



BC Ministry of Energy, Mines and Petroleum Resources

Bioenergy in BC: Moving Forward

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April 3, 2007



Pine Beetle Infestation

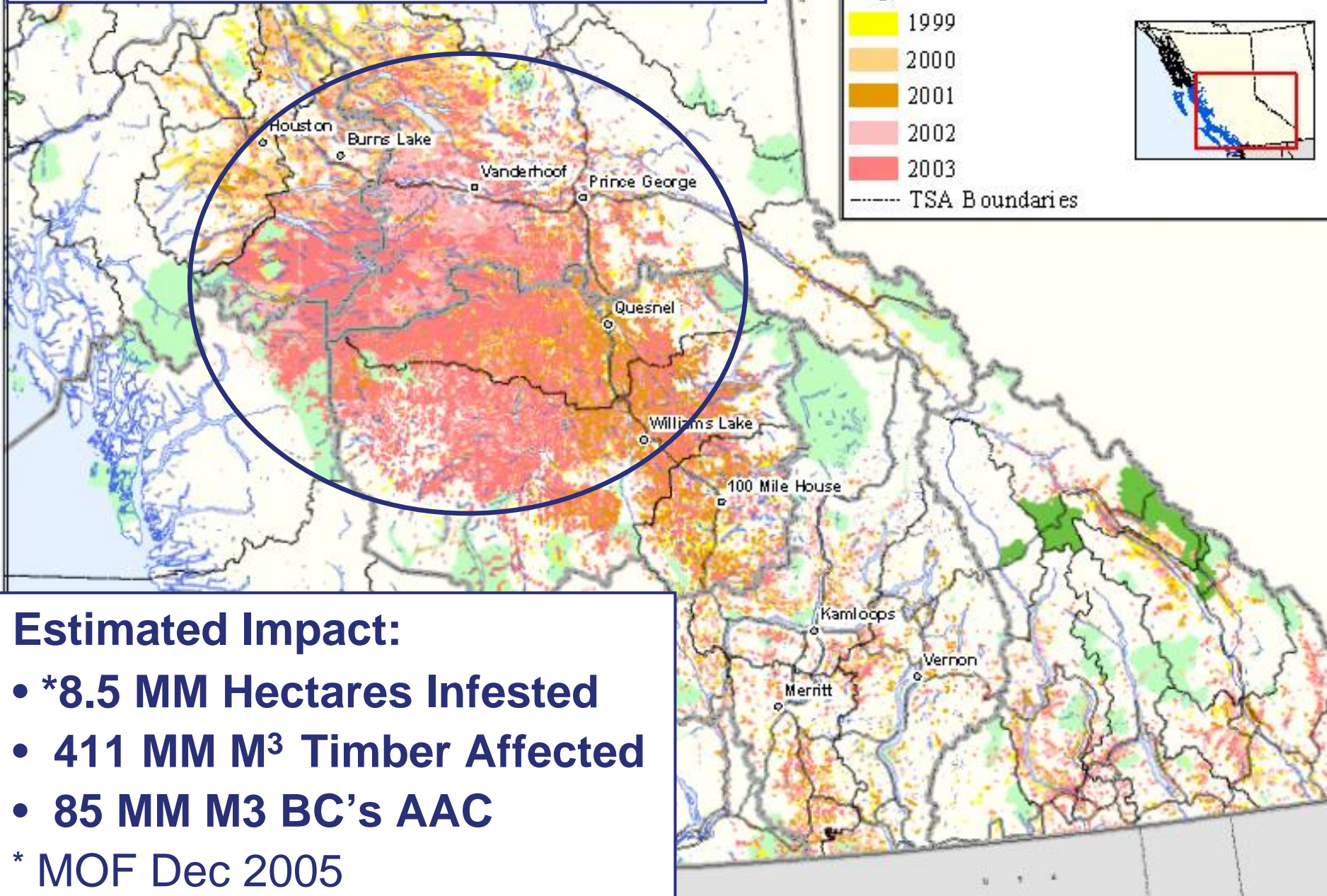


Mountain Pine Beetle
(Years 1999-2003)



