A GLOBAL OVERVIEW OF THE SPF INDUSTRY

ROBERT OUTRAM
IAL CONSULTANTS
NAFTA SPRAY FOAM MARKET PERFORMANCE

• Growth continued in 2014-2015
• Construction sector the key driver
  → Demand still largely driven by renovation of existing buildings and weatherization projects
• Industrial output improved
• Canadian housing market improved
• Mexican market still remains underdeveloped.
GLOBAL SPRAY FOAM MARKET TRENDS

- Demand for energy efficiency increasingly important
- Difficult economic situation in Europe and China
- Fire regulations and health and safety issues having an impact
- 4th generation blowing agents now available in the market
- Growth potential remains in emerging markets
Estimated Global PU Production, 2015

Source: IAL
PU RAW MATERIAL USE

PU Raw Material Consumption, MLbs, 2015

Source: IAL
## RAW MATERIAL DEMAND
### GLOBAL PICTURE (MLBS)

<table>
<thead>
<tr>
<th>Component</th>
<th>Flexible Foam</th>
<th>Rigid Foam</th>
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<tbody>
<tr>
<td>MMDI</td>
<td>2,000</td>
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</tbody>
</table>

![Bar Chart](chart.png)
GLOBAL MARKET DRIVERS
AND RESTRAINTS

Economic difficulties – China, Europe
Political turmoil
Health and safety concerns
Overcapacity
Oil prices – reduced investment

Government construction projects – housing and infrastructure
Consumer spending
Urbanization, higher standard of living
Demand for energy efficiency
# GDP GROWTH RATE FOR MAJOR ECONOMIES (%)

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</tbody>
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Source: IMF  
*Forecasts
GLOBAL CONSTRUCTION SECTOR

• Construction market driven by US, China and India
• US and India to grow faster than China
• Emerging markets taking advantage of China slowdown
  o Urbanization, growing middle class, higher standard of living
• Europe still below pre-crisis levels
  o Strong growth in the UK
• China, US, India, Indonesia, UK, Mexico, Canada and Nigeria to account for 70% of global growth in construction
## CONSTRUCTION SPENDING IN MAJOR ECONOMIES 2012-2018 (US$ BILLION)*

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<td>750</td>
<td>803</td>
<td>837</td>
<td>889</td>
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<td>Spain</td>
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<td>UK</td>
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<td>210</td>
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<td>236</td>
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</table>

Source: IHS, Euroconstruct, BRG Building Solutions

*Excluding civil engineering

** Forecasts BRG Building Solutions
NEW CONSTRUCTION BY REGION

New Construction by Region 2013-2019 (‘000s of Units)

Source: IHS, Euroconstruct, BRG Building Solutions
New Construction by Region excl. Asia 2013-2019 (‘000s of Units)

Source: IHS, Euroconstruct, BRG Building Solutions
## US HOUSING ACTIVITY (‘000 UNITS)

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<tr>
<td>Total Housing Starts</td>
<td>529</td>
<td>609</td>
<td>781</td>
<td>925</td>
<td>1,003</td>
<td>1,111</td>
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<tr>
<td>Single Family</td>
<td>415</td>
<td>431</td>
<td>535</td>
<td>618</td>
<td>648</td>
<td>715</td>
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<tr>
<td>Multi Family</td>
<td>114</td>
<td>178</td>
<td>245</td>
<td>307</td>
<td>355</td>
<td>396</td>
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<tr>
<td>New Single Family Home Sales</td>
<td>310</td>
<td>305</td>
<td>369</td>
<td>429</td>
<td>439</td>
<td>501</td>
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<tr>
<td>Existing Single Family Home Sales</td>
<td>4,182</td>
<td>4,263</td>
<td>4,656</td>
<td>5,087</td>
<td>4,935</td>
<td>5,260</td>
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</table>

*Source: National Association of Home Builders*
FORECAST % GROWTH IN CONSTRUCTION SPENDING 2015 TO 2016

Source: IHS Insight, September 2015 estimate
## CANADA HOUSING STARTS (UNITS)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Units</th>
<th>Percentage Change</th>
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<td>2008</td>
<td>211,056</td>
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<tr>
<td>2009</td>
<td>149,081</td>
<td>-29.4</td>
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<tr>
<td>2010</td>
<td>189,930</td>
<td>27.4</td>
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<tr>
<td>2011</td>
<td>193,950</td>
<td>2.1</td>
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<tr>
<td>2012</td>
<td>214,827</td>
<td>10.8</td>
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<tr>
<td>2013</td>
<td>187,923</td>
<td>-12.5</td>
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<tr>
<td>2014</td>
<td>189,329</td>
<td>0.7</td>
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<tr>
<td>2015</td>
<td>195,535</td>
<td>3.3</td>
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</table>
MEXICAN CONSTRUCTION SECTOR

- Growth that started in late 2014 continued in 2015
- Government initiatives such as National Infrastructure Plan aiding growth
- Future prospects cautiously optimistic
- Growing interest in sustainability and eco-friendly buildings
- 139 LEED certified and 460 LEED-registered projects in Mexico
GLOBAL SPF MARKET
MARKET TRENDS

