Watershed Sentinel

June/July 2008
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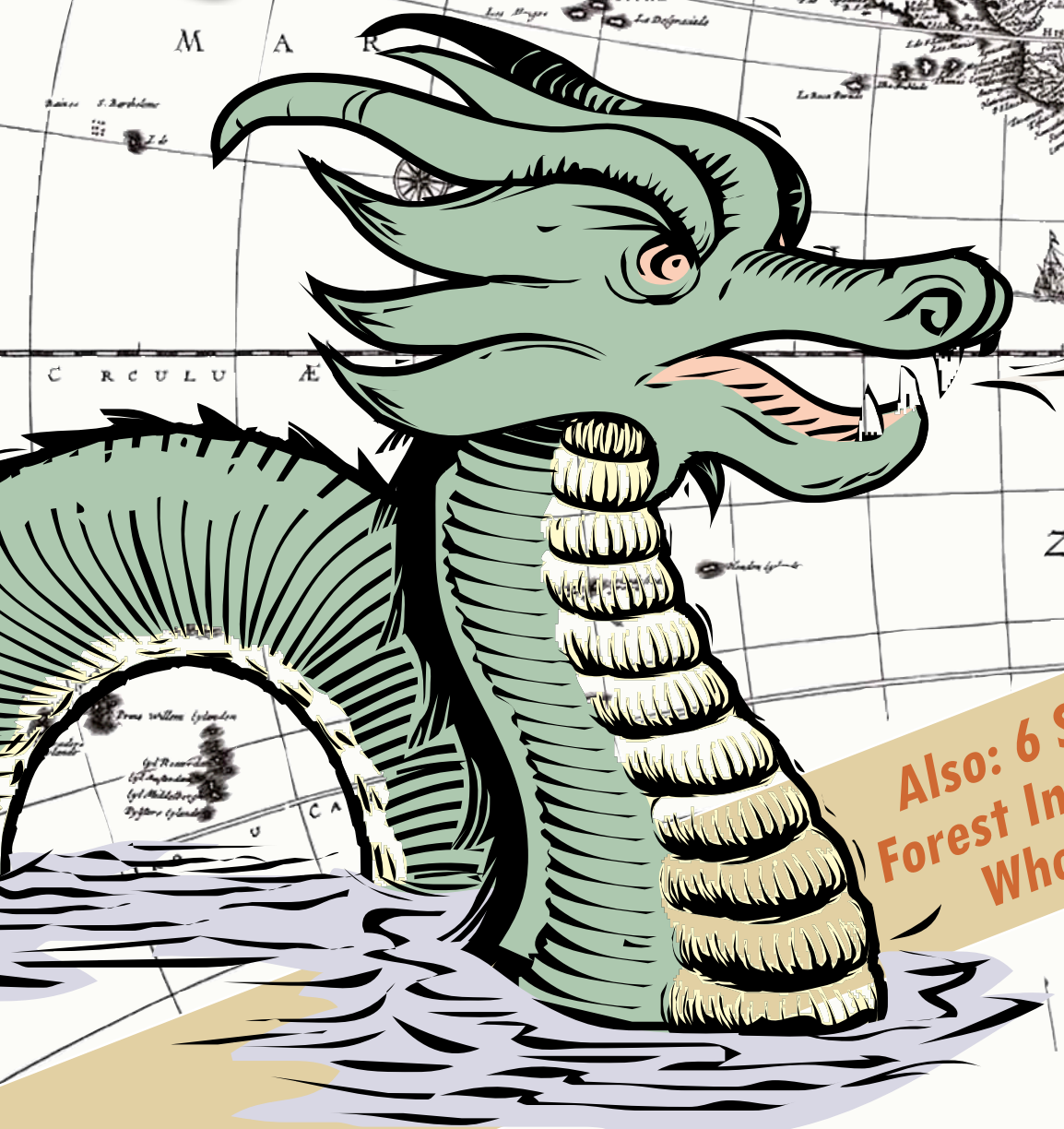
Environmental News from BC and the World

Here Be Dragons



Also: 6 Sweet Secrets
Forest Industry Falldown
Who Wants LNG?

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Watershed Sentinel

June-July 2008

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No matter where on Earth we live, we are all residents of a watershed. Throughout history, clans, tribes, and all organized groups have endeavoured to protect their home watershed or territory. Sentinels were stationed throughout the highlands of a watershed to herald the coming of friends or of threats in the form of encroachment, floods, fire, or hostile armies.

Threats to our watersheds exist to this day whether they come from careless individuals or insensitive corporations. The *Watershed Sentinel* keeps watch and informs.

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Map of the Americas, attributed to Claes Visscher of Amsterdam in the 1670s

Watershed
Sentinel

Editor Delores Broten
Publisher Watershed Sentinel Educational Society
Associate Editor Don Malcolm
Assistant Editor Leslie Gillett
Cover and Graphic Design Ester Strijbos
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Watershed Sentinel

Box 1270, Comox
BC, Canada V9M 7Z8
Ph: 250 339-6117

Email *editor@watershedsentinel.ca*
http://www.watershedsentinel.ca

GUEST EDITORIAL

Resilience or Survival

Many of the new ideas about sustainability and resilience are nothing more than a recognition that the old ways of living are actually good, as seen today in small villages throughout Europe, Mexico, Latin America, Asia and Africa.

In our Western culture of over-consumerism we have actually missed the opportunity of reaching any kind of sustainability. Perhaps we never have actually understood what the concept is all about. I always believed that the original sustainable development term – which was coined 20 years ago in the 1987 UN report, *Our Common Future* – was a total oxymoron.

Perhaps the main reason that we never got it, is that such a level of true understanding of what is at stake requires being proactive. We need to think about the implications of our lifestyle, think about consequences. Yikes, that is too much work, so why bother! It is easier just to keep on BAUing (Business As Usual) and pretend everything is fine.

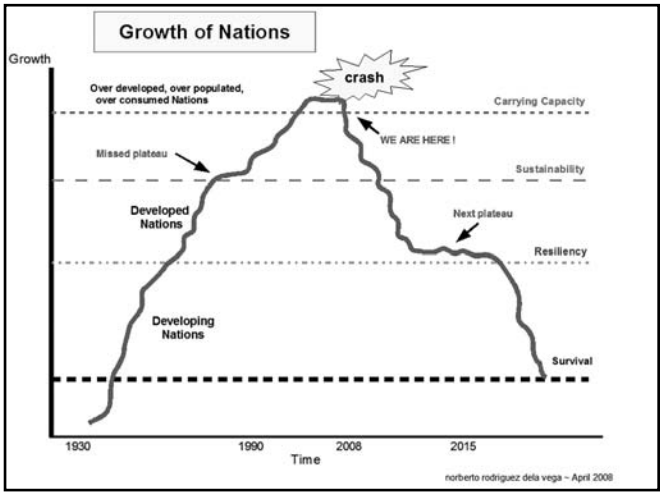
As a consequence of our inaction, we are starting to see the concept of resilience replacing sustainability as a goal.

Perhaps this is because we are finally realizing that the imminent threats of global warming, climate change, overpopulation, poverty, religious wars, peak oil, food scarcity, etc. are real. So we are now talking about the need to become resilient, to be ready to cope with all the social, economic and environmental changes and challenges that are coming.

Suddenly, a sense of urgency is in the air and there is talk about local resilience and resilient communities. If we don't understand these concepts, and make the changes necessary for a significantly different way of life, sooner or later we will be forced into facing the next level down: becoming survival communities of sorts.

The diagram tries to graph this idea. We have already missed the sustainability plateau and we are starting the descent. Maybe we can stop the fall at the resiliency plateau. If we can't, we will then face really difficult times.

Noberto Rodriguez dela Vega, Whaletown BC, May 2008



Canadians Reject Integration with US

Opposition to Security and Prosperity Partnership (SPP) Continues

INTEGRATE THIS!
CHALLENGING THE SECURITY AND PROSPERITY PARTNERSHIP OF NORTH AMERICA

In 2005, as a result of intense lobbying from North America's richest corporations, the leaders of Canada, Mexico and the United States met in Waco, Texas to shake hands on the Security and Prosperity Partnership of North America (SPP). The SPP was a pledge to speed up the corporate goal of continental economic integration by linking it to US government security demands.

This April, a poll by Environics Research, commissioned by the Council of Canadians, revealed continuing deep public opposition to the major SPP policy directions and initiatives, including North American regulatory convergence, energy integration with the United States, bulk water exports, and the adoption of US-style security measures in Canada.

- 87% of Canadians agree that Canada should maintain the ability to set its own independent environmental, health and safety standards, even if this might reduce cross-border trade opportunities with the United States.
- 89% of Canadians agree that Canada should establish an energy policy that provides reliable supplies of oil, gas and electricity at stable prices and protects the environment.
- 88% of Canadians agree that Canada should adopt a comprehensive national water policy that recognizes clean drinking water as a basic human right and also bans the bulk export of fresh water.
- 48% of Canadians do not feel that Canada should harmonize its security policies with the United States, even if this affects our trading relationship. The 2008 Federal budget committed millions of extra dollars to SPP security initiatives.
- 86% of Canadians agree that the SPP agreement should be debated and submitted to a vote in Parliament.

The poll interviewed 1,007 respondents, resulting in a margin of error of plus or minus 3.09%, 19 times out of 20.

The Council of Canadians comments: "Canadian preferences for policies that run counter to the key SPP priorities listed above show conclusively that Prime Minister Harper does not have a democratic mandate for pursuing this agenda in secretive trilateral talks like the upcoming North American leaders summit in New Orleans. The government must cease all further SPP talks and debate the agreement fully and openly before submitting it to Parliament for a vote."

—For more information see www.canadians.org

Baby's Off that BPA Bottle! Should You Be?

In April, Health Canada announced that it will ban the use of Bisphenol A (BPA) in baby bottles, but not other consumer products. This will be the first regulatory step in the world to curtail infant exposure to the chemical, which is literally, everywhere. Health Canada said bisphenol A at low levels of exposure can affect neural development and behaviour when animals are exposed in very early life, but that their scientists did not believe a link to breast and prostate cancer or obesity had been proven. US researcher Frederick vom Saal says BPA changes play behaviour, weakens gender differences, decreases sperm count, stimulates prostate cancer and causes Attention Deficit Hyperactivity Disorder symptoms.

With up to 2 billion pounds produced in the United States each year, bisphenol A is found in dental sealants, baby bottles, the liners of food cans, CDs, eyeglasses and hundreds of household goods. Heating the container releases BPA into food, so Health Canada proposes to ask producers to take voluntary measures to lower the leaching in infant foods. Environmentalists said the government's actions were too timid to protect Canadians, and that pollution prevention should be practised by implementing a more extensive ban.

Adults may not be affected by their current exposure to BPA, but the chemicals seem to affect fetuses through exposure in the womb to the chemical in the mother's body. Babies' bodies also do not clear BPA. This means that women of child-bearing age should be protected from exposure, including absorption through the skin by contact with keyboards, CDs and other household items. That in turn means that societal use of BPA must be curtailed.

This spring, following the lead of most major retailers, water bottle maker Nalgene said that, although their products are safe, it will phase out production of bottles made with BPA due to consumer demand. Polycarbonate hard plastics, marked number 7, may contain BPA, and those with a PC beside the number 7 almost certainly do.

—Health Canada, Washington Post, April 18, 2008, CNN, April 19, 2008, eFluxMedia, April 21, 2008, LA Times, May 19, 2008

From Our Readers

Detailed and Accessible Resource

When I came to BC Citizens for Public Power, I knew very little about the privatization of power in the province. I read and filed every piece of paper we've ever produced or collected. Ironically, it was after more than six months of reading and filing that your publication "Rivers of Riches" (*Watershed Sentinel*, January-February 2007) came to the top of my pile.

I must say, I wish someone had said to me, when I started here, "If you don't read anything else for your first 3 months here, please, please read Arthur Caldicott's 'Rivers of Riches'." It is the most detailed - but accessibly written - publication on this issue and a key resource on Run-of-River in this province. Once I had a basic grasp of the issues from your publication, it significantly increased my understanding of the more complex and technical readings on this issue."

Thank you for your tremendous contributions around this issue.

Melissa Davis, Executive Director, BC Citizens for Public Power, Vancouver BC

Rural Communities Need Programs

I don't know if the proposed carbon tax is unfair to rural residents or not. But the provincial and federal governments are neglecting and attacking smaller communities in many ways, such as closing hospitals which forces people to drive more, and facilitating raw log exports (read rural job exports).

People are being laid off in droves from the forest industry. It would be very dumb for the environmental movement to disregard this situation. Many rural residents rightly feel attacked and neglected by the provincial Liberals, and see the carbon tax as part of this.

Where is the environmental movement's advocacy for programs to help rural people with the transition to the post-peak oil / low-carbon economy? I live in a big city, but I can guess a few of the things people in rural communities might support:

a.. re-opening smaller hospitals

b.. more frequent service and lower fares on highway buses and trains

c.. incentives for a domestic wood pellet & stove industry (rather than just exporting wood pellets)

d.. an energy efficiency upgrade program specifically for colder areas of the province

e.. a guarantee that the carbon tax will not result in a net cut to rural school districts and municipalities

f.. a commitment to reducing inequality as carbon taxes are phased in, eg., by eliminating MSP premiums

The *Watershed Sentinel* welcomes letters but reserves the right to edit for brevity, clarity, legality, and taste.
Anonymous letters will not be published.
Send your musings and your missives to:
Watershed Sentinel, Box 1270, Comox BC V9M 7Z8
editor@watershedsentinel.ca

g.. other stuff city slickers like me wouldn't think of

The Green Party and NDP would likely seize on these kinds of measures if environmental groups advocated for them first. And the Liberals might have to respond. The electoral clock is ticking.

Eric Doherty, Vancouver BC

Speedy National Fix

Climate change? How about this for a speedy national fix: over half the work of keeping the nation alive is unpaid work. So let us request the other half to become volunteers also! Think of the joy and satisfaction engendered for rescue events where price tags are insignificant. Materials flow, less commerce. Models: Canada WWII invoked a people skills survey (can you milk a cow? etc.). Attached ration coupons to all commodities likely to become scarce. Assigned priorities to industry, to worker skills, to crash training programs. Maintained rental controls. Stopped building automobiles.

Technocracy's "Total conscription" went further, but was never instigated. It disallowed any profiteering while lives were being conscripted.

Martin Rossander, Powell River BC.

Continued Vigilance

Enclosed is a cheque for $75, a donation to the *Watershed Sentinel* for its continued vigilance re environmental issues. This amount is what I received as first prize for weaving entered in last year's Gibsons Landing Fibre Arts Festival. GLFAF is largely sponsored by Howe Sound Pulp and Paper, the mill which has thumbed its nose at the BC government and coastal citizens by continuing to burn coal non-stop since last fall in non-compliance with its new permit issued in December 2007.

I now consider this prize tainted money and refuse to contribute to GLFAF as long as HSPP continues to burn coal and be a sponsor of GLFAF.

Susan Fletcher, Sechelt BC

[The mill finally stopped under orders from the Environmental Appeal Board in early March –ed.]

More Letters, Page 12

Have You Heard

Compiled by Delores Broten

Ontario Bans Cosmetic Lawn Chemicals

Ontario celebrated Earth Day by announcing it will follow Quebec in banning on 80 chemicals in 300 lawn and garden products. The new law, to take effect in the spring of 2009, will take precedence over the local bans which currently protect 44% of Ontario citizens. Farms, golf courses and managed forests will be exempt. Crop Life Canada, the trade association representing pesticide manufacturers, said the products about to be banned have been approved for use by Health Canada. Home Depot added to the Earth Day aura by announcing it will voluntarily stop selling pesticides and herbicides across Canada by the end of 2008. Over 140 communities across Canada have acted to ban or restrict cosmetic pesticides and herbicides.

—Globe & Mail, April 22, 2008

U Calgary Funds Ads Against Climate Action

An audit review of over $507,000 contributed to two University of Calgary "research accounts" has revealed that $123,427 was routed to Friends of Science (FoS) – a group lobbying the Canadian government against taking action on global warming. The audit, which was prompted by persistent inquiries from a volunteer SourceWatch editor, revealed that over $100,000 was paid to APCO Worldwide for "strategic communications services." In addition, Morten Paulsen Consulting, the firm of lobbyist Morten Paulsen, invoiced FoS for over $25,000 for developing radio advertisements and purchasing air time in five Ontario markets during the 2006 Canadian election. Additional amounts of over $25,000 were also paid to Paulsen's current employer, the PR and lobbying firm Fleishman-Hillard, and the video production company Directors Chair. In a press release, the university noted that it had "advised Elections Canada and Canada Revenue Agency of its concerns regarding the accounts Friends of Science and the ongoing auditor's review."

—PRWatch.org, University of Calgary, April 14, 2008 (www.ucalgary.ca/news/april2008/audit)

Switching to vegetables one day per week cuts the carbon dioxide equivalent of driving 1160 miles per year

Eat Local Vegetables!

New research published in April in *Environmental Science & Technology* casts doubt on the climate change effectiveness of the 100 Mile Diet. It says the results of a life cycle analysis show that *what* you eat has a lot more to do with greenhouse gas emissions than *where* it is grown.

The research counted not only the carbon dioxide produced when food is shipped, but also all greenhouse gases, including methane and nitrous oxide emitted from farm production. This means counting all the way back to the fossil fuels used to manufacture fertilizer and run tractors. Red meat production is particularly intense in methane and nitrous oxide emissions.

Engineers Christopher Weber and Scott Matthews of Carnegie Mellon University say that switching completely to a locally grown diet would save the equivalent of not driving 1000 miles a year. But a small change in diet could accomplish the same scale of savings.

Replacing red meat and dairy with chicken, fish, or eggs for one day per week reduces emissions equal to 760 miles per year of driving. Switching to vegetables one day per week cuts the equivalent of driving 1160 miles per year.

Nonetheless, eating locally has other benefits, as New York's Sustainable Table points out, including better tasting, fresher food, and support for local community economies, as well as helping to save family farms.

