

Creating Resilience in the SLRD

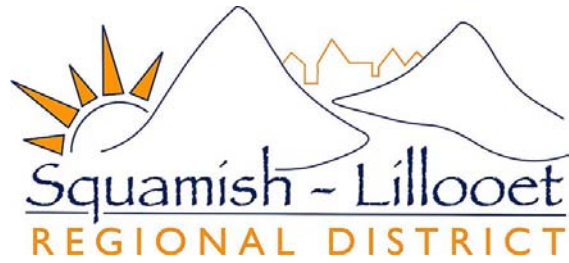
The Report of the SLRD Energy Resilience Task Force



Energy Resilience Task Force

SQUAMISH LILLOOET REGIONAL DISTRICT

FINAL REPORT
February, 2011



Energy Resilience Task Force

SQUAMISH LILLOOET REGIONAL DISTRICT

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A partial list of things made from Oil...

Solvents	Diesel fuel	Motor Oil	Bearing Grease
Ink	Floor Wax	Ballpoint Pens	Football Cleats
Upholstery	Sweaters	Boats	Insecticides
Bicycle Tires	Sports Car Bodies	Nail Polish	Fishing lures
Dresses	Tires	Golf Bags	Perfumes
Cassettes	Dishwasher parts	Tool Boxes	Shoe Polish
Motorcycle Helmets	Caulking	Petroleum Jelly	Transparent Tape
CD Player	Faucet Washers	Antiseptics	Clothesline
Curtains	Food Preservatives	Basketballs	Soap
Vitamin Capsules	Antihistamines	Purses	Shoes
Dashboards	Cortisone	Deodorant	Footballs
Putty	Dyes	Panty Hose	Refrigerant
Diapers	Life Jackets	Rubbing Alcohol	Linings
Skis	TV Cabinets	Shag Rugs	Electrician's Tape
Tool Racks	Car Battery Cases	Epoxy	Paint
Mops	Slacks	Insect Repellent	Oil Filters
Umbrellas	Yarn	Fertilizers	Hair Colouring
Roofing	Toilet Seats	Fishing Rods	Lipstick
Denture Adhesive	Linoleum	Ice Cube Trays	Synthetic Rubber
Speakers	Plastic Wood	Electric Blankets	Glycerin
Tennis Rackets	Rubber Cement	Fishing Boots	Dice
Nylon Rope	Candles	Trash Bags	House Paint
Water Pipes	Hand Lotion	Roller Skates	Surf Boards
Shampoo	Wheels	Paint Rollers	Shower Curtains
Guitar Strings	Luggage	Aspirin	Safety Glasses
Antifreeze	Football Helmets	Awnings	Eyeglasses
Clothes	Toothbrushes	Ice Chests	Footballs
Combs	CD's & DVD's	Paint Brushes	Detergents
Vaporizers	Balloons	Sun Glasses	Tents
Heart Valves	Crayons	Parachutes	Telephones
Enamel	Pillows	Dishes	Cameras
Anesthetics	Artificial Turf	Artificial limbs	Bandages
Dentures	Model Cars	Folding Doors	Hair Curlers
Cold cream	iPods	Soft Contact lenses	Drinking Cups
Fan Belts	Car Enamel	Shaving Cream	Ammonia
Refrigerators	Golf Balls	Toothpaste	Gasoline

A. Executive Summary

The Squamish-Lillooet Regional District (SLRD) Energy Resilience Task Force (“Task Force” or ERTF) is a citizen advisory body comprised of individuals representing a wide variety of sectors within the region. The Task Force has prepared a series of recommendations to the Board of the Squamish-Lillooet Regional District with respect to building a more resilient SLRD. The Task Force was convened to investigate issues related to peak oil and how these issues could potentially impact the SLRD. The focus of the Task Force was to look at all sectors within the SLRD and to seek ways that the SLRD and/or its member municipalities can build resilience with respect to energy, particularly oil and gas.

Peak Oil is generally defined as the time at which global oil production reaches a maximum output, “peaks” and begins to decline. The Task Force’s mandate was not to debate whether or not peak oil will eventually or has already occurred. Instead, the Task Force accepted generally held expert opinions that peak oil is inevitable and that it may have already occurred. Their focus was instead to look at how future declines in oil production could present shortfalls in supply and how those shortfalls could impact the various sectors that are operating within the region.

The Task Force analyzed how energy price volatility and potential shortages could affect such sectors as agriculture, forestry, transportation, distribution, business, tourism and accommodation, environment, social services and health care, housing and construction, government services, education, alternative energy, waste, recycling, water and infrastructure. In order to prepare for and respond to peak oil, and minimize major disruptions, the SLRD Energy Resilience Task Force recommends that the SLRD implement a number of short and long term changes within its own operations; as well as to use its leverage within British Columbia and the region, to influence change in a variety of ways. While these changes will not prevent peak oil, they will help the region to become more resilient to the many impacts that peak oil is likely to create.

The Task Force brought their own experience and professional opinions to the recommendations. In addition, the Task Force was given a number of other task force reports, including: *The Report of the City of Portland Peak Oil Task Force*, the *Berkeley Oil Independence Task Force Report*, the *San Francisco Peak Oil Preparedness Task Force Report*, the *Oil Independent Oakland Action Plan* as well as the recommendations from the UK Industry Taskforce on Peak Oil and Energy Security. The SLRD Energy Resilience Task Force was encouraged to review the recommendations from other task forces, and to utilize those recommendations that also apply to the SLRD. The intent was not to “reinvent the wheel” but to come up with appropriate and timely recommendations that can be readily implemented.

Task Force Process

The Squamish-Lillooet Regional District's Energy Resilience (Peak Oil) Task Force is the first regional peak oil task force in Canada. The Task Force is one component of the SLRD's Climate and Energy Action Plan process which is aimed at both reducing greenhouse gases and building regional resilience in the face of climate change and peak oil. This project was awarded a grant from the Federation of Canadian Municipalities Green Municipal Fund.

The Climate and Energy Action plan includes a direction to strike a task force to develop recommendations with respect to regional energy resilience. In March, 2010 the SLRD Energy Resilience Task Force held their inaugural meeting.

Based on the work done by other task forces, the SLRD Energy Resilience Task Force's role was:

1. To review current and credible data and information with respect to peak oil and energy production and related societal implications;
2. To seek community and business input on the impacts to various sectors and to propose "actionable" solutions;
3. To develop recommendations to the SLRD Board on strategies that the SLRD can take to mitigate the impacts of declining energy supplies in areas including, but not limited to: transportation, tourism, business, energy and infrastructure, housing, food and agriculture, the environment, health care, social service, communications, land use, emergency planning and the delivery of SLRD services.
4. To propose methods of educating the public about this issue in order to create positive behaviour change among businesses and residents in order to reduce dependence on fossil fuels.

In addition to the ~20 members of the Task Force, SLRD staff, representing the Planning, Utilities and Administration Departments supported the Task Force in their work.

The meetings were structured to address the following topics:

- 1) Land use
- 2) Community energy systems
- 3) Social, Health Care and Emergency services
- 4) Information and Outreach/Awareness
- 5) Transportation
- 6) Food and Agriculture

- 7) Built Form and Housing
- 8) Economic issues and Tourism
- 9) Water, waste, recycling and infrastructure issues.

Meetings of the Energy Resilience Task Force involved several presentations by regional stakeholders and experts in the subject fields in order to provide the task force with a common perspective and information base with respect to the issues. Some of the speakers included:

- Rex Weyler, co-founder of Greenpeace, author and member of the Vancouver Peak Oil Executive.
- Mark Allison, Whistler Centre for Sustainability.
- Lisa Griffith, New Leaf Consulting.
- Emma Dal Santo, transportation planner with the Resort Municipality of Whistler.
- Herb Barbolet, founder of Farm Folk/City Folk, SFU adjunct professor.
- Patrick Condon, Professor at UBC School of Architecture and Landscape Architecture and author of "Seven rules for Sustainable Communities: Design Strategies for the Post-Carbon World".

In addition, members of the task force also gave presentations about their respective sectors, including:

- Wayne Cankovic, Energy Solutions Manager, Terasen Gas.
- Victoria Smith, Manager, Aboriginal & Sustainable Communities Sector Customer Care, BC Hydro.
- Kimberly Needham, professional urban and rural planner (on contract with the SLRD), volunteer with Al Gore's The Climate Project and member of the Vancouver Peak Oil Executive.
- Lois Wynne, Executive Director, Sea to Sky Community Services.
- Corrine Visscher, Manager of Acute Care Services, Vancouver Coastal Health.

Task force members and contributors included:

- Kimberly Needham, Chair, and professional planner (on contract with the SLRD)
- Roxanna Kuurne, P.Ag, Pemberton Valley farmer
- Lucy Jones, P.Ag, Lillooet farmer
- Doug Hackett, VP Information Services and Administration, Squamish Terminals
- Nolan Cox, Vice Principal, Pemberton Secondary School

- Bruce Stewart, Manager, Nesters Market
- Amica Antonelli, Principal, Vireo Planning and Resource Management
- Jeannette Nadon, B.Comm, Bird's Eye Strategies
- Arthur DeJong, Mountain Planning and Environmental Resource Manager, Whistler/Blackcomb
- Wayne Cankovic, Energy Solutions Manager, Terasen Gas
- Victoria Smith, Manager, Aboriginal & Sustainable Communities Sector Customer Care, BC Hydro
- Jeff Browne, Assistant Director of Facilities and Services, Sea to Sky School District #48
- Lois Wynne, Executive Director, Sea to Sky Community Services
- Sue Senger, PhD., Lillooet farmer and bear habitat specialist
- Dave Evans, Manager, Sysco Foods
- Katie Pease, Principal, Synapse Consulting, member of Squamish Climate Action Network
- Eric Anderson, member of Squamish Climate Action Network
- Jack Crompton, General Manager, Transportation Whistler
- Naomi Devine, Whistler 2020 Energy task force
- Allison Macdonald, Open Spaces Coordinator, SLRD
- Jesse Lee, former Environmental Technician, SLRD
- Peter DeJong, Manager of Transportation, SLRD

Full bios of Task Force participants are attached as an Appendix to this report.

Task Force management and meeting facilitation was provided by:

- Mark Allison, MCIP, Senior Planner and Manager, Advisory Services at the Whistler Centre for Sustainability
- Lisa Griffith, MCIP, Associate - Whistler Centre for Sustainability and Principal, New Leaf Consulting.

The Task Force meeting process and report were completed in a streamlined fashion in order to produce recommendations within a condensed time frame. The process was not meant to be all-encompassing, or to delve deeply into each sector; rather, the intent was to develop a set of recommendations for the SLRD to begin the process of becoming more resilient based on existing knowledge and information. Task force members provided information to the group about their own sectors, undertook research, and reviewed other task force recommendations in developing their input to this process.



In fall 2010, the ERTF draft recommendations were presented to the public at a series of interactive meetings held in Lillooet, Pemberton, Whistler and Squamish. At the public meetings, the public was presented with the draft recommendations and were given the opportunity to provide input to the task force. This public input is reflected in the final recommendations made in this report. These ideas represent the beginning of a shift to a new paradigm, and there will no doubt be many more ideas that can be added over time.

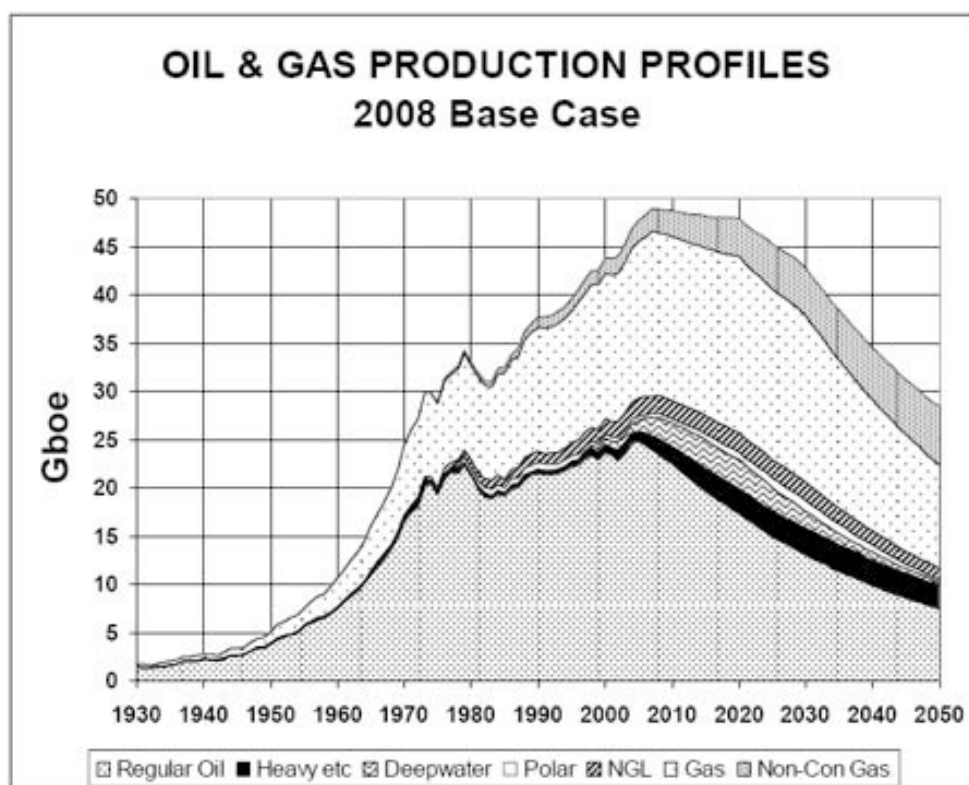
As the first regional district in Canada to convene a peak oil task force, the SLRD is demonstrating bold leadership. The Task Force recommends that the SLRD also act boldly to implement these recommendations, in order to begin the process of creating resilience. Perhaps the boldest recommendation is that the SLRD consider adopting a peak oil resolution and the Oil Depletion Protocol, commitments that acknowledge the need to reduce consumption of petroleum in accordance with the annual depletion rate of 3-5% per annum. In addition, the Task Force recommends that the SLRD support the creation of Agricultural Land Trusts in order to create food security within the region. The Task Force recommends that the SLRD filter all future infrastructure investments through an energy lens and that it use future utilization scenarios planning in infrastructure decision-making. The Task Force also recommends that the decisions with respect to the tourism industry be reviewed more carefully regarding potential impacts that peak oil might have on the region's tourism economy. Many other recommendations of the Task Force are detailed in this report.

Ultimately, the Task Force process has been an exercise in preparedness planning. Taking action to plan and prepare for peak oil is recognized by the Task Force as being of high importance to the future of the region. By mobilizing sooner than later, the SLRD will be socially and economically in a more secure position if energy price and supply fluctuations occur in the future. Building resilience has many social and economic benefits that can only serve to make the SLRD a more vibrant and liveable region.



B. Overview and Background

While most people have heard about climate change and the global implications that accompany it, fewer people understand the implications of peak oil. Climate change and peak oil are closely related, with the two sometimes described as being the flip side of the same coin. Both phenomena are the result of burning too much carbon to fuel our energy-intensive world. In short, we have now burned through most of the easily accessible oil, and have damaged the environment in so doing. Peak oil represents the end of the cheap and easy oil, the point at which production is maximized and begins to drop off. Peak oil also represents the point at which prices becoming higher and more volatile.



This graph indicates the production profiles for various conventional and non-conventional oil and gas, using 2008 base data and known world reserves. GBOE= gigabarrels of oil equivalent. NGL=natural gas liquids.

Source: Association for the Study of Peak Oil and Gas (ASPO-USA) website.



For the past decade, the price of petroleum has varied wildly, from as low as \$12 to \$147 per barrel. This is a market behaviour that has not been seen before, but it is a trend that is likely to continue, trending toward higher prices over time. There is enough evidence to accept that oil prices are on what is called “the bumpy plateau”, symptomatic of peaking supply. Peak oil, as it has come to be referred to, is upon us, and society is likely to be forever changed.

Lloyds of London, the British Insurance company, published a white paper in June, 2010 entitled “Sustainable Energy Security”. Lloyds’ chief executive Richard Ward writes in the introduction:

“What it outlines, in stark detail, is that we have entered a period of deep uncertainty in how we will source energy for power, heat and mobility, and how much we will pay for it.”

It is clear that the era of cheap and abundant energy has passed. Historically, each year there has been more and more energy available than in the year before. Peak oil means that this trend will reverse and there will be less oil available than in years before. On a per capita basis, this will be compounded even further, as world population increases and more people compete for less available energy.

Respected institutions and governments throughout the world are bringing concerns about energy supply to the forefront. While there are many suggestions as to how to best deal with the issue using a “top down” policy approach, there are fewer suggestions as to how to transition to a lower energy society using a “bottom up” approach, starting at the local and regional levels. This report looks at solutions from a regional perspective. While there are many assumptions being put forth as to the exact time of “peak oil”, the task force has taken the approach that regardless of the timing, there needs to be a planning approach put in place in order to address the possible issues associated with energy depletion. In other words, the report utilizes a precautionary approach that focuses on preparedness and building resilience.

The **precautionary principle** states that “if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is *not* harmful falls on those taking the action... The principle implies



that there is a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk”¹

A **resilient community** is one that takes intentional action to enhance the personal and collective capacity of its citizens and institutions to respond to and influence the course of social and economic change.²

While British Columbia has been blessed with an abundance of hydro power, it remains almost entirely dependent on liquid fuels for its transportation systems. Therefore, British Columbia is vulnerable to rising fuel prices and potential supply disruptions which have the potential to negatively impact the economy and the social fabric. To mitigate any potential oil price increases or supply disruptions, communities in British Columbia must make bold plans to reduce dependence on fossil fuels and to build resilience into their local economies. Inaction leaves communities less resilient to the impacts of both climate change and peaking oil supplies.

“Taken together, Climate Change and Peak Oil make a nearly airtight argument. We should reduce our dependency on fossil fuels for the sake of future generations and the rest of the biosphere; but even if we choose not to do so because of the costs involved, the most important of those fossil fuels will soon become more scarce and expensive anyway, so complacency is simply not an option.”³ – Richard Heinberg

The peak oil predicament facing society will require a bold, strategic and systemic approach that needs to be pursued with diligence and urgency in order to build local and regional resilience. The recommendations of the Squamish-Lillooet Regional District Energy Resilience Task Force favour the precautionary principle and promote resilience and preparedness. Some recommendations are operations-oriented, others are policy-oriented, some require further study, and other recommendations are more advocacy-oriented. Overall, the recommendations will help to build a region that is better prepared for the future, socially robust, with a thriving and diverse local economy.

¹ Wikipedia

² Centre for Community Enterprise. *The Community Resilience Model*. CED, British Columbia, 1999.

³ Heinberg, Richard, 2006. *The Oil Depletion Protocol: A Plan to Avert Oil Wars, Terrorism and Economic Collapse*. New Society Publishers, Canada.



C. Energy Resilience Themes

The recommendations in this report are organized by a number of themes, based on the meeting discussions held by the task force. The matters addressed in these themes were considered to be the most important issues facing the SLRD with respect to energy resilience.

The themes in this report are:

1. Land Use
2. Built Form
3. Community Energy Systems
4. Infrastructure
5. Social, Health, and Emergency Services
6. Food and Agriculture
7. Transportation
8. Economy and Tourism
9. Reducing Consumption and Waste
10. Outreach, Awareness, and Education

Each theme includes the following sections:

- **Introduction.** This section provides an overview of the theme.
- **Why is this Important?** This section explains why this theme is important with respect to achieving energy resilience.
- **SLRD Context.** This section explains the relationship of the theme with respect to the SLRD's current situation.
- **Recommendations.** These are based on the recommendations of the Energy Resilience Task Force, with public input.

C.1 Land Use

Introduction

“Land use” encompasses a wide range of issues from ecological preservation, forestry planning, urban design, parks planning, infrastructure design, farmland and urban-rural fringe issues, industrial and commercial development issues and residential design and planning. In one way or another, the SLRD has some influence over all of these issues through its policies and regulations as well as through its lobbying powers.

Well-planned land use is fundamental to sustainability, and to reducing energy use. Since the 1950’s, many communities throughout North America have been planned in order to allow for “the American Dream” of owning a house in the suburbs, with a focus on developing infrastructure for the private automobile. This form of planning has permeated the urban form and has resulted in sprawling, single-function subdivisions, with wide roads, large amounts of land dedicated to asphalt and inefficient transit services. Auto-oriented land use is anathema to sustainability. It is important for communities to turn this form of land use around, in order to create more efficient and sustainable alternatives and to address the effects of peak oil.

“We have made the tremendous mistake of restructuring our metropolitan regions on the wrong assumptions: that fuel was unlimited and its use was without environmental consequence, and that we could always build enough roads to eliminate congestion. Neither is true.”¹

Why is this important?

The investment and planning decisions made now will entrench land use and transportation patterns for a very long time. Therefore, it is imperative that these decisions be made with full knowledge of the environmental, social and economic costs and implications. Misguided investment at this stage could leave the SLRD saddled with “stranded investments” or infrastructure that is ill-used and inappropriate for the needs of the region, while also limiting its financial capacity to invest in better alternatives. By utilizing scenarios-based planning, future utilization and full-cost accounting can help to ensure that the most effective investments are made.

It is now clear that compact development can reduce greenhouse gases (and thereby reduce energy use). According to UBC Professor Patrick Condon, “When combined with a reasonable

¹ Condon, Patrick. Seven Rules for Sustainable Communities: Design Strategies for the Post-Carbon World. Island Press, 2010.



minimum residential density of ten dwelling units per acre, and a fine-grain distribution of land uses such that commercial areas and frequent transit are within a five-minute walk, per capita GHG production will be reduced by at least 40 percent.”² Whenever greenhouse gases are reduced, energy expenditure is also reduced.

In his book, “Seven Rules for Sustainable Communities”, Professor Condon notes a number of ideas for creating good urban form that also address the critical issues of GHG reduction and peak oil. Some that are applicable to the SLRD context are:

- Create a wide variety of housing types and tenures, job sites and services, close together and in easy access to schools and transit (for a variety of reasons, he favours electric streetcars);
- Create interconnected street systems (avoid cul-de-sac subdivisions) and avoid large block sizes;
- Create a linked system of natural areas and parks;
- Invest in lighter, greener, cheaper, and smarter infrastructure (make roads narrower, utilities less intensive, use natural drainage, utilize infiltration and create permeability);
- Support the most GHG-efficient housing types: low-rise, medium-to high-density structures at about twenty to sixty-five dwelling units per acre.

In addition to good urban planning and design, it will also be important for the SLRD to manage the other land assets that it has: forest lands, agricultural lands, river assets, riparian areas and wilderness areas.

SLRD Context

The SLRD covers a total area of 16,355 square kilometres of land. It includes a wide range of landscapes and topography. In the south of the region, at Howe Sound, the region consists of the wet Coastal Western Hemlock zone, and in Lillooet, the area is mostly a dry Interior Douglas Fir zone. The land varies from agricultural river valleys to steep mountainous terrain, with heavily forested areas and glaciers. Approximately 20% of the SLRD is located within parks and protected areas. There are a range of settlement types with the region, including the revitalized Squamish area, the Pemberton Valley, the world-class ski resort of Whistler, the historic Lillooet and Gold Bridge areas and the mining town of Bralorne, a number of remote aboriginal communities, rural recreational land and farmland.

While the built-form within the SLRD is already established and somewhat fixed, the land use policies and regulations have some room for flexibility. Land use policies and regulations are some of the most effective tools that local government has for influencing energy resilience.

² IBID



Through good land use planning, communities can also achieve significant results with respect to improving air quality and reducing greenhouse gases, improving quality of life and sense of community, reducing traffic congestion, creating more liveable places, improving public health, achieving food security and creating housing affordability.

The communities in the SLRD have not been as thoroughly impacted by poor planning principles as have other communities in North America. Therefore, it will be somewhat easier for the SLRD and its member municipalities to create more sustainable land use in the future. One of the most important overarching planning policy documents that the SLRD has is the Regional Growth Strategy (RGS). While the document is not focussed on addressing peak oil in particular, it does contain policies that have the intention of reducing greenhouse gas emissions in an effort to combat climate change. These policies will also help the SLRD to address peak oil. The SLRD adopted the Regional Growth Strategy (RGS) in 2010. The RGS aims to encourage compact, complete sustainable communities as the basis for land use planning throughout the region. According to the RGS:

“Compact, Complete, Sustainable Communities refers to settlement that takes a long-term view of the quality of life for future generations, promotes the efficient use of land at higher population densities with greater transportation choices, protects agriculture, natural areas and open spaces, and provides an opportunity to live and work in the same community. Focussing settlements into compact, complete, sustainable communities or nodes moves us toward a vision of sustainable, highly liveable communities with accessible services, public spaces, parks, and cultural and recreation amenities.

The Regional Growth Strategy provides a smart growth framework that recognizes a range of opportunities to apply these principles across different settlement types. The purpose of this framework is not to limit development in the region but rather to shape the pattern and quality of development along a more sustainable path. Population growth and settlement development will be primarily directed to compact Urban Areas and Master Planned Communities on the basis of smart growth principles. New urban communities will not be considered outside of the established settlement areas. Non-Settlement Areas that have important agricultural, environmental, back-country recreational, aesthetic and natural resource values will be protected.”

