Global Perspective on the Roof Coatings Industry

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• Global roofing market overview
• Regional roof coating markets
  – North America
  – South America
  – Asia Pacific
  – Africa
  – Middle East
  – Europe
• Summary
Roof coatings is 0.016% of world construction

Sources: CIA World Factbook, Dow internal estimates
Global roofing overview

• Global roofing market is about 10B sq m valued at $80B
• Bitumen and concrete are major materials for global roofing. About 1/3 of global roofing materials are bitumen based and about 1/3 are cement based.
• About 25% of global roofing demand is in China and about 20% is in the US.
• In NA, single-ply roofs constitute the largest share of low slope roofing demand.
• Metal and single-ply roofs exhibit the strongest growth.

Sources: CIA World Factbook, market reports, Dow internal estimates
Total global roof coating market is about $1.5B

Source: Dow internal analysis
Overview of global roof coating market

US and Canada
• Leading low slope roof: TPO
• Focus on water ponding resistance improvement

Mexico and Caribbean
• Asphalt - common in low slope
• Concrete in Caribbean
• Focus on mech. properties

Middle East & North Africa
• Main Substrate: Concrete
• Focus on DPUR and SR

South America
• Fiber cement in Brazil, others
• Focus on application efficiency

South Africa
• Metal and Concrete are most common substrates
• Cool roofs gain traction

China
• Asphalt is main substrate
• Focus on DPUR improvement

Europe
• Established market
• ETAG 005 - the code to meet

India
• Concrete and asphalt roofs
• Cool roofs gain traction

ANZ
• Concrete and metal roofs
• Low adoption of cool roofs

Market growth: □ low □ med □ high

Source: Dow internal analysis
### US and Canada

#### Country Information & GDP**
- Population: 347,000,000
- GDP (PPP): $16.8 trillion
- GDP per capita: $53,200
- GDP growth: 2.0% annual

#### Construction Market & Roof Coatings
- Construct market: $1,455B*
- Market growth rate: 2%
- Roof Coatings: ~$750M

#### Substrates:
- SPF, Metal, Mod-bit, Single-ply
- TPO is becoming the leading low slope roof

#### Market:
- Established market with room for growth
- Increasing awareness of roof coatings as a roof maintenance solution
- Need for water ponding resistance prompts increasing interest in high-end coatings
- Fairly high awareness of cool roof benefits
- Tightening regulations for reflectivity and low VOC standards

#### Standards & Regulations:
- Well established regulatory space
- Reputable industry consortium organizations (CRRC, RCMA/RRCI)

*Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates*
### Mexico and Caribbean

#### Country Information & GDP**
- **Population**: 120,286,655
- **GDP (PPP)**: $1,845 billion
- **GDP per capita**: $15,600
- **GDP growth**: 1.2% annual

#### Construction Market & Roof Coatings
- **Construct. market**: $139B*
- **Market growth rate**: 0.7%
- **Roof Coatings**: ~$150M

#### Substrates:
- BUR and Mod-bit are dominant in low slope
- Concrete and clay tiles are popular in steep slope
- Concrete flat roofs in Caribbean are common

#### Market:
- Increasing interest in high-end roof coatings. Strong focus on mechanical properties
- Emergence of Acrylic/PU hybrids
- Cool roofs are valued for bringing energy conservation in some areas and home comfort in others (where homes do not have A/C)
- Early rain resistance in Caribbean is important because of weather

#### Standards and Regulations:
- The role of paint society in Mexico ANAFAPYT (FSCT equivalent) [http://www.anafapyt.org.mx/](http://www.anafapyt.org.mx/) is important in roof coatings segment
- Mexican market developed their own standard similar to ASTM D6083
- In Caribbean, collection of rain water on roofs is common. National sanitary foundation certification (Puerto Rico) is needed.

*Sources: CIA World Factbook**, IHS Global Construction Outlook (*), Dow data and estimates
Central and South America

### Country Information & GDP**

<table>
<thead>
<tr>
<th>Population</th>
<th>467,732,848</th>
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<tbody>
<tr>
<td>GDP (PPP)</td>
<td>$7,256 B</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>$15,520</td>
</tr>
<tr>
<td>GDP growth</td>
<td>1.2% annual</td>
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</table>

### Construction Market & Roof Coatings

- **Construct. market:** $263B*
- **Market growth rate:** 0.4%
- **Roof Coatings:** ~$50M

### Substrates:
- In Brazil, fiber cement (~48%) and ceramic tile (~34%) are popular roof materials

### Market:
- Large portion of the market is low end coatings.
- Re-coating every couple years is common
- Emphasis on higher durability, application efficiency and mechanical property improvement
- Increasing interest in roof coatings in the South

### Standards & Regulations:
- Formation of industry consortium organizations for cool roof standards (e.g. in Brazil)
- ABNT (Brazilian Association of Technical Standards) define standards of coatings for waterproofing in Brazil although there is still lack of regulation in the market
- Argentina uses ASTM D6083.