—Science News, April 16, 2008, Environ. Sci. Technol., ASAP Article, 10.1021/es702969f, Sustainable Table, April 29, 2008

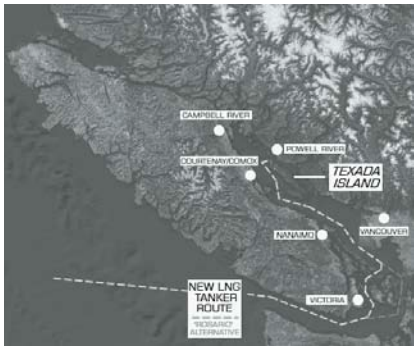
Wind Power for Quebec

After a two and a half year process, Hydro-Québec is accepting 15 bids for a total of 2,004 MW of wind power, to come on stream in stages from 2011 to 2015. The average price offered by the winning bids is 10.5¢/kWh in total. The projects will require capital outlays estimated at $5.5 billion, including $1.1 billion for transmission infrastructure. The proponents must obtain the required environmental and municipal permits before starting the work.

—Hydro-Quebec, May 5, 2008

WHO Wants to Build a Gas Plant on Texada?

by Delores Broten. *Map by Arthur Caldicott*



A Liquefied Natural Gas terminal on Texada Island in the middle of scenic Georgia Strait is one of those bizarre ideas that shouldn't float, but, given the peculiar throes of the world of fossil fuels and the absence of strategic energy planning in BC these days, one never knows.

Residents of Texada Island, 84% opposed to the idea, are taking no chances and are trying to squash the proposal before it gets to the formal application stage, possibly in 2009. They rally behind the slogan "It's not needed, it's not wanted, and it's not green."

WestPac LNG is a private company which recently relocated to Vancouver from Calgary. Geoff Plant, the former Campbell Liberal Attorney General and special advisor to the Premier, is on their Board of Directors. WestPac wants to build a liquefied natural gas terminal on Texada to receive tankers from Russia, southeast Asia, and/or the Middle East.

When natural gas (which is mostly methane) is cooled to minus 160 degrees Celsius, it changes from a gas to a liquid, and its volume is reduced 600 times. It is then referred to as liquefied natural gas or more commonly, LNG.

The process of extracting, processing, pipelineing, extreme cooling, shipping, and then regasifying uses a lot of energy, between 20 and 30% of the gas product. Gas which escapes, referred to as "fugitive emissions," is even worse than the gas burned in the process, since methane has a greenhouse effect 23 times that of carbon dioxide.

Thirty Six Tankers a Year

The company estimates that 36 tankers a year will arrive on Texada, where the liquid cargo will be offloaded and regasified. Some of it would be used to fuel a 600 MW or maybe 1200 MW natural gas electrical generating station which would emit up to 4 million tonnes of greenhouse gas (GHG) annually, more than all the GHGs from electricity generation in BC today as well as substantial other pollution (echoes of Sumas 2, Duke Point and Port Alberni Generation). The big transmission lines which keep the lights on for Vancouver Island – the 500 kV Cheekye-Dunsmuir system – run across Texada, perfectly located for WestPac to feed the power into the BC grid, although the islanders object to the idea of a new big transmission line running down the spine of Texada. The rest of the natural gas, imported from cheap fields abroad, would go into the existing Terasen gas pipeline which runs from Huntingdon near Abbotsford, where it connects to the big pipeline which starts in BC's gas fields in the northeast and goes south into the USA.

Projected Pollution from Texada Gas Plant (Tonnes per year)

Source	PM	SOx	NOx	CO	CO2
WestPac LNG (500 mmcf/d)	12	57	171	178	162,881
Kitimat LNG (1 bcf/d)	23	114	342	355	325,761

Table is extrapolated from the Kitimat LNG application to the Environmental Assessment Office

BC has no shortage of natural gas, exporting 60 to 80% of what we produce, but gas flows to wherever the demand (or price) is greatest, so WestPac's imported gas in the pipeline could easily be exported to the US. American towns from southern California to northern Oregon have been successful in fighting off similar LNG proposals. In response to the difficulties to shipping, potential dangers, and fears of terrorism, many new proposed LNG terminals are sited way offshore.

Avoiding US Opposition

WestPac's Texada proposal avoids US opposition by not locating in the US, and it hoped to avoid Canadian opposition by not docking in any large cities or communities in Georgia Strait. No wonder the residents of Texada were offended by company officials as they tried to sell the idea: "They were talking to us as if we were a bunch of stupid assholes," said one resident, still irate weeks later.

Ironically, the Canadian federal government has been strident in its opposition to US proposals for a LNG tanker route on the coastal border at the southeast corner of New Brunswick and the northeast corner of Maine.

Liquefied Natural Gas Fact Sheet

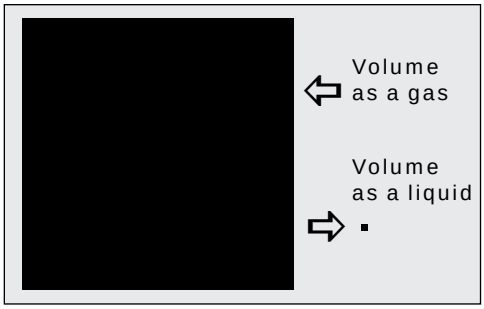
Written by Arthur Caldicott for the Watershed Sentinel, 2008

What Is It?

Usual abbreviation for Liquefied Natural Gas: LNG
Volume of natural gas when it is liquefied: 1/600th of its volume as a gas
Temperature at which natural gas becomes a liquid: -160°C
Method used to liquefy natural gas: Refrigeration, not compression
Pressure under which LNG is stored: Atmospheric
Primary hydrocarbon in natural gas: Methane (CH_4)
The only viable method to transport natural gas, as a gas: Pipelines

Why Is LNG Useful?

LNG's big advantage #1: It can be stored in tanks, until it is needed
Places in BC where LNG is stored in tanks: Terasen's Tilbury Island facility in Delta, started in 1971; Ladysmith, under construction
LNG's big advantage #2: It can be transported across oceans



Where Does LNG Come From?

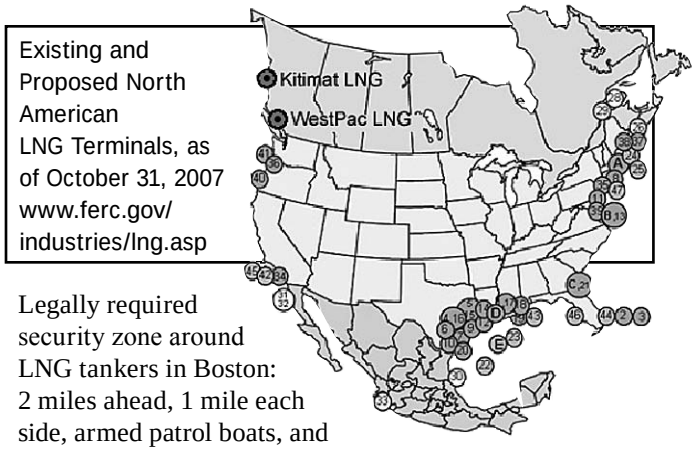
Primary sources of LNG: Russia, Middle East, Latin America, Africa
Primary destinations for LNG: North America, Europe, Japan, and China
Number of operating LNG import terminals in North America: Six
Number of proposed LNG terminals in North America: 53 – 7 in Canada, 6 in Mexico, 40 in USA

Do We Need It?

Canadian annual natural gas production: About 6.2 trillion cubic feet (tcf), with about 3.5 tcf exported
Quantity of additional natural gas needed in Canada in 2008: None
Quantity of LNG imported to Canada, which will be used in Canada: None

Is It Dangerous?

Explosive potential of LNG in a tank or tanker: Low
Explosive potential of LNG which has been released from a tank or tanker: Extremely high
Percentage of methane in air at which it is flammable: 5.5-14%



Existing and Proposed North American LNG Terminals, as of October 31, 2007 www.ferc.gov/industries/lng.asp

Legally required security zone around LNG tankers in Boston: 2 miles ahead, 1 mile each side, armed patrol boats, and no overhead flights

Proposed BC Sites

Proposed BC LNG import terminals: Texada Island (WestPac LNG), Kitimat (Kitimat LNG)
Number of proposed LNG tankers coming to BC per year: Texada Island (36), Kitimat (90)
Local economic benefit: Kitimat – 50 jobs and rent to Haisla First Nation; Texada – taxes to Powell River Regional District
Status of Kitimat LNG: Environmental Assessment (EA) complete, but needs contracts for supply, shippers, and customers, and a new billion dollar pipeline to Summit Lake, north of Prince George
Status of WestPac LNG: Unable to submit an EA application because it doesn't know what size and kind of generation plant to build. All are in contradiction with BC energy policy, due to greenhouse gas releases

Greenhouse Gases

Quantity of natural gas to be moved annually through Texada & Kitimat terminals: 182,500 & 365,000 million cubic feet
Greenhouse gases (GHGs) emitted while operating an LNG import terminal: 0.89 tonnes per million cubic feet
GHGs per year operating Texada Island and Kitimat LNG terminals: 162,881 & 325,761 tonnes
Quantity of GHGs created in burning one million cubic feet of gas: approx 52 tonnes
GHGs created when all the gas moved through Texada and Kitimat terminals is burned: 8.5 & 17 million tonnes

6 Sweet Secrets

by Delores Broten

It is one of the four basic flavours that we can taste (salty, sour, and bitter are the other three), and it is a shape-changer. The simple carbohydrates sucrose, glucose, and fructose show up in many forms – from table sugar, honey, and maple syrup to corn and pineapple. Some of us, those with a "sweet tooth," have a yearning for it. For others, those with diabetes, it can be deadly.

Once upon a time, the sugar in our diets came only from foods like fruits and berries or the occasional, delightful, hard-won honeycomb, stolen from the bees. There is evidence that sugar cane, which is chewed for its sweetness, was first grown between 6,000 and 10,000 years ago, in either the South Pacific or in India. The word sugar comes from the Sanskrit *sharkara*.

Between the 8th and 13th centuries, during their great agricultural era, the Arabs created industrial sugar production, adapting equipment from India. The production of sugar spread around the world rapidly during the European expansion of the 16th century and onwards, when it was introduced, most unpleasantly, to North and South America and the Caribbean.

Sugar, unlike the staple grains in the sudden global food crisis, boasts an 11 million ton surplus in 2007. Most of that sugar comes from either sugar beets (genetically modified in the United States) or sugar cane.

Now, in the industrialized world, sugar sits in on every meal, and lurks in every corner of the pantry. According to the Indian Sugar Mills Association, sugar, unlike the staple grains in the sudden global food crisis, boasts an 11 million ton surplus in 2007, on production of 170 million tonnes, despite a demand steadily growing at over 2% per year. Most of that sugar comes from either sugar beets (genetically modified in the United States) or sugar cane. Now biofuel production is absorbing about a tenth of the sugar beet crop in Brazil, where rainforest used to thrive.

Like so much in our industrial version of civilization, a lot of the sweets in our life are not sugar at all, but concoctions from a chemistry lab owned by unknown corporations. More are invented every year. Globally, $5.3 billion worth of artificial sweetener concoctions last year and hundreds of millions more in various sugar crops drive the sweets industries, where trade wars, subsidies, and dark suspicions abound.

No wonder there is so much bitter speculation swirling around the sweets in our lives.

1. Nutrition

"White death," they called refined table sugar back in the '60s. Honey and brown sugar are still sometimes considered to be better for you, but really, if you are looking at sugar as a source of nutrition, you're in trouble! Outside of some carbohydrate value, there's little nutrition in any of the sugars, except those bound naturally into fruits and vegetables. Brown sugar is ordinary table sugar made brown by adding molasses, which might add a tad more nutritional value than white sugar, but not enough to make it any more valuable as a source of nutrients. Demerara is raw cane sugar.

The exception might be honey, at least in part because it is a mixture of fructose and glucose, 65 calories as opposed to white sugar's 20, but with 0.5% proteins. Honey contains small amounts of a wide array of nutrients and antioxidants and it is suitable for fast energy requirements, such as sports. *Foodreference.com* echoes many similar claims when it says: "The vitamins found in honey may include (depending on floral variety) niacin, riboflavin, and pantothenic acid; minerals present include calcium, copper, iron, magnesium, manganese, phosphorus, potassium, and zinc. Just as the colour and flavour of honey varies by floral source, so does the vitamin, mineral, antioxidant, and amino acid content."

2. Sugar Alcohols

You may have noticed the names mannitol, sorbitol, xylitol, lactitol, isomalt, maltitol, hydrogenated starch hydrolysates (HSH), or simply sugar alcohol on food packaging. Food products labelled "sugar-free," including hard candies, cookies, chewing gums, soft drinks, and throat lozenges, often contain sugar alcohols. They are frequently used in toothpaste and mouthwash too, especially "sugar free" ones.

Sugar alcohols, also known as polyols, occur naturally in foods and come from a range of plant products such as

fruits, from berries to pineapple to corn cobs. They provide about half to one-third less calories than regular sugar. This is because they are converted to glucose more slowly, require little or no insulin to be metabolized, and don't cause sudden increases in blood sugar.

However, sugar alcohols, especially eaten to excess, can cause bloating and diarrhea. The American Diabetes Association says that sugar alcohols are acceptable in a moderate amount but should not be eaten in excess. Some people with diabetes, especially Type I diabetics, have found that their blood sugars rise if sugar alcohols are eaten in uncontrolled amounts.

3. The Sweet Nothing That Doesn't Go Away

Sucralose, an artificial sweetener known under the trade name Splenda in North America, is gaining in popularity by leaps and bounds, in large part because it can be used to directly substitute for sugar in baking. Although sucralose is made from table sugar, it has no calories because it isn't digested in the body. Apparently it isn't digested outside the body either.

Cyclamate was banned in the US in 1969, after studies seemed to show evidence of potential for bladder cancer and testicular atrophy in mice.

Sucralose was introduced to Norway in 2005. By 2006, scientists were reporting that sucralose was everywhere in the environment – in wastewater effluent and in Oslo Fiord. Now Swedish scientists have documented that the sweetener passes unchanged through sewage treatment systems. Larger treatment plants can decrease sucralose concentrations by 10% at most.

Sucralose was approved as safe for human consumption but did not undergo an environmental review in Europe, the US, or Canada, where it was approved in the early 1990s. In any event, because it is "only" persistent in the environment and not bioaccumulative, it would probably have passed an eco-assessment. Issues that would not have been examined include the potential to change organisms' feeding behaviour or interfere with the mechanisms of plant photosynthesis. In research at the University of Queensland, Australia, sucralose has been shown to interfere with the transport of sucrose in sugar cane (*Science News,* March 12, 2008).

4. Where There's Smoke

Sweetness with no calorific consequences obsesses western civilisation, in ironic contrast to the rest of the world, where caloric intake is a desirable effect from eating. Artificial sweeteners were originally developed as a dietary aid for people with diabetes, but now they are the cash cow of the food industry. Consistently, there is a lot of smoke about the negative health impacts of artificial sweeteners. With billions of dollars at stake, the pressures on government regulators are high.

To add to the confusion, a compound that is not allowed in one country may be totally accepted in another. For example, only five artificial sweeteners are approved by the US Food and Drug Administration: aspartame, saccharin, acesulfame-K, neotame, and sucralose. Cyclamate was banned in the US in 1969, after studies seemed to show evidence of potential for bladder cancer and testicular atrophy in mice. Wikipedia notes: "Cyclamate is approved as a sweetener in more than 55 countries: for example, the brand-name beverage sweetener Sweet'N Low, which contains only dextrose, saccharin, cream of tartar, and calcium silicate in the United States, contains cyclamate in Canada (where saccharin is banned except for diabetic usage). Similarly, Sugar Twin, the brand-name cyclamate sweetener in Canada, contains saccharin in the United States." Mexican consumer groups recently celebrated their victory in getting Coke to remove sodium cyclamate from the Mexican version of Coke Zero.

Aspartame has been used around the world for over 20 years and is in over 6000 products, but every few years another study pops up questioning its safety. The most recent concern was raised in 2005. The Ramazzini Foundation of Oncology and Environmental Sciences in Italy claimed that rat-feeding experiments, which is their area of expertise, showed evidence of lymphomas and leukemias, among other cancers. In 2006, the European Food Safety Authority, after reviewing all the data, declared there was no cause for alarm because of study flaws in the Italian work, noting that aspartame has been well studied: "Since its approval, however, the safety of aspartame has been repeatedly questioned, with discussions focusing not only on the safety of aspartame itself, but also on the safety of its breakdown products, aspartic acid, phenylalanine, and methanol. All these substances occur naturally in the body."

The Ramazzini Foundation, however, stands by its conclusion and published a further peer-reviewed study in 2007: "The results of this carcinogenicity bioassay confirm and reinforce the first experimental demonstration of APM's multipotential carcinogenicity at a dose level close to the acceptable daily intake for humans. Furthermore, the study demonstrates that when life-span exposure to APM begins during fetal life, its carcinogenic effects are increased" ("Life-Span Exposure to Low Doses of Aspartame Beginning during Prenatal Life Increases Cancer Effects in

Continued on Page 10 ⇨

⇦*Sweet Secrets continued*

Rats," *Environmental Health Perspectives* Vol. 115, No. 9, Sept 2007).

It is important to note that the US National Cancer Institute has looked for and found no correlation between cancer and artificial sweeteners in the US in its study of over a half million retirees. Of course, most of those retirees would not have been exposed in the womb to anything sweeter than honey.

It is important to note that the US National Cancer Institute has looked for and found no correlation between cancer and artificial sweeteners in the US in its study of over a half million retirees. Of course, most of those retirees would not have been exposed in the womb to anything sweeter than honey.

5. Stevia — Yes, It's Natural

Many people are turning to the plant *Stevia rebaudiana*, a native plant from South America, as a herbal sweetener. Both the plant and its extracts have been used for several years as a sweetener in South America, Asia, Japan, and China. However, the European Union has refused to approve its use as a general sweetener, as has the US and Canada, where it is legal for sale only as a herb. The EU's Scientific Committee On Food notes that most of the documentation submitted on stevia focused on various extractions of stevioside, but that the compound broke down to steviol in the gut. Steviol has not been fully tested.

Although proponents scoff at the concerns, the EU scientists note laboratory results about steviol that point to evidence of potential mutagenicity, a range of pre-cancerous and sub-chronic impacts on the organs, and toxicity to the male reproductive organs, as well as reduction in male fertility. The caution and calls for more research are given extra weight by the notation that the Indians of Paraguay did indeed drink a stevia tea – as a male contraceptive.

