



Ministry of Energy, Mines and Petroleum Resources

Bioenergy: A British Columbia Opportunity

*Presentation to IEA Bioenergy Workshop
August 28, 2006*

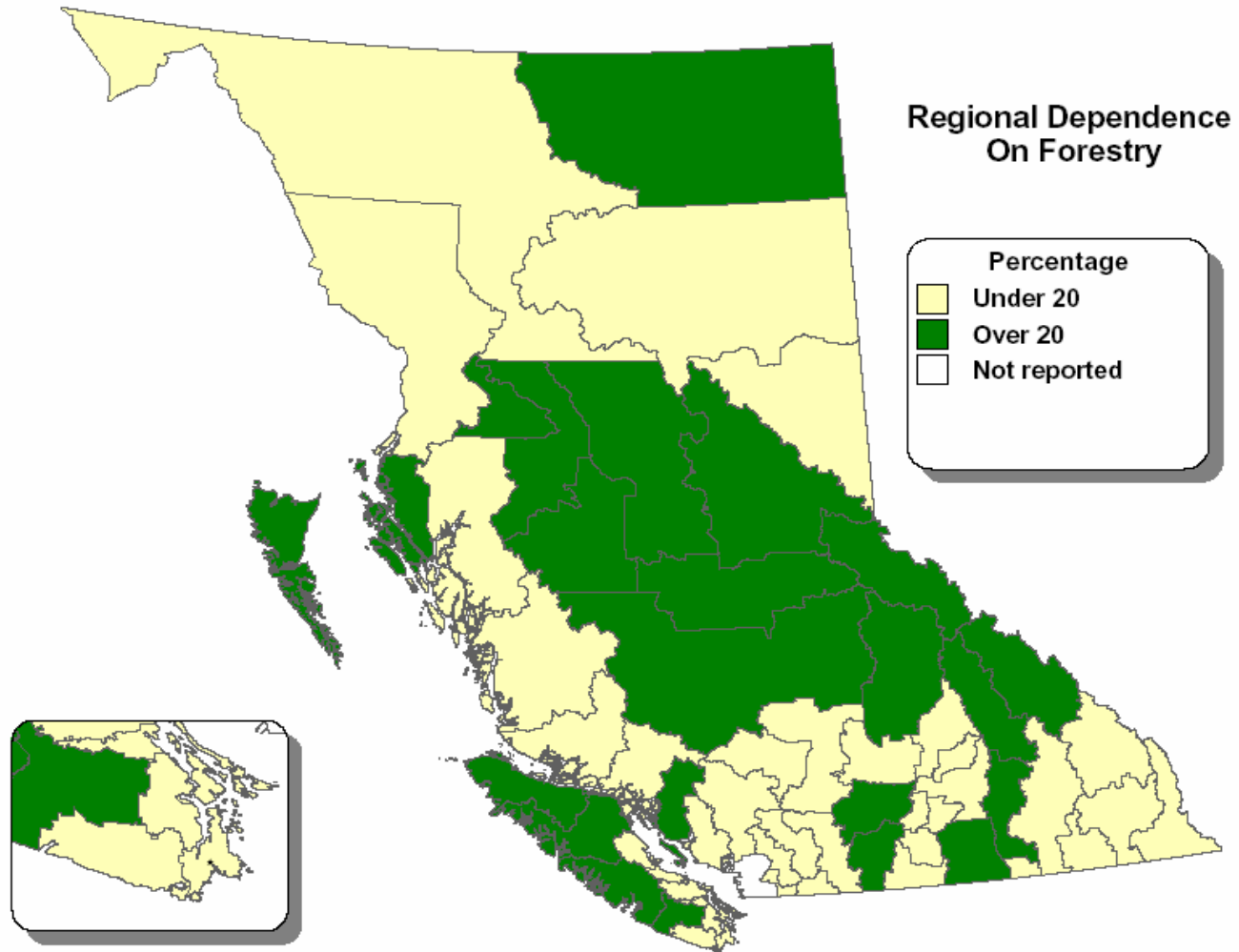




Forestry in BC

- Sales in 2005 of \$17.7 billion, 41% of BC manufacturing shipments
- Exports in 2005 of \$14.1 billion, 41% of total exports
- Direct employment of 80,000 persons in 2005
- With indirect and induced effects, forestry accounts for 150,000 jobs.
- Stumpage revenue of \$1.16 billion in 2005/06 and \$1.07 billion in 2006/07

Economic Dependence





BC's Energy Resources

- **Abundant conventional energy resources (coal, oil, natural gas)**
- **Abundant alternative energy resources – one of the few jurisdictions in the world with the full range of renewable energy resources**
 - huge biomass resources
- **A world leader in energy technology development (e.g. fuel cells, LED solar, biomass, etc.)**

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 40% over the next 20 years**



MEMPR's Mandate

- **Advocate for BC's energy sectors – both conventional and alternative**
- **Promotion of alternative energy sources like wind, hydro, solar, ocean, biomass, geothermal**
- **Advancement of innovative and leading edge energy technologies like fuel cells**
- **Optimization of energy efficiency and conservation programs**



BC's Energy Plan (2002)

4 cornerstone principles:

- Low electricity rates and public ownership of BC Hydro
- Secure, reliable supply
- More private sector opportunities
- Environmental responsibility and no nuclear power sources



Energy Plan (2002):Policy Actions

- **PowerSmart; ResourceSmart**
- **Voluntary 50% BC Clean Electricity target**
 - **BC Clean Electricity Guidelines developed**
 - **Net metering**
- **Energy performance for buildings**
 - **Updating *Energy Efficiency Act***

