

# **Economic and social drivers for bioenergy use**

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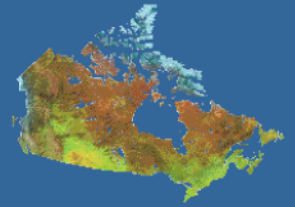
**Vancouver, August 25 2009**



Natural Resources  
Canada

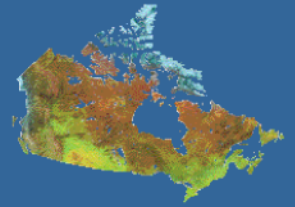
Ressources naturelles  
Canada

Canada



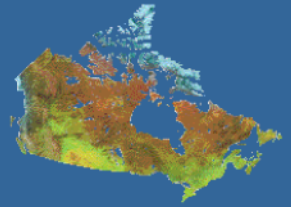
## Canadian situation

- Energy by source
  - Petroleum 39%
  - Natural Gas 28%
  - Coal 13%
  - Hydro 11%
  - Biomass 6%
  - Nuclear 3%



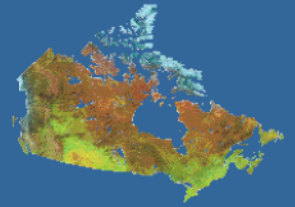
## Study Origins

- What must happen for biomass to achieve greater penetration in the energy mix?
  - Advocacy versus analysis
- Went back to the basics of economics to find the answer.
  - Original work aimed at non-economists
  - Understanding the agents involved and their motivations



# Biomass and bioenergy market

- Agents: Households, firms and government
- The level and type of bioenergy use in an economy will ultimately be determined by two base conditions:
  - (1) availability of appropriate inputs for bioenergy production
    - (1) Can be directly affected by agriculture, resource and waste management policies
  - (2) decisions made by agents in the economy whose actions will influence supply and demand



# Agents participating in the bioenergy market: households, firms and government

## Household

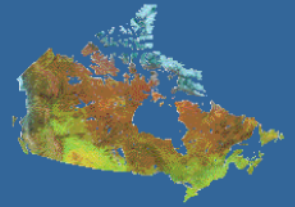
1. Consumer of bioenergy
2. Supplier of biomass

Primary driver:

**improved utility**

Primary constraints:

**New technology, information**



## **Firm**

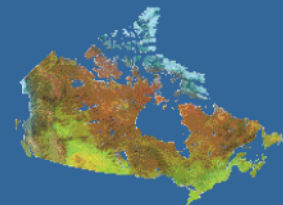
1. Produces bioenergy for its own purposes;
2. Sells excess bioenergy after satisfying own energy purposes;
3. Bioenergy production as core business;
4. Produces and sells biomass;
5. Uses bioenergy as an energy source;
6. Supplies equipment and/or services to the bioenergy sector.

Primary driver:

**Profitability**

Primary constraints:

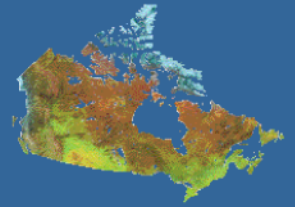
Market entry barriers, information



## **Government**

1. Provide an environment and system for bioenergy market development
2. Consumer of bioenergy
3. Leading example
4. Producer of bioenergy
5. Provide information

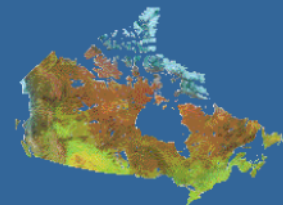
Primary driver:  
**Improved social welfare**



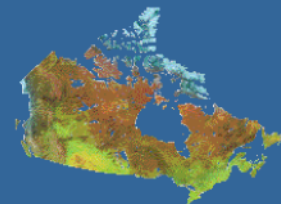
# Information

- Information is a tool used by industry (private marketing), NGOs (social marketing) and government in an attempt to modify consumer behaviour.
- Information is a good subject to the same economic principals as other goods
- Not all messages will be received by all agents so they have to be aware that information exists and know where to look for it.
- Governments often lack the capacity to completely close the information gap for firms and households.
- Lack of full information a major impediment to increased biomass use.



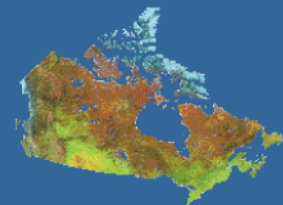


# Economic drivers for a household participating in a bioenergy market



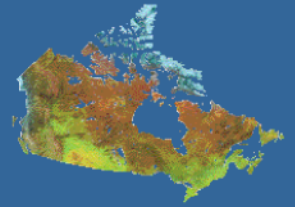
Attitudes and values	Position in the market			
	Consumer (demand side)		Producer (supply side)	
	System requirements / regulation	Dominant driver: Improved standard of living	System requirements / regulation	Dominant driver: Improved standard of living
<b>Ecocentric</b> <b>More comfortable</b> <b>Potential job creation</b> <b>Inertia/ reluctance to change</b> <b>Intergeneration equity</b>	<b>Penalty (i.e. mineral fuel tax, carbon tax)</b> <b>Subsidy (i.e. reimbursement of costs for purchasing a biomass boiler)</b> <b>Support (information, service)</b>	<b>Cost</b> <b>Service</b> <b>Availability of technology</b> <b>Reliable energy source</b>	<b>Existing market</b> <b>Subsidy</b>	<b>Small and Medium enterprises</b> <b>Additional income</b> <b>Potential job/investment opportunity</b> <b>Existing market</b> <b>Conversion from food to non-food cultures is more profitable</b>





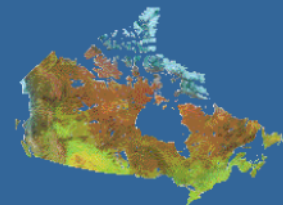
## How to move from “this is a really good thing; people and firms should use more bioenergy”

- Firms can target areas such as cost, convenience and full information.
- Households desiring more bioenergy use for environmental reasons, must convince governments that this will improve social welfare.
- Governments can use their command and control authority through regulation and taxes or through simply being a clearinghouse for information which will move bioenergy use closer to an optimal level for societal welfare.
- As agents understand the motivations of other agents, they can further their own goals.



## Conclusion

- Surveys of households, firms and governments would be useful to learn the attitudes and values of agents.
- These would help agents alter their actions to achieve an optimal level of bioenergy in the market
  - E.g. governments learn that consumers need more information



# Questions?

