

INSEAD

The Business School
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Private Equity (Group 7 AB)

Team Project Sponsor: WHEB Ventures

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Green Building
technologies
business

Recap: Project deliverables and Status

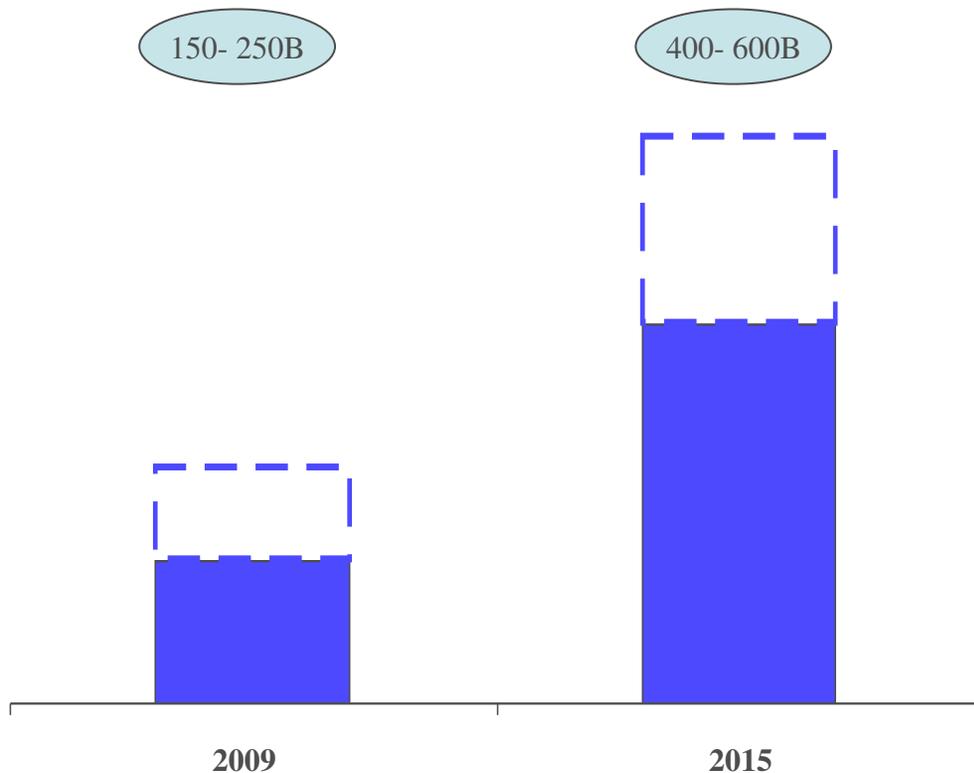
<u>Deliverable</u>	<u>Status</u>
• Define green building materials market including market size and growth rate	
• Define green building value chain in detail	
• Select attractive sub-segments in value chain based on quantitative and qualitative factors	
• Find a list of attractive companies in selected sub-segments	<div>To be discussed today</div>
• Provide basic information about these companies	

Agenda

- **Market overview**
- Green building value chain
- Potential targets
- Appendix

The “Green building” sector is predicted to more than double before 2015

Global market growth 2009-2015 (USD billion)



