Solution Team
Values and Benefits of Forest Products

LCTPi  Forests and Forest Products as Carbon Sinks

The Role of the Bioeconomy in Climate Change Mitigation

WBCSD: Forest Solutions Group

Action2020 Priority Clusters & Solutions
- Social Impact: Business Solutions
- Sustainable Lifestyles: Business Solutions
- Climate & Energy: Business Solutions
- Water: Business Solutions
- Ecosystems & Landscape Management: Business Solutions
- Safe & Sustainable Materials: Business Solutions

Sector or Value Chain Projects
- Utilities
- Sustainable Buildings
- Sustainable Cities
- Reaching Full Potential
- Sustainable Mobility Project (SMP)
- Forest Solutions Group (FSG)
- Cement Sustainability Initiatives (CSI)
- Tire Industry Project (TIP)

Cross Cutting Project & Functions
- Redefining Value (RV), Future Leaders Program (FLP)
- Global Policy Affairs, Communications & Global Network
- Member Engagement, People & Resources (Finance, HR, IT, Events)
Low Carbon Technology Partnerships Initiative (LCTPi)

This initiative was launched at COP20 in Lima by the WBCSD with Sustainable Development Solutions Network (SDSN) and the International Energy Agency (IEA). It is one of the flagship initiatives of the French Presidency of COP21.

WBCSD’s Action2020 Business Solutions, SDSN’s Deep Decarbonisation Pathways and IEA’s Technology Roadmaps come together to achieve two objectives:

1) **Accelerate the diffusion of existing technologies** by removing technological, market and social barriers and introducing required policy and financial instruments.

2) **Develop Public Private Partnerships (PPPs)** on the Research, Development, Demonstration and Deployment (RDD&D) of potentially game-changing new technologies.

Strong links between the two on the bio-economy, land use and landscape approaches.
The LCTPi Process

Baseline
- Action underway by business and governments

Roadmap
- Shared vision with clear targets and milestones

Opportunities & Challenges
- Identify where there are gaps and effort is needed

Action Plan
- Highlight actions beyond BAU at COP21 Paris
- Individual and joint actions to address gaps

Biz
Fin
Gov

"The role of business"

To be developed through webinars / workshops / Roundtables

“The role of public policy”

Note: to go beyond policy, and include gaps in terms of funding, market acceptance, technology
Replacing more energy intensive products with wood based products and scaling up sustainable forest management is the most efficient way to mitigate climate change. Therefore we will:

- Stabilize forest cover by 2030 and restore forest cover to 1990 levels by 2050
- Meet the global demand for forest products by doubling output from sustainably managed and production forests by 2030 and tripling output by 2050
- Fast track bioeconomy development through sector collaboration and value chain partnerships to deliver innovative bioproducts and breakthrough technologies to reduce GHG emissions in manufacturing
Clustered Business Solutions

Forests and Forest Products as Carbon Sinks Business Solutions

The Forest Solutions Group of the WBCSD seeks to develop sector-wide solutions that align with global agreements and can be deployed at scale and at relatively low cost when compared to the cost of abatement and mitigation in other sectors. These are clustered into three main areas of focus referencing SDGs and the New York Declaration on Forests.

**Sustainable Forest Management**

The vision for sustainably managed forests is aligned with the IPCC supply-side mitigation options and potential for the AFOLU sector presented in its Fifth Assessment Report (AR5). This vision is also aligned with SDG 15 and 13 and the commitments made by signatories to the New York Declaration on Forests. The LCTPi will support the mitigation objectives of the WBCSD Climate Smart Agriculture group in relation to agriculture-driven deforestation and degradation.

**Breakthrough Technologies**

The pulp and paper sector is energy intensive while being a relatively low greenhouse gas emissions source due to the use of biomass for energy generation. New breakthrough technologies in pulp and paper processes have the potential to dramatically reduce energy consumption and make more available emissions free energy to the grid or to other emissions intensive industrial processes. This approach is aligned with SDG 8 and 13.

**Forest Products and the Bioeconomy**

The FSG has documented and quantified a range of measures, business practices and initiatives that would support the growth of the bioeconomy from sustainably managed forests. The vision is to triple forest production from planted forests by 2050 in order to sustainably meet the demand for forest products. SDGs 8, 12, 13 and 15.
### Focus Action Areas – Forests and Forest Products as Carbon Sinks

#### Sustainable Forest Management
- Increase planted forest area by 60% focusing on non-forested land and degraded forestland
- Reduce harvesting on 5 million ha/yr in modified natural forests (e.g. less fuel wood harvesting from degraded forests)
- Reduce deforestation by 5 million ha/yr in line with the New York Declaration on Forests
- Promote sustainable fiber sourcing to ensure fiber production from sustainably managed forests

