value

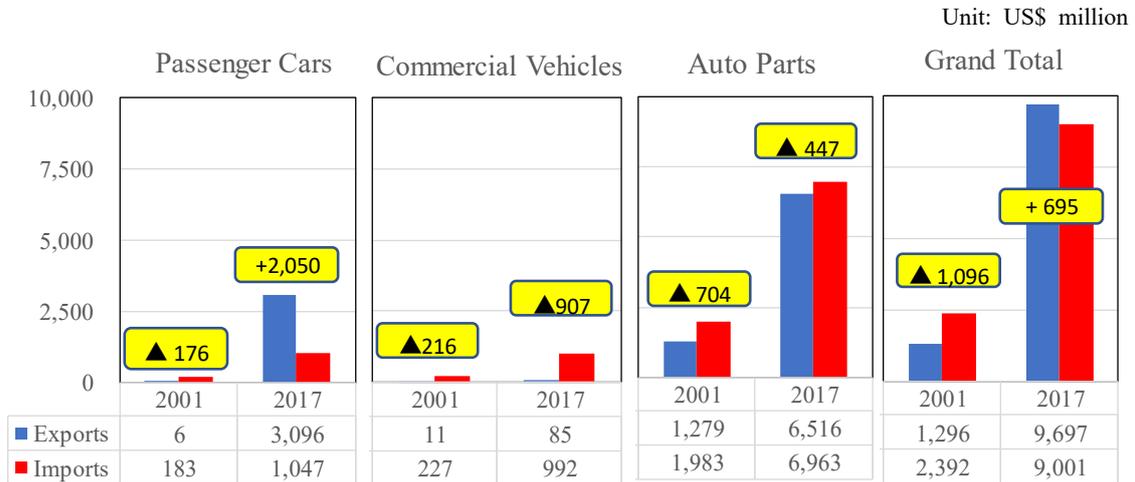
^{1/} ASEAN 4 = Philippines, Indonesia, Malaysia, Viet Nam.

Source: JICA Expert Team based on ITC Trade Map
Figure 39 Structural Changes in Thailand's Auto Parts Trade

3.2.5 Automotive Trade of Indonesia

(1) Overview

The basic trade structure of the Indonesia’s automotive industry in the three segments and salient structural changes of the industry from 2001 to 2017 are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

Figure 40 Overview of the Indonesia’s Automotive Trade in 2001 and 2017

- 1) Indonesia’s automotive export value expanded more than seven folds from US\$ 1.3 billion in 2001 to US\$ 9.7 billion in 2017 with a high CAGR of 13.4%. Its imports had grown from US\$ 2.4 billion to US\$ 9.0 billion with a CAGR of 8.6% during the same period. With the faster growth of exports, the net exports of the industry had shifted from negative in 2001 to positive in 2015.
- 2) The changes are attributable to the growth of passenger cars and auto parts segments.
- 3) The automotive industry occupies a greater share in the country’s overall exports. The share increased from 2.3% to 5.7%. While the share of auto industry in the Indonesia’s total exports, the opposite trend is observed for imports. While the imports for the automotive industry had grown at a CAGR of 8.6%, the country’s overall imports had grown faster at a CAGR of 10.7%, resulting in the decrease of the automotive industry’s share in the country’s overall imports.
- 4) When analyzing Indonesia’s automotive trade, the most salient characteristic is the growth of passenger car exports. Indonesia transformed itself from an importing country of passenger cars to an exporting country. From 2001 to 2017, the passenger car exports had grown from US\$ 6 million to US\$ 3,090 million with an astonishingly high CAGR of 47.5%. Indonesia’s passenger car imports peaked at US\$ 2.7 billion in 2012 and has been declining since then.

- 5) Indonesia also produces commercial vehicles; however, the most are for the domestic consumption for now. In 2017, it imported US\$ 992 million worth of commercial vehicles; meanwhile, it exported US\$ 85 million.
- 6) In the auto parts segment, while its imports increased from US\$ 2.0 billion to US\$ 7.0 billion with a CAGR of 8.2%, its exports increased more rapidly from US\$ 1.3 billion to US\$ 6.5 billion with a CAGR of 10.7%. Like Thailand, Indonesia's auto parts exports steadily increased during the period; its imports peaked at 2012 declined since then. This suggests the growth of supporting industries.
- 7) The leading segments for auto parts exports for Indonesia are automotive tires/wheels, engines and engine parts, and drivetrain parts. Especially, the exports of the drivetrain parts segment grew significantly with a high CAGR of 28.2%.

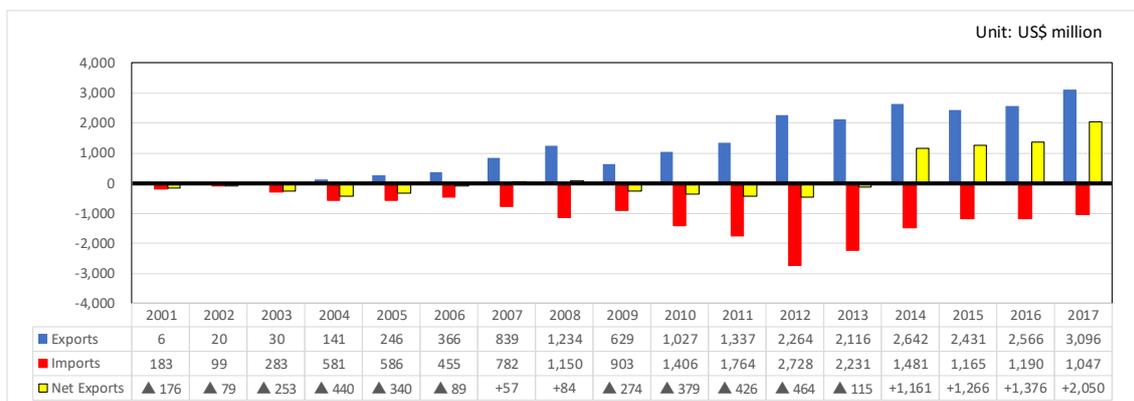
Table 42 Structural Changes of Automotive Trade of Indonesia

[Indonesia]	HS code	Exports					Imports					Net Exports (US\$ mill)	
		Value (US\$ mill)		Share (2017)	CAGR		Value (US\$ mill)		Share (2017)	CAGR		2001	2017
		2001	2017		01-17	12-17	2001	2017		01-17	12-17		
Passenger Car	(14 items)	6	3,096	100%	47.5%	6.5%	183	1,047	100%	11.5%	▲ 17.4%	▲ 176	+2,050
Gasoline engine (<= 1l)	870321	1	226	7.3%	44.0%	158.4%	31	3	0.3%	▲ 13.1%	▲ 31.2%	▲ 30	+223
ibid (1.0 l < xx <= 1.5 l)	870322	0	1,150	37.1%	73.3%	4.3%	17	300	28.6%	19.8%	▲ 22.0%	▲ 17	+850
ibid (1.5 l < xx)	870323	2	721	23.3%	45.0%	▲ 4.2%	86	434	41.4%	10.7%	▲ 14.6%	▲ 84	+287
Commercial Vehicle	(7 items)	11	85	100%	13.9%	▲ 17.8%	227	992	100%	9.7%	▲ 17.8%	▲ 216	▲ 907
(semi-) Diesel (<= 5 t)	870421	1	4	4.9%	12.4%	2.9%	4	244	24.6%	30.3%	▲ 12.2%	▲ 3	▲ 240
Gasoline (<= 5 t)	870431	1	44	52.5%	32.1%	▲ 22.0%	0	18	1.8%	35.7%	▲ 15.9%	+0	+26
Auto Parts	(89 items)	1,279	6,516	100%	10.7%	3.2%	1,983	6,963	100%	8.2%	▲ 3.7%	▲ 704	▲ 447
100 Engines & parts	36 items	313	1,504	23.1%	10.3%	3.8%	738	2,565	36.8%	8.1%	▲ 5.1%	▲ 425	▲ 1,061
200 Drivetrain parts	11 items	21	1,120	17.2%	28.2%	5.6%	260	1,609	23.1%	12.1%	▲ 4.1%	▲ 240	▲ 489
300 Tires/ Wheels	6 items	247	1,698	26.1%	12.8%	▲ 1.3%	19	306	4.4%	18.8%	3.2%	+227	+1,392
400 Steering & parts	1 item	6	24	0.4%	9.1%	6.2%	31	186	2.7%	11.8%	▲ 1.4%	▲ 25	▲ 162
500 Suspension & parts	2 items	9	79	1.2%	14.5%	▲ 0.0%	7	73	1.1%	15.4%	▲ 3.0%	+2	+6
600 Brake & Parts	6 items	5	84	1.3%	19.8%	13.8%	18	268	3.9%	18.3%	7.8%	▲ 13	▲ 184
700 Bodies and Parts	13 items	36	416	6.4%	16.5%	10.0%	61	578	8.3%	15.1%	▲ 3.5%	▲ 24	▲ 161
800 E&E Components	12 items	515	1,278	19.6%	5.8%	4.8%	59	514	7.4%	14.4%	▲ 1.2%	+455	+764
900 Others	2 items	128	312	4.8%	5.7%	6.0%	788	863	12.4%	0.6%	▲ 5.1%	▲ 660	▲ 551
Grand Total	(110 items)	1,296	9,697	-	13.4%	3.8%	2,392	9,001	-	8.6%	▲ 8.2%	▲ 1,096	+695
Ref: Indonesia's Total Trade		56,317	168,810	-	7.1%	▲ 2.3%	30,962	157,388	-	10.7%	▲ 3.9%	+25,355	+11,422
Auto Industry's Share		2.3%	5.7%	-	-	-	7.7%	5.7%	-	-	-	-	-

Source: JICA Expert Team based on ITC Trade Map

(2) Passenger Cars

Indonesia's passenger car exports skyrocketed in the last 15 years; it became a car exporting country from 2014. Other salient changes of Indonesia's passenger car trade are summarized as follows:



Source: JICA Expert Team based on ITC Trade Map

Figure 41 Passenger Car Trade of Indonesia from 2001 to 2017

- (1) Due to the drastic expansion of exports, the Indonesia's passenger car trade shifted from deficit to surplus in 2014. Once a passenger car importing country, Indonesia became a passenger car exporting country. In 2017, it exported US\$ 3.1 billion worth of passenger vehicles.
- (2) The Philippines is the top destination of passenger cars from Indonesia, occupying almost 40 % of its share in 2017. From 2006 to 2015, Saudi Arabia was the leading destination of passenger cars from Indonesia, which was surpassed by the Philippines in 2016. As with its relationship with Thailand, the Philippines' passenger car trade relationship with Indonesia is characterized by trade imbalance.
- (3) In 2017, 34% of passenger cars exported from Indonesia were cars with gasoline engine sized 1000 cc - 1500 cc., 28% are cars with diesel and semi-diesel engine sized over 2,500 cc., and 23% were cars with gasoline engine sized 1500 cc - 3000 cc. The exports of cars with diesel and semi-diesel engine sized over 2,500 cc. increased greatly from 2016 (approx. 10 times more than the previous year); about 90% were exported to the Philippines in 2017.
- (4) In 2014, the production of passenger cars in Indonesia exceeded the domestic sales. The exports data also shows that Indonesia became an exporting country for passenger cars on the same year.

Table 43 Top 10 Export Destinations of Passenger Cars from Indonesia

	Country	Value (US\$ mill)	Share	Quantity (1,000 tons)
1	Philippines	1,203	38.9%	97.9
2	Saudi Arabia	494	16.0%	46.7
3	Viet Nam	242	7.8%	19.6
4	Thailand	177	5.7%	14.9
5	Japan	135	4.4%	13.5

	Country	Value (US\$ mill)	Share	Quantity (1,000 tons)
6	UAE	126	4.1%	10.9
7	Mexico	110	3.6%	12.5
8	Oman	92	3.0%	8.0
9	Pakistan	88	2.9%	12.6
10	Malaysia	83	2.7%	8.8

* Share in the Indonesia's Passenger Car Trade
Source: JICA Expert Team based on ITC Trade Map



Source: JICA Expert Team based on ITC Trade Map

Figure 42 Export Destinations of Passenger Cars from Indonesia (2017)

- (5) From 2003 to 2016, Thailand was the top origin of passenger cars imported into Indonesia. The imports of passenger cars to Indonesia peaked in 2012 at US\$ 2.7 billion and steadily declined to US\$ 1.0 billion in 2017. The portion of passenger car imports declined were mostly from imports from Thailand. At its peak in 2012, imports of passenger cars from Thailand was US\$ 1.5 billion (55% of all Indonesia's passenger car imports), which was declined to US\$ 0.3 billion. This suggest that Indonesia is now producing the type of passenger vehicles that used to be imported from Thailand.
- (6) Before being taken over by Thailand in 2013, japan was the top origin of passenger cars in Indonesia. In 2017, it again became its top importing partner. Indonesia mainly imports cars with gasoline engine sized 1500 cc - 3000 cc from Japan.

(3) Commercial Vehicles

Indonesia produces commercial vehicles, but not yet enough to export. Unlike its passenger car segment, the Indonesia's commercial vehicle segment is still a trade deficit industry. Salient points of the Indonesia's commercial vehicle from 2001 to 2017 are summarized as follows:

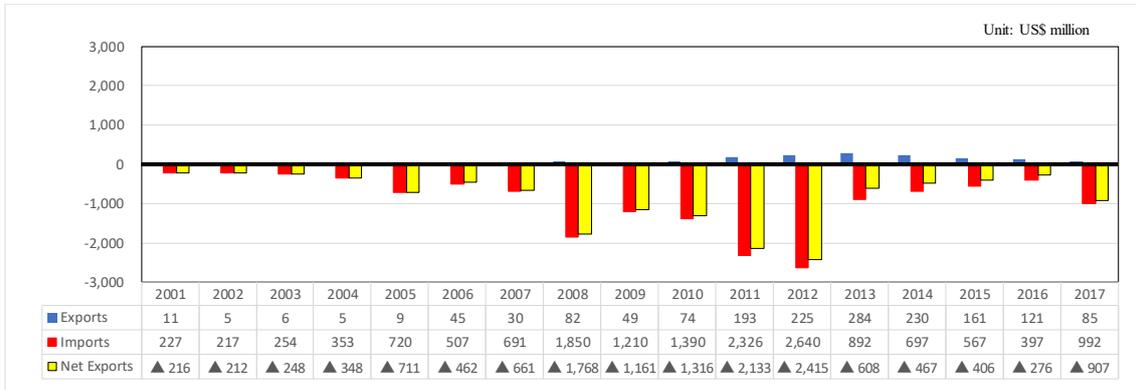
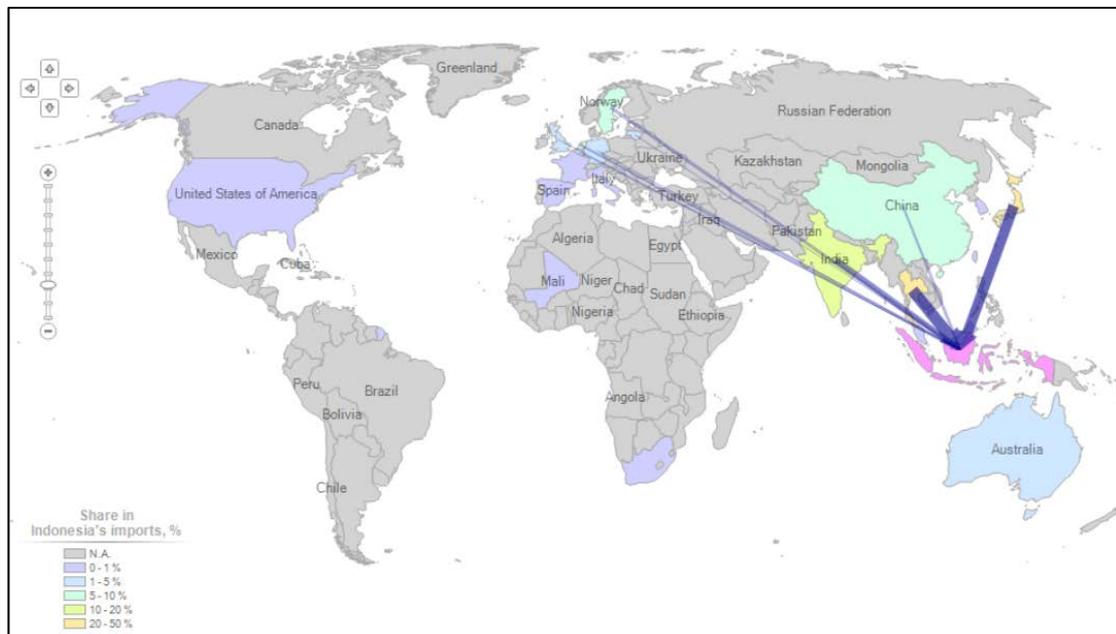


Figure 43 Commercial Vehicle Trade of Indonesia

- 1) Indonesia's imports of commercial vehicles grew significantly until 2012 and has seen a drastic drop.
- 2) In 2017, Indonesia imported about almost 29.3% of commercial vehicles from Thailand, 26.3% from Japan, and 14.3% from India. When analyzed by trade volume, China ranked the top 4 origin of Indonesia's commercial vehicle imports.



Source: JICA Expert Team based on ITC Trade Map

Figure 44 Import Sources of Commercial Cars into Indonesia (2017)

Table 44 Changes in Origins of Commercial Vehicle Imports to Indonesia

2001				2017				
	Country	Value (US\$ mill)	Share (%)		Country	Value (US\$ mill)	Share (%)	
1	USA	88	38.7	➔	1	Thailand	291	29.3
2	Japan	70	30.7		2	Japan	260	26.3
3	Sweden	18	7.8		3	India	142	14.3
4	Singapore	14	6.1		4	Sweden	79	8.0
5	France	13	5.9		5	Netherlands	71	7.1
Total (World)		227	100	Total (World)		992	100	

Source: JICA Expert Team based on ITC Trade Map

- The key changes that have happened over the last 17 years is that many emerging economies, such as Thailand, India and China, are included in the top import origins and the growth of imports. For example, from Thailand, Indonesia imported only US\$ 4 million worth of commercial vehicles in 2001; the imported value from Thailand reached US\$ 513 million (approx. 130 times higher) in 2012 when Indonesia's imports of commercial vehicles its peak in recent years.

(4) Auto Parts

The auto parts segment of Indonesia's trade increased in both exports and imports from 2001 to 2017. Structural changes of Indonesia's auto parts trade are summarized as follows:

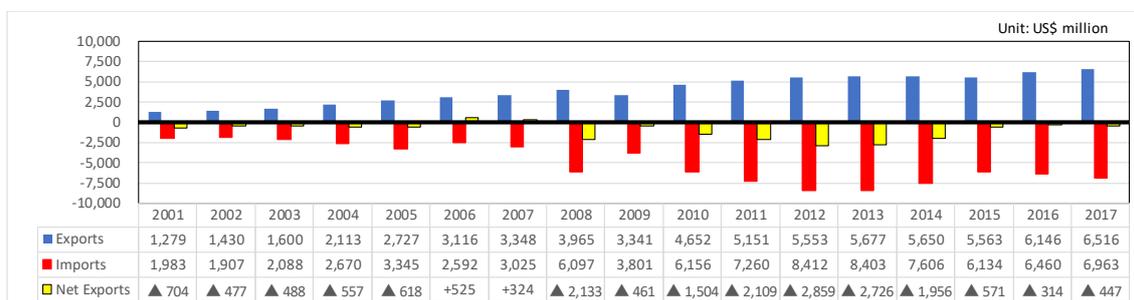


Figure 45 Auto Parts Trade of Indonesia

- The Indonesia's exports of auto parts had a gradual and steady growth. In 2017, the scale of Indonesia's auto parts exports was US\$ 6.5 billion, which is much smaller than that of Thailand (US\$ 21.0 billion), but slightly bigger than that of Viet Nam (US\$ 6.1 billion) and the Philippines (US\$ 4.2 billion).
- Like Thailand, Indonesia's auto parts imports has been on a slight decline since 2012.
- From 2001 to 2017, Japan and the USA remained Indonesia's leading export destinations (see Figure 46). While Indonesia's exports to Japan grew from US\$ 0.2 billion to US\$ 1.3 billion, the Japan's share in the Indonesia's auto parts exports remained stable from 17.9% to 20.4%. Its auto parts exports to the USA had the same trend; the USA's share did not change much from 15.6% to 15.3% during the period.

- 4) As shown in Table 45, the biggest export items are the automotive tire/wheels (20% share for car tires and 4% for wheels), E&E components (wire harness), and engine and engine parts. The first one is a natural resource-based commodity and the second one requires labor-intensive production processes.

Table 45 Top 12 Export Items in Auto Parts of Indonesia

No.	Classification (Segment)	Exported Products	HS Code	Value (2017)		Volume (2017) (ton)	Value (2001)		CAGR	No. 1 Destination *
				US\$ mill	Share		US\$ mill	Share		
1	Automotive Tires/Wheels	Automotive Tires (for cars)	401110	1,317	20.2%	335,235	170	13.3%	13.6%	USA
2	E&E component	Wire harness	854430	908	13.9%	35,686	104	8.1%	14.5%	Japan
3	Drive train	Transmission and parts	870840	722	11.1%	43,664	1	0.1%	54.8%	Thailand
4	Bodies and Parts	Other body parts	870829	303	4.7%	38,087	15	1.2%	20.7%	Thailand
5	Other parts	Other parts	870899	288	4.4%	32,942	122	9.5%	5.5%	Thailand
6	Automotive Tires/Wheels	Wheels	870870	256	3.9%	49,000	49	3.8%	10.9%	Japan
7	Engines and engine parts	Gasoline Engine (cylinder capacity > 1.000 cm ³)	840734	248	3.8%	18,941	40	3.1%	12.1%	Malaysia
8	Engines and engine parts	Gasoline Engine Parts	840991	211	3.2%	10,431	3	0.2%	31.1%	Thailand
9	Engines and engine parts	Engine battery (lead-acid accumulators)	850710	206	3.2%	76,797	47	3.7%	9.6%	UK
10	Engines and engine parts	Diesel Engine Parts	840999	194	3.0%	22,967	25	1.9%	13.8%	Thailand
11	Drivetrain parts	Drive-axles with differential	870850	155	2.4%	15,875	7	0.5%	21.7%	USA
12	E&E Component	Radio-broadcast receivers	852721	144	2.2%	2,678	254	19.9%	▲ 3.5%	USA
Top 12 Items		Total:		4,953	76.0%	-	836	65.3%	11.8%	
Total (89 Items)				6,516	100%	-	1,279	100%	10.7%	

Source: JICA Expert Team based on ITC Trade Map

- 5) For Indonesia's auto parts imports, Japan remained its top partner. While the imported value of auto parts from Indonesia to Japan grew from US\$ 1.3 billion in 2001 to US\$ 2.3 billion in 2017, the Japan's share in Indonesia's auto parts imports dropped almost in half from 63.8% to 33.2%.
- 6) Thailand had an all-around growth in auto parts trade with Indonesia from 2001 to 2017. Its imports grew from US\$ 64 million to US\$ 954 million and its exports grew from US\$ 80 million to US\$ 1,711 billion. This indicates mainly two things: 1) the development of the automotive and auto parts industry in the two countries and 2) the complementary relationship of auto parts supply established between the two.
- 7) Auto parts imports from China to Indonesia largely expanded from US\$ 30 million in 2001 to US\$ 1,094 billion in 2017; however, its exports did not have a significant growth only from US\$ 4 million to 151 million. This indicates that the automotive and auto parts

industry in China has also developed, presumably as a partial result of the production shift from Japan; however, unlike the Indonesia's relationship with Thailand, the complementary auto parts supply relationship does not exist between Indonesia and China. The relationship is categorized by one-way traffic from China.

- 8) Fast-growing export commodities for Indonesia are found to be relatively more technologically advanced and higher value-added products, such as transmission and parts (HS Code 870840), and gasoline engine parts (HS Code 840991).

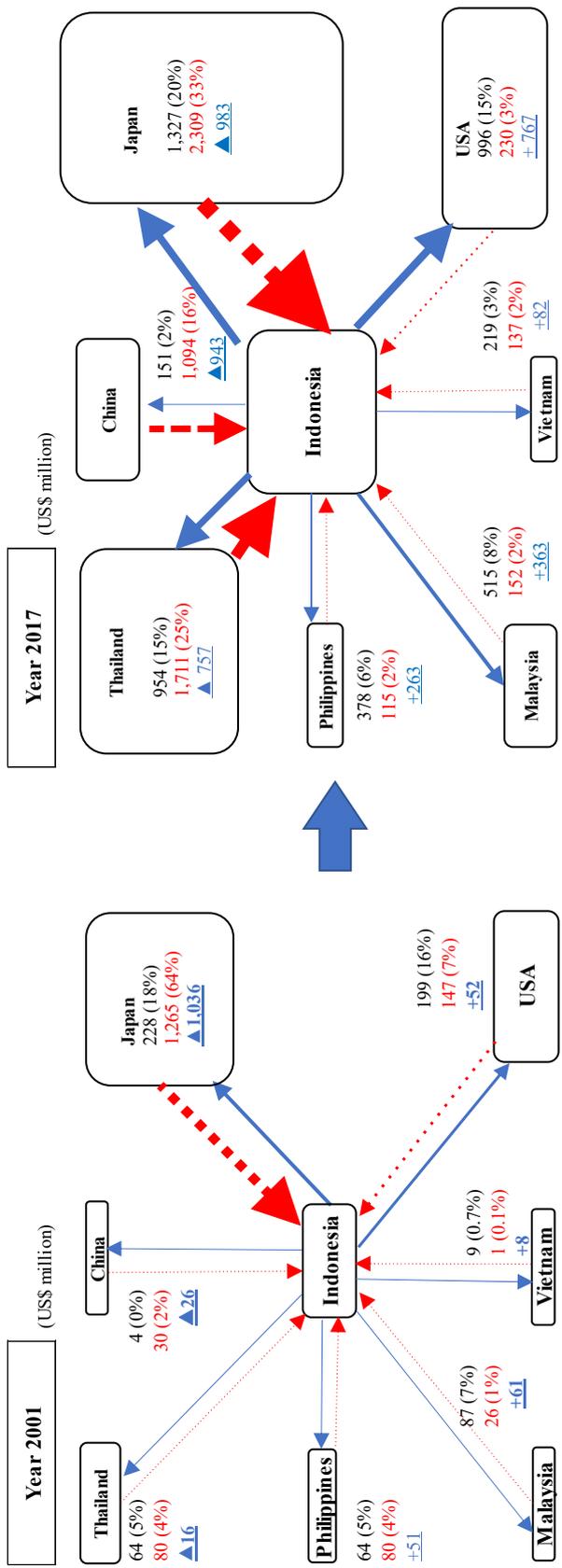
Table 46 Top 12 Import Items in Auto Parts of Indonesia

No.	Classification (Segment)	Imported Products	HS Code	Value (2017)		Volume (2017) (ton)	Value (2001)		CAGR	No. 1 Destination *
				US\$ mill	Share		US\$ mill	Share		
1	Other parts	Parts and accessories	870899	799	11%	583,019	769	38.8%	0.2%	Japan
2	Drivetrain	Transmission and parts	870840	658	9%	106,901	24	1.2%	23.0%	Japan
3	Engine and engine parts	Diesel Engine	840820	358	5%	NA	47	2.4%	13.5%	Thailand
4	Engine and engine parts	Gasoline engine parts	840991	344	5%	62,042	192	9.7%	3.7%	Japan
5	Bodies and parts	Other body parts	870829	322	5%	63,986	38	1.9%	14.3%	Japan
6	Drivetrain parts	Drive axles /non-drive axles	870850	306	4%	76,281	11	0.5%	23.2%	Japan
7	Engine and engine parts	Diesel engine parts	840999	301	4%	58,639	109	5.5%	6.6%	Japan
8	Brakes and parts	Brakes and servo-brakes and their parts	870830	225	3%	45,474	0	0.0%	-	Thailand
9	Steering and parts thereof	Steering wheels, steering columns and steering boxes, and parts	870894	186	3%	33,854	31	1.6%	11.8%	Thailand
10	Drivetrain parts	Transmission shafts, incl. cam shafts and crank shafts, and cranks	848310	165	2%	40,332	79	4.0%	4.7%	Japan
11	Automotive Tires	Automotive Tires (for buses and lorries)	401120	163	2%	80,918	6	0.3%	22.4%	China
12	Engines and engine parts	Filtering machinery	842139	150	2%	17,995	14	0.7%	15.8%	China
Top 12 Items		Total:		3,976	57%	-	1,321	66.6%	7.1%	
Total (89 Items)				6,963	100%	-	1,983	100%	8.2%	

* No 1 destination based on value

Source: JICA Expert Team based on ITC Trade Map

- 9) The most noticeable change in Indonesia's imports is the diversification of imported items. Compared to 2001, the imported items in 2017 were more widespread in different categories. In 2001, about 40% of all imported items were parts and accessories (HS code 870899).
- 10) Imports of the drivetrain parts and engines and engine parts segments from Japan increased, which implies that for core parts required for the engine and OEM assembly process, Indonesia still rely on imports from Japan.



Year 2017	Value (US\$ million)	Share (%)	CAGR
Indonesia's Auto Parts Trade in Total	Exports : 6,516 Imports : 6,963 Net Exports ▲ 447	100% 100% 100%	10.7% 8.2% 8.2%
Indonesia's Auto Parts Trade with ASEAN 4	Exports : 2,066 Imports : 2,115 Net Exports ▲ 48	31.7% 30.4% 30.4%	14.9% 19.6% 19.6%

Year 2001	Value (US\$ million)	Share (%)
Indonesia's Auto Parts Trade in Total	Exports : 1,279 Imports : 1,983 Net Exports ▲ 704	100% 100% 100%
Indonesia's Auto Parts Trade with ASEAN 4	Exports : 225 Imports : 120 Net Exports +105	17.5% 6.0% 6.0%

Country	Thailand		Philippines		Malaysia		Vietnam		China		Japan		USA		Total (ASEAN 4)		Total (World)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Value (US\$ mill)	64	80	64	115	87	26	9	1	4	151	228	1,327	199	225	225	225	1,279	1,983
Net Export	▲ 16		+51		+61		+8		▲ 26	▲ 943	▲ 1,036	+52	+82	+105	+105	+767	▲ 704	
Share (%)	5%	4%	5%	1%	7%	1%	1%	0%	0%	2%	18%	64%	16%	18%	18%	6%	10.7%	8.2%

Country	Thailand		Philippines		Malaysia		Vietnam		China		Japan		USA		Total (ASEAN 4)		Total (World)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Value (US\$ mill)	954	1,711	378	115	515	152	219	137	151	1,094	1,327	2,309	996	230	2,066	2,115	6,516	6,963
Net Export	▲ 757		+263		+363		+82		▲ 943	▲ 983	▲ 983	+767	+82	+48	+48	+447	▲ 447	
Share (%)	15%	25%	6%	2%	8%	2%	3%	2%	2%	16%	20%	33%	15%	3%	32%	30%	10.7%	8.2%
CAGR	18%	21%	12%	15%	12%	12%	22%	35%	25%	25%	12%	4%	11%	3%	15%	20%	11%	8%
Difference*	+890	+1,631	+314	+102	+428	+126	+210	+136	+147	+1,064	1,045	+797	+82	+82	+1,842	+1,995	+5,236	+4,980

* Difference (US\$ million) : 2017 export (import) value - 2001 export (import) value

Source: JICA Expert Team based on ITC Trade Map

Figure 46 Structural Changes in Indonesia's Auto Parts Trade

3.3 Analysis of Value/Supply Chain through Company Visits

3.3.1 Procedures and Key Aspects of Company Visits

Company visits were conducted as one of main methodologies of GVC analysis as well as a capacity development tool for GVC Analysis WG members. This activity was conducted not only for the detailed analysis of the automotive value/supply chains, but also for GVC Analysis WG members to learn supply chains in automotive assembly (OEMs) and auto-parts manufacturing along the automotive industry's value chain.

Using the following criteria and several lists of automotive companies and Japanese-affiliated companies in the Philippines, companies to be visited were selected by DTI/BOI and the JICA Expert Team.

- (1) Major OEMs and Tier 1 companies that have large-scale operations in the Philippines
- (2) Major exporting (PEZA) companies
- (3) Companies with the supply chain linkage with OEMs and Tier 1 companies located in the Philippines
- (4) Companies that are conducting not only production activities but also other value chain activities, such as R&D support

The selection of companies was made to cover OEMs in the Philippines and as many different segments of the automotive industry as possible (see Table 47). During company interviews and plant tours, the following data/information were requested from company management personnel and discussed later among GVC Analysis WG members for further analysis:

- (1) Materials, process and equipment for production (supply/manufacturing chain),
- (2) Destination of products, volume and value (domestic market and/or exported) (sales/marketing chain),
- (3) Logistics cost and transportation time for materials and parts as well as finished products (custom fee, transportation cost and time), and,
- (4) Human resources in R&D, production management and control, availability of efficient engineers and technicians, skills and capability of production/line workers.

The following issues were also discussed during company visits to clarify the positioning of the Philippines through location factors or reasons why companies have selected to invest in the Philippines.

- (1) What are the strengths of your operations in the Philippines in terms of your company's GVC? How will the strengths be utilized further and/or expanded in the future?
- (2) What are the weaknesses of your operations in the Philippines in terms of your company's GVC? How has (will) your company been coping (cope) with the weaknesses?
- (3) What opportunities do you perceive to exist for your operations in the Philippines in terms of upgrading the operations in your company's GVC? What are the prospect of utilizing the opportunities?

- (4) What do you perceive as threats to your operations in the Philippines? How is your company planning to deal with these threats?

3.3.2 Coverage of Company Visits

From February and July 2017, the Project visited 36 companies and organizations in total; GVC Analysis WG members visited 24 out of 36. Among the 36 companies, five were Japanese OEMs, three were direct affiliates of Japanese OEMs producing transmissions and drive train parts, 15 were Japanese auto-parts suppliers (Tier 1 and/or Tier 2), five were Philippines local suppliers, and five were other Japanese affiliates, including 3 R&D supporting companies.

The total number of employees of the companies visited by the Project reached around 39,000⁴⁷. In the meantime, according to the Philippine Industry Survey (census data), there are 177 automotive companies in the Philippines with a total employment of around 67,000⁴⁸. In terms of the number of employees, it is estimated that companies visited by the Project covered around 50% of the automotive industry in the Philippines⁴⁹.

⁴⁷ Based on information obtained in company visits by the GVC Analysis WG and/or JICA Expert Team

⁴⁸ The figure of 67,000 is a sum of the number of employees of C291 (Manufacturer of Motor Vehicle: 7,244 employees) and C293 (Manufacture of parts and accessories for motor vehicle: 59,739 employees)

⁴⁹ It should be noted that some of the companies visited by the Project may be categorized under different categories in the census, such as electric component. That being said, it is deemed that the company visit coverage by the Project is wide enough to get the accurate general trend of the industry.

Table 47 List of Companies Visited by the Project

No.	Category	Name of Company	Main Products	Product Classification	No. of Employees	
					Total (approx)	Japanese
1	Japanese OEM	Toyota Motor Philippines Corp. (TPM)	Manufacture and wholesale of automobiles	Vehicle assembly	2,450	9
2		Mitsubishi Motors Philippines Corp. (MMPC)	Manufacture and wholesale of automobiles	Vehicle assembly	1,490	22
3		Honda Cars Philippines, Inc. (HCPPI)	Manufacture and wholesale of automobiles	Vehicle assembly	620	7
4		Isuzu Philippines Corp. (IPC)	Manufacture and wholesale of automobiles	Vehicle assembly	700	7
5		Nissan Motors Philippines Corp.	Manufacture and wholesale of automobiles	Vehicle assembly	-	-
6	Japanese OEM Affiliates (Drivetrain)	Toyota Autoparts Philippines, Inc. (TAP)	Transmission (T/M), CVJ (constant velocity joint)	Drivetrain parts	1,420	4
7		Asian Transmission Corporation (ATC)	T/M Assy, T/M components parts, engine assembly	Drivetrain parts	600	3
8		Isuzu Autoparts Manufacturing Corporation (IAMC)	T/M, other automotive parts	Drivetrain parts	490	9
9		Mitsuba Philippines Corporation	Integrated motor/horn manufacturing (wiper motors, etc.)	E&E components	5,930	19
10	Japanese Auto Parts Suppliers (Tier 1 and/or Tier 2)	Yazaki-Torres Manufacturing, Inc.	Wire harness	E&E components	13,370	8
11		Inasen Philippine Manufacturing Corp.	Car seat reclining adjusters, car seat, side adjusters	Other parts	420	4
12		Toyota Boshoku Philippines, Inc.	Car seat assembly, door trim assembly, headlining	Interior	430	3
13		TRP INC. (Tokai Rika Philippines)	Various types of switches (lever combination, power seat, etc)	E&E components	1,430	9
14		Laguna Auto-Parts Manufacturing Corp. (LAMCOR)	Alternator (assy), starter (assy), stator, sensor	Engines and engine parts	2,030	7
15		Furukawa Electric Autoparts Philippines, Inc. (FEAP)	Steering roll connectors	E&E components	1,400	5
16		Philippine HKR, Inc. (Hikari Seiko)	Universal joint, gear sleeve, heat treatment	Other parts	210	3
17		FCC (Philippines) Corp.	Clutch friction disk	Drivetrain parts	390	3
18		Denso Philippines Corporation	Meter, gauge and sensor, smart key, radiator, compressor, etc	E&E components	1,780	-
19		Laguna Dat-Ichi Inc.	Sensors, control units, IC case, smart key, etc	E&E components	280	7
20		Hella Philippines, Inc.	Assembly of head lamps	Other parts	45	-
21	Mahle Filter System Philippines Corp.	Air filter element as engine parts	Engines and engine parts	150	2	
22	Aachi Forge Philippines, Inc. (AFP)	Hot forging parts for drivetrain	Drivetrain parts	280	7	
23	Fujitsu Ten Corporation of the Philippines (FTCP)	Engine management module, air-bag ECU, car navigation system	E&E components	900	-	
24	Roberts Automotive and Industrial Parts Mfg Corp	Radiator, kalspring, stamp parts	Suspension and parts	680	N/A	
25	Philippine Local Suppliers	Integrated Micro-Electronics Inc. (IMI)	Design and joint development solution, design services	Other parts	700	N/A
26		Metals Engineering Resources Corporation (METECOR)	Brake drum and brake disc, heat treatments, glass	Brake and parts	110	N/A
27		Valerie Products Manufacturing Inc. (VPMI)	Evaporator Assy, fuel tank/stamping, interior parts, seat part	Bodies and parts	250	N/A
28		Manly Plastics Inc	Automotive Plastic Parts (bumpers, console, etc.)	Other parts	-	-
29		Mistuba Philippines Technical Center (MPTC)	Engineering analysis, Simulation, 3D data output	R&D support	150	6
30		Denso Philippines Corporation Design Center (DNPH-DC)	Engineering support for all of global Denso operations	R&D support	160	6
31		F-Tech R&D Philippines, Inc.	Engineering support for all of global F-Tech operations	R&D support	50	3
32	Other Japanese Affiliates	Ito Manufacturing (Phils.), Corp.	Progressive stamping, mold and die design/production	Other parts	110	1
33		BEMAC Electric Transportation Philippines Inc.	E-Vehicle manufacturing	E-Vehicle production	60	-
				(Reference: TOTAL)	39,085	-
34	Other	Metals Industry Research & Development Center (MIRDC)	Testing, R&D and training provider	-	-	
35		AGC Flat Glass Philippines, Inc. (Asahi Glass)	Flat glass production by "Float method" for construction use	Material for auto glass	400	7
36		SIIX	Semiconductor	Material for E&E Parts	-	-

Note: (1) The companies or organizations highlighted were visited by the GVC WG (24 companies/organizations). The rest of the companies were visited by the JICA Expert team.

(2) Reference information: Number of Employees (and Companies) by the Philippine Industry (Census) Survey (2012)

C291. Manufacture of Motor Vehicle: 7,266 (43 companies) C293. Manufacture of parts and accessories for motor vehicles: 59,739 (134 companies) C291+C293 = 67,005 (177 companies)

3.3.3 Findings and Implications

Key findings and implications from company visits are summarized as follows. The details of the analysis of results of seven segments—OEMs, drivetrain and drivetrain parts, engine parts, E&E components including wire harness, Philippine local suppliers, and R&D support—are discussed in the latter sections.

(1) Overall Business Performance (Trend of Sales/Employment/Investments)

The overall business performance of the automotive industry in the Philippines is positive. An upward trend in sales and employment across the industry is observed. The expansion of global and domestic automobile markets is a major contributing factor toward the trend.

The sales of Japanese OEMs have shown a steadfast growth in recent years. Provided with the rapidly expanding domestic automotive market, most OEMs have performed well in terms of sales, mainly from the CBU segment. Utilizing the CARS Program's incentives, two OEMs have gradually been expanding their production capacity with new investments for increasing their local contents.

In the drivetrain segment, Japanese transmission makers and transmission parts makers have accumulated capital stock (i.e. facility, equipment) and experienced human resources over the years. There is a firm operating foundation in terms of technology and human resources under this segment in the Philippines. When viewed over a long-term perspective of the last 15 years, the segment has had an increase in its sales and employment; however, some of the companies in this segment have reported relatively low utilization rates of equipment in the past few years. This is presumably due to the change in the business environment in the Philippines under more regionalized, fast-growing auto market in the ASEAN region. As discussed in the earlier section, the Philippines has functioned as a production and export hub for FR (Front-engine, Rear-drive)-type manual transmission for pick-up trucks. While there have been reorganization efforts by Japanese transmission makers in their progressing global supply chains, the production of certain transmission models has shifted to other countries, such as Thailand.

As a general trend among other auto-parts segments, Japanese global auto-parts suppliers (Tier 1) have expanded their production, sales (mainly exports), capital investments, and the number of employees. Especially, the engine parts segment and the E&E components segment have had positive performance in the Philippines. By utilizing PEZA status advantages, companies under the two segments have plans to invest more in specific auto-parts or components for exports; these parts and components are to be exported to their mother companies in Japan and/or group Tier 1 companies located in countries having large automotive markets. In these cases, the Philippine factories (companies) function as a key regional center for labor-intensive production. In terms of employment, the biggest job provider is the wire harness industry.

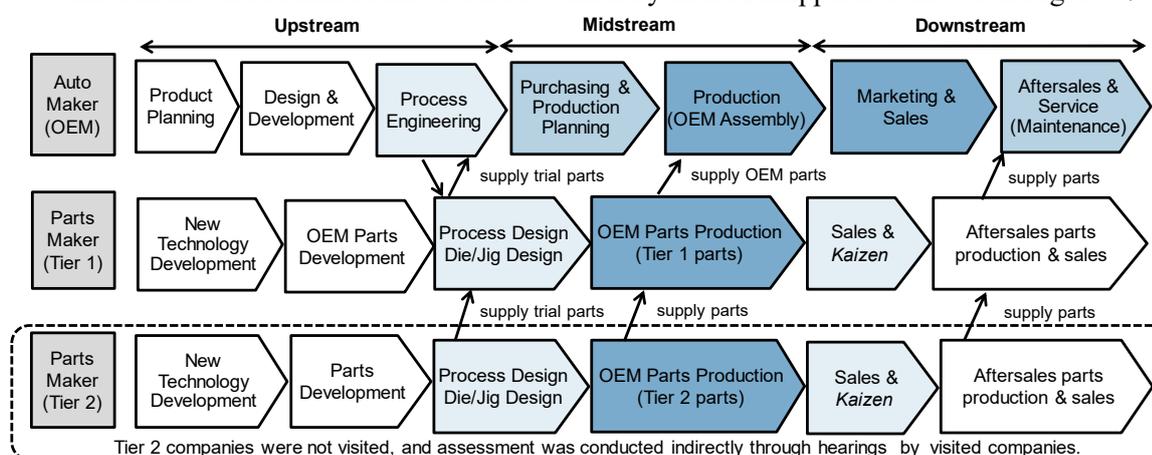
Philippine local suppliers have also had a relatively stable growth; however, their involvements in Japanese OEMs' supply chains are limited in terms of scale and variety. Despite the initial expectations for the CARS program, local suppliers have not experienced significant impacts. Many local suppliers produce parts and components for the traditional pick-up truck segment (e.g. Mitsubishi L300 model) that have been assembled in the Philippines for a long time. In the light of

the scheduled phasing out of some models that local suppliers used to supply to and the assembly of the new models by the CARS Program, local suppliers are standing at the crossroads. It is observed that for their future business survival, the local suppliers are posed with the challenge to change their mode of operations and transform themselves through developing, producing and supplying new types of auto parts for the mass-produced passenger car segment that meet OEMs' strict qualifications in terms of quality, cost and delivery (QCD).

Meanwhile, R&D support activities of global auto-parts suppliers have steadily increased in the Philippines. In all cases, companies have had their production facilities in the country and have expanded R&D support services to their mother R&D centers located in major auto-production/market countries such as Japan and the USA.

(2) Value Chain

The current value chain of the automotive industry in the Philippines is shown in Figure 47.



Note: Dark-blue colored functions are value chain functions conducted in the Philippines. Pale-blue colored ones are also conducted but with a limited scale and weak linkage inside the country. Other white parts are not conducted in the Philippines

Source: the JICA Expert Team

Figure 47 Current Value Chain of the Philippine Automotive Industry

Except for local suppliers, many automotive companies in the Philippines conduct the production portion on their value chain. In the case of OEMs, while they have several different value chain functions, such as purchasing and marketing, they have collaboration with and are also supported by their regional headquarters and companies located in countries with more advanced automotive industry such as Thailand, as well as their parent companies in Japan. In the case of export oriented PEZA companies, many Japanese global Tier 1 companies produce and supply large volumes of specific parts and sub-components for their mother factories in Japan and other advanced countries; therefore, their participation in other value chain functions is limited. The exception is the case of R&D supporting companies of Japanese global Tier 1 that concentrate on a rather upward value chain function of R&D support, such as drawings and simulation. Those companies with R&D functions feel that it is their challenge to establish synergetic effects in terms of communication and collaborative activities with their production companies located in the Philippines. The number of companies in charge of R&D support are increasing at slow pace.

(3) Supply Chain and Local Contents

The domestic supply chain linkage between OEMs and Tier 1 companies in the Philippines is weak. The drivetrain segment has the strongest and the most integrated supply chain linkage with OEMs. Beside the drivetrain segment, there are various parts suppliers (Tier 1 companies) supplying parts to OEMs, but the variety of parts supplied domestically is limited and the supply volume is small. In the E&E component segment, there are (Japanese) global Tier 1 companies putting more focus on producing specific parts and sub-components for exports. The parts are exported to their mother/sister factories/companies in advanced markets such as Japan.

Local content rates at purchased cost bases vary between 10% and 80% among companies. The situations are different between OEMs/Philippine locals and PEZA companies. The former refers to the companies registered with BOI that focus on domestic sales and constantly strive to increase local contents to lower their production costs. The latter, on the other hand, pertains to the export-oriented companies mainly conducting labor-intensive assembly operations with various imported parts that are usually not so bulky and heavy with specifications provided by their global sourcing centers in the mother country/ies. When PEZA companies export to ASEAN countries, their concern is on the ASEAN content (60%). On average, the local content rate is roughly estimated around 50-60%.

