<table>
<thead>
<tr>
<th>Section</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages from the Premier and the Minister</td>
<td>1-2</td>
</tr>
<tr>
<td>The BC Energy Plan Highlights</td>
<td>3-4</td>
</tr>
<tr>
<td>Energy Conservation and Efficiency</td>
<td>5-8</td>
</tr>
<tr>
<td>Electricity</td>
<td>9-16</td>
</tr>
<tr>
<td>Alternative Energy</td>
<td>17-21</td>
</tr>
<tr>
<td>Electricity Choices</td>
<td>22-26</td>
</tr>
<tr>
<td>Skills, Training and Labour</td>
<td>27-28</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>29-37</td>
</tr>
<tr>
<td>Conclusion</td>
<td>38</td>
</tr>
</tbody>
</table>

**Appendix A:** The BC Energy Plan: Summary of Policy Actions
The BC Energy Plan: A Vision for Clean Energy Leadership is British Columbia's plan to make our province energy self-sufficient while taking responsibility for our natural environment and climate. The world has turned its attention to the critical issue of global warming. This plan sets ambitious targets. We will pursue them relentlessly as we build a brighter future for B.C.

The BC Energy Plan sets out a strategy for reducing our greenhouse gas emissions and commits to unprecedented investments in alternative technology based on the work that was undertaken by the Alternative Energy Task Force. Most importantly, this plan outlines the steps that all of us— including industry, environmental agencies, communities and citizens—must take to reach these goals for conservation, energy efficiency and clean energy so we can arrest the growth of greenhouse gases and reduce human impacts on the climate.

As stewards of this province, we have a responsibility to manage our natural resources in a way that ensures they both meet our needs today and the needs of our children and grandchildren. We will all have to think and act differently as we develop innovative and sustainable solutions to secure a clean and reliable energy supply for all British Columbians.

Our plan will make B.C. energy self-sufficient by 2016. To do this, we must maximize our conservation efforts. Conservation will reduce pressure on our energy supply and result in real savings for those who use less energy. Individual actions that reduce our own everyday energy consumption will make the difference between success and failure. For industry, conservation can lead to an effective, productive and significant competitive advantage. For communities, it can lead to healthier neighbourhoods and lifestyles for all of us.

We are looking at how we can use clean alternative energy sources, including bioenergy, geothermal, fuel cells, water-powered electricity, solar and wind to meet our province’s energy needs. With each of these new options comes the opportunity for new job creation in areas such as research, development, and production of innovative energy and conservation solutions. The combination of renewable alternative energy sources and conservation will allow us to pursue our potential to become a net exporter of clean, renewable energy to our Pacific neighbours.

Just as the government’s energy vision of 40 years ago led to massive benefits for our province, so will our decisions today. The BC Energy Plan will ensure a secure, reliable, and affordable energy supply for all British Columbians for years to come.

Premier Gordon Campbell
The BC Energy Plan: A Vision for Clean Energy

Leadership is a made-in-B.C. solution to the common global challenge of ensuring a secure, reliable supply of affordable energy in an environmentally responsible way. In the next decade, government will balance the opportunities and increased prosperity available from our natural resources while leading the world in sustainable environmental management.

In developing this plan, the government met with key stakeholders, environmental non-government organizations, First Nations, industry representatives and others. In all, more than 100 meetings were held with a wide range of parties to gather ideas and feedback on new policy actions and strategies now contained in The BC Energy Plan.

By building on the strong successes of Energy Plan 2002, this energy plan will provide secure, affordable energy for British Columbia today, while reaffirming our commitment to public ownership of our BC Hydro assets while broadening our supply of available energy.

Honourable Richard Neufeld
Minister of Energy, Mines and Petroleum Resources
In 2002, the Government of British Columbia launched an ambitious plan to invigorate the province's energy sector. Energy for Our Future: A Plan for BC was built around four cornerstones: low electricity rates and public ownership of BC Hydro; secure, reliable supply; more private sector opportunities; and environmental responsibility with no nuclear power sources. Today, our challenges include a growing energy demand, higher prices, climate change and the need for environmental sustainability. The BC Energy Plan: A Vision for Clean Energy Leadership builds on the successes of the government's 2002 plan and moves forward with new policies to meet the challenges and opportunities ahead.

**Environmental Leadership**

The BC Energy Plan puts British Columbia at the forefront of environmental and economic leadership by focusing on our key natural strengths and our competitive advantages of clean and renewable sources of energy. The plan further strengthens our environmental leadership through the following key policy actions:

- Zero greenhouse gas emissions from coal fired electricity generation.
- All new electricity generation projects will have zero net greenhouse gas emissions.
- Zero net greenhouse gas emissions from existing thermal generation power plants by 2016.
- Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.
- No nuclear power.
- Best coalbed gas practices in North America.
- Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.

**A Strong Commitment to Energy Conservation and Efficiency**

Conservation is integral to meeting British Columbia's future energy needs. The BC Energy Plan sets ambitious conservation targets to reduce the growth in electricity used within the province. British Columbia will:

- Set an ambitious target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020.
- Implement energy efficient building standards by 2010.

Current per household electricity consumption for BC Hydro customers is about 10,000 Kwh per year. Achieving this conservation target will see electricity use per household decline to approximately 9,000 Kwh per year by 2020.
Energy Security

The Government of British Columbia is taking action to ensure that the energy needs of British Columbians continue to be met now and into the future. As part of ensuring our energy security, The BC Energy Plan sets the following key policy actions:

- Maintain public ownership of BC Hydro and the BC Transmission Corporation.
- Maintain our competitive electricity rate advantage.
- Make small power part of the solution through a set purchase price for electricity generated from projects up to 10 megawatts.
- Explore value-added opportunities in the oil and gas industry by examining the viability of a new petroleum refinery and petrochemical industry.
- Be among the most competitive oil and gas jurisdictions in North America.
- BC Hydro and the Province will enter into initial discussions with First Nations, the Province of Alberta and communities to discuss Site C to ensure that communications regarding the potential project and the processes being followed are well known.

Investing in Innovation

British Columbia has a proven track record in bringing ideas and innovation to the energy sector. From our leadership and experience in harnessing our hydro resources to produce electricity, to our groundbreaking work in hydrogen and fuel cell technology, British Columbia has always met its future energy challenges by developing new, improved and sustainable solutions. To support future innovation and to help bridge the gap experienced in bringing innovations through the pre-commercial stage to market, government will:

- Establish an Innovative Clean Energy Fund of $25 million.
- Implement the BC Bioenergy Strategy to take full advantage of B.C.'s abundant sources of renewable energy.
- Generate electricity from mountain pine beetle wood by turning wood waste into energy.
Ambitious Energy Conservation and Efficiency Targets

The more energy that is conserved, the fewer new sources of supply we will require in the future. That is why British Columbia is setting new conservation targets to reduce growth in electricity demand. Inefficient use of energy leads to higher costs and many environmental and security of supply problems.

Conservation Target

The BC Energy Plan sets an ambitious conservation target, to acquire 50 per cent of BC Hydro’s incremental resource needs through conservation by 2020. This will require building on the "culture of conservation" that British Columbians have embraced in recent years. The plan confirms action on the part of government to complement these conservation targets by working closely with BC Hydro and other utilities to research, develop, and implement best practices in conservation and energy efficiency and to increase public awareness. In addition, the plan supports utilities in British Columbia and the BC Utilities Commission pursuing all cost effective and competitive demand side management programs. Utilities are also encouraged to explore and develop rate designs to encourage efficiency, conservation and the development of renewable energy.

Future energy efficiency and conservation initiatives will include:

- Continuing to remove barriers that prevent customers from reducing their consumption.
- Building upon efforts to educate customers about the choices they can make today with respect to the amount of electricity they consume.
- Exploring new rate structures to identify opportunities to use rates as a mechanism to motivate customers either to use less electricity or use less at specific times.
- Employing new rate structures to help customers implement new energy efficient products and technologies and provide them with useful information about their electricity consumption to allow them to make informed choices.
- Advancing ongoing efforts to develop energy-efficient products and practices through regulations, codes and standards.

The average household uses about 10,000 kilowatt-hours of electricity per year.
Implement Energy Efficiency Standards for Buildings by 2010

British Columbia implemented Energy Efficient Buildings: A Plan for BC in 2005 to address specific barriers to energy efficiency in our building stock through a number of voluntary policy and market measures. This plan has seen a variety of successes including smart metering pilot projects, energy performance measurement and labelling, and increased use of Energy Star appliances. In 2005, B.C. received a two year, $11 million federal contribution from the Climate Change Opportunities Envelope to support implementation of this plan.

Working together industry, local governments, other stakeholders and the provincial government will determine and implement cost effective energy efficiency standards for new buildings by 2010. Regulated standards for buildings are a central component of energy efficiency programs in leading jurisdictions throughout the world.

The BC Energy Plan supports reducing consumption by raising awareness and enhancing the efforts of utilities, local governments and building industry partners in British Columbia toward conservation and energy efficiency.

Aggressive Public Sector Building Plan

The design and retrofit of buildings and their surrounding landscapes offer us an important means to achieve our goal of making the government of British Columbia carbon neutral by 2010, and promoting Pacific Green universities, colleges, hospitals, schools, prisons, ferries, ports and airports.

British Columbia communities are already recognized leaders in innovative design practices. We know how to build smarter, faster and smaller. We know how to increase densities, reduce building costs and create new positive benefits for our environment. We know how to improve air quality, reduce energy consumption and make wise use of other resources, and how to make our landscapes and buildings healthy places for living, working and learning. We know how to make it affordable.

Government will set the following ambitious goals for all publicly funded buildings and landscapes and ask the Climate Action Team to determine the most credible, aggressive and economically viable options for achieving them:

- Require integrated environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.
- Supply green, healthy workspaces for all public service employees.
- Capture the productivity benefits for people who live and work in publicly funded buildings such as reduced illnesses, less absenteeism, and a better learning environment.
- Aim not only for the lowest impact, but also for restoration of the ecological features of the surrounding landscapes.

Gigawatt = 1,000,000 kilowatts
Kilowatt = amount of power to light ten 100-watt incandescent light bulbs.
Community Action on Energy Efficiency

British Columbia is working in partnership with local governments to encourage energy conservation at the community level through the Community Action on Energy Efficiency Program. The program promotes energy efficiency and community energy planning projects, providing direct policy and technical support to local governments through a partnership with the Fraser Basin Council. A total of 29 communities are participating in the program and this plan calls for an increase in the level of participation and expansion of the program to include transportation actions. The Community Action on Energy Efficiency Program is a collaboration among the provincial ministries of Energy, Mines and Petroleum Resources, Environment, and Community Services, Natural Resources Canada, the Fraser Basin Council, Community Energy Association, BC Hydro, FortisBC, Terasen Gas, and the Union of BC Municipalities.

Leading the Way to a Future with Green Buildings and Green Cities

British Columbia has taken a leadership role in the development of green buildings. Through the Green Buildings BC Program, the province is working to reduce the environmental impact of government buildings by increasing energy and water efficiency and reducing greenhouse gas emissions. Through this program, and the Energy Efficient Buildings Strategy that establishes energy efficiency targets for all types of buildings, the province is inviting businesses, local governments and all British Columbians to do their part to increase energy efficiency and reduce greenhouse gas emissions.

The Green Cities Project sets a number of strategies to make our communities greener, healthier and more vibrant places to live. British Columbia communities are already recognized leaders in innovative sustainability practices, and the Green Cities Project will provide them with additional resources to improve air quality, reduce energy consumption and encourage British Columbians to get out and enjoy the outdoors. With the Green Cities Project, the provincial government will:

- Provide $10 million a year over four years for the new LocalMotion Fund, which will cost share capital projects on a 50/50 basis with municipal governments to build bike paths, walkways, greenways and improve accessibility for people with disabilities.
- Establish a new Green City Awards program to encourage the development and exchange of best practices by communities, with the awards presented annually at the Union of British Columbia Municipalities convention.
- Set new financial incentives to help local governments shift to hybrid vehicle fleets and help retrofit diesel vehicles.
- Commit to making new investments in expanded rapid transit, support for fuel cell vehicles and other innovations.
Industrial Energy Efficiency Program

Government will establish an Industrial Energy Efficiency Program for British Columbia to address challenges and issues faced by the B.C. industrial sector and support the Canada wide industrial energy efficiency initiatives. The program will encourage industry driven investments in energy efficient technologies and processes; reduce emissions and greenhouse gases; promote self generation of power; and reduce funding barriers that discourage energy efficiency in the industrial sector. Some specific strategies include developing a results based pilot program with industry to improve energy efficiency and reduce overall power consumption and promote the generation of renewable energy within the industrial sector.

The 2010 Olympic and Paralympics Games: Sustainability in Action

In 2010 Vancouver and Whistler will host the Winter Olympic and Paralympics Games. The 2010 Olympic Games are the first that have been organized based on the principles of sustainability.

All new buildings for the Olympics will be designed and built to conserve both water and materials, minimize waste, maximize air quality, protect surrounding areas and continue to provide environmental and community benefits over their lifetimes. Existing venues will be upgraded to showcase energy conservation and efficiency and demonstrate the use of alternative heating/cooling technologies. Wherever possible, renewable energy sources such as wind, solar, micro hydro, and geothermal energy will be used to power and heat all Games facilities.

Transportation for the 2010 Games will be based on public transit. This system – which will tie event tickets to transit use – will help reduce traffic congestion, minimize local air pollution and limit greenhouse gas emissions.

• Undertake a pilot project for energy performance labelling of homes and buildings in coordination with local and federal governments, First Nations and industry associations.
• New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.
• Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia’s industrial sector.
• Increase the participation of local governments in the Community Action on Energy Efficiency Program and expand the First Nations and Remote Community Clean Energy Program.
Electricity Security

Electricity, while often taken for granted, is the lifeblood of our modern economy and key to our entire way of life. Fortunately, British Columbia has been blessed with an abundant supply of clean, affordable and renewable electricity. But today, as British Columbia's population has grown, so too has our demand for electricity. We are now dependent on other jurisdictions for up to 10 per cent of our electricity supply. BC Hydro estimates demand for electricity to grow by up to 45 per cent over the next 20 years.

We must address this ever increasing demand to maintain our secure supply of electricity and the competitive advantage in electricity rates that all British Columbians have enjoyed for the last 20 years. There are no simple solutions or answers. We have an obligation to future generations to chart a course that will ensure a secure, environmentally and socially responsible electricity supply.

To close this electricity gap, and for our province to become electricity self-sufficient, will require an innovative electricity industry and the real commitment of all British Columbians to conservation and energy efficiency.

The New Relationship and Electricity

The Government of British Columbia is working with First Nations to restore, revitalize and strengthen First Nations communities. The goal is to build strong and healthy relationships with First Nations people guided by the principles of trust and collaboration. First Nations share many of the concerns of other British Columbians in how the development of energy resources may impact as well as benefit their communities. In addition, First Nations have concerns with regard to the recognition and respect of Aboriginal rights and title.

By focusing on building partnerships between First Nations, industry and government, tangible social and economic benefits will flow to First Nations communities across the province and assist in eliminating the gap between First Nations people and other British Columbians.

Government is working every day to ensure that energy resource management includes First Nations' interests, knowledge and values. By continuing to engage First Nations in energy related issues, we have the opportunity to share information and look for opportunities to facilitate First Nations' employment and participation in the electricity sectors to ensure that First Nations people benefit from the continued growth and development of British Columbia's resources. The BC Energy Plan provides British Columbia with a blueprint for facing the many energy challenges and opportunities that lay ahead. It provides an opportunity to build on First Nations success stories such as:

- First Nations involvement in independent power projects, such as the Squamish First Nation's participation in the Furry Creek and Ashlu hydro projects.
Almost $4 million will flow to approximately 10 First Nations communities across British Columbia to support the implementation of Community Energy Action Plans as part of the First Nation and Remote Community Clean Energy Program.

The China Creek independent power project was developed by the Hupacasath First Nation on Vancouver Island.

Achieve Electricity Self-Sufficiency by 2016

Achieving electricity self-sufficiency is fundamental to our future energy security and will allow our province to achieve a reliable, clean and affordable supply of electricity. It also represents a lasting legacy for future generations of British Columbians. That’s why government has committed that British Columbia will be electricity self-sufficient within the decade ahead.

Through The BC Energy Plan, government will set policies to guide BC Hydro in producing and acquiring enough electricity in advance of future need. However, electricity generation and transmission infrastructure require long lead times. This means that over the next two decades, BC Hydro must acquire an additional supply of “insurance power” beyond the projected increases in demand to minimize the risk and implications of having to rely on electricity imports.

Small Power Standing Offer

Achieving electricity self-sufficiency in British Columbia will require a range of new power sources to be brought online. To help make this happen, this policy will direct BC Hydro to establish a Standing Offer Program with no quota to encourage small and clean electricity producers. Under the Standing Offer Program, BC Hydro will purchase directly from suppliers at a set price.

Eligible projects must be less than 10 megawatts in size and be clean electricity or high efficiency electricity cogeneration. The price offered in the standing offer contract would be based on the prices paid in the most recent BC Hydro energy call. This will provide small electricity suppliers with more certainty, bringing small power projects into the system more quickly, and help achieve government’s goal of maintaining a secure electricity supply. As well, BC Hydro will offer the same price to those in BC Hydro’s Net Metering Program who have a surplus of generation at the end of the year.

Ensuring a Reliable Transmission Network

An important part of meeting the goal of self-sufficiency is ensuring a reliable transmission infrastructure is in place as additional power is brought online. Transmission is a critical part of the solution as often new clean sources of electricity are located away from where the demand is. In addition, transmission investment is required to support economic growth in the province and must be planned and started in anticipation of future electricity needs given the long lead times required for transmission development. New and upgraded transmission infrastructure will be required to avoid congestion and to efficiently move the electricity across the entire power grid. Because our transmission system is part of a much larger, interconnected grid, we need to work with other jurisdictions to maximize the benefit of interconnection, remain consistent with evolving North American reliability standards, and ensure British Columbia’s infrastructure remains capable of meeting customer needs.

BC Hydro’s Net Metering Program was established as a result of Energy Plan 2002. It is designed for customers with small generating facilities, who may sometimes generate more electricity than they require for their own use. A net metering customer’s electricity meter will run backwards when they produce more electricity than they consume and run forward when they produce less than they consume.

The customer is only billed for their “net consumption”; the total amount of electricity used minus the total produced. Net metering allows customers to lower their environmental impact and take responsibility for their own power production. It helps to move the province towards electricity self-sufficiency and expands clean electricity generation, making B.C.’s electricity supply more environmentally sustainable.
In order for British Columbia to ensure the development of a secure and reliable supply of electricity, The BC Energy Plan provides policy direction to the BC Transmission Corporation to ensure that our transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand. This will include ensuring there is adequate transmission capacity, ongoing investments in technology and infrastructure and remaining consistent with evolving North American reliability standards.

**BC Transmission Corporation Innovation and Technology**

As the manager of a complex and high-value transmission grid, BC Transmission Corporation is introducing technology innovations that provide improvements to the performance of the system and allow for a greater utilization of existing assets, ensuring B.C. continues to benefit from one of the most advanced energy networks in the world. BC Transmission Corporation’s innovation program focuses on increasing the power transfer capability of existing assets, extending the life of assets and improving system reliability and security. Initiatives include:

- **System Control Centre Modernization Project**: This project is consolidating system operations into a new control center and backup site and upgrading operating technologies with a modern management system that includes enhancements to existing applications to ensure the electric grid is operating reliably and efficiently. The backup site will take over complete operation of the electric grid if the main site is unavailable.

- **Real-Time Phasors**: British Columbia is among the first North American jurisdictions to incorporate phasor measurement into control centre operations. Phasors are highly accurate voltage, current and phase angle “snapshots” of the real-time state of the transmission system that enable system operators to monitor system conditions and identify any impending problems.

- **Real-Time Rating**: This is a temperature monitoring system which enables the operation of two 500 kilovolt submarine cable circuits at maximum capacity without overloading. The resulting increase in capacity is estimated to be up to 10 per cent, saving millions of dollars.

- **Electronic Temperature Monitor Upgrades for Station Transformers**: In this program, existing mechanical temperature monitors will be replaced with newer, more accurate electronic monitors on station transformers that allow transformers to operate to maximum capacity without overheating. In addition to improving performance, BC Transmission Corporation will realize reduced maintenance costs as the monitors are “self-checking.”

- **Life Extension of Transmission Towers**: BC Transmission Corporation maintains over 22,000 steel lattice towers and is applying a special composite corrosion protection coating to some existing steel towers to extend their life by about 25 years.
Public Ownership

Public Ownership of BC Hydro and the BC Transmission Corporation

BC Hydro and the BC Transmission Corporation are publicly-owned crown corporations and will remain that way now and into the future. BC Hydro is responsible for generating, purchasing and distributing electricity. The BC Transmission Corporation operates, maintains, and plans BC Hydro’s transmission assets and is responsible for providing fair, open access to the power grid for all customers. Both crowns are subject to the review and approvals of the independent regulator, the BC Utilities Commission.

