

Transforming an Industry: Innovation to Application



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Vice-President, FPInnovations

Location: SCA Annual Meeting
Date: June 14, 2011

FPInnovations in Brief

- World Largest forest related research institute
 - 550 employees and annual budget of ~ \$90M
- Major innovation programs in:
 - Forest Operations, Wood Products, Pulp & Paper
- Programs to support bioeconomy/sustainability
 - Bioenergy, chemicals, biomaterials, and green products

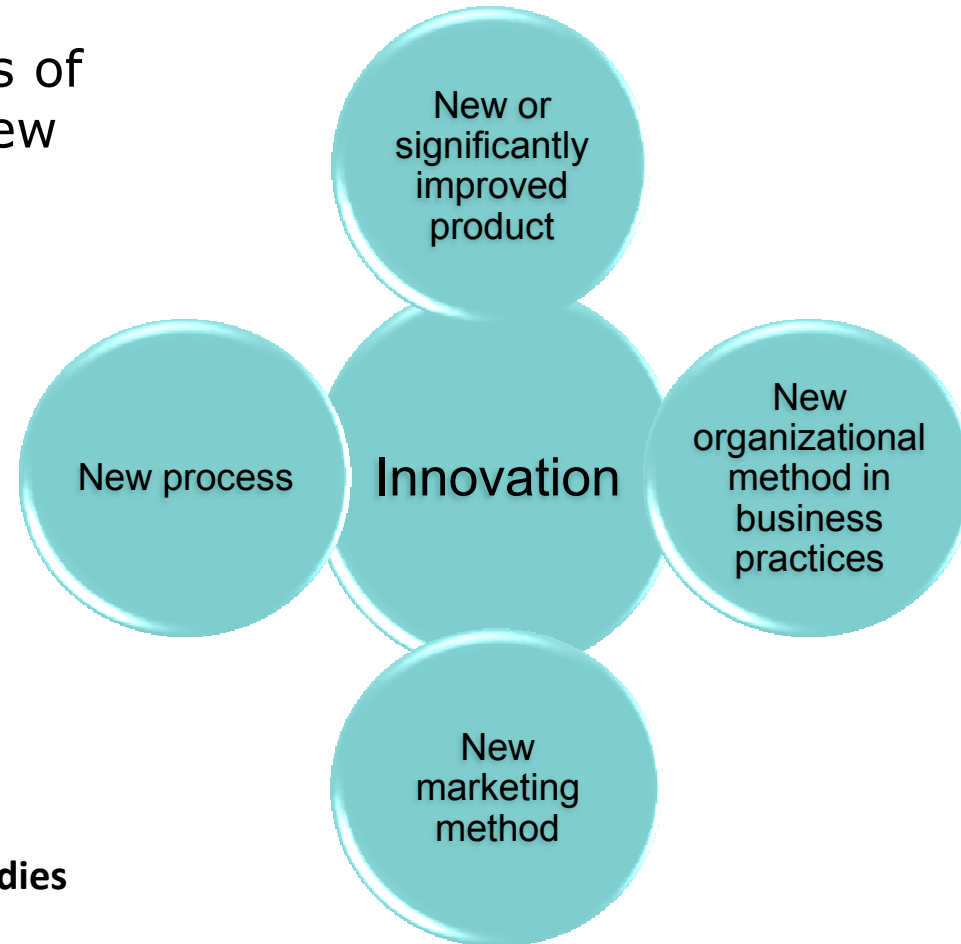


Supporting Members from Coast to Coast



What is Innovation?

“Innovation is the process of creating and delivering new customer value in the marketplace.”



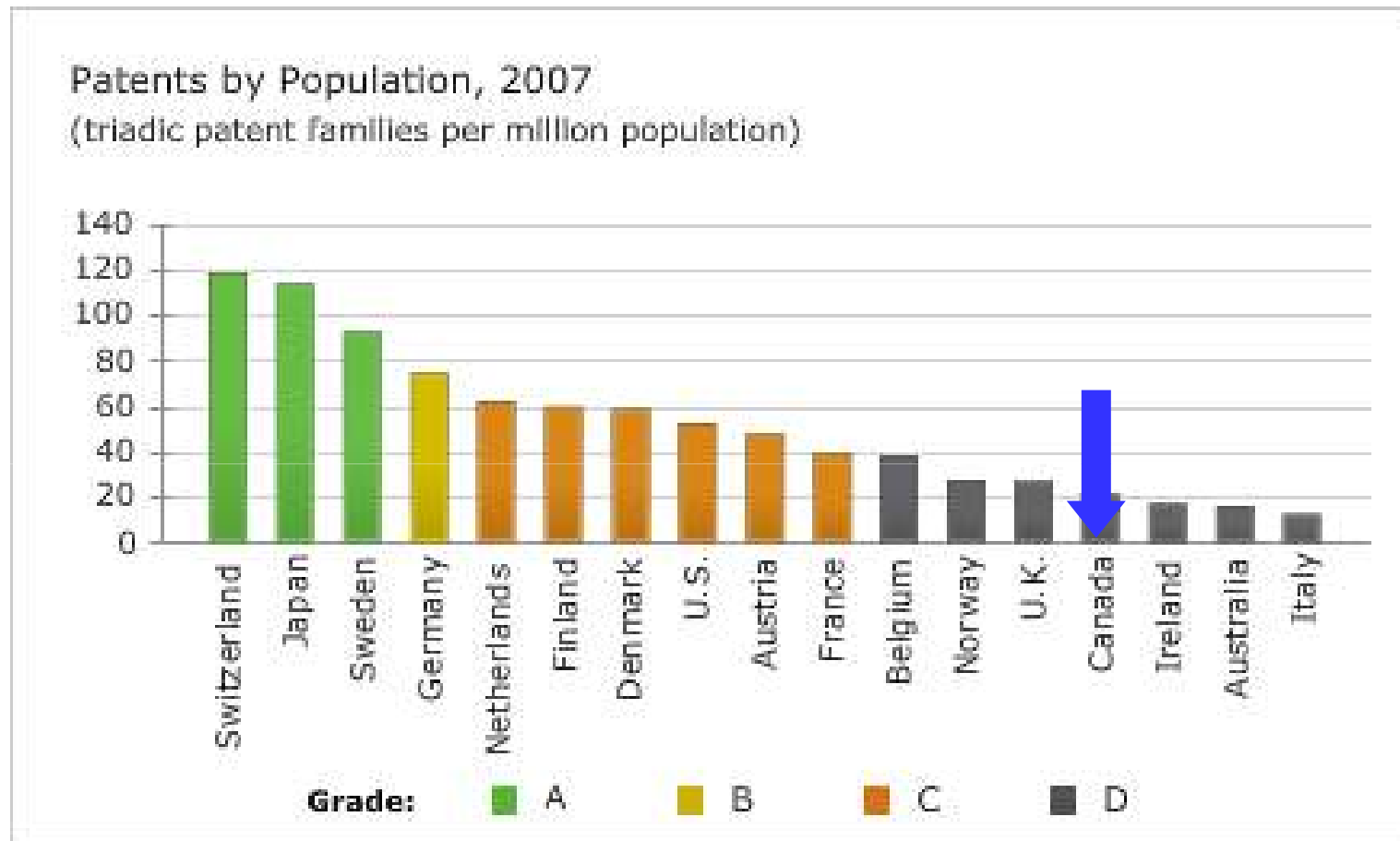
Source: The Centre for Innovation Studies

