Yukon Energy
Charrette Report

YUKON ENERGY

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Yukon's Energy Future… Let's Talk!

Yukon Energy brought together over ninety Yukoners and energy experts from across Canada for three days in March 2011 to talk about the territory's energy issues. Yukon Energy has committed to engage Yukoners in the territory's energy future. The charrette planning process was chosen as one of the ways that Yukon Energy will carry out this objective. The purpose of the charrette was to educate the participants, help inform the corporation's updated 20-Year Resource Plan, develop guiding principles for energy decision making and to find out how Yukoners want to be involved in planning Yukon's energy future.

As part of the charrette process, Yukon Energy held public meetings in three rural communities (Dawson City, Mayo, and Haines Junction) and in Whitehorse, spoke with various individuals and stakeholders through meetings and one on one conversations, and hired energy experts to develop background information and share their expertise.

This is a synopsis of the Yukon Energy Charrette process. It is important to acknowledge that this document does not include every comment from every charrette participant. It provides an overall picture of the general themes and outcomes of the charrette.

Photo: www.archbould.com

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Introduction

The Yukon Energy Charrette was held March 7th, 8th and 9th 2011 in Whitehorse. It brought together invited stakeholders and nationally and internationally recognized energy experts for three days of discussion and information sharing. In the evenings, the general public came to hear from the experts, review each day's work and add their thoughts to the process.

The objectives of the charrette were:

- To educate Yukoners about the territory's current energy circumstances and the potential options to meet future energy demand.
- To inform the Yukon Energy Resource planning process.
- To develop energy planning principles Yukon Energy can use when making energy planning decisions and that can help with risk and trade off assessments.
- To hear how Yukoners want to be engaged in future energy planning and energy decisions.

This report is designed to provide a summary of what happened during those three days in March. This report will be used by the Yukon Energy Corporation to inform the development of the 20-Year Resource Plan and assist Yukon Energy in engaging Yukoners in future energy planning.

We would like to thank all those who participated in the energy charrette and the community meetings and stakeholder interviews held in preparation of the charrette. Yukon Energy is excited and committed to be working with Yukoners together to meet the challenge to provide ***affordable, reliable, environmentally responsible and flexible*** electricity now and into the future.

Photo: Mike Thomas

Like other jurisdictions, Yukoners want energy services that are affordable, reliable and environmentally responsible. But the Yukon's isolated grid and the substantial but uncertain energy needs from mining activity mean that energy system flexibility has a high value in Yukon too. Focusing on this challenge, the charrette participants generated an impressive array of energy portfolios for Yukoners to consider.

~ Dr. Mark Jaccard, Charrette Keynote Speaker

Yukon Energy Charrette Participants

Stakeholder groups:

Yukon Anti-Poverty Coalition

Yukon Chamber of Commerce

Council of Canadians Whitehorse Chapter

Raven Recycling

Yukon Electrical Company Limited

Western Copper Corporation

Northern Cross Yukon Limited

Whitehorse Chamber of Commerce

Yukon Conservation Society

Tourism Industry Association of Yukon

Yukon Utilities Consumer Group

Yukon Research Centre of Excellence

Governments and development corporations:

Federal government

Various Yukon government departments, including Energy Mines and Resources (Energy Solutions Centre), Executive Council Office, Economic Development, Highways and Public Works, and Environment (Yukon Climate Change Secretariat)

Council of Yukon First Nations

Champagne and Aishihik First Nations

First Nation of Na-cho Nyak Dun

Kwanlin Dun First Nation

Kluane First Nation

Little Salmon Carmacks Development Corporation

Taku River Tlingit Development Corporation

Yukon Indian Development Corporation

Dakwakada Development Corporation

City of Whitehorse

Town of Watson Lake

Village of Carmacks

Other:

Experiential Science 11 Class (16 students)

Eight members of the general public

Ten representatives of Yukon Energy Corporation (board members and staff)

Six Yukon Energy consultants

Sixteen resource experts

Charrette Preparation

Yukon Energy began preparing for the charrette in September of 2010. The energy charrette was introduced to Yukoners as one of the public consultation methods Yukon Energy would use to gather information and input for the corporation's 20-Year Resource Plan update. In preparation for the charrette and for the resource plan update, background information was gathered. Demand and supply forecasts were updated and a variety of energy supply options were discussed.

The charrette planning team tried to present all possible supply options to the charrette participants in addition to the energy supply concepts Yukon Energy was researching. This includes energy conservation, hydro enhancement work at Marsh Lake, Atlin Lake and Gladstone Lake, waste to energy, geothermal, new hydro, storage and wind. Energy supply options Yukon Energy was not currently working on that were presented at the charrette included coal, nuclear, natural gas (LNG), biomass, grid connections to B.C./Alaska and solar.

January and February were used to gather information from Yukoners to inform the charrette. Individual and small group interviews were conducted with community and business leaders, non-governmental organizations, mining industry representatives, federal, territorial, First Nation and municipal government representatives, local energy experts and interested parties to ensure the charrette would reflect varying Yukon interests and views. Yukon Energy also hosted community meetings in Mayo, Dawson City, Haines Junction and Whitehorse.

This information helped Yukon Energy determine how Yukoners would participate in the charrette and to better understand the issues important to Yukoners. The gathering of this data was also important to ensure the necessary background reports were completed for the charrette. The interview and community information was compiled and shared with the charrette participants and other interested people via Yukon Energy's website.

Stakeholder Interviews

Yukon Energy considers all Yukoners to be stakeholders in the territory's energy future. However for the purposes of the charrette Yukon Energy interviewed 56 stakeholder groups. The stakeholders represented business, energy, all levels of government, First Nation Development Corporations, environment, mining, youth, community groups, communities (both Whitehorse and rural) and interested members of the public.

The stakeholders were asked what their interest was in energy, what they felt were the short and long term energy issues for Yukon, what they thought were the options and opportunities that Yukon Energy must consider when creating a clean energy future, and what they wanted as an outcome from the charrette.

The major themes from the stakeholder interviews that were considered by the charrette participants included:

- Valuing the development of energy conservation and energy efficiency programs
- Understanding the regulatory context within which Yukon Energy operates, including the *'obligation to serve'*;
- Managing risks associated with industrial clients, specially mining customers who come on and off the system (referred to in the charrette as *'the hangover effect'*);
- Understanding the true cost of electricity and all the factors that go into calculating that cost;
- Creating clarity as to what clean energy is and what clean energy options are realistic to meet future needs; and
- Creating partnership opportunities with First Nations, independent power producers, mines and municipalities.

Photo: www.archbould.com

Community Meetings

Another avenue for gathering information and creating excitement for the charrette was a series of community meetings held in February in Mayo, Dawson City and Haines Junction, along with a charrette kick-off event that took place in Whitehorse.

The notes from the community meetings were shared on Yukon Energy's website and formed part of the charrette background information reported in the *Charrette Participant's Guidebook* (available on the Yukon Energy website at www.yukonenergy.ca). The main issues heard during the community meetings included the need to serve mining customers, and concerns that serving large mines will have a negative impact on ratepayers, identifying renewable energy projects, ensuring power is reliable and affordable, recognizing the need to conserve electricity, and identifying the need to be forward thinking about solving future energy needs. The meeting participants want to see Yukon Energy continue to engage with communities and they are eager to take part in innovative pilot projects.

Specific resource options identified by the communities for future Yukon Energy consideration included energy conservation, biomass, hydro, energy efficient building standards, and a river turbine in Dawson City.