6. No Way to Lose Weight

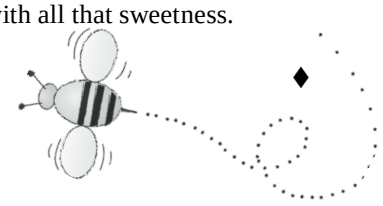
Whatever the outcome of the scientific duels about the cancerous and toxic effects of the various artificial sweeteners, one scientific study is bound to have a crushing impact.

Researchers at Purdue University published a rat study in February where they speculated that the ability to taste sweetness is part of the body's way of assessing caloric intake. The researchers fed rats yoghurt sweetened with saccharin or with glucose. The rats on the saccharin sweetener ate more and gained more weight than the rats on glucose. The researchers speculate that artificial sweeteners upset the body's communication with itself about how much caloric intake it is experiencing. "We found that reducing the correlation between sweet taste and the caloric content of foods using artificial sweeteners in rats resulted in increased caloric intake, increased body weight, and increased adiposity, as well as diminished caloric compensation and blunted thermic responses to sweet-tasting diets. These results suggest that consumption of products containing artificial sweeteners may lead to increased body weight and obesity by interfering with fundamental homeostatic, physiological processes." ["A Role for Sweet Taste: Calorie Predictive Relations in Energy Regulation by Rats," Susan E. Swithers and Terry L. Davidson, *Behavioral Neuroscience,* 2008, Vol. 122, No. 1, 161–173]

Given the stakes, we can be very sure that other studies are being rushed to press, arguing against the results of that study.

Meanwhile, it seems one effect of artificial sweeteners is already well documented. "An elevation in insulin levels is known to cause an increase in cravings for food and consequently, weight gain. Sodium saccharin, sodium cyclamate, stevioside, and acesulfame-K are all known to enhance insulin release even though they are not carbohydrates," says a weight loss web site succinctly *(www.shapefit.com).*

Perhaps, like our distant relatives the bears, we should stick to honey. At least we'd be getting some nutrients along with all that sweetness.



Energy Geek Takes Over Kitchen

by David Simms

Courtesy of Home Hardware's recent sale on kilowatt-hour meters, I've been transformed into Clearwater's version of Bill Nye, the science guy, running around the house measuring the energy consumption of each and every appliance.

My motivation to monitor our electricity consumption comes from a decade we spent doing some off-grid windmilling back in the 70's and 80's. Today, there've been many advances in energy-efficient appliances, often focused on niche markets. My challenge is to find these. One bonus of this obsession is that I'm able to tell other people how these niche technologies can be applied to their conventional household situations.

After muddling around on the Internet, I discovered something called an "induction cooktop." A company called Sunpentown markets a very affordable line of counter-top induction cooktops which could certainly represent a boon to energy conservers.

Induction cookers use rapidly changing magnetic fields to generate a phenomenon called "eddy currents" in ferromagnetic metals, like iron or steel. As the tiny magnetic domains do their eddy-current dance in these metals, they heat pots or fry pans sitting on the cooker, and they do this instantly. The economy results from energy being directed to where it is needed; none is wasted heating things that don't need to be heated. Induction cookers are safe because the magnetic fields are confined to the target metals and the surface of the cooker remains quite cool.

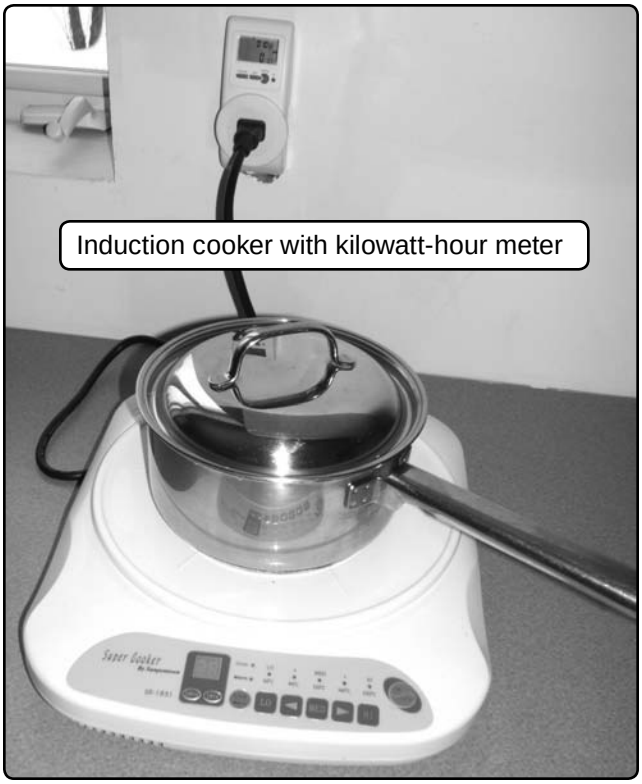
All things being equal, the Sunpentown induction cooker claims energy savings of 30% to 35%. My tests show that the induction unit boils 500 ml of water using 0.05 kw-hr (kilowatt-hour) while a conventional stovetop takes 0.08 kw-hr to do the same. My oatmeal recipe takes 0.06 kw-hr whereas the stove uses 0.09 kw-hr.

Some relearning is needed for the most effective use of an induction cooker, but the Sunpentown induction cooker helps out with a timer that shuts it off when the cook-time has elapsed. Its interactive "scan" feature decides how to modulate the heat for two modes and nine settings, based on input from a sensor. The only thing I didn't like was that it continues to draw some current even when it is turned off. It has to be unplugged when out of use.

For conservation buffs, off-grid or not, induction cooking represents a way of cooking food that uses less electricity. Sunpentown also makes high-tech, far-infrared, countertop convection ovens that promise similar gains in efficiency. These advances should not surprise. Since the electric range is an adaptation of the 200-year-old wood stove, complete with mainly trivial attempts at innovation, the ghost of Charles Darwin now seems due for a visit.

♦

David Simms is a retired teacher with a lifelong interest in energy matters.



From Our Readers

Tar Sands & Fossil Fool Thinking

Regarding carbon emission controls:

The tar sands are responsible for over half of Canada's greenhouse gas. This is unacceptable not only to the global community but to every individual who cares about survival of the human race.

We need to put a cap on the tar sands production now. The fossil fool thinking has to stop. Just because the US demands we sell them the oil is not a good reason to give it to them or anybody else. It is almost treason to undermine our future energy security. The year 2020 is meaningless unless you start now. Every barrel worth of alternate energy created should result in another barrel of oil capped.

The historic economy of Alberta is being ruined by polluted well water and river water shortages, making it an uninhabitable wasteland. The biggest problem is denial which runs rampant from oil companies through the oil company infected regulatory bodies and governments including the government of Alberta. This infection leads all the way to the oil supported PM's office.

Canada as a country needs to rapidly rethink the import/export policies. Future energy shortages mean build locally, shop locally and conserve our energy resources. The bottle of water that comes from Fiji in the local coffee shop is no more acceptable than NAFTA which demands we import/export against our own interest.

As our glaciers melt, Alberta will increasingly be feeling extreme pressures from water shortages. Definitely we need to stop greenhouse emissions at the source now. Stopping this insane fossil fool and radioactive journey will encourage the alternative energy economy needed for economic and environmental sustainability. Staying the course will lead us all towards extinction.

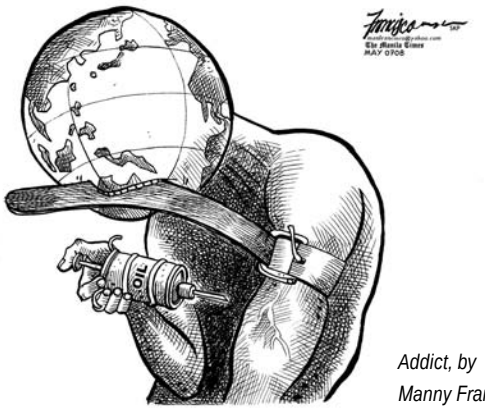
Sue Hiscocks, Jim Wight, Victoria BC

Do Smart Meters Conserve Energy?

We are led to believe that these smart meters will be a tool for conservation. And really, who would or could argue with that? Of course we should understand how much electricity we use per household, business and industry! But don't we already know that from the current meters?

Well, we're told, with smart meters you will know when in the day, the week, the month and year you're using most of your energy. Let's put on our thinking caps again: The month and year we already know with our stupid meters – we get the read outs and even a graph with our bill.

So that must leave the real smart part: The smart meters will tell you when in the day you use the energy… Generally, there will be little peaking in your energy consumption during night time hours.



Addict, by Manny Francisco

There is increased usage when you get up, turn on the lights, radio, the heat, shower, blow-dry hair, brew coffee, make toast, fry eggs, check your emails, and if you're working for a living, get yourself out the door. For us retirees the consumption pattern may be slightly different. But it isn't rocket science.

Good grief, I must be smart and I didn't have to have the smart meter to figure out that smart meters for residences aren't really all that smart.

Let us all be even smarter than that! Advise our government, our ministers, BC Utilities Commission and our neighbours that we don't need these so called smart meters for residential properties. And the smartest part of *not* buying smart meters is that you and I will save $ millions and millions that would otherwise be spent needlessly!

Gudrun Langolf, Vancouver BC

Site C Round Two

I became a member of the Peace Valley Environment Association in 1979. When we were fighting Site C in the 80's people said, "Why are you wasting your energy? It is going to be built." Here we are in 2008 fighting again.

At a recent meeting with BC Hydro, the first comment made was, "No decision has been made as to whether Site C will be built." In the Hydro booklet on the very first page, it is stated that a decision is still years away.

Therefore, I call on all citizens to become informed as to the truth about what the proposed Site C dam will do to the Peace River Valley. Visit : www.peacevalley.ca, www.nositec.ca, www.paddleforthepeace.ca You may send questions and comments to *pvea@shaw.ca*

Ruth Ann Darnall, Fort St. John BC

"The future will only contain what we put into it now."
—May 1968 graffiti in France.

Changes At the 'Shed

Notice of Price Increase

You would think that the *Watershed Sentinel* was part of Canada's underclass – we fit Statistics Canda's profile of working Canadians, with no increase in pay since 1998! That's right, it has been ten years since we raised our subscription rates and something's gotta give!

Subscriptions and donations are the backbone of our non-existent financial plan, so keep us in mind, next time you buy a caffeine brew! That's a fancy way of saying, we think we're worth at least as much as a few cups of coffee.

As of our September-October issue, coming out in late August, the cost of an annual or biannual subscription will be going up and the number of free copies we distribute will be going down. If your subscription is due for renewal, or if you're not yet one of those special people who subscribe, you can beat the increase by getting your renewal in to us over the summer.

If you are a new subscriber, you will be entered to win one of five great books – just fill out that subscription insert and send it in.

Moving? Moved?

Want an e-copy of your subscription, instead of snail mail, or in advance of snail mail? Let us know.

Email:
orders@watershedsentinel.ca

Annual General Meeting

The Annual General Meeting of the Watershed Sentinel Educational Society will be held in Comox on July 7th from 11:00 am to 3:30 pm.

Membership in the Watershed Sentinel Educational Society is open to subscribers, and if you have elected to become a member you are invited to attend the AGM.

We are looking for board members, who play an adminstrative role in publishing the magazine. Most board meetings will be held by telephone conference call.

And we are always looking for volunteers to become part of the WS editorial team. If you are interested in writing, copy-editing, taking responsibility for a department, helping with promotion, advertizing, cartoons, and that most essential of tasks, proofreading, please get in touch. Our volunteers are scattered all over British Columbia, so distance is no problem, as long as you have access to the internet.

To receive information on the location of the *Watershed Sentinel* AGM, please email *editor@watershedsentinel.ca* or phone 250-339-6117.

Attention Reporters!

The *Watershed Sentinel* invites proposals for investigative reports on environmental and social issues not currently covered in the mainstream media. We plan to select 5 proposals for contracts of between $500 and $2000, to produce stories of between 500 and 2000 words.

All sources must be referenced for the editors and a reading list must accompany the copy. High resolution graphics and photographs should also be provided. Stories will be published in print and on line.

Contact *editor@watershedsentinel.ca* with a short (one page) outline, potential sources and proposed deadlines, as well as samples of previous work.

Look for Us on BC Ferries

Thanks to the BC Association of Magazine Publishers, the *Watershed Sentinel* will be on the magazine ranks on BC ferries this September – we're looking forward to it, and planning to look our best.

Notice of My Death

. . .I believe my environmental advocacy contributed to making Canada's environment a little better than it would have been without my efforts. I liked being an environmental activist. I enjoyed a good argument (as long as it wasn't personal), I liked challenges and I liked making a difference. I also enjoyed getting to know so many people through my environmental activities.

People used to ask me where I got all my energy. I would tell them from nature. The mountains, the trees, the rivers and the wildlife gave me enjoyment and energy. I really was a tree hugger! I loved my walks in the woods and canoeing down rivers.

. . . If you would like to do more than remember me (which I consider important… remembering me, that is), then I would ask you to do something extra to benefit the environment. Something you were not already planning to do or something you were not planning to do this soon. Through the additional actions taken by those who remember me, the environment will continue to benefit.

love, Martha

Martha Kostuch, well-known within the environmental community as an effective activist and passionate defender of nature, both in the province of Alberta and on the federal scene, passed away on April 23, 2008.

MillWatch

JUNE 2008

The Face of Falldown Unmasked

by Rob Wiltzen

They called it 'Black Tuesday' for Vancouver Island mill workers when Catalyst Paper announced the layoff of 227 employees between its Crofton and Elk Falls mills, but the event was soon overshadowed by worse news for about 800 workers at the Pope & Talbot Harmac and Mackenzie mills, when the company's bankruptcy and the mill's closures were announced.

In fact, the ever-increasing frequency of closures, layoffs and production curtailments announcements has reached a dizzying pace in recent weeks and months. Sales, mergers and acquisitions further serve to contribute to the kaleidoscopic landscape of the forestry business in BC.

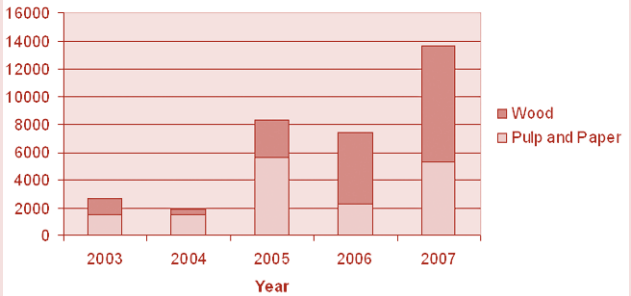
The BC pulp mill industry is heavily dependent on the sawmills of the province to provide fibre from the wood waste of their processes, and therefore, are as sensitive to the lumber markets as they are to the pulp markets when fibre supplies run short. Between the US economic downturn, with its related housing market collapse, and the devaluation of the US dollar, lumber export markets have crashed and sawmills have been closing all over the province.

The most recent examples are the TimberWest sawmill at Campbell River, and the Western Forest Products flagship Ladysmith sawmill, the main suppliers of fibre for the Campbell River Elk Falls mill and the Crofton mill respectively. Announcement has been made for both of their closures, and laying off close to 300 workers. The layoffs at the pulp mills followed close behind.

Some argue that, economic climate notwithstanding, the real culprit is BC government forestry policies that have given the green light to raw log exports and sacrificed the 'value added' sectors of the BC industry. Pulp markets are reportedly strong enough to support the business, the problem being that the fibre shortage from the closing sawmills has seriously impacted the availability of materials and escalated the price of inputs, making BC pulp producers uncompetitive in global markets. Recently, the Vancouver Sun reported that the Catalyst Crofton mill was actually buying sawdust from US mills that was derived from Canadian raw log exports.

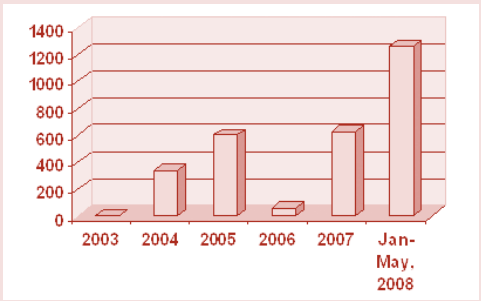
The logging sector has not, however, been immune to cutbacks either in BC, as demonstrated by Western Forest Products idling large parts of its logging operations on the coast this spring to bring their production in line with the sawmill demand, affecting about 800 workers. Clearly, raw log export volumes are insufficient to justify all the allowable logging operations.

Layoffs in the Canadian Forest Industry



Adapted from information supplied by Canadian Forest Service, Natural Resources Canada and news reports on job losses

BC Pulp & Paper Layoffs



Adapted from information supplied by Canadian Forest Service, Natural Resources Canada

According to the Industry Canada website, the total number of employees for the Pulp, Paper and Paperboard Mills industry group decreased from 68,438 workers in 1994 to 53,704 workers in 2003 – a loss of 14,734 jobs (or 22%). Figures from the Canadian Forest Service show a decrease of 16, 755 jobs in the pulp and paper sector in just the next 5 years between 2003 and 2007 – over double the rate of job loss. 2008 is shaping up to follow the trend.

The same Canadian Forest Service reports named 40 sawmills that have closed across BC since January, 2003. On top of that there are another 21 instances of partial shut-downs and shift reductions. In the same period (January, 2003 – April, 2008) only 3 pulp mills faced full closure with another 8 announcements of shift reductions and partial shut-downs. With sawmill

closures accelerating at this rate, pulp mills have little choice but to follow on their heels however, amply demonstrated by the recent closures and cut-backs in the six weeks since the report release. 2008 has already surpassed any previous year in layoffs in British Columbia pulp and paper mills, and it is not yet halfway through the year.

No one denies the severe impact that these job losses have on local economies, especially considering the semi-rural nature of many mill locations, making entire communities dependent on one mill for local economic generation. There has been a recent trend to shift municipal tax base away from the corporate sector, but still the tax base of mill-towns is sent into shock when the mill is suddenly gone. Harmac accounted for 72% of the industrial tax base of the Nanaimo region with their $3.5 million tax bill.

Recent calls for provincial government assistance for the industry have mostly met with stony silence, perhaps due to the fact that BC, by most accounts, seems to be doing just fine despite the forest industry's claims of its keystone position in the provincial economy. Statistics Canada reports BC unemployment for April 2008 at 4.3%, considerably below the national average of 6.1% and nowhere near past national highs of 11-13%.