Role of FPInnovations

- **Research** is the conversion of cash into new knowledge and ideas
 - Research is our tool!
- **Innovation** is the conversion of ideas and knowledge into cash
 - Innovation is our goal!



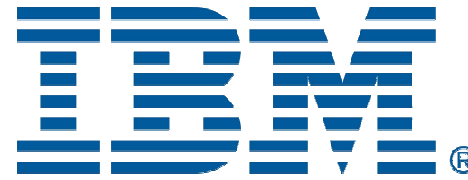
Canada vs. the World



Source: Conference Board of Canada

Canada vs. the World

- Patents issued in 2010



5,896



4,551



Microsoft 3,094

Source: Neil Reynolds, Globe and Mail, Wednesday, February 16, 2011

Canada vs. the World

- R&D spending as % of GDP

Country	Expenditures on R&D (billions of US\$, PPP)	% of GDP PPP	Year
Israel	9.4	4.2%	2011
Japan	144.1	3.3%	2011
Sweden	11.9	3.3%	2011
Finland	6.3	3.1%	2011
South Korea	44.8	3.0%	2011
United States	405.3	2.7%	2011
Austria	6.3	2.5%	2011
Denmark	5.1	2.4%	2011
Germany	69.5	2.3%	2011
Taiwan	19.0	2.3%	2011
Switzerland	7.5	2.3%	2011
Iceland	0.3	2.3%	2011
Singapore	6.3	2.2%	2011
France	42.2	1.9%	2011
Canada	24.3	1.8%	2011

Canada ranked 15th



Source: Wikipedia, March 31, 2011

Canada vs. the World

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Businesses cut R&D spending in Canada

Last Updated: Wednesday, December 8, 2010 | 10:37 AM ET The Canadian Press

Businesses performing industrial research and development anticipated spending \$14.8 billion in 2010.

That's a 6.2 per cent drop from what they spent in 2008 and



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Internal Links

- PHOTO GALLERY: Innovative companies
- University research for industry soars

What about the Forest Sector?

CANADA'S TOP
100
CORPORATE
R&D SPENDERS
10th Anniversary

RESEARCH
Infosource Inc.

Canada's Corporate Innovation Leaders

A SUPPLEMENT PREPARED BY RESEARCH INFOSOURCE INC., AN IMPACT GROUP COMPANY

Canada's Top 100 Corporate R&D Spenders 2010

Rank		Company	R&D Expenditures			Revenue	Research Intensity	Industry
2009	2008		FY2009 \$000	FY2008 \$000	% Change 2008-2009	FY2009 \$000	R&D as % of Revenue**	
1	6	Research In Motion Limited*++	\$1,101,848	\$729,892	51.0	\$17,076,582	6.5	Comm/telecom equipment
2	1	Nortel Networks Corporation*	\$864,494	\$1,677,884	-48.5	\$4,668,496	18.5	Comm/telecom equipment
3	2	BCE Inc.	\$806,000	\$983,000	-18.0	\$17,735,000	4.5	Telecommunications services
4	11	TELUS Corporation	\$653,000	\$210,000	211.0	\$9,606,000	6.8	Telecommunications services
5	5	IBM Canada Ltd. (fs)	\$556,500	\$397,000	40.2	nd	nd	Software and computer services
6	3	Magna International Inc.*	\$553,870	\$692,900	-20.1	\$19,833,114	2.8	Automotive
7	4	Pratt & Whitney Canada Corp. (fs)	\$398,000	\$442,000	-10.0	\$2,969,000	13.4	Aerospace
8	7	Atomic Energy of Canada Limited	\$393,051	\$329,406	19.3	\$387,016	101.6	Engineering services
9	8	Alcatel-Lucent (fs)	\$224,000	\$237,000	-5.5	nd	nd	Comm/telecom equipment
10	14	Ericsson Canada Inc. (fs)	\$197,000	\$126,000	56.3	\$615,923	32.0	Comm/telecom equipment

