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GENUINE CANADIAN MAGAZINE

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GUEST EDITORIAL

A Terrible Ambivalence

"….We are not going to have a future better than the present: not in our lifetimes, and not in those of our grandchildren's grandchildren. We collectively closed the door on that possibility decades ago, and none of the rapidly narrowing range of choices still open to us now offers any way of changing that…Once a car goes skidding off a mountain road into empty air, it requires neither a crystal ball nor a faith in predestination to recognize that nothing anybody can do is going to prevent a terrific crash.

"It's nonsense to claim, as some inevitably do, that this realization makes taking action pointless. Our efforts, given hard work, wisdom, and a substantial dollop of luck, may well succeed in making the future less difficult than it will otherwise be.…During the age that is coming to an end, the billion or so of us who have lived in the industrial world have enjoyed comforts and opportunities that our species had never known before and almost certainly will never know again. Those could never have been anything but temporary, they were distributed no more fairly than anything else passed around by human hands, and a wiser species would likely have had more common sense than to launch itself on the trajectory we followed, but it's as distorting to dismiss the extraordinary achievements of our age as it would be to ignore the terrible cost for those achievements that will be paid by us and our descendants.

"So many of us want things all one way or the other, all good or all evil, without the terrible ambivalence that pulses through all things human as inescapably as blood. So many of us want to see today's civilization as humanity's only hope or as ecocide incarnate, and long for a future that will be either the apotheosis or the final refutation of the present. It's far less popular, and arguably far more difficult, to embrace that ambivalence and accept both the wonder and the immense tragedy of our time. Still, it seems to me that if we are to face up to the challenges of the future that's bearing down on us, that difficult realization is an essential starting point."

John Michael Greer, September 2009,
http://thearchdruidreport.blogspot.com

In this humanity

In this humanity,
In which we all live,
We are all
A part of each other.

What a wonderful world
We will inherit,
When we recognize ourselves
When we meet.

Don Malcolm, 2009

Round-Up Ready Beets

In September, a US federal judge overturned approval of a sugar beet genetically engineered to resist Monsanto's Roundup. Noting that pollen from genetically altered sugar beets could be blown by the wind long distances to related crops, such as chard and table beets, the judge ordered an environmental impact statement examining the issue.

A similar ruling in 2007 forced a ban on planting Roundup Ready alfalfa until a re-examination was done. That environmental impact statement is not yet done.

The plaintiff, an organic farmer, says steps were taken to keep similar crops apart to prevent cross-pollination, but Roundup Ready seed growers would not divulge which fields were growing genetically altered crops.

The judge did not address the harvest of this year's crop, half of which comes from Roundup Ready sugar beets.

—AP, September 23, 2009

GM Flax Infects Prairies

Europe has confirmed the contamination of Canadian flax with a genetically modified (GM) flax, cutting off sales. The Canadian Grain Association found one genetically modified seed out of every 10,000.

The GM flax has been illegal to grow in Canada since 2001 when flax growers forced the government to take the product off the market to protect their export markets. How the GM flax got into the crop this year is a mystery.

—Globe & Mail, October 27, 2009

Tamiflu Found In Water

Results from water treatment plants in Japan have found Tamiflu, the most important flu-fighting drug, in its active form in every sample. River residues showed lower amounts. The test was not conducted during a pandemic, when Tamiflu prescription rates might be 10 times higher.

Scientists from Kyoto University are concerned that ducks and other water birds, which are natural influenza carriers, may develop and spread Tamiflu-resistant strains of seasonal and avian flu, although not H1N1, which bypasses birds.

—Science News, September 30, 2009

Curry-cure?

Scientists are reporting, in the *Journal of Agricultural and Food Chemistry,* the development of a nano-size capsule that boosts the body's uptake of curcumin, an ingredient in yellow curry now being evaluated in clinical trials for treatment of several diseases.

Curcumin is a potent antioxidant found in the spice, turmeric. Clinical trials are checking its safety and effectiveness for colon cancer, psoriasis, and Alzheimer's disease. However, digestive juice in the gastrointestinal tract quickly destroys curcumin so that little actually gets into the blood.

Encapsulating insulin and certain other drugs into structures called liposomes can boost absorption. The scientists prepared the liposomes encapsulating curcumin and fed them to laboratory rats. Encapsulating more than quadrupled absorption of curcumin, and also boosted antioxidant levels in the blood. The encapsulating process could be an answer to the problem of increasing curcumin's absorption in the digestive environment of the gastrointestinal tract, they suggest.

—American Chemical Society, November 4, 2009

Talcum Powder Linked to Ovarian Cancer

The US Cancer Prevention Coalition warns that genital talc dusting is a dangerous, but avoidable, cause of ovarian cancer. Since 1992, over a dozen major scientific articles documenting the link between talc and ovarian cancer have appeared in leading medical journals. The capstone of research against talc came in 2003 when the journal, *Anticancer Research*, published a large scale review of 16 previous published studies which found a 33 percent increased risk of ovarian cancer in talcum powder users.

In 1994 and 2008 the Cancer Prevention Coalition submitted a Citizen's Petition to the FDA requesting that a warning label be placed on *all* talcum powder products. The FDA failed to respond, but it is hoped that the new FDA commissioner, Margaret Hamburg, MD will take the issue more seriously.

—World Wire, September 30, 2009

From Our Readers

Re: Biomass Nightmare

I agree we should be very sceptical and critical of large scale projects in the BC Interior to burn trees to make electricity, since they over-commit long-distance transport of biomass and create socio-economic path dependencies beyond the timeframe of the immediate beetle epidemic.

But I have an open mind about small scale bioenergy concepts, especially when they address and solve a number of problems at the same time, for instance on Cortes Island, with a Coastal Douglas Fir/Coastal Western Hemlock transition ecology that has been somewhat dependent on fire ecology for Douglas Fir regeneration. Wildfires may be natural, but definitely send a lot of CO_2 into the atmosphere, and can be pretty destructive on thin soils and late-seral biodiversity, not to mention human residences.

Ecoforestry practices on the coast aim towards resilience and maturity in our native forests, and try to address this fire risk by thinning to reduce the chances of catastrophic runaway crown fires, but a lot of this work can be costly, and if always left in the bush, the culled trees can also present a fuel-loading situation. So I wonder if there's a practical way to weed out "non-commercial" hemlock regen. and cover the costs of that work by running a small-scale steam turbine selling power into the grid.

Even better for the carbon cycle might be some sort of biochar/pyrolisis process that does the same with partial combustion, but also creates charcoal as both a miraculous soil amendment and a very durable carbon store.

As with mega-hydro power export projects versus sustainable local power systems, the scale of any project can be a good indicator of how sustainable or "green" it really is.

David Shipway, Cortes Ecoforestrty Society, Cortes Island, BC

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

Have You Heard

Saskatchewans Oppose Nuclear Power

Public consultations on the Saskatchewan government's Uranium Development Partnership saw an "overwhelming response" against nuclear power and other aspects of the industry, widespread concern over health, safety and environmental impacts and skepticism towards the partnership itself, according to a report prepared by former NDP Deputy Minister, Dan Perrins. The Saskatchewan Party government said the report will not necessarily halt development but it does signal the province to be careful in how it proceeds.

—Saskatoon Star-Phoenix, September 15, 2009

BC Land Protection, Some New

The BC government has introduced Bill 10, the Protected Areas of British Columbia Amendment Act, 2009, to establish one new "Class A" provincial park, an ecological reserve and make additions to seven existing provincial parks.

It will also enact nine new conservancies covering more than 111,000 hectares that were established by Order in Council in December 2008. These nine conservancies are a result of the Haida Gwaii land-use agreement with the Haida Nation. Adding these areas to the act will give them full legislative protection. More than 14 per cent (or 13.5 million hectares) of BC is protected.

—BC Ministry of Environment, September 24, 2009

Fish Gear Recovered in Puget Sound

In August, fishnet cleanup crews, made up of commercial divers, pulled 173 nets from Puget Sound, many of them choked with the remains of sea life that include seals and porpoises. The Northwest Straits Commission wants to clear 90 percent of existing derelict fishing nets from Puget Sound by 2012. Decades of commercial and recreational fisheries have left tonnes of old fishing gear behind that can continue to trap sea life for years.

—Peninsula Daily News, September 14, 2009

The Salish Sea

In early November the Washington State Board on Geographic Names joined BC and Canada in approving the addition of Salish Sea as a name for the body of water encompassing Puget Sound, the Strait of Juan de Fuca, and the Strait of Georgia

—Straight.com, October 30, 2009

Alberta Sour Gas Ruling

The Alberta Court of Appeal has ruled that Alberta residents were denied their rights to oppose the drilling of a pair of potentially deadly sour wells, 140 kilometres southwest of Edmonton. The court decision could dramatically increase the number of people that must be consulted before future wells containing deadly hydrogen sulphide can be drilled in Alberta. The Board has suspended licensing approvals while it considers the ruling.

—Edmonton Journal, October 28, Energy Resources Conservation Board, November 3, 2009

Quebec Innu Against Hydro Project

The Innu of Uashat Mani-Utenam want a permanent injunction to stop the Romaine project, a $6.5-billion plan for four dams along the Romaine River, which would produce 1,550-megawatts of electricity by 2020.

The Innu contend a huge portion of the Romaine project, notably the transmission lines, is going to be built on the backbone of their traditional territory. The Innu say they have not been consulted nor given consent to the project and the governments are infringing on their ancestral rights on the territory. The four dams will have negative impacts on the territory, the ecosystem and their way of life, such as fishing and hunting traditions.

—National Post, September 4, 2009

New Hopes for Coral Reefs

A three-year study in the Galapagos Islands has discovered new species of coral – as well as some thought to be extinct, raising hopes that coral reefs may be more resilient to rising sea temperatures than previously thought.

Honeycomb coral had apparently been wiped out in 1997-98 by the last big El Niño event, but the study conducted in the northwest of the main archipelago found several separate colonies.

Many scientists fear that concentrations of CO_2 in the atmosphere are already high enough to ensure a mass extinction of coral in the coming decades. The Galapagos study indicates that algae, which have a symbiotic relationship with coral, may be adapting to warmer ocean temperatures.

—The Guardian, September 9, 2009


Rachel Darvill

Back Country Wreckreation

by Jim Cooperman

As the Olympic spotlight begins to shine on British Columbia, citizens need to learn more about the exponential increase of habitat destruction caused by off-road vehicle 'wreckreation.' Not only is the backcountry environment getting trashed, but non-motorized trails are being over-run by irresponsible ATV and motor bike riders, in some cases making these trails unusable for cycling and hiking.

While the problems are occurring throughout the province, particularly in alpine areas and wetlands, it is in the drier Thompson, Okanagan and Kootenay grasslands where off-road wreakreation is most problematic because these machines can go anywhere.

Once areas have been damaged, the impacts can last for decades. The escalating problems from off road vehicles is compounded by the lack of regulations, as BC is the only jurisdiction in North America that does not require licenses or training to operate these vehicles.

The Coalition for Licensing and Registration of Off-Road Vehicles, which includes the ATV Association, the Outdoor Recreation Council and stewardship groups, produced a report with 47 recommendations, from licensing to trail markers. The BC Wildlife Federation is not a member of the Coalition, advocating for a simplified approach featuring point of sale licensing to enable identification of irresponsible use. The province is now finally considering new regulations, including visible license plates, to better control off-road vehicle use.

Thousands of riders from other provinces and states where rules exist travel to BC yearly and tear up the hillsides. Dave Quinn, program manager with Wildsight says, "It is not just summer use that is out of control, as snowmobilers flock here from Alberta every winter and shred up critical caribou habitat." In 2007, 3,000 snowmobilers tore up Boulder Mountain near Revelstoke during their "Big Iron Shootout." Consequently the local snowmobile club has been working with government to discourage future large events like this one that can damage plantations and leave mounds of litter.

It is not just summer use that is out of control, as snowmobilers flock here from Alberta every winter and shred up critical caribou habitat.

Europeans who have come to cycle the province's famed Kettle Valley Railway trails are returning home with the message that these trails are becoming unusable for cyclists due to the damage caused by ATVs and motorcycles, particularly near Midway and Beaverdell.

The TransCanada Trail has also been hit hard by off-road vehicles, especially in the Chilliwack River valley. Hardest hit in the Shuswap are the accessible alpine areas such as atop Crowfoot Mountain and on Hunter's Range, but the problems occur wherever ATVs, motorcycles and 4x4s enter wetlands or make new trails on steep hillsides.

The off-road vehicle clubs have a key role in solving the problems caused by a small but growing group of irresponsible riders. Not only do these groups help to educate riders and encourage responsible use of trails, but they also watch for the trouble makers and report infractions.

The forest service's compliance and enforcement officers also have been known to ticket offenders. Existing laws can result in fines up to $100,000 and up to one year in jail or both. Earlier this year on the May long weekend, Shuswap/Okanagan forest service staff checked over 500 riders and issued 48 tickets and warnings, made one arrest and seized one vehicle. Members of the public can also help report violations by phoning the RAPP line (1-877-952-7277) or by phoning their local forest service office.

