

# **Bio-Diesel** and the Need for **Local Green Alternatives**



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**Cowichan Bio-Diesel Co-op**

**October 30, 2008**  
**CWMA Conference**



# Outline

- Introduction



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- **Global Climate Change**



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- Peak Fossil Fuel Production and what it Means to You



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- The Cowichan Bio-Diesel Co-op



# Introduction

*“Become the change  
you seek in the world.”*

- Mahatma Gandhi



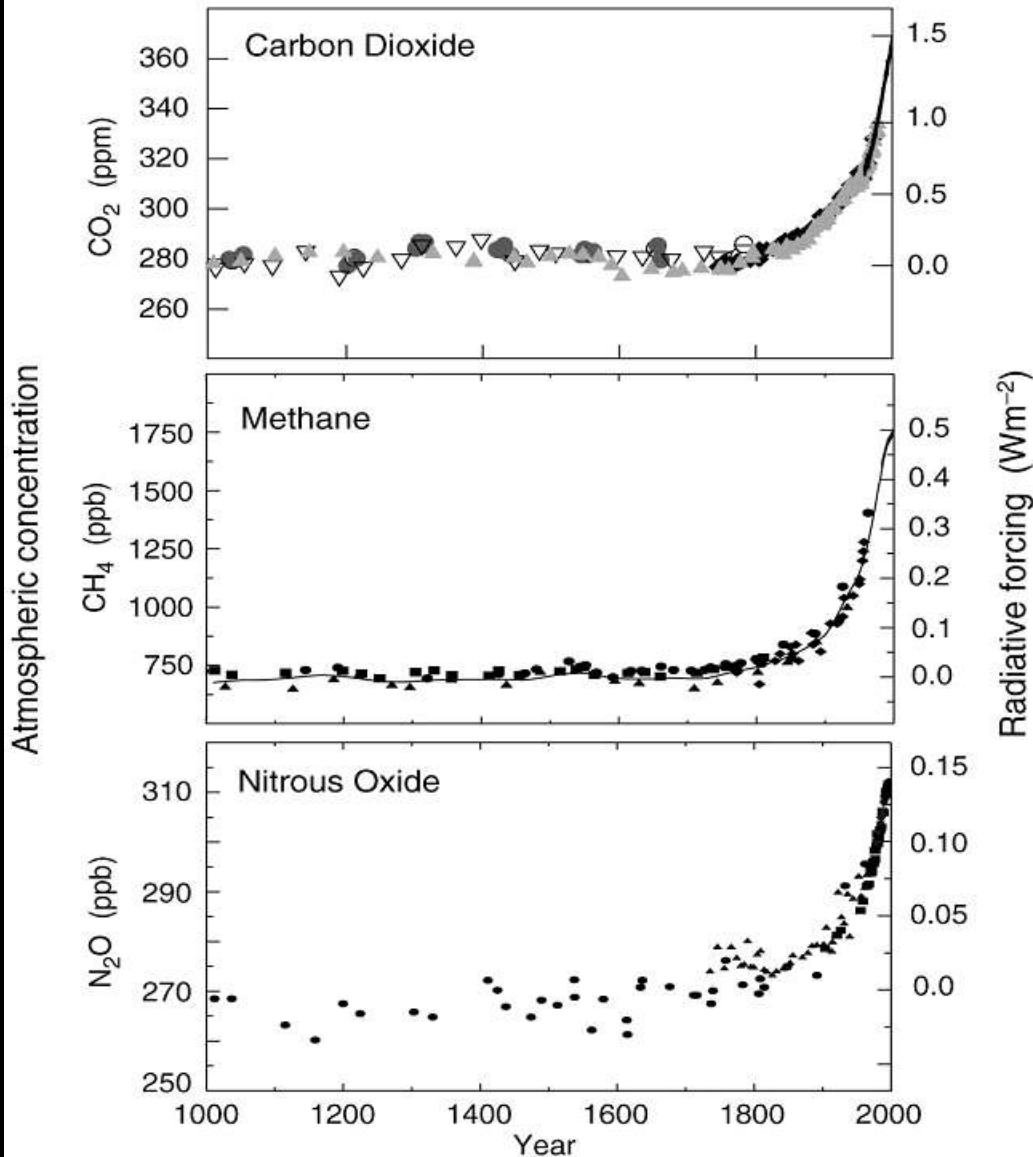
# Global Climate Change

***“Facts do not cease to exist  
because they are ignored.”***

**- Aldous Huxley**



(a) Global atmospheric concentrations of three well mixed greenhouse gases



"One hundred and fifty years ago humans started a grand, uncontrolled experiment with carbon on earth. We don't know exactly how the experiment will turn out, but it will certainly change our climate and our lives."

