OMICS INTERNATIONAL

OMICS International through its Open Access Initiative is committed to make genuine and reliable contributions to the scientific community. OMICS International signed an agreement with more than 1000 International Societies to make healthcare information Open Access.

OMICS Journals are welcoming Submissions

OMICS International welcomes submissions that are original and technically so as to serve both the developing world and developed countries in the best possible way.

OMICS Journals are poised in excellence by publishing high quality research. OMICS International follows an Editorial Manager® System peer review process and boasts of a strong and active editorial board.

Editors and reviewers are experts in their field and provide anonymous, unbiased and detailed reviews of all submissions.

The journal gives the options of multiple language translations for all the articles and all archived articles are available in HTML, XML, PDF and audio formats. Also, all the published articles are archived in repositories and indexing services like DOAJ, CAS, Google Scholar, Scientific Commons, Index Copernicus, EBSCO, HINARI and GALE.

For more details please visit our website:
http://omicsonline.org/Submitmanuscript.php

JUNWANG TANG

Editor PPT

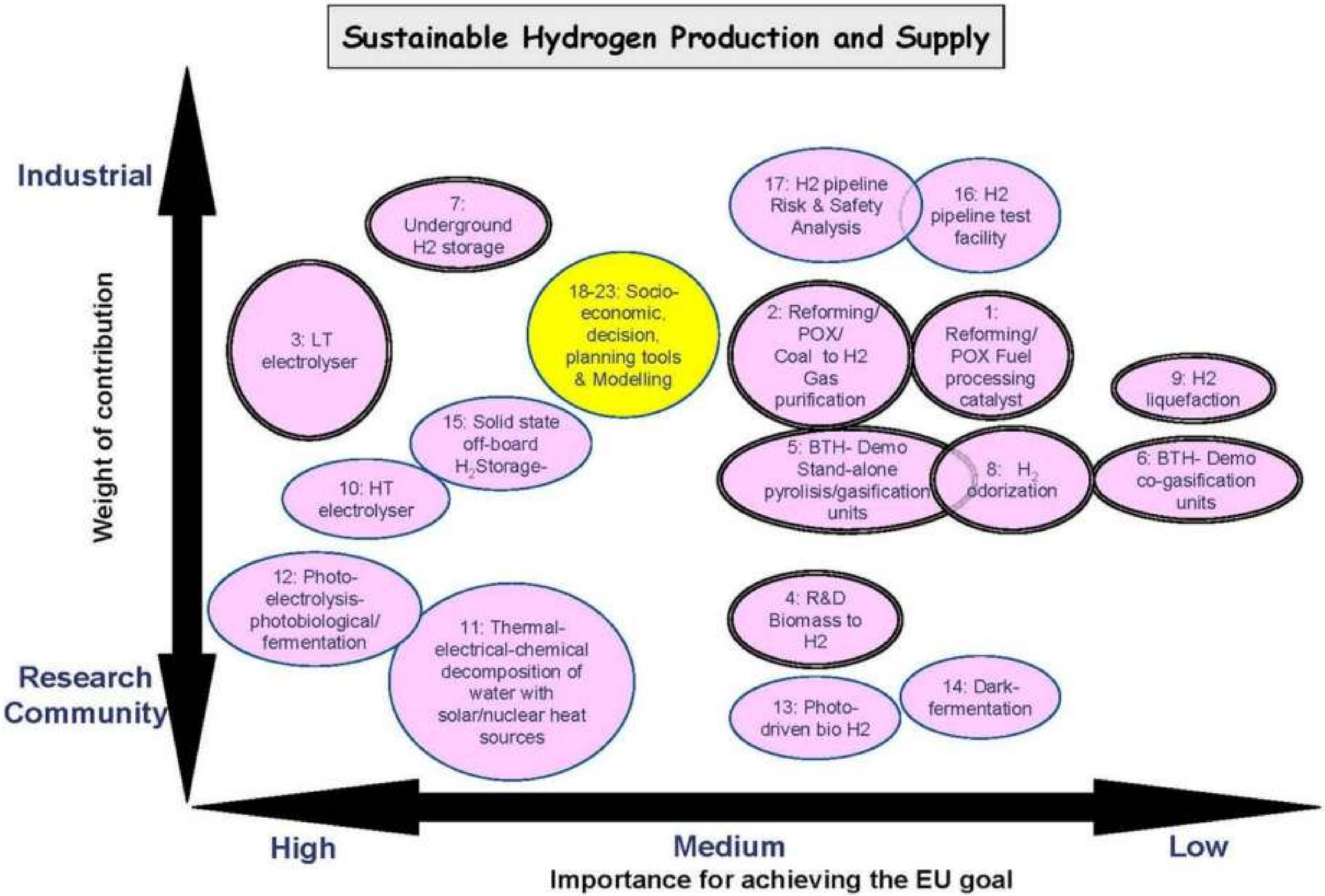
Biography

- Dr. Tang received his PhD in Physical Chemistry in 2001 from Dalian Institute of Chemical Physics. Between 2002-2005, he had been a Japan Society for the Promotion of Science (JSPS) Fellow & NIMS researcher working on solar energy conversion in NIMS, Japan. After that, he moved to the Department of Chemistry, Imperial College and then the Department of Chemical Engineering, UCL as a Senior Researcher, Lecturer in Energy, and then promoted Senior Lecture and Reader. He has been recognized by an Outstanding President's Award of Chinese Academy of Sciences (2001), JSPS Fellowship (2003) and Young Scientist Award by the International Association of Catalysis Societies (2008).
- He is the Guest Editor-in-Chief of a special issue of International Journal of Photoenergy, 2012, Associate Editor of Chinese Journal of Catalysis and sits on the editorial board of several international journals. He is an Honorary Lecturer in Chemistry at Imperial College London and Adjunct Professor in Chinese Academy of Sciences and Nanjing Tech University. Up to now, he has published ~100 papers with a total citation of >3100.

Research Interests

- His Research Interests lie in Nanostructured crystals and films synthesis, in particular by microwave promoted flow chemistry; Solar H_2 synthesis; CO_2 capture and conversion to a renewable fuel (Artificial Photosynthesis); CH_4 conversion; Photocatalytic contaminant decomposition; Biomaterials; Microwave catalysis.