BC deserves national and international censure for its lack of regulations governing backcountry recreation. Sustainable, non-motorized tourism is being impacted by the ongoing motorized exploitation of the backcountry.

After decades of efforts by environmentalists, forest companies have improved their practices; but now some of the greatest environmental problems are being caused not by resource companies, but by out-of-control 'terrain terrorists' riding roughshod over sensitive grasslands, wetlands and alpine meadows across this province. Not only are regulations and enforcement actions sorely needed, but B.C. needs a new backcountry culture that would help discourage irresponsible off-road vehicle use.

♦

Jim Cooperman is president of the Shuswap Environmental Action Society, www.seas.ca

Four Degrees of Devastation

"Increasingly, people are being realistic," Canada's Environment Minister Jim Prentice told the Calgary Herald in October, speaking about Canada's stance on carbon reductions. But what is realistic?

by Stephen Leahy

The prospect of a four-degree Celsius rise in global average temperatures in 50 years is alarming – but not alarmist, climate scientists now believe. Eighteen months ago, no one dared imagine humanity pushing the climate beyond an additional two degrees C of heating, but rising carbon emissions and inability to agree on cuts has meant science must now consider the previously unthinkable.

Four degrees of warming would be hotter than any time in the last 30 million years, and it could happen as soon as 2060 to 2070.

"Four degrees C is definitely possible...This is the biggest challenge in our history," Chris West of the University of Oxford's UK Climate Impacts Programme told participants at the "4 Degrees and Beyond, International Climate Science Conference" at the University of Oxford last week.

It is a world with a one-to-two metre sea level rise by 2100, leaving hundreds of millions homeless. This will head to 12 metres in the coming centuries as the Greenland and Western Antarctic ice sheets melt, according to papers presented at the conference in Oxford.

Reality and the US Senate

"Political reality must be grounded in physical reality or it's completely useless," John Schellnhuber, director of the Potsdam Institute for Climate Impact Research, told the conference.

Schellnhuber recently briefed US officials, but he says they chided him that his findings were "not grounded in political reality" and that "the [US] Senate will never agree to this."

He had told them that the US must reduce its emissions from its current 20 tonnes of carbon per person average to zero tonnes per person by 2020 to have an even chance of stabilizing the climate around two degrees C. China's emissions must peak by 2020 and then go to zero by 2035, based on the current science, he added.

Even with a two-degree rise, most of the world's coral reefs will be lost, large portions of the ocean will become dead zones, mountain glaciers will largely vanish and many other ecosystems will be at risk, Schellnhuber warned. And there is the risk of reaching a tipping point where the warming rapidly accelerates.

Four degrees of warming would be hotter than any time in the last 30 million years, and it could happen as soon as 2060 to 2070

Continuing on the current high emissions path means average global temperatures would increase by 4.0 to 5.6 degrees by 2090, if not earlier. Brazil, much of Canada, parts of the US, Siberia and Central Europe would be eight degrees warmer than in the past 50 years. Computer models show the Arctic warming by 15 degrees while many other regions of the world would experience 10 degrees more warming.

These scenarios do not include potential tipping points like the release of the 1.5 trillion tonnes of carbon in northern permafrost or the melting of undersea methane hydrates.

Put your feet up and die

In a four-degree warmer world, adaptation means "put your feet up and die" for many people in the world, Oxford's Chris West said bluntly.

One to two billion people will not have access to adequate fresh water because of the major shift in rainfall patterns, said Nigel Arnell, director of the Walker Institute for Climate Systems Research at the University of Reading in Britain.

Up to 15 percent of existing or potential cropland – and 40 percent in Africa – will become too dry and too hot for food production. While there might be some gains in northern areas like Canada and Russia, generally the soils there are not suitable for crops, he said.

Carbon emissions must stop

The current focus on CO_2 concentrations like 450 parts per million (ppm) or 350 ppm is not the right approach since it is the total cumulative emissions that determine how warm the planet will get, said Myles Allen of the Climate Dynamics group at University of Oxford's Atmospheric, Oceanic and Planetary Physics Department.

If climate negotiators only look at slowing rates of carbon emissions, the total amount of carbon in the atmosphere will continue to increase.

"We didn't save the ozone layer by rationing deodorants," said Allen.

♦

Stephen Leahy is an environmental journalist from Uxbridge Ontario.

Incinerators: The Next Generation

The record shows precious little energy but lots of potential for profit

by Joyce Nelson

Across Canada, the US, the UK, Europe, and Asia, communities are facing an unprecedented onslaught of proposals for new incinerators. In July 2008, Friends of the Earth released a map showing dozens of planned new incinerator sites across the UK. The British government has committed billions to new incineration, while cutting budgets for recycling by 30 per cent.

Germany, which already has such an over-capacity of incineration that it imports millions of tonnes of garbage each year to feed its maw, is nonetheless planning 100 new incinerators. The Germany waste-disposal industry is lobbying fiercely to get the government out of regulating the sector.

What's driving this onslaught is a new generation of incinerating technologies that is being touted as the answer to both waste disposal and energy needs. These new technologies – variously called "gasification," "plasma gasification," "plasma arc," "pyrolysis," "plasma torch," – are collectively referred to as multi-stage waste-to-energy (WTE) plants. Since these WTE facilities burn waste, we'll refer to them as incinerators, even though their lobbyists refuse the term.

In Canada, the key lobby group for WTE incinerators is the Canadian Energy From Waste Coalition (see sidebar 1). On June 27, 2009, the Coalition made a presentation to the Metro Vancouver Council-of-Councils. Metro Vancouver is deciding what to do with its municipal solid waste (MSW) and is seriously considering six new WTE incinerators for the region.

Since Metro Vancouver is itself a member of the Canadian Energy From Waste Coalition, the lobbyists appear to have been conveniently lobbying themselves that June day.

This three-part series will look at several members of the Coalition – Aquilini Renewable Energy, Covanta Energy Corp., and, of course, Metro Vancouver – along with another big WTE player, Plasco Energy Group.

A Clean Energy Future?

Faced with climate change, escalating greenhouse gases, and peak oil, governments are attempting to legislate a "clean energy future" that

Canadian Energy From Waste Coalition Members

Waste Management Inc.	The Canadian Plastics Industry Association	Golder Associates
Wheelabrator Technologies Inc.	The Cement Association of Canada	Willis Energy Services Ltd.
Veolia Environmental Services	Maple Reinders Group	City of Hamilton
Covanta Energy Corp.	The Power Workers Union	Hamilton Utilities Corp.
AE&E-Von Roll Inc.	Willms & Shier Environmental Lawyers LLP	Peel Region
Alter Nrg Corp.	Ramboll Danmark A/S	Metro Vancouver
Aquilini Renewable Energy	Earth Tech Inc.	City of Edmonton
Borden Ladner Gervais	GENIVAR Ontario Inc.	

— www.energyfromwaste.ca

boosts the amount of energy obtained from renewable sources like wind and solar.

According to WTE industry thinking, garbage should also be seen as a "renewable" source of "clean" energy. Obviously, these proponents want the waste/garbage stream to be never-ending and the burning of it to create new synthetic fuels and generate "green electricity" costed as "clean" for tax breaks, favourable pricing, and preferential treatment.

In the US, the debate is still raging. But in Canada, the federal government appears to have already decided the issue. On August 20, 2008, a Government of Canada news release announced the first project in its "ecoEnergy for Renewable Power" program, which provides $1.48 billion to applicants who can "increase Canada's supply of clean electricity from renewable sources such as wind, biomass, low-impact hydro, geothermal, solar photovoltaic and ocean energy."

"Biomass" is industry jargon for food processing waste, agricultural residues, wood waste and waste from forestry operations, and almost every form of "cellulose-based waste."

To date, neither Scandinavian nor European countries have bothered to obtain much electricity from WTE incinerators. Modern incinerators yield negligible electricity compared to the energy wasted in them and in running them.

A recent background paper by the Recycling Council of BC (RCBC) explains: "Existing WTE facilities with mass-burn technologies, such as those found in Europe and the currently operating Burnaby WTE facility, typically achieve power outputs of about 0.6 MWh/tonne of MSW." Proponents of next-generation WTE incinerators claim to be able to significantly increase that output.

Fighting For Waste

The amount of energy produced from MSW burned in a WTE facility depends on what's in the waste. If the waste contains lots of plastics, tires, residual oil, wood waste and paper, then the energy potential in incineration is high. But all of these items – called "feedstocks" in the incinerator industry – are things that could be recycled or dealt with by Extended Producer Responsibility take-back programs.

As the RCBC paper states: "A WTE facility requires the carbon in materials such as paper, plastic and tires to produce energy, yet much more energy would be conserved if these materials were recycled than would be produced if they were destroyed in a WTE facility."

And now it becomes understandable why the plastics industry is part of the incinerator lobby.

In the UK and Europe, activists are not only fighting incinerators, they're fighting to keep their recycling programs alive – much less expanding them to include more plastics – in the face of government cuts (as in Britain) and the insatiable maw of next-generation WTE incineration.

For example, in East London, Quebec-based Enerkem Inc. is providing the technology for a $50 million gasification incinerator to burn 90,000 tonnes of pre-sorted MSW annually. *The Guardian* (Sept. 20, 2006) noted that, "to burn well," the plant will need significant amounts of paper and plastic – "the argument against it has always been that it will undermine recycling."

In 2006, the Ontario government began streamlining the approvals process for WTE incinerators, prompting nine environmental and community groups to write to the provincial Ministry of Environment:

Continued on Page 10 ⇨

Hot Air from Sweden

Canadian politicians have been going on taxpayer-financed junkets to Sweden and Europe to investigate modern incinerators, no doubt spurred on by a piece in the *Toronto Star* in May 2006, written by Swedish diplomat Magnus Schonning and entitled "Integrated Waste Management in Sweden: Where Incineration Is Not a Dirty Word."

Schonning claims, "The truth is that modern technology has cut [toxic air] emissions dramatically, particularly in the case of dioxins. Fifteen years ago, 18 Swedish waste incineration plants emitted a total of about 100 grams of dioxins every year. Today, the collective dioxin emissions from all 29 Swedish waste incineration plants amounts to 0.7 of a gram…quite an improvement."

Yes, quite an improvement, but according to the *2006 Annual Report of the Swedish Association of Waste Management*, "The total emissions of dioxins from waste incineration amounted to 1.1 g. in 2005" – significantly higher than Schonning's claim (which was based on 2004 figures) and indicating a rise in WTE dioxin emissions.

Moreover, the report lists seven other components of air emissions, including 131 kg. of the chemical components of nanoparticles and 2,312 tonnes of acid gases. Incineration residue (toxic slag and ash) amounted to 711,770 tonnes that year – an increase of almost 100,000 tonnes.

As the *Globe & Mail's* John Barber put it (Feb. 12, 2008), "The rubes are endlessly susceptible to technobabble from Sweden, a country that has miraculously transcended the need for landfills by exporting thousands if not millions of tonnes of incinerator ash – by weight equal to 30 per cent of the burned garbage – to other countries every year."

By 2005, Sweden had also begun importing waste from other countries to feed its incinerators: 212,990 tonnes that year, likely accounting for the higher emissions and residue.

⇦*Incinerators continued*

"The proposed regulatory amendments will weaken the government's oversight of recycling activities while promoting the burning and/or thermal degradation of municipal waste."

In 2007*, Canadian Business* observed that next-generation WTE incinerators "depend on a steady flow of garbage into their plants, so waste diversion programs would actually be undermined" by such facilities.

The industry likes to frame the waste-disposal debate as a choice between incineration or landfill. But what they're really against is the Zero Waste movement: composting, reducing, re-using, recycling, returning (Extended Producer Responsibility), refusing, and redesigning products to the point where there is negligible garbage to deal with.

Currently, the next-generation WTE incinerator proponents have two strategies: 1) depict themselves as part of "the Zero Waste goal" and 2) lock in long-term contracts for waste.

Burning For Energy

At a July 2009 industry conference, Dino Milli, vice-president of Enerkem, told participants: "Supply agreements that are fixed and long-term are virtually worth their weight in gold."

Enerkem and partner GreenField Ethanol Inc. recently signed a 25-year contract with the City of Edmonton to annually incinerate 100,000 tonnes of MSW at a new $70 million gasification facility. The carbon-rich feedstock will include contaminated paper and cardboard, textiles, plastics that are not recycled, as well as old utility poles that have been treated with creosote and other chemical preservatives.

According to Enerkem's own information, the company's "thermochemical biorefinery" pilot project in Sherbrooke, Quebec ran for "more than 3,600 hours" between 2003 and (apparently) 2006. That's about five-months' total operating time over several years.

It was on this basis that, in 2006, a corporate spokeswoman sold the idea for a gasification plant to England's Thames Gateway Development Corp., claiming gasification was a "well-developed and mature technology" used in a "proven demonstration plant in Canada."

Enerkem's demonstration plant in Westbury, Quebec, which did not begin its start-up phase until January 2009, has shown a yield of only 1.3 million gallons/year of "syngas" from biomass.

Nonetheless, the company's gasification WTE facility has been deemed "proven" by the City of Edmonton, and the world's first such 25-year waste-to-biofuels gasification contract has been signed with a major municipality.