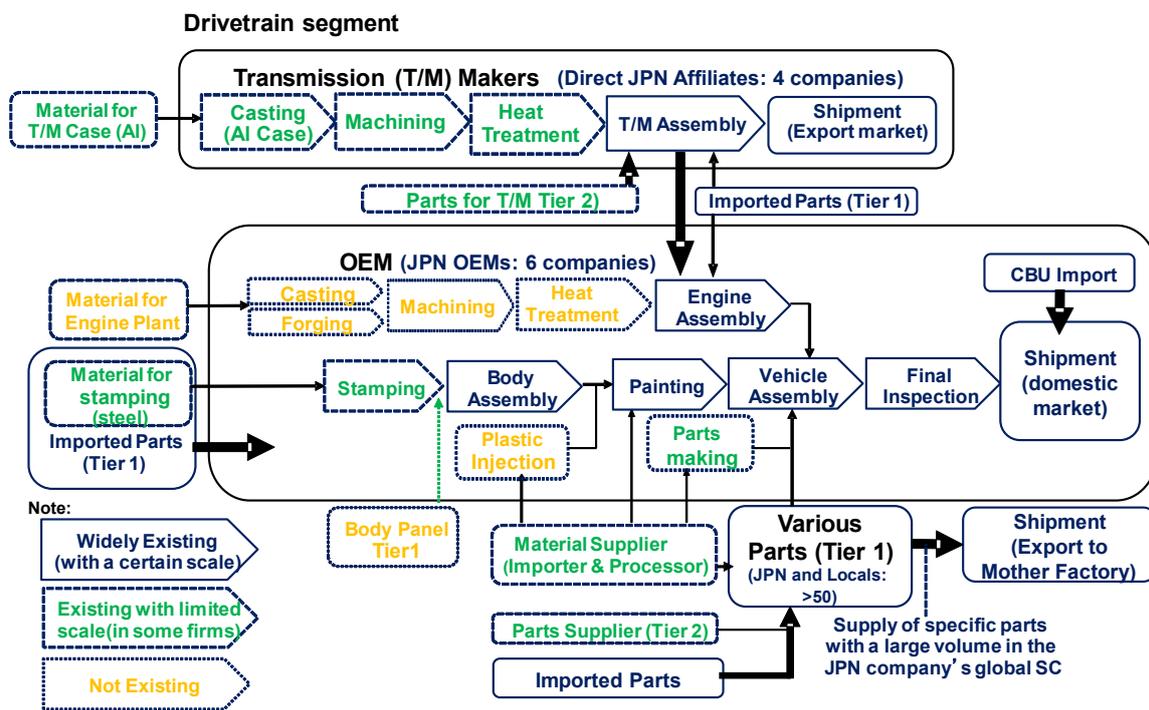
For Japanese OEMs and Tier 1 companies, one of the main challenges in their operations in the Philippines is a limited availability and variety of parts and component suppliers. Currently, the drivetrain segment is the only auto-parts segment that has a supply chain which is integrated and closely linked with the OEMs and located in the Philippines. Although companies in other segments are increasing in number, such as the case of wire harness companies in the E&E component segment, their linkages with the OEMs located in the Philippines are still limited. The variety of auto-parts produced in the Philippines is limited and the accumulation of global Tier 1 companies producing system/module parts has not advanced. It is considered that these facts can be attributed to the small scale of the current OEM production capacity in the Philippines.

The difficulty in sourcing raw materials, such as steel and resin, is also a major weakness of the Philippines' manufacturing. Although companies source those materials by themselves and/or from domestic processing centers and distributors, which is counted as "domestic sourcing," raw materials sold by these domestic processing centers and distributors in the Philippines are originally imported from other countries, such as Japan and Thailand. While the local content figure is reported to be between 50-60%, the "real local content figure", excluding imported items from various sources, is estimated to be much lower (around 25-30%). The major origins of imports for parts and materials are countries such as Thailand, China and Japan. Many companies effectively utilize the increasing interdependence in their global supply chains, particularly within the East Asia and ASEAN regions. Due to the high volume and value of imported parts and materials, several OEMs have commented that the total production cost of vehicles in the Philippines is higher than importing CBUs from Thailand.

In terms of logistics, many companies view that the Philippines' logistical infrastructure does not pose unmanageable challenges to their supply chains under normal or regular circumstances; however, when an irregularity occurs at Manila Port, it can quickly turn into a problem that disrupts

their supply chain operations. Several companies commented that the congestion around Manila Port is a problem and further development of the Port of Batangas would benefit the automotive industry in the Philippines for coastal shipping of the assembled cars.

In order to further reduce costs and meet the ASEAN content condition (60%), several OEMs and PEZA-registered auto-parts suppliers have invested in facility expansion and equipment provision to have in-house-based upward integration of their supply chains. This is because they have difficulty in increasing their local contents from expanding local sourcing. The current supply chain of the automotive industry in the Philippines is shown in Figure 48.



Source: JICA Expert Team

Figure 48 Current Supply Chain of the Philippine Automotive Industry

Table 48 Parts Segment and Sub-Components Produced in the Philippines

Parts Segment	Parts and Sub-Components Produced by Tier 1
Engine	Cylinder Block, Cylinder Head, Crank Shaft, Cam Shaft, Connecting Rod, Piston, Piston Ring, Int-Manifold, Exhaust Manifold, Water Pump, Oil Pump, Catalyzer, <u>Radiator</u> , Fuel Injector, <u>Air Filter</u> , Oil Filter, EGR Valve, <u>Battery</u> , <u>Starter Motor</u> , <u>Alternator</u>
Drivetrain	<u>FR Layout Transmission (M/T, A/T)</u> , FF layout Transmission (M/T, A/T), Torque Converter, Clutch, CVT, Differential Gear, <u>CVJ (Constant Velocity Joint) Drive Shaft</u> , Propeller Shaft, Tire, Wheel, Rear Axle, <u>Universal Joint</u>
Chassis	Coil Spring, Shock Absorber, Stabilizer, Rack & Pinion Steering, Steering Column, Steering Lock, Brake Caliper, Brake Rotor, <u>Exhaust Muffler</u> , Fuel Tank
Body	<u>Engine Hood</u> , <u>Fender</u> , <u>Roof</u> , <u>Door</u> , <u>Trunk Lid</u> , Sill, Front Pillar, Center Pillar, Front Roof Rail, Side Roof Rail, Side Member, Floor, Small Body Parts
Body Parts	Window Regulator, Outside Handle, Door Weather Strip, Door Lock, Windshield Glass, Door Glass, Glass Run, Check Link, T/Lid W/Strip
Control Parts	Transmission Control, Parking Brake Control, <u>Brake Pedal</u> , <u>Accelerate Pedal</u> , <u>Clutch Pedal</u> , <u>Steering Wheel</u> , Hood Control Cable, Trunk Lid Control Cable
Exterior	<u>Bumper</u> , <u>Head Lamp</u> , <u>Rear Combination Lamp</u> , <u>Radiator Grill</u> , Door Mirror, Air Spoiler, Side Marker Lamp, <u>License Plate Finisher</u>
Interior	HVAC, <u>Instrument Panel</u> , <u>Center Console</u> , <u>Seats</u> , <u>Head Lining</u> , <u>Pillar Garnish</u> , <u>Door Trim</u> , <u>Sun Visor</u> , <u>Carpets</u> , Air Bag, Three-Pointed Seat Belt
E&E Component	<u>Wire Harness</u> , <u>Wiper</u> , <u>Printed Circuit Board</u> , <u>Combination Switch</u> , <u>Horn</u> , <u>Car Navigation System</u> , Ignition Coil, <u>Meter/Clock</u> , <u>Audio</u> , <u>Radio Antenna</u> , <u>Fuel Sender</u> , <u>ECUs</u> , <u>Sensors</u> , Actuators

*The blue shade indicates the presence level of companies in the Philippines. The darker the color, the greater the number of companies existing in the Philippines (or confirmed by the JICA Expert Team).

* **Red Colored Parts with underline**: Produced in the Philippines, which GVC WG visited/confirmed in GVC Analysis. Source: JICA Expert Team. The presence level is estimated based on experts' observations from company visits.

(4) Technology

It was observed that a certain degree of technological accumulation is happening in various production processes across the Philippine automotive industry. By utilizing cost-effective labor, many companies have established stable and integrated manufacturing bases in the country. In elemental technological areas, such as assembly, metal processing and machining, effective production systems utilizing both equipment and workers have been put in place.

Some production technologies, such as machining and heat treatment for processing metal-parts and welding, as well as soldering for non-metal parts, are commonly practiced in the Philippines. A wide range of production technologies and process areas that a country needs to have for further development of its auto/auto-parts industry are practiced only to a limited scale in the country.

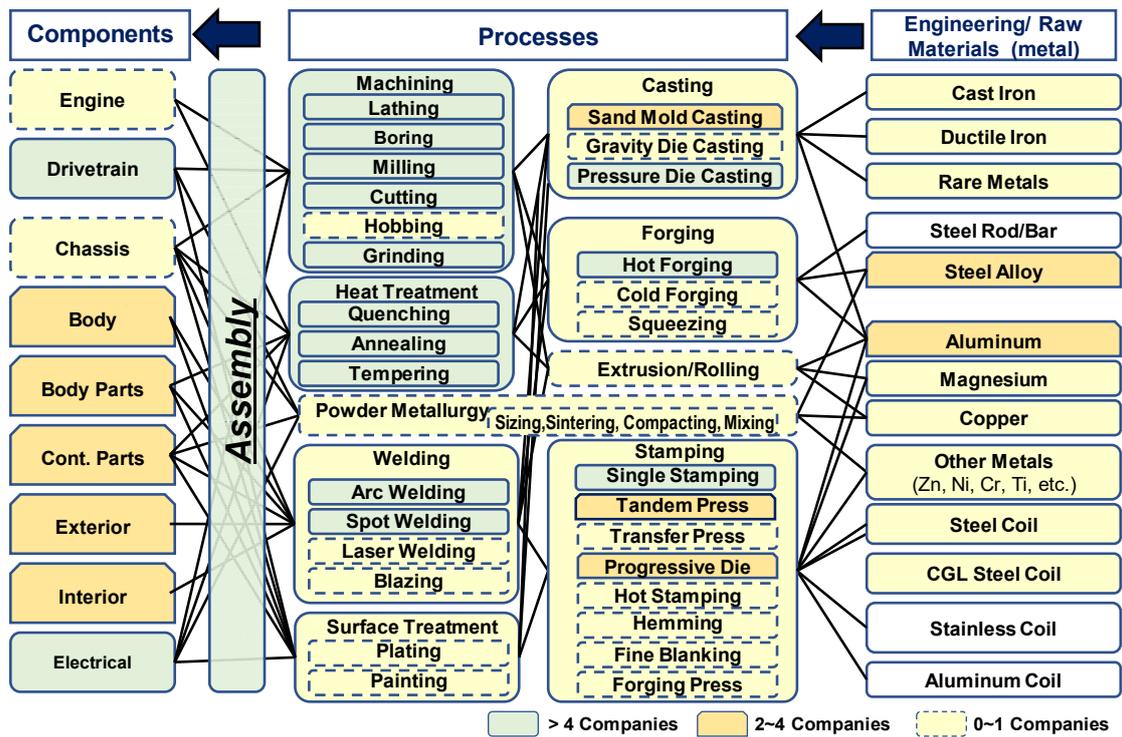
Production management technology, such as Kaizen (Japanese work ethics and management tool for continuous improvements), QCD (quality, cost, and deliver; QCD are key performance indicators for continuous improvements), *Monozukuri* (philosophy/attitude toward manufacturing, including managing safety at workplace), are being taught to workers through in-house training among Japanese-affiliated companies. Some spillover effects through OEMs' supplier networks are observed; however, the permeation level of such production technology among local suppliers is not enough.

In the E&E component segment, the utilization/application of know-how and technology of the E&E cluster in the Philippines is beginning to be seen. This is especially salient in manufacturing of high-value added, sensitive auto-components, such as sensors, cameras, electronic control unit (ECU) and print circuit board (PCB). One such example is an integrated manufacturing system with a combination of a series of equipment for processing/ assembly with a certain level of factory automation and cost-effective labor operating in clean rooms (i.e. work environment that is free of dust and other contaminants).

Auto Parts Structure	Unit	Major Parts	Component	Material	Mold & Die
Engine & Drivetrain	Engine	5C parts, injector, piston	Bearing, Engine bolt, Valve, Piston rod	Casting Material (Scrap Metal)	Stamping Die
	MT (FR)	Starter motor/Alternator	Battery, Air Filter	Aluminum Ingot	
	MT (FF), AT/CVT(FF/FR)	Radiator	Gear bolt, Ring gear	Meta Alloy	
	Drive shaft (CVJ for FF)	Gears / MT Housing (FR only)	Spider		
Chassis & Control	Prop shaft (for FR)	Universal Joint	Differential Gear		Progressive Die
	Axle	Axle Housing	Hub bolt, Welding bolt	Hot Rolled Steel (HR), Steel rod	
	Steering unit	Steering gears	Bracket		
	Brakes	Brake Disk / Drum	Actuator, Piston, Cylinder, Spring, Sensor		
Body, Body Parts & Exterior	Suspension (Leaf Spring)	ABS/ESC unit	Steering Wheel		Stamping Die
	Suspension (Coil Spring, Shock Absorber)	Engine Hood, Fender, Roof, Door, Trunk Lid	Accelerate/Brake/Clutch Pedal		
	White body	Sill, Front/Center Pillar, Front/Side Roof Rail, Side Member, Floor	Door Hinge, Weld Bolt & Nut Bracket	Cold Rolled Steel (CRC) Galvanized Steel (CGL) Bonding /Sealing	
	Head / Rear Combination Lamp, Door Mirror, Wiper	Bumper, Radiator Grill, License Plate Finisher	Lamp Valve, Side Marker Lamp		
Interior	HVAC	Blower, Evaporator			Plastic mold
	Instrument Panel	Meter, Combination Switch	Bolt & Nut / Bonding / Fastening Clip	Plastics: PP (Polypropylene), ABS (Acrylonitrile Butadiene Styrene), Polycarbonate, etc.	
	Center Console, Head Lining, Pillar Garnish, Door Trim	Slide Rail, Reclining Device			
	Seats	Air Bag, 3 Pointed Seat Belt			
Electric & Electronic Parts	Audio/Car Navigation System/ Radio Antenna	Wire Harness	Harness		N/A
	Meters/Clocks	LCDs	Connector	Silicone, Plastic, Copper, PVC, etc	
	ECUs	PCB, Metal housing, etc (Depends on parts type)	IC, Semi conductor, Sensor, resistor, Stepping motor, etc. (Depends on parts type)		
	Sensors				
	Horn, Ignition Coil, Actuators				

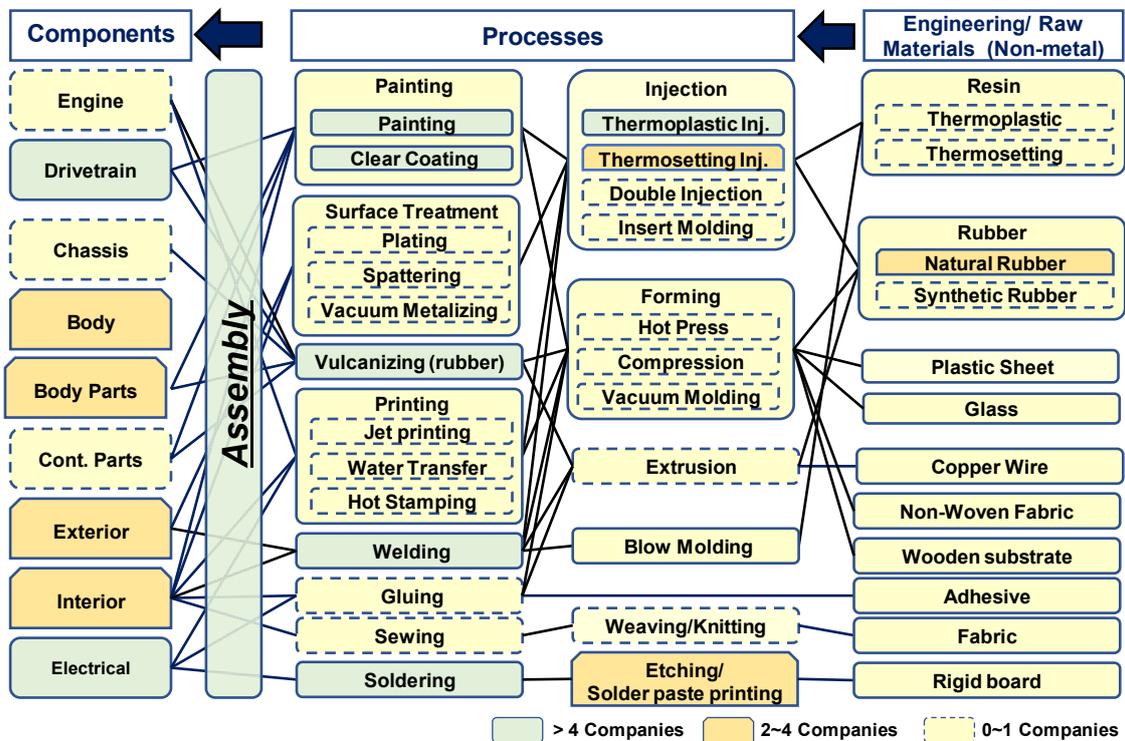
Source: JICA Expert Team

Figure 49 Automotive Parts Produced in the Philippines



Source: JICA Expert Team

Figure 50 Technology/Process Chain of Metal Parts in the Automotive Industry*



Source: JICA Expert Team

Figure 51 Technology/Process Chain of Non-metal Parts in the Automotive Industry*

* The colors indicate the existence level of technology in the Philippines. (The existence level is estimated based on experts' observations from company visits)

(5) Industrial Human Resources

The availability of cost-effective labor is widely acknowledged by companies as a big, positive factor in the Philippines. There is abundance of young job seekers. Once hired, many of them work as direct workers at production lines. The general characteristics of workers in the country can be characterized as diligent and obedient. Labor-intensive operations, such as inspection for intermediate and finished products and material/product handling at inventory and shipment yards, are conducted in many companies, most notably E&E component companies. There is a need for continuous training for direct workers, and most companies provide opportunities for in-house training. Although some companies voiced concerns regarding the cost increase due to the change in the government's labor regulation on ending labor contractualization, the availability of cost-effective labor will continue to be an advantage for the Philippines.

At many manufacturing companies, difficulties in hiring and retaining good engineers in production management and R&D were discussed. Meanwhile, most R&D supporting companies commented that there is a wide availability of young university-graduates who can be recruited and trained for their R&D supporting activities, such as drawing and simulation on PC. A high English proficiency among local people was also pointed out by R&D companies as a big advantage for their operations in the Philippines.

(6) Findings and Implications by Segment⁵⁰

1) OEM Segment

The OEM segment in the Philippines mainly conducts production and marketing functions in their company's value chain. At the same time, OEMs manage purchasing and supply of necessary parts and components for both themselves and Tier 1 companies in their supply chains in the Philippines by use of their global sourcing networks. Toyota Motor Philippines (TMP) and Isuzu Philippines Corporation (IPC) operate training schools for automobile maintenance in order to utilize enhanced technical human resources not only for domestic sales networks but also for potentially sending them to other countries to support their global value chains. Due to their fluency in the English language, the Philippine human resource is seen by OEMs as a potential asset that can be utilized for further strengthening their global network in the field of automotive maintenance.

The OEM segment has had an upward-trend in sales, given the continuous expansion the domestic auto market. While there are more CBU imports than the number of cars assembled in the Philippines, the assembly capacity of OEMs located in the country has been increasing. TMP and MMPC—top two OEMs in the Philippines with the largest assembly capacities—have annual production capacities of around 55,000 units and 44,000 units, respectively. The employment numbers of TMP and MMPC are around 2,500 and 1,500, respectively.

⁵⁰ See Reference Document A-1) for detailed discussions on automotive manufacturing, manufacturing processes conducted in the Philippines, and points for consideration for upgrading local suppliers's QCD capacity.

The current supply chain of the OEM segment in the Philippines is shown in Figure 52. The following are its characteristics.

- a) The major in-house processes of OEMs are: 1) engine and transmission assembly, 2) body assembly, 3) painting, and 4) vehicle assembly.
- b) No OEMs have engine manufacturing plant in the Philippines. All the engines, related major parts and components are imported from their parent or sister companies in other countries such as Thailand and assembled in the Philippines.
- c) While automatic transmissions are imported mainly from Thailand, most manual transmissions for the pick-up truck segment, traditionally assembled in the country are sourced from their group companies located in the Philippines (See the next section).

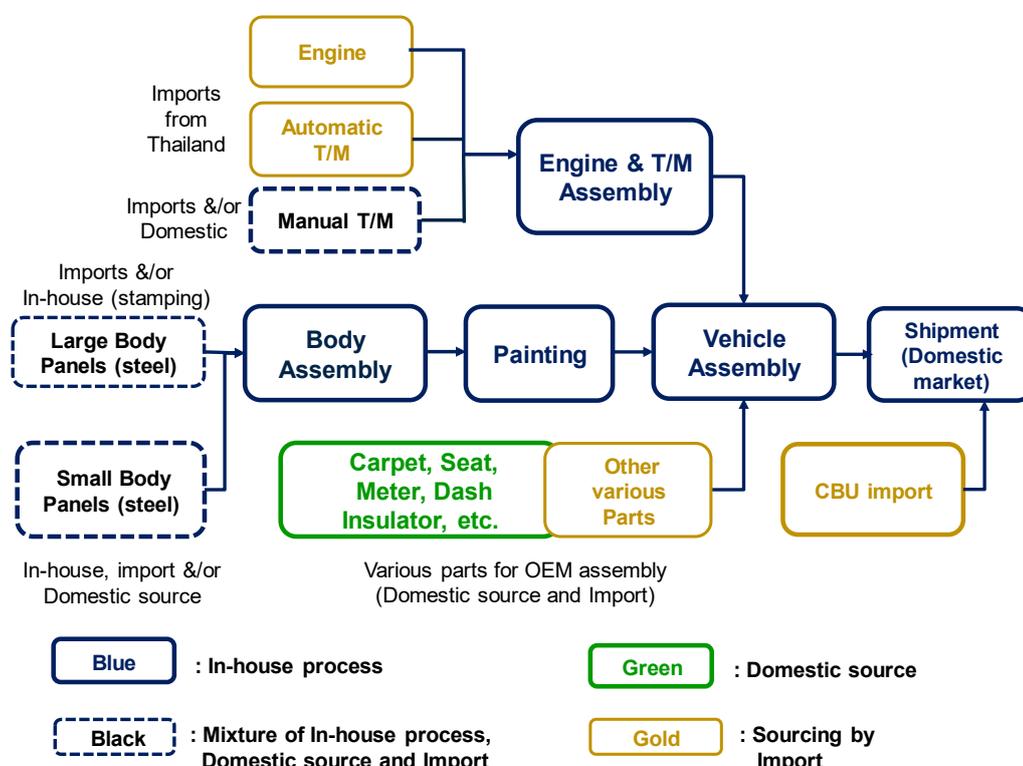


Figure 52 Supply Chain of the OEM Segment

- d) The stamping capacity of OEMs is still relatively small, compared to the situation of other countries with OEM assembly capacity of several 100,000 units per year. There are no large-scale Tier 1 companies that produce stamping parts and supply to OEMs. Most large-sized body panels are imported from other countries, mainly from Thailand. Provided with the CARS program's incentives, TMP and MMPC have accelerated their in-house investments for large stamping facilities. TMP plans to operate 1,600t servo-stamping machines from 2019, and MMPC plans to start an operation of the 2,000t-1,000t tandem machine, which is currently being set up.

- e) Small body steel panels are produced and supplied by several local suppliers, such as Valerie Products MFG. Inc. and Roberts Automotive and Industrial Parts Manufacturing Corporation, mainly for the traditional pick-up truck segment. However, OEMs import significant amounts of small body panels, and TMP and MMPC also conduct in-house production.
- f) A limited variety of auto-parts, such as carpet, seat, meter, dash instrument, are produced in the Philippines and supplied to OEMs. Most auto-parts are imports mainly from countries such as Thailand, Indonesia, Japan and China.
- g) There is one local plastic injection molding company (Manly Plastics, Inc.) that has been supplying parts to OEMs mainly for the traditional pick-up truck segment. While the company is nominated as a local supplier for CARS models, its capacity still needs to be upgraded in terms of both quantity and quality. TMP plans to invest in a new injection machine for bumpers of Vios by itself.
- h) Under the CARS program, TMP plans to increase its local content ratio calculated based on body weight from the current 40% to 60% for Vios. MMPC plans to do the same for the newly started assembly of Mirage from 10% to 45% in the future⁵¹.
- i) OEMs use the Port of Manila for importing all the necessary parts and components, while they use the Port of Batangas for importing CBUs.

In OEMs, production management technologies for QCD and Safety, such as 5S/Kaizen, TPS and the Monozukuri spirit, are widely introduced and practiced with continuous in-house training and OJT in production lines. OEMs have made efforts to disseminate these concepts and practices to major local companies that are integrated into the Japanese OEM's supply chains through their suppliers' network.

The domestic market expansion is and will continue to be the most significant opportunity for the OEM segment's growth. Meanwhile, the following are some of the challenges for the segment to grow further:

- Logistics and infrastructure, such as port and roads, particularly in Manila
- Regulatory business environment (e.g. car registration, hiring contract workers)
- Limited domestic supply of auto parts: In order to increase investments potential for mass-production assembly plant of OEMs, more supplies of auto-parts need to be expanded through investments by global Tier 1 companies and strengthening of local supplier linkage.

⁵¹ A rough estimation by the JICA Expert Team based on interviews with all the companies they visited.

- Shortage of production engineers in quality/quantity: There is a need to develop more production engineers in the Philippines's higher education and vocational training system for regular operation and assembly of mass-produced passenger cars in the Philippines.

It should be noted that consistency in government policies for the development of the Philippine automotive industry is and will be a pre-condition for potential consideration by OEMs for further investment.

2) Drivetrain Segment

Drivetrain is the auto-parts segment in which the Philippines has the most integrated accumulation of production capacity and technology. There are four direct Japanese-affiliated manufacturers of manual transmission, all of which are PEZA companies. There is also one hot-forging parts manufacturer. The oldest transmission maker is the Asian Transmission Corporation (ATC), which was established in 1973. The current largest transmission maker is Toyota Autoparts Philippines, Inc. (TAP), established in 1990.

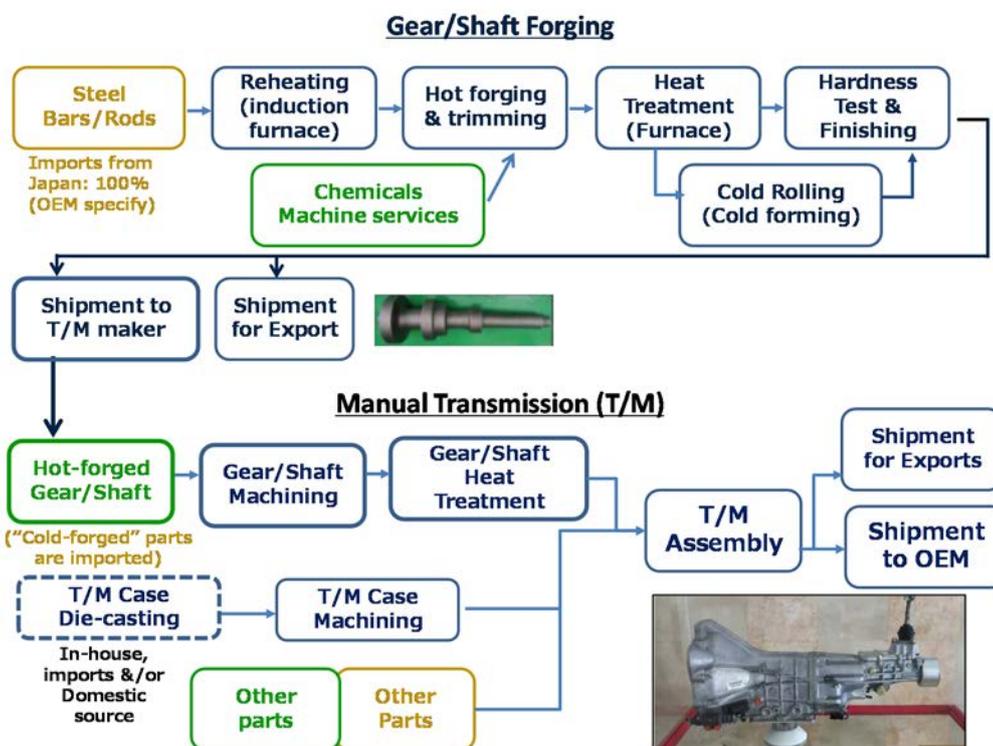
Manufacturers in the drivetrain segment mainly conduct the production portion in each company's global value chain. They have traditionally been positioned as a regional production hub for FR-type manual transmission for the pick-up truck segment with a large export value/volume, including Thailand.

The current supply chain of the drivetrain segment in the Philippines is shown in Figure 53. The following are its characteristics.

- a) All steel materials for hot-forged transmission parts (e.g. gears and shafts) are imported from Japan⁵². The specifications for steel materials are provided by OEMs because these parts and materials are directly connected with the issue of safety in manufactured cars.
- b) Hot-forged transmission parts are supplied to most transmission makers in the Philippines; however, cold-forged and sintered parts for transmission assembly are imported. The hot-forging process requires a large amount of electricity for heating; therefore, the high cost of electricity in the Philippines is a critical issue for forging companies and for this type of metal-related material processors.
- c) Due to the changing global supply chain and reorganization of production bases amongst Japanese transmission makers, the production level of transmission makers in the Philippines is currently low. In one company's case, its production peaked in 2010-2012 when the company exported almost 95% of their products, mainly to Thailand (around 30-40%) and Indonesia (around 25-30%).
- d) The local content rate of transmissions manufactured in the Philippines is estimated to be around 50% at purchased cost base, while transmission companies import many parts and components from ASEAN, mainly Thailand, and from Japan. In the case of Isuzu Autoparts

⁵² Major imported parts are hot-rolled round steel bars (HS 722830).

Manufacturing Corporation, the company invested in aluminum die-casting machines for transmission cases in 2014 in order to further reduce costs and to increase its ASEAN content.



Source JICA Expert Team

Figure 53 Supply Chain of the Drivetrain Segment

- e) TAP also produces constant velocity joint (CVJ) annually, a sub-component for FF-type transmission, which is also supplied for manufacturing of Toyota Vios. The local content rate of CVJ is estimated to be only around 15%, while 50% are imported from Thailand and 35% from Japan. Anticipating an increase in the Vios assembly in the Philippines by the CARS program, TAP looks for an opportunity to increase the sales of CVJ.
- f) As a traditional production hub for FR-type manual transmission, there is an accumulation of equipment and technology as well as experienced human resources in the segment. This could become a leading factor for the future growth of the segment when OEMs and associated drivetrain companies continue to position the Philippines as a favorable country for producing this auto-parts segment by utilizing accumulated capital stock and human resources.

Challenges to the future growth of the drivetrain segment include:

- As the CARS-participating OEMs shift their product focus to the mass-produced compact passenger car segment, away from the traditional pick-up truck segment, companies in the

drive train segment are facing transitional challenges, which can also be construed as an opportunity for growth.

- To reduce production costs, more metal-processed parts need to be supplied in the Philippines through investments in material processing technology, such as forging and heat treatment.
- The Philippines' very high electricity cost is a critical issue for energy-consuming metal processors using furnaces in the drivetrain segment.

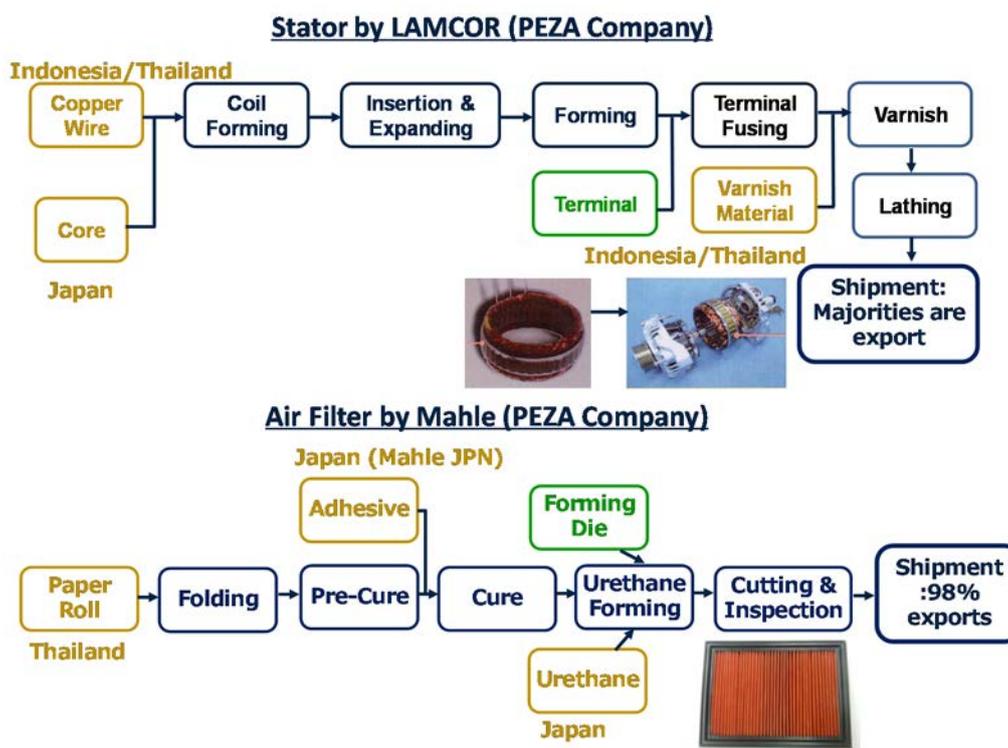
3) Engine Parts Segment

The OEMs located in the Philippines have no engine manufacturing plants. All engines and most necessary parts for OEM assembly are imported from other countries, such as Thailand, Indonesia and Japan. There are, however, several Japanese Tier 1 companies that produce specific engine parts and supply sub-components to OEMs. It is observed that these companies focus on the export market, not the domestic market, because OEMs' production capacity is still small. However, they have expanded by utilizing the Philippines' cost-effective labor and focusing on the production portion on their group companies' global value and supply chain.

The current supply chains of two specific parts in the engine parts segment in the Philippines are shown in Figure 54. The followings are their characteristics.

[Stator (by LAMCOR)]

- a) Stator is a core sub-component for alternator, a core part for electric generation (ignition) of engines. As a group company of Mitsubishi Electric Corporation (MELCO) in Japan, Laguna Autoparts Manufacturing Corporation of the Philippines (LAMCOR) has been operating in the Philippines since 1991. The company currently produces five million units of stators and other motor-related sub-components, such as electric power steering (EPS), and employs around 2,000 workers.
- b) Major parts and materials, such as copper wire (HS code 854411) and core (HS code 851191), are imported from Thailand, Indonesia and Japan. LAMCOR's local content rate is unclear; however, its ASEAN content rate is estimated to be around 70%. The company's purchasing activities of parts and components, one of value chain functions, is coordinated by the global purchasing center of MELCO Headquarters in Japan.
- c) LAMCOR's in-house operations, such as coil forming, insertion/expanding and forming, are mostly labor-intensive. The company operates several production lines of around 100 workers per line with two shifts. The labor policy issued by the government for promoting employment of permanent workers instead of hiring contracted, temporary workers was raised as one of the constraints to the company's further growth.
- d) The company also imports alternators and stators from Thailand and Indonesia. They also supply them to MMPC for the latter's assembly operations in the Philippines.



Source JICA Expert Team

Figure 54 Supply Chain of the Engine Parts Segment

[Air Filter (by Mahle)]

- a) Established as Tennex Philippines in 1996, Mahle Filter Systems Philippines Corporation (Mahle) produces 72-million-unit air filter elements per year, and employs around 150 workers.
- b) Almost all air filter elements used in the assembly by Mahle Japan are produced and exported by Mahle. As a PEZA company, Mahle exports 98% of its products (HS code 842131, HS code 842199), mainly to Japan.
- c) Paper roll (HS code 480540), the major material for air filter production, is imported from Thailand, while adhesives (HS code 350699) are imported from Japan. Urethane is also imported from Japan. Other raw materials and sub-materials, such as steel sheets, viscous oil, and packaging materials are sourced domestically, however, the steel sheets that Mahle procures domestically are originally from countries such as Japan.

More material processors and suppliers, such as paper filter manufacturers, are needed for the future growth of the existing companies in the segment. Considering an abundance of the availability of cost-effective labor, the production of a great variety of sub-components in the engine parts segment as an opportunity for future growth of the Philippines. The Philippines may be able to seize this opportunity if investment promotion activities toward global Tier 1 companies focusing on the utilization of cost-effective labor are more aggressively conducted.

4) E&E Component Segment (including Wire Harness)

The E&E component segment, represented by wire harness, is a fast-growing segment. It is the biggest contributor in terms of trade surplus in the growing Philippines' auto-parts exports and the biggest employment generator for the automotive and auto parts industry as a whole. Companies in this segment function as production hubs for specific E&E auto-parts, such as wire harness, meter, and lever combination switch, which are exported to the USA and Japan. There is an accumulation of companies conducting motor-related parts assembly utilizing cost-effective labor in the Philippines. The utilization and application of know-how/experiences of the E&E cluster accumulated in the Philippines is beginning to be seen in the manufacturing of high-value added, sensitive auto-use electronics components, such as sensors, cameras, ECU and PCB.

As for the value chain functions, most companies mainly conduct production in the company's GVC; however, there are also some companies that conduct R&D supporting activities and engineering design in this segment in the Philippines. The following are characteristics of manufacturing process, technology and supply chain of the E&E component segment.

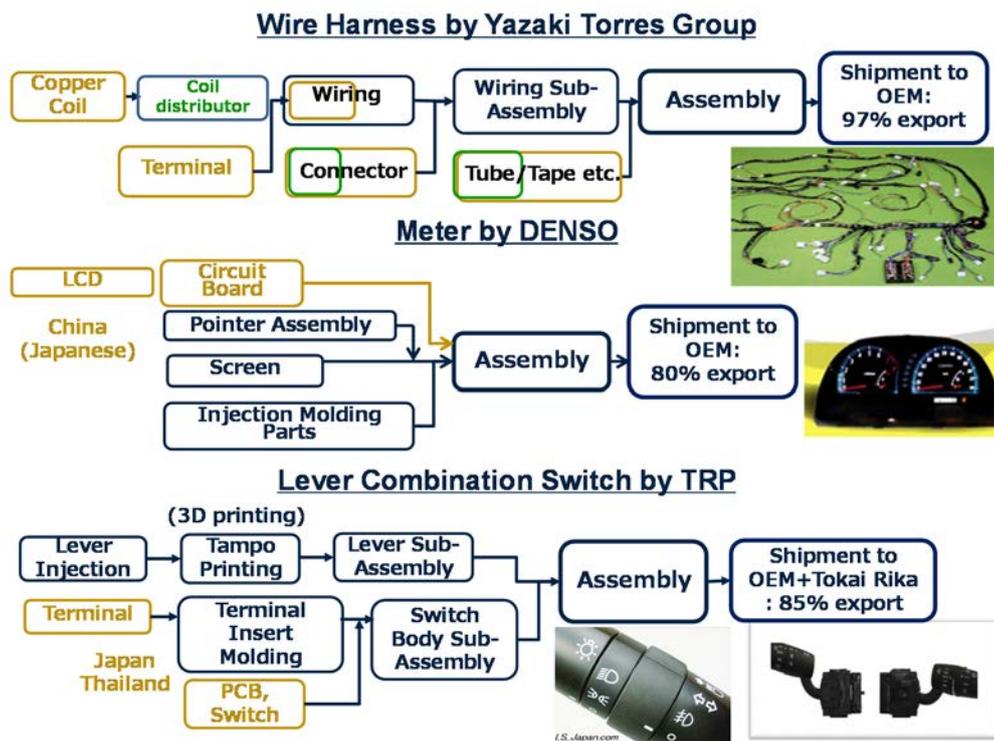
- a) More than 80% of E&E auto parts are exported in most cases. Meanwhile, major parts and components of the E&E auto parts assembled in the Philippines are imported.
- b) The main countries of origin of imported parts are Japan, China and Thailand.
- c) Many companies in the segment are equipped with well-designed, integrated assembly lines by combining a large volume of cost-effective labor and a certain scale of factory automation. Material/parts/semi-products handling, inspection and inventory/shipment control are conducted by workers (not by machines).
- d) Highly sensitive, higher value-added electronics parts are starting to be produced in the Philippines. The assembly of such products is done in a so-called "clean room" (strictly a regulated hygienic environment free from dust and other contaminants). Some manufacturing processes are automated; however, companies make good use of cost-effective labor to keep the production costs down.

Other than wire harness, there are also several E&E component manufacturers that are growing fast by utilizing the Philippines' cost-effective labor and accumulated experiences of the electric/electronics industry. The following summarizes the three cases representing the E&E component segment and the characteristics of their supply chains.

[Wire Harness (Yazaki Torres Group)]

- a) Established as a Japanese Yazaki group company in 1973, the Yazaki-Torres Group has continuously expanded to record Php 23.6 billion (approx. US\$ 450 million) in total sales and has around 13,400 employees in its four company branches (plants) in 2016. Wire harness manufacturing is a typical labor-intensive assembly industry; at the same time, it requires the adoption of a company's cost-effective, globally-standardized operation facility and procedures.

- b) Although the group supplies its products to almost all OEMs in the Philippines, the domestic share in shipment value occupies only 3% of the total shipments and the rest (97%) are exported. Two leading destinations of its exports are the USA (72%) and Japan (24%). This is another example of a company in the Philippines that carries out labor intensive operations functions as and functions as an export hub for the two countries.
- c) The major imported items for manufacturing are shield wire (HS code 854449), connector (HS code 854720), sensor cable (HS code 854442) and terminal (HS code 853690). Copper, which is the basic material for wiring, is sourced from domestic distributors that import copper coil as raw materials.
- d) In total, the company's local content rate at purchasing-base is estimated to be 30%. The main region of origins of imported parts and materials are ASEAN countries (33%), Japan (23%), the USA (9%) and Europe (4%). When the value addition, such as compensation to its employees, is included in calculation, Yazaki-Torres estimates that the local content at value-base increases to around 50%.



Source JICA Expert Team

Figure 55 Supply Chain of the E&E Component Segment

[Meter (DENSO)]

- a) Established in 1995 under the name of Philippine Auto Component Inc., as one of major Toyota suppliers, DENSO has expanded its operations in the Philippines. Currently, the company has annual sales of US\$ 197 million and employs around 1,800.
- b) A hub for meter production is the company's position in the progressing Denso's global supply chain. In addition to meters, the company manufactures other E&E components, such as fuel sender and ultrasonic sensor, all of which require integrated and sensitive electronic-related assembly work by manual and/or automation conducted in clean rooms.
- c) The company recently announced its plan of further expansion.
- d) The company's export ratio of its manufactured products reaches to 80%. As a hub for meter production, Denso exports meter products to countries such as Thailand, Indonesia, Malaysia, Viet Nam and Pakistan. In the Philippines, it supplies its products to TMP.
- e) Advanced electronics parts, such as LCD and circuit boards, are imported from Japanese manufacturers located in China. There are eight meter-assembly lines in total. The company employs many young workers.
- f) DENSO considers an abundance of young, cost-effective workers as a strong point in the company's location factor. While Denso places importance on human resources development of its employees by conducting nine-day in-house training for entrants, it finds retaining good production engineers as one of its challenging issues.
- g) The company established its design center in 1998, a couple of years after the manufacturing company's inauguration. The design center currently employs around 130 engineers for R&D support activities for the company's global operation. The main clients are parent and sister R&D centers located in Japan and other advanced countries. Increase in synergetic effects between the company's production operation and R&D-related value chain functions is a challenging task for the future (see the section of the R&D Support segment).

[Lever Combination Switch (Tokai Rika Philippines: TRP)]

- a) Established as one of the major Toyota supplier companies in 1995, TRP has expanded to record total sales of US\$ 122 million and the employment number of 1,430 employees in 2016.
- b) While continuing to supply its products to TMP, TRP has placed focus on targeting the export market and has become a leading export-oriented auto-parts manufacturer in the Philippines. TRP is now a switch production hub of the Tokai Rika's global supply chain, having 20% share of Tokai Rika's global switch production. The main product is lever combination switch (HS code 853650). The main export destinations of the company's products are the USA (45%), Japan (20%) and ASEAN countries (13%). The company's exports to the USA and Japan have grown in recent years, which led the company to invest

in the third expansion of its plant in 2015. The availability of “low-cost, good labor” was raised as a key factor for the company’s decision of expansion.

- c) Lever combination switches manufactured by TRP and supplied to TMP are indirectly exported to Thailand and Indonesia through TMP for Toyota’s assembly work in the two countries (models of Vios in Thailand and Innova in Indonesia). Due to this type of indirect exports, the real consumption of TRP’s switches in the Philippines is estimated to be only 1% of TRP’s total production. It is noteworthy that the progress of Toyota’s global supply chain has been supported by companies like TRP, demonstrating a very strong interdependence between Toyota and some of its major Tier 1 suppliers at a global-scale.
- d) TRP is equipped with integrated assembly processes. The company’s manufacturing operations are conducted in clean rooms. The major parts are directly and indirectly imported mainly from Japan, the USA, and Thailand. All the electric parts necessary for assembly are specified by its headquarters in Japan. The company procures parts and materials from 24 local suppliers, all of which are Japanese affiliates. There is also a Japanese affiliate company that supplies printed circuit board (PCB) manufactured in the Philippines. Being able to source PCB locally is seen as another advantage of operating in the Philippines or a location factor for this type of E&E component assembly.

As with the cases of DENSO and TRP, there are other Japanese global Tier 1 and/or Tier 2 auto-parts companies located in the Philippines that function as manufacturing hubs for specific sub-parts and sub-components.

For example, Mitsuba Philippines Corporation manufactures motor-related sub-components for wiper modules and horns with the employment of approx. 6,000 in its three plants. The company exports 98% of its products, mainly to North America (50%), Japan (20%), China (20%), Europe (10%), and other countries in Asia. The sub-components exported to Thailand are assembled into wiper modules at the Mitsuba’s factory and supplied to the assembly of Mitsubishi Mirage in Thailand.

Furukawa Electric Autoparts Philippines (FEAP) is another example. The company manufactures 800,000 units of steering roll connectors (SRC) per month, an electrical sub-component for an airbag system, with an export ratio of 96%. Almost all exports are supplied to a global Tier 1 auto-parts maker located in Japan. FEAP has 40% share of Furukawa’s SRC production all over the world. All cases show that the Philippines has advantages in manufacturing, particularly in assembling work that uses abundant and cost-effective labor.

This Philippines’ advantage of having an abundance of young, educated, dexterous labor is also utilized by other companies that manufacture sensitive electronic products, such as sensors, cameras, electronic control units (ECUs), and PCBs. Examples of such companies are Denso-Ten (former Fujitsu Ten Corporations of the Philippines) and Integrated Micro-Electronics Inc. (IMI). IMI is a provider of electronics manufacturing services under the umbrella of Ayala Group; it is a local company that is fast accelerating its global operations, including in Japan. In the manufacturing process, these companies require many people to conduct material/parts/semi-

product handling and inspection along the assembly lines and inventory/shipment control. From the viewpoint of cost-effectiveness, the Philippines is a good investment destination for labor intensive manufacturing even for a relatively high value added E&E component assembly. As the Philippines continues to accumulate investments in the E&E component segment, the need for locally available components and materials will be increased.

The following are opportunities of the E&E component in the Philippines for future growth.

- In the wire harness sub-segment, an opportunity exists in manufacturing higher value added harness products. In order to keep its position as an export hub for Japan and the USA, the Philippines should act flexibly toward business chances that come out as a result of a rapidly developing car electronics industry.
- Labor-intensive assembly for motor-related products continue to be good investment opportunities for global Tier 1s. The investment promotion activity for this area should proactively be conducted considering that there are ongoing production shifts from China and Thailand to other countries with more cost-effective labor.
- The potential of fostering the synergetic linkage between the country's accumulated electric/electronics cluster and its auto E&E component segment (especially the upstream of E&E component manufacturing such as mounting on the board and PCB assembly) should be explored.

5) Philippine Local Suppliers

Although the number of local suppliers visited by the Project is limited, the general sentiment among the Philippine automotive industry players toward local suppliers is that Philippine local suppliers have a weak linkage to OEMs and global Tier 1 companies of the automotive industry located in the country.