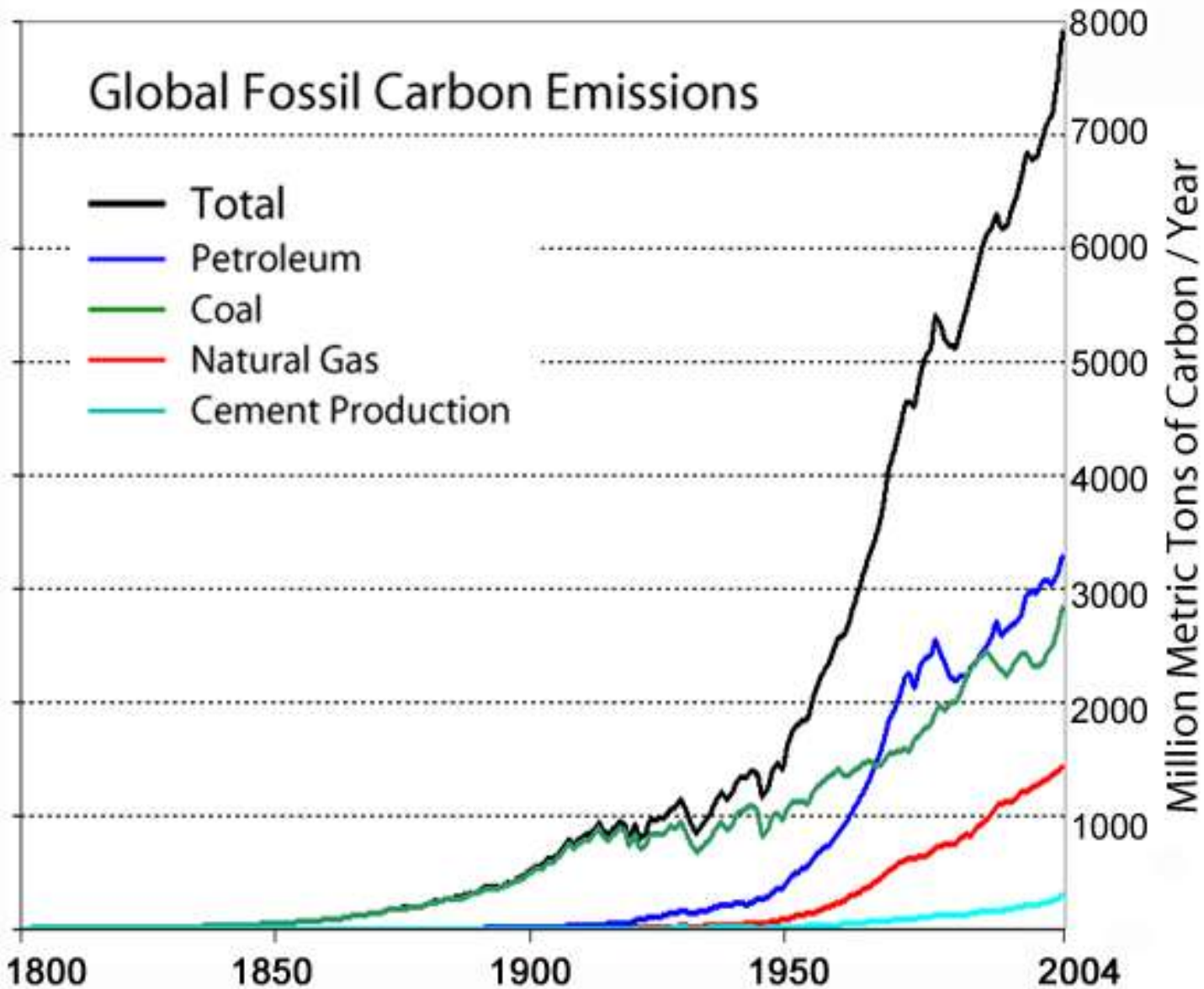
-George Kling

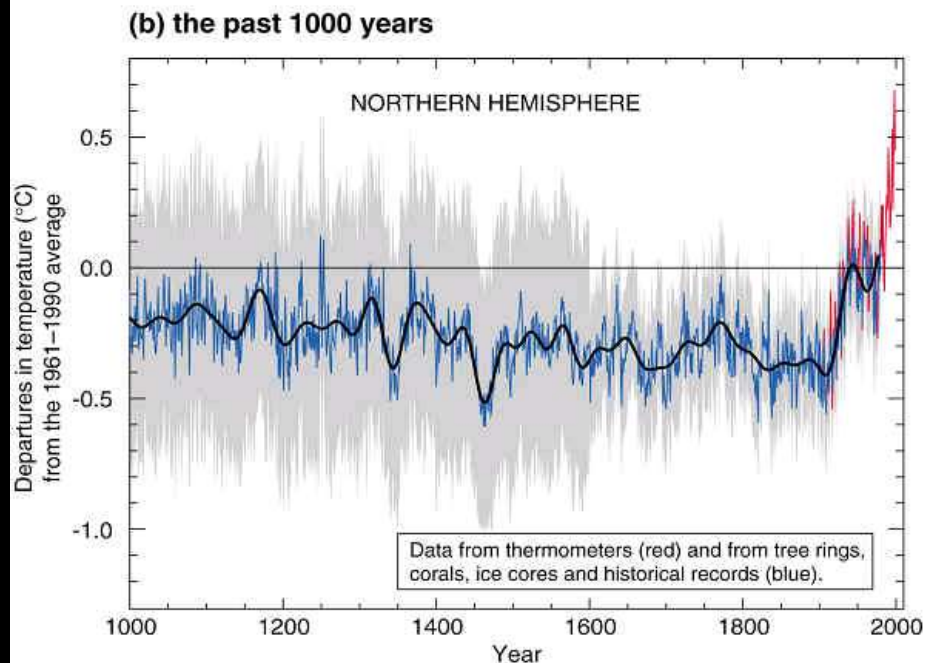
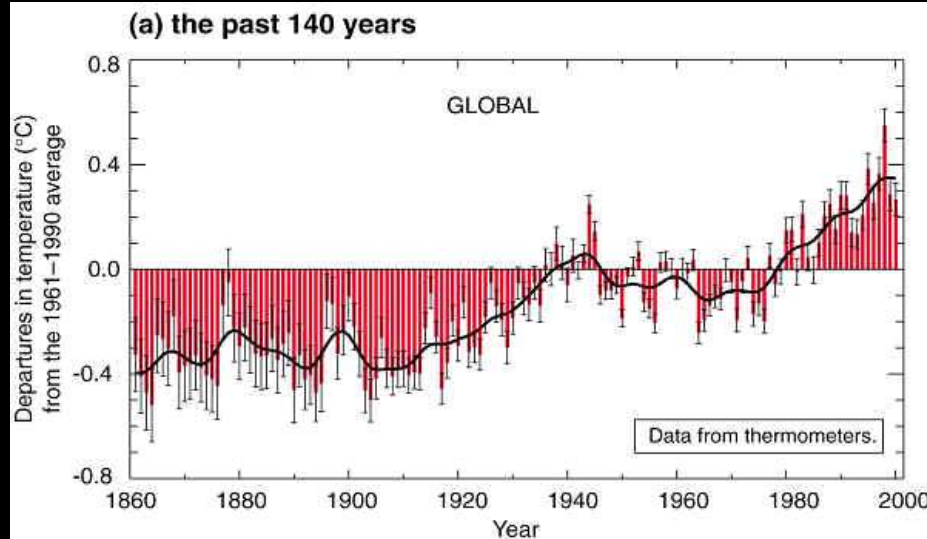


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# Global Fossil Carbon Emissions

