Sustainability:
Strategy and Results at Owens Corning

Frank O’Brien-Bernini
VP, Chief Sustainability Officer, Owens Corning
Owens Corning at a Glance

- Founded in 1938, an industry leader in glass fiber insulation, roofing and glass fiber reinforcements
- 2012 sales: $5.2 billion
- 15,000 employees in 27 countries
- Fortune® 500 company for 59 consecutive years
- Component of Dow Jones Sustainability World Index
- Three powerful businesses, three valuable franchises
  - Insulation
  - Roofing
  - Composites
A Heritage of Innovation

1940s, bomber & ship insulation

2000s, long/light wind blade solutions

2010s, EcoTouch® insulation, EnergyComplete® sealant

1950s, fiberglass apps, e.g. Corvette

1930s, commercial glass fibers

1990s, Advantex® platform

1960s, beta yarn for space suits

1980s, fiberglass mat for shingles

1970s, cold-top electric melter

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Meeting the needs of the present without compromising the world that we leave to the future

Adapted from the U.N. World Commission on Environment and Development, in its final document - generally known as the Brundtland Report (1983-1987)
SAVING THE PLANET...
SAVING THE PLANET... FOR HUMANS
BICEP (Business for Innovative Climate & Energy Policy), a project of Ceres, is an advocacy coalition of businesses committed to working with policy makers to pass meaningful energy and climate legislation enabling a rapid transition to a low-carbon, 21st century economy – an economy that will create new jobs and stimulate economic growth while stabilizing our planet’s fragile climate.
Macro Trends

- Presenting a massive opportunity in our markets
  - Soaring interest in Energy Efficiency…public and private
  - Personal desire to achieve sustainability
  - Green product, application, building and renewables demand

- Winning with green…today!
  - Pink-is-Green™…our business and communication strategy

Need: Scalable solutions that address the global challenges
Sustainability: Our (evolving) Strategy

Driving to be a net-positive Company…

1. Operations Sustainability
2. Product and Supply Chain Sustainability
3. Innovation and collaboration to deliver energy efficiency and durable material solutions at scale
4. Employee safety, health and engagement and community vitality
Transparent External Reporting
Operations Sustainability

...closing out our 1\textsuperscript{st} 10 year goals

<table>
<thead>
<tr>
<th>Environmental Footprint</th>
<th>Goal</th>
<th>Actual</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>-25%</td>
<td>-30%</td>
<td>✓</td>
</tr>
<tr>
<td>Greenhouse Gas</td>
<td>-30%</td>
<td>-34%</td>
<td>✓</td>
</tr>
<tr>
<td>Nitrogen Oxides</td>
<td>-25%</td>
<td>-74%</td>
<td>✓</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>-25%</td>
<td>-33%</td>
<td>✓</td>
</tr>
<tr>
<td>Particulate</td>
<td>-20%</td>
<td>-36%</td>
<td>✓</td>
</tr>
<tr>
<td>Waste to Landfill</td>
<td>-35%</td>
<td>-35%</td>
<td>✓</td>
</tr>
<tr>
<td>Water</td>
<td>-15%</td>
<td>-38%</td>
<td>✓</td>
</tr>
</tbody>
</table>

We successfully met all 7 aggressive Environmental Footprint reduction goals!
## Operations Sustainability

...progress on our 2\textsuperscript{nd} 10 year goals

<table>
<thead>
<tr>
<th></th>
<th>Global Intensity (2010-2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Goal</td>
</tr>
<tr>
<td>Primary Energy</td>
<td>-20%</td>
</tr>
<tr>
<td>Greenhouse Gas</td>
<td>-20%</td>
</tr>
<tr>
<td>Particulate Matter 2.5</td>
<td>-15%</td>
</tr>
<tr>
<td>Toxic Air Emissions*</td>
<td>-50%</td>
</tr>
<tr>
<td>Waste to Landfill</td>
<td>-70%</td>
</tr>
<tr>
<td>Water</td>
<td>-35%</td>
</tr>
</tbody>
</table>

*formaldehyde, ammonia, polycyclic aromatic compounds, manganese and hexavalent chromium

Our aim is to continuously shrink our Footprint, decreasing negative impact
# Typical Energy Projects

## General
- Lighting, daylighting, HVAC
- Natural Gas leak detection/repair
- Boiler upgrades/replacement/insulation
- Incinerator upgrades/optimization
- Compressor upgrades/optimization
- Pneumatic to electric motor conversions
- Pneumatic to hydraulic conversions
- Compressed air to blower conversions
- Water (pumping) use reduction
- Diesel to NG conversions
- VFD’s for fans & pumps
- Energy audits, DOE and Industrial Assessment Center (IAC), Audits by universities, plant Kaizen events

## Process Specific
- High recycled glass usage
- Furnace technology upgrades
- Furnace/FH waste heat recovery
- Oven upgrades/optimization
- High emissivity furnace coatings
- Tank fume use as combustion air
- Building and Process Insulation
- Compressed Air Leak Detection
- Glass Chemistry and Raw Materials
- Steam Systems Optimization
- Campus/facility consolidation
- Advanced process modeling/control
- Process make-up air
- Solar hot water/space/PV, Biomass, fuel cells
Product Sustainability

…Attribute Based

1. Save energy or water
2. Use salvaged, recycled or plant-based content
3. Conserve natural resources through
   – Reducing material usage
   – Exceptional durability or low maintenance
   – Use of rapidly renewable materials
4. Avoid toxic or other emissions
5. Contribute to safe, healthy indoor environment
6. Are reusable or recyclable at end-of-life

Green is well defined in our markets: Science based – 3rd party certified
Example: EcoTouch™ with PureFiber™ Technology
The term Life Cycle Assessment (LCA) is a compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle.