BC Hydro owns the heritage assets, which include historic electricity facilities such as those on the Peace and Columbia Rivers that provide a secure, reliable supply of low-cost power for British Columbians. These heritage assets require maintenance and upgrades over time to ensure they continue to operate reliably and efficiently. Potential improvements to these assets, such as capacity additions at the Mica and Revelstoke generating stations, can make important contributions for the benefit of British Columbians.

Confirming the Heritage Contract in Perpetuity

Under the 2002 Energy Plan, a legislated heritage contract was established for an initial term of 10 years to ensure BC Hydro customers benefit from its existing low-cost resources. With The BC Energy Plan, government confirms the heritage contract in perpetuity to ensure ratepayers will continue to receive the benefits of this low-cost electricity for generations to come.

British Columbia’s Leadership in Clean Energy

The BC Energy Plan will continue to ensure British Columbia has an environmentally and socially responsible electricity supply with a focus on conservation and energy efficiency.

British Columbia is already a world leader in the use of clean and renewable electricity, due in part to the foresight of previous generations who built our province’s hydroelectric dams. These dams - now British Columbians’ ‘heritage assets’ - today help us to enjoy 90 per cent clean electricity, one of the highest levels in North America.

All New Electricity Generation Projects Will Have Zero Net Greenhouse Gas Emissions

The B.C. government is a leader in North America when it comes to environmental standards. While British Columbia is a province rich in energy resources such as hydro electricity, natural gas and coal, the use of these resources needs to be balanced through effective use, preserving our environmental standards, while upholding our quality of life for generations to come. The government has made a commitment that all new electricity generation projects developed in British Columbia and connected to the grid will have zero net greenhouse gas emissions. In addition, any new electricity generated from coal must meet the more stringent standard of zero greenhouse gas emissions.

- Continue public ownership of BC Hydro and its heritage assets, and the BC Transmission Corporation.
- Establish the existing heritage contract in perpetuity.
- Invest in upgrading and maintaining the heritage asset power plants and the transmission lines to retain the ongoing competitive advantage these assets provide to the province.

Setting a requirement for zero net emissions over this time period encourages power producers to invest in new or upgraded technology. For existing plants the government will set policy around reaching zero net emissions through carbon offsets from other activities in British Columbia. It clearly signals the government’s intention to continue to have one of the lowest greenhouse gas emission electricity sectors in the world.

Ensure Clean or Renewable Electricity Generation Continues to Account For at Least 90 per cent of Total Generation

Currently in B.C., 90 per cent of electricity is from clean or renewable resources. The BC Energy Plan commits to maintaining this high standard which places us among the top jurisdictions in the world. Clean or renewable resources include sources of energy that are constantly renewed by natural processes, such as water power, solar energy, wind energy, tidal energy, geothermal energy, wood residue energy, and energy from organic municipal waste.

Zero Greenhouse Gas Emissions from Coal

The government is committed to ensuring that British Columbia’s electricity sector remains one of the cleanest in the world and will allow coal as a resource for electricity generation when it can reach zero greenhouse gas emissions. Clean-coal technology with carbon sequestration is expected to become commercially available in the next decade. Therefore, the province will require zero greenhouse gas emissions from any coal thermal electricity facilities which can be met through capture and sequestration technology. British Columbia is the first Canadian jurisdiction to commit to using only clean coal technology for any electricity generated from coal.

Policy Actions

- All new electricity generation projects will have zero net greenhouse gas emissions.
- Zero net greenhouse gas emissions from existing thermal generation power plants by 2016.
- Require zero greenhouse gas emissions from any coal thermal electricity facilities.
- Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.
- Government supports BC Hydro’s proposal to replace the firm energy supply from the Burrard Thermal plant with other resources. BC Hydro may choose to retain Burrard for capacity purposes after 2014.
- No nuclear power.
Burrard Thermal Generating Station

A decision regarding the Burrard Thermal Natural Gas Generating Station is another action that is related to environmentally responsible electricity generation in British Columbia.

Even though it could generate electricity from Burrard Thermal, BC Hydro imports power primarily because the plant is outdated, inefficient and costly to run. However, Burrard Thermal still provides significant benefits to BC Hydro as it acts as a "battery" close to the Lower Mainland, and provides extra capacity or "reliability insurance" for the province's electricity supply. It also provides transmission system benefits that would otherwise have to be supplied through the addition of new equipment at Lower Mainland sub-stations.

By 2014, BC Hydro plans to have firm electricity to replace what would have been produced at the plant. Government supports BC Hydro's proposal to replace the firm energy supply from Burrard Thermal with other resources by 2014. However, BC Hydro may choose to retain the plant for "reliability insurance" should the need arise.

Benefits to British Columbians

Clean or renewable electricity comes from sources that replenish over a reasonable time or have minimal environmental impacts. Today, demand for economically viable, clean, renewable and alternative energy is growing along with the world's population and economies. Consumers are looking for power that is not only affordable but creates minimal environmental impacts. Fortunately, British Columbia has abundant hydroelectric resources, and plenty of other potential energy sources.

Maintain our Electricity Competitive Advantage

British Columbians require a secure, reliable supply of competitively priced electricity now and in the future. Competitively priced power is also an incentive for investors to locate in British Columbia. It provides an advantage over other jurisdictions and helps sustain economic growth. We are fortunate that historic investments in hydroelectric assets provide electricity that is readily available, reliable, clean and inexpensive. By ensuring public ownership of BC Hydro, the heritage assets and the BC Transmission Corporation and confirming the heritage contract in perpetuity, we will ensure that ratepayers continue to receive the benefits of this low cost generation. Due to load growth and aging infrastructure, new investments will be required. Investments in maintenance and in some cases expansions can be a cost effective way to meet growth and reduce future rate increases.

No Nuclear Power

As first outlined in Energy Plan 2002, government will not allow production of nuclear power in British Columbia.

A carbon offset is an action taken directly, outside of normal operations, which results in reduced greenhouse gas emissions or removal of greenhouse gases from the atmosphere. Here's how it works: if a project adds greenhouse gases to the atmosphere, it can effectively subtract them by purchasing carbon offsets which are reductions from another activity. Government regulations to reduce greenhouse gases, including offsets, demonstrate leadership on climate change and support a move to clean and renewable energy.
British Columbia must look for new, innovative ways to stay competitive. New technologies must be identified and nurtured, from both new and existing industries. By diversifying and strengthening our energy sector through the development of new and alternative energy sources, we can help ensure the province's economy remains vibrant for years to come.

**Rates Kept Low Through Powerex Trading of Electricity**

Profits from electricity trade also contribute to keeping our electricity rates competitive. BC Hydro, through its subsidiary, Powerex, buys and sells electricity when it is advantageous to British Columbia's ratepayers. Government will continue to support capitalizing on electricity trading opportunities and will continue to allocate trade revenue to BC Hydro ratepayers to keep electricity rates low for all British Columbians.

**Ensure Electricity is Secured at Competitive Prices**

One practical way to keep rates down is to ensure utilities have effective processes for securing competitively priced power. As part of The BC Energy Plan, government will work with BC Hydro and parties involved to continue to improve the Call for Tender process for acquiring new generation. Fair treatment of both buyers and sellers of electricity will facilitate a robust and competitive procurement process. Government and BC Hydro will also look for ways to further recognize the value of intermittent resources, such as run-of-river and wind, in the acquisition process—which means that BC Hydro will examine ways to value separate projects together to increase the amount of firm energy calculated from the resources.

**BC Utilities Commissions’ Role in Social and Environmental Costs and Benefits**

The BC Energy Plan clarifies that social, economic and environmental costs are important for ensuring a suitable electricity supply in British Columbia. Government will review the BC Utilities Commissions’ role in considering social, environmental and economic costs and benefits, and will determine how best to ensure these are appropriately considered within the regulatory framework.
Bring Clean Power to Communities

British Columbia's electricity industry supports thousands of well-paying jobs, helps drive the economy and provides revenues to sustain public services. British Columbia's electricity industry already fosters economic development by implementing cost effective and reliable energy solutions in communities around the province. However, British Columbia covers almost one million square kilometres and electrification does not extend to all parts of our vast province.

Government and BC Hydro have established First Nation and remote community energy programs to implement alternative energy, energy efficiency, conservation and skills training solutions in a number of communities. The program focuses on expanding electrification services to as many as 50 remote and First Nations communities in British Columbia, enabling them to share in the benefits of a stable and secure supply of electricity. Government will put the policy framework in place and BC Hydro will implement the program over the next 10 years. The Innovative Clean Energy Fund can also support technological advancements to address the issue of providing a clear and secure supply of electricity to remote communities.

2006 Average Residential Electricity Price

<table>
<thead>
<tr>
<th>Price (Canadian cents per kilowatt hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Boston, MA</td>
</tr>
<tr>
<td>San Francisco, CA</td>
</tr>
<tr>
<td>New York, NY</td>
</tr>
<tr>
<td>Houston, TX</td>
</tr>
<tr>
<td>Miami, FL</td>
</tr>
<tr>
<td>Charlottetown, PE</td>
</tr>
<tr>
<td>Halifax, NS</td>
</tr>
<tr>
<td>Toronto, ON</td>
</tr>
<tr>
<td>Regina, SK</td>
</tr>
<tr>
<td>Edmonton, AB</td>
</tr>
<tr>
<td>Moncton, NB</td>
</tr>
<tr>
<td>Ottawa, ON</td>
</tr>
<tr>
<td>Nashville, TN</td>
</tr>
<tr>
<td>St. John's, NL</td>
</tr>
<tr>
<td>Chicago, IL</td>
</tr>
<tr>
<td>Seattle, WA</td>
</tr>
<tr>
<td>Portland, OR</td>
</tr>
<tr>
<td>Montreal, QC</td>
</tr>
<tr>
<td>Vancouver, BC</td>
</tr>
<tr>
<td>Winnipeg, MB</td>
</tr>
</tbody>
</table>

Source: Hydro Quebec comparison of Electricity Prices in Major North American Cities, April 2006

Electricity in the remote community of Atlin in northwestern British Columbia is currently supplied by diesel generators. The First Nations and Remote Community Clean Energy Program is bringing clean power to Atlin.

The Taku Land Corporation, solely owned by the Taku River Tlingit First Nation will construct a two megawatt run-of-river hydroelectric project on Pine Creek, generating local economic benefits and providing clean power for Atlin. The Taku Land Corporation has entered into a 25 year Electricity Purchase Agreement with BC Hydro to supply electricity from the project to Atlin's grid. Over the course of the agreement, this will reduce greenhouse gas emissions by up to 150,000 tonnes as the town's diesel generators stand by.

The province is contributing $1.4 million to this $10 million project. This is the first payment from a $3.9 million federal contribution to British Columbia's First Nations and Remote Community Clean Energy Program. Criteria for federal funding included demonstrating greenhouse gas emissions reductions, cost-effectiveness, and partnerships with communities and industry.
Government will work with other agencies to maximize opportunities to develop, deploy and export British Columbia clean and alternative energy technologies.

**Innovative Clean Energy Fund**

British Columbia's increasing energy requirements and our ambitious greenhouse gas emission reduction and clean energy targets require greater investment and innovation in the area of alternative energy by both the public and private sector.

To lead this effort, the government will establish an **Innovative Clean Energy Fund** of $25 million to help promising clean power technology projects succeed. The fund will be established through a small charge on energy utilities. The Minister of Energy, Mines and Petroleum Resources will consult with the energy utilities on the implementation of this charge.

Proponents of projects that will be supported through the fund will be encouraged to seek additional contributions from other sources.

Following the advice of the Premier's Technology Council and the Alternative Energy and Power Technology Task Force, the fund will focus strictly on projects that:

- Address specific British Columbia energy and environmental problems that have been identified by government.

Some problems that the fund could focus on include:

- Developing reliable power solutions for remote communities—particularly helping First Nations communities reduce their reliance on diesel generation for electricity.
- Advance conservation technologies to commercial application.
- Finding ways to convert vehicles to cleaner alternative fuels.
- Increasing the efficiency of power transmission through future grid technologies.
- Expanding the opportunities to generate power using alternative fuels (e.g., mountain pine beetle wood).
The British Columbia Bioenergy Strategy: Growing Our Natural Energy Advantage

Currently, British Columbia is leading Canada in the use of biomass for energy. The province has 50 per cent of Canada’s biomass electricity generating capacity. In 2005, British Columbia’s forest industry self-generated the equivalent of $150 million in electricity and roughly $1.5 billion in the form of heat energy. The use of biomass has displaced some natural gas consumption in the pulp and paper sector. The British Columbia wood pellet industry also enjoys a one-sixth share of the growing European Union market for bioenergy feedstock. The province will shortly release a bioenergy strategy that will build upon British Columbia’s natural bioenergy resource advantages, industry capabilities and academic strength to establish British Columbia as a world leader in bioenergy development.

British Columbia’s plan is to lead the bioeconomy in Western Canada with a strong and sustainable bioenergy sector. This vision is built on two guiding principles:

- Competitive, diversified forest and agriculture sectors.
- Strengthening regions and communities.

The provincial Bioenergy Strategy is aimed at:

- Enhancing British Columbia’s ability to become electricity self-sufficient.
- Fostering the development of a sustainable bioenergy sector.
- Creating new jobs.
- Supporting improvements in air quality.
- Promoting opportunities to create power from mountain pine beetle-impacted timber.
- Positioning British Columbia for world leadership in the development and commercial adoption of wood energy technology.
- Advancing innovative solutions to agricultural and other waste management challenges.
- Encouraging diversification in the forestry and agriculture industries.
- Producing liquid biofuels to meet Renewable Fuel Standards and displace conventional fossil fuels.

Generating Electricity from Mountain Pine Beetle Wood: Turning Wood Waste into Energy

British Columbia is experiencing an unprecedented mountain pine beetle infestation that has affected several million hectares of trees throughout the province. This infestation is having a significant impact on forestry-based communities and industries, and heightens forest fire risk. There is a great opportunity to convert the affected timber to bioenergy, such as wood pellets and wood-fired electricity generation and cogeneration.

Through The BC Energy Plan, BC Hydro will issue a call for proposals for electricity from sawmill residues, logging debris and beetle-impacted timber to help mitigate impacts from the provincial mountain pine beetle infestation.

British Columbia is experiencing an unprecedented mountain pine beetle infestation that has affected several million hectares of trees throughout the province. This infestation is having a significant economic impact on B.C.’s forestry industry and the many communities it helps to support and sustain. The forest fire risk to these communities has also risen as a result of their proximity to large stands of “beetle-killed” wood.

B.C. has developed a bioenergy strategy to promote new sources of sustainable and renewable energy in order to take advantage of the vast amounts of pine beetle-infested timber and other biomass resources. In the future, bioenergy will help meet our electricity needs, supplement conventional natural gas and petroleum supplies, maximize job and economic opportunities, and protect our health and environment.

The production of wood pellets is already a mature industry in British Columbia. Industry has produced over 500,000 tonnes of pellets and exported about 90 per cent of this product overseas in 2005, primarily to the European thermal power industry. Through The BC Energy Plan, BC Hydro will issue a call for proposals for further electricity generation from wood residue and mountain pine beetle-infested timber.
Addressing Greenhouse Gas Emissions from Transportation

The BC Energy Plan: A Vision for Clean Energy Leadership takes a first step to incorporate transportation issues into provincial energy policy. Transportation is a major contributor to climate change and air quality problems. It presents other issues such as traffic congestion that slows the movement of goods and people. The fuel we use to travel around the province accounts for about 40 per cent of British Columbia’s greenhouse gas emissions. Every time we drive or take a vehicle that runs on fossil fuels, we add to the problem, whether it’s a train, boat, plane or automobile. Cars and trucks are the biggest source of greenhouse gas emissions and contribute to reduced air quality in urban areas.

The government is committed to reducing greenhouse gas emissions from the transportation sector and has committed to adopting California’s tailpipe emission standards from greenhouse gas emissions and champion the national adoption of these standards.

British Columbians want a range of energy options for use at home, on the road and in day-to-day life. Most people use gasoline or diesel to keep their vehicles moving, but there are other options that improve our air quality and reduce greenhouse gas emissions.

Natural gas burns cleaner than either gasoline or propane, resulting in less air pollution. Fuel cell vehicles are propelled by electric motors powered by fuel cells, devices that produce electricity from hydrogen without combustion.

Cars that run on blends of renewable biofuels like ethanol and biodiesel emit lower levels of greenhouse gases and air pollutants. Electricity can provide an alternative to gasoline vehicles when used in hybrids and electric cars.

By working with businesses, educational institutions, non-profit organizations and governments, new and emerging transportation technologies can be deployed more rapidly at home and around the world. British Columbia will focus on research and development, demonstration projects, and marketing strategies to promote British Columbia’s technologies to the world.

Implementing a Five Per Cent Renewable Fuel Standard for Diesel and Gasoline

The BC Energy Plan demonstrates British Columbia’s commitment to environmental sustainability and economic growth by taking a lead role in promoting innovation in the transportation sector to reduce greenhouse gas emissions, improve air quality and help improve British Columbians’ health and quality of life in the future. The plan will implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry. It will further support the federal action of increasing the ethanol content of gasoline to five per cent by 2010. The plan will also see the adoption of quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions. These renewable fuel standards are a major component and first step towards government’s goal of reducing the carbon intensity of all passenger vehicles by 10 per cent by 2020.
Government will implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.

A Commitment to Extend British Columbia's Ground-breaking Hydrogen Highway

British Columbia is a world leader in transportation applications of the Hydrogen Highway, including the design, construction and safe operation of advanced hydrogen vehicle fuelling station technology. The Hydrogen Highway is a large scale, coordinated demonstration and deployment program for hydrogen and fuel cell technologies.

Vancouver's Powertech Labs established the world's first fast-fill, high pressure hydrogen fuelling station. The station anchors the Hydrogen Highway, which runs from Victoria through Surrey to Vancouver, North Vancouver, Squamish, and Whistler. Additional hydrogen fuelling stations are now in operation in Victoria and at the University of British Columbia.

The goal is to demonstrate and deploy various technologies and to one day see hydrogen filling stations around the province, serving drivers of consumer and commercial cars, trucks, and buses.

The unifying vision of the province's hydrogen and fuel cell strategy is to promote fuel cells and hydrogen technologies as a means of moving towards a sustainable energy future, increasing energy efficiency and reducing air pollutants and greenhouse gases. The Hydrogen Highway is targeted for full implementation by 2010. Canadian hydrogen and fuel cell companies have invested over $1 billion over the last five years, most of that in B.C. A federal-provincial partnership will be investing $89 million for fuelling stations and the world's first fleet of 20 fuel cell buses.

British Columbia will continue to be a leader in the new hydrogen economy by taking actions such as a fuel cell bus fleet deployment, developing a regulatory framework for micro-hydrogen applications, collaborating with neighbouring jurisdictions on hydrogen, and, in the long term, establishing a regulatory framework for hydrogen production, vehicles and fuelling stations.

Agriculture 4%
Waste 9%
Electricity 3%
Other Industry 16%
Residential and Commercial 11%
Fossil Fuel Production 18%
Transport 39%

B.C. Greenhouse Gas Emissions by Sector
(Based on 2004 data)
Source: Ministry of Environment

Cars and trucks are the biggest source of greenhouse gas emissions and reduce the quality of air in urban areas.

POLICY ACTIONS

- Implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.
- Support the federal action of increasing the ethanol content of gasoline to five per cent by 2010 and adopt quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions.
- Develop a leading hydrogen economy by continuing to support the Hydrogen and Fuel Cell Strategy for British Columbia.
- Establish a new, harmonized regulatory framework by 2010 for hydrogen by working with governments, industry and hydrogen alliances.
Promote Energy Efficiency and Alternative Energy

It is important for British Columbians to understand the appropriate uses of different forms of energy and utilize the right fuel, for the right activity at the right time. There is the potential to promote energy efficiency and alternative energy supplemented by natural gas. Combinations of alternative energy sources with natural gas include solar thermal and geothermal. Working with municipalities, utilities and other stakeholders the provincial government will promote energy efficiency and alternative energy systems, such as solar thermal and geothermal throughout the province.

