

***CBIN : Canadian Biomass Innovation Network***

***RCIB : Réseau canadien d'innovation dans la biomasse***

***Overview Presentation***

***Biomass Innovation: Moving  
Forward in Canada***

***Nov 8, 2005***

**Maria Wellisch, Program Coordinator**

**Natural Resources Canada, CETC, Ottawa**



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Outline



- **Who/What is CBIN – RCIB ?**
  - Applied R&D : Bioenergy, Bioproducts and Industrial Biotechnology
  - Structure & People
- **Current Sources of Federal R&D Funding**
  - PERD BEST
  - T&I Biotechnology
- **Research Activities & Themes**
  - Linkages to Other Programs
- **Next Steps**
  - Strategic Work and Communication



# Introduce CBIN – RCIB



- **Network of researchers (government, industry, university), program managers, policymakers**
  - Vibrant R&D base to support sustainable bio-based innovation in Canada
  - **Applied R&D** in bioenergy, biofuels, industrial bioproducts & bioprocesses
  - Outputs feed demonstration, pre-commercialization programs (e.g. TEAM, APF Science & Innovation, SDTC, policymakers, technology developers, etc.)



## Biomass Feedstocks (Residues & New Crops)

### Forest

- residues
- slash
- short rotation forestry

### Agriculture

- crops (e.g. cereal grain, oilseeds)
- crop residues
- livestock manure
- animal fat
- energy crops (e.g. grasses)

### Urban & Other Ind Wastes

- MSW
- municipal effluent
- industrial effluent
- fisheries waste

## Biofuels & Chemicals

Renewable Diesel:  
methyl ester &  
SuperCetane

Acids:  
lactic,  
levulinic,  
succinic

Alcohols:  
ethanol  
methanol  
glycol

Bio-based Gas:  
biogas, syngas  
hydrogen

Bioenergy  
heat  
power

Products

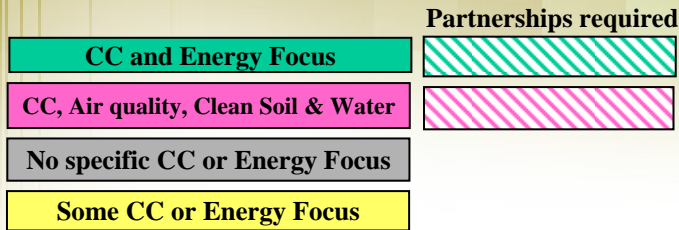
## Biomaterials & Other Bioproducts

Natural fibres, composites,  
lubricants, adhesives & resins, pesticides,  
solvents, fertilizers, plastics, modified  
proteins, saponins, nutraceuticals