Experiential Science 11 Classroom Meeting

Planning for Yukon's energy future meant engaging the future leaders and ratepayers in the charrette. Yukon Energy was pleased to work with the Experiential Science 11 Class from Wood Street School in Whitehorse and have the sixteen students attend all three days of the charrette. In preparation for the charrette, Yukon Energy's President David Morrison, along with Stuart Hickox from the organization OneChange, spent an afternoon with the students sharing background information and discussing the energy issues and opportunities.

Photo: Mike Thomas

Electrical Energy Resource Options

A key feature of the energy charrette was the bringing together about a dozen energy experts to share their knowledge about potential electrical energy resource options. The experts presented a full palette of resource options and helped educate and engage charrette participants. The resource experts and their energy topic areas are listed below:

- Biomass Energy – Dr. Fernando Preto
- Energy Conservation and Efficiency – Ivano Labricciosa, P. Eng., Bev Van Ruyven, B.A; Krista Roske, MPA
- Diesel and Thermal – Cam Osler, MA
- Energy Storage & Transmission Inter-tie – Bruce Ledger, P. Eng
- Geothermal Resources – Tim Sadlier-Brown, P. Geo.
- Hydroelectric Resources – Forest Pearson, P. Eng.
- Nuclear Energy – Dr. Chary Rangacharyulu
- Natural Gas Energy – David Dunn, P. Eng.
- Solar Electricity – Gordon Howell, P. Eng.
- Waste to Energy – Don McCallum, P. Eng.
- Wind Energy – Mark Green, B.Sc.

Background papers were prepared by the resource experts on each of the topic areas listed above. Copies of the eleven background papers are posted on Yukon Energy's website (www.yukonenergy.ca). The background papers examine Yukon specific factors and were used in the development of the *Yukon Energy Game*, which was played on Day 2. The energy factors considered include:

Resource capacity – how much of the energy resource exists or has been discovered in Yukon.

Potential for electricity production – how much electricity could potentially be produced from the energy resource source in Yukon.

Electricity cost[1] – typical cost ranges for electricity generated from the energy resource.

Complementary applications – whether electricity generated from the energy resource typically has any complementary applications (e.g., combined heat and power).

Time to market – an estimate of how long it might take to bring the electricity into production given current technologies.

Probability to market – the probability that available technologies can actually produce electricity in Yukon on time and on budget.

Regulatory issues – the nature and potential scale of regulatory issues specific to the type of energy being considered.

Environmental issues – an indication of the possible effects on the environment from use of the type of energy being considered.

Seasonality – whether there are any seasonal factors that make electricity generated from the energy source more or less attractive.

Each of the resource experts also made presentations on their topic areas at the charrette. The complete list of presentations prepared for the charrette is shown below. Digital copies of the presentations are available on the Yukon Energy website (www.yukonenergy.ca).

- Bev Van Ruyven, PowerSmart
- David Dunn, Natural Gas
- Eric Schroff, Climate Change
- Ivano Labricciosa, Smart Meter
- Manon Moneau, Energy Strategy
- Paul Kishchuk, Energy Planning
- Pierre Guimond, Canadian Electricity Association
- Timothy Sadlier-Brown, Geothermal
- John Streicker, Climate Change
- Cam Osler, Loads and Role of Diesel
- Cam Osler, Thermal Generation Options
- John Landry, Utility Regulation in Yukon
- Forest Pearson, Yukon's Hydroelectric Resources
- Bruce Ledger, Storage and transmission
- Fernando Preto, Bioenergy
- Chary Rangacharyulu, Nuclear Energy

[1] Costs can also refer to the potential for "shutdown hangover", the situation where the demand load from a large consumer stops suddenly and before capital costs for generation infrastructure are adequately paid off.

Installed Electricity Generation Capacity – Yukon (Megawatts)

Yukon Energy Corporation		The Yukon Electrical Company Ltd.	
Hydro		**Hydro**	
Whitehorse	40.0	Fish Lake	1.3
Aishihik*	30.0	**Diesel**	
Mayo**	5.4	Carmacks	1.6
Total	75.4	Haines Junction	1.8
Diesel		Teslin	1.5
Whitehorse	22.5	Ross River	1.0
Faro	8.9	Watson Lake	5.3
Dawson	4.0	Beaver Creek	1.0
Mayo	1.7	Destruction Bay	0.9
Mobile	1.6	Old Crow	1.1
Total	38.7	Pelly Crossing	1.0
Wind		Stewart Crossing	0.4
Haeckel Hill	0.8	Swift River	0.2
		Mobile	1.1
		Total	16.9
		Total Yukon Energy Corporation Capacity	114.9
		Total Yukon Electrical Company Ltd. Capacity	18.2
		Total Yukon (YEC and YECL) Capacity	133.1
		Total Yukon (YEC and YECL) Hydro Capacity – Summer	76.7
		Total Yukon (YEC and YECL) Hydro Capacity – Winter	60.0
		Total Yukon (YEC and YECL) Diesel Capacity	55.6
		Total Yukon (YEC) Wind Capacity	0.8

Source: Yukon Energy Corporation. * An additional 7MW of installed capacity will be available when the third turbine is brought on line at the Aishihik Hydro Facility. ** An additional 10MW of installed capacity will be available upon completion of the Mayo B project.

- Don McCallum, Waste to Energy
- Gordon Howell, Solar Electricity
- Mark Green, Wind
- Stuart Hickox, Motivating Change
- Dr. Mark Jaccard, Energy Policy Experiences
- Dr. Mark Jaccard, Keynote Address

In addition to being used to engage and educate charrette participants, the background papers and presentations are being used as source material in the preparation of Yukon Energy's next 20-Year Resource Plan.

Planning Context

The following background was provided as the planning context within which Yukon Energy is operating. Electricity is generated by two utilities in Yukon, both regulated by the Yukon Utilities Board. Yukon Energy Corporation, owned by the Government of Yukon, is the primary generator and transmitter of electricity in the territory. The Yukon Electrical Company Limited, a private utility owned by ATCO Electric Limited, is Yukon's primary distributor of electricity. Both utilities generate electricity from hydro and diesel combustion sources. Yukon Energy also produces a small amount of electricity from wind. The table above outlines the utility-owned installed electricity generation capacity in Yukon in 2010.

Yukon's electricity system is isolated. This means that the territory's electricity suppliers (primarily Yukon Energy) must generate the exact amount of electricity customers are demanding at any given point in time without the benefit of being able to import electricity from suppliers outside Yukon, all the while ensuring the supply of electricity is continuous and precise in terms of frequency and voltage.

Notwithstanding the isolation of Yukon's electrical system from transmission grids in other jurisdictions, Yukon ratepayers have enjoyed stable and relatively low prices for electricity over the last decade. Rates for residential customers have been in the range of 13 cents to 14 cents per kilowatt hour over the period 2001 to 2009. Rates for general service category customers, which include commercial customers, ranged between 15 cents and 16 cents per kilowatt hour. Residential and commercial customers have received

government-funded bill subsidies during the same time period, which slightly reduced actual bill costs for those customers.

