



Agriculture and  
Agri-Food Canada

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# **The Pacific Food System Outlook Conference 2006-07, Singapore**

## **Rising Energy Costs: Consequences for the region's food system**

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# Questions

- **The longer-term viability of alternatives energy sources such as ethanol and other bio fuels that compete directly for food-producing resources.**
- **The policy response in promoting food system efficiencies, energy conservation, and alternative energy sources.**
- **The cross-regional impacts and farm-level adjustment strategies to rising fuel and other input costs.**
- **The beyond-the-farm-gate supply chain impacts on a food system ever more dependent on processing and transportation services.**

# **The longer-term viability of alternatives energy sources such as ethanol and other bio fuels**

- **Price of crude oil**
- **Costs**
  - **Efficiency gains**
  - **Price of feed stocks**
- **Price of by-products**
- **Trade policy on these products**
- **Regulation**
- **Government incentives**

## **Costs vary according to feedstocks**

- **Ethanol from sugar cane in Brazil**
- **Bio-diesel from animal fats in New Zealand**
- **Ethanol from wheat in Canada**
- **Ethanol from corn in USA and Canada**
- **Ethanol from sugar beet in UK**
- **Bio-diesel from rapeseeds in EU soybean in USA and palm oil in Malaysia**
- **Ethanol from ligno-cellulosic in pilot plants**

## **Breakeven price with crude oil price**

- **Ethanol from sugar cane: 40 US\$/bbl**
- **Bio-diesel from animal fats: 60 US\$/bbl**
- **Ethanol from corn: 65 US\$/bbl**
- **Government initiatives**

## **Scenario with no government subsidies, no tariff and high crude oil price** (or medium crude oil price and tax exemption)

- **Brazil uses an increasing share of sugar cane to produce and export ethanol.**
- **Brazil and other efficient producers of sugar cane would dominate the ethanol market initially until the increase in the price of sugar limits future use of sugar cane for ethanol production.**
- **Ethanol production from cereals would eventually become profitable.**
- **The maize and sugar markets would be much more integrated through the substitution in the sweetener and bio-fuel markets.**

## **Scenario with government subsidies, no tariff and high crude oil price** (or medium crude oil price and tax exemption)

- **Brazil uses an increasing share of sugar cane to produce and export ethanol.**
- **Brazil and other efficient producers of sugar cane play a major role on the ethanol market alongside with subsidized cereals based ethanol production.**
- **The impact on the price of sugar is not as high as in the previous scenario but the price of cereals would be higher.**
- **The maize and sugar markets would be even more integrated through the substitution on the sweetener and bio-fuel markets.**

# **Scenario with high tariff on ethanol and high crude oil price** (or medium crude oil price and tax exemption)

- **Brazil uses an increasing share of sugar cane to produce and export ethanol but the impact is much more limited as some countries with large cereals production are limiting imports of ethanol.**
- **The impact on the price of sugar is much smaller but the price of cereals would be higher.**



# **If crude oil price return to 40 US\$/bbl?**

- **In the absence of trade barriers Brazil and other efficient sugar cane producers would dominate the much smaller ethanol market.**
- **Regulation and/or tax exemption could create a much larger ethanol market.**
- **Trade barriers, regulation, subsidies and/or tax exemption would be needed to support cereals based ethanol industries.**

**Canadian policy response in promoting food system efficiencies, energy conservation, and alternative energy sources.**

- **General energy conservation policies at the federal and provincial level.**
- **Fuel rebates to farmers.**
- **Promoting bio-fuel.**

# Promoting bio-fuel in Canada

- **Bio-fuel government objective: 5% of on-road transportation in Canada by 2010.**
- **Trade barriers on ethanol are limited: Free with USA under NAFTA and only 4.92 c/l MFN including Brazil.**
- **Tax exemption: Many provinces exempt renewable fuels from their road taxes and the federal government from its excise tax.**
- **Regulation: Saskatchewan, Manitoba and Ontario have passed legislation requiring ethanol use when supply becomes available within their borders.**
- **Public support: The Federal government is providing capital assistance through the Ethanol Expansion Program (EEP).**

# Bio-fuel in Canada

- **Current production of ethanol: 200 m.l.**
- **Current consumption of ethanol: 300 m.l.**
- **Canada imports 100 m.l. from Brazil and USA**
- **Current bio-diesel production: 100 m.l.**
- **By the end of 2007 Canada could produce 1.4 b.l. of ethanol**
- **The 5% renewable goal by 2010 represents about 3 b.l. of bio-fuels**

# **The cross-regional impacts and farm-level adjustment strategies to rising fuel and other input costs.**

- **According to the OECD a permanent 10% higher price of crude oil over a period of 9 years will reduce supply and generate higher world price of grains and oilseeds by 5 to 7%. The higher energy and feed price will reduce supply of livestock products and lead to higher prices (2 to 3.5% for red meat and 1 to 4.5% for dairy products).**
- **A 10% increase in crude oil price leads to a 1% increase in overall farm operating expenses in Canada.**
- **Share of direct energy cost jumps from 8.5 to 10.8% of farm operating expenses in Canada and fertilizer and pesticides jumps from 13 to 14%.**
- **Potatoes, corn and oats will be more seriously affected by the increase in the price of nitrogen → land into soybean, lentils, field peas and wheat.**

# **The beyond-the-farm-gate supply chain impacts on the food system**

- **Econometric estimate suggests that a 10% increase in the price of energy will increase consumer price of food purchased in retail store by 1.2% in Canada.**
- **Food manufacturing industries use in general less energy than most other manufacturing sectors.**
- **The most energy dependent food industry are grain milling and rendering and meat processing.**
- **An insulating effect on all agricultural markets in the world because transport cost between countries, which acts like a tariff, will increase.**