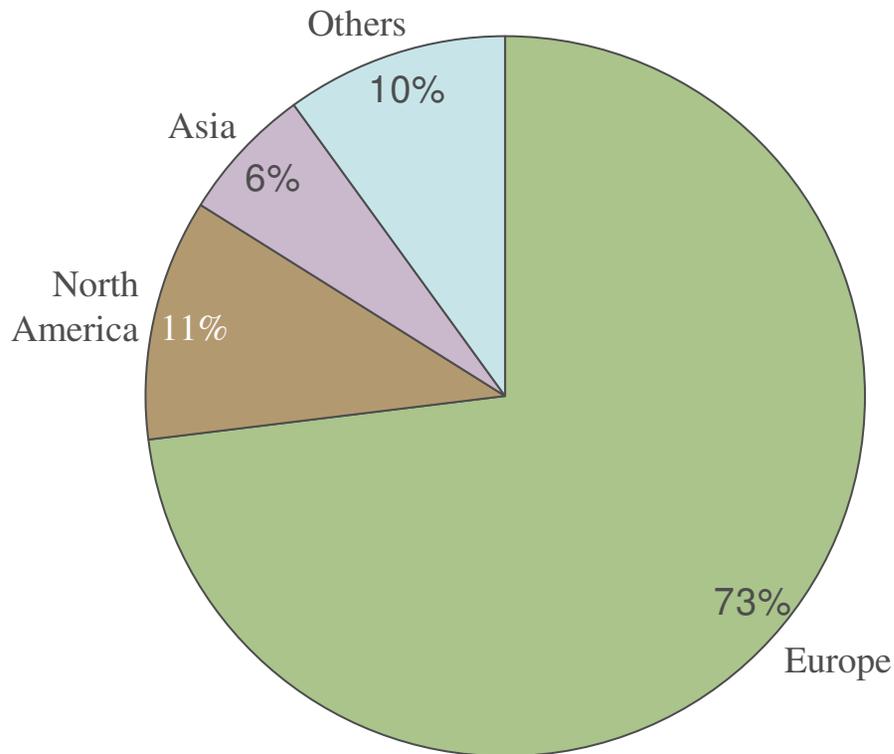
Source: <http://www.prlog.org/10487465-global-green-building-industry-market-research-report.html>

Key facts

- The case for green building is growing. Traditional buildings at global level currently accounts for:
 - 40% of energy use
 - 20% of water use
 - 30% of raw material
 - 1/3 of greenhouse emissions
- Asia has been identified as the fast growing region
- Government focus on energy efficiency and green building is increasing as a stimulus against the recent global crisis
- Retrofitting is vital part of green building ~60% of building in 2050 have already been built
- Upfront investment premium (1.8% over traditional building) can yield lifetime costsavings of 10 times

Europe is the most developed market followed by North America, while Asia may represent the future