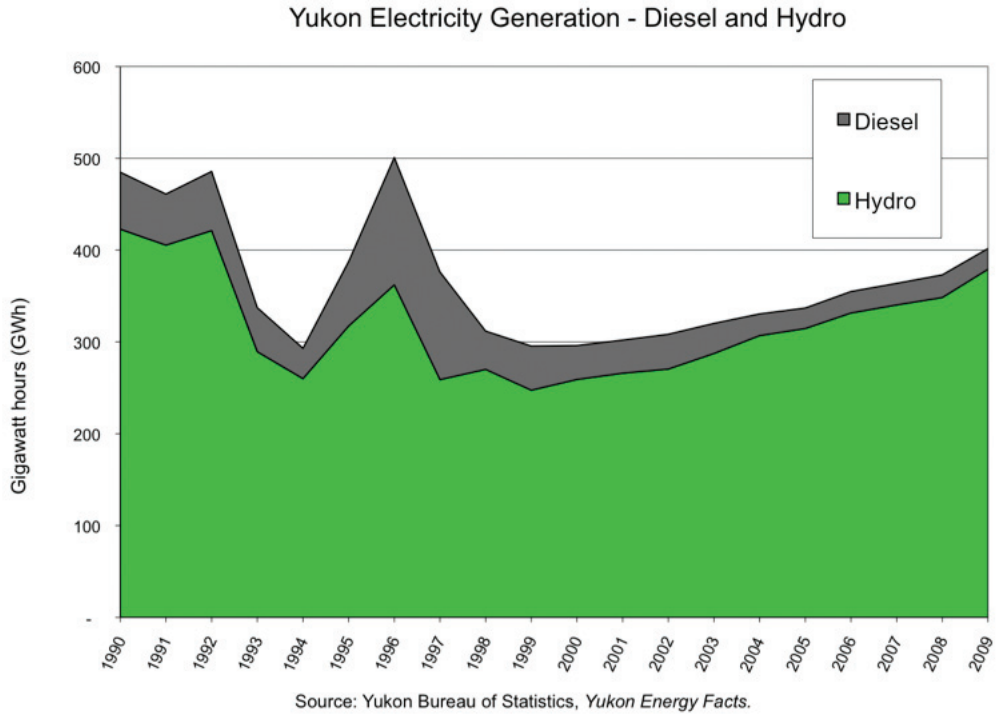
The relatively stable and low electricity rates enjoyed by Yukon ratepayers are a direct result of legacy hydro-electric infrastructure constructed between 1952 and 1985. The most recent electricity generation project of significant size in Yukon was the Fourth Wheel at the Whitehorse Rapids Plant, completed in 1985. The next-most recent generation project was the Aishihik hydro facility, completed in 1975. Thus, in a way, current Yukon ratepayers are living off the retirement savings of a previous generation.

While the Yukon Energy Corporation currently has a number of generation-enhancement projects in the planning stages, new electricity generation facilities will need to be built in the medium to longer term to fulfill demand from both non-industrial and industrial (including mining) customers.

The installation of new generation capacity holds significant potential for electricity prices to increase. On an isolated and regulated electrical system, planning and capital costs must necessarily be borne by ratepayers. It is not possible to "over build" to bring capital costs down and then sell surplus electricity into a larger grid. Further, not all planned projects are constructed. Notwithstanding that, planning costs are typically in the order of 10 percent of capital costs. Also, it must be remembered that short-term infrastructure decisions can strongly influence long-term infrastructure choices. As a result, decisions about new electricity generation options will no doubt receive an exceptional level of ratepayer scrutiny.

While an obvious solution to the coming shortfall might seem to be to connect to an existing grid in British Columbia or Alaska, estimated capital costs remain prohibitive at this point in time. For example, even with completion of the Northwest Transmission Line, which would extend the B.C. grid as far north as Bob Quinn Lake, the lowest cost conceptual option for a connection with the B.C. system is estimated at more than $1 billion. The relative size of the B.C. and Yukon electricity markets also bears consideration – in 2007, total Yukon electricity generation accounted for less than one percent of total electricity generation in B.C. (Statistics Canada, Cat. No. 57-202).

In contrast to its northern neighbors, the Northwest Territories and Nunavut, Yukon is currently in the enviable situation of being able to meet almost all of its electricity demand with supply from renewable hydro-electric sources. As illustrated in the chart below, 94 percent of all electrical load demand in Yukon was met with electricity generated from renewable



Source: Yukon Bureau of Statistics, *Yukon Energy Facts.*

sources in 2009. The 'carbon footprint' of Yukon's electricity generation sector is currently correspondingly very small. Among the challenges faced by Yukon Energy is to be able to meet increased demand loads while attempting to maintain the current mix of electricity generation from renewable and non-renewable sources.

Draft Load Forecast

Yukon looks poised to enter a period of sustained economic growth led by potential mineral development both on-grid (Victoria Gold, Carmacks Copper) and off-grid (White Gold region, Casino, Ketza River and Selwyn). Industrial load growth at the mines, to the extent that such loads materialize and are sustained, will in turn drive non-industrial load demand by residential and commercial customers.

As is well-understood in Yukon, mine-led growth in the electricity generation system brings its own challenges, primarily in the form of risk of "shutdown hangover". Since industry growth (and decline) is strongly correlated with highly variable mineral prices determined in global markets, ratepayers can be adversely affected through bill shocks and rate instability if electricity demand, from industrial customers, drops before capital costs for generation infrastructure are adequately paid off.

Also bringing implications for future electricity load demand is the price of oil. If oil prices continue to climb, fuel switching - the substitution of electricity for petroleum-based forms of energy - may begin to drive electricity load growth. For example, electricity customers who heat their homes with fuel oil may instead use more electricity to heat their homes as electric heat continues to become relatively less expensive.

The table below illustrates the forecast electrical energy loads on the combined Whitehorse-Aishihik Faro (WAF) and Mayo Dawson (MD) electricity transmission grids at three distinct points in time: 2015 (near term), 2025 (medium term), and 2050 (long term).

Key assumptions are described in the notes section of the table. For the sake of simplicity, the forecasts do not

Energy Charrette
Yukon Integrated Grid Load Scenarios (GWh/yr)
(Non-Industrial & Industrial Generation Loads including Losses)

Year	Low	Medium	High
Near-term (2015)*	442	544	610
Medium Term (2025)**	445	673	1,510
Long Term (2050)***	592	1,050	2,340

Notes

* Low = Non-Industrial growth at 2.34%/yr, no new mine connections
Medium = Low plus Victoria Gold
High = Low plus Victoria Gold & Potential Other Mine Loads

** Low = After 2020, Non-Industrial at 1%/yr, no mine connections
Medium = Non-Industrial at 2.34%/yr plus 200 GWh/yr Other (Mines or Fuel Switching)
High = After 2020, Non-Industrial at 4.0%/yr plus 1000 GWh/yr Other (Mines and/or Fuel Switching)

*** Low = After 2020, Non-Industrial at 1%/yr, no mine connections
Medium = Non-Industrial at 2.34%/yr plus 200 GWh/yr Other (Mines or Fuel Switching)
High = After 2020, Non-Industrial at 4.0%/yr plus 1000 GWh/yr Other (Mines and/or Fuel Switching)

incorporate generation from wind, Yukon Electrical Company Limited's Fish Lake plant, or secondary sales. The forecast loads are measured in gigawatt hours or GWh (the amount of electrical energy needed) rather than megawatt hours or MW (capacity to generate electricity) to better allow for comparisons between different energy sources. *Note that one GWh provides enough electricity to power 100 homes.* The forecast loads are based on non-industrial growth as well as the potential for new mines and fuel switching.

Charrette Teams and Integrators

Stuart Hickox, One Change, Dr. Jaccard, Simon Fraser University, and John Streicker, Climate Change Specialist acted as the charrette integrators. Their role was to identify, integrate and share with the group the themes emerging from day to day during the three day event.

To carry out the small group work taking place each afternoon, organizers divided the participants into nine charrette teams made up of the following perspectives and expertise:

- Charrette Planning Team (Group Facilitator)
- Planner
- Environment / First Nation Lands
- Economic Development
- Energy Expert
- Politician/Policy
- Political / community group
- Public
- Youth

Photo: Mike Thomas

The Yukon Energy Charrette

Day 1 Activities and Outcome

Day 1 March 7 session proceedings began with an opening prayer from elder and Yukon Energy board member Judy Gingell. This was followed by opening remarks from Yukon Energy Chair Piers McDonald and President and CEO David Morrision. Dr. Jaccard gave a keynote speech on "Clean Energy Goals and How to Get There."