Legend

- 1999
- 2000
- 2001
- 2002
- 2003
- TSA Boundaries

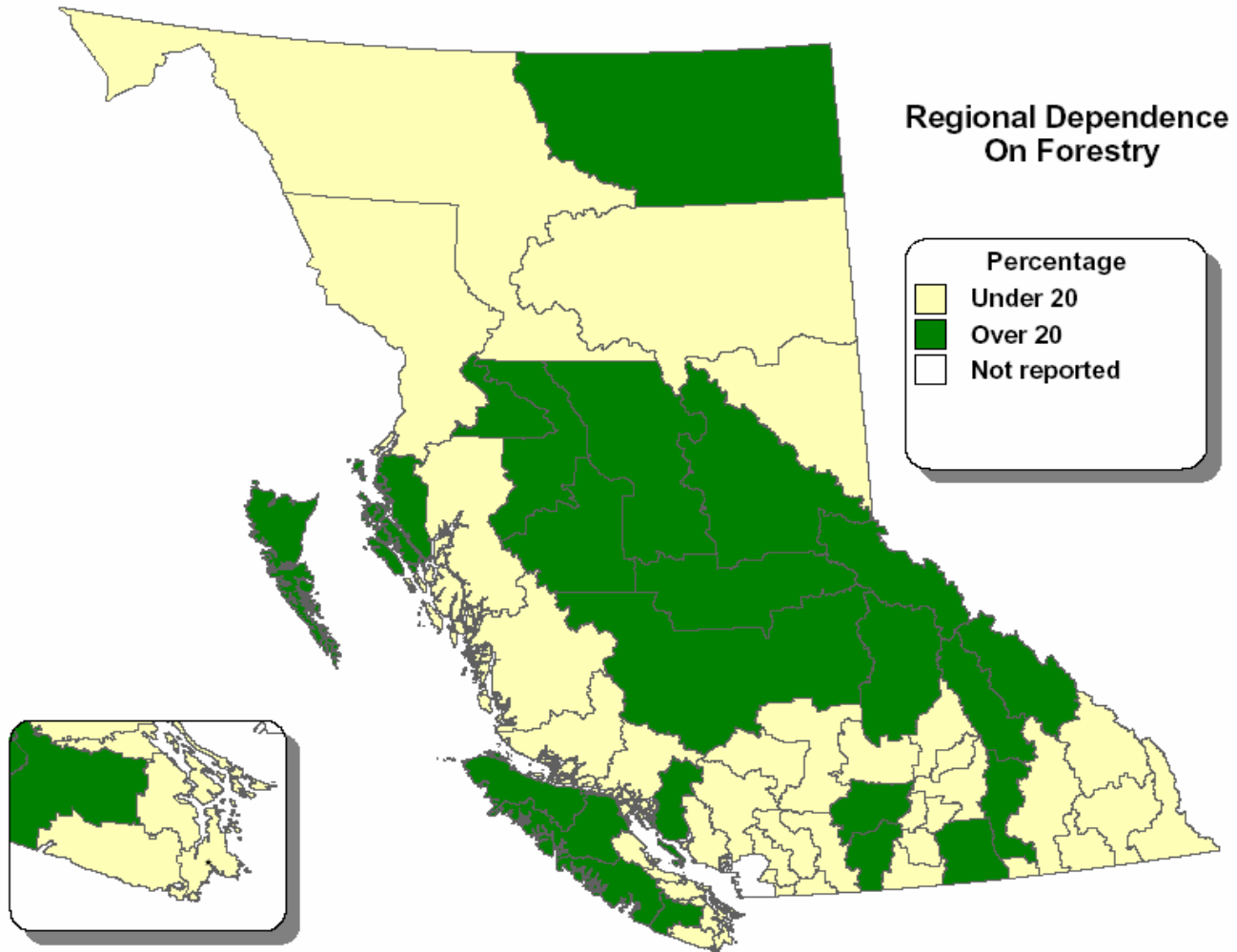


Estimated Impact:

- ***8.5 MM Hectares Infested**
- **411 MM M³ Timber Affected**
- **85 MM M³ BC's AAC**