direct



# Federal Energy Science and Technology Eligible Activities and Stages of Technology



## Support Criteria (measurement criteria highlighted)

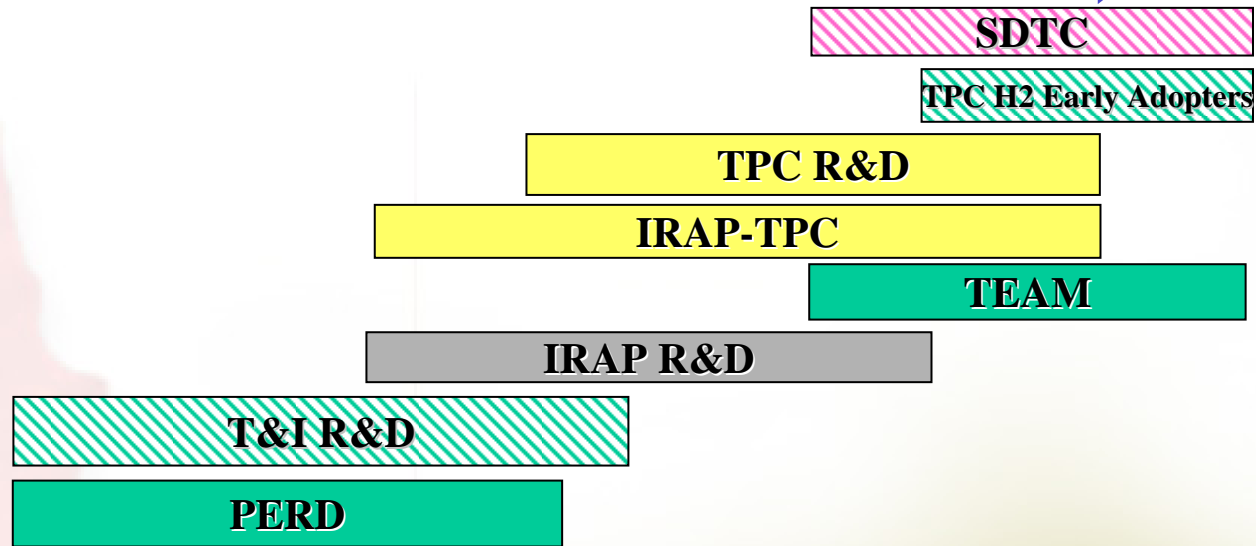


- Techno & economic benefits to Canada
- Lead to industrial development & commercial exploitation
- Enhance profitably, improve technology base of firms
- Advancing unproven S&T to validation stages of demo & commercialization
- Acquisition & growth of new S&T capability & capacity.
- Reduce Technical Risk
- Novel & new approaches

Mainly Commercial Criteria-driven

Mixed Commercial & S&T Criteria-driven

Mainly S&T Criteria-driven



Early-stage R&D	Applied R&D	Advanced Development, Product Development and pre-Commercialization	Demonstration & Technology Transfer	Deployment & Commercialization
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# Contribute towards Ultimate Goal: More sustainable, bio-based economy



- Increased supply of sustainable energy (incl energy carriers) from biomass
- Less unutilized and wasted biomass
- Reduced energy intensity of energy production, industrial manufacturing sectors
- Reduced GHG intensity of energy production, industrial manufacturing & transportation sectors
- Increased production of chemicals and materials from biomass feedstocks in appl where sustainability is enhanced rel to conventional manufacturing





# CBIN Management

- *Interdepartmental, Collaborative, Concensus-Based*



- **CBIN Executive Committee**

Organization	Voting Member	Alternate
NRCan	Hamid Mohamed (Chair)	Maria Wellisch (Coordinator)
AAFC	Dr. Jim Brandle	Mark Stumborg
EC	Dr. Terry McIntyre	Matthew Schacker
IC	Dr. John Jaworski	Joe Cunningham
NRCan - CFS	Jeff Karau	Dr. Robert Stewart
NRCan - CETC	Dr. Bill Cruickshank	Jody Barclay
NRCan - CETC	John Burnett	Ed Hogan
NRCan - OERD		Nicole Richer
NRC	Kevin Jonasson	Jane Dymant-Saaltink