Cascades - 50th

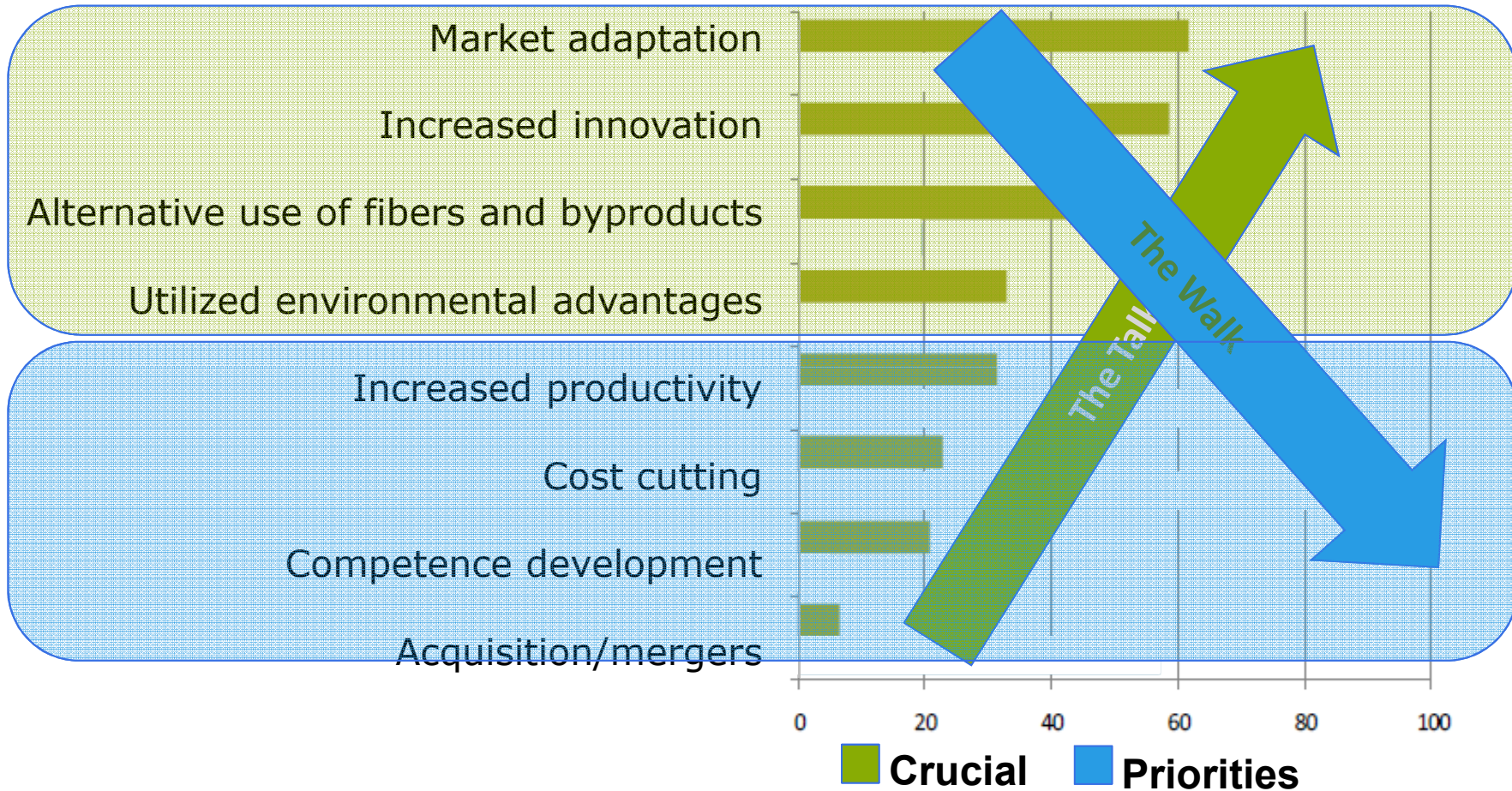
Tembec - 65th

50	55	Cascades Inc.	\$35,200	\$37,600	-6.4	\$3,877,000	0.9	Forest and paper products
65	50	Tembec Inc.	\$26,646	\$46,144	-42.3	\$1,786,000	1.5	Forest and paper products

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Intent vs. Reality

Futures Studies - Sweden



Source: Opticom International Research AB, September 16, 2009

Can a Business Reinvent Itself?

- “Old” companies can innovate
 - 1837: P&G started making and selling soap & candles
 - 2010: Ranked in Top 25 innovative companies (Business Week)
 - New model: 50% of new product ideas from outside P&G's labs (15% in 2000!)
- Companies in a well established industry can innovate (Top 25)
 - Virgin Atlantic Airways:
hip lifestyle brand to operations
 - Southwest:
master of operational innovations



Disappeared R&D Performing Companies- Top Three Characteristics

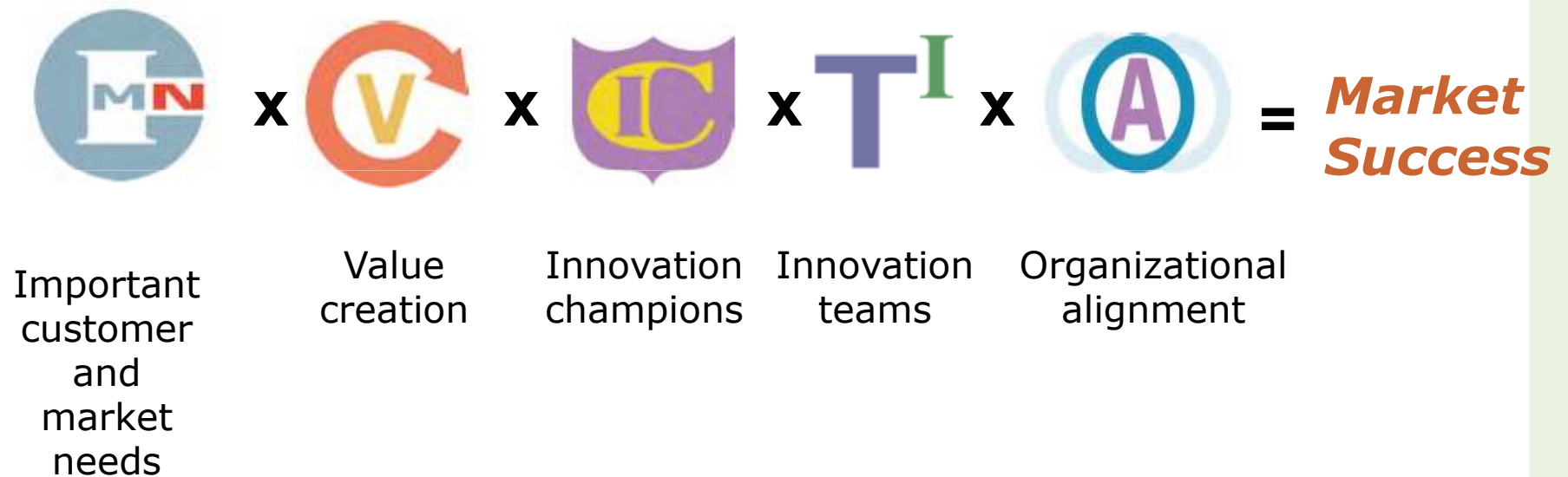
Analyzed 18 R&D intensive disappeared companies