- Total
- Petroleum
- Coal
- Natural Gas
- Cement Production



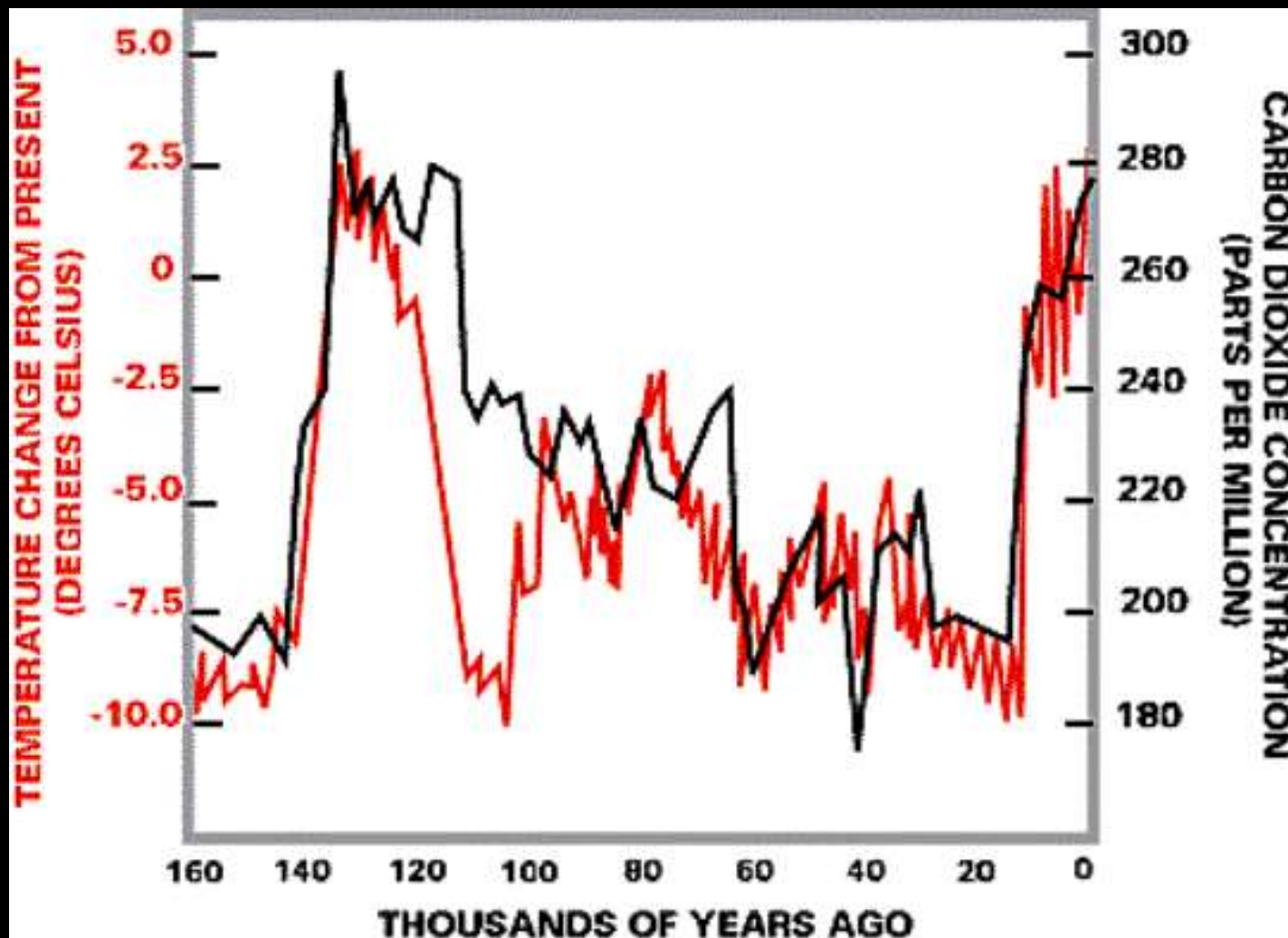


"The more people there are on the planet, the less each of us can use the atmosphere for waste disposal without contributing to further global warming."

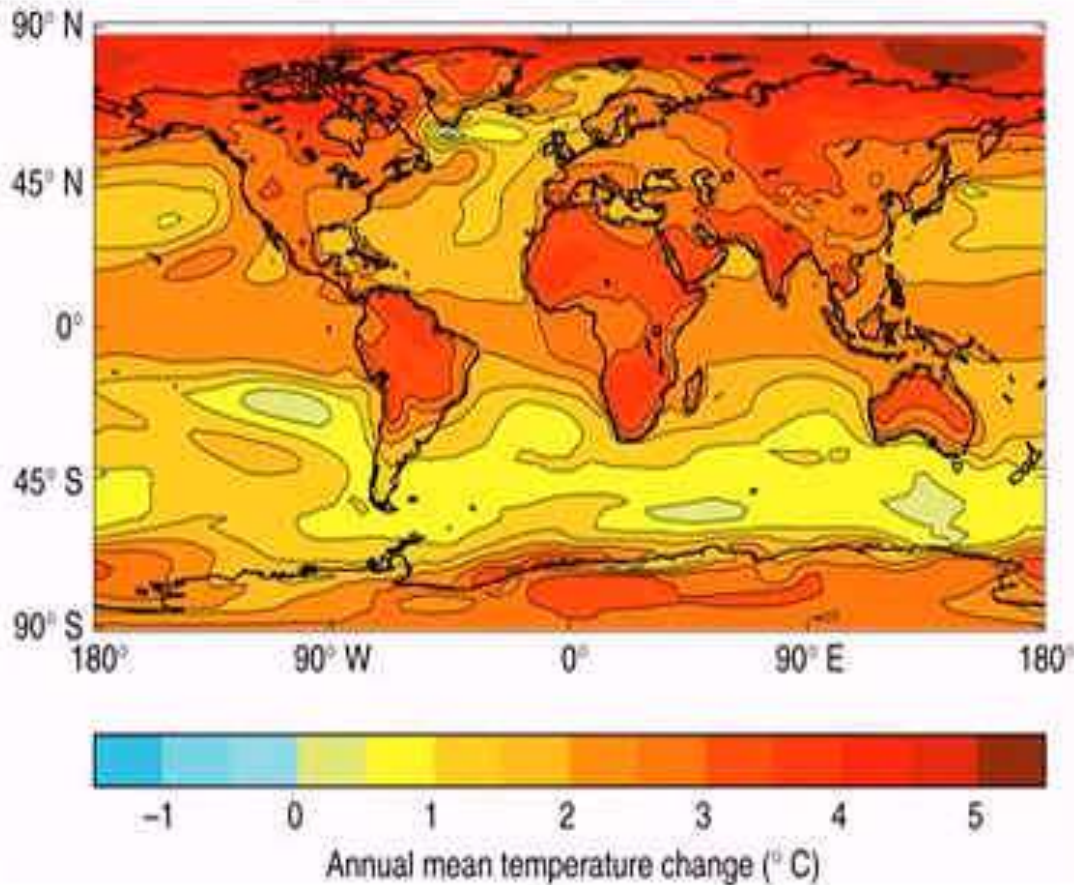
- Population Action International, 2000



**Plot showing how CO2 concentrations (estimated from measurements of CO2 trapped in ice cores) are correlated with global temperature (estimated from indicators such as isotopes in organic matter of ocean sediments) over the last 160,000 at least.**



## Projected Changes in Annual Temperatures for the 2050s



Projected change compared to the present, assuming ~1%/yr increase in equivalent CO<sub>2</sub>



# Peak Fossil Fuel Production and what it Means to You

*Humanity's way of life is on a collision course with geology - with the stark fact that the Earth holds a finite supply of oil.*

(National Geographic, June 2004)



## Every second, the world consumes:

- 37,000 gallons of oil,
- 480 tons of coal, and;
- 3 trillion cubic feet of natural gas.