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Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
China

**Country Information & GDP**
- Population: 1,355,692,576
- GDP (PPP): $13,390B
- GDP per capita: $9,800
- GDP growth: 7.7% annual

**Construction Market & Roof Coatings**
- Construct market: $2,664B
- Market growth rate: 8%
- Roof Coatings: ~$45M

**Substrates:**
- Concrete (20%) and Asphalt (50%) & Metal (20%)

**Market:**
- Elastomeric roof coatings have relatively low market awareness compared to traditional roofing
- Metal deck retro-fit is the fastest growing segment
- DPUR is a major concern. Retention of energy efficiency performance is valued.
- 40 mil dry thickness is common (for qualifying coating as a waterproofing layer)

**Standards and Regulations:**
- Green Building program run by the Government of China (similar to LEED in the US) is considering to include cool roofs
- US-China clean energy commission to set-up standards similar to CRRC
- Dedicated codes for metal decks that specify coatings (JC/T-375)

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
**India**

### Country Information & GDP**

<table>
<thead>
<tr>
<th>Population</th>
<th>GDP (PPP): $4,990 B</th>
<th>GDP per capita: $4,000</th>
<th>GDP growth: 3.2% annual</th>
</tr>
</thead>
</table>

### Construction Market & Roof Coatings

- **Construct. market:** $468B*
- **Market growth rate:** 6.5%
- **Roof Coatings:** ~$15M

### Substrates:

- Concrete (50%), Asphalt (20%), Metal (20%).
- Metal roofs are present in both commercial and residential sectors.

### Market:

- Roof coatings used as a waterproofing layer.
- Roofs rarely have insulation. Interest in cool roofs.
- A lot of interactions between Middle East and India. Companies in ME are eyeing Indian market.

### Standards and Regulations:

- Cool roof benefits are under evaluation by the government of India.
- In general, construction products follow US ASTM standards.

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Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates.
Australia and New Zealand

**Country Information & GDP**

- Population 26,910,000
- GDP (PPP): $1,134 B
- GDP per capita: $42,152
- GDP growth: 2.5% annual

**Construction Market & Roof Coatings**

- Construct. market: $255B *
- Market growth rate: 6.2%
- Roof Coatings: ~$15M

**Substrates:**
- Concrete based roofs are most common
- Most residential roofs have concrete roof tiles; no asphalt shingles

**Market:**
- Roof coatings are used on concrete and metal
- Elastomeric roof coatings are used for repair and retrofit
- Cool roofs have not gained traction yet

**Regulations and Standards:**
- Construction industry mostly follows US building practices and standards

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
Japan and South East Asia

**Country Information & GDP**

Population 665,000,000  
GDP (PPP): $7,980 B  
GDP per capita: $12,000  
GDP growth rate: 6% annual

**Construction Market & Roof Coatings**

Construct. market: $1,900B*  
Market growth rate: 6%  
Roof Coatings: ~$35M

**Substrates:**
- Korea, Japan, South East Asia – a lot of steep slope roofs; concrete, metal  
- Low slope in urban areas, steep slope in rural

**Market Trends:**
- Cool roof aspect of elastomeric roof coatings is gaining traction  
- Urbanization/industrialization is South East Asia prompts interest in advanced construction chemical solutions  
- Retrofit for energy efficiency in Japan is growing  
- There is a lot of interest in new liquid applied solutions for waterproofing.

**Regulations and Standards:**
- Most of South East Asia follow Singapore or US standards  
- Japan has its own code: JIS K 5675 High Solar Reflection Roof Code

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
South Africa

- **Substrates:**
  - Metal and Concrete are most common substrates.
  - Metal is popular in residential, Concrete – in industrial and retail construction

- **Market:**
  - Growing, emerging roof coating market
  - Cool roofs are gaining interest. Growing concerns about energy efficiency because of high cost of energy and shortage of energy supply.
  - Sizeable DIY market for roof coatings

- **Regulations and Standards**
  - South Africa Bureau of Standards is trying to create standards for roof coatings along the lines of ASTM D6083. Standards are planned to be introduced this year.
  - South Africa DOE works very close with the US DOE on incorporating energy efficiency in construction practices

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
Turkey

**Country Information & GDP**
- Population: 81,619,392
- GDP (PPP): $1,167B
- GDP per capita: $15,300
- GDP growth: 3.8% annual

**Construction Market & Roof Coatings**
- Construction market: $70B*
- Market growth rate: 4.5%
- Roof Coatings: ~$12M

- **Substrates:**
  - Substantial volume of roof coatings are used in Hi-rise buildings on bitumen or concrete