The RGS notes that “compact, complete, sustainable communities will be achieved by:

- **Developing Compact Urban Form.** Accommodating major growth within the urban boundaries of Squamish, Whistler, Pemberton and Lillooet, with appropriate policies for in-fill and increased population density.
- **Establishing Long-term Settlement Boundaries.** Delineating the existing and future settlement areas and, in accordance with *smart growth* principles, provide for the



- phased extension of urban boundaries to clearly distinguish the urban/non-urban edge.
- **Maintaining Nodal Development in the Sea to Sky Corridor.** Concentrating development in the Howe Sound to D'Arcy corridor into compact, well-planned centres separated by natural resource and rural land uses and avoid the potential for continuous or dispersed linear development.
 - **Encouraging Urban Growth and Revitalization in Lillooet.** Supporting urban development of central Lillooet as the major service centre in the northern sub-region in conjunction with economic development initiatives.
 - **Promoting More Complete Communities.** Providing for a mix of land uses in community development, particularly at Porteau Cove, Furry Creek and Britannia Beach, to enhance the potential for more integrated, complete communities.
 - **Protecting Rural / Resource Landscapes.** Maintaining the integrity of 'non-settlement' lands that have particular physical constraints or values, and ensure rural residential or resort development is compatible with the rural landscape."

The RGS goes a long way to ensuring that planning within the region will reduce energy use through the built form. As a high-level planning document, the RGS can only influence future development to the extent that the SLRD, and its member municipalities can deliver detailed land use policies, zoning regulations and development negotiations that bring the policies of the RGS into a tangible form.

The task force stressed the importance of ensuring that the jobs to housing ratio is managed in a way that ensures that land for jobs, including industrial land, is preserved for those uses. In addition, the task force raised concerns about the amount of commuting that currently occurs in the region. It was felt that within SLRD communities, more jobs must be created close to where people live in order to prevent these communities from being "bedroom" communities. By addressing the jobs to housing ratio, through good land use planning, commuter vehicular trips can also be reduced, thus reducing energy consumption throughout the region.

Recommendations

In the face of peak oil, the SLRD may encounter challenges to the existing built-form. There will likely be a shift to more walking, biking and transit use resulting in a reduced demand for parking. Increased telecommuting will lead to fewer car trips. Vehicle-oriented subdivisions and big-box retail stores may see different utilization or pressure to infill parking areas. Housing and retail uses near transit may become more desirable. There may be pressure for urban intensification, more electrified transit, improved rail service and additional mixed use development.



Some remote areas may become more difficult or costly to access and may encounter depopulation.

The task force's recommendations related to the Land Use theme are:

- 1 Support and implement the Regional Growth Strategy, encourage densification* of existing communities across the region as a means of accommodating population growth, and cease approving satellite communities. * <6 storey, food-secure, smart growth.
- 2 Preserve all rail corridors in the region.
- 3 Ensure that all new residential development is designed with the ability to grow and store food, including the provision of community gardens, greenhouses or green roofs and community kitchens (in addition to other Smart Growth policies). (Also see the Food section).
- 4 Prioritize the jobs/housing ratio in future planning in order to preserve employment land and reduce the need for commuting.
- 5 Protect and enhance contiguous wildlife corridors and parks.
- 6 Create new zoning regulations that allow urban agriculture and horticulture in all areas.
- 7 Encourage rainwater harvesting and rain barrels as a means of conservation and allow community grey water recycling for irrigation of parks and golf courses.
- 8 Protect industrial and manufacturing land, particularly areas with rail access to allow for economic diversification.
- 9 Create policy which mandates new residential, commercial or industrial neighbourhoods to be energy-efficient.
- 10 Support transit-oriented development (buses, etc.) and ensure that all new development is transit-friendly.
- 11 Encourage land-owners to lease land to persons interested in growing food.
- 12 Meter water usage in order to prevent water waste.
- 13 Provide regional subsidies for residential rain barrels and worm composters (vermi-composting) to reduce the waste stream that needs to be transported and treated.
- 14 Consider planting streets with species that can provide nutrition or medicinal health benefits (that are not necessarily attractive to bears).
- 15 Prepare Agricultural Area Plans for all agricultural areas in the SLRD.
- 16 Do not support any more applications for subdivisions in the ALR (particularly non-ag uses).

C.2 Built Form

Introduction

The built form is everything that humans have created, including buildings, structures, and infrastructure, whether above or below ground.

Together, these building systems account for considerable amounts of energy in both construction, i.e., the “embodied energy” in materials such as concrete, and in operations, for heating, cooling, and electrical and mechanical systems. This chapter will focus on development sites and the buildings and structures within them, while the infrastructure considerations of the built form are discussed in another chapter.

Buildings

Buildings use energy for a variety of purposes, including heating, cooling, refrigeration, mechanical systems, lighting, and a variety of electrical appliances. Buildings also generate energy requirements indirectly, through infrastructure such as water, sewer, and drainage systems, and street lighting.

There are, unfortunately, a number of regulatory and consumer acceptance barriers to constructing low-energy “green” buildings and neighbourhoods. In particular, builders who wish to vary from traditional, or “business as usual,” construction techniques promoted by the provincial building code are generally required to submit detailed and costly reports prepared by professional engineers and architects to demonstrate that these variations are equivalent to the requirements of the building code. Available third-party green building standards can also be difficult and costly to certify, which is an additional deterrent to “raising the bar” on energy efficiency, alternative energy, and sustainable design.

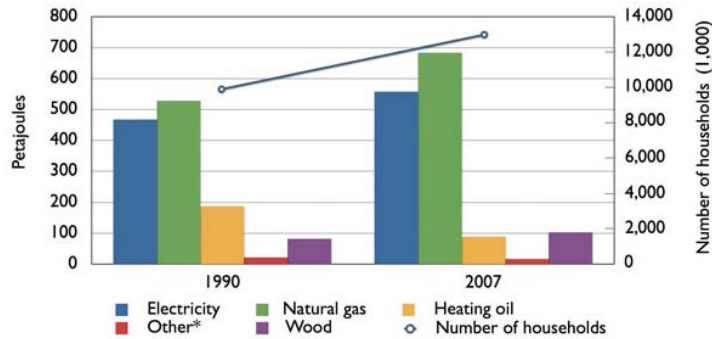
The next two sections summarize energy considerations in residential buildings and commercial/institutional buildings, which are the predominant building forms in the SLRD.

Residential Buildings

Usage of both natural gas and electricity, which is increasingly generated from fossil fuels, has increased significantly in recent years in Canada (see chart below). This is due in part to the growth in households and in part due to larger single family homes and townhouses offsetting any gains from larger numbers of smaller apartment condominiums.



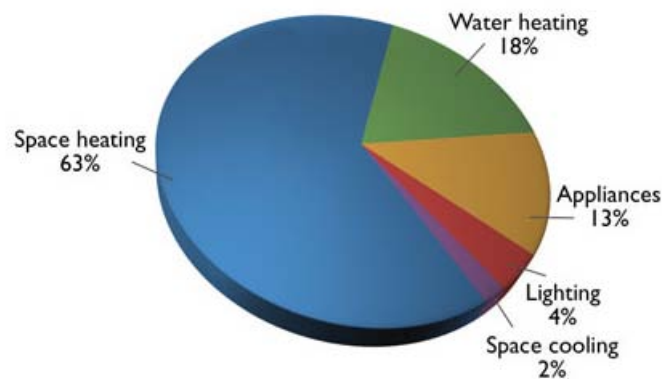
Residential energy use by fuel type and number of households, 1990 and 2007¹



* "Other" includes coal and propane.

As we see from the diagram below, space heating and cooling accounts for 2/3 of residential energy demand on average, with cooling loads increasing as global temperatures rise and more multi-family buildings increase the use of glass, causing greater heat gain in summer.

Distribution of residential energy use by end-use, 2007 (percent)²



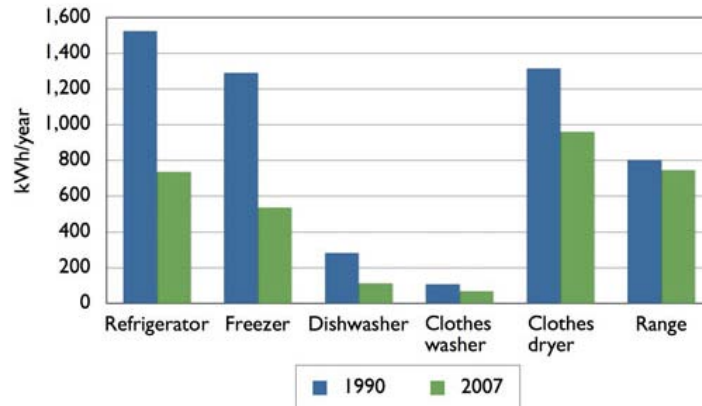
There have been energy efficiency gains in some areas, particularly in lighting and home appliances, along with some fuel switching to renewable, low impact energy sources, such as geexchange and solar hot water heating, but these sources are still dwarfed by electricity and fossil fuel use.

¹ NRCAN "Energy Efficiency Trends in Canada, 1990 to 2007"

² Ibid



Unit energy consumption of major electric appliances, 1990 and 2005³

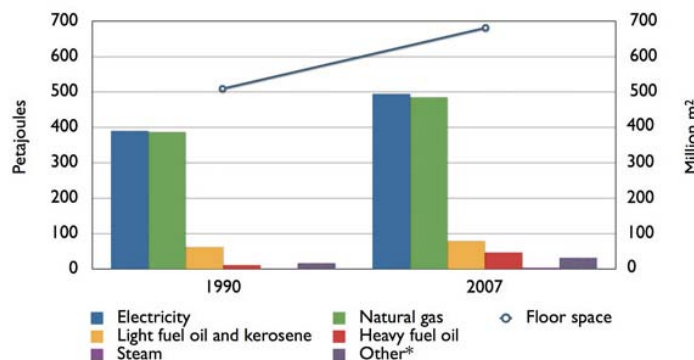


Unfortunately, in contrast to trends for major appliances, energy use for smaller appliances such as televisions, VCRs, DVDs, stereo systems and personal computers more than doubled (+124 percent). This increase more than outweighed the energy use reduction from major appliances. One example of the rapid growth in minor appliances is the increased penetration of personal computers. In 1990, computers were present in less than one out of six households, but by 2007 they were present in more than three out of four households in Canada.

Commercial Buildings

Energy use in commercial and institutional buildings is also increasingly rapidly:

Commercial/Institutional energy use by fuel type and floor space, 1990 and 2007⁴

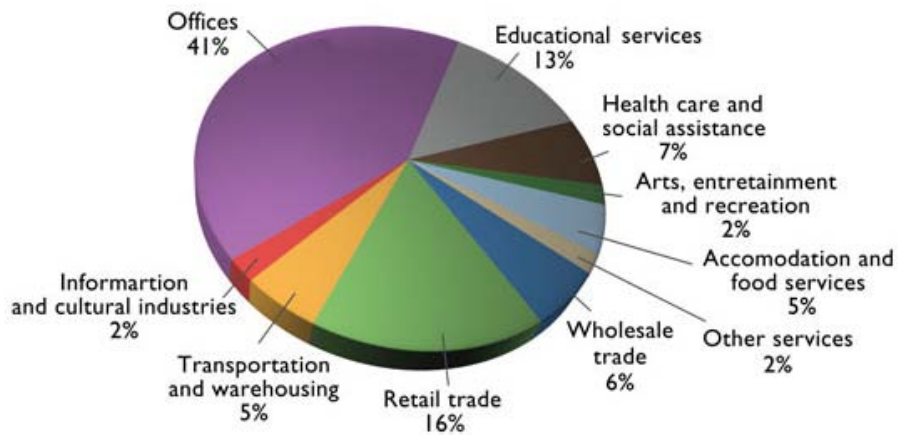


³ Ibid

⁴ Ibid

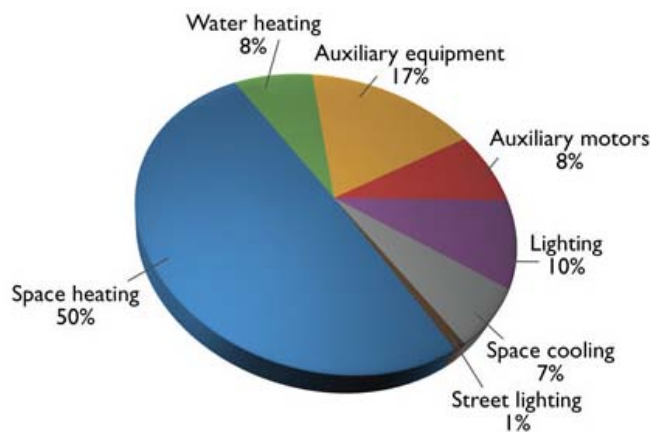
Office space is the most significant floor space to supply, followed by retail space:

Commercial/Institutional floor space by activity type, 2007 (percent)⁵



As is shown below, the nature of energy use is significantly different in commercial and institutional buildings, with more energy being used for cooling, lighting, and mechanical systems, including auxiliary equipment and motors:

Commercial/Institutional energy use by end-use, 2007 (percent)⁶



⁵ Ibid

⁶ Ibid

Development Patterns

The built form concerns not only buildings, but the development patterns of buildings, including how densely they are constructed, how closely they are located to the needs of building occupants, and how diverse the land use (i.e., the “mix”) is, all of which affect energy use.

There is a variety of development patterns in the SLRD, ranging from relatively low density, automobile-oriented residential and commercial sites to higher density, mixed-use development that is more suited to supporting walking, cycling and transit use. Older development is predominantly the former pattern and newer development is increasingly the latter pattern. The older development also tends to be “single use,” meaning that uses such as residential, commercial, and institutional, are separated and there are longer distances between needs, such as employment, shopping, and other services. Mixed-use development seeks to locate these needs closer together and reduce travel needs.

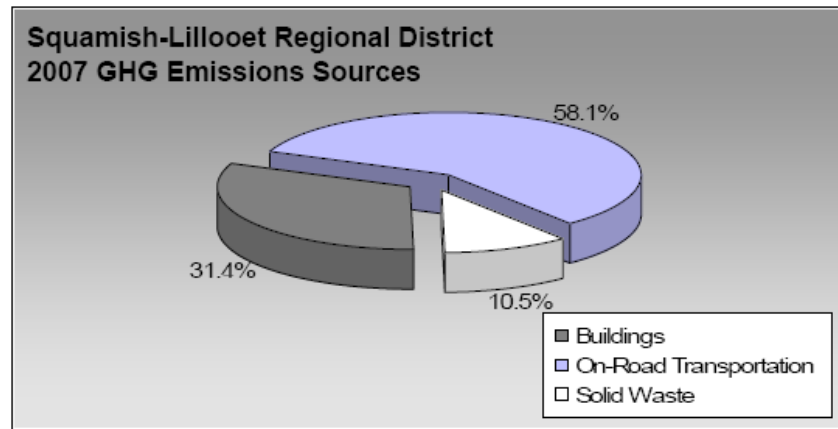
Several energy issues besides building energy use are related to a “compact,” complete built form, which is higher density and mixed-use, including:

- Transportation requirements in terms of distances and number of trips are generally reduced and alternative modes are more attractive and feasible;
- Infrastructure costs are lower and less energy intensive; and
- Community energy systems are more feasible, particularly district energy systems.

Why is this important?

In the SLRD, buildings account for approximately one third of greenhouse gas emissions, ranging from 5% in Lillooet, where transportation energy use dominates, to over 50% in Whistler where there is a large amount of tourist accommodation.⁷

⁷ Province of British Columbia, 2007 Community Energy and Emissions Inventory



Energy consumption by buildings and in neighbourhoods is arguably one of the easiest areas to effect significant change in energy consumption, both in energy retrofits and new building design. Energy savings of up to 50% is not uncommon in retrofits, while new buildings can now actually be made “net-zero,” i.e., produce all of their own energy on-site. With improved building design guidelines and the cost of alternative building and energy systems continuously decreasing, the payback period for investments in low energy buildings may now be under 10 years.

Of particular importance is that there are many simple, proven, cost-effective technologies that can reduce energy use resulting from buildings and the built form, and support energy resilience, including:

- Increasing building insulation values;
- Using alternative and renewable energy sources, such as geexchange systems and biomass heat sources;
- Building more multi-family buildings that share walls to reduce heat loss;
- Using passive design guidelines, such as the use of roof overhangs that allow in sunlight during the winter for heating while blocking the sun during the summer for cooling; and
- Increasing development density and mix to support district energy systems and alternative transportation modes.

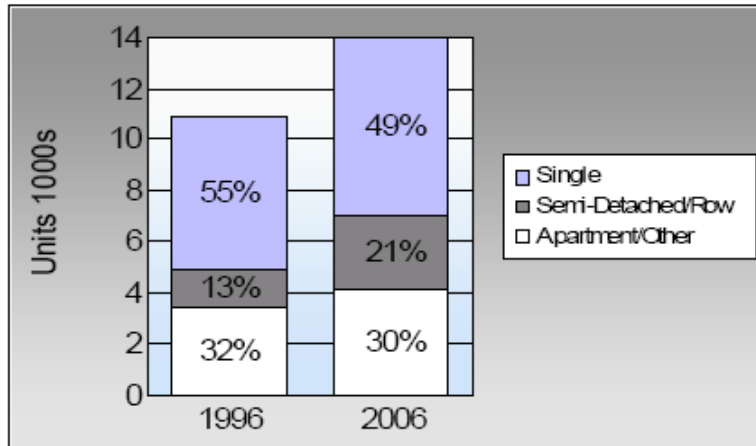
SLRD Context

Although the composition of the SLRD’s building stock is similar to that of British Columbia, there are significant differences between SLRD communities in terms of age, building type, and overall density of communities. As the graph below shows, the SLRD is becoming increasingly compact, with more people choosing multi-family housing units:⁸

⁸ Community Energy and Emissions Inventory (CEEI) 2007 - SLRD

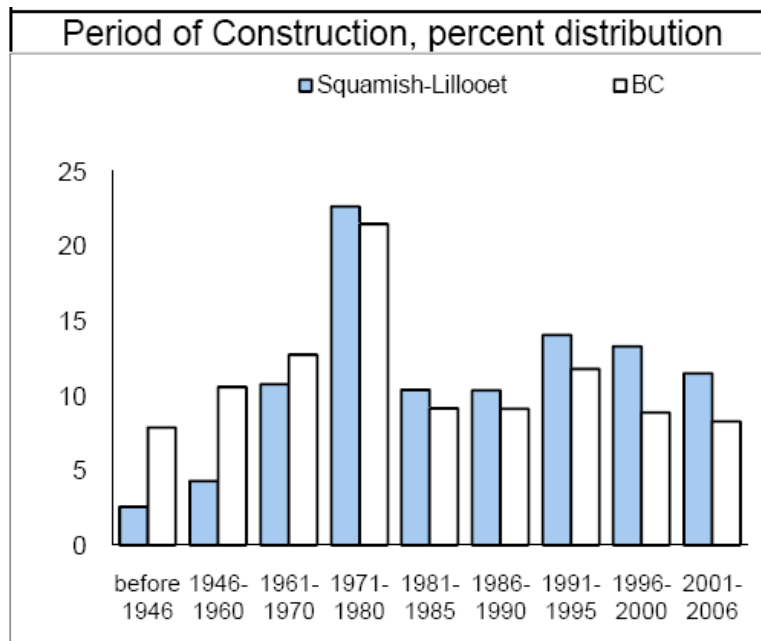


Are we living more compactly? Housing Type



In BC, single family detached housing made up 49% of housing in 2006.

A major difference is that much of the SLRD is fast growing, with a higher and growing percentage of newer housing units, particularly in Pemberton, Squamish, and Whistler, which could be built to higher standards. Older housing stock does, however, provide significant opportunities for energy retrofits which can also result in high energy savings.





In terms of development patterns, the SLRD's Regional Growth Strategy (RGS) calls for complete, compact communities that are energy and resource efficient. Further, Smart Growth and Leadership in Energy and Environmental Design (LEED) guidelines have been established in the SLRD, with the Downtown Squamish Plan having been developed using the "Smart Growth on the Ground" process, and the Athletes Village in Whistler having been developed according to LEED Neighbourhood Design (LEED-ND) guidelines, which seek to advance sustainability. The Athletes Village demonstrates not only sustainable, energy-efficient buildings, but also a built form that is supportive of alternative energy, in this case a district heating system using heat from a nearby waste water treatment plant.

Recommendations

The Task Force's recommendations related to the Built Form theme are:

- 1 Encourage attractive medium density (20-50 units/acre) low-rise, multi-family development in complete, compact communities, as opposed to single family home neighbourhoods, by:
 - a. Requiring good urban design standards that create private and useable indoor and outdoor space.
 - b. Including greenhouses, community gardens, community kitchens, trails, shared meeting and work space, green spaces, shared vehicles, etc.
- 2 Promote energy-efficient innovation in buildings through education, outreach, and lobbying for more energy-efficient building codes (i.e. SLRD solar hot water ready bylaw).
- 3 Promote Smart Growth principles in keeping with the Regional Growth Strategy, i.e., compact, complete neighbourhoods, emphasizing housing, commercial and employment mix, provision of basic needs, close to transit, and walkable/bikeable neighbourhoods.
- 4 While promoting higher density and building forms that work well in a low energy environment, discourage development higher than six storeys (in favour of Paris-style development density over Manhattan-style) within the region, as lower, wood-frame buildings: Have lesser embodied energy in construction materials; Are less exposed to unwanted heat loads and drains caused by sun and wind than are taller, concrete buildings; Will be more resilient if energy becomes less reliable (as they do not have elevator malfunction issues or multi-storey water pumping issues to contend with).
- 5 Promote local building products by showcasing local materials and products in future government projects.
- 6 Encourage and support energy saving demonstration projects (e.g., Whistler recycled rain water duplex and Passive House).
- 7 Explore affordable housing options to accommodate demographic trends including support for an aging population.



- 8 Partner with non-profits to promote public education and establish community buy-in for sustainability (including sustainable building methods) through methods such as:
 - a. An inspirational speaker series;
 - b. Print and online information;
 - c. Public open houses; and
 - d. Alternative events, e.g., kitchen table sessions, attendance at community events.
- 9 Promote green buildings (provide awards, etc. for LEED or Built Green projects).
- 10 Support education for decision makers on sustainable built form (as part of a larger sustainability education program), e.g., courses for new Board members through UBCM.
- 11 Encourage energy-efficient retrofits (i.e. PACE - Property Assessed Clean Energy Financing) in order to help owners avoid many of the up-front costs by offering longer repayment periods and tying the investment to the property rather than the owner.



C.3 Community Energy Systems

Introduction

District Energy systems (DE) centralize the production of heating or cooling for a neighbourhood or community.

Community energy systems promote energy that is either produced locally, or is used collectively in groupings of buildings or neighbourhoods to increase efficiency. They may also include the use of low impact, alternative energy sources, as opposed to energy systems that power only one building or site. Although these systems often take the form of District Energy systems, they can also include systems such as micro-hydro facilities or Combined Heat and Power (CHP) facilities, which produce heat and electricity that can be used for buildings.

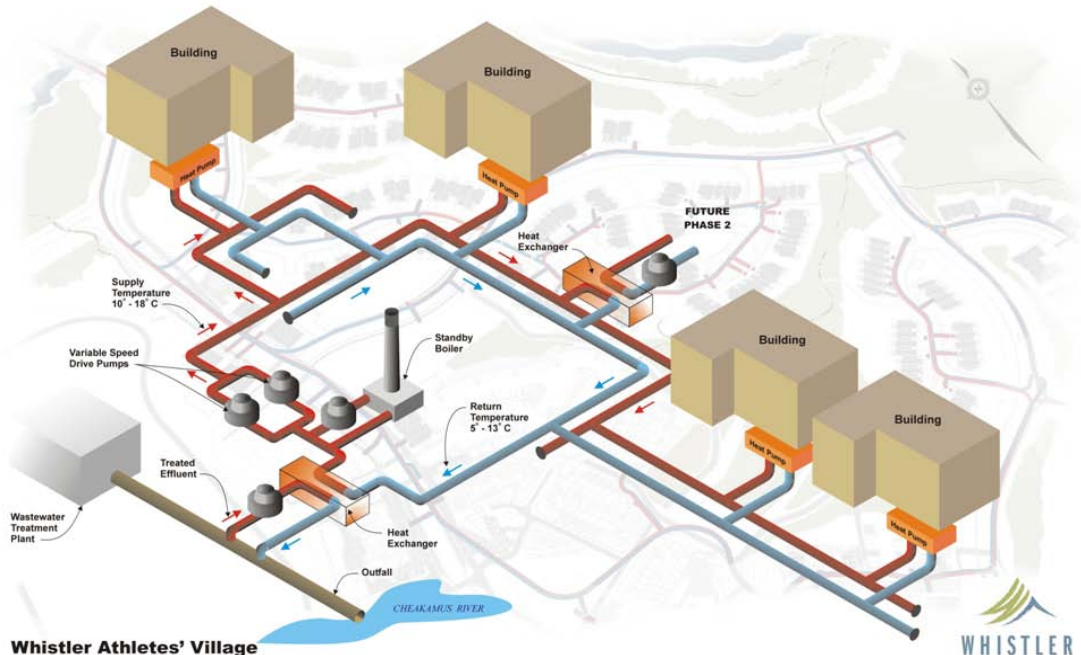
District Energy (DE) systems can use energy in a variety of forms, including:

1. Geoexchange;
2. Biomass (waste wood, wood pellets, etc.);
3. Solar Hot Water;
4. Waste heat recovery, including:
 - a. Sewer waste heat;
 - b. Industrial waste heat;
 - c. Commercial waste heat (e.g., from store lighting and cooling systems);
 - d. Institutional waste heat (e.g., from arena cooling systems);
5. Other (e.g., Wind and Tidal).