Environmental Leadership in Action

The BC Energy Plan: A Vision for Clean Energy
Leadership complements other related cross-government initiatives that include supporting transportation demand management, reducing traffic congestion and better integrating land use and transportation planning. These plans include actions across a broad range of activities. Some key initiatives and recent announcements include:

- Extending the tax break on hybrid vehicle purchases beyond the current March 2008 deadline.
- Government to purchase hybrid vehicles exclusively.
- Reducing diesel emissions through new financial incentives to help municipalities shift to hybrid vehicle fleets and retrofit diesel vehicles with cleaner technologies.
- Green Ports:
  - Working with ports and the shipping sector to reduce emissions from their activities and marine vessels.
  - The Port of Vancouver has established idle reduction zones and has reduced truck emissions with its container reservation system which has reduced average wait times from two hours to approximately 20 minutes.
- The port is also evaluating port-side electrification which would see vessels using shore-side electrical power while berthed rather than diesel power.
- Improving upon the monitoring and reporting of air quality information.
- Highway Infrastructure and Rapid Transit Infrastructure funding including the Gateway Program, the Border Infrastructure Program, high occupancy vehicle lanes, construction of the Rapid Transit Canada Line linking Richmond, the Vancouver International Airport and Vancouver, and the Rapid Transit Evergreen Line linking Burnaby to Coquitlam.
- Expanding the AirCare on the Road Program to the Lower Fraser Valley and other communities.
- Implementing the LocalMotion Program for capital projects to improve physical fitness and safety, reduce air pollution and meet the diverse needs of British Columbians.
A Choice of Electricity Options

The range of supply options, both large and small, for British Columbia include:

Bioenergy: Bioenergy is derived from organic biomass sources such as wood residue, agricultural waste, municipal solid waste and other biomass and may be considered a carbon-neutral form of energy, because the carbon dioxide released by the biomass when converted to energy is equivalent to the amount absorbed during its lifetime.

A number of bioenergy facilities operate in British Columbia today. Many of these are "cogeneration" plants that create both electricity and heat for on-site use and in some cases, sell surplus electricity to BC Hydro.

Reliability¹: FIRM
Estimated Cost²: $75 - $91

Coal Thermal Power: The BC Energy Plan establishes a zero emission standard for greenhouse gas emissions from coal-fired plants. This will require proponents of new coal facilities to employ clean coal technology with carbon capture and sequestration to ensure there are no greenhouse gas emissions.

Reliability¹: FIRM
Estimated Cost²: $67 - $82

Geothermal: Geothermal power is electricity generated from the earth. Geothermal power production involves tapping into pockets of superheated water and steam deep underground, bringing them to the surface and using the heat to produce steam to drive a turbine and produce electricity. British Columbia has potential high temperature (the water is heated to more than 200 degrees Celsius) geothermal resources in the coastal mountains and lower temperature resources in the interior, in northeast British Columbia and in a belt down the Rocky Mountains. Geothermal energy's two main advantages are its consistent supply, and the fact that it is clean, renewable source of energy.

Reliability¹: FIRM
Estimated Cost²: $44 - $60

Hydrogen and Fuel Cell Technology: British Columbia companies are recognized globally for being leaders in hydrogen and fuel cell technology for mobile, stationary and micro applications. For example, BC Transit's fuel cell buses are planned for deployment in Whistler in 2009.

Reliability¹: FIRM
Estimated Cost²: n/a

The environmental assessment process in British Columbia is an integrated review process for major projects that looks at potential environmental, community and First Nation, health and safety, and socioeconomic impacts. Through the environmental assessment process, the potential effects of a project are identified and evaluated early, resulting in improved project design and helping to avoid costly mistakes for proponents, governments, local communities and the environment. An assessment is begun when a proposed project that meets certain criteria under the Environmental Assessment Act makes an application for an environmental assessment certificate. Each assessment will usually include an opportunity for all interested parties to identify issues and provide input; technical studies of the relevant environmental, social, economic, heritage and/or health effects of the proposed project; identification of ways to prevent or minimize undesirable effects and enhance desirable effects; and consideration of the input of all interested parties in compiling the assessment findings and making decisions about project acceptability. The review is concluded when a decision is made to issue or not issue an environmental assessment certificate. Industrial, mining, energy, water management, waste disposal, food processing, transportation and tourist destination resort projects are generally subject to an environmental assessment.

¹ Reliability refers to energy that can be depended on to be available whenever required
² Source: BC Hydro's 2006 IEP Volume 1 of 2 page 5-6
³ Source: BC Hydro's Open Call for Power Report
⁴ These costs do not reflect the costs of zero GHG emissions for coal thermal power
Large Hydroelectric Dams: The chief advantage of a hydro system is that it provides a reliable supply with both dependable capacity and energy, and a renewable and clean source of energy. Hydropower produces essentially no carbon dioxide.

Site C is one of many resource options that can help meet BC Hydro’s customers’ electricity needs. No preferred option has been selected at this time; however, it is recognized that the Province will need to examine opportunities for some large projects to meet growing demand.

As part of the BC Energy Plan, BC Hydro and the Province will enter into initial discussions with First Nations, the Province of Alberta and communities to discuss Site C to ensure that communications regarding the potential project and the processes being followed are well known. The purpose of this step is to engage the various parties up front to obtain input for the proposed engagement process. The decision-making process on Site C includes public consultation, environmental impact assessments, obtaining a Certificate of Public Convenience and Necessity, obtaining an Environmental Assessment Certificate and necessary environmental approvals, and approval by Cabinet.

Reliability: FIRM
Estimated Cost: $43 - $62

Natural Gas: Natural gas is converted into electricity through the use of gas fired turbines in medium to large generating stations; particularly high efficiencies can be achieved through combining gas turbines with steam turbines in the combined cycle and through reciprocating engines and mini and macro turbines. Combined cycle power generation using natural gas is the cleanest source of power available using fossil fuels. Natural gas provides a reliable supply with both dependable capacity and firm energy.

Reliability: FIRM
Estimated Cost: $48 - $100

Small Hydro: This includes run-of-river and micro Hydro. These generate electricity without altering seasonal flow characteristics. Water is diverted from a natural watercourse through an intake channel and pipeline to a powerhouse where a turbine and generator convert the kinetic energy in the moving water to electrical energy.

Twenty-nine electricity purchase agreements were awarded to small waterpower producers by BC Hydro in 2006. These projects will generate approximately 2,851 gigawatt hours of electricity annually (equivalent to electricity consumed by 285,000 homes in British Columbia). There are also 32 existing small hydro projects in British Columbia that generate 3,500 gigawatt hours (equivalent to electricity consumed by 350,000 homes in British Columbia).
**Solar:** With financial support from the Ministry of Energy, Mines and Petroleum Resources, the "Solar for Schools" program has brought clean solar photovoltaic electricity to schools in Vernon, Fort Nelson, and Greater Victoria.

The BC Sustainable Energy Association is leading a project which targets installing solar water heaters on 100,000 rooftops across British Columbia.

**Reliability:** INTERMITTENT  
**Estimated Cost:** $700 - $1700

**Wind:** British Columbia has abundant, widely distributed wind energy resources in three areas: the Peace region in the Northeast; Northern Vancouver Island; and the North Coast. Wind is a clean and renewable source that does not produce air or water pollution, greenhouse gases, solid or toxic wastes.

Three wind generation projects have been offered power purchase contracts in BC Hydro's 2006 Open Call for Power. These three projects will have a combined annual output of 979 gigawatt hours of electricity (equivalent to electricity consumed by 97,900 homes).

**Reliability:** INTERMITTENT  
**Estimated Cost:** $71 - $74

**Tidal Energy:** A small demonstration project has been installed at Race Rocks located west-southwest of Victoria. The Lester B. Pearson College of the Pacific, the provincial and federal government, and industry have partnered to install and test a tidal energy demonstration turbine at Race Rocks. The project will generate about 77,000 kilowatt hours on an annual basis (equivalent to electricity consumed by approximately eight homes).

**Reliability:** INTERMITTENT  
**Estimated Cost:** $100 - $360

---

1. Reliability refers to energy that can be depended on to be available whenever required.
2. Source: BC Hydro's 2006 IEP Volume 1 of 2 page 5-6
4. Based on a 250 MW combined cycle gas turbine plant.
6. These costs do not reflect the costs of zero net GHG emissions for natural gas.
Announced in early 2005, this demonstration project between the provincial and federal governments, industry, and Pearson College is producing zero emission tidal power at the Race Rocks Marine Reserve on southern Vancouver Island. Using a current-driven turbine submerged below the ocean surface, the project is producing about 77,000 kilowatt hours of electricity per year, enough to meet the needs of approximately eight households. The knowledge gained about tidal energy will help our province remain at the forefront of clean energy generation technology.

Table 1: Summary of Resource Options

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimated Cost $/megawatt hour</th>
<th>Reliable</th>
<th>Greenhouse gas emissions tonnes per gigawatt hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 – 76</td>
<td>Yes</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>43 – 62</td>
<td>Yes</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>48 – 100</td>
<td>Yes</td>
<td></td>
<td>0 – 350</td>
</tr>
<tr>
<td>67 – 82</td>
<td>Yes</td>
<td></td>
<td>0 – 855</td>
</tr>
<tr>
<td>75 – 91</td>
<td>Yes</td>
<td></td>
<td>0 – 500</td>
</tr>
<tr>
<td>44 – 60</td>
<td></td>
<td>Yes</td>
<td>0 – 10</td>
</tr>
<tr>
<td>71 – 74</td>
<td>Depends on the availability and speed of wind</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60 – 95</td>
<td>Depends on the flow of water, which varies throughout the year</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100 – 360</td>
<td>Future supply option which has great potential for British Columbia</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>700 – 1700</td>
<td>Depends on location, cloud cover, season, and time of day</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes:
1. Source: BC Hydro's 2005 Integrated Electricity Plan Volume 1 of 2, page 5-6
2. Reliability refers to energy that can be depended on to be available whenever required
3. Source: BC Hydro's 2006 Integrated Electricity Plan, Volume 2 of 2, Appendices F and Appendices E, page 5-14 and Table 10-2
4. Based on a 250 MW combined cycle gas turbine plant
5. Based on a 500 MW supercritical pulverized coal combustion unit
6. GHG are 0 for wood residue and landfill gas. GHG is 502 tonnes per gigawatt hour for municipal solid waste
7. Source: BC Hydro's 2004 Integrated Electricity Plan, page 69
8. The BC Energy Plan requires natural gas plants to offset to zero net greenhouse gas emissions. These costs do not reflect the costs of zero net GHG emissions.
10. The costs do not include the costs of requiring zero emissions from coal thermal power.
The majority of B.C.'s electricity requirements over the next 10 years can be achieved through increased conservation by all British Columbians and new electricity from independent power producers.

**British Columbia's Strength in Electricity Diversity**

British Columbia is truly fortunate to have a wide variety of future supply options available to meet our growing demand for energy. A cost effective way to meet that demand is to conserve energy and be more energy efficient. However, British Columbia will still need to bring new power on line to meet demand growth in the years ahead. In order to ensure we have this critical resource available to British Columbians when they need it, government will be looking to secure a range of made-in-B.C. power to serve British Columbians in the years ahead.

Government's goal is to encourage a diverse mix of resources that represent a variety of technologies. Some resource technologies, such as large and small hydro, thermal power, wind and geothermal provide well-established, commercially available sources of electricity. Other emerging technologies that are not yet widely used include large ocean wave and tidal power, solar, hydrogen and advanced coal technologies.

**2004 Total Electricity Production by Source (% of total)**

<table>
<thead>
<tr>
<th>British Columbia</th>
<th>Large Hydro</th>
<th>Small Hydro</th>
<th>Wind</th>
<th>Thermal</th>
<th>Hydro</th>
<th>Geothermal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>0.0</td>
<td>92.8</td>
<td>0.0</td>
<td>1.0</td>
<td>6.0</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>2.3</td>
<td>4.4</td>
<td>0.0</td>
<td>0.0</td>
<td>12.0</td>
<td>2.6</td>
<td>78.7</td>
<td>100</td>
</tr>
<tr>
<td>0.3</td>
<td>6.9</td>
<td>0.0</td>
<td>0.6</td>
<td>12.3</td>
<td>0.70</td>
<td>79.2</td>
<td>100</td>
</tr>
<tr>
<td>10.7</td>
<td>17.0</td>
<td>14.5</td>
<td>0.0</td>
<td>37.7</td>
<td>0.0</td>
<td>20.1</td>
<td>100</td>
</tr>
<tr>
<td>16.3</td>
<td>0.1</td>
<td>0.0</td>
<td>8.8</td>
<td>24.7</td>
<td>4.0</td>
<td>46.1</td>
<td>100</td>
</tr>
<tr>
<td>0.4</td>
<td>17.6</td>
<td>26.5</td>
<td>12.4</td>
<td>14.9</td>
<td>0.7</td>
<td>27.5</td>
<td>100</td>
</tr>
<tr>
<td>0.2</td>
<td>11.3</td>
<td>78.3</td>
<td>1.0</td>
<td>3.2</td>
<td>1.0</td>
<td>5.0</td>
<td>100</td>
</tr>
<tr>
<td>4.2</td>
<td>4.5</td>
<td>27.1</td>
<td>2.6</td>
<td>10.0</td>
<td>1.6</td>
<td>50.0</td>
<td>100</td>
</tr>
<tr>
<td>0.4</td>
<td>9.5</td>
<td>26.1</td>
<td>1.9</td>
<td>22.6</td>
<td>12.3</td>
<td>27.2</td>
<td>100</td>
</tr>
<tr>
<td>0.3</td>
<td>98.8</td>
<td>0.0</td>
<td>0.5</td>
<td>0.3</td>
<td>0.0</td>
<td>0.1</td>
<td>100</td>
</tr>
<tr>
<td>1.8</td>
<td>24.8</td>
<td>49.7</td>
<td>0.0</td>
<td>5.2</td>
<td>0.5</td>
<td>18.0</td>
<td>100</td>
</tr>
<tr>
<td>2.3</td>
<td>64.4</td>
<td>0.0</td>
<td>0.0</td>
<td>26.3</td>
<td>0.1</td>
<td>6.9</td>
<td>100</td>
</tr>
<tr>
<td>0.7</td>
<td>94.5</td>
<td>3.2</td>
<td>0.0</td>
<td>0.1</td>
<td>1.5</td>
<td>0.0</td>
<td>100</td>
</tr>
<tr>
<td>0.5</td>
<td>1.9</td>
<td>20.2</td>
<td>2.1</td>
<td>40.3</td>
<td>1.2</td>
<td>33.8</td>
<td>100</td>
</tr>
<tr>
<td>2.3</td>
<td>70.0</td>
<td>8.8</td>
<td>0.0</td>
<td>8.6</td>
<td>0.1</td>
<td>10.2</td>
<td>100</td>
</tr>
</tbody>
</table>

The BC Energy Plan has a goal that most of B.C.'s electricity requirements over the next 10 years can be achieved through increased conservation and energy efficiency by all British Columbians, coupled with generation by independent power producers. However, these new projects take time to plan and implement. In addition, many of these sources provide limited amounts of firm supply. The province will also need to consider options for new, large scale sources to meet forecasted demand growth in the next 10 to 20 years. Large scale options could include Site C, large biomass facilities, clean coal or natural gas plants. As with all large scale undertakings, these kinds of projects will require years of lead time to allow for careful planning, analysis, consultation and construction.

Perhaps the biggest challenge facing British Columbians is simply to begin choosing our electricity future together. Demand for electricity is projected to grow by up to 45 per cent over the next 20 years. To meet this projected growth we will need to conserve more, and obtain more electricity from small power producers and large projects. Given the critical importance of public participation and stakeholder involvement in addressing the challenges and choices of meeting our future electricity needs, government and BC Hydro will seek and share solutions.
Taking Action to Meet the Demand for Workers

The energy sector has been a major contributor to British Columbia’s record economic performance since 2001. The BC Energy Plan focuses on four under-represented groups that offer excellent employment potential: Aboriginal people, immigrants, women and youth.

At the same time, the energy sector must overcome a variety of skills training and labour challenges to ensure future growth. These challenges include:

- An aging workforce that upon retirement will leave a gap in experience and expertise.
- Competition for talent from other jurisdictions.
- Skills shortages among present and future workers.
- Labour market information gaps due to a lack of in-depth study.
- The need to coordinate immigration efforts with the federal government.
- The need for greater involvement of under-represented energy sector workers such as Aboriginal people, immigrants, women, and youth.
- A highly mobile workforce that moves with the opportunities.
- The need to improve productivity and enhance competitiveness.

Innovative, practical and timely skills training, and labour management is required to ensure the energy sector continues to thrive. As part of The BC Energy Plan, government will work collaboratively with industry, communities, Aboriginal people, education facilities, the federal government and others to define the projected demand for workers and take active measures to meet those demands.

Attract Highly Skilled Workers

Demographics show that those born at the height of the baby boom are retired or nearing retirement, leaving behind a growing gap in skills and expertise. Since this phenomenon is taking place in most western nations, attracting and retaining skilled staff is highly competitive.

To ensure continued energy sector growth, we need to attract workers from outside the province, particularly for the electricity, oil and gas, and heavy construction industries where the shortage is most keenly felt. At this time, a significant increase in annual net migration of workers from other provinces and from outside Canada is needed to complement the existing workforce.

Government and its partners are developing targeted plans to attract the necessary workers. These plans will include marketing and promoting energy sector jobs as a career choice.
Develop a Robust Talent Pool of Workers

It is vital to provide the initial training to build a job-ready talent pool in British Columbia, as well as the ongoing training employees need to adapt to changing energy sector technologies, products and requirements. We can ensure a thriving pool of talent in British Columbia by retraining skilled employees who are without work due to downturns in other industries. Displaced workers from other sectors and jurisdictions may require some retraining and new employees may need considerable skills development.

Another way to help ensure there are enough skilled energy sector workers in the years ahead is to educate and inform young people today. By letting high school students know about the opportunities, they can consider their options and make the appropriate training and career choices. Government will work to enhance information relating to energy sector activities in British Columbia's school curriculum in the years ahead.

Retain Skilled Workers

Around the world, energy facility construction and operations are booming, creating fierce, global competition for skilled workers. While British Columbia has much to offer, it is critical that our jurisdiction presents a superior opportunity to these highly skilled and mobile workers. That is why we need to ensure our workplaces are safe, fair and healthy and our communities continue to offer an unparalleled lifestyle with high quality health care and education, affordable housing, and readily available recreation opportunities in outstanding natural settings.

Inform British Columbians

To be effective in filling energy sector jobs with skilled workers, British Columbians need to be informed and educated about the outstanding opportunities available. As part of The BC Energy Plan, a comprehensive public awareness and education campaign based on sound labour market analysis will reach out to potential energy sector workers. This process will recognize and address both the potential challenges such as shift work and remote locations as well as the opportunities, such as obtaining highly marketable skills and earning excellent compensation.
Be Among the Most Competitive Oil and Gas Jurisdictions in North America

Since 2001, British Columbia's oil and gas sector has grown to become a major force in our provincial economy, employing tens of thousands of British Columbians and helping to fuel the province's strong economic performance. In fact, investment in the oil and gas sector was $4.6 billion in 2005. The oil and gas industry contributes approximately $1.95 billion annually or seven per cent of the province's annual revenues.

The BC Energy Plan is designed to take B.C.'s oil and gas sector to the next level to enhance a sustainable, thriving and vibrant oil and gas sector in British Columbia. With a healthy, competitive oil and gas sector comes the opportunity to create jobs and build vibrant communities with increased infrastructure and services, such as schools and hospitals. Of particular importance is an expanding British Columbia-based service sector.

There is a lively debate about the peak of the world's oil and gas production and the impacts on economies, businesses and consumers. A number of countries, such as the UK, Norway and the USA, are experiencing declining fossil fuel production from conventional sources. Energy prices, especially oil prices, have increased and are more volatile than in the past. As a result, the way energy is produced and consumed will change, particularly in developed countries.

The plan is aimed at enhancing the development of conventional resources and stimulating activity in relatively undeveloped areas such as the interior basins—particularly the Nechako Basin. It will also foster the development of unconventional resources such as tight gas, shale gas, and coalbed gas. The plan will further efforts to work with the federal government, communities and First Nations to advance offshore opportunities.

The challenge for British Columbia in the future will be to continue to find the right balance of economic, environmental and social priorities to allow the oil and gas sector to succeed, while protecting our environment and improving our quality of life.

The New Relationship and Oil and Gas

Working together with local communities and First Nations, the provincial government will continue to share in the many benefits and opportunities created through the development of British Columbia's oil and gas resources.

Government is working to ensure that oil and gas resource management includes First Nations' interests, knowledge and values. Government has recently concluded consultation agreements for oil and gas resource development with First Nations in Northeast British Columbia. These agreements increase clarity in the process and will go a long way to enhancing our engagement with these First Nations.

Government will continue to pursue opportunities to share information and look for opportunities to facilitate First Nations' employment and participation in the oil and gas industry to ensure that Aboriginal people benefit from the continued growth and development of British Columbia's resources.

Policy Actions

- Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.
- Establish policies and measures to reduce air emissions in coordination with the Ministry of Environment.
- Best coalbed gas practices in North America. Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.
- Enhance the Oil and Gas Environmental Stewardship Program, ensuring sound environmental, land and resource management.
The BC Energy Plan adopts a triple bottom line approach to competitiveness, with an attractive investment climate, environmentally sustainable development of B.C.'s abundant resources, and by benefiting communities and First Nations.