Enerkem has received millions of dollars in funding from Natural Resources Canada, Sustainable Development Technology Canada, Agriculture and Agri-Food Canada, Natural Resources Quebec, Alberta Energy Research Institute, and the City of Edmonton.

The Achilles' Heel

Along with the proceeds from selling "green electricity" to the grid and "syngas" to refineries, next-generation WTE proponents expect big money from these long-term contracts signed by municipalities to provide a set supply of MSW for many years, or pay the consequences. These "put or pay" contracts (which also demand large "tipping fees" for each tonne of garbage taken at the site) are part of the reason that several municipalities – for example, Port Moody, BC, and in Ontario, Halton Region, Niagara Region, and Toronto – have backed away from incineration, for now.

According to Dr. Paul Connett, a US expert on incineration, for the taxpayers, an incinerator is an "economic disaster," but for some people an incinerator is a "gravy train."

That "gravy train" is on a collision course with communities across Canada, especially in terms of environmental and public health issues, issues that will be explored throughout this series.

In 2005, another industry lobby group, Ontario Environment Industry Association (to which Plasco Energy Group belongs) commissioned a report on next-generation WTE incinerators, written by University of Western Ontario professor Andrew Knox.

In his report Knox looked at gasification, pyrolysis, plasma converters, and stated clearly: "Dioxins are *strongly connected to EFW [energy-from-waste] incineration in particular* as not only are the dioxins existing in waste emitted by incinerators, but new dioxins and furans are created during the burning of waste. As more information about the effects of dioxins and furans is gathered they may be revealed as the Achilles' heel of incineration." (my emphasis)

These guys know they're poisoning us. As the popular button states: "God Recycles/The Devil Burns."

♦

Joyce Nelson is a freelance writer, visual artist, and author of five books.

Selected Sources

Jordan Best for the Recycling Council of BC, *Examining The Waste-To-Energy Option,* **October, 2008.**

Lynn Moore, "'It Will Be A Fight For Feedstock,' International Conference Told," *The Gazette,* **July 22, 2009.**

"Garbage Power," *Canadian Business,* **Nov. 5, 2007.**

Mike Breslin, "Waste Conversion Into Fuel Skyrockets," *American Recycler,* **May 2009.**

Andrew Knox, *An Overview of Incineration and EFW Technology as Applied to the Management of Municipal Solid Waste (MSW),* **February 2005.**

When Good Fuel Additives Go Bad: MTBE

by Clara Broten

Some History

In the 1990s, additives were found to oxygenate gasoline to make it burn better and reduce the pollutants and the toxics in car exhaust. The US *Clean Air Act of 1990* required the use of oxygenated gasoline, called reformulated gasoline, in areas with air pollution problems. One of the additives was methyl tertiary-butyl ether, (MTBE). By 2000 MTBE was the leading gasoline additive in the States.

Water Contamination

MTBE dissolves easily in water and travels easily along underground water courses. Once in groundwater, it is persistent and does not easily break down. Leakage from gasoline storage facilities is common. Since MTBE is a suspected carcinogen, its presence in groundwater was, and is, worrying. In 1996 MTBE was found in two wellfields that supplied half the drinking water to Santa Monica, California. The wellfields were shut down.

By 2000, the EPA was sounding alarms about MTBE in groundwater, and attempting to have it replaced with ethanol in gasoline.

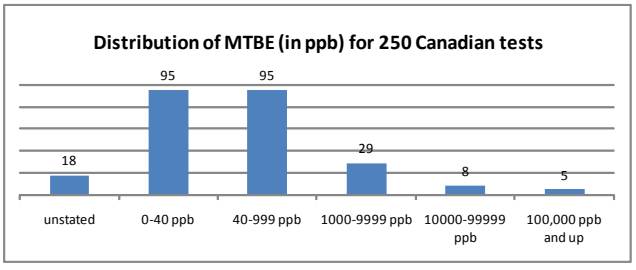
On the Canadian side of the border, alarm bells were also sounding even though MTBE was not in widespread use here. In 1997, low levels of MTBE were detected in the Abbottsford-Sumas Aquifer in southern British Columbia. In 2000, MTBE was found (by students doing a school project) in groundwater at Chevron's Burnaby refinery.

In 2001, reports of MTBE use and spills to Environment Canada revealed MTBE in groundwater in 250 locations in every province. However, out of the 23 companies responding, only 3 regularly tested for MTBE in groundwater: 80% of the contamination discovered was reported by only two of those companies. Other sites with MTBE contamination across Canada may be undiscovered due to lack of testing.

Concentrations of MTBE in groundwater ranged from 1 part per billion (ppb) in Clinton, BC to 59 million ppb in Come by Chance, NF.

Health Effects

The US EPA has not set a 'safe' drinking water level. Most people can't detect it by odour or taste at less than 20-to-40 ppb (the BC "aesthetic objective") but California has a Drinking Water Guideline against excess cancer risk



of 20 ppb. Health Canada says that existing studies are not suitable for creating a drinking water standard due to flaws in the test procedures.

Breathing large amounts of MTBE for a short term can cause nervous system reactions varying from hyperactivity to convulsions in animals. Long term exposure to large amounts of MTBE in the air may cause kidney damage or cancer in animals. The EPA states that effects on humans of long or short term exposures are unknown. High doses do seem to indicate a carcinogenic effect in most studies, according to Health Canada.

Current Status

As of 2007, 25 states had full or partial bans of MTBE. Most gasoline containing MTBE in Canada was produced for export to the United States. By 2001, only Irving Oil and North Atlantic Refining were still producing it.

Current information on MTBE in Canada is difficult to find, most likely because it has been phased out. However, without testing we will not discover if contamination continues to pose a threat in our water.

♦

Clara Broten has a background in computer science and fine arts, with an interest in environmental issues from an early age.

Main Sources

Bellamy, J., Guthrie, J., & Groves, S. *Use and Releases of MTBE in Canada.* Oil, Gas and Energy Branch, Environment Canada, 2003.

US Environmental Protection Agency, *Methyl Tertiary Butyle Ether (MTBE),* September 13, 2007. *www.epa.gov/mtbe/* and *Chemicals In The Environment: Methyl-Tert-Butyl Ether*, August 1994. *www.epa.gov/chemfact/f_mtbe.txt*

Health Canada, *Methyl Tertiary-Butyl Ether (MTBE) - Guidelines for Canadian Drinking Water Quality: Guideline Technical Document, July 2006. www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/mtbe/index-eng.php*

BC Ministry of Environment, *Ambient Water Quality Guidelines for Methyl Tertiary-Butyl Ether (MTBE), 2001. www.env.gov.bc.ca/wat/wq/BCguidelines/mtbe/mtbe.html#drinking*

Tragedy of the Commons or Hardin's Hubris?

Garret Hardin's projection of his own flawed values onto communities managing commons should have been discarded instead of embraced. As Dr. Elinor Ostrom's recent Nobel Prize in Economics has shown, local community management is often the best option.

by Tim Kelly

Garrett Hardin's *The Tragedy of the Commons* remains a bastion of environmental and political policy to this day, over forty years since publication. Hardin's premise, that individuals will maximize their own interests in shared resources even if it leads to environmental destruction, has been quoted hundreds if not thousands of times, and taken as gospel truth. However, subsequent to the publication of the article, many researchers continued to study community management of common resources, and one researcher has extracted design principles that are present in successfully managed commons. The "tragedy" is not inevitable, nor does it require external authority to avoid.

In addition to ignoring actual examples refuting his position, Garrett Hardin promoted a belief in elitism and external control, even to the point of stating, "Freedom to breed is intolerable," and calling for a rejection of the United Nations' *Universal Declaration of Human Rights.* In spite of these obvious affronts to equal rights, Hardin's article has become a central tenet in the promotion of external control of natural resources, with the imposition of "property rights" coming from advocates of either nationalization or privatization. The imposition of property rights has often led to swift and massive devastation of previously sustainably-managed natural resources.

In some cases of privatization or nationalization, a vibrant community-based management of the natural resource was swept away, as in the recent cases of the nationalization of forests of Nepal in 1957 and the privatization of lands in Argentine Chaco since 1982.

Even without property rights, wider access to a natural resource previously closed by locals may be enforced by national and international governments, as is occurring off the coast of Somalia, where local fishermen are turning to piracy to replace the fishing income lost to naval-guarded European factory ships and transport vessels dumping toxic waste.

In other cases, regional economic goals impose minimum extraction rates on natural resources, inhibiting conservation efforts. In the South Saskatchewan River Basin of Alberta, water licensees who do not extract water for three consecutive years may lose their license, even though the rivers are already drawn dangerously low. While people may be extracting the natural resource at an unsustainable rate, this is not due to a lack of restriction within local communities but is instead driven by external authorities.

Central to the concept of "commons" is that the outcomes are collective: everyone that relies on a resource is dependent on the actions of everyone else. Most aboriginal groups are already familiar with this concept. The Nuu-chah-nulth of the Alberni Valley on Vancouver Island have a saying, *"Hishuk-ish-t'sawalk,"* which means "Everything is one and all is interconnected." The connection to the land, the air, and the water conditioned individuals from taking more than what met their necessity, even though no external authority existed to restrain them.

Central to the concept of "commons" is that the outcomes are collective: everyone that relies on a resource is dependent on the actions of everyone else.

The concept of interconnectedness is forcibly driven from Western culture in most arenas, whether through the ridicule of "Zen mysticism" and "communist notions," or the exultation of individual accomplishments.

In the battle between the leviathan of giant government and the tyrannyasaurus of market-based "efficiency"

(where it is good to be at the top of the food chain), a third option is ignored. Much like the rise of small, nimble mammals, local community-based management is often the most successful approach to sustainable management of natural resources.

The irrigation systems of the Zanjeras of the Phillippines were first recorded by the Spaniards in 1630. These mud canals flood frequently and require substantial amounts of shared manual labour by landowners. Access to water is not necessarily specific to the geographic location of the land; water access is made available through multiple sections, not just upstream/downstream placement, which ensures that almost everyone has balanced benefits and costs.

In Spain, the irrigation areas known as Huertas were chartered in 1432, but the organizations date back another 500 years. Community management determines access to the water, and each huerta has unique rules. Water allocation may be by time, where each irrigator has a fixed length of time to divert water to his or her fields, or by volume, where each irrigator's storage capacity is filled but rotation will not return until everyone else's storage is also filled. The opening of gates adjacent to two irrigation systems is done jointly, by the irrigator losing access and by the irrigator gaining access. As a result, opportunistic behaviour is reduced through decreased opportunities.

In studying both successful and unsuccessful management of commons by community groups, Dr. Elinor Ostrom has determined that there are eight characteristics of successful management. These "design principles" are rarely explicitly documented in the rules governing community management, but analysis can determine if the design principles are present. One such principle is known as "minimal recognition of rights to self-organize," where external authorities recognize the rights of the local community group to manage, without impediment, the natural resource. This principle is often violated by governments bound by trade agreements and/or political and financial greed.

Two other design principles are monitoring and sanctioning. While Canadians are very good at organizing monitoring operations on natural resources, the emphasis on "positive" actions often leads to an unwillingness to increase the costs to violators through sanctions. Efforts to alter self-maximizing behaviour are unlikely to succeed unless the community management group is willing to alter the bottom line of the violators by increasing costs, either socially or financially.

Garrett Hardin's superficial examination of the selfish nature of humans should have been discarded along with other distorted views on humanity. Instead, it became entrenched in environmental and political philosophy. There are many challenges to sustainable management of commons, but destruction by self-maximizing individuals is not inevitable.

Ostrom's Eight Design Principles for Successful Commons Management

1) **Clearly Defined Boundaries:** This includes geographic regions, who, what, how much, when, and under what conditions these conditions may change.
2) **Proportional Equivalence Between Benefits and Costs:** A balance should occur between the effort expended and the rewards accrued.
3) **Collective-Choice Arrangements:** The people affected by the rules make the rules and enforce them.
4) **Monitoring**
5) **Graduated Sanctions:** This is internal monitoring and internal sanctioning. Long-enduring systems have low initial sanctions, and those sanctions which are agreed-to by the participants are the ones least contested yet most effective.
6) **Conflict Resolution Mechanisms:** Resolve conflicts quickly and affordably.
7) **Minimal Recognition of Rights to Organize:** This is external recognition of rights. When a decision is made locally, external authorities respect that decision.
8) **Nested Enterprises:** Small systems grouped into small numbers within small numbers at even higher levels. The seven preceding design principles are all repeated at each of these levels. The key is to drive the decision-making down to the level that is directly impacted by those decisions.

—Ostrom 1990.

Cultural values play a significant role in creating internal norms that limit or encourage individual behaviours, and community efforts can reinforce those values. The structure of the community management system is as important as the coherence of values within the community. In this day of failed nationalization, and the privatization of natural resources, local community management can be the best option.

♦

Tim Kelly, owner of Pacific Coast Environmental Metrics, has been studying Dr. Ostrom's work and corresponding with her for the last year and a half. He wrote the article before Dr. Ostrom won her Nobel Prize.