1. No identified potential customers...
... only markets
2. No engagement with potential customers to determine their needs and to involve them earlier
3. No sales and no urgency to achieve sales

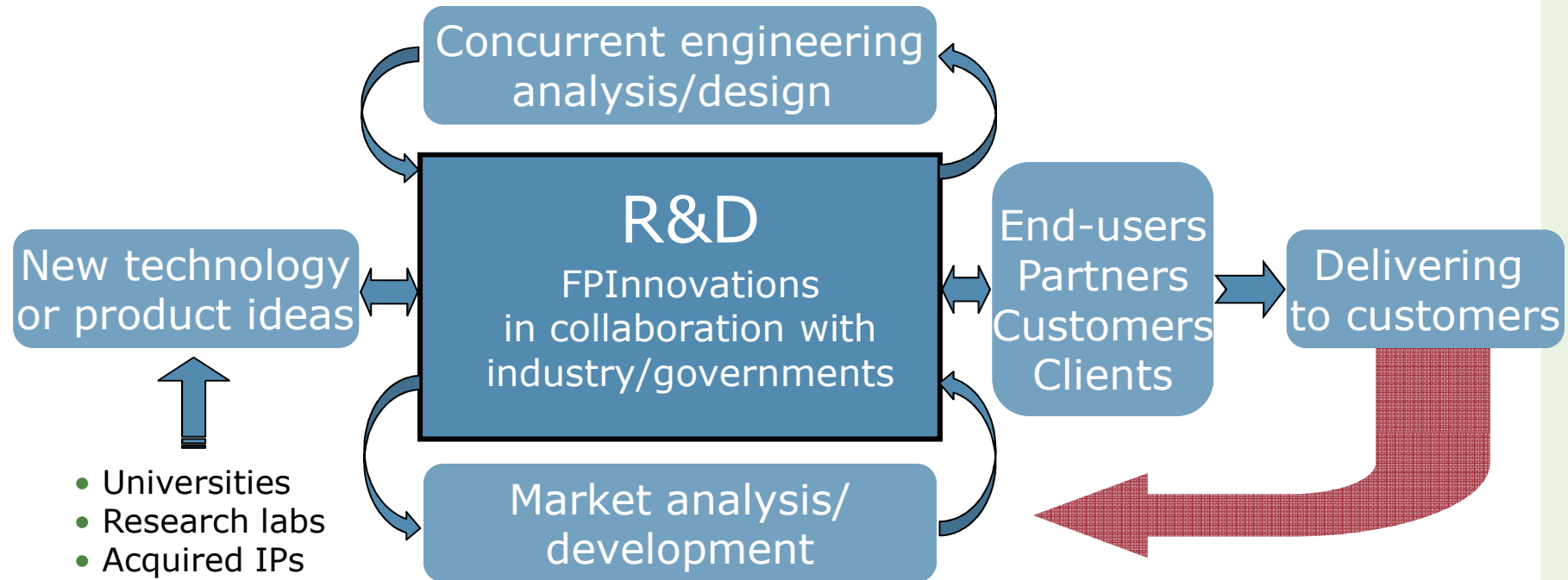
Understanding of the Disappearance of Early-stage and Start-up R&D Performing Firms A Comprehensive Study, H.D. Barber & J. Crelinsten, 2009

Innovation Management for More Efficiency

- SRI 5DOIs
- Our key elements for high impact research and development



Process to Accelerate Innovation Delivery

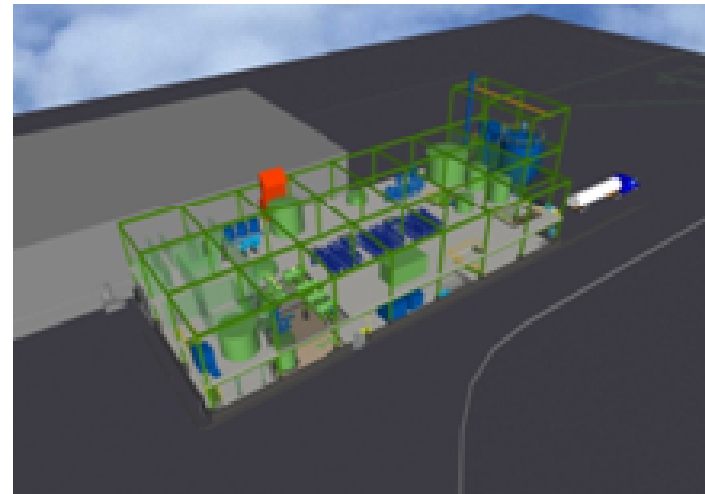


- Universities
- Research labs
- Acquired IPs

- ✓ Focus on innovation delivery not just doing R&D
- ✓ Work with partners to accelerate the delivery of the right new technologies to the mills and new products to the markets

Are the Changes Working?

Design of the first NanoCellulose Crystalline plant NCC Commercial Demonstration Plant