- **Market:**
  - Early generation roof coatings, which were low cost and low performing, started failing and created bad reputation for the segment
  - The applicators are still cost oriented, aiming to do the jobs as fast as possible and with as little material as possible (was the reason for failures of early generation of coatings)
  - Very entrepreneurial environment, frequent market need changes and high competition among producers
  - Contractors are very conservative, tending to go with something they know for big projects
  - High-performing coatings are starting to generate interest

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
# Middle East

## Country Information & GDP**
- Population: 59,734,000
- GDP (PPP): $1,158 B
- GDP per capita: $20,000
- GDP growth: 4.5% annual

## Construction Market & Roof Coatings
- Construct. market: $196B*
- Market growth rate: 7.2%
- Roof Coatings: ~$30M

## Substrates:
- Concrete flat roofs dominate. A lot of low cost coatings requiring re-coat in 1-2 years
- #1 substrate for roof coatings is metal (galvanized aluminum sloped)

## Market:
- New, emerging market for cool roofing (admittedly, starting from small base)
- Focus on DPUR, maintaining solar reflectivity
- Growing local manufacturing of roof coatings
- Lack of qualified contractors

## Standards & Regulations:
- Construction codes are weak, starting from nothing
- Aggressively looking at codes from other parts of the world
- Many builders use US codes but buy products from Europe

*Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates*
Northern and Central Europe

Country Information & GDP**
- Population: 287,305,000
- GDP (PPP): $11,286 B
- GDP per capita: $39,284
- GDP growth: 0.4% annual

Construction Market & Roof Coatings
- Construct. market: $1,200B*
- Market growth rate: 1.2%
- Roof Coatings***: ~$330M

- **Substrates:**
  - Concrete and bitumen roofs
  - Some indication that TPO and EPDM are taking over the bitumen space.

- **Market:**
  - UK, Germany, France, Scandinavia – PU belt
  - A lot of interest in high performing, water resistance coatings that meet ETAG 005.
  - Movement to environmentally friendly products. EHS profile of 1K PU is under scrutiny
  - Interest in high-performing water-based products that meet both environmental and performance standards in Europe

- **Standards and Regulations:**
  - ETAG 005
  - REACH
  - CE marking
  - European Cool roof council, similar to the US CRRC, is becoming the voice of cool roof movement in Europe. [http://coolroofcouncil.eu/](http://coolroofcouncil.eu/)

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates

***all Europe
### Southern Europe

**Country Information & GDP**
- Population: 159,624,000
- GDP (PPP): $4,461 B
- GDP per capita: $15,520
- GDP growth: -0.5% annual

**Construction Market & Roof Coatings**
- Construct. market: $500B*
- Market growth rate: -2.0%
- Roof Coatings***: ~$330M

### Substrates:
- Bitumen membrane is the leading substrate

### Market:
- Recession caused overcapacity of roof coatings and producers look for other markets for their products (e.g. North and South Africa)
- Lukewarm interest in cool roofs partly explained by recession. White paints on roofs is a common practice already. Residential flat roofs in Southern Europe are used as living space.
- PVs are incentivized. However, subsidies for PVs are going down. PVs is now an established technology and fairly common on European roofs.
- Warehouses (commercial construction structures) are already optimized for A/C because of prior year regulations.
- Heavy fiscal debts impact investments in construction.

### Standards:
- ETAG 005 is the code to meet

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***all Europe

**Sources:** CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
# Eastern Europe & CIS

## Country Information & GDP**

<table>
<thead>
<tr>
<th>Population</th>
<th>327,412,203</th>
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<tbody>
<tr>
<td>GDP (PPP)</td>
<td>$5,628 B</td>
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<td>GDP per capita</td>
<td>$17,188</td>
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<tr>
<td>GDP growth</td>
<td>1.2% annual</td>
</tr>
</tbody>
</table>

## Construction Market & Roof Coatings

- Construct. market: $461B*
- Market growth rate: -2.0%
- Roof Coatings: ~$5M

- Very small, almost non-existent roof coating market
- Bitumen roofs dominate substrate space
- Construction industry is characterized by aging infrastructure and lack of investment
- Political uncertainty

Sources: CIA World Factbook(**), IHS Global Construction Outlook (*), Dow data and estimates
Global roof coating market is about $1.5B
More than 50% of global roof coating market is still in North America
A few emerging regions around the world (Middle East, South Africa and parts of Asia) are increasingly embracing roof coatings as an effective roof maintenance solution
Global awareness of cool roof benefits is growing. A few governments around the world are looking at cool roofs as a solution to improve energy efficiency of buildings
THANK YOU