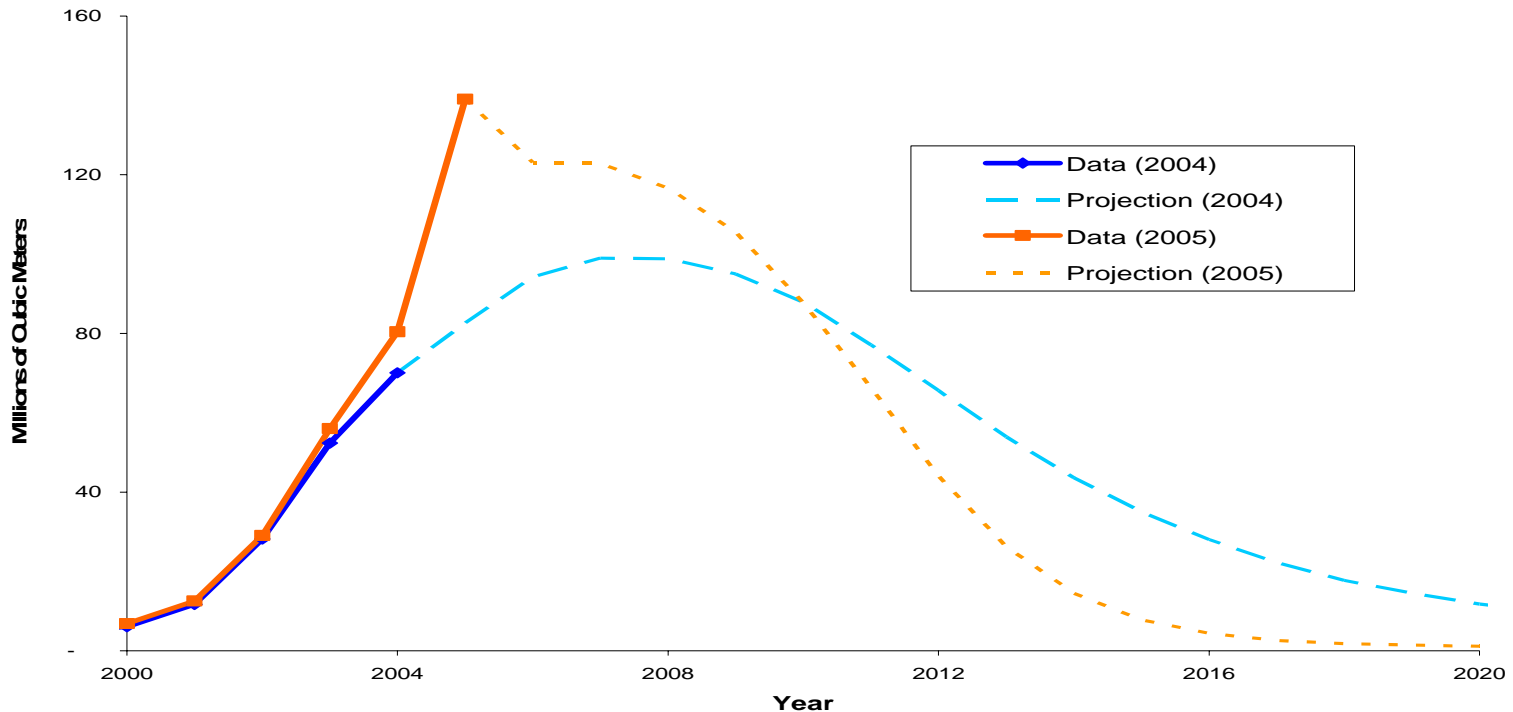
* MOF Dec 2005

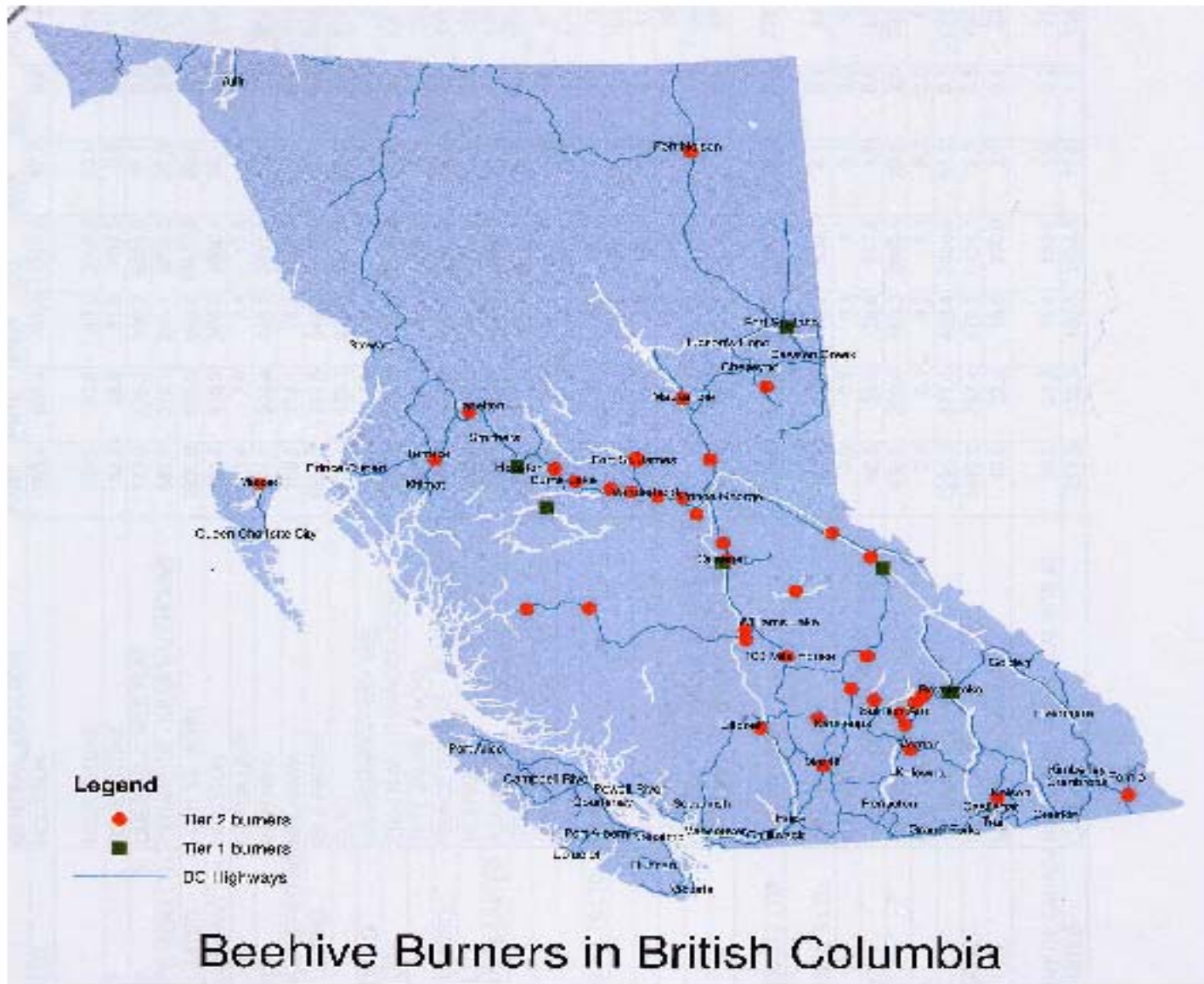
Economic Dependence



Opportunity from Crisis

The Mountain Pine Beetle (MPB) emergency requires cross-government, industry and community response strategies. Most of the Interior pine will be dead within about 10 years.