• **Western Europe**: Regulations continue to drive the demand for energy efficient insulation
• **Eastern Europe**: Still offers much untapped potential
• **Middle East & Africa**: Turbulent political situation
• **South America**: Slowdown in construction market, Brazilian economy in recession
• **Asia Pacific**: Growth in India and South East Asia, decline in China
EMEA SPF MARKET

EUROPE

• Panels remain the most popular PU product
• Great country specific variation between insulation products used
  o PIR vs. PU
  o Panels preferred in major construction markets of UK and Germany
  o Mineral wool still widely used
• France and Benelux key markets for SPF
• Spain experiencing recovery
• Growth potential in Eastern Europe; Poland a growth market
EMEA SPF MARKET
RUSSIA AND CIS

• Russian market remains the largest in the region, and has great growth potential
  o The sector has been affected by the Ukrainian conflict
• Strict fire regulations – preference for mineral wool
• PU/PIR panels more popular than SPF in construction application
• Traditional materials most common choice in the rest of the CIS
• Many dwellings in desperate need of better insulation
• Turkey, Saudi Arabia, UAE and Iran are key countries for SPF demand in Middle East
• In Saudi Arabia and Iran, SPF often used for roof insulation together with elastomer coating or aggregate covering
• Improved awareness increased demand despite the lack of building codes
• Market affected by war and conflict
• Low oil prices having an impact:
  o Saudi Arabia cutting spending
  o Iran?
  o UAE, Qatar, Kuwait diversified economy
ASIA PACIFIC

CHINA

• Demand for SPF declined in 2014, influenced by fire regulations
• Weak construction sector has a further negative impact
• Regional restrictions remain in place
• Use in exterior wall applications declined since the fires in 2010, and has not recovered
• Some demand for open cell foam in bus roof and body insulation, imported products used
• 141b currently used in China
• Demand from cold storage, warehouses, tanks, pipes and containers increased
ASIA PACIFIC
REST OF ASIA PACIFIC

• Japanese demand impacted by slow economy
  o Regulations increasing demand
  o First country to use 4th generation blowing agents
• Sluggish demand in South Korea despite energy efficiency regulations
• Indian market limited by lack of legislation and acceptance of high quality insulation materials
• SPF competes with cheaper materials in South East Asia
  o Limited local production and product knowhow
  o Some growth in air conditioned buildings in Indonesia
  o Fast growth in industrial applications in Malaysia
GLOBAL SPF PRODUCTION
BY REGION

Global SPF Production in 2013, 2015 and Forecast Production in 2018 (MLbs)
LEADING SPF PRODUCING COUNTRIES

SPF Production by Country in 2013, 2015 and Forecast in 2018 (MLbs)
SPF IN AMERICAS

UNITED STATES

• US has resumed its position as the fastest growing SPF producer
  o Building codes
  o Continuous insulation
  o Air barrier requirement
• Most growth within wall insulation but roofing also increasing
• PIR Boards growth > SPF
• Regional differences
• More contractors
• Safety concerns

<table>
<thead>
<tr>
<th>Application</th>
<th>Demand 2015 (MLbs)</th>
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<tbody>
<tr>
<td>Wall Applications</td>
<td>240</td>
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<tr>
<td>Roofing</td>
<td>115</td>
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<tr>
<td>Other Applications</td>
<td>87</td>
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</table>
SPF IN AMERICAS

CANADA

• Canadian demand also growing
  → Slower than US
• New market entrants
  → Price decreases
• New systems suppliers
• Demand from residential construction growing
• External wall insulation systems common
• Pipe insulation

<table>
<thead>
<tr>
<th>Application</th>
<th>Demand 2015 (MLbs)</th>
</tr>
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<tbody>
<tr>
<td>Wall Applications</td>
<td>74</td>
</tr>
<tr>
<td>Roofing</td>
<td>8</td>
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<tr>
<td>Other Applications</td>
<td>35</td>
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</tbody>
</table>
• Mexican demand remains small
  o Commercial and residential roofing
  o Increase in demand for wall insulation
• Lack of awareness and extreme weather
  o Use of heat insulation often not considered necessary
• Poor reputation an issue
• 141b was to be pushed out by 2015.

<table>
<thead>
<tr>
<th>Application</th>
<th>Demand 2015 (MLbs)</th>
</tr>
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<tbody>
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<td>Wall Applications</td>
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<td>Other Applications</td>
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</table>
AMERICAS PRODUCTION

Open-Cell vs. Closed-Cell Foam in 2015, MLbs

- USA
  - Cons. Closed-cell
  - Ind. Closed-cell
  - Open-Cell

- Canada
  - Cons. Closed-cell
  - Ind. Closed-cell
  - Open-Cell

- Mexico
  - Cons. Closed-cell
  - Ind. Closed-cell
  - Open-Cell
GLOBAL SPF INDUSTRY

CHALLENGES

• Health and safety issues
• Poor application
  o Homeowner complaints
  o Contractor problems
• Increased competition
• Competition from alternative materials that are cheaper and have a better fire performance
GLOBAL SPF INDUSTRY OPPORTUNITIES

- Promotion of energy efficiency
- Continuous growth of housing market
- Emerging markets and untapped global markets
- Rising installation standards → Improved reputation
- Versatility and adaptability
- Excellent performance
Thank You!

Robert Outram
routram@brggroup.com
+44 (0)208 832 7780
www.ialconsultants.com