**Hew Crane and Ed Kinderman,**

SRI Consulting (2000). "Energy's Inevitable Game Change. SRI Consulting, Business Intelligence Program, Scan No. 2143



# Is the world running out of cheap oil?

Fifty years ago, geologist M. King Hubbert developed a method for projecting future oil production and predicted that oil production in the lower 48 states (the USA except Alaska) would peak about 1970.

Hubbert showed that oil production peaks and starts to decline when approximately half of the EUR oil has been recovered.

Hubbert's prediction proved to be remarkably accurate in [US oil production peaked 1971] .

EUR = Estimated Ultimate Recovery

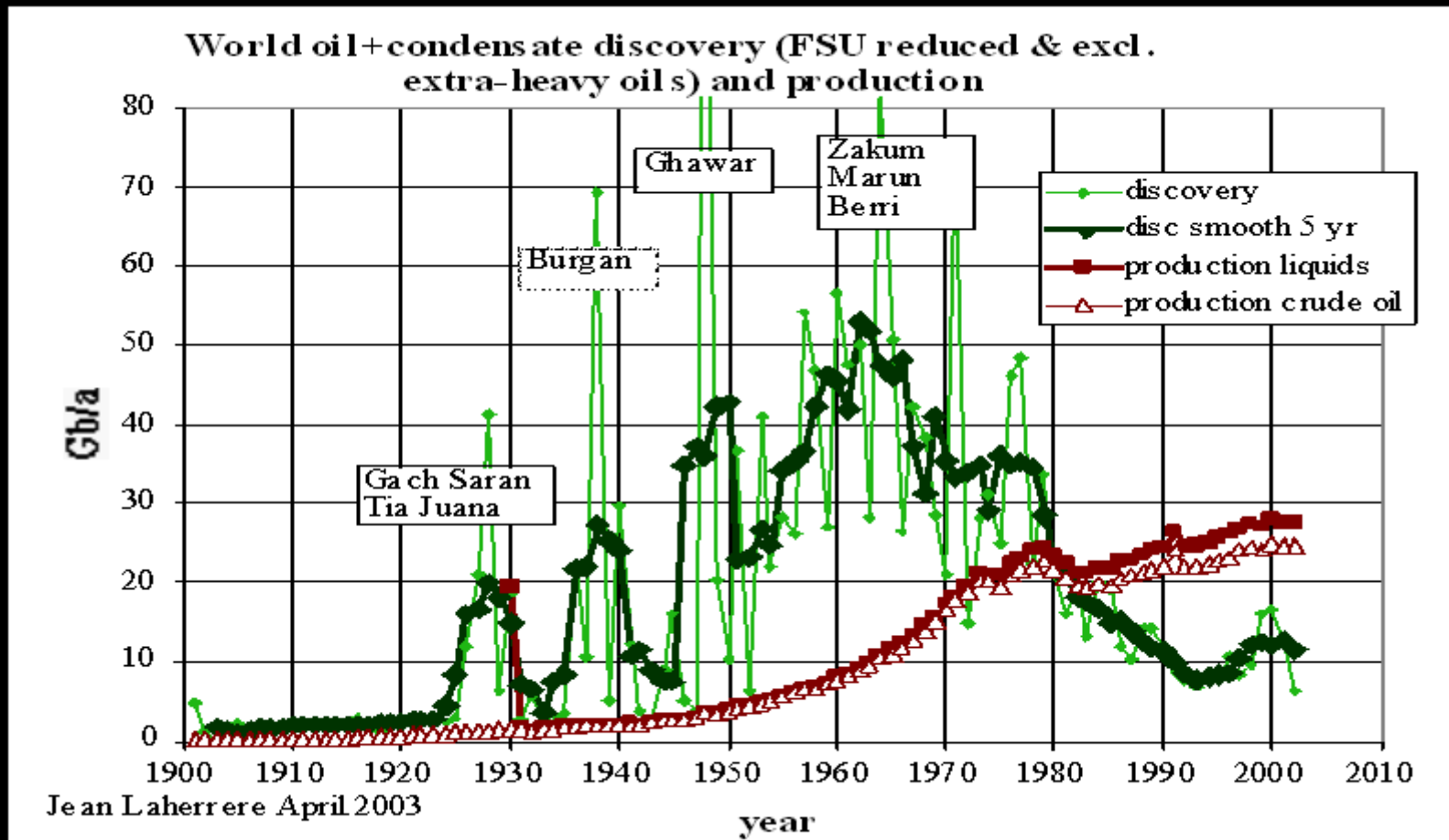


# Peak Oil Estimates

- Petroleum experts Colin Campbell, Jean Laherrere, Brian Fleay, Roger Blanchard, Richard Duncan, Walter Youngquist, and Albert Bartlett have all estimated a "peak" in "conventional oil" around 2005.
- The CEOs of Agip, ENI SpA, (Italian oil companies) and Arco have all published estimates of peak in 2005.
- The Canadian Imperial Bank of Commerce (CIBC) which relies on Petroconsultants' analysis for its energy research on Sep. 19, 2000, released a report that concluded "After rising for 140 years, world oil production is about to peak."
- Petroconsultants (now IHS Energy Group) of Geneva, the world's leading provider of data and analysis for oil exploration and production, in 1995 published a report for oil industry insiders titled WORLD OIL SUPPLY 1930-2050 which concluded that world oil production could peak as soon as the year 2000 and decline to half that level by 2025.
- The IEA (International Energy Agency) prepared a paper for the G8 Energy Ministers' Meeting in Moscow March 31, 1998 adopted the Laherrere and Campbell's view, and forecast a peak in conventional oil for 2012 at 78.9 Mb/d and a decrease in 2020 at 72.2 Mb/d.
- Harry L. Longwell, executive Vice-President of Exxon-Mobil noted "The catch is that while demand increases, existing production declines....we expect that by 2010 about half the daily volume needed to meet projected demand is not on production today." (2002)