It will be up to the communities to cope, adapt and replace the mills with something else that can replace at least some of the tax revenue and local economic multiplier effects to keep other businesses going in the small communities. The decline of the pulp mill industry in BC, although painful for many, represents a unique opportunity for communities, and the province, to re-invent itself. Examples around the province include shifting the local economy to everything from eco-tourism and the arts, to the Gold River example of morphing the pulp mill into a waste incinerator.

Local politicians in Gold River are ecstatic that their tax-base and employment will be re-instated by the facility, but the health impacts of living near waste incinerators are well documented. The trade-off, while looking attractive in the short term appears to ignore the new and increased level of toxic load that the facility will bring to the community.

While the provincial government may be powerless to change macro-economic effects like the housing market of the United States, they are not powerless to help shape the local economic alternatives. Dealing with the toxic legacy of closed mills is not straightforward or cheap and it will be up to the Ministry of Environment to ensure that someone is taking responsibility for the legacy landfills full of toxic waste and all of the other pollution sources on a mill site.

The province can help best by helping to develop sustainable alternatives for local economies, providing bridging mechanisms and re-training for workers and fully participating in the transformation from mill towns to communities geared to the opportunities of the future. The government role is not to prop up a failing industry, but to support the communities and the workers who are facing traumatic times as they make this transition.

New York to Buy PCF

The Chlorine Free Products Association is pleased to announce that New York's new Governor, David Paterson (post Eliot Spitzer), recently signed an executive order mandating that New York state agencies, including SUNY campuses, begin using 100% post consumer waste content process chlorine free recycled paper!

—Chlorine Free Products Association, May 12, 2008

Green Paper Sales Jump

Canada's printing, newspaper, book and magazine sectors made major environmental headway in 2007 despite difficult economic conditions for Canada's paper mills. A report released in February at Paper Week by Markets Initiative shows more than 520 Canadian book publishers, magazines, newspapers and printers now have Ancient Forest Friendly™ or eco-paper purchasing policies in place, up from 172 publishers, printers and magazines at the beginning of 2007, a 300% increase.

Meeting this increased market, seventeen additional eco-papers were available to publishers in 2007. Whilst most paper producers faced record losses and mill closures in 2007, green paper mills fared well with increased sales and market access. One mill, Cascades Fine Paper, saw a 235% jump in the sales of their 100% recycled paper. Sales for Domtar Inc's FSC paper doubled from 2006 to 2007. Last October, Montreal-based Transcontinental became the first major North American print-media conglomerate to implement a paper-purchasing policy that champions "environmentally preferable'' papers.

New polling unveiled in the report shows these environmental initiatives – including printing publications on recycled paper – are greatly supported by Canadian consumers. Ninety five percent of Canadians say an environmental policy and progress toward meeting its targets are important benchmarks of a publishing company's environmental integrity.

—www.marketsinitiative.org, February 2008

There is a tide in the affairs of men, Which, taken at the flood, leads on to fortune; Omitted, all the voyage of their life, Is bound in shallows and in miseries, On such a full sea are we now afloat; And we must take the current when it serves, Or lose our ventures. – Brutus, *Julius Caesar*, Shakespeare

Ocean Energy in British Columbia

by Arthur Caldicott

British Columbia is awash in ocean energy. A handful of companies stand on its shores eager to try out a quirky assortment of untested machines which they hope will exploit that energy for electricity generation.

At present, the BC government's only ocean energy policy is no policy. Staking of ocean rights has already begun. First Nations and communities have little idea what to expect or how to respond to it. The environmental risks are unknown. As for the economic opportunity for BC in this emerging industry, the policy vacuum tells us there will be no "leading on to fortune."

Here Be Dragons: The Monster of Maude Island

What we don't know, we fear: cartographers have for millennia drawn dragons and other fierce mythical creatures on those parts of their maps where their knowledge was non-existent. "Here be dragons" – actually, it was "*hc svnt dracones*" – was inscribed five hundred years ago on the Lenox Globe.

There be monsters close to home, as well. Chief Harry Assu, an elder from Cape Mudge on Quadra Island, spoke of a place in Seymour Narrows between Quadra and Vancouver Islands where dangerous sea monsters dwell. "One of these monsters always emerged around Maude Island. It must have been fifty feet across," said Chief Assu. "Everybody stayed away for fear of being pulled in and dragged under the water." [*Spirit in the Stone*, Joy Inglis, 2000] Petroglyphs near the site depict what might be one of these monsters.

Perhaps it wasn't so much fear, as it was a cartographic and pictographic expression of the precautionary principle.

For the last sixty years, the tides haven't spilled between Maude and Quadra Islands. A causeway closed off the passage in 1942. Now Canoe Pass Tidal Energy Corp. wants to install turbines in the pass, remove the causeway, and let the 8-to-10 knot tides rip between the islands again.

Welcome back, tides, and welcome to a new breed of sea creature – generators that harness the energy in tides and waves.

Blind Vision: BC Energy Policy

For independent power producers (IPPs), British Columbia's 2002 Energy Plan was a dream. "The private sector will develop new electricity generation," the Plan said, and BC Hydro will buy it from them. The 2007 energy policy update added date and quantity targets to the directive – "self-sufficiency" by 2016.

What a gift to IPPs! Not only did government order BC Hydro to buy new energy only from private companies, but it dictated how much power BC Hydro has to acquire, told the public utility that it can't import power or build generation itself. With a captive market in BC Hydro, IPPs have been unleashed, bounty hunting for power projects. Monsters, indeed!

By these policies, analyst Marvin Shaffer calculates that BC ratepayers' pockets will be emptied of nearly 900 million dollars in 2016 alone. [Lost in Transmission, Marvin Shaffer & Associates Ltd., 2007]

The BC government actually did open the field for energy generation projects and technologies that were impossible within BC Hydro's culture of "big box generation" – big dams, reservoirs, and thermal plants. IPPs could run with the wind, so to speak.

But having unleashed the dogs, IPPs were guided by no public energy vision other than an ideological fixation on getting BC Hydro out of the generation business. Consequently, IPPs all ran to the safest thing – small hydro – and then to the bank, leading on to private fortune, at least.

Ocean Energy Potential in Waves and Tides

Waves and tides have attracted the interest of humans almost since we evolved onto land. Leonardo da Vinci studied them and sketched ingenious devices to harness their energy. The potential is obvious, predictable, and in many instances is found close to land, transmission systems and load centres. Ocean energy, aka hydrokinetic energy, is on the cusp of major exploitation for electricity generation.

A 2006 comprehensive study of Canada's ocean energy potential estimated that BC has a tidal stream capacity of 4015 MW at 89 sites which could produce 35,000 GWh of energy annually. BC's wave potential is 37,000 MW, which at only 10% energy conversion efficiency could produce 32,320 GWh. [Inventory of Canada's Marine Renewable Energy Resources, Andrew Cornett, 2006]

In reality, the wave energy present on BC's coast is an inconceivably large number. Also in reality, the practical usable energy is a mere fraction of what's there. (To put these numbers in some context, BC's "heritage" hydroelectric capacity is 10,232 MW, which produces about 44,500 GWh annually.)

MW, GW and GWh

To illuminate a 10 watt compact fluorescent light (CFL), a generator must have the capacity to produce 10 watts. To keep this light on for an hour, the generator would need to run for an hour, producing 10 watt hours of energy.

That same 10 watt hours could keep a 1 watt light emitting diode (LED) illuminated for ten hours instead of one, and the generator would only need a capacity of 1 watt, instead of 10. But the generator could NOT light up a 100 watt bulb for even a millisecond, because it only has the capacity to generate 10 watts of energy.

The key words are capacity, and energy. Capacity is usually measured in watts, kilowatts, and megawatts. 1 kilowatt (kW) = 1000 watts. 1 megawatt (MW) = 1000 kW. Energy is the electricity generated or consumed over a period of time. It is measured in kilowatt hours (kWh), megawatt hours (MWh), and gigawatt hours (GWh).

1 MWh = 1000 kWh;

1 GWh = 1000 MWh.

Unleashing Developers: Staking Frenzy

Since 2000, BC Hydro has indeed been in the crosshairs of companies seeking electricity purchase agreements. Eight years later, it's evident that the policy has not actually resulted in any new thinking in energy generation. Nearly sixty small hydro projects, a handful of biomass, and still no grid-connected wind project. BC is the only Canadian province which can make that sad boast.

The sixty hydro projects are merely the tip of a staking frenzy on BC's streams which rivals the province's earlier gold rushes.

But small hydro is all conventional construction and established technology. It does not represent a breakthrough industry for BC; it's more of what we do as hewers of wood, drawers of water, and importers of manufactured turbines. [See "Rivers of Riches," *Watershed Sentinel*, January-February 2007.]

Now the bounty hunters are staking sites in the sea. Over thirty ocean energy applications have already been accepted by the province's Integrated Land Management Bureau. More than 5100 hectares (ha) of promising tide and wave energy sites have already been claimed.

No policy is guiding ocean energy in BC. What there is consists of four-pages: the "Ocean Energy Project Application Directive," issued in June 2007, lists little more than the three types of permits developers must acquire:

- A two year renewable Investigative Permit, the first step, costs $500. 33 are on file. A tidal prospect is limited to 50 ha, a wave prospect is limited to 500 ha.
- A Licence of Occupation for installation of equipment, also costs $500. Canoe Pass is the first.
- An actual Ocean Energy Project costs $3300. There have been no applications yet.

Forty years ago, a tidal barrage was built in the Rance estuary on the Brittany coast; twenty years ago, another was constructed in the Bay of Fundy at Annapolis, NS. Both proved to be harmful to local ecology with heavy siltation, erosion, impeded water flows, and impacts on marine wildlife. Tidal barrages are mostly off the radar for future energy development because of the enormous capital cost and the enormous environmental impacts.

Continued on Page 18 ⇨

⇦*Dragons continued*

The environmental impacts that come with exploitation of waves and tides for energy are in most respects untested and unknown. Concerns include impacts to shipping, fishing, visual impacts, habitat disruption, effects on marine life, and electromagnetic effects. We don't know the scope of all the impacts, or even what some of them are. We are the monsters on this map – and we must proceed with great caution.

Water Wings for a New Industry

Government must be involved at the earliest stages in the research required to understand the implications and consequences of ocean energy technologies, otherwise companies with limited resources will do as little as necessary to obtain permits. What they learn will be held as proprietary information. It's a non-policy which ensures that the knowledge inventory and technological advantage goes to other jurisdictions.

SyncWave Energy of Pemberton, BC, has underwritten research at the University of Victoria, and its site near Tofino will be used to gather wave data. Company founder, Nigel Protter, says in an email that the site is representative of the BC coast's wave energy resource. He believes that this is the kind of work that government should be paying for. It benefits everyone in the industry, and ultimately is a benefit to the people of BC.

A government has many ways to encourage an industry, but fiscal incentives beat all the advertising and trade shows, and are what bring the investment in.

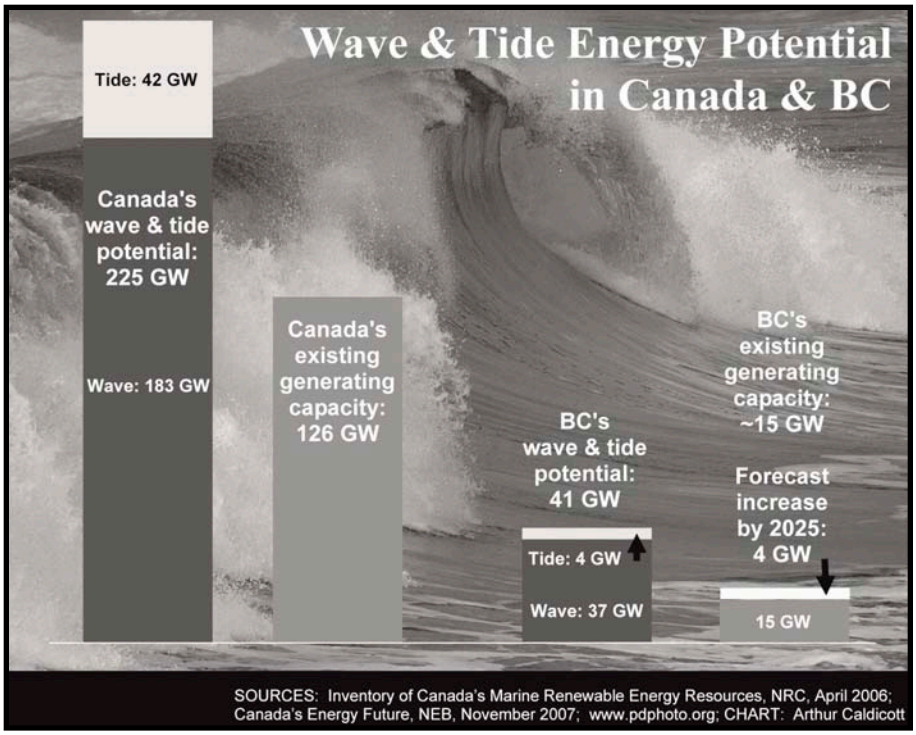
Europe has the most ambitious renewable energy goals. Its simple "feed-in tariff" has been effective in drawing investment and moving EU countries toward the renewables targets. A feed-in tariff covers the difference between the cost of generation using renewable technologies and the market price of electricity. The extra cost is blended and passed through to electricity end-users.

In Portugal, power from ocean energy is paid $363/MWh (€0.23/kWh.) In the UK, electricity from ocean energy and offshore wind fetches approximately $222/MWh. It makes a difference: Edinburgh-based Pelamis is in Portugal with its first production deployment, not the UK – because of the tariff.

BC Hydro will pay a rate centred on $88/MWh for any kind of power, whether it comes from rivers, wind, biomass, or fossil fuels. Changes to the Utilities Commission Act introduced in the spring 2008 legislative session may help with greenhouse gas reduction goals, but won't selectively encourage specific technologies.

Unrealized Potential

Ocean energy is not like small hydro, or even wind. With those energy sources, the technology is mature or at least settling into commercial stability. BC has no opportunity to take leadership with design or manufacturing.



Ocean energy is an emerging technology, in some shops still not far advanced from guys sketching schemes in the pub. The only commercial production is from the two old tidal barrages in Nova Scotia and France. But near Aguçadoura in northern Portugal, three Pelamis units are awaiting deployment. This will be the first commercial wave energy installation in the world, capable of producing 2.25 MW.

While it still can, the UK wants to seize the opportunity to become to ocean energy what Denmark has become to wind – a global leader. As part of that strategy, the country sponsors two testing sites.

- The £15 million European Marine Energy Centre (EMEC), in operation since 2004.

EMEC has wave and tidal sites in the Orkney Islands Developers can test their devices in the ocean without having to bear the costs of installing cables, connecting to the grid, build mounting berths, evaluating environmental impacts, etc. BC's Clean Current Technologies tested its tidal energy turbine at the facility. (www.emec.org.uk)

- In 2009, the £28 million Wave Hub off the coast of Cornwall will provide a site for full demonstration installations, where companies will obtain revenue from the grid connection. (www.wavehub.co.uk)

Canadian governments are aware of the opportunities. In 2006, Mossadiq Umedaly, who is now CEO of BC Hydro, wrote of ocean energy in his "Vision … for Growing a Sustainable Energy Cluster," that "We can be leaders in Sustainable Energy – in approaches, components, systems, and integrated solutions. …. We can become a market jumping-off point to India, China and more.… To further grow clean and green production the government needs to provide clearer policy and more direction."

The federal government has formed the Federal Ocean Energy Working Group, developed a comprehensive resource assessment, and provided some funding for the Race Rocks Tidal Energy project near Victoria. It was co-sponsor with AXYS Environmental Systems of Sidney BC, of the TRIAXYS Directional Wave Sensor – the state-of-the art in solar-powered, remote sensing, recording and transmitting of wave data.

The Nova Scotia government has underwritten $4.7 million for the Fundy Institute for Tidal Energy facility, where three turbine developers, including BC's Clean Current Technologies, will be able to test full-scale versions in the world's largest tides. EnCana is the second funding partner, providing $3 million.

EnCana has also provided $3 million for the Race Rocks project which deployed a prototype generator from Clean Current Technologies. The remaining $1 million came mostly from the federal government. The BC government's contribution: $187,000.

Glen Darou, CEO of Clean Current, says that nationally, and especially in BC, more can be done:

"The economic development angle has not been exploited, except in Nova Scotia. At this point if an industry is spawned it will be in the Maritimes. Nova Scotia is trying hard to displace coal fired electricity production. They are motivated.

"Ireland and Scotland are offering about 30 cents per kwh for ocean energy. As a result most of the development activity is happening in Europe."

Wise Monkeys

We are nearing breakthrough with ocean energy conversion technologies which are economic and will not ultimately destroy the environment that sustains us. BC's coast is one of the best places on earth to grow an ocean energy industry.

The energy potential is huge, but the economic potential for BC, were we to become a global leader with emerging ocean energy technology, is even greater.

We must also exercise caution – we humans have demonstrated repeatedly that our ingenuity and our greed can unleash the most dreadful monsters on nature. The oceans are already at risk. They too have a tipping point.

Yet the provincial government appears to be managing ocean energy with a uniquely British Columbian twist on the three wise monkeys theme. Hearing nothing, the government is issuing investigative tenures to every applicant. Speaking to no-one, no consultation or education is taking place, and no baseline data is being compiled to properly inform decisions on future applications. And seeing nothing, blind to its economic potential, BC's ocean industry is left to fend for itself, ensuring that the global winners in ocean energy won't be from BC.