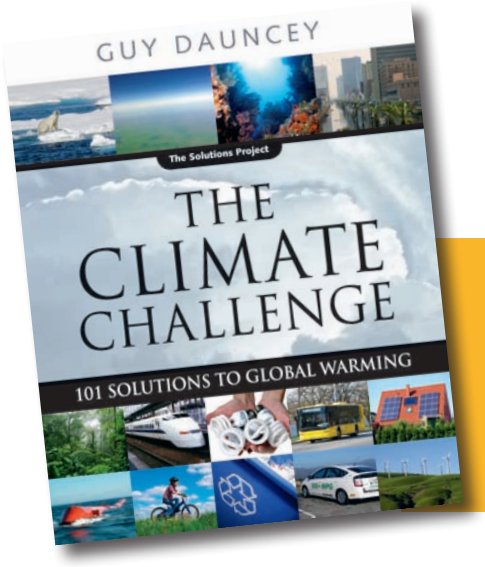
References:

Altrichtera, Mariana, and Basurto, Xavier (2008). "Effects of Land Privatisation on the Use of Common-pool Resources of Varying Mobility in the Argentine Chaco," ***Conservation and Society*** **6(2) pp.154-165.** ***www.conservationandsociety.org/cs-6-2-154.pdf***

Bromley, Daniel W., and Chapagain, Devendra P. (1984). "The Village against the Center: Resource Depletion in South Asia." ***American Journal of Agricultural Economics*****, 66 (5) pp. 868-873.**

Hardin, Garrett (1968). "The Tragedy of the Commons," www.garretthardinsociety.org/articles/art_tragedy_of_the_commons.html

Ostrom, Elinor (1990). ***Governing the Commons: The Evolution of Institutions for Collective Action.*** **Cambridge University Press. New York, NJ, U.S.A. 18th printing, 2006**



101 Solutions

The indefatible Guy Dauncey has done it again! *Delivered another energetic kick-start to our plans and schemes for effecting movement on changes to our carbon habits, lifestyles, technologies, our cities and our land use. Here's an excerpt from the latest exhaustively referenced how-to-do-it handbook. Every civil servant and politican should have a copy.*

Guy Dauncey, The Climate Challenge: 101 Solutions to Global Warming, New Society Publishers, Gabriola Island, 2009. ISBN: 978-0-86571-589-9, 307 pages, $24.95

Earth's Future Atmosphere

The science of Earth's atmospheric future is complex and full of uncertainties. A host of factors are at play, including the role of carbon cycle feedbacks, aerosol forcings, ocean heat uptake, climate sensitivity behavior and the interactions among the different components.…It is clear, however, that reducing our greenhouse gas emissions to zero will not be enough.

Almost all scenarios that try to find a "safe landing" require negative CO_2 emissions in the second half of the century – which means capturing the surplus carbon. The current level of atmospheric carbon (800 Gigatonnes – Gt) is 260 Gt above the pre-industrial level (560 Gt), and rising by 5 Gt a year, so we need to draw 280 Gt of carbon out of the atmosphere, ideally by 2100.…

In 2009 Tim Lenton and Naomi Vaughan from Britain's University of East Anglia published the first comprehensive assessment of the various options, comparing their ability to reduce radiative forcing. Aside from proposals that were deemed ineffective or too risky, they found that if there was a strong commitment to reduce emissions, then a combination of afforestation, reforestation, bio-char burial and global-scale air capture and storage might be able to reduce the atmospheric level of CO_2 back to the pre-industrial level of 280 ppm by 2100.

Earth's Forests

Trees absorb carbon dioxide, storing it in their timber, roots and forest soil. The older a forest, the greater its capacity to store carbon.

What we need, therefore, is a global treaty in which nations agree to protect their ancient forests, adopt holistic practices in their working forests and engage in major tree planting. If successful, Earth's forests could draw down 50 to 100 Gt by 2100. At the same time, rising temperatures will be causing more droughts, insect outbreaks and forest fires; so while the strategy is essential, we can't depend on it for our salvation.

Farmlands and Grasslands

Farmland soils store carbon too – and organic farms store 15–28% more, for an additional 2.2 tonnes per hectare per year (one ton per acre). If we assume one tonne per hectare, and if all the world's farmers went organic on 1.5 billion hectares of cropland, this could draw down up to 1.5 Gt of carbon a year, or 100 Gt by 2100.

The same applies to the world's 3.4 billion hectares of grasslands. If 50% of the world's grassland farmers were to graze their animals rotationally, mimicking the way they used to graze when predators were around, they could store an additional one tonne per hectare per year. Globally, this would capture 1.7 Gt of carbon a year, or up to 150 Gt by 2100.

Both farmlands and grasslands will be subject to a saturation ceiling when the soil can absorb no more, but the numbers are encouraging.

Biochar Production

It has been estimated that if farmers could be persuaded — financially or otherwise — to adopt the habit of turning their agricultural wastes into charcoal by burning them in very low-oxygen chambers and then plowing the charcoal into the soil, they could store 0.5 Gt of carbon a year, rising to 1.75 Gt a year by 2060. By 2100 this could amount to a further 50 Gt of carbon. Biochar advocates calculate that if biochar additions were applied on 10% of the world's cropland, it could store 8 Gt a year of carbon, offsetting nearly all the emissions from fossil fuel burning.

♦

From Introduction: The Challenge, page 60

Climate Notebook

Tidal Power Approved

A $10-million research facility in Nova Scotia to test underwater turbines for converting tidal energy into electricity, first introduced in 2008, has passed its environmental assessment.

The Fundy Ocean Research Centre for Energy will develop a comprehensive environmental effects monitoring program and establish an environmental effects advisory committee. The marine demonstration site will consist of three underwater berths for turbines located in the Minas Passage, home of the highest tides in the world.

—CBC News*,September 15, 2009*

Montreal Protocol Hope

A phase out of refrigeration chemicals under the highly successful Montreal Protocol could make enormous and quick gains for climate protection. Used primarily in the world's more than 4 billion refrigerators and air conditioners, soaring HFC use threatens to negate efforts to offset CO_2 and other greenhouse gas reductions being negotiated within the Copenhagen talks. HFCs were introduced globally as a quick substitute for ozone depleting refrigerants.

"By some estimates, action to freeze and then reduce this group of gases could buy the world the equivalent of a decade's-worth of $C0_2$ emissions," says U.N. Under-Secretary General and UNEP Executive Director Achim Steiner.

—Environmental Investigation Agency, November 2009 and files

Largest Solar Plant in World for China

US energy giant First Solar will build the world's largest solar power plant in China. Arizona-based First Solar will construct the two-gigawatt plant in Ordos City, Inner Mongolia. The solar facility is to be built in four phases over a decade and supply power to three million Chinese homes, the company said.

—Calgary Herald, September 9, 2009

Not Too Late

A new analysis of climate risk, published by researchers at MIT and elsewhere, shows that even moderate carbon-reduction policies now can substantially lower the risk of future climate change. It also shows that quick global emissions reductions would be required in order to provide a good chance of avoiding a temperature increase of more than 2 degrees Celsius above the pre-industrial level. Without prompt action, extreme changes could soon become much more difficult, if not impossible, to control.

—MIT News Office, October 2, 2009

Climate Map

In October, the British Embassy in the US sent a press release and climate impact map to the North American media.

Generated by the UK's Met Office Hadley Centre, the map of the world shows devastating impacts on the world's agriculture, water resources, and weather systems if climate change is left unchecked. Hadley Centre produced the new map in collaboration with 27 leading scientists, to represent the latest peer-reviewed science on the impacts that would be felt were global temperatures to rise by 7˚Fahrenheit (4˚Celsius). A 4˚C rise globally would mean temperature rises far higher than 4˚C in many countries and regions.

Writing in a blog, the British Ambassador to the US, Nigel Sheinwald, said: "This is not apocalyptic scaremongering: these are the best assessment by leading British scientists based on the most recent research. So we need to listen, and act.

"This is no longer just an environmental issue: it's geo-political. Profound changes like these risk creating a more unstable and divided world, with intensified competition for dwindling resources, and all the implications for global security that flow from that….We need to …ensure global temperatures don't rise by more than 2 Celsius degrees. And that's why an international agreement at Copenhagen this December is so important – for all our future security and prosperity."

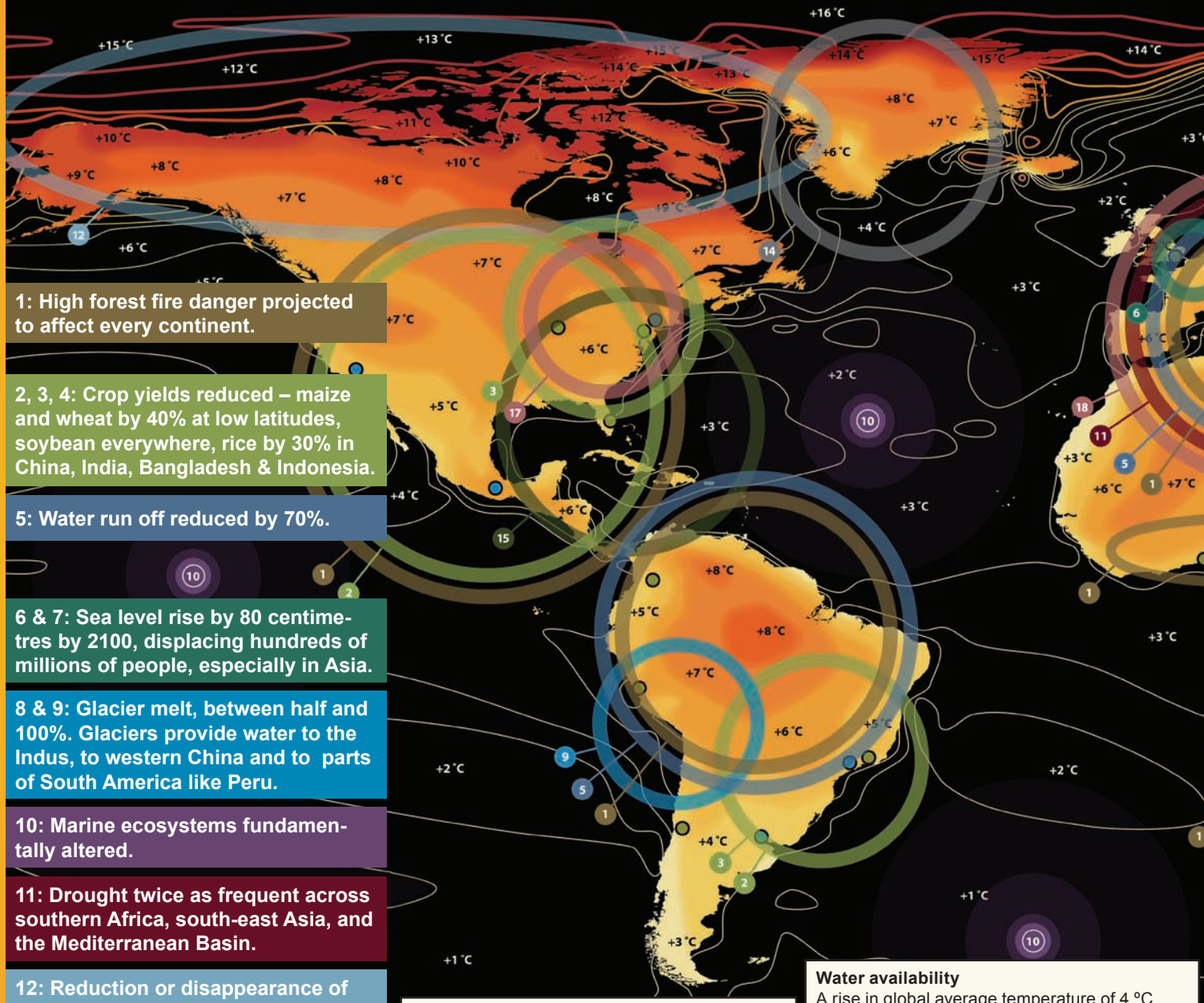
An interactive version of the map, showing impacts on temperatures, sea levels, and other aspects of the environment, can be viewed online at *www.actoncopenhagen.decc.gov.uk.*

A print version of this map is overleaf.

— British Embassy in the US, October 22, 2009

Met Office Hadley Centre | Quantifying and Understanding the Earth System (QUEST) | Walker Institute | Tyndall Centre for Climate Change Research

The impact of a



1: High forest fire danger projected to affect every continent.

2, 3, 4: Crop yields reduced – maize and wheat by 40% at low latitudes, soybean everywhere, rice by 30% in China, India, Bangladesh & Indonesia.

5: Water run off reduced by 70%.

6 & 7: Sea level rise by 80 centimetres by 2100, displacing hundreds of millions of people, especially in Asia.

8 & 9: Glacier melt, between half and 100%. Glaciers provide water to the Indus, to western China and to parts of South America like Peru.

10: Marine ecosystems fundamentally altered.

11: Drought twice as frequent across southern Africa, south-east Asia, and the Mediterranean Basin.

12: Reduction or disappearance of near-surface permafrost in northern Siberia and the Arctic.