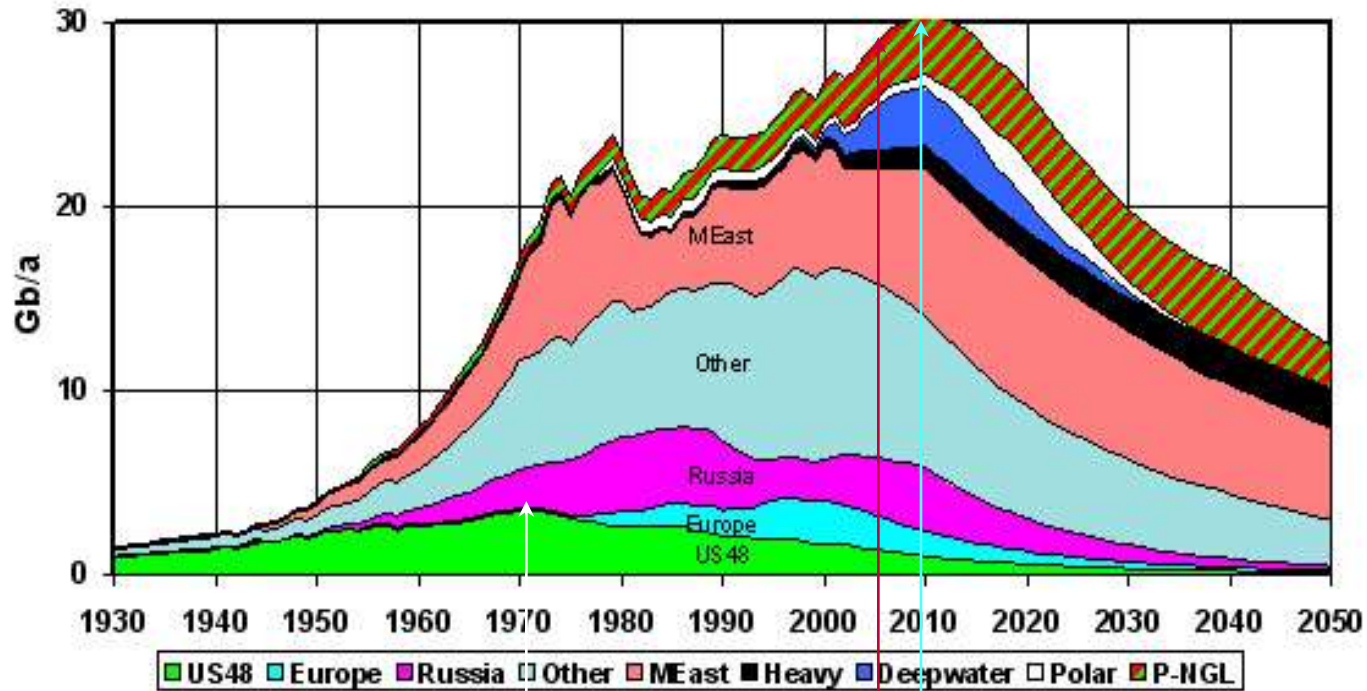
# Global Conventional Crude and Condensate Discovery/Production Shows the Same Trend



Conventional petroleum discovery peaked in early 1960s and extraction will likely peak by 2005; up to half of conventional reserves has already been consumed.



## Regular Oil & Natural Gas Liquids 2003 Base Case Scenario



- US oil production peaked in 1971
- Canadian conventional oil production peaked in 1973

2005: Peak date in conventional oil and gas production (ASPO)

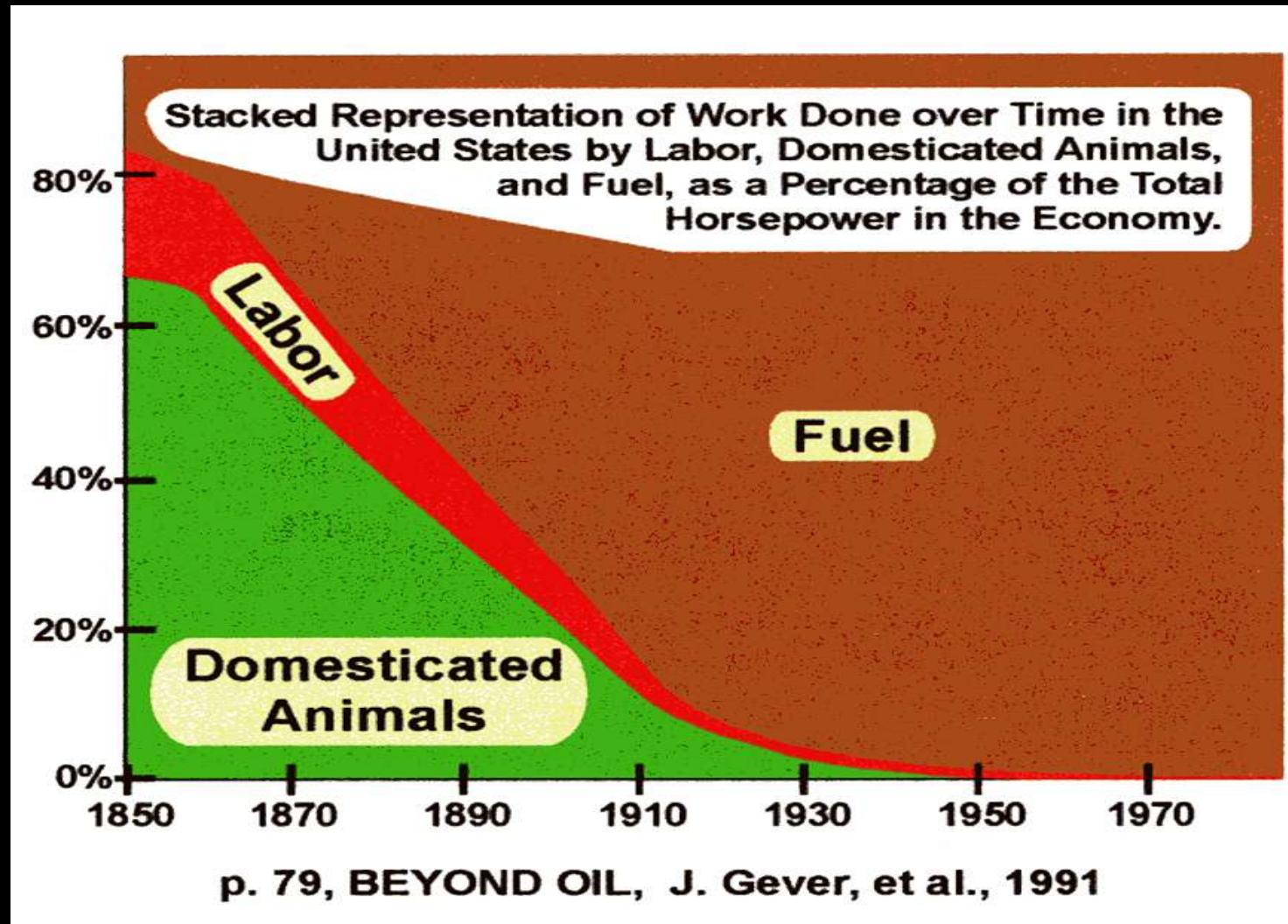
**2010: Peak date for all oil and gas, including oilsands**