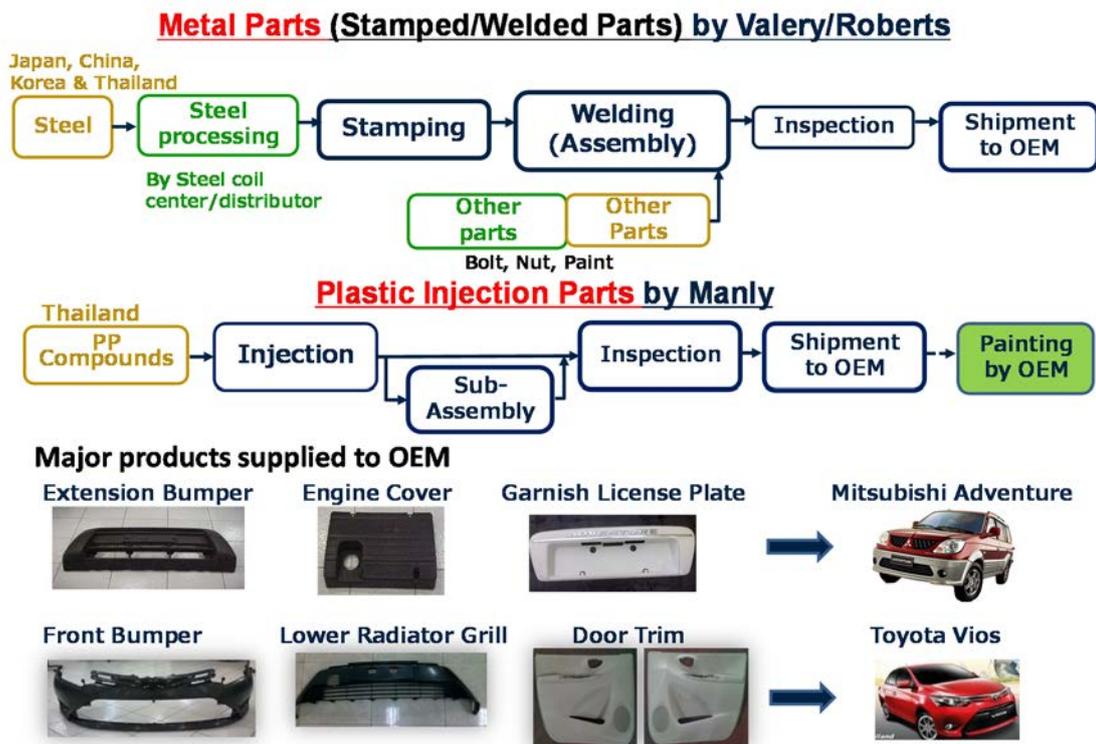
As local companies' operations are usually confined within the country, local suppliers conduct a series of value chain activities from upstream to downstream. Local companies do not necessarily focus on the automotive industry; they also supply to other industrial sectors⁵³. The main function conducted by local suppliers are production and marketing. Activities in the upstream of value chain, such as R&D, are still limited and need to be further strengthened in order to flexibly meet the changing needs of OEMs and Tiers 1 companies of the automotive industry.

Illustrative cases of auto-parts that have linkages with the CARS-participating models (Toyota's Vios and Mitsubishi's Mirage) supplied by Philippine local companies are metal parts by Valery and Roberts and plastic injection parts by Manly.

⁵³ The reasons for local Tier 2 and 3 companies also supplying to other industries are: 1) their products are more versatile, 2) the auto industry requires higher quality and safety assurance standards compared to other industries (e.g. home appliances and logistics) due public safety concerns, and 3) the scale of auto assembly in the Philippines is relatively small.

The following are characteristics of their supply chains:

- e) Valerie and Roberts are two well-known local companies that conduct auto industry-use metal (steel) processing in the country. They conduct in-house manufacturing operations, such as stamping, welding and assembly, and painting and inspection. These two companies have a certain accumulation of necessary equipment and technology for their production, such as heavy stamping machines. While some of their core materials, such as steel coils and sheets, are supplied by local steel coil centers/distributors, all raw materials are essentially imported.
- f) The major products by Valerie are body parts and panels for Vios, Mirage, and other vehicles assembled in the Philippines, and fuel tanks for Mitsubishi's L300 and Adventure. Roberts produces mufflers for Vios, and radiators, and a significant percentage (17%) of its products are currently supplied for various body parts of Adventure. In the meantime, the production of a Mitsubishi model(s)—Adventure (and possibly L300)—is scheduled to be phased out by the end of 2017.
- g) Valerie has technical tie-ups with two Japanese companies, i.e. Hiruta Kogyo Co. Ltd for the production of auto parts for Mirage and Ogihara for Vios; the company has a positive attitude toward scaling up technical partnerships with Japanese auto-parts suppliers. Roberts currently has a technical tie-up with Japan's Futaba Sangyo for mufflers and exhaust system. With the investment for three new tandem-press machines, Roberts is expected to produce and supply 23 parts for the assembly of Mirage by MMPC. These two cases are good examples of local companies utilizing technical partnerships and successfully being linked to OEMs and Tier 1 companies. As demonstrated by these cases, an effective technical cooperation with global partners in auto-parts production, particularly with Japanese companies, is a key issue for technical upgrading and continuous improvements in QCD among Philippine local suppliers.



Source JICA Experts

Figure 56 Supply Chain of Philippine Local Suppliers

- h) Manly is a local manufacturer of plastic injection molding parts. The company's main market segments are the food and beverage as well as packaging industries. Manly supplies plastic molding products, such as cases and pallets, to these industries. It also supplies to the automotive industry, currently holding a share of auto-parts segment of 12% of the company's total sales.
- i) Manly supplies to TMP, MMPC, and other OEMs in the Philippines. The company's major products are bumpers, engine cover, and door trim. The company operates several plastic injection molding machines, including 3,000 tons. Polypropylene, which is its major raw material for injection process, is imported from Thailand.
- j) With the anticipation to supply its plastic parts to MMPC for Mirage and to TMP for Vios, Manly plans to invest Php 250 million (US \$4.9 million) on its facility. Despite Manly's investment plan, large plastic parts, such as instrument panel and bumper for the new Vios, are planned to be produced by TMP's in-house operation with its own investments for upward integration. Manly is expected to make further efforts for continuous improvements in QCD as well as for closer communication and collaboration with OEMs by participating in the initial stages of the vehicle development process (See Box 5 for the detailed discussion on vehicle development process).

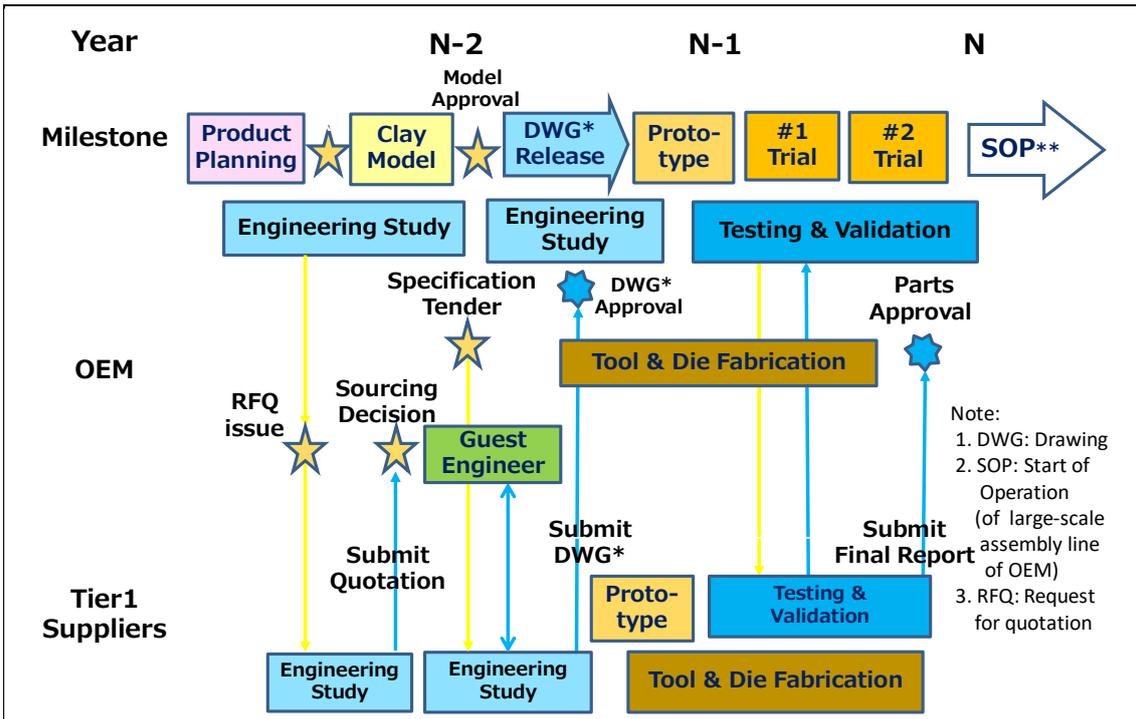
As described above, since Philippine local suppliers have mainly produced and delivered parts and components for the pick-up truck segment that has been traditionally assembled in the Philippines, the CARS program, which has encouraged the mass production of passenger car models, created both positive and negative, unintended impacts. The scheduled phasing out of Adventure (and possibly L300) production by MMPC will negatively affect many local suppliers' businesses and pose serious challenges for them. As the phasing out time approaches, Philippine local suppliers need to deepen their understanding of the issues and challenges relating to vehicle development and evolution of local production in terms of the relationships with OEMs and Tier 1 companies.

Opportunities for local suppliers exist in OEMs' growing needs to increase their local content rates under the current trend of shifting from the production of pick-up trucks to passenger car models. While OEMs have supported to diffuse the concepts and practices for continuous improvement in QCD to their major local suppliers, local suppliers are expected to understand the vehicle development process and timeline and have a clear image of what is expected of them by OEMs and Tier 1 suppliers.

Box 5 Vehicle Development and Evolution of Local Production

An OEM's vehicle development process takes a long time. From the product planning stage to the start of production (SOP) stage, it commonly takes at least two to three years. The development process is marked by several milestones, such as product planning, clay modeling, drawing release, prototype production, the first trial, etc. (See the figure below). During the process, Tier 1 suppliers closely communicate and collaborate with the OEM. The selection of parts suppliers is progressively made during this long development process.

When OEMs make their decisions about potential suppliers—whether to enter into discussion, whether to get quotations, and whether to finally select—QCD are always the key questions. QCD refers to quality (conformance to specification), cost (profitability), and delivery (ability to supply a specified amount in a timely and stable manner on agreed dates and for agreed intervals). Therefore, potential local suppliers need to participate in a long development process from an early stage to get their fighting chance. Realistically speaking, OEMs do not choose local suppliers by simply handing out their drawings to potential local suppliers and having them manufacture sample products or prototypes.



Source: JICA Expert Team

Figure 57 Vehicle Development Process and Timeframe

In the Philippines, as already described, not many local suppliers are strongly connected with the supply chains of Japanese OEMs located in the Philippines. This is mainly because no vehicle models were developed and mass-produced in the country and most of the OEM assembly operations were simple CKD (complete knockdown). With the efforts by several OEMs and through the government policy for the promotion of OEM assembly (e.g. CARS Program), the Philippines has slowly begun to move from Step 0 to Step 1. In order to accelerate the development of the automotive industry, it is necessary for the Philippine government to continue its support measures for accelerating the localization of both vehicle and parts production under a concrete policy framework with a clear message for the government's intended target.

		Powertrain	Platform	Upper Body	Parts	Vehicle Production	Remarks	Localization Ratio	Example
		Parts Production	Parts Production	Parts Production	Parts Production				
Step 0	CKD	Current Position of the Philippines					Only Local Assembly all parts from Mother Plant	~20%	
Step 1	Parts Localization			In transition			Copy of Original Parts, most of Parts from Mother Plant	20~30%	2nd Vios Philippines 6th Mirage Philippines
Step 2	Vehicle Localization						Vehicle Validation with Local Parts, Major Parts from Mother Plant	30~50%	2nd Vios Thailand
Step 3	UPR Body Development on the existing Platform						New Vehicle Development with Local Parts, No Mother Plant	50~70%	3rd Vios Thailand 2nd Innova Indonesia
Step 4	New Vehicle Development w/new Platform						New Vehicle Development with Local Parts, No Mother Plant	70~80%	6th Mirage Thailand
Step 5	New Vehicle Development w/new Powertrain						Original Development	80%~	2nd Tundra USA (Full-Size Pick-Up)

Note:

- (1) Pale blue-colored are conducted in Japan (or more advanced countries in localization such as Thailand).
- (2) Pale red-colored are conducted in automotive-developing countries such as Thailand and Philippines.

Source: JICA Expert Team

Figure 58 Evolution of Local Vehicle and Parts Production
(Relationship between Production in Japanese OEMs [mother plant] and Localization in Automotive Developing Countries)

(Source: JICA Expert Team)

6) R&D Support Segment

Although still few in number, R&D support centers for the automotive industry have steadily been growing among global Tier 1 companies in the Philippines. They conduct R&D support services such as engineering analysis (calculation, simulation, and modeling) and drawings (3D/2D), a downstream portion of R&D function in Tier 1 companies' global value chains.

The main characteristics of R&D support centers' operations, their positioning in the value chains, and advantages/challenges of placing the R&D function in the Philippines are discussed below⁵⁴:

- a) The three centers observed by the Project employ between 50 and 160 young engineers (university-graduates). The numbers of employees at these centers have steadily been expanding. One company has a plan to increase the number of engineers by around 60% within a couple of years.

⁵⁴ Three R&D support centers visited by the Project are Mitsuba Philippines Technical Center (MPTC) established in 2000 (wiper, power window, sunroof and power seat system), Denso Philippines Corp. Design Center established in 1998 (a part of DENSO, for Meter, ECUs) and F-Tech R&D Philippines, Inc established in 2006 (for pedal, brake, clutch)

- b) All three centers operate for 24 hours with engineers working in two shifts. Because R&D support centers' operations require expensive hardware and software, such as CATIA and CAD terminals, maximizing equipment utilization by utilizing the labor of young, cost-effective engineers is a key issue. Since the Philippines employs such people, the availability of university-graduate engineers works to the country's advantage.
- c) Two R&D support centers, both of which are PEZA registered, also have the equipment for validation and testing for the engineering function. In this respect, incentives to PEZA companies for equipment investments are beneficial not only for manufacturing companies but also for R&D support operation companies.
- d) Customers of R&D support centers located in the Philippines tend to be their company headquarters (mother R&D centers) in Japan and other R&D centers in North America and Europe. Concrete tasks or projects are given to the Philippines, either by the headquarters or by other mother R&D centers directly.
- e) All three centers have some collaboration with their manufacturing companies located in the Philippines; however, the degree of collaboration differs among the centers. The fact that OEMs located in the Philippines do not have R&D centers or R&D activities decrease their potential to ladder up in the R&D segment of the value chain because they do not have opportunities to make direct and frequent communication as well as collaboration with their final customers.
- f) While the management of these three centers sees that the educational level of universities in the Philippines is not fully sufficient for the R&D support operations of the automotive industry, the availability (a large number of job applicants for recruitment) of abundant, fresh university graduates who have majored in science and technology disciplines is a strong point in their site selection factors. Proficiency in English (both speaking and writing skills) among Philippine engineers contributes to effective operations through globally-connected servers and internet in their 24-hour operations. This factor works for the companies particularly when communicating with their R&D centers located in the USA. It also becomes a comparative advantage against other ASEAN countries with a low level of English proficiency, such as Thailand and Viet Nam.
- g) All the centers conduct in-house human resources development programs for young engineers, including working in Japan between several months and one year. Despite the presumed increase in their engineers' market-value (employability) after being employed and trained at Japanese affiliated R&D centers, these centers' turnover rates of engineers are not significantly higher than other manufacturing firms interviewed, varying between several percentage and 12%.
- h) Compared to R&D support engineers, all the companies feel that good production engineers are not sufficiently available in the Philippines.

3.4 Firm-Level Financial Data Analysis

3.4.1 Procedure and Key Aspects of Firm-Level Financial Data Analysis

In order to support and complement the findings and observations through the two central GVC analysis methodologies—trade statistics analysis and interview (company visits)—the Project conducted the analysis of automotive- related companies’ financial statements obtained from the Securities and Exchange Commission (SEC).

In the firm-level financial data analysis, financial statements of 124 automotive, auto parts, and related companies were collected and analyzed to deepen the understanding of financial performances of these companies as well as to further clarify their contribution to the Philippine economy. The firm-level financial data analysis was conducted with the following foci:

- (1) Comparison of 11 categories (54 major companies out of the 124 companies): OEMs, drive train (transmission), drive train parts, engine parts, wire harness, E&E, metal parts, tire, seats, R&D support, and Philippine local suppliers.
- (2) Calculation of the gross value added (GVA) and value added per person⁵⁵
- (3) Periodic trend analysis on the number of employees, net sales, raw material costs, GVA amount, and GVA per person from 2001 to 2015
- (4) Comparison of firm-level financial data analysis results with the 2009 Philippine Standard Industrial Classification (PSIC) report for a confirmation purpose.

Companies were selected for the firm-level financial data analysis using the following categories as the company selection criteria: 1) members of the Philippine Parts Maker Association, Inc (PPMA), 2) Japanese Chamber of Commerce and Industry of the Philippines, Inc (JCCIP) members that are in the automotive industry, 3) the companies visited by the Project, and 4) affiliated companies (group companies or suppliers) of the companies visited by the Project. It should be noted that all information necessary to analyze the periodic trends of GVA and value-added amount per person were available from only 50 out of 124 companies. Comparative analysis based on 11 categories was conducted on 54 companies, including almost all the companies visited by the Project.

3.4.2 Findings and Implications

The firm-level financial data analysis results and the summary of the automotive section in the 2009 PSIC report were shown in Tables 49 and 50.

⁵⁵ GVA was calculated using the following formula;
GVA = income from operations + depreciation (incl. amortization) + labor costs (direct labor, indirect labor and other labor related expense such as health insurance and retirement expenses)

Table 49 Firm Level Data Analysis based on 11 Categories

[Total]

Category (No. of Companies Analyzed)	No. of Employees ^{1/}	Net Sales (US\$ mill.)		Raw Material Costs (% to Net Sales)		Value of GVA (US\$ mill.)		% of GVA (% to Net Sales)		GVA per person (1,000 US\$)			
		2001	2015	2001	2015	2001	2015	2001	2015	2001	2015		
OEM ^{2/}	5	3,699	3,315	779	4,288	80%	81%	42	494	7%	14%	15	149
Drive Train (T/M)	4	1,403	2,370	166	418	64%	62%	25	91	20%	22%	24	29
Drive Train Parts	3	152	655	17	84	49%	56%	3	10	26%	12%	19	16
Engine Parts	2	630	2,082	17	120	57%	57%	4	28	21%	23%	6	13
Wire Harness	10	17,479	35,361	475	1,704	69%	74%	92	240	19%	14%	5	7
E&E	9	10,236	15,302	255	1,122	69%	63%	49	179	21%	16%	5	10
Metal Parts	7	947	1,474	49	161	63%	53%	2	25	10%	16%	4	17
Tire	2	1,497	2,391	83	365	48%	59%	20	114	25%	31%	14	48
Seat	6	149	559	10	58	69%	86%	1	5	21%	9%	7	10
R&D Support	4	383	1,343	6	39	N/A	N/A	2	27	35%	68%	4	13
Philippine Locals	2	314	1,751	19	77	71%	62%	3	12	28%	16%	9	7
TOTAL	54	36,889	66,603	1,876	8,436	66%	65%	242	1,224	13%	15%	7	17

[Reference: 50 Companies out of 124 companies with All Information Necessary for Analysis and 124 companies in total]

50 Companies	-	37,748	55,831	1,594	6,986	57%	56%	263	1,092	17%	16%	7	20
124 Companies	-	46,431	78,173	2,322	9,425	62%	59%	297	1,466	16%	16%	6	14

[Reference: Average Figure]

Category (No. of Companies Analyzed)	No. of Employees ^{1/}			Net Sales (US\$ mill.)			Value of GVA (US\$ mill.)		
	2001	2015	CAGR	2001	2015	CAGR	2001	2015	CAGR
OEM (5) ^{2/}	925	829	▲ 1%	195	858	11%	14	123	17%
Drive Train (T/M) (4)	351	790	6%	42	105	7%	8	23	7%
Drive Train Parts (3)	76	218	8%	6	28	12%	2	3	9%
Engine Parts (2)	315	1,041	9%	8	60	15%	2	14	16%
Wire Harness (10)	1,942	3,536	4%	48	170	10%	9	24	7%
E&E (9)	1,137	1,913	4%	28	125	11%	6	20	9%
Metal Parts (7)	189	211	1%	7	23	9%	1	4	13%
Tire (2)	749	1,196	3%	42	183	11%	10	57	13%
Seat (2)	149	280	5%	5	29	14%	1	3	7%
R&D Support (6)	77	336	11%	1	7	15%	0	4	21%
Philippine Locals (4)	157	438	8%	5	19	10%	1	3	6%
TOTAL (54)	820	1,359	4%	35	156	11%	6	23	10%

[Reference: 50 Companies out of 124 companies with All Information Necessary for Analysis and 124 companies in total]

50 Companies	755	1,117	3%	32	140	11%	5	22	11%
124 Companies	505	878	4%	19	77	11%	3	12	10%

1/ It is speculated that numbers of employees reported by companies in financial statements submitted to PSE reflect only the numbers of their regular employees. When the numbers of contract workers (temporary workers) are included, the number of employees are presumed to be much higher than the numbers shown above.

2/ Include both sales (trading) and manufacturing of vehicles

Source: JICA Expert Team based on Companies' Financial Statements obtained from SEC

Table 50 Overview of the Philippine Automotive Sector in the 2009 PSIC Report

1US\$ = 42.2 PHP

2009 PSIC Code	Number of Establishments	Total Employment	Total Income (million US\$)	Value Added (million US\$)	GVA Ratio (%: to Total Income)	Value Added per Person (1,000 US\$)
Total Companies						
C291	43	7,266	2,258	180	8.0%	25
C292	39	1,271	48	12	24.4%	9
C293	134	59,739	3,861	856	22.2%	14
Total	216	68,276	6,168	1,048	17.0%	15
Companies less than 20 Employees						
C291	10	111	8	2	19.5%	14
C292	21	146	2	0	23.2%	3
C293	33	366	85	2	2.2%	5
Sub-total	64	623	95	4	4.1%	6
Companies more than 20 Employees						
C291	33	7,155	2,250	179	7.9%	25
C292	18	1,125	47	11	24.4%	10
C293	101	59,373	3,777	854	22.6%	14
Sub-total	152	67,653	6,074	1,044	17.2%	15

Source: PSA; Currency Exchange: Bangko Sentral Ng Pilipinas

(1) C291: Manufacturer of Motor Vehicles

(2) C292: Manufacturer of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers

(3) C293: Manufacturer of parts and accessories for motor vehicles

From the firm-level financial data analysis, the following trends in the Philippine automotive industry can be observed:

- (1) The size of employment in the automotive industry almost doubled from 2001 to 2015. The total employment of the 54 major companies increased from approx. 37,000 to 66,000 during the said period. The total number of people employed by the 124 companies (including the 54 companies) increased from 46,000 to 78,000. In both cases, the average growth rate of employment per company is 4%. These firm-level financial data analysis results (the employment growth rate of 4% and the size of employment) support the data in the 2009 Philippine Standard Industrial Classification (PSIC), which reported that the total number of employees in the automotive industry (survey size 216 companies) was approx. 68,000. It should be noted that out of 124 companies (out of which 89 provided information on employment figures in 2015) there were only three companies with the employment size of less than 20; whereas, 30% of 216 companies in the 2009 PSIC report had the employment size of less than 20.
- (2) The growth in employment during the 2001-2015 period was especially high among companies under the following categories: R&D support (CAGR 11%), engine parts (9%), drive train parts (8%), and Philippine local companies (8%).

- (3) The total net sales of the automotive industry grew almost four times higher from 2001 to 2015. The total net sales of the 54 companies increased from approx. US\$ 1.9 billion to US\$ 8.4 billion during the period. The total net sales of the 124 companies increased from approx. US\$ 2.3 billion to US\$ 9.4 billion. In both cases, the average growth rate of net sales per company is 1%. These firm-level financial data analysis results (net sale growth rate of 11 % and the size of total net sales) support the data in the 2009 PSIC, which reports that the total income from the automotive industry (216 companies) was approx. US\$ 6.2 billion.
- (4) Across all 11 categories, the growth rates (CAGR from 2001 to 2015) of net income are high, ranging from 7% to 15%. The categories with the highest growth rates are R&D support and engine parts.
- (5) There are no significant changes in the share of raw material costs in company's net sales from 2001 to 2015. The shares are in the 60% to 70% range in both years, except for OEM companies, which is about 80%.
- (6) There has been a significant increase in value addition in the automotive industry in the last 15 years. The total GVA amount of the 54 companies increased from US\$ 0.2 billion in 2001 to US\$ 1.2 billion in 2015. The average growth rate (CAGR) of the 54 companies' GVA amount from 2001 to 2015 was 10%; the rates of the 50 companies for which all the information was available and all 124 companies analyzed was 11% and 10% respectively. Noting that the total amount of value addition for 124 companies (valid information from 120 companies) was US\$ 1.5 billion in 2015 (up from US\$ 0.3 billion in 2001), taking into account the annual growth rate of 10-12 %, these firm-level financial data analysis results correspond with the 2009 PSIC, which reported that the total value addition from the automotive industry was about US\$ 1.0 billion.
- (7) The highest growth of value addition was found in the R&D segment. The total GVA amount increased from US\$ 2 million in 2001 to US\$ 27 million in 2015 with a CAGR of 21%. This is followed by OEM (17%) and engine parts (16%) categories.
- (8) The share of GVA in the net sales amount for the 54 companies was 15% in 2015. The figure is almost the same for the analysis result for the 124 companies (16%) and the 2009 PSIC report (17%).
- (9) Lastly, there has been a significant increase in the value addition per person. Among the 54 companies, the average amount of value addition per person increased from US\$ 7,000 in 2001 to US\$ 17,000 per person in 2015. Looking into the data of the 124 companies, on the other hand, the increase is only slightly less from US\$ 6,000 in 2001 to US\$ 14,000 in 2015. The value addition per person in the automotive industry reported in the 2009 PSIC is a similar figure of US\$ 15,000.

- (10) The biggest increase in GVA per person is in the OEM category from US\$ 15,000 in 2001 to US\$ 149,000 in 2015. This figure is disproportionately larger in comparison to other categories, which ranges from US\$ 7,000 to US\$ 48,000. It should be noted that the OEM category covers not only the manufacturing but also the sales of vehicles.
- (11) In contrast to the OEM category, GVA per person showed a decline in two categories: drive train (transmission) and the Philippine locals.
- (12) The following implications can be drawn from the above findings.
- (13) The employment generation in the Philippine automotive industry has been occurring in most categories/segments. Wire harness and E&E components have the two largest employments in terms of both total number and average, while the R&D support segment has the higher growth rate. These observations match with the findings of the statistical analysis and company visit survey, which may show one direction for the Philippines to further develop its automotive industry.
- (14) For the OEM category, the huge increase in net sales in the last 15 years have not equaled to employment generation. As discussed in the earlier section (2.2 Present Situation and Challenges for the Philippine Automotive Industry), vehicle sales in the Philippines increased from approx. 80,000 vehicles per year in 2001 to 324,000 vehicles per year in 2015 with the 70% of the sales being imported cars; however, the CKD-CBU ratio had been overturned in the last 20 years. The firm-level financial data analysis findings from the OEM category—the huge increase in the net sales (up from US\$ 0.8 billion to US\$ 4.3 billion), GVA, and GVA per person in the OEM category yet a slight decline in the number of employees (from 3,700 in 2001 to 3,300 in 2015)—shed an alarming light on the Philippine automotive industry’s direction, in terms of employment generation in the automotive production (assembly). This may suggest that the Philippines needs to further develop the assembly capacity of OEMs not only through the CARS Program but also by continuous policy measures for promotion.
- (15) In contrast to the OEM category, the drive train and Philippines local categories recorded moderate growth rates in employment generation and net sales, however, these two categories recorded decline in GVA per person. As described before, these are the companies supplying their parts mainly for the pick-up truck segment with manual transmissions. While there is a continuous demand for vehicles with manual transmission, the demand for compact vehicles with automatic transmission has been growing on a global scale. The decline in GVC per person is indicative of the need for innovation among companies in these categories through changing their product lines to catch up with the global market demand.

3.5 Input-Output Table Analysis

3.5.1 Procedures and Key Aspects of I-O Table Analysis

As discussed in Chapter 2, one million annual car sales in the Philippines is projected to be achieved between 2025 and 2028. The Project conducted input-output (I-O) analysis⁵⁶ to estimate economic ripple effects that are likely to be produced across various industries when one million annual car sales is achieved in the Philippines.

The I-O analysis is conducted based on the following preconditions (or limitations):

- (1) The 2006 version of the I-O Tables published by the Philippine Statistics Authority⁵⁷ was used. While it is a decade-old data, it is nonetheless the latest data set available. As this is the base set data, the analysis does not take into account economic development and structural changes of industries that have occurred in the Philippine from 2007 onwards.
- (2) The transaction table and Leontief inverse matrix coefficients table⁵⁸ of the I-O Tables of the Philippines were used for analysis to calculate primary ripple effects and increase employment compensation. As of 2006, I-O database only publishes three basic tables (i.e. transaction table, technical coefficient table, and Leontief inverse matrix coefficients), while other key items for policy planning such as job creation (which can be calculated from an employment coefficient table) could not be estimated.
- (3) The 2006 I-O Accounts of the Philippines covers 240 economic sectors. The automotive industry is classified under “154 Manufacture of Motor Vehicles, Trailers and Semi-Trailers.” Since more detailed classifications of economic sectors and sub-sectors are unavailable from the base data set, the Project’s analysis results could not provide ripple effects occurring in more detailed economic segments.
- (4) Increase in new demand, ripple effects, and increase in employee compensations are calculated as follows:

[Increase in new demand]

- New demand unit = 1,000,000 - 99,541 (the number of cars sold in 2006)
= 900,459

⁵⁶ I-O analysis is a widely used method that provides tools for systemic analysis of an economy at the macro level. It examines the interrelationships of industries functioning within the economy, more especially how one industry's outputs become the input of another industry. The method was developed by Wassily Leontief, an American economist, in the 1930s and published in *The Structure of American Economy, 1919–1929* (1941). It is popularly used for economic policy planning and economic forecasting as it can be used to show demand projection and ripple effects across industries.

⁵⁷ The latest version of international I-O table preferred by IDE-JETRO was as of 2005.

⁵⁸ Inverse matrix coefficients table indicates the amount of production directly or indirectly induced in each economic sector when one unit of the final demand occurs for one economic sector.

- An average car price is assumed as Php1,042,000 (average price of cars sold between 2006 and 2015⁵⁹)
- New demand = 900,459 cars * Php1,042,000 = approx. Php938 billion

[Ripple effects]

- New demand * domestic self-sufficiency rate = α
- Primary ripple effect = inverse matrix coefficients table * column vector (α)

[Increase in employee compensation]

- Increase in employee compensation = primary ripple effect * employer income factor

3.5.2 Findings and Implications

The I-O table analysis results based on the 2006 I-O table indicates that when one million car sales are realized,

- (1) Primary ripple effects amounting to approx. Php 233 billion Php will be produced; and
- (2) The employee compensation will increase approx. Php 23 billion.

The table in the succeeding page shows the top 20 economic sectors that will be most affected by “one million car sales demand in the Philippines.”

From the above findings, the following implications of the Philippine automotive industry can be inferred.

- (1) The above I-O analysis results are strongly influenced by the Philippines’ low domestic self-sufficiency rate. The rate can be calculated by obtaining the ratio of imported items for satisfying domestic demands in the transaction table. If the domestic self-sufficiency rate is high, the rate at which the new demand can be covered by domestic production increases and economic ripple effects tend to increase.
- (2) The ripple effect on the automobile industry is only about 10% of the new demand. This is because the domestic self-sufficiency rate of the automobile industry in 2006 is about 10%⁶⁰. The majority of vehicles and auto parts were imported in 2006; therefore, increase in the new demand will have ripple effects on trading companies and distribution companies. Meanwhile, ripple effects on auto parts manufacturers in the Philippines will be limited to some extent. This finding also matches the finding from the firm-level

⁵⁹ Car prices may decline as demand increases, but it is not considered in this estimation because the range of decline is unknown.

⁶⁰ Since the industrial field classification in the I/O tables varies from country to country, findings from the I/O table analysis of one country cannot be used to compare with findings of other countries to draw much meaningful implications or for benchmarking. Noting the complexity in using the I/O table analysis results, the domestic self-sufficiency rate of the Philippines being 10% is undeniably low. It is even more so when there are data that the domestic procurement rate of Thailand for the transportation field (including automobiles) reached 65.7% in 2015 and some vehicle models made in Indonesia have the local procurement rates exceeding 75%.

financial data analysis. In the last 15 years, OEMs experienced a high increase in sales and GVA, while there's a slight decrease in employment.

- (3) The proportion of daily necessities (foods, clothing items etc) in private consumption expenditures is relatively high in the Philippines according to the 2006 base data. This indicates that when salaries increase, the Filipino people will likely to spend their increasing income on essential goods, rather than on other items, such as cars.
- (4) Taking into account the growing accumulation of the manufacturing industry from 2006 to the present, ripple effects on the manufacturing industry will be larger than shown in the above analysis results. It should also be noted that with the increase in the domestic self-sufficiency rate in the automobile industry, the ripple effect on new demand will increase.

Table 51 Primary Ripple Effects & Increase in Employee Compensations

Unit: php million

Code	Description	New Demand	First ripple effect	Increase in Employee Compensation
154	Manufacture of Motor Vehicles, Trailers and Semi-Trailers	938,278	94,687	6,205
195	Wholesale and retail trade	0	44,242	8,076
128	Manufacture of basic iron and steel	0	10,041	384
149	Manufacture of lighting equipment and electric lamps and other electrical equipment , n.e.c	0	9,540	1,250
107	Manufacture of refined petroleum products	0	7,919	155
137	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	0	6,977	507
175	Generation, collection and distribution of electricity	0	6,678	588
41	Crude oil and natural gas	0	5,712	95
118	Manufacture of rubber products	0	4,670	723
147	Manufacture of insulated wires and cables	0	4,612	168
113	Manufacture of basic chemicals except fertilizers and nitrogen compounds	0	2,404	242
132	Manufacture of structural metal products	0	2,122	257
196	Repairs of motor vehicles, motorcycles, personal and household goods	0	1,649	354
183	Road freight transport	0	1,578	108
108	Manufacture of other petroleum products	0	1,338	83
192	Telephone service includes telegraphs	0	1,211	191
136	Manufacture of other fabricated metal products, n.e.c.	0	1,201	12
10	Rubber	0	1,179	602
130	Manufacture of basic precious and non-ferrous metals	0	1,156	15
116	Manufacture of other chemical products, n.e.c.	0	1,129	124
148	Manufacture of accumulators, primary cells and primary batteries	0	1,057	134
	Other	0	22,258	2,928
	Total	938,278	233,361	23,201

Source: JICA Expert Team

3.6 Overall Summary of GVC Analysis

The overall framework of GVC analysis involved detailed analysis of trade statistics and company visit survey as main methods, and the firm-level financial data analysis (including data confirmation with the PSIC data) as a supplementary method. The major findings and observations from each method are summarized in.

Table 52 Summary of GVC Analysis Findings and Observations

<p>1. Trade Statistics Analysis</p> <p>a. The Philippines has a moderate growth of auto trade in the last 20 years. Its auto parts industry has steadily expanded; however, compared to other ASEAN countries such as Thailand, Indonesia, China, and Viet Nam that have seen the drastic development of auto industry, the Philippines has not been able to take a full advantage of regionalization of the auto supply chain and expansion of the ASEAN market.</p> <p>b. The Philippines' auto industry has become a trade deficit industry since 2015 due to the higher increase in CBU imports. Its main import partners for CBUs are Thailand and Indonesia. The Philippines has been the key export partners for these countries where domestic markets has been said to reach the saturated stage since the 2010s. In other words, the Philippines is absorbing the production surplus of these countries.</p> <p>c. Supply chain linkage (interdependence) with the ASEAN region increased for all segments.</p> <p>d. Japan/USA remain as top partners for the Philippines' growing auto-parts exports.</p> <p>e. The Philippines' exports of E&E components (incl wire harness) and drivetrain segments are the biggest compared to other auto segments, but the variety of exported products are limited. In Viet Nam that has the same location factor as the Philippines when it comes to labor costs, the E&E segment and drive-train segment have seen drastic growth.</p> <p>f. Exports of labor-intensive assembly products (e.g. wire harness) have moderately expanded over the last two decades. New players (Viet Nam, Cambodia, and Myanmar) have entered in the global supply chain of these products and became fierce competitors to the Philippines.</p>
<p>2. Analysis of the Company Visit Survey</p> <p>a. The sales and employment of auto-related companies in the Philippines have steadily increased, largely due to the automotive market expansion. The expansion of the domestic market has contributed to the positive performance of OEMs in the country and that of the global market have contributed to the positive performance of PEZA companies.</p> <p>b. While the two OEMs participating in the CARS Program have accelerated investments for expansion, the scale of OEM assembly in the Philippines is still insufficient to convince existing auto-parts markers to significantly increase their investments into the country.</p> <p>c. Drivetrain is the only auto-parts segment that has a strong supply chain linkage with OEMs in the Philippines. Through the production of FR-type manual transmission for pick-up trucks for large-scale exports, companies in this segment have accumulated capital stock (equipment and technology) and experiences. As the greater share of the global automotive market shifts toward compact vehicles with automatic transmission, the drivetrain segment faces transition challenges.</p> <p>d. Export-led Japanese Tier 1 companies are growing in the E&E component segment. Utilizing benefits of PEZA-registered companies and the Philippines' cost-effective labor, some companies in this segment tend to function as center (hub) for global production of specific parts and sub-components exported to their mother companies in Japan and/or sister</p>

companies in other advanced countries under the company's global supply chain.

- e. In the E&E component segment, the assembly of high-valued added components, such as ECB/ECU for car electronics use has begun in the Philippines. It exemplifies a case where the upgrading in the supply chain occurred in part due to the growing cluster of electronic industry in the Philippines.
- f. The integration of Philippine local suppliers into OEMs' supply chains is limited and local suppliers are facing impediments to further growth. In the light of the phasing out of some vehicle models produced in the Philippines, which they have long been supplying, local manufacturing companies are faced with a need to provide swift responses including product changes and upgrade of QCDs to the level that global OEMs and Tier 1 companies require.
- g. Several R&D support companies supplying services to their mother R&D centers in Japan have emerged. Utilizing benefits of PEZA-registered companies and the Philippines' cost-effective English-speaking engineers. These companies run for almost 24 hours by two (2)-shift operations, which allows them to have communication in real time with their clients (mother and sister R&D centers) and swiftly process orders.
- h. The variety of parts, sub-components and materials in auto-parts production in the Philippines is limited. Many areas of fundamental production/processing technology do not exist.
- i. In the assembly, metal-processing and machining fields, the Philippines has accumulated a certain level of capital stock and technical experiences/knowhow.
- j. An abundance of diligent, cost-effective human resources is an advantage for the Philippines. The country's available human resources is attracting not only those companies that are known to produce labor-intensive products, such as wire harness, but also high-skilled businesses, such as R&D support centers.
- k. Main human-resources related challenges in the Philippines include difficulties in recruiting production engineers in good quality and quantity, and a constant need to provide in-house training to all levels of human resources.

3. Firm-level financial data Analysis and confirmation with census data

- a. The total number of employees, net sales and value of calculated gross value added (GVA) of the auto-related companies increased by 4%, 11% and 10% from 2001 to 2015 respectively. This data supports findings from the trade statistics analysis and the company visit survey.
- b. The total employment size of the major 54 auto-manufacturing companies in the Philippines analyzed in the firm-level financial data analysis reached to 66,600 (2015), is supported by the figure of 68,000 for the three automotive PSICs, shown in the 2009 census data.
- c. The total net sales of the 54 companies increased to 8.4 bill. in 2015, while the figure based on the 2009 census data was US\$6.2 billion.
- d. The average share of raw material cost in a company's net sales was around 65%; there was no significant change between 2001 and 2015.
- e. The R&D support, OEM, and engine parts segments had higher GVA growth rates than other segments. The average share of calculated GVA in company's net sales was 15% in 2015.

The JICA Expert Team assessed above findings from the viewpoints of potential investors to the Philippine automotive industry and organized the findings into four categories: the Philippines' strengths, weaknesses, opportunities and threats (SWOT). Table 55 shows the SWOT analysis

result.

**Table 53 SWOT of the Philippine Automotive Industry
(Perspective of “Location factors”)**

<p align="center"><u>Strengths (S)</u></p> <ol style="list-style-type: none"> 1. Geographical location and proximity to Japan and the USA: Gateway to the Pacific Rim region 2. Availability of an abundant cost-effective English-speaking human resources 3. Existence of capital stock and experiences in several segments 4. Benefits/incentives provided by PEZA 	<p align="center"><u>Weaknesses (W)</u></p> <ol style="list-style-type: none"> 1. Small-scale OEM assembly capacity 2. Limited variety of auto-parts and materials produced 3. QCD standards among local suppliers are not up to the standard by OEMs 4. Insufficient supply of quality engineers who stays in the company for a long period
<p align="center"><u>Opportunities (O)</u></p> <ol style="list-style-type: none"> 1. Rapid expansion of the domestic automotive market 2. Potential for linkage with a growing cluster of electric/electrical industry in the Philippines 3. Global trend to strengthen C.A.S.E capability among auto makers 4. Expansion of the R&D support segment 	<p align="center"><u>Threats (T)</u></p> <ol style="list-style-type: none"> 1. Existence of far-leading Thailand 2. Competition with other ASEAN countries such as Viet Nam

The Philippine automotive industry is expected to go into a new expansion and “take-off” period, supported by both general incentive packages by PEZA, Motor Vehicle Development Program(MVDP), and the CARS program. With the continuous expansion of its economy, there is a promising growth scenario for the Philippine automotive industry, however, the current situation of the Philippine automotive industry should be seen as being at the crossroads. The Project’s GVC analysis showed that assembly capacity of the OEM segment is still small and the variety of auto-parts produced in the Philippines is quite limited. Meanwhile, the E&E component segment, the drivetrain segment, and some portions of the engine-parts segment are leading the Philippines’ auto parts exports.

The structure of the overall Philippine automotive industry is fragmented; the industry is not well advanced in terms of its participation into both global value chain and supply chains. The country’s participation in the global value chain is concentrated in the midstream of GVC, especially the function of production. The supply chain inside the country is also very weak and limited as indicated by low local content ratios among OEMs and Tier 1 companies.

While the Philippine automotive industry is running far behind some of ASEAN countries such as Thailand, there are some positive signs when one scratches underneath the surface. Findings and observations from GVC analysis suggest that investments by large-scale, global OEMs and Tier 1 companies (particularly Japanese companies) to strengthen their companies’ global value chains and supply chains have brought about positive impacts to the Philippine automotive industry by improving the Philippine production centers for selected sub-components of auto parts

or through sub-contract R&D supporting centers for their R&D functions. These companies' strategies and investments have gradually accelerated the Philippines to increase the country's participation into the global value chain and supply chain.

In terms of location factors for investors, the Philippines automotive industry has attractive strengths and opportunities that the Philippine government should actively advertise and support. At the same time, it is necessary to take appropriate measures to address its weaknesses for further advancement of the industry.

To conclude the GVC analysis, the following four points are raised as the most important findings for consideration of strategic segments for promoting the growth of the Philippine automotive industry:

- (1) A clear development concept for the Philippine automotive industry needs to be indicated by setting the target scale of OEM production to be achieved in the future. Having a clear industry target will help to accelerate the development and accumulation of the Philippine automotive industry as a whole.
- (2) The Philippines in specific auto-parts segments have a competitive edge in the drivetrain and E&E segments. In the drivetrain segment, in which exports to the ASEAN region have increased greatly over the years. Utilizing these accumulated assets in capital stock and human resources, the Philippines should explore how to best utilize its strategic segments to complement the regional supply chains in the ASEAN region.
- (3) Examples and successful cases of the auto E&E component segment benefiting from the electric/electronics industry clusters growing in the Philippines are observed. The Project confirmed that R&D support companies (so to call "ESO") are steadily growing in the Philippines. R&D support is located at the downstream of the R&D segment and is a higher value-added part of the automotive value chain. For the development of the Philippine auto industry, it will be strategically important to consider how to continue attracting companies in the auto E&E segment.
- (4) The labor-intensive industry has been shifting from China and Thailand, where labor costs have been raising to the extent that they are increasingly no longer considered attractive investment destinations for the type of the industry, to neighboring countries. The Philippines has been seen as one of the favorable investment destinations of "Thailand plus One" country. The accumulation of labor-intensive industry in various auto-parts segments will continue to be a key issue for the development of the Philippine automotive industry, particularly viewed from the short- and medium-term perspectives.

Chapter 4 Automotive Industry Promotion Plan

4.1 Consistency with the Philippine Government’s Development Policies

(1) Framework of the Industry and Economic Development Strategy / Plan

In the Philippines, the general long-term direction of the country’s development is described in AmBisyon Nation 2040⁶¹ (EO. No. 5s. 2016, signed by President Duterte), which envisions the Philippines to become a “prosperous middle-class society by 2040.”

The Philippine Development Plan (PDP) is the medium-term development plan prepared by NEDA. PDP 2017-2022, the first medium-term plan to be anchored on the 0+10 Point Socioeconomic Agenda and the AmBisyon Natin 2040, aims to lay down the foundation for inclusive growth, a high-trust and resilient society and globally competitive knowledge economy. Consistent with the long-term development vision and the medium-term development plan, various economic policies and programs, including the Investment Priorities Plan (IPP)⁶², the Comprehensive National Industrial Strategy (CNIS), the Manufacturing Resurgence Program (MRP), and the Manufacturing Industry Roadmap (MIR), are being implemented to achieve economic development.

As discussed in Chapter 2.2.6, in the area of MSME support, initiatives such as the SSF program, SME Roving Academy, and Negosyo Centers have been established across the country. As recognized in PDP 2017-2022, strengthening competitiveness of the industry is indispensable in capturing opportunities that arise from AEC integration and globalization.

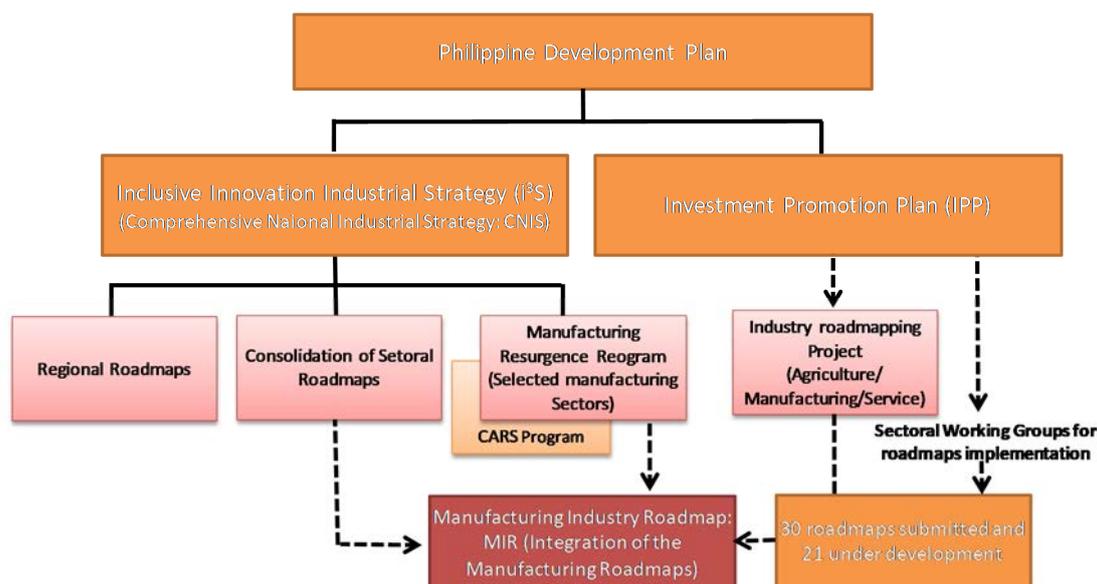


Figure 59 Correlation among Policies

⁶¹ Manufacturing is one of priority sectors in the document. Transportation facility, including automotive/auto parts industries is the sub-segment of the sector specified in the vision.