District energy systems exist throughout BC, including:

1. City of North Vancouver (Natural Gas supplemented by solar hot water and geoexchange);
2. Southeast False Creek, Vancouver (Sewer Heat Recovery);
3. Revelstoke (Biomass); and
4. Dockside Green, Victoria (Biogas from Biomass).

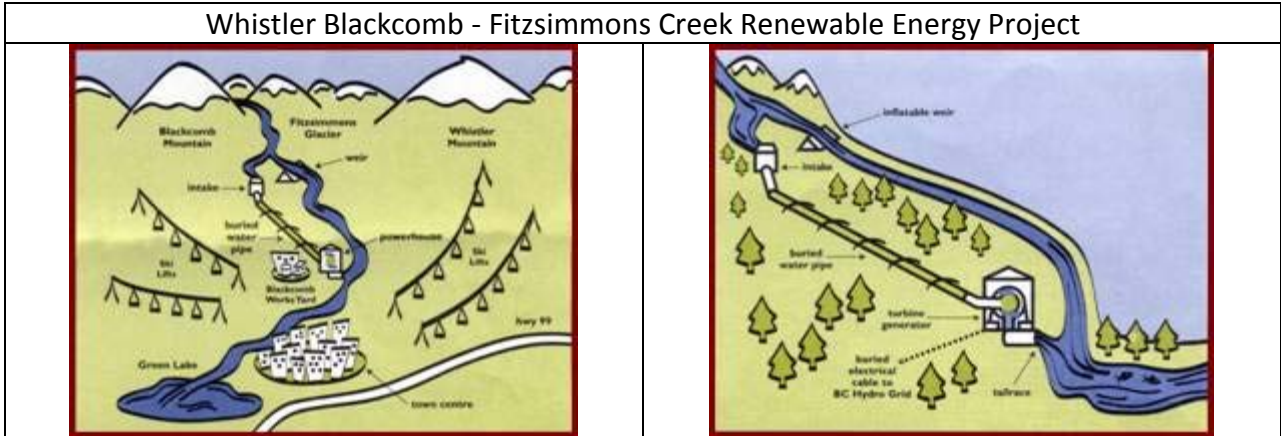
Closer to home, district energy has been used to heat and cool the Olympic Athletes Village at Cheakamus Crossing and a community energy system has been installed at Fitzsimmons Creek on Whistler Mountain and includes a run-of-river hydro facility (connecting to the grid) that generates power that is equivalent to what Whistler Blackcomb consumes in the course of its annual operations. Studies are underway in other communities around BC to determine the potential for community energy systems.



Whistler Athletes' Village
Low-Temperature District Energy-Sharing System Schematic
Two-pipe closed loop can provide both heating and cooling.



Whistler Blackcomb - Fitzsimmons Creek Renewable Energy Project



As discussed in the section on Built Form, higher land use densities and mixes are often prerequisites for the implementation of both alternative transportation modes and effective community energy systems. Although there is generally the potential for a reasonable rate of return on investment over time, the capital costs associated with district energy systems are higher than the “business as usual” case of using electric baseboard heat or natural gas boilers and furnaces. This requires that there be a certain “critical mass” of building floorspace to



justify the investment in district heating energy sources and that infrastructure, particularly piping, be minimized to reduce the payback period for these investments. Development also generally needs to be phased, i.e., if development is not focused on the area of the District Energy investment, the payback period can become unacceptably long.

Why is this important?

Under appropriate circumstances, community energy systems can have a number of distinct advantages for energy security and reducing energy use, including:

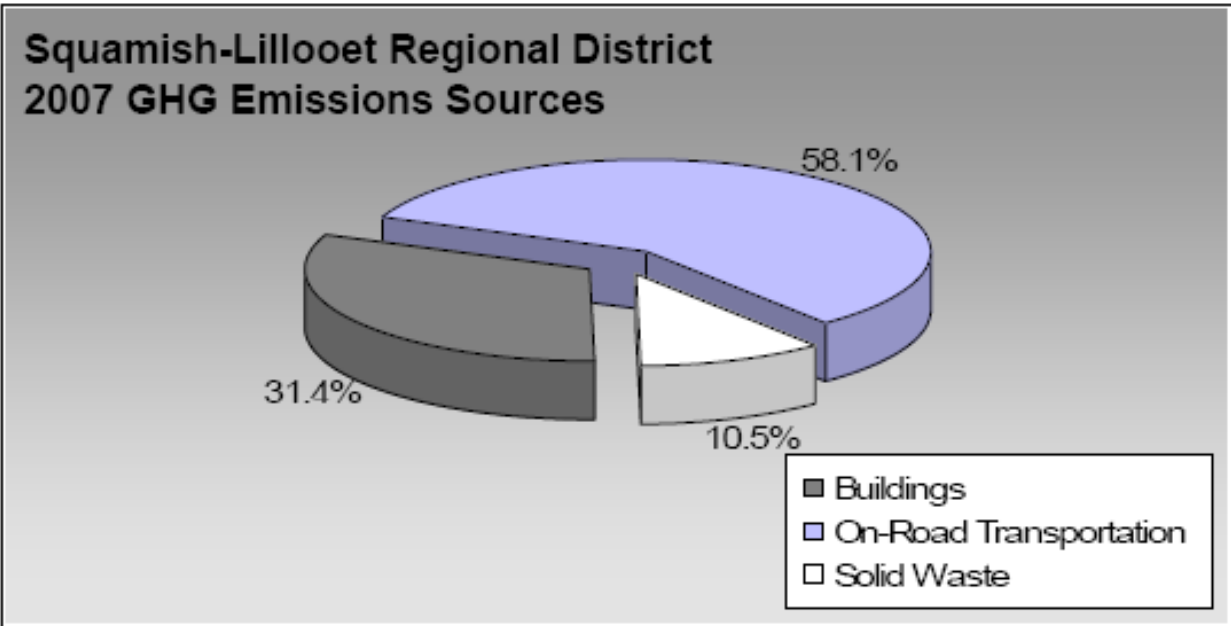
- Reduced operating costs that soon cover additional capital costs and result in significant long term savings;
- Collective ownership and use of systems, such as a larger geoexchange field serving a neighbourhood, can reduce the risk on individual building systems and reduce the management and operating costs associated constructing and maintaining the systems;
- District Energy Systems can be easily designed to accommodate flexible energy sources to adapt to future supply availability;
- Community-owned and managed power facilities (heat and/or electrical) can put control over key issues, such as environmental impacts, in local hands and ensure that the community has security over decision making; and
- Potential to use energy sources readily available in the SLRD, particularly biomass.

Many community energy systems also require compact, mixed-use development for their viability, which has a number of other sustainability advantages, such as promotion of priority transportation modes.

SLRD Context

In total, approximately 1/3 of the energy and emissions in the SLRD result from buildings, from activities such as heating, cooling, ventilation, pumping and other electrical devices.¹

¹ Province of British Columbia, Community Energy and Emission Inventory (CEEI) for the SLRD



The energy consumed in buildings has significant economic considerations for the SLRD:²

Local government	Approx. building energy consumption in Gigajoules	Approx. energy cost (Natural Gas-NG equivalent)
Lillooet	146,000 GJ	\$1,460,000
Pemberton	152,000 GJ	\$1,520,000
Squamish	995,000 GJ	\$9,950,000
Whistler	2,056,000 GJ	\$20,560,000
Squamish-Lillooet RD	3,606,300 GJ	~\$36M

As energy prices for fossil fuels increase, and as imported electrical energy is increasingly generated from fossil fuels, more money will flow out of SLRD communities to import energy, leaving fewer financial resources for other goods and services.

At the moment, most energy used in buildings is electrical. While this form of energy is currently relatively clean and cheap, the provincial government has announced that electricity prices will increase over the coming decade and that all new forms of electricity generated in the province will come from renewable sources, which could significantly increase costs, or it will be imported from other jurisdictions, which generally have a greater reliance on fossil fuels.

² Community Energy Association estimates



Recommendations

The task force's recommendations related to the Community Energy Systems theme are:

- 1 Create a strategy to promote the development of a regional wood biomass supply chain. Such a strategy should assess available sources (forest management, industry, construction and demolition), infrastructure and collaboration needs to facilitate use of wood waste as a local renewable energy resource.
- 2 Market the SLRD as "Clean Energy Powerhouse" :
 - a)Support business opportunities (for designing, manufacturing, and installing systems);
 - b)Promote a network of local systems to apply business opportunities.
 - c)Explore the use of modular, multi-fuel "energy cabins ".
- 3 Support Community Energy Systems as well as District Energy Systems and undertake an inventory and economic analysis in order to identify opportunities for potential renewable, low impact energy sources throughout the SLRD. Explore the applicability of community energy systems to developments scaled to the size and form of SLRD communities, e.g., look at smaller towns and cities in Sweden using biomass, in terms of size, density, mixes of use.
- 4 Engage a Regional Energy Manager, to serve as a shared resource for SLRD communities and establish a working group tasked with identifying and evaluating the barriers to small-scale energy production and recommending solutions.
- 5 Share information among member municipalities, e.g., draft model bylaws for District Energy systems.
- 6 Make communities aware of the opportunities and benefits of local energy systems, such as reduced power line impacts and future energy independence.
- 7 Lobby the Province/BCUC, BC Hydro, Terasen to create a tariff structure that creates a level playing field for alternative energy sources and systems.
- 8 Evaluate options and opportunities from the new BC Clean Energy Act that are appropriate in the Sea to Sky corridor, including funding opportunities from BC's \$100M "Innovative Clean Energy" (ICE) fund and other funding opportunities.
- 9 Encourage education about the advantages and disadvantages of community ownership of various types of energy supply.
- 10 Explore opportunities for clean energy pilot projects throughout the SLRD and use these as learning centres.
- 11 Promote community energy education/ideas generation in the Sea to Sky School District #48 and School District #74 (Lillooet).
- 12 Develop partnerships with the science community to create education opportunities with respect to potential impacts of alternative energy systems and properly mitigate these



impacts.

- 13 Lobby senior governments, utilities, and private agencies for seed funding to undertake initial feasibility studies for community energy systems.
- 14 Apply appropriate incentives and disincentives (eg. Limit burning permits) to discourage open burning of potential energy sources, such as waste wood, burning that wastes energy and creates air quality issues.

C.4 Infrastructure

Introduction

Infrastructure includes all of the local, regional, and provincial physical services that support our built form and modern way of life. While much of this infrastructure is visible, such as roads, sidewalks, streetlights, and traffic signals, much of it is hidden, including water, sanitary sewer, and drainage systems, including treatment plants. Significant amounts of energy are consumed in the construction and operation of our infrastructure.

Examples of the energy and materials used in construction include the oil used in asphalt for our roads, concrete used in sidewalks, metal and oil-based plastics used in pipes, and energy used for excavation. Operational uses include energy for pumps, street lighting, the operation of treatment plants, and maintenance, such as snowplows.

While a relatively small proportion of energy is used for infrastructure, it is not a negligible amount. In the U.S., for example, 3% of all energy is used just for water and wastewater systems.¹ A recent community energy study in Coquitlam indicated that energy aware planning could reduce infrastructure capital and operating costs by 30%.² New technologies and practices exist that can result in dramatic energy savings for infrastructure, including:

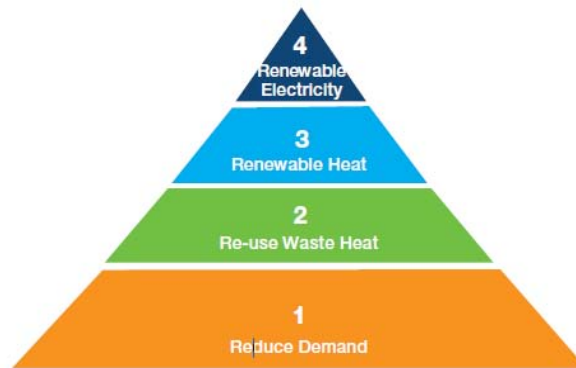
- Recycling of existing asphalt when repaving roads;
- Using alternative development standards that reduce road widths;
- Considering natural drainage systems in lieu of traditional stormwater sewer and drainage systems that depend on mechanical pump systems;
- Directing lighting systems only to areas that need to be lit, rather than general areas, to reduce the number of lights required and energy consumed;
- Installing street lighting and traffic light systems with LEDs or energy-efficient white light sources, such as metal halide;
- Planning compact development patterns that require less infrastructure;
- Applying Leadership in Energy and Environmental Design (LEED) building standards to operational buildings and structures, just as with other institutional buildings; and
- “Right sizing” fleets and developing protocols to ensure that larger vehicles are only used when necessary for infrastructure maintenance operations and not for general business.

¹ http://water.epa.gov/infrastructure/sustain/bettermanagement_energy.cfm

² Community Energy Association, A Tool Kit for Community Energy Planning In British Columbia (2006)

Infrastructure can also be a renewable energy resource. A considerable amount of waste heat can be extracted from sewer systems for use in district energy systems. As the graphic below suggests, after reducing energy demand, waste heat recovery can be the second most important “source” of energy... by harvesting renewable, low-impact heat, we avoid the need to use other non-renewable, higher impact heat sources, particularly fossil fuels.

4 R's of Sustainable Community Energy Planning

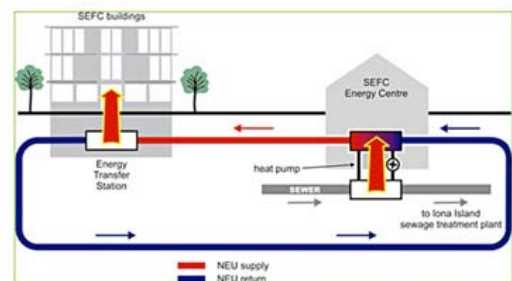


- 1** **Reduce Energy Demand** – through community design, green buildings, and efficient technologies.
- 2** **Re-use Waste Heat to heat buildings and hot water** – e.g. industrial or commercial waste heat, sewer and wastewater heat recovery.
- 3** **Renewable Heat Sources to heat buildings and hot water** – e.g. solar thermal and geo-exchange.
- 4** **Renewable Energy for Electricity** – e.g. biomass/biogas combined heat and power, micro-hydro, wind, solar, tidal and geothermal.

Suggested steps in energy planning.

Concept source: Robyn Wark and Jorge Marques, BC Hydro

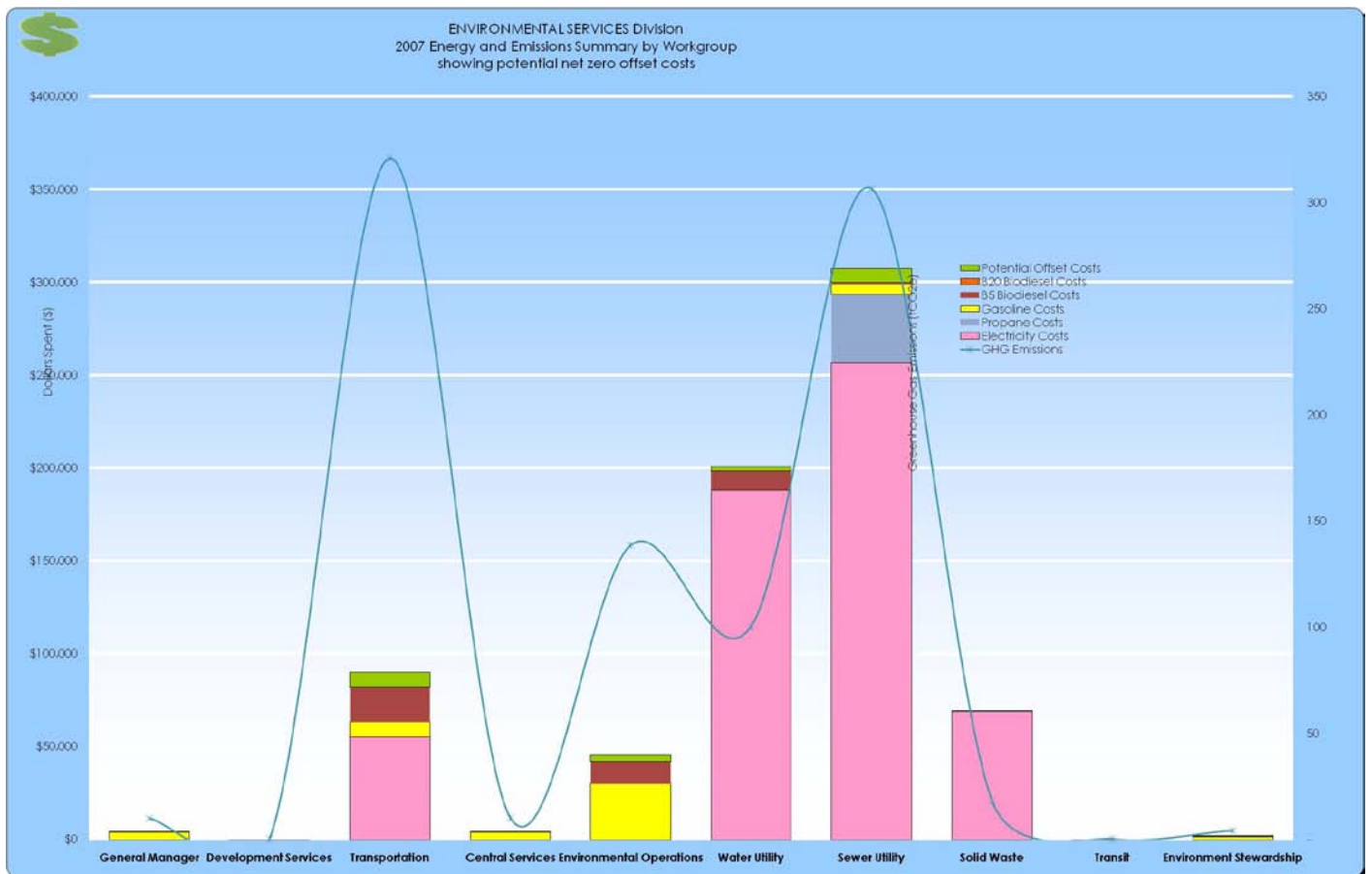
The following images provide examples of sustainable infrastructure initiatives, including in-place asphalt recycling, solar-powered LED street lighting, and a sewer heat recovery system.





Why is this important?

Infrastructure consumes a significant amount of local government budgets. For example, Whistler's Environmental Services Division spends close to a million dollars per year in energy costs, which is about half of the municipality's entire energy budget, including buildings, and much of this is related to the Sewer, Water, and Solid Waste utilities, as is shown below. Another quarter of a million dollars is spent on park and village operations for electricity, much of which is used for lighting.



In addition to potential energy cost savings, applying best practices in energy use for infrastructure provides community leadership, but also sets an example for businesses and institutions, many of which have extensive private infrastructure systems.

SLRD Context

The SLRD and most member communities own a large number of infrastructure assets valued in the hundreds of millions of dollars, and spend millions of dollars every year to maintain and operate these assets. As is shown above, energy is a significant component of these operating costs.

Growing communities, such as Squamish and Pemberton, have an opportunity to incorporate best practices in infrastructure when planning and building new neighbourhoods, such as natural drainage systems and other alternative development standards. Slower growing communities will have the opportunity over time, as assets reach the end of their useful lives, to upgrade to more energy efficient infrastructure, such as lighting and pumps. Opportunities also exist in established neighbourhoods, when doing major road reconstruction, to incorporate infrastructure for community energy systems, such as piping for water distribution for district energy.

Recommendations

The task force's recommendations related to the Infrastructure theme are:

- 1 Reduce impacts of major transmission facilities from distant power plants and build energy independence by:
 - a) Promoting low-impact local power solutions and lobbying for provincial regulations and policy that support local and provincial energy sufficiency over energy exports;
 - b) Providing non-intrusive local electrical distribution networks in support of community energy systems; and
 - c) Lobbying the Province for transmission corridor planning to reduce impacts of multiple access roads and transmission lines.
- 2 Use a long-range energy lens when making decisions on infrastructure investments (engage in scenarios based planning using economic tools that evaluate future utilization and full-cost accounting – factoring in the cost of carbon, and opportunity costs) in order to avoid investment in “stranded assets” that do not make sense in less energy intensive environment.
- 3 Plan local streets for pedestrians, cyclists, transit and smaller, energy efficient vehicles not large wheelbase trucks and SUVs. Support “Road diets” that include reduced road widths and less asphalt, while keeping pedestrian and cycling safety paramount.
- 4 Encourage the use of roundabouts where appropriate to reduce delays, idling, and energy consumption.



- 5 Plan to leave space for alternative energy infrastructure, e.g., district heating pipes, when designing new or updating existing underground utilities.
- 6 Support sustainable infrastructure, such as on-site water retention, swales and water reuse.
- 7 Use low energy street lighting, such as solar powered or LED lighting, limited to where it is necessary, minimize wasted or unnecessary lighting, and promote dark sky policies (keeping safety in mind).
- 8 Use low energy signage and develop energy efficient signage bylaws.
- 9 Re-use and re-purpose existing infrastructure, where appropriate.
- 10 Create a phased plan to install electric vehicle plug-ins in public parking lots and at on-street parking stalls (start with several demonstration projects)
- 11 Expedite the approval process for the extensive provision of weather-protected bicycle parking facilities and transit shelters throughout the region.
- 12 Design new neighbourhoods and projects with localized facilities to reduce travel needs, including garbage bins, recycling, and composting.
- 13 Use distributed local facilities for waste collection and treatment to reduce energy for transportation, provided necessary economies of scale are observed, balancing short-term cost savings against long term social, economic, and environmental impacts. Consider barge transport (from Squamish) for certain solid wastes.

C.5 Social, Health, and Emergency Services

Introduction

As we move further down from the energy peak, there may be associated impacts to social, health and emergency services. Lowered energy results in lowered GDP. As a result, there may be less money that can be allocated to health care, social benefits programs, unemployment programs, infrastructure and other government programs.

Social and health services cover a wide range of services and programs in the region. These include the programs currently offered by the Sea-to-Sky Community Services Society (SSCS), the Whistler Community Services Society (WCSS), Vancouver Coast Health, various health care centres as well as various other non-profit agencies.

Other social services include emergency services such as police, fire and ambulance.

Why is this important?

Social, health and emergency services are imperative for the well being of individuals and for a well-functioning society. As noted by task force members, these sectors are highly entrenched in the fossil fuel paradigm. Large and often energy intensive health care facilities require large quantities of paper, plastic and electronics to do their work. Medical supplies are mostly plastic and disposable, generating extensive waste and often requiring just-in-time delivery. It should be noted that in the past, hospitals had staff who collected used supplies from nursing stations, cleaned and repackaged them, sterilized them in onsite autoclaves and redistributed supplies to the nursing stations. Cheap, disposable supplies made in distant countries using cheap labour has replaced this local, but more expensive labour.

Manufacturing pharmaceutical and medical drugs requires expensive petroleum inputs and delivery systems. Patients and doctors in the region must drive to access the region's health care centres. Emergency medical transportation and organ transport may also need to be reconsidered in light of more expensive fuel costs. In addition, hospitals use almost double the energy per square foot of space as regular office buildings. Pumps, monitors, equipment and electronics are highly intensive in these facilities. Many of the basic systems for provision of care may need to be re-assessed if energy becomes more expensive.

The general health of the population may also be impacted by peak oil. There is a large body of research that proves the link between poor nutrition and poor health. As the price of food increases, healthy food options may be less affordable to the more vulnerable segments of the population, leading to more diseases such as diabetes, heart disease, osteoporosis, high blood

pressure and certain forms of cancer which are directly related to an unhealthy diet. This additional burden to the health care system may be felt in the short run. The good news is that in the long run, as localization encourages more local food growing, the general diet of the population may actually improve.

The emergency and policing sectors are also highly dependent on liquid fuels to run and operate many police vehicles, fire trucks and ambulances. This makes emergency services exposed to fuel cost increases. With rising energy costs, there may be additional economic distress, which is associated with increases in crime. This may place increased pressure on emergency service providers.

While the SLRD does not have direct influence over all components of social, health and emergency services, it should seek to exert what influence it has in order to bolster the provision of these services and to prepare for any energy price and supply volatility.

SLRD Context

Health Services

There are a number of hospitals and health care facilities throughout the SLRD, located in all of the member municipalities. In Whistler, there is a health centre offering emergency services, medical imaging and a laboratory. In addition, vaccinations and sexual health services are offered. In Pemberton, there is also a health centre offering medical and emergency services.

In Lillooet, there is a 24-hour hospital offering acute care and surgical services 2 days per week offered by visiting specialists and surgeons. Laboratory and medical imaging is also available in Lillooet. Counselling for mental health and addictions is also offered through the Lillooet District Hospital. Home and community care and home support are also available in Lillooet, including frozen meal services. Public health programs are offered through Interior Public Health. Programs and services are offered at the individual, group and community levels and in a variety of sites (homes, schools, care facilities, workplaces, health units etc.). Programs include prenatal and postpartum programs, as well as a variety of infant, child, teen, adult and seniors' programs. Squamish is also served by a 24 hour full service hospital, Squamish General Hospital.