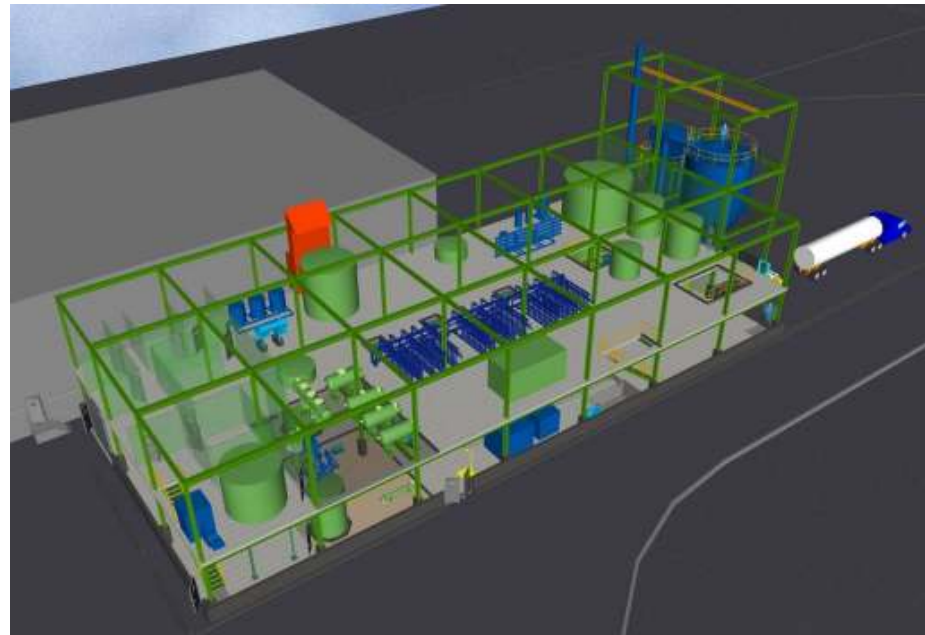


- From grams to tons in less than 3 yrs
- Capital from 115M\$ to 32M\$
- 50% reduction in NCC operating costs (\$/T)
- 60% reduction in drying costs
- 70% reduction in fresh water usage

Turn Innovation into Business Opportunities: CelluForce

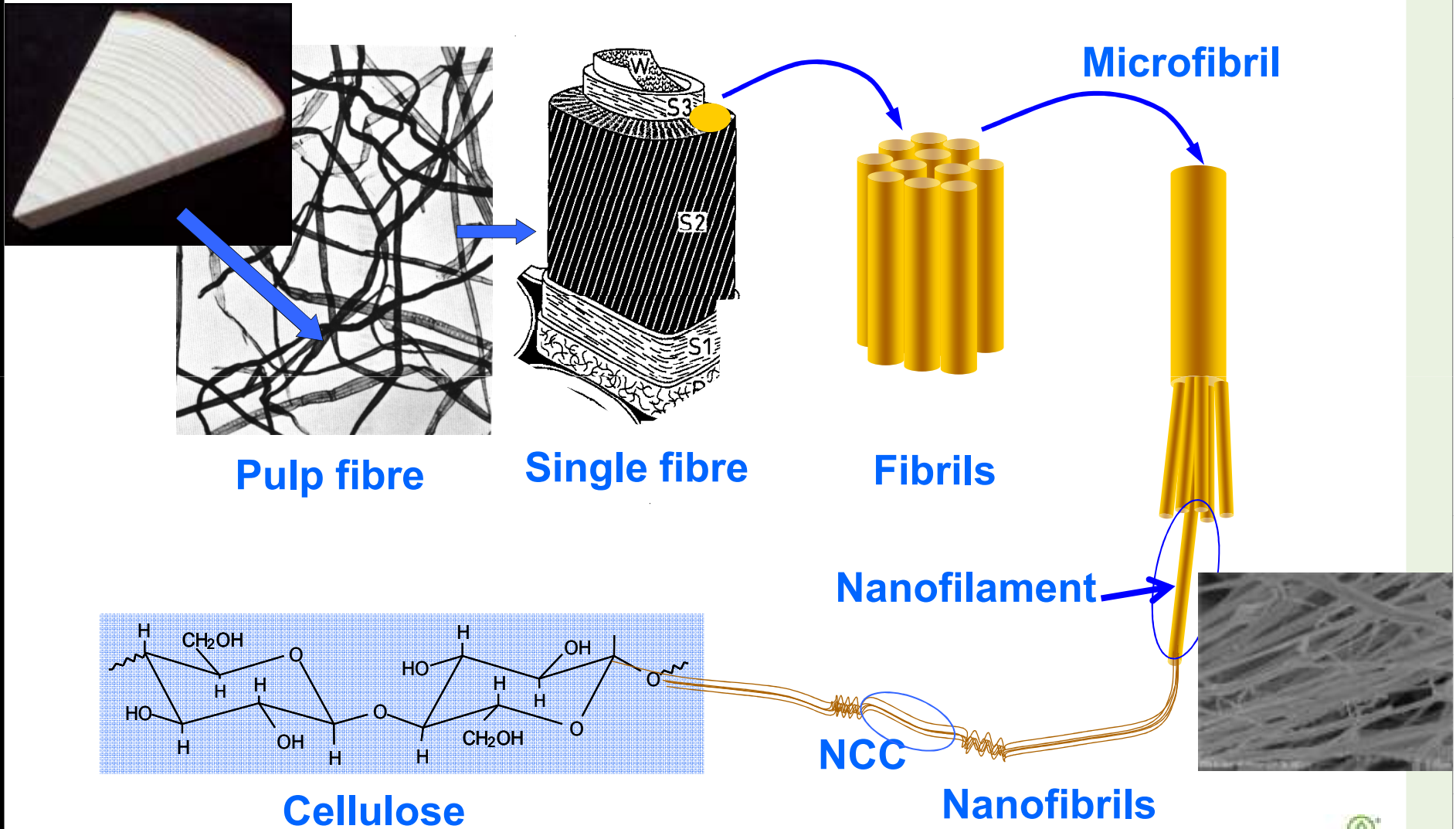
Demo Plant in Construction: 1 ton/day

- **First in the world**
 - \$42M (\$32M in capital)
 - Business model Innovations
 - Joint venture with Domtar
- Support from Québec and Canadian governments
- Start-up: Fall 2011