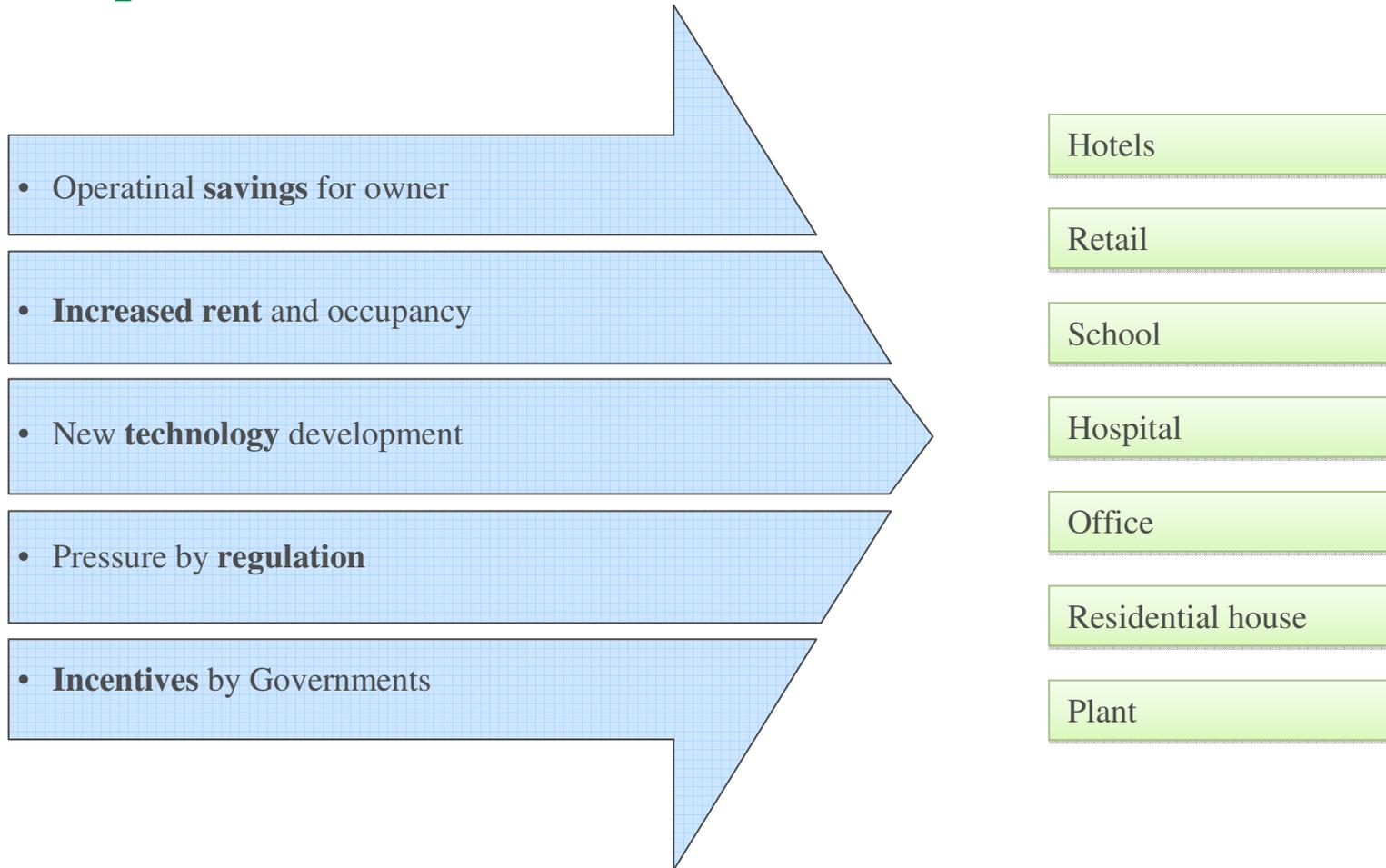
Green Building market by geography 2009 (Total: ~550 USD bn)



Source: Press clippings, Fredoonia Group report, Team analysis and estimates

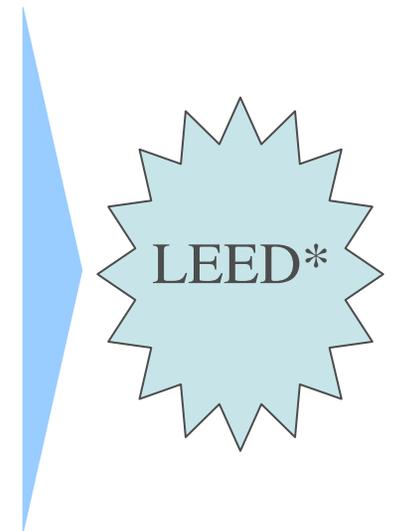
- **Global population increase** will drive the growth of the construction market. By 2020 total population of ~8 billion:
 - developed countries 1.3 bn
 - developing countries 6.7 bn (*of which: Asia: 4.7 bn, Africa 1.5 bn, Latin America 0.7 bn*)
- **Europe:** Green Building Programme and Energy Performance of Buildings Directive (EPBD) implemented to help the EU saving energy around 75% by the end of 2020
- **North America:** green building investments part of the fiscal stimulus to foster the economy in a sustainable way
- **Asia:** greener building standards and the rising energy costs are the market's main propellants. Unfortunately, enforcement of energy standards is uneven and customers are highly price sensitive

Several forces are shaping the construction business in all its end products



Buildings must meet five restricting criteria in order to be defined “green”