Dr. Jaccard is a professor at Simon Fraser University and is a national and international energy expert. He was formerly the chair and CEO of BC Utilities Commission. In his key note address, he touched on the topics of energy sustainability, Yukon-specific challenges, and challenges shared by many other jurisdictions. He challenged participants to question their definition of what clean or green means and its relevance to the size and scope of the energy problem not only facing Yukon but most other jurisdictions in Canada. He warned that there is no one solution to energy problems and that for every choice there are trade-offs where some stakeholders are happy and some are not.

Common challenges facing the energy sector include the balance between equity and economic development. For instance, how do we determine and provide affordable energy and what is energy's role in economic development? And, how do we determine this when the future is hard to predict? There is a great deal of uncertainty associated with future energy demands, future energy technologies, effects of climate change, future price of fossil fuels, etc. Institutions must plan to meet a multiple of objectives, within a complex policy and regulatory system, and changing political context. To aid in this process he suggested the need to have a multi-attribute trade-off analysis mechanism to do electrical system planning. Attributes could include financial, environmental and social elements.

Specific to Yukon, Dr. Jaccard pointed out the challenge of managing quick increases and decreases in load, because of mining importance, in an isolated system. Some of the options range from quickly building new fixed supply to meet load, to connecting to another grid, to requiring mines to provide all their own power needs.

Following Dr. Jaccard was a presentation on the Yukon energy planning context, delivered by Paul Kishchuk (Vector Research) which was followed by three presentations from resource policy experts (copies of which can be found on the Yukon Energy website):

Solar: Gordon Howell (Howell-Mayhew Engineering)

Wind: Mark Green (Natural Power)

Waste to Energy: Don McCallum (Morrison Hershfield Environmental Engineering)

After an explanation of the connection between energy planning and the Yukon Government Climate Change Action Plan by Eric Schroff, Dr. Jaccard shared some of his ideas for Yukon energy planning based on his experiences with failures from around the world. Darielle Talarico wrapped up the morning's presentations with a brief report from the stakeholder and community meetings.

In the afternoon of Day 1, charrette participants were placed into teams (there were nine teams; each included a mix of perspectives and expertise) and tasked with answering two questions:

1) How would you describe the energy planning problem that Yukon Energy is facing?
2) What are the objectives the corporation is trying to achieve through energy planning?

Each charrette team shared the results of their discussions in a brief presentation to all charrette participants. The results of the first day's discussion can be summarized under four broad headings:

a) Future Growth and Economic Development

How does Yukon plan and build capacity for new electricity demand when faced with:

- a duality of demand – a growing trend of non-industrial demand accompanied by occasional spikes of industrial demand;
- concerns about the security of supply for fossil fuels such as diesel;
- limited short-term solutions to meet growing demand; and
- the importance of electricity in supporting economic development.

This must be done while keeping electricity prices predictable, stable and affordable for Yukoners.

b) Regulatory Structure and Social Issues

The regulatory and governance structure for electricity supply in Yukon makes it challenging to align electricity supply options with broader public policy objectives. The dimensions of this planning problem were described by charrette participants as follows:

- the true cost of electricity is not reflected in rates (because of direct and cross-subsidization) so people are not aware of the real cost of power;
- regulatory structure is confusing; issues are very complex and intertwined making it difficult for customers to contribute to the discussion in a meaningful way;
- there is a need for broad public education and engagement to fill the public education gap;
- there are different opinions on what constitutes a right or wrong energy decision;
- there is a culture of "energy entitlement" in Yukon;
- to serve or not to serve industrial clients and in particular mines is an issue that needs to be addressed, including what opportunities exist and who should be responsible for providing that power;
- expensive energy lowers our standard of living; we need to support people who are vulnerable; and
- the use of Orders in Council to direct the Yukon Utilities Board is cumbersome and makes it hard to know who is in charge of what.

c) Environmental Issues

Charrette participants indicated they are concerned about the effects of electricity generation on the environment. They expressed their concerns as follows:

- we need and want more electricity without using diesel, which produces green house gases and is expensive;
- renewable energy is attractive but can be expensive in the short to medium term;
- new hydroelectric development may result in flooding, which can have environmental impacts and affect First Nations land use;
- district heating could create some beneficial energy efficiencies;
- electricity planning needs to involve some form of sustainability test that considers social, economic and environmental factors; and
- we need to aim for the lowest carbon intensity possible, e.g., carbon neutral.

d) Yukon-specific Operating Challenges

The isolation of Yukon's electricity generation and transmission system means that Yukon Energy faces a variety of operating challenges and constraints that will influence future energy supply choices:

- technology choices need to be well-matched to available skills;
- new generation solutions need to complement the seasonality of the existing hydro-based electricity generation system;
- need to implement a mechanism to allow for electricity production by Independent Power Producers;
- new generation capacity needs to match the load on an ongoing basis; it needs to be scalable;
- energy conservation and efficiency efforts are way behind; we need to encourage energy conservation by implementing demand side management programs; and,
- Yukon Energy will soon need to replace aging diesel-fired generators.

Photo: www.archbould.com

Energy Planning Principles

The charrette participants agreed to four key principles for electricity resource planning in Yukon:

1. **Reliability** – there is a need for reliable capacity and energy for utility customers today and in the long-term. This includes the need for short-term reliability to keep the lights on, to ensure reliable capacity to meet winter and summer peak loads, and to minimize the number and duration of any power outages. When assessing new resource options, reliability also includes the ability to develop new resource options in a timely manner as needed to meet near-term requirements in a cost effective manner. Security is also a requirement given fossil fuel supply constraints and the ups and down of the economy. As well, there is a need for predictable costs and supply and the link to B.C. or Alaska should be investigated. Mines loads could be used to subsidize new infrastructure.

2. **Affordability** – minimize costs for power utility customers today and in the long term. The Yukon Utilities Board regulates the costs to be recovered through rates, focusing on need, justification, and reasonableness of costs incurred – and with a clear objective to minimize the costs required to serve customers today and in the future. Yukon Energy needs to avoid rate shock and address risk associated with the obligation to serve. Rates need to be equitable, fair, and socially responsible for Yukoners.

3. **Flexibility** – need for flexibility to deal with major and sudden changes in grid loads. Resource planning must be attentive to the fact that loads will not grow at continuous rates into the future but (as experienced in the past) will likely come on and off the system in lumps to the extent that mine industrial loads are connected to the grid. Because Yukon is not interconnected with grids in other provinces/jurisdictions, surplus renewable energy in Yukon cannot be exported and new demand cannot be met through energy imports. Sudden loss of mine loads can result in major rate increases for the remaining customers in Yukon to the extent that ongoing fixed generation or transmission costs remain to be funded. Accordingly, new resource supply options need to be planned in light of any such ongoing load uncertainties and must provide for resilience under various potential load scenarios. There needs to be diversity in the generation mix, look at district heating, be open to emerging technologies and explore solutions that are incremental (scalable).

Cost-effectiveness, reliability, and safety are the pillars on which the Canadian electric power system was built. A new constant, sustainability, is one of the key driving forces behind the transformation that will occur in the decades to come. The future industry will take into consideration the balance of environmental, social, and economic impacts, which the system will have on Canadians.

~ Pierre Guimond, President and CEO, Canadian Electrical Association

4. **Environmental Responsibility** – the importance of environmental responsibility with regard to local and global socio-economic and environmental impacts on water, air and land. This principle goes beyond responsible planning for new resource projects as required by various regulatory authorities before these projects will be permitted. Yukon Energy is committed to planning for energy solutions that reduce greenhouse gas emissions (GHGs) and meeting the goals of climate change action plans in Yukon as well as nationally and globally. Yukon Energy needs to include green building codes or super green, district heat, heat pumps and encourage energy efficiency including smart meters and prioritize demand side management project. Yukon Energy should also watch the environmental foot print from projects and lifecycle impacts.