Raw material and energy consumption:

- Raw Material
- Fabrication Steps
- Use
- End of Life

Emissions to air, water and soil

Our 2015 goal is to make transparent the total LCA of all our core products.
Example: Competitive Advantage in Product Sustainability

Environmental Product Declarations:

- 3rd party verified, internationally recognized, transparent disclosure of product life cycle impact
- A green “nutrition” label for a product
- Quantified environmental data based on an LCA that specifiers, consumers and purchasers can use to identify environmental risks (LEED 2012 V4 Credit)

Driving adoption of EPDs creates the transparency needed for data-based decisions
“Handprinting”

- Quantifies the net-positive consequences of a company, its products, and how it relates with all its stakeholders
  - Uses cradle-to-cradle life cycle accounting
  - Includes exponential effect of influence on others
- Partnered with Greg Norris at Harvard
  - Develop and refine the methodology
  - Test it on OC (water heater blanket 1\textsuperscript{st})
  - Establish and grow our Handprint
  - Publish/communicate results

Continuously expand our Handprint, and shrink/overwhelm our Footprint
Conceptual Handprint

- Energy
- Climate Change
- Human Health
- Water Consumption
- Working Conditions
- Community Vitality
- Economic Development
- Ecosystems / Biodiversity

Expanding Handprint

Shrinking Footprint
The term Life Cycle Assessment (LCA) is a compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system through out its life cycle.

Raw material and energy consumption

Raw Material ——— Fabrication Steps ——— Use

Emissions to air, water and soil

Seeking and capturing ways to amplify the net-positive impact of our company
Shingle Recycling

Owens Corning Roofing makes shingle recycling differentiating, easy, and cost-competitive by connecting contractors with eligible recycling services

• Criteria…it's easy:
  – Contractors find an eligible recycler at www.Earth911.com
  – Take the Pledge to recycle at www.roofing.owenscorning.com/recycle

• Benefits:
  – Leads…identified on Contractor Locator and homeowner promotional programs
  – Recycling discounts available
  – Marketing tools
  – Convenient drop-off or dumpster delivery

• Results¹
  – Over 85 open markets
  – Over 60% Population coverage
  – Over 500,000 tons recycled in 2012
  – Contractors saved an estimated $10 million compared to landfill fees

Our Shingles are now labeled as recyclable!

¹ Owens Corning Roofing and Asphalt results and estimates, March 2013.
Innovation and collaboration to deliver **energy efficiency** and durable material solutions at scale

**Energy consumption by end-use sector**

- **41%** Buildings
- **22%** Residential
- **28%** Transportation
- **31%** Industrial
- **19%** Commercial

**Heating and Cooling Cost ($/yr)**

- **Standard Home**:
  - Energy cost: ~1500
  - Mortgage add: ~500

- **50% Improvement**:
  - Energy cost: ~1000
  - Mortgage add: ~500

~$10,000 available

Sources: Owens Corning management estimates

Source: U.S. Energy Information Administration
Annual Energy Review 2011
Energy Codes

...Raising the Floor

Residential Energy Efficiency Improvements

Indexed Energy Use (% of pre-code)

-20 0 20 40 60 80 100

No Code 1987

2006 IECC 2009 IECC 2012 IECC 2015 IECC *ZNE-R **ZNE ΔPNE

Adoption / Compliance Focus

Leadership Focus

Sources: Pacific Northwest National Laboratory, and Owens Corning management estimates
IECC – International Energy Conservation Code

Zero Net-Energy Ready
Zero Net-Energy
Positive Net-Energy
Energy Consumption Surveys

Building code changes expected to continue lowering energy consumption

“Doing the Math”…2020 Residential Energy Savings

Energy Savings in 2020 (Quads)

Source: Owens Corning estimates. 2009 is adoptions to date; 2012 assumes 100% adoption 1/1/2014; ZNE-R assumes 100% adoption 1/1/2014
“Doing the Math”...2020 Residential Energy Savings

Energy Savings in 2020 (Quads)

- 2009 IECC
- 2012 IECC
- ZNE-R

Source: Owens Corning estimates. 2009 is adoptions to date; 2012 assumes 100% adoption 1/1/2014; ZNE-R assumes 100% adoption 1/1/2014

~53 days US Petroleum Use
“Doing the Math”…2020
Greenhouse Gas Savings

Source: Owens Corning estimates. 2009 is adoptions to date; 2012 assumes 100% adoption 1/1/2014; ZNE-R assumes 100% adoption 1/1/2014
“Doing the Math”…2020 Greenhouse Gas Savings

GHG Savings in 2020 (MM Tonnes)

Source: Owens Corning estimates. 2009 is adoptions to date; 2012 assumes 100% adoption 1/1/2014; ZNE-R assumes 100% adoption 1/1/2014

~29 MM Cars off the Road
Take-Aways…

1. At ~400ppm CO2…the time to act is now
2. Footprint reduction is (just) a start
3. Handprint increases can be limitless
4. Building solutions are massively scalable
5. Do the (right) math…an important, yet imprecise, metric is way better than a precise meaningless one

Devote your precious personal energy to getting big stuff done… and less so on arguing around the edges
Questions?