13 & 14: West Antarctic and Greenland ice sheets may melt, raising sea levels 10 metres.

15: Tropical cyclones more intense and destructive.

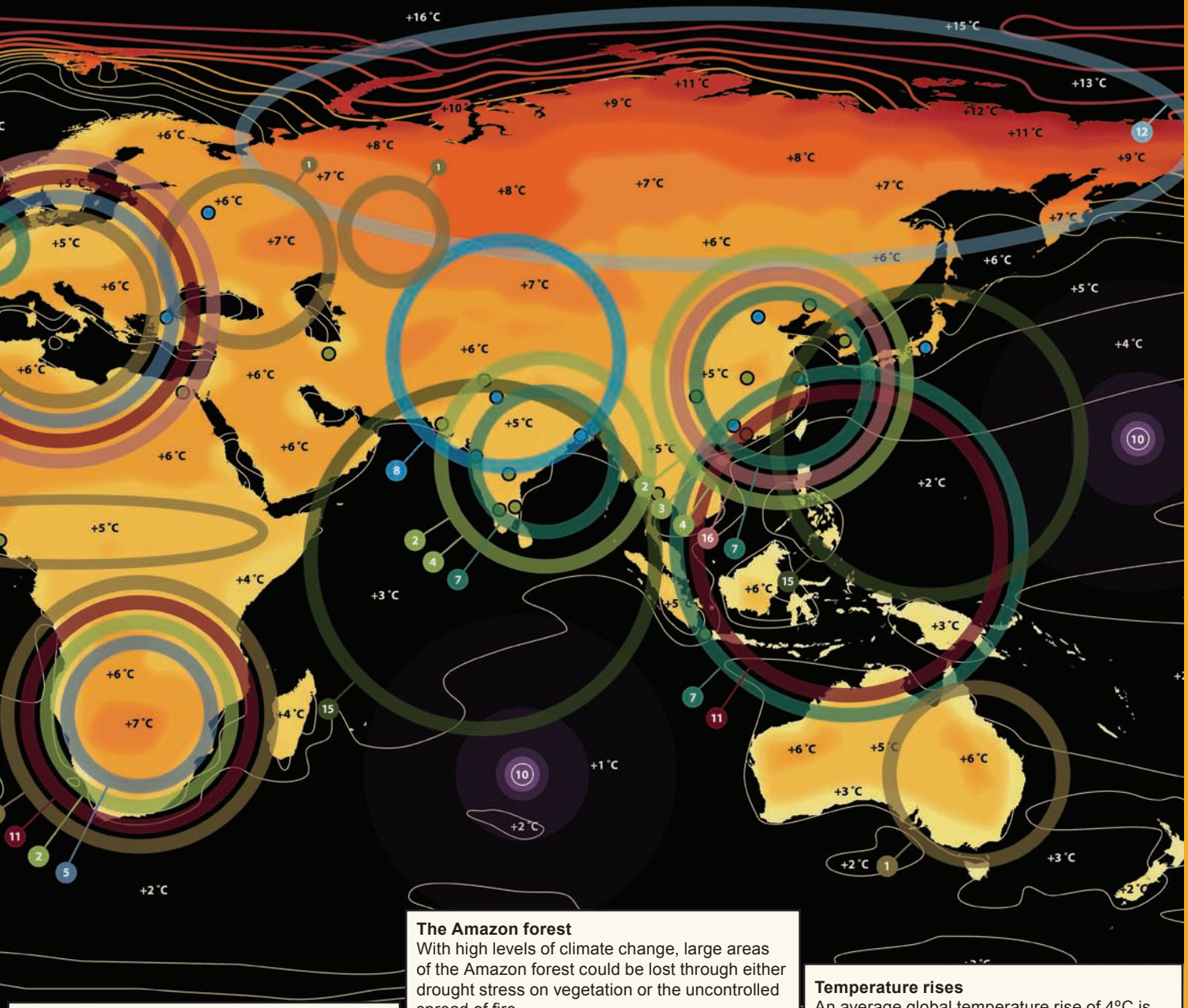
16, 17, 18: Hottest days of the summer between 6 and 10 degree C hotter.

Agriculture
Agricultural yields are expected to decrease for all major cereal crops in all major regions of production, once the global average temperature increases beyond 3°C. Tens to hundreds of millions of additional people (roughly a 10-20% increase), would be at risk from hunger. This would occur mostly in Sub-Saharan Africa, and in some parts of south Asia and Central America.

Water availability
A rise in global average temperature of 4 °C would have a substantial effect on river flows and the availability of water. For the population rise at 2080, without climate change, just over 3 billion people, out of a global population of 7.5 billion, could be living in areas with limited per capita water availability (less than 1000m^3/person/year). By reducing river run-off, climate change could mean that significantly less water was available to approximately 1 billion of these people substantially increasing the pressure of managing water supplies. As glaciers retreat, communities relying on glacier melt-water will also come under further threat.

global temperature rise of 4 °C (7 °F)

HM Government



Sea-level rise
Low-lying coastal areas will become more vulnerable to flooding and land loss. As these areas often have dense populations, important infrastructure and high value agricultural and bio-diverse land, significant impacts are expected. At the beginning of the 21st century, an estimated 600 million people live no more than 10 metres above sea level.

The Amazon forest
With high levels of climate change, large areas of the Amazon forest could be lost through either drought stress on vegetation or the uncontrolled spread of fire.

Carbon cycle
The 20th century rise in CO_2 concentration was only 40-50% of the actual rate of emissions, because the rest was absorbed by the world's ecosystems and oceans. At 4ºC increase in global average temperature, the proportion of CO_2 emissions remaining in the atmosphere could rise to as much as 70%.

Temperature rises
An average global temperature rise of 4ºC is not uniform as oceans heat more slowly than the land, and high latitudes, particularly the Arctic, will have larger temperature increases. The temperature of the hottest days will increase and many areas of high population density will see a larger change in extreme high temperatures.
This will significantly impact health, water availability, agricultural productivity, the risk of fire, the melting of ice sheets and the thawing of permafrost.

Falling Flat

by Susan MacVittie

It seems that the brighter colours and sharper images that flat screen TVs offer come at a price. They are electricity hogs.

LCD (liquid crystal display) TVs, which account for 90% of the four million TVs purchased in California each year, consume 43% more energy on average than the older cathode ray tube TVs (CRTs), while plasma TVs use three times as much. A 60-inch plasma TV uses more power in a few hours than the largest residential refrigerator running 24 hours.

This is partly because, in the midst of TV upgrading, consumers often go bigger. Another factor is brightness. Obviously, the bright picture is one of the advantages of high definition TVs over CRTs, but adjusting that down will cut energy use, and it will also make your TV last longer.

The California Energy Commission is preparing to vote in November on new power-saving standards for flat screen TVs. The rules would require sets that cut electricity use 30 per cent by 2011, and 50 per cent by 2015.

Energy Commission Spokesman Adam Gottlieb says the standards will help reduce the demand on local power plants. "Televisions in California now average 10 per cent of our home consumption. And, it's rising. This proposal will make Californians' televisions more energy efficient, save money and save energy."

As to be expected, industry is not happy with the proposed regulations. Jim Palumbo, President of the Plasma Display Coalition, which opposes the rules, says many of the flat screen TVs on the market already exceed the energy standards the state is considering. He also says the rules would force flat screen firms to remove 20 per cent of their sets from store shelves...limiting consumer choice.

Clearly consumer choice takes precedence over energy conservation. Say Hello to more hydro-electric projects that are thrust upon pristine wilderness areas.

♦

BC Hydro TV Efficiency Tips: *www.bchydro.com/guides_tips/green-your-home/electronics_guide/buy_green_elec.html*

9 Tips for Greener Electronics

by Susan MacVittie

1. Go rechargeable

15 billion batteries produced and sold each year are mostly disposable alkaline batteries. Look for electronics that are rechargeable. For removable batteries, lithium-ion (Li-Ion) and nickel metal hydride (NiMH) are cost-effective, green alternatives. The fastest battery chargers can juice up AAs in about 15 minutes, and will pay for themselves quite quickly.

2. Kill Vampire Power

Just because your cell phone is unplugged from the charger or your TV is off, doesn't mean these devices aren't drawing a current and running up your electricity bill. Devices that have a standby mode do the same thing. To make sure you aren't wasting energy, pull the plug on devices when not in use or put all of your electronics and chargers on a power bar. This way you can flip the power strip off when your electronics are not in use.

3. Buy with energy in mind

Some types of electronics suck more energy than others. Doing research on different technologies and their respective energy consumption can save you in the long run. For example, if you want a flat panel television, look into LCD models, which use much less energy than plasmas. Look for products labelled with Energy Star, the international symbol of premium energy efficiency. For more info on Energy Star check the Office of Energy Efficiency website:

www.oee/nrcan.gc.ca

4. Treat those batteries right

Nickel Cadmium (NiCd) need very little preventative maintenance but discharge them fully before recharge, do not 'top up.' Nickel-metal-hydride (NiMh) are slightly less robust than NiCd (but have higher capacities), and need no discharge before charging. Your battery is most likely to be Lithium Ion (Li-Ion) or Lithium Ion Polymer (LiPo) which has the highest performance, but is the most fragile. They have a finite life whether you use them or not, but generally the harder they work the shorter their life. They hate high temperatures, and long periods of deep discharge. Don't store them fully charged for long period (ie. 6 months), they prefer a partial charge of about two thirds for long periods of storage.

5. Make it a short circuit

Cell phones are among the fastest growing types of trash so don't just throw your old one out – this risks releasing chemicals into the ecosystem. Many organizations are in need of computers and other electronic donations or you could try re-selling them. At the very least, recycle. Check Return-It Electronics to find where you can drop off your electronic devices.

www.encorp.ca

6. Buy used

Don't want to spend a fortune on technology? You can find top quality, totally functional used electronics at sites like Ebay, Craigslist and yard sales. This not only cuts down on the amount of new resources being used for the production of more stuff, it also creates a market for sellers to safely recirculate electronics they're no longer using. Of course, our greenest electronic is the one we don't buy!

7. Bright idea: The solar charger

There are an increasing number of options for on-the-go solar power. From handheld to backpack power, solar chargers now come in a spectrum of types for juicing up phones, PDAs, Bluetooth headsets, iPods, and laptops. Many have an onboard battery pack that can charge while the solar cells are in the sun, and then transfer the power to your device when you need it.

8. Extend use

There's definitely a cult around replacing our electronic toys and tools every 15 minutes or so when a new model comes out. In some cases, the older models are superior. Step back from the whole technophelia thing and take stock of what your real needs are.

9. Look for EPEAT

EPEAT(electronic product environmental assessment tool) is an attempt at environmental certification for computers (CPUs, monitors, and notebooks). Released in early 2006, a growing number of products have been registered with EPEAT.

www.epeat.net

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Greed and Black Liquor Fuel Pulp Trade Wars

by Rob Wiltzen

When US lawmakers unveiled the new *Highway Act of 2005*, they likely weren't aiming to ignite a global trade dispute in the forest products sector. The *Act* was allegedly designed to increase the alternative and renewable fuel mixtures powering the transportation of America.

The legislation, however, was fatally flawed in its vague eligibility criteria. The rollout of the tax credits translated to a massive subsidy for the American pulp industry.

Pulp mills claim the tax credit for burning black liquor, a waste by-product of the kraft pulping process, as a renewable fuel. Black liquor is defined as renewable because it comes from trees. Burning black liquor has been standard practice for decades in pulp mills. Because the legislation specifies a fossil fuel/renewable blend in order to qualify, the mills add new diesel, to their traditional fuel – completely perverting the goal of the subsidy.

Further, since black liquor is only produced in virgin fibre pulping, it has given virgin pulp a huge competitive advantage over recycled fibre. The subsidy can discount the price of pulp up to 60%.

International Trade Response

The US black liquor tax credit was met with alarm around the world. Opponents argue that the subsidies distort the market beyond recognition and could make kraft pulp a by-product of the black liquor production and burning process in the US, instead of the other way around, flooding markets with low-cost pulp.

Canada, along with Brazil, Chile and EU countries threatened the US with action through the World Trade Organization (WTO) and demanded that the loophole be closed immediately.

Canadian Response Breaks WTO Rules

The Canadian pulp industry began lobbying heavily, not for the government to take action through the WTO, but to match the subsidy.

Although Canadian finance minister Flaherty was on record in June of 2009 as labelling a matching Canadian subsidy a "recipe for downward spiral to depression," by the end of that month the Pulp and Paper Green Transformation Program was introduced. In October, a billion dollars was allotted to be divided between 24 companies, ranging from $2.6 million for Meadow Lake mill in Saskatchewan, to $143 million for Domtar.

The US pulp industry association wasted no time in pointing to the Canadian subsidy as being in contravention of the WTO rules. The US subsidy, they argued, violates no trade obligations since it is not aimed to benefit a specific industry, and does not target an export market. The Canadian black liquor subsidy however, they submit, is indisputably guilty on both counts.