#### Breakthrough Technologies
- Deep eutectic solvents (DES) - A chemical process by which biomass can be dissolved into lignin, cellulose and hemicellulose using minimal energy
- Flash condensing - Using steam to blast dry fibers into a forming zone using very little water
- Supercritical CO2 - Drying pulp and paper without the need for heat and steam

#### Forest Products Bio-economy
- Public sector and private sector procurement to fast track bio-economy development
- Liquid biofuels as a drop in replacement for diesel in heavy vehicles
- Solid biofuels in biomass to energy plants and co-firing operations
- Forest products as carbon sinks and substitutes for emissions intensive materials, especially in construction
Bioeconomy enabling conditions

- The fundamental basis for the bioeconomy must be from sustainably managed forests
- Carbon neutral biomass is a key requirement for the sector to flourish
- Public sector procurement and private sector procurement: biopreferred policies (USDA case study)
- Value chain partnerships and cross-sectoral approaches – construction, liquid transport fuels, plastic composites
- PPPs to fast-track and scale up the bioeconomy
Bioeconomy and LCTPi Engagement

LCTPi Bioeconomy Science Technology and Innovation Forum

October 13
10.30-15.30
SCA Stockholm
Facilitated by McKinsey and Co
THRIVE Case Study

European Parliament, September 29, 2015
From Trees to THRIVE
1ST PLATFORM TECHNOLOGY FOR CELLULOSE FIBERS (CF)

Thermoplastic Polymers

Processing Technologies

Bio Polymers (PLA…)

Rigid PVC (PVC)

Poly Ethylene (PE)

Polypropylene (PP)

Thrive™ DX Composites

Markets

Regions

Light Vehicles

Industrial

Household Goods

Small Appliances

Blow Molding

Compression Molding

Extrusion

Injection Molding

USA

Brazil

China

Europe
## ENERGY AND WEIGHT SAVINGS

<table>
<thead>
<tr>
<th>End-Product</th>
<th>Alternative Material</th>
<th>Moulding Cycle Time Savings</th>
<th>Weight Savings</th>
<th>Potential GHG life cycle savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Material Glass-filled</td>
<td>Polypropylene</td>
<td>26%</td>
<td>6%</td>
<td>19% (6.8 kg CO2/kg product; 3.3 kg Co2/kg in production, 3.5 kg CO2/kg in use)</td>
</tr>
<tr>
<td>Industrial Bracket ABS (acrylonitrile butadiene styrene)</td>
<td>43%</td>
<td>11%</td>
<td></td>
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</tr>
<tr>
<td>Office Furniture Leg End Cap HIPS (high-impact polystyrene)</td>
<td>53%</td>
<td>13%</td>
<td></td>
<td></td>
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<tr>
<td>Industrial Pump housing assembly Glass-filled nylon</td>
<td>66%</td>
<td>26%</td>
<td></td>
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</tbody>
</table>
THRIVE Benefits

- Reinforcing fiber is “green/sustainable”
- Passes auto interior odor tests
- Rapid molding at significantly lower cycle times
- Lighter weight parts versus most composites
- The bigger the part, the greater the energy savings
- Minimizes surface sink and internal voids
- Bonds easily to plastic and elastomeric materials
- Reduced mass = stronger parts using less material
SUCCESS!!

- 2014 SPE’s Auto Innovation Awards – Environmental Category Winner

OEM/Vehicle: Ford Motor Co.
2013 Lincoln MKX luxury CUV
System Supplier: Johnson Controls, Inc.
Material Processor: Johnson Controls, Inc.
Material Supplier: Weyerhaeuser NR Co.
Resin: Thrive 200X235 PP

This application represents the first time glass fiber-reinforced FRP has been replaced by a natural fiber-reinforced FRP with equivalent performance but improved environmental impact. The annual carbon usage 20% more sustainable. The raw material is sustainably harvested by products. The resulting part is more neutral to 1% further reduces fuel consumption, and lowers process energy 15% thanks to lower temperature and faster process cycles. From a lifecycle analysis standpoint, it reduces CO2 emissions by 11% and saves 2,600 gal of fuel over the vehicle’s life.
THRIVE: Challenges

- **Internal:**
  - Polymer market: entirely new market/customers for CF
  - R&D: limited knowledge of composite formulations
  - Sales force: not well equipped to serve the polymer market
    - No footprint in the polymer market or speak “plastics language”
    - Selling composite pellets not pulp
  - Manufacturing: full dispersion of cellulose fibers in the polymer matrix
  - Purchasing power: limited (e.g. raw materials)
  - Management of expectations
THRIVE: Challenges

External:

- Displacing “well established materials” that have been in the market for > 30 years
- THRIVE is a new class of composites – reaching target markets quickly and effectively
  - Risk disequilibrium: understand market risk that THRIVE creates for its customers (e.g. automotive)
  - Complex value chain: how to engage and navigate it
  - Understand time to market differences between markets