Climate Change Report to the CRD Environment Committee

Committee Chair Vic Derman

Rationale

In January 2016, CRD Board Chair Barb Desjardins asked the Environment Committee to provide a report detailing how the regional district should respond to climate change. The Board Chair's request is opportune. Recent evidence suggests that climate change is accelerating and poses an ever growing, potentially critical, threat to human society and all species on our planet.

Only three years ago, generally accepted estimates indicated a maximum sea level rise by 2100 of about 33 centimetres. By 2015, estimates had been revised to indicate a rise of about 100 centimetres. Recent examination of the West Antarctic ice sheet revealed deterioration at a much more rapid pace than expected. This new information caused researchers to suggest sea level rise of 200 centimetres could be expected by the end of the century. A subsequent review of data by another research group led them to conclude that a near 300 centimetre rise could be expected, quite possibly by 2050 – 2060 as described in the following quote:

"*In a presentation at the Risk Management Society's RIMS 2016 conference in San Diego April 12, a top scientific official with the National Oceanic and Atmospheric Administration said that recent, as-yet-unpublished data from Antarctica suggests that sea levels could rise three meters — almost ten feet — by the* middle *of the century.*

Margaret Davidson, NOAA's senior advisor for coastal inundation and resilience science and services, told conference attendees that ***"the latest field data out of West Antarctic is kind of an OMG thing."*** *Davidson said that data shows sea level rise could reach three meters by 2050 or 2060, a much steeper rise happening far sooner than even the most catastrophic scenarios currently available in peer-reviewed journals and the far more conservative estimates published by the Intergovernmental Panel on Climate Change. That steep a rise in sea level would put significant parts of many California cities underwater in just two or three decades.*"

These estimates have yet to be fully reviewed and accepted by the broader scientific community. Nevertheless, if correct, they suggest a **catastrophic** outcome if serious mitigation does not occur **very** quickly.

Another metric is equally alarming. The recent Paris conference on climate change agreed that society cannot exceed 2 degrees Celsius (C) of warming without risking run away climate change. However, the conference also accepted that keeping warming to 1.5 degrees C would limit damage and provide a much greater margin of safety. Subsequently, a researcher at Concordia University has created a "climate change clock" to indicate when these targets might be reached. His answer: Without a substantial increase in efforts to mitigate, 1.5 C will be reached in about 15 years (2031) with 2.0 degrees being reached in about 26 years (2042). These dates suggest very short time lines to accomplish the paradigm shift that all communities, including our own, must make. The time for serious response is now.

Responding to Climate Change in an Urban Environment

Mitigation

In the Capital Region, roughly 55% of greenhouse gases (GHG's) are related to transportation with about 35% related to buildings and about 9% related to waste streams. There are a number of initiatives that can mitigate these emissions.

1. ***Compact Land Use***

   Urban form as determined by land use decisions is probably the biggest single determinant of GHG production. Compact land use can dramatically reduce GHG emissions in a number of ways. With compact land use, transportation needs can be substantially reduced since residents will generally face shorter travel distances to reach what they need or desire. Compact land use can further reduce energy requirements since infrastructure requirements take less energy to build, operate, maintain and ultimately replace. Since such infrastructure is also considerably less expensive, it frees up the "regional wallet" and allows for increased investment in other initiatives to mitigate climate change. Finally, compact land use reduces pressure on urban and wilderness areas which generally operate as a "carbon sink" around urban cores. This contribution needs to be recognized, valued and preserved.

2. **Complete Communities**

   Complete communities can also reduce transportation need and energy use by providing more things residents need and want close at hand. It should be noted, however, that while dispersed nodes of density are more desirable than general sprawl, they still involve substantial transportation needs leading to expensive infrastructure and do not provide as much benefit as truly compact communities.

3. **Reduced Use of Fossil Fuel Energy**

   For energy use, as for transportation needs, conservation should come first (avoided energy use as fuel). As described prior, energy requirements can be reduced through land use decisions resulting in a compact urban form. Energy needs can be further reduced through improvements in building envelopes and orientation (passive solar design) as well as through improved efficiency of equipment for heating, cooling, lighting and entertainment. Energy use that can't be avoided should increasingly be serviced by renewable energy sources such as solar and wind. Moving to these sources could provide the added benefit of a distributed and potentially more resilient grid. Finally, incentive programs such as "pay as you go" residential solar installations (The utility pays **all** up-front costs which the resident pays back from savings) should be created to encourage the necessary shift in energy sourcing.