Additional principles noted in the energy charrette included provision for local jobs and energy security. Where feasible there was a preference to use resources that are locally

available (e.g., wood biomass such as beetle kill timber near Haines Junction) as well as technologies that Yukon is familiar with (e.g., hydro).

No one principle takes precedence or is given greater weight than any other principle. The objective is to achieve an appropriate balance among the key principles using professional judgment and based on known near term and longer term requirements. These principles are applied with a view to the existing Yukon policy framework[2], as well as existing general and transmission requirements (both on-grid and off-grid).

Day 1 Evening Open House

Each evening during the charrette, the public was invited to review and provide comments on the work of the charrette participants. The results from the evening sessions were recorded and became part of the record of the charrette (details on Yukon Energy's website). Forty to fifty members of the public attended the evening sessions with some people attending one session while others attending all three evenings. The evening meetings all began with a presentation from keynote speaker Dr. Jaccard who recapped the activities and results of the day.

On the first evening, the public was asked to add to the charrette participants' work by defining the problem, followed by identifying the principles Yukon Energy needs to consider when making decision. The public responses were similar to those of the charrette participants during the day. Serving the mines, replacing diesel generated electricity with renewable sources, knowing the true costs of electricity, and Yukon Energy working openly with Yukoners were seen as the main issues that Yukon Energy needed to address in its future planning. The principles that needed to be considered in addition to affordability, flexibility, reliability and environmental responsibility were innovations, local economic benefit for Yukoners, examination of the synergies, development of a mix of options and long term planning.

Photo: www.archbould.com

[2] This includes Yukon's Energy Strategy and the Yukon Climate Change Action Plan, and any other relevant government policies or directions, as well as Yukon Energy's Strategic Plan.

Day 2 Summary

Dr. Jaccard began the second day with a reflection on the Day 1 presentations and discussions, and briefly introduced the concept of "decision making under uncertainty." He spoke to several issues including not making decisions on energy options just based on price per kilowatt hour, as there are so many other factors involved. He also stated his concern that planners can't be too linear in their approach and this is why he again emphasized the need for a decision making analysis process. He referenced that, in the day's group work, participants would use a framework outlined in the book 'Smart Choices' by John Hammond, Ralph Keeney, and Howard Raiffa. He also challenged participants to explore during their group work exercise what it means to have a flexible system, and check to see if it is resilient and robust.

Next, President and CEO of the Canadian Electricity Association Pierre Guimond shared some perspectives on the future of the Canadian electricity sector.

This was followed by a series of other presentations that included:

Energy Conservation and Efficiencies: Ivano Labricciosa (Toronto Hydro-Electric System)

Hydro: Forest Pearson (AECOM Canada)

Natural Gas: David Dunn (Fekete Associates Inc.)

Geothermal: Timothy Sadlier-Brown (Sadlier-Brown Consulting Ltd.)

Bio-energy: Dr. Fernando Preto (CanmetENERGY Technology Centre)

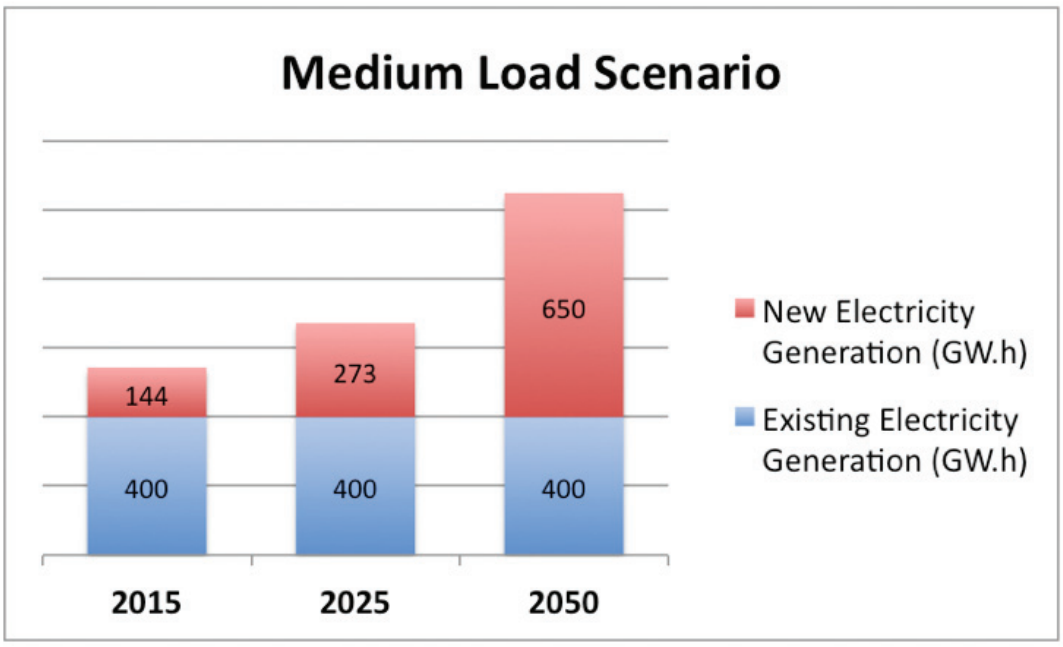
Nuclear: Dr. Chary Rangacharyulu (University of Saskatchewan)

Energy Storage and Transmission: Bruce Ledger (BBA Engineering)

Coal / Thermal: Cam Osler (InterGroup Consultants Ltd.)

The small group activity for Day 2 was centered on the use of an energy game that was designed to help the participants identify and discuss decision making tradeoffs. The energy game consisted of 21 cards that described "some" of the broad selection of energy supply and conservation options available in Yukon. Energy game options included:

- hydro enhancements at Atlin, Gladstone and Marsh Lake;
- a 21 MW wind farm at Ferry Hill;
- replacing some of Yukon Energy's diesel engines with natural gas engines or turbines;
- use gas turbines to generate electricity at off-grid locations using trucked-in liquefied natural gas;



- use coal to generate electricity at the Division Mountain Coal minesite;
- construct new small-scale (less than 10 MW) hydro, construct medium-scale (10 to 100 MW) hydro, and construct large-scale (100 MW+) hydro;
- build a geo-thermal generation plant; build a micro-nuclear facility; construct a grid-connected photovoltaic (solar) system;
- build a cogeneration (biomass) plant for both electricity and heat; construct a waste to energy plant for both heat and electricity;
- implement short-term energy storage technology to improve reliability of electrical system operations (spinning reserve);
- implement long-term energy storage technology such as pumping water to a higher elevation at times of low energy demand and release it during periods of high electricity demand; connect to the BC grid;
- implement programs that encourage consumers to reduce their energy consumption and influence how and when electricity is used;
- alter electricity rate structure to reward consumers for consuming electricity when it is least expensive to generate; and
- amend building codes and standards to require more energy efficient design and construction.

With these cards, under the conditions presented to each team, game participants were given three scenarios to work within: short-term 2015, mid-term 2025, and long-term 2050. As well, the participants had to work within the context of Yukon regulatory regime in applying the objectives discussed the day before (reliable, affordable, flexible, and environmentally responsible).

The table on the previous page illustrates the forecast electrical energy loads on the combined Whitehorse-Aishihik-Faro (WAF) and Mayo-Dawson (MD) electricity transmission grids at three distinct points in time: 2015 (near term), 2025 (medium term), and 2050 (long term).