Social Services

Social services in the SLRD are offered through a variety of programs and services. Sea to Sky Community Services Society offers the following programs throughout the Sea to Sky region:

- Food bank
- Family and Affordable housing

- Homeless Outreach
- Addiction Recovery programs and housing
- Supported housing
- Youth centre
- Counselling
- Employment resources
- Community Living
- Sexual Abuse intervention
- Child and Pre-school programs
- Child development programs

The Whistler Community Services Society offers the following programs, specific to Whistler:

- Community kitchen and greenhouses
- Counselling assistance
- Emergency financial assistance
- Food bank
- Parent and child programs
- Re-use it centre
- Drug and Alcohol prevention programs
- Interim housing
- Young adult support programs
- Re-build-it centre (expected to open in 2011)

In Lillooet and the Bridge River Valley, there are a variety of programs, some offered through Interior Public Health, including:

- Food bank
- Child, teen and youth services
- Drug and alcohol programs

According to task force member Lois Wynne who is involved with social service provision in the region:

- *“More expensive energy affects food production, storage and transportation. Without proper food, health issues can and will arise. Pregnant women who may be at risk to deliver low birth weight babies and babies with other health issues due to poor nutrition and unhealthy lifestyles will be at risk as food prices increase. This means that these families will purchase less healthy and organic food and more, cheap and non-nutritious foods. And to add to this, research shows that proper nutrition during pregnancy adds to the healthy brain development for the baby.*



- *When there is unemployment, there is a rise in the use of soup kitchens, food banks, therefore there will be more pressure on those services.
We have seen this throughout the corridor; communities cannot keep up with the demand for food. We have now added food cupboards at most of our sites for the folks that we serve to help supplement their income available for food, food bank and soup kitchen use.*
- *Less construction/housing; less affordable housing available.
We know that in order to have strong family development not only is employment, food, clothing and access to appropriate medical care important, but adequate housing is equally important. It wasn't all that long ago in Squamish where there was no recognition of a homeless/at risk of being homeless issue. Two years ago, the Sea to Sky Community Services Society started a homeless outreach service – today in Squamish alone, they serve up to 200 individuals, homeless or at risk of homelessness.*
- *When there is not enough food, no access to essential services, no proper shelter, there is an increase in family stress, family breakdown and family violence.*
- *There seem to be more people at the lower end of economic scale. They don't make enough money and as costs increase they have the least economic resources.
We see the population in the corridor increasing but housing opportunities decreasing due to affordability. We see families taking from their food budget to buy gas, to get to work. We have seen over the years a dramatic increase in serious drug manufacturing and use in the corridor. Not only are folks getting addicted, they use the manufacturing as a source of income. These are families with children, babies, cooking drugs in their kitchen.*
- *Programs for high-risk populations disappear as governments tighten their belts.
We are certainly experiencing this in the corridor and will most likely see this trend continue for the next few years. SSCSS has seen significant cuts in existing programming for high risk individuals and families. Provincial government funding is shrinking, so staff at SSCSS has to use creative ways of doing more with less. This includes less one-on-one counselling and more group work. Partnering with other agencies and groups and sharing of resources is occurring more now.*
- *Costs increase, wages don't reflect this increase.
SSCSS is presently involved in a rental housing project with a local Squamish developer and BC Housing. There will be 30 BC Housing units for seniors and an additional 54 less than market rentals for seniors, persons with disabilities and families. This is scheduled*



to open in Sept. 2010, and we have a wait list of 58. A number on this wait list are staff of SSCSS.

- *Transportation issues.*
A number of staff at SSCSS travel the corridor to provide an array of services. There has been a concerted effort to car pool when multiple staff is moving up and down to help reduce the number of cars on the road and costs associated both for the environment and the agency. For persons served, bus service is not always readily available or reliable. This impedes on their capacity to seek and/or receive services.
- *Child care is an interesting dilemma.*
What we find is with a dwindling economy, families do their best to adjust their schedules to reduce the amount of outside child care needed as much as possible. They also tend to look for the cheapest arrangement which may not always be in the child's best interest. Young school aged children are often going home to empty houses. We often get phone calls asking me is there a legal age you can let your child be at home alone. In the last year we have set up three school based after school programs to help with this issue. Cost remains a problem, but at least it offers another option to sending kids home alone. The next problem will be in a few years when the corridor baby boom hits school age and those empty classrooms that the SSCSS have been using will be needed again."

"I hadn't really attributed these issues to Peak Oil before, but when I look at the literature, and then consider the work that staff are doing, who they are serving, the connection becomes clearer. We have had some major industries close in Squamish, some that displaced a few hundred individuals and families. After that time we had an increase in child protection support services, alcohol and drug outpatient treatment services, youth violence etc.

We serve a number of families that live in questionable housing. Even if they wanted to reduce the amount of energy they were consuming, there is no capacity on their part to improve insulation, add a garden or change windows, it is out of their control.

Less healthy families = less healthy children with less resilience to succeed."

Lois Wynne, Executive Director, Sea to Sky Community Services

Emergency Services

Emergency services (police, fire, ambulance) within the region will feel the impact of peak oil due to their heavy reliance of fossil fuel for mobility. While the SLRD does not directly manage these services, its member municipalities do manage fire fighting and in the case of Whistler, the RCMP.

Fire fighting in the region will be impacted by rising fuel costs in a number of ways. There will be costs incurred for fuel to access fire impacted areas. Fire retardant foams are composed of petrochemicals. In addition, the region has been susceptible to many forest fires over the years. Many of these forest fires are located in remote parts of the region and are accessible only by air. As climate change creates a drier environment in certain parts of the region and the pine beetle creates more diseased and decaying forests, the sheer number of forest fires is likely to increase, with associated increases in costs. Fighting the forest fires in the summer of 2009 cost BC taxpayers \$390 million dollars, well beyond the fire fighting budget for that year.

Policing may be impacted by rising fuel costs. The current paradigm for policing in the region is almost entirely auto-dependent. Given that rising fuel prices are likely to bring more social strife, the problem will be exacerbated: more crime and a lessened ability to police crime.

Ambulance services in the region are currently facing issues around funding. Paramedics have been on partial strike for over a year. Given the highly fuel dependent nature of this emergency health service, the problems associated with providing paramedic services are likely to increase.

Recommendations

The task force's recommendations related to the Social, Health, and Emergency Services theme are:

- 1 Focus on the provision of affordable housing to address the economically vulnerable population.
- 2 Engage different age groups to get involved in local food production – include greenhouses and gardens as part of the school curriculum, raised beds for seniors at seniors centres, etc.
- 3 Strengthen the social safety net to address social challenges related to the transition to a lower carbon future:
 - a) Provide support for counselling and public education on the emotional impacts;
 - b) Protect vulnerable populations (food, housing);



- c) Support social services funding; and
 - d) Support services like the 1-800-Nurse line to reduce unnecessary health care trips.
- 4 Lobby for government vehicles, ambulances, police and fire vehicles, taxis, transit, and social service vehicles to use recycled bio-diesel (waste veggie oil) or, preferably, to convert to electric or low-energy fleets. Also see the Transportation section.
 - 5 Encourage specialists to travel to the corridor on regular basis instead of every separate patient travelling to the Lower Mainland (i.e., one-day a month, specialists do a circle tour through the region and beyond).
 - 6 Build and utilize regional teleconference facilities that can be used for “video link” first consultations with medical specialists in order to reduce unnecessary trips. Offer this service to other users. Also see the Transportation section.
 - 7 Lobby the province to support preventative therapy and provide more coverage for naturopathic medicine, medicinal herbs and alternative health practices.
 - 8 Encourage family-planning in regional public health programs.
 - 9 Prepare a Food Security Plan for the SLRD that addresses food distribution, warehousing and allocation as well as an emergency rationing plan to deal with possible supply disruptions. (also noted in the Food section)
 - 10 Ensure that shared facilities are provided in new multi-family developments, such as community kitchens / community ovens in order to support food preservation (and thereby reduce pressures on the social safety net). Also see the Food section.
 - 11 Allow accessory units throughout the SLRD and work with UBCM and the Province to create subsidies for landlords to ‘weatherize’ rentals to reduce heating burdens on tenants.



C.6 Food and Agriculture

Introduction

The global food system is highly dependent on fossil fuel inputs along every aspect of the food production, processing, packaging, distribution, retailing and household consumption chain. The globalized food system means that the average meal travels over 2,000 kilometres from farm to fork and for every 10 calories of food produced, approximately 10 calories of fossil fuel is required.¹ Any break in the world petroleum supply will put this system in jeopardy. Globally, food security is at risk due to a combination of climate change, peaking fossil fuel supplies and excessive population growth, combined with other market and non-market forces and trends.

The so-called Green Revolution brought with it a dependence on the use of petroleum-based fertilizers, pesticides and herbicides and the use of genetically modified crops. Genetically modified (GM) crops require special seeds that are of a hybrid nature, meaning that the seeds are sterile and cannot be saved and used in future seasons (seed saving has been the agricultural tradition since the beginning of farming). Instead, farmers using GM seeds must buy new seeds each year as well as the chemicals that are required to make them sprout and grow. GM seeds are generally not bred to be specific to each area, making them less robust to the weather and soil conditions of the specific biogeoclimatic zones in which they are planted. The use of GM seeds generally reduces the resilience of farming, as it requires farmers to buy seeds each year in order to produce chemically-dependent monoculture crops that are more susceptible to super-weeds, pests and disease. The annual addition of a variety of chemicals to the soil, pollutes water supplies and also depletes the soil of vital living organisms in the humus, creating soil that is more “dusty” in nature and more susceptible to erosion and soil loss.²

In recent years, food security has been further strained by the onset of crop-based biofuel production, whereby farmers are being subsidized to grow fuel crops rather than food. The trends in agriculture have led to larger farms in order to take advantage of economies of scale. All of these factors have contributed to an agricultural system that is highly dependent on the use of fossil fuel inputs. Taken together, these trends point to the need to make regional food security a priority.

¹ Heinberg, Richard. “What will we eat as the Oil Runs out?”; June 23-25, 2005. [www.richardheinberg.com/Museletter #159](http://www.richardheinberg.com/Museletter#159).

² Pollan, Michael. “The Omnivore’s Dilemma”. Penguin Books, 2006.



Why is this important?

“Food security is achieved when the structure and capacity of the food system can meet the food related human, cultural, economic, social and environmental needs of the individual and community. The *food system*, the nucleus of this definition, is defined as the integrated process by which food is produced locally, imported, is packaged, processed, distributed/marketed, consumed, and the waste stream managed through reuse, composting and disposal.”³

If any components of the food system are impacted by fuel price shocks and rising costs of inputs, then food security can be impacted. It will be increasingly more important to bolster the foundations of the food system in order to improve food security. In particular, the foundations of production, processing, packaging and delivery will need to be made more resilient.

In British Columbia, only 5% of the land base is suitable for farming and only 1% is considered to be high quality.⁴ This has implications for all of the foundations of the food system. BC’s Food Self-Reliance report notes that in order to simply maintain the current levels of self-reliance (which are inadequate) and keep up with the projected 30% population growth, farmers will need to increase production by 30% over 2001 levels by 2025.⁵ And, if farmers are to produce a healthy diet for the population by 2025, an additional 92,000 hectares will need to be irrigated (49% more than in 2005). The need to intensify agriculture throughout BC will certainly have bearing on the SLRD’s limited farming areas.

SLRD Context

The Squamish-Lillooet Regional District is home to approximately 36,000 people, only 190 of whom are classified as farmers. The population in the SLRD is growing faster than in BC as a whole (3.6% per annum versus 1.6%). The region includes 16,355 square kilometers of land of which, 196 square kilometres are being used as farms. The region includes 129 farms of various sizes, producing a variety of crops, including hay and fodder, alfalfa and alfalfa mixes, potatoes, carrots, apples and other crops. In addition, the region produces cattle, some pigs and other livestock. Almost no food processing is being carried out in the region. This presents food system vulnerabilities, in that almost all processed food must be trucked to the region.

The majority of farming in the region occurs in the Pemberton Valley and Lillooet areas. In Pemberton, there are approximately 3,500 hectares of land being farmed. This represents over

³ Food Secure Vancouver Baseline Report. Prepared for Vancouver Food Policy Council. Serecon Management Consulting Inc. in partnership with Zbeetnoff Agro-Environmental Consulting Inc., March, 2009.

⁴ Smart Growth BC. Agricultural Lands. From the Smart Growth BC website.

⁵ Ibid, pg. 2.



75% of the private land that is available for agriculture (not including crown land, rights of way, airport land and Indian Reserve land).⁶ Pemberton was the first community in the world to grow virus-free seed potatoes, starting in 1967. Seed potatoes are the staple crop of Pemberton, meaning that 1/5 to 1/4 of the land is planted in seed potatoes at any given time. The rest of the land is in rotation, allowing the land to “rest” and is rotated to grow alternative cash crops, principally beef production, as well as hay to feed the cattle. The seed potato industry has grown and enjoyed commercial success, supplying seed potatoes across North America. The seed potato industry is highly dependent on fossil fuel inputs. According to an oil vulnerability audit, commissioned by the Squamish-Lillooet Regional District and conducted by the University of Liverpool, a typical seed potato farm is dependent on fossil fuel for over 30% of its operations.⁷ The report noted that farms in Pemberton should electrify their machinery and tractors, wherever possible, in order to improve resilience. In addition, the need for local food processing facilities was seen as crucial in the face of peaking fossil fuel supplies.

In recent years, there has been some intensification (farming crops that have higher farm gate receipts per acre) of growing in the Pemberton Valley, with the addition of grapes, nurseries and berries. According to the draft Pemberton Valley Agricultural Plan, the agricultural sector in Pemberton grossed \$6.34 million in farm receipts in 2006, up 38% from 1995.

In general, it cannot be said that Pemberton is near to being food self-sufficient as most of the food is exported to other markets.⁸ Squamish, Whistler, and Lillooet are even further away from being food self-sufficient. In British Columbia, farmers produce 48% of all foods consumed in BC, however, when this production is compared to Canada’s Food Guide to Healthy Living requirements, which outlines the needs for a healthy diet, BC’s food self-reliance actually drops to a 34% self-sufficiency, based on what is actually grown in the Province.⁹ BC is most self-reliant with respect to fruit (159%), and is least self-reliant with respect to grain (<14%), vegetables (43%) and dairy (57%).

Small scale, local food production is happening throughout the region in various ways. In Squamish, there is a growing resurgence of local foods and educational initiatives about the importance of a robust, resilient and sustainable localized food system. Small-scale farmers and farms, alongside community gardens and home gardens, are developing in the area. A seasonal farmers market is held every Saturday morning and multiple food projects continue to unfold in the corridor. Squamish also has several community gardens and Whistler has several community greenhouses that are available for rent. In Pemberton, there is a community garden, with large plots of land rented for \$30 per season. The expansion of community

⁶ Kim Sutherland, BC Ministry of Agriculture, 2010 email.

⁷ Oil Vulnerability Report on a Seed Potato Farm in the Pemberton Valley. Simon Snowden, University of Liverpool, 2009.

⁸ Ibid

⁹ BC’s Food Self-Reliance: Can BC’s Farmers feed our Growing Population? BC Ministry of Agriculture and Lands, 2009.



gardens and greenhouse space is limited by the land base. On a seasonal basis, there are farm-stands and U-picks in the region, most located in the Pemberton Valley. Traditional hunting and gathering still goes on throughout the region, with mushroom harvesting and fishing still quite common.

Lillooet is seeing a revitalization of its agricultural sector. There are a number of small-scale organic farms that started over the last few years. A new vineyard and a new hopyard have also begun operations. Lillooet hosts an annual Apricot Tsaqwem (Saskatoon berry) festival, celebrating the fruits of the area. There is also a vibrant farmers market held in Lillooet every Friday morning from May to October.

Transport and Distribution

With respect to the regional food system, transport plays a significant role, as food requires fossil fuels to deliver it from farm to end-user. The flow of food to grocery stores is something that is easily taken for granted. Currently there are over 50 truck deliveries to a typical grocery store in the region, every week.¹⁰ The good news is that many of these truck deliveries could be consolidated into one or two deliveries if various food distributors would consolidate their orders. Currently, bread, dry goods, vegetables and meat, all come in different trucks. With most food being shipped by trucks, the food system is 98% dependent on fossil fuels. The need to electrify the transport system and move to train transport will be imperative. At the regional level, train transport should be further reviewed. For places such as Lillooet, and regions in the north, this could be a critical factor, as train service has been lacking over the past decade and will need to be revitalized in the future.

The other component of the distribution system has to do with the procurement policies of the large food distributors that supply the large grocery chains. These distributors are all located in the Lower Mainland and require on-site delivery of produce from farmers located within the SLRD. The produce is then sorted and re-packed and then sent back to the chain stores within the SLRD. These logistical practices have significant fuel consumption implications and impacts to freshness, in addition to the obvious price implications of travel and the addition of middlemen. Co-operative food stores were cited as one way that the large distribution system can be avoided as they have their own procurement rules that allow them to buy directly from farmers (subject to meeting the Vegetable Marketing Commission's minimum price requirements).

¹⁰ Information provided by Bruce Stewart, General Manager, Nesters Market, Whistler.



Food for Vulnerable Populations

Food banks are located in all of the main member municipalities within the SLRD. According to Sea to Sky Community Services, the food banks are struggling to keep up with demand. Squamish also runs a soup kitchen. Many of the schools throughout the region have food programs to ensure a healthy student population.

Food Waste

Food waste is not consistently addressed within the region. Whistler has a large-scale community composter that takes all organic food waste and processes it at a central facility. Throughout the rest of the corridor, organic wastes are not processed in any organized way. Opportunities for neighbourhood composting could be addressed through bear-proof fencing and simple composting technology. In this way, organics can be used to create new soil (rather than disposed of) and minimal fossil fuels would need to be employed in order to transport them. This issue is further discussed in the “Reducing Consumption and Waste” section of this report.

Food Packaging

Food packaging is heavily dependent on oil supplies. Currently the food system includes excessive amounts of plastic packaging for all sorts of packaging uses. This includes plastic around boxes, plastic for yogurt and juice containers, plastic for wrapping vegetables and meats, etc. Alternative packaging materials will need to be brought to the market and new, low-energy packaging products will need to be created. Buying in bulk will become more economical and there may be economic opportunities for food sales that include less packaging.

Organic Food

Organic food is generally described as food that uses limited chemical pesticides, fertilizers and herbicides, as well as being non-genetically modified. Only sixty years ago, almost all food was organic. Organic food is generally less fossil fuel intensive than non-organic food, however, most organic food available for sale in British Columbia still comes from outside BC. In fact, only 15% of fruits and vegetables grown, and less than 1% of meat and livestock raised in BC are organic. A shift to organic production may result as energy becomes more expensive and chemical additives rise in price. This could have a number of other positive spin-offs for agriculture, human and soil health.

Recommendations

The global food system creates vulnerabilities within the region due to its reliance on long-distance trucking and just-in-time delivery. A way to counteract this issue will be to re-localize and re-regionalize the food supply within the region and to bring back the resilience that has



been lost to globalization based on cheap fossil fuel. Localization and regionalization is about becoming locally independent with respect to goods and services and decision making. It involves reducing long supply chains and bringing production closer to end consumers. Localizing helps to build independence with respect to food, energy and all other needed goods. By localizing the food supply, the SLRD can build resilience in the face of declining fossil fuels. Localization of the food system will involve maximizing local food production in every way possible. This will require a coordinated and strategic approach.

A diversified food system must be developed and intensified in order to build resilience. This means broadening the foods that are currently grown in the Province and the region to include more of the crucial items that are not currently grown here, such as more nuts, grains and vegetables.

Another way of localizing/regionalizing the food system and reducing food miles will be to create local distribution networks, thereby shortening the supply chain. Currently, food needs to be shipped to large distributors located outside the region. The key to resilience will be in building up a regional food distribution network.

With cheap fossil fuel and the globalization and wage arbitrage that goes with it, there has been extensive “offshoring” of food processing. Pickles now come from Poland, jam from Germany and frozen vegetables from China. Resilience to fossil fuel scarcity and price shocks will be built by going back to the old ways of dealing with the harvests of a short growing season: canning and preserving the harvest for use throughout the year. The ways to preserve food include canning, freezing, and drying as well as salting, smoking and fermenting (eg. cabbage into sauerkraut). By engaging in these preservation activities, the harvest is kept in the region and available throughout the year. In this way, dependence on goods imported from elsewhere will be lessened. Building the food preservation infrastructure will be a key to building resilience. Instant quick freezing equipment is expensive and food processing has extensive space requirements, but the investment in these resources will be necessary if a resilient food preservation infrastructure is to be created.

Local control of farmland is an important component of food security and preserving regional farmland will be advantageous to creating local control. The SLRD supports the Agricultural Land Reserve and the work of the Area C Agricultural Advisory Committee, however, there are a number of ways in which the SLRD can become more involved with fostering food security as noted by the SLRD Energy Resilience Task Force. In many communities, local governments are taking food security further, by supporting Agricultural Land Trusts. The concept of land trusts stems back to the 1800’s. Land trusts can be set up for many purposes and in the case of Agricultural or Farmland trusts, they are generally established to acquire and manage land on behalf of the public in order to preserve the land in perpetuity. Agricultural Land Trusts within the SLRD can help to achieve a number of food security initiatives, including providing community gardens and farms, providing farming and agricultural education, and ensuring that



farm production is kept in the community. It should be noted that the concept of Agricultural Land Trusts was the most publicly supported of all of the ERTF recommendations, as noted at the public input sessions. As multi-national corporations and foreign governments continue to buy valuable farmland throughout the world, regional preservation of farmland will become ever more important as a food security tool.

The task force's recommendations for the Food and Agriculture theme are:

- 1 Champion Agricultural Land Trusts – buying land for community food growing and protecting it in perpetuity is a community investment in long-term food security (community-owned agriculture). A community agricultural land trust can provide opportunities for a working farm, a community garden or an agricultural park and can provide food security, education and tourism opportunities. This can be done through the land acquisition powers granted by the Local Government Act. Agricultural Land Trusts can be found in many communities throughout North America.
- 2 Lobby the Agricultural Land Commission to allow up to 4 dwelling units (located in one building on the same size footprint as a single-family home) on parcels 50 acres and greater, in order to put more farmers on the land, to facilitate group farm purchases and more intensive farming.
- 3 Research opportunities and conduct feasibility studies around:
 - a) Opening local processing plants;
 - b) Cooperatively owned processing equipment and machinery;
 - c) Creating a local dual purpose abattoir for both birds and meats;
 - d) Investigate the possibility of developing a local co-op to distribute local veggies locally; and
 - e) Investigate funding to hire students to do this research.
- 4 Ensure that all local agricultural zoning bylaws allow for local processing of food to reduce transportation requirements.
- 5 Reduce or ban herbicide and pesticide use and promote research into biological control of weeds (with exemptions for some industrial farms) in order to preserve the soil and begin the transition to low-carbon and organic inputs.



- 6 In conjunction with the SLRD Emergency Plan process, prepare a Food Security Plan for the SLRD that addresses food distribution and access as well as an emergency food and fuel rationing plan. Include the results of the Sea to Sky Corridor inventory done by the Social Planning Group on the availability of food in the region.
- 7 Build capacity for local food production by:
 - a) Working with member municipalities, non-profits and the School Districts to provide food preservation education (freezing, drying, seasonal cooking, yogurt and cheesemaking, beekeeping, backyard chickens, herbal medicines, seed saving, nutrition, canning, etc) using school facilities (cafeteria), and open up classes to the public.
 - b) Investigating the provision of seed funding for the creation of a small tool lending library that includes such items as pressure canners, cheese presses, grain mills, sewing machines, and tools.
- 8 Research practices and provide examples of carbon labeling on local food products to help consumers make informed product decisions. Work with the UBCM to lobby for product labelling rules.
- 9 Designate SLRD as GMO-free and promote seed-banks / seed savings in order to create regional food independence and resilience. Educate on the importance of buying seeds produced in B.C.
- 10 Encourage, and, where possible, incentivize the shift toward organic growing and educate farmers on how to increase income by going organic.
- 11 Continue to support land use regulations that allow horticulture/community gardening in all residential zones (already supported in SLRD bylaws).
- 12 Investigate ways of supporting regional food banks.
- 13 Support Whistler's 2020 Food Task Force for other regionally actionable ideas.
- 14 Lobby the Province for changes to regulations which prevent or limit farm-gate sales.
- 15 Partner to promote a "Buy Local BC food" campaign.
- 16 Partner to promote the Pemberton Almanac, which was produced for Slow Food Cycle.

- 17 Adopt and implement the recommendations contained in the SLRD Agricultural Area Plan as soon as possible.
- 18 Designate Sea-to-Sky as a “Slow Food Region” and investigate other food-related reasons to promote the area.
- 19 Support local food security by adding links on the SLRD website to non-profit groups in order to share information about food sources and training.
- 20 Investigate offering further tax breaks as a way of encouraging agricultural land owners to farm or lease their lands.
- 21 Design all land uses that involve food or waste to prevent bear attraction.