4. **Transportation energy needs**

Transportation energy use can be best addressed by committing to compact land use containing complete communities. A compact pattern substantially reduces transportation need and encourages alternate transportation modes such as cycling and walking which are distance dependent. Since distances are shorter with compact land form, cycling and walking become more feasible. In addition, more compact land use makes serving residents with good public transit economically viable.

A shift to preferred modes can also be stimulated by providing infrastructure that makes these modes, safe, comfortable, direct and competitive to use. Attempts should be made to give preferred modes a "competitive advantage" over single occupancy vehicles. Furthermore, the region and its local governments should actively promote a "cultural shift" that sees alternate modes become an accepted, respected and desired choice (e.g. Copenhagen and Amsterdam with cycling).

For those who must continue to utilize the auto, fuels other than fossil carbon (bio-fuels, electricity and hydrogen) need to become the norm. Finally, the shift to priority modes can be accelerated through an appropriate travel demand management program (TDM) utilizing measures such as increased parking rates for single occupancy vehicle (SOV) commuters who park their car downtown all day while they are at work. Pricing road use is another TDM measure that is becoming more common.

5. **Waste Streams and Energy Use**

While it is largely out of the region's control. Reducing the amount of waste produced (e.g. excessive packaging) should be a priority. The region should be proactive in advocating to other levels of government for necessary changes. Set reduction of waste as the highest priority in the hierarchy of "Reduce – Reuse – Recycle" (3 R's). The region should also be proactive in advocating for product design that aims to make implementing the 3 R's easier and more effective.

Wherever possible, "waste" that can't be eliminated should be re-used or used as a fossil carbon use replacement (Resource). Solid waste, for example, could be turned into heat and gas. Using waste as a resource could significantly reduce regional GHG emissions. Finally, both liquid and solid waste systems should be designed to minimize net energy requirement for pumping, treatment, transportation and processing.

6. **Supporting Infrastructure**

Compact land use that requires less extensive supporting infrastructure (roads, water, sewer, stormwater, street lighting etc.), is the best way to reduce energy required to provide these services. However, new technologies such LED street light heads can

further reduce energy use for operation while also reducing needs for maintenance and replacement. The region should provide incentives for conversion to more efficient technologies and should advocate to other levels of government for their support. The region could also look at future opportunities for water re-use and rainwater collection for local use as a way of reducing energy used in the distribution system.

7. **Natural Carbon Sinks**

   By removing atmospheric carbon, carbon sinks such as the urban forest and adjacent rural forests are extremely important to GHG mitigation. The urban forest, in particular, provides many other benefits (e.g. cooling, stormwater retention and cleansing) that can reduce energy. Every effort should be made to retain and enhance such natural sinks.

8. **Encourage Local Agriculture**

   Encouraging local agriculture is unlikely to result in substantial **loca**l GHG mitigation. However, there are GHG emissions associated with transporting "cheap" food from distant locations. Replacing imported food could reduce emissions on a global basis. Encouraging local food also has implications for food security and regional resilience.

9. **Fossil Carbon – Price to reflect ALL costs**

   Climate change is primarily caused by excessive use of fossil carbon. Unfortunately, the market price of gasoline and other fossil carbon products generally reflects only the cost of obtaining, refining and distributing them. The environmental costs of using these products are not adequately represented. Ensuring that end price reflects the real costs of using fossil carbon is potentially a **very** important option in the mitigation toolkit. The region and other local governments should advocate strongly for appropriate taxation of fossil carbon use.

While there are other opportunities for GHG reduction, these 9 initiatives are key to an effective mitigation plan.

Implementation Steps

1. Recognizing the **urgen**t need for action is the first step towards effective mitigation action. This is not something to be planned for 10 or 15 years down the road, or carried out incrementally over an extended period of time. We need to act now.
2. Beyond commitment to act, agreement on how to best mitigate GHG reduction (RGS and other documents) will need to be established. Accomplishing that agreement will not be easy. Compact land form, for example, should be an obvious choice but may be

unpalatable to some politicians in the region. Hopefully, a sense of urgent common purpose will prevail.