Solar Hydrogen Synthesis

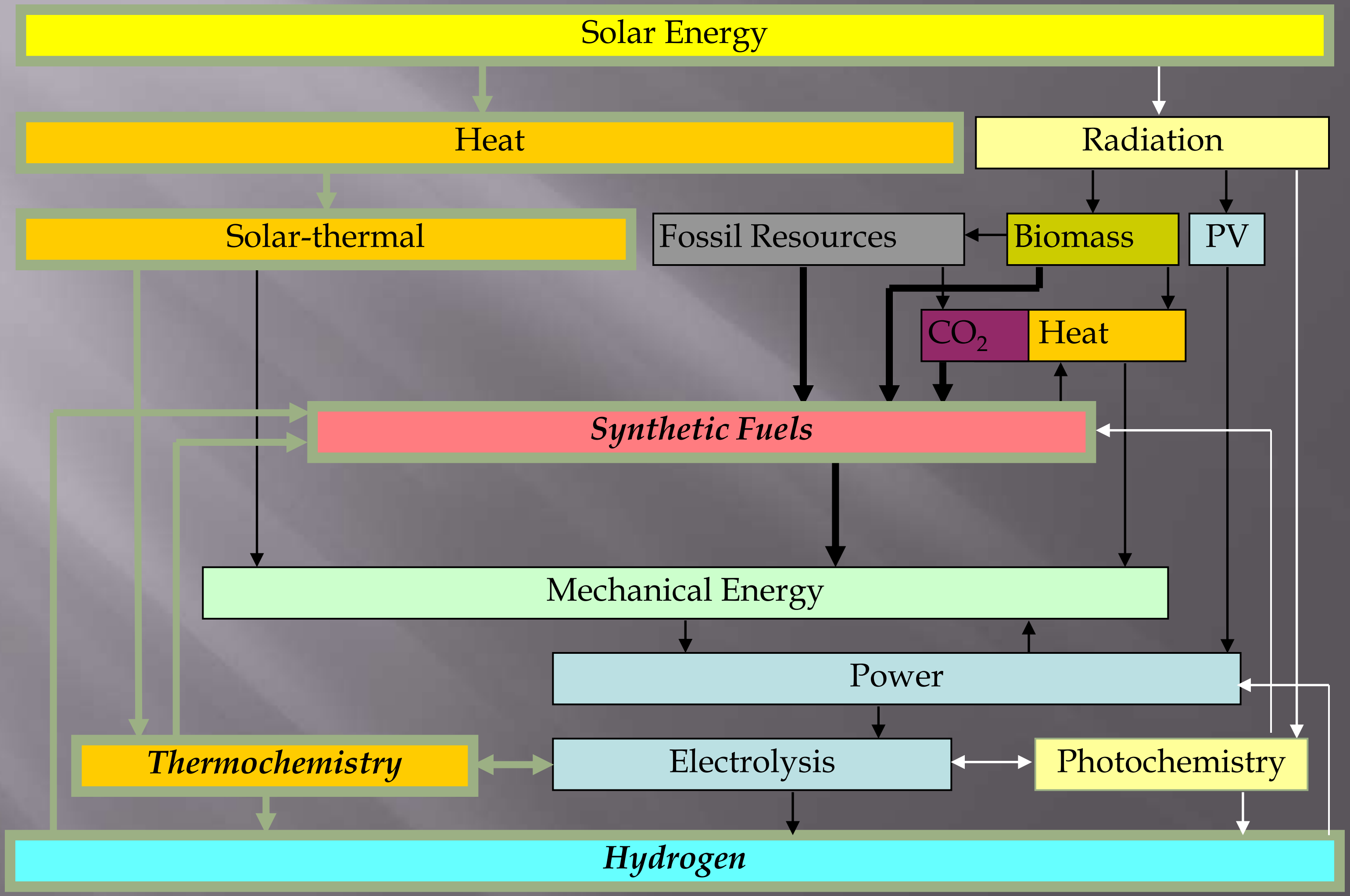

Sustainable Hydrogen Production and Supply
Industrial
Research Community
Weight of contribution
7: Underground H2 storage
3: LT electrolyser
18-23: Socio-economic, decision, planning tools & Modelling
15: Solid state off-board H2 Storage-
10: HT electrolyser
12: Photo-electrolysis-photobiological/ fermentation
11: Thermal-electrical-chemical decomposition of water with solar/nuclear heat sources
17: H2 pipeline Risk & Safety Analysis
16: H2 pipeline test facility
2: Reforming/ POX/ Coal to H2 Gas purification
1: Reforming/ POX Fuel processing catalyst
9: H2 liquefaction
5: BTH- Demo Stand-alone pyrolisis/gasification units
8: H2 odorization