While striving to be among the most competitive oil and gas jurisdictions in North America, the province will focus on maintaining and enhancing its strong competitive environment for the oil and gas industry. This encompasses the following components:

- A competitive investment climate.
- An abundant resource endowment.
- Environmental responsibility.
- Social responsibility.

**Leading in Environmentally and Socially Responsible Oil and Gas Development**

The BC Energy Plan emphasizes conservation, energy efficiency, and the environmental and socially responsible management of the province's energy resources. It outlines government's efforts to meet this objective by working collaboratively with involved and interested parties, including affected communities, landowners, environmental groups, First Nations, the regulator (the Oil and Gas Commission), industry groups and others. Policy actions will support ways to address air emissions, impacts on land and wildlife habitat, and water quality.

The oil and gas sector in British Columbia accounts for approximately 18 per cent of greenhouse gas air emissions in the province. The main sources of air emissions from the oil and gas sector are flaring, fugitive gases, gas processing and compressor stations. While these air emissions have long been part of the oil and gas sector, they have also been a source of major concern for oil and gas communities.

**Eliminate Flaring from Oil and Gas Producing Wells and Production Facilities By 2016**

Through The BC Energy Plan, government has committed to eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011. In addition, government will adopt policies to reduce natural gas flaring and venting at test sites and pipelines, and encourage compressor station efficiency to cut back emissions. Government will also explore opportunities and new technologies for safe, underground disposal of carbon dioxide or sequestration from oil and gas facilities. Sequestration is considered a cost effective mitigation strategy in reducing carbon dioxide emissions.

**Enhance Carbon Dioxide Sequestration in British Columbia**

British Columbia is a member of the Plains CO2 Reduction (PCOR) Partnership composed of nearly 50 private and public sector groups from nine states and three Canadian provinces that is assessing the technical and economic feasibility of capturing and storing carbon dioxide emissions from stationary sources in western sedimentary basins.

B.C. is also a member of the West Coast Regional Carbon Sequestration Partnership, made up of west coast state and provincial government ministries and agencies. This partnership has been formed to pursue carbon sequestration opportunities and technologies.

To facilitate and foster innovation in sequestration, government will develop market oriented requirements with a graduated schedule. In consultation with stakeholders, a timetable will be developed along with increasing requirements for sequestration.

The leadership of British Columbian companies can be seen in all areas of the energy sector through innovative, industry leading technologies.

Procurement of a new generation of chemical injection pump for use in the oil and gas industry is beginning. The pumps, developed and built in British Columbia, are the first solar powered precision injection pumps available to the industry. They will reduce emissions by replacing traditional gas powered injection systems for pipelines.

Other solar technologies developed in British Columbia provide modular power supplies in remote locations all over the globe for marine signals, aviation lights and road signs.

Roads in B.C. and around the world are hosting demonstrations of fuel cell vehicles built with British Columbia technology. Thanks to the first high pressure hydrogen fuelling station in the world, compatible fuel cell vehicles in B.C. can carry more fuel and travel farther than ever before.

The Innovative Clean Energy Fund will help to build B.C.'s technology cluster and keep us at the forefront of energy technology development.
Government will work to improve oil and gas tenure policies as well as develop new guidelines to determine areas that require special consideration prior to tenure approval.

**Environmental Stewardship Program**

In 2004, the Ministry of Energy, Mines and Petroleum Resources initiated the Oil and Gas Environmental Stewardship Program having two components: the Environmental Policy Program and the Environmental Resource Information Project. The Environmental Policy Program identifies and mitigates environmental issues in the petroleum sector focusing on policy development in areas such as environmental waste management, habitat enhancement, planning initiatives, wildlife studies for oil and gas priority areas and government best management practices. Some key program achievements include the completion of guidelines for regulatory dispersion modeling, research leading to the development of soil quality guidelines for soluble barium, a key to northern grasses and their restorative properties for remediated well sites, and moose and caribou inventories in Northeast British Columbia.

The Environmental Resource Information Project is dedicated to increasing opportunities for oil and gas development, through the collection of necessary environmental baseline information. These projects are delivered in partnership with other agencies, industry, communities and First Nations.

The BC Energy Plan enhances the important Oil and Gas Environmental Stewardship Program. This will improve existing efforts to manage waste and preserve habitat, and will establish baseline data as well as development and risk mitigation plans for environmentally sensitive areas. Barriers need to be identified and steps taken for remediation, progressive reclamation, and waste management.

**Best Coalbed Gas Practices in North America**

Government will continue to encourage coalbed gas development with the intent of demonstrating that British Columbia is a leading socially and environmentally responsible coalbed gas developing jurisdiction. Coalbed gas, also known as coalbed methane, is natural gas found in coal seams. It is one of the cleanest burning of all fossil fuels. Proponents wanting to develop coalbed gas must adopt the following best practices:

- Fully engage local communities and First Nations in all stages of development.
- Use the most advanced technology and practices that are commercially viable to minimize land and aesthetic disturbances.
- Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.
- Meet any other conditions the Oil and Gas Commission may apply.
- Demonstrate the company’s previous experience with coalbed gas development, and information must be made publicly available as to how the company plans to meet and be accountable for these best practices.

**Ensuring Offshore Oil and Gas Resources are Developed in a Scientifically Sound and Environmentally Responsible Way**

The BC Energy Plan includes actions related to the province’s offshore oil and gas resources. Since 1972, Canada and British Columbia have each had a moratorium in place on offshore oil and gas exploration and development. With advanced technology and
positive experiences in other jurisdictions, a compelling case exists for assessing British Columbia's offshore resource potential.

Government will work with coastal communities, First Nations, the federal government, environmental organizations, and others to ascertain the benefits and address the concerns associated with offshore oil and gas development.

**Maintaining B.C.'s Competitive Advantage as an Oil and Gas Jurisdiction**

British Columbia's oil and gas industry is thriving thanks to high resource potential, industry and service sector expertise, and a competitive investment climate that includes a streamlined regulatory environment. To attract additional investment in British Columbia's oil and gas industry, we need to compete aggressively with other jurisdictions that may offer lower taxes or other investment incentives.

Another key way to be more competitive is by spurring activity in underdeveloped areas while heightening activity in the northeast, where our natural gas industry thrives. The province will work with industry to develop new policies and technologies for enhanced resource recovery making it more cost-effective to develop British Columbia's resources.

By increasing our competitiveness, British Columbians can continue to benefit from well-paying jobs, high quality social infrastructure and a thriving economy.
British Columbia's Enormous Natural Gas Potential

The oil and gas sector will continue to play an important role in British Columbia's future energy security. Our province has enormous natural gas resource potential and opportunities for significant growth. The BC Energy Plan facilitates the development of B.C.'s resources.

British Columbia has numerous sedimentary basins, which contain petroleum and natural gas resources. In north-eastern British Columbia, the Western Canada Sedimentary Basin is the focus of our thriving natural gas industry. The potential resources in the central and northern interior of the province, the Nechako and Bowser Basins and Whitehorse Trough, have gone untapped.

First Nations, community groups, landowners and other key access and landowner rights issues. The stakeholders. In 2006, the Northeast Energy and Mines Advisory Committee (NEEMAC) was created to provide an inclusive forum for representative organizations to build relationships with each other, industry and government to provide input on Ministry policy, and recommend innovative solutions to stakeholder concerns.

Since its creation, NEEMAC has identified and explored priority concerns, and is beginning to find balanced solutions related to environmental, surface disturbance, access and landowner rights issues. The Ministry is committed to implementing recommendations that represent the broad interests of community, industry and government and expects that the committee will continue to provide advice on energy, mining and petroleum development issues in support of The BC Energy Plan.

The delayed evaluation and potential development of these areas is largely due to geological and physical obstructions that make it difficult to explore in the area. Volcanic rocks that overlay the sedimentary package combined with complex basin structures, have hindered development.

The BC Energy Plan is aimed at enhancing the development of conventional resources and stimulating activity in undeveloped areas such as the interior basins - particularly the Nechako Basin. It will also foster the development of unconventional resources and take a more stringent approach on coalbed gas to meet higher environmental standards.

Attracting Investment and Developing our Oil and Gas Resources

The BC Energy Plan promotes competitiveness by setting out a number of important regulatory and fiscal measures including: monitoring British Columbia’s competitive ranking, considering a Net Profit Royalty Program, promoting a B.C. service sector, harmonizing and streamlining regulations, and developing a Petroleum Registry to examine royalty and tenure incentives, and undertaking geoscience programs.

Establishment of a Petroleum Registry

The establishment of a petroleum registry that functions as a central database will improve the quality and management of key volumetric, royalty and infrastructure information associated with British Columbia’s oil and gas industry and promote competition while providing transparency around oil and gas activity.
Increasing Access

In addition to regulatory and fiscal mechanisms, the plan addresses the need for improving access to resources. Pipelines and road infrastructure are critical factors in development and competitiveness. The BC Energy Plan calls for new investment in public roads and other infrastructure. It will see government: establish a clear, structured infrastructure royalty program, combining road and pipeline initiatives and increasing development in under-explored areas that have little or no existing infrastructure.

Developing Conventional and Unconventional Oil and Gas Resources

To support investment in exploration, The BC Energy Plan calls for partnerships in research and development to establish reliable regional data, as well as royalty and tenure incentives. The goal is to attract investment, create well-paying jobs, boost the regional economy and produce economic benefits for all British Columbians. We can be more competitive by spurring activity in underdeveloped areas while heightening activity in the northeast where our natural gas industry thrives. The plan advocates working with industry to develop new policies and technology to enhance resource recovery, including oil in British Columbia.

Improve Regulations and Research

The province remains committed to continuous improvement in the regulatory regime and environmental management of conventional and unconventional oil and gas resources. The opportunities for enhancing exploration and production of tight gas, shale gas, and coalbed gas will also be assessed and supported by geoscience research and programs. The BC Energy Plan calls for collaboration with other government ministries, agencies, industry, communities and First Nations to develop the oil and gas resources in British Columbia.

Focus on Innovation and Technology Development

The BC Energy Plan also calls for supporting the development of new oil and gas technologies. This plan will lead British Columbia to become an internationally recognized centre for technological advancements and commercialization, particularly in environmental management, flaring, carbon sequestration and hydrogeology. The service sector has noted it can play an important role in developing and commercializing new technologies; however, the issue for companies is accessing the necessary funds.
**Technology Transfer Incentive Program**
A new Oil and Gas Technology Transfer Incentive Program will be considered to encourage the research, development and use of innovative technologies to increase recoveries from existing reserves and encourage responsible development of new oil and gas reserves. The program could recover program costs over time through increased royalties generated by expanded development and production of British Columbia’s petroleum resources.

**Scientific Research and Experimental Development**
The BC Energy Plan supports the British Columbia Scientific Research and Experimental Development Program, which provides financial support for research and development leading to new or improved products and processes. Through credits or refunds, the expanded program could cover project costs directly related to commercially applicable research, and development or demonstration of new or improved technologies conducted in British Columbia that facilitate expanded oil and gas production.

**Research and Development**
The BC Energy Plan calls for using new or existing research and development programs for the oil and gas sector. Government will develop a program targeting areas in which British Columbia has an advantage such as well completion technology and hydrogeology.

A program to encourage oil and gas innovation and research in British Columbia’s post-secondary institutions will be explored. These opportunities will be explored in partnership with the Petroleum Technology Alliance Canada and as part of the April 2006 Memorandum of Understanding between British Columbia and Alberta on Energy Research, Technology Development and Innovation.

Together with the Oil and Gas Centre of Excellence in Fort St. John, an oil and gas technology incubator, a site which provides innovators with space to build prototypes and carry out testing as well as providing business infrastructure and assistance accessing additional support will be established, allowing entrepreneurs to develop and test new innovations and commercialize new, innovative technologies and processes.

**Nechako Initiative**
The BC Energy Plan calls for government to partner with industry, the federal government, and Geoscience BC to undertake comprehensive research in the Nechako Basin and establish new data of the resource potential. It will include active engagement of communities and the development and implementation of a comprehensive pre-tenure engagement initiative for First Nations in the region. Specific tenures and royalties will be explored to encourage investment, as well as a comprehensive Environmental Information Program to identify baseline information needs in the area through consultations with government, industry, communities and First Nations.
By increasing our oil and gas industry’s competitiveness, British Columbians can continue to benefit from well-paying jobs, high quality social infrastructure and a thriving economy.

**Value-Added Opportunities**

To improve competitiveness, The BC Energy Plan calls for a review of value-added opportunities in British Columbia. This will include a thorough assessment of the potential for processing facilities and petroleum refineries as well as petrochemical industry opportunities. The Ministry of Energy, Mines and Petroleum Resources will conduct an analysis to identify and address barriers and explore incentives required to encourage investment in gas processing in British Columbia. A working group of industry and government will develop business cases and report to the Minister by January 2008 with recommendations on the viability of a new petroleum refinery and petrochemical industry and measures, if any, to encourage investment.

**Oil and Gas Service Sector**

British Columbia’s oil and gas service sector can also help establish our province as one of the most competitive jurisdictions in North America. The service sector has grown over the past four years and with increased activity, additional summer drilling, and the security of supply, opportunities for local companies will continue. Government can help maximize the benefits derived from the service sector by:

- Promoting British Columbia’s service sector to the oil and gas industry through participation at trade shows and providing information to the business community.
- Identifying areas where British Columbian companies can play a larger role, expand into other provinces, and through procurement strategies.

The government also supports the Oil and Gas Centre of Excellence at the Fort St. John Northern Lights College campus, which will provide oil and gas, related vocational, trades, career and technical programs.

**Improving Oil and Gas Tenures**

Government will work to improve oil and gas tenure issuance policies as well as develop new guidelines to determine areas that require special consideration prior to tenure approval by the end of 2007. This will provide clear parameters for industry regarding areas where special or enhanced management practices are required. These measures will strike the important balance between providing industry with clarity and access to resources and the desire of local government, communities, landowners, stakeholders and First Nations for input into the oil and gas development process.

**Create Opportunities for Communities and First Nations**

**Benefits for British Columbians from the Oil and Gas Sector**

The oil and gas sector offers enormous benefits to all British Columbians through enhanced energy security, tens of thousands of good, well-paying jobs and tax revenues used to help fund our hospitals and schools. However, the day-to-day impact of the sector has largely been felt on communities and First Nations in British Columbia’s northeast. Community organizations, First Nations, and landowners have communicated a desire for greater input into the pace and scope of oil and gas development in British Columbia.
Together with the Oil and Gas Centre of Excellence in Fort St. John, an oil and gas technology incubator will be established, allowing entrepreneurs to develop and test new innovations.

Through The BC Energy Plan, government intends to develop stronger relationships with those affected by oil and gas development, including communities and First Nations. The aim is to work cooperatively to maximize benefits and minimize impacts. The plan supports improved working relationships among industry, local communities and landowners by increased and improved communication to clarify and simplify processes, enhancing dispute resolution methods, and offering more support and information.

The government will also continue to improve communications with local governments and agencies. Specifically, The BC Energy Plan calls for efforts to provide information about increased local oil and gas activities to local governments, education and health service providers to improve their ability to make timely decisions on infrastructure, such as schools, housing, and health and recreational facilities. By providing local communities and service providers with regular reports of trends and industry activities, they can more effectively plan for growth in required services and infrastructure.

**Building Better Relationships with Landowners**

The BC Energy Plan: A Vision for Clean Energy Leadership also supports improved working relationships between industry, local communities and landowners and First Nations. Landowners will be notified in a more timely way of sales of oil and gas rights on private land. Plain language information materials, including standardized lease agreements will be made available to help landowners deal with subsurface tenures and activity. There will be a review of the dispute resolution process between landowners and industry by the end of 2007. The existing setback requirements, the allowed distance of a well site from a residence, school or other public place, will also be examined. These measures seek to strike the important balance between providing industry with clarity and access to resources and the desire of local government, communities, landowners, stakeholders and First Nations for input into oil and gas development.

**Working in Partnership with First Nations and Communities**

Government will work with First Nations communities to identify opportunities to benefit from oil and gas development. By developing a greater ability to participate in and benefit from oil and gas development, First Nations can play a much more active role in the industry. The BC Energy Plan also supports increasing First Nations role in the development of cross-cultural training initiatives for agencies and industry.
Leadership sets the standard for proactively addressing the opportunities and challenges that lie ahead in meeting the energy needs for all the citizens of the province, now and in the future. Appendix A provides a detailed listing of the policy actions of the plan. The BC Energy Plan will attract new investments, help develop and commercialize new technology, build partnerships with First Nations, and ensures a strong environmental focus.

British Columbia has a proud history of innovation that has resulted in 90 per cent of our power generation coming from clean sources. This plan builds on that foundation and ensures B.C. will be at the forefront of environmental and economic leadership for years to come.
ENERGY CONSERVATION AND EFFICIENCY
1. Set an ambitious conservation target, to acquire 50 per cent of BC HYdro's incremental resource needs through conservation by 2020.
2. Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia.
3. Encourage utilities to pursue cost effective and competitive demand side management opportunities.
4. Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation.
6. Undertake a pilot project for energy performance labeling of homes and buildings in coordination with local and federal governments, First Nations, and industry associations.
7. New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.
8. Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia's industrial sector.

ELECTRICITY
10. Ensure self-sufficiency to meet electricity needs, including "insurance" by 2016.
11. Establish a standing offer for clean electricity projects up to 10 megawatts.
12. The BC Transmission Corporation is to ensure that British Columbia's transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand.
13. Ensure adequate transmission system capacity by developing and implementing a transmission congestion relief policy.

ALTERNATIVE ENERGY
20. Establish the Innovative Clean Energy Fund to support the development of clean power and energy efficiency technologies in the electricity, alternative energy, transportation and oil and gas sectors.

30. Implement a provincial Bioenergy Strategy which will build upon British Columbia’s natural bioenergy resource advantages.
31. Issue an expression of interest followed by a call for proposals for electricity from sawmill residues, logging debris and beetle-killed timber to help mitigate impacts from the provincial mountain pine beetle infestation.
32. Implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.
33. Support the federal action of increasing the ethanol content of gasoline to five per cent by 2010 and adopt quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions.
34. Develop a leading hydrogen economy by continuing to support the Hydrogen and Fuel Cell Strategy for British Columbia.
35. Establish a new, harmonized regulatory framework by 2011 for hydrogen by working with governments, industry and hydrogen alliances.

OIL AND GAS
36. Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.
37. Establish policies and measures to reduce air emissions in coordination with the Ministry of Environment.
38. Best coalbed gas practices in North America. Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.
39. Enhance the Oil and Gas Environmental Stewardship Program, ensuring sound environmental, land and resource management.
40. Continue to work to lift the federal moratorium on offshore exploration and development and reiterate the intention to simultaneously lift the provincial moratorium.
41. Work with the federal government to ensure that offshore oil and gas resources are developed in a scientifically sound and environmentally responsible way.
42. Participate in marine and environmental planning to effectively manage marine areas and offshore oil and gas basins.
43. Develop and implement a comprehensive community engagement program to establish a framework for a benefits sharing agreement resulting from offshore oil and gas development for communities, including First Nations.
44. Pursue regulatory and fiscal competitiveness in support of being among the most competitive oil and gas jurisdictions in North America.
45. Enhance infrastructure to support the development of oil and gas in British Columbia and address impediments to economic development such as transportation and labour shortages.
46. Encourage the development of conventional and unconventional resources.
47. Support the growth of British Columbia’s oil and gas service sector.
48. Promote exploration and development of the Interior basins with a priority focus on the Nechako Basin.
49. Encourage the development of new technologies.
50. Add value to British Columbia’s oil and gas industry by assessing and promoting the development of additional gas processing facilities in the province.
51. Provide information about local oil and gas activities to local governments, education and health service providers to inform and support the development of necessary social infrastructure.
52. Work with First Nations to identify opportunities to participate in and benefit from oil and gas development.
53. Support First Nations in providing cross-cultural training to agencies and industry.
54. Improve working relationships among industry and local communities and landowners by clarifying and simplifying processes, enhancing dispute resolution methods, and offering more support and information.
55. Examine oil and gas tenure policies and develop guidelines to determine areas that require special consideration prior to tenure approval.
Energy in Action

POWERSMART
BC Hydro offers a variety of incentives to adopt energy saving technologies. Incentives such as rebates on efficient lighting or windows encourage British Columbians to improve the energy efficiency of their homes and businesses.

PROVINCIAL SALES TAX EXEMPTIONS
Tax breaks are offered for a wide variety of energy efficient items, making it easier to conserve energy. Tax concessions are in place for alternative fuel and hybrid vehicles as well as some alternative fuels. Bicycles and some bicycle parts are exempt from provincial sales tax, as are a variety of materials, such as Energy Star qualified windows, that can make homes more energy efficient.