Source: **The Peak and Decline of World Oil and Gas Production**  
By K. Aleklett and C.J. Campbell (Uppsala University, Sweden)



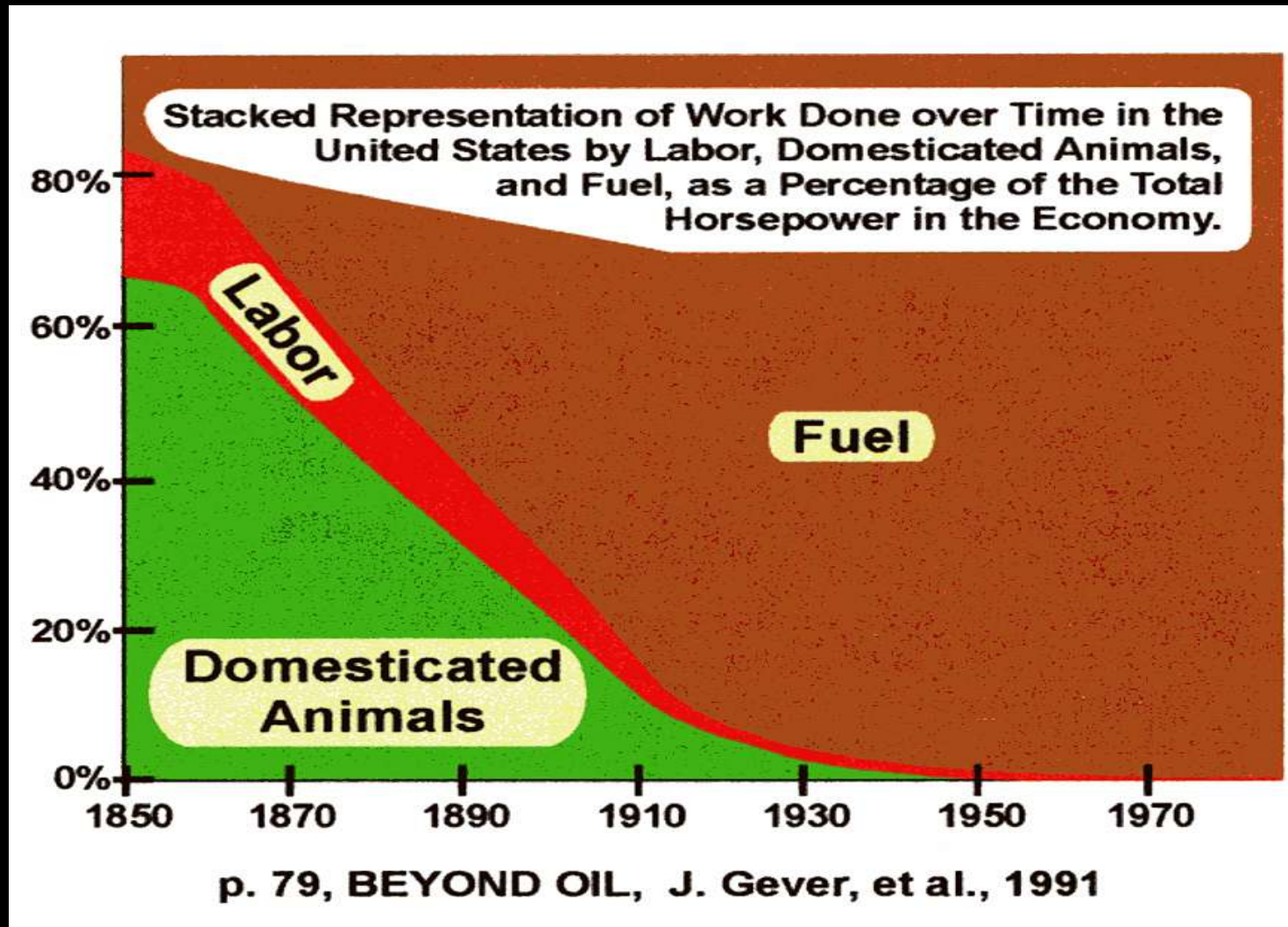
# The Fossil Fuel Connection

Agriculture production is 90% oil dependent.



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bio-diesel co-op

Was the Green Revolution just part of the Black One?

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# Finding Solutions – The need for Green Local Alternatives

“The pattern of the past – use up the natural resources and move on to new land – is no longer an adequate solution. The time has arrived when all peoples must take stock of their resources and plan their future accordingly”

- Carter and Dale, 1974



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*“History may not repeat itself,  
but it does rhyme.....”*

- Mark Twain



# Finding Solutions – The need for Green Local Alternatives

*“We cannot solve our problems with the  
same thinking we used when we created  
them”*

**- Albert Einstein**



# The Same Thinking

**“Energy consumption inertia driven by large-scale use and growth plans and unwillingness to shift away from the status quo are significant barriers.”**

Hew Crane & Ed Kinderman

Source: SRI Consulting (2000). “Energy’s Inevitable Game Change. SRI Consulting, Business Intelligence Program, Scan No. 2143



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# Different Thinking:

- Reduce and Simplify
- Diversified Energy Production
- Local (Supplied at Source)
- Small/Community vs Mega Scale