6: BTH- Demo co-gasification units
4: R&D Biomass to H2
13: Photo-driven bio H2
14: Dark-fermentation
High
Medium
Low
Importance for achieving the EU goal

Hydrogen production – benchmark processes for solar technologies

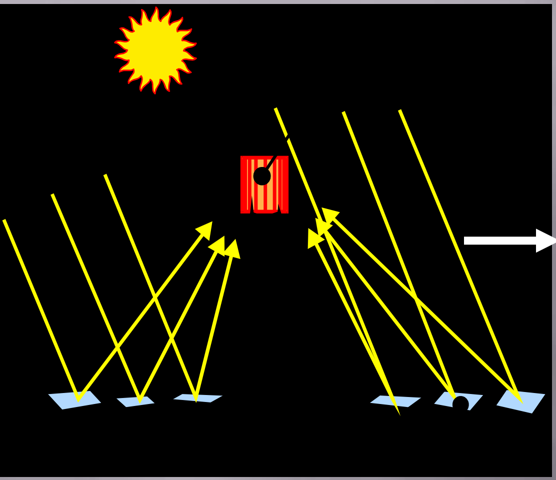
Technology	Process	Governing reaction[1]	Variations
SMR Steam Methane Reforming	Methane, Steam → H_2, CO_2	$CH_4 + 2H_2O \rightarrow 4H_2 + CO_2$	▪ On-site SMR ▪ Central SMR ▪ Central SMR + CCS
WE Water Electrolysis	Water, Electricity[3] → H_2, O_2	$2H_2O \rightarrow 2H_2 + O_2$	▪ On-site WE ▪ Central WE
CG/(IGCC) Coal Gasification /Integrated Gasification Combined Cycle	Coal[2], Steam → H_2, CO_2	$C + 2H_2O \rightarrow CO_2 + 2H_2$	▪ CG ▪ CG + CCS ▪ IGCC ▪ IGCC + CCS