Main areas	Criteria description
Site selection	<ul style="list-style-type: none">Discouraging development on previously undeveloped land; minimizing a building’s impact on ecosystems; regionally appropriate landscaping; smart transportation choices; reduction of erosion, light pollution, heat island effect and construction related pollution
Water Efficiency	<ul style="list-style-type: none">Encouraging smart use of water; water reduction is typically achieved through more efficient appliances, fixture and fittings inside and water-wise landscaping outside
Energy Efficiency	<ul style="list-style-type: none">Commissioning, energy monitoring, efficient design and construction, efficient appliances-systems-lighting, usage of renewable sources of energy
Material utilized	<ul style="list-style-type: none">Selection of sustainably grown, harvested, produced and transported products and materials. Re-use and recycling are also considered
Indoor quality evaluation	<ul style="list-style-type: none">Improvement of indoor air as well as access to natural daylight, views and acoustic



* LEED = Leadership in Energy & Environmental Design – international green building certification system

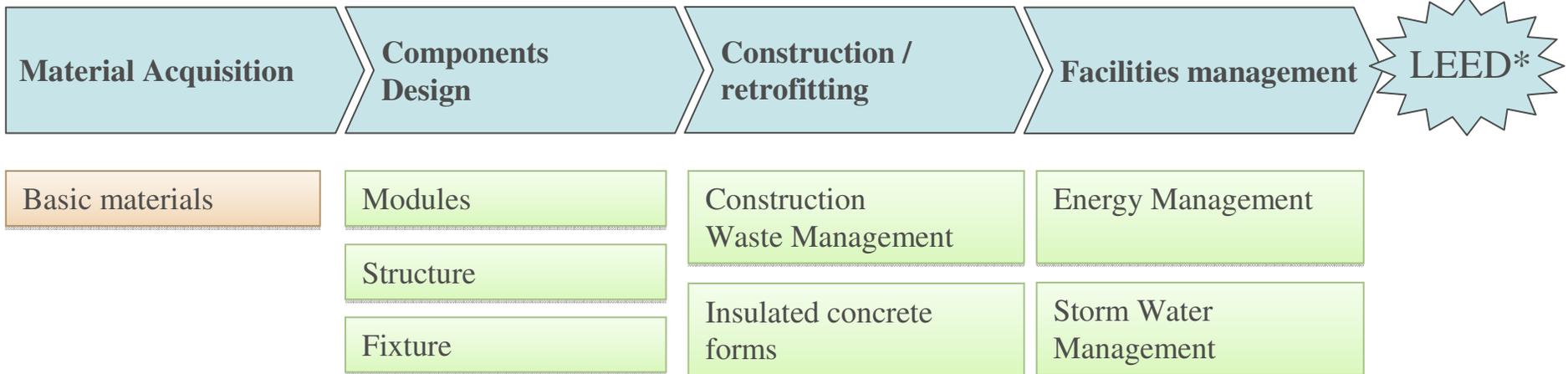
Source: Green Building in Asia, Responsible Research – March 2010

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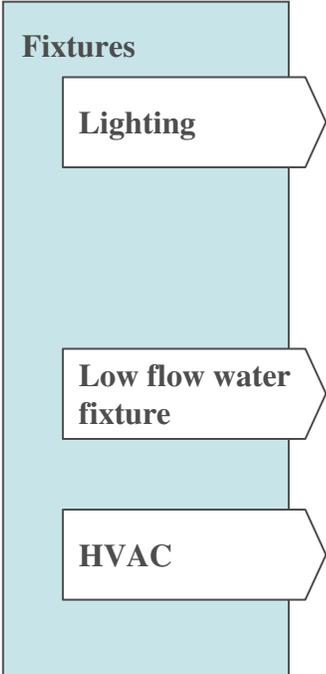
Green Building Value Chain

Out of Scope
Detailed in next slides



* LEED = Leadership in Energy & Environmental Design – international green building certification system

Components Design (1/3)