A New Approach is Necessary

- The forest sector needs refurbishing as an essential base, and new initiatives are needed with new players and different business models, and even different metrics
- Is a tree a number of cubic metres (m³) or potential Giga Joules (GJ) of natural gas energy or Megawatt Hours (MWh) of electricity?
- Agriculture is also looking for new opportunities and new markets



Energy Demand

- **BC's strong economic growth (averaging 3% increase per year) and growing population creates growing demand for energy**
- **Estimates indicate electricity requirements will increase between 25 and 45% over the next 20 years**

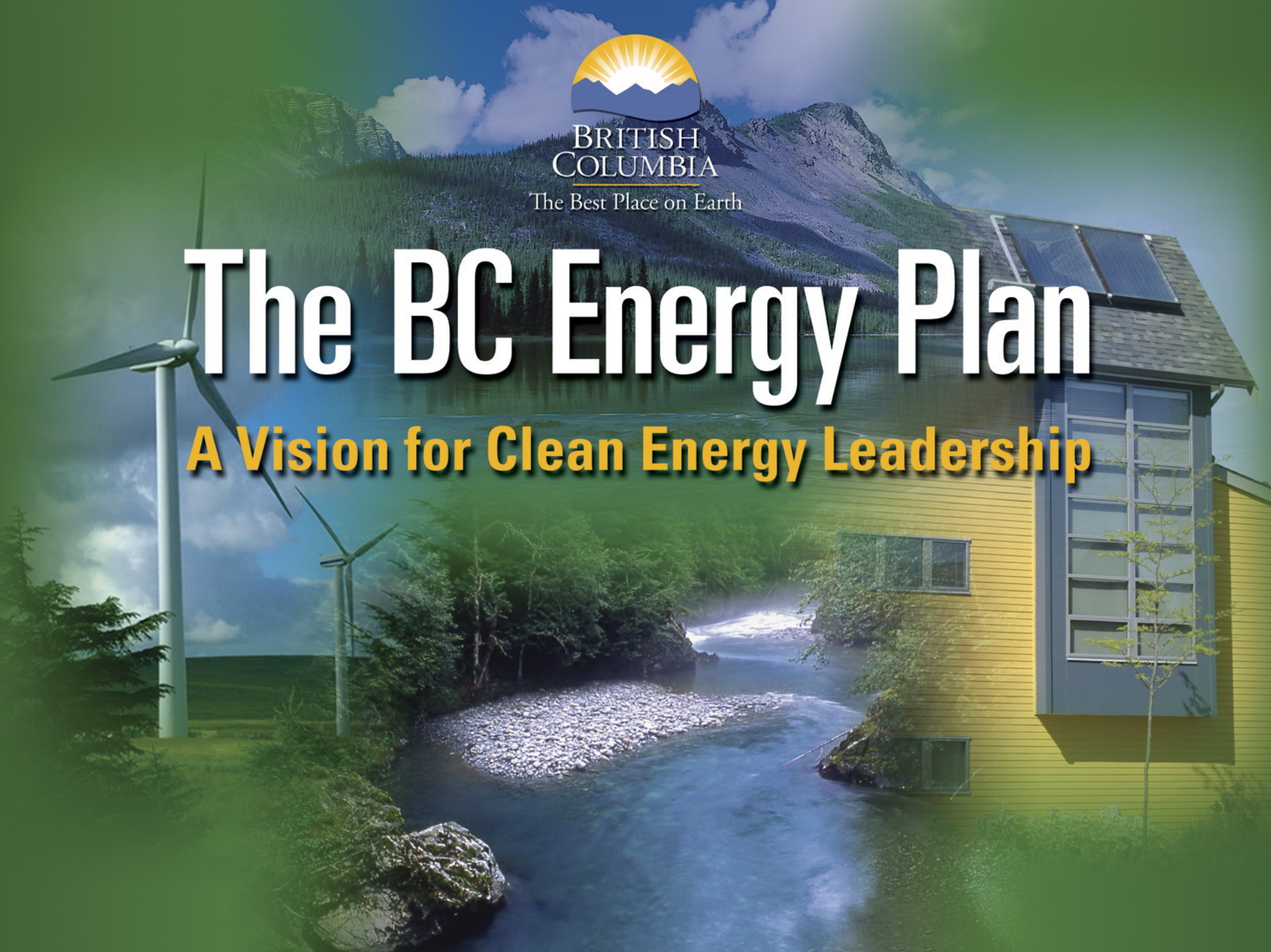


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The Best Place on Earth

The BC Energy Plan

A Vision for Clean Energy Leadership



Energy Conservation and Efficiency

Strong Commitment to Conservation:

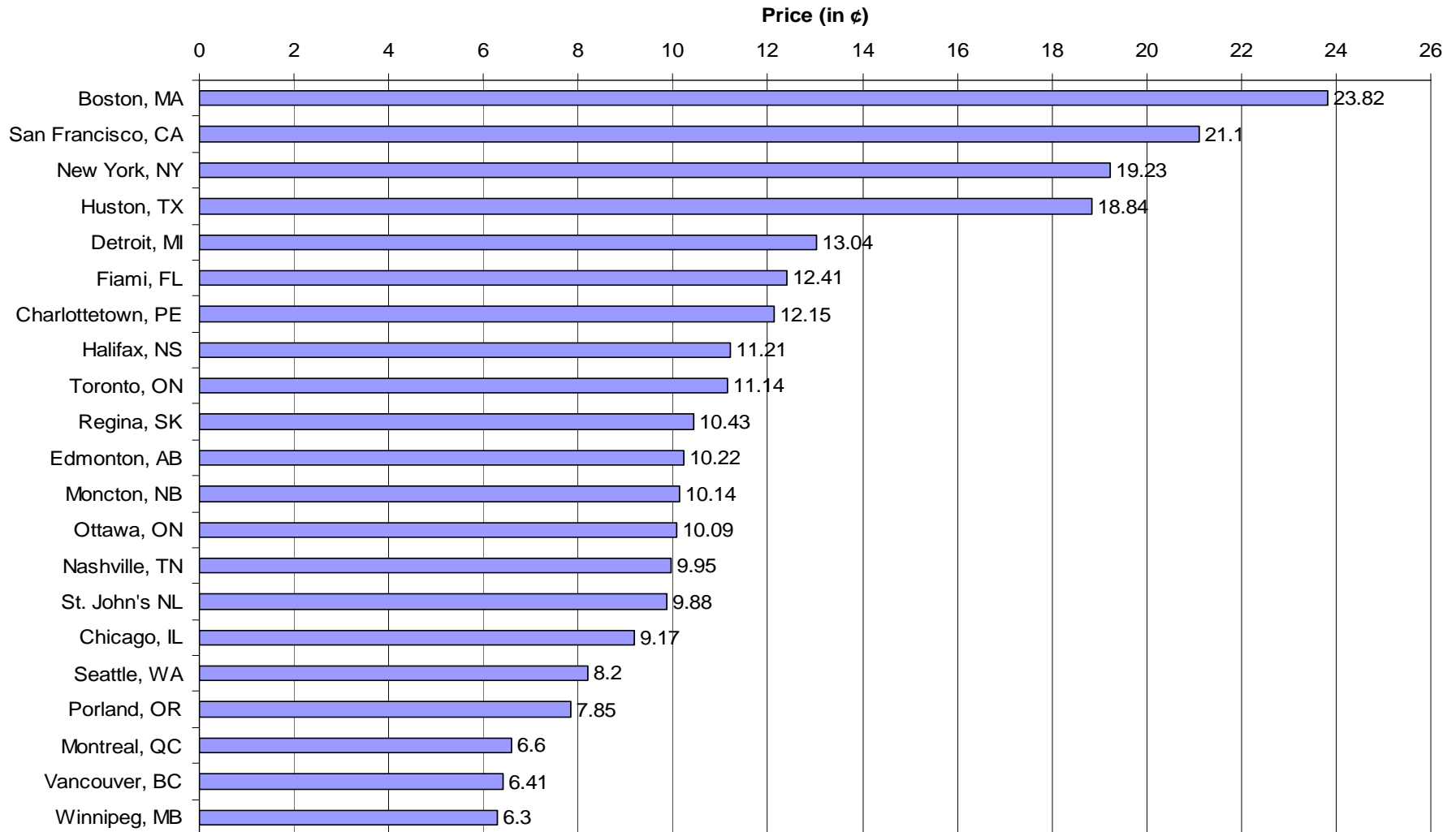
- 50 per cent of BC Hydro's incremental resource needs met by conservation by 2020
- New energy efficiency standards for all new buildings by 2010
- Construct provincial buildings with the highest standards
Make the BC Government Carbon Neutral by 2010
- Increase participation in the Community Action on Energy Efficiency program and expand the First Nations and Remote Community Clean Energy program
- Develop an Industrial Energy Efficiency Program