⁶² Three year rolling plan prepared by BOI. See Chapter 2.2.8-(2) for more discussion on IPP.

General industry promotion efforts by relevant intuitions are the same, even though different (some overlapping) priority industries are identified in these policy documents, such as BOI's investment priority industries, key employment generating industries, and DTI's industry clusters. While concerted efforts by government agencies is a key success factor for industry promotion, insufficient coordination is observed. Another important policy challenge is that each program's effectiveness is unclear because agencies responsible for implementing the program and the timelines etc. are not clearly defined.

(2) Inclusive Innovation Industrial Strategy (i³S) of the Philippines

In 2017, in the context of reviving manufacturing and linking it with agriculture and services, a new industrial policy known as Inclusive Innovation Industrial Strategy (or i³S) was formulated by DTI/BOI. CNIS is now considered as a part of i³S; it provides the framework of i³S.

i³S is based on five major pillars, namely 1) building new industries, clusters, and agglomeration, 2) capacity building and human resource development, 3) MSME growth and development, 4) innovation and entrepreneurship, and 5) ease of doing business and investment environment. With the recognition that Industry 4.0 will change business models globally at an accelerated pace, innovation is placed at the heart of the strategy.

In terms of implementation, it adopts both horizontal (cross-sector) and vertical (sectorial) approaches; it should be highlighted, however, that the coordination mechanism will play a key role.

The strategy has twelve (12) focus sectors, and among them, automotive is the foremost sector and the CARS program will be the main policy measure for the sectorial development.

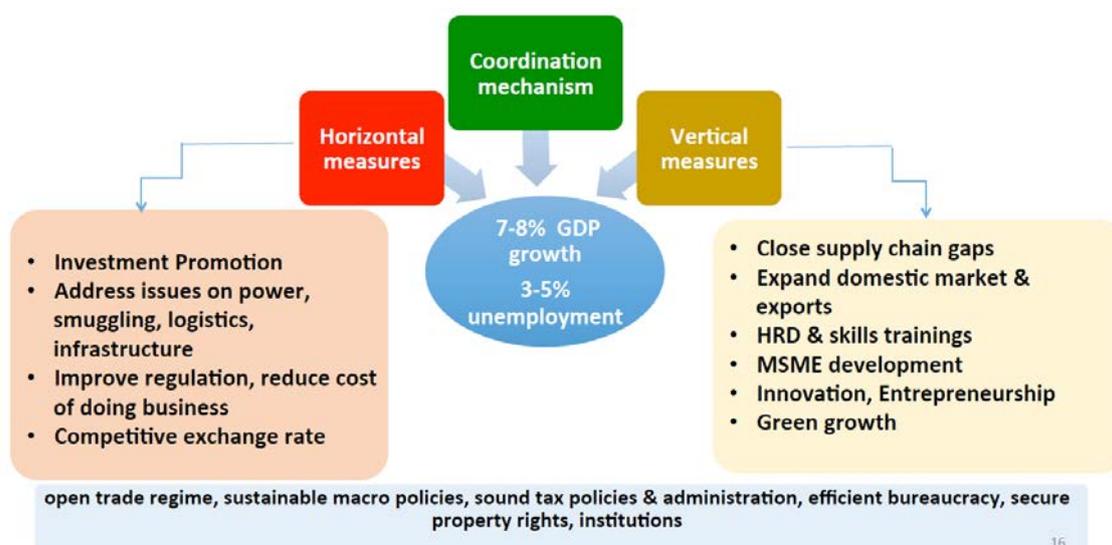


Figure 60 Policy Measures to Transform Industries to Be Innovative and Competitive

(3) Manufacturing Industry Roadmap (MIR)

The Industry Road-mapping Project started in 2014 in order to address the need to focus on the manufacturing industry. Through the implementation of the roadmap, the project aims to generate an additional 30% of economic value added and 15% in employment.

The approaches for developing the roadmaps were as follows:

- (1) Identify present and future growth potential of industries in both domestic and export markets, and rapidly growing industries,
- (2) Check if private sector activities of the identified industries already exist, or if they are in the infancy stage of its growth. If non-existent, explore attracting foreign investments,
- (3) Improve product quality and identify barriers for new companies to enter the industry, and,
- (4) Remove those barriers.

Industry associations formulated their respective industry roadmaps. At present, at least 27 roadmaps have been published while some sectors, such as shipbuilding and precious metal industries, are still working on formulating their roadmaps. MIR is prepared based on the sectorial roadmaps submitted by industries to DTI/BOI. In Phase I, the Project closely examined relevant industry roadmaps, including ones for the automotive, auto-parts, and electronics sectors.

The long-term vision of MIR is to develop an internationally-competitive manufacturing industry, supported by the collaboration of upstream and downstream of both domestic and international supply chains.

The Government's initial plan was to integrate these roadmaps into MIR, however this operation was yet to be conducted. Upon instruction from DTI/BOI, industry associations are the ones responsible for the development and updating of the roadmaps. Without a clear guidance, the frequency that the roadmaps are reviewed and updated varies widely by industry. Among automotive industry related industries, the roadmap on automotive assembly sector (prepared by CAMPI) has yet to be updated, the road map on auto parts industry (prepared by PPMA) was reviewed and revised once. The electric vehicle sector (prepared by e-VAP) roadmap has been reviewed and updated multiple times to reflect the most up to date government strategies for promoting the e-vehicle industry.

4.1.4 Industry Development Council (IDC)

The Industry Development Council (IDC) is the primary coordinating mechanism on all policies, programs and initiatives of the Philippine government. This is a crucially important mechanism for promoting industrial policy, since relevant policy actions and priorities should be harmonized across agencies.

Chaired by DTI, its member composition includes representatives from the public and private sectors; namely the Office of the President, NEDA, the Bangko Sentral ng Pilipinas (BSP), DOF,

the Department of Agriculture (DA), the Department of Foreign Affairs (DFA), DOST, DOLE, the Department of Energy (DOE), the Department of Environment and Natural Resources (DENR), the Department of the Interior and Local Government (DILG), the Department of Public Works and Highways (DPWH), DepEd, CHED, the National Competitiveness Council (NCC), and representatives from business associations, citizen's groups/NGO, research institutions and think-tanks. IDC is mandated to perform the following power and functions:

- (1) Recommend approval of the CNIS, which shall be consistent with the Philippine Development Plan (PDP);
- (2) Coordinate, monitor and assess the implementation of the sectorial roadmaps and the CNIS;
- (3) Review periodically and assess the performance, problems, and prospects of the country's industries;
- (4) Recommend legislation that would contribute to industry development;
- (5) Formulate policies and recommend measures to improve industry competitiveness;
- (6) Grant and review the accreditation of Philippine industry associations/organizations.
- (7) Adopt policies, rules, procedures and systems for the efficient and effective exercise of its powers and functions.

The CARS Program is one of the programs, endorsed by IDC.

IDC was originally established in 1996 (EO 380) under the Ramos administration. It has been inactive for many years. Even though DTI drafted a new EO to re-convene the council in 2014 and IDC meetings were held twice in 2014, the draft EO has not been officially signed until today. Given no legal basis, IDC meetings have not been convened on a regular basis and the council has not been able to carry out its intended mandate. DTI/BOI is following up on the draft EO to reconvene the council.

As an alternative mechanism, DTI is considering of having a MOU on innovation and entrepreneurship signed by DTI with six other government agencies, namely NEDA, DOST, DA, DICT (Department of Information, Communication, and Technology), CHED, and DepEd; the MoA will create a forum to discuss and address industry development issues.

4.2 Strategic Concept on Promotion of the Philippine Automotive Industry

4.2.1 Automotive Sector

(1) Development Concept

The idea of “one million domestic vehicle production” is a very important idea for the investors. Through a series of interviews of OEMs and Tier 1 suppliers, the JICA Expert Team confirmed that the “annual production of one million cars” is a necessary condition for potential investors, such as Japanese OEMs and affiliated-Tier 1 companies, to invest in the Philippine automobile industry. The followings are some of the comments made by them during the interviews.

- It may be difficult to invest in the Philippines since our current strategy is to invest in Indonesia; however, “one-million units” will be the keyword to move our headquarters in Japan (OEM).
- Our headquarters will not budge unless there is a commitment by the Philippine Government to "promote one-million-unit production" (several OEMs)
- We will consider transferring our development function to the Philippines when the country breaks the one million unit-mark. (auto-parts maker)
- If “one-million units” are achieved, we will consider setting up our company’s three strategic-base structure in Thailand, Indonesia and the Philippines. (auto-parts maker)
- We will invest in a new processing plant if the Philippines reaches the one million production mark. (auto-parts maker)

As discussed in Chapter 2.1.2, the domestic vehicle sales will exceed one million units between 2025 and 2028. Given this projection and the import trend of CBUs, the Philippine Government’s Automotive Industry Promotion Policy in the next few years will determine whether the country will become the biggest automotive importer or one of the top three auto makers in the ASEAN regions, alongside Thailand and Indonesia. As shown in succeeding pages, there are several scenarios for the direction of automotive industry development in the Philippines. Among all possible scenarios available for the Philippines, this report explores the one that will bring about most positive outcomes in term of employment generation and trade balance.

Therefore, the development goal of the Industry Promotion Plan should be to “produce one million units per year at the time when domestic demand exceeds one million (=around 2027) (with the assumption 50% will be exported).” The 50 (domestic sales)-50 (exports) ratio is same as the cases of Japan, Mexico, and other auto producing countries. It is assumed that 400,000 units will be exported to the ASEAN region and 100,000 units to other region where there are needs on the similar type of cars⁶³. It should be noted that low cost compact crossover is one possible idea of the models that can be produced in the Philippines. The type of cars to be produced should not be defined by the government, but should be left to industry’s discretion.

⁶³ Based on the market size, breakdown of the market would be: 150,000 to Thailand, 100,000 to Indonesia, 50,000 to Viet Nam and other ASEAN member states 100,000, and 100,000 units to other regions including South Asia.

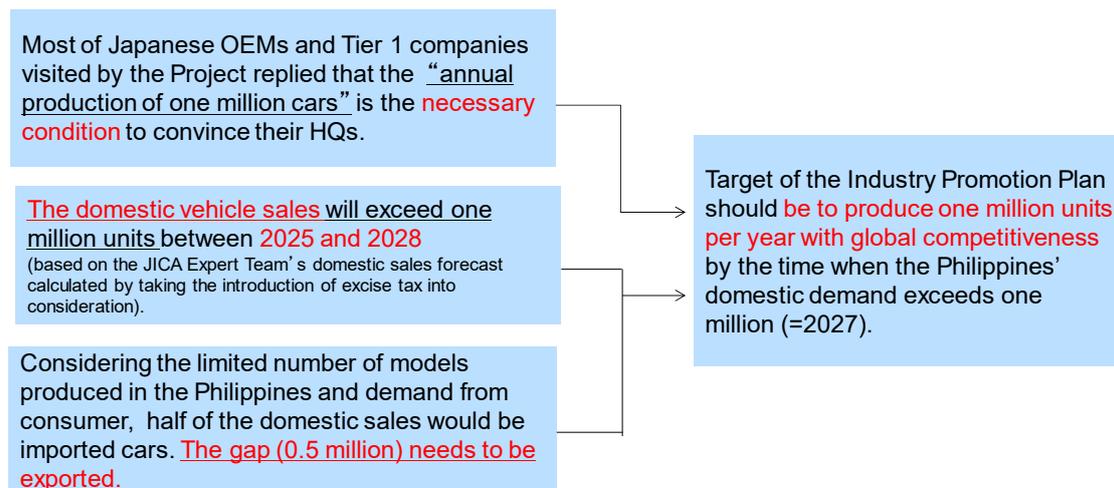


Figure 61 Logical Flow of the Development Concept (Automotive Sector)

According to an OEM, assuming that the company's domestic share in the Philippines continues to remain as it is, seven to eight years in minimum is the timeframe needed before the company can expand its operation facility setup to the point where the production volume is 10 times bigger than the current volume. Given a comment like this, the timeframe of the development goal (one million car production by 2027) is achievable yet ambitious when taking into the time for decision-making by their HQ into account. OEMs interviewed commented, while the target is bold, it is still well within the realm of reasonable.

(2) Development Model of 1 Million Units of Automotive Production

During the period between 2025 and 2028, new car sales will reach one million units in the Philippines. Our target is to achieve production of one million units by that time. Judging from the cases of Japan and Mexico, it is reasonable to imagine that half a million units (50% of total production) will be produced for exports.

The development scenario of automotive manufacturing is conceptualized as shown in Figure 62.

The development model is difficult to actualize without an approval from the Philippine Government. For successful implementation, at least two years should be set aside for the Government to undergo and complete the review and approval process of the industrial promotion plan. This entails BOI to coordinate with other government agencies. BOI also needs to scale up its efforts in attracting investments from the auto parts industry. The more auto parts makers in the Philippines, the lower production costs for OEMs; therefore, the greater investments by parts makers will facilitate more investments by OEMs. For the investment promotion of auto parts suppliers, measures such as the transfer of technical skills to local suppliers and update and improvements of investment tools specifically for the auto industry, should continue to be implemented under a close coordination of BOI, industry associations, and other public and private stakeholders. The incentive program after the CARS Program (CARS II or Post-CARS

Program) should be hopefully set by DTI by 2023⁶⁴.

It should be noted that the model discussed above is an optimistic one without taking account of potential political interventions.

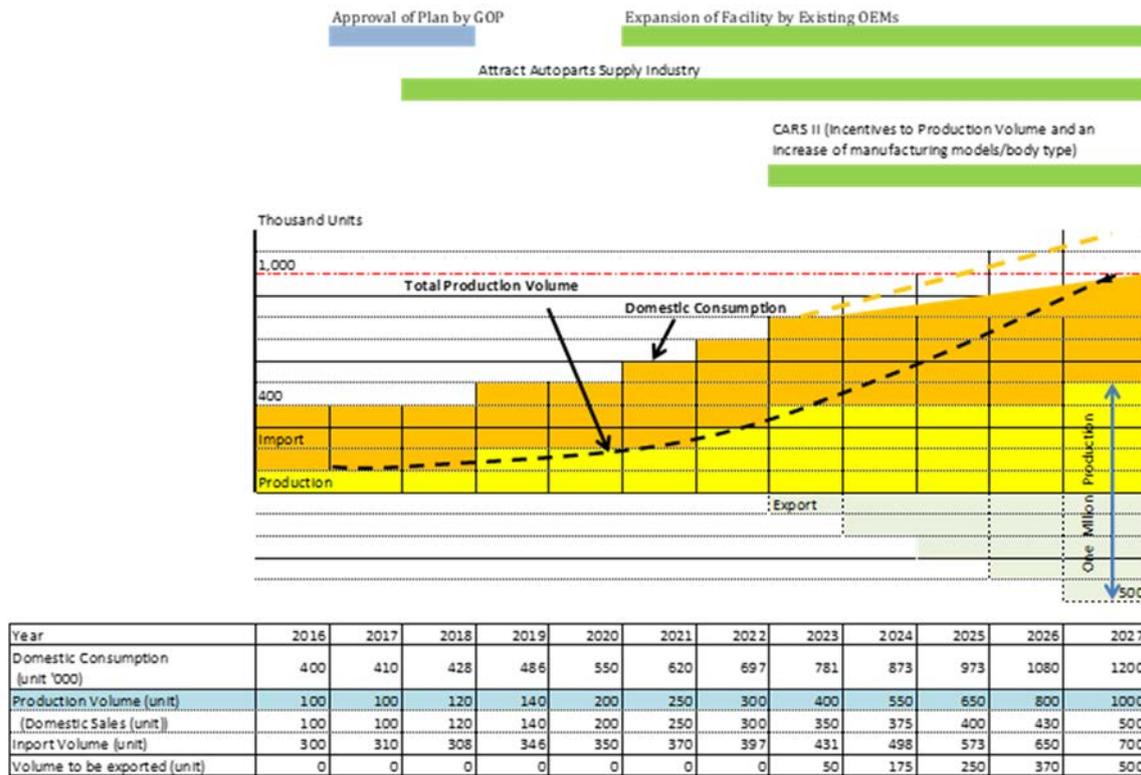


Figure 62 Development Model of “One Million Production” until 2027⁶⁵

(3) One Million Unit Production Strategy

In the CARS program, Toyota started the production of Vios, and Mitsubishi started the production of Mirage and Mirage G4. As with the case of these two companies, compact cars will increasingly be produced in the future as explained in Chapter 2. With the recent growing demand for compact cars in emerging markets, it is expected that compact cars can secure a certain volume of export sales.

⁶⁴ Judging from DOF’s feedback to the project’s findings, setting up a new incentive program before the completion of existing CARS Program poses a high bar. Also DTI needs intensive effort to persuade DOF because it is their idea that the Program (or incentives which need fiscal action) should be delivered fairly and impartially to all manufacturing industries (USEC Chua, June 2017).

⁶⁵ Refer to "Box 1. Car Sale Projection and Effects of Excise Tax in the Philippines: Annual Sales of One Million between 2025 to 2028".

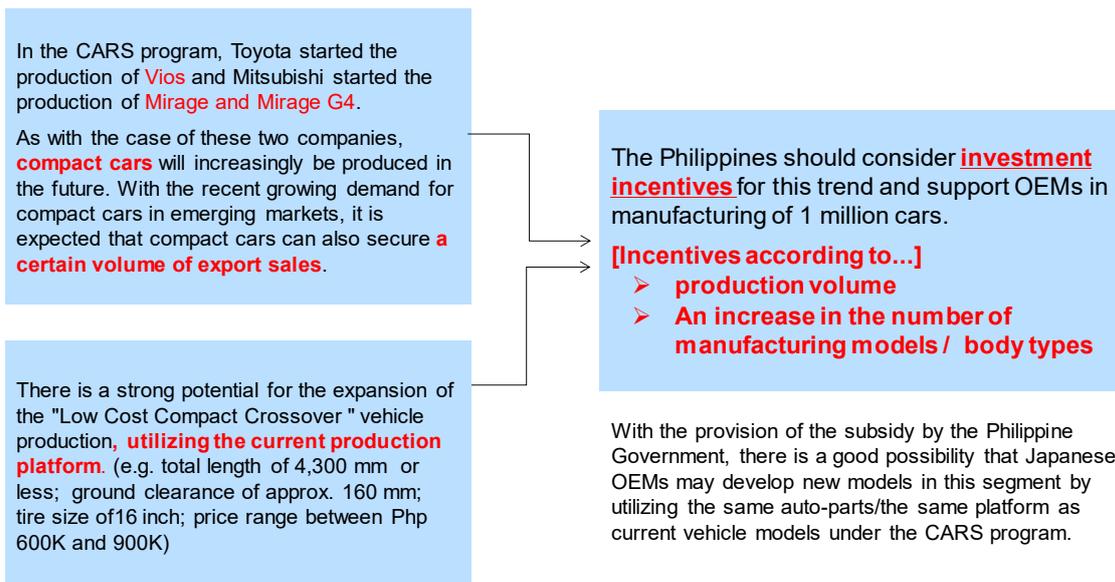


Figure 63 Logical Flow of One Million Unit Production Strategy

Assessing from findings from comparative analysis of the Philippines' ASEAN competitors and needs analysis of auto related manufacturers in the Philippines (see Chapter 3), it is recommended that the Government reorganize investment incentives for this trend and support OEMs in manufacturing of one million vehicles. The following incentives are proposed to prepare as the candidate for post-CARS Program.

- Incentives according to production volume
- Incentives according to an increase in the number of manufacturing models / body types

The expansion of "Low Cost Compact Crossover" vehicle production is a good idea for the Philippines because the country is in the process of establishing the base for compact-crossover production through implementation of the CARS Program. For the post-CARS Program, it is possible to utilize the current production platform to produce various types of compact- crossover vehicles. Ideal car price is lower than Php 1.1 million (or cheaper than the middle price range of excise tax) (e.g. total length of 4,300 mm or less; ground clearance of approx. 160 mm; tire size of 16 inches; price range between Php 600,000 and 900,000)

If the subsidy by the Philippine Government is available, there is a good chance that Japanese OEMs develop new models in this segment by utilizing the same auto parts/ platform as the vehicle models under the CARS program.

(4) Policies to be Strengthened

To realize above, relevant policies need to be strengthened. It is recommended that the policies highlighted in red color below be strengthened.

- Institutional setup
 - ✓ Approval of the Automotive Industry Promotion Plan and **relaxing of the PEZA's 70% rule.**
- Investment Promotion
 - ✓ investment incentives **(1) according to production volume and (2) according to an increase in the number of manufacturing models / body types.**
- Local Supplier Development
 - ✓ **Establishment of dealer network system (attracting more dealers)**
 - ✓ Increasing auto-finance dealers
- Industrial Human Resources Development
 - ✓ **Nurturing experienced engineer-based managers** who have experienced model change
- Infrastructure Development
 - ✓ Development of all kinds of infrastructure (electricity, road/sea/air transportation, telecommunication)

4.2.2 Auto Parts Sector

Promotion of the auto parts industry is not a necessary condition to produce one million production of automotive as exemplified by the case of Indonesia⁶⁶. Nonetheless, it will make it easier for OEMs to achieve the target production volume if more auto parts become locally available by improving the OEMs' QCD (Quality-Cost-Delivery)⁶⁷ and increasing competitiveness of the Philippine automotive industry.

The below-mentioned strategies have been identified as mutually reinforcing paths of auto industry development for the Philippines to support the achievement of the "one-million units a year" goal. These strategies are extracted from the review of findings from GVC analysis of the auto sector and socio-economic environment analysis of the Philippines.

- (1) Complementation strategy of the ASEAN automotive industry
- (2) Attraction strategy of focused car electronics industries
- (3) Accumulation strategy of labor-intensive industries

GVC analysis findings were categorized into two types: 1) strengths of the Philippines or factors that will facilitate further development of the auto industry and 2) challenge or issues to

⁶⁶ Indonesia achieved one million car production in 2012 without a great concentration of auto parts makers in the country.

⁶⁷ The upgrading of QCD standards require actions taken in multiple domains. Especially important measures to be taken are 1) improvements in production management technology and processing technology (Action Plans 3-2, 3-3), 2) research and framework development for strengthening skill areas that are absent or weak in the Philippines (Action Plan 1-2), 3) reduction of transportation /logistic costs for lowering production costs (Action Plans 1-3 and 5-1) See "4.5 Specific Measures and Action Plans by Policy Domain" and Annex B for details of action plans.

be addressed for the development of the Philippine auto industry. Three strategies were generated through the internal discussion among the JICA Expert Team by using a problem-solving methodology called the K-J Method, which is known to be effective for identifying priorities and setting up strategies⁶⁸ (see Figure 64).

For example, “stable operation and accumulation of capital stocks (plants, equipment and other assets), but a relatively low utilization rate of equipment and facility among transmission makers in recent years” is one of results from GVC analysis as discussed in Chapter 3. This result was classified under the “Philippines’ Strengths” because the Philippines has already established the solid production base of manual transmission among ASEAN countries and this shows the possibility of attracting further advanced transmission makers and related parts makers in the next stage (such as AT and CVT). Nevertheless, those advanced transmission types are being produced by forerunners (Japan and partly in Thailand). The possibility remains for the Philippines to complement the production with ASEAN competitors⁶⁹. From this line of process of idea thinking, it was logically aligned that the result strongly correlates the first strategy of “complementation strategy of the ASEAN automotive industry”.

As the promotion of auto parts industry boosts automotive production in terms of procurement of affordable parts domestically, attracting foreign auto parts suppliers to the Philippines is placed as the first step for the enhancement of domestic auto parts industry. The details of these three concepts are elaborated in the next section.

⁶⁸ The K-J Method was developed as the affinity diagram by Jiro Kawakita in the 1960s and has become one of the seven management and planning tools used in Total Quality Control.

⁶⁹ It is thought that once production base of transmission was established, the manufacturers would tend to utilize such facilities for the next advanced transmission, because invested capital and facilities for production are too huge to move to other production site.

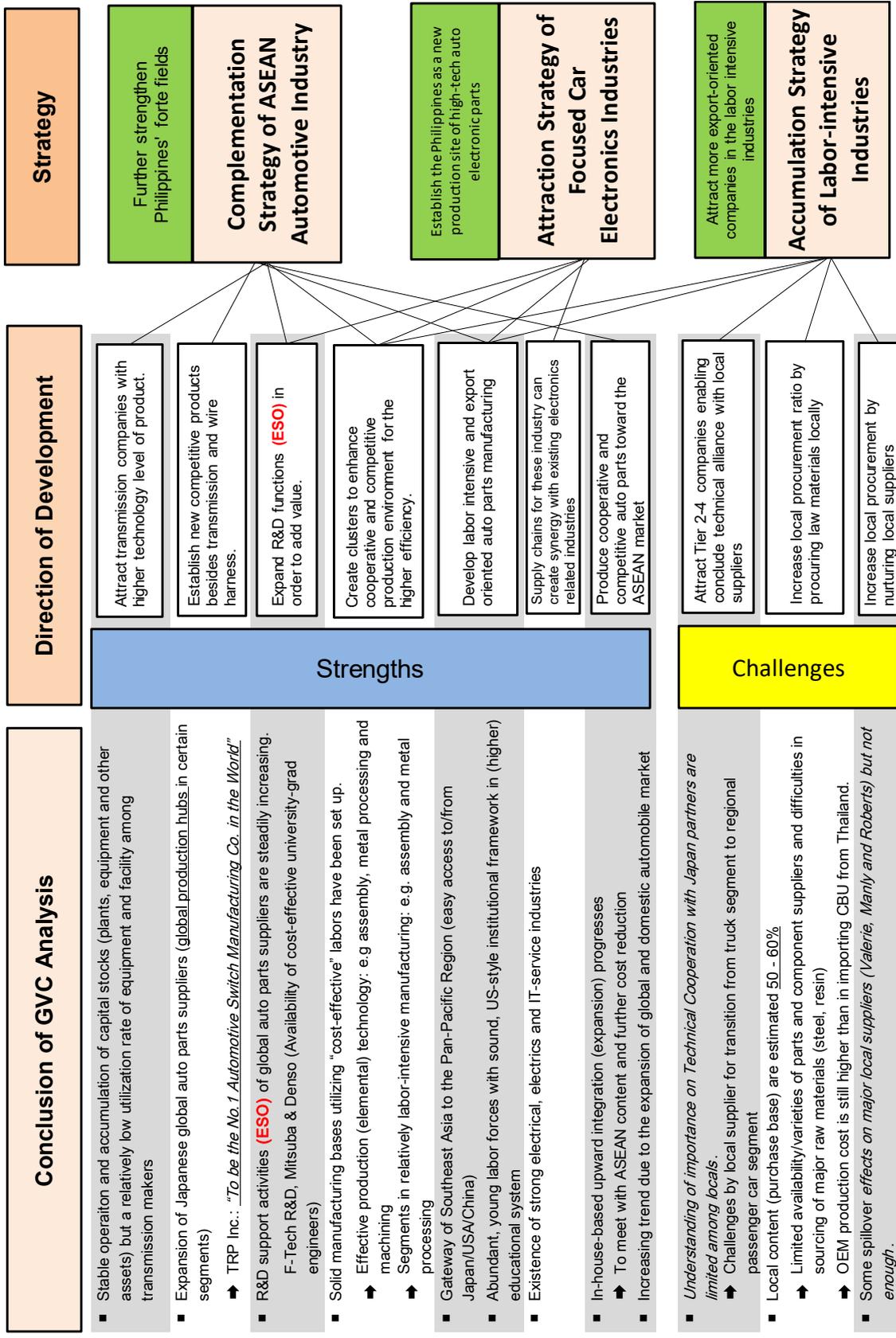
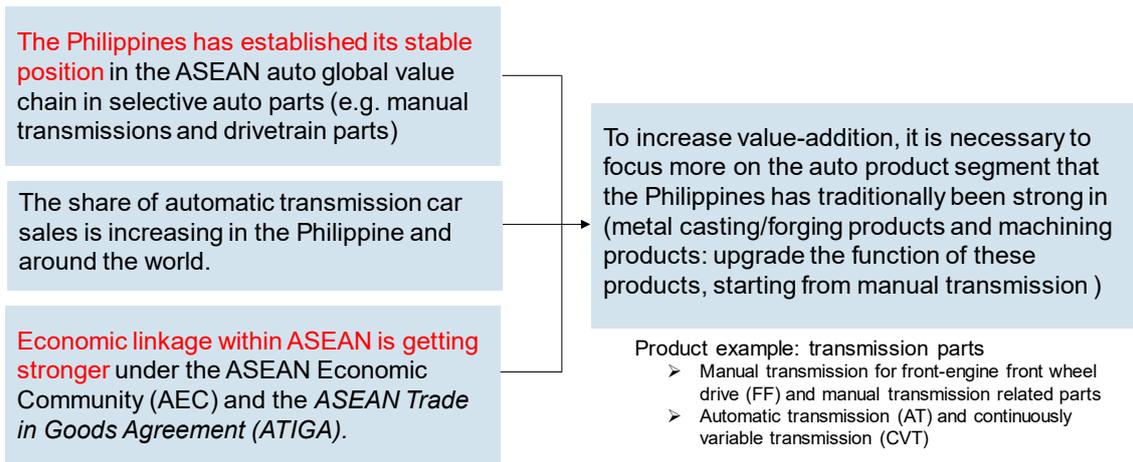


Figure 64 Logic Map of the Auto Parts Industry Promotion Strategy

(1) Complementation Strategy of the ASEAN Automotive Industry

The Philippines has established a stable position with specific auto parts such as manual transmission. Economic ties among ASEAN countries is getting stronger as economic alliances inside the region prevail. On the other hand, along with global market trend, the share of manual transmission is gradually getting smaller compared to automatic transmission or continuously variable transmission in the Philippines.



**Figure 65 Logical Flow of Strategy 2-1
(Complementation Strategy of the ASEAN Automotive Industry)**

The market structure of ASEAN is changing; it is vital for the Philippines to keep catching with the trend of the auto parts market centered in MT and/or their areas of specialty, for example:

- Manual transmission for front-engine, front wheel (FF) drive cars (Aisin Ai Co. Ltd, Aichi Machine Industry Co. etc.) and manual transmission-related parts (helical gear, shaft, differential gear, transmission case etc.)
- Automatic transmission and continuously variable transmission for FF cars (Aisin AW Co. Ltd, JATCO Ltd. etc), automatic transmission/ continuously variable transmission related parts (torque converter, planetary gear, control valve etc.)
- Other casting and forging products (brake caliper, hub bearing, constant velocity joint, transaxle for hybrid cars, power transfer unit for FF-4WD, hypoid gear etc)

The strategy focuses on the Philippines' traditionally strong products such as, metal casting/forging products and machining products. To upgrade the process, product and function of these products, it is proposed to start from manual transmission and enhance investment promotion by focusing the parts of similar or related functions. In addition to the expansion of products produced in the Philippines, there is also a need to focus on the other segments of the value chain (i.e. R&D, sales and service) as these may have potential for higher value addition.

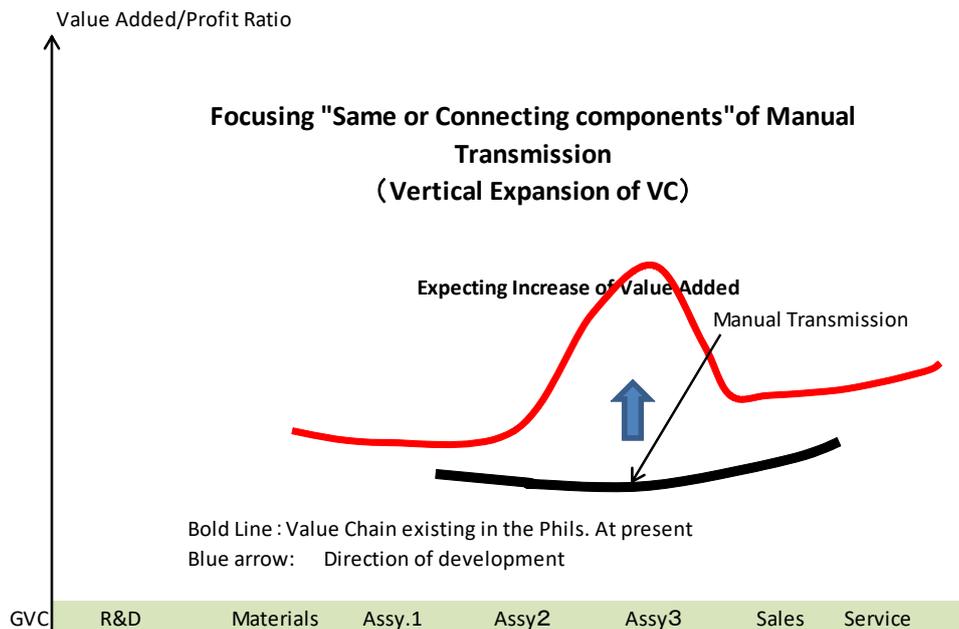


Figure 66 Image of the Complementation Strategy

(2) Attraction Strategy of Focused Car Electronics Industries

A small portion of value-added electronic parts produced by PEZA companies in the Philippines are consumed domestically; the majority of them are produced for exports. As recent models require more car electronics parts and the trend of auto industry is moving towards improving C.A.S.E. (car connectivity, autonomous or assisted driving, new mobility or car sharing, electrified powertrains and components) capabilities, additional global strategic production sites for auto electronics are needed. Corresponding to such trend, some companies are starting to move R&D functions to the Philippines. The characteristics of high-value added parts recently are small and light and those are used considerable numbers (>20) in one car as seen in sensors and actuators. The Philippines is a good production site for such products because those parts are exported in bulk and the exports of these products are not affected by the condition of transportation infrastructure, which is regarded as one of key weak points of the Philippines. Attracting R&D functions of manufacturing companies offers a possibility to establish a new set of local value-chain. Several Japanese Tier 1 companies have newly set R&D functions for last three years. Although these R&D functions are under the control of Japan HQ, they are trying to establish the linkage with existing local factory of the same company. Accordingly, the production of high-value added electronics (incl. R&D) should be attracted more to the Philippines. An example of such a possibility would be motors and sensors.

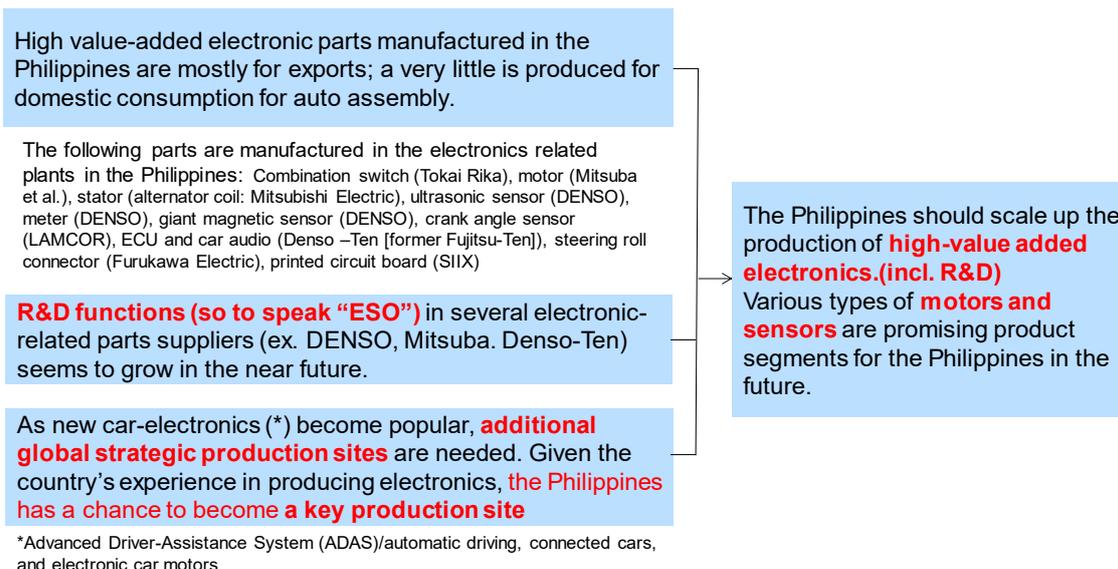


Figure 67 Logical Flow of Strategy 2-2
(Attraction Strategy of Focused Car Electronics Industries)

This strategy aims to attract auto parts suppliers who manufacture high-value added electronics (e.g. motors, actuators, sensors, ECUs etc). Such ‘high-value added electronics’ have the following characteristics: 1) products are light and small, 2) they are electronics-based but produced in the labor-intensive operation; 3) more than several million products are produced in one factory (it is said that the minimum production lot for electronic products are one million), and 4) strategic production sites have yet been fragmented in the ASEAN region (they are still mainly produced in Japan). Only a few high value-added electronic parts that are manufactured in the Philippines are used for the domestic production of vehicles, and, at the same time, most of them are exported overseas.

As the demand for car electronics (e.g. advanced driver-assistance system (ADAS)/automatic driving, connected cars, and electronic car motors) increases, companies will consider setting up the second and third global strategic production sites. Given the country’s experience in producing electronics, the Philippines has a good chance to become a key global production hub for car electronics, especially for sub-segments such as motors, sensors and actuators given the current operation of electronics companies in the Philippines⁷⁰.

The following parts are already been manufactured domestically by companies such as DENSO, Denso Ten (former Fujitsu-Ten), Rohm, SIIX, Mitsubishi Electric, Furukawa Electric, and Mitsuba : Combination switch (Tokai Rika), motor (Mitsuba et al.), stator (alternator coil: Mitsubishi Electric), ultrasonic sensor (DENSO), meter (DENSO), giant magnetic sensor (DENSO), crank angle sensor (LAMCOR), ECU and car audio (Denso Ten), steering roll

⁷⁰ For example, Integrated Micro-Electronics, Inc., (IMI), an electronics manufacturing service provider in the Philippines, produces camera sensors used in ADAS for BOSCH and DENSO has positioned the Philippines as its export base for ultrasonic sensors. In addition to these parts, the Project recommends the investment promotion of electronics parts whose markets are likely to expand in the future (e.g. ADAS - ECUs, millimeter wave sensors, lidars, electronic speed control [ESC], hybrid motor etc.).

connector (Furukawa Electric), printed circuit board (SIIX)

As for the development policy for this strategy, it will be effective to focus on promoting engineering service outsourcing (ESO) while attracting electronic related manufacturers with high value-added products.

(3) Accumulation Strategy of the Labor-intensive Industry

The availability of cost-effective and skilled labor force is a strength of the Philippines. The Philippines can develop a competitive export-oriented industry using its human resources. It needs to continue attracting more companies which fall under the “labor-intensive industry” category and establish a cluster. The cluster should realize upgrading of QCD through process improvement, cost reduction and timely delivery made possible by sharing technical information and competitive rivalry.



**Figure 68 Logical Flow of Strategy 2-3
(Accumulation Strategy of the Labor-intensive Industry)**

The following summarizes examples of products that are produced in labor intensive operations.

- Products that are manufactured with a good balance between semi-automation and labor-intensive works: e.g. steering roll connector (SRC) for airbag by FEAP and meters by DENSO
- Products that require labor-intensive work in the assembly and mid-inspection stages: e.g. ultrasonic sensor by DENSO and giant magnet resistance (GMR) sensor products by LAMCOR
- Products with labor-intensive manufacturing processes that have a competitive edge to

similar operations in Japan: e.g. the final external inspection (100% coverage) by human workers such as in the case of surface mount technology (SMT) line work for PCB (SIIX)

- There are several auto parts manufacturers which formed a kind of accumulation (cluster) in the Philippines, for example;
- Wire harness is manufactured mainly by the Yazaki Torres Group, the Sumitomo Electric Group and the Furukawa Electric Group, amounting to 49% (2015) of auto-parts exports.
- LAMCOR's stator, Mitsuba's motor, etc. are also positioned as a labor-intensive industrial cluster centering on assembly work.

The investment promotion for this strategy should continuously be implemented as it has the most impact in terms of employment generation.

4.3 Alternative Development Concept

There are several alternative options for the Automotive Industry Promotion Plan. The JICA Expert Team has come up with three alternative plans as shown in the figure below. It is vital that the Philippine government discuss the alternative options and determine which direction that the country should proceed.

Alternative	Socio-Economic Indicator				Decisive Factor
	Employment Generation	Trade Balance	Cost Estimate (Base Cost of CARS (Php27 billion=1))	Tax revenue	
OPTION 1 Full Set Development (Automotive + Auto parts)			>1	(+++) Excise Tax (+++) Income Tax (+++) VAT (+++) Corporate Tax (-) Incentives	<ul style="list-style-type: none"> • Big initial expense by the Government • Big potential pushed by socio-economic growth
OPTION 2 Automotive only			≤ 1	(+++) Excise Tax (±) Income Tax (+) VAT (+) Corporate Tax (-) Incentives	<ul style="list-style-type: none"> • Lesser Tax revenue • Lesser contribution to job creation₁
OPTION 3 Auto parts only			<1	(+++) Excise Tax (++) Income Tax (++) VAT (++) Corporate Tax (-) Incentives	<ul style="list-style-type: none"> • No countries have this experience₁ • Big trade deficit in the future₁

Figure 69 Three Policy Options to be Discussed⁷¹

(1) Full Set Development Plan (Option 1)

The first option is a full set development plan wherein both automotive and auto parts are included. The JICA Expert Team recommends this option because of the biggest economic impacts in terms of employment generation, trade balance, and investment, among the three options. Option 1 will generate more employments than the status quo and reduce the ratio of CBU imports in the domestic sales. Tax revenue will be the biggest with a greater number of

⁷¹ Part of Presentation Materials used in the 3rd JCC in October 2017

investors. The biggest challenge will be the finance by the Philippine Government since the expected initial cost will be higher than the current CARS program.

(2) Main Focus on Automotive Assembly (Option 2)

The second option is to focus on automotive assembly only, not including auto parts. This option gives lesser impact on employment generation and tax revenue compared to Option 1 due to fewer number of OEM companies compared with that of auto parts suppliers. Further, trade balance will not improve dramatically with this option till export of cars happened and increase. Local supplier linkage will not improve neither with this option, thus cost of production remains high and competitiveness relies on how much incentive the government can provide to attract OEMs to produce domestically.

(3) Main Focus on Auto-parts Production (Option 3)

The third option is to focus on auto-parts production only. Employment generation may be the largest among the three options due to expected increase in the number of suppliers. Trade balance will be worsened if the country keeps importing CBU. Government cost of incentives may be the least. Option 3 is a situation before the CARS Program was implemented wherein auto parts export companies benefit incentives from PEZA. Recent negative trade balance proves that this option is not recommended. Moreover, no countries have experienced of growing auto industry just focusing on auto parts.

(4) Summary

The key aspects of three options are summarized in the table below. The JICA Expert Team recommends Option 1 because of the largest impact in employment generation, trade balance and tax revenue.

Option 1: Full Set Development (Automotive and Auto parts)
<ul style="list-style-type: none"> • Employment generation (large with synergetic effect) • Trade balance (Need to import car and car parts in the beginning but exporting car and car parts gradually begin) • Cost estimates (Base cost of CARS Program=1, it is more than one because the Government need to establish CARS II and other incentives) • Tax revenues (Government needs to subsidize incentives but expect a lot from Income tax, VAT and Corporate Tax increase)
[Decisive factor] Large initial expenses vs. large potential driven by socio-economic growth
Option 2: Automotive only
<ul style="list-style-type: none"> • Employment generation (Only few) • Trade balance (Needs to import car and car parts until the end but exports of cars gradually increase. The pace of export will be slow.) • Cost estimates (Need to establish CARS II and other incentives) • Tax revenues (Government needs to subsidize incentives but expect a little from Income

tax, VAT and Corporate Tax)
[Decisive factor] Lesser employment generation vs. low value-added earnings caused by auto parts importation
Option 3: Auto Parts only
<ul style="list-style-type: none"> • Employment generation (Increased by investment) • Trade balance (Need to import car and car parts continuously until the end. The pace of import will mushroom) • Cost estimates (Lesser amount shouldered by the Government) • Tax revenues (Government needs to subsidize Incentives (small) but expect Income tax, VAT and Corporate Tax increases (medium))
[Decisive factor] No experience by other country and big trade deficits vs little incentive expenses

(5) Development Scenario of the Philippine Automotive Industry under Option 1

Kick-starting a project is always challenging. As recommended by a Japanese OEM interviewed by the Project, the Philippines (BOI) should start by attracting well-known auto parts manufacturers (more than one). Then, it should work to increase the auto parts production through providing government subsidies to raw material importers. In doing so, local procurement of bulky body parts will increase, and procurement costs will go down. Some OEMs said that a production factory with 200,000 to 300,000 units of cars can realistically be established if the costs of production in the Philippines are reduced and at the same time the production capacity of other countries achieves their peak.

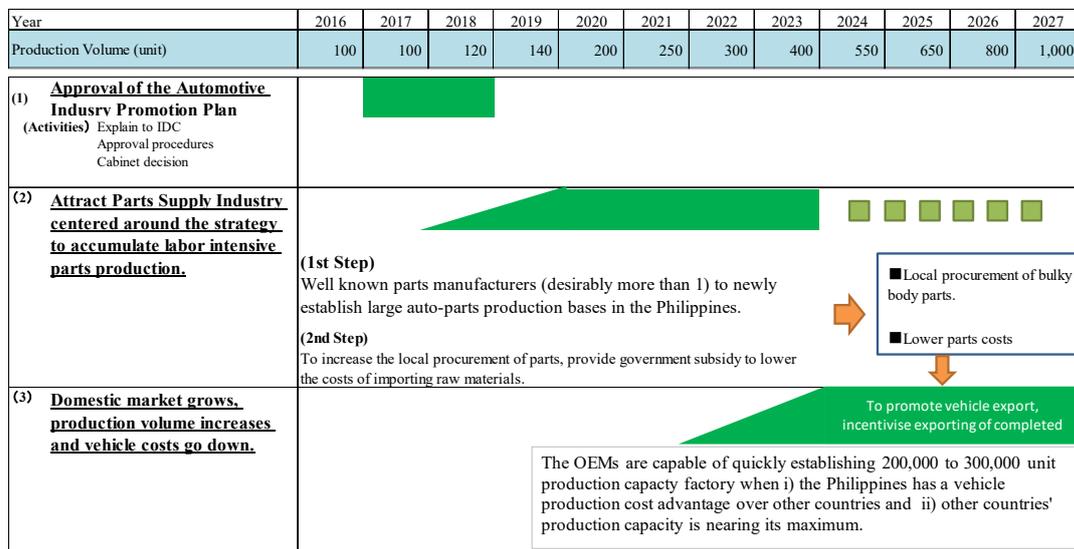


Figure 70 Development Scenario under Option 1

4.4 Automotive Industry Promotion Plan (AIPP)

(1) Five Policy Domains which compose Automotive Industry Promotion Plan

For the automotive industry promotion plan, the following five policy domains are set based on prevailing macroeconomics theories (such as “growth accounting”): 1) Policy/System and Major Program Development, 2) Investment Promotion, 3) Local Supplier Development, 4) Industrial Human Resources Development, and 5) Infrastructure Development.

The figure below depicts that “infrastructure development” and “industrial human resources development” are the base of the economy and “investment promotion” and “local supplier development” are the pillar of the plan which are set on the base. “Policy/system development” is placed as the roof of the plan and the entire housing structure functions form the automotive promotion plan.