	<u>Market Size & Growth</u>	<u>Return Metrics</u>	<u>Description</u>	<u>Attractiveness</u>
Fixtures 	Lighting	Large(upto \$15bn); 7%	GMs: 15% (for exterior fixtures) to 55% (automated control) <ul style="list-style-type: none"> •Largely LED and fluorescent lighting, which is saturated •Automatic control systems – high margin, but dominated by large players •Exterior fixtures: low margin and mainly residential 	Low; Search for niche players in control systems
	Low flow water fixture	Small (<\$1bn)	GMs: 15% (faucets) - 35% (flush technology) <ul style="list-style-type: none"> •Small market with low margins •Mainly residential market 	Low; Deprioritize
	HVAC	Large	GMs: 15% - 30% (automated heating controls) <ul style="list-style-type: none"> •Market dominated by large global HVAC players •Relatively low technological intensity vs. other segments 	Low; Deprioritize

Source: Press clippings, Piper Jaffray analysis, Team analysis and estimates

Components Design (2/3)

Modules	Market Size & Growth	Return Metrics	Description	Attractiveness
Roofing	TBD; 17%	Gross Margins of up to 40% on the higher side for cool roofing	<ul style="list-style-type: none"> •Largely low-margin asphalt shingles dominated by large players (3M, Uni-Solar etc.) •Some higher margin products (e.g. green roofs, cool roof) – small market •Mainly a commercial market 	Medium: Look at companies newer roof categories
Windows	Large (upto\$25bn); 5.7%	Typically low gross margin because this is an evolved category	<ul style="list-style-type: none"> •Mainly a residential segment (~80%), which is heavily fragmented 	Low
Flooring	Medium; 6.6%	GMs upto 40% for laminate floorings with recycled products	<ul style="list-style-type: none"> •Potential for high growth because commercial uptake is picking up (on the basis of aesthetics mainly!) • Relatively higher margins because of use of recycled products, but low tech intensity 	Medium: Companies in laminate, vinyl and ceramics
Composite products	Large (>\$30bn)	GMs range from 10%-60% because of wide range of products	<ul style="list-style-type: none"> •Mainly a residential segment, which is dominated by traditional base materials like wood and glass •More metal-based composites being introduced in the commercial segment 	Low/Medium: Companies in metal & ceramic composites

Source: Press clippings, Freedonia Group, Piper Jaffray, Team analysis and estimates

Components Design (3/3)

	<u>Market Size & Growth</u>	<u>Return Metrics</u>	<u>Description</u>	<u>Attractiveness</u>
Structure <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Insulation</div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Plumbing</div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Electricity</div>	TBD; 15%	GMs: Low 20s (cellulose) to mid-40s (spray foams)	<ul style="list-style-type: none"> •The overall market is small, but growing faster than other segments •New techniques being introduced to cut down costs and space utilization 	High: Look at companies in spray foam and other new areas

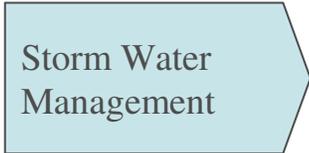
Source: Press clippings, Piper Jaffray analysis, Team analysis and estimates

Construction and Retrofitting

	<u>Market Size & Growth</u>	<u>Targeted Customers</u>	<u>Description</u>	<u>Attractiveness</u>
Construction waste management	Small but fast growing	60% Commercial 40% Residential	<ul style="list-style-type: none"> • Growing consumer awareness • Wide applicability (75%-90% of materials could be recycled) • Regulation stimulus • Incumbents established 	Medium: Look at companies on waste prevention and deconstruction
Insulated concrete forms	Small and steady growth	Residential	<ul style="list-style-type: none"> • Incremental innovations and low margins • Potential consolidation of small players • Excess capacity due to past years contraction • Innovation driven by material choice 	Medium/low: Look at companies in modular spray foam

