



Competitive Advantage through Collaboration

**John Marrone, Executive Director
BioFuelNet Canada**

Scaling Up Conference

Chateau Laurier, Ottawa, Ontario



The Evolution of Competitive Advantage

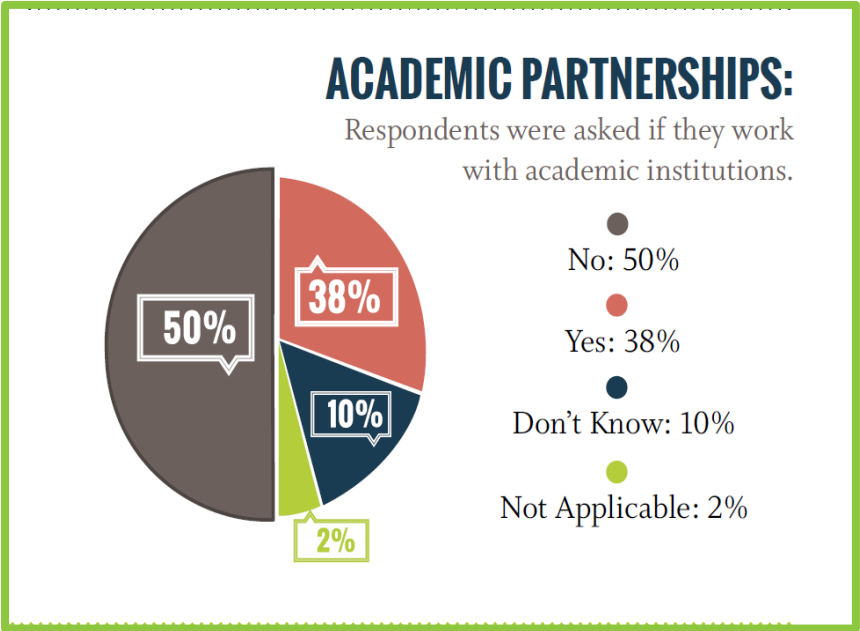
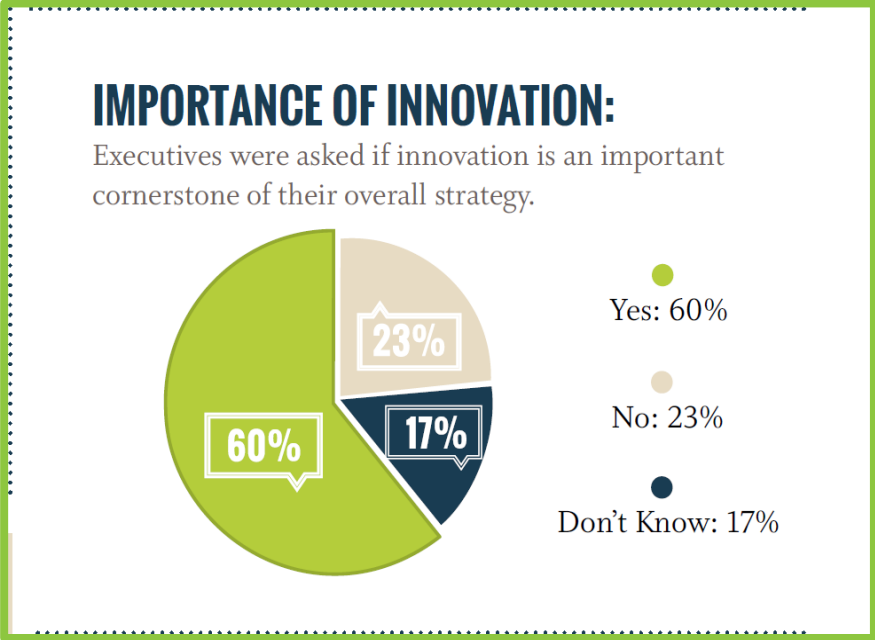
1937: Companies gain a competitive advantage by reducing informational and transactional costs through internal collaboration. (Ronald Coase, The Nature of the Firm)