♦

Stakes in BC continued on Page 20 ⇨

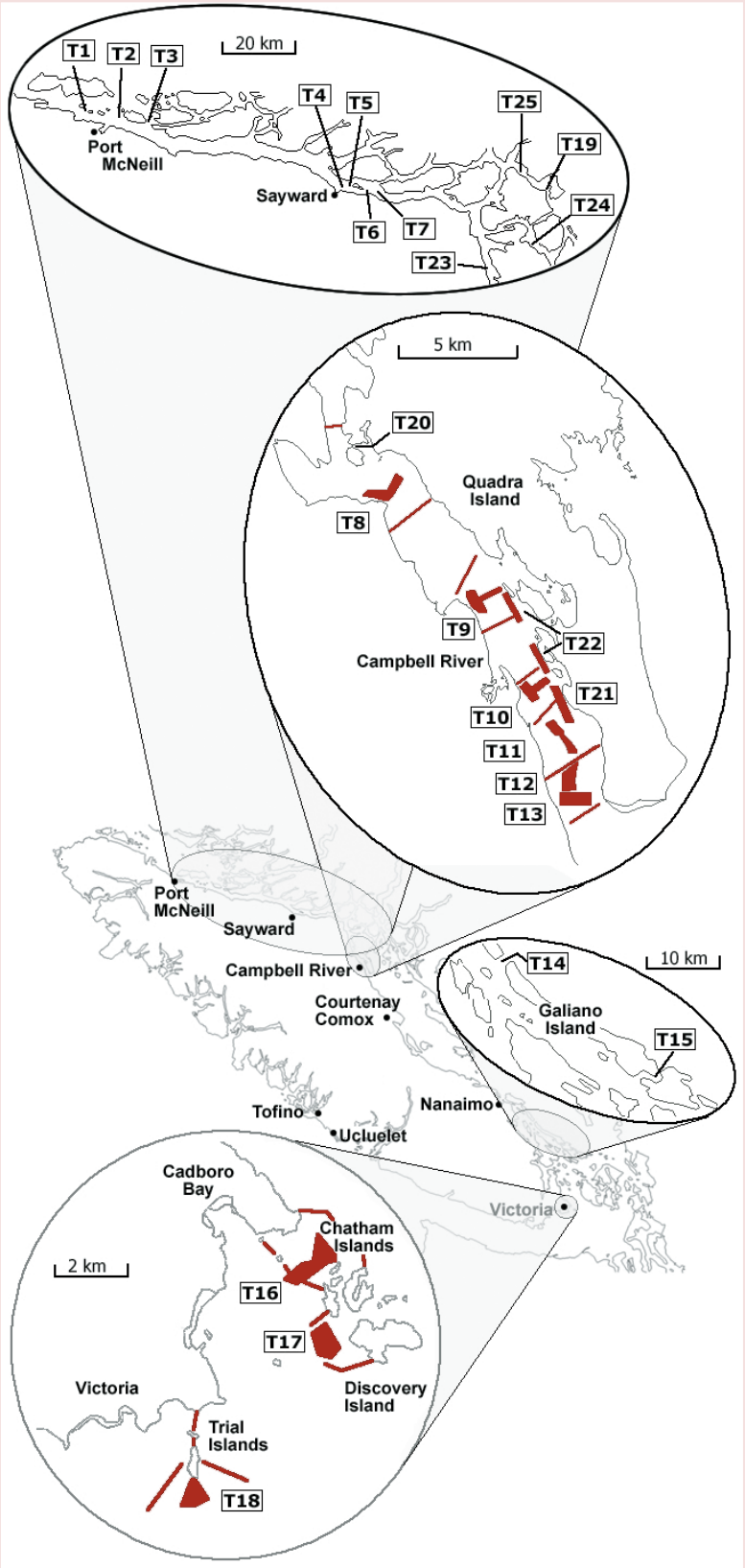
10,000 GWh or Bust

The challenge of matching supply with demand

By 2016, BC Hydro will need to purchase an additional 10,000 GWh of energy. A single plant capable of generating 1142 MW, if run continuously, would produce that amount of energy.

But that's not how electricity load or demand works in the real world. We use a lot more energy during the business day and early evening and in winter, than at night, and in the summer. That's not how the rivers, winds, and tides operate, either. Rivers flood in spring, dry up in summer, freeze in winter. Wind is sporadic. Tides go slack twice a day.

To get the required 10,000 GWh when it is needed, means that BC Hydro will have to contract for considerably more capacity than straight arithmetic would suggest. Instead of 1142 MW, BC Hydro may have to acquire 3000 to 6000 MW of capacity.



Tidal Energy Tenure Applications as of 20-April-2008

0778992 BC Ltd.

T1	Pearse Passage, near Alert Bay, 48.93 ha
T2	Weynton Passage, near Hanson Island, 49 ha
T3	Blackney Passage, near Hanson Island, 49ha
T4	Current Passage, near Helmcken Island 47ha
T5	Current Passage, near Helmcken Island, 49ha
T6	Johnstone Strait, near Helmcken Island, 50 ha
T7	Johnstone Strait, near West Thurlow Isl., 50 ha
T8	Discovery Passage, near Race Point, 49 ha
T9	Discovery Passage, near Orange Point, 47ha
T10	Discovery Passage, near Campbell River, 45 ha
T11	Discovery Passage, near Yaculta Bank, 50 ha
T12	Discovery Passage, near Yaculta Bank, 50 ha
T13	Discovery Passage, near Cape Mudge, 46 ha
T14	Trincomali Channel & Porlier Pass, 49 ha
T15	Active Pass at Matthews Point, 49 ha
T16	Baynes Channel, near Oak Bay, 48 ha
T17	Plumper Passage, near Oak Bay, 49 ha
T18	Enterprise Channel, near Trial Islands, 49 ha

BC Tidal Energy Corp.

T19	Innes Passage, Sonora Island, 23 ha

Canoe Pass Tidal Energy Corp.

T20	Canoe Pass, between Quadra & Maude Isld., 3 ha

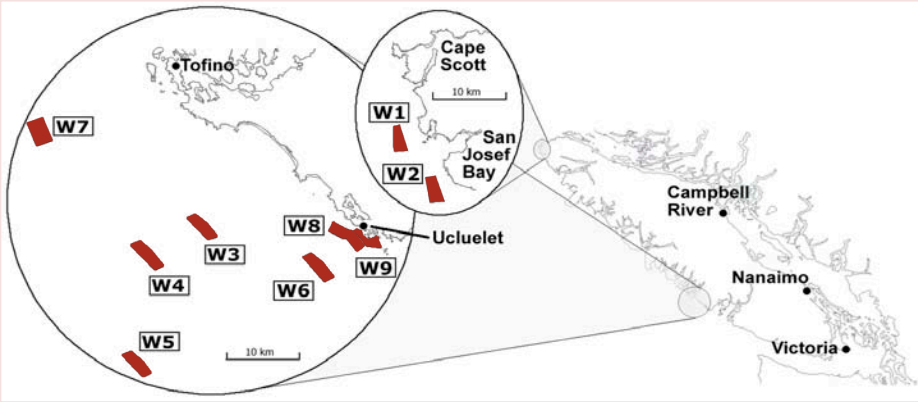
6420800 BC Ltd. (Lunar Energy)

T21	Cape Mudge, Quadra Island, 50 ha
T22	Discovery Passage, near Quadra Island, 50 ha

Orca Power Inc.

T23	Discovery Passage, S of McMullen Pt, 4 ha
T24	Okisollo Channel, W side Quadra Isld., 2 ha
T25	Dent Rapids, Cordero Channel, Sonora Isld, 6 ha

Wave Energy Tenure Applications
as of 24-April-2008



0778992 BC Ltd.
W1 W San Josef Bay, 497 ha
W2 SW San Josef Bay, 497 ha
W3 20 km W Ucluelet, 500 ha
W4 26 km W Ucluelet, 500 ha
W5 36 km SW Ucluelet, 500 ha
W6 8 km SW Ucluelet, 500 ha

Syncwave Energy Inc.
W7 21 km SW Tofino, 635 ha

Finavera Renewables Inc.
W8 1 km offshore Ucluelet, 496 ha

Global Energy Horizons Corp.
W9 adjacent Ucluelet, 425 ha

The Stakes in BC

As of mid-April, BC's Integrated Land Management Bureau lists applications for nine wave energy sites and twenty-five tidal energy sites. (tinyurl.com/2k4w4h)

Only one project is seeking a License of Occupation, at Canoe Pass (site T20) in Discovery Passage, all the others are Investigative Permits.

0778992 BC Ltd. for Fred. Olsen Group

Fred. Olsen Group is a Norwegian conglomerate with interests in just about everything to do with the oceans – shipping, fishing, offshore oil – and now 6 wave sites and 18 tidal sites in BC, including Active Pass, Porlier Pass, the Trial Islands, and most of Discovery Passage (which contains half of BC's practically usable tidal energy potential).

Fred Olsen's Buldra, now known as FO3

Technology: No tidal technology. FO3, the Fred. Olsen Group's wave energy device, exists only in scale model prototypes, though the FO3 is one of three technologies selected for Wave Hub. It looks like so many giant eggs bobbing under an offshore oil platform. The vertical motion of the eggs is converted to rotary motion which turns a generator.

Finavera Renewables Inc.,

Vancouver-based Finavera Renewables Inc., (TSX-V: FVR) has wind energy projects in Ireland, Alberta and BC. Five wave energy projects in the USA, Canada, South Africa and Portugal, including a power purchase agreement from PG&E, are all "under development," with no revenues.

Technology: The AquaBuOY wave energy converter consists of a floating buoy connected to the seabed by a long rubber tube. When the buoy rises with the wave, the tube stretches and contracts; when it descends, the tube expands. A neutrally buoyant piston floating at the top of the tube is connected to and turns a generator.

The only AquaBuOY in existence, a testing model built in 2007, was deployed in September off the coast of Newport, Oregon. It sunk a few weeks later, and now sits on the seabed. Finavera claims the device functioned as intended (apart from the sinking), and demonstrated that the company is betting on the right technology.

Finavera recently moved its wave energy operation to Oregon. Company spokesman Myke Clark says that Oregon has created a fiscal and regulatory framework to encourage ocean energy development, which does not exist in BC.

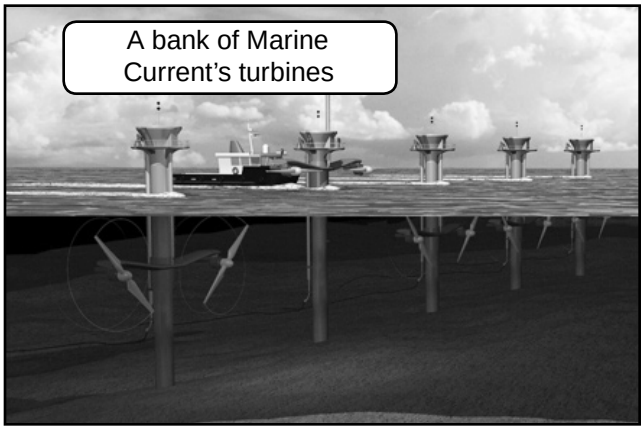
They intend to install a TRIAXYS wave testing device at the site off Ucluelet. If developed, the company envisions a farm of up to 400 AquaBuOYs, each generating 250 kW, capable of generating 50-100 MW or more.

www.finavera.com

SyncWave Energy Inc.

SyncWave Energy Inc., based in Pemberton, BC, has identified smaller off-grid oceanside communities and industries and off-shore applications as appropriate customers.

Continued on Page 22 ⇨


A bank of Marine Current's turbines

⇦*Dragons continued*

Technology: The Wave energy, "Power Resonator" consists of connected floating devices which, when tuned and operating together, optimize the energy conversion from wave action. Mounted in the centre of three outside "wave follower" devices is a resonator which "lags the signal" of the wave. The patented brains in the system is the tuner. It incorporates the company's "SyncWave Energy Matching System" or "SWELS". The tuner controls the resonator for optimum performance.

www.syncwaveenergy.com

6420800 BC Ltd.

Owned by UK-based Lunar Energy

Technology: "Rotech Tidal Turbine" is a horizontal axis turbine housed in a symmetrical Venturi duct. Water can flow either way through the device. It resembles the Clean Current Technologies turbine.

www.lunarenergy.co.uk

Canoe Pass Tidal Energy Corp.

Canoe Pass wants to build the first of six bridges, remove the sixty year-old causeway between Quadra and Maude Islands, and install a series of vertical axis turbines, each 6 m high by 6 m in diameter, produced by New Energy Corp. of Calgary.

The Canoe Pass Licence of Occupation application is the first of its kind in BC, all the others being Investigative Permits. The environmental impacts will be considerable, and disruptive, but they will largely restore the area to its condition prior to building the causeway in the 1940s.

BC Tidal Energy Corp.,

Sister company to Canoe Pass Tidal Energy Corp., BC Tidal Energy Corp. states it has an agreement with UK-based Marine Current Turbines, which makes a unique axial flow device, mounted with pairs of turbines.

www.marineturbines.com

Orca Power Corp.

This company name was once associated with Anthony Duggleby, who was once associated with Seabreeze Power and Katabatic Power.

Global Energy Horizons

Global Energy Horizons of Victoria describes itself as a company created to attract capital to the energy industry.

Technology: the Australian CETO II wave device is an anchored sea-pump operated by the action of a slightly-submerged float. Seawater is pumped to a turbine and generator onshore – which is why this site is adjacent to land. A commercial scheme would involve hundreds of 18kW CETO units in a farm.

www.globalenergyhorizons.com, www.ceta.com.au

Other BC Companies

Clean Current Technologies

Glen Darou, company CEO, of North Vancouver's Clean Current Technologies, which is clearly BC's leading technology developer for tidal energy, says no time will be wasted obtaining site permits because the company is focused on technology. It provided the turbine which was installed at Race Rocks and is one of three turbine designs chosen for the Fundy Tidal Energy Facility. It has been tested at EMEC. The product is a ducted horizontal axis device, similar to the Lunar Energy Rotech turbine. The company plans on versions with different blade sizes and ratings, and sees them deployed in farms of dozens to hundreds of units.

ww*w.cleancurrent.com*

Blue Energy International

At eleven years, Blue Energy may be BC's longest standing ocean energy company but has not been able to attract funding or a sponsor to build a demonstration project. Its vertical axis design, referred to as the Davis turbine, is named after Barry Davis, its early developer. The New Energy Corp. device is also derived from the Davis turbine.

www.bluenergy.com

Elsewhere in the World

Pelamis Wave Power Ltd.

Pelamis ("seaworm") is a series of huge floating tubes, with smaller tubes between them containing the hydraulic generating machinery which is activated as the tubes rise and fall with the wave action. Its first commercial wave project is near Aguçadoura, Portugal and it is one of the technologies implemented at Wave Hub

www.pelamiswave.com

Ocean Power Technologies

The Powerbuoy is a floating tube which is submerged below the surface. As it rises and falls with the waves, it

causes motion in a piston-like structure, which is connected to a generator. The device is designed to be deployed in farms of multiple units, and will be installed at Wave Hub.

www.oceanpowertechnologies.com

SMD Hydrovision

TidEL is a buoyant tidal energy device with two 500 kW turbines, mounted together on a single crossbeam. It is tethered to the seabed by a series of mooring chains. The device floats in the tidal stream, oriented correctly toward the oncoming current.

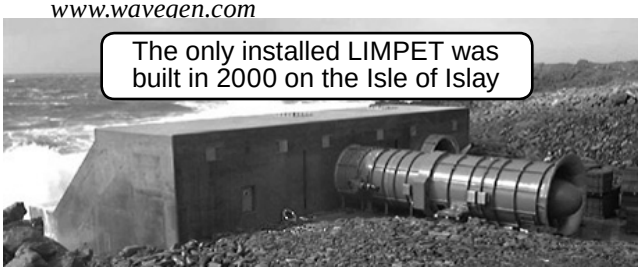
www.smd.co.uk

Wavegen

No discussion of ocean energy devices should omit the LIMPET, the "Land Installed Marine Powered Energy Transformer." It is mounted on land, and captures energy from the waves washing ashore.

Wavegen was purchased in 2005 by Voith Siemens, indicating the parent company believes the device has commercial promise.

www.wavegen.com



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For more information about this and other ocean energy devices see *www.bwea.com/marine/devices.html*

Reading list available at *www.watershedsentinel.ca*

Recommended reading

Inventory of Canada's Marine Renewable Energy Resources, CHC-TR-041, Andrew Cornett, Canadian Hydraulics Centre, National Research Council Canada, April 2006, at *www.oreg.ca*

A Feasibility Study: Tidal Power Generation for a Remote, Off-Grid Community on the British Columbia Coast, Bob Davidson, February, 2007, at *www.oreg.ca*

The Path Forward: A Plan for Canada in the World of Renewable Ocean Energy, The Ocean Renewable Energy Group, March 2006, at *www.oreg.ca*

Environmental Impact Assessment: Guidance for Developers at the European Marine Energy Centre, The European Marine Energy Centre (EMEC), 2005, *www.emec.org.uk/pdf/EMEC_EIA_Guidelines.pdf*

Thornton Bank – Oostende, Belgium

Wind Power in Europe

The first of six wind turbines base towers has left the West Flemish coastal town of Oostende for the Thornton Bank. Thousands of spectators watched the attraction. The wind turbine base was transported 30 km to the North Sea sandbank off the Flemish coast.

Once completed, the largest off-shore wind turbines in the world will tower 184 metres above the North Sea. The wind farm at Thornton Bank will not be visible from the coast.

C-Power is the company behind the multi-mullion-euro project to provide enough wind energy to supply 600,000 homes.

A total of 60 wind turbines should be up and running by 2012.

Also in April, the Scottish government formally rejected plans for one of Europe's largest onshore wind farms. Plans had been to build the £500 million windfarm in the Outer Hebrides.

The Lewis windfarm, with 181 turbines, was projected to produce 650 MW of electricity, roughly 10% of Scotland's electricity needs, but its location on a significant peat moor would have released carbon dioxide and endangered rare birds.

It was opposed by 11,000 islanders, despite its support from local government and the community financial trust. Scotland is committed to developing renewable energy projects to supply all its electrical usage.

—The Guardian, April 21, 2008

www.7on7.eu

We get a lot of questions here at the Watershed Sentinel, so we've started a regular column from your questions.

Write to: Ask WS, c/o editor@watershedsentinel.ca

Dear WS: I hear you about the cloth shopping bags, but if I did use plastic bags, are there any plastics that break down completely when put in the waste stream?

– Persistent in Powell River

Dear Persistent: Attempts to circumvent the problem of waste plastics are dividing themselves generally into two types of theoretically biodegradable plastics.

The first ones are petroleum-based plastics, which are decomposed by microbes or light, and have small amounts of additives, generally about 5 percent cornstarch. However, some "biodegradable" plastics merely break into very small pieces rather than changing their chemical make-up. And those very small pieces all wind up in a big flotilla in the middle of the Pacific Ocean.