Electricity – Self-Sufficiency

- BC will be electricity self-sufficient by 2016
- Maintain public ownership of BC Hydro and the heritage assets
- Small power standing offer

Maintain our Electricity Competitive Advantage

Average Residential Electricity Price



Electricity – BC's Leadership in Clean Energy

- All new electricity will have zero net GHG emissions
- By 2016, existing thermal generating power plants will achieve zero net GHG emissions
- Zero greenhouse gas emissions from any coal thermal electricity facilities
- No nuclear power
- Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation

Alternative Energy

- \$25 million Innovative Clean Energy Fund.
- Invest \$89 million in the world's first fleet of 20 hydrogen fuel cell buses and refueling infrastructure.
- Implement a 5 per cent renewable fuel standard.
- Implement a Bioenergy Strategy
- BC Hydro will issue a call for proposals for electricity from wood biomass.
 - RFEOI deadline is April 17, 2007
 - info session April 3, 2007 in Prince George hosted jointly by BC Hydro, MEMPR and MOFR
 - For more information and to register for the information session, please visit: www.bchydro.com/2007bioenergy



BC's Bioenergy Strategy

- **Developed in collaboration with MFOR and BC Hydro, and in consultation with the forest industry, the energy sector, communities and academia to advance bioenergy in BC**
- **Slated for release soon**



Bioenergy Strategy Vision, Goals and Objectives

- **Leadership in bioenergy and biorefining**
- **Competitive, diversified forestry and agriculture**
 - **Bioenergy as another line of business**
 - **Creative solutions to biomass residue management**
- **Strengthen and diversify regions and communities**
- **Generate more “home-grown” energy & create jobs**
- **Develop remote and First Nations project potential**
- **Collaborate with other jurisdictions**



Bioenergy Benefits for BC

- ✓ **Reduced energy costs and a potential new source of income for BC's forest industry**
- ✓ **The creation of approximately 1,500 well paying jobs in the BC Interior replacing projected job losses in the sawmilling sector**
- ✓ **Significant improvement in air quality resulting from the closure of beehive type incinerators**
- ✓ **GHG reduction when wood residue is substituted for natural gas**
- ✓ **Reduction in the threat of forest fires**
- ✓ **Innovative, value-added solutions for agriculture residue management (e.g. Fraser Valley) and opportunities for dedicated energy crops**