\* *TIMS Observer: Melanie Chamberland/Jesse Hebert*



# Contributors to Strategic Planning



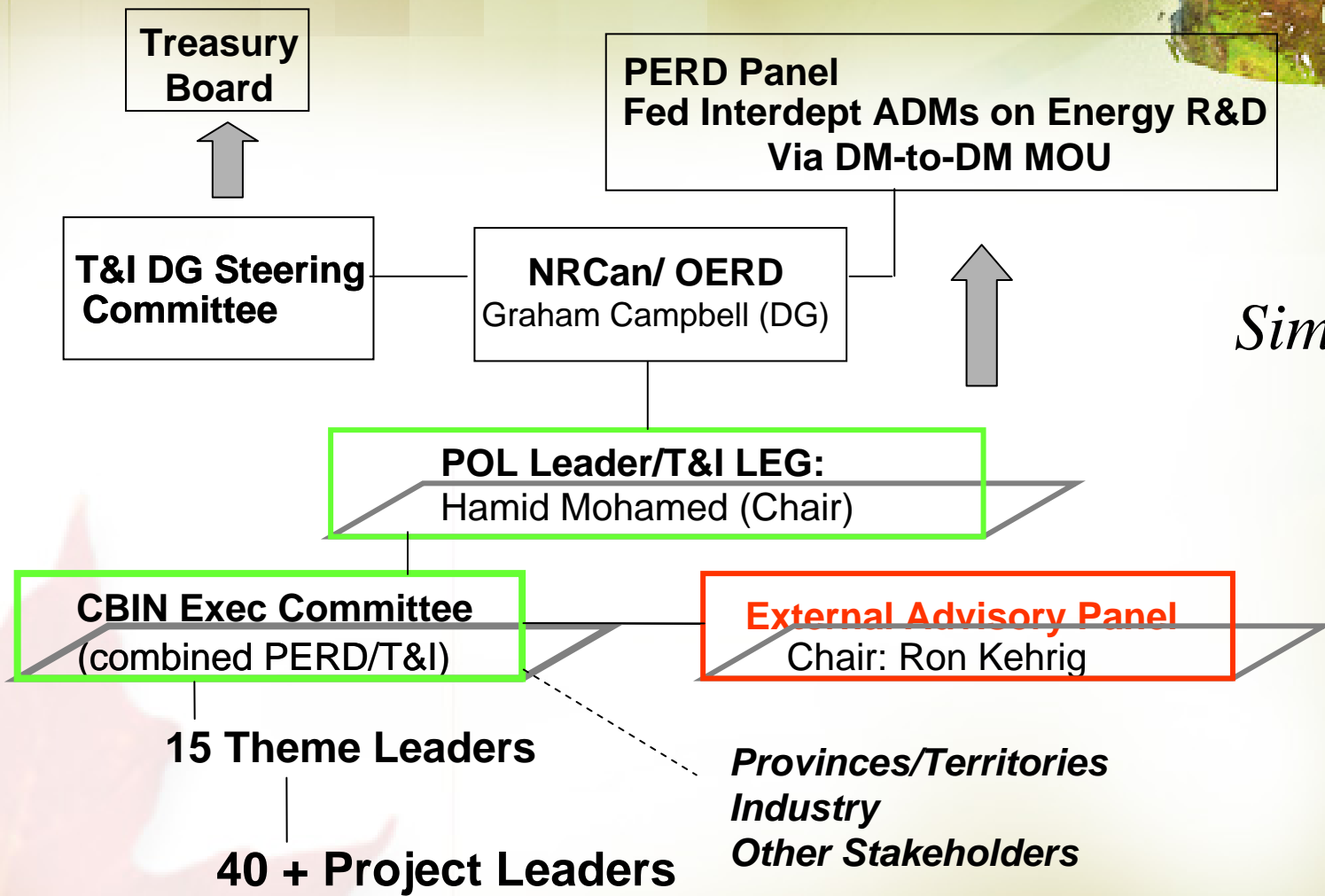
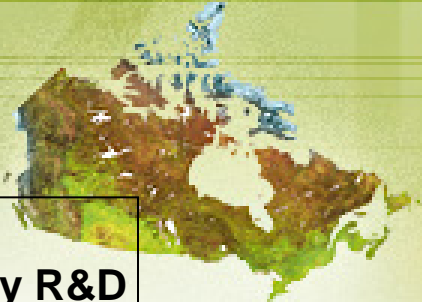
## “External Advisory Panel - EAP”

- *Chair: Ron Kehrig, AgWest Bio*
- Richard Ablett, Atlantic Bioresource  
TechnoVenture Centre
- Carolyn Baillie, Queen's University
- Bob Benson, Retired VP, Tembec
- Ajay Dalai, University of Saskatchewan
- Bob Morgan, POS Pilot Plant Corp
- Don O'Connor, (S&T) 2 Consultants Inc. ,
- Larry Russo, US DOE, Office of the Biomass
- Deny St. George, Manitoba Hydro
- Genevieve Tanguay, CQVB

Provinces/Territories  
Industry  
Other Stakeholders







*Simplified*



## More about CBIN – RCIB ...



- **Vision**

- *To make strategic R&D investments that will advance Canada's development of bioenergy, biofuels, industrial bioproducts and bioprocesses to:*