1 Simplified reaction
2 Includes co-firing with biomass

Energy Routes



Principle of the solar fuel production



Solar Tower

Wireless electricity

Recourses
Natural Gas
Water, CO_2

Chemical Reactor

Fuel
H_2
$CO + H_2$

Industry

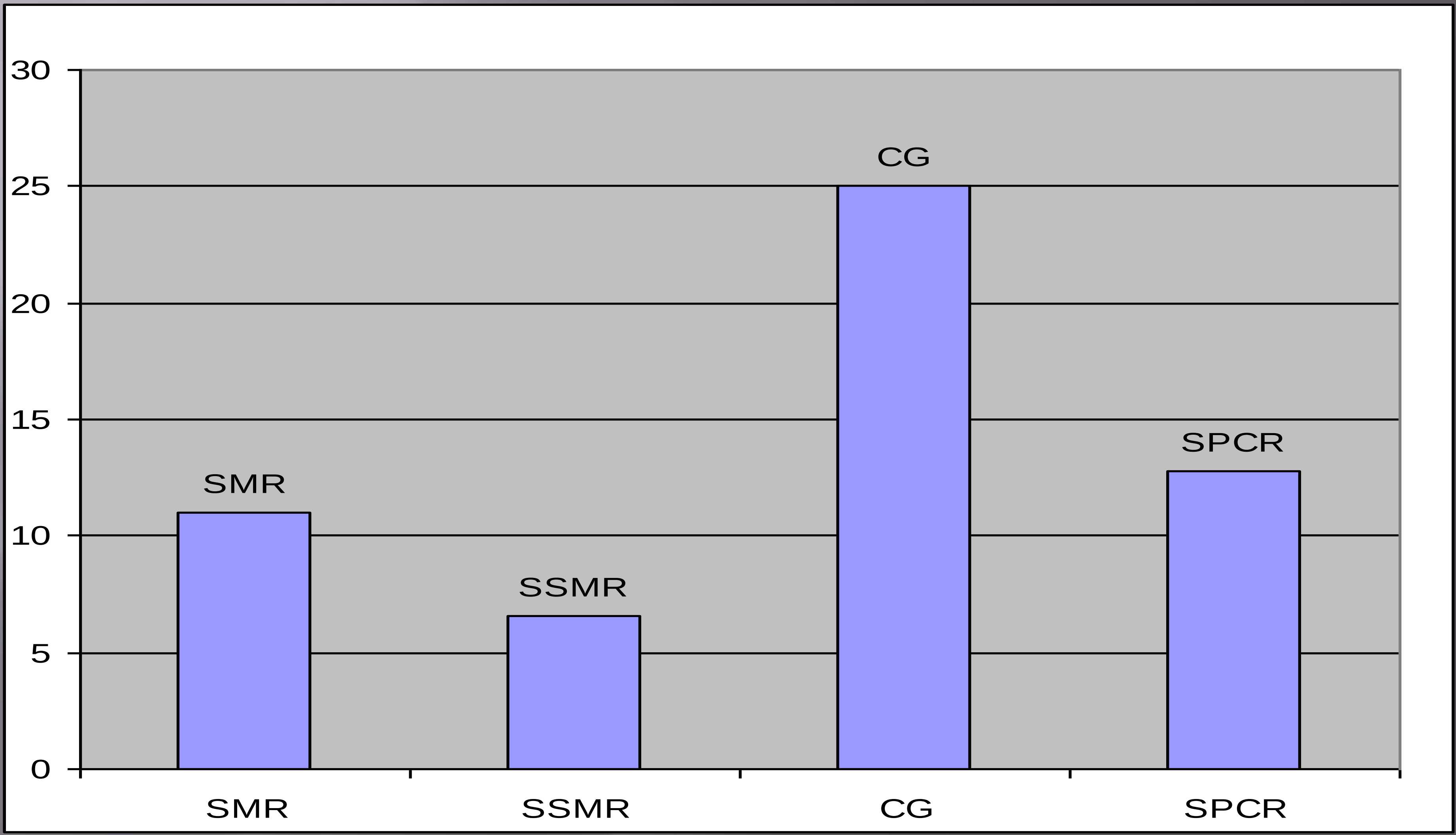
Transportation

Energy Converter
Fuel Cell

Transportation

Power Production

CO2 Reduction by solar heating of state of the art processes like steam methane reforming and coal gasification