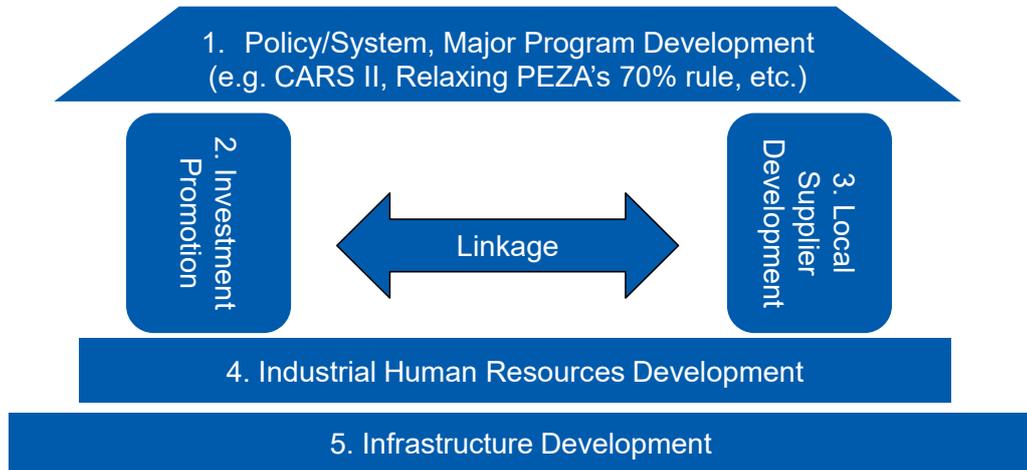


Figure 71 Five Policy Domains that Compose the Automotive Industry Promotion Plan

(1) Key Performance Indicators for Auto and Auto Parts Strategies

As for the implementation of the full-set plan (the promotion of both automotive and auto parts industries, as stated 4.3 above), the following key performance indicators (KPIs) were set by sector⁷².

<p>Automotive Industry Promotion Strategy</p> <ul style="list-style-type: none"> ■ Strategy for Automotive Sector (Strategy 1) <u>Production of one million units in 2027</u> ■ Strategy for Auto-parts Sector (Strategy 2) 2-1. Complementation Strategy of the ASEAN Automotive Industry
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⁷² Although the JICA Expert Team sets the KPI on local procurement ratio at 70% in 2027, it is necessary to re-examine this figure in future. The figures are based on the company visit conducted under GVC Analysis; however, there is a speculation that the current figure of 50% seems too high.

- 2-2. Attraction Strategy of Focused Car Electronics Industries
- 2-3. Accumulation Strategy of Labor-Intensive Industries

Overall KPIs:

- 1) Approve of the Automotive Industry Promotion Plan (Policy/System)
- 2) Relaxing of PEZA's 70% rule (Policy/System)
- 3) Attracting 15 target companies per year (Investment Promotion)
- 4) Five technical advisory contracts are signed between local suppliers and Tier 1-2 companies by 2025 (Local Supplier Development)
- 5) Six Policies, Standards, and Guidelines (PSG) and 15 Training Regulations (TR) on auto-related courses are reviewed/revise with the support of the auto industry. (Industrial Human Resources Development)
- 6) The Philippines' ranking for the infrastructure development indicator in the Global Competitiveness Index increases from Top 60 in 2017 to Top 40 by 2027.

Five development domains are set and approved in the 3rd JCC in October 2017. KPIs by each domain for three strategies for the auto-parts sector are summarized below. It is recommended that all five policy domains be strengthened to fully execute the strategy. The breakdown of each domain depicts the direction of performance indicator to be elaborated in the succeeding section. It is recommended to stress the policies with red color below.

1) KPI for Strategy 2-1 (Complementation Strategy for the ASEAN Auto Industry)

Strategy 2-1 focuses on products that the Philippines is traditionally strong in such as manual transmission. The below are KPIs by each domain for this strategy; it is recommended that the Philippines will especially focus addressing the policies in red font below.

- Policy/System, Major Program Development
 - ✓ Sophistication of processing technology.
- Investment Promotion
 - ✓ Improve the way that investment promotion is conducted and successfully attract **five companies per year on average**
 - ✓ **Strengthen the incentive system** that manufactures and exports products related to **drive-train components** of compact cars (e.g. AT and CVT)
- Local Supplier Development
 - ✓ Encourage technical alliance with overseas companies
- Industrial Human Resources Development
 - ✓ **To Review and revise (or develop) the PSG on mechanical and manufacturing engineering and TR under the automotive and transportation and metal and engineering segments with the support of the auto industry**
 - ✓ Supply 2,000 quality engineering graduates (manufacturing, production, mechanical, and industrial engineering fields) and quality technicians per year to the auto industry
- Infrastructure Development
 - ✓ Batangas port development for cohesive networking with ASEAN countries

The key focus in this strategy should be advancing the level of quality, costs, and delivery (QCD) for such products. In order to achieve this, the sophistication of processing technology should be stressed at the institutional setup field. On the related note, in the Global Competitiveness Index 2017/18, the Philippines was ranked at 91st for the indicator of “government procurement of advanced technology products,” which is the lowest among ASEAN competitors (e.g. Thailand 56th, Malaysia 4th, Indonesia 12th, and Viet Nam 40th). The Philippines Government need to review, for example, the quality of testing equipment available at MIRDC and its procurement procedures.

The overall KPI for investment promotion is set at attracting 15 auto-related investments annually, out of which this strategy should contribute attracting five companies (drive train components manufacturers) per year on average for five consecutive years. The government needs to look into the best way to incentivize this sub-sector.

The KPI on local supplier development also aims to conclude five technical alliances with Tier 1-2 companies by 2025 and this KPI is applicable for three strategies as a whole. For this, there is a need to make local suppliers more visible towards foreign companies located in and out of the Philippines, through continuous expansion and updating of the local supplier database.

The KPI on industrial human resources development is six policies, standards, and guidelines and 15 Training Regulations on auto-related courses are reviewed/ revised with the support of the auto industry. Under this strategy, Policies, Standards, and Guidelines on mechanical engineering and manufacturing engineering and Training Regulations under the automotive and transportation and metal and engineering segments should be reviewed/ revised with the support of the auto industry. In order to do so, there needs to be functioning forums for relevant government agencies to reflect the industry’s needs in these documents. For the employment generation, 2,000 college graduates and vocational students a year is targeted⁷³.

Infrastructure development is out of scope from this Project; however, Batangas Port development is set to strengthen the Philippines’ complementary function with ASEAN countries although it is not tangible KPI.

2) KPI for Strategy 2-2 (Attraction Strategy of Focused Car Electronics Industries)

Strategy 2-2 focuses on high value electronic products, such as motors, sensors and actuators, that are small, light, exported in bulk, and not as affected by transportation infrastructure issues when exporting. Since this segment is a highly sought-after segment by many competitors around the world, it is expected that the competition in attracting companies that belong to this segment will be severe. It is recommended that the Philippines will especially focus addressing the policies

⁷³ See 4.7.4 for employment generation projection. For the increase in the number and quality of college and vocational training graduates seeking employment in the auto industry, measures that need to be taken are 1) strengthening of industry-academia linkage and spread of the Monozukuri culture (Action 4-1) and 2) curriculum revision, capacity development of faculty members and training, and strengthening of teach work and project management (e.g. PDCA) skills through project based learning (Action 4-3) See Annex B for more details on action plans.

in red font below.

- Policy/System, Major Program Development
 - ✓ Development strategy of **Engineering Service Outsourcing (ESO)**
- Investment Promotion
 - ✓ Improve the way that investment promotion is conducted and successfully **attract two companies** per year on average (e.g. Denso and Mitsubishi Electric for specific sensors)
 - ✓ **Develop incentives to E-vehicle related parts manufacturing** (motor, battery, etc.).
- Local Supplier Development
 - ✓ **Encouraging the establishment of technical alliance** between Tier1-2 investor and local supplier through Government support.
- Industrial Human Resources Development
 - ✓ **To Review and revise (or develop) the PSG on electronics and IT engineering and TR under the electrical and electronics segment with the support of the auto industry**
 - ✓ Supply 2,000 quality engineering graduates (electronics, industrial, manufacturing/production, IT engineers etc) and quality technicians to the auto industry
- Infrastructure Development
 - ✓ Reducing electricity cost by 10% for industry promotion.

Grasping the global ESO trend, the Philippines needs to prepare a development strategy to accelerate this movement. Car electronics sector will be the key segment in establishing ESO industry in the Philippines and it will newly form higher level of value chain centered on attracted R&D function.

Since the global competition for attracting this segment is quite severe, OEMs interviewed by the Project consider that successfully attracting two auto electronic companies a year is a very good scenario for the Philippines. Accordingly, KPI on investment promotion under this strategy is set two companies out of 15. In addition, the discussion on incentive to xEV related parts will be necessary as a part of incentive review. On the related issue to investment promotion, technical alliance with local suppliers should be promoted through highlighting the electronic cluster that has been expanding in the Philippines.

KPIs for industrial human resources development is to review and revise (or develop) the Policies, Standards, and Guidelines on electronic engineering and IT engineering and Training Regulations under the electrical and electronics segment with the support of the auto industry. Since technologies concerning this strategy are especially fast-evolving, there is a strong need to set up a fast-track mechanism for revising standards or regulations for related courses. For the employment generation, 2,000 college and vocational students a year is targeted.

Infrastructure development ideally should realize reducing electricity cost by 10%.

3) KPI for Strategy 2-3 (Accumulation Strategy of Labor-Intensive Industries)

Strategy 2-3 targets labor-intensive, auto-parts industries. The following KPIs for the strategy will continue to be applied until the target year of 2027.

- Policy/System, Major Program Development
 - ✓ Review hiring requirements of contract workers
- Investment Promotion
 - ✓ Attract eight companies/year
 - ✓ Strengthen the existing incentive system
- Local Supplier Development
 - ✓ Encourage the establishment of technical alliance between Tier1-2 investor and local supplier through Government support. (boosting the alliance between invested company and local suppliers)
- Industrial Human Resources Development
 - ✓ Review and revise curriculums for production management techniques
 - ✓ Supply 2,500 quality engineering graduates (manufacturing/production, industrial engineers, etc) and technicians to the auto industry.
- Infrastructure Development
 - ✓ Improvement of infrastructure (Each industrial park in Region 4A should be more easily accessible)

For the Philippines, the labor-intensive industry brings about significant impacts in terms of employment generation, increase in capital stocks, and alleviation in the trade deficit. Especially for labor-intensive operations, flexibilities in hiring contractual workers determine business outcomes. Considering economic impacts that labor-intensive segment bring to the Philippines, it is vital that hiring requirements are reviewed.

Since an abundance of affordable young labor force is one of the strongest appeals for the Philippines, in comparison to other ASEAN countries, the KPI on investment promotion for this strategy is set at eight. The KPI on local supplier development is set in the same manner with prior two strategies. For industrial human resources development, the importance of reviewing curriculums for production management technologies is especially stressed in this strategy. As for the KPI on infrastructure development, the direction of forming a cluster is important and from this view interregional network formulation was emphasized.

(2) KPIs by Policy Domain

The development concept for the automotive industry and affiliated strategies for auto parts industries are broken down into five essential domains as explained above. To achieve one-million units of automotive production with global competitiveness, KPIs are set through three strategies of auto parts sector and automotive sector. Having said that, the enhancement of the auto parts industry will contribute to the improvement of QCD in the automotive industry. Accordingly, KPIs of auto parts sector are designed to achieve this.

Table 54 Matrix Table of KPIs by Concept/Strategy and by Policy Domain

Strategies			
	Auto Parts Sectors	Accumulation Strategy of Labor-Intensive Industries	Automotive Sector
	Complementation Strategy of the ASEAN Automotive Industry	Attraction Strategy of Focused Car Electronics Industries	
	<ul style="list-style-type: none"> Sophistication of processing technology 	<ul style="list-style-type: none"> Develop a strategy to attract ESO industries (more than 20 ESO companies are operating in the Philippines by 2025) 	<ul style="list-style-type: none"> Approval of the automotive industry promotion plan
<p>1. Policy/System and Major Program Development</p> <ul style="list-style-type: none"> Approve of the Automotive Industry Promotion Plan Relaxing PEZA's 70% rule 	<ul style="list-style-type: none"> Attract five companies /yr [Incentives] For drive-train manufacturing companies 	<ul style="list-style-type: none"> Review hiring requirements of contract workers 	<ul style="list-style-type: none"> Investment incentives Production volume Number of manufacturing models/body time
<p>2. Investment Promotion :</p> <ul style="list-style-type: none"> Attract 15 target companies per year 	<ul style="list-style-type: none"> Attract two companies /yr [Incentives] For electronic motor and parts of E-vehicles 	<ul style="list-style-type: none"> Attract eight companies/yr [Incentive] Strengthen the existing incentive system 	<ul style="list-style-type: none"> Establishment of the dealer network system (attracting more dealers) Increase in auto-finance dealers
<p>3. Local Supplier Development</p> <ul style="list-style-type: none"> Five technical advisory contracts are signed between local suppliers and Tier 1-2 companies by 2025 	<ul style="list-style-type: none"> One local supplier concludes technical alliance with Tier 1 -2 company 	<ul style="list-style-type: none"> Two local suppliers conclude technical alliance with Tier 1 -2 companies 	<ul style="list-style-type: none"> Nurturing experienced engineer-based managers who have experienced model change 2,000 quality engineering graduates and technicians
<p>4. Industrial Human Resources Development</p> <ul style="list-style-type: none"> Six Policies, Standards, and Guidelines (PSG) and 15 Training Regulations (TR) on auto-related courses are reviewed/ revised with the support of the auto industry. 	<ul style="list-style-type: none"> Curriculum review/revision in the fields of mechanical and manufacturing engineering 2,000 quality engineering graduates and technicians 	<ul style="list-style-type: none"> Curriculum review/revision in the fields of industrial engineering (production management technology) 2,500 quality engineering graduates and technicians 	<ul style="list-style-type: none"> Development of all types of infrastructure (electricity, road, sea, air transportation, telecommunication)
<p>5. Infrastructure Development :</p> <ul style="list-style-type: none"> The Philippines' ranking for the infrastructure development indicator in the Global Competitiveness Index increases from Top 60 in 2017 to Top 40 by 2027. 	<ul style="list-style-type: none"> Electricity cost per kwh is reduced by 10% in 2025 compared to that of 2016 	<ul style="list-style-type: none"> Industrial parks in Region 4A becomes accessible within one hour at the maximum by road development 	

Source: JICA Expert Team

4.5 Specific Measures and Action Plans by Policy Domain

Based on KPIs set forth, special measures and corresponding action plans are generated by each policy domain. It means that specific measures are set for each domain; toward such measure, the incidental action plans are planned. The domains are aligned horizontally by 1) Policy/System Development, 2) Investment Promotion, 3) Local Supplier Development, 4) Industrial Human Resources Development, and 5) Infrastructure Development, in this order (see Annex B for more details on specific measures and action plans).

(1) Policy Domain 1: Policy/System and Major Program Development

As shown in Figure 71, “Policy/System and Major Program Development” is the umbrella of the entire promotion plan which includes action plans on 1) policy formulation and 2) research and framework development.

This policy domain starts with the approval of the automotive industry promotion plan. Then for the automotive sector, preparation and approval of CARS II program for achieving one million vehicle production is the next step. As for the auto parts sector, relaxing of PEZA’s 70% rule is also necessary in conjunction with the approval of several incentive programs. In addition, research and framework development for QCD improvement is conducted.

Table 55 Specific Measures on Policy Domain 1

	Specific Measures (Policy/System and Major Program Development)
Overall	<ul style="list-style-type: none"> Approval of the Automotive Industry Promotion Plan
Automotive Sector	<ul style="list-style-type: none"> Preparation and approval of the CARS II Program for achieving one million production (*)
Auto Parts Sector	<ul style="list-style-type: none"> Relaxation of the PEZA’s 70% export rule for enhancing the domestic supply chain Approval of the incentive program for strategic auto parts (*)

* See action plans for investment promotion

Policy formulation aims to establish the base condition of one million units of production toward the rest of the globe as shown in Action 1-1. To smoothly push forward the three strategies of auto parts development, research and framework development is necessary to enhance technical aspects in the field of processing techniques (forging and casting) and QCD.

Table 56 Action Plans for Policy Domain 1

Action Plans	Reference
<Policy Formulation> Approval of the Automotive Industry Promotion Plan: release of the one million car production plan and relaxing of PEZA’s 70% rule	Action 1-1
<Research and Framework Development> 1 Technology sophistication	Action 1-2
2 Reduction of transportation / logistic costs for lowering production costs	Action 1-3

(*) Action 1-2 is the framework development for improvement of QCD. Action 1-3 concerns infrastructure development related issues (Policy Domain 5); necessary initiatives of DTI/BOI were listed.

(2) Policy Domain 2: Investment Promotion

Investment promotion is critical for achieving the overall target (i.e. KPI: attracting 15 strategic parts companies per year over a five- year average⁷⁴.) The pillar of “Investment Promotion” will be carried out through overall improvement efficiency with enhancing tools for promotion.

Proposed several incentive systems should be further discussed in this domain.

Table 57 Specific Measures on Policy Domain 2

	Specific Measures (Investment Promotion)
Overall	<ul style="list-style-type: none"> • Improvements of efficiency in investment promotion activities
Investment Promotion Tools	<ul style="list-style-type: none"> • Preparation of attractive incentive packages • Strengthening of intelligence activities • Information provision of supporting industries

* Activities will be carried out in collaboratin with actions for local industries development

Action plans for Policy Domain 2 (Investment Promotion) are composed of “Increased Efficiency” and “Implementation.” Increased Efficiency proposes improving ways that investment promotion activities are conducted. Implementation includes discussion/application of improved incentive system, strengthening of intelligence activities, and nurturing and accumulating supporting industries through investment promotion.

Table 58 Action Plans for Policy Domain 2

Action Plans	Reference
<p><Increased Efficiency></p> <p>1 Carry out investment promotion activities with improved efficiency to attract business</p> <ul style="list-style-type: none"> • Select target companies • Conduct investment promotion activities in Japan, South Korea, etc 	Action 2-1
<p><Implementation></p> <p>2 Discussion/ application on the improved incentive system</p> <ul style="list-style-type: none"> • Incentives on drive-train related parts manufacturing • Incentives on export promotion • Incentive on electric motor and parts used for E-vehicles • Incentives on production volume and the number of manufacturing models / body types (CARS II) <p>3 Strengthening intelligence activities</p> <p>4 Nurture and accumulate supporting industries for companies that are targeted for investment promotion</p>	Action 2-2 Action 2-3 Action 2-4

⁷⁴ Five companies for the complementation strategy, 2 companies for the car electronics attraction strategy and 8 companies for the labor intensive strategy.

(3) Policy Domain 3: Local Supplier Development

For enhancing local supplier development, it is critical to identify the needs of buyers (OEMs and Tier 1 & 2 companies) and prepare strategies based on understanding of their needs. The first measure to be taken for local supplier development is the profiling of local suppliers and their respective technology levels. Through several actions like 2 and 3 shown in the table below, Capacity Development of Local Suppliers will be realized.

With an understanding of their needs, it will be effective to bring buyers on board for capacity development of local suppliers with clear individual targets (i.e. KPI: 5 local suppliers conclude technical alliance with a Tier 1-2 company). Technology/business upgrading services aim to raise technical standards of local companies and perform better support for them through increasing motivation to participate in GVC.

Table 59 Specific Measures on Policy Domain 3

	Specific Measures (Local Supplier Development)
Overall	<ul style="list-style-type: none"> Research for identifying needs by Tier 1 & 2 and preparation of strategies for local supplier development
Technology and business upgrading services	1. Profiling of local suppliers and their technology level ↓
	2. Technical support from Tier 1 and 2 companies to local suppliers
	3. Promotion of business matching ↓
	4. Capacity development of local suppliers (Kaizen, production planning, safety, business management, etc)

The action plan for Policy Domain 3 (Local Supplier Development) is categorized in two folds, Institutional Setup and Technology/ Business Upgrading Services. Most of the actions regarding this policy domain should be carried out by private sector so that the Government should just support entire domain.

Table 60 Action Plans for Policy Domain 3

Action Plans	Reference
<Institutional Setup> 1 Carry out investment promotion activities with improved efficiency to attract business <ul style="list-style-type: none"> Establish a collaborative working group Support the collaborative working group's activities 	Action 3-1
<Technology and Business Upgrading Services> 1 Support upgrading processing technologies among local suppliers (technology, equipment, and facility upgrading)	Action 3-2
2 Support upgrading production management technologies among local suppliers (Kaizen, leadership and management, and safety)	Action 3-3
3 Support business matching and expansion of local suppliers	Action 3-4

(4) Policy Domain 4: Industrial Human Resources Development

A KPI of this domain is the establishment of Six Policies, Standards, and Guidelines and 15 Training Regulations on auto-related courses are reviewed/ revised with the support of the auto industry. At present the Industrial Human Resources Development (IHRD) system is not meeting industry needs so that the figure below shows target sectors of FDI and industrial human resources development.

The action plan for Policy Domain 4 (Human Resource and Technology Development) focuses on four human resource segments in this triangular shape, and the outline of the action plan is mentioned in the right side of each segment.

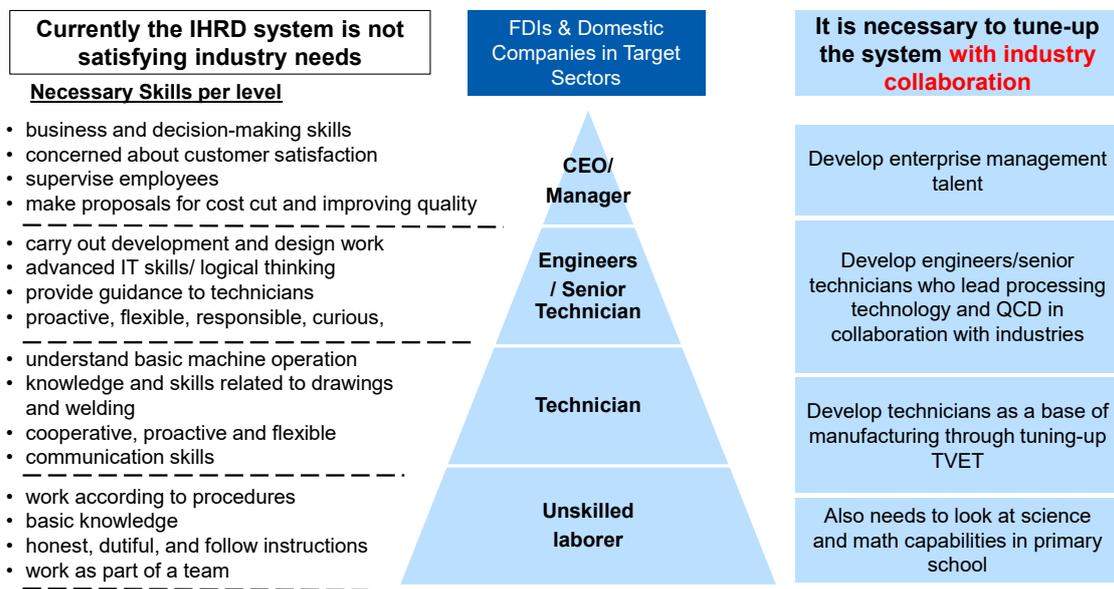


Figure 72 Specific Measures on Policy Domain 4

The biggest reason for the skill gap issue is an insufficient coordination and communication among industry, academia, and relevant government agencies responsible for the education sector. There are little opportunities that the academia (and vocational training institutions) to be informed of the industry’s needs. There are few professors, trainers, and industry coordinators who are well informed of the Philippine auto industry, including information such as auto parts and components that are being produced in the Philippines. They do not have knowledge what processing and production management technologies that the industry wishes for job applicants to learn in school. There is also no automotive manufacturing courses in the Philippines. Consequently, newly graduated job applicants are often deemed ill-equipped for the industry. Against this background the following specific measure and action plans were prepared.

Table 61 Specific Measures on Policy Domain 4

	Specific Measures (Industrial Human Resources Development)
Overall	<ul style="list-style-type: none"> • Establish a well-functioning mechanism for supporting the industry-academia collaboration
Industry-Academia Linkage	➤ Increase more opportunities to learn about the automotive industry
	➤ Review/revise courses related to the automotive industry
	➤ Strengthen industrial human resources of all skill levels

The action plan for Policy Domain 4 includes two groups of activities: Awareness/Linkage Formulation and Quality Upgrading. Awareness/Linkage Formulation focuses on all segments of human resources and aims to increase opportunities to learn about automotive industry. Meanwhile, quality upgrading activities focus on each the enhancement of quality of human resources supplied to the auto sector, “Action 4-2 for worker/technician level, “Action 4-3 for engineers and senior technician level.

Table 62 Action Plans for Policy Domain 4

Action Plans	Reference
<Awareness / Linkage Formulation>	
1 Strengthen the linkage between the automotive industry and the academia/TVET institutions	Action 4-1
<Quality Upgrading>	
1 Develop fundamental industrial human resources as a base of manufacturing ⇒ Workers/Technician Level	Action 4-2
2 Develop talents who have appropriate skills and knowledge for advancing production technology and production management ⇒ Engineers / Senior Technicians	Action 4-3
3 (Develop enterprise management talent ⇒ CEO/ Managers, covered in the Supplier Development Section, See Action 3-3)	

(5) Policy Domain 5: Infrastructure Development

As the base of automotive industry development, “Infrastructure Development” aims to upgrade the level of groundwork for the manufacturing industry.

Continuous enforcements of projects such as competitive power supply, road and bridge construction, better maintenance of the port of Batangas, development of industrial areas at the port hinterland, and reinforcement of the communications infrastructure, etc. are necessary for the auto industry cluster zone located in Region 4A.

As the KPI of this policy domain, it is proposed that the Philippines rank within Top 40 in the world by 2027 in the infrastructure maintenance category of the Global Competitiveness Report (2017-2018) reported by the World Economic Forum. The Philippines currently ranks at 57th. Ranking; being within Top 40 puts the Philippines on par with Indonesia.

The action plan for Policy Domain 5 (Infrastructure Development) includes almost all sectors of infrastructure. It is thought that all infrastructure are very closely related to the QCD of automotive industry.

Table 63 Action Plans for Policy Domain 5

Action Plans	Reference
<p><Development Direction></p> <p>1 Improve infrastructure for the manufacturing industry</p> <ul style="list-style-type: none"> • Port of Batangas • Access road to seaports and airports • Electric power development • Telecommunication development • Industrial park development 	Action 5-1

(6) Summary of Specific Measures and Action Plans

To realize the development strategy on automotive/auto parts industry promotion plan it is proposed that, in total, 15 specific measures with 52 action plans should be implemented. The figure below illustrates the procedural flow for the full-set development which the Project pursued.

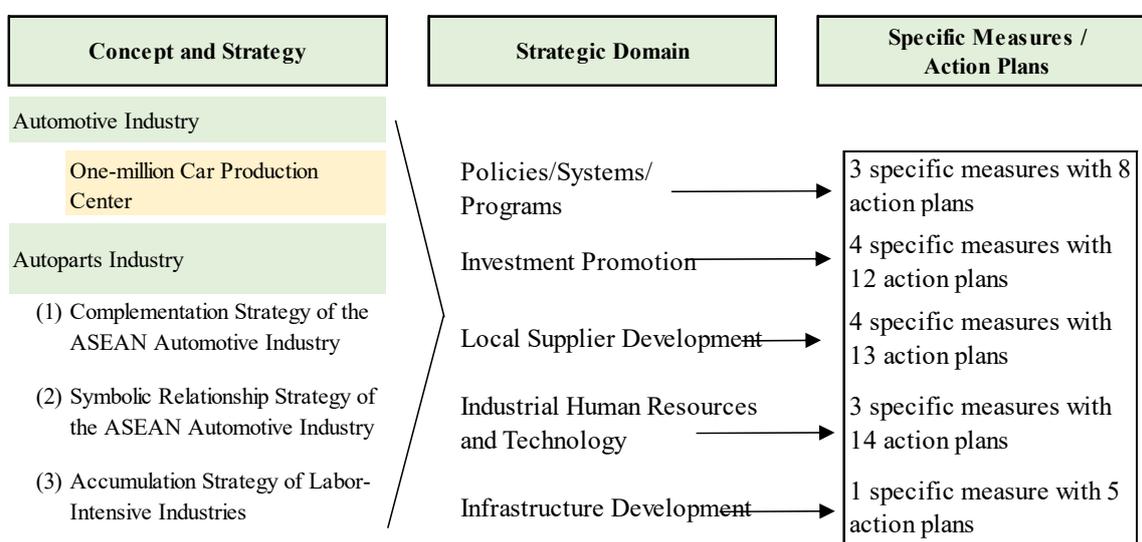


Figure 73 Entire Structure of Automotive Industry Promotion Plan

Thematic working groups established in Phase II of the Project have played a significant role in reviewing and revising the specific measures and the action plans. Each thematic working group selected one or two action plans and implement the plan(s) as pilot activities.

In the Investment promotion WG, an investment promotion brochure focused solely on the automotive industry was developed; the material was different from previously prepared investment promotion materials without specific focus to priority economic sectors. Furthermore, investment seminars and a business matching (B2B) event were held in the areas in Japan where there are concentration of auto related companies (i.e. home town of Toyota and Mitsubishi). As the seminars and event concluded with a high attendance and a possibility of future business matchings, such initiative proves to be effective. It also confirmed that there is a strong need for the improvement in BOI’s language supports in targeted countries as it is expected that the future target of investment promotion will increasingly include small-medium sized enterprises that do

not necessarily have strong English skills.

In the Local Supplier Development WG, two pilot activities, namely local supplier profile database development and firm-level Kaizen consultation, were conducted. The first pilot activity, local supplier profile database development, was confirmed to be very effective based on the number of access counts to the BOI's webpage where the profiles are uploaded, the wide range of access country origins, and listed companies' feedback. For investment promotion and business matching, rather than presenting a mere directory which lists companies' products and contact details, it is important to present a complete and detailed information package of local companies, including the types of processing equipment/machinery available, production capacity, and main products. Firm-level Kaizen consultation was also successful; however, for Kaizen activities among local suppliers to be successfully sustained, it is observed that continuous pressure and encouragement from their clients and group/partner companies are also needed. Therefore, it is necessary to create more opportunities and forums such as business matching that local companies can use to advertise their Kaizen activities for more business gains.

In the Industrial Human Resources Development WG, the industrial human resources development organization profiling survey and the auto industry-academia linkage promotion event were conducted. Through these activities, it was observed that college students and faculty members in related engineering fields in the Philippines do not necessarily understand the Philippine auto industry and employment opportunities that exist for college graduates majored in engineering degrees. There is a strong need to facilitate more academia-industry partnerships in the auto manufacturing sector.

To simplify the relationship between "Specific Measure" and incidental "Action Plan", the tables in the succeeding pages are prepared. The action plan should be reviewed again after the Government decided the Philippines' direction of industry promotion among alternative options proposed in this report.

4.6 Implementation Schedule

The implementation schedule of action plans is also discussed among new working groups (See Annex B). Major activities are to start from 2020 allowing for the time required for the Government to review and approve the Automotive Industry Promotion Plan. Same as action plans, the implementation schedule should be reviewed after the Government's policy has fixed.

Table 64 Abstract of Specific Measures and Action Plan by Domain

Domain 1: Policy/System and Major Program Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Approval of the Automotive Industry Promotion Plan 	[Policy Formulation] 1 Approval of the Automotive Industry Promotion Plan <ul style="list-style-type: none"> Release of the one million car production plan Relaxing of PEZA's 70% rule 	Action 1-1
Automotive Sector	<ul style="list-style-type: none"> Preparation and approval of the CARS II Program for achieving one million production (*) 		
Auto Parts Sector	<ul style="list-style-type: none"> Relaxation of the PEZA's 70% export rule for enhancing the domestic supply chain Approval of the investee program for strategic auto parts (*) 		
		[Research and Framework Dev.] 1 Technology sophistication 2 Reduction of transportation / logistic costs for lowering production costs	Action 1-2 Action 1-3

* See action plans for investment promotion

(*) Actions 1-2 is the framework development for improvement of QCD. Action 1-3 concerns infrastructure development related issues (Policy Domain 5); necessary initiatives of DTI/BOI were listed.

Domain 2: Investment Promotion

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Improvements of efficiency in investment promotion activities 	[Increased Efficiency] 1 Carry out investment promotion activities with improved efficiency to attract business <ul style="list-style-type: none"> Select target companies Conduct investment promotion activities in Japan, South Korea, etc (Improve multi-language support services.) 	Action 2-1
Investment Promotion Tools	<ul style="list-style-type: none"> Preparation of attractive incentive packages Strengthening of intelligence activities Information provision of supporting industries 		
		[Implementation] 1 Discussion/ application on the improved incentive system <ul style="list-style-type: none"> Incentives on drive-train related parts manufacturing Incentives on export promotion Incentive on electric motor and parts used for E-vehicles Incentives on production volume and the number of manufacturing models / body types (CARS II) 2 Strengthening intelligence activities 3 Nurture and accumulate supporting industries for companies that are targeted for investment promotion	Action 2-2 Action 2-3 Action 2-4

* Activities will be carried out in collaboration with actions for local industries development

Domain 3: Local Supplier Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Research for identifying needs by Tier 1 & 2 and preparation of strategies for local supplier development 	[Institutional Setup] 1 Carry out investment promotion activities with improved efficiency to attract business <ul style="list-style-type: none"> Establish a collaborative working group Support the collaborative working group's activities 	Action 3-1
Technology and business upgrading services	<ul style="list-style-type: none"> Profiling of local suppliers and their technology level ↓ Technical support from Tier 1 and 2 companies to local suppliers Promotion of business matching ↓ Capacity development of local suppliers (Kaizen, production planning, safety, business management, etc) 	[Technology and Business Upgrading Services] 1 Support upgrading processing technologies among local suppliers (technology, equipment, and facility upgrading) 2 Support upgrading production management technologies among local suppliers (Kaizen, leadership and management, and safety) 3 Support business matching and expansion of local suppliers	Action 3-2 Action 3-3 Action 3-4

Domain 4: Industrial Human Resources Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Establish a well-functioning mechanism for supporting the industry-academia collaboration 	[Awareness / Linkage Formulation] 1 Strengthen the linkage between the automotive industry and the academia/TVET institutions	Action 4-1
Industry-Academia Linkage	<ul style="list-style-type: none"> Increase more opportunities to learn about the automotive industry Review/revise courses related to the automotive industry Strengthen industrial human resources of all skill levels 	[Quality Upgrading] 1 Develop fundamental industrial human resources as a base of manufacturing ⇒ Workers/Technician Level 2 Develop talents who have appropriate skills and knowledge for advancing production technology and production management ⇒Engineers / Sr. Technicians	Action 4-2 Action 4-3

Domain 5: Infrastructure Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Follow the national policy, “Build, Build, Build (BBB) Program” (the public spending on infrastructure projects is targeted at Php 8 -9 billion from 2017-2022) Encourage the private sector to partake in the “Swiss Challenge” for infrastructure development for industry development 	[Development Direction] 1 Improve infrastructure for the manufacturing industry <ul style="list-style-type: none"> Port of Batangas Access road to seaports and airports Electric power development Telecommunication development Industrial park development 	Action 5-1

* The study on infrastructure development was out of scope of the Project

4.7 Socio-Economic Impacts on Each Development Domain

This section summarizes socio-economic impacts on each development domain. Proposed policy actions in this project have been carefully examined, based on the current state of the automotive sector in the Philippines and lessons from neighboring ASEAN countries' experiences. These actions will bring significant positive impacts on the industry and society of the country. In general, these policy actions will support industry from market failure and stimulate the resurgence of automotive sector.

While these policy actions are expected to bring a huge socio-economic impact, quantitative assessment of the effectiveness of the policy actions is difficult at this stage. There are four reasons for this difficulty as described below.

First of all, the cost of each policy action is not yet scrutinized. These policy actions are proposed as an orientation for policy making. The amount of budget required should be calculated by the government, taking into account of administrative costs.

Second reason is a technical restriction. Even with a rough estimation of the cost, assessment of the benefit is difficult, due to lack of detailed statistical information. This project has been focusing on automotive sector and studied in detail of auto parts manufacturing. However, for example, input/output (I/O) table of the Philippines does not have such detailed segmentation information. In addition, development of I/O table takes long time and is becoming old when it is published. The industrial structure may have been already changed.

Third reason is that many of proposed policy actions consist of several projects. Quantitative assessment such as cost benefit analysis will be worth to conduct when cost and benefit are clearly defined. Typical case is a road construction project, where reduction of driving hours, decrease of driving cost, decrease of traffic accidents and increase of employment will be measured as benefits of the project. For road construction project, the sphere of influence of the project is relatively easily defined. On contrary, a policy consists of several projects may be more difficult to identify the scope of benefits that will be brought by the policy.

Fourth reason is that these quantitative analysis needs reliable data. Even in a simple road construction project case, a study needs data of traffic, economic value of drivers' time and accidents and perspective of improvement of these parameters etc. In many cases, for precise and reliable cost benefit analysis, data and information gathering is needed and it may require some additional budget and human resources.

Even without quantitative analysis, proposed policy actions are designed to bring large socioeconomic impacts to the Philippines. Following sections will describe the impact of each development domain.

(1) Policy/System and Major Program Development

Policy/System and Major Program Development is the umbrella of the entire promotion plan which includes action plans on 1) policy formulation and 2) research and framework development.

1) Policy Formulation

Policies here include (1) the Automotive Industry Promotion Plan, (2) the CARS II Program for automotive sector to achieve one million vehicle production, and (3) relaxation of PEZA's 70% export rule for auto parts sector to enhance domestic supply chain.

Socio-economic impacts of these policy approval and implementation will be significant, specifically on employment generation, trade balance and tax revenue as mentioned in another section. Based on the interviews with OEMs and different suppliers as well as benchmarking study of neighboring countries, impact of "one million productions" target and committed support coming from the government encourages investors to study the possibility of investing in the Philippines. These foreign direct investments will give impact to supporting industries as well as other industries such as retail and housing due to employment generation. Relaxation of PEZA's 70% export rule will benefit not only auto industry but all other industries such as electronics and construction who have been providing products and services to PEZA companies.

As a reference, a study conducted by JICA on "Assessment Study on Fiscal Incentives as an Investment Policy Instrument" in 2014 shows potential investors perceive fiscal incentives as "top priority" in their decision-making process for choosing an investment destination. More importantly, the economic impact brought by investments is much greater than lost earnings and administrative costs of the government by providing the incentives. Though the study has a limitation of number of respondents, total initial investment of selected companies of php 9.8 billion led to a direct effect and primary & secondary indirect effects of php 17 billion in the initial construction phase, and approximately php 68 billion effects every year in the operation phase while the costs of government amount to only php 1.4 billion (2.1% of the total annual benefits). This gives an indication that the benefits are greater than the costs of providing incentives to potential investors. With the new government policy with accompanying incentives, economic impact is expected to be significant.

2) Research and Framework Development

Research and framework development is inevitable to realize the abovementioned policy. Goal is to sophisticate technical aspects in the field of processing techniques such as forging and casting and QCD. If the Government decides to attract investors focusing on car electronics industries, research and framework development on ESO for example will be necessary. Research and framework development itself does not give a direct socio-economic impact, however it will contribute to strengthen the quality of human resources. Based on the Global Competitiveness Index 2017-2018 by the World Economic Forum, the Philippines is ranked at 61st (score of 3.72, 1-7 (highest)) for "Innovation and sophistication factors" out of 137 countries. Comparing with ASEAN neighboring countries on innovation and sophistication factors, it is still higher than Viet Nam which rank is 84th (score of 3.49), the Philippines is far behind Thailand (47th, score of 3.92), Indonesia (31st, score of 4.29) and Malaysia (21st, score of 4.91). The Philippines has been

known for reasonable labor resources, but it needs to compete with other countries in terms of quality of human resources.

(2) Investment Promotion

Investment promotion is the key policy domain of AIPP; it falls under the mandates of DTI/BOI. The general rule of thumb of macro-economic development based on the growth accounting theory is that investment promotion activities when done effectively and efficiently can substantially increase the capital stock of the target sector and can trigger the enhancement of industrial human resources development and local supplier development, consequently become the backbone of various industries.

Since there are no specific targets for investment promotion of the automotive industry sector, the assessment of its impact is usually done by time series comparison of investment numbers and amounts to the sector. AIPP inclusive of two industrial strategies will contribute to setting a specific target for this domain.

At present, outcomes of main indicators, such as investment numbers and amounts, are affected by many external, uncontrollable factors, which makes it difficult for DTI/BOI to assess performance of its investment promotion activities. Given this situation, AIPP defines the KPI of investment promotion as “bringing in investments from 15 auto parts manufacturers each year (average of continuous 5 years)”. To carry out this indicator, DTI/BOI should follow AIPP strategies on the auto parts sector and strategically targets those companies that fall under the three specified segments in the auto parts sector strategies.

Having said above, investment promotion will stabilize capital stock of the automotive industry. The Department of Finance (DOF) has voiced the importance of setting up objectively verifiable assessment measures to concerned agencies. For example, DOF stressed the need to conduct the cost-benefit analysis when discussing new incentives in a case of a mini bus project proposed by DTI/BOI as CARS II Program. According to DOF Undersecretary Chua, the following four indicators are typically looked into when considering a new incentive system:

1. Employment generation (number of new jobs created)
2. Value added produced in the Philippines
3. Degree of area development (border or remote area is placed bigger importance)
4. Positive contribution to trade balance

As for employment generation, the JICA Expert Team projects the increase in employment at 900,000⁷⁵, which is 4.5 times higher what was projected under the CARS program. Value added

⁷⁵ Based on the statistics available on the current direct employment for the auto industry and employment figures of related industries as well as the comparative analysis with other auto producing countries, the Project estimated the current employment by the auto industry and projected employment to be generated by the domestic production of one million vehicles. It is roughly estimated that the current employment from the auto industry is about 1.68 million (4.2% of the overall working population), among which 0.06 million is from the direct employment (manufacturing of cars, body, and parts) and 1.62 million is from the indirect employment (manufacturing of auto

produced in the Philippines will increase dramatically; viz. based on the calculation from GVC analysis, the average value added per company is estimated at US\$ 23 million and very roughly it will increase by US\$ 345 million a year once annual target at 15 investments are realized. Although it is unlikely that AIPP will contribute significantly to rural/border area economic development, AIPP will moderate the imminent trade balance challenge posed by the auto industry, which was long been a trade surplus industry but shifted to a major trade deficit industry starting from 2016.

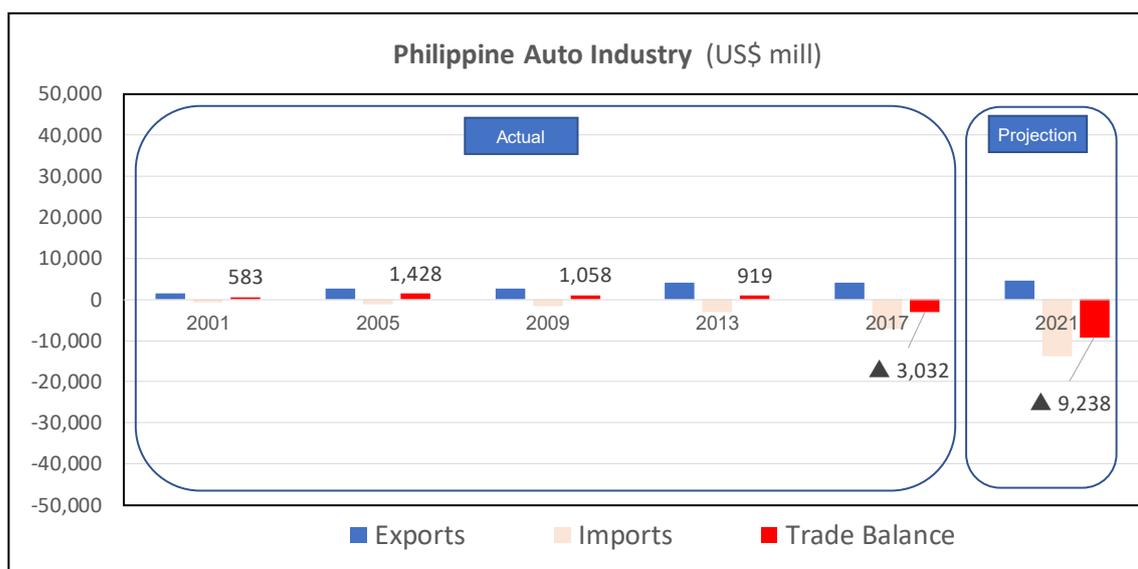


Figure 74 Trend/Projection of Trade Balance on Automotive Industry in the Philippines

The investment promotion is deemed the trigger of diversified socio-economic impacts to be emerged through AIPP. From the viewpoint of macro economy, investment promotion establishes the base of growth account which accrues various positive impacts under AIPP.

(3) Local Supplier Development

Policy actions for local supplier development are expected to contribute to an increase in investments in the industry and tax revenue, employment generation, and strengthening of the domestic supply chain. Furthermore, since many suppliers cater not only to the auto industry, positive impacts of policy actions will have spill over to other related manufacturing industries, such as electronics and aeronautics.

The difficulty in sourcing parts and components from local suppliers is often cited as one of key challenges faced by auto assemblers and auto parts manufacturers. This was confirmed through interviews with OEMs and Tier 1 and 2 companies in Phase 1. It is reported that only 330

components [auto electronics components, metal, rubber, etc] , automotive use [sales/maintenance], transportation [incl jeepney, taxi, bus drivers, and other hired drivers], construction, auto insurance, etc). In a realistic projection, with the increase in the production to one million unit, the employment number will increase to 2.58 million (0.25 million for direct employment and 2.33 million for indirect employment); in an optimistic projection, it will increase to 3.12 million (0.33 million for direct employment and 2.79 million for indirect employment). Based on the realistic scenario, the increase in employment is estimated to be around 900,000.

of the 20,000 – 30,000 total vehicle parts are produced in the Philippines. Many OEMs and Tier 1 and 2 companies have reported despite their continuous efforts in increasing local procurement rates to keep their product costs more competitive, many local companies do not meet their QCD (quality-cost-delivery) standards.

Being unable to meet the buyers’ QCD standards resulted in unfortunate missing out of golden opportunities that came about with the CARS Program that rolled out in 2016 as well as the loss of businesses due to the enforcement of Euro 4 emission standards which came into force in 2018. Due to the production stoppage of models such as Cross Wind and L300, many Filipino auto SMEs visited by the Project had lost significant portions of their businesses and had to reduce the number of employees in the recent years. For example, one company with the employment size of approximately 100 people had to reduce 20% of production, lose 20% of sales and let go eight regular employees. There were companies that experienced the more than 60 % of production reduced.

The automotive industry is changing fast around the globe. The Project considers what happened in recent years as the majority of local SMEs’ failure to fit in what can be conceptualized as the “new paradigm” of the auto industry. The key characteristics of these two opposite paradigms are summarized in table blow.

Table 65 New and Old Paradigms of the Auto Industry

Old Paradigm	New Paradigm
Long model change cycle	Rather shorter model change cycle ➔ The R&D function is strengthened ➔ To keep competitiveness of an OEM
No big investment	Rather big investment
Old technology	Innovative technology with car electronics · ETC, NAVI, ADAS etc.
Local procurement	Global/ASEAN based procurement with regional bundling
Less competition and no cost reduction activity	Severe Competition
No stringent regulations	Stringent regulations · Emission: EURO4 · Safety Standard: ASEAN NCAP · Corporate average fuel efficiency (CAFÉ regulation)
Less control from headquarters in Japan and no modern management	Modern Management · Platform Strategy · Continuous Improvement (QCD) · Part Approval System (APQP, PPAP) · Field Quality Feedback Management
Domestic sales only	Domestic sales + export challenge

Note) APQP: Advanced Product Quality Planning PPAP: Production Part Approval Process
 Source: JICA Expert Team

In the automotive industry under the old paradigm, a model change took a long time; an investment size was relatively smaller; the traditional technology was used for production; more parts were procured locally; suppliers faced less competitions; there were no stringent environmental regulations; companies had to deal with less control from overseas headquarter and focused only on domestic sales⁷⁶. In contrast, in the auto industry under the new paradigm, a model change is conducted in much more speedy manner; an investment size become much bigger; cutting-edge and innovative technology is adopted, especially for the car electronics segment; the procurement is done on a global scale; competitions for automakers and auto parts suppliers became more severe; new stringent environmental regulations are put in place, and companies have to deal with a greater management control from overseas headquarters and focus on both export sales and domestic sales.