Bioplastics are made from plant sources such as corn and wheat. They are designed to be composted, so microbes can break down the plant-based polymers they come from.

—NOVA, Australian Academy of Science.

Dear WS: My query concerns global warming. Seeing as it takes our solar system 225 million years to make one orbit of our galaxy, the Milky Way, could global warming and ice-ages be cyclical?

– Cosmic in Comox

Dear Cosmic: Yes, ice ages are indeed cyclical, but the causes lie well within our own solar system. The ice age cycle is based, as far as we know, on variations in the Earth's cycle around the sun. Scientists at Woods Hole Oceanographic Institution say: "Studies of the past million years indicate a repeatable cycle of Earth's climate going from warm periods ("interglacial," as we are experiencing now) to glacial conditions. The period of these shifts are related to changes in the tilt of Earth's rotational axis (41,000 years), changes in the orientation of Earth's elliptical orbit around the sun (23,000 years), and to changes in the shape (more round or less round) of the elliptical orbit (100,000 years)."

Scientists do not even really know if the last ice age is really over or if our present 11,000 year warming is just a short break, one which has proved most fortunate for humans.

Researchers at the University of California say analysis of 360,000 years of Antarctic ice cores shows that the last four great ice age cycles began when Earth's distance from the sun during its annual orbit became great enough to prevent summertime melts of glacial ice. The team found a correlation between ice ages and variations in the Earth's closest approach to the sun, every 23,000 years.

Changes in Earth's orbit that terminate ice ages amplify their own effect on climate through a series of steps that releases more carbon dioxide from the oceans into the air. This feedback has accounted for as much as 30 percent of the warming seen as previous ice ages end. The new timeline will allow researchers to test climate forecast models of the effects of carbon dioxide levels in the atmosphere.

—The study was published in *Nature*, August 23, 2007.

♦

It's Broom Removal Time – Again

by Sarah Downey

Soon those beautiful yellow broom flowers will be popping out, bringing sunshine to the landscape. Very unfortunately, Scotch Broom *(Cytisus scoparius)* is an invasive species to this area and considered a Noxious Weed by the BC Government. It was first introduced as an ornamental to the Victoria area in the late 1800's and has been marching north ever since, wreaking environmental havoc along the way. As it quickly spreads, it crowds out, shades out, and generally out competes native species and rare plants, as well it releases toxins and destroys wildlife habitat. Although we will never be able to eradicate broom, we can help ecosystems become more functional by removing it, or at least some of it periodically.

Scotch broom is native to southern Europe and northern Africa. It is still cultivated by some gardeners, and used to be spread to stabilize the sides of highways. It is highly invasive in the west, and its seeds will survive for up to 80 years.

In the old days, in the "old country," broom had two major uses, and was regarded as a useful plant. According to Maureen Gilmer of the DIY Network, dampened broom branches were used to sweep out bakers' ovens, and the branches also served as the "bubble pack" for shipping fragile items, such as whiskey bottles.

The best time to remove broom is when the plant is at peak bloom and the energy of the plant is in seed production. Small plants can be pulled and big ones can be cut close to the ground. There are tools that exist called "broom pullers" which can be very helpful for the removal of large plants. Some say that pulling out the big broom disturbs the soil and may encourage more growth. Seeds can remain dormant for decades and then become active again!

On Cortes Island there is a small group of volunteers who, with the support of BC Parks and FOCI work to remove broom in the Manson's Lagoon area. Thanks go out to Jim Hentschel and Fred Zwickel for spearheading this project. This initiative is in its 5th year and will require further volunteer energy to continue. Please consider lending a hand to help out this year.

If you see broom growing in your backyard or neighbourhood, do take some time to cut it back or pull it out if you can.

♦

Two BC "broom pullers" are The Extractigator and the Pullerbear, both, apparently, from Shawnigan Lake.

www.extractigator.com
www.pullerbear.com

Major Change for Friends of Cortes Island

With great regret we have to announce that our President, Richard Andrews, is leaving our organization. For personal reasons, he is moving to Salt Spring Island.

Richard has been in the Chair of FOCI for two years. He brought to our group many ideas from his younger perspective and a serious background in environmentalism and activism.

His contribution and support for putting together our newest I-CAN (Island Climate Action Network) initiative, working with our local children to set a vision for a transition towards reducing our community's carbon footprint and building local resilience, has been invaluable. His help has been key in making this program come to reality.

His viewpoints have always been positive and right to the point, with a broad understanding of environmental, economic and social problems at the global level, and focusing on practical solutions and actions at the local level. No matter how bad a situation seems to be, Richard always manages to find a constructive answer. Pessimism and cynicism are words that do not exist in his vocabulary.

The scope of his practical skills is huge, from farming and gardening, to transportation – his speciality is bikes, all of them – to green building, forestry, social issues, self-sufficiency and more.

We will certainly miss his wise and witty words in the weekly ads for his Monkey Wrench Bikes shop.

We want to express our most sincere appreciation for all his work and wish him all the best in Salt Spring. This is a big loss for Cortes Island and at the same time a big win for Salt Spring. We will miss you Richard !

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Watershed Sentinel,
P.0. Box 1270,
Comox, BC
Canada V9M 7Z8

by Maggie Paquet

A little over a year ago, I became a member of the Board of Directors of a brand new provincial non-profit society called the Stewardship Centre for British Columbia (SCBC). Currently, I am Vice-Chair of SCBC and represent Vancouver Island NGOs on the Board of Directors. I'm a member of the Citizens' Stewardship Coalition in Port Alberni. Since the SCBC just held its AGM after just over a year as a registered society, I felt it was a good time to increase awareness of the SCBC and an interview with Naomi Tabata, SCBC's coordinator, would be a great start.

Naomi: The SCBC is a partner-based non-profit organization dedicated to supporting ecological stewardship throughout BC. We do that primarily by making resource materials available and by helping build capacity of stewardship organizations.

Maggie: Where is the Centre located? What can people find there?

Naomi: SCBC is a virtual centre. We're found at *www.stewardshipcentre.bc.ca.* When you visit our site, you see the range of activities and projects we're involved in, as well as the numerous organizational sites we host, such as The Water Bucket. There's also a directory, the Stewardship Series, and a range of useful reports.

We define stewardship as an ethic that promotes living on the earth in a way that recognises the need to enable all living things to flourish – today and into the future. Among our guiding principles are that information we present is credible, knowledge-based, accessible, and responsive to the needs of stewards in BC.

Maggie: How did the SCBC start? Who are the people making up the SCBC now?

Naomi: The Stewardship Centre started with a group of government employees from various agencies who collaborated informally on resources for a variety of stewardship activities. Consultation with a number of sectors (education, industry, and ENGOs) consistently underscored the need to bring together diverse stewardship information and publications and make it electronically accessible for all. This was the initial rationale for creating a virtual stewardship centre for the province.

Maggie: What does the SCBC do? What are its goals? Who does SCBC serve? Who does it benefit?

Naomi: SCBC provides resources. One of our primary goals is to build the capacity of stewardship groups. We serve anyone with an interest in stewarding the lands and waters of BC. This includes private landowners, developers, planners, local governments, communities, and the general public.

Maggie: What are some of SCBC's current projects? Who does the work? How are projects funded?

Naomi: The *speciesatrisk.bc.ca* website was recently launched and is a tool for local governments and others to find information on species at risk in their region and suggested management strategies for each species.

Green Shores (*greenshores.ca*) is an ongoing project that promotes coastal planning and design that recognizes the ecological features and important functions of coastal systems.

The Green Bylaws Toolkit (*greenbylaws.ca*) is a new tool for local governments that provides comprehensive approaches and examples for stewardship planning and bylaws.

Stewardship Works! is one of our major projects. Its main goal is to build capacity of stewardship groups by providing small multi-year grants for core operating expenses. The success of stewardship groups in BC is limited by their lack of capacity. Most of the major funding sources for fisheries and watershed work have been lost. In fact, over $40 million worth of funding annually has disappeared. Stewardship Works! aims to fill the gap left by the loss of these funds. Most SCBC projects have an advisory committee. Some hire coordinators, but most are completed by volunteers, with my assistance.

Maggie: How can people get more involved with SCBC, or get their grassroots organization involved?

Naomi: Check out our website *(www.stewardshipcentre.bc.ca).* You can add your organization's profile and contribute events and publications. We would love to hear how we could help promote stewardship in your area. We are often looking for people who can assist us with volunteer opportunities and participate on project committees. Readers can contact me through the website if they have any questions.

♦

Changing Lightbulbs - A Dim Move

Spot the Naked Emperor!

"The threat is not considered to be significant."*—BC Hydro website on Compact Fluorescent lightbulbs*

" ... (CFLs) are running into resistance from waste industry officials and some environmental scientists, who warn that the bulbs' poisonous innards pose a bigger threat to health and the environment than previously thought." *—Alex Johnson, Msnbc website, April 7, 2008*

by Leslie Gillett

Why is there such a massive global push for compact fluorescent light bulbs? They are being marketed as the be all and end all to save the world from a return to the Dark Ages or perhaps another ice age. If everyone just changes one light bulb, the ads tell us oh-so-earnestly, All Will Be Well.

Conspiracy theorists are madly trying to find a link between CFL bulbs, weapons manufacturing, waste mercury treatment companies and leaders in the western world. While nothing conclusive seems to be appearing as of yet, even those of us without tin foil hats are wondering just what is behind all this hype.

First of all, there is the bread and circuses theory – as in distract the masses with something small and make them Feel Good and they won't notice the world's corporations are going along happily trading carbon credits in public and not being very green at all in reality. More coal burning plants are a good idea? Really, how distracted do the powers that be think we all are?

Secondly, there is the confirmed fact that the twirly lights are poisonous to humans and the earth. "Compact fluorescent bulbs do include small amounts of mercury, a toxic metal that can lead to adverse health effects for fish and humans," says the BC Hydro website.

No one has yet figured out how to deal with all mercury contained inside them ever so delicately. You cannot throw them out as they are deemed hazardous. So then what? Surely it would have made more sense to have a cradle to grave response in place before selling the bulbs to the unsuspecting public.

Since haz-mat gear is not usually found in Canadian closets, one would agree with Msnbc reporter Alex Johnson who says that if the disposal problem is to be solved, speed would appear to be called for: "Consumers bought more than 300 million CFLs last year, according to industry figures, but they may be simply trading one problem (low energy-efficiency) for another..."

Thirdly, there is the matter of the EMF interference as in when the TV keeps turning itself on. Then off. Then on.

From the General Electric website on CFLs: "Many electronic devices, such as radios, televisions, wireless telephones, and remote controls, use infrared light to transmit signals. Infrequently, these types of electronic devices accidentally interpret the infrared light coming from a compact fluorescent bulb as a signal, causing the electronic device to temporarily malfunction or stop working. (For example, your television might suddenly change channels.) Fortunately, this only happens when light is produced at the same wavelength as the electronic device signals, which is rare."

One wonders if perhaps the plan is to have us all glow in the dark so we won't need electricity to read at night.

What if all that time, energy and money had been put into a truly efficient light that does not cause head aches or toxic waste sites in the kitchen garbage?

Mercury Content Comparison

Product	Amount of Mercury	Number of Equivalent CFLs
CFL	5 milligrams	1
Watch battery	25 milligrams	5
Dental amalgams	500 milligrams	100
Home thermometer	500 milligrams – 2 grams	100 – 400

"We don't think that any amount of mercury is safe and it doesn't make sense to be spending huge amounts of money to clean it out of our environment, only to put some of it back through light bulbs," says Wendy Priesnitz, editor of *Natural Life* magazine. "...The best alternative is the light-emitting diode (LED). LEDs are already used in electronics, flashlights, headlamps for hiking and Christmas decorations, but their use as household lighting is not yet widespread, possibly due to the high price. But they are far superior to CFLs, so we think all that will change quickly."

LEDs are better than CFLs because they don't contain mercury, and better than halogens because they burn cool and aren't fragile. They last up to 10 times longer than CFLs - up to 60,000 hours, which averages out to 12 hours of light per day for 12 years. They are also highly directional, which means that they only put the light where you aim it.

LED technology is moving fast. It is already being used in remote African villages, using solar or bicycle power to provide white reading lights at night. Soon we will have inside lights without costing the people or the earth more grief. Ill-advised stop gap measures usually make things worse in the long run, which is why CFLs are highlighted in this edition of Spot the Naked Emperor.

♦

For information see:

www.oee.nrcan.gc.ca/energystar/english/consumers/questions-answers.cfm

www.lighting.com

When a CFL Lightbulb Breaks

The federal government's Natural Resources Canada website includes the following directions for minimizing the risk of mercury contamination when disposing of a broken CFL:

When a CFL breaks on a hard surface:

* Open windows (if possible) to ventilate the room for a few minutes.
* Wear rubber gloves and scoop or sweep up the debris with a stiff paper or cardboard, and then place the debris in a sealed plastic bag.
* Wipe the area with a damp paper towel and put it all in that same sealed plastic bag.
* Dispose of the bag in accordance with local disposal options as mentioned above.

When a CFL breaks on a carpet:

* Open windows (if possible) to ventilate the room for a few minutes.
* Wear rubber gloves to remove as much debris as possible with a stiff paper or cardboard.
* Use sticky tape (such as duct tape) to pick up any small pieces of glass or fine particles, and then if necessary, vacuum the area and then immediately dispose of the vacuum bag along with the debris and sticky tape in a sealed plastic bag.
* Dispose of in accordance with local disposal options...

All of this can be done by oneself – no need to call in a hazardous waste team.

Information on LED Technology

While there is no question CFL technology is more energy efficient than incandescent lightbulbs, there is increasing concern about the disposal of the bulbs and reservations about use in some circumstances. Some lighting pros are suggesting moving straight to LED (light emitting diode) technology.

* By using the directed light and increasing the utilization factor, LEDs decrease the overall electricity draw significantly.
* There is no lead used in the manufacturing of LEDs and no reason to recycle this technology (as opposed to florescent tubes).
* LEDs are directional and therefore far more efficient than conventional lighting by getting the light where it needs to go. An incandescent desk lamp will draw about 50 watts of power whereas an LED desk lamp will use 2 or 4 watts of power. The LED desk lamp uses the directionality of the emitting light to make it more efficient, reducing the power required.
*New advances in LED technology have created longer lasting, brighter lights.
*LEDs do not emit UV (ultra violet radiation), making them ideal for use in art galleries or wineries as the products are not adversely affected by the damaging effects of standard light bulbs. In fact, the Mona Lisa is currently illuminated with high brightness LEDs because of the lack of UV rays.
* LEDs can endure extreme temperatures. Because of this LEDs are the perfect choice for solar powered lighting. LEDs offer up to 50 lumens/watt of light energy. Unlike fluorescent fixtures, LEDs have no ignition problems in cold temperatures, which, in fact, increases their efficiency.

—from the dealer website *Nemalux.com*

For more information on these products, one Canadian dealer website is *www.greenNclean.ca*

Around The World

Compiled by staff

Carbofuran Kills Hippos

Conservationists in Kenya are calling for a ban on the neurotoxic pesticide carbofuran, after the death of several hippopotomuses and paralysis of lions which ate the dead hippos at the Maasai Mara Game Reserve. Carbofuran is illegal in Europe and might be banned in the US. In Canada it is still legal for use on potatoes, raspberries and strawberries in BC, canola, turnips and rutabagas. According to Health Canada, in the early 1990s between 100 000 and 500 000 kg were used annually in Canada. Carbofuran leaches, and its persistence in soil and water varies depending on the conditions.

—France 24, April 28, 2008, Health Canada, www.pmra-arla.gc.ca

Alta First Nation Sues

The Beaver Creek Cree First Nation northeast of Edmonton have filed a huge civil lawsuit against the federal and Alberta governments, claiming oil and gas development renders its treaty rights meaningless. The statement of claim lists more than 15,000 approved or proposed developments in its traditional lands, which the band says means that Treaty 6 guarantees to hunting, trapping and fishing are infringed. The First Nation seeks compensation and a halt to the exploitation.

—Canwest News, May 15, 2008

Good Work

On May 1st, thousands of longshoremen walked off the job, or rather, simply didn't report to work, closing the entire US west coast to shipping for the day, in protest against the war in Iraq. The protests attracted support from a range of causes. "We're loyal to America, and we won't stand by while our country, our troops and our economy are being destroyed by a war that's bankrupting us to the tune of $3 trillion," the president of the International Longshore and Warehouse Union, Bob McEllrath, said in a written statement. "It's time to stand up, and we're doing our part today."

—New York Times, May 2, 2008

"It's time to stand up, and we're doing our part today." –Longshore union

EPA Head Forced Out

The head of regulation for the Environmental Protection Agency in US Midwest says she has been forced to quit her job because she was doing it. In an interview with the Chicago Tribune, Mary Gade said two top officials at the EPA in Washington stripped her of her powers as regional administrator and told her to quit or be fired by June 1. In particular, she had tried to force Dow Chemical to clean up four hot spots of dioxin, including the largest ever recorded in the USA, spreading from its Midland Michigan plant into Saginaw Bay and Lake Huron. Dow went to Washington instead. Dow acknowledges it is responsible for the dioxin contamination from manufacturing Agent Orange, but has resisted government involvement in cleanup plans. In the early 1980s, the EPA's acting national administrator resigned after it was revealed he had ordered regional EPA officials in Chicago to censor a report on the dangers posed by dioxin.

—Chicago Tribune, May 1, 2008

No Prepaid Water Meters

The High Court of South Africa has ruled that the City of Johannesburg's forced prepayment water meters scheme in Phiri, a township in Soweto, is unconstitutional, on the basis of differentiation between low-income historically black townships and wealthy historically white suburbs. The Court also ordered the City to provide residents of Phiri with 50 litres of free water per person per day, on the basis of the needs of the residents and the availability of the water and financial resources to do so. The Court said the State is obliged by the constitutional protection of the right to water to provide free basic water to the poor.

—Right to Water Programme, May 2008, www.cohre.org/water

No Uranium Mines For British Columbia

BC has announced that the province will not support the exploration and development of uranium and is establishing a "no registration reserve" under the *Mineral Tenure Act.* This will ensure that future claims will not include the rights to uranium and that all uranium deposits will remain undeveloped. Saskatchewan is the only province in Canada where uranium mining is active, although claims are being staked in Ontario. After extensive public hearings, BC had imposed a uranium mining moratorium in the 1980s, but it had expired.