NET METERING
The Net Metering program offered by BC Hydro for customers with small generating facilities, allows customers to lower their environmental impact and take responsibility for their own power production. The customer is only billed for the amount of energy used minus the total produced. Net Metering helps to move the province towards electricity self-sufficiency and expands clean electricity generation.

POWERING THE ECONOMY
The Oil and Gas sector invested $4.6 billion in B.C. in 2005 and contributed more to the provincial treasury than any other resource in 2005/06. In 2006, 1,416 oil and gas wells were drilled in the province and between 2002 and 2005, summer drilling increased 242 per cent.

FRIDGE BUY-BACK PROGRAM
This program offers customers $30 in cash and no-cost pickup and disposal of an old, inefficient second fridge. If all second operating fridges in B.C. were recycled, we would save enough energy to power all the homes in the city of Chilliwack for an entire year.

LIGHTING REBATES
This program offers instant rebate coupons for the retail purchase of Energy Star light fixtures and Energy Star CFLs (Compact Fluorescent Lights).

WINDMILLS
The Windmills Rebate Program offers rebates for the installation of Energy Star® wind turbines in new, renovated, or upgraded single-family homes, duplexes, townhouses, or apartments.

PRODUCT INCENTIVE PROGRAM
The Product Incentive Program provides financial incentives to organizations which replace inefficient products with energy efficient technologies or acid on products to existing systems to make them more efficient.

HIGH-PERFORMANCE BUILDING PROGRAM FOR LARGE COMMERCIAL BUILDINGS
Financial incentives, resources, and technical assistance are available to help qualified projects identify energy savings opportunities early in the design process, evaluate alternative design options and make a business case for the high-performance design, and offset the incremental costs, if any, of the energy-efficient measures in the high-performance design.

HIGH-PERFORMANCE BUILDING PROGRAM FOR SMALL TO MEDIUM COMMERCIAL BUILDINGS
Incentives and tools are offered to help owners and their design teams create and install more effective and energy-efficient lighting in new commercial development projects.

NEW HOME PROGRAM
Builders and developers are encouraged to build energy efficient homes by offering financial incentives and Power Smart branding for homes that achieve energy efficiency ratings.

ANALYZE MY HOME
BC Hydro offers an online tool that provides a free, personalized breakdown of a customer's home energy use and recommendations on where improvements can be made to lower consumption.

CONSERVATION RESEARCH INITIATIVE
A 12-month study in six communities that examines how adjusting the price of electricity at different times of day influences energy use by residential customers, and how individual British Columbians can make a difference in conserving power in their homes and help meet the growing demand for electricity in B.C.

THE GREEN BUILDINGS PROGRAM
Provides tools and resources to support school districts, universities, colleges, and health authorities to improve the energy efficiency of their buildings across the province.

ATTRACTING WORKERS
The Ministry of Energy, Mines and Petroleum Resources hosts job fairs across B.C. to attract workers to the highly lucrative oil and gas sector. Job fairs were held in 14 communities in 2005 and 16 communities in 2006 attracting thousands of people and resulting in hundreds of job offers. Centre of Excellence Government is partnering with industry and the Northern Lights College in Fort St. John to build a centre for oil and gas excellence, more than doubling the number of students training for jobs in the oil and gas industry.

CENTRE OF EXCELLENCE
Government is partnering with industry and the Northern Lights College in Fort St. John to build a centre for oil and gas excellence, more than doubling the number of students training for jobs in the oil and gas industry.

THE 100,000 SOLAR ROOFS FOR B.C.
The Ministry of Environment, Energy, Mines and Petroleum Resources are sponsoring the development of a plan that will see the aggressive adoption of solar technology in B.C. The goal of the project is to see the installation of solar roofs and walls for hot water heating and photovoltaic electricity generation on 100,000 buildings around B.C.

PARTNERING FOR SUCCESS
Since 2003, the Province of B.C. has partnered in the construction of 1.38 million new oil and gas road and pipeline infrastructure. The Sierra Yoyo Den Road public-private partnership implemented the road allowing year-round drilling activity in the greater Sierra natural gas play. The project was recognized with the Gold Award for Innovation and Excellence from the Canadian Council for Public Private Partnerships in 2004.

ENERGY EFFICIENT BUILDINGS: A PLAN FOR B.C.
This strategy will lower energy costs for new and existing buildings, by $127 million in 2010 and $474 million in 2020, and reduce greenhouse gas emissions by 2.9 million tonnes in 2020. The Province is implementing ten policy and market measures in partnership with the building industry, energy conservation groups, utilities, non-governmental organizations, and the federal government.
1. **Set an ambitious conservation target, to acquire 50 per cent of BC Hydro’s incremental resource needs through conservation by 2020.**

   Government has set a goal to reduce the growth in electricity demand so that, by 2020, 10,000 GWh of currently forecast needs will be met through demand reduction measures. This may include energy efficiency, conservation, and other demand side solutions like load displacement, fuel switching (e.g. solar hot water heating) and small distributed generation (e.g. net metering.) To put this goal in context, it represents about 20 per cent of the 52,000 GWh of electricity BC Hydro required in 2006 to meet the needs of British Columbians.

   This conservation target will be accomplished through BC Hydro aggressively pursuing and then exceeding its existing target to meet one-third of its forecast increase in requirements through demand reduction. In addition, new government policies and programs will support BC Hydro and other electricity and natural gas utilities in further reducing demand growth. This may involve clarifying the criteria the British Columbia Utilities Commission uses in its oversight of utility rates and other utility efforts designed to promote conservation.

2. **Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia.**

   British Columbia’s energy utilities, the Province, the federal government, the private sector, industry associations, non-profit organizations, local governments and First Nations are delivering a wide range of energy efficiency and conservation initiatives, including:

   • **Community Action on Energy Efficiency**  
   • **Energy Savings Plan**  
     http://www.saveenergynow.ca/
   • **Built Green BC**  
     http://www.chbabc.org/content.php?id=504
   • **BOMA Green Buildings Foundation**  
     http://www.greenbuildingsfoundation.org/
   • **Canada Green Building Council**  
     http://www.greenbuildingsfoundation.org/
   • **First Nation and Remote Community Clean Energy Program**  
     http://www.empr.gov.bc.ca/AlternativeEnergy/Alt_Energy_Home.htm
   • **BC Hydro’s Power Smart**  
     http://www.bchydro.com/powersmart/
   • **Terasen Gas**  
   • **FortisBC’s PowerSense program**  
     http://www.fortisbc.com/energy_efficiency/energy_efficiency_programs.html
Green Buildings BC
http://www.greenbuildingsbc.com/

Lighthouse Sustainable Building Centre
http://www.sustainablebuildingcentre.com/new_ici_murb_construction_initiative

ecoEnergy Efficiency Initiative (Natural Resources Canada Office of Energy Efficiency)
http://www.ecoenergy.gc.ca/

There is currently limited coordination of these numerous initiatives. If BC is to achieve its energy efficiency/clean energy goals, these programs and initiatives must work together in a coordinated and complementary manner. For example, some programs, such as targeting household space and water heating, may not be justified on the basis of either electricity savings or gas savings alone. However, a coordinated effort may be cost-effective.

The Ministry of Energy, Mines and Petroleum Resources will take the lead in working with key players to ensure that initiatives are coordinated, and that opportunities for joint initiatives are not missed.

3. Encourage utilities to pursue cost effective and competitive demand side management opportunities.

Energy efficiency is a critical piece of all BC utility resource plans. Through demand side management (DSM) actions, energy utilities play a vital role in promoting energy conservation with investments in energy efficient technologies and building designs along with capacity building measures with communities, trade allies, industry associations and consumer organizations.

Under the 2002 Energy Plan, the Utilities Commission Act was amended to ensure that utilities specifically considered demand reduction measures as a part of long term resource plans. Under this Energy Plan, utilities in BC are to pursue all cost-effective investments in demand side management. Cost-effective demand-side investments are those that are equal to or lower in cost than supply side resources. Utilities are also encouraged to develop a diversified portfolio of programs to ensure all ratepayers can benefit from these programs. In particular, program development should consider how to make DSM programs accessible to residential ratepayers across all income levels.

The Ministry of Energy, Mines and Petroleum Resources will monitor utilities' progress on energy efficiency and assess whether there are barriers to the implementation of reasonable and cost-effective programs. If required, the Ministry may consider and propose as needed regulatory measures. (e.g. directions to the Commission under the Utilities Commission Act) As well, the Ministry will assess whether additional measures are needed to ensure appropriate incentives are in place to encourage investor owned utilities to identify and pursue cost-effective DSM programs and to facilitate and promote better cooperation and coordination among energy utilities regulated by the BCUC.
4. **Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation.**

A key demand side management tool is pricing structures to either discourage consumption overall, or shift demand to less costly periods. The 2002 Energy Plan directed BC Hydro to develop stepped rates for industrial customers to ensure rates reflected the marginal cost of new supply and to encourage energy efficiency. These stepped rates came into effect on April 1, 2006.

The BC Energy Plan, with all utilities are encouraged to explore, develop and propose to the Commission additional innovative rate designs that encourage efficiency, conservation and the development of clean or renewable energy. These include stepped rates for other rate classes, interruptible/curtailable rates, critical period rates, clean electricity supply rates, tariffs focused on promoting energy efficient new construction and others. A part of this work should include consideration of the benefits of 'smart' or advanced metering technology, which offer potential for much greater consumption information and control being available to the consumer.

The Ministry of Energy, Mines and Petroleum Resources will monitor and assess progress on the development and implementation of price structures and advanced metering to encourage energy efficiency and conservation, and may propose additional regulatory measures (e.g. Special Directions) if required.

5. **Implement Energy Efficiency Standards for Buildings by 2010.**

Government will work with industry, local governments and other stakeholders to prepare and implement cost-effective energy efficiency standards for buildings. Provincial energy efficiency building standards are needed to achieve energy efficiency and conservation targets and to support the goal of self sufficiency, including commitments under BC Hydro's current Integrated Electricity Plan. Regulated standards for buildings are a central component of energy efficiency programs in leading jurisdictions throughout the world. Performance-based standards can effectively build upon the uptake of energy efficiency measures currently applied voluntarily by developers and supported by partnerships between government and industry associations.

The Ministry of Energy, Mines and Petroleum Resources will work closely with the Buildings Policy Branch of the provincial Office of Housing and Construction Standards to develop recommendations by the end of 2007 on specific energy efficiency standards for houses and buildings and the mechanisms for implementation. These may include incentives, voluntary targets and/or regulated requirements. With active participation of industry, utilities and other stakeholders, the goal is to introduce building standards no later than 2010, provided they are cost-effective to administer and implement.
6. Undertake a pilot project for energy performance labelling of homes and buildings in coordination with local and federal governments, First Nations, and industry associations.

Energy performance labelling supports increased energy efficiency by making the efficiency of buildings observable, in much the same way that the Energy Star and EnerGuide labels provide information for consumers on appliance energy use. Labelling also supports other policies and programs, such as energy-efficient mortgages, promotion of energy efficiency by realtors and property inspectors, and new utility incentives to promote energy efficiency upgrades of houses and buildings.

The Ministry of Energy, Mines and Petroleum Resources will work with utility, federal and local government and industry partners, to implement an expanded “Energy Savings Plan” pilot project that would evaluate the potential for widespread energy performance labelling of homes and buildings.

7. New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.

Buildings have many environmental impacts, including energy demand, water consumption, waste water production, the embodied energy of building materials, solid waste production, and in some cases, disposal of toxic materials. Buildings have impacts beyond their physical boundaries - orientation and height can impact on neighboring buildings by shading key solar resources, occupants’ impact on transportation systems, and greenfield construction can impact on food production.

The Climate Action Team will define a number of “indicators of integrated environmental design” (e.g., greenhouse gas, energy, water, building materials and transportation footprint). The indicators will be calculated on a regular basis by conducting audits of all existing, publicly funded buildings of a minimum size, and for all new construction projects. These include provincial government, school district, health authority, BC Housing, crown corporation and local government buildings with funding from the Province.

After completing the audits, prior to 2010, the Climate Action Team will establish targets for new integrated environmental design standards that will apply to all buildings that receive new funds from the Province, supporting the goal of the government of B.C. being carbon neutral by 2010. Reporting will be completed annually, including audits of all new buildings and “recommissioning” on a regular basis (e.g., every five years). Industry driven certification systems will be considered as a means of evaluating environmental performance.
For energy use, a carbon neutral target may require an aggressive deployment of advanced building designs that includes, but is not limited to:

- maximization of advantageous passive solar energy gains and daylighting,
- incorporation of high-performance windows,
- maximization of heat recovery from exhaust ventilation air, grey water and cooling equipment,
- use of the highest efficiency heating and cooling equipment and passive ventilation systems, and
- integration of smart building controls that promote energy and water conservation.

In addition, any greenhouse gas emissions created from the use of purchased energy supplies could be offset through leadership on transportation systems connected with buildings—supporting low- or zero-carbon employee transportation choices and/or locating buildings near amenities and workplace destinations to minimize the need for work-related vehicle travel.

The Province is already a leader in North America on low carbon building designs. For example, the BC Cancer Research Agency uses 50 per cent less energy than the model energy code for buildings. Taylor Park Elementary School in Burnaby uses 41.5 per cent less energy and 50 per cent of the site is landscaped with native vegetation requiring little or no irrigation. The 48,600 square foot Nicola Valley Institute of Technology in Merritt uses 35 per cent less energy with an efficient envelope, solar control, thermal mass and natural ventilation. A comprehensive post occupancy evaluation was conducted after this building had been occupied, involving interviews with the building designers and operators, a site visit, analysis of energy and water consumption data, and a satisfaction survey.

8. Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia's industrial sector.

Government will establish an Industrial Energy Efficiency Program for British Columbia to address challenges and issues faced by the BC industrial sector and support the Canada wide industrial energy efficiency initiatives led by the Council of Energy Ministers. The program will encourage industry driven investments in energy efficient technologies and processes; reduce emissions and greenhouse gases; promote self generation of power; and reduce funding barriers that prohibit energy efficiency in the industrial sector. Some specific strategies include developing a results-based pilot program with industry to improve energy efficiency and reduce overall power consumption and promote the generation of renewable energy within the industrial sector.

The Community Action on Energy Efficiency (CAEE) program provides financial and research support to BC local governments to advance the energy conservation and efficiency through local government policies and public outreach.

In 2007, a total of 29 communities in all regions of the province are participating. Each community has signed on to one or more of the Provincial targets for new and existing (public and private sector) buildings outlined in "Energy Efficiency Buildings: A Plan for BC," including residential, commercial, institutional and industrial buildings.

Phase 1 of CAEE was a jointly managed pilot project with Natural Resources Canada in 2004 and 2005 that engaged two local governments and a remote community. Support was provided towards human resources to advance energy efficiency objectives, including "one-stop-shop" information services.

Under Phase 2 of CAEE (early 2006) 15 communities were provided with $10,000 to implement energy efficiency policies. The Fraser Basin Council has provided policy research support to local governments that want to pioneer innovative energy efficiency initiatives through land use planning, development controls and educational/voluntary measures. In addition, Phase 2 of CAEE also provides funding for the "Energy Savings Plan," an education, labelling and incentive initiative that targets consumers and industry with the support of participating local governments.

Under Phase 3 of CAEE, announced on October 25, 2006, a total of $450,500 was directed to support new energy efficiency and community energy planning projects in sixteen communities throughout British Columbia. Each community will develop an energy efficiency program unique to its own needs and policies. These programs could address a range of leadership, voluntary and policy measures such as:

- Establishing energy commitments in the official community plan,
- Completing integrated energy, air quality and greenhouse gas action plans,
- Considering energy efficiency guidelines for building developers,
- Providing information to community residents, and
- Introducing green building policies.

The Province is also providing technical support to a number of CAEE communities through the "Green Buildings BC" initiative.

The First Nation and Remote Community Clean Energy Program was announced by MEMPR on November 23, 2006 in the northern community of Atlin, near the Yukon border. The program included pilot projects with ten communities to implement alternative and renewable energy supplies and energy efficiency measures. These include hydropower, wind, solar photovoltaics, energy efficiency and conservation measures.
Many remote communities rely on expensive diesel electricity supplies. In partnership with BC Hydro's Remote Community Electrification program, efforts have been made to improve the reliability and affordability of electricity systems, while maximizing energy conservation, efficiency and clean electricity supply options. The federal government contributed $3.863 million to support the program, along with significant financial support from communities and development partners.

The BC Energy Plan includes an expansion to additional local governments and remote and First Nation communities, with an aim to have 50 local governments and additional First Nations and remote communities in BC participating in CAEE by 2010, and 50 per cent of local governments and remote communities by 2016 (about 90 local governments and 30 remote communities).

The following communities are participating in CAEE and the First Nation and Remote Community Clean Energy Program:

- City of Abbotsford
- Atlin - Taku River Tlingit First Nation
- Municipality of Bowen Island
- City of Burnaby
- City of Campbell River
- Regional District of Central Kootenay
- Capital Regional District
- District of Central Saanich
- City of Dawson Creek
- Douglas First Nation
- City of Fort St John
- Hartley Bay - Gitga'at First Nation
- District of Houston
- Hupacasath First Nation
- City of Kamloops
- Village of Kaslo
- City of Kelowna
- Kitamaat Village - Haisla First Nation
- Klemtu - Kitasoo-Xaixais First Nation
- Kyuquot/Checklesaht First Nation
- City of Merritt
- Regional District of Nanaimo
- City of New Westminster
- City of North Vancouver
- Town of Oliver
- City of Port Moody
- City of Quesnel
- District of Saanich
- Salt Spring Island Trust
- Town of Smithers
- District of Squamish
- City of Surrey
- Treaty 8 Tribal Association
- City of Vancouver
- District of Vanderhoof
- City of Victoria
10. Ensure self-sufficiency to meet electricity needs, including “insurance”.

The Province wants to ensure that British Columbia has the reliable made-in-BC supply it needs to meet the growing demand for electricity, and that new resource acquisition is planned in a way that recognizes the long lead time and implementation risks associated with new power projects, and the challenges of forecasting future needs. In particular, for BC Hydro, the Province wants to ensure that BC Hydro has enough BC-based power at all times, even in low water years, to meet its customers’ electricity needs. Therefore, after implementing all cost-effective energy conservation opportunities, BC Hydro will acquire sufficient BC-based resources by 2016 so that BC Hydro can meet its customers’ needs even under critical water conditions. By 2026, BC Hydro will acquire 3,000 gigawatt hours of supply on top of their firm energy requirements (the energy required to meet customer needs under critical water conditions) and capacity resources needed to effectively integrate this energy in a cost-effective manner. The Province recognizes the ongoing importance of trade for maximising the value of BC Hydro’s heritage resources and for optimising its system, and this activity will continue. The British Columbia Utilities Commission will continue to have responsibility for regulating BC Hydro, within the context of the self-sufficiency requirement.

11. Establish a standing offer for clean electricity projects up to 10 megawatts.

The Province wants to facilitate the development of distributed clean electricity generating projects in British Columbia to support its goal of self-sufficiency and help promote B.C. innovation. The Province is concerned about the size of the administrative burden for small project proponents to bid on BC Hydro calls. For this reason, this policy directs BC Hydro to develop a program, in consultation with stakeholders, to purchase, continuously or in regular offer windows, electricity from projects with a capacity of 10 MW or less. The Standing Offer will allow small projects to sell power to BC Hydro at a fixed price and with standard contract terms and conditions. A Standing Offer Program would be in addition to planned Calls for Power from larger projects. The Program design will be subject to the review and approval of the BCUC.

The Province has established the following general principles to guide the design of the Program:

- Simplify the process, contract terms and conditions for small power projects in BC;
- Competitive pricing for these projects relative to other supply sources; and
- Ensure cost-effectiveness, transparency, and fairness of the Program.

Some specific design guidelines are as follows:

- Except for local safety and security reasons, there should be no quota initially for the Standing Offer program.
- The product should be contractually non-firm energy.
- Proponents should not be required to pay a deposit for the Standing Offer program, although BC Hydro may establish other eligibility and security requirements, subject to approval from the BCUC. BC Hydro may also limit the maximum length of time a proponent has between receiving a contract and commercial operating date (COD).
- Transmission or distribution connected projects of 10 MW or less, and either clean, renewable or co-generation with an overall efficiency (heat and electricity production) in excess of 80 per cent will be eligible for the program.
- BC Hydro will absorb transmission / distribution network upgrade costs for individual projects subject to a cap established in consultation with stakeholders and approval from the BCUC, after which project proponents may be required to pay for additional network upgrade costs.
The price should be transparent, simple, and based on the most recent call results and updated regularly, but not more than annually.

- BC Hydro will retain any rights and incentives associated with the green attributes, as well as any credits associated with greenhouse gas emissions (GHG). The clean or alternative electricity acquired will contribute to maintaining the Province's standard of having 90 per cent of BC's electricity generated being clean or renewable.