WHISTLER 2020 Community Food Strategy

Appendix to the Food and Agriculture section

The SLRD Energy Resilience Task Force supports The Resort Municipality of Whistler's 2020 Task Force process which included a Community Food Strategy. In the strategy, they have a vision for the future in the year 2020:

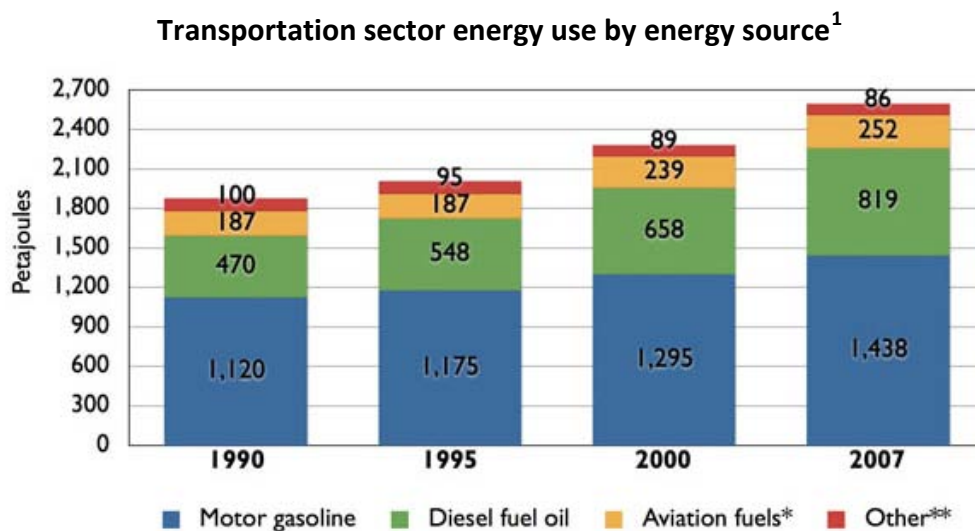
"In 2020, a co-operative and collaborative community-supported bioregional food system improves the health of communities, the environment and individuals over time, involving a shared effort to build a locally based, self-reliant, secure food system and economy. By this time:

1. All community members have dignified access to sufficient, nutritious, culturally appropriate, safe and affordable food.
2. Regional agricultural land is preserved, enhanced and replenished and encroachment on nature is minimized.
3. Opportunities for food production on both protected farmland and developed lands are encouraged.
4. The food system is managed through best practices to maximize biodiversity.
5. Materials, synthetic chemicals and persistent compounds in the food system are proactively managed to protect and promote human and ecosystem health.
6. Waste from the food system is continually decreasing, what remains is being increasingly diverted from landfills, and material inputs are progressively more sustainable.
7. Water is used efficiently and water quality is protected throughout all aspects of the food system.
8. Energy use and related emissions are being reduced within the food system and are transitioning toward renewable energy.
9. Community members continually learn about food, its cycles and the complexity of its social, economic and environmental benefits and impacts.
10. The food system and related activities enhance the regional economy, increasing regional jobs and wealth from farm to fork.
11. Regional food producers, retailers and First Nations traditions are celebrated and supported in the marketplace as valuable components of the region's identity, health, vitality and economic prosperity.
12. The region holds a shared vision for the food system and works together to achieve that vision and share it with visitors."

C.7 Transportation

Introduction

Transportation affects our lives in many ways. It provides access to basic needs, services, employment, and recreation. It also supports a wide range of emergency services, such as fire, police, ambulance, and firefighting, much of which depends on fossil fuel. Motorized transportation is a fundamental element the modern lifestyle and has greatly shaped the form and character of our communities. While the world was once scaled to slower, human, animal, or wind-powered modes of travel, the introduction of fossil fuels over the last few centuries has made us accustomed to faster, and more convenient modes of travel. As a result, we have dramatically increased both the number of trips that we make and the distance of these trips.



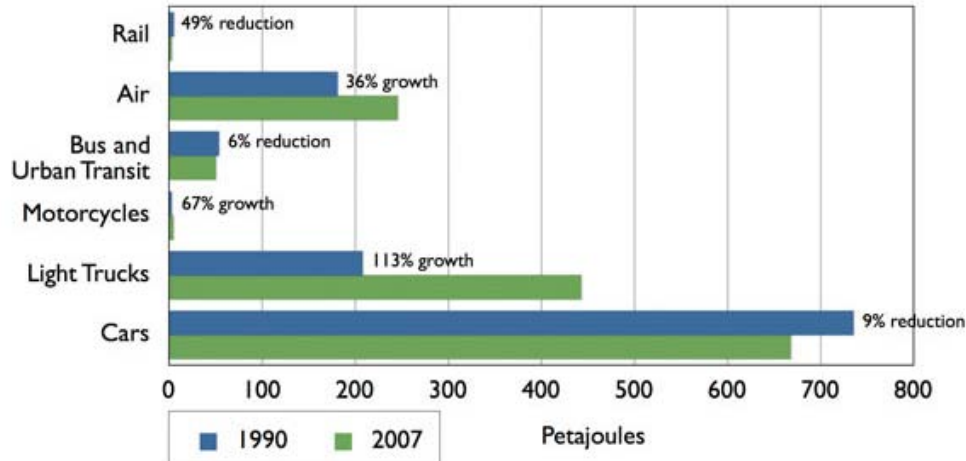
* Aviation fuels include aviation turbo fuel and aviation gasoline.

** "Other" includes electricity, natural gas, heavy fuel oil and propane.

Unfortunately, while traffic and travel-related energy usage has been relatively stable, there has been no decrease in consumption, in spite of more energy efficient vehicles, due to a trend towards "light trucks," i.e., SUVs, vans, and pickup trucks in lieu of smaller, higher mileage passenger vehicles.

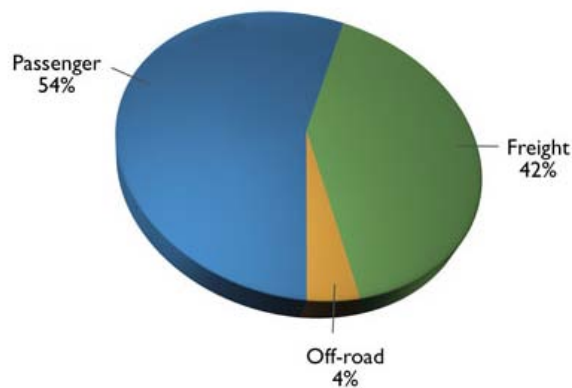
¹ NRCAN, Energy Efficiency Trends in Canada, 1990 to 2007 (2009)

Canadian passenger transportation energy use by mode, 1990 and 2007²



In addition to transporting ourselves, there is a tremendous amount of energy used to transport goods and services for personal, as well as business, purposes.

Canadian energy use by subsector, 2007 (percent)³



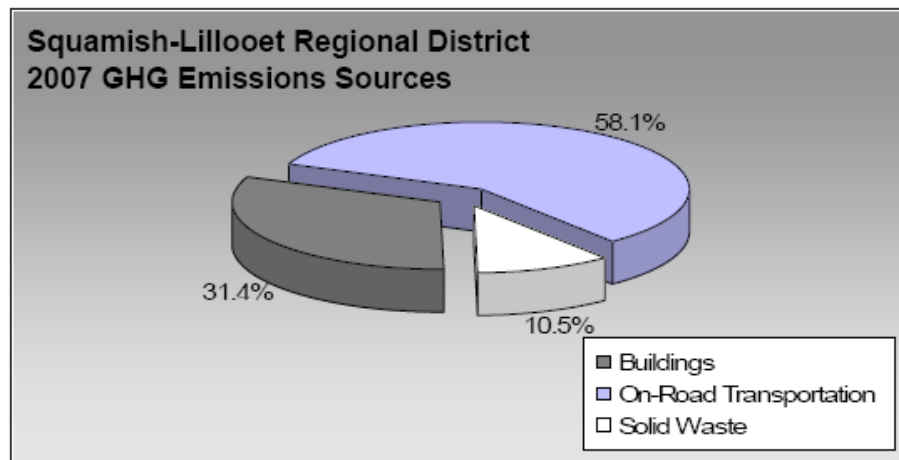
It has been estimated that food for a typical Canadian household travels *on average* 2400km to get to the table. Needless to say, as the average Canadian consumes hundreds of kilograms of food every year, this is enormously costly and requires considerable amounts of energy for transportation.

² Ibid.

³ Ibid.

Why is this important?

On-road transportation accounts for almost 60% of the SLRD's measured emissions sources, which is significantly larger than emissions from buildings and other sources.⁴



If we cannot significantly reduce our energy consumption related to transportation in the SLRD, or shift to energy that is renewable and not dependent on imports from other locations, increased costs and uncertainties in supplies suggest that there is a considerable risk that there may be severe disruptions to our quality of life and economic sustainability.

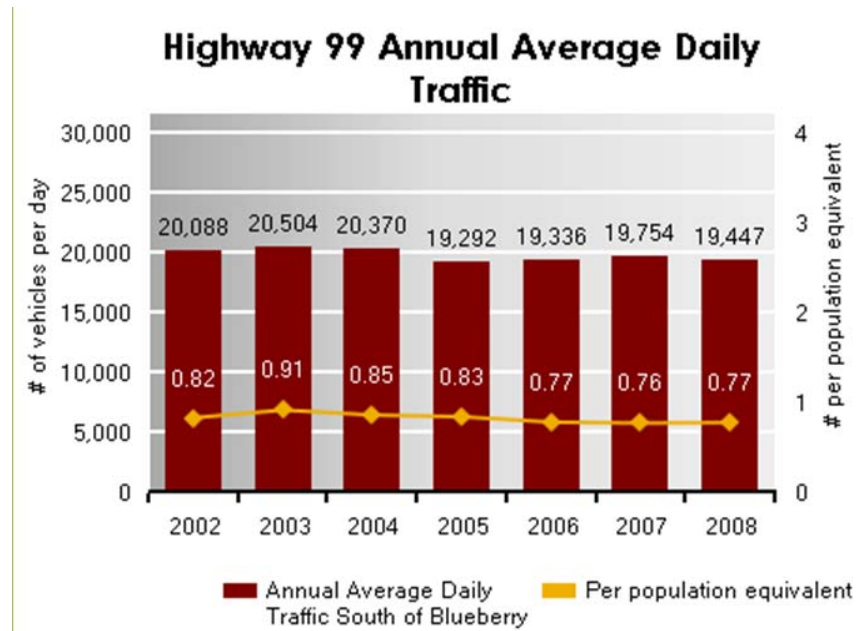
SLRD Context

Much of the data available concerning travel patterns in the SLRD is reflected in highway traffic volumes. Average Annual Daily Traffic (AADT) fluctuates from year to year, but there has been approximately a 10% increase in the number of trips north and south on Highway 99 between Squamish and Whistler in the 5 years between 2004 and 2009, from approximately 9,500/day to 10,500/day.⁵ This is about half of the traffic on Highway 99 within Whistler, when local traffic is added in.⁶ Between Whistler and Squamish, the AADT is about 4,000/day with about a 5% increase in traffic. By comparison, the volume between Pemberton and Lillooet is approximately 800/day in the summer.

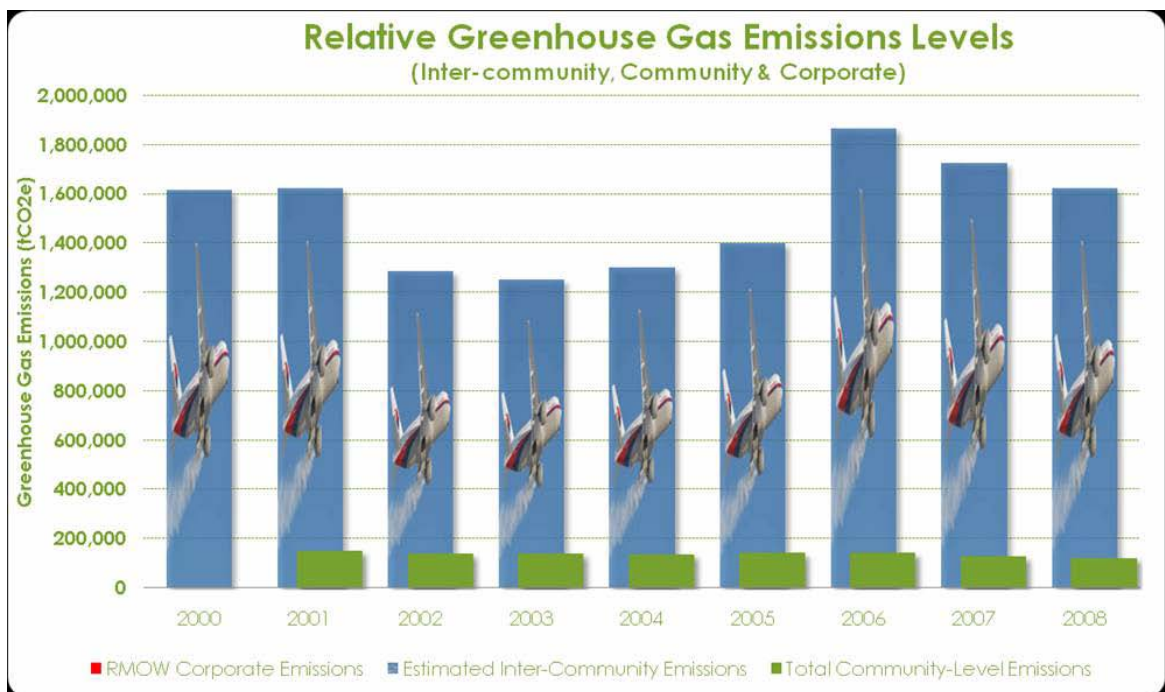
⁴ Province of British Columbia, 2007 Community Energy and Emissions Inventory (2010)

⁵ Ministry of Transportation and Infrastructure, Permanent Count Station data (2004-2009)

⁶ Whistler2020 Explorer, www.whistler2020.ca



One important consideration for the region’s tourism sector is that, while local transportation energy and emissions are growing relatively slowly, these energy and emissions are dwarfed by the energy used for visitors from outside the region, particularly those who are flying, as the Whistler example below indicates. This type of energy use has grown in the last two decades and may continue to grow.








Various international studies caution that there are significant pending limits to long-distance transportation in the tourism economy:

- *Earlier studies demonstrated that as a result of its inherent transport component, tourism is fuel driven and comparatively energy-intensive.* (Gossling et al., 2005; Patterson & McDonald, 2004)
- *While there are technological alternatives to fossil fuel-based transport there are also a wide range of limitations associated with each alternative. For air travel in particular, alternative fuel sources such as hydrogen are unlikely to be introduced in the near future.* (Peeters, Gossling, & Becken, 2006)

It should be noted that considerable resources have been expended in the promotion of alternative transportation modes in the SLRD. Where there was no transit a generation ago, regular transit service is available throughout the Sea to Sky corridor, bike lanes and paths have been created, and facilities for pedestrians and those with special needs have expanded greatly. Nevertheless, while transit usage grew 50 % in the 10-year period from 1996 to 2006, the percentage of people driving alone to work alone and the number of people driving as passengers did not change, and half the new ridership in transit use was from former pedestrians. Four out of five trips are still made by private vehicles.⁷

Are we driving less?
Commute To Work

	1996	2006
	69.2%	68.2%
	10.3%	10.9%
	4.5%	6.8%
	10.2%	9.0%
	3.0%	3.2%

In BC, 10% of people took transit, 7% walked, and 2% cycled to work in 2006.

A wide range of factors has contributed to this slow and small shift to alternative modes, including long distances in many area, stable automobile operating costs, the availability of convenient, free parking in most areas, underdeveloped walking and cycling facilities in many

⁷ Statistics Canada, 1996, 2006 Journey to Work data

locations, and a transit system that is not time competitive with the automobile, particularly in the evening, weekend, and off-season.

Goods Movement

While there is an important agricultural sector in the SLRD, particularly in the Pemberton area, the great majority of our food in the SLRD is transported from other places, and the average person consumes more than 500 kg of food per year. Higher energy costs will affect regional exports of food to other places and imports of food. These higher transportation costs may have an indirect economic benefit, in that they may spur local processing of raw foods in order to reduce the cost of transporting agricultural inputs to other places and shipping the processed foods back for local consumption.

In addition to energy used to transport goods that support the local population, such as food, there is a considerable amount of shipment of raw materials and finished products within and through the region, by road, rail, and sea. Given that freight vehicles obtain fuel at various locations on their route, it is difficult to identify how much renewable and non-renewable fuel is used for goods movement to, within, from, and through the region.

We do know that 42% of transportation energy is typically used for freight and, in general, water transport is more fuel efficient than rail, rail is more fuel efficient than truck movement of goods, and air freight is significantly more energy intensive than any other mode. In the U.S., for example, rail fuel efficiency was found to be much higher than truck fuel efficiency in terms of ton-miles per gallon, with rail fuel efficiency varying from 156 to 512 ton-miles per gallon and truck fuel efficiency ranges from 68 to 133 ton-miles per gallon.

Within the SLRD, which has road, rail, water, and limited air freight facilities, the main issues to consider from an energy resilience perspective are:

- Increasing local production and transport of goods and services; and
- Promoting the use of freight modes that are the most fuel efficient for the distance travelled.
- Exploring multi-modal freight facilities to facilitate the mode appropriate for the type of goods (e.g., bulk versus finished products) and the distances travelled (short haul versus long haul).

Recommendations

The task force's recommendations related to the Transportation theme are:

- 1 Ensure that the rail system in the SLRD is not dismantled and identify opportunities for increasing shipping and transport by rail.
- 2 Ensure that there are accessible, efficient commuter options to Vancouver and throughout the corridor (e.g., lobby to reinstitute early morning Greyhound commuter buses from Pemberton, Whistler and Squamish to Vancouver).
- 3 Identify and support all opportunities for convenient, lower impact multimodal transportation, e.g., walking, cycling, transit, water, and rail.
- 4 Work to provide better pedestrian infrastructure between neighbourhoods and schools, e.g., more "best routes to schools" initiatives and wider widths for pedestrian trails.
- 5 Prioritize bike lanes in all new street resurfacing projects.
- 6 Create a regional transportation advisory committee for the SLRD (separate from the Sunshine Coast as it is currently) that works with the Province and other stakeholders to address sustainable transportation needs for the region.
- 7 Work with the transportation industry to get more data on freight transport in the SLRD.
- 8 Develop regulations to ensure that all new residential development with over 10 units provide for an efficient car share vehicle and other transportation demand management measures (as done in Vancouver and New Westminster).
- 9 Encourage the grocery sector to combine large truck deliveries to reduce the number of large truck trips throughout the region.
- 10 Explore alternative road paving materials for new development within the SLRD, in order to reduce the use of petroleum-based products.
- 11 Work with member municipalities to amend the SLRD Emergency Plan in order to address food security and fuel allocation planning in order to ensure:
 - a) fuel to emergency and first responders; and
 - b) essential food distribution and freight deliveries.
- 12 Ensure that there is better data available to track the use of Highway 99, including data on commuter and tourist use.
- 13 Preserve opportunities, options and nodes for short sea shipping and identify ways of increasing short sea shipping, e.g., barge transport, where appropriate.
- 14 Support a region-wide public art project that encourages local community art/installations that double as weather-protected bike racks.



- 15 Invest in easily accessible and high quality central hubs throughout the region to allow for videoconferencing to avoid the need to travel to meetings and create additional educational opportunities for rural communities.
- 16 Examine the business case for neighbourhood garbage pickup in order to reduce personal trips.
- 17 Conduct an SLRD corporate transportation energy reduction plan that:
 - a) Includes SLRD vehicle efficiency standards;
 - b) Enables telecommuting to reduce commuter trips;
 - c) Investigates the provision of car-share vehicle(s) as a demonstration project (located in the SLRD parking lot);
 - d) Promotes biking and end-of trip facilities (showers, etc.) at the SLRD office.
- 18 Work with regional fleet managers to create a resolution for presentation to the Union of BC Municipalities, in order to ensure that government vehicles, ambulances, police and fire vehicles, taxis, transit, and social service vehicles switch to more high-efficiency fleets.
- 19 Work with member municipalities to reduce free employee parking and eliminate municipal employee car allowances, in favour of subsidized transit.
- 20 Offer incentives to employees to take alternative transportation and encourage telecommuting, where appropriate.

C.8 Economy and Tourism

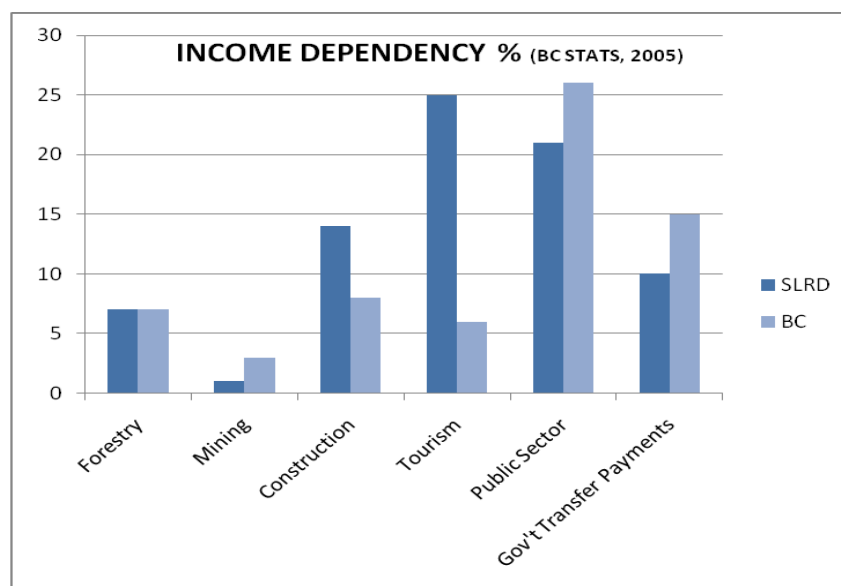
Introduction

The Squamish-Lillooet Regional District has been undergoing a transition from a tier one economy (resource-based) to a tier 3 economy (knowledge and tourism-based) for the past few decades. This shift has created a number of job losses, as well as a number of job gains. What is increasingly clear is that the growth in the economy of the region has been closely tied to the availability of cheap and abundant fossil fuels and a world economy that has also been similarly buoyed by access to cheap energy. With the onset of peak oil it is likely that all economic drivers within the region will be somewhat affected, particularly those that are highly dependent on fossil fuel. It will be of utmost importance for the communities within the SLRD to bolster and diversify their local economies and to find ways to reduce dependence on international “destination” tourism and long distance private vehicle trips, as these forms of travel will become increasingly expensive.

Why is this important?

Building a more resilient economy within the region is important. The good news is that by building a more resilient economy now, the SLRD can gain an economic foothold into the post-carbon economy and will be better able to withstand any bumpy economic circumstances that energy depletion may bring.

SLRD Context



Growth in recreation-based tourism, public services, construction and service industries shows that the SLRD is becoming less resource-based. The following sections outline the main economic sectors that operate within the SLRD.

Forestry

Over the past two decades, the SLRD's economic base has seen a shift from resource extraction (primarily forestry). Several of the forest product processing mills in the region have closed in recent years, or have seen output reductions. The Wood Fibre pulp mill in Squamish closed in 2006. In Lillooet, over the past two years, both Ainsworth Lumber and Bridgeside Mill have closed, amounting to approximately 225 job losses. The immediate prospects for wood industries in Lillooet are uncertain at the present time.

Maintaining a healthy, multi-functional and sustainable forest management infrastructure (expertise, skilled workers, access, local processing capability) is necessary for support of the forestry economy in the region. In addition, forest planning that includes backcountry road access, higher level landscape management planning, and forest protection (eg. from wildfires and clearcutting) will be important for support of the tourism industry. Encouraging enhanced utilization of local forests, will continue to be important for the region for a variety of reasons that go beyond forestry jobs. Healthy, vigorous forests, with a balanced mix of age classes and species have importance as a carbon sink, and protect against the disease issues related to monocultures.

The increased level of local (especially First Nations) ownership of timber rights should offer new opportunities for collaboration and made-in-the-region forest management and wood product manufacturing strategies. A particular need in forest management throughout the region is to address utilization opportunities for underutilized species and lower grade timber resources, particularly mountain pine beetle affected stands. Promoting new forest products such as wood pellets and beetle-kill wood products may provide an economic boost to the regional forest sector.

Education

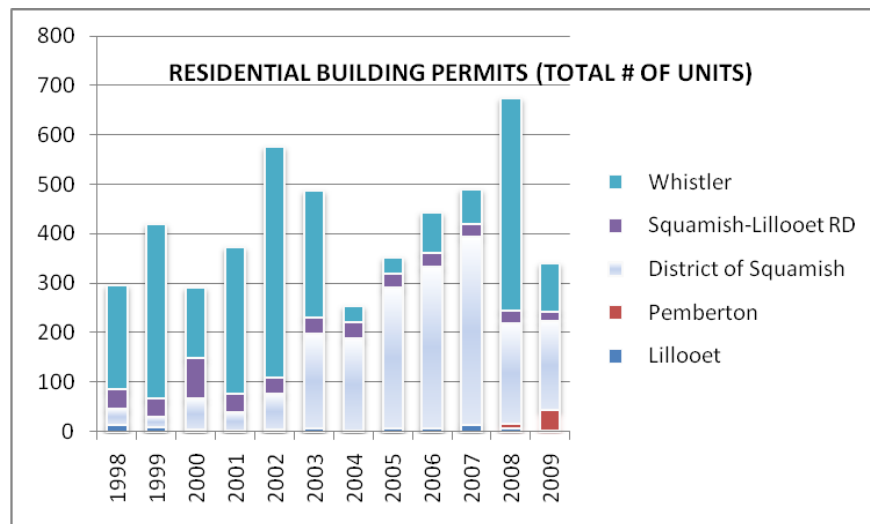
The area is seeing other signs of diversification to a knowledge economy. Quest University opened in Squamish in 2007 and is the first private liberal arts university in Canada. With less than 300 students at this time, Quest expects to increase enrolment to just under 900 students over the next few years.