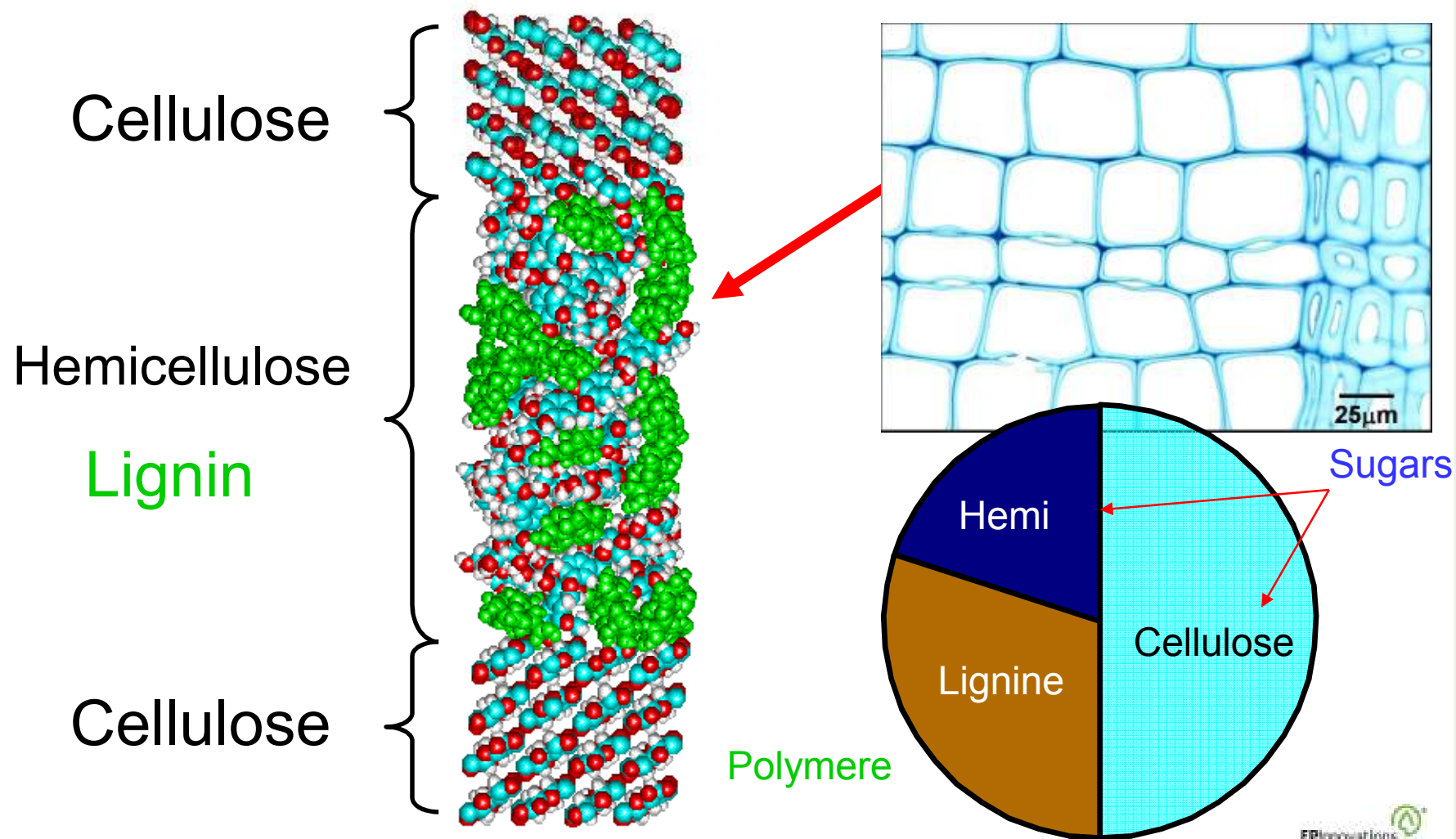


Where is the future for the forest products?

Wood: A Renewable Source of Material Component

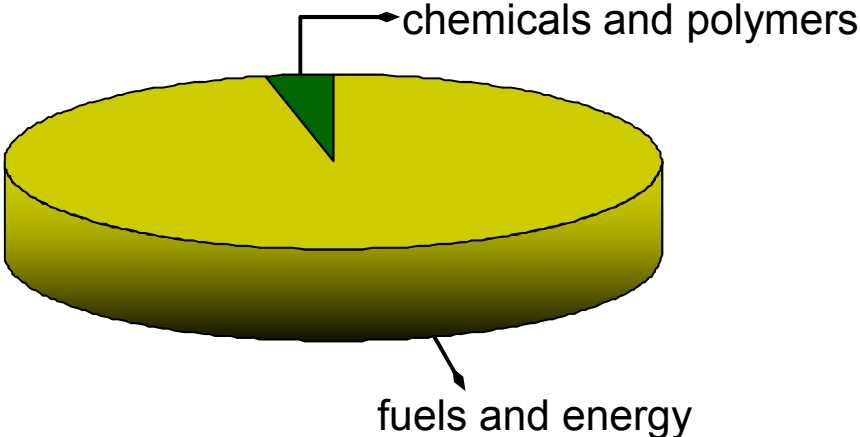


Wood: A Renewable Source of Energy and Chemical Components

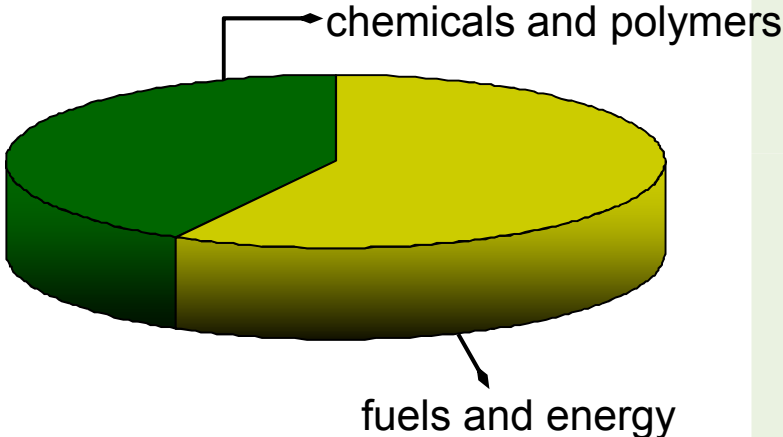


Energy or Chemicals: Where is the Value?

