



Environment and Energy Committee Meeting Date: March 16, 2010

To: Environment and Energy Committee

From: Ann Rowan, Senior Policy Analyst, Policy and Planning Department
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Date: February 17, 2010

Subject: **Metro Vancouver and Peak Oil**

Recommendation:

That the Environment and Energy Committee receive for information the report dated February 17, 2010, titled "Metro Vancouver and Peak Oil".

1. PURPOSE

At its July 14, 2009 meeting the Environment and Energy Committee directed staff to prepare a brief analysis of how Metro Vancouver's current policies address the dual challenges of peak oil and climate change. The request was in response to a presentation that suggested policy solutions designed to address climate change were not necessarily effective in preparing the region for sharp increases in fossil fuel prices.

2. CONTEXT

Reducing greenhouse gas emissions, both in its corporate operations and in regional planning initiatives, is a Metro Vancouver objective as part of its Sustainable Region Initiative. Greenhouse gas mitigation measures developed, advanced and adopted by Metro Vancouver are consistent with the steps needed to transition the corporation and the region to a low carbon future. These involve measures to promote energy conservation, increase energy efficiency and switching from fossil fuel based energy to low carbon, renewable sources.

Peak oil refers to the point when the global production of oil is at its highest. Researchers have predicted that oil production will peak between 2005 and 2040, with the majority of published estimates between 2005 and 2010. In terms of planning, the issue is how sudden the decline in production will be and how that will be reflected in the price of oil and related products. Most likely, we will experience greater price volatility. For instance, in January 2005, the price of a barrel of crude oil was \$42, in July 2008 it climbed to \$147, by April 2009 it had dropped to \$40 and in February 2010 it has climbed to \$79. This kind of saw tooth pattern with a general upward trend in oil prices is the expectation under peak oil.

According to the U.S. Energy Information Agency, 77% of the products made from a barrel of crude oil are related to transportation and transport, 3% is used for heating oil, and 20% to other products. Gas prices may be the most visible effect of peak oil, but there will be an echo effect in the prices of other commodities reflecting increases in shipping costs.

Metro Vancouver's Commitments and Targets

Since 2008, energy and climate change are addressed directly in Metro Vancouver's yearly Action Plan and related management plans. The draft 2010 Action plan contains the following:

Climate Change commitment and targets:

Metro Vancouver commits to minimizing the region's contribution to climate change and prepares the region for the effects of climate change.

- Reduce regional greenhouse gases 15% by 2015 and 33% by 2020 from 2007 levels.
- Metro Vancouver operations will be carbon neutral (excluding solid waste operations) by 2012.

Energy commitment and targets:

Metro Vancouver commits to minimize energy use and maximize energy recovery from Metro Vancouver operations.

- Metro Vancouver will be a net energy contributor by 2015.
- Metro Vancouver will seek alternative forms of energy by
 - Increasing energy from liquid waste by 10% by 2012 (compared to 2007)
 - Recovering significant energy potential from drinking water reservoirs by 2020
 - Increasing energy from solid waste by 10% by 2015 (compared to 2007).

Becoming a Carbon Neutral Operation and a Net Energy Contributor

To meet these commitments, Metro Vancouver is active in identifying opportunities to recover and use energy within its own operations, as well as providing recovered heat and energy generated from renewable sources to households and businesses within the region which will displace fossil fuel use. Existing projects include:

- Metro Vancouver currently provides both recovered heat to industrial users as well as electricity generated at the Waste to Energy Facility (WTEF) to BC Hydro; and
- The wastewater treatment facilities rely on co-generation capacity and at the Iona WWTP, produced biogas is used to generate electricity and heat, replacing natural gas and reducing electricity purchases.

New projects include:

- The joint Water Use Plan being developed for the Capilano and Seymour watersheds that includes a feasibility analysis of generating hydro power from excess winterflows out of the reservoirs;
- Using heat recovered at the WTEF to supply the neighborhood energy utility for the East Fraser Lands residential development;
- Recovering sewer heat at the Sapperton Pump Station to heat buildings for a planned mixed use development nearby;
- Future projects under study include effluent heat recovery, the use of biosolids as clean, renewable fuel source and the use of biogas for heating or to create biofuel for vehicles; and
- North Shore sewage treatment study includes examining the possibility of implementing a "closed loop" energy system and/or water recovery.

More broadly one of the guiding principles of the Liquid Waste Management Plan and the Solid Waste Management Plan is integrated resource recovery. Integrated resource recovery involves designing and managing urban systems, particularly utilities, to generate synergies that enable the 'waste' from one system to become 'resources' for another.

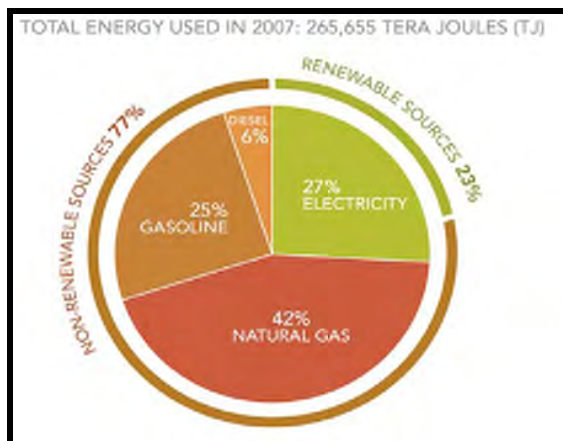
By incorporating technologies into Metro Vancouver utility operations (e.g., “cooking” compost to produce biogas), we can recover heat or energy from local sources, or waste streams, to replace virgin fossil fuels that have traditionally supplied heat and energy in the region. In addition, as landfills and sewage lagoons emit greenhouse gases, diverting waste into energy recovery can be a positive contribution to the corporation’s efforts to reduce climate changing emissions. The upcoming Metro Vancouver Corporate Climate Action Plan will further elaborate the strategies to ensure the carbon neutrality of our operations and additional efforts to reduce emissions.