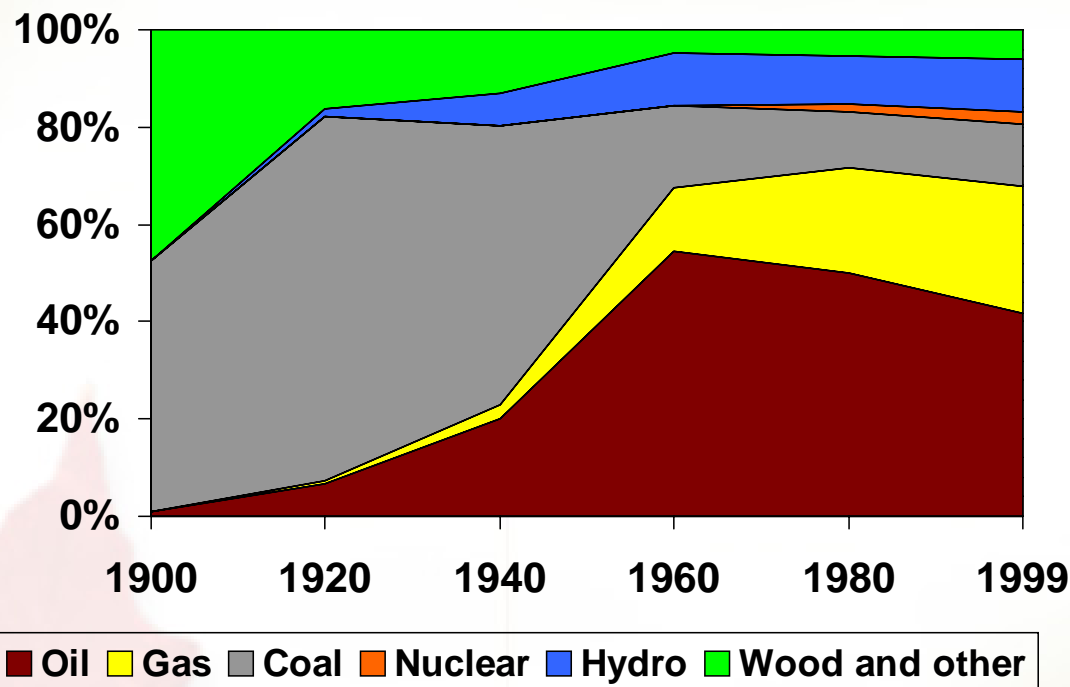
- *displacing fossil fuel energy by increasing supply of bio-based energy and improving energy efficiency*
    - *directly or indirectly reduce greenhouse gas (GHG) emissions and*
    - *seed the sustainable development of the bio-based economy.*

- **Currently, 2 Sources of federal funding:**

- PERD (Program of Energy Research & Development)
  - T&I (Technology and Innovation)



## 20<sup>th</sup> Century: Forest biomass resources converted into energy – heat & power



Bioenergy displaced by fossil fuel energy (coal, oil, nat gas) over the last century

2000 (6% share):  
504 PJ (hogfuel + spent pulping liquor)  
95 PJ (residential wood)

*R&D funding through NRCan - PERD*



# Envision a More Bio-Based Economy, but different 'bio' than 20th century



*Energy Consumption*  
*11,589 PJ (2003)*

*92% fuels & energy*  
*10,700 PJ (2003)*

*7.8% non-energy use*  
*(903 PJ, e.g. chemical feedstocks, etc.)*

Supply side:

- In 2025, 6-7% (NEB) to 8-9% (with R&D) of primary energy share
- cleaner and more diversified forms of bio-based fuels & energy
- more biomass used as feedstock for Chemicals, Materials, etc.