Power

The SLRD includes several hydro projects, with a number of projects now complete and several applications in the queue. The Fitzsimmons Creek, Rutherford Creek, Ashlu River and Miller Creek run-of-river hydro power projects (among others) are now operational. These projects contribute power to the BC Hydro grid, so the power does not directly contribute to regional energy independence, however, these projects do reduce the need for imported coal-based power from Alberta.

Construction

The construction industry has been a key player in the economy of the SLRD over the past 20 years. Construction has comprised 14% of all employment income, as compared to 8% in BC (based on 2005 data). Since 1998, construction levels in the region have fluctuated, but currently appear to be stagnant or in decline. From 2004, Whistler's construction values have decreased (with the exception of 2008 when the 2010 Olympic facilities were being constructed). In contrast, Squamish has seen rising construction levels, however, in the past two years these numbers have been in decline. Construction and real estate development have a strong link to energy prices and the economy as a whole.



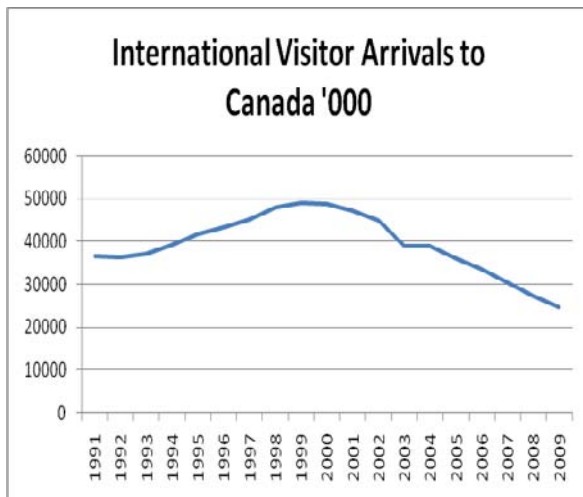
The construction sector is directly related to the real estate sector. Real estate sales volumes have been declining over the past few years, possibly due to the economic meltdown from 2008 to present. The real estate market is now somewhat flooded, particularly at the lower end of the market, with more units offered for sale than in past years and with fewer units sold, although 2010 seems to have seen some improvement over 2009.

Tourism

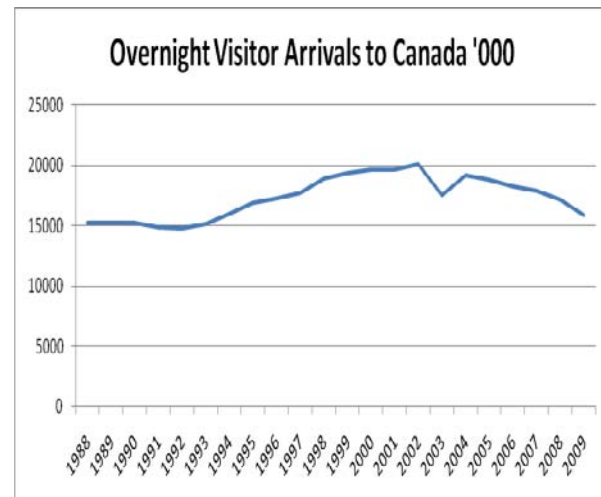
Tourism is an offshoot of the oil age. Before oil, people typically journeyed only a few hundred kilometres from where they lived over the course of a lifetime. Cheap and abundant energy has enabled people to make travel a regular part of their lives, and the tourism industry has developed as a result. Whistler grew out of the age of international tourism, with all of the associated infrastructure, employees and multiplier industries that go with tourism.

Tourism is the sector of greatest importance to the SLRD, particularly in Pemberton, Whistler and Squamish, providing a whopping 25% of employment income as compared to only 6% in BC as a whole. BC Stats notes that “heavy dependency on the primary sector increases the vulnerability of the region to swings in the economic cycle, resulting in economic hardship.” The SLRD is heavily dependent on tourism as a primary sector, and tourism is a very energy-intensive and economically vulnerable sector. It is likely the first sector to be impacted in the face of rising energy prices.

Interestingly, when total international and overnight visitors to Canada is viewed over time, there are “peaks” around the year 2000, with numbers dropping consistently thereafter. That said, on worldwide scale, travel and tourism employs more than 235 million people and generates approximately 9.2% of global GDP.¹



Source: World Travel and Tourism Council



Source: World Travel and Tourism Council

The tourism sector in the region is best analyzed by these key statistics: visitor numbers, room revenues, occupancy rates and room nights sold.

¹ World Travel and Tourism Council website. www.wttc.org

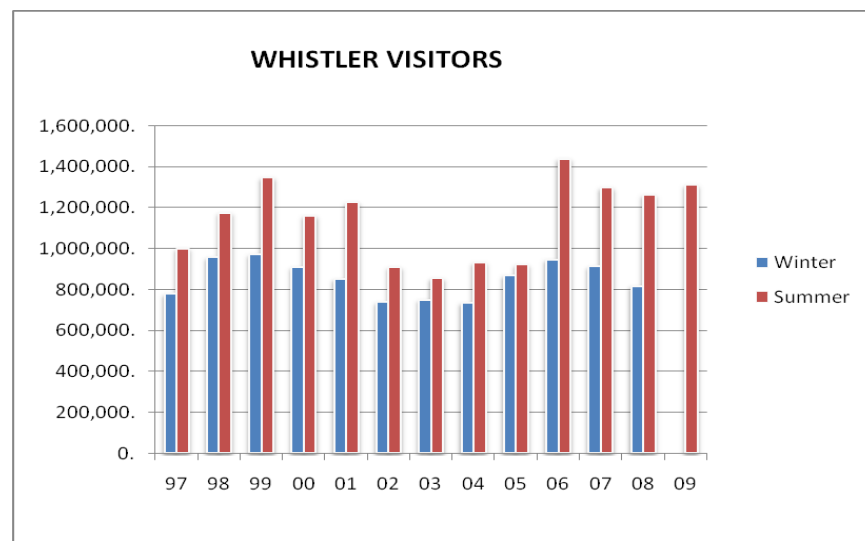


Visitor Numbers

In Whistler, summer visitation rose in 2009 after declining since 2006, however, summer visits remain high when viewed over a 10 year period. Visitation declined in winter 2008/09 and has been declining since 2006. Winter visits have been on a bumpy course since the late 1990's, ranging from an average of almost 970,000 in 1999 to 733,000 in 2004. The worldwide economic recession and credit crisis, which started in 2008, has likely played a major role in reduced tourist numbers (a recession that coincides with the price of oil hitting \$147 per barrel in July, 2008).

In Squamish, total summer visitors (as recorded by the visitor centre) have been bumpy for the past few years. Visitation in 2009 was down 23% from 2007. This “bumpy” trend can also be seen in Pemberton, where summer visitation in 2009 was lower than in 2002. In Lillooet, summer visitation in 2009 was at the lowest in 5 years. It may be that advances in technology (GPS and smart phones) are allowing people to get the information that they need without going to a visitor centre, but these trends should be noted nonetheless.

For all member municipalities, the largest visitor component is the BC market, followed by the European market. The dependency on the European market has weaknesses, especially given the potential for rising energy prices and the failing European economies.

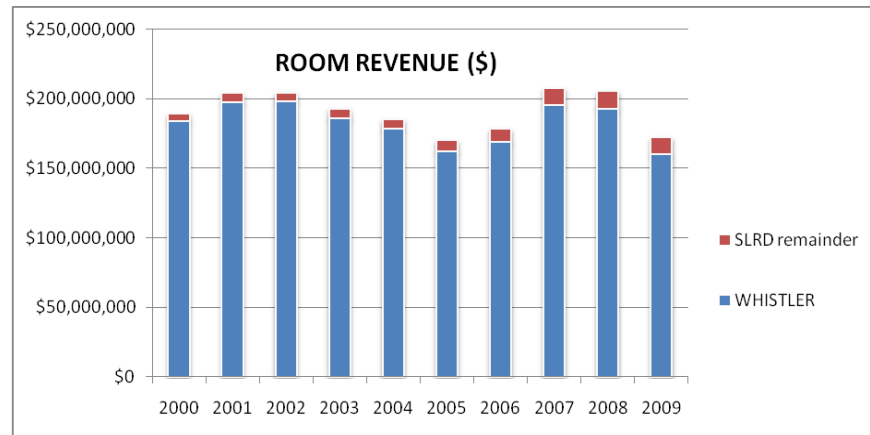


Source: Tourism Whistler

Tourism Whistler has recently (July, 2010) launched a new strategy to target foreign markets in their marketing campaigns. Given the influence of rising energy prices on international travel, there are likely to be impacts on tourist visits within the region as energy prices rise, especially since the foreign market comprises such a large component of tourist visits. International tourist visits offer more revenue per guest than regional visits, so the loss of international visitors over time will create a significant economic impact.

Room Revenue (entire SLRD)

Room revenue collected in the SLRD in 2009 was among the lowest in the past ten years. This is a significant indicator in that it reflects the direct amount of money being brought into the region’s hotel sector (not including the multiplier effect on restaurants, retail and tourist activities).



Occupancy Rate (Whistler only)

The three-year average hotel occupancy rate saw an increase (in Whistler), however, the year over year 2007/08 – 2008/09 winter occupancy rate saw a decrease.

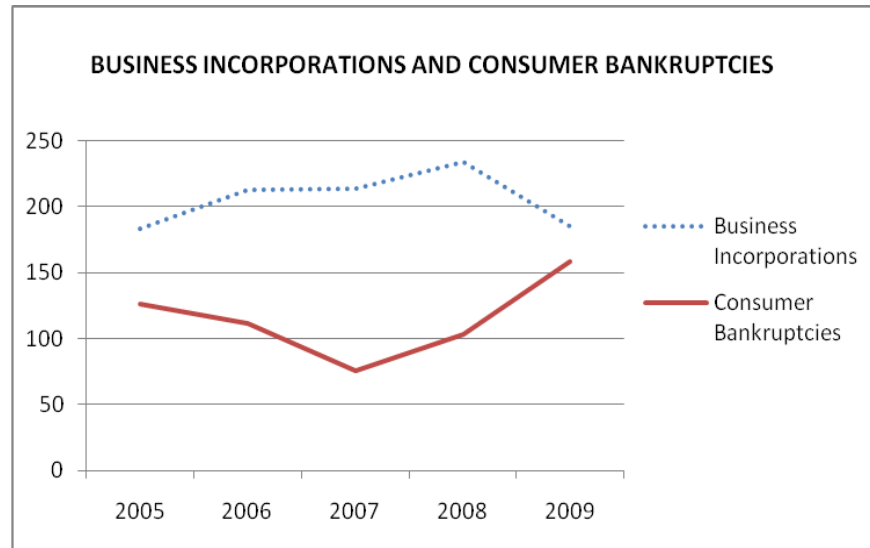
Room Nights Sold (Whistler only)

Summer - After two years of record numbers, the hotel room nights sold in the summer of 2008 decreased, although still among the top three years over the past ten years.

Winter - Between 2007/08 and 2008/09 the room nights sold decreased. Winter 2009/10 will be an anomaly given that the region co-hosted the 2010 Winter Olympics.

Business Incorporations and Consumer Bankruptcies

Another key indicator of the health of the SLRD’s economy is the number of business incorporations and consumer bankruptcies. Business incorporations saw a drop from 2008-2009 and consumer bankruptcies saw a significant increase since 2007. These changes are related to the world-wide economic recession and it will be important to follow these indicators over the next few years.



Maintaining a jobs-to-housing link

More and more, the southern SLRD is seeing a closer link to the Metro Vancouver area with respect to jobs. It is estimated that between 30-40% of Squamish workers commute to either Vancouver or Whistler for work.² This dependence on long-distance commuting to employment will place the region's residents at risk as energy prices rise. A focus on ensuring that there is a suitable jobs-to-housing ratio in place within SLRD member municipalities will help to ease the need for regional residents to travel outside of the region for employment. This ties closely to land use decision-making.

Recommendations

The Task Force's recommendations for the Economy and Tourism theme are:

- 1 Create economic strategies that ensure that there are sufficient local employment opportunities for the local work force, including:
 - a) maintaining employment lands close to where people live;
 - b) promoting live-work/home-based employment options;
 - c) encouraging mixed-use neighbourhoods; and
 - d) promoting green jobs.

² BC Stats



- 2 Lobby for changes that support the local B.C. economy, such as legalizing or decriminalizing marijuana and marijuana-related products.
- 3 Investigate food-related economic development opportunities (tourism, processing, etc.) and investigate designating the SLRD as a “Slow Food” region (see the Food section)
- 4 Explore and support opportunities for developing the forest sector: wood products, biomass energy, etc.
- 5 Work with member municipalities and Tourism Whistler to create a working group that is tasked with identifying the current oil/energy requirements for tourism in our region in order to develop a plan for a future when oil and energy is more limited. Identify the energy requirements of each market, compared to their net economic benefit and use this information to target the markets that provide the greatest economic benefit with the least oil inputs. (similar studies have been done in New Zealand).
- 6 Encourage tourism providers and marketers to think regionally by:
 - a) attracting a broader, more ethnically /culturally diverse market;
 - b) deepening the regional market (encourage more short-haul travel; less long-haul flights);
 - c) offering packages that entice visitors to stay longer in the entire corridor;
 - d) promoting the quality of life and health benefits (healing qualities) of being in a natural environment, especially the high alpine;
 - e) using eco-tourism as key to promoting area.
 - f) market the region as a “natural” place.
- 7 Support the diversification of the local economy and promote economic localization.
- 8 Support and improve the Community Forest model in order to increase local control of regional forestry.
- 9 Market and promote the SLRD as a “Clean Energy Powerhouse,” and support business opportunities for designing, manufacturing and installing energy systems. (see the Community Energy Systems section)
- 10 Support people-powered, low energy consuming mechanisms of recreating on crown land.
- 11 Ensure that Zoning bylaws allow for home-based businesses to help promote economic opportunities and ensure that all new development includes live/work-style units.



C.9 Reducing Consumption and Waste

Introduction



“ ...“The child from birth to death will generate 13 tons of waste paper, 10,355 tons of waste water, 2.5 tons of waste oil and solvents, 3 tons of waste metals and 3 tons of waste glass. From manufacturing processes, mining and agriculture used to support this individual, there will be 83 tons of hazardous waste, 419 tons from mining (not including coal mining), 197 tons from manufacturing in general, 1,418 tons of carbon dioxide, and 19 tons of carbon monoxide. Consumption of materials during a lifetime will include 1,870 barrels of oil, and 260 pounds of pesticides used to produce the food to sustain the individual.”(Walter Youngquist)... The volume of these waste materials (about 50,000 pounds per person each year) is shocking, and the invisible waste generated in a gaseous form is threatening life on earth.”¹

The following definitions are helpful to the discussion of waste:

Waste: To use, consume, spend, or expend thoughtlessly or carelessly. 2. To cause to lose energy, strength, or vigor; exhaust, tire, or enfeeble. ²

Waste disposal: the collection, transfer and landfilling of the remainder of garbage that is not recycled or composted.

¹ Murphy, Pat. Plan C: Community Survival Strategies for Peak Oil and Climate Change. New Society Publishers, 2008.

² Freeonlinedictionary.com



Recycling: the collection, processing and shipping to market of glass, paper, metal and plastic or wood waste.

Organic waste: Waste food and organic matter.

Upstream impacts: The demand for new materials and products, which results in greenhouse gas emissions and pollution.

Downstream impacts: The greenhouse gases created in the transport of waste to landfills and transfer stations and the methane produced from biodegradables in landfills.

According to Jim Merkel, in *Radical Simplicity*, “we have no choice but to radically reduce consumption, immediately stabilize population growth, and rapidly make better use of technology. If we make these changes now, the damage can be minimized. If we delay, crash will be inevitable...”³ Waste is the result of consumption, and consumption is growing more and more each year. Infinite growth and consumption on a finite planet is impossible.

*“The truth is that all of our major environmental concerns are either caused by, or contribute to, the ever-increasing consumption of goods and services.”*⁴

Why is this important?

*“The best way to reduce any environmental impact is not to recycle more, but to produce and dispose of less.”*⁵

It will be important to reduce waste and consumption in order to reduce the impacts to the planet. Organic or biodegradable waste produces methane as it breaks down within a landfill, however, it produces much less methane if it is properly composted. Methane is a powerful green house gas which contributes to climate change. The diversion of organic waste from the waste disposal stream is therefore important.

Recycling is considered one way that society can reduce energy and waste, however, recycling is often really “downcycling” resulting in a less robust material than the original product. The recycling process consumes less energy - and therefore produces less carbon - than the

³ Merkel, Jim. *Radical Simplicity*. New Society Publishers, 2004.

⁴ Lilienfeld, Robert and Rathje, William. *Use Less Stuff: Environmental Solutions for Who We Really Are*. Ballantine Books, 1998.

⁵ IBID



extraction and processing of new raw materials. Recycling paper, for instance, results in a 40-60% reduction in energy versus paper made with unrecycled pulp.⁶

“Recycling is an aspirin, alleviating a rather large collective hangover...overconsumption.”⁷

Reducing waste, in all of its forms, will help to create energy efficiencies. Every time waste can be prevented, there is energy saved. Waste is considered to be a design flaw.⁸ In other words, society does not currently produce “things” with their ultimate disposal in mind. If products, buildings and other items were designed with disposal in mind, they would be designed quite differently than they are today.

From a peak oil perspective, the fewer “things” that are made, the less energy that is embedded in the raw material processing and transport, product manufacture, packaging, shipping and ultimate disposal. At a local government level, it is at the disposal phase that the impact is most felt, as it is at this stage that the local government assumes responsibility for the transfer (normally by diesel truck) to a landfill, transfer station or other facility. It is likely that in times of energy price or supply volatility, that disposal services will be given priority with respect to access to liquid fuels.

Ironically, the onset of peak oil, may actually reduce the amount of waste, as there may be fewer products purchased, less packaging per unit, more repairs to existing products, and more re-use. However, it is important to remember that any waste reductions on an individual level are likely to be offset by population growth, which will see Canada’s population more than double by 2080.

SLRD Context

The SLRD’s waste disposal system is divided as follows:

Southern SLRD D’Arcy to Furry Creek – waste goes to the Squamish Landfill (operated by the District of Squamish).

Whistler waste goes to Rabanco Washington. Whistler composted approximately 1000 tonnes of food waste in 2009.

⁶ US Energy Information Administration.

⁷ Lilienfeld, Robert and Rathje, William. *Use Less Stuff: Environmental Solutions for Who We Really Are*. Ballantine Books, 1998.

⁸ McDonough, William and Michael Braungart. *Cradle to Cradle: Remaking the way we make things*. North Point Press, 2002.



Northern SLRD Region waste goes to the Lillooet Landfill (operated by the SLRD).

The SLRD operates waste transfer stations at: Gold Bridge, Devine, Pemberton and Furry Creek. Curbside collection is provided at Britannia Beach. The following charts show the most recent (2007) data for the SLRD:

Disposal Site	Tonnage sent to landfill in 2007
Gold Bridge Transfer Station	161
Pemberton Transfer Station	223
Devine Transfer Station	83
Britannia Beach Transfer Station	409
Furry Creek Transfer Station	140
Whistler Transfer Station	17,387
Lillooet Landfill	2,753
Squamish Landfill	16,818
Total	37,975

Member Municipality	Associated Landfill (if known)	Total Tonnage contributed in 2007
Village of Pemberton	Squamish Landfill	1,365
District of Lillooet	Lillooet Landfill	1,162
Resort Municipality of Whistler	Rebanco - USA	15,812
District of Squamish	Squamish Landfill	15,748

As noted, the biggest impacts of peak oil to the SLRD in terms of waste will be with respect to disposal. However, the SLRD can contribute to waste reduction through various purchasing policies, development planning, lobbying functions and education programs.

Recommendations

The task force's recommendations for the Reducing Consumption and Waste theme are:

- 1 Undertake a study to evaluate the potential for local product manufacturing utilizing supplies of locally-generated recycled materials and wood waste and identify a suitable site for receiving and processing these products.
- 2 Investigate becoming a Zero-Waste community through the SLRD Solid Waste Management Plan (via Recycling Council of BC)
- 3 As part of an SLRD procurement, corporate waste and energy reduction plan, include:
 - a) Create a model SLRD sustainable procurement policy (for corporate operations), aimed at zero waste;
 - b) Carbon neutral and waste-wise events;
 - c) Banning polystyrene foam disposable packaging and requiring the use of biodegradable or compostable packaging for all food vendors supplying the SLRD;
 - d) Banning bottled water in SLRD buildings and at SLRD events;
 - e) Including recycled content and low toxics in purchasing criteria.
- 4 Consider lobbying for a ban on plastic packaging in the commercial sector.
- 5 Compost all compostable materials generated within SLRD buildings.
- 6 Investigate a ban on petroleum powered garden equipment (lawn mowers, weed wackers and leaf blowers).
- 7 Require all new strata-developments to install bear-proof composters and recycling facilities.
- 8 Encourage household composting by providing community composters and/or subsidizing individual household composters (bear-proof) throughout the region (subject to budgets and bylaws). Provide composting workshops. Look to the North Shore Recycling program as a model.
- 9 Include clear, simple information on the SLRD website to educate the public on how to use the SLRD waste reduction systems that are in place and provide them with current targets and diversion targets. Include definitions of Zero-waste and links to the RCBC website and Recyclopedia.
- 10 Prepare a report on the state of waste management in the region. Specify each area's diversion rates (including "parked" or warehoused recyclables). Include a waste audit that shows the composition by product type (not material type) to identify areas for new programs and provide input into Extended Producer responsibility programs.



- 11 Investigate block or neighbourhood composting and recycling to limit that amount of compost material that needs to be transported.
- 12 Promote solutions to waste reduction for the car-free.
- 13 Support the efforts of the Whistler Community Services Society and other agencies in the corridor to build Re-Build-it/Re-Use-it centres and to market these services regionally through the SLRD Building Department and website.
- 14 Investigate decentralized pickup for donated recycled materials.
- 15 Consider banning plastic bags in the region or requiring biodegradable bags only.
- 16 Work with the business sector and UBCM to ensure that the Province of BC's Extended Producer Responsibility (EPR, i.e., full life-cycle on packaging) programs are understood and implemented.
- 17 Support toy libraries, tool libraries, clothing swaps, sharing sheds, tool sharing, etc.

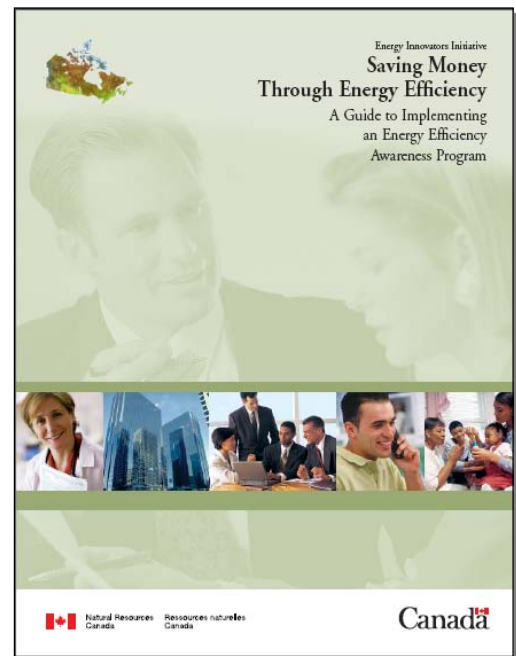
C.10 Outreach, Awareness, and Education

Introduction

Achieving energy resilience requires knowledge of energy security and impact issues, an understanding of actions, and gaining acceptance of the need for action.

Outreach, Awareness, and Education are the means by which SLRD residents, businesses, and other stakeholders become aware of the issues and actions and accept and implement these actions through education.

While “Change Management” is a label often used at the corporate level for this theme, “Community-Based Social Marketing” (CBSM) for sustainability is now an accepted best practice at the community level. Not to be confused with “social engineering,” which seeks to manipulate public opinion to achieve societal objectives, CBSM is about making sustainability issues understood, shared, and acted on by the entire community. An effective CBSM program positively affects both personal lifestyle decisions and in community support for business, organizational and government decisions that support commonly held sustainability values.



According to the organization Fostering Sustainable Behaviour, “Community-based social marketing draws heavily on research in social psychology which indicates that initiatives to promote behaviour change are often most effective when they are carried out at the community level and involve direct contact with people. The emergence of community-based social marketing over the last several years can be traced to a growing understanding that programs which rely heavily or exclusively on media advertising can be effective in creating public awareness and understanding of issues related to sustainability, but are limited in their ability to foster behaviour change.¹”

Why is this important?

While knowledge, understanding, and technical solutions are important and necessary building blocks, there may be little progress if these elements are not communicated effectively and convincingly to key community partners and the general public.

¹ <http://www.cbsm.com>

While local government is often identified as the level of government that is closest to most people, there are important potential economies of scale that can be realized when there is cooperation between local governments and regional partners to reach out and engage that population in a meaningful way that makes people embrace change.