In addition, to ensure even treatment of new supply acquired through BC Hydro's net metering program and the Standing Offer approach, Government will issue a direction to the Commission that BC Hydro makes appropriate changes to its net metering program. This will ensure the price paid for net annual surpluses of generation 'purchased' by BC Hydro is generally consistent with the prices paid in the Standing Offer program.

12. The BC Transmission Corporation is to ensure that British Columbia's transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand.

The BC Transmission Corporation's investments in advanced control and monitoring technologies increase the capacity of existing assets by enabling more precise operation of the transmission system. By taking a broader and more progressive approach to transmission planning, BCTC will also be able to ensure that new transmission infrastructure will be in place to reliably meet the province's future electricity needs.

Since its inception, BCTC has planned system upgrades and new transmission projects in response to a customer's request. Transmission projects, however, require longer lead and construction times than generation or load build. The experience of other jurisdictions with this type of planning approach is that transmission capacity is often not in place when it is needed.

To prevent this situation from occurring in British Columbia, BCTC will move beyond this contract driven approach to an approach that builds infrastructure in advance of need. The BC Transmission Corporation will study and propose, where appropriate, system upgrades or expansions based, in part, on its own assessment of future market needs. Three types of transmission projects will benefit from this approach:

- a planned system upgrade for a Network Customer already identified in the BCTC Capital Plan that can be beneficially advanced in time;
- a system upgrade required for a customer that can beneficially be made larger than the immediate requirement; and
- a project that BCTC identifies as having future benefits, but which has not been triggered by a customer request.

BCTC will identify this third type of project through an annual project review designed to identify possible projects that would be viable as a BCTC led investment.

BCTC will only proceed with an upgrade or expansion project after completion of a strong business case that identifies the costs and benefits of the proposed project, completion of thorough stakeholder and First Nation consultations, and receiving all necessary regulatory approvals.
13. Ensure adequate transmission system capacity by developing and implementing a transmission congestion relief policy.

The congestion-relief policy will support the priorities of energy security and self-sufficiency by ensuring full and adequate transmission infrastructure is available at all times, and across all regions, of BC’s electricity grid.

By implementing a congestion-relief planning regime, and by designating specifically-defined infrastructure projects as congestion-alleviating, Government will ensure that BC’s transmission system is developed in a timely manner, is able to support optimum energy security and economic growth, and BC Hydro achieves electricity self-sufficiency. Specifically-defined infrastructure projects will ensure a transmission system robust enough to support the most efficient use of generation resources from a province-wide perspective.

Government will work with BCTC to create and implement the congestion-relief policy. This policy will guide transmission system planning on the basis of cost-effectively removing existing system congestion and constraints, and maintaining that state. This will be accomplished through specifically-defined transmission infrastructure upgrades or expansions, planned from the perspective of meeting and maintaining an un-congested system. This stands in contrast to the current regime of project planning based on specific customer-driven requirements, or opportunities identified through BCTC’s current Expansion Policy. The policy will define the specific approach to identifying congestion-relieving priority projects.

Other jurisdictions have employed similar policies designed to get congestion out of a system. For example, Alberta has policies requiring zero congestion and transmission solutions. The United States has passed legislation (as part of the Energy Policy Act), to permit the Federal Energy Regulatory Commission to solve persistent and damaging congestion.

14. Ensure that the province remains consistent with North American transmission reliability standards.

Government will commit to ensure that industry developed reliability standards are introduced in British Columbia, cost-effectively and in a manner that respects BC’s regulatory sovereignty.

The analysis of recent large-scale electricity blackouts has confirmed the value of common and mandatory reliability standards for the electricity industry. New North American standards are emerging from the North American Electric Reliability Council, an industry body made up of technical experts from Canada and the United States. British Columbia will follow the industry practice of making these common standards mandatory for users, owners, and operators of the bulk power transmission system in BC. Consultations with industry will be undertaken to discuss the options for BC to implement these standards.

The BC Utilities Commission will determine, set and enforce reliability standards in the province, and can approve variances if it determines that a variance is appropriate. This approach is consistent with steps taken by other Canadian jurisdictions.
15. **Continue public ownership of BC Hydro and its heritage assets, and the BC Transmission Corporation.**

The BC Energy Plan upholds and confirms the 2002 Energy Plan's fundamental principle of public ownership of BC Hydro, its heritage assets, and the BCTC.

Under the 2002 Energy Plan, the government passed the *BC Hydro Public Power Legacy and Heritage Contract Act* to ensure continued public ownership of BC Hydro and its heritage assets, including BC Hydro's generation, distribution and transmission systems. While BC Hydro retains ownership of the transmission system, the *Transmission Corporation Act* dealt with the transfer of transmission operation, management and planning responsibility to BCTC. The *Transmission Corporation Act* included the stipulation that BCTC must be 100 per cent owned by government and cannot be sold.

These protections remain in place to continue to ensure public ownership of these corporations and assets.

16. **Establish the existing heritage contract in perpetuity.**

The 2002 Energy Plan recognized that BC Hydro's heritage assets represent valuable provincial assets yielding a substantial return for BC Hydro ratepayers in the form of low cost electricity generation. Energy Plan 2002 included policy actions to secure that benefit.

The *BC Hydro Public Power Legacy and Heritage Contract Act* provided enabling legislation to allow Government to require a "Heritage Contract" ensuring the electricity generated by the heritage assets continues to be available to BC Hydro ratepayers based on cost of service. The Heritage Contract ensures BC Hydro ratepayers receive heritage power that are based on costs of generation, not market prices. The Heritage Contract was implemented by the Heritage Contract Special Direction #2.

The Heritage Contract includes a provision stating the Contract may be terminated with 5 years notice if notice is given any time after April 1, 2009. While no official 'end date' to the Heritage Contract exists, the language of the contract implies the potential for termination and thus creates uncertainty. Government will re-affirm and strengthen its commitment to the Heritage Contract though amendments addressing this uncertainty.

17. **Invest in upgrading and maintaining the heritage asset power plants and transmission lines to retain the ongoing competitive advantage these assets provide to the province.**

Thanks to the valuable investment made in heritage assets by previous generations of British Columbians, BC Hydro ratepayers today reap substantial benefits from this low cost, reliable, flexible electricity system.

As with Energy Plan 2002, BC Hydro will continue to pursue efficiency improvements and upgrades to its existing assets under its 'Resource Smart' program. In addition, BC Transmission Corporation will continue to plan for enhancements required to support the transmission system. The British Columbia Utilities Commission will continue to oversee the resource plans of these utilities and approve the projects it deems to be cost effective and in the public interest.
18. All new electricity generation projects will have zero net greenhouse gas emissions.

Currently, electricity accounts for only a small portion (around 3 per cent in 2004) of the province's overall GHG emissions. This Energy Plan maintains the low greenhouse gas intensity of the electricity sector.

In The BC Energy Plan, government commits that all new natural gas or oil fired electricity generation projects developed in BC and connected to the integrated grid will have zero net GHG emissions. This means that the proponents of these generation projects would have to invest in other initiatives that would completely offset the GHG emissions generated by these projects, unless the technology was available to eliminate or capture and store the emissions from the plant.

The cost of this measure will depend on the province's offset policy, which will be developed over the next several months. The Ministry of Environment, in consultation with MEMPR, will be responsible for leading the development of the offset policy, as well as all necessary regulatory and legislative changes. The policy may include the option of contributing to the Innovative Clean Energy Fund as an alternative to investing in offset projects.


To ensure consistent treatment between new and existing generation projects, while allowing time to plan for this change, The BC Energy Plan commits that by 2016, all existing natural gas and oil fired electricity generating facilities in the integrated grid will need to completely offset their GHG emissions.

20. Require zero greenhouse gas emissions from any coal thermal electricity facilities.

The BC Energy Plan stipulates that coal-fired generation must meet a zero emission standard, through a combination of "clean coal" fired generation technology, carbon sequestration and offsets for any residual GHG emissions. Through technology that allows the carbon dioxide to be captured from the plant and "stored", coal fired generation can have 'near zero' GHG emissions. There is considerable investment, both nationally and internationally, in the development of this technology, which many believe will be commercially available in the next decade.

21. Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.

Currently in BC, about 90 per cent of electricity is from clean or renewable resources. Under The BC Energy Plan, Government commits to maintain this high standard – which places us among the top jurisdictions in the world. Government will issue guidelines to define what sources qualify as clean or renewable, and will provide additional policy guidance and directions, as needed, to ensure BC continues to meet this standard.
22. Government supports BC Hydro's proposal to replace the firm energy supply from the Burrard Thermal plant with other resources. BC Hydro may retain Burrard for capacity purposes after 2014.

As a part of its Integrated Electricity Plan, BC Hydro has a plan to replace the firm energy from Burrard Thermal by 2014. The proposed approach by BC Hydro is consistent with Government's desire to see Burrard Thermal phased out. The government recognizes that the value of the capacity and voltage support provided by Burrard Thermal may warrant continuing to keep Burrard Thermal available if needed for peaks in demand (for example, resulting from cold winter weather, Christmas lighting, to deal with other resources being unexpectedly unavailable, etc.). These may continue to be appropriate longer term roles for Burrard if that Burrard Thermal continues to be a cost effective voltage support and capacity resource.

23. No nuclear power.

British Columbia's 2002 Energy Plan had environmental responsibility and no nuclear power sources as one its cornerstones. The BC Energy Plan continues the Province's commitment that nuclear power is not a part of BC's energy future. The financial and environmental problems experienced in other jurisdictions that have invested in nuclear power continue to make it a risky proposition. The government rejects nuclear power as a strategy to meet British Columbia's future energy needs.

24. Review BC Utilities Commission's role in considering social and environmental costs and benefits.

The BC Energy Plan explicitly recognizes that low costs means more than least financial costs. Environmental, social and economic development objectives of the province are also values that need to be considered in determining whether utilities' plans and programs serve the public interest. Some stakeholders argue that the BC Utilities Commission does not take full consideration of this broader perspective when regulating utilities. Others argue that environmental, social and environmental policy properly rests with the province, and not the regulator.

A policy action of The BC Energy Plan is to review the BC Utilities Commission's role in considering social, environmental and economic costs and benefits as a part of its regulatory framework.
25. Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources.

BC Hydro, with stakeholder input, will develop an approach to allow for the recognition of any additional value associated with intermittent clean or renewable energy projects including portfolio benefits, for the purposes of evaluating these generators’ capacity and firm energy output in its energy calls and acquisition processes. Intermittent resources are those for which the ‘fuel’ supply to the generator (e.g. the wind or the water flow) is not always available and cannot be ‘ordered’ when needed.

BC has substantial potential to develop green resources such as wind and small-hydro, and doing so is an objective of The BC Energy Plan. The intermittent, seasonal and non-dispatchable nature of these resources tends to make their output less valuable compared to the output from coal, natural gas, or biomass-fired plants that can generate on a consistent basis or can be dispatched or displaced based on short-term demand and market conditions. Wind and run of river small-hydro generators also provide a less valuable product individually than do large hydro facilities with storage, since these large hydro facilities combine flexibility benefits with the “firmness” attributes of thermal generation resources. Finally, there are challenges to manage and integrate intermittent resources into the electricity delivery system that can require study (and related costs) and potentially additional infrastructure costs.

However, when the combined output from a portfolio of clean or renewable resources is considered, there may be advantages associated with the diversification of these resources that could increase the value of their combined output relative to when their outputs are considered individually. For example, the overall firmness (predictability) of a diverse portfolio of intermittent resources may be higher than the firmness of individual resources within the portfolio, especially if the output of the resource portfolio is composed of different types of resources and/or resources from different regions. When intermittent generators are viewed in this aggregated way, their value may be higher. Any net increase in value should be reflected in the choices made by BC Hydro when determining which resources are required to meet its needs, and in determining how to value these resources.

This policy is in no way intended to give preference to intermittent resources or establish a pre-defined target for intermittent energy. It is simply intended to ensure a level playing field among different resource types in order to reduce the overall cost to ratepayers of meeting growing demands and standards for clean or renewable electricity.
26. Work with BC Hydro and parties involved to continue to improve the procurement process for electricity.

BC Hydro's energy procurement plays a critical role in the reaching Government's self-sufficiency objective, as well as meeting the Government's objects for competitive rates, clean or renewable electricity, the development of a vibrant and competitive IPP sector and other fiscal and provincial policy objectives. As such, it is important that all parties – IPPs, BC Hydro, BC Hydro's customers who pay the costs through their rates, and the BC Utilities Commission – are satisfied that the approach used by BC Hydro, and the terms and conditions in BC Hydro's power purchase contracts, meet the objectives set out in this policy.

BC Hydro's efforts to design call processes must take into account the diversity of potential resource types available in British Columbia (small, large, firm intermittent, conventional and alternative) and the multiple issues that are related to or can affect policy objectives. These include penalties for non-performance, risk allocation, pricing, contract length and renewability provisions.

In addition, not all projects will necessarily fit into a call for power type process. BC Hydro needs the flexibility to utilize different procurement approaches so that it is able to acquire new supply in the most appropriate manner. However, given a call process is a transparent, competitive process, the prices, terms and conditions of these call processes serve as a useful guide to BC Hydro in its acquisition of resources through the standing offer and net metering, bilaterally negotiated contracts, request for proposals and other processes.

Under the current regulatory process, the Commission is able to evaluate BC Hydro's procurement approach before the fact under its general authority, and it can reject BC Hydro's tender results and/or contract terms after the fact in approving contracts under Section 71 of the Utilities Commission Act.

To ensure the procurement processes are consistent with provincial energy policy, the Ministry of Energy, Mines and Petroleum Resources (MEMPR) will continue to participate in the discussions regarding the design of BC Hydro's procurement processes, and will be able to respond more promptly to any policy issues that arise. In addition, MEMPR will consider if regulatory or other changes are advisable.

MEMPR's engagement will add certainty and stability to BC Hydro's call processes by ensuring they are consistent with energy policy objectives. The goal is to establish a transparent and well-understood regulatory regime for reviewing BC Hydro's procurement processes, both before and after the fact.
27. Pursue BC Hydro's planned Remote Community Electrification Program to expand or take over electricity service to remote communities in British Columbia.

There are approximately 50 permanent remote communities in BC that are self-reliant or reliant on a third party for electric power; the vast majority of these are First Nations communities. For many of these communities, electricity service is characterized by sub-standard reliability, provided by ageing assets that are poorly maintained and highly inefficient, and creates significant environmental risks related to diesel emissions and fuel handling.

Over the next 10 years, BC Hydro will pursue its remote community electrification program (RCE) to expand its service to remote communities that meet specific criteria and that are seeking service from BC Hydro. Service to these communities will be provided under BC Hydro's Zone 2 tariff. (The Zone 2 tariff is used to service BC Hydro's existing Non-Integrated Areas.) Costs will be recovered from currently-responsible agencies - such as the Department of Indian and Northern Affairs - and BC Hydro ratepayers.

28. Ensure BC Hydro considers alternative electricity sources and energy efficiency measures in its energy planning for remote communities.

Remote communities and Non-Integrated Areas tend to rely on diesel generation for electricity supply with high operating costs. Given the environmental and economic issues associated with this type of generation, the business and social case for pursuing clean electricity and energy efficiency solutions in remote communities is much stronger than in other areas of the Province. These solutions should not be overlooked when considering service options for remote communities.

BC Hydro will work with the Ministry of Energy, Mines and Petroleum Resources (MEMPR) to develop community energy plans (CEP) prior to extending service to remote communities under its Remote Community Electrification program. In addition, BC Hydro will develop community energy plans when it is considering renewal or replacement of diesel generators in Non-Integrated Areas, or in other circumstances where unique opportunities are evident. CEPs will consider all cost-effective solutions to meet the electricity needs of the remote community, including energy efficiency, alternative energy solutions and integration with the main grid. In addition, the CEPs will seek to integrate with plans for skills training and local economic development opportunities.
29. Establish the Innovative Clean Energy Fund to support development of clean power and energy efficiency technologies in the electricity, alternative energy, transportation, and oil and gas sectors.

Government support for the advancement of energy technologies through the pre-commercial development stage can play a critical role in their early and successful uptake by the marketplace. British Columbia will take a leadership role in advancing innovation in its energy technology sectors, both conventional and emergent, through the establishment of an Innovative Clean Energy Fund.

The Fund will be administered by the Ministry of Energy, Mines and Petroleum Resources with the input and advice of an industry-government advisory body.

Projects supported by the Fund will:

- Address specific British Columbia energy and environmental problems that have been identified by government
- Showcase BC technologies that have a strong potential for international market demand in other jurisdictions because they solve problems that exist both in BC and other jurisdictions
- Support pre-commercial energy technology that is new, or commercial technologies not currently used in British Columbia
- Demonstrate commercial success for new energy technologies.

The development process of new technology evolves through many different phases, and the type of support needed in each phase varies significantly. For example, emerging technologies in the basic research, development and demonstration phases (e.g., fuel cells and wave/tidal energy) may need partnerships among industry, academia and government to help fund the necessary work to carry them to commercialization. Other examples include technologies that are already commercial but require more widespread adoption (e.g., wind energy). These technologies may require other types of assistance, such as the dissemination of information and technology transfer, or government taking leadership in applying the technologies in government operations. Lastly, those technologies with developed markets (e.g., fossil fuels and hydropower) may require sustained private sector investment in order to support local manufacturing and maintain employment levels.

Examples of energy resources, technologies and systems that may be considered under the Fund include:

- Renewable resources (e.g., biomass; ocean/hydro, solar, wind, geothermal)
- Improvements in the development and use of non-renewable resources (i.e., conventional and unconventional oil and natural gas)
- Energy carriers and storage (e.g., hydrogen, fuel cells)
- Gasification
- Carbon capture and sequestration
- Emissions management
- Energy systems integration
- Power measurement and management
- Energy efficiency and conservation
- Transportation (e.g., engine, vehicle and alternative fuel technologies)
- Fuels (e.g., biodiesel and ethanol)
- Waste energy capture and utilization
30. Implement a provincial Bioenergy Strategy which will build upon British Columbia's natural bioenergy resource advantages.

British Columbia is blessed with significant biomass resources such as woody debris, agricultural crop residues, animal manure and organic municipal wastes that can be used to produce heat, electricity, liquid fuels and other forms of energy. These resources are renewable, well-distributed throughout the province, and suitable for either large-scale or smaller, community-based energy production opportunities. Wood pellet production, wood-fired electricity generation and cogeneration are already well established in British Columbia, with wood gasification, liquid biofuel production and other bioenergy/biorefining technology also well positioned to play a significant role in British Columbia's energy future.

The provincial Bioenergy Strategy, which builds upon The BC Energy Plan and other provincial initiatives, will help advance British Columbia's bioenergy development opportunities in the near- mid- and long-term, while also promoting diversity and competitiveness in the province's forestry and agriculture sectors, and strengthening regions and communities throughout the province.

31. Issue an expression of interest followed by a call for proposals for electricity from sawmill residues, logging debris and beetle-killed timber to help mitigate impacts from the provincial mountain pine beetle infestation.

British Columbia has an abundance of underutilized wood residues, in the form of sawmill residues, logging debris and a growing supply of timber killed by the Mountain Pine Beetle (MPB) that will become less usable for conventional forest products over time. While British Columbia currently leads the nation in wood energy production and consumption, with about 50 per cent of Canada's biomass electricity generating capacity, it is estimated that about 1.2 million bone-dry tonnes (BDt) of mill residues per year are incinerated in beehive burners in the province with no energy recovery and adverse impacts on local air quality. There are about seven million BDt per year of logging residues in the Central Interior, and recent estimates indicate that the Mountain Pine Beetle infestation has already killed over one-third of the merchantable pine volume in the province. It is further estimated that 80 per cent of the merchantable pine will be dead by 2013, with the bulk of that damage (75 per cent) occurring before 2010. Estimates of non-recoverable losses vary between 200 and 500 million cubic meters, which equates to roughly 400 million to 1 billion BDt. These resources, and abundant wood residues in other regions throughout the province, present a significant opportunity for increased bioenergy production in British Columbia.

In order to encourage greater development and use of "home-grown," wood-fired electricity in the province, and to help address the MPB emergency and capture value from the affected timber, the government will instruct BC Hydro to issue an expression of interest followed by a call for proposals for electricity generated from wood residue and MPB timber. The terms of the call will be developed by BC Hydro in consultation with the Ministry of Energy, Mines and Petroleum Resources and the Ministry of Forests and Range, with input from the forest and energy sectors.
32. Implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.

In Spring 2006, the federal government announced its intention to proceed with a two percent national average renewable fuel standard (RFS) in Canada's diesel fuel no later than 2012. British Columbia will move beyond the federal RFS by adopting a five per cent biodiesel requirement in provincial diesel fuel supplies by 2010.

33. Support the federal action of increasing the ethanol content of gasoline to five per cent by 2010, and adopt quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions.