To further challenge the participants each group had one or two "game changers" introduced at random into their discussions. Upon the introduction of a game changer, the charrette teams were asked to re-think their energy supply choices. The game changers were:

- Large mine connects to grid (50+ MW)
- Large mine shuts down operations ten years earlier than expected (50+ MW)
- Oil prices go up to $250.00/barrel

Summary of the type of choice cards selected per time frame scenario

2015	2025	2050
• Hydro Enhancement (Marsh Lake) • Demand side management • Wind • Biomass • Hydro enhancement (Atlin Lake) • Hydro enhancement (Gladstone) • Liquefied natural gas • Solar • Waste to energy • Diesel enhancement • Individual district generation • On-site generation at large mines	• Solar • Wind • Liquefied natural gas • Biomass • Demand side Management • Medium sized hydro • Geothermal • Micro-nuclear • Small hydro/hydro enhancements • Vehicle battery storage • Waste-to-energy • Connection to B.C. grid • Independent Power Producers • Large hydro • Spinning reserve	• Solar • New hydro • Biomass • Demand side management • Grid connection with BC/Alaska • Liquefied natural gas (from pipeline) • Electric transportation • Geothermal • Micro-nuclear • New technologies

- A new transmission line is constructed in Yukon (e.g. Casino to White Gold/ Wolverine to Ketza River)
- Yukon transmission grid is extended to Bob Quinn Lake, B.C.
- There is a transmission line connection from Yukon to Southeast Alaska
- The Alaska Highway Natural Gas Pipeline is constructed
- Whitepass Railroad goes back to its original business of supply and service to the mines
- The Alaska Canada Railway is built linking Yukon and Alaska to the North American railroad system
- Liquid natural gas becomes available in Yukon
- Development of the Northern Cross natural gas field at Eagle Plain
- All new electrical energy must cost less than $0.15/kwh
- All new electrical energy must be from renewable sources
- Metal prices collapse and all Yukon mines stop operating

While there was not full consensus among the nine groups, or even among individuals within each group, there were some common themes and predominant views that emerged from the game. The main realization was decision making is complex and involves a number of tradeoffs. The second was that, selecting short-term solutions was not as hard as selecting medium term and long term solutions, as the future is hard to predict and uncertainty increases risk. The chart on the previous page demonstrates some of the energy cards that were selected as a means of meeting each of the scenario targets.

After playing the game, some charrette participants expressed their realization that there are many trade-offs that must be considered when doing resource planning. Here is a sample of what they told us:

- Consider the development of a matrix or framework, that could assist in assessing the resource technology options against the energy planning principles so they can be properly compared. The matrix/framework should include a means to establish environmental impacts, other attributes associated with affordability besides price, means of judging reliability in terms of seasons and system compatibilities, and the variables associated with flexibility (short and long term, use of local resources, policy changes).
- Costs associated with different options can be confused by subsidies and pricing that does or does not include the full life cycle cost of a technology.
- It was increasingly more difficult to plan or even anticipate what might be the type of solutions or technologies available when planning to 2050.
- The concept of energy security took on various meanings to various people: long term security or short term, use of local resources versus connecting to the North American or Alaskan grid, the use of solar and wind to secure our own homes versus total reliance on the Yukon grid, and in general, just how vulnerable our economy and communities are to electricity.
- The need for innovative solutions to meet the energy demands of mining and other industrial customers that are on or off the grid. Do mining companies take care of their own needs or do Yukoners through policy/ regulation want to be involved to ensure the off grid industrial customers are using clean energy options?

Day 2 Evening Open House

The second evening Dr. Jaccard recapped the work of the charrette participants and spoke about the energy choices and the 'bumpiness' of the grid. The public played a game so they could see what it was like to make decisions regarding energy. They also had to adhere to the decision making principles of reliability, affordability, flexibility, and environmental responsibility. They were given 'sticky dots' and told to find 273 new gigawatt hours/year of electricity. The energy resource options the public chose in order of preference were: energy conservation (demand side management), biomass, wind (both Ferry Hill and Mount Sumanik), new hydro medium scale, nuclear, solar, geothermal, transmission connection, Marsh Lake storage, new hydro small scale, Atlin Lake storage, waste to energy, Gladstone Lakes diversion, and natural gas. A facilitated discussion about the impacts of these choices followed the game.

Day 3 Summary

Day 3 of the charrette began with an introduction by climate change expert John Streicker and a sharing of the discussions at the open house from the previous night. Dr. Jaccard delivered a presentation on the topic of "Energy-Climate Policy Experiences" which explored the effectiveness of energy conservation and climate change policies in Canada. Next, Deputy CEO and Executive Vice President of BC Hydro Bev Van Ruyven shared some of her experience at BC Hydro with implementing the company's PowerSmart program.

Utility lawyer John Landry gave a presentation on "Utility Regulation in Yukon: Constraints and Opportunities." Stuart Hickox of the advocacy group OneChange followed with a talk about overcoming barriers and building trust, which outlined a path to effective community engagement for energy conservation. John Streicker ended the morning presentations with an exploration and discussion of Yukon's energy future and climate change.

The small group activity for Day 3 was in two parts. First, the charrette teams were asked to consider how a significant loss in electricity demand would change their energy choices from the previous day. Dr. Jaccard wanted the groups to reflect on the principle of flexibility. Second, each of the teams was asked to consider how it wants Yukon Energy to engage with Yukoners after the energy charrette.

Question 1 - What happens to your generation plans from Day 2 when there is a significant loss of energy demand?

- Charrette participants discovered that the sudden loss of a substantial amount of demand would likely have consequences to the energy choices they made in the short and medium term. In particular, if they had selected an energy choice that had long term value but cost a lot of money, a sudden loss of demand might mean rate payers would be saddled with paying for infrastructure that wasn't needed. The exercise drove home the point that careful consideration must be given to short term options, as they may have long term impacts.

Question 2 – How do you want to be further engaged by Yukon Energy?

- Charrette participants want to keep talking with Yukon Energy about our energy future. They also want to broaden the discussion to include all Yukoners – students, young children, parents, people living in Yukon communities, businesses, employees, and other governments and organizations. A continued dialogue will build trust and periodic reporting and progress reports will demonstrate accountability.
- Yukon Energy should engage more Yukoners through ongoing education and implementation of public education through: traditional methods (e.g., information sessions, another charrette, brown bag lunch sessions, better bill information, newspaper ads); methods that make use of new technology (e.g., smart phone apps, a SIM City-like video game, solar-powered billboards showing real-time generation information, websites, blogs); art-based methods (e.g., Music, Art and Drama art piece, "Power-Nut" super hero); and, action-oriented projects to increase the public's knowledge about energy and energy conservation (e.g., school audits, door to door campaigns, shock-inducing false bills).

