Sustainable Nanomaterials
Industry Perspective

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The U.S. Forest Products Industry's Economic Impact

- 5% of U.S. manufacturing GDP
  - Ninth largest manufacturing sector in U.S.
  - On par with plastics and automotive
  - Top 10 manufacturing employer in 48 states
  - 418 pulp and paper manufacturing facilities
- 900,000 jobs, many in rural areas
  - Payroll over $50 billion
  - Average salary $54,000/year
- $175 billion in annual sales
- $7 billion per year in taxes
- Fully integrated into the global economy

The U.S. Forest Products Industry: A Leader in Sustainability

- Uses renewable resources grown with sustainable forestry practices
- Encourages sustainable manufacturing
  - Specific industry goals for 2020
- Makes recyclable products – 66.8% recovered in 2011
- Generates 77% of nation's industrial biomass energy
  - More renewable energy than any other industry
  - 66% of energy from biomass

MeadWestvaco Corporation (MWV)

- MWV is a global leader in packaging and packaging solutions
- Innovative products and services to consumer products companies
- $6 billion in sales worldwide in 2011
- Leader in making products more sustainable
- Primary manufacturing sites in Alabama, Kentucky, South Carolina, Texas, Virginia

Forest Products Industry and Innovation

- The industry encourages innovation as an essential element of sustainability
  - Grow domestic manufacturing and jobs
  - Reduce manufacturing costs
  - Reduce environmental footprints – energy, emissions, water
  - Enable new product attributes
- A robust industry-driven R&D program is an important building block in changing the industry
  - Agenda 2020
  - IPST at Georgia Tech
- Developing new technology-based solutions is a strategic priority

Opportunities with Cellulosic Nanomaterials

- Create new high-strength, low-weight, bio-based composites
- Reduce weight of paper and packaging by 20-50%
- Develop new paper features—optical, electronic, barrier, sensing, thermal, and surface texture
- Develop new forms of biomass-based packaging to reduce demand for oil-based plastics
- Develop printed electronics on paper and paperboard

Role for Federal Agencies in Collaborative R&D

- Much basic research and many early-stage development programs are needed to advance the use of sustainable nanomaterials
- Best way forward is collaborative programs with public funding
- Benefits to society will result from successful development – jobs, sustainability, taxes
- Publicly-funded R&D generates 20-67%return on total investment (according to the U.S. Department of Energy*)

* EADGENE. "Technology Transfer a Partnership between Research and Industry". September 2009.

R&D Leadership in Cellulosic Nanomaterials Is Outside U.S.

- Significant government support in Europe
  - Sweden
  - Finland
  - EU 7th Framework
- Public funding in Canada
  - $40 million to CelluForce large-scale MDF
  - Public/private partnership with Domtar

Industry Is Receptive to Public/Private Partnerships

- U.S. forest products industry has considerable interest in a public/private partnership for sustainable nanomaterials
- DOE Manufacturing Demonstration Facility for sustainable nanomaterials would hasten commercial deployment and benefits
  - Basic understanding and early-stage developments
  - Resource for companies to conduct proprietary trials
  - Expertise in sustainable nanomaterials
  - Training and workforce development for new technologies
- DOE MDF would help U.S. regain leadership position

Thank you

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