# Alternatives to Fossil Fuels

- Biomass
  - Ethanol
  - Bio-Diesel
  - Straight Vegetable Oil (SVO)
  - Wood and other organic waste
- Geothermal
- *Hydricity* (Fuel Cells)
- Hydro
- Nuclear
- Solar
- Tidal
- Wind



# Alternative Vehicles & Transportation

- Hybrids (Toyota Prius, Honda Civic, GM truck)...transitional
- VW TDI...highway vehicles; cleaner and more efficient diesels by 2005.
- Natural gas powered... too valuable and increasingly scarce to use.
- Electrics... declining use except in gated/retirement communities.
- Biodiesel engines... many options.
- Hypercar (Amory Lovins)...the ultimate direct-hydrogen fuel cell, ultra-lite vehicle
- Fuel cell vehicles... \$1 million! 20-25 years out.
- The “VegiVagen” (Joey Hundert) (burns SVO: Straight Vegetable Oil)
- Increasing public transit (Lawrence Schmidt, Alberta Transportation)



**Which of these diverse solutions  
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**BIODIESEL!**



# BIODIESEL?



# Why Bio-Diesel?



# Why Bio-Diesel?

- Safe, non-toxic, biodegradable, renewable **fuel that can be used now** in unmodified diesel engines and other fuel applications.



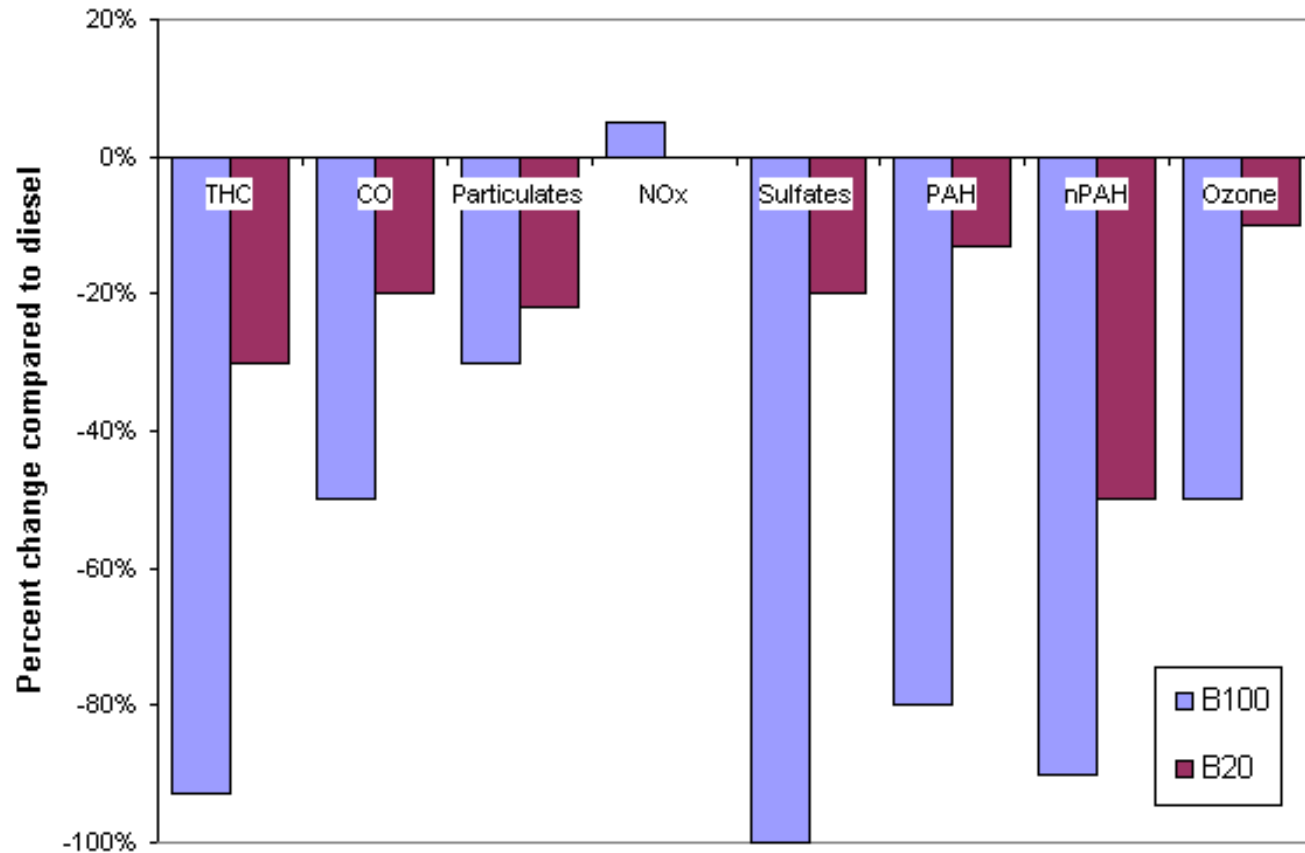
# Why Bio-Diesel?

- 40-70% reduction in GHG emissions
- Reduction in air pollution, particularly in comparison with lead-based diesel
- Classification as non-toxic
- Biodegradable (blending biodiesel with petroleum diesel accelerates the rate at which the latter biodegrades)
- The use of biodiesel/petroleum blends make petroleum diesel burn better
- Sulphur-free
- Use in heavy machinery for agriculture and construction can have major environmental benefits as these are important sources of GHG emissions and pollution