BC Biomass Energy Today

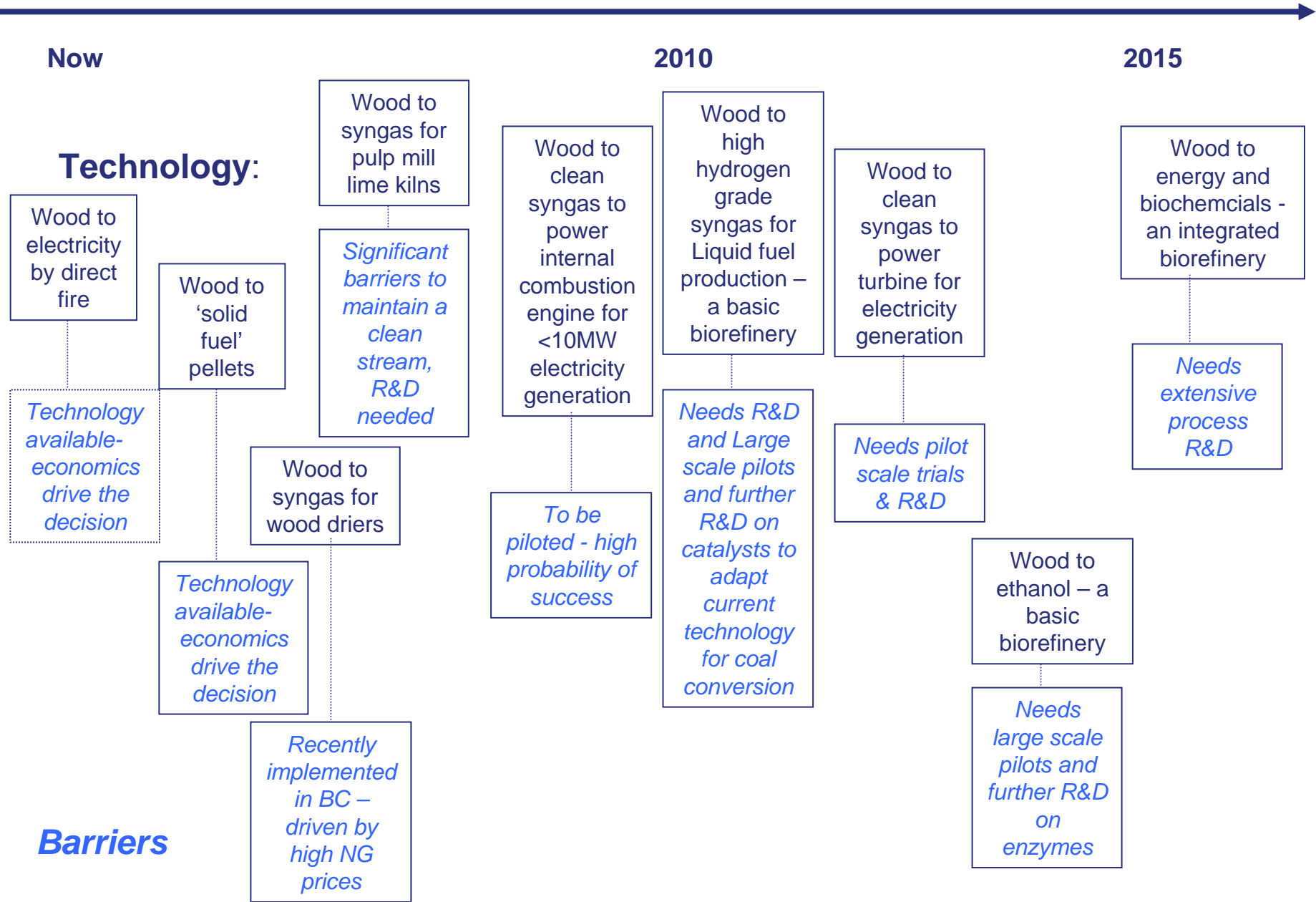
- **Wood Pellets – a burgeoning BC industry**
- **Forestry sector self-generates 4000 GWh wood-fired electricity; 1300 GWh on contract to BC Hydro**
- **Nexterra/Tolko biomass gasification pilot project**
- **AgriGreen Biodiesel production in Fernie**
- **Lignol Innovations' Cellulosic ethanol project at UBC**
- **MSW/landfill gas-to-energy: Hartland, SEEGen**
- **BC companies in other jurisdictions (e.g. DynaMotive)**



Biomass Energy R&D/Initiatives

- **UBC Dept. of Wood Sciences**
- **UBC Dept. of Chemical Engineering**
- **UNBC**
- **Ethanol BC**
- **Bioproducts BC**
- **BIOCAP**
- **Links to other jurisdictions**

Estimated timeline for commercial implementation of bioenergy technologies





Bioenergy Opportunities

- Electricity Generation/Cogen
- Wood Pellets
- Gasification
- Liquid fuels (ethanol, bio-oil, etc.)
- District Energy (e.g. Revelstoke, Prince George, Quesnel, Docksider Green, etc.)
- Hydrogen production
- Biorefining



Related/Supportive Activities/Policies

- **MPB Action Plan**
- **Value-Added Agriculture**
- **Community Energy Planning**
- **Climate Change Plan**
- **Vancouver 2010 Winter Olympics**
- **Federal and International environmental and energy imperatives**



Conclusion

- **BC has proven capabilities in bioenergy**
- **BC has enormous bioenergy resources and significant bioenergy opportunities**
- **BC is working to advance bioenergy development**

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