Facilities Management

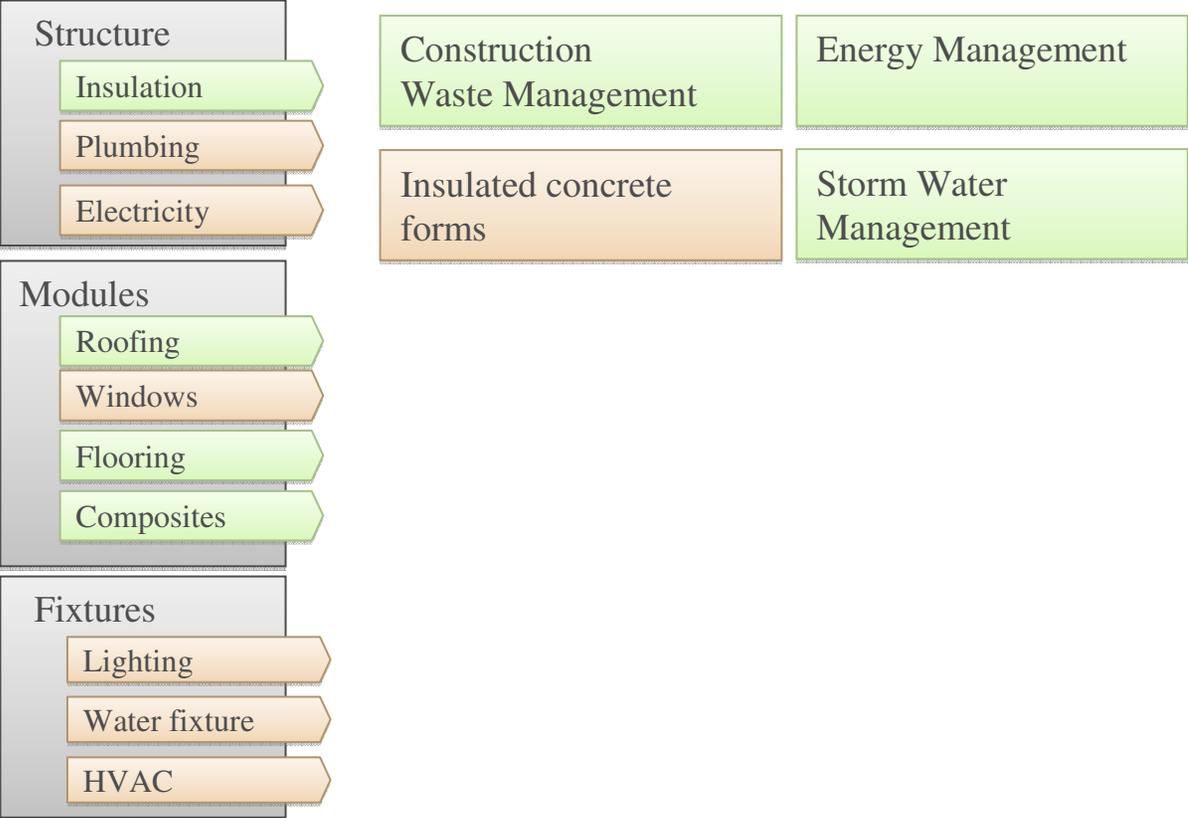
	Market Size & Growth rate	Targeted Customers	Description	Attractiveness
 <p>Energy Management</p>	<p>Large (\$7 bn by 2020) and fast growing (10%)</p>	<p>Mainly commercial</p>	<ul style="list-style-type: none"> • Cost saving catalyst • Increasing policy benefits • 3 major incumbents* • Higher growth potential in the residential 	<p>Medium: uprising potential segments in remote security activation and network</p>

 <p>Storm Water Management</p>	<p>Large and ready to take-off</p>	<ul style="list-style-type: none"> • Construction • Residential • Agricultural • Commercial • Irrigation 	<ul style="list-style-type: none"> • Potential for accelerated growth • Next tech frontier ready to break through • Project related stimulus growth 	<p>High: large market and attractive margins due to project nature</p>

* Johnson Controls, Honeywell and Siemens

Selected segments

Out of Scope
 Selected focus



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Bioroof Systems

Roofing

Profile

- **Started Year:** 2000
- **Location:** Canada
- **Presence:** North America
- **Website:** www.bioroof.com
- **Additional information:**
 - B2B
 - Entirely own by LandSource Organic

Description of Business:

Bioroof is active in the green building roofing segment and has designed a system that fulfills the goals of biodiversity, storm water retention, reduction of urban heat island effect and reduced energy consumption all in one.