— BC Energy, Mines & Petroleum Resources, April 24, 2008

Talcum Powder Warning

The Cancer Prevention Coalition is demanding that a warning label against genital use be placed on talcum powder, since it is strongly associated with ovarian cancer. The Chicago-based coalition has been trying since 1994 to get the US Food and Drug Administration to act on the findings of dozens of studies which show an increased risk of between 35 and 90% among women and girls who used talc, which is made from ground rock and similar to asbestos. Most convincingly, there is no such elevated risk in women whose fallopian tubes had been tied, blocking the access of talc dust to the ovaries.

—Cancer Prevention Coalition, March 30, 2008, www.preventcancer.com

Mobiles Bad for Babies

A study of 13,000 children has surprised researchers by revealing that pregnant women who used mobile phones just two or three times a day substantially raised the risk of their babies developing hyperactivity and difficulties with conduct, emotions and relationships. Further, the likelihood is even greater if the children themselves used the phones before the age of seven. The study follows a warning from the Russian National Committee on Non-Ionizing Radiation Protection that pregnant women and children should limit their use of the phones due to long and short term mental effects on the children. Canadian research on pregnant rats exposed to similar radiation has found structural changes in their offspring's brains.

—The Independent, May 18, 2008 www. http://www.independent.co.uk

Two Poems by Hannah Main

WHEN UGLY WAS NOT YET

White loon throat was whiter then
our eyes did not know rushing
did not point and click

pebbles - each with its own distinction
as well as family and lineage-
were true to themselves
and reverent as water

in those days no two shards
of arbutus bark were the same

fir needles, cones, bracts
were distinctive in their myriads
none not one
had been reproduced as a likeness

before pigments and pixels
before frames and reframing

it is the time just before waking
the moment before seeing becomes naming
the breath a pencil takes before
it implements.

THE CURE FOR URGENT TRAVEL DESIRE SYNDROME

involves travel far off in a place close by. Live close to water? You're halfway there.

Are any ducks more gorgeous than male Harlequins? If so, it's a marvel you do not need. These dabblers on the rocks suffice; cinnamon butt, white dotted. They could brag but don't. Fabulous brochure birds cannot compare. Exotic is right here

but without the jetlag. Will they depart soon to nest by mountain rapids? Bless them; they shall return again.

Urgent! There are even more birds in the next bay over! Take a vow of stability and don't move. Teal sides, chalk stripes and ciphers figure it out.

No more rushing no more grabbing. The treatment is taken by eye. You're cured when you really arrive at last, right where you are.

UN Says Change Global Farming

A new United Nations Environment Programme report from the International Assessment of Agricultural Science and Technology for Development (IAASTD) by over 400 scientists has called for radical changes in global food production. It recommends localizing food production and using more "natural processes" like crop rotation and organic fertilizer.

The benefits of modern agriculture have been spread unevenly and have come at an increasingly intolerable price paid by small-scale farmers, workers, rural communities and the environment.

Professor Robert Watson Director of IAASTD said those on the margins in developing countries are ill-served by the present system: "The incentives for science to address the issues that matter to the poor are weak... the poorest developing countries are net losers under most trade liberalization scenarios."

The report says that the way to meet the challenges lies in putting in place institutional, economic and legal frameworks that combine productivity with the protection and conservation of natural resources like soils, water, forests, and biodiversity while meeting production needs.

In many countries, it says, food is taken for granted, and farmers and farm workers are poorly rewarded for acting as stewards of almost a third of the Earth's land. Investment directed toward securing the public interest in agricultural science, education and training and extension to farmers has decreased at a time when it is most needed. The authors conclude that continuing with current trends would exhaust our resources and put our children's future in jeopardy.

Professor Bob Watson, Director of IAASTD said: "To argue, as we do, that continuing to focus on production alone will undermine our agricultural capital and leave us with an increasingly degraded and divided planet is to reiterate an old message. But it is a message that has not always had resonance in some parts of the world. If those with power are now willing to hear it, then we may hope for more equitable policies that do take the interests of the poor into account."

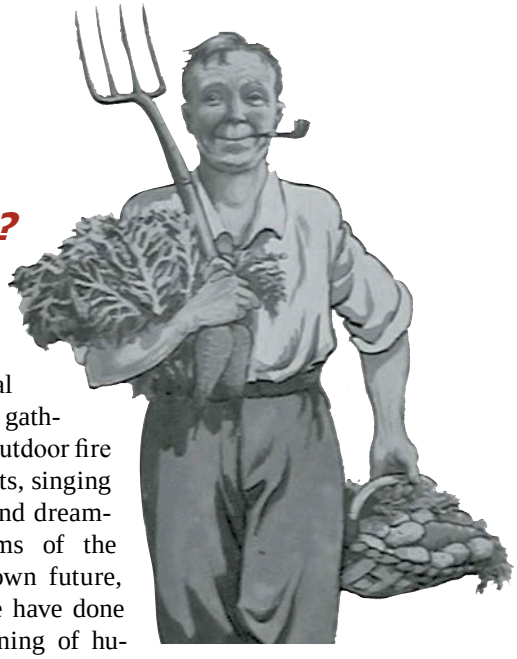
At an intergovernmental plenary in Johannesburg, only USA, Canada, the UK, and Australia of 64 governments withheld or qualified their approval of the report.

—International Assessment of Agricultural Knowledge, Science and Technology for Development, April 15, 2008, www.agassessment.org

What's for Dinner?

Is food security slipping away?

by Don Malcolm



Probably the most frequently asked question throughout the world on any given day is, "Hey Mom, what's for dinner?" At the moment of birth, a child's first priority is to fill its lungs with air, establish a voice, and then to eat. After finding the mother's breast and satisfying its hunger, the next priority, for the baby and the mother, is to drift off to sleep. They have both worked hard. Throughout their lives food will be a major consideration for both mother and child.

Through the lean times and the fat, throughout North America, children rarely went to bed hungry. Wild game such as venison, grouse and fish, along with wild fruits, nuts, lamb's quarters, (also known as pigweed) provided many country meals.

In December, after lakes and streams were frozen over, a hog was slaughtered to provide meat for a family over winter. Before electricity became available, meat was frozen in wooden barrels in sheds outside the houses. A hundred pound bag of Keynote flour stored in a secure place, yeast, two pounds of salt and five pounds of sugar, rolled oats and powdered milk for porridge, five pounds each of butter and lard, and water from a clean creek, or a dug well, could easily see a family through the winter. A small flock of hens produced eggs and a chicken for the pot now and then.

In the spring, brooding hens increased the flock's number, if the rooster managed to avoid the stew-pot over the long winter. A cow to provide milk and butter was a blessing. Having access to a mixed forest with maple trees was an exciting adventure for children and a boon to a family's food supply. Staying up late at night boiling down maple sap until it became syrup, with some set aside in a cast iron pot for additional boiling to produce taffy on snow and maple sugar, must have left a sweet memory ingrained on the hearts and mind of many Canadians.

Those who shunned the major cities and established their homes, instead, in the rural areas, found themselves better-off in the lean times than did those who chose the shifting, fanciful benefits of the cities.

Life was considerably less stressful for country folk. Once the gardens were established and harvested, the root-cellars and wood-sheds filled, and the preserving done, winter in the country offered considerable benefits. Parents knew where their children were. In winter they may be, along with their parents, skiing or sleigh-riding on a local hill on moonlit nights, skating on a local safe pond or just gathered around an outdoor fire on the dark nights, singing or just talking and dreaming their dreams of the past and their own future, as young people have done since the beginning of human awareness. The long days of summer when children were let loose from school were filled with chores in the family garden, fishing for trout or bass in local streams and lakes, picking wild berries, and engaging in countless adventures, real and imagined.

Food produced in summer was usually more than enough to sustain a family through the winter. Farm gate sales provided some income, enabling rural families to purchase city produced goods, if necessary.

Looking backward, it might appear that we held our world in our collective hands. Did we let it slip through our fingers? Where did we go wrong? Were we worshiping at the alter of Mammon while our elected governments sold us out to multinational corporations? We no longer know where our food comes from, or if it is safe to eat. Pesticide residues are everywhere, even in mothers' milk.

We must take back control of our food supply. We need to aggressively demand that elected politicians forsake their shared beds with the multinational corporations, and that the Canadian Wheat Board remains in place. Perhaps we should resort to guerrilla gardening in the dark of night, planting food crops wherever possible, and especially on the lawns of provincial legislatures, and the parliament in Ottawa.

We are in grave danger that control of our food supply could be handed off to transnational corporations.

When our citizens are arrested and charged for growing food in their back yards for their own dinner tables, we will be very sorry that we didn't try harder to gain the attention of our elected representatives.

♦

Ignoring The Elephant With Wings

by Barry Saxifrage

When I read in George Monbiot's book, *Heat*, that there is no climate-compatible solution for high-speed air travel, I didn't believe it. I couldn't accept that the world must stop nearly all of its flying.

At first I thought I could bike more, turn down the heat, and still fly. But Monbiot's indictment of people who know better, but are unwilling to make the necessary changes themselves, stung. To continue to fly, I had to prove to myself that my flying was OK.

Through two years of research, I watched my flying emissions overwhelm all my other efforts. I finally had to look at the elephant in the room sitting in front of me, and it had wings. Monbiot and others were right: a person can't live a climate-sustainable life and still fly. Air travel is the one major industry without an available technological solution to climate change.

Join The Club

My research did reveal that I'm not alone in this collision between hope for a livable future and desire for high-speed air travel. Addiction to flying is forcing countless individuals, families, businesses and governments into untenable positions. Here are a few examples.

Flying Over Patagonia

Patagonia founder Yvon Chouinard has been at the forefront of the environmental movement for decades. Patagonia's mission statement includes to "use business to inspire and implement solutions to the environmental crisis."

Chouinard knows the stakes. He states, "global warming is deadly serious for the future…we can't wait for the government; it'll be too late." He quotes David Brower: "There's no business to be done on a dead planet."

Yet, when asked if he personally struggles with any environmental issues he admits there is a "special place in hell" for him, paved with his own flying emissions. Organic cotton, yes. Stop traveling by plane to favourite fishing destinations, no.

Hundreds Of Tonnes

Canada's leading environmental voice for decades, David Suzuki is one of CBC's greatest living Canadians and host of the popular TV show "The Nature Of Things" for years.

He ardently warned the public over a decade ago that global warming is the biggest threat to human beings' survival as a species outside a nuclear holocaust. Suzuki states that, to survive climate chaos, each person can emit no more than one tonne of carbon emissions from fossil fuels a year.

Yet by his own calculations, his yearly flying emissions are hundreds of tonnes more than what the average Canadian emits for everything in their lives. More importantly, his flying emissions are hundreds of times the sustainable limit he says we all must meet. Spurred on in part by his daughter, he is now starting to scale back some on his global jet-setting.

Except For That

National Geographic recently produced one of the best primers on climate change, a Special Report titled "Changing Climate." Currently available on newsstands, the report summarizes what everyone "should know," and what each person "can do."

The senior editor describes his family's extensive efforts to reduce their emissions by bringing in a professional energy auditor and a top efficiency expert. They installed a ceiling fan, turned down the AC and the water heater, changed light bulbs, used power strips, drove less, biked more, walked to the farmers' market and so on.

When time came to add it all up they were in for a "big surprise" because their emissions were double the average Americans. Their many efforts were "small potatoes," more than wiped out by a single flight.

What did this highly-motivated family do when it ran smack into the elephant of their flying emissions? Skipping the flight "was never an option," and "if you put our plane trip aside…[we] were able to cut our personal CO2 emissions by almost half. Not bad."

In the carbon math of even the most environmentally aware, if the elephant in the room has wings, it doesn't count.

The Business Of Stewardship

REI is the USA's largest consumer cooperative with more than three million active members. Its mission is to "inspire, educate and outfit for a lifetime of outdoor adventure and stewardship." REI has pledged to be carbon-neutral by 2020.

REI's single biggest source of emissions? Adventure travel flights. They account for 30% of all REI's emissions, while only serving a tiny 0.1% of active members. The share of REI's greenhouse gas emissions by these 4,000 people is

75,000% more per person than for the remaining 99.9% of members.

It gets worse. REI's total emissions grew 24% in one year from 2006 to 2007. The cause for the huge increase: "more people traveling."

So how does one of the world's premier, member-owned co-ops with a central mission of earth stewardship react to this elephant with wings trampling their efforts? Do they return "adventure travel" to its low-emission roots of sailing ships and trains, cycling and hiking? After all, it is hard to think of a continent more loaded with opportunities for adventure than North America. Or do they ignore their rapidly growing elephant? According to the *Seattle Times:* "The company will stay in the adventure-travel business, whose revenues and profits it doesn't disclose."

Nation State

England has made some of the most forceful calls to action of any government. How does flying fit in to the British government's strategy? According to the UK's own Tyndall Centre on Climate Change, aviation emissions account for over 10% of the UK's total, and comprise the fastest growing source. At current rates, aviation alone will use up all 100% of total allowable emissions for every aspect of English life and industry within decades.

Yet last year, government employees flew over a million miles per workday on government business, not including military flights. In the age of the Blackberry, the web, instant global messaging and video conferencing, the official response seemed overly pat: "The Government would never indulge in unnecessary air travel."

The government also has a high-profile push to expand airports including Heathrow, the world's busiest airport. It also refuses to levy the same taxes on aviation fuel as it does on gas for road transport, providing flyers with a 30% to 40% savings on fuel costs over what drivers pay.

The British government, like individuals and corporations, doesn't acknowledge the elephant with wings sitting on the scale as it strives to counterbalance climate change.

Why Does It Matter?

Everyone has their areas of hypocrisy and contradictions. Why focus on environmentally aware folks and their oversized flying emissions?

Because, when world-wealthy, highly-motivated, climate-knowledgeable people can't come to grips with their biggest climate impact, one that is a non-essential luxury well beyond the reach of 90% of humanity, what hope do we have for a bottom-up, grass-roots emissions solution?

It seems we are going to have to "wait for government" to solve climate change, after all. But, sadly, even our government laws and proposed solutions are unlikely to reduce flying emissions.

Flying has a special status that exempts it from limits imposed on other emission sources: no fuel tax; not included in Kyoto; not included in any cap-and-trade schemes; not even on the emissions balance sheets of any nations.

Worse, all our laws to reduce climate changing emissions, whether carbon taxes or cap-and-trade, rely on the marketplace to distribute a limited amount of fossil fuels based on price alone. The people who can afford to buy the fuel get it.

People who fly frequently are the world's wealthiest, the last folks on earth affected by carbon pricing. Just look at the last few years. Jet fuel has quadrupled in cost, yet aviation miles continue to grow at 7%, and aviation emissions at 5%, year after year. If years of relentlessly rising fuel prices coincide with record increases in flights and flying emissions, how will further cost increases from carbon taxes cut the bulk of emissions?

In fact, all the world's climate changing emissions are skyrocketing even while fossil fuel prices climb to new heights. What's going on?

The Missing Puzzle Piece

Professor Stephen Pacala of Princeton suggests an answer. His latest research shows that 50% of all global climate changing emissions are caused by the wealthiest 8% of the population. The majority of emissions are caused by the folks who are the least sensitive to price. It helps explain why flying is growing despite price increases.

If the most wealthy cause the majority of emissions, we have trouble ahead. To significantly blunt demand by the most wealthy, fossil fuels will need to be extremely expensive. Long before we get to a price that changes the wealthy folks' behaviour, most other people will have been priced out of their ability to fuel their cars or maybe even buy their food.

If so, our current tools will lead to carbon riots long before they lead to big carbon cuts. Voters will ultimately reject a system that hurts the majority of folks and doesn't even solve the problem.

Aviation is the biggest, clearest example of the fundamental flaw we have with our current schemes. It highlights why our best plans are in danger of failing spectacularly.

We need a tool that addresses the huge emissions of the wealthiest folks world wide. A single price for carbon alone won't do it. Carbon rationing, a personal emissions cap, tiered pricing or something else might. Now is the time to start that discussion.

♦

Complete and extensive sources for this article are available from the Watershed Sentinel or on line at www.watershedsentinel.ca

A Valley of Heroes

by Joe Foy

By the end of May, if everything goes to plan, the government of BC will have enshrined the protection of 11 new provincial parks and 70 new conservancies, totaling almost a million hectares.

The new protected areas span landscapes that were the battlegrounds of the War in the Woods back in the late 1990s. Elaho Valley – Sims Valley – Great Bear Rainforest – Haida Gwaii. They are all represented in the new parks and conservancies. So too are more peaceful valleys in the Whistler area, the Okanagan and up the coast. Every valley, every mountain lake, every stream has a story of the people who laboured for its protection.

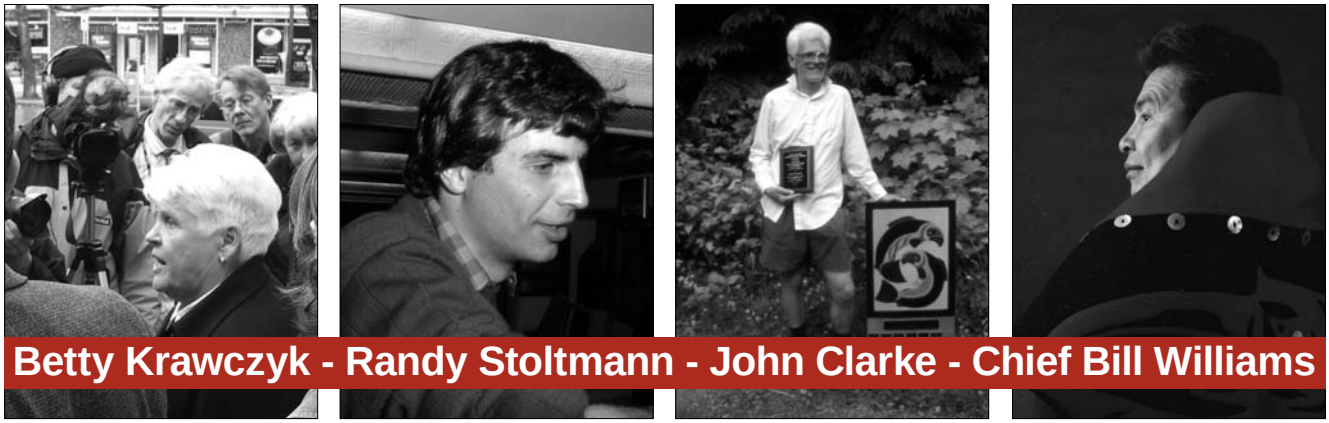
But it is the Elaho Valley that I am thinking about today. The fight for the Elaho was without a doubt the toughest, most demanding conservation campaign I have ever been involved with. By the time it was over, an amazing collection of eco-heroes had stepped up to save the valley.