Duelling Subsidies

It was only a matter of days after the Canadian handout that the next round was fired, when a United States IRS memo was released with a new interpretation of the farm bill of 2008. The bill was designed to reduce the focus on corn-ethanol as an alternative fuel, due to its well-documented impacts on food production and distribution. It introduced a tax credit for ethanol made from cellulose, to start just as the previous *Highway Act* black liquor subsidy was scheduled to end, and endure through to the end of 2012. The farm bill subsidy for black liquor, if the interpretation sticks, is twice the amount of the current one, and could amount to an American pulp industry windfall worth up to $50 billion.

The Canadian government is already under pressure from industry to beef up the matching subsidy. If Canada responds true to form, it will not only be the latest chapter in an environmental policy framework gone horribly wrong, it can only serve to exacerbate a simmering trade war in which Canada has abdicated any advantage.

Canada's Green Transformation

The Canadian response to the misguided American tax credit was a one billion dollar subsidy awarded to 24 companies responsible for the operation of 38 pulp mills producing kraft pulp.

Credits are based on 16 cents per litre of black liquor burned in 2009 for any mill, but are awarded to the controlling company rather than the mill. The largest portion of the subsidy for one producer was $147 million for Domtar based on credits generated by three mills. Domtar can direct the funds to projects anywhere in its operations, and is not restricted to the mills generating the credits.

The 'Green Transformation' segment of the name comes by virtue of the project eligibility. The subsidy funds must be directed to capital projects in Canada that result in 'demonstrable improvements in environmental performance.' Expenditures must also be made before the end of March 2012.

Rewards for Tax Revolt in BC

Meanwhile Catalyst Paper has been leading a corporate tax revolt in BC, refusing thus far to pay in full their assessed municipal taxes, which they maintain are unfair. They have come up with their own 'Consumptive Tax Model' whereby they assess their own taxes on the basis of the services that they consume. They continue to withhold $17 million in the four communities where they operate pulp mills, despite a BC Supreme Court ruling that the tax assessments were legal. They have been awarded $18 million under the Green Transformation subsidy program.

The Catalyst tax revolt was soon followed by Mercer International, owner of Castlegar's Celgar mill who owe $3.6 million in unpaid taxes, about 45% of the municipal budget, leaving the town cash-strapped. They have received $57.7 million under the federal program.

The municipalities have no claim on the federal subsidy money since it is for new capital projectswith a discernible improvement in environmental performance.

Ten Years of Forgiving Kamloops Emissions

In October, the Ministry of Environment announced that they were giving Domtar another three-year extension on their extension of a deadline to reduce emissions at their Kamloops pulp mill.

Domtar had applied for the second extension to postpone improvements that were originally scheduled for the end of 2007. As a result of an earlier five year extension, pollution control was slated to be complete by 2012, but Domtar has pleaded economic hardship as justification for further extending the deadline to the end of 2015.

In addition to the deadline extension, the ministry granted a reconfiguration of the emission stacks that will share the discharges between the current high level stack and two mill-level stacks. The change has been challenged by local environmentalists that charge that the lower level stacks will increase particulate matter and nitrous oxide emissions at valley level by several times.

The ministry has employed dispersion modeling, done with computer software that emulates the conditions of the emissions coming out of the stacks, taking into account winds, temperatures, topography and other natural variables. The model, they say, predicts an overall improvement in air quality with the proposed technology.

A group led by environmentalists Bronwen Scott and Ruth Madsen in Kamloops say that the predicted levels have only a theoretical relationship to actual air quality. They question the reliability of Domtar's data which is based, they say, on data generated from older problematic software. They also point to issues with haze and the fact that the modeling exercise did not include all the pollutants emitted by the mill.

Grounds for appeal are being prepared by the Shuswap-Thompson Organic Producers Association, said Madsen.

Information from Natural Resources Canada research and other authorities are clear that dispersion models should not be relied upon alone, she said. Dispersion modeling, the groups contend, was developed for long range emissions studies.

—Rob Wiltzen

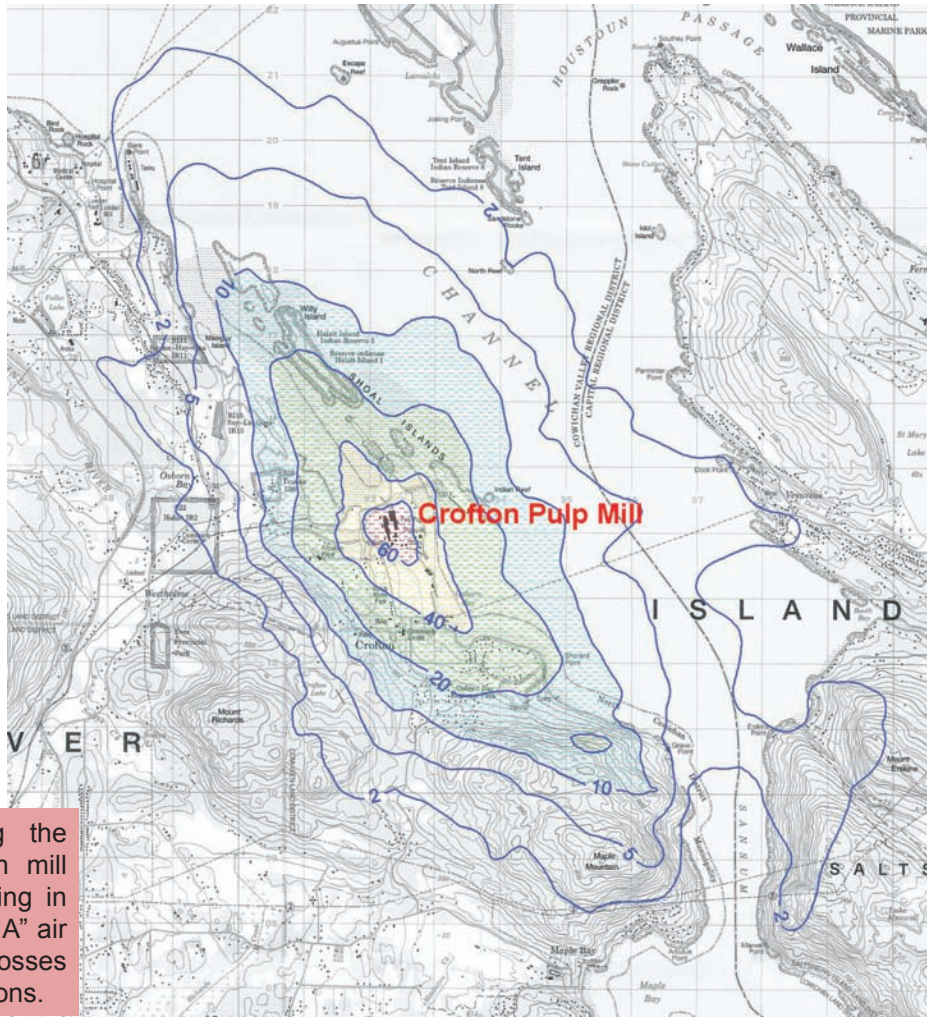
Bucket Brigade Gets Results

In Prince George BC, the Peoples Action Group for Healthy Air, working with the Miller Additions Citizens Committee, has deployed air sampling buckets and discovered high concentrations of methyl-ethyl-ketone (MEK), found in varnishes, lacquers and glues. The sampling also revealed touluene, which is an organic acid, alpha-pinene, d-limonene, 3-carene and beta phellandrene, more likely to be mill signature chemicals. Canfor has promised to reduce odours by 50% over the next four years. The groups originally borrowed one of the buckets *Reach for Unbleached!* had deployed at two coastal pulp mills in 2002. [See "Tests Find High Levels of Toxic Air Pollution," Millwatch, *Watershed Sentinel,* February 2003.]

—250 News, October 15, 2009

Mill Permits Permit Wide Swath of Air Quality Concerns

It comes as no surprise to those suffering from frequent "bad air days" around BC's pulp mills. A new study of the air quality impacts of the Crofton pulp mill reveals that the air pollution permit levels could expose a wide swath of the countryside to air quality worse than provincial or federal guidelines.



On the right: Map showing the percent of time when Crofton mill permits allow emissions resulting in levels of TRS above BC "Level A" air quality objectives. The red crosses are locations of monitoring stations.

Reach for Unbleached! and the Crofton Airshed Citizens Group commissioned RWDI Air to model the potential impacts of mill emissions if the mill were to pump out pollution at the levels allowed by the permits from the provincial government. The pollutants studied were Total Suspended Particulate (TSP) and smaller particulate matter (PM10 and PM2.5), total reduced sulphur (TRS), chlorine dioxide (ClO2), and dioxins and furans (PCDD/DFs).

In the case of chlorine dioxide, real emissions numbers were available to the scientists. The mill is persistently out of compliance with its permit levels on chlorine dioxide emissions, and the study found that an area immediately around the mill exceeded the Alberta one hour air quality objective (BC has none) 8% of the time, which would be about 29 days of the year.

Even more concerning are the results for TRS (the "smell of money" pollutant) and particulate. If the mill were to output TRS at the levels which it is allowed under the permits, an area about 5 by 20 kilometres, from Maple Mountain almost to Chemainus would be exposed to TRS over the BC 24 hour "Level A" objective 5% of the time, about 18 days a year. Worse, a substantial area closer to the mill, including most of Crofton, would exceed that level 20% of the time – one day in five, while the west side of Saltspring Island would be exposed 2% of the year, more than 7 days.

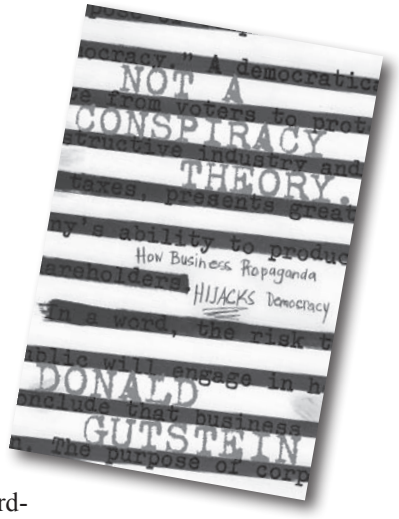
TRS is annoying and makes some people feel ill, but very fine particulate matter (PM 2.5) is a confirmed health risk. There are no permit standards for PM2.5 but there are ambient air measurements for the Crofton area, and it is generally known that PM2.5 forms about 70% of pulp mill particulate. From the models, it appears that BC 24 hour objectives could be exceeded for a similar, although slightly smaller and different area, when the mill output is combined with background air concentrations.

In all cases, two of the three air monitors in the area are outside the predicted areas of major impact.

The full report and all maps are available at *www.rfu.org*, "What's New."

—Delores Broten

Not a Conspiracy Theory



Not a Conspiracy Theory, Donald Gutstein. Key Porter Books, Toronto, 2009. ISBN 978-1-55470-191-9. 376 pages, $22.95

In *Not a Conspiracy Theory*, Donald Gutstein explores the roots of corporate propaganda in the United States and traces its rise and influence across Canada. He documents how corporate propaganda works, who funds it and how it is marketed to the mainstream media – usually without any acknowledgement. For anyone who worries that the propaganda machine has hijacked the democratic process, *Not a Conspiracy Theory* is a must read.

Gutstein documents the prolonged propaganda campaigns mounted by business to influence our opinions on fundamental issues of social and political life. Think tanks with impressive names and populist-sounding agendas – staffed with credentialed researchers with well-honed reputations – churn out research that purports to be both independent and free of bias. But peel back the curtain and you find big business with its big bucks and anti-democratic agenda: maximizing and maintaining profits no matter what.

But *Not a Conspiracy Theory* ends on a surprisingly optimistic note, as Gutstein points out how the Canadian public has persisted in its hard-held beliefs in Medicare, in social programs, in Canada itself, despite the onslaught of some of the best propaganda money can buy. He closes with some communications advice for those trying to effect social change: label the environmental, anti-racist, peace, and social justice movements "the progressives," en masse, and label the right-wing business interests the "market fundamentalists." Then be done with all the distracting petty differences and focus on opposition to corporate power.

Definitely worth the read, and lots of thought.

—Delores Broten

Respite for the Soul

Regreen: New Canadian Ecological Poetry, edited by Madhur Anand and Adam Dickinson, Your Scrivener Press, Sudbury, 2009. ISBN 978-1-896350-36-3. 142 pp., $18.00

If you didn't think ecological poetry was a genre of its own, this little collection might make you reconsider. But on the other hand, it is far more delightful to wander among the poets' thoughts, the odd metaphor grasping at the mind, like Robin Sarah's "place of unbleached reckoning." Featuring a wide-ranging collection of over 3 dozen skilled writers from across Canada, *Regreen* is going to provide many a delightful moment of rest and reflection. *—DB*

Desperate Times, Desperate Measures

Could carbon capture and sequestration save the world? Canadian taxpayers are putting $1.6 billion into the experiment.

by Stephen Leahy

Like a reckless gambler, the federal government's plan to deal with our emissions of climate-altering carbon dioxide is to put most of our money on an unproven, risky and expensive long shot called "carbon capture and sequestration," CCS for short. In a pair of October announcements, the Alberta and federal governments committed $1.6 billion to use this untested technology to reduce carbon emissions from an Alberta coal plant and a Shell Oil tar sands upgrader. Billions more are promised.