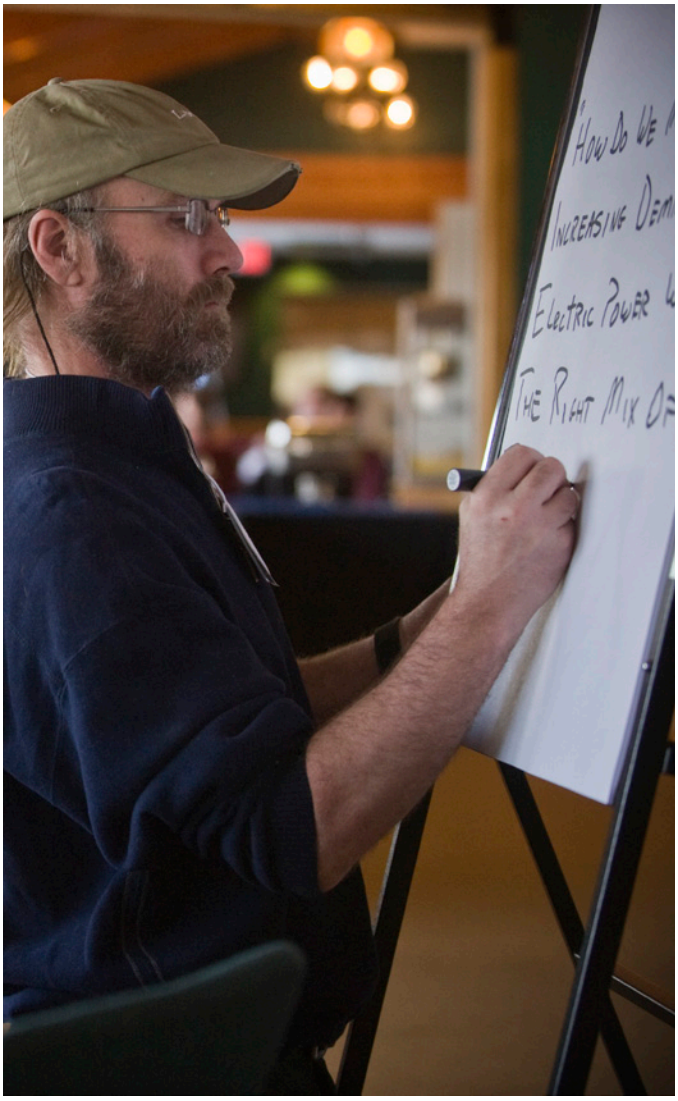
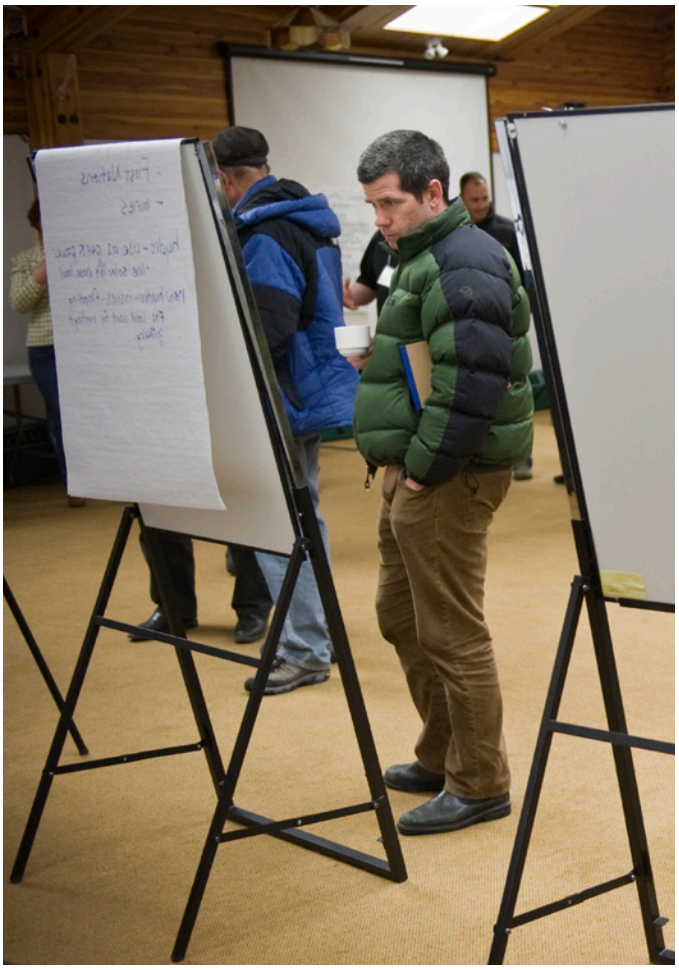


Photo: www.archbould.com

- As a result of the charrette, more Yukoners have an improved understanding of the complexity of energy planning in Yukon and they want to stay informed and involved. Yukoners want the opportunity to be involved in the development of the 20-Year Resource Plan update. They want to understand the energy options/choices and they want Yukon Energy to explain the rationale in public. They asked that the corporation hold public meetings on a regular basis to keep Yukoners up to date on energy planning and on the corporation's resource plan.
- Several charrette participants indicated that Yukon Energy needs to show leadership as we move forward in shaping Yukon's energy future. This could include things such as helping people understand that energy issues affect everyone and should be important to everyone, bringing the Yukon government and large industrial customers (mines) further into the energy conservation and championing energy pilot projects.



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Day 3 Evening Open House

Bev Van Ruyven of BC Hydro started the evening session by discussing her utility's PowerSmart program. Conservation as an energy resource option was one of the preferred choices coming out of the charrette to meet short term loads. BC Hydro is a recognized leader in energy conservation. Ms Van Ruyven shared her company's experience and also spoke about new initiatives the utility is pursuing with residential, commercial and industrial customers. John Landry, Yukon Energy's Utility Board expert and lawyer, then discussed with the public the constraints faced by Yukon Energy as a utility regulated by the Yukon Utilities Board (YUB) and as a monopoly in regards to the *'obligation to serve'*. Mr. Landry advised at the meeting that the YUB is focused on economic regulations; the social and environmental considerations of Yukon Energy projects are most often reviewed and regulated by the Yukon Environmental and Social-economic Assessment Board and the Yukon Water Board. The *'obligation to serve'* was reported as a resource planning issue for other utilities across Canada.

The charrette ended with a discussion of how Yukon Energy should engage with the public. The Yukoners who attended the evening sessions want to keep talking. They want to see the 20-Year Resource Plan reflect what was heard at the charrette and that the decision making principles are being used. There was support for partnerships and education, including the development of curriculum for schools and partnerships with First Nation governments and Development Corporations. The idea of an energy working group made up of stakeholders and public was also suggested.

The Charrette Developments

During the three days of the charrette, the participants talked about energy ideas with experts and each other. They learned about Yukon's planning realities, the resource planning options and the risks and uncertainties which make planning for Yukon's energy future challenging.

From the beginning Yukon Energy set out to engage Yukoners to find the answers together. The results of the charrette include:

- Yukoners are talking about energy;
- Yukoners have a better understanding of Yukon Energy planning realities and future resource options;
- Yukon Energy has energy resource background papers specifically prepared considering the Yukon context for hydro, demand side management, biomass, wind, natural gas, diesel, coal and thermal, waste to energy, storage and transmission, nuclear, geothermal and solar;
- Yukoners learned that the *obligation to serve* is a risk and uncertainty that other utilities across Canada share and plan for;
- Yukoners want energy decisions to consider more than just cost;
- Future energy options must be affordable, reliable, flexible and environmentally responsible;
- Energy conservation must be considered as the key resource planning option in the short term;
- Along with exploring new hydro, hydro enhancements, wind at Ferry Hill, geothermal and waste to energy, Yukon Energy should also investigate possible options such as biomass, wind, solar and liquefied natural gas;
- Yukon Energy should explore the local beetle kill forest as fuel for biomass;
- Yukon ratepayers may need to pay more for their electricity if the rates are to better reflect the true cost;
- The next 20-Year Resource Plan must reflect what was heard at the charrette;
- Yukon's youth (as represented by Experiential Science 11) want to be engaged and part of Yukon's energy solution; and
- Yukon Energy must continue to work with Yukoners to find the answers together.