Of course nobody knew how tough it would be in the early spring of 1994. That's when Randy Stoltmann stopped by the Wilderness Committee's office in Gastown to leave a copy of his latest report. In it, he detailed what he believed was the largest tract of wilderness remaining in the Vancouver area. He'd mapped out a vast expanse of roadless area centred on the Sims, Clendenning and Upper Elaho Valleys in the mountains north of Squamish. He'd scaled the surrounding peaks and looked down at the great green valleys. "It was really something," he told me with a twinkle in his eye. "The Upper Elaho is a huge wide valley carpeted in old growth forest – the logging companies are going to flip out when they see my report calling for its protection," he said with a little smile.

That was the last time I ever spoke with Randy. Less than a month later he had lost his life in a mountaineering accident while ski touring the vast wilderness of glaciers and peaks that surround BC's Kitlope Valley – midway between Kitimat and Bella Coola.

Randy had been the pathfinder for many of us in the wilderness preservation movement. Though barely 30 when the mountains took him, Randy had already mapped out many of the biggest trees in Canada, all of them in BC's coastal rainforest. He'd authored several books on big trees and wilderness. It was Randy Stoltmann who had pointed the way to Carmanah Valley as home to the tallest trees in Canada. The valley eventually was protected with the designation of the Carmanah Walbran Provincial Park. And it was Randy who had shown us the Elaho.

Accompanying Randy on his fateful traverse of the Kitlope peaks was John Clarke – a wilderness legend in his



Betty Krawczyk - Randy Stoltmann - John Clarke - Chief Bill Williams

own right. John had more first assents of peaks in the rugged Coast Mountains than just about anyone. Many of his epic journeys he'd done alone – mostly, he said, because he couldn't find anyone else able to complete the weeks long treks required.

For nine years after Randy's death John worked tirelessly to protect the wilderness that Randy had mapped. John recreated himself as a wilderness educator giving countless presentations in campgrounds, schools and even the Provincial Legislature in Victoria. He was a passionate voice for the preservation of Coast Mountain wilderness in general and Randy's wilderness around the Elaho in particular.

Then, when a brain tumor took John's life in 2003 the Elaho had lost another of its heroes.

Great Grandma Betty didn't like it one bit when she saw that young people who had been protesting logging in the Elaho Valley had been beaten up by a mob of angry loggers in 2000.

A lot of people didn't like to see that – but Betty Krawczyk chose to protest the beatings by standing on the mainline logging road leading to the Elaho and refusing to move to let the logging trucks pass. For this she received a year in prison – serving four months before her harsh sentence was overturned and she was freed.

Chief Bill Williams is both a hereditary and elected chief of the Squamish Nation. Through all the turmoil, Bill worked quietly and with great determination to map out a series of Squamish Nation Wild Spirit Places, including the Elaho Valley. He worked day in and day out to educate people both within and without the Squamish Nation on the importance of protecting these areas for future generations. It was through government-to-government negotiations that the Squamish Nation finally achieved protection for the Elaho and many other areas in their territory.

Time and space do not allow me to list all of the heroes involved in the preservation of the Elaho. There were so many. So many heroic acts.

All I can say is that if you are involved in a fight to save a little piece of wild BC, may I suggest taking a bit of a break. Go take a hike on the Elaho trail. Walk in the footsteps of heroes. Then go back to your neck of the woods – and win.

♦

Joe Foy is Campaign Director for the Wilderness Committee, Canada's largest citizen-funded membership-based wilderness preservation organization, which has 28,000 members from coast to coast.

Photos by Wilderness Committee

Forbidden Fruits

The more we demand, the less we get

by Gordon Albright

> **The way to grow grand**
> **Is not to demand**
> **In life's every field,**
> **You are what you yield**
>
> **—Piet Hein**

From the dawn of the human race, our greatest challenge has been to keep our higher intelligence from doing us more harm than good. Our growing cleverness opened up all kinds of tempting new opportunities. Unfortunately, most of them turned out to be "forbidden fruits," which seemed wonderful at first, but ended up costing us far more than they were worth. Like the Sorcerer's Apprentice, when we tried to make our lives easier and better, we usually brought disaster on ourselves.

Modern science, technology and industry have made the problem far worse. Our reckless pursuit of Forbidden Knowledge and Forbidden Power, that go beyond what we can have without harming our future, now threatens the very survival of the human race. For the first time in human history we are not only destroying the capacity of the land to support us, but also the capacity of the oceans. We are causing more and worse natural disasters all the time, such as climate change. We have ravaged our natural life-support system for a brief surge of false prosperity, to the point where even fresh water and food are starting to run low. Excessive demands that were once driven by arrogance are now driven even more by desperation.

At first it may be hard to accept that things are exactly the opposite of what we thought, that all our struggle and sacrifice to make our future better have only made it worse. But until we accept our human and natural limitations, and learn to live within them, we will keep on destroying ourselves. If we don't do this of our own free will, the natural world will force us to do it at far greater cost, and it may be more than we can pay. When we try to make our lives far better than they can be, we make them far worse than they ought to be.

5 Laws of Survival

❶ We cannot live at the expense of our future

❷ We must care for everything that our future depends on ahead of ourselves, and even sacrifice ourselves if necessary

❸ One for all and all for one

❹ All the material products we consume must be completely recycled as fast as we consume them

❺ When we use our material power for the greatest immediate gain, it destroys us

Giving up all the things that we can only have at the expense of our future, especially when we've become addicted to them, may seem like resigning ourselves to lives of misery, darkness and despair. But in fact, giving up everything that costs us more than it's worth is the only way to *free* ourselves from misery, darkness and despair, make rapid progress, make science, technology and industry serve us instead of destroying us, and build lasting well-being. As Lao Tsu has said,

> **"The bright path seems dim;**
> **Going forward seems like retreat;**
> **The easy way seems hard…"**
>
> **—Tao Te Ching 41**

Our greatest need is not for material wealth and power, but for security and stability. These can never be achieved by bludgeoning each other and the natural world into submission, but only by building strong, mutually supportive partnerships among ourselves and with the natural community of life. This is the only way we can ever gain the secure, stable material support that is essential to our survival and prosperity. Instead of trying to master the material world we must learn to master ourselves, to achieve the spiritual wealth of needing as little as possible, and the spiritual power of having as much as possible to give. Then we will no longer destroy everything that sustains us by demanding too much from it, and giving too little in return.

The Five Laws of Survival (*Watershed Sentinel*, September-October 2007) are a necessary and sufficient set of conditions for human survival on Earth. They define our natural limits, and how to live within them. They are the guidelines for building a new, healthy, flourishing human society on the ashes of our old, sick, dying civilization. They will give us genuine, lasting progress, instead of a brief spurt of false prosperity that ends up destroying us.

To keep on working and sacrificing for our present self-destructive civilization and our current way of life (which is really a way of death) will destroy us. We can only save ourselves by facing reality, and living as it requires. For the sake of ourselves, our children, everything that sustains us and our future, we must learn to live within the limits of our safe, lasting means of support. This is what we must fight and work for, with everything we have in us.

> **The desire of power in excess caused the angels to fall;**
> **The desire of knowledge in excess caused man to fall.**
> **—Sir Francis Bacon**

We're perfectly capable of doing what we have to do, once we realize what it is. Our greatest responsibility, to ourselves and to everyone else, is to establish a lasting base of support that gives the entire human race all the real necessities of life. This will make most people better off materially than they are now, and we'll all have everything we really need. The overall quality of life will be far better for everyone. We'll have far greater stability and security, our families and communities will be far stronger, we'll be far better off emotionally and spiritually, and our lives will be far richer and happier. We'll finally be at peace with ourselves, each other, and the natural world.

It's not about saving the planet, it's about saving ourselves. We're at the crossroads of our existence. Our greatest enemies used to be our arrogance and our manic optimism, which made us think we could easily overcome any disaster our recklessness and destructiveness might cause. But now our greatest enemies have become our cynicism and pessimism, that make us think we're doomed no matter what we do. If we give up on ourselves and on each other, and put immediate concerns ahead of our lasting well-being, then short-sighted cleverness will win out over far-sighted wisdom, and we'll sacrifice our future for our present until we destroy ourselves.

But if we all do the best we can to put our lasting well-being first, limit our immediate demands to what we really need, and give as much as possible in return, then far-sighted wisdom will triumph over short-sighted cleverness, and we'll have the greatest Renaissance the human race has ever seen.

Best of all, if we do survive this critical test, it will finally teach us how to live without destroying our future. Then we'll keep on making genuine progress for as long as the Earth lasts, if not longer.

♦

Gordon Albright is a Professor Emeritus of Mathematics at York University.

Getting There is Half the Fun

by Carrie and Barry Saxifrage

When we did our first carbon footprint, the only truly bad news was that a single trip to Southern California to visit our families was equal to an entire year of driving our Subaru Legacy. That one flight was far more greenhouse gas than a person can emit for an entire year's transport, if they don't want to contribute to devastating climate consequences. Everything else in our footprint we could work with: line drying our clothes, biking more, buying local products, turning down the heat, getting a more efficient car.

But no flying? Giving up flights to great vacation destinations wasn't too hard because there are so many things we love to do close to home and the pleasures of flying faded as the climate consequences came clear. But what about our family visits? We love the yearly visits to California. It connects us with our parents, siblings, nephews and nieces. We relied on our ability to fly in choosing to live so far from our families. If we can't in good conscience fly to see them every year, how will we maintain those relationships?

Time for a road trip!

Time was indeed the main issue, because flying is so much faster. We could have done the entire road trip to Southern California within the two weeks of our son's spring break, if we pushed. But we wanted to explore. So we arranged to add two more weeks and be available for work by email. Then we loaded up the Prius with wetsuits, and drove the coastal route to Los Angeles.

We found fossilized clams on a white, wind-swept Oregon Beach. We were miniaturized in time and stature by the huge trunks of the coastal redwoods. We read Cannery Row aloud, and recognized the place names around Monterey Bay. We watched elephant seals and sea lions lounge and sea otters frolic. We toured Hearst Castle. We visited our favourite winery. We looked up lots of old friends we hadn't seen in years and spent the lovely nights with their families. We rode a cable car. We played "Punch Prius" until we reached Berkeley, where they became too thick to play anymore. We drove along twisting roads high above the glittering sea, drinking in the light. We zipped through gridlock in car pool lanes from Santa Barbara to Orange County, gaping at the single occupant SUVs around us. And, whenever we could, we pulled on our wetsuits and splashed into the chilly, roiling Pacific to play in the waves.

Our Prius averaged 21 km/liter (49 miles/US gallon). Although we traveled 3000 km more than the flight distance due to side trips, we still spent only about $100 per person on gasoline. Best of all we produced 75% less emissions than we would have just on our flight…more than 2 tons saved. In total, we have reduced our yearly transportation emissions from 8 tons apiece four years ago to less than 1 ton apiece this year.

And we still got to have a great time with our family in Southern California. In addition, we reconnected to the landscape and to our friends along the way in a way that flying doesn't allow. In fact, getting there was half the fun.

♦

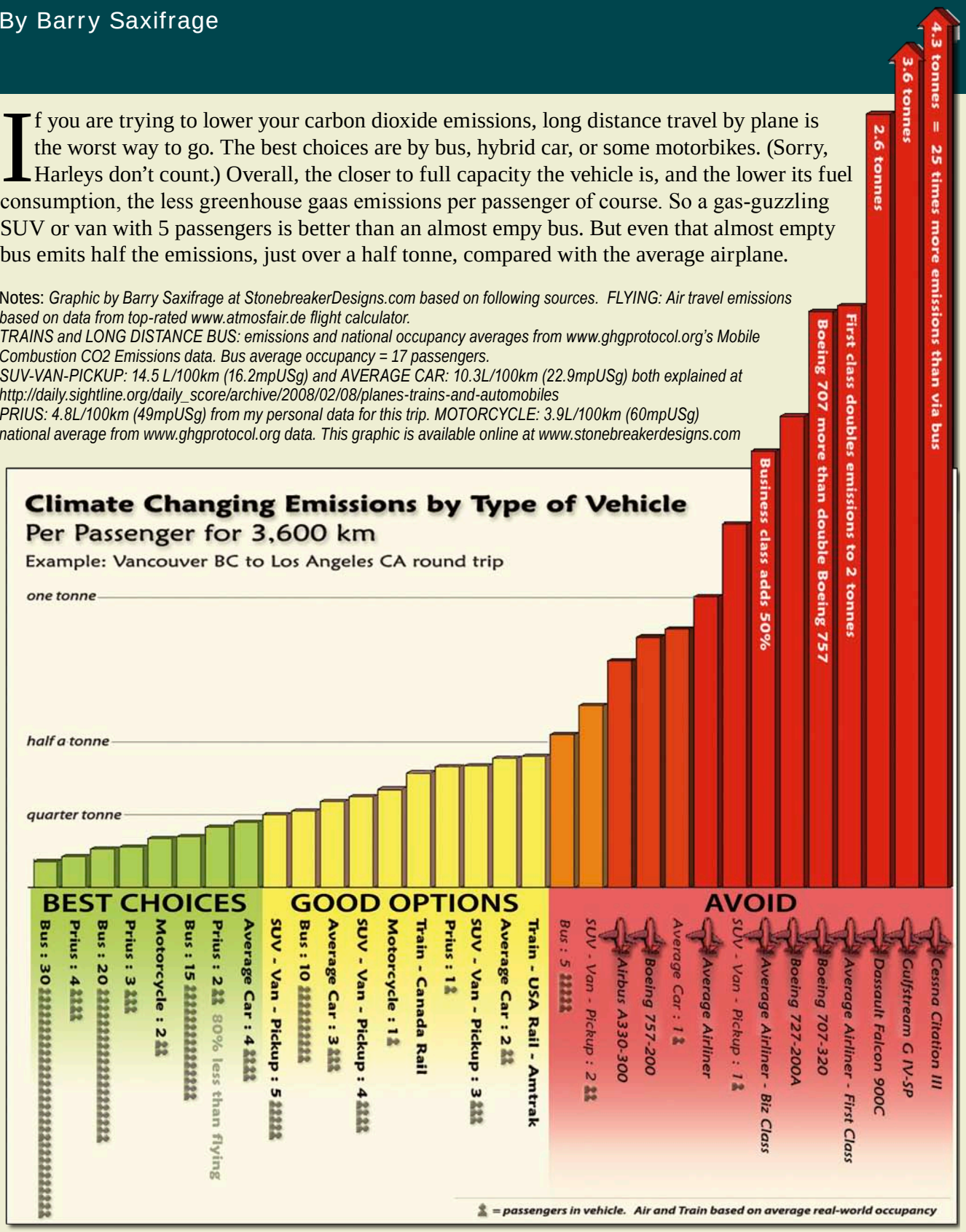
Barry Saxifrage creates websites and tracks new climate change information. Carrie works as administrator at Linnaea School, a K-8 school on Cortes Island that emphasizes connection to the natural world. The Saxifrages enjoy growing food and exploring by rowboat.

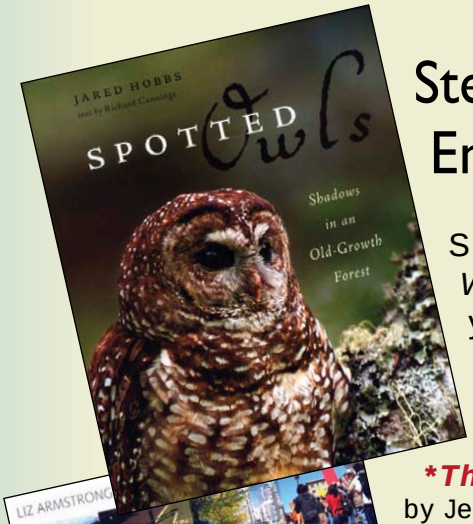
Plane or Train? Bus or Van?

By Barry Saxifrage

If you are trying to lower your carbon dioxide emissions, long distance travel by plane is the worst way to go. The best choices are by bus, hybrid car, or some motorbikes. (Sorry, Harleys don't count.) Overall, the closer to full capacity the vehicle is, and the lower its fuel consumption, the less greenhouse gaas emissions per passenger of course. So a gas-guzzling SUV or van with 5 passengers is better than an almost empy bus. But even that almost empty bus emits half the emissions, just over a half tonne, compared with the average airplane.

Notes: *Graphic by Barry Saxifrage at StonebreakerDesigns.com based on following sources. FLYING: Air travel emissions based on data from top-rated www.atmosfair.de flight calculator.*
TRAINS and LONG DISTANCE BUS: emissions and national occupancy averages from www.ghgprotocol.org's Mobile Combustion CO2 Emissions data. Bus average occupancy = 17 passengers.
SUV-VAN-PICKUP: 14.5 L/100km (16.2mpUSg) and AVERAGE CAR: 10.3L/100km (22.9mpUSg) both explained at http://daily.sightline.org/daily_score/archive/2008/02/08/planes-trains-and-automobiles
PRIUS: 4.8L/100km (49mpUSg) from my personal data for this trip. MOTORCYCLE: 3.9L/100km (60mpUSg) national average from www.ghgprotocol.org data. This graphic is available online at www.stonebreakerdesigns.com





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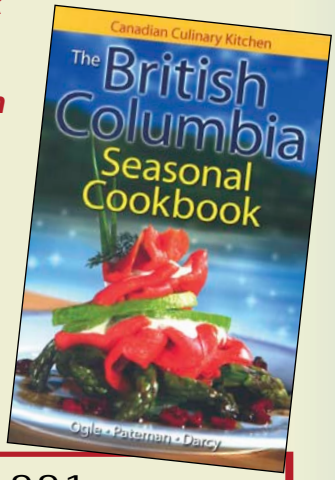

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