% of all petroleum consumed



% of total value



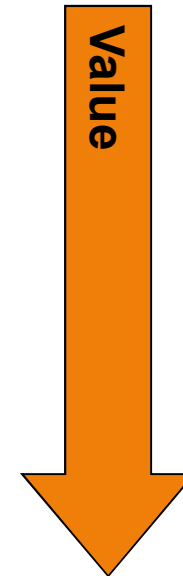
Source: Werpy, 6th BioWorld Congress, 2009



World Market for Plastics

(in thousand ton)

Product Type	2010	2020
Commodity	287,000	510,000
Engineering	12,000	24,500
Specialty	400	1,100
Advanced Composites	200	500
Total	300,000	538,000

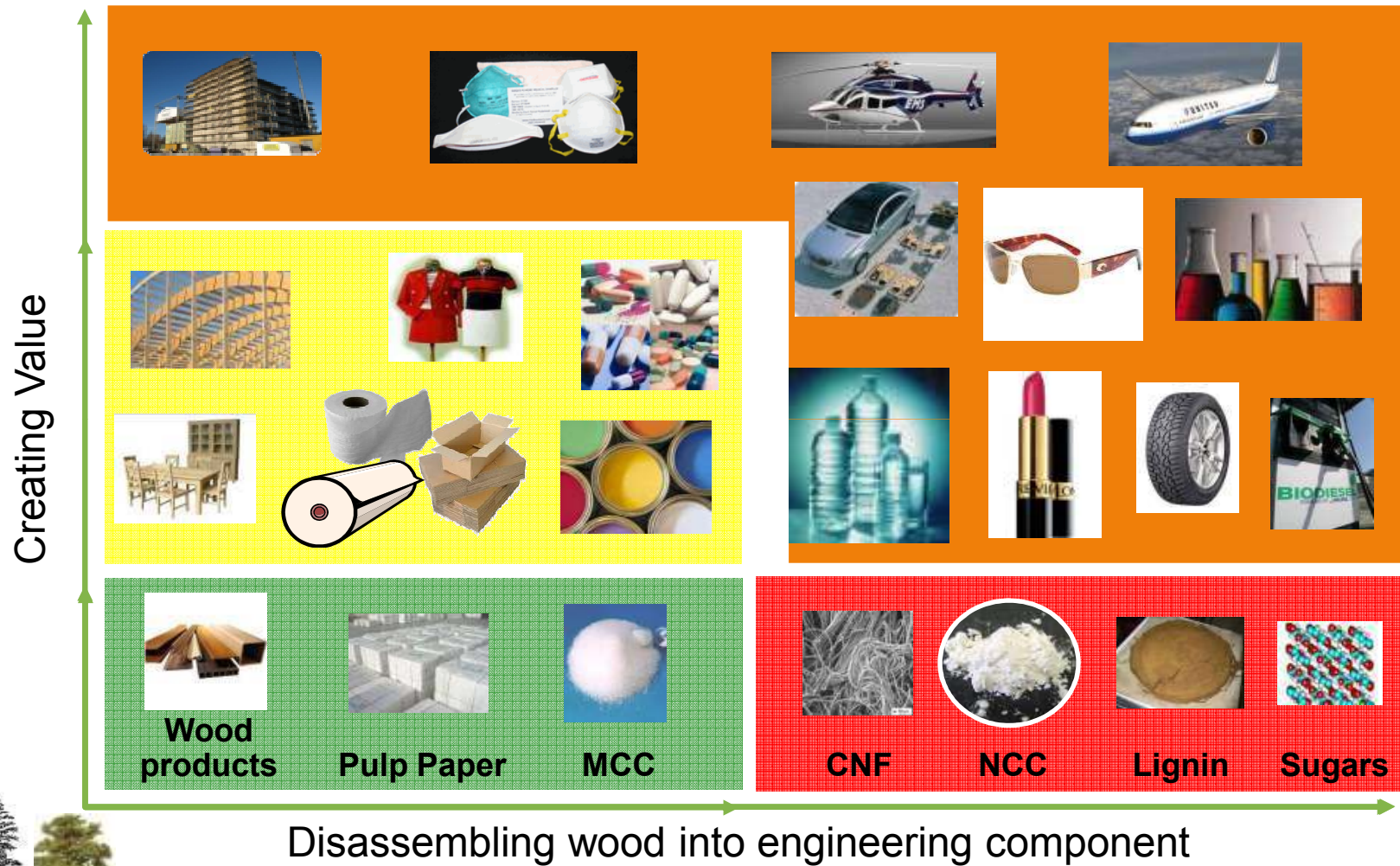


Growth

**Opportunities for biomaterials
in fast growing high value products**

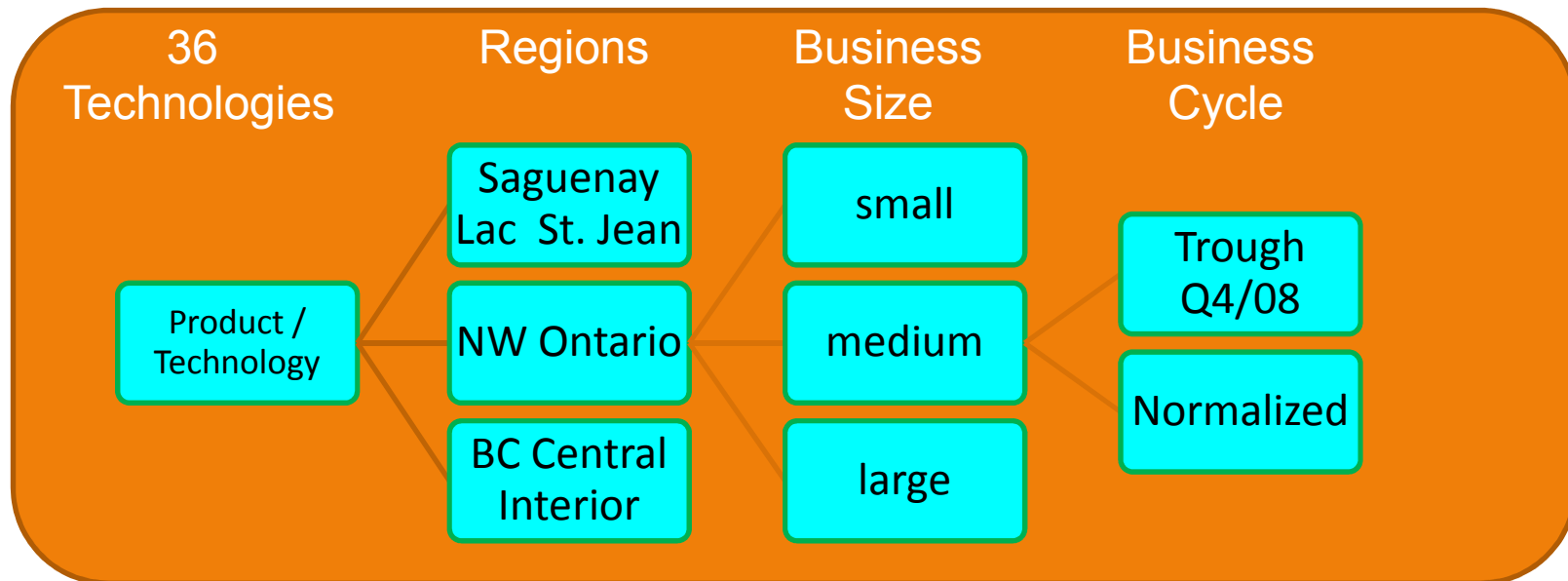
<http://www.pardos-marketing.com>

Forest Product Industry must Focus on New Products

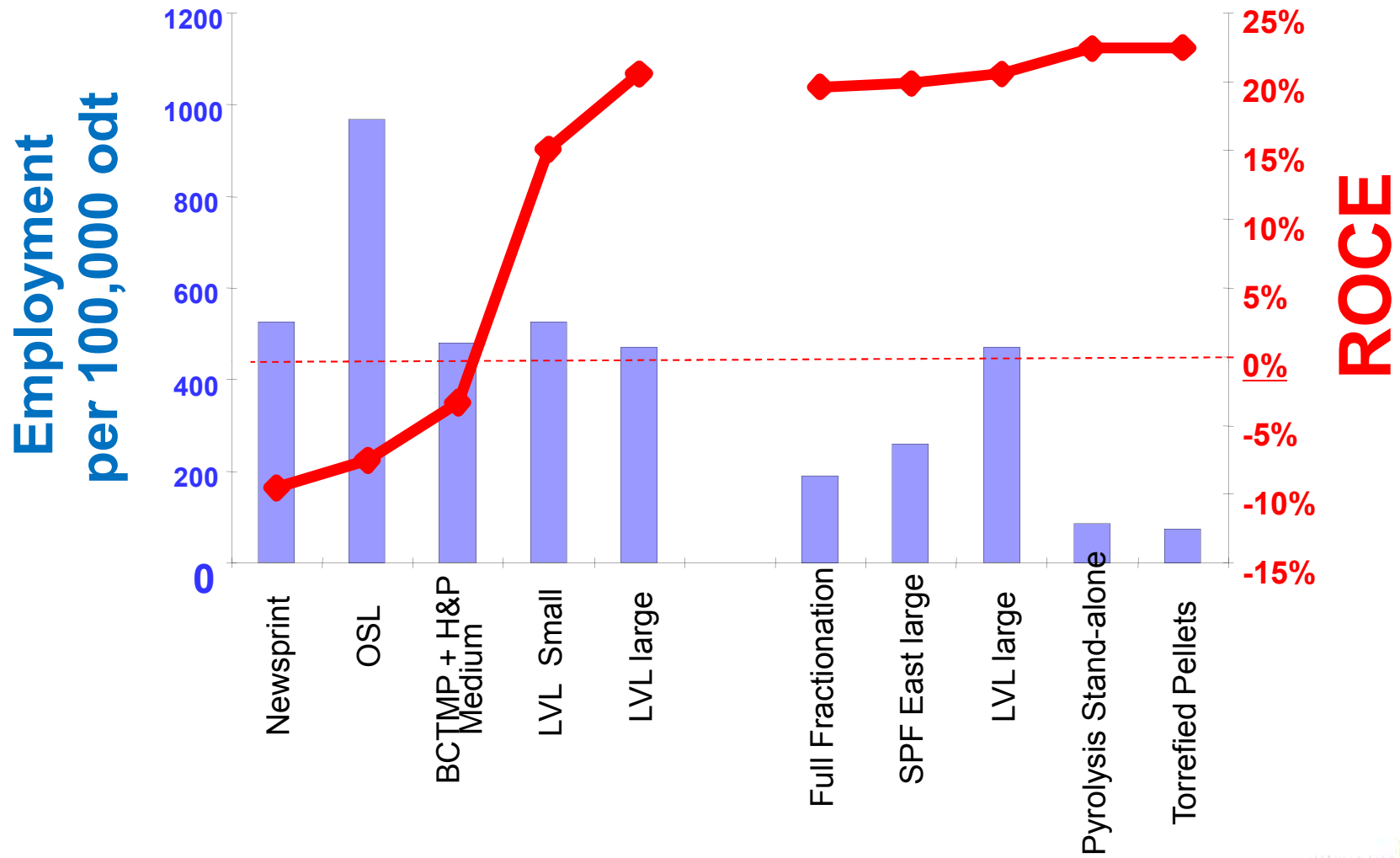


Biopathways Project

- Provide quantitative picture of the “bio” opportunities for emerging technologies and products that are beyond lab and R&D stage
- Assessed market readiness and impact on:
 - Economic (ROCE, EBITDA)
 - Social (GDP multiplier, employment multiplier)
 - Environmental (carbon footprint)



Trade-offs happen



Essential Concepts Driving Innovations

- Identify and understand **markets**
 - Partners with people who know specific markets
 - Interview customers: existing and new ones
 - Don't negotiate with yourself about the advantage of your research or products → Validate!
- Need **Clients** + know **Client's** needs
- **Innovation process** management (≠ research)
 - Invest in concurrent market and engineering
- Intensive **partnership** to win
 - **Forest Product Industry + Chemistry**

Future

- The resources is there and growing
- Demand for new material will grow
- Forest Product Industry can meets needs but need to merge into new products through innovations
- Forest Industry and Chemical Industry must partner to meet the innovation challenge

**Are you ready to
partner to develop
the Canadian fiber
toolbox?**





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