Investment thesis:

- Product design reduces requirement of maintenance after the installment, unlike typical 'roof gardens'
- The innovation is in the combination of several innovative components to create a self-maintaining roof

Biobased Insulation

Insulation

Profile

- **Started Year:** 2003
- **Location:** United States
- **Presence:** Worldwide
- **Website:** <http://biobased.net>
- **Additional information:**
 - Entirely own by Biobased Technologies (a bio-chemical research company)

Description of Business:

Developer and manufacturer of spray polyols insulating foam that permit the sealing and insulating in one easy step. Biobased Insulation uses the proprietary formula of Agrol that reduces the usage of petroleum and chemical components without compromising performance

Investment thesis:

- Young company in the early stage of development, focused on B2B
- Highly focused on research and development (they are developing a sealing foam from soy)
- Product particularly easy to apply, efficient and “green” (it gives lot of LEED points)
- Several green building product awards

Coat-Innovative

Insulation

Profile

- **Started Year:** NA
- **Location:** Singapore
- **Presence:** Worldwide
- **Website:** www.coat-innovative.com.sg
- **Additional information:**
 - Application also in the automotive industry
 - Patented technology
 - Size potentially above threshold

Description of Business:

CI produces a revolutionary self-leveling liquid/gel coating to glass facade suitable for residential and commercial. It comes in liquid form, and within a few hours of application, it forms a seven micron thin solid layer on the glass surface. The coating is able to self-level on its own at room temperature, blocking out ultra-violet and infra-rays.

Investment thesis:

- Easy to apply and efficient revolutionary technology that is applied directly on glass surfaces and increase also visibility
- Asia focus: developed and marketed especially for Asia where new building construction is growing fast

Encelium Tech., Inc.

Energy Management Systems

Profile

- **Started Year:** N/A
- **Location:** Canada
- **Presence:** North America and Europe
- **Website:** www.encelium.com
- **Additional information:** Awarded most promising company in EMS

Description of Business:

Encelium manufactures advanced lighting control system geared specifically for energy management in commercial building. Those systems reduces lighting use & energy costs with an average payback of 2-5 years.

Investment thesis:

Product highly-performing: 50-75% savings on energy systems, double than the market standard. ECS is a cost-effective addressable dimming system that allows each person in a commercial building to control their own workspace light levels from their desktop computer.

Aquatherm

Water Management

Profile

- **Started Year:** 1973
- **Location:** U.S.
- **Presence:** Worldwide
- **Website:** www.aquathermpipe.com
- **Additional information:**

Description of Business:

Aquatherm provides an environmentally friendly, sustainable solution for piping applications. It is designed to outlast other piping systems using polypropylene and fusion, as well as being fully recyclable.

Investment thesis:

Growth potential for new product line Climatherm includes all the advantages of aquatherm greenpipe, but is engineered and priced for chilled water, hydronic heating, and industrial applications. Pipeline can also be used to renovate old building thanks to their easy heat-way installation use.

Watertronics

Storm Water Management

Profile

- **Started Year:**
- **Location:** U.S.
- **Presence:** North America
- **Website:** www.skyharvester.com
- **Additional information:** Margins likely below threshold

Description of Business:

Watertronics is a single source manufacture and integrator of water harvesting and water control systems. Other products include pump stations, control systems, filtration systems, and engineering. Sky Harvester systems can help companies reduce their potable water needs by up to 80%.

Investment thesis:

Integrated end-to-end product that provides tailored options:

- General structure and tank sizing assistance;
- Remote data logging and control;
- Multiple replenishment source control;
- Completely integrated with building automation systems.