Policy actions for local supplier development will increase local SMEs' survival rates under the new paradigm. In order to win business competitions, detailed policy actions should be designed and implemented based on the needs of the strongest or buyers (OEMs and Tiers 1 or 2 companies). For example, training on upgrading or introducing specific processing technologies will be planned and carried out based on what buyers perceive most in-demand skills and technologies for their operations. Training on production management technologies should also cater to the needs of buyers and be done in a way to enable SMEs to meet their QCD requirements. Especially with its entry into the ASEAN Economic Community, the Philippines is more entangled than ever in globalized as well as regionalized supply chains; local SMEs' competitors are not just companies making similar products domestically, but more importantly, companies in other countries that have more advanced automotive industries, such as Thailand, Malaysia, China and Japan. The technical support in both fields (i.e. processing technologies and production management technologies) will prepare local companies to have a solid foundation for competing with their competitors abroad. In return, this will create more likelihood of further investments to be made by existing buyers and their cluster companies, leading to job creation and expansion of the local supply chain.

Policy actions may not equally benefit all local SMEs (estimated to be somewhere between 200 to 300 companies⁷⁷); however, one can expect that the absence of aggressive policy actions will lead to more loss of opportunities and business operations, resulting in loss of employment, etc. Companies that have successfully captured opportunities presented by policy actions will experience more technical tie-ups, increase in employment, and increase in sales, as already demonstrated by companies that were able to benefit from the CARS program.

⁷⁶ The main reason for the increased control from the headquarters are: 1) economic partnership programs made it possible to establish more integrated and complicated regional/global supply chains and 2) it was widely believed that due to different regulatory and other circumstances it was only natural and efficient that each country had its own marketing and procurement methods.

⁷⁷ The exact number of local SMEs and their total number of employees in the Philippine auto industry is unavailable. Considering that it is reported that there are 430 auto-related manufacturing companies in the Philippines (21 companies in auto assembly, 24 companies in motorcycle assembly, and 385 companies in the auto parts manufacturing) and slightly over 100 auto manufacturing companies are registered as member companies of the automobile section of the Japanese Chamber of Commerce and Industry of the Philippines, it is estimated that the number of local SME establishments range from 200 to 270.

(4) Industrial Human Resources Development

Policy actions for industrial human resources development are expected to strengthen the employability of the Filipino youth not just in the automotive industry but also in other economic sectors. The proposed actions will also facilitate the Philippine auto industry to move up value chains as well as local supplier development and facilitate more investments to be made in the Philippines.

As with other policy domains, the academia's collaboration with the industry will play the central role throughout all aspects of industrial human resources development, starting from career formulation (students being informed of career paths that they can choose in the auto industry), exposure to the *Monozukuri* culture and learning of general and industry specific technologies through, for example, OJT, dual training, and plant tours, and curriculum development/improvement. As discussed earlier in the local supplier development section, the automotive industry is changing fast with new players coming in—even those companies that were not considered auto-related companies, such as Google and Panasonic. More innovative and cutting-edge technologies are being used in the production especially in the car electronics segment that this Project and other similar researches (e.g. USAID's COMPETE Project) concludes that the Philippines already has a strong production foundation and has a strong possibility to further expand its strategic value in the auto supply chain. Like local suppliers, education institutes, including both technical vocational institutes and higher education institutes, but especially higher education institutes, need to formulate stronger linkages with industry partners to train and educate future technicians and engineers.

In the Philippines, it is estimated that there are approximately 80,000⁷⁸ to 100,000 people working in the auto manufacturing segment⁷⁹. In the manufacturing sector, about 20% (16,000 to 20,000 people) are estimated to be college graduates and 80% (64,000 to 80,000 people) are TVET graduates and/or high school graduates. As the attrition rate of the Philippine industry sector is reported to be 12.2%⁸⁰, approximately 10,000 to 12,000 people, among which 2,000 to 2,400 are college graduates, are landing jobs in the auto manufacturing industry every year.

⁷⁸ 2017: Compilation of Industry Statistics on Labor and Employment, Philippines Statistics Authority,

⁷⁹ The project compiled the employment data of 89 auto companies from the Securities and Exchange Commission in Phase 1. The total employment of 89 auto companies was 78,173. Since almost all large sized companies in the auto manufacturing segment are included in the 89 companies, the rest of companies in the auto manufacturing segment (340 companies) may be small to medium sized companies. Supposed the average employment of the 340 companies are 50, the total employment of auto manufacturing increases to approx. 95,000. It should also be noted that it is reported by PSA that direct manufacturing in the auto sector was 58,000 in 2016. 80,000 to 100,000 include employment that are counted in indirect manufacturing under PSA's classification (for example, auto electronics and batteries and vehicles are not classified under Manufacturing of Motor Vehicle (PSIC C, Group 29) in PSIC classification.

⁸⁰ Absorption rate = separation rate + turnover rate

Table 66 Absorption of College and TVET Graduates to the Auto Manufacturing Sector

		HEIs	TVET	Mfg Sector 1/	Auto Manufacturing Sector	
					2016	Absorption 2/
1	Managers: chief executive, administrative, production and specialized service managers	⊙		16%	12,456	About 20%: 16,000 college graduates 3/
2	Professionals: Engineers and IT	⊙		1%	1,128	
3	Associate professionals: Engineering Associates/Technicians	○	○	4%	3,290	
4	Other professionals, and associate professionals: legal, business and administration	⊙		3%	2,400	
5	Plant and Machine Operators		⊙	17%	13,607	About 80%: 64,000 TVET or high school graduates
6	Workers (incl. trade workers and workers in manufacturing plant)		⊙	44%	35,158	
7	Administration Support Workers (clerical, customer service, sales, etc)		○	5%	4,254	
8	Others (incl. cleaners, helpers, ect)		○	10%	7,943	
	Total:			100%	80,000	Approx 10,000 a year with the accession rate of 12.28 % (2,000 college and university graduates3/, 8,000 TVET and high schools)

1/ "2017: Compilation of Industry Statistics on Labor and Employment" by the Philippines Statistics Authority

2/ Based on the industry sector's accession rate of 2018 1st quarter (PSA). During the same period, the separation rate for the industry sector was 8.58%. The turnover rate was 3.69%. The numbers matche auto companies' comments obtained in the Project.

3/ The number of graduates (incl. associate, BS, and MS) from engineering and technology diciplain is 78,000 (2016/17). 2,000 is about 3%.

It is projected that, the achievement of one million car productions requires somewhere between 280,000 and 440,000 people to work in the auto manufacturing by 2027. To achieve the size of employment from the base number of 80,000, the employment needs to expand at the annual growth rate of 12.0% to 16.7 %. When the industry expands to the size of 280,000 to 440,000, the industry will absorb 7,000 to 10,000 college graduates. In this calculation, the aggregate total absorption of college and university graduates to the industry will be 39,000 to 54,000 for nine years from 2019 and 2027, the aggregate of TVET students and high school students will be 156,000 to 217,000⁸¹. Action plans for industrial human resources development will directly impacts companies that will hire these groups of people, especially 39,000 to 54,000 college and university graduates, by increasing their preparedness to contribute to the Philippine auto industry development. With the implementation of action plans, students will have more opportunities to be exposed to new technologies and have more chances to be involved in project-based learning (e.g. auto related R&D competitions); as a result, they will be better equipped to support the Philippine auto industry going up the ladder in the auto value chain.

Policy actions will also have positive ripple effects in other industries. Since many Japanese companies visited by the Project emphasized the importance of strengthening the basic education, especially math skills, policy action plans place a great deal of emphasis in strengthening the math and science culture in the Philippines. The policy actions promote math and science related activities, such as the participation in international and regional math and science assessments and mathematics Olympiad. Building math and science skills tend to lead produce logically-minded solution finders. The further production of such group of people will attract more investments in not just auto manufacturing segments, but also other manufacturing industries and service industries.

⁸¹ The separation rate as of now is 8.58%. With the expansion of the industry, it is expected that the separation rate will also increase.

Table 67 Employment of the Auto Sector

	Philippines			(Reference)		
	2016	2027		Japan	EU (27 countries)	
			[Realistic]	[Optimistic]	(2014)	(2013)
Domestic Production (no. of vehicles)	0.1 mill.	1 mill.		9.8 mill.	16.2 mill.	
Working Population	40 mill.	48 mill.		64 mill.	219 mill.	
		[Realistic]	[Optimistic]			
Total Employment	3.5 mill.	5.02 mill.	5.14 mill.	5.3 mill.	12.7 mill.	
Total Manufacturing	0.08 mill.	0.32 mill.	0.44 mill.	1.3 mill.	3.1 mill.	
Direct Employment	0.06 mill.	0.25 mill.	0.33 mill.	0.8 mill.	2.2 mill.	
([Ratio] Job : No. Cars Produced)	(1:2)	(1:4)	(1:3)	(1:12)	(1:6)	
Indirect*	Indirect Employment (Other Manufacturing)	0.02 mill.	0.08 mill.	0.11 mill.	0.5 mill.	0.9 mill.
	Automotive Use (Sales /Maintenance) 1/**	0.5 mill.	0.7 mill.	0.7 mil	1.0 mill.	3.9 mill.
	Transporation 2/ **	2.7 mill.	3.4 mill.	3.4 mill.	2.7 mill.	4.9 mill.
	Others (Construction, car insurance etc) 3/ **	0.2 mill.	0.6 mill.	0.6 mill.	0.3 mill.	0.7 mill.

(Note)

Direct Employment: Manufactures of 1) motor vehicles, 2) bodies for motor vehicles, 3) parts and accessories for motor vehicles)

Parts and accessories for motor vehicles: It includes brakes, gearboxes, axles, road wheels, suspension shock absorbers, radiators silencers, exhaust pipes, catalysers, clutches, steering wheels, steering columns and steering boxes; safety belts, airbags, doors, bumpers, car seats, motor vehicle electrical equipment, electric ignition or starting equipment for internal combustion engines, and other parts of accessories

Other Manufacturing (materials): manufacture of refined petroleum products; rubber products (including tires and rubes and other products); plastic products, metals (iron, still, non-ferrous metals), structural metal products tanks, consumer electronics (incl. electronic audio for motor vehicles) , batteries, general purpose machinery (incl. air conditioning machines for motor vehicles)

* Rough Estimate 1/ CAGR 2.25% 2/ CAGR 2.0% 3/CAGR 9.9% (CAGR figures are based on growth of these segments in the last 5 years)

** Domestic manufacturing of vehicles are non variable to indirect non-manufacturing segments; these segment will grow as car sales grows.

Source: “2017: Compilation of Industry Statistics on Labor and Employment” by the Philippines Statistics Authority, Japan Automobile Manufacturers Association, Inc (JAMA), “the Automobile Industry Pocket Guide (2014-2015)” European Automobile Manufacturers Association (ACEA)

(5) Infrastructure Development

Physical expansion of infrastructure such as Batangas port, highways and high-speed internet will relieve congestion and regain economic value which are being lost by such congestion. Suppose if a minimum wage of Region 4-A is php 40 per hour and half of population of the region (which is about 8 million) will save 10 hour per year due to those infrastructure expansions, then the gained economic value will be php 3.2 billion. These projects will also create demand for construction which will have multiplier impact on local economy including employment, which will be widespread to other sectors including manufacturing and services.

Reducing cost of power distribution and internet will benefit users and will be one of incentive factors of new investments. Reducing the fee of these service will discouraging to service providers for a while but it can expand the number of customer or the usage of the service and will benefit service providers in a long run.

In most of the cases, infrastructure development is “upfront investment”. In Thailand in the 1980s, in Viet Nam in the 1990s to the 2000s, and in Myanmar in the 2010s, the governments decided to invest in large scale infrastructure for industry and these investments had announcement effects for attracting foreign direct investors. There have been a huge investment inflow after the infrastructure development in these countries. Meanwhile, infrastructure development in the Philippines have been moderate and the perception of the country as a manufacturing center has become weak compared to other ASEAN member states. In this context, infrastructure development plan is highly important for attract more investments, especially from foreign countries. As it is seen in Thailand, Viet Nam and Myanmar, socio-economic impact of infrastructure development will be very large.

4.8 Items to be Considered for the EV policy

(1) Massive subsidies will be required to develop the domestic market for EVs.

In the Philippines, electricity costs are high, and as a result, on top of the expensive initial costs, Battery EV owners have to pay high running costs. Considering the facts, the marketability of BEV in the Philippines is very low.

The market price of a xEV is about JPY 1 million (US\$ 10,000) higher than a regular ICE (internal combustion engine) vehicle of the same grade. Due to the price gap, the xEV market in the Philippines is quite small. In the case of Japan, the Japanese Government provided a large amount of government subsidies and preferential fiscal incentives to support the xEV industry development since Toyota Prius was launched in 1997⁸².

If the Philippine Government promotes the xEV industry with the premise of catering to the needs of the domestic market, it will require unprecedented financial outlays to cover purchase subsidies, electricity subsidies, tax incentives, and infrastructure development costs (e.g. power charge stations). Considering the Philippines' situation in which there is even a debate over the abolition of investment incentives, the fiscal spending that have such a low cost-efficiency and benefits only a small certain portion of affluent citizens is hardly realistic and justifiable.

In the situation where there is no domestic market potential and a limited accumulation of car parts makers and supporting industries (or processing industries), it is difficult to imagine that companies would want to invest without a massive roll out of subsidies by the government.

That being said, the modernization of PUVs has already been decided; its implementation process is expected to continue. The use of xEVs under this policy will bear a certain level of impacts based on the following reasons: 1) travel distances of PUVs are generally short and the routes are pre-determined; therefore, the development and maintenance of power charge stations along the pre-determined routes are manageable; 2) the reduction of exhaust noise and exhaust gas is expected to create positive impacts not only from the environmental perspective, but also in other fields such as public health; and 3) the implementation of PUV modernization can serve as a verification test to check policy challenges associated with xEV industry development.

It is important to note that the recognition of possible impacts or benefits of PUV modernization should not be seen as a go sign for all-out-promotion of the EV or EV parts manufacturing industry by the Philippine government. What needs to be done instead is that in the process of supporting some portions of PUVs to shift to xEVs, the Philippine Government carefully looks into the feasibility of the xEV production in the country and the government's support mechanism.

⁸² The Japanese government's budget for clean energy automobile subsidies was JPY 13 billion (US\$ 130 million) in 2018. Buyer subsidies for vehicles with high fuel efficiency is JPY 400,000 (US\$ 4,000) per vehicle. In addition, the government has been losing tax revenues that it would have received if not for tax reduction incentives provided to xEV owners. Even after 20 years from the release of the first xEV, the government is shouldering the financial burden of the said scale every year.

(2) Support to domestic manufacturing companies

If there are companies that are willing to invest their capital and efforts into development, manufacturing, and domestic sales or exports of xEV related products even without government subsidies, they should be entitled to the same investment incentives as given to ICE related companies as they will contribute to the employment generation, creation of domestic added value, improvement in trade balance.

Other possible support measures to domestic manufacturing of xEV related products in the Philippines include the provision of preferential treatments and the reduction of excise tax to the imports of xEV related materials and components.

Government's infrastructure development projects such as road and port development that will directly benefit companies that are using locally sources materials and are contributing to the realization of the CNIS's framework, local industrial development, job creation, added value creation, etc. (for example, battery manufacturing companies that are using locally sourced cobalt and other materials) can also be given a higher priority in budgeting and implementation.

Rather than binding its thinking to the xEV industry, it will be highly worthwhile for the Philippine Government to aggressively implement investment promotion activities targeting electronic parts companies that produce or design parts commonly used both in xEV and ICE vehicles, especially considering a fast advancement of electrification and informatization in automobiles as a whole, as well as development of industrial human resources for the electrical and electronic related field. The xEV manufacturing industry is not likely to spring up in a place where materials, components, parts, and processing capabilities needed for ICE vehicle production are insufficient in supply. The first step to xEV production should be to enhance investment incentives for companies that can bring in materials, components, parts, and/or processing capabilities that are used both by ICE vehicles and xEVs and successfully attract them to invest in the Philippines.

Final Report

Project for Elaboration of Industrial Promotion Plans Using Value Chain Analysis
in the Republic of the Philippines

Annex A

Overview of Project Activities

May 2019

- Joint Venture Project Team -



野村総合研究所
Nomura Research Institute

IMG Inc.

IL
JR
19-050

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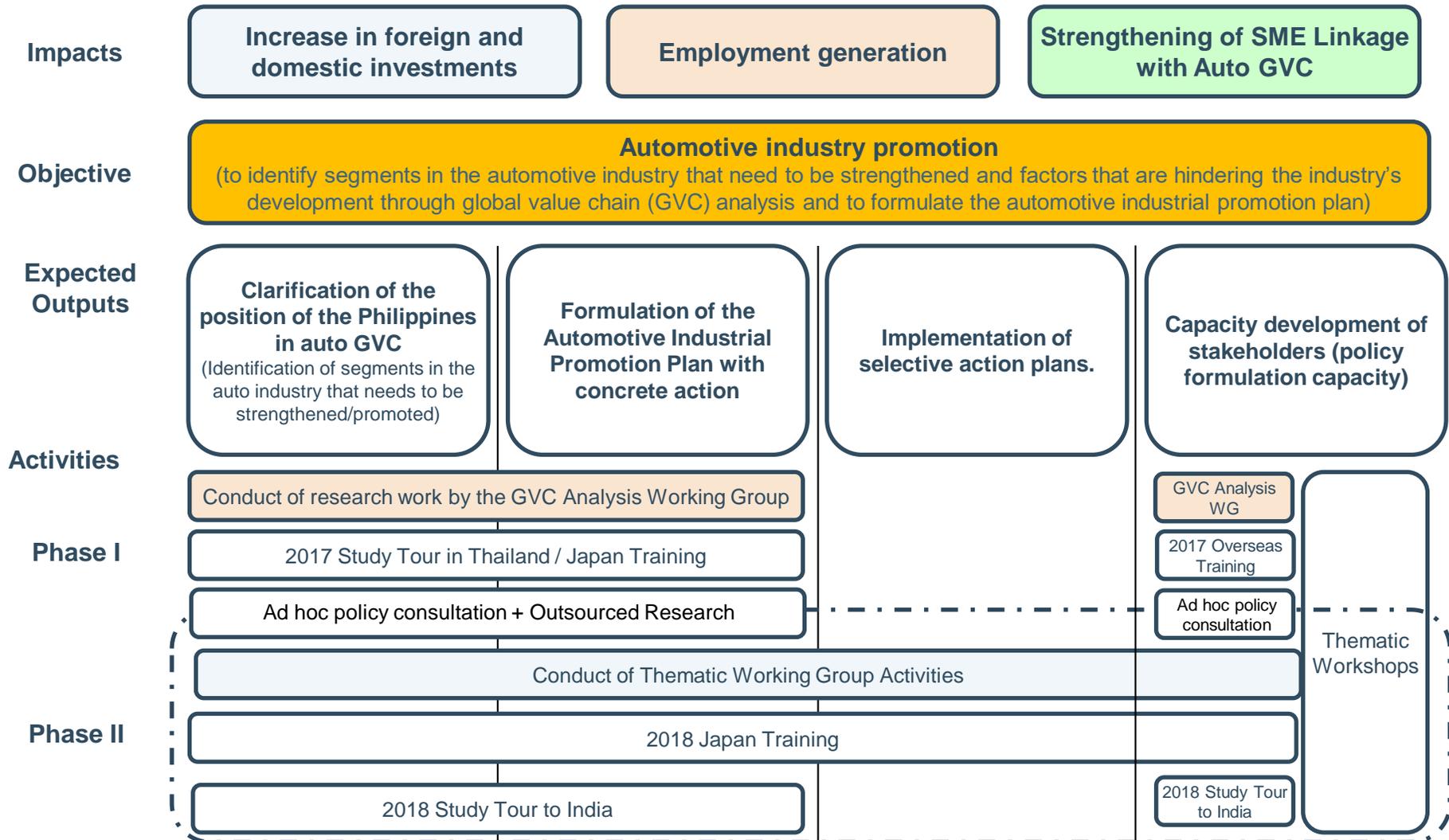
3 Phase II: Working Group Activities

4 Other Activities: Overseas Training, Workshops, Consultation, etc

5 Capacity Development Results

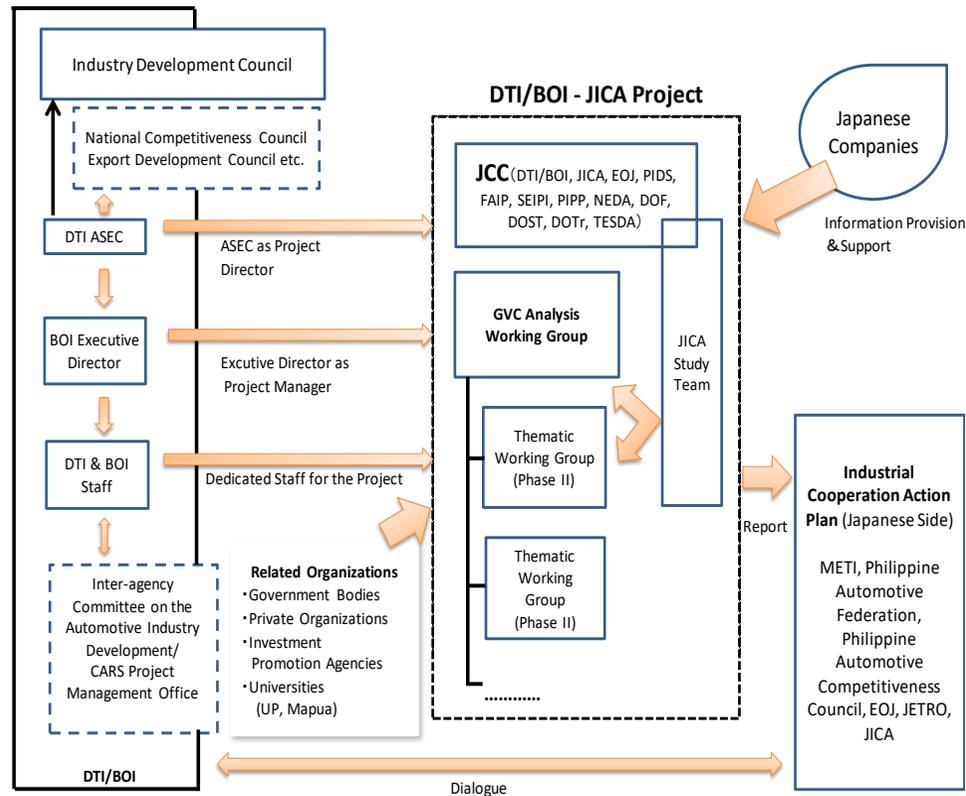
1. Overview of the Project

Project Objective, Outputs, and Activities



Project Stakeholders

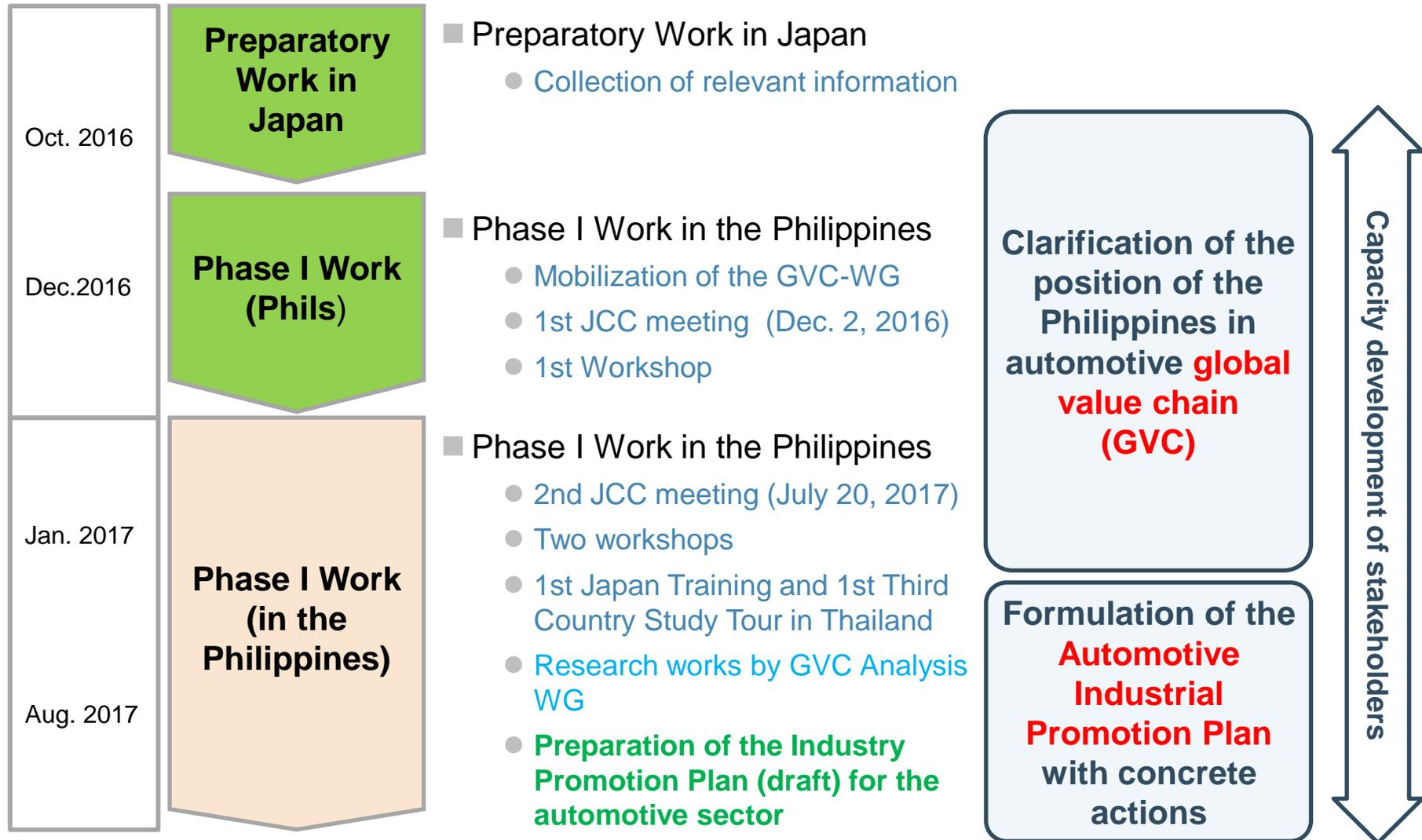
Organizational Chart



JCC Members

Japan Side	Philippine Side	
Government Organizations	Government Organizations	Private Organizations
<ul style="list-style-type: none"> ➤ JICA Philippine Office ➤ Embassy of Japan in the Philippines 	<ul style="list-style-type: none"> ➤ DTI ➤ National Economic and Development Authority (NEDA) ➤ Department of Finance (DOF) ➤ Department of Science and Technology (DOST) ➤ Department of Transportation (DOTr) ➤ Technical Education and Skills Development Authority (TESDA) ➤ Philippine Institute for Development Studies (PIDS) ➤ Steering Committee for the Philippine Investment Promotion Plan (PIPP) 	<ul style="list-style-type: none"> ➤ Federation of Automotive Industries in the Philippines (FAIP) ➤ Semiconductor and Electronics Industries in the Philippines Foundation, Inc. (SEIPI)

Outline of Project Activities in Phase I (Sep 2016 – Aug 2017) — Preparation of the Automotive Industry Promotion Plan —



1. Outline of the project

Outline of Project Activities in Phase II (Sep 2017 – 2019) — Implementation of Selective Action Plans —

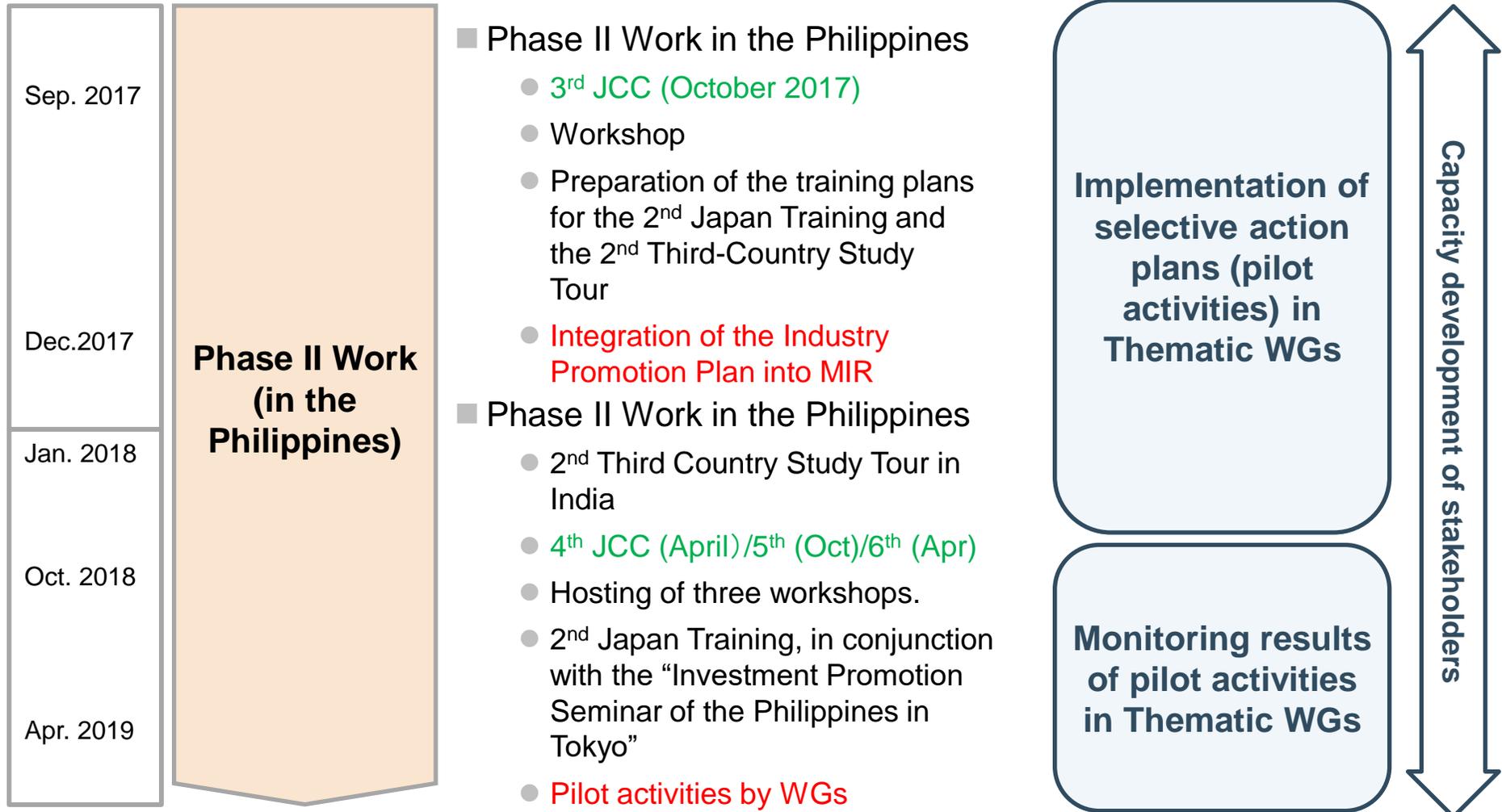


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4 Other Activities: Overseas Training, Workshops, Consultation, etc

5 Capacity Development Results

Overview of WG Activities in Phase I

Phase I : Global Value Chain (GVC) Analysis / Drafting of the Automotive Industry Promotion Plan

➤ Conduct of Research Works by the GVC Working WG

- Objective: to clarify the positioning of the Philippine auto industry through GVC analysis and strengthen skills related to policy formulation among WG members.
- Working group members: 23 members: DTI/BOI (8 members), CARS Program Management Office (1), CAMPI (1), PPMA (2), PIDS (1), MIRDC/DOST (1), TESDA (2), NEDA (1), and JICA Experts (6)
- The Project applied the 3G principles at close.
- Visited 36 companies in the Philippines (Japanese OEMs, Tier 1, R&D and local suppliers, etc) and 10 in Thailand and 8 in Japan
- See Chapter 3 for the findings from the GVC analysis study

3 G Principle (Sangen-shugi)	
Genba 	Actual place: The manufacturing plant/workplace where the product is actually produced
Genbutsu 	Actual things: The actual equipment, materials, products and any other items that are actually involved in the production
Genjitsu 	actual situations/facts: Actual situations, processes, and facts involved in the production

Note: See Reference Document D for list of WG members

Overview of WG Activities in Phase I

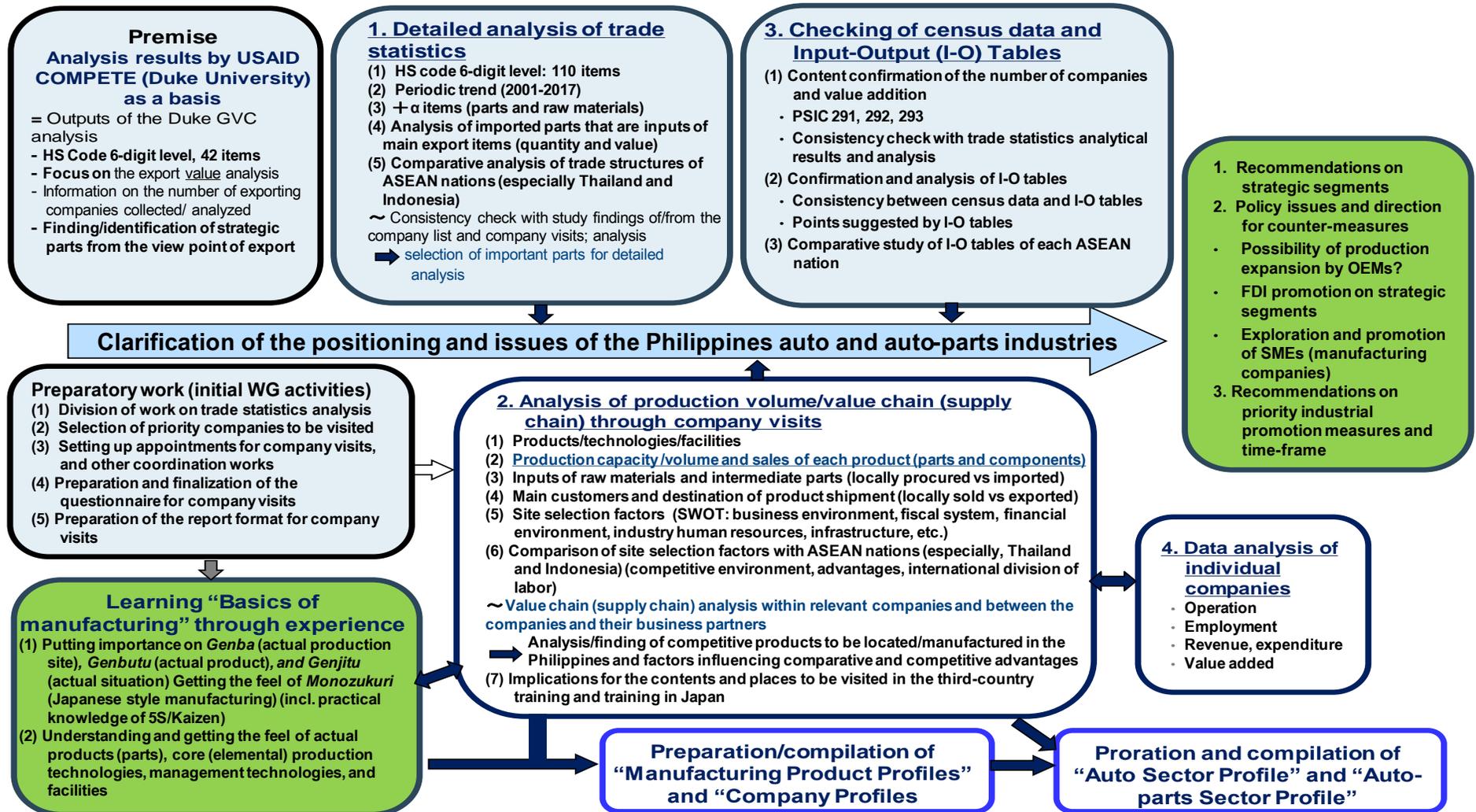


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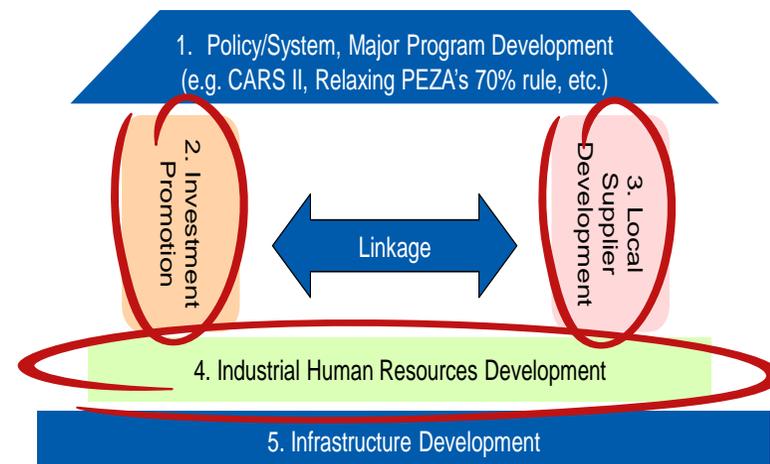
5 Capacity Development Results

Overview of WG Activities in Phase II

Phase II: Thematic Working Groups and Elaboration of Action Plans

Conduct of pilot activities (selected action plans thematic working groups)

- **Objective:** to review action plans for the Auto Industry P Plan, to implement selected action plan, and to deepen understanding about related issues affecting the auto industry in the fields of investment promotion, local supplier development and industrial human resources development and infrastructure development



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Investment Promotion	Local Supplier Development	Industrial Human Resources Development
14 members: DTI/BOI (11), PEZA (1), PIDS (1), and JICA Expert (1)*	9 members: DTI/BOI (3), MIRDC/DOST (1), NEDA (1), PPMA (1), JICA Expert (3) (in addition: DAP and NWPC participated in Kaizen consultation)*	8 members: DTI/BOI (1), TESDA (2), CHED (2), DOLE (1), CAMPI (1), and JICA Expert (1)*
<ul style="list-style-type: none"> • Development of investment promotion tools • Conduct of group specific investment activities (see 2018 Japan Training) • Review/revision of action plans 	<ul style="list-style-type: none"> • Provision of Firm-level Kaizen consultation • Development of the local manufacture profile database • Review/revision of action plans 	<ul style="list-style-type: none"> • Conduct of the industrial human resources development survey • Participated in 2017 International Convention on Quality Control Circles • Facilitation of industry-academia linkage • Review/revision of action plans

*See Reference Document D for list of WG members

- In each working group, findings from pilot activities and information gathered through other WG-related activities were discussed in periodic working group meetings. In the process, action plans attached to the Automotive Industry Promotion Plan were reviewed and elaborated.
- See Reference Document C for detailed reports or documents prepared in each working group.

3. Phase II: Working Group Activities

1

Investment Promotion: Area Specific Investment Promotion

[Targeted Locations/Keiretsu]

- Okayama – for MMPC
- Nagoya – for Toyota

[Period]

- July 2018

[Organized by]

- PH Embassy in Japan and JICA Expert Team

[Cooperation Partners]

- Okayama International Business Association (OIBA)
- Nagoya Chamber of Commerce and Industry
- Osaka International Business Promotion Center

[Participated Auto-Parts Companies from Philippines]

- Integrated Micro-Electronics Inc (IMI)
- RJ Spring Rubber and Metal Parts Mfg Corp.
- Tri-R Allied Industries Inc
- Manly Plastics
- Laguna Carparts Mfg., Inc

	Main Activities	No.
Jul 23	Seminars <ul style="list-style-type: none"> • “The Philippines as Investment Destination” DTI Asec Aldaba • “Business Experiences in the Philippines” OB Kogyo 	42 persons (27 companies)
	Business matching (7 Philippine companies)	47 persons (25 companies)
Jul 26	Seminars <ul style="list-style-type: none"> • “Manufacturing Industry Resurgence in the Philippines” DTI Lopez • “Business Experience in the Philippines” NBC Corporation 	99 persons
Jul 27	Seminars <ul style="list-style-type: none"> • “Manufacturing Industry Resurgence in the Philippines” DTI Lopez • “Business Experience in the Philippines” OB Kogyo 	102 persons
Total (Aggregate)		243 persons



1,000 copies of promotional materials distributed (see Reference Document C)

1 Investment Promotion: Area Specific Investment Promotion

Major findings and learnings from the pilot project

Area specific investment promotion is effective especially for the automotive sector.

- Automotive industry tends to locate in certain area for reducing logistics cost and lead time.

Multi language support for medium sized companies is important especially for following up after a seminar / business matching.

- One participated auto parts company reported follow-up communication was difficult, partly due to the language barrier .

Potential market, incentive support for investment and business friendly environment for automotive sector are the key topics to be delivered.

- The main concern of investor is the payout time of investment and the long term sustainability of the business.

2 Local Supplier Development: Supplier Database

- Development of the Auto Supplier Profiles: 59 profiles developed
- Auto Supplier Profile Database (launched at the end of Sep. 2018)
 - <http://boi.gov.ph/supplier-database/>
- Access Counts



Oct –Dec 2018	Jan-March 2019
832 (Oct: 473, Nov: 210, Dec: 149)	457 (Jan: 141, Feb: 126, Mar: 190)
Philippines (64%), Japan (24%), Singapore (5%), US (2%), South Korea (1%), Taiwan (1%), Thailand, Bangladesh, Germany, Spain, Sri Lanka, Sweden, Turkey, Viet Nam	Philippines (76%), Japan (10%), US (4%), Singapore (3%), South Korea (2%), Thailand (2%), Australia, Bangladesh, India, Malaysia, Spain, Sri Lanka, Sweden, Turkey, Viet Nam

2 Local Supplier Development: Supplier Database

Feedback from companies listed in the database:

- Feedback/Reaction from Companies Visited by the Project (as a part of monitoring for Kaizen and other activities):

VSO Global

A company, Nobile Inc. is a local company of which its headquarters in Germany, browsed their profile in the website and contacted VSO. Nobile Inc already toured VSO's plant and VSO is now working on drawing.

Fasteners, Tri-Rallied, & Albert

They have yet to have contacts from new clients who found them through the BOI supplier database. Their managements were not aware that their profiles became finally open to the public through the database.

IMI

There seem to be multiple databases under construction by the Philippine Government. It is confusing. There should be one consolidated database.

2 Local Supplier Development: Supplier Database

Major findings and learnings from the pilot project

This sort of database is quite effective for promoting local suppliers to potential customers all over the world.

Information of types and numbers of process machinery and production capacity are very important.

- A simple directory of companies will not be sufficient to draw attention of potential clients.

The database should be appealed in investment promotion and information should be proactively and widely published to the world.

Local Supplier Development: Kaizen Monitoring: Kaizen Consultation

		Done	On-going	Approved/ Planned	Rejected	Total
Albert Metalcraft Inc. (metal sheets; Valenzuela)	April 2018 (identified)	39	13	-	3	55
	Nov. 2018 (updates)	52	0	-	0	52
	Nov. 2018 (new)*	0	0	-	0	0
Fasteners Inc. (metal fasteners; Caloocan City)	April 2018 (identified)	5	25	5	7	42
	Nov. 2018 (updates)	15	18	4	5	42
	Nov. 2018 (new)	7	0	0	0	7
Tri-R Allied Industries, Inc. (metal parts; Cavite)	April 2018 (identified)	2	1	2	-	5
	Nov. 2018 (updates)	3	1	1	-	5
	Nov. 2018 (new)	3	0	0	-	3
VSO Global, Inc. (auto seat wires; Laguna)	April 2018 (identified)	2	1	2	-	5
	Nov. 2018 (updates)	3	1	1	-	5
	Nov. 2018 (new)	2	0	0	-	2

* The company has been undergoing renovation; this is why no new Kaizen ideas are proposed.

2 Local Supplier Development: Kaizen Monitoring: Kaizen Consultation

-  Kaizen ideas that were raised but yet implemented during the consultation period have steadily been implemented at all four companies. **Most of them are completed.**
-  **Less Kaizen ideas are being produced** compared to the consultation period.
-  Companies managed by those who have a very strong motivation for Kaizen are **implementing “Yokoten** (lateral application of Kaizen solutions to other processes)”
-  **No companies have developed Kaizen plans.**
-  Companies that are taking a part in **group-company QC competitions or internal Small Group Activity (QC) competitions** as a way to give recognitions for Kaizen achievements **are progressing in their Kaizen efforts.**

[Positive Impacts Reported by Top Management]

Cost reduction, quality improvement, increase in awareness to notice items to be improved, learning of new Kaizen analytical tools.

[Request for Future Technical Guidance]

Production planning, improvement of productivity, improvement of press process, mold design and etc.



2 Local Supplier Development: Kaizen

Major findings and learnings from the pilot project

To participate in GVC, continuous efforts of Kaizen is essentially important.

- The quality, cost, delivery and production volume should meet the requirement of global standard.

Disappointment: no company developed Kaizen plan. Kaizen activity slowed after consultants left.

Offering chances for local suppliers to appeal their Kaizen capability to potential clients will be very important to motivate continue the activity.

- The local supplier database and/or business matching with large / foreign companies will be good occasions.

3 Industrial Human Resources Development: Industry-Academia Linkage

Main Activities	Note
<p>Facilitate the industry-academic linkage</p>	<ul style="list-style-type: none"> ■ The Project, with the collaboration with the Technological Institute of the Philippines (TIP) and Jobstreet.com (leading recruitment on-line site in the Philippines), hosted the Philippine Auto Industry-Academia Linkage Congress at TIP-Quezon Campus in September 2018. ✓ The event was composed of the seminar portion in the morning and the “meet auto companies” session in the afternoon. In the seminar, three companies (IMI, Denso, and SIIX) gave presentations about their current and future operation and human resources needs and BOI gave a presentation about the overview of the auto industry in the Philippines. ✓ More than 1,000 university students and industry coordinators (faculty members in charge of industry coordination) attended the event. ✓ 25 companies participated: 6 Assemblers (OEMs), 17 Tiers 1/2, 2 Tier 3 ✓ The video (livestreaming) of the seminar was broadcasted by TIP’s FB account was watched by 3.8K viewers (aggregate total).

3 Industrial Human Resources Development: Industry-Academia Linkage

Major findings and learnings from the pilot project

It is important to expand industry–academia linkage in various aspects (layers).

- i.e., industry & students, industry & faculty members etc. Further mutual understanding is key for better employment and better curriculum.

Motivating both industry & academia to spontaneously continue this sort of activity with little help from the government is the key for success.