It should be noted that achieving, and then maintaining, Metro Vancouver’s carbon neutrality as well as becoming a net renewable energy provider will be an on-going challenge as long as the region continues to experience population growth.

Transitioning to a Low Carbon Future through Regional Planning

The Metro Vancouver region is highly dependent on fossil-based energy sources, primarily to heat buildings and fuel motor vehicles (See Figure 1). In addition, not all the electricity in the region comes from renewable sources. In 2006, BC Hydro reported that 16% of the energy provided to its customers came from thermal plants within the province and energy imported from other jurisdictions.

Figure 1: Inventory of Energy Used in Metro Vancouver in 2007



The situation in energy use is reflected in regional emissions of greenhouse gases; the combined emissions from motor vehicles and energy use associated with buildings account for 66 % of the region’s greenhouse gas emissions. The strategies and actions in the Air Quality Management Plan as well as those in the draft Regional Growth Strategy (RGS) identify the reduction of regional greenhouse gas emissions as a priority. In the draft RGS the majority of new development will be concentrated within a compact metropolitan area with a significant amount of new residential development targeted for transit-oriented, complete communities. But land use that is conducive to walking, biking and transit though must be supported by investment in infrastructure that will support these transportation choices. Concentrated urban development also makes the use of district energy systems more viable. New or upgraded district energy systems using recovered heat or renewable energy sources will reduce or avoid the greenhouse gas emissions associated with natural gas as a heat source.

The Regional Climate Change Action Strategy is being drafted and will articulate the climate change mitigation strategies required to meet the region's targets for emission reductions. At the same time, Metro Vancouver and TransLink are engaged in a collaborative process for establishing regional transportation performance measures for tracking vehicle kilometers traveled and transportation mode share. This will be useful in monitoring the region's progress on reducing the reliance on private vehicles for transportation.

Addressing Peak Oil

In North America there are a few examples of local governments that have established task forces to consider the implications of peak oil but have yet to develop a strategy or action plan to address the issue. In "Towards Oil Resilience: an information paper to inform the development of the Oil Vulnerability Mitigation Strategy and Action Plan", the state of Queensland in Australia identifies three key areas to focus on:

- creating oil-resilient transport networks,
- promoting a sustainable fuel supply, and
- planning for oil resilient towns and cities.

Many of the policies discussed that would promote oil-resilient transport networks as well as oil resilient towns and cities are consistent with those found in Metro Vancouver's RGS. Development of the Queensland plan has now been put on hold pending the release of the national government's revised energy policy.

In terms of addressing oil vulnerabilities the best examples of policies are at the national level. Denmark and Sweden have both developed national strategies to reduce the reliance on fossil fuels of their respective economies and to stimulate the development and production of domestic sources of renewable energy. In both cases, the catalyst for policy development was the oil crises of the 1970s.

It is worth noting that in 1980, burning fossil-based fuels essentially supplied all the heat for district energy systems in Sweden. As a result of a federal policy to reduce Sweden's reliance on imported fossil fuels, the technology for district energy systems was adapted so that now biofuels, peat and waste supply 78% of the heat and fossil fuels only 18%. This shift in fuels source was accomplished at the same time there was nearly a three-fold expansion of district energy systems.

Addressing peak oil will involve the investment in techniques to capture heat and energy from renewable and preferably local sources as well as infrastructure that enables residents to become less reliant on automobiles for their daily travel. In evaluating the benefits of these investments it will be important to keep in mind the long term upward trajectory of oil prices. The long-term perspective is important, for there will be times, if oil prices follow a saw tooth pattern, where oil prices will be relatively low, making conventional sources of fuel and modes of transportation less costly in the near term, but will lock in a reliance on oil and therefore significant extra costs further into the future.

3. ALTERNATIVES

None presented.

4. CONCLUSION

In terms of planning, the expected trajectory of oil prices is upwards in a saw tooth pattern – spikes in prices followed by a drop in prices during periods of market correction. In terms of a policy response by local governments, policies that promote transition to a low carbon future are consistent with effective planning for peak oil and climate change. However, it is the pace of required transition that is an issue. In Metro Vancouver, there would seem to be two important priorities. The first is to identify and develop more local sources of energy that can replace virgin fossil fuels as an energy source. The second is to ensure that policies and land use decisions that will effectively provide alternatives to automobiles as a mode of transportation are adopted.

Furthermore, given the reliance on fossil fuels for most modes of transportation and transport, spikes in oil prices will have dramatic economic ramifications in Metro Vancouver as a gateway for a wide variety of commodities and goods traded in global markets and the importance of tourism. Addressing these systemic challenges of peak oil is generally beyond the capacity and jurisdiction of Metro Vancouver. In other jurisdictions, it has been the responsibility of the federal government to develop a comprehensive energy plan.