SLRD Context

The SLRD itself forms an effective forum for an exchange of knowledge and cooperation within the region, both for staff and elected officials. The recent completion of the Regional Growth Strategy is a good example of regional partners working together to create a common vision for the future.

As we have seen in other chapters, the SLRD and its member municipalities have also been demonstrating community leadership on a wide range of projects, including Smart Growth neighbourhood planning, sustainability initiatives, green buildings, Greenhouse Gas reduction plans, new transit systems, green fleets, renewable energy systems and promoting alternative development standards for sustainability.

Several city governments have now adopted peak oil resolutions and have signed city-specific Oil Depletion Protocols (ODP). The original Oil Depletion Protocol was developed by Dr. Colin Campbell, a prominent petroleum geologist and founder of the Association for the Study of Peak Oil and Gas. While the ODP was developed for use at a national level, there are some local communities that have tailored the protocol to address local energy usage, by agreeing to reduce their energy use according to depletion rates. According to the Oil Depletion Protocol website:

“By agreeing to reduce oil imports and exports by a specified amount each year, about 2.6 percent, signatory nations will help mitigate the negative consequences of an over-reliance on cheap oil and help prepare for a global decline in the world’s oil supply. The premise of the Protocol is inherently straightforward: oil importing nations would agree to reduce their imports by an agreed-upon yearly percentage, referred to as the World Oil Depletion Rate, while oil producing nations would agree to reduce their rate of production by their National Depletion Rate. This simple and sensible formula will produce, in effect, a global rationing system. If the entire world adopted the Protocol, global consumption of oil would decline by almost 3 percent per annum, thus stabilizing prices, preserving the resource base, and reducing competition for remaining supplies.”²

By adopting municipal versions of the Oil Depletion Protocol and/or by adopting a Peak Oil resolution, the SLRD would be setting an example for individuals and businesses in the region, while also helping to effectively transition to a less energy intensive society.

² <http://www.oildepletionprotocol.org/about/history>

Regional businesses, community groups, and individuals have been active in promoting energy efficiency and alternative energy. This includes a wide range of initiatives, such as local food security, the greening of institutional buildings, efficient transportation of goods and people in the region using priority modes, waste management plans with widespread recycling, and using renewable energy for operations.

To be the most effective, the community needs to hear a consistent message from a number of regional partners with an interest in a sustainable energy future, including:

- Educational institutions, including the School Districts;
- Health, community, and social services organizations;
- Agricultural community;
- Business and labour organizations;
- Community associations;
- Professional associations;
- Non Governmental Organizations (NGOs); and
- Local, Regional, Provincial, and Federal governments

Recommendations

The Task Force's recommendations related to the Outreach, Awareness, and Education theme are:

- 1 Encourage an ongoing dialogue and information exchange between the SLRD and its member municipalities, in order to stress the benefits of energy security planning through public outreach channels and public information such as:
 - a) Partnering with non-profits and others to promote public education and establish community buy-in for sustainability;
 - b) Creating a regional inventory of inspirational regional success stories, eg. Whistler Athletes Village, etc.
 - c) Creating a regional contest (multi-media/film/essay) relating to energy resilience issues;
 - d) Using multi-media tools to distribute information through a wide variety of channels, including the SLRD website;
 - e) Creating an inspirational speaker series;
 - f) Providing print and online information;
 - g) Hosting public open houses; and

- h) Offering alternative events, e.g., kitchen table sessions, themed community events, film screenings, etc.
- 2 Encourage an SLRD corporate culture that supports existing and proposed sustainability policies through the development of hiring criteria and the creation of ongoing staff training with respect to sustainability and energy resilience.
- 3 Consider adopting a Peak Oil Resolution and signing a region-specific Oil Depletion Protocol, acknowledging peak oil and committing to reduce energy consumption in alignment with world energy depletion rates. Similar resolutions have been adopted in Portland, San Francisco and Oakland.
- 4 Create a dedicated energy/sustainability/resilience function within the SLRD to:
 - a) Work with local government and First Nations partners;
 - b) Secure funding and grants for education, outreach and other projects;
 - c) Manage community energy planning, sustainability and resilience initiatives and consult with local energy managers; and
 - d) Oversee the recommendations of the Energy Resilience Task Force and other sustainability initiative.
- 5 Support education courses through member municipalities that support energy resilience, which could apply to:
 - a) Adult Education;
 - b) Teacher training (e.g., through Professional Development days; and
 - c) Discretionary curriculum.
- 6 Establish a leadership role for the SLRD by promoting strong energy policies for internal operations.
- 7 Conduct education workshops on energy resilience for SLRD Mayors and Councils, Staff, and Community Thought Leaders in order to build corporate capacity and create alignment around a common vision of sustainability and energy resilience.
- 8 Hold a SLRD Energy Summit to share the results of the ERTF findings and explore partnerships and means to implement the recommendations.

D. Summary and Conclusions

The recommendations of the SLRD Energy Resilience Task Force are broad and extensive. The focus is on preparedness in the face of price volatility and supply disruptions, commitment to using less energy, creating new policies and procedures to address energy use, and looking at the existing conditions within which the SLRD and its member municipalities operate.

The ERTF requests that the SLRD Board support the recommendations contained in this report and that they allocate resources accordingly, in order to ensure that these recommendations are achieved in a timely fashion. The task force suggests that their recommendations be implemented as soon as possible, based on the preparation of a strategic implementation plan.

The recommendations can generally be categorized as:

- Improvements to local and regional government operations;
- Community capacity building and development;
- Information, education and outreach; and
- Lobbying for change.

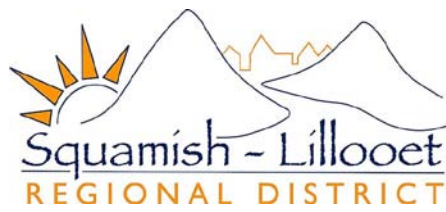
The following broad actions will be required to achieve resilience:

- Strengthen the social safety net;
- Prepare emergency energy and food plans in coordination with emergency, social and health care providers;
- Plan for and building renewable transportation policies and infrastructure;
- Preserve and secure farmland and support major increases in local food growing and processing;
- Reduce SLRD energy consumption through changes to corporate operations, staffing and purchasing;
- Implement the Regional Growth Strategy to create compact, complete and transit-friendly communities;
- Localize wherever possible in order to reduce the need for vehicular trips, including economic activities (including manufacturing and processing), infrastructure and services;
- Ensure that new buildings, development and infrastructure encourages energy efficiency;
- Prevent infrastructure investment that depends on cheap and available fuel;
- Lobby the Province of BC and the Agricultural Land Commission for appropriate policy changes.



The ERTF commends the Squamish-Lillooet Regional District for embarking on this planning process and supports the SLRD in carrying out the task force’s recommendations. In order to help the SLRD in carrying out the task force recommendations, the task force agrees that it will be available to carry on as a standing committee of the SLRD Board, on an as-needed basis.

Finally, the ERTF suggests that if the SLRD acts now, and acts quickly in implementing their recommendations, the SLRD will be in a positive position to deal with the implications of peak oil. The task force believes that its recommendations will ultimately have a positive impact on both the local economy of the SLRD, as well as providing for a more liveable, region that will prove more resilient in the future.

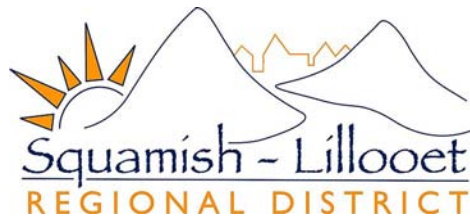


E. Appendices

Appendix 1 – Terms of Reference

Appendix 2 – Task Force Members

Appendix 3 – Brainstorming Results – “What should we have accomplished by...
2020, 2030, 2040?”



ERTF Terms of Reference

The Task Force's charge will be:

1. To review current and credible data and information with respect to peak oil and energy production and related societal implications;
2. To seek community and business input on the impacts to various sectors and to propose "actionable" solutions;
3. To develop recommendations to the SLRD Board on strategies that the SLRD can take to mitigate the impacts of declining energy supplies in areas including, but not limited to: transportation, tourism, business, energy and infrastructure, housing, food and agriculture, the environment, health care, social service, communications, land use, emergency planning and the delivery of SLRD services.
4. To propose methods of educating the public about this issue in order to create positive behavior change among businesses and residents in order to reduce dependence on fossil fuels.

Principles:

The following principles will be employed by the Task Force:

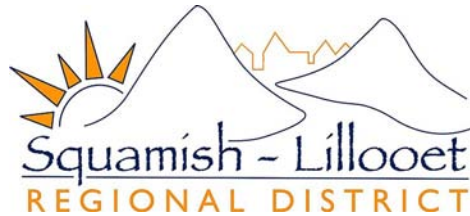
- Recommendations will be actionable by the SLRD
- Bold ideas will be pursued
- Efforts will be made to refer to the actions and findings of other task forces
- Impacts on the environment, equity and the economy will be taken into account
- An open and inclusive approach that does not foreclose on options will be utilized
- Ensure that recommendations have a positive impact and promote resilience

Membership:

Stakeholders (12-15) representing, but not limited to:

- Energy, infrastructure and utilities
- Business and economic development
- The agriculture /food community (including farming, sales and distribution)
- Local environmental groups
- Construction sector
- Transportation sector

APPENDIX 1



- Education sector
- Tourism sector
- Social and emergency services

SLRD Staff (2)

- Planning
- Public Works and Utilities

The SLRD will seek stakeholders within each sector, through targeted invitation based on sectoral and geographic representation, and will seek to have at least 1 stakeholder representative from SLRD Electoral Areas A, B, C and D.

Membership terms will last for the duration of the task force's standing or up to 2 years. A person's membership will cease if 3 consecutive meetings are missed.

Alternates may attend when necessary with voting privileges. Sub-committees and/or work groups will be struck and appointed as needed to address specific topics, issues or questions. Sub-committees will address land use and transportation, food and agriculture, public and social services and overall economic issues.

Chair:

The Committee will have one Chair (from the Planning Department).

Minutes:

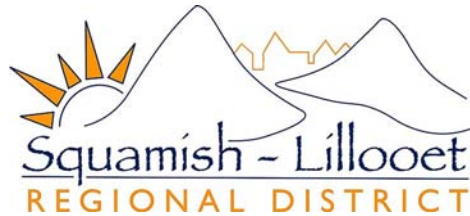
A facilitator will compile and circulate minutes to members within seven days of the meeting. Minutes will be included on the SLRD Board meeting agenda for information and any recommendations needing approval would be included in a separate report to the SLRD Board.

Reports to:

The SLRD Board of Directors

Frequency of Meetings:

Twice monthly for the first 4 months and at least once monthly thereafter, as needed. Meetings are to begin in late March, 2010.



Additional working group or sub-committee meetings or phone calls may be scheduled as required but it is likely that their work can be completed during regular meeting times.

Review of Terms of Reference:

To be reviewed annually or on an as-needed basis.

Proposed Timeline:

Proposed meeting dates are noted on Wednesday afternoons as follows:

- Meeting 1: March 31 (10 – 3 meeting)
- Meetings 2 and 3: April 14, 28
- Meetings 3 and 4: May 12, 26
- Meetings 5 and 6: June 9, 23
- Meeting 7: July 7

Future dates may be scheduled, as required.

Proposed regular meeting times are 4 pm to 6 pm with the inaugural meeting being held between 10 am and 3 pm.

Meeting 1: Inaugural meeting, introductions, review of terms of reference, rules of conduct, presentation by energy expert, global context, video.

Meeting 2: Review of meeting minutes, video, review of overall energy issues, discussion and review of other task force reports, review of next steps and need for further information.

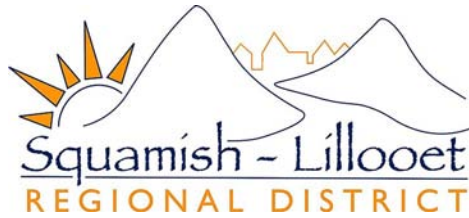
Meeting 3: Review of meeting minutes, short video, brainstorming of issues, group review and discussion of other task force report findings, information sharing, sub-committee break-out sessions and planning.

Meeting 4: Review of meeting minutes, sub-committee updates, group discussion, need for further information, visualization exercise, sub-committee break-out sessions and planning.

Meeting 5: Review of meeting minutes, sub-committee updates, group discussion, need for further information, sub-committee break-out sessions and planning, discussion of next steps and need for further information.

Meeting 6: Review of meeting minutes, sub-committee updates, group discussion, any last ideas or information, submission of findings to the consultant for preparation of the first draft

APPENDIX 1



of the task force report. Review of meeting minutes, submission of sub-committee findings to the SLRD and facilitator for preparation of the first draft of the task force report.

Meeting 7: Discussion of the first draft of the task force report.

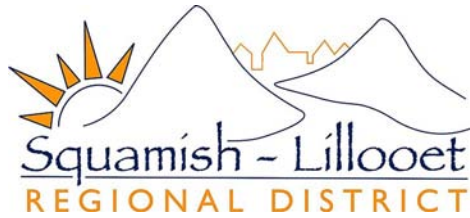
Implementation and Monitoring

Following completion of the project, planning staff and the SLRD will incorporate action items on their annual work plan.

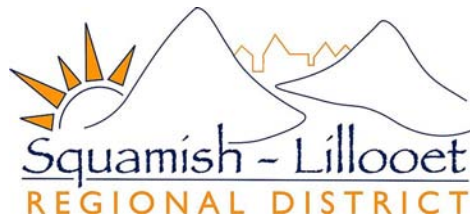
Why an Energy Task Force?

<i>Problem Defined (related Issues and key question)</i>	<i>Desired Outcomes (key result if problem is addressed)</i>
Need to address climate change	Reduced greenhouse gas emissions
Global liquid fuels are facing peak production and will not keep up with demand within the next 5 years.	Strategies in place to address liquid fuel reductions
Regional transportation of people, goods and food will be affected by the growing imbalance between supply and demand for liquid fuels	Strategies for: Food security Energy independence Transportation based on efficient and renewable energy sources Building and community design that focuses on energy efficiency and renewable energy sources
Liquid Fuel for heating and electricity will be affected by liquid fuel scarcity	Local energy strategies that allow for independence from the electricity grid

APPENDIX 1



Business instability caused by economic contraction and dependence on fossil fuels	A sustainable and successful business sector
Rising costs, unstable economic circumstances and limited fuel supplies cause social instability	Vulnerable and marginalized populations have a safety net.



PEAK OIL – AN OVERVIEW

Peak oil theory was developed by M.King Hubbert, Chief General Geology consultant to Shell Oil. In 1956, he accurately determined that U.S. domestic oil production would peak between 1965 and 1970. Hubbert’s predictions were accurate, as U.S. oil production peaked in 1970. After that time, the U.S. became ever more dependent on imported oil. As a result, the U.S. became vulnerable to socio-political upheavals, and was subject to an oil embargo in 1973, characterized by fuel shortages, and skyrocketing oil prices.

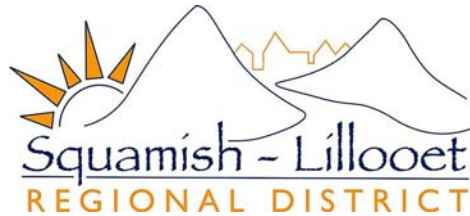
The theory that world oil production will reach a peak is the basis for peak oil theory. After the peak, the world will experience a decline in oil supply. World oil supply is finite, therefore decline is unavoidable. Peak oil is said to have occurred when about half or slightly more of the ultimately recoverable oil has been produced. Peak oil does not mean that no more oil exists, but that global production can no longer be maintained or increased. Declining oil production creates an inability for production supply to meet demand and therefore prices increase. This situation is compounded by increasing demand created by a growing world population base.

The theory of peak oil generally applies to peak natural gas (which has a similar production curve), although in the case of natural gas, the peaking time is thought to be later than that of oil. These fuels can in many cases be substituted for each other, and together, they account for close to 70% of the primary energy used in the world. In Canada, natural gas production is close to its peak, while in the U.S. gas production appears to have already peaked, creating a dependency on imported natural gas that must be liquefied for transport and then re-gasified for distribution.

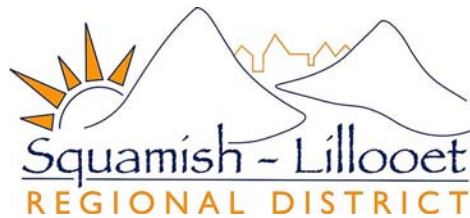
Some facts about Peak Oil

Predictions about the exact timing of oil and gas peaking vary, however, most researchers predict peaking to occur most certainly before 2020. The date of peak production is important, however, it is more important to begin to plan for the consequence of peak production rather to argue if or when it will occur, because it surely will occur sooner than later, and the implications deserve serious consideration.

There are a number of facts that support the imminent peak in world oil production. These include:



1. There can be no oil production without discovery. Production follows discovery by between 25 to 40 years.
2. World oil discoveries peaked in 1964 and have been in decline ever since.
3. In the mid-1980's, discoveries fell below production and have continued to fall. The world is now drawing down its reserves. For every barrel of oil found, the world produces and uses 4 to 6 barrels.
4. Hubbert's original model has been updated to show world peaking occurring this decade. Hubbert himself predicted a world peak in production in 2010.
5. There are no more "elephant" or super-giant oil fields left. New discoveries are smaller, more remote, more challenging, deeper and more costly to develop. The easy oil has already been discovered.
6. The world's geology has been extensively mapped and searched using extensive knowledge and technology. Many holes have been drilled. There will be few surprise finds in the future.
7. "Unconventional" oil, including tar sands are very expensive to develop, require massive amounts of natural gas to harvest, and have environmental implications that are unthinkable in terms of climate change, water pollution and ecosystems.
8. OPEC reserve estimates are unreliable because they are the basis for production quotas and there has been a tendency for OPEC member countries to provide inflated estimates, followed by deflated estimates.
9. More and more oil exporting nations are becoming oil importing nations as their production goes into decline.
10. Approximately 2/3 of oil producing nations are in decline, including the U.S., Mexico, the U.K., Norway, Indonesia, etc.
11. At least 2 of the 5 "elephant" fields in the world have peaked and are in decline. This includes Burgan in Kuwait and Cantarell in Mexico, which is in steep decline. There is some evidence that the Saudi Arabian fields are at or near peak.



Recommended Reference Books on Energy, Peak Oil and Resilience for Task Force members:

Deffeyes, Kenneth, S., 2004. *Beyond Oil: The View from Hubbert's Peak*. Hill and Wang, New York.

Heinberg, Richard, 2005. *The Party's Over: Oil, War and the Fate of Industrial Societies*. New Society Publishers, Canada.

Hirsch, Robert, 2005. *Peaking of World Oil Production: Impacts, Mitigation, and Risk Management*. Prepared for the U.S. Department of Energy. **(NOTE: A summary of this report will be provided to the Task Force members prior to the first meeting).**

Hopkins, Rob, 2008. *The Transition Handbook: From Oil Dependency to Local Resilience*. Green Books Ltd, Totnes, UK. **(NOTE: This book will be provided to Task Force members prior to the first meeting).**

Murphy, Pat, 2008. *Plan C: Community Survival Strategies for Peak Oil and Climate Change*. New Society Publishers, Canada.

Rubin, Jeff, 2009. *Why Your World is About to Get a Whole Lot Smaller: Oil and the End of Globalization*. Random House Canada. **(NOTE: this book nicely summarizes many issues).**

Peak Oil Task Force Reports:

Descending the Oil Peak: Navigating the Transition from Oil and Natural Gas: Report of the City of Portland Peak Oil Task Force. March, 2007.

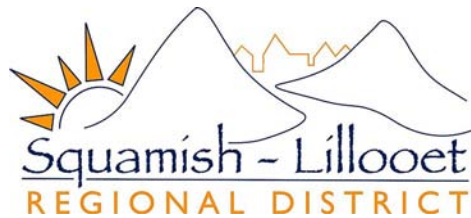
Twin Cities Peak Oil Resource Guide: Information and Ideas for Community Sustainability. The Twin Cities Peak Oil Working Group. June, 2007.

Oil Independent Oakland Action Plan. City of Oakland. February, 2008.

Berkeley Energy Descent 2009-2020: Transitioning to the Post Carbon Era Final Report. April, 2009. Berkeley Oil Independence Task Force.

Kinsale 2021: An Energy Descent Action Plan – Version 1.2005. By students of Kinsale Further Education College, Ireland.

APPENDIX 1



Some additional website resources on Peak Oil

www.energybulletin.net

www.theoil drum.com

www.peakoil.net

www.postcarbon.org

www.communitysolution.org

www.wolfatthedoor.org.uk

www.futurescenarios.org

Task Force Bios

CHAIR

Kimberly Needham

Kimberly Needham is an urban planner and designer who has worked on a wide variety of land development and policy projects throughout British Columbia. She has been actively involved with issues related to community sustainability, climate change, peak oil and energy planning. Kim has trained with the Transition Network, The Pachamama Alliance and The Natural Step. She was appointed to the Canadian Institute of Planners' Climate Change Policy working group and was selected by The Climate Project (a non-profit run by Al Gore) to be a climate change presenter. She is a member of the Vancouver Peak Oil Executive and sits on the Whistler 2020 Energy Task Force. Kim is passionate about building community resilience with respect to climate change and peak oil, and she speaks regularly on these issues. She is currently on contract with the SLRD.

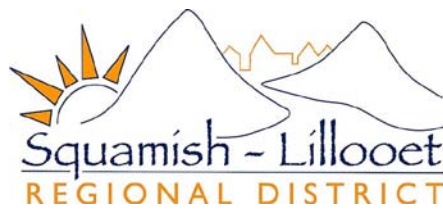
MEMBERS

Amica Antonelli

Amica Antonelli lives in Pemberton, B.C., where she enjoys small town life and the surrounding wilderness. She has a Bachelor of Science in Agroecology and a Masters degree in Environmental Design. Amica is passionate about working for positive change in the environment. She has been employed in the fields of resource management and community planning for approximately ten years, and has volunteered on projects locally and abroad. She is also a writer, focusing on fiction and environmental journalism. Her first novel was completed in 2009. Skiing, climbing, and travel take up much of the rest of her time.

Eric Andersen

Eric Andersen is a native of Squamish, and has returned to the community after many years working for small scale forestry organizations and programs in B.C., Canada and internationally; and also in coastwise (shortsea) shipping. Eric currently works as a research and communications consultant, primarily within in the wood products industry, with focus on wood building technology transfer, European exchange, and wood biomass energy. He is currently a director of the Sea-to-Sky Forestry Centre Society seeking to build a local museum and exhibit facility in Squamish, and is coordinator of the Squamish Climate Action Network's Energy & Green Building Group.

**Jeff Browne**

Jeff Browne is a facility management professional with 25 years of experience working in municipal, public school K-12, colleges, social housing and health care sectors. The previous 10 years working in the college and public school sector and is currently the Assistant Director of Facilities and services at School District No. 48 (Sea to Sky). His focus is to effectively encompass disciplines to ensure functionality of built environment by integrating people, place, processes and technology.

Energy related work includes administration of energy management operations, programs and energy efficient facility upgrades to lighting and mechanical heating systems.

Sustainability related work includes administration and reporting of carbon emissions, sustainability initiatives and active role in policy and procedure development and sustainability plan implementation. He holds two facility management designations, Real Property Administrator – Building Owners Management Institute and Systems Maintenance Administrator – Southern Alberta Institute of Technology.

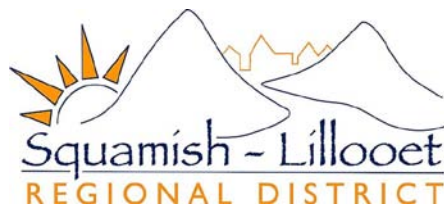
Wayne Cankovic

Wayne has been in the gas industry for over 25 years as a contract gas fitter and most recently with the natural gas utility, Terasen Gas. During his 20 years with Terasen, Wayne started in the field as a technician, and most recently as Operations Manager for Squamish and Whistler. He was the Project Manager for 2009 Whistler Conversion Project, which entailed converting over 14,000 gas appliances in 2,500 buildings from piped propane to natural gas. Wayne has recently taken on a new position as Energy Solutions Manager for Terasen. In this role he will work with key accounts and builder/developers in the North Shore & Howe Sound areas, facilitating the installation of gas infrastructure and promoting Terasen's involvement in developing and operating alternative energy systems, such as geothermal, solar, biogas and district energy systems.

Wayne has a BA from Simon Fraser University in geography and economics, as well as a Class A gas fitters ticket. Wayne and his family have resided in Whistler for the past 20 years where they plan to finish raising their children.

Nolan Cox

Nolan Cox is the Principal of Pemberton Secondary School.

**Jack Crompton**

Jack Crompton is the General Manager at Transportation Whistler where he oversees transportation planning and implementation. He has been creating innovative transportation solutions for tour groups, travel agents and conferences in Whistler since 2002. In 2008 he launched Transportation Whistler's online ground transportation booking portal at www.ridebooker.com which now offers service across Canada. In 2003 Jack founded Whistler Resort Cabs which he operated until its sale in 2008. Jack and his wife Carolyn live in Whistler with their 4 children.

Arthur DeJong

Arthur DeJong has been with Whistler Blackcomb for 30 years through various roles including Ski Patrol Manager and Mountain Operations Manager.