Canada puts 600 million tonnes of carbon dioxide into the atmosphere every year. That has to stop. This generation, you and me, must determine what methods and technologies offer permanent CO_2 reduction at the scale we need, and do so quickly, safely and at the lowest cost. And we must act on that knowledge as if the future of children's lives depend it because we are shaping the world they will inherit.

We cannot rely on political and business leaders to make these decisions on their own, as will become evident.

What other ways could we reduce our CO_2 emissions with $1.6 billion of public money – $200 per Canadian family of four? Replace 3.2 million older inefficient refrigerators with high-efficiency ones, thus reducing carbon emissions by 2-3 million tonnes annually. The two proposed Alberta carbon capture and sequestration (CCS) projects promise emission reductions of 2.1 million tonnes in total, if they work as touted. Keep in mind there are no large-scale CCS projects anywhere in the world.

With this level of investment, replacing refrigerators or windows or lights or a dozen other energy efficiency improvements can produce major emission reductions quickly, safely and guaranteed. Buildings use at least 40 per cent of all energy consumed in Canada and retrofits could reduce that energy use to 10 per cent or even less, experts have repeatedly pointed out.

What about alternative energy generation from wind, solar or geothermal? That $1.6 billion could buy and install 1000 one-mega-watt wind turbines – enough carbon-free electricity for 500,000 homes. How many solar panels does $1.6 billion buy and how much CO_2 reduction?

These questions need to be part of a public discussion about the ways Canada can reduce its carbon emissions. Right now the Alberta and federal government are only talking to the fossil fuel industry, and "clean coal" CCS is what we get. "There's been no announcements for efficiency or renewable energy programs," says Amy Taylor, Director of Alberta Energy Solutions, at the Pembina Institute, a Calgary-based environmental organization with a focus on sustainable energy. "We need a balance in energy generation and emission reductions. What if CCS doesn't work?"

Replacing refrigerators or windows or lights or a dozen other energy efficiency improvements can produce major emission reductions quickly, safely and guaranteed.

Despite misgivings, Pembina supports the development of CCS in the hopes the technology can reduce emissions on existing coal plants. "The only way to reduce their emissions is with CCS or shutting them down," she says. Any new coal-fired power plants like the Keephills 3 being built west of Edmonton must have CCS, she says. Not that Alberta actually needs any new coal power plants. Alternative energy generation using wind, solar, or geothermal, combined with energy efficiency, would easily meet Alberta's future energy needs, Pembina has documented.

"What if you could have your cake and eat it, too?" said Stephen Snyder, president and CEO of TransAlta Corp, an Alberta energy utility building the Keephills 3. Snyder was responding to Prime Minister Stephen Harper and Alberta

Premier Ed Stelmach's announcement of $778-million to develop CCS technology to capture CO_2 emissions from the plant's smokestack, compress them and store them underground forever.

"What CCS is all about is we get to keep burning coal," says Graham Thompson, a journalist with the *Edmonton Journal* and author of a new report on CCS. Canada seems determined to continue to expand fossil fuel energy use and tar sands production since it is relying on CCS to reduce emissions 70 per cent by 2050. "They are making those numbers up....and talk as if this is a proven technology on a large scale," Thompson said in an interview. "The allure of CCS as a political fix threatens to divert resources from energy efficiency and delay more durable reforms."

Humanity emits nearly 30 billion tonnes of CO_2 annually, mainly from burning fossil fuel. That number has increased year after year, but scientists agree that, to avoid dangerous climate change, global emissions must peak by 2015 and rapidly decline, eventually to zero. CO_2 resides in the atmosphere for many centuries, and so this year's 30 billion tonnes of heat trapping gases is another still-thicker layer on top of the last 150 annual layers of human emissions. The thicker our global atmospheric duvet gets, the hotter our world becomes.

"The public doesn't understand the scale of the energy and CO_2 reduction challenge," says Juerg Matter, a geochemist at Columbia University in New York City. "They think we don't need coal, we should just shut them down," says Matter who is also a leading expert on CCS research.

Globally, some 40 per cent of electricity production comes from coal, by far the most CO_2 intensive energy source, according to the International Energy Agency (IEA). The Paris-based IEA estimates coal use will grow at 2 per cent per year until 2030, almost exclusively in the developing world, China and India in particular.

Add in other CO_2-emitting electricity generation fuels like natural gas and oil and you can see why Matter and many scientists, including the International Panel on Climate Change, say the world needs some form of CCS.

There are different CCS research efforts around the world that hope to sequester CO_2, under the sea floor where pressures would keep it immobilized, or turn the gas into limestone, a process called mineral carbonation. Matter explains that under the right conditions CO_2 can be dissolved into water and converted into limestone or chalk, locking up CO_2 permanently. The first major pilot project is underway in Iceland.

Given current and future emissions, CCS is a critical technology for reducing emissions, says Matter. "We need a mix of energy sources and all kinds of places and ways to sequester carbon."

Canada, Alberta, and many other countries are putting almost all of their money behind "clean coal" CCS technology that chemically separates 70 to 90 per cent of CO_2 at a coal plant's smokestack, compresses it, and pumps it through pipelines to a suitable underground reservoir.

Although some Canadian politicians like Environment Minister Jim Prentice pretend CCS is a proven technology, there are no large-scale CCS projects anywhere in the world. Three small-scale efforts, including those in Saskatchewan and Norway, don't involve coal plants. The world's first "clean coal" CCS demonstration project, expected to be operational in Spremberg, Germany this year, hasn't pumped CO_2 underground because of protests by local residents.

Small Slow Leaks Aren't the Only Hazard

Pumping millions of tonnes of CO_2 deep underground into saline aquifers under towns or communities may make people nervous. A leak of sufficient volume and concentrations could be hazardous to people, animals and plants. The chances should be remote, says Columbia's Matter, but do require monitoring. The real danger is many small, slow leaks that add more CO_2 to the atmosphere. For CCS to work, the sequestration part has to be reliably, 1000-plus-years, permanent.

Large volumes of pressurized CO_2 pumped underground have the potential to displace or contaminate groundwater.

The *Edmonton Journal's* Thompson report for Munk Centre for International Studies at University of Toronto takes a hard look at the risks of CCS in Alberta, given the fact that the province hopes to eventually pump 140 million tonnes of captured CO_2 underground. Many parts of Alberta are literally pin-cushions with thousands of old drilling and bore holes, Thompson discovered. The University of Alberta's Karlis Muehlenbachs told him that at least 400,000 such holes have been drilled in Alberta in the last 70 years. Although plugged with cement, 100,000 of those may have sprung leaks.

Large volumes of pressurized CO_2 pumped underground have the potential to displace or contaminate groundwater either directly or indirectly. The captured CO_2 will also contain contaminates from coal combustion including nitrogen oxides and sulphur dioxide as well as trace heavy metals including lead, mercury and cadmium. Both CO_2 and sulphur dioxide form acids in contact with water, and could leach lead or arsenic out of the surrounding rocks.

Worse still is the possibility of causing earthquakes. In 2008, the CCS demonstration site at Norway's Sleipner gas field in the North Sea, may have triggered a magnitude 4

Continued on Page 26 ⇨

⇦ *CCS continued*

earthquake, according to Christian Klose, a geophysicist at the Think Geohazards consulting firm in California. Klose and other specialists were in London, England in early October at a special conference to assess the risks of CCS.

Another of those specialists, Andrew Chadwick of the British Geological Survey, warned that if pressurized CO_2 rises up through porous rocks or cracks it will expand. "If enough CO_2 is injected into an aquifer, it could increase the pressure enough to reactivate a fault and trigger an earthquake," Chadwick told the magazine *New Scientist*.

No Clean Coal

Even if CCS works as promised, there is nothing clean about burning coal. Coal plants are the leading cause of smog, acid rain, emissions of mercury and other toxic metals. Burning coal and oil costs the United States about $120 billion a year in health costs, mostly because of thousands of premature deaths from air pollution, the US National Academy of Sciences reported in a study on October 19th. The study did not include the environmental damage from coal mining or the pollution of rivers with chemicals that were filtered from coal plant smokestacks to keep the air clean.

"Coal mining is a dirty, dirty business," agrees Columbia's Matter. CCS will do nothing to improve that fact but some worry that such huge investments in CCS bring new and longer life to a dirty business that ought to be phased out for other environmental reasons.

CCS and the Tar Sands

When it comes to large-scale industrial pollution nothing in Canada tops the Alberta tar sands oil production. It is the country's largest and fastest growing source of CO_2, and releases at least three times the CO_2 emissions as regular oil production, according to Pembina. And CCS will do little to change that, agree Taylor and Thompson. Tar sands, also called oil sands, production covers thousands of square kilometres, and emissions come from a great many sources including the giant trucks used to move the mined sands. "CCS doesn't really work in the tar sands," says Thompson, despite all the claims.

One of the two CCS projects announced in mid-October was Shell's Scotford oil sands upgrader north of Fort Saskatchewan. An upgrader is a massive, energy intensive petro-chemical complex that converts mined bitumen into a range of synthetic crude oils and is one of the few single-source large emitters of CO_2. The project was awarded $865 million from the Canadian and Alberta governments to kickstart the $1.35 billion project to capture about 40 per cent of the upgrader's annual emissions and pump them 2,300 metres underground.

"Taxpayers should not be shouldering the bulk of the cost of this project," says Taylor. "Oil companies should be paying for their pollution."

Why does Canada need to invest billions in "clean coal" CCS at all? There are only 21 coal plants in the entire country, and Ontario is shutting down its four plants to reduce its emissions. CCS doesn't do much for tar sands. And new energy needs could be met by serious investments in alternative energy sources and efficiency improvements.

"The coal age is over," says Lester Brown, founder and president of the Washington-based Earth Policy Institute, a think tank devoted to creating an environmentally sustainable economy. "Even the US energy utilities are giving up on coal. And they aren't interested, and don't have confidence in CCS," Brown said in an interview.

Fortunately low-carbon energy sources like natural gas, wind, and solar are ramping up and energy efficiency is finally getting started. US carbon emissions have fallen 9 per cent since 2007 and that drop is only partially due to the recession. Bigger declines are in the pipeline because the Obama administration has passed laws to improve appliance efficiency, and mandated that federal government departments reduce their energy use. More than 100 wind farms will go on line in 2009, and 132 geothermal plants are underway along with 15 very large solar thermal plants.

"Investing in CCS for coal is thinking in the past when things are changing very fast," Brown says.

Apparently Ottawa and Alberta didn't get the memo.

♦

Stephen Leahy is an environmental journalist from Uxbridge Ontario.

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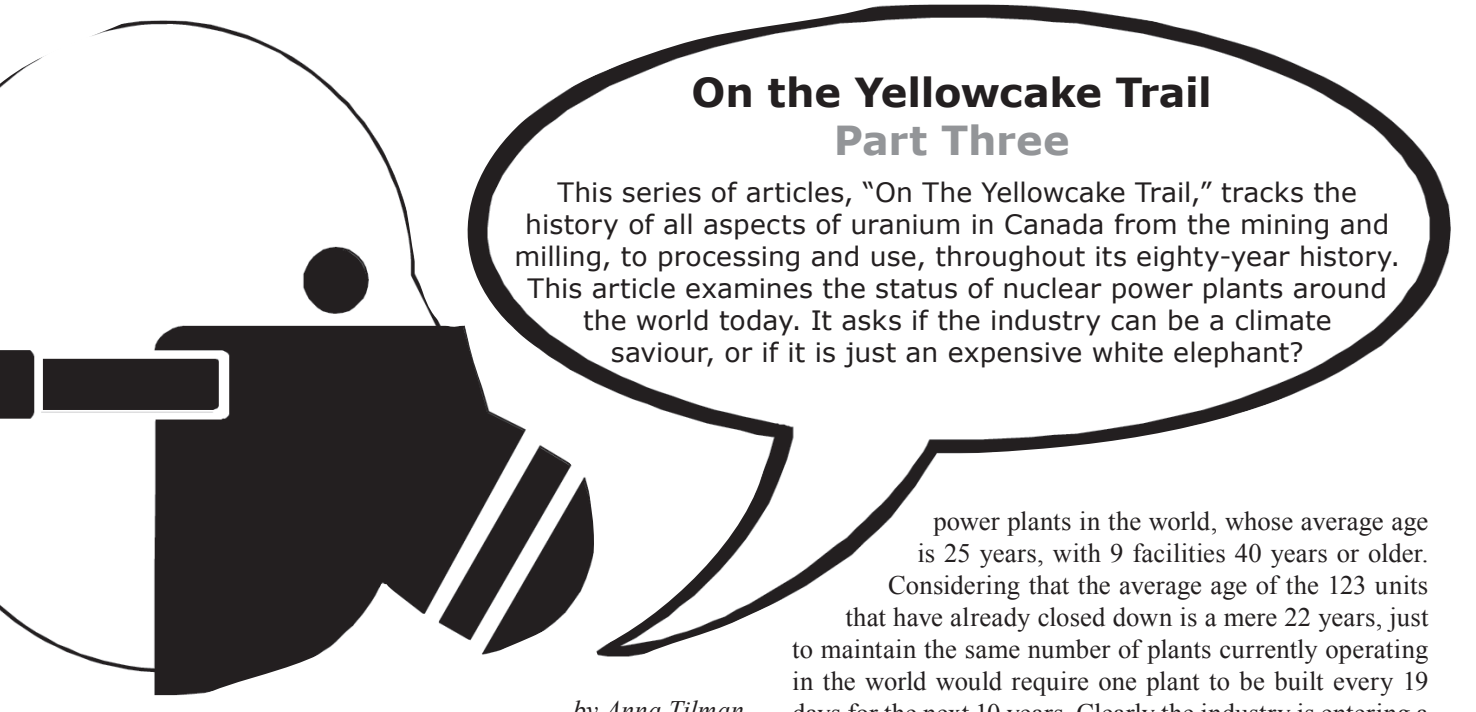


On the Yellowcake Trail
Part Three

This series of articles, "On The Yellowcake Trail," tracks the history of all aspects of uranium in Canada from the mining and milling, to processing and use, throughout its eighty-year history. This article examines the status of nuclear power plants around the world today. It asks if the industry can be a climate saviour, or if it is just an expensive white elephant?

by Anna Tilman

Reality Check

The nuclear energy industry has a dream of a new renaissance – but their dream could be our nightmare. Already there are large quantities of long-lasting highly radioactive waste at reactor sites sitting in cooling pools of water with nowhere to go. A nuclear renaissance would only make this desperate problem even worse.