In Spring 2006, the federal government announced its intention to proceed with a five per cent average national renewable fuel standard (RFS) in Canada's gasoline by 2010, and a two per cent national average RFS for Canada's diesel fuel no later than 2012. British Columbia is supportive of the national RFS to help reduce transportation-related air emissions and advance the renewable fuel industry in Canada, and will move beyond the federal RFS by adopting a five per cent biodiesel requirement in provincial diesel fuel supplies by 2010.

The Council of Energy Ministers (CEM) Renewable Fuels Working Group was established in September 2000 to advance the development and use of renewable fuels in Canada. This group, comprised of federal, provincial and territorial government officials, works together and in consultation with industry and other stakeholders to:

- Address issues such as closing information gaps and phasing out inter-provincial trade barriers;
- Coordinate existing and future programs to avoid inefficiencies;
- Collectively address competitiveness issues with the United States and other jurisdictions;
- Encourage cooperation and economies of scale for next-generation technology commercialization; and
- Facilitate policy work among jurisdictions.

British Columbia will continue to represent its interests at the CEM Working Group and help to implement the federal RFS in British Columbia by 2010.

Critical to the reliability and acceptance of renewable fuels in Canada is the adoption of fuel quality parameters for renewable fuels and fuel blends. Currently, requirements for biofuels to respect recognized product quality standards are not mandated; however, generally accepted production and procurement standards exist. Two standards generally accepted in North America are:

- ASTM D6751 - the American standard that covers pure biodiesel (B100), for blending with petrodiesel in levels up to 20 per cent by volume; and
- CGSB for B1 to B5 - the Canadian General Standards Board set a biodiesel standard for biodiesel blends between one and five per cent.

Adherence to regulated quality parameters will provide both consumers and petroleum companies with the confidence required to purchase and distribute biofuels. This is especially important for biodiesel and biodiesel blends. In the case of biodiesel, there are several technical requirements that must be addressed in blending, transport, and distribution in order to provide a fuel with uncompromised integrity.
34. Develop a leading hydrogen economy by continuing to support the Hydrogen and Fuel Cell Strategy for British Columbia.

British Columbia is a leader in hydrogen and fuel cell technologies – with the largest cluster of companies in Canada. The sector employs around 1,200 people in British Columbia. In 2003, Premier Gordon Campbell announced “Our goal is to develop the hydrogen and fuel cell sector to make British Columbia the world’s leading hydrogen economy by 2020”. The primary vehicle to achieve this goal is the British Columbia Hydrogen and Fuel Cell Strategy. The Strategy is an industry initiative, which seeks to accelerate the demonstration, deployment and commercialization of hydrogen and fuel cell technologies. The unifying vision of the strategy is the Hydrogen Highway initiative. In March 2005, British Columbia provided a $2 million grant to industry, which is administered by Hydrogen and Fuel Cells Canada. More than $110 million in investment activity in hydrogen and fuel cells in British Columbia has been announced since the award of this grant, including more than $30 million in federal funding.

35. Establish a new, harmonized regulatory framework by 2010 for hydrogen by working with governments, industry and hydrogen alliances.

Hydrogen technology has the potential to offer tremendous economic and environmental benefits for British Columbia. British Columbian companies have established a global market presence and Canadian hydrogen demonstration projects are being watched by international observers and consortiums. The “Hydrogen Highway” will be showcased during the upcoming 2010 Olympic and Paralympic Winter Games.

British Columbia is recognized as a North American expert in hydrogen regulatory frameworks. Regulatory reform leadership is needed to remove trade barriers and offer industry transparency. A new, harmonized regulatory framework will be developed to promote the emerging hydrogen economy and enable British Columbia’s industry to maintain its competitive edge in the global market. Key actions to establish a regulatory framework for hydrogen include:

- Determine how existing and future regulations apply for hydrogen products;
- Determine appropriate codes and standards;
- Link legislative areas across different jurisdictions; and
- Hold stakeholder workshops.

The Province will work with Canadian jurisdictions and international participants (e.g., International Standards Organization, International Electro-Technical Commission and the UN / Global Technical Regulations) towards a harmonized framework.
36. Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.

Reducing flaring is an issue for many jurisdictions and the World Bank is leading a Global Gas Flaring Reduction Partnership.

The province has set a goal of reducing routine flaring at producing wells and production facilities by 50 per cent in five years and eliminating all routine associated gas flaring in 10 years. Routine associated gas flaring is considered gas that meets an economic threshold for conservation. Operators will be required to perform an economic analysis of all sources of continuous solution gas flaring and subsequently tie in any gas that shows a net present value greater than zero.

Currently, the Province does not receive a royalty for gas that is flared, consequently incentives designed to reduce flaring will be considered.

Reduce routine flaring at producing wells and production facilities.

The primary purpose of flaring is to act as a safety device to protect vessels or pipes from overpressuring due to unplanned upsets and maintenance. This acts just like the spout on a tea-kettle when it starts whistling as the water in it starts boiling. A small amount of gas is continuously burned, like a pilot light, so that in the event of over-pressure, it is always ready to flare gas.

In British Columbia, the total amount of flared gas for 2004 was approximately 250 million cubic metres (m$^3$) broken down by the following categories:

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount of Gas Flared, million m$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Plant</td>
<td>35.0</td>
</tr>
<tr>
<td>Well Testing</td>
<td>72.4</td>
</tr>
<tr>
<td>Under-balanced Drilling</td>
<td>89.0</td>
</tr>
<tr>
<td>Associated Gas</td>
<td>37.9</td>
</tr>
<tr>
<td>Gas Gathering</td>
<td>14.0</td>
</tr>
<tr>
<td>Total</td>
<td>248.3</td>
</tr>
</tbody>
</table>

Of the associated gas, about two thirds is continuous (i.e. not upset or emergency) flaring. Although well test flaring is necessary, there is some work that can be done to help standardize allowed flare volumes and durations which may result in some improvements. There may be limited opportunities to reduce flaring during under-balanced drilling. Flaring at gas plants occurs as a result of process upsets, emergencies and plant maintenance. In Alberta, the regulator has implemented some requirements for planned shut downs and identification of causes of recurring upset flaring. There may also be scope to reduce flaring at gas plants in British Columbia, working with operators and the federal regulator, the National Energy Board, which regulates many of the gas plants in British Columbia.
Reduce the flaring and venting of natural gas at test sites, well sites and on pipelines, and eliminate the growth of fugitive gases.

The Ministry will work with industry to develop policies and strategies to reduce the flaring of natural gas at test sites, well sites and on pipelines, and eliminate the growth of fugitive gases and venting. Similar tools as those to reduce routine flaring will be pursued.

37. Establish policies and measures to reduce air emissions in coordination with the Ministry of Environment.

Fossil fuel industries in British Columbia account for approximately 18 per cent of greenhouse gas air emissions in the province. Environment Canada data suggests that the main sources of air emissions from the oil and gas sector are: flaring, fugitive gases, gas processing and compressor stations. In the late 1990's, the amount of gas flared declined as a result of new practices. With increased drilling activity, the amount of gas flared has stabilized. There are also limited unexploited cogeneration opportunities at compressor stations to capture waste heat and generate electricity or use the heat in other applications. Actions to reduce flaring, fugitive gases, increase compressor station efficiency and acid gas reinjection and sequestration are expected to reduce emissions to below 2000 levels.

Development of policies and measures to augment anticipated federal government policies will be part of this initiative.

Develop policy guidelines and identify regions in British Columbia which are suitable for the underground disposal of acid gas.

Disposal of acid gas to underground formations is sometimes a cost effective alternative to sulphur recovery and reduces flaring and emissions.

The Ministry will develop a policy for acid gas disposal based on the underground storage legislation, which has provisions for assigning long-term responsibility through tenuring and licensing arrangements. Currently, acid gas (primarily hydrogen sulphide and carbon dioxide) is being disposed of in depleted gas reservoirs without clearly assigning long term responsibility through tenuring and licensing arrangements.

The Ministry will conduct an assessment of suitable regions in BC for acid gas injection and identify opportunities to facilitate industry activities. Legislation and regulations from other jurisdictions will be reviewed and an appropriate framework will be proposed by 2008/09 or sooner.
Explore opportunities and new technologies to develop underground disposal of carbon dioxide (sequestration or carbon capture and storage).

Geological carbon sequestration involves disposing of carbon dioxide safely and permanently in carefully selected underground locations. There are opportunities to dispose of carbon dioxide into depleted gas reservoirs or specific formations with saline water, or to use the carbon dioxide to enhance oil recovery.

Currently there are more than 50 sites in western Canada for reinjection and permanent storage. For example, the Weyburn project takes carbon dioxide from the US and transports it for use in enhanced oil recovery in Saskatchewan. There may be opportunities for enhanced oil and gas recovery in BC, albeit somewhat limited.

The Ministry will explore with industry the opportunity to dispose of carbon dioxide from major facilities such as processing plants. Geological and hydrogeological mapping and monitoring will be conducted in key areas of interest for acid gas injection through 2009/2010.

Working with International Partners on Carbon Capture

British Columbia is a member of the Plains CO₂ Reduction (PCOR) Partnership composed of nearly 50 private and public sector groups from nine states and three Canadian provinces that is assessing the technical and economic feasibility of capturing and storing carbon dioxide emissions from stationary sources. The province is also a member of the West Coast Carbon Sequestration Partnership, consisting of west coast state and provincial government ministries and agencies that were formed to pursue carbon sequestration opportunities and technologies on the west coast.

As part of The BC Energy Plan the provincial government supports involvement in these partnerships and calls for the development of market oriented requirements with a graduated schedule to foster innovation in sequestration. In consultation with stakeholders, a timetable will be developed along with increasing requirements for sequestration.

Please visit: [http://www.em.gov.bc.ca/subwebs/oilandgas/petroleum_geology/carbon.html](http://www.em.gov.bc.ca/subwebs/oilandgas/petroleum_geology/carbon.html) for more information.

Create policy to help improve compressor station efficiency and reduce emissions.

The Ministry will develop policies to reduce emissions at compressor stations, improve their efficiency and where possible, capture otherwise wasted heat and transform it into useable energy. In addition, results-based regulations will encourage innovation, new technologies and best practices that are key to an expanding and sustainable oil and gas industry.

The Ministry will work with industry and regulators to pursue the possibility of accelerated introduction of more efficient compressor in BC. One of the tools to be explored is linking the Motor Fuel Tax levied on compressor stations to their efficiency.
38. **Best coalbed gas practices in North America.** Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.

BC will require proponents to follow Best Practices in all stages of coalbed gas development, including:

- Fully engaging communities and First Nations;
- Using the most advanced technology and practices that are commercially viable;
- No surface discharge of CBG produced water; and
- Any re-injected coalbed gas produced water must be well below aquifers.

As a result, the Code of Practice for the Discharge of Produced Water from Coalbed Gas Operations will be reviewed and updated where appropriate.


**Conduct scientific and geological research and provide results to potential investors, communities and First Nations to further the exploration and development of coalbed gas.**

The Ministry in coordination with the Ministry of Environment will undertake a program to gather scientific and geological data in areas of interest for CBG development. Specifically, numerous issues relating to groundwater have arisen in CBG developments in other jurisdictions and have become a public concern in BC. The existing surface water sampling program will be expanded to include work on groundwater and to conduct hydrogeological studies in coal basins. Research findings will be shared with industry, well owners and local communities including First Nations. Baseline surface hydrology and subsurface hydrogeological studies and monitoring will be conducted in key areas of interest for CBG development, when and where appropriate, including Hudson Hope, Telkwa and other sites, through 2009/2010.

Study and monitoring results will be made available publicly to all interested parties including local communities, First Nations, well owners and industry through 2009/10.

39. **Enhance the Oil and Gas Environmental Stewardship Program, ensuring sound environmental, land and resource management.**

A comprehensive review of the oil and gas environmental stewardship program will enhance programs including waste management, habitat enhancement, baseline data collection, planning initiatives such as land use planning and general development plans, programs for environmentally sensitive areas, infrastructure corridors, and remediation and progressive reclamation.

In 2004, the Ministry initiated the Oil and Gas Environmental Stewardship Program having two components: the Environmental Policy Program and the Environmental Resource Information Project. The Environmental Policy Program identifies and mitigates environmental issues in the petroleum sector focusing on policy development in areas such as environmental waste management, habitat enhancement, planning initiatives, wildlife studies for oil and gas priority areas and government best management practices. Some key program achievements include the completion of guidelines for regulatory dispersion modeling, research leading to the development of soil quality guidelines for soluble barium, a key to northern grasses and their restorative properties for remediated well sites, and moose and caribou inventories in Northeast British Columbia.

The Environmental Resource Information Project is dedicated to increasing opportunities for oil and gas development, through the collection of necessary environmental baseline information. These projects are delivered in partnership with other agencies, industry, communities and First Nations.

40. **Continue to work to lift the federal moratorium on offshore exploration and development and reiterate the intention to simultaneously lift the provincial moratorium.**

In response to provincial requests to lift the federal moratorium, Natural Resource Canada (NRCan) launched a three-part review in 2003. The science component concluded there was no scientific reason to maintain the moratorium (a similar conclusion was reached by the Province's Science Panel in 2002). To date, Canada has not formally responded to the review reports.

The Province re-affirms its commitment to offshore oil and gas exploration and development, its request to Canada to lift the federal moratorium and reiterates that the provincial moratorium will be lifted at the same time.
41. **Work with the federal government to ensure that offshore oil and gas resources are developed in a scientifically sound and environmentally responsible way.**

While many coastal residents have expressed concern about the prospect of offshore oil and gas activity, some are supportive, provided development is undertaken in an environmentally sound manner, and their communities share in the benefits. A number of First Nations have indicated they might consider offshore activity if they have a role in the management and regulation of activity.

The major tenure holders have stated that before investing in exploration activities, key issues must be addressed: clarification of the fiscal and regulatory regime, identification of "go" and "no go" areas, confirmation of existing tenures, and resolution of First Nation issues.

As a result, the Ministry has focused on the following key areas:

- Engaging First Nations, coastal communities and other key stakeholders who have an interest in how offshore oil and gas development might affect them;
- Developing options for BC's position on management/regulatory and fiscal regimes; and
- Co-ordinating a federal-provincial approach to science.

Considerable progress has been achieved. The Ministry has provided some coastal communities, First Nations and stakeholders with funding for educational activities, and involved First Nation and local government leaders in offshore fact finding tours. The Ministry has also entered into an MOU with the Union of BC Municipalities (UBCM) that establishes an Offshore Oil and Gas Working Group.

The BC Energy Plan reflects government's support for the lifting of the offshore exploration moratorium if it can be done in an environmentally safe and scientifically sound manner. If the moratorium were lifted, before any exploration took place, a framework would be developed through public consultation which would guide all offshore oil and gas activities. Specific issues that would need to be addressed include:

- Comprehensive assessment of offshore developments;
- Adoption of best practices, including "zero discharge" to the marine waters; and
- Negotiation of a collective First Nations representation for all management or regulatory processes.

42. **Participate in marine and environmental planning to effectively manage marine areas and offshore oil and gas basins.**

British Columbia will continue to participate in oceans strategy and marine planning initiatives including Oceans Strategy, Marine Planning, Marine Protected Areas Strategy and National Marine Conservation Area planning to promote environmental management and economic development objectives in marine areas and offshore oil and gas basins.
43. Develop and implement a comprehensive community engagement program to establish a framework for a benefits sharing agreement resulting from offshore oil and gas development for communities, including First Nations.

Offshore, as a "greenfield" project, represents a unique opportunity to demonstrate the province’s commitment to coastal communities, the New Relationship and economic opportunities for First Nations. An early commitment to benefit sharing provides coastal communities and coastal First Nations with a clear interest in future exploration and development, while representation of First Nations in the regulatory processes would be a step in addressing concerns about environmental risks.

44. Pursue regulatory and fiscal competitiveness in support of being among the most competitive oil and gas jurisdiction in North America.

To be the most competitive jurisdiction in North America, new policies and reporting accountabilities will be created, building on the Oil and Gas Development Strategies (OGDS). The Ministry will identify and implement opportunities to reduce costs and increase efficiencies.

Monitor British Columbia’s competitive ranking as an oil and gas jurisdiction and publish results.

Every three years the Progress Board or another independent agency will publish a report on the competitiveness of the oil and gas sector in BC. The Progress Board has developed the “North Star” index for the province. A similar index with performance indicators for the oil and gas sector will be created. A first report is expected by the end of 2008/09.

- The BC Progress Board issues an annual benchmarking report comparing British Columbia with other provinces on measures of economy, innovation, education, environment, health and society. Twenty additional performance indicators shed further light on BC’s economic and social performance, along with recommendations to reach the Progress Board’s 2010 North Star leadership benchmarks.

Further information on the BC Progress board can be found at: http://www.bcprogressboard.com/index.php

Implement a net profit royalty program to stimulate development of natural gas and oil resources.

The Ministry is currently developing a net profit royalty program to stimulate development of natural gas and oil resources by sharing the capital risk of successful developments, recognizing the long-lead times associated with these developments, while maintaining the province’s royalty share. The net profit royalty program will be an important tool for government to create incentives for industry activity in under-explored areas of the province such as the Nechako Basin.

- In 2007/08, a net profit royalty program will be available for approved proposals. Projects that qualify for the net profit program are not eligible for any other royalty credit programs. Royalty rates begin at a nominal rate at the beginning of the undertaking and escalate during the project ending at a rate significantly higher than the current rate. The average royalty rate over the life of the project is similar to other programs.
Efficient regulations and cross-ministry harmonization.

The Best Practices Working Group—an industry and inter-agency working group—is a key interface to identify and implement initiatives to reduce costs and improve efficiencies. The Ministry and the Best Practices Working Group will create an annual work plan for initiatives aimed at reducing government and industry costs and improving efficiencies.

Work with industry, the federal government and other provinces to improve regulatory efficiency and reduce federal/provincial overlap.

The Province will work with industry, other provinces and the federal government to improve regulatory efficiency and reduce overlap. There are already harmonization agreements with the federal government, for example under the Environmental Assessment Act and Species at Risk Act that could serve as a model.

Pursue the development of a Petroleum Registry in coordination with the Ministry of Small Business and Revenue.

The Ministry will evaluate and develop a business case for setting up a BC-specific registry, including negotiating with stakeholders, industry, the Ministry of Small Business and Revenue, the Oil and Gas Commission and other users on the appropriate cost allocation.

A Petroleum Registry that functions as a central database will improve the quality and management of key volumetric, royalty and infrastructure information associated with British Columbia’s oil and gas industry. A Registry would make regulatory compliance easier, reduce costs, reduce the amount of paper generated, and provide users with online access to information. It makes it possible for data to be uploaded directly from industry systems and allows stakeholders to submit and edit their data online. This data can be used for a variety of purposes and would be linked with well spacing since it provides information on pools, fields and pipelines. The registry would provide one reporting format to be integrated with other agencies, allowing for quicker delivery of detailed information.

- In Alberta, the Petroleum Registry has provided the following benefits to industry, the regulator and the Department of Energy:
  - A more accurate royalty administration system;
  - Fewer amendments, reworks, and reconciliation;
  - Better, more reliable, more accessible information;
  - Standardization and improved effectiveness of input, reporting, and analytic processes.

More information can be found at: http://www.petroleumregistry.gov.ab.ca/
45. Enhance infrastructure to support the development of oil and gas in British Columbia and address impediments to economic development such as transportation and labour shortages.

Under the OGDS III and IV, the Ministry contributes, through a royalty credit-based funding arrangement, to the construction of more and better resource roads, and on a more limited basis, to small-scale natural gas pipelines. The Ministry will identify new infrastructure opportunities for both resource and public road infrastructure. The Province would continue to partner in these infrastructure opportunities through innovative business arrangements such as public private partnerships (P3s) and differential royalty arrangements.

There are areas in northeast British Columbia that have not been explored and developed (sometimes referred to as “white spaces”). Industry has noted two primary impediments: lack of geoscience knowledge and lack of access.

The Ministry will develop actions to address these impediments, such as building on the Pipeline Pilot Program to encourage companies to drill in new or under-drilled areas so as to ensure good stewardship of evaluate the full resource potential.

Northeast British Columbia offers a number of under-explored and under-drilled areas that may be capable of producing oil or gas. However, these potential operating areas lack the necessary infrastructure, in the form of pipelines and processing facilities, to economically extract and transport product to market.

A number of oil and gas producers and pipeline mid-streamers operating in BC have indicated that limited or non-existent pipeline infrastructure is a key barrier to their investment in under-developed oil and gas areas in northeast BC.
Develop a multi-year infrastructure-based royalty program that introduces an integrated approach to the development of resource roads, pipelines and processing facilities. This approach to oil and gas infrastructure will further stimulate development in emerging and under-explored areas of northeast British Columbia.

The existing royalty credit program for resource roads was launched in 2004 and has since been renewed, through new instalments of road-based royalty credits, in each successive year thereafter. The pipeline royalty credit program was implemented on a pilot basis late in 2005 and yielded successful results through 2006.