Markes International

Monitoring and Testing

Profile

- **Started Year:** 1998
- **Location:** London, UK
- **Presence:** Global
- **Website:** www.markes.com
- **Additional information:** Products also used in defense and food industries

Description of Business:

Markes International is a manufacturer of analytical thermal desorption instrumentation and associated sampling equipment. These equipments are used for air monitoring in green buildings as well as for testing building materials' LEED compliance

Investment thesis:

- Products used for multiple applications across the Green Building segment
- Evidence of technological R&D over the years in newer generation of products

Planet Reuse

Construction waste management

Profile

- **Started Year:** 2008
- **Location:** US
- **Presence:** US
- **Website:** www.planetreuse.com
- **Additional information:**

Description of Business:

Planet Reuse was started as an internet based E commerce material website then grew into a consultative brokerage house for salvaged and reclaimed construction materials

Investment thesis:

- Recent high profile partnership with GreenWizard provides it access to the largest database of product data for green building materials
- Low capital requirements

Low Interest Companies

Insulation

Do-it-yourself (DIY) Home Insulation

- Small DIY Spray Foam insulation kits sold through retail hardware stores
- Pure consumer goods business with seemingly low differentiation
- Top companies include – Spray Insulation Limited, Foam Seal, DIY Spray Foam

Building Envelopes – Commercial Insulation

- Very small market and dominated by few American players
- Many claimants to better spray foam technology, but nothing concrete
- Top companies include – Pittsburgh Corning (UK website - <http://www.foamglas.co.uk/building/home/>) and Owens Corning (Europe website - <http://www.owenscorning.eu/en/index.aspx>)

Todd Ecological Design

Water Waste Management

Profile

- **Started Year:** 1989
- **Location:** U.S.
- **Presence:** Worldwide
- **Website:** www.toddecological.com
- **Additional information:**
2008 Buckminster Fuller challenge award; Target for growth equity

Description of Business:

John Todd Ecological Design is a pioneer in the use of natural systems for the removal of chemicals, petroleum hydrocarbons, endocrine disruptors, and other detrimental water pollutants with over 30 years experience with natural wastewater treatment design, general aquatic management, and project supervision.

Investment thesis:

The Eco-Machine is a major technology breakthrough supported by consolidated reputation and wide range of consulting services, which allow owners to minimize, or even eliminate environmental impact, as treated wastewater can be reclaimed and used as irrigation or for reuse as toilet fixture flush water.

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- **Appendix**

Main sources of information used

Analyst reports

- Piper Jaffray, *Green Building Products*, December 2009
- Wedbush, *Echelon Corporation Equity Research*, September 2009
- Macquire Research, *Building Going Green*, March 2008

Companies websites and annual reports

- Johnson Controls
- Mohawk
- Armstrong
- GE
- LG

Other sources

- HGTV Pro – Guide to Green Building Materials
- Factiva press clippings
- Web searches
- Green Building International Conferences and Expos 2009 and 2010

Sources for market sizing

World market size

- Green market research: <http://www.greenmarketresearch.com/SRG03>
- SBI Energy: <http://www.sbireports.com/Global-Green-Building-2644940>
- New Generation Research: <http://gigaom.com/cleantech/green-building-materials-market-to-jump-to-571b-by-2013/>
- Companies and markets: <http://www.companiesandmarkets.com/Summary-Market-Report/green-building-materials-a-global-strategic-business-report-317179.asp>

North America and Europe

- Mc Graw Hill Construction: http://construction.com/market_research/reports/GreenOutlook.asp
- Nations building news: www.nbnnews.com/NBN/issues/2007-04-02/Front+Page/index.html
- Freedonia Group, 2009
- Frost and Sullivan, Green building materials market drivers, 2009

Asia Pacific

- Research and markets: http://www.researchandmarkets.com/reportinfo.asp?report_id=1241370&t=e&cat_id=
- EMSI: http://www.emsi-green.com/content/Green%20Building%20Trends%20in%20China_Sept07.pdf
- Buy USA: <http://www.buyusa.gov/hongkong/en/greenbuilding.html>
- Trade British Columbia: <http://trade.britishcolumbia.ca/Partnerships/Documents/India-Urban%20Design%20and%20Green%20Building.pdf>