3. Establishing a climate change "lens" is a necessary step for swift action. All relevant planning, decision making and subsequent action will need to flow through the lens. Planning documents such as the RGS must be **strongly** shaped by the climate lens.
4. The CRD needs to insure that internal decision making and action are also consistent with the climate change lens. To their credit, CRD staff are already working on such mechanisms.
5. The CRD should work with member local governments, stakeholders such as BC Hydro, and/or other levels of government to create:
    a. an agreement to plan for a compact regional form and complete communities
    b. incentive programs designed to speed the transition to renewable energy
    c. a commitment to substantially increased funding for priority transportation modes.
    d. support for transportation infrastructure designed to provide a competitive advantage to priority modes
    e. a "culture" of cycling. Copenhagen and Amsterdam provide excellent examples of how this can be accomplished.
    f. changes in regulation to require substantial new increases in building energy efficiency.
    g. incentives for conversion to more efficient technologies (e.g. LED street lights)
    h. incentives for energy reducing retrofits to existing buildings
    i. a TDM program designed to reduce single occupancy vehicle use
6. The CRD and its members should utilize UBCM, FCM and any other available means to encourage legislation requiring reduced packaging and product design that facilitates the 3 R's.
7. The CRD should work with local governments to preserve and enhance natural carbon sinks such as the urban forest and surrounding rural and wilderness areas.
8. The CRD should co-ordinate the creation of a "Where We Must Go As a Region" document and should insure that it is broadly available to the general public. The general public needs to be brought onside with efforts to mitigate GHG's and needs to be made aware of the consequences of a failure to act.

9. The CRD needs to co-ordinate efforts to promote local agriculture. To the region's credit, this is already underway.
10. Finally, utilizing the power of the market through carbon pricing is one of the best ways to accomplish GHG mitigation. To be effective, such pricing will have to be considerably more substantial than it is today. In the end, however, the cost of using fossil carbon should be reflective of the environmental damage it creates. The CRD and local governments should lobby other levels of government for taxation on fossil carbon use commensurate with the real costs of using it.

Adaptation

Given the latency effect of atmospheric carbon, we will have to deal with serious climate change impacts even if an all-out effort to mitigate started today.

- Provide resources to insure estimates of climate change speed and impacts are as current as possible. Insure that staff and politicians are aware of latest projections even if they have not yet become mainstream. Estimates are changing rapidly (e.g. sea level rise estimates). Since feedback loops will likely cause continued climate change acceleration estimates only a few years old may not be reliable.
- Provide resources to model the regional impact of climate change impacts such as sea level rise and extreme weather. Insure that such models are continuously updated with changing projections and model for various scenarios (e.g. model the impact of 1, 2 and 3 metre rises in sea level). Use model results to aid in decision making.
- Base decisions, especially concerning infrastructure, on possible climate change scenarios. Recognize that feedback mechanisms will likely accelerate climate change and provide sufficient margin of error for such a possibility.
- Include the likely financial costs of climate change adaptation, and mitigation, in projections for near, intermediate and long term regional financial requirements.
- Create a regulatory environment designed to avoid decisions that may increase the cost and difficulty of adapting. (e.g. Avoid allowing additional development in areas that may be impacted by sea level rise). Follow the precautionary principle and, once again, provide sufficient margin to allow for accelerated climate change.
- Where possible use natural systems to help with adaptation. For example, use natural holding areas and filtration to deal with storm water (more frequent large storms are expected). Additional holding areas could be created as "water features in regional parks and other green space or rural areas. Such holding features could be receiving points for existing systems and could be designed with substantial extra capacity to deal with more frequent large storms.

- Promote local agriculture as a hedge against the possibility that current global food supply systems may be adversely affected as climate change progresses.

In Summary

Climate change today represents an increasing and likely critical threat to human society and the ability of our spaceship to sustain us.. Think of the ripple that has moved through the fabric of society as a consequence of 2 to 3 million Syrian refugees. Multiply that by 100 and you are starting to approximate the societal dislocation that would likely result from a 2 to 3 metre rise in sea level. We have little choice other than to respond as quickly an appropriately as we can

Unquestionably, many of the decisions we must make will involve financial outlays. In some cases, they will be considerable. When deciding whether or not decisions being considered are "affordable", the CRD and local governments should ask the question: "*What will be the cost to the planet and ultimately to us, if other local governments around the world were to join us in deciding that we simply can't afford to respond".*