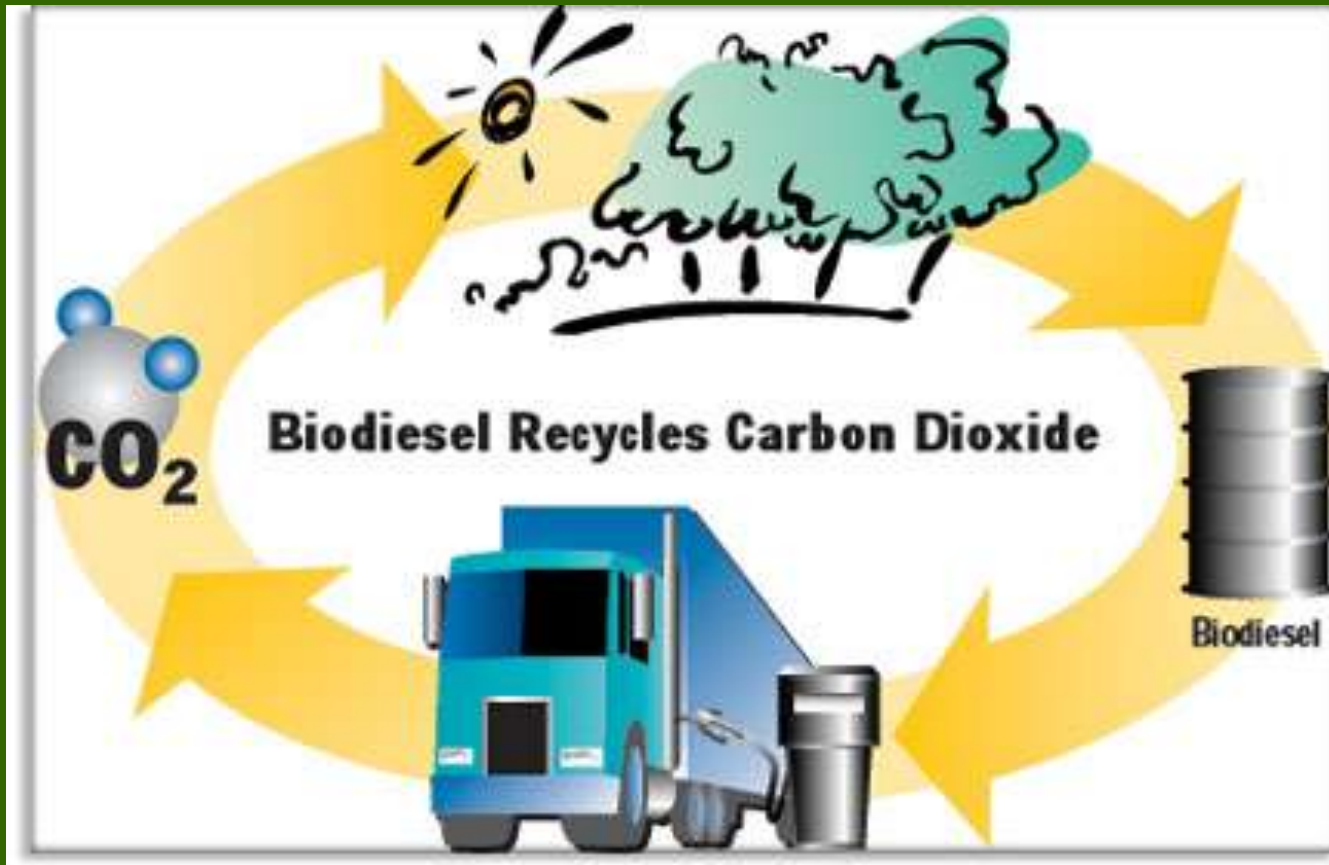
**(National Resources Canada, 2004; I-SIS, 2006; National Biodiesel Board; Worldwatch Institute, 2006)**



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- Diverse variety of feedstocks can be used to produce bio-diesel, including **locally available waste vegetable oil (WVO) recycled from restaurants and other local sources.**



# The Cowichan Bio-Diesel Co-op

*“The use of vegetable oils for engine fuels may seem insignificant today. But such oils may become in course of time as important as petroleum of the present time”*

- Rudolf Diesel, 1912



# The Cowichan Bio-Diesel Co-op

The Cowichan Bio-Diesel Coop (CB-DC) is a community based, owned and operated organization dedicated to the local production, use, and promotion of bio-diesel as a means of achieving a more ethical, environmentally-sustainable, local economy.



# The Cowichan Bio-Diesel Co-op

## PURPOSE:

To sustainably produce, use, and promote bio-diesel.



# The Cowichan Bio-Diesel Co-op

HOW?



# The Cowichan Bio-Diesel Co-op

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6. Share information about community-based bio-diesel.



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# The Cowichan Bio-Diesel Co-op

Business Concept: To recycle WVO from local restaurants and process it into bio-diesel and SVO which can be sold to Co-op members as a diesel fuel substitute. Markets for the glycerine bi-product will also be explored.

Feedstock Collection: The Co-op sets up regular collection periods for local restaurants and other kitchen facilities and provides them with collection containers and/or recycles existing containers. The collection service is provided at no charge.



# Different Thinking:



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# Different Thinking:

- Reduce and Simplify



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# *ENERGY SECURITY*



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# The Cowichan Bio-Diesel Co-op

## Current Status:

Positive business plan and feasibility study completed in 2007 with:

- **UBC Bio-Diesel Project and the Environmental Youth Alliance**
- **Co-op Development Initiative (Federal Funding Grant)**
- **BC Co-op Association**
- **Our Community and Local Businesses**



# The Cowichan Bio-Diesel Co-op

- Currently supplies bio-diesel and SVO to over 120 members



# The Cowichan Bio-Diesel Co-op

- Currently supplies bio-diesel and SVO to over 120 members
- CO2 emissions in the Cowichan Valley reduced by over 150 tonnes and counting!



# The Cowichan Bio-Diesel Co-op

## Future Goal:

Pursuing a proposal to build a community-scale WVO recycling and bio-fuels processing facility with support from:

- **Vancouver Island University (formerly Malaspina)**
- **Cowichan Valley Regional District (CVRD)**
- **Environmental Youth Alliance (UBC)**
- **Our Community and Local Businesses**



# The Cowichan Bio-Diesel Co-op

- “There aren't many ways for concerned individuals to put their principles into practice, especially when it comes to our reliance on automobiles. Producing something of value from waste is one of the most empowering and positive things a person can do to immediately affect our impact on the environment. Cowichan Bio-diesel Coop is a small example of how cooperation can help communities find their own solutions to the big questions of today's complex environmental problems.”

- *Tom Shandel, Getaway Films*



# Conclusions

What can you do to help?

*“Become the change you seek in the world.”*

- Mahatma Gandhi



# Many thanks to:

- **Our Volunteers and Members who make the Co-op worthwhile**
- **Our Community and Local Businesses who support us**
- **Karun Koernig & Grace Myong**  
UBC Bio-Diesel Project and the Environmental Youth Alliance
- **Co-op Development Initiative (Federal Funding Grant)**
- **BC Co-op Association**
- **CVRD and Staff**
- **Vancouver Island University**
- **Mark Anielski, Anielski Management Inc**

Adjunct Professor, Corporate Social Responsibility - School of Business, University of Alberta  
Adjunct Professor, Sustainability Economics - Bainbridge Graduate Institute (Washington)



# Cowichan Bio-Diesel Co-op

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