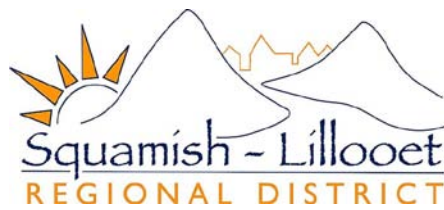
Arthur pioneered work in the area of environmental planning on Whistler Blackcomb which has led him to his current position of Mountain Planning and Environmental Resource Manager. In this role, Arthur works to marry planning techniques that both improve the guest experience and respect the natural environment. Whistler Blackcomb has been recognized as one of the greenest employers in Canada by the Globe and Mail for 2009 and 2010. He consults to governments and tourism operators globally on how to integrate business and environmental strategy. Arthur also dedicates volunteer time to crisis line counselling and international aid programs.

Peter DeJong

Peter DeJong is employed as a Manager of Transportation with the SLRD. An avid skier, Peter has witnessed first hand the changes in the Sea to Sky Corridor over the past 40 years. After practising law in the Vancouver area for 10 years, he started up and ran a successful tourist accommodation company in Whistler before turning his attention to local government administration. As the Transportation and Risk Manager for the Squamish-Lillooet Regional District, Peter has particular interest in the long range security and efficiency of the sustainable movement of people and goods throughout the SLRD.

Naomi Devine

Naomi is a climate change and sustainability policy advisor who is responsible for overseeing the Whistler2020 community process and working on Whistler's Official Community Plan review. Naomi joined the centre after working as the Sustainability Coordinator for the Resort Municipality of Whistler (RMOW) where she worked on the creation of the Carbon Neutral Operations Plan, and created the Climate Action Innovation Fund, which directs carbon tax money into commercial and municipal emissions reductions



projects. Prior to this, Naomi worked in the University of Victoria's office of Campus Planning and Sustainability, creating the university's first sustainability policy and action plan.

In November 2007, Naomi was appointed to British Columbia's Climate Action Team, which offers the Government's Cabinet Committee on Climate Action policy advice on measures to achieve its legislated greenhouse gas reductions of 33% below 2007 levels by 2020, as well as setting interim targets for 2012 and 2016. She is a co-founder of Common Energy at the University of Victoria, an organization that works to move organizations 'beyond climate-neutral' and is a co-author of the report: Building on Progress: A Plan to move the University of Victoria Beyond Climate-Neutral. Naomi has also served as Vice-Chair of the City of Victoria's Environment and Shoreline Advisory Committee and is currently a Director with the BC Sustainable Energy Association.

Dave Evans

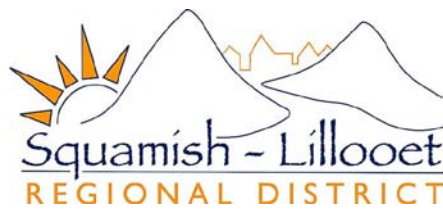
Dave Evans has been employed by Sysco Vancouver for 20 years. His position with the company is Operations Manager where I have held this title for 3 years. He is responsible for overseeing all of the inbound and outbound cases through the warehouse. He is also involved in transportation to a degree where on occasion he has filled in for the Director of Transportation. Sysco Vancouver currently employs 225 people in the operations department and employ over 400 as a whole company. Dave currently resides in Abbotsford with his wife and two daughters.

Doug Hackett

Doug Hackett started as Information Systems Manager at Squamish Terminals Ltd. in 1996 and is now a member of the Board of Directors and Vice President, Information Services. He is responsible for the operation and development of all data applications at the terminals including Squamish Terminals' award winning Tracking System. As Vice President, he is also responsible for office administration, human resources, quality management systems and marine facility security.

Prior to joining Squamish Terminals, Doug worked as Network Manager at Blackcomb Mountain and prior to that, as Project Leader with the System Development Group at the Vancouver Stock Exchange.

He is an elected member of BC Wharf Operations Association and serves on the Executive Board, has been an elected School Trustee in the Howe Sound School District, serving his last term as Board Chair. Doug also served as a volunteer with the Callaghan Organizing Committee (CALOC) and served as a field of play official (biathlon) during the 2010 Olympic Games. Doug has lived with his family in Squamish since 1990.

**Lucy Jones**

Lucy Jones is a Range Agrologist with the BC Ministry of Forests and Range – Range Branch. She is a Lillooet farmer and also operates the Lillooet Sheep Pasture Golf Course with her sister, Kathy Gillis and mate, Jeremy Manning. She spends the bulk of her spare time labouring on the golf course just outside of Lillooet. The rest of her spare time is spent harvesting forage for livestock. Lucy loves the land and her community and she feels most fortunate to live where she does.

Roxy Kuurne

Roxy Kuurne is a former soil scientist, chair of the Pemberton Farmers Institute and a member of the Squamish Lillooet Regional District's Agricultural Advisory Committee. She has been growing seed potatoes in the Pemberton Valley with her husband since 1985 and is a partner in Pemberton Natural Beef.

Jesse Lee

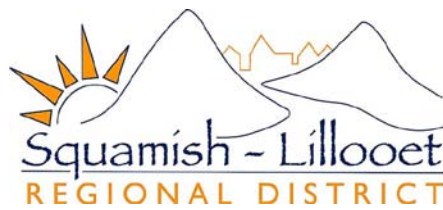
Jesse Lee was the Environmental Technician in the Utilities Department at the Squamish-Lillooet Regional District with experience in solid waste management. He is now employed by the Regional District of Comox.

Allison Macdonald

Allison Macdonald is the Open Spaces Coordinator for the Squamish-Lillooet Regional District. In this position, she is responsible for development of trails and parks within the Regional District. Allison is an avid mountain biker and skier, and can imagine no better place to raise her two children than the Pemberton valley.

Jeannette Nadon

Jeannette Nadon is a self-employed small business consultant with over 15 years of experience in Whistler's tourism industry. She offers her clients a range of services including strategic planning, systems development, marketing strategy and project management, communications and event planning. Originally from Edmonton, Alberta, Ms. Nadon obtained a Bachelor of Commerce degree from the University of Alberta and spent 3 years working in the banking industry before moving to Whistler in 1994. She was drawn here by a love of the mountains and a desire to live a healthy, active and balanced lifestyle. She is a member of the Whistler 2020 Food Task Force, a dedicated cyclist, aspiring vegetable



gardener, amateur Permaculturist and a passionate advocate for strengthening community and regional resilience.

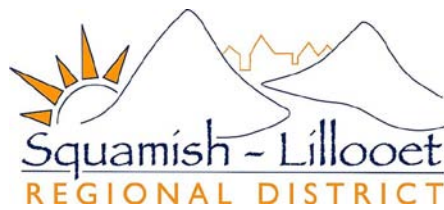
Katie Pease

Katie works with the process of organizational change, combining the concepts of systems thinking, collaboration, and strategic planning. Her background is in sustainability, with education and experience in land use planning and community engagement. She holds a Masters degree in Strategic Sustainable Development with training in The Natural Step framework, which she applies in her work with organizations and communities.

She started her professional career at Quincy Natural Foods, a community based cooperative where she was trained in management and group decision-making processes, eventually acting as a member of the Board of Directors, steering the organization toward more sustainable practices. She has worked with organic farming businesses across California, the Resort Municipality of Whistler and more recently a diverse collection of stakeholders in Squamish, to help create local community food systems. She also currently teaches at UBC on Sustainability Leadership. Incorporating a broad range of themes in the sustainability field she is a principal of Synapse, providing companies, communities and individuals with the tools to work toward a more sustainable society.

Sue Senger

Sue Senger, PhD, RPBio, PAg, principal of Windwalker Consulting Services, has worked as an ecologist in Lillooet since 1995. She currently focuses primarily on grizzly bears (*Ursus arctos*) in south west BC, and her work involves project management, extension, First Nations liaison, and both field and professional services including habitat assessments, spatial analysis, human-bear conflict reduction strategies, and best management practices for developments. Her broader experience includes Woodlot extension services, and extensive involvement in the Lillooet Land and Resources Management Planning process as a working group leader and local government liaison. Sue is a qualified entomologist whose Masters focused on bark beetle (*Ips pini*) pest management, and PhD on the landscape ecology and dispersal behavior of Western cherry fruit fly (*Rhagoletis indifferens*). She was a certified organic seed producer for more than 5 years, and continues to be involved in seed saving and local food security issues. In addition to consulting, Sue currently teaches adult education and environmental science courses in Lillooet through Nicola Valley Institute of Technology and Lillooet Tribal Council education programs.

**Victoria Smith**

Victoria Smith is the Manager of the Aboriginal & Sustainable Communities sector in Customer Care at BC Hydro. Her group is focused on delivering value for communities around the province through community energy planning, conservation programs and energy innovation projects. Prior to taking on this role, Victoria worked with the Whistler Sustainability team on Whistler2020 as part of her Masters thesis research and through the International Centre for Sustainable Cities spent 6 months in Dar es Salaam, Tanzania working for the Mayor to help to build capacity in urban sustainability planning with local government. Most recently, Victoria has participated on the Translink Sustainability Advisory Committee, presented at the House of Commons Standing Committee on Natural Resources on integrated urban energy systems, taught at the UBC Summer Sustainability Institute and currently chairs QUEST BC.

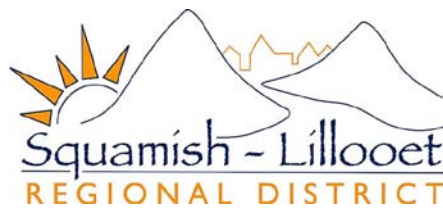
Victoria has contributed to a number of organizations and boards including; UNICEF BC, SafeTeen, the Youth Millennium Project and the Mt. Pleasant Neighbourhood House community board. Victoria has over 15 years of public and private sector experience in the field of energy conservation and holds a Master's of Environmental Education and Communication degree from Royal Roads University.

Lois Wynne

Lois Wynne has been the Executive Director of SSCSS since 1986. A graduate from UBC, Lois's entire working career has been in community social services, working first for 6 years for the then Ministry of Social Services in direct service delivery in the areas of child protection and child day care to community development and administration. Lois believes in the development of social responsibility and helping communities become self reliant. She has participated in the growth of SSCSS over the years and believes strongly in the services and individuals who provide them and the quality and value they bring. She has been very active in various community committees up and down the corridor, with a particular interest in social health and wellbeing of individuals and families. Lois is married with three children and enjoys camping, gardening, being with her family and friends and Canucks hockey!

FACILITATORS**Mark Allison**

Mark Allison, MCIP, is a community and regional planner who is responsible for overseeing the Whistler Centre for Sustainability's professional services for communities and tourism organizations seeking to advance sustainability. Before joining the Whistler Centre for

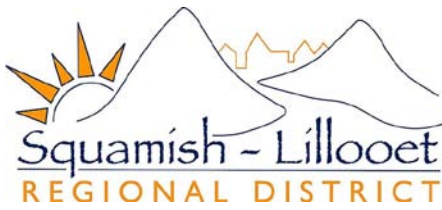


Sustainability, Mark was the Senior Policy Planner for the City of Surrey, leading major planning processes for the City's award-winning Sustainability Charter, the City Centre Plan Update, the Official Community Plan Update and a variety of energy studies. Mark has also worked as the Transportation Planner for the City of New Westminster, the Regional Growth Strategy Coordinator for the Fraser Valley Regional District, and as a sustainability planning consultant, after finishing his masters degree in community and regional planning at UBC. His thesis research focused on the relationships between land use, housing and transportation for growth management in Metro Vancouver. Long an advocate of sustainable development, smart growth, and transit oriented development, Mark is an active board member with the Community Energy Association and served 6 years as a board member and Vice President of Smart Growth BC.

Prior to his planning career, Mark completed a masters degree in Experimental Physics at the University of Waterloo and worked for a number of years as a research scientist and senior systems engineer in Canada and abroad on the design of advanced control systems and a variety of alternative energy projects, including solar cells, electrical power generation and plasma fusion experiments. Mark is an accomplished outdoor enthusiast and traveller, backpacking for a month each year to explore the history, culture, geography, architecture, and community life in other countries.

Lisa Griffith

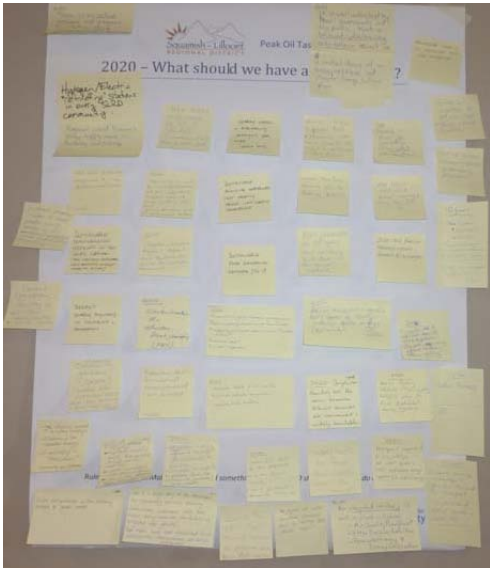
Lisa Griffith, MCIP, is a graduate of UBC's School of Community and Regional Planning and a former community planner for the Squamish-Lillooet Regional District. Lisa is the principal of New Leaf Consulting and has a keen interest in facilitating and promoting community health and well-being. She is passionate about stakeholder engagement around issues such as food security, smart development and growth management. She is a volunteer board member of Stewardship Pemberton, and the Pemberton Children's Centre and co-chair of the Pemberton Creek Community Garden. Lisa enjoys hiking, biking, surfing, snowboarding, cross-country skiing, preparing healthy meals and exploring with her three year old son.



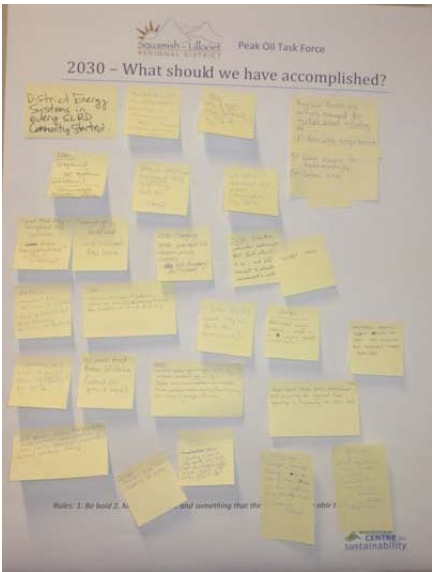
Results of Initial Meeting Brainstorming

What should we have accomplished by...

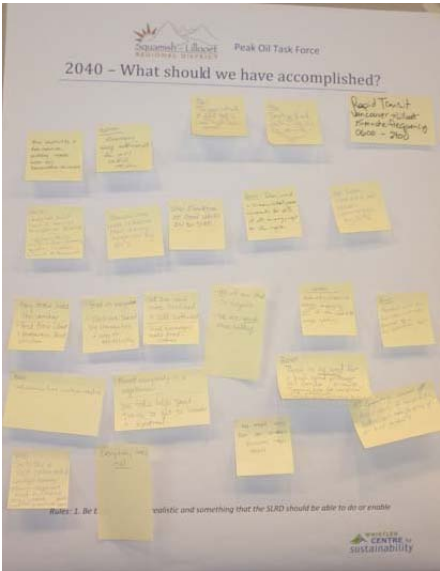
2020?

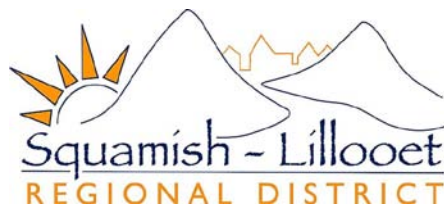


2030?



2040?

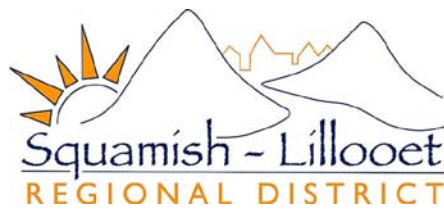




2020 – What should we have accomplished?

TRANSPORTATION

- Sustainable transportation network in the SLRD corridor (you can get anywhere conveniently without needing a car)
- Gas stations converted to battery exchange
- Public transportation is the primary people and goods mover
- Free bikes available in all 4 SLRD municipalities for public use
- Regular, reliable, frequent transit from Pemberton / Mount Currie to Whistler & Squamish
- Electrification of vehicles; fleets changing (PEV)
- Regularly scheduled public transportation through-out the corridor
- Active & successful ride-share program Bio-fuel vehicle engines
- Usable bus system
- Vehicles will have a greater fuel efficiency – we have come far but need to go further, way further
- Transportation is reduced due to food and supplies being produced locally (dairy, fruit, vegetables, meats)
- Single, hybrid cars are the norm because transit services are convenient and widely available
- Regular use of alternative means of transportation, i.e., car pools, energy efficient vehicles, bikes, walking
- Local funding initiatives (highway, parking tolls) in place to fund “distributed energy systems”
- Development requirements to only utilize hot water systems and/or distributed energy systems (i.e., district energy)
- Agreed and accepted transitional alternative fuel for Whistler fleet vehicles (electric?)
- Bike transit system



- Better bus transport system STS & Lillooet
- Hydrogen Electric ‘refuelling’ stations in every SLRD community (*note: hydrogen is **not** supported as a Task Force recommendation, based on it being an energy intensive carrier of energy, with an expensive infrastructure and challenging storage issues*).

ENERGY SYSTEMS & ALTERNATIVE ENERGY

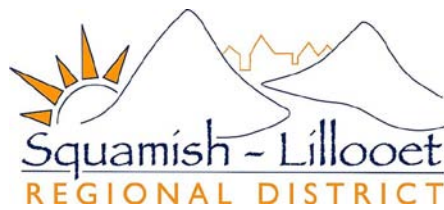
- Regional wood biomass energy supply chain is functioning and evolving
- Energy needs & availability analysis for SLRD completed
- District energy systems in Squamish and Pemberton Preferred energy is accessible and cost effective
- We have doubled micro-hydro generation in low conflict public acceptance
- Solar heating

BUILDING INFRASTRUCTURE

- Affordable, energy-efficient housing for individuals & families
- Sustainable building guidelines that heavily favour low carbon development
- All new construction required to use geothermal heat
- All new housing has renewable energy
- All new housing is “Passivhaus”
- Solar hot water for all new buildings

FOOD SECURITY/ AGRICULTURE

- Organic community gardens galore! Across the region residents are growing a lot of their own food
- Central composting facility in all four municipalities to build local soils
- Community greenhouses exist
- Agriculture will be re-established as an important & viable use of land within the ALR

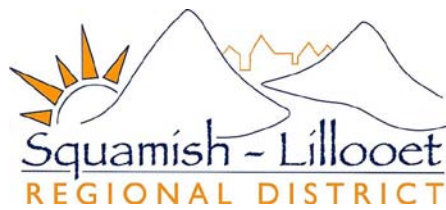


- Young farmers will be encouraged to farm
- Protection for farmland strengthened, not eroded
- Increase in capacity to produce food via community gardens /greenhouses
- Food is a major part of the discussion for community resilience planning
- Communities understand their food needs today (and into the future with projected population growth)
- Food nodes have been established in all communities (demonstration, education, and distribution)
- Sea-to-Sky designated as a “Slow Food” region & transition town
- Sustainable food purchasing network / co-op
- Permanent protection of farmland
- Mapping out best soils in lower mainland and sea to Sky
- Population of farmers is increasing
- More/all food for the district will be grown locally
- More food produced in Squamish & Lillooet
- Hybrid tractors
- Roof-top gardens, community gardens, garden-sharing programs
- Home gardens – increased knowledge & interest in food processing
- We have reduced meat consumption by 30%

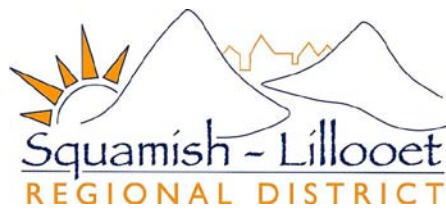
PUBLIC POLICY/COMMUNITY LIFE

- Outreach programs in place to assist people to come to terms with the emotional and psychological issues arising from transition
- Youth involved in building solutions
- Discussing population freeze in smaller communities

APPENDIX 3



- Recycling 80% of all waste
- Public has been educated that there is a serious problem and things must change
- It is well understood by local governments and the public that a balanced jobs/housing ratio must be a central focus of an Energy Resilience and Climate Change Action Plan
- The Regional Growth Strategy (RGS) celebrates its 10th anniversary and is due for a major update
- Wars will be fought over water (water is the next oil)
- Enhanced meeting technology to decrease the need for transport; exploration of virtual worlds to enable this
- An integrated system is well in place – linking: Air Quality Management, GHG emission reduction & Renewable energy & energy consumption



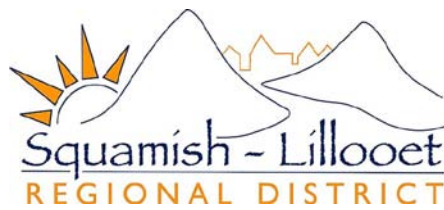
2030 – What should we have accomplished?

TRANSPORTATION

- Regular bus service to Lillooet
- Single occupancy vehicles seen as socially unacceptable (e.g. smoking or drunk driving)
- Plug in stations represent 50% of public parking spaces
- Charging areas available for electric vehicle owners
- Further reduce transportation in the corridor, using electric train, cars, planning communities around walking, biking
- High occupancy rail system
- Electric vehicles outnumber fossil fuel vehicles 4 to 1 and all transit is electric, convenient and well-used
- Sea to Sky bike trail needs major repair due to over-use! Rail/Skytrain-type system in place for Pemberton to Whistler to Squamish to Vancouver every ½ hour

ENERGY SYSTEMS & ALTERNATIVE ENERGY

- Geothermal will be affordable & available on a community basis – system created, workable & installed
- 10% of the region's energy is produced by wind
- District Energy Systems in every SLRD community started
- Expanded District Energy System (Whistler)
- Renewable Energy system cheaper - Squamish, Pemberton
- communities have reduced their energy footprint by 60%
- Distributed energy systems in place in all 4 major SLRD communities
- Preferred energy sources become the most cost effective and accessible energy available
- Smart grid evolving / begun (?)Regional forests are sustainably and actively managed for multiple-values including:



1. Renewable energy resource;
2. Water resource for hydro-electricity;
3. Carbon sink

BUILDING INFRASTRUCTURE

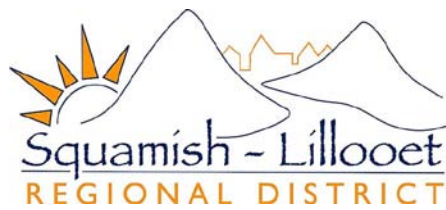
- “Building Green Standards” adopted by all regions and municipalities

FOOD SECURITY / AGRICULTURE

- No more food from California (instead we grow it here)
- Local food throughout the corridor
- Every neighbourhood is food sufficient
- More people entering agricultural industry than leaving it
- Food-sheds have been established and planning for regional food security is happening on this level
- Food processing/distribution facility in Pemberton
- Best soil uncovered & protected
- We have reduced our meat consumption by 50%

PUBLIC POLICY / COMMUNITY LIFE

- Everything is localized; work/school from home
- Small, rural population’s growing at 1 – 3 %; large urban centres growing
- No cars in major city centres
- Changed concept of ‘camping’, e.g., no need to haul 5th wheel but have satellite camp-friendly venues, leaving no footprint



2040 – What should we have accomplished?

TRANSPORTATION

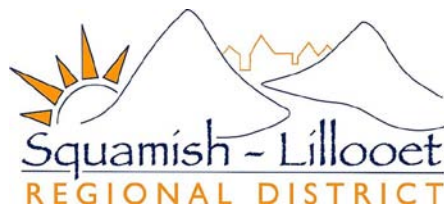
- Regional bus/transit service throughout district
- Tiny train links the corridor
- Smart grid and electric vehicles fully optimized in region
- Cars are shared by communities & are on electricity
- Rapid transit Vancouver => Lillooet, 15 min frequency, 0600 – 2400
- We take high speed trains to get to Toronto & Montreal
- Elimination of all diesel vehicles in the SLRD

ENERGY SYSTEMS & ALTERNATIVE ENERGY

- Communities have reduced their energy footprints by 80%
- Solar, wind and ocean/tidal power accounts for 25% of all energy required for the region
- Alternative / renewable energy supplying all of the distributed energy systems
- Energy independent through local / district energy systems
- All municipal and residential energy needs met by renewable sources
- Energy self-sufficiency for all SLRD region

FOOD SECURITY / AGRICULTURE

- Regional food distribution/processing system in place Lillooet -> Squamish
- Local food production for Pemberton and Squamish
- We have reduced our meat consumption by 75%
- Food from Lillooet & Pemberton feeds Whistler
- Food is everywhere



- Tractors will be fuel efficient &/or powered by a non-petroleum fuel

PUBLIC POLICY / COMMUNITY LIFE

- Sea-to-Sky is 100% carbon-neutral, localized economy
- All communities are carbon neutral
- SLRD is ten years ahead of the global 80% carbon reduction target
- No need for an Energy Resiliency Task Force
- Almost everyone is vegetarian & all of our food is organic
- We are much more healthy & everybody looks real
- Completely weaned off fossil fuels for transportation, heating, and manufacturing of oil-based products
- There is no need for a high speed passenger rail corridor because 'communities are complete' and, after all, "good jobs are close to home"