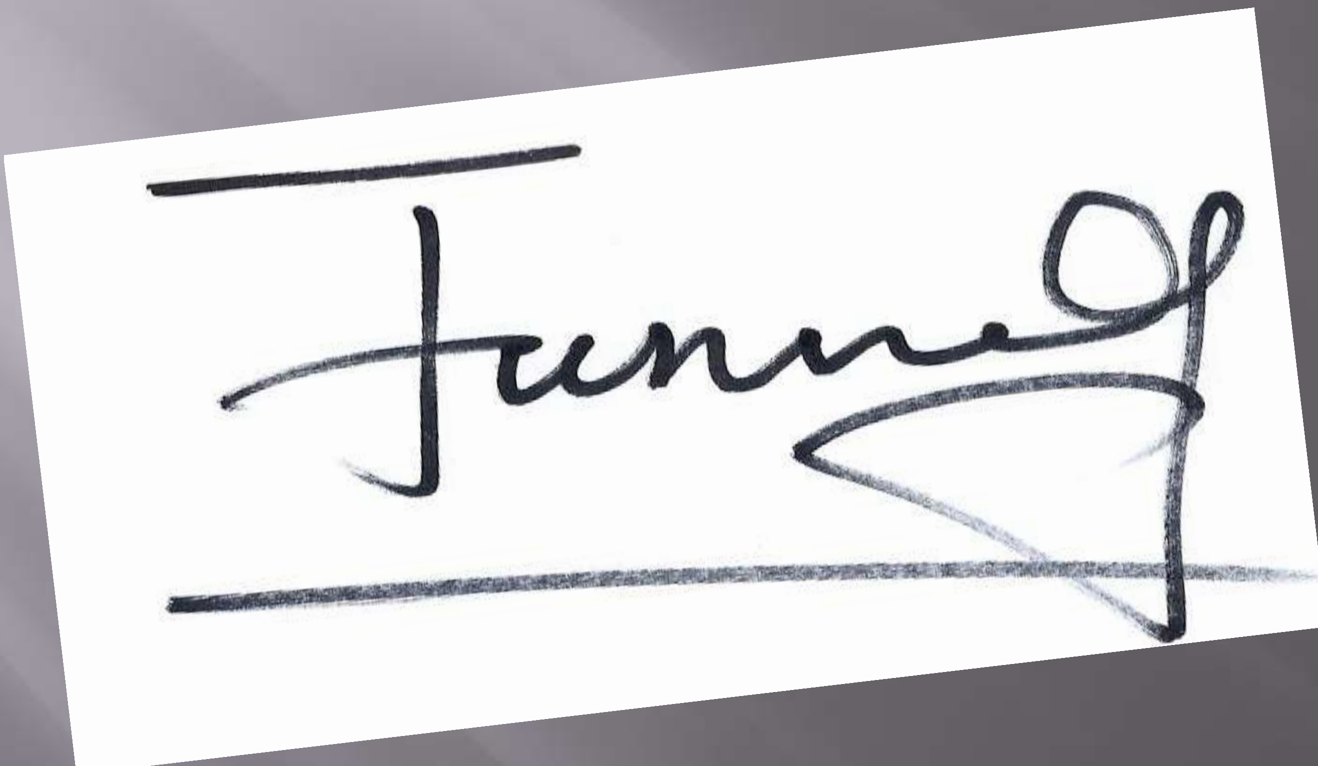
Efficiency comparison for solar hydrogen production from water

Process	T [°C]	Solar plant	Solar-receiver + power [MWth]	η T/C (HHV)	η Optical	η Receiver	η Annual Efficiency Solar – H_2
Direct solar driven water splitting	25	No need	semiconductor	NA	NA	NA	>10%
Elctrolysis (+solar-thermal power)	NA	Actual Solar tower	Molten Salt 700	30%	57%	83%	14%
High temperature steam electrolysis	850	Future Solar tower	Particle 700	45%	57%	76,2%	20%
Hybrid Sulfur-process	850	Future Solar tower	Particle 700	51%	57%	76%	22%
Hybrid Copper Chlorine-process	600	Future Solar tower	Molten Salt 700	49%	57%	83%	23%
Nickel Manganese Ferrit Process	1800	Future Solar dish	Rotating Disc < 1	52%	77%	62%	25%

RELATED JOURNALS

Chemical Sciences Journal

Chemical Engineering & Process Technology



OMICS International **Open Access Membership**

OMICS International's Open Access Membership enables academic and research institutions, funders and corporations to actively encourage open access in scholarly communication and the dissemination of research published by their authors.

For more details and benefits, click on the link below:

http://omicsonline.org/membership.php