A multi-year infrastructure royalty program, that integrates roads, pipelines and facilities as an infrastructure bundle, will be developed so as to offer oil and gas partners longer term partnership arrangements with the Province, an improved operating chance on measures of risk and return and therefore, even greater confidence to push out the Province's oil and gas frontier. This integrated (resource roads, pipelines and facilities) infrastructure program will revolve a finite pool of infrastructure-based royalty credits through the best candidate oil and gas infrastructure projects. Royalty credits would be advanced into a completed project as it meets requirements to receive the Province's contribution, as credits are subsequently recovered by the Province, through new oil and gas royalties these same royalty credits would be re-advanced to support new infrastructure partnerships. On this basis the Province would invest and re-invest, through a capped but revolving infrastructure fund, in high quality oil and gas infrastructure projects.

A pipeline and facilities royalty credit could incent entry into under-developed areas, both by large companies who traditionally have been reluctant to absorb the full risk of pioneering under-developed areas, and by small producers whose capital resources are typically insufficient to finance large-scale resource development. There may also be cases to stimulate development in under-developed areas through partnerships involving producers, pipeline operators (mid-streamers) and the Province through the royalty credit that is transferable, on a one-time basis, between a mid-stream operator and an oil and gas producer.

Invest in resource-based and public road infrastructure and explore new infrastructure opportunities in northeast British Columbia.

Over the past three years, significant new investment in oil and gas infrastructure has proven to be an important lever in further developing the Province's oil and gas resource and establishing a competitive presence in North American natural gas markets. Building and maintaining high grade, all-season resource roads has demonstrably lengthened the drilling season, opened up new areas to development, and aligned operating costs in BC with other competing jurisdictions. Increased investment in high-grade resource roads, with connections to connecting public roads and highways has also created safer working and living places for industry, contractors and communities.

The Province will continue to invest in the public road infrastructure throughout northeast BC. The Ministry will explore new infrastructure opportunities for public road infrastructure, and continue to partner in the construction of producer built roads, pipeline and facilities infrastructure.
46. Encourage the development of conventional and unconventional resources.

The northeast region of the Province (194,000 square kilometres) has been a focus of petroleum exploration and development since 1952. About 17,000 wells have been drilled to date.

The table below shows the estimated undiscovered resource potential for all of the province, in trillion cubic feet (Tcf) for natural gas, and billion barrels of oil (Bbl) and the known reserves for northeast BC. BC is primarily a gas producing jurisdiction with raw gas production of about 1.1 Tcf in 2005, has produced about 17.5 Tcf, with remaining reserves of 12.9 Tcf.

<table>
<thead>
<tr>
<th>RESOURCE POTENTIAL</th>
<th>Natural Gas Tcf</th>
<th>Tight Gas Tcf</th>
<th>Shale Gas Tcf</th>
<th>Coalbed Gas Tcf</th>
<th>Oil Bbl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>98.0</td>
<td></td>
<td></td>
<td></td>
<td>17.6</td>
</tr>
<tr>
<td>Unconventional</td>
<td></td>
<td>300</td>
<td>250</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>Offshore</td>
<td>41.8</td>
<td></td>
<td></td>
<td></td>
<td>9.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESERVES</th>
<th>Natural Gas Tcf</th>
<th>Tight Gas Tcf</th>
<th>Shale Gas Tcf</th>
<th>Coalbed Gas Tcf</th>
<th>Oil Bbl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast BC Reserves (Dec 31, 2005)</td>
<td>12.9</td>
<td></td>
<td></td>
<td></td>
<td>0.131</td>
</tr>
<tr>
<td>Northeast BC Produced (up to Dec 31, 2005)</td>
<td>17.5</td>
<td></td>
<td></td>
<td></td>
<td>0.67</td>
</tr>
</tbody>
</table>

Declining conventional resources in North America has lead to a shift in some of the focus of oil and gas producers to unconventional gas—tight gas, shale gas and coalbed gas (CBG). The Western Canada Sedimentary Basin is rich with these emerging resources. The distribution of these unconventional resources, and the total amounts of economically producible or marketable resources are critical to attracting investment, planning for sustainable development and community involvement.

Tight gas is likely to hold the highest potential for remaining technically recoverable natural gas resources in the northeast. Tight gas is now being specifically targeted in pervasive, regional resource play developments, like those focused on the Greater Sierra near Fort Nelson and at Cutbank Ridge, west of Dawson Creek. In 2003 the Ministry of Energy and Mines released an Exploration Assessment of Tight Gas Plays in northeast BC and determined that the in-place tight gas resource base could be about 300 Tcf.

About 25 per cent of BC’s 2005 production is estimated to come from tight gas formations. Further research is needed to identify areas of potential growth. Shale gas is just starting to be evaluated and developed in British Columbia.

With commercial success of several shale gas plays in the United States, British Columbia’s shales are now being recognized as potential reservoirs estimated to have the capacity to hold about 250 Tcf gas-in-place. Though recoverable volumes will be considerably less, shale gas remains a significant untapped resource. Recent studies by the Ministry on Devonian and Triassic formations in northeast British Columbia, show shale gas potential throughout very large areas.
Undertake assessments and support geoscience evaluations to further the development of shale and tight gas.

While the amount of in-place shale and tight gas in BC is substantial, there are a number of obstacles that may impede development such as technology gaps to extract natural gas, the need for more geoscience, and a lack of knowledge amongst communities, landowners and First Nations on the impacts of developing these unconventional resources.

The Ministry will work with the Petroleum Technology Alliance of Canada (PTAC) and other agencies to address specific technical and community issues to identify areas of potential growth.

Develop policies and new technologies for Enhanced Resource Recovery.

Even with the increased price of crude oil, British Columbia has seen little interest from industry in increasing oil production from existing facilities or exploring and developing oil reserves. The Ministry will identify barriers to enhanced resource recovery.

By partnering with PTAC and other agencies, the Ministry will work with industry to support and develop policies to promote enhanced resource recovery (ERR). In addition, results-based regulations will be introduced in 2008 encouraging industry to implement new leading edge technologies. Results-based regulations will eliminate prescriptive methods that create disincentives to technical development. Through new compliance tools, the Oil and Gas Commission will be able to regulate industry without limiting the introduction of innovation, new technologies and best practices that are key to an expanding and sustainable oil and gas industry.

Enhance marketing efforts with major oil and gas companies in conjunction with the Ministry of Economic Development to increase knowledge of and investment in British Columbia's oil and gas sector.

While there is substantial investment in the oil and gas sector, many oil and gas companies do not have holdings and are not active in BC. To encourage investment, the Ministry will work with the Ministry of Economic Development's market representatives in Calgary, Houston, Asia Pacific and London and federal counterparts (e.g. Canadian consulates) to promote BC's potential resources and the advantages of investing in BC.

A comprehensive marketing plan will be implemented to encourage investment from companies that do not currently have holdings in BC.

47. Support the growth of British Columbia's oil and gas service sector.

The British Columbia based service sector has grown over the past four years and exhibits the
potential for further growth. In 2003, the Minister of Energy, Mines and Petroleum Resources established a Service Sector Strategy Committee with representation from the Northern Society of Oilfield Contractors and Service Firms, the Northeast Aboriginal Business Centre, the Canadian Association of Petroleum Producers and member firms, Treaty 8, the Fort Nelson Chamber of Commerce, the Oil and Gas Commission and the Ministry.

Increased activity in the traditional winter drilling season, together with the emergence of summer drilling, has created a more stable, secure, near to year-round operating platform for oil and gas producers enabling them to make multi-year commitments to the service industry and promote local companies.

The Ministry will participate in trade shows and work with the Service Sector Committee to introduce and market BC service sector companies to the oil and gas industry. Companies will both sponsor and participate in these marketing initiatives. The Ministry will continue to actively support the development of the Oil and Gas Centre of Excellence.

**Continue to promote awareness of British Columbia-based service sector companies in the interest of the BC sector securing a representative market share of oil and gas activity in the province.**

The Ministry will undertake a study in 2007 that updates previous analysis that describes the market share of BC service sector companies. This study will establish a benchmark and identify specific business segments where BC companies can play a larger role. Thereafter, this study will be updated every two years with new data, benchmarks and trend analysis.

In addition, the Ministry and the Service Sector Committee will work to promote BC service sector companies through informing, educating and connecting the business community to expanding and emerging oil and gas both within and outside British Columbia.

**Continue to support initiatives that enhance the competitiveness of British Columbia’s oil and gas service sector and support the drive toward companies in the service sector capturing representative market share of activity within the province.**

The Ministry of Small Business and Revenue is developing a small business strategy and intends to implement this strategy starting in 2007. The Ministry of Energy, Mines and Petroleum Resources will work with the Ministries of Small Business and Revenue and Finance to improve small business competitiveness and specifically pursue a greater share of the oil and gas service sector for BC based businesses.

48. Promote exploration and development of the Interior basins with a priority focus on the Nechako Basin.
The Whitehorse, Bowser and Nechako Basins of north central and interior British Columbia remain largely unexplored as a result of insufficient infrastructure and lack of geological information.

In relation to the Whitehorse and Bowser Basins, the Nechako is less remote; has more favourable geography and infrastructure; more is known about the potential for oil and gas; and is the geographic area most affected by the Mountain Pine Beetle.

While recognizing the potential for oil and gas development throughout the other Interior Basins in the longer term, the Nechako Basin has the most immediate potential to engage industry, First Nations and the local communities.

The Nechako Initiative aspires to provide multiple benefits including:

- Expansion of B.C's oil and gas activities;
- Economic diversification and job creation in areas severely affected by the Mountain Pine Beetle; and
- Innovative economic opportunities for First Nations and local communities.

Strategic components of the Initiative include:

- Geoscience information collection and analysis;
- Fostering First Nations relationships and opportunities;
- Community and stakeholder engagement;
- Environmental management;
- Industry promotion;
- Infrastructure development; and
- Policy considerations such as tenure and royalties.

GeoScience BC has received $5 million from the Province specifically targeted for the Nechako Basin. Collaborative programs will leverage additional funds and enhance the knowledge base to stimulate industry investment.

The "New Relationship" has created an opportunity for the Ministry to work with First Nations early in the planning process. Oil and gas exploration is a new industry to local communities and there is a need to communicate basic information about the industry well in advance of any proposed development, for First Nations to meaningfully engage in the process. An early, broad-based capacity development plan is needed to enable effective First Nations engagement by both the Ministry and industry.

**Undertake geoscience activity in the Nechako Basin to establish new data of the**
resource potential for oil and gas development.

The Ministry, in collaboration with the federal government, other agencies, and industry, will expand its geoscience work to stimulate industry exploration and development of oil and gas resources in the Nechako Basin.

The Nechako Basin is a 70,000 square kilometre area in the central interior of the province. The boundaries of the Nechako Basin are generally considered to be the Skeena Arch in the north, Highway 97 to the east, and the Chilcotin and Camelsfoot Ranges to the south.

The Nechako Basin has promising geologic formations including up to 4,000 meters of sedimentary rocks in smaller sub-basins and the presence of rocks that suggest the potential for oil and gas. There are minor hydrocarbon shows.

To date the area is largely unexplored. Seismic testing was undertaken in the 1980s and only twelve exploration wells have been drilled over the past 75 years with no resulting discoveries.

In conjunction with work being conducted elsewhere in the Interior Basins, geoscience work is being conducted in the Nechako Basin including:

- A review of known data and interpretation of subsurface data;
- A pilot project to re-process old seismic data; and
- Completion of a second field season of geoscience work including source bed analysis of subsurface rocks; a regional heat flow study and a detailed description of subsurface samples. The results will refine the search for hydrocarbons.

The Ministry will continue to develop partnerships, including the federal government, to undertake an extensive seismic program in the Nechako Basin to provide industry with data on the potential resource.

More information on GeoScience BC can be found at:

http://www.geosciencebc.com/

Develop tenures and royalties specific to the Nechako Basin to encourage development and investment.

The traditional means of awarding tenure may not be appropriate for exploration and development in the Interior Basins. More innovative tenure mechanisms and royalty regimes appropriate for these unexplored basins may be considered.

Develop and implement a comprehensive First Nations pre-tenure engagement
program in the Nechako Basin to develop First Nations capacity and knowledge of the oil and gas industry.

Focussing on First Nation's rights and interests, the Ministry will undertake a comprehensive information sharing program with local First Nations to gather their interests and exchange information on the oil and gas industry and the area's potential for development.

**Develop and implement a comprehensive First Nations engagement process in the Nechako Basin to develop options for implementing the New Relationship.**

The Ministry will undertake a comprehensive engagement process that includes information sharing and pre-tenure consultation with First Nations in the Nechako Basin area. This process will establish a forum to share information on the oil and gas industry and the area's potential for development, while exploring First Nations interests in this region. This process will include developing a potential benefit sharing model that includes economic opportunities.

**Develop and implement a comprehensive community engagement program in the Nechako Basin to establish a framework for a benefits sharing agreement.**

The Ministry will initiate a community engagement program on oil and gas development in the Nechako Basin. Also, the Ministry will develop, in cooperation with local communities, a benefits sharing framework and an environmental stewardship program.

**Develop a comprehensive Environmental Information Program to identify baseline information needs in the Nechako Basin through consultations with government, industry, communities and First Nations.**

The need for an environmental information program will be assessed by 2007/08. Data gap analysis will be completed by 2008/09 including a searchable, web accessible database.

49. **Encourage the development of new technologies.**
British Columbia has the opportunity for technological advancements and commercialization, particularly in environmental management, flaring, carbon sequestration and hydrogeology. The service sector has noted that it can play an important role in developing and commercializing new technologies, however, access to funds is an issue. Royalty credits is one option that is currently not available to the service sector and under this objective, the Ministry will assess the possibility of providing a company with transferability of royalty credits as a funding mechanism.

Establish a technology transfer incentive program.

The province will establish a technology transfer incentive program similar to the Saskatchewan Petroleum Research Incentive model but focusing on different technologies. This program, possibly funded by royalty credits, will encourage the research, development and use of innovative technologies to increase recoveries from existing reserves and encourage responsible development of new oil and gas reserves. The program should be designed to fully recover program costs, over time, through increased royalties generated by expanded development and production of BC’s petroleum resources. An additional objective is to transfer the technology developed so there is a greater awareness and use of new technology in BC, particularly technology that leads to the reduction of environmental impacts of oil and gas production.

The BC Scientific Research and Experimental Development Program provides financial support to corporations for research and development that leads to new or improved products and processes. The Ministry, in consultation with the Ministry of Small Business and Revenue, will explore the expansion of the program to cover an individual’s project costs directly related to commercially applicable research, development or demonstration for new or improved technologies conducted in British Columbia that facilitate expanded oil and gas production through credits or refunds. Work will also proceed in collaboration with PTAC.

Explore and establish other research and development programs for the oil and gas industry.

The Province will develop a program targeting specific areas where BC has demonstrated strengths.

The Province will work with the Fort St. John Centre of Excellence and other partners to establish an oil and gas technology incubator, encouraging entrepreneurs to develop and commercialize new and innovative technologies and processes. Workshops, information provision and expansion of existing events (e.g., tradeshows and oil and gas conferences) will be held to assist innovators.

The Province will develop a program to encourage oil and gas innovation and research in British Columbia’s post-secondary institutions.

The Province will promote investment in research and development opportunities with the PTAC and the new MOU between BC and Alberta on Energy Research, Technology Development and Innovation.

50. Add value to British Columbia’s oil and gas industry by assessing and promoting the development of additional gas processing facilities in the province.
The goal is to develop a strategy promoting gas processing facilities in British Columbia. With a number of proposals for new pipelines carrying crude to the coast, landing condensate, and liquefied natural gas regasification terminals, there may be an opportunity to create an integrated petroleum refining and petrochemical industry, providing jobs and investment on the north coast.

Conduct an analysis into the potential for processing facilities to be located in British Columbia.

The Ministry will identify and analyze constraints, in the form of scale or nature of oil and gas processing facilities, that limit development and enhanced stewardship of BC’s oil and gas resource.

Determine the viability of establishing a new petroleum refinery and petrochemical industry in British Columbia.

British Columbia is a small crude oil producer in Canada. With approximately 17 million barrels of crude oil production per year (2.8 billion litres), BC provides 1.8 per cent of total Canadian crude oil production. About half of BC’s crude oil production is processed at the two refineries—Chevron in North Burnaby and Husky in Prince George, and the rest is processed in Alberta. Small quantities are exported to the US.

There are numerous proposals for condensate and crude oil pipelines, and importing liquefied natural gas for regasification. The Province will establish an industry/government working group to develop business cases and promote opportunities for new refining and petrochemical investment in BC. The working group will report to the Minister within six months with recommendations on the viability of a new petroleum refinery and petrochemical industry and measures, if any, to encourage investment.

51. Provide information about local oil and gas activities to local governments, education and health service providers to inform and support the development of necessary social infrastructure.

Provide local communities and service providers with regular reports of trends and industry activities so that they can more effectively plan for growth in required services and infrastructure.

Work with local communities, ministries and industry to address housing demands.

Ministry of Energy, Mines and Petroleum Resources, in partnership with the Ministry of Forest and Range’s Housing Policy Branch, will actively work with and assist communities wishing to implement recommendations of the 2006 Housing Report.

52. Work with First Nations to identify opportunities to participate in and benefit from oil and gas development.
Access to land to explore and develop oil and gas resources is a fundamental requirement as noted by the Progress Board and the Competition Council. First Nations have been increasingly concerned about the incremental approach to resource development, particularly gas well authorizations used by the Oil and Gas Commission. They want to participate in the new wealth being generated by industry within their asserted Traditional Territories.

The "New Relationship" is an opportunity for First Nations to participate in, and benefit from, the development of resources surrounding their communities.

**Increase First Nations capacity to participate in, and benefit from oil and gas development.**

The Ministry and the Oil and Gas Commission will continue to facilitate and assist in developing First Nations' capacity to engage in the oil and gas sector and work to improve relationships between industry, First Nations, the Oil and Gas Commission and the Ministry.

The Ministry will also facilitate and support opportunities for First Nations training, education (see also The BC Energy Plan Labour Strategy) and private-First Nations' partnerships.

53. **Support First Nations in providing cross-cultural training to agencies and industry.**

The Ministry will work with First Nations to develop and provide cross-cultural training to agencies and industry.

54. **Improve working relationships among industry and local communities and landowners by clarifying and simplifying processes, enhancing dispute resolution methods, and offering more support and information.**

In oil and gas development on private land, landowners negotiate land leases with industry. The acts governing oil and gas, minerals, coal and geothermal resources all have provisions for entry on private land by the subsurface resource title holder. These provisions provide rights to the surface landowners beyond those which would be afforded by Common Law.

**Improve landowner notification and awareness of sales of oil and gas rights on private land.**

The Ministry, in partnership with its established consultation mechanisms, will develop a process to better inform landowners in advance of sales of oil and gas rights on private land.

The Ministry has established several consultation mechanism (i.e., the Northeast Energy Mines Advisory Committee, the Provincial Forum, etc.) to provide advice on oil and gas policy issues. These processes involve participants from First Nations, local government, rural landowners, business and community groups, ranchers, agriculture and wildlife interests among others.

Enhanced web design and information improving landowner's access to online information about existing and proposed oil and gas tenures to better inform landowners of sales of oil and gas rights on private land will be in place in 2007/08.

**Improve private landowners' knowledge of subsurface resource titles and lease**
arrangements for land used for oil and gas development.

The Ministry will develop an educational package to assist landowners in dealing with subsurface resource titles. The Ministry will consult with stakeholders, local landowners, organizations, and industry to re-assess the current guidelines and methodologies to determine lease payments to landowners for land used for oil and gas development. Other actions include: development of standardized lease arrangements including an amount (up to $5,000) as assistance to develop a lease arrangement with an oil and gas company, and a publicly accessible registry of lease arrangements to improve transparency.

Assess and improve the process of dispute resolution between landowners and the industry.

The Ministry, in partnership with industry, the Oil and Gas Commission and the Mediation and Arbitration Board will assess processes to resolve disputes between landowners and the industry. Depending on the results of this assessment, landowner organizations will be engaged to develop new processes.

Review current setback regulations.

The Ministry will engage with local communities, landowners, First Nations, industry and the Oil and Gas Commission in reviewing requirements for setback distances between wells and occupied building structures based upon scientific studies, public health and safety, and economic and social considerations.

55. Examine oil and gas tenure policies and develop guidelines to determine areas that require special consideration prior to tenure approval.

Develop clear and consistent guidelines to determine areas which are off-limits for oil and gas tenures or where special management practices are required.

The Ministry will work with local governments, communities, landowners, stakeholders, and First Nations to develop guidelines to determine which areas require special consideration for oil and gas tenures.

Notice of special areas will be posted on line and identified on the Petroleum Titles Online maps.