Demand side:

- more bioprocesses (substituting more energy intensive chemical & physical processes)



# Funding from 2 Federal Programs



## Existing PERD BEST POL

### Bio-based Energy Systems and Technologies

- \$ 2.7 million/yr
- 25+ yrs in existence
- Biomass production, bioenergy, biofuels R&D

## New Technology & Innovation (T&I) Biotechnology Program

- \$ 20 million for R&D / 4 yrs
- GHG reductions in 2025

*\* All investments require partnerships, leverage and dissemination*

2.1.3. Transportation Fuels from Renewable Energy Sources

4.2.3 Forest and Forest Products Industry

4.2.5 Agriculture and Forestry Biomass Supply for Energy



# Federal Funding 04/05 - 07/08 (\$ million)



Fiscal Yr	PERD BEST	T&I Biotech	Total	
2004/05	2.7	1.2	4	
# projects	32	14	46	
2005/06	2.7	5.5	8.3	←
2006/07	2.7	6	8.7	
2007/08	2.7	7.1	10.2	

\*\* T&I 2003/04 - 0.2k

- R&D is underway
- Majority of funds are allocated
- Seeking new/additional sources of funds for post 2008







## 4 Areas of Activity

### 4: Cross-Cutting/Program

= strategy work, policy & reg framework, assessment (environmental, techno and socio-economic, market, etc.), dissemination

### 3: Integrated Bio Applications

- 2 themes

*30% funds (05/06)*

**1: New & Existing Biomass Supply**

- 4 themes



**2: Biomass Conversion & Utilization Technologies**

- 6 themes

*50% funds (05/06)*



# Linkages with Other Fed Bio Programs



<b>CBIN R&amp;D Activity</b>	<b>Other Bio Programs</b>
New & Existing Biomass Supply	Greencrop, BIOCAP
Biomass Conversion & Utilization Technologies	TEAM, EcoAMu, ETAA, Biodiesel Targeted Measures, SDTC
Integrated Bio Applications (incl. biorefineries)	TPC, provinces & municipalities, closer to commercialization
Cross-Cutting (strategy, policy & reg framework, market assessments, dissemination)	All programs (e.g. APF Science & Innovation, CBS - Stewardship, etc.); provinces & municipalities; BIOCAP



# Key Messages



- **2005/06: \$ 8.3 million fed investment in Applied R&D, not including leveraging**
  - Livestock manure & MSW into biogas
  - Forest fibre into energy – focus: solid wood industry, lime kilns, cleaner combustion
  - Agriculture crops & crop residues into fuels, energy, chemicals and materials
    - Oilseeds: interface with new crop development; biodiesel, specialty industrial oils, chemicals
    - Cereals/starch: ethanol, materials
    - Fibre: energy; new materials/composites
  - Mixed biomass feedstocks
  - Co-products development
  - Industrial biotechnology applications

*Contact theme leaders &  
project leaders  
Partner ?*



## Next Steps

*some could be done collaboratively*



- **Writing Canada's Bioenergy & Industrial Biotech Story**
- **Develop Strategy (post 2008)**
  - Set targets for bioenergy, biofuels, biogases & adoption of industrial bioprocesses
  - Which bio pathways make sense for Canada ?
  - Develop biomass infrastructure: cost, availability, sustainability
- **Specific Projects**
  - Analytical Work (Canadian RBAEF ?)
  - T&I "Technology to Market" – 2 or 3 studies (starting in 06/07)
- **Communication – telling the bio story**
  - Internally: Sustainable Energy Strategy, etc.
  - Externally: Provinces, Conferences: World Congress, etc.



# CBIN Websites



- **Contact: Nathalie Beaupré – CBIN Communications Officer**
- **Public Website: [www.cbin-rcib.gc.ca](http://www.cbin-rcib.gc.ca)**
  - CBIN Strategic Plan
  - Theme Descriptions & Contacts
  - Project List & Contacts
  - Upload Nov 8 meeting presentations \* (translated)
- **Password-protected website**
  - Community zero
  - 'easy to use' to upload information – general announcements, events, for discussion forums, etc.



*Thank you, Merci !*



*For more information:*

- **CBIN Program:**

- Hamid (Mo) Mohamed – CBIN Chair tel (613) 995-5782
- Nicole Richer – OERD Science Advisor tel (613) 944-4755
- Maria Wellisch – Program Coordinator tel (613) 996-6195
- Nathalie Beaupré – Communications Officer tel (613) 947-2120

- **ExCo Members**
- **Theme Leaders**
- **Project Leaders**

