

**Demand Side Management Paper
for the Energy Conservation
Workshop, April 19, 2012**

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1.0 Introduction

Energy conservation and efficiencies, referred to in the utility industry as demand side management (DSM), provides opportunities in Yukon to meet future energy requirements by reducing the need to construct additional electricity generation capacity. DSM includes both decreasing the total electricity demand and shifting the demand by changing when electricity is used. In both cases the cost of constructing new electricity generation capacity is avoided. DSM maximizes the use of the existing installed capacity. As such, DSM meets Yukon Energy's energy planning principles of reliability, affordability, flexibility, and environmental responsibility.

Direction from the Yukon Utilities Board, public responses (survey and energy charrette) and alignment with the Yukon government's Energy Strategy and Yukon Energy's corporate priorities means that an effective and robust DSM program is a crucial element in Yukon Energy's energy resource planning. According to a recently completed Conservation Potential Review conducted for the territory's two utilities and the Yukon government, it has been estimated that by 2030, DSM has the potential to save up to 48% of projected residential and commercial electricity demand growth on the Yukon grid.¹

Direction from the Yukon Utilities Board, public responses (survey and energy charrette) and alignment with Yukon Government's Energy Strategy and Yukon Energy's corporate priorities has resulted in ensuring that an effective and robust DSM program is considered when forecasting Yukon's energy and capacity requirements over the next twenty years. Yukon Energy is also working to reduce its own energy consumption through Supply Side Enhancements (i.e. improved efficiency of generation units, transmission, etc.) and internal corporate energy conservation and efficiency initiatives (changes to operations, procurement, staff behavior, etc.). As well, it is working one-on-one with the industrial (mining) sector on energy conservation/efficiency initiatives. In order for DSM to achieve the greatest potential it requires participation from all Yukoners.

2.0 20-Year Resource Plan Demand Forecasts

Yukon Energy is updating its 20-year resource plan which will address the corporation's generation and transmission priorities in Yukon to 2030. The plan will provide overall planning guidance for resource options to be implemented in the next five years and over the longer term. Energy conservation is an important part of the plan.

The hydro surplus in existence since the closure of the Faro mine in the late 1990s is becoming depleted as demand for electricity increases from all sectors (residential, commercial, government and industrial). Further, most of the hydro enhancement opportunities previously identified have now either been developed or are currently under active consideration. Yukon Energy is exploring a range of other energy options that will either minimize or displace reliance on diesel. Energy conservation/efficiencies is one of the best of these options, since the more electricity is saved, the less new infrastructure needs to be built.

¹ Yukon Electricity Conservation and Demand Management Potential Review (CPR 2011) released January 9, 2012

3.0 Public Response to Energy Conservation

Yukoners support energy conservation. A public opinion survey conducted for Yukon Energy in June 2010 reported 89 percent of Yukoners support assuming more personal responsibility toward energy conservation².

The energy charrette hosted by Yukon Energy in March 2011, which brought together about 100 Yukoners and energy experts from across Canada for three days to talk about the territory’s energy issues, further confirmed support for DSM. Energy conservation was ranked as the most preferred energy resource option and was considered as a key resource planning option in the short, medium and long term planning scenarios (see Figure 2 below from the Charrette Report)

Figure 2: Energy Charrette March 2011

Summary of the type of choice cards selected per time frame scenario		
2015	2025	2050
<ul style="list-style-type: none"> • Hydro Enhancement (Marsh Lake) • Demand management side • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Solar • New hydro • Biomass • Demand side management • Grid connection with BC/Alaska • Liquefied natural gas (from pipeline) • Electric transportation • Geothermal • Micro-nuclear • New technologies

4.0 What Yukon Energy is Doing

Building on the public affirmation that DSM is a crucial element in helping us meet Yukon’s growing electricity needs, Yukon Energy has moved forward on energy conservation. In working towards the development of a territory-wide energy conservation/efficiency plan, Yukon Energy has been involved in the following initiatives over the past year:

² Public and Stakeholder Phone Survey Results Public Awareness Campaign Phase 1: Research Report 1 released June 25, 2010

New Department

Yukon Energy established an energy conservation department in 2011 to work with stakeholders on Yukon-wide energy conservation and efficiency programs. This department will also help the Corporation find ways of reducing our own energy use. Energy conservation is a critical element in helping us meet Yukon's growing energy needs.

Working Group

Yukon Energy chairs an energy conservation working group, made up of representatives from Yukon Electrical Company Limited and the Yukon government's Energy Solutions Centre along with two of our own staff. We also participate in a Demand Side Management steering committee, made up of senior officials from the two utilities and the Yukon government. Both groups meet regularly to ensure planning is done collaboratively and that programs are executed in a transparent and cooperative manner that avoids duplication.

Conservation Potential Review

Yukon Energy has been working to find out more about how people use electricity in the territory and where the greatest gains might be in terms of energy conservation and efficiencies. In 2011 we partnered with the Yukon Electrical Company Limited and the Yukon government's Department of Energy, Mines & Resources to collect this information.