1985: Companies gain competitive advantage by collaborating along the entire value chain. (Michael Porter, Competitive Advantage)

2013: Agility trumps size! Pace of innovation is much faster so companies must collaborate to seek transient competitive advantage. (Rita Gunther McGrath, The End of Competitive Advantage)



Use of Collaborative Innovation Capacity in Canada



Online survey of over 300 Executives in Cleantech sector in Canada
(Cleantech Directions 2016)

BioFuelNet, a Collaborative Innovation Network

McGill University (Host)

- **27** Network member universities
- **71** Network Investigators (169 collaborating)
- **99** industry partners, **17** government departments/agencies and over **40** other partners
- **700** Highly Qualified Personnel (HQP) trained or being trained



BioFuelNet's Partners



Strategic Business Summit (SBS)

...an ongoing investment in social capital

SBS-2013 Montreal




SBS-2014 Toronto

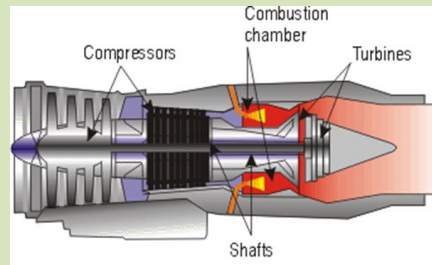


Collaborative Research



 **Enerkem**

Improved catalytic formulations (Abatzoglou lab)



SIEMENS

Better gas turbines



Pan-Canadian Feedstock Trials



GHG Trade Off




Integrated Modeling Tools developed





Priority pathways guide industry and policy decisions

Pre-Commercial Collaborations



flueTRU

Fluetru innovation




Aviation biofuels demonstration project



Forge Hydrocarbons



Improved Ignition control (E-bird spark plug)



Repurposing pulp and paper mills

Testimonials

Successfully Integrating Research across Canada

“Being involved in the ‘Animating Biomass Supply Chains in Canada’ initiative in BFN has brought me in contact with researchers who have expertise in biomass feedstocks, conversion technologies and policy issues, which I otherwise would have had no opportunity to collaborate within my own research program.”

Dr. J. Kevin Vessey, Professor of Biology & Associate Vice President Research, Saint Mary’s University

“Enerkem has maintained a close relationship with research leaders of BioFuelNet. The fundamental findings of collaborative research projects have been incorporated, by the company’s engineering group, into our novel technology that converts wastes into biofuels. A commercial plant is the outcome of the effort. Numerous graduate students and postdocs, trained during the research projects, have joined the ranks of Enerkem. We are grateful to BioFuelNet for the continuing collaboration.”

David Lynch, General Manager, R&D

“BioFuelNet support came at a critical time in the technology development ... allowed the launched company (2013) to leverage additional partners ... The network also linked the company to critical expertise ... Presentation of the technology at the BioFuelNet symposia also exposed the technology ... The result \$9.2 million invested.”

David Bressler – Forge Hydrocarbons.

In my role as country representative on IEA Task 42 Biorefineries, I was asked to provide a list of national ‘Major R&D Consortia & Projects’ ... BioFuelNet was the only national network I could identify that focused on the development of advanced biofuels.”

Maria Wellisch, Senior Policy Analyst – Bioeconomy Policy, AAFC

Competitive Advantage through Collaboration



SOLO



TEAMWORK



SUPPLY-CHAIN LOGISTICS
CONVERSION & ENGINE OPERATIONS
RESIDUES & WASTE MANAGEMENT
& INTERNATIONAL COLLABORATION
PYROLYSIS
GASIFICATION
BIOCONVERSION
EMERGING CONVERSION TECHNOLOGIES
PURPOSE-GROWN FEEDSTOCK
LIFE CYCLE ANALYSIS & MICROECONOMICS

**UNITING
ACADEMIA, INDUSTRY, GOVERNMENT AND INVESTMENT
FOR STRATEGIC INNOVATION**