In the succeeding JICA project, this kind of event is expected to continue

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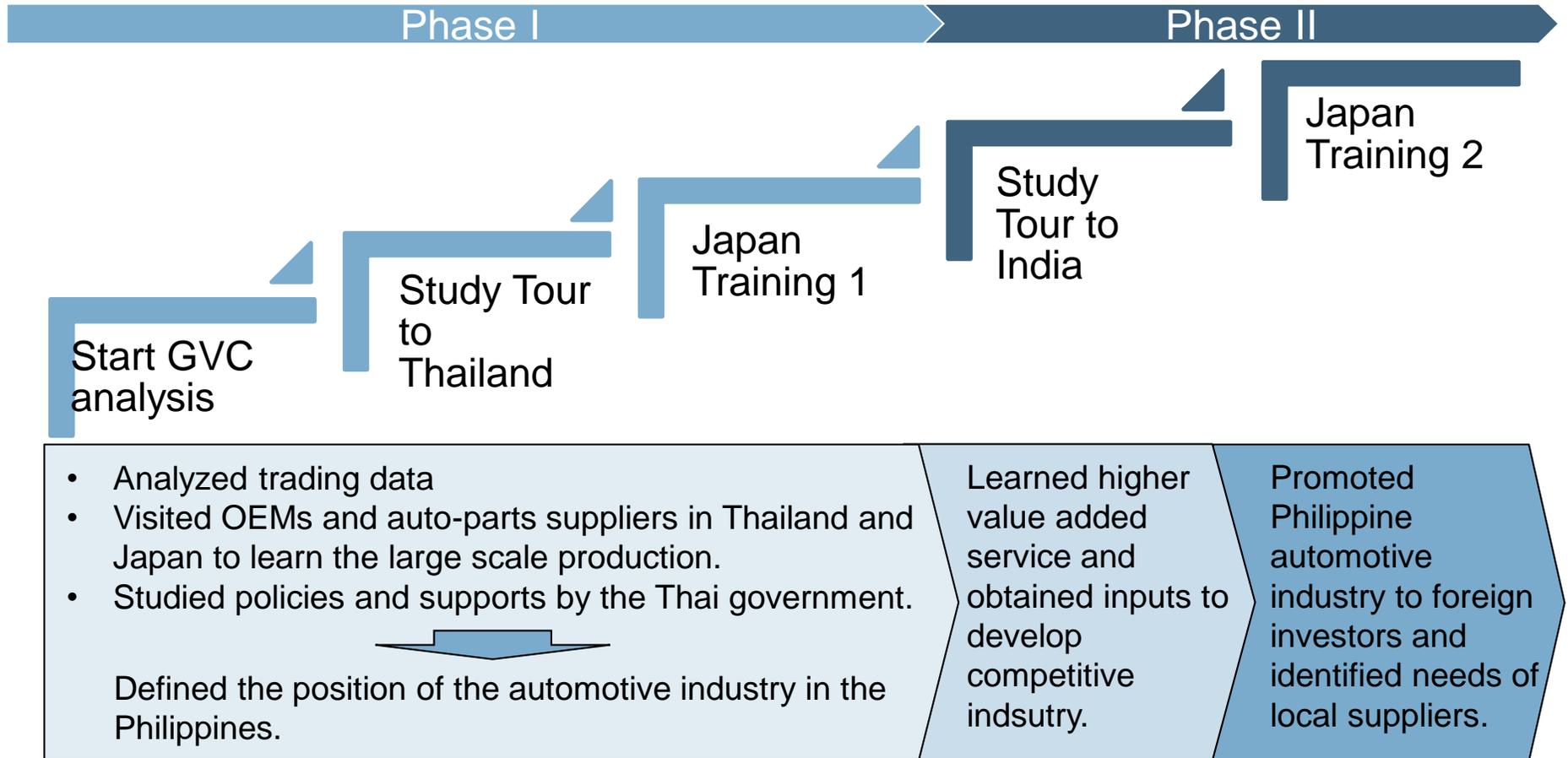
2 Phase I: Working Group Activities

3 Phase II: Working Group Activities

4 Other Activities: Overseas Training, Workshops, Consultation, etc

5 Capacity Development Results

Overseas Training



Outcome of participants:

- **Have deeper understanding of the position of the Philippine automotive industry to promote.**
- **Understand the needs of the industry to improve and can suggest solutions.**

Note: See Reference Document D for list of participants, detailed itinerary, and reports submitted by training/tour participants.

Overseas Training in Phase I

➤ **2017 Study Tour to Thailand**

- Participation: 8 representatives from: DTI/BOI (5 persons) , MIRDC/DOST (1) , TESDA (1), and NEDA (1)
- Main activities: Visited two Japanese OEMs and two parts suppliers in Thailand, four Thai parts suppliers, two Thai Government Agencies, and one educational institute focused on auto manufacturing
- Outputs: Study tour report on five topics: 1) Policies and Regulations, 2) Industrial Technology, 3) Quality Control, 4) Human Resources Development, 5) R&D Activities.

➤ **2017 Japan Training**

- Participation: 10 representatives from: DTI/BOI (6) , MIRDC/DOST (1) , TESDA (1), NEDA (1), and PIDS (1) (1)
- Main activities: Visits to two Japanese OEMs, seven parts
- Outputs: Action plans (concept paper) for the promotion of the automotive industry in the Philippines

Overseas Training in Phase II

➤ 2018 Study Tour to India

- Participation: 10 representatives in total from: DTI/BOI (7) , MIRDC/DOST (1) , TESDA (1), and NEDA (1)
- Main activities: Visits to two Japanese OEMs, two Indian auto parts suppliers (Tier 1), **two ESO companies**, one government organization and two industry associations related to auto manufacturing
- Learnings : Learned ESO as a new value added service being different from labor intensive job, obtained inputs for BOI to achieve Inclusive Innovation Industries Strategy.

➤ 2018 Japan Training

- Participation: 9 representatives in total from: DTI/BOI (8) and PIDS (1)
- Main activities: Investment promotion seminar, business matching, visit to OEMs, discussion with a Japanese bank supporting SMEs to venture overseas businesses
- Learnings: Learned needs of enhancing not only production skills of Philippine local companies, but also sales and marketing skills to promote Philippine local suppliers.

4. Other Activities: Overseas Training, Workshops, Consultation, etc

Overview of Activities in Phase I + II: Capacity Development (Thematic Workshops)

No.	Date	Presentation Titles	Presenters	No
1	Dec. 2, 2016	<ul style="list-style-type: none"> Philippine Auto Industry and CARS Program Global Warming and Automobile Technology Trend – the Potential of E-Vehicle in the Philippines- Development History of the Indian Automobile Industry 	DTI Asec Ms. Aldaba Mr. Imai, JICA Expert Mr. Sharma, JICA Expert	51
2	Feb. 16, 2017	Automobile Industry: Typical Supply-Chain of Auto Industry; Platform; Evolution of Car Electronics	Mr. Imai, JICA Expert	21
3	Mar. 24 2017	<ul style="list-style-type: none"> Promotion Policy and Development of the Thai Automotive Industry Evolution of Local Vehicle Production & Vehicle Development Process 	Mr. Iwadare, JICA Expert Mr. Imai, JICA Expert	33
4	July 20, 2017	<ul style="list-style-type: none"> Overview of Automotive Sector and Policy of Indonesia Engineering Services Outsources (ESO): India's Success Story, Imperatives for the Philippines 	Mr. Iwadare, JICA Expert Mr. Sharma, JICA Expert	22
5	Oct. 23, 2017	<ul style="list-style-type: none"> Supplier Development and Location for Automotive Industry Promotion Investment Promotion Policies in India 	Mr. Imai, JICA Expert Mr. Sharma, JICA Expert	34
6	Apr. 20, 2018	<ul style="list-style-type: none"> Toyota Production System (TPS) Perspectives for Automotive Electronics Production in the Philippines 	Mr. Yoshida, JICA Expert Mr. Sugiyama, JICA Expert	24
7	Oct. 16, 2018	xEV (HEV, PHEV, BEV) Global Developments and Implementation for the Philippines	Mr. Sharma, JICA Expert	28
8	Apr 12 2019	<ul style="list-style-type: none"> For Further Development of the Automotive Sector in the Philippines Introduction of the Succeeding Project PH Auto Policy: Building the Manufacturing Ecosystem and Transforming the Auto Industry in the New Digital Age 	Mr. Iwadare, JICA Expert Mr. Fujiwara, JICA Expert DTI Usec Ms. Aldaba	85

See Reference Document A for Presentation Materials Used in the Workshop

Overview of Activities in Phase I + II

- Ad Hoc Policy Consultation + Stakeholder Engagement
 - Electric vehicle matters (discussion with the CARS Team and private sectors)
 - ESO development in the Philippines
 - Presentation in the 2018 Manufacturing Summit
 - Preparation in the ESO roadmap development
- Outsourced Research (See Reference Document B)
 - Study on Industrial Statistics and Manufacturing Industry Development Policies in ASEAN: Thailand, Indonesia, Malaysia, Viet Nam
 - Use of the Batangas Port

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1 Overview of the Project

2 Phase I: Working Group Activities

3 Phase II: Working Group Activities

4 Other Activities: Overseas Training, Workshops, Consultation, etc

5 Capacity Development Results

Learning Gained

Through partaking in project activities...

- Representatives from key agencies (namely, DTI/BOI, NEDA, TESDA, MIRDC/DOST, and PIDS) gained in-depth understanding of the current situation and issues/challenges surrounding the automotive industry not only in the Philippines but also other countries, such as Thailand, India and Japan.
 - Auto industry supply chains / value chains
 - Local supplier development
 - Industrial human resources development
 - Investment promotion
 - Electric vehicles
 - ESO

- Representatives from key agencies became able to suggest measures (action plans) to address the issues affecting the industry. (See Reference Document D for Main Outputs Produced by working group members)

NRI

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Dream up the future.

Final Report

Project for Elaboration of Industrial Promotion Plans Using Value Chain Analysis
in the Republic of the Philippines

Annex B Automotive Industry Promotion Plan

May 2019

- Joint Venture Project Team -



野村総合研究所
Nomura Research Institute

IMG Inc.

IL
JR
19-050

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1. One Million Unit Production in the Philippines

2. Specific Measures and Action Plans for Five Policy Domains

3. Implementation Schedule of AIPP

One-million car production is led by OEMs. Acceleration of investments by auto parts suppliers is usually observed when a country hitting the one million unit mark become a realistic future.

(Breaking the One-million Production Mark in Thailand and Indonesia)

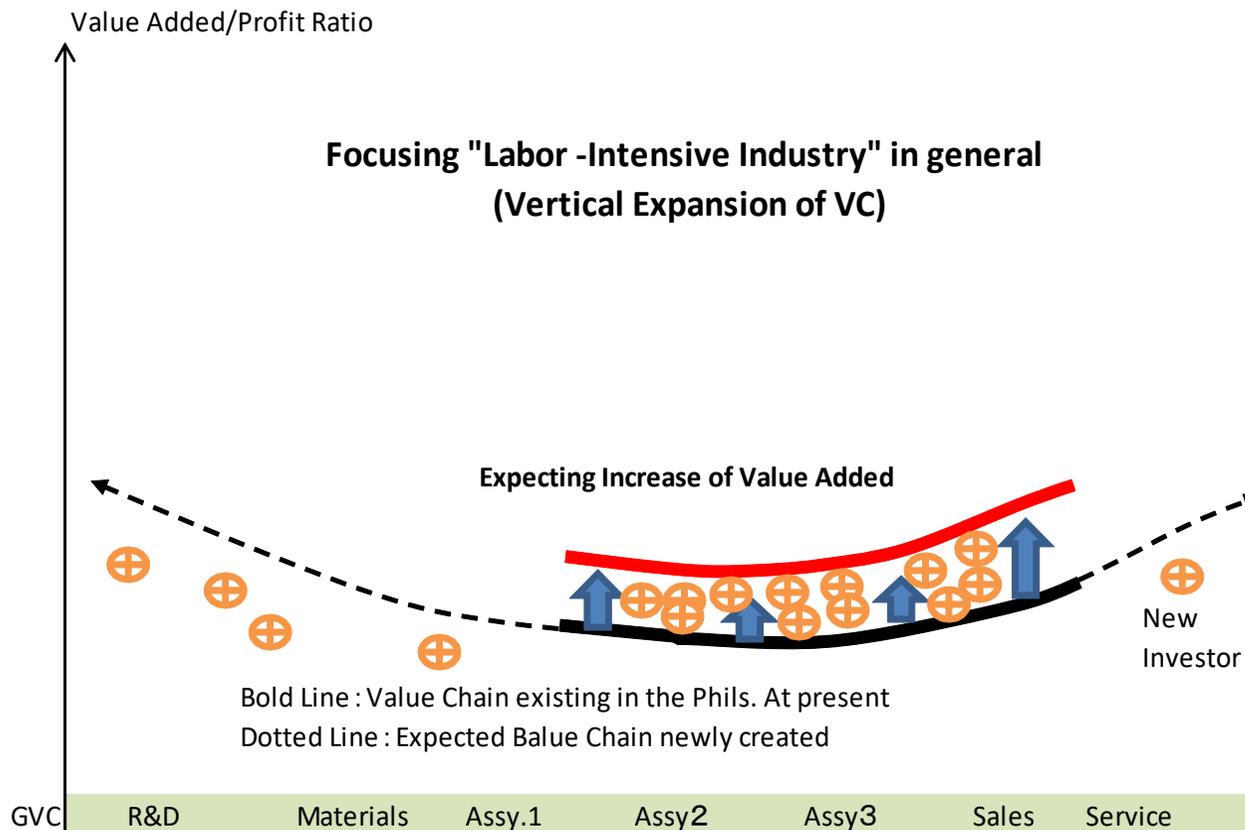
- Both countries broke the one-million car production mark in 2012. In 2016, there are remarkable difference between two countries; Thailand produces 1.94 million units and Indonesia at 1.18 million units.
- This difference may be caused from the stock of capital and human resource during the preceding years. In 2013, the investment of the transportation sector in Indonesia amounted at US\$1.0 billion and it was 75% of Thailand (the investment in Thailand was US\$13.2 billion in the same year) . It shows that Indonesia is catching up Thailand since the 2013 investment amount in the former was nearly the same level of the latter in 2006.
- The one-million automotive production in Indonesia was led by OEMs but not by auto parts supplier. According to many academic researches, the one-million production mark in Indonesia was caused by **i) market size, ii) Income level of buyer, and iii) car sales promotion (incentive) by the Indonesia Government**. In Indonesia, investments from auto parts supplier started to mushroom after 2013.
- Accordingly, one-million car production is achievable even without development of auto parts industry. Attracting auto parts supplier is prerequisites (in a sense increasing capital stock) but not sufficient condition. Accumulation of auto parts industry, as far as saying from the precedents of Thailand and Indonesia, is affecting to the growth rate of car production after achieving one-million production.

Table Distribution of Autoparts Supplier after late-2010s

	Number of Auto parts Suplier	OEM	Tier1	Tier2	Below Tier3
Japan	25,000	14	800	4,000	20,000
Thailand	2,500	16	700	1,700	
Indonesia	550	12	170	350	
Philippines	340	13	220-270	70-120	

Cluster formulation by attracting investors should take effect. Improving QCD capacities among cluster members will occur as a result.

- Improvement of QCD capacities occurs through sharing of common techniques and competitive rivalry. It will be also brought about by the gradual introduction of the higher grade (= high value) of auto parts that will be manufactured if a technology level of cluster members is upgraded and new opportunities created through this are recognized by HQ.



- DTI/BOI needs to establish clusters for these suppliers and enhance the linkage among those companies.
- Attracting big players draws the interest of entire players.

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1. One Million Unit Production in the Philippines

2. Specific Measures and Action Plans for Five Policy Domains

a. Policies/System and Programs

b. Investment Promotion

c. Local Supplier Development

d. Industrial Human Resource
Development

e. Infrastructure Development

3. Implementation Schedule of AIPP

2. Specific Measures and Action Plans for Five Policy Domains

Domain 1: Policy/System and Major Programs

Specific Measures	
Overall	<ul style="list-style-type: none"> Approval of the Automotive Industry Promotion Plan
Automotive Sector	<ul style="list-style-type: none"> Preparation and approval of the CARS II Program for achieving one million production ^{1/}
Auto Parts Sector	<ul style="list-style-type: none"> Relaxation of the PEZA's 70% export rule for enhancing the domestic supply chain Approval of the investment program for strategic auto parts ^{1/}

^{1/} See action plans for investment promotion



Action Plan	Ref
[Policy Formulation] 1 Approval of the Automotive Industry Promotion Plan <ul style="list-style-type: none"> Release of the one million car production plan Relaxing of PEZA's 70% rule 	Action 1-1
[Research and Framework Dev.] 1 Technology sophistication 2 Strengthening technologies that are lacking 3 Reduction of transportation / logistic costs for lowering production costs	Action 1-2 Action 1-3 Action 1-4

(*) Actions 1-2 and 1-3 are the framework development for improvement of QCD. Action 1-4 concerns infrastructure development related issues (Policy Domain 5); necessary initiatives of DTI/BOI were listed.

Domain 2: Investment Promotion

Specific Measures	
Overall	<ul style="list-style-type: none"> Improvements of efficiency in investment promotion activities
Investment Promotion Tools	<ul style="list-style-type: none"> Preparation of attractive incentive packages Strengthening of intelligence activities Information provision of supporting industries*

* Activities will be carried out in collaboration with actions for local industries development



Action Plan	Ref
[Increased Efficiency] 1 Carry out investment promotion activities with improved efficiency to attract business <ul style="list-style-type: none"> Select target companies Conduct investment promotion activities in Japan, South Korea, etc 	Action 2-1
[Implementation] 1 Discussion/ application on the improved incentive system <ul style="list-style-type: none"> Incentives on drive-train related parts manufacturing Incentives on export promotion Incentive on electric motor and parts used for E-vehicles Incentives on production volume and the number of manufacturing models / body types (CARS II) 2 Strengthening intelligence activities 3 Nurture and accumulate supporting industries for companies that are targeted for investment promotion	Action 2-2 Action 2-3 Action 2-4

Domain 3: Local Supplier Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Research for identifying needs by Tier 1 & 2 and preparation of strategies for local supplier development 	[Institutional Setup] 1 Carry out investment promotion activities with improved efficiency to attract business <ul style="list-style-type: none"> Establish a collaborative working group Support the collaborative working group's activities 	Action 3-1
Technology and business upgrading services	<ul style="list-style-type: none"> Profiling of local suppliers and their technology level* ↓ Technical support from Tier 1 and 2 companies to local suppliers Promotion of business matching ↓ Capacity development of local suppliers (Kaizen, production planning, safety, business management, etc) 	[Technology and Business Upgrading Services] 1 Support upgrading processing technologies among local suppliers (technology, equipment, and facility upgrading) 2 Support upgrading production management technologies among local suppliers (Kaizen, leadership and management, and safety) 3 Support business matching and expansion of local suppliers*	Action 3-2 Action 3-3 Action 3-4

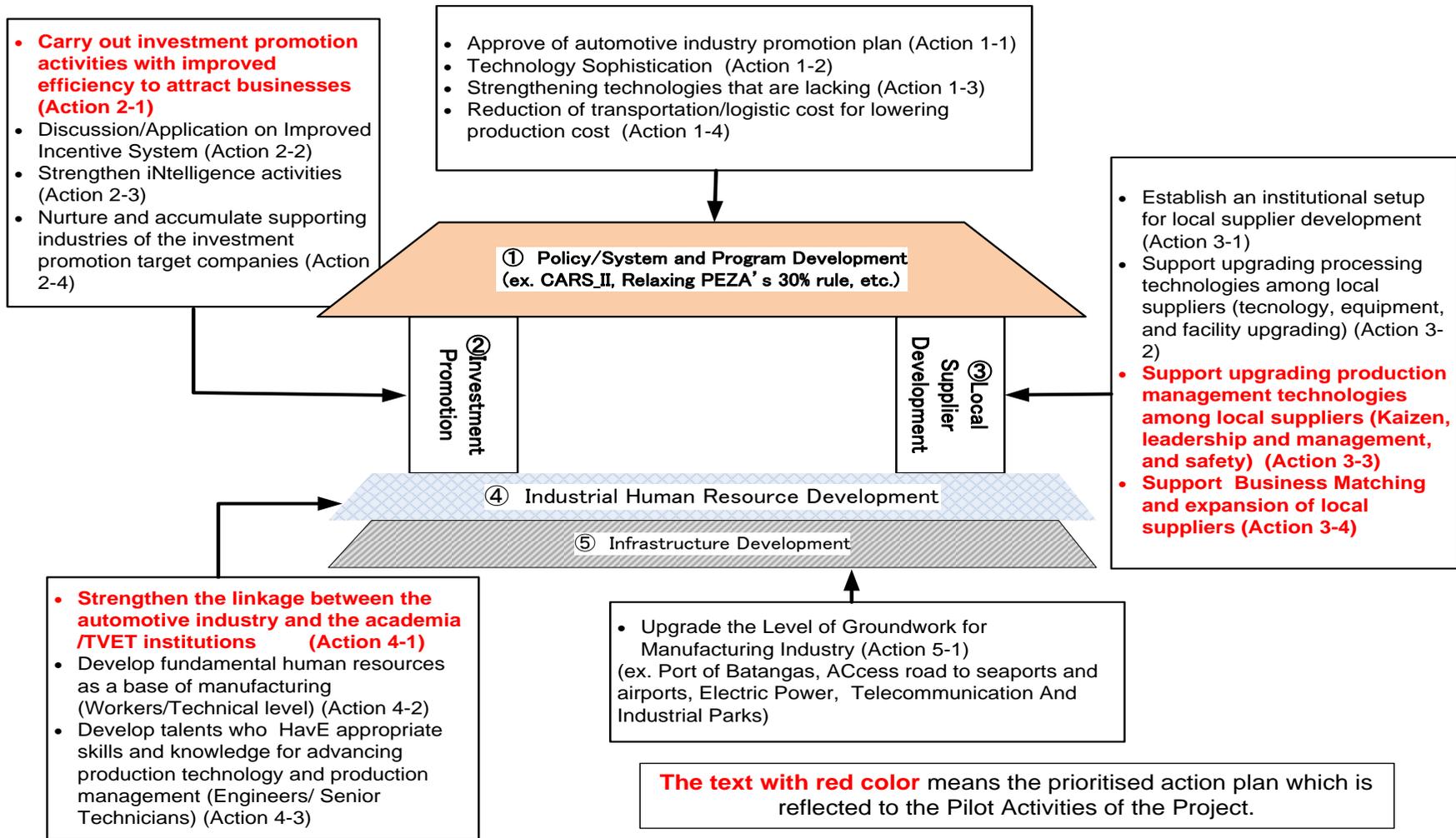
Domain 4: Industrial Human Resources Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Establish a well-functioning mechanism for supporting the industry-academia collaboration 	[Awareness / Linkage Formulation] 1 Strengthen the linkage between the automotive industry and the academia/TVET institutions	Action 4-1
Industry-Academia Linkage	<ul style="list-style-type: none"> Increase more opportunities to learn about the automotive industry Review/revise courses related to the automotive industry Strengthen industrial human resources of all skill levels 	[Quality Upgrading] 1 Develop fundamental industrial human resources as a base of manufacturing ⇒ Workers/Technician Level 2 Develop talents who have appropriate skills and knowledge for advancing production technology and production management ⇒ Engineers / Sr. Technicians	Action 4-2 Action 4-3

Domain 5: Infrastructure Development

Specific Measures		Action Plan	Ref
Overall	<ul style="list-style-type: none"> Follow the national policy, "Build, Build, Build (BBB) Program" (the public spending on infrastructure projects is targeted at Php 8 -9 billion from 2017-2022) Encourage the private sector to partake in the "Swiss Challenge" for infrastructure development for industry development 	[Development Direction] 1 Improve infrastructure for the manufacturing industry <ul style="list-style-type: none"> Port of Batangas Access road to seaports and airports Electric power development Telecommunication development Industrial park development 	Action 5-1

* The study on infrastructure development was out of scope of the Project



Action Plans by Five Policy Domains

2-1 Detail Explanation of Action Plan

This section aligns the contents of each policy domain discussed so far and clarifies major activities which composes set Action Plan. The tables shown after the page for the alignment of domain shows such activities.

2-1-1 Policy/System and Major Program Development

Each Action Plan contains several remarkable activities and those were indicated the correspondence of action plan number (ex. The activity “# Policy 1-1-1” falls into the category of “Action 1-1” below).

Policy Domain 1: Policies/Systems and Major Programs																						
Direction:	<ul style="list-style-type: none"> As the umbrella policy domain of the entire promotion plan, Policies /Systems and Major Programs Domain include action plans on i) policy formulation and ii) research and framework development. The Philippine government approves the one-million automotive production plan. 																					
Indicators:	1) Approval of the Automotive Industry Promotion Plan, 2) relaxing the PEZA’s 70% rule, and 3) approval of incentive programs for automotive and auto parts																					
Action Plans (8 plans):	<table> <tr> <td><Policy Formulation></td> <td>Action 1-1</td> <td>(2 plans)</td> </tr> <tr> <td>Approval of the Automotive Industry Promotion Plan</td> <td></td> <td></td> </tr> <tr> <td>➤ Release of the one million car production plan</td> <td></td> <td></td> </tr> <tr> <td>➤ Relaxing the PEZA’s 70% rule</td> <td></td> <td></td> </tr> <tr> <td><Research and Framework Development></td> <td></td> <td></td> </tr> <tr> <td>Technology sophistication</td> <td>Action 1-2</td> <td>(3 plans)</td> </tr> <tr> <td>Reduction of transportation / logistic cost for lowering production cost</td> <td>Action 1-3</td> <td>(3 plans)</td> </tr> </table>	<Policy Formulation>	Action 1-1	(2 plans)	Approval of the Automotive Industry Promotion Plan			➤ Release of the one million car production plan			➤ Relaxing the PEZA’s 70% rule			<Research and Framework Development>			Technology sophistication	Action 1-2	(3 plans)	Reduction of transportation / logistic cost for lowering production cost	Action 1-3	(3 plans)
<Policy Formulation>	Action 1-1	(2 plans)																				
Approval of the Automotive Industry Promotion Plan																						
➤ Release of the one million car production plan																						
➤ Relaxing the PEZA’s 70% rule																						
<Research and Framework Development>																						
Technology sophistication	Action 1-2	(3 plans)																				
Reduction of transportation / logistic cost for lowering production cost	Action 1-3	(3 plans)																				

Overall: Approval of the Automotive Industry Promotion Plan

Automotive: Preparation and approval of the CARS II Program for achieving 1 million production (*)

Auto Parts: Relaxation of the PEZA’s 70% export rule for enhancing domestic supply chain

Approval of the incentive program for strategic auto parts (*)

* See action plan for investment promotion

Research and framework development for QCD improvement

# Policy 1-1-1	Implementing Event: 2018 - 2019
Action	Approval of the Automotive Industry Promotion Plan as the compass for developing the manufacturing industry in the Philippines.
Activity	Release of the One-Million Unit Production Plan
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Engage various stakeholders with the discussions on the AIPP in order for the plan becomes a part of the Philippine government's policy and is widely recognized by stakeholders. Automotive Industry Promotion Plan to be recognized by stakeholders.
Partners:	Automotive industry players (industry association, OEMs, and suppliers)
Resources:	Detailed action plan for implementation
Challenge:	Approval from DOF on financial requirements (government incentive/subsidy)
【Responsibilities】	
Responsible Agencies:	DTI/BOI, Industrial Development Committee (IDC)
Implementing Agency:	DTI/BOI
【Major Expenses】	Total(Approx.): NA
<input type="text"/>	

# Policy 1-1-2	Implementing Event: 2019 - 2020
Action	Approval of the Automotive Industry Promotion Plan as the compass for developing the manufacturing industry in the Philippines.
Activity	Solve operational challenges caused by PEZA regulations
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Conduct a study on the PEZA's 70% export rule in order to provide more products made in PEZA zones are consumed in the local market. Bigger percentage of auto parts produced in PEZA areas are sold to the local market.
Partners:	DOF, PEZA locators
Resources:	Economic impact study result
Challenge:	Approval by DOF
【Responsibilities】	
Responsible Agencies:	DTI/BOI, PEZA, IDC
Implementing Agency:	PEZA
【Major Expenses】	Total (Approx.): Php NA
<input type="text"/>	

# Policy 1-2-1	Implementing Event: 2019 -
Action	Technology sophistication
Activity	Shortlist technologies to improve
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Study what technologies are accumulated in each value chain Study investors' deciding factors of locating R&D centers
Partners:	OEMs and suppliers
Resources:	Company interviews
Challenges:	Technical expertise to conduct the study. Cooperation of companies.
【Responsibilities】	
Responsible Agencies:	PPMA, DOST, DTI/BOI
Implementing Agency:	DOST
【Major Expenses】	Total (Approx.): Php NA
<input type="text"/>	
Consultant Fee	

# Policy 1-2-2	Implementing Event: 2020 -
Action	Technology sophistication
Activity	Support R&D activities
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Study incentives for promoting R&D Centers to be placed in the Philippines . • Implement the incentive schemes for R&D Centers.
Partners:	Academe, industry association
Resources:	Benchmark study of R&D centers in other ASEAN countries
Challenges:	<ul style="list-style-type: none"> • Government fund for incentives • Highly advanced human resources to conduce R&D functions
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOF, DOST
Implementing Agency:	DOST
【Major Expenses】	Total (Approx.): Php NA
Budget for Incentives	

# Policy 1-2-3	Implementing Event: 2020 -
Action	Technology sophistication ¹
Activity	Conduct seminars for technology sophistication
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Conduct technology seminars by having instructors from OEMs and Tier 1 companies
Partners:	OEMs and Tier 1 suppliers
Resources:	Knowledge on updated technology
Challenge:	Disclosure and sharing of information by private companies
【Responsibilities】	
Responsible Agencies:	DOST, PPMA, DTI/BOI
Implementing Agency:	PPMA
【Major Expenses】	Total (Approx.): Php NA
Seminar expense	

# Policy 1-3-1	Implementing Event: 2018 -
Action	Support to reduce transportation/logistics costs for lowering production costs
Activity	Study the possibility of lowering logistics costs
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • To lower logistics costs, study the possibility of joint delivery (cooperative delivery) and/or mixed loading, etc.
Partners:	Logistics company
Resources:	Sample companies for cost simulation
Challenge:	Optimization system across the companies (who to initiate, lead and manage the alternative logistic operation)
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOTr
Implementing Agencies:	DTI/BOI, DOTr
【Major Expenses】	Total (Approx.): Php NA
Consultant Fee	

¹ Bringing in technologies that are lacking in the Philippines is one of important policy action area. While this is related to the “Policies and Main Programs” policy domain, policy actions are covered under the local supplier development policy domain.

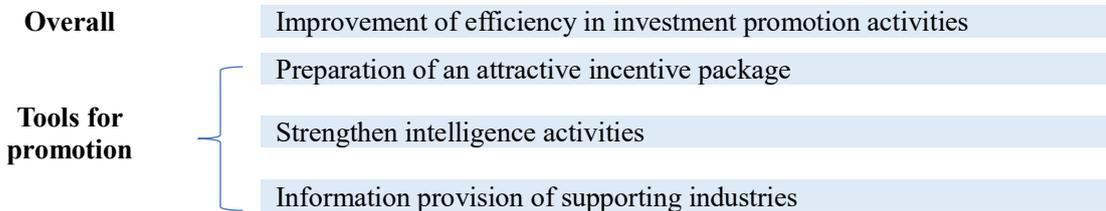
# Policy 1-3-2	Implementing Event: 2019 -
Action	Support to reduce transportation/logistics costs for lowering production costs
Activity	Study the possibility of lowering materials costs
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> To lower material costs, study and understand the current practices of purchasing (material, quantity, manufacturer etc.) of major raw materials suppliers and consider the possibility of joint purchase. DTI/BOI initiates the initial setup (including feasibility study by auto part) and industrial association will establish the group to join collective purchase.
Partners:	Companies (recipient of the raw materials), Raw material suppliers
Resources:	Sample companies for cost simulation
Challenge:	Identifying the common raw materials among the companies.
【Responsibilities】	
Responsible Agency:	DTI/BOI, DOST
Implementing Agency:	PPMA
【Major Expenses】	Total (Approx.): Php NA
Consultant Fee	

# Policy 1-3-3	Implementing Event: 2019 -
Action	Support to reduce transportation/logistics costs for lowering production costs
Activity	Raise awareness about the government's infrastructure development policies
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> More actively share information among different departments and agencies and announce guidelines and schedule on infrastructure development as a pledge to investors Make infrastructure development as government's pledge to the public and execute on schedule.
Partners:	Concerned Government Agencies
Resources:	Infrastructure Development Plan
Challenge:	On time implementation of the plan
【Responsibilities】	
Responsible Agency:	DOTr, Multiple agencies
Implementing Agency:	
【Major Expenses】	Total (Approx.): Php NA
N/A	

2-3-2 Investment Promotion

Each action plan contains several remarkable activities and those were indicated the correspondence of action plan number (ex. The activity “# Investment 2-1-1” falls into the category of “Action 2-1” below).

Policy Domain 2: Investment Promotion	
Direction:	<ul style="list-style-type: none"> Investment promotion is critical for achieving the overall target (i.e. attracting 15 strategic parts companies per year on average.) (5 companies for the complementation strategy, 2 companies for the car electronics attraction strategy and 8 companies for the labor-intensive strategy) The pillar of “Investment Promotion” will be carried out through overall improvement efficiency with enhancing tools for promotion. Proposed several incentive systems should be further discussed in this domain.
Indicator:	Attracting 15 target companies a year
Action Plan:	<Institutional Setup> Action 2-1 (2 plans)
(12 plans)	Carry out investment promotion activities with improved efficiency to attract business
	<Implementation>
	Discussion/ application on improved incentive system Action 2-2 (4 plans)
	<ul style="list-style-type: none"> ➤ Incentives on drive-train related parts manufacturing ➤ Incentives on export promotion ➤ Incentive on electric motor and parts used for E-vehicles ➤ Incentives on production volume and the number of manufacturing models / body types (CARS II)
	Strengthen intelligence activities Action 2-3 (3 plans)
	Nurture and accumulate supporting industries for companies that are the target for investment promotion Action 2-4 (3 plans)



Activities will be carried out in collaboration with actions for local industries development

# Investment 2-1-1	Implementing Event: 2017 -
Action	Carry out investment promotion activities with improved efficiency to attract businesses
Activity	Select target companies
【Activity Direction】	
Contents:	Select promising companies to attract using MarkLines, etc.
Partners:	PEZA and other Investment Promotion Agencies (IPAs) in the Philippines
Resources:	IPAs, the Philippine embassies, central/local government agencies in designated country etc.
Challenge:	<ul style="list-style-type: none"> • Securing good information sources • Obtaining prior information before conducting investment promotion such as strengthening the linkage with JETRO and the chamber of commerce of each country
【Responsibilities】	
Responsible Agencies:	Overseas Philippines embassies, BOI/PEZA
Implementing Agencies:	DTI/BOI in corroboration with Philippine embassy of each country
【Major Expenses】	Total (Approx.): Php 10 Mil (annual)
Travel expenses including the cost of venue, updating of promotion tools etc,	

# Investment 2-1-2	Implementing Event: As required
Action	Carry out investment promotion activities with improved efficiency to attract businesses
Activity	Conduct investment seminars
【Activity Direction】	
Contents:	Investment seminar regularly conducted in partnership with the embassy of the Philippines in Japan
Partners:	JETRO, ASEAN Center of Japan
Resources:	IPAs, overseas Philippine embassies, central/local government agencies in designated country etc.
Challenges:	<ul style="list-style-type: none"> • Having network with remarkable parsons (such as professors specialized in the automotive industry). • Having empirical know-how on investment promotion in Japan. • BOI's continuity of local supplier profiling as the participant to matching business session of investment promotion.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, Embassy of the Philippines in Japan
Implementing Agencies:	DTI/BOI in corroboration with the Philippine embassies
【Major Expenses】	Total (Approx.): Php 50 Mil (annual)
Travel Expenses, venue expenses, honorarium to guest speaker, hiring of translators, cost of meeting and setup, promotion cost .etc.	

# Investment 2-2-1	Implementing Event: 2018 - 2020
Action	Discuss and implement an improved incentive system
Activity	Provide incentives on drive-train related parts manufacturing
【Activity Direction】	
Contents:	Strengthening incentive system that manufactures products related to drive train components of compact cars (e.g. AT and CVT)
Partners:	Filipino government agencies (DOF, DOTr, etc.), Existing and attracted tenants (investors), JCCIP/ JETRO
Resources:	Impact analysis on the CARS Program
Challenges:	<ul style="list-style-type: none"> • Preparation of impact analysis and obtaining consensus on incentives from DOF and other government agencies. • Institutional setup on approving/implementing/monitoring incentive provision.
【Responsibilities】	
Responsible Agencies:	DTI/BOI (especially CARS Team) , PIPP, DOF
Implementing Agency:	BOI
【Major Expenses】	Total (Approx.): Php NA
Cost of research and coordination. Cost of subsidy/Incentive.	

# Investment 2-2-2	Implementing Event: 2018 - 2020
Action	Discuss and implement an improved incentive system
Activity	Incentives on cost competitiveness of the products
【Activity Direction】	
Contents:	Government subsidy that could lower the costs of importing steel (raw material which has to be imported) and also by providing some form of incentives to export the finished products.
Partners:	Filipino government agencies (DOF [incl. Bureau of Customs] ,etc.) Existing and attracted tenants (investors) , JCCIPI/JETRO
Resources:	Impact analysis on the CARS Program
Challenges:	<ul style="list-style-type: none"> • Preparation of impact analysis and obtaining consensus on incentives from DOF and other government agencies. • Preparation of incentivized items/materials • Institutional setup on approving/implementing/monitoring incentive provision.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, PIPP, DOF
Implementing Agency:	BOI
【Major Expenses】	Total (Approx.): Php NA
Cost of research and coordination, Cost of subsidy/incentive	

# Investment 2-2-3	Implementing Event: 2018 - 2020
Action	Discussion/application on improved incentive system
Activity	Incentives on parts and components for electric powertrain
【Activity Direction】	
Contents:	Strengthening incentive system to parts manufacturing of parts and components of electric powertrain (motor, control unit, etc.).
Partners:	eVAP, PPMA, PIDS (for provision of information), Expert/Consultant from private sector
Resources:	Research on up-to-date information on this agenda, Trend of the world
Challenges:	<ul style="list-style-type: none"> • Understanding and recognizing up-to-date information by government policy makers. • Establishing the government policy on electric motor and parts and components of electric powertrain.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, eVAP, DOF, DOTr, DENR etc.
Implementing Agencies:	BOI (for production) , DOTr (for dissemination)
【Major Expenses】	Total (Approx.): Php 3 mill.
Expense for presentation by expert/consultant	

# Investment 2-2-4	Implementing Event: 2018 - 2022
Action	Discussion/application on improved incentive system
Activity	Incentives on production volume and the number of manufacturing models by their performance standards (CARS II)
【Activity Direction】	
Contents:	Investment incentives for OEMs in manufacturing of 1 million cars which include two types of forms viz; i) Incentives according to production volume, and ii) Incentives according to an increase in the number of manufacturing models by their performance standards.
Partners:	CAMPI, PPMA
Resources:	Evaluation report of the CARS Program
Challenges:	Convincing concerned government agencies about the necessity of incentives by DTI/BOI.
【Responsibilities】	
Responsible Agencies:	Government committee (incl. DTI/BOI, PIPP, DOF etc.)
Implementing Agency:	BOI (CARS Team)
【Major Expenses】	Total (Approx.): Php NA
Cost of research and coordination, Cost of subsidy/incentive	

# Investment 2-3-1	Implementing Event: 2020 - 2022
Action	Strengthen intelligence activities
Activity	Strengthen the system for investment promotion
【Activity Direction】	
Contents:	Recruit Japanese expert (s) of automotive industry who will dedicate to the work on investment promotion.
Partners:	JCCIFI, CAMPI, PPMA, JICA
Resources:	Achievement of former JICA Expert who worked investment promotion for BOI, New TOR expecting to Japanese expert
Challenge:	Discussion with partners mentioned above and preparation of TOR for Japanese expert.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, PEZA, JICA
Implementing Agency:	BOI
【Major Expenses】	Total (Approx.): Php 3 mill.
JICA Expert Support Expenses	

# Investment 2-3-2	Implementing Event: As Required
Action	Strengthen intelligence activities
Activity	Share company information
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Share information on the companies visited and the level of their interest to invest among different organizations involved. Achieve smoother disclosure of import/export statistics information (from Import Bureau and Export Bureau) within DTI
Partners:	CAMPI, PPMA, Information Service (MarkLines etc.)
Resources:	MM prepared by circle members, Periodical input from trade statistics.
Challenges:	<ul style="list-style-type: none"> Establishing a circle by interested agencies to share information. Involving financial source (such as a project from World Bank) for continuity of the circle activities.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, respective PIPP entities, Embassy of the Philippines in Japan, private sector
Implementing Agency:	BOI
【Major Expenses】	Total (Approx.): Php 1 Mil (annually)
Information Service, Management expense of the circle	

# Investment 2-3-3	Implementing Event: 2020 - 2022
Action	Strengthen intelligence activities
Activity	Monitor investors (companies invested)
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Based on the information gathered from the companies invested, provide feedback to improve the future activities of investment promotion.
Partners:	Private industrial park, Private consultant to conduct feedback interview
Resources:	BOI's record on FDI
Challenges:	<ul style="list-style-type: none"> Examining of methodology on gathering information, analyzing them. Requesting JICA for a long-term expert on investment promotion
【Responsibilities】	
Responsible Agencies:	DTI/BOI, JICA Expert
Implementing Agencies:	Private industrial park (questionnaire survey), Private consultant (interview survey, etc.)
【Major Expenses】	Total (Approx.): Php 1Mil (annually)
Included in the above "Strengthen the System for Investment Promotion", apart from the expenses may be requested to JICA	

# Investment 2-4-1	Implementing Event: 2019 -
Action	Nurture and accumulate supporting industries
Activity	Create investment promotion and search companies in the supporting industry
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Create investment promotion tools (e.g. Introduction of local companies, introduction of infrastructure development timeline.) • Search companies in the supporting industries from MarkLines, etc.
Partners:	MIRDC (technical support to refer technology), CAMPI, PPMA
Resources:	Information database (ie. MarkLines), Needs survey from OEM and Tier 1-3 companies, BOI's database on SME profile
Challenges:	<ul style="list-style-type: none"> • Maintaining/increasing of BOI's database on local supplier profile • Planning of investment promotion activity (mode, timing, tool etc.) • Tying up with PH Embassy in Japan on information sharing
【Responsibilities】	
Responsible Agency:	DTI/BOI
Implementing Agencies:	BOI, PIDS, MRDC
【Major Expenses】	Total (Approx.): Php 2 mill (annually)
Printing, Expenses for the use of MarkLines	

# Investment 2-4-2	Implementing Event: As required
Action	Nurture and accumulate supporting industries
Activity	Investment promotion for supporting industry
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Carry out investment promotion activities focusing on companies who have products and technologies needed by the target companies. • Use MarkLines, etc. effectively when searching for such companies in the supporting industries.
Partners:	MRDC (technical support to refer technology), CAMPI, PPMA
Resources:	Information database (ie. MarkLines), Needs survey from OEM and Tier 1-3 companies
Challenges:	<ul style="list-style-type: none"> • Conducting one-on-one meeting and attracting designated company (conducting a new style of investment attraction) • Close linkage among players.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, Embassy of the Philippines in Japan
Implementing Agencies:	Embassy of the Philippines in Japan, PPMA
【Major Expenses】	Total (Approx.): Php 5 mil (annually)
Travel Expenses, Expenses for the use of MarkLines, Translator in Japan	

# Investment 2-4-3	Implementing Event: As required
Action	Nurture and accumulate supporting industries
Activity	Rental factory for small sized investors
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Rent out small sized factory for test running of production. • Provide rental equipment and product test centers used collectively with small sized investors and local suppliers.
Partners:	Industrial park operators
Resources:	Information on designated investors, DTI/DOST/PEZA/Private sector WEB sites
Challenge:	<ul style="list-style-type: none"> • Customizing the factory based on SME's specific needs • Establishing business network with private sector • Establishing institutional setup to support private industrial park operator
【Responsibilities】	
Responsible Agencies:	DTI/DOST, private industrial park
Implementing Agencies:	DTI/DOST, private industrial park
【Major Expenses】	Total (Approx.): Php NA
Subsidy for renting factory, Rental equipment	

2-3-3 Local Supplier Development

Each Action Plan contains several remarkable activities and those were indicated the correspondence of action plan number (ex. The activity “# Supplier Dev. 3-1-1” falls into the category of “Action 3-1” below).

Policy Domain 3: Local Supplier Development			
Direction:	To facilitate local supplier development, it is critical to identify needs of buyers (OEMs and Tiers 1 and 2) and prepare strategies based on the understanding. Technology/business upgrading services should aim to raise QCD (quality, cost, and delivery) standards of local suppliers and facilitate their integration into the automotive global value chain.		
Indicator:	Five local suppliers conclude technical alliance with Tiers 1 or 2 companies		
Action Plan: (13 plans)	Establish an institutional setup for local supplier development	Action 3-1	(2 plans)
	Support upgrading processing technologies among local suppliers (technology, equipment, and facility upgrading)	Action 3-2	(4 plans)
	Support upgrading production management technologies among local suppliers (Kaizen, leadership and management, and safety)	Action 3-3	(5 plans)
	Support business matching and expansion of local suppliers	Action 3-4	(2 plans)

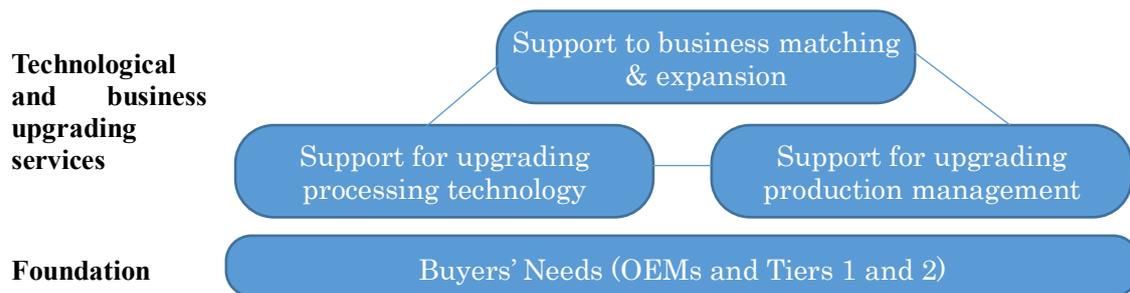


Figure 1. Concept of Local Supplier Development Action Plans

[Institutional Arrangement]

# Supplier Dev. 3-1-1	Implementing Event: 2018-2019
Action	Establish an institutional setup for local supplier development
Activity	Establish a collaborative working group
【Activity Direction】	
Contents:	Organize a collaborative working group, and regularly hold meetings led by the chair selected in the group.
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, <i>Philippine Automotive Competitiveness Council, Inc. (PACCI)</i>
Resources:	Meeting room at DTI/BOI
Challenge:	-
【Responsibilities】	
Responsible Agency:	DTI/BOI
Implementing Agencies:	DTI/BOI, PPMA, CAMPI, DOST
【Major Expenses】	Total (Approx.): Php NA
Expenses associated with establishing a collaborative working group	

# Supplier Dev. 3-1-2	Implementing Event: 2019-2022
Action	Establish an institutional setup for local supplier development
Activity	Support the collaborative working group's activities
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Conduct regular information exchange and study sessions on buyers' needs in terms of both core production technologies, production management technology, and any other issues that affect their relationships with local suppliers • Conduct research on external factors, such as listed below, that affect local suppliers: <ul style="list-style-type: none"> ➢ Supply and value chains of major sectors that supply parts to the auto and auto parts industry to validate reported issue of a lack of locally-sourced raw materials and to identify materials or components that have higher potentials to be procured domestically, ➢ Ease of access to finance and government supports such as R&D grants, and ➢ New technology for the auto and auto parts manufacturing. • Study items that are currently produced by FDI companies that can be outsourced to local companies (e.g. Resin painting and ED coating) and list up companies that provide such services. • Develop policy recommendations based on the information shared and researched
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, <i>PACCI</i>
Resources:	Research expenses
Challenge:	-
【Responsibilities】	
Responsible Agency:	DTI/BOI
Implementing Agency:	DTI/BOI, PPMA, CAMPI, DOLE
【Major Expenses】	Total (Approx.): Php NA
Research expenses, meeting expenses	

# Supplier Dev. 3-2-1	Implementing Event: 2019- 2020
Action	Support upgrading processing technologies among local suppliers
Activity	Develop a training plan based on the buyers' needs on processing technologies.
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Based on the meeting results of 3-1-2 and research on the topics below, identify the most in-demand skills and technologies. <ul style="list-style-type: none"> ➢ What technologies are accumulated in each value chain ➢ Current state of locations of R&D functions. • Map out human resources (=experts and trainers from OEMs and Tier 1 and 2 companies as well as government organizations) that are domestically available to conduct training on topics identified. • Map out various schemes available to support the plan (e.g. Balik Scientist Program² by DOST, DOST Grants-In-Aid Program³, and technical assistance projects by donor countries) • Note: Areas of training that may be needed in the Philippines are: pattern making techniques (casting and forging), precision aluminum die casting, use of CAD/CAM in machining, molding techniques to be used for engineering plastic products, and energy efficient and cleaner production technologies
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, <i>PACCI</i>
Resources:	Research fee
Challenge:	-
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOST
Implementing Agencies:	DOST's Office of the Secretary, Advanced Science and Technology Institute (ASTI) ⁴ and MIRDC, DTI/BOI
【Major Expenses】	
	Total (Approx.): Php NA
Meeting expenses, research expenses	

# Supplier Dev. 3-2-2	Implementing Event: 2019- 2020
Action	Support upgrading processing technologies among local suppliers
Activity	Provide training and seminars on in-demand processing skills identified
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Based on the training plan developed in 3-2-1, implement training under the initiative of the private sector. <ul style="list-style-type: none"> ➢ Firm-level consultation and training ➢ In-class seminars • Support the private sector to access government grants or schemes necessary to obtain necessary resources
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, PACCI, DOST, donor agencies
Resources:	
Challenge:	Finding appropriate talents
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOST
Implementing Agencies:	DOST, ASTI and MIRDC, DTI/BOI
【Major Expenses】	
	Total (Approx.): php Mil
Expenses relating to bringing in experts (honorarium, travel expenses, accommodation etc.), seminar expenses, coordination expenses	

² Balik Scientist Program is a program by DOST to encourage highly-trained overseas Filipino scientists and technologists, experts, and professionals to return to the Philippines and share their expertise for the acceleration of the scientific, agro – industrial and economic development of the country.