We hired ICF Marbek to do a conservation potential review. Through its research, the company sought answers to the following questions:

- How do Yukoners currently use energy (i.e. what percentage of energy consumption goes towards heat, hot water, lighting, plug loads, etc.)?
- How much power would Yukon need in future years if there weren't any energy conservation/efficiency initiatives put in place?
- How much potential is there in Yukon for energy savings through conservation/efficiency initiatives?
- Where are the greatest gains to be made in terms of conservation of electricity?

The consultants gathered the information using customer billing data, stakeholder consultation and customer surveys. They processed all the collected data and returned to Yukon in November to share their initial findings. Through stakeholder "Achievable Potential" workshops they asked participants to talk about how much of the electricity savings identified in the draft report can realistically be achieved within Yukon's residential, commercial and renewable sectors.

Marbek used the feedback it received during these workshops to further refine its report. The final report is now available to the public.

One Change Community Tour

In the summer of 2011 Yukon Energy took our conservation message on the road. Together with Yukon Electrical Company Limited and the non-profit group [One Change](#), we visited almost every community in the territory. We set up tents with interactive displays in highly visible areas, gave away energy efficient products, and talked to hundreds of Yukoners about what they think a territory-wide electricity conservation plan should look like. The input will assist us in our work to develop conservation programs for Yukon.

LED Streetlight Pilot Project

In 2011 we did research on Light Emitting Diode (LED) streetlights in Dawson City, with positive results. The research shows that the annual energy used by the traditional High Pressure Sodium streetlights is 416 kilowatt hours per light, compared with only 150 kilowatt hours per LED streetlight, a savings of 64 percent.

However LED technology is changing rapidly and we would like to test some options that weren't available to us when we started the pilot project. This year we will experiment with several different types of LED streetlights before deciding which types/brands will be the best for our Northern needs.

Alexco Mine Audit

In the summer of 2011 we partnered with Alexco Resource Corporation to do an audit of their mine site near Keno. We'll continue working with Alexco this year to implement some of the suggested energy saving measures. We will conduct similar initiatives with other Yukon mines and we will work with the City of Whitehorse to audit their facilities.

Internal Audit

Yukon Energy is also looking at our own operations as well with an eye to conserving energy. In 2011 we completed an audit of our Whitehorse and Dawson City office and plant buildings and we are prioritizing actions that will increase the efficiency of our facilities. Yukoners will be able to follow our progress on our website (www.yukonenergy.ca).

City of Whitehorse Audit

Yukon Energy has partnered with the City of Whitehorse to do an audit in 2012. This pilot includes a look at continuous improvement as part of the audit/planning cycles.

Fridge and Freezer Retirement Program

In 2011 Yukon Energy partnered with the Yukon government's Energy Solutions Centre to help members of the public replace their old refrigerators and freezers with new more energy-efficient models. The used appliances must be at least five years old and in working condition. Not only will Yukoners received \$50 for each fridge or freezer they have replaced (up to two appliances) but the Energy Solutions Centre will remove the old model, take it to the landfill, and pay the landfill tipping fee. Yukon Energy will continue to support this program this year.

Online Energy Calculator

With assistance from Maritime Electric, we developed an online energy calculator in 2011. It allows Yukoners to determine how much electricity each of their household appliances and other electronic equipment requires to operate. The tool gives members of the public the ability to better manage their electricity usage and lower their power bills.

Tradeshows

In the spring of 2011, Yukon Energy ran a public awareness campaign that promoted the use of clotheslines. Employees set up a booth at an annual trade show in Whitehorse and gave away hundreds of packages of clothespins, along with several drying racks and clotheslines. We also provided tip sheets that included other energy saving information.

This year we will once again be set up at the Lion's Trade Show in Whitehorse with a very large Plinko game board. People will have a chance to play Plinko to win energy-savings products. We'll also have our Plinko board set up at Swan Haven on April 21 and 22 during Celebration of the Swans.

Dollars to Sense Workshops

Yukon Energy, working with Yukon Electrical Company Ltd., and Natural Resources Canada, hosted a series of energy management workshops in 2011 for Yukon businesses and First Nation and municipal governments. Sessions were offered both in the spring and fall. We will offer them again in future years if there is demand.

Energy Conservation Kids Ed-Venture Program

Yukon Energy and the Yukon Conservation Society partnered in 2011 to provide an afternoon of learning and fun for pre-schoolers, focused on energy conservation and electricity. The aim was to teach the children about using electricity safely and wisely. This was done through music and dance, storytelling, hands-on science and crafts. We plan to expand this program to other locations this summer.

Earth Hour

Yukon Energy worked with the Yukon Conservation Society and the Yukon government's Energy Solutions Centre both last year and this year to promote Earth Hour. It's an annual event that encourages people to reduce their energy consumption as much as possible for one hour, and think of ways that they could continue to conserve throughout the year. This year Yukoners reduced their energy consumption by about 1.1 megawatts. That's up from 2011, at which time Yukoners cut their consumption by 1 megawatt. In 2010 reduced their electricity usage during Earth Hour by .8 of a megawatt.

5.0 Conclusion

Yukon Energy is committed to working with Yukoners to develop a strong and effective energy conservation plan for the territory.

Over the last year the corporation and its partners have devoted a great deal of time and effort to building a framework for such a plan. However there is more work ahead, and your thoughts and suggestions are a crucial part of the planning process. Thank you for your time and support for a clean energy future.