Conclusion

- Yukon must plan and build capacity for new electricity demand that meets future system growth and supports the economy within the reality of increasing diesel prices and limited short-term solutions. Can an increase in demand due to economic growth be turned into an opportunity to create a supply of clean or sustainable energy that Yukoners agree to and can afford?
- Regulatory rules that exist tend to be confusing and complex. Orders in Council further complicate this situation. Most people do not know the true cost of electricity and have expectations that they should continue to have low cost power. Some people can pay the true cost of power while for others it would be a hardship.
- Generation of power must be done with the least amount of impact on the environment. This includes the need to avoid, as much as possible, the production of greenhouse gases. Renewable energy is attractive but can be expensive in the short to medium term. Hydro can impact the environment through flooding. How can we plan for future energy needs in a more integrated way that takes into account ideas such as district heating, reduction of transportation fuels, minimizing environmental foot prints, renewable energy and the use of local resources?
- Isolation and present capacity of Yukon's electricity generation and transmission system is a challenge. What technology and local skills best fit with our existing hydro system? What is the role for independent power producers? How can new generation be scalable to needs? What and how much energy can be conserved?

Next Steps

The immediate next steps for Yukon Energy are to:

- Report on the response from the community meetings and the charrette; advance the implementation of energy conservation and efficiency programs;
- Ensure principles agreed to at the charrette are reflected in the 20-Year Resource Plan update; and
- Continue engaging stakeholders, governments and the public.

Yukon Energy would like to thank all those who participated in the charrette process. You were incredibly generous with your time and your ideas, and your efforts will be a huge help as Yukon Energy moves forward with you in planning for the future.

Let's keep talking!

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Post-Charrette Comments

Following the charrette, a draft of this summary report was sent to charrette participants for their input. Here are the comments Yukon Energy received, which we appreciate and which form a part of this report.

City of Whitehorse

- This charrette dealt with more related to Yukon Energy's electricity needs and not Yukon's energy needs.
- Electricity demand is forecast to increase not just related to increasing economy but also will increase with changes in energy use as people want to get away from using fuel for vehicles and fuel for heating homes.
- Biomass opportunities should be pursued not just related to use of beetle kill trees, but forest fire kill. Use of biomass related to dead trees could also have spin off opportunities related to use of pellets and wood chips to reduce the demands for importing heating fuels.
- To be able to reflect rates related to the true cost of power, time of use metering and rates based on time of use was discussed and supported. City of Toronto and BC Hydro both spoke to time of use metering and rates related to that.
- What came out at the meeting and may not have been discussed effectively is the B.C. goal of increasing green power and stopping the purchase of power high in GHG (i.e. coal from Alberta or within B.C.) and the future hydro demands may in fact be of benefit to the Yukon as it may be worthwhile to consider major hydro facilities that can service B.C.
- On page 8, a bar graph or something similar to the one on page 14 would be easier to absorb.
- On page 9, under Environmental Issues, first bullet seems to negate energy conservation right off the bat (We need and want more electricity…").
- On page 12, we thought the four principles were established prior to the charrette and participants were informed these were the principles our ideas had to adhere to.
- On page 15, good summary of participants' selections. More easy to read summaries of responses and ideas from participants (like this one) and the activities would be helpful.
- On page 16, the need for innovative solutions to meet the energy demands of mining and other industrial customers is a big important question and one that would be good to discuss more with the public. Interesting that the public rated biomass so much higher than the day's participants.
- On page 17, under Question 1, an idea was suggested to promote the Yukon as a green, eco hub and attract more businesses that want to use carbon neutral energy. Don't give up on the culture of conservation if the demand plummets again.
- On page 18, what about Yukon Energy having a greater understanding of the public's concerns and their desire to be engaged? Learning can go both ways. Also, we like the idea of an energy working group that involves the public. A committee consisting of energy partners to undertake conservation projects would be a great way to get around the comment "that's not in our mandate". Let's work together to make it everyone's mandate.
- On page 19, what did Yukon Energy learn from the charrette?
- In the conclusions section on page 19, bullet #1, let's turn challenges into a great opportunity. Bullet #2, add "unless there were programs to super insulate (and offer other energy saving ideas) people's homes and businesses so they actually pay less. Bullet #3, it's good to see transportation mentioned. It's the elephant in the room when it comes to GHGs.
- On page 20, what about assessing the risk associated with different customers and if mines should provide some of their own power?
- This charrette was about Yukon Energy's future. Working with energy stakeholders to discuss the Yukon's energy future in a broader context would be good (including transportation etc.). Developing a Community Energy Plan could help address some broader issues, and get more players to come to the table and take responsibility for their piece.

Yukon Conservation Society

- We feel that when hydro is mentioned in the report, the negative environmental impacts are glossed over. Creating reservoirs that did not previously exist or increasing/decreasing the size of lakes to manage water levels for hydro projects causes irreparable damage to ecosystems. Hydro projects also change the flow of rivers – increasing and decreasing – that also affects fish and fish habitat. All of our existing hydro projects (Whitehorse Rapids, Mayo and Aishihik) have had disastrous consequences for fish and people who subsist on fish. Yukon Energy and Intergroup clearly want to promote hydro as a clean alternative to diesel generation, but to help the public with their multi attribute trade-off analyses, the environmental impacts need to be stated more truthfully in this document.
- We don't feel the report adequately speaks to the common theme of the need for an increase in diversity of energy sources. Currently we have the limited mix of hydro and diesel and (barely any) wind. This carries a great deal of risk considering the financial and environmental costs of fossil fuels, and the fact that changes in our climate occurring now and predicted for the future will make our hydro capacity less firm than is currently being planned for. The Yukon Conservation Society would like to see a lot of wind, solar and other renewable alternatives complementing our existing legacy hydro facilities. We also want to see more distributed generation: small, low impact projects harnessing energy close to where it is needed. We support net metering and IPPs that meet low-impact criteria to help meet growing demand. We want to see meaningful government and government-owned utility incentives and sharing of risk for household generation.
- Our now interconnected grid is inefficient and vulnerable. The entire territory can be knocked offline from lightening, a fallen tree or a misfortunate squirrel. The current grid is faltering with only a few well-understood sources of power. What will happen once more wind, net meters or IPPs are added to the mix?
- It does not appear that our grid is smart or resilient enough at present for the Yukon's needs now and into the future. Our dated infrastructure from transmission lines down to meters in our homes must be updated in conjunction with new initiatives so we can truly move forward.
- We are happy to see DSM featured prominently in the report. The public is on board wanting initiatives to reduce our demand for electricity and to ensure existing capacity is used in the best possible way before new generating facilities are built. We are encouraged that Yukon Energy has initiated some public education programs and has hired staff to manage DSM. YCS has been a champion of efficiency and conservation for a long time and is keen to play a role in whatever programs would benefit from our involvement.

Kwanlin Dun First Nation

- There were a couple of–perhaps surprising – points that emerged from the energy game and associated discussions. One was the strength of the positive opinion toward biomass as a possible energy source. Another was the heat around the debate over hooking up to the B.C. grid. The strength of the support for demand side management was quite pronounced. It would be good if some of the more striking points of consensus or division could be captured prominently in the report.
- While the evening sessions were open to all comers, the day sessions mostly involved stakeholders and experts. We gave up a good deal of time and would like to think that it was more than an "energy game", but the first stab at a planning process that would get increasingly detailed, focused and rigorous. Similarly, we would like to see the "Next Steps" section strengthened with details of process, deliverables and timelines.
- Change the closing invocation of "Let's keep talking!" to something along the lines of "Decision time's coming and we'd better get cracking!"

Utilities Consumer Group

- Don't know where we are going with this report and don't want it to be used as a way for Yukon Energy to push their agenda or tell the Board they have consulted on a future resource plan.
- This is a bad time of year to try and consult with the public and stakeholders. Everyone is trying to enjoy and get the most out of summer. Early winter is much better timing as people are settling in and have much more available time.
- We need to work on an updated resource plan, including DSM, IPPs and net metering in the picture for the short term, then look at longer range forecasts to discuss possibilities.
- We can use the old resource plan, the Energy Strategy and the charette report as aids to help us decide on what means we use to develop new energy infrastructure into the future.

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