³ DOST Grants-In-Aid Program is a program by DOST that is aimed to harness the country's scientific and technological capabilities by providing financial grants to S& T programs and projects.

⁴ ASTI is an attached agency or R&D Institute of DOST, focused on the fields of ICT and Microelectronics

# Supplier Dev. 3-2-3	Implementing Event: 2021 -
Action	Support upgrading processing technologies among local suppliers
Activity	Support the procurement of equipment and machinery
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Map out technical upgrading needs in terms of machinery and equipment based on the study conducted in 3-1-2 and 3-2-1. Outline loan schemes accessible to SMEs in the Philippines Develop subsidies (government guarantee loan schemes) for equipment and machinery that enables mass production and are in line with the needs identified and facility. Announce the schemes and start the implementations
Partners:	DOF
Resources:	-
Challenge:	Funding source for subsidies
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOST
Implementing Agencies:	DOST, ASTI and MIRDC, DTI/BOI
【Major Expenses】	
	Total (Approx.): Php NA
Subsidies for equipment purchase of targeted technology	

# Supplier Dev. 3-2-4	Implementing Event: 2021 -
Action	Support upgrading processing technologies among local suppliers
Activity	Conduct training of trainers
【Activity Direction】	
Contents:	For the in-demand skills and technologies identified in 3-1-2 that do not have available domestic trainers, find trainers from abroad and conduct training of trainers
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, PACCI, DOST, donor agencies
Resources:	-
Challenge:	Finding appropriate talents
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOST, DOF
Implementing Agencies:	DOST
【Major Expenses】	
	Total (Approx.): Php NA
Expenses relating to bringing in experts (honorarium, travel expenses, accommodation etc.), seminar expenses, coordination expenses	

# Supplier Dev. 3-3-1		Implementing Event: 2019- 2020
Action	Support upgrading production management technologies among local suppliers.	
Activity	Develop a training plan on production management technologies and other production management issues such as leadership, safety, and environment.	
【Activity Direction】		
Contents:	<ul style="list-style-type: none"> • Based on the meeting results of 3-1-2, develop a training plan on production management technologies, categories under different positions (lower to middle level management and middle to upper level management) <ul style="list-style-type: none"> * Statistical analysis tools * Quality control (QC), Kaizen and Toyota Production System * Administrative Management Issues: new policies and regulations (labor issues, environment), project cycle management * Others: leadership, value engineering R&D, etc. • Map out human resources (=experts and trainers from OEMs and Tier 1 and 2 companies as well as government organizations) that are domestically available to conduct training on topics selected. • Map out various schemes available to support the plan (e.g. Balik Scientist Program by DOST, DOST Grants-In-Aid Program, and technical assistance projects by donor countries) 	
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, PACCI	
Resources:	Research fee	
Challenge:	Availability of trainers	
【Responsibilities】		
Responsible Agencies:	DTI/BOI, DOST, DOLE/NWPC	
Implementing Agencies:	DTI/BOI, DOST, DOLE/NWPC	
【Major Expenses】		Total (Approx.): Php NA
Meeting expenses, research expenses		

# Supplier Dev. 3-3-2		Implementing Event: 2019- 2020
Action	Support upgrading production management technologies among local suppliers.	
Activity	Provide training and seminars on production management technologies	
【Activity Direction】		
Contents:	<ul style="list-style-type: none"> • Based on the training plan developed in 3-3-1, implement training under the initiative of the private sector. <ul style="list-style-type: none"> ➢ Firm-level consultation and training ➢ In-class seminars • Support the private sector to access government grants or schemes necessary to obtain necessary resources 	
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, PACCI, DOST, donor agencies	
Resources:	Experts	
Challenge:	Finding appropriate talents	
【Responsibilities】		
Responsible Agencies:	DTI/BOI, DOST	
Implementing Agencies:	DOST's Office of the Secretary, ASTI and MIRDC, DTI/BOI	
【Major Expenses】		Total (Approx.): Php NA
Expenses relating to bringing in experts (honorarium, travel expenses, accommodation etc.), seminar expenses, coordination expenses		

# Supplier Dev. 3-3-3	Implementing Event: 2021 -
Action	Support upgrading production management technologies among local suppliers.
Activity	Conduct training of trainers
【Activity Direction】	
Contents:	For the in-demand skills and technologies identified in 3-1-2 that do not have available domestic trainers, find trainers and conduct training of trainers
Partners:	CAMPI, member companies of PPMA, PACCI, DOST, donor agencies
Resources:	
Challenge:	Finding appropriate talents
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOST, DOF
Implementing Agency:	DOST
【Major Expenses】	
	Total (Approx.): php Mil
Expenses relating to bringing in experts (honorarium, travel expenses, accommodation etc.), seminar expenses, coordination expenses	

# Supplier Dev. 3-3-4	Implementing Event: 2019 -
Action	Support upgrading production management technologies among local suppliers.
Activity	Develop Kaizen leaders
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • 3 to 5 companies to form a group and conduct Kaizen training using actual production processes of each company as learning materials. • Conduct Kaizen seminars to develop managers who can implement process improvements at production site. • Include HEI researchers in the field of industrial engineering to participate in the group learning process for documentation and hand-on learning experiences
Partners:	CAMPI, member companies (Tier 1 and 2) of PPMA, DOST, HEIs
Resources:	
Challenge:	
【Responsibilities】	
Responsible Agencies:	DTI/BOI, CAMPI, PPMA, DOST
Implementing Agencies:	DTI/BOI, CAMPI, PPMA, DOST, HEIs
【Major Expenses】	
	Total (Approx.): Php NA
Kaizen Consultant Fee	

# Supplier Dev. 3-3-5	Implementing Event: 2021 -
Action	Support upgrading production management technologies among local suppliers.
Activity	Promote clean and safe working conditions.
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Review regulations related to safety and environment protection. • Dispatch monitoring and advisory teams to enforce pollution control and safety, especially in the area of Resin painting and ED coating waste fluids and welding.
Partners:	NGO agencies concerned with environment, National Environment Protection Council
Resources:	
Challenge:	Finding appropriate talents and enforcement
【Responsibilities】	
Responsible Agencies:	DTI/BOI, DOST, National Environment Protection Council, DOLE
Implementing Agency:	DOST
【Major Expenses】	
	Total (Approx.): Php NA
Travel expenses and meeting expenses	

# Supplier Dev. 3-4-1	Implementing Event: 2018-
Action	Support business matching and expansion of local suppliers
Activity	Profile local suppliers and their technology level
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Visit auto local suppliers and profile their business operations and technology levels • Compile the profiles into a database • Launch the on-line database for public use • Market the on-line database
Partners:	PPMA, CAMPI
Resources:	-
Challenge:	Coordination (making appointments)
【Responsibilities】	
Responsible Agencies:	DTI/BOI, PPMA
Implementing Agencies:	DTI/BOI
【Major Expenses】	Total (Approx.): Php NA
Editing (fact-checking) costs, travel expenses etc	

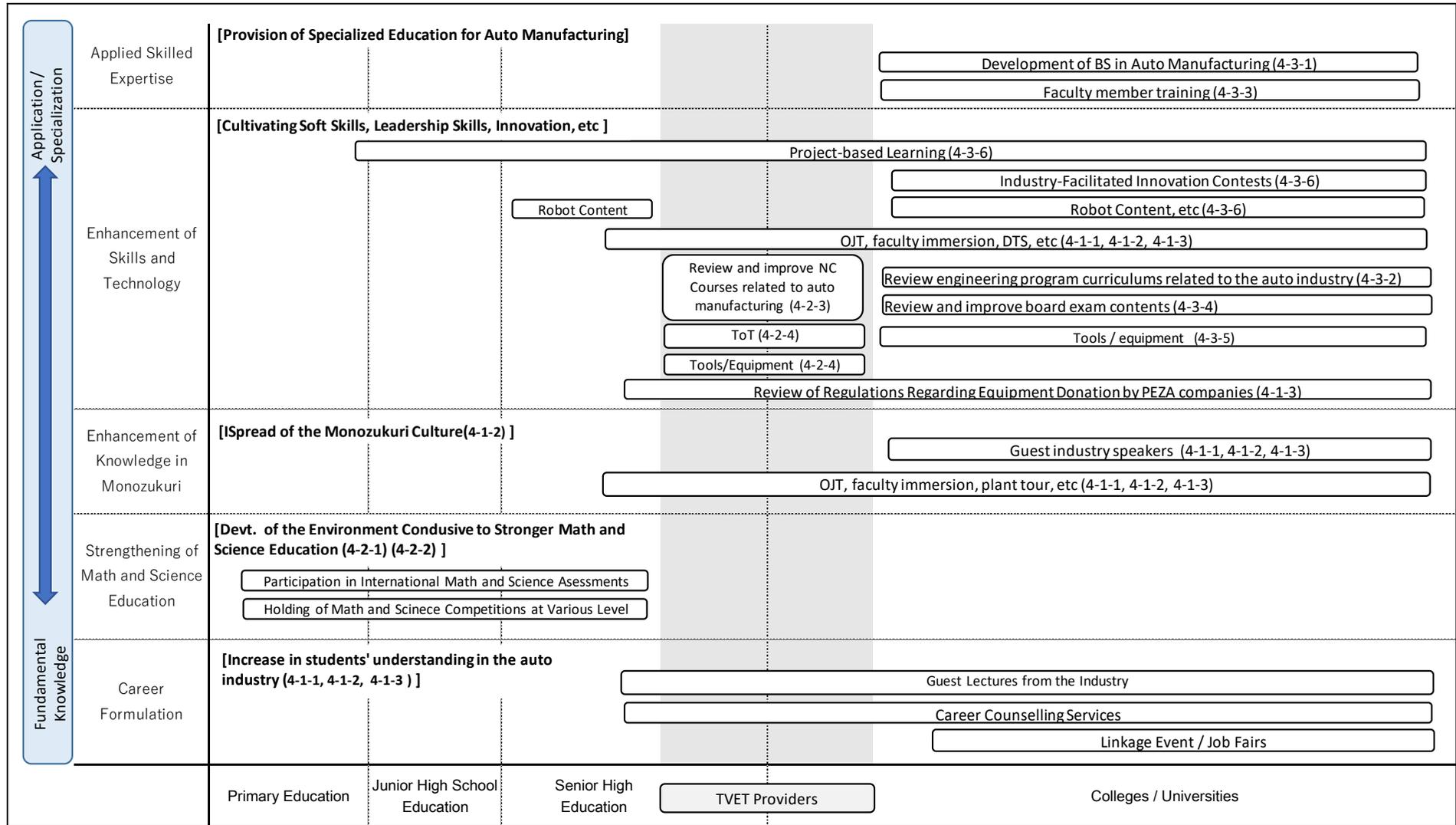
# Supplier Dev. 3-4-2	Implementing Event: 2018 -
Action	Support business matching and expansion of local suppliers
Activity	Conduct strategic investment promotion activities for facilitating technical tie-ups or agreements
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Based on 3-1-2, map out the most in-demand technical skills needed to be brought in from abroad. • Conduct strategic investment promotion activities based on the identified skills • Provide special incentives to bring in these companies that have most in-demand technical skills
Partners:	PEZA, DOF
Resources:	-
Challenge:	Securing budget for trade shows and incentives
【Responsibilities】	
Responsible Agencies:	DTI/BOI, PEZA
Implementing Agencies:	DTI/BOI, PEZA
【Major Expenses】	Total (Approx.): Php NA
Financial resources for trade shows and incentives	

2-3-4 Industrial Human Resources Development

Each Action Plan contains several remarkable activities and those were indicated the correspondence of action plan number (ex. The activity “# HR Devt. 4-1-1” falls into the category of “Action 4-1” below).

Policy Domain 4: Industrial Human Resources Development	
Indicators:	Six Policies, Standards, and Guidelines and 15 Training Regulations on auto-related courses are reviewed/ revised with the support of the auto industry
Action Plans: (14 plans)	<Linkage Formulation> Action 4-1 (3 plans) Strengthen the linkage between the automotive industry and the academia/TVET institutions
	<Implementation> Develop fundamental industrial human resources as a base of manufacturing ⇒ Workers/Technician Level Action 4-2 (5 plans) Develop talents who have appropriate skills and knowledge for advancing production technology and production management ⇒ Engineers / Senior Technicians Action 4-3 (6 plans) (Develop enterprise management talent ⇒ CEO/ Managers, covered in the Supplier Development Section, See Action 3-3)





Conceptual Map of IHRD Action Plans

<Industry-Academia Linkage>

# HR Devt. 4-1-1	Implementing Event: 2018 - 2022
Action	Strengthen the linkage between the automotive industry and the academia/TVET institutions
Activity	Create more opportunities for universities/colleges/TVET institutions to learn more about the Philippine auto industry.
【Activity Direction】	
Contents:	Conduct auto industry-academia linkage events (= seminar, networking between industry coordinators and companies, career guidance orientation, and job fair)
Partners:	Recruitment agencies (e.g. Jobstreet.com Philippines Inc.), universities/colleges, TVIs, industry associations, and companies
Resources:	Venue, booths, staff, marketing
Challenge:	As coordination of such events involve many stakeholders, it is very time-consuming.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, CHED, TESDA
Implementing Agencies:	DTI/BOI, DTI regional offices
【Major Expenses】	
	Total (Approx.): Php NA
Venue (incl. booths), event organization costs, staff allocation to the event secretariat	

# HR Devt. 4-1-2	Implementing Event: 2019 - 2022
Action	Strengthen the linkage between the automotive industry and the academia/TVET institutions
Activity	Develop incentives for companies to work closely with academia/TVET institutions
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Review and outline various industry academia linkage programs, frequently-reported challenges that companies encounter in taking a part in the programs, regulations that companies need to abide by when participating in the programs, and government support on industry-academia partnerships. • Study incentives or training schemes offered in other countries. • Offer incentives for: <ul style="list-style-type: none"> ➢ Joint research and development (R&D) projects ➢ Corporation sponsored R&D competitions ➢ Faculty member training/industry immersion ➢ Equipment donation
Partners:	Companies, universities and colleges
Resources:	N/A
Challenge:	N/A
【Responsibilities】	
Responsible Agencies:	CHED, TESDA, DOLE, DTI/BOI, DOST
Implementing Agencies:	CHED, TESDA, DOLE, DTI/BOI, DOST
【Major Expenses】	
	Total (Approx.): Php NA
Research expense	

# HR Debt. 4-1-3	Implementing Event: 2019 - 2022
Action	Strengthen the linkage between the automotive industry and the academia/TVET institutions
Activity	Facilitate a greater linkage among government agencies for the industrial-academe linkage
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Conduct an interagency working group • Standardize procedures, documents and formats used by universities, colleges, TVET providers, and secondary schools for industrial – academe linkage programs (e.g. OJT, dual training system, faculty immersion, guest lectures, adopt a school program etc.) • Develop an inter-agency directive (e.g. Policies, Standards, and Guidelines) on how to facilitate industry-academia linkage, outlining government support programs, rules and regulations, appropriate advice to be given to both the industry and the academia
Partners:	Auto /automotive companies
Resources:	N/A
Challenge:	N/A
【Responsibilities】	
Responsible Agencies:	CHED, TESDA, DepED, DOLE, DTI/BOI
Implementing Agencies:	CHED, TESDA, DepED, DOLE, DTI/BOI
【Major Expenses】	Total (Approx.): Php NA
Meeting expenses and research expenses	

<Development of Worker and Technician-Level Human Resources>

# HR Devt. 4-2-1	Implementing Event: 2019 -
Action	Develop fundamental industrial human resources as a base of manufacturing
Activity	Enhance math and science programs in the elementary education
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Further promote domestic math and science competitions at the school, municipality, provincial, and national levels • Participate in international assessments international assessments of the mathematics and science knowledge of students such as the Trends in International Mathematics and Science Study (TIMSS) • Introduce peer to peer learning for in-service teacher professional development • Conduct the comparative analysis of the math and science education at the elementary education level (curriculum, teaching styles, learning environment, etc.) with those of high performing countries
Partners:	-
Resources:	Consultants,
Challenge:	Budget constrain at the school level to participate in the inter-school math and science competitions and peer to peer learning for in -service teachers
【Responsibilities】	
Responsible Agencies:	DepEd, Science Education Institute (STI)/DOST
Implementing Agencies:	DepEd, STI/DOST
【Major Expenses】	Total (Approx.): Php NA
Participation costs on international math and science assessments and competitions, awards of math and science Olympic winners and teachers	

# HR Devt. 4-2-2	Implementing Event: 2019 -
Action	Develop fundamental industrial human resources as a base of manufacturing
Activity	Enhance math and science programs in the secondary level education
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Further promote domestic math and science competitions at the school, municipality, provincial, and national levels (e.g. provide monetary awards to math and science competition winners and their teachers) • Participate in international assessments of the mathematics and science knowledge of students such as TIMSS and the Programme for International Student Assessment (PISA). • Study the situation surrounding the math and science education in the Philippines, incl. ones in the STEM track. • Introduce peer to peer learning for in-service teacher professional development • Promote more STEM students to join Asia Pacific Mathematics Olympiad • Based on the above study and other researches, prepare action plans to improve the math and science education and implement them
Partners:	Industry partners, external consultants
Resources:	Consultants, implementation costs of proposed action plans
Challenge:	Budget constrain at the school level to participate in the inter-school math and science competitions and peer to peer learning for in -service teachers
【Responsibilities】	
Responsible Agencies:	DepEd, STI/DOST
Implementing Agencies:	DepEd, STI/DOST
【Major Expenses】	Total (Approx.): Php NA
Participation costs on international math and science assessments and competitions, awards of math and science olympic winners and teachers, promotion of peer to peer learning for in-service teacher professional development	

# HR Devt. 4-2-3	Implementing Event: 2019 -2022
Action	Develop fundamental industrial human resources as a base of manufacturing
Activity	Review and update/develop training regulations (TRs) on auto manufacturing related courses
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Hold consultative meetings between TESDA and industry partners to review existing training regulations related to auto manufacturing • Study equipment procurable domestically and regionally for auto manufacturing related courses • Update existing TRs and develop new TRs on current and future in-demand skill areas • Conduct the trial of newly updated/developed TRs at target TVET providers • Promulgate newly updated/developed TRs
Partners:	Industry partners, external consultants (curriculum review and development)
Resources:	Consultation fee
Challenge:	Coordination (i.e. involvement of industry partners from various positioning in the value chain), finding appropriate talents to update and review the TRs
【Responsibilities】	
Responsible Agencies:	TESDA, CHED, DepEd, DTI/BOI
Implementing Agencies:	TESDA
【Major Expenses】	Total (Approx.): Php NA
Meeting costs, consultation costs	

# HR Devt. 4-2-4	Implementing Event: 2019 -2022
Action	Develop fundamental industrial human resources as a base of manufacturing
Activity	Conduct training of trainers for the newly updated/developed TRs with the support of industry partners
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Identify new skills areas that are covered by newly updated/developed TRs. Provide training to trainers on the identified new skill areas
Partners:	Industry partners, external consultants
Resources:	Industry partners, external consultants
Challenge:	Coordination, finding an appropriate talent to lead the training
【Responsibilities】	
Responsible Agencies:	TESDA, CHED, DepEd, DTI/BOI
Implementing Agencies:	TESDA
【Major Expenses】	Total (Approx.): Php NA
Meeting costs, ToT expenses, procurement of necessary equipment for implementing of training courses under new TRs	

# HR Devt. 4-2-5	Implementing Event: 2019 -2022
Action	Develop fundamental industrial human resources as a base of manufacturing
Activity	Upgrade tools and equipment based on newly updated / developed TRs.
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Outline the specifications of tools and equipment that need to be procured based on the newly updated/developed TRs Outline budget sources and develop procurement plan
Partners:	-
Resources:	-
Challenge:	Finding sufficient budget for procurement
【Responsibilities】	
Responsible Agencies:	TESDA, CHED, DepEd
Implementing Agencies:	TESDA, CHED, DepEd
【Major Expenses】	Total (Approx.): Php NA
Tools, software, and equipment	

# HR Devt. 4-3-1	Implementing Event: 2019 -2022
Action	Develop talents for advancing production technology and production management
Activity	Develop a Bachelor of Science in Automotive Manufacturing
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Hold consultative meetings between CHED (Office of Programs and Standards Development) and industry partners to discuss what needs to be put in the Policies, Standards and Guidelines (PSGs) for the Degree of Bachelor of Science in Auto Manufacturing (Since the Philippines has a strong foundation for the electronics industry, consider putting a strong focus on car electronics.) Develop the PSGs for the BS in Auto Manufacturing Conduct the trial of newly development BS program at model schools (three public schools and three private schools) Issue a CHED Memorandum Order on PSGs for the Degree of Bachelor of Science in Auto Manufacturing
Partners:	Industry partners, external consultants
Resources:	New equipment, industry partners, external consultants
Challenge:	Coordination (i.e. involvement of industry partners from various positioning in the value chain)

# HR Devt. 4-3-1	Implementing Event: 2019 -2022
【Responsibilities】	
Responsible Agencies:	CHED
Implementing Agencies:	CHED (Office of Programs and Standards Development), DTI/BOI
【Major Expenses】	Total (Approx.): Php NA
Meeting costs, procurement of necessary equipment	

# HR Devt. 4-3-2	Implementing Event: 2019 -2022
Action	Develop talents for advancing production technology and production management
Activity	Review the curriculums for engineering programs related to the auto industry
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Hold consultative meetings between CHED and industry partners to review current programs and curriculums for engineering programs related to the auto industry. • Study the possibility of developing an interdisciplinary program on car-electronics • Revise and update if needed. • Facilitate faculty members to go industry immersion to learn new technologies,
Partners:	Industry partners
Resources:	Equipment (incl. software) deemed necessary
Challenge:	Coordination (i.e. involvement of industry partners from various positioning in the value chain)
【Responsibilities】	
Responsible Agencies:	CHED
Implementing Agencies:	CHED (Office of Programs and Standards Development), DTI/BOI
【Major Expenses】	Total (Approx.): Php NA
Meeting costs, procurement of necessary equipment	

# HR Devt. 4-3-3	Implementing Event: 2022-
Action	Develop talents for advancing production technology and production management
Activity	Develop a pool of human resources that can teach BS course in auto manufacturing.
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Source appropriate human resources to teach the BS course in auto manufacturing (e.g. use the Balik Scientist Program) • Develop the consortium for faculty members specialized in auto manufacturing • Hold annual conference to improve share knowledge and the curriculum for BS in auto manufacturing
Partners:	Auto companies in the Philippines and overseas
Resources:	
Challenge:	Finding sufficient numbers of human resources who can teach the BS course in auto manufacturing
【Responsibilities】	
Responsible Agencies:	CHED, DTI/BOI, DOST
Implementing Agencies:	CHED, DTI/BOI, DOST
【Major Expenses】	Total (Approx.): Php NA
Sourcing and retaining costs of appropriate talents, conference costs	

# HR Devt. 4-3-4	Implementing Event: 2020-2025
Action	Develop talents for advancing production technology and production management
Activity	Review and improve the contents of board exams on subjects related to auto manufacturing
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Hold consultative meetings with industry partners and quality assurance agencies in ASEAN countries • Conduct research on high education evaluation in other ASEAN countries • Improve contents of board exams on subjects related to auto manufacturing
Partners:	Industry partners and quality assurance agencies in other countries (e.g. Japan Institution for Higher Education Evaluation: JIHEE)
Resources:	Consultation fee
Challenge:	
【Responsibilities】	
Responsible / Implementing Agencies:	PRC, DOLE, DTI/BOI
【Major Expenses】	
Consultants' fee	Total (Approx.): Php NA

# HR Devt. 4-3-5	Implementing Event: 2019 -2022
Action	Develop talents for advancing production technology and production management
Activity	Upgrade tools and equipment based on newly updated / developed curriculums.
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Outline the specifications of tools and equipment that need to be procured based on the newly updated/developed curriculums • Outline budget sources and develop procurement plan
Partners:	Private colleges and universities, private companies
Resources:	Industry partners, external consultants
Challenge:	Finding sufficient budget for procurement
【Responsibilities】	
Responsible / Implementing Agencies:	CHED
【Major Expenses】	
Tools, software, and equipment	Total (Approx.): Php NA

# HR Devt. 4-3-6	Implementing Event: 2019-
Action	Develop talents for advancing production technology and production management
Activity	Facilitate the project-based learning at the higher education institutes
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> • Participate in international contents for engineering students (i.e. ABU Robocon) • Design grants available to companies who will organize inter-school engineering competitions • Conduct domestic inter-school engineering competitions with the support of industry partners
Partners:	universities, colleges, and industry partners
Resources:	Engineering competition grants
Challenge:	
【Responsibilities】	
Responsible / Implementing Agencies:	CHED, DTI/BOI
【Major Expenses】	
Engineering competition grants, venue,	Total (Approx.): Php NA

2-3-5 Infrastructure Development

Each Action Plan contains several remarkable activities and those were indicated the correspondence of action plan number (ex. The activity “#Infrastructure 5-1-1” falls into the category of “Action 5-1” below).

Policy Domain 5: Infrastructure Development	
Direction:	The pillar of “Infrastructure Development” aims to upgrade the level of groundwork for manufacturing industry.
Context:	Continuous enforcement such as competitive power supply, road and bridge construction, better maintenance of port of Batangas, development of industrial area at the harbor hinterland, and reinforcement of the communications infrastructure, etc are necessary for the auto industry cluster zone centered around Region 4A.
Indicator:	World Competitiveness Report” ranking on infrastructure raises to 60s in 2025
Action Plan: (5 plans)	Improve infrastructure for the manufacturing industry. Action 5-1 (E.g, Port of Batangas, access road to seaports and airports, electric power development, telecommunication development, and industrial parks development) (5 plans)

# Infrastructure 5-1-1	Implementing Event: 2019 -
Action	Upgrade the level of groundwork for manufacturing industry
Activity	Rehabilitate and improve the port of Batangas
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Improve the efficiency of operation, develop the stockyard for import/export products of Batangas port, and carry out promotions to utilize the port to increase shipping service.
Partners:	Shipping line company, port operators
Resources:	Knowhow of efficient port operation
Challenges:	Cost competitiveness including logistics cost from Region 4A to the port. Streamlining inefficient operation of the port. Securing budget for future expansion of the port.
【Responsibilities】	
Responsible /Implementing Agencies:	Multiple agencies
【Major Expenses】	
	Total (Approx.): Php NA
Development funding source	

# Infrastructure 5-1-2	Implementing Event: 2019 -
Action	Upgrade the level of groundwork for manufacturing industry
Activity	Improve access road to seaports and airports
【Activity Direction】	
Contents:	<ul style="list-style-type: none"> Open all routes of Skyways Distribute functions of Manila Port
Partners:	Real estate developers and construction companies
Resources:	Technical assistance for planning of comprehensive logistics network including road network.
Challenges:	Securing budget, purchasing land for road construction and promotion of seaports and airports other than Manila port/airport.
【Responsibilities】	
Responsible /Implementing Agencies:	Multiple agencies
【Major Expenses】	
	Total (Approx.): Php NA
Development funding source	

# Infrastructure 5-1-3	Implementing Event: 2019 -
Action	Upgrade the level of groundwork for manufacturing industry
Activity	Develop power sources
【Activity Direction】	
Contents:	• Develop power sources, improve efficiency of power distribution and implement pricing policy in order to supply low cost power.
Partners:	Power distributors
Resources:	Technical assistance for cost efficiency.
Challenge:	Analysis of cost efficiency is necessary to identify the cause of inefficiency (Power distribution is supposed to be the issue rather than power generation).
【Responsibilities】	
Responsible /Implementing Agencies:	Multiple agencies
【Major Expenses】	Total (Approx.): Php NA
Development funding source	

# Infrastructure 5-1-4	Implementing Event: 2019 -
Action	Upgrade the level of groundwork for manufacturing industry
Activity	Develop telecommunication infrastructure
【Activity Direction】	
Contents:	• Realize high speed internet
Partners:	Telecommunication companies
Resources:	Technology of high-speed internet infrastructure
Challenge:	Steady implementation of “National Broadband plan” to which the Government of Japan has already announced their contribution including financial support.
【Responsibilities】	
Responsible /Implementing Agencies:	Multiple agencies
【Major Expenses】	Total (Approx.): php Mil
Development funding source	

# Infrastructure 5-1-5	Implementing Event: 2017 -
Action	Upgrade the level of groundwork for manufacturing industry
Activity	Develop more industrial parks to accommodate new investments
【Activity Direction】	
Contents:	• Prepare locations such as industrial parks, etc. • Develop interlink road network among industrial parks.
Partners:	Real estate developers
Resources:	Master plan of industrial location and infrastructure development.
Challenge:	Securing land for industrial park and active investment promotion including preferable incentive for investments.
【Responsibilities】	
Responsible Agencies:	DTI/BOI, PIPP
Implementing Agencies:	
【Major Expenses】	Total (Approx.): php Mil
NA (At SONA on July 24, 2017, Rodrigo Duterte's php 8-trillion infrastructure program was confirmed)	

Table of Contents

1. One Million Unit Production in the Philippines

2. Specific Measures and Action Plans for Five Policy Domains

3. Implementation Schedule of AIPP

a. Policies/System and Programs

b. Investment Promotion

c. Local Supplier Development

d. Industrial Human Resource
Development

e. Infrastructure Development

3 Implementation Schedule

a. Policies/System and Programs

(Action Plan 1-1) Approve the Automotive Industry Promotion Plan as a compass for strengthening the manufacturing industry of the Philippines.

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Release the 1 millionn unit production plan	-Coordinate with agencies involved	■	■										
2 Solve operational challenges caused by PEZA regulations (Reluxing PEZA's 70% rule)	-Conduct study on PEZA's 70% export rule in order to provide more percentage to local market. -Bigger percentage of auto parts produced in PEZA area forwarded to the local market.		■	■									

(Action Plan 1-2) Strengthen technology sofistication in casting and forging (areas of strengths)

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Shortlist technologies to improve (Research in order to shortlist the technologies to improve)	-Conduct research on what technologies are accumulated in each value chain -Conduct research on the current state of locations of R&D functions.		■	■				■	■				■
2 Support R&D activities	-Study about granting incentives for locating R&D center and implement incentives.			■	■								
3 Conduct seminars for technology sophistication	-Conduct technology seminars by having instructors from OEMs and Tier 1 companies			■	■	■	■	■	■	■	■	■	■

(Action Plan 1-3) Support to reduce transportation/logistics costs for achieving overall lower cost production

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Study the possibility of lowering logistics costs	-To lower logistics costs, study the possibility of joint delivery (cooperative delivery) and/or mixed loading.		■				■				■		
2 Study the possibility of lowering materials costs	-To lower material costs, study and understand the current practices of purchasing (material, quantity, manufacturer etc.) of major raw materials suppliers and consider the possibility of joint purchase.		■				■				■		
3 Raise awareness about the government's infrastructure development policies	-More actively share information among different departments and agencies and announce guidelines and schedule on infrastructure -Make infrastructure development as government's pledge to the public and execute on schedule.			■	■	■	■	■	■	■	■	■	■

3 Implementation Schedule

b. Investment Promotion

(Action Plan 2-1) Carry out investment promotion activities with Improved efficiency to attract businesses

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Select target companies	-Select target companies to attract using MarkLines, etc.												
2 Conduct investment seminars.	-Investment seminar regularly conducted in partnership with the embassy of the Philippines in Japan -Targeted sales activities to the selected companies												

(Action Plan 2-2) Discuss and apply the improved incentive system

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Provide incentives on drive-train related parts manufacturing	- Strengthening incentive system that manufactures products related to drive train components of compact cars (e.g. AT and CVT)												
2 Incentives on cost competitiveness of the products	- Government subsidy that could lower the costs of importing steel (raw material which has to be imported) and also by providing some form of incentives to export the finished products.												
3 Incentives on parts and components for electric powertrain	- Strengthening incentive system to parts manufacturing of parts and components of electric powertrain (motor, control unit, etc.).												
4 Incentives on production volume and the number of manufacturing models by their performance standards (CARS II)	- Investment incentives for OEMs in manufacturing of 1 million cars which include two types of forms viz; i) Incentives according to production volume, and ii) Incentives according to an increase in the number of manufacturing models by their performance standards.												

(Action Plan 2-3) Strengthen Intelligence activities

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Strengthen the system for investment promotion	-Engage Japanese expert(s) of automotive industry who will be dedicated to work on investment promotion.												
2 Share company information	-Share information on the companies visited and the level of their interest to invest among different organizations involved. -Achieve smoother disclosure of import/export statistics information (from Import Bureau and Export Bureau) within DTI												
3 Monitor investors (companies invested)	-Based on the information gathered from the companies invested, provide feedback to improve the future activities of investment promotion.												

(Action Plan 2-4) Nurture and accumulate supporting industries

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Create investment promotion and search companies in the supporting industry	-Create investment promotion tools (e.g. Introduction of local companies, introduction of infrastructure development timeline.) -Search companies in the supporting industries from MarkLines, etc.												
2 Investment promotion for supporting industry	-Carry out investment promotion activities focusing on companies who have products and technologies needed by the target companies. -Use MarkLines, etc. effectively when searching for such companies in the supporting industries.												
3 Rental Factory for small sized investors	- Rent out small sized factory for test running of production for small sized investors. - Provide rental equipment and product test center used collectively with small sized investor and local supplier.												

3 Implementation Schedule

c. Local Supplier Development

(Action Plan 3-1) Carry out investment promotion activities with improved efficiency to attract businesses

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Establish a collaborative working (research) group	-Organize a collaborative working group, and regularly hold meetings led by the chair selected in the group.			-----									
2 Support the collaborative working group's activities	-Conduct regular information exchange and study sessions on buyers' needs -Research on external factors that affect local suppliers: - Study items that are currently produced by FDI companies that can be outsourced to local companies -Develop policy recommendations based on the information shared and researched			-----									

(Action Plan 3-2) Support upgrading processing technologies among local suppliers

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Develop a training plan based on the buyer's needs on processing technologies	- Based on the meeting results of 3-1-2 and research on following topics and identify the most in-demand skills and technologies: a. What technologies are accumulated in each value chain, b. current state of locations of R&D functions '- Map out human resources and various schemes available to support the plan			-----									
2 Provide training and seminars on in-demand processing skills identified	- Based on the training plan developed in 3-2-1, implement firm-level and in-class training under the initiative of the private sector.			-----									
3 Support the procurement of equipment and machinery	- Map out technical upgrading needs for machinery and equipment while outline loan schemes for equipment and machinery - Develop subsidies, announce the schemes and start the implementations				-----								
4 Conduct training of trainers	- For the in-demand skills and technologies that do not have available domestic trainers, find trainers from abroad and conduct training of trainers				-----								

(Action Plan 3-3) Support Upgrading production management technologies among local suppliers

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Develop a training plan on production management technologies and other production management issues such as leadership, safety, and environment	- Develop a training plan on production management technologies, categories under different positions a. Statistical analysis tools b. Quality control (QC), Kaizen and Toyota Production System d. Others: leadership, value engineering R&D, etc. '- Map out human resources and various schemes available to support the plan		-----						-----		-----		-----
2 Provide training and seminars on production management technologies	- Implement in-class and firm level training under the initiative of the private sector. - Support the private sector to access government grants		-----										
3 Conduct training of trainers	- For the in-demand skills and technologies that do not have available domestic trainers, find trainers from abroad and conduct training of trainers				-----								
4 Develop Kaizen Leaders	-3 to 5 companies to form a group and conduct Kaizen training using actual production processes of each company as learning materials. -Conduct Kaizen seminars to develop managers who can implement process improvements at production site.		-----			-----			-----			-----	
5 Promote clean and safe working conditions.	- Review regulations related to safety and environment protection. - Dispatch monitoring and advisory teams to enforce pollution control and safety				-----								

(Action Plan 3-4) Support business matching and expansion of local suppliers

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Profile local suppliers and their technology level	- Visit auto local suppliers and profile their business operations and technology levels - Compile the profiles into a database, launch the on-line database for public use, and market the on-line database		-----						-----		-----		-----
2 Conduct strategic investment promotion activities for facilitating technical tie-ups or agreements	-Conduct strategic investment promotion activities based on the identified skills								-----		-----		

3 Implementation Schedule

d. Industrial Human Resources Development

(Action Plan 4-1) Strengthen the linkage between the automotive industry and the academia/TVET institutions													
Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Create more opportunities for universities/colleges/TVET institutions to learn more about the Philippine auto industry.	- Conduct auto industry-academia linkage events (= seminar, networking between industry coordinators and companies, career guidance orientation, and job fair)		—	—		—							
2 Develop incentives for companies to work closely with academia/TVET institutions	- Study incentives or training schemes offered in other countries and apply good practices to the Philippines			—	—	—							
3 Facilitate a greater linkage among government agencies for the industrial-academia linkage	- Develop an inter-agency directive (e.g. Policies, Standards, and Guidelines) on how to facilitate industry-academia linkage, outlining government support programs, rules and regulations, appropriate advice to be given to both the industry and the academia			—	—	—							
(Action Plan 4-2) Develop fundamental industrial human resources as a base of manufacturing													
Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Enhance math and science programs in the elementary education	- Promote domestic math and science competitions at the school, municipality, provincial, and national levels - Participate in international assessments of the mathematics and science			—	—	—	—	—	—	—	—	—	—
2 Enhance math and science programs in the secondary level education	- do -			—	—	—	—	—	—	—	—	—	—
3 Review and update/develop training regulations (TRs) on auto manufacturing related courses	- Update existing TRs and develop new TRs on current and future in-demand skill areas					—	—	—	—	—	—	—	—
4 Conduct training of trainers for the newly updated/developed TRs	- Provide training to trainers on the identified new skill areas					—	—	—	—	—	—	—	—
5 Upgrade tools and equipment based on newly updated / developed TRs	- Outline the specifications of tools and equipment/budget that need to be procured based on the newly updated/developed TRs					—	—	—	—	—	—	—	—
(Action Plan 4-3) Develop Talents who Lead Strengthening Processing Technology and QCD													
Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Develop a Bachelor of Science in Automotive Manufacturing	- Develop the PSGs for the BS in Auto Manufacturing		—	—	—	—							
2 Review the curriculums for engineering programs related to the auto industry	- to review current programs and curriculums for engineering programs related to the auto industry - Study the possibility of developing an interdisciplinary program on car-electronics		—	—	—	—							
3 Develop a pool of human resources that can teach BS course in auto manufacturing	- Develop the consortium for faculty members and hold annual conference to improve share knowledge and the curriculum for BS in auto manufacturing					—	—	—	—	—	—	—	—
4 Review and improve the contents of board exams on subjects related to auto manufacturing	- Improve contents of board exams on subjects related to auto manufacturing			—	—	—	—	—	—	—	—	—	—
5 Upgrade tools and equipment based on newly updated / developed curriculums	- Outline the specifications of tools and equipment /budget sources based on the newly updated/developed curriculums		—	—	—	—	—	—	—	—	—	—	—
6 Facilitate the project-based learning at the higher education institutes	- Participate in international contents for engineering students - Design grants available to companies who will organize inter-school engineering competitions - Conduct domestic inter-school engineering competitions with the support of industry partners	—	—	—	—	—	—	—	—	—	—	—	—

3 Implementation Schedule

e. Infrastructure Development

(Action Plan 5-1) Improve infrastructure for the manufacturing industry

Activities	Contents	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1 Rehabilitate and improve the port of Batangas	-Expand the size of Batangas port, develop its hinterland, and carry out promotions to utilize the port.			-----	-----	-----	-----	-----					
2 Improve access road to seaports and airports	-Open all routes of Skyways -Distribute functions of Manila Port			-----	-----	-----	-----	-----					
3 Develop power sources	-Develop power sources, improve efficiency of power distribution and implement pricing policy in order to supply low cost power.			-----	-----	-----	-----	-----	-----	-----	-----		
4 Develop telecommunication infrastructure	-Realize high speed internet			-----	-----	-----	-----	-----					
5 Develop more industrial parks to accommodate new investments	-Prepare locations such as industrial parks, etc. -Develop interlink road network among industrial parks.	-----	-----	-----	-----	-----	-----	-----					

Final Report

Project for Elaboration of Industrial Promotion Plans Using Value Chain Analysis
in the Republic of the Philippines

Annex C Recommendations

May 2019

- Joint Venture Project Team -



野村総合研究所
Nomura Research Institute

IMG Inc.

IL
JR
19-050

Agenda

1. For the Achievement of the Automotive Industry Promotion Plan

2. Recommendations/Implications to the Next Project

Important Considerations for the Actualization of the Philippines' Auto Industry Potentials

- Indonesia and Viet Nam are moving forward, very fast. The Philippines will be left behind if swift and decisive actions were not taken.

Country	Automotive Industry Development
Thailand	<ul style="list-style-type: none"> • Promotion of EV and car electronics. • Thai factories / R&D centers are becoming ASEAN regional centers. • Accelerate export of CBU while domestic market is shrinking.
Indonesia	<ul style="list-style-type: none"> • Promotion of automotive industrial policy led by BAPPENAS: inter-ministry policy forum, WG, Policy coordination board. • Policy measures for HRD, R&D&D and SME finance have been already adopted and discussed, await for legislation. • Promotion of export, supported by increased capacity of port and road. • Aiming 2.5 million production and 0.5 million export (by 2027).
Viet Nam	<ul style="list-style-type: none"> • National car has been developed (Vinfast) with support from Europe. • Promotion of supporting industry at designated industrial estate, with generous incentive scheme.
Philippines	<ul style="list-style-type: none"> • Competitiveness of car manufacturing? • AIPP has been incorporated into the national policy? • Infrastructure development for automotive sector?

Important Considerations for the Actualization of the Philippines' Auto Industry Potentials

- To incorporate AIPP to the National Economic Development Plan and legislate relevant policy measures.
- To announce industry people that the Philippines' industrial policy focuses on manufacturing, especially on the automotive sector, by legislating relevant policies.
- The government should not trivialize the issue to the automotive sector. It relates to all the base of manufacturing and engineering sub-sectors and it will be a huge issue for the trade balance of the country.
- Inter-ministry coordination is quite important to strengthen the global competitiveness (industrial cluster approach will be effective).
- Continuity of the policy is crucially important for manufacturing sector as a whole, since it takes long time to have a return on investment. Initial investment will be very large.

Agenda

1. For the Achievement of the Automotive Industry Promotion Plan

2. Recommendations/Implications to the Next Project

Linking to the New Project

- Title of the New Project:

Project for Industrial Competitive Enhancement through Industrial Human Resource Development and Supply & Value Chains Development

- 4 year project starting 2019

- Two Pillars = Same as the Thematic Working Groups in Phase II

- Industrial Human Resources Development
- Supply and Value Chain Development (= Investment Promotion and Local Supplier Development)

Industrial Human Resources Development

■ **More concerted efforts by all parties are needed under a strong initiative by industry associations and government agencies.**

- ✓ Need for improvements in the current mechanism to feedback the industry's needs
 - Working groups by segments should be set up.
 - Working groups should meet more regularly for technologically fast moving sectors.
- ✓ Need for more standardized paperwork (various forms) to be submitted by universities / colleges / TVET institutions to companies and need for more industry-academia promotion tools

■ **Auto industry players beside assemblers are not still well known among industry coordinators and students.**

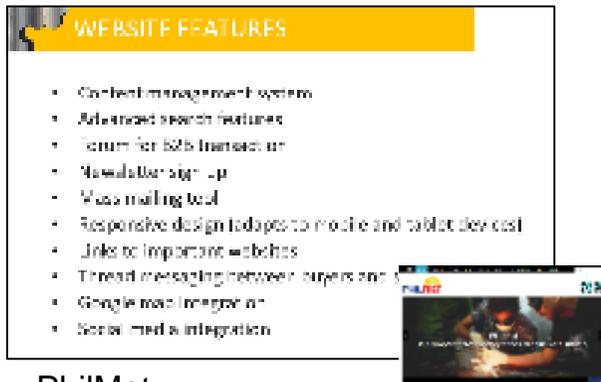
- ✓ More opportunities for students to learn about Tier 1 and below companies and career opportunities are needed to attract more students to the industry.
- ✓ Need for far-sighted efforts to be made for Japanese SME investment promotions. (Cf, large influx of overseas students from Viet Nam to Japan to study in HEIs / language schools)
- ✓ Compared to other ASEAN countries, linkages between Japanese and Philippine universities are not as strong.

Local Supplier Development

■ BOI Plan for Expansion

- Include the database expansion in the annual work plans of BOI staff from the Manufacturing Industries Service, Industry Development Group
- Set specific number of profiles as work targets of staff responsible

- There are multiple supplier databases in making : one by this project, one by MIRDC, and one currently planned by IFC. There is a need to consolidate and make one database.



PhilMet

- 15 buyers registered
- 90 suppliers registered

MIRDC would like to work with JICA and IFC to expand its database.



IFC is considering to develop the supplier's database based on the CzechInvest's model.

Today, the database hosts over 4,000 companies.

Local Supplier Development: Production Management Technology

- **Without consultation from OEMs, peer learning, and pressure from clients, it is difficult for suppliers to understand the importance of Kaizen and effective ways to conduct it.**
 - **There will be more suppliers which are not accustomed to Kaizen activities in the next phase of the project. A well prepared program will be needed.**
 - ✓ It is important that prior to on-site consultancy, target companies will undergo in-class training to learn key concepts, such as quality assurance, lean production, etc and analytical tools.
 - ✓ It is important not only to teach how to do Kaizen but also how to present its achievements and create an opportunity to present to top management at the final stage of consultancy.
 - ✓ Many companies who participated in the TPS seminar responded that they would like to learn more about “Production Planning,” and analytical tools (practical learning) of production management technology.
 - **Mechanism for sustained Kaizen activities.**
 - ✓ It is important to provide guidance on setting up a mechanism (organizational structure) in which Kaizen activities will be systemically continued. (e.g. preparation of annual Kaizen plans and reporting of its progress to top management every months)

Investment Promotion

● Language support for investors

- BOI should have bilingual/multilingual members tasked to support investment promotion.
- BOI should build a mass of bilingual/multilingual translators who can be tapped as consultants by private businesses when they participate in B2B matching. By working closely with DOLE and DFA to create a database of technical and multilingual Filipinos.

● Capacitate Philippine businesses on how to engage in business matching activities

- Identify opportunities in these meetings and ably present their value proposition that is tailor fit to the needs of the prospective clients/business partners. It is the organizers' responsibility to ensure this.

● The ties created with the companies and government agencies are maintained and even strengthened, follow-ups should be made after promotion activities.

- To ensure the organizers provide assistance to local companies in communicating with their potential partners to support their initiatives. Without this, the overall objective of the activity may not be achieved.

● Need to facilitate more concerted efforts among government agencies

- TRABAHO bill is the major concern (hindering factor) of potential investors as of early 2019. One main banks in Japan reported that have seen a drop in inquiries on investment to the Philippines.
- Overly stringent environment regulations (PH environment regulations are considered one of the most strictest among Asian countries including Japan) prevent investments in the electro-planning industry.

NRI

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