**All new power projects contracted by BC Hydro since 2002
have all been BC Clean**



Energy Plan Renewal

- in process; slated for release in late 2006/early 2007
- greater emphasis on energy efficiency, alternative energy, conservation and innovation



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's biomass gasification pilot project near Kamloops**
- **AgriGreen Biodiesel production in Fernie**
- **Lignol Innovations' Cellulosic ethanol project at UBC, Syntec Biofuels**
- **MSW/landfill gas-to-energy: Hartland, SEEGen**
- **BC companies in other jurisdictions (e.g. DynaMotive)**



BC's Biomass Resources

- Significant forestry residues and forest biomass
- MPB: over one-third of the merchantable pine volume in the province has already been killed (400 to 450 million cubic meters). Further, that 80% of the merchantable pine will be killed by 2013, with the bulk of that damage (75%) occurring before 2010
- Also agriculture, aquaculture and MSW biomass

Pine Beetle Infestation



Mountain Pine Beetle
(Years 1999-2003)



Legend

1999

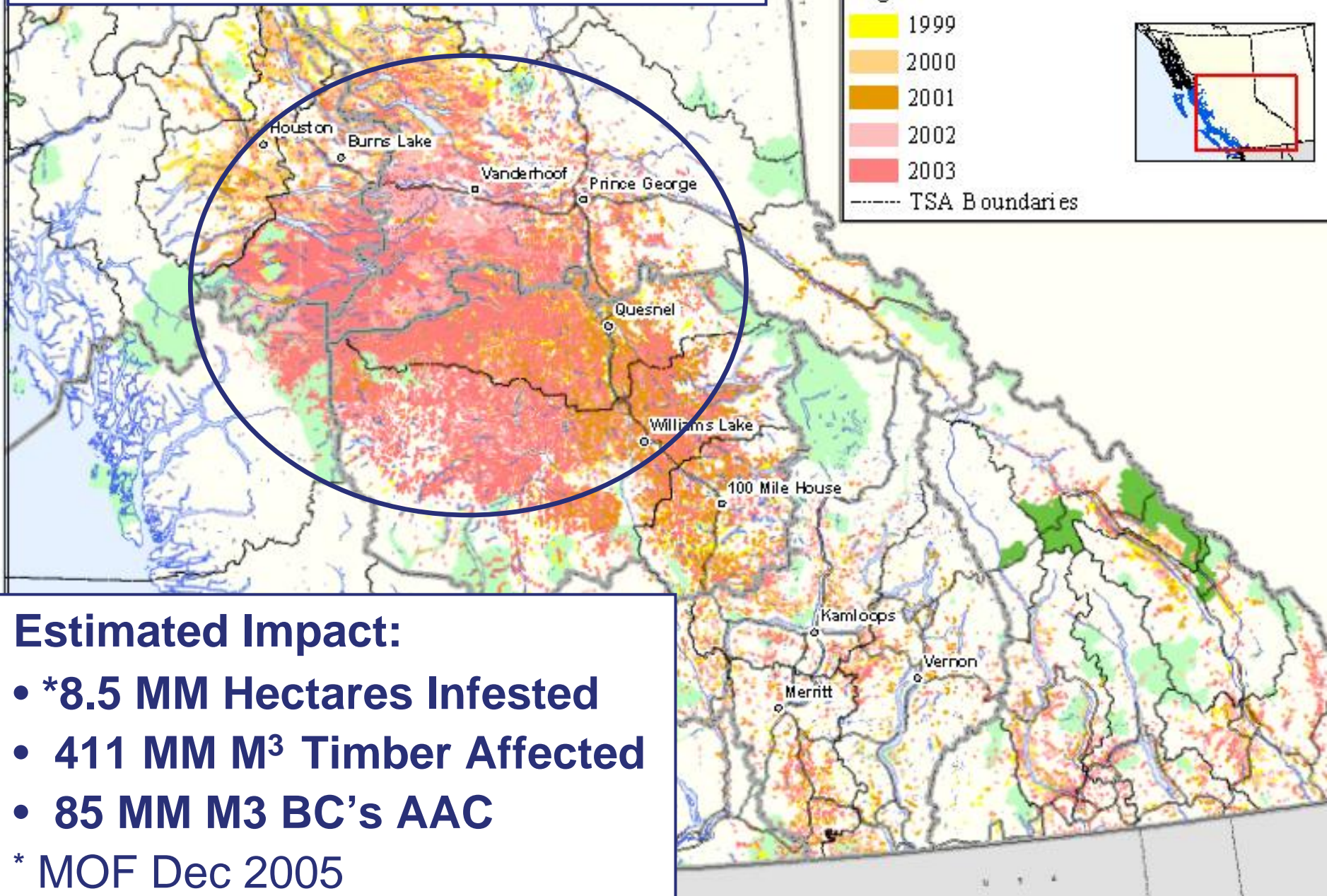
2000

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



Biomass Energy R&D/Initiatives

- **UBC Dept. of Wood Sciences**
- **UBC Dept. of Chemical Engineering**
- **Ethanol BC**
- **Bioproducts BC**
- **BC Bioenergy Strategy options (under development)**



Bioenergy Opportunities

- Electricity Generation/Cogen
- Wood Pellets
- Gasification
- Liquid fuels (ethanol, bio-oil, etc.)
- Hydrogen production
- District Energy (e.g. Revelstoke, proposal for Dockside Green, etc.)
- Biorefining



Related/Supportive Activities/Policies

- **MPB Action Plan**
- **Value-Added Agriculture**
- **Vancouver 2010 Winter Olympics**
- **Community Energy Planning**
- **Climate Change Plan**
- **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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