Despite all the reports about leaks, shutdowns (temporary and long-term), construction woes, and financial costs, nuclear power proponents continue to portray it as safe, reliable and cheap. Worst of all, they portray it as the solution for climate change.

A reality check on the status of the world nuclear industry, according to the International Atomic Energy Agency (IAEA), shows that as of August, 2009, 435 nuclear reactors were operating, generating about 14% of the world's electricity. Fifty-two units are categorized as "under construction," and many of these units have been in this stage for more than 20 years. About 90% of these nuclear power plant projects are concentrated in Eastern Europe and Asia, 16 in China alone.

While new plants have come on the grid every year since commercial use of nuclear energy began in 1954, no new nuclear plant was connected to the grid in the year 2008. The most recent nuclear plant to come on line was Cernavoda-2 in Romania in 2007, a CANDU reactor that took twenty-four years to build.

This is a far cry from the nuclear industry's peak year in 1979, when 233 reactors were being built. Even after the explosion at the Chernobyl plant in the Ukraine in 1986, 120 new reactors came on line.

What this boils down to is an aging fleet of nuclear power plants in the world, whose average age is 25 years, with 9 facilities 40 years or older. Considering that the average age of the 123 units that have already closed down is a mere 22 years, just to maintain the same number of plants currently operating in the world would require one plant to be built every 19 days for the next 10 years. Clearly the industry is entering a steep decline, not a renaissance.

Life Beyond Sixty?

The nuclear industry estimates the lifespan of a nuclear power plant to be forty years. However, the nuclear plants that have shutdown so far have an average age of only twenty-two years. Despite this clear evidence, the nuclear industry, especially in the US, is claiming that the lifetime of reactors can be extended to 60 years and beyond. Since too few plants are being built to replace the existing ones, the only way to prevent a decline is to keep the old ones creaking along, regardless of safety and reliability. So far, only two operating reactors in the world have exceeded a 40-year lifespan, and these two reactors (in the UK) are scheduled to close in two years. Even in those plants, generation was temporarily suspended due to a fire.

Nuclear plants are not like any other plants. If something goes wrong, it can cause a major disaster. So what magic potion does the nuclear industry have in mind to boost the ages of these plants without compromising safety and reliability? Will they be able to prove that that they can do this to the regulatory agencies that must authorize such extensions? This is unknown territory.

Where are the Nuclear Workers?

A major issue facing the industry is a declining experienced workforce. In many countries where nuclear plants have been in operation for several years, the most experienced staff is approaching retirement and too few recruits are entering into the field to replace them. Even France, where 80% of the electricity is nuclear-generated, is facing a shortage of skilled workers. The President of the Cana-

dian Nuclear Safety Commission (CNSC) has stated that CNSC is "facing many of same issues as the rest of the nuclear industry," including a 10% annual turnover and 23% of the workforce eligible to retire in the next five years.

Since most of the proposed expansion is likely to occur in countries that do not have experience with nuclear power plants, the lack of a skilled workforce, combined with regulatory regimes that will likely be more lax, is very disconcerting.

The Big Fish...and the up-and-coming ones

Out of the thirty-one countries presently using nuclear energy, six countries dominate the field, the US, France, Japan, Germany, Russia, and South Korea. These "big fish" generate two-thirds of the world's nuclear energy. Canada is positioned seventh, along with the Ukraine, which has plans for two new nuclear plants.

The US, with 104 nuclear plants in operation, is the world's biggest nuclear power. Almost all the reactors were built in the 1960s and 1970s. Since 1977, there have been no new construction starts in the US, partly because natural gas generation was considered more economical, and construction schedules for nuclear plants were frequently extended. The partial melt-down of Three-Mile Island in 1979 has effectively nailed the coffin on newly built plants for the last thirty years.

In 2001 George W. Bush launched the Nuclear Power 2010 program with the objective to "complete construction and deploy multiple commercially viable new nuclear plants by 2010." It is now obvious that no new plant will be up and running in the US by 2010. Only one unit (in Texas) is currently planned to operate before 2015. In the nuclear industry, things just don't work out as expected.

The New "State-of-the-Art" Reactor – Trouble in Finland

The "big six" countries, as they are known, have had their share of nuclear woes. But if serious consideration is ever given to a nuclear renaissance, the experience in Finland alone should provide the strongest possible deterrent.

The largest nuclear construction site in Europe is in Olkiluoto, Finland, an island in the Baltic Sea. Olkiluoto is also the site for a final repository for Finland's spent fuel. The project is managed by the French-owned AREVA, the largest nuclear builder in the world. This project was meant to showcase Areva's newly designed Evolutionary Power Reactor (EPR). But it is turning out to be a major fiasco in every way.

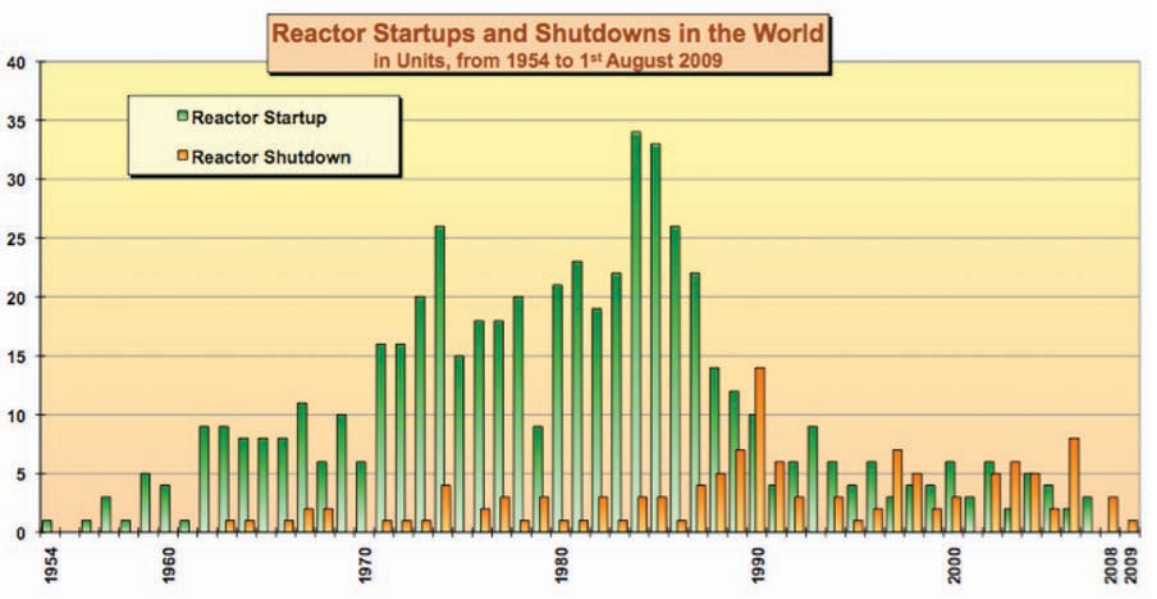
The reactor is more than three years behind schedule,

Continued on Page 30 ⇨

Status of Nuclear Power in the World (August 2009)

	Nuclear Reactors				**Power**
Countriy	*Operating*	*Average Age*	*Under Construction*	*Planned*	*Share Electricity (%)*
Argentina	2	31	1	1	6
Armenia	1	30	0	0	39
Belgium	7	29	0	0	54
Brazil	2	18	0	1	3
Bulgaria	2	20	2	0	33
Canada	18	26	0	3	15
China	11	8	16	29	2
Czech Republic	6	18	0	0	32
Finland	4	30	1	0	30
France	58	24	1	1	76
Germany	17	28	0	0	28
Hungary	4	24	0	0	37
India	17	18	6	10	2
Iran	0	0	1	2	0
Japan	53	24	2	13	25
Lithuania	1	22	0	0	73
Mexico	2	18	0	0	4
Netherlands	1	36	0	0	4
Pakistan	2	24	1	2	2
Romania	2	8	0	2	18
Russia	31	27	9	7	17
Slovakia	4	19	2	0	56
Slovenia	1	28	0	0	42
South Africa	2	25	0	3	5
South Korea	20	17	5	7	36
Spain	8	26	0	0	18
Sweden	10	31	0	0	42
Switzerland	5	34	0	0	39
Taiwan	6	28	2	0	19
Ukraine	15	21	2	0	47
UK	19	28	0	0	13
USA	104	30	1	11	20
Total	**435**		**52**	**92**	**14**

Compiled from *www.world-nuclear.org/info/reactors.html*



Mycle Schneider Consulting 2009

⇦*Nuclear Power continued*

and the start-up date gets pushed further into the future. There are major construction problems ranging from inappropriate materials to an inexperienced workforce. There are legal disputes between Areva and the Finnish utility (TVO). There are cost overruns, putting the project more than 50% over budget from the original estimate of about $4.5 billion. If this is a state-of-the-art project, then what can be expected from ones that aren't?

Other than this reactor in Finland, the only nuclear reactor currently being built in Western Europe is in Flamanville, France. It is a clone of the Finnish reactor, and not surprisingly, it is encountering similar problems – construction issues, delays, and budget overruns.

The escalating costs that plague the industry should prevent the construction of any new reactors. Only very generous government subsidies, and government protection against legal liability, have kept the nuclear industry alive. No other industry is so heavily subsidized.

Canada's Reactors

Canada has a supreme place in the nuclear industry. It is the world's largest uranium producer, supplying about 23% of the global market, and exports more than 85% of its uranium. It was one of the early investors in nuclear power, and began developing a new design of heavy water reactor in 1944. This set the development of the Canadian reactor program down a unique path, with the adoption of the CANDU – CANadian Deuterium Uranium – reactor design.

The key differences between the CANDU reactors and the more widely adopted light water reactors are that they are fuelled by natural uranium (as opposed to enriched uranium), can refuel without shutting down, and are cooled and moderated by heavy water. While the CANDU saves costs in enrichment, these savings are partially offset by the cost of producing heavy water.

The first commercial CANDU reactors began operation in Pickering, Ontario, in 1971. Sixteen reactors are located in Ontario, and one each in Quebec and New Brunswick. Nuclear power provides 14.8% of Canada's electricity, and 53% of Ontario's electricity.

Throughout their history, the Canadian reactors have been plagued by technical problems, leading to cost overruns, and reduced power generation. The initial estimate for Darlington Station in Ontario, Canada's last-built nuclear plant, was $5 billion, and it nearly tripled to $14 billion or more, a cost passed on to Ontario's taxpayers.

In August 1997, Ontario "temporarily" shut down its oldest seven reactors to allow a significant overhaul to be undertaken. Four reactors were shut down at the end of 1997, and three others were closed in March 1998. An eighth reactor had already been shut down in October 1995.

At the time, it was the largest single shutdown in the international history of nuclear power – over 5,000 MW of nuclear capacity, one third of Canada's nuclear plants. As of May 2009, only four of the eight reactors had returned to operation. Two more are scheduled to come back on line later in 2009 or early in 2010. Two other reactors have been retired from service.

Proposals for constructing new plants, whether by government or private interests, are encountering substantial local opposition.

Ontario has shelved its plans to build two new units at Darlington, partly because of the cost (over $26 billion), but also because the economic recession has lowered electricity demand. Bruce Power, a private company, has cancelled plans to build nuclear plants at Nanticoke, Ontario (the site of the largest coal plant in North America, on the shores of Lake Erie) in the face of strong local opposition. But it has moved westward to Alberta in search of a willing host.

New Brunswick is investigating the option of adding a second nuclear reactor at its Point Lepreau site. Meanwhile, a $1.4 billion refurbishment project on the existing reactor, which has been off-line since April 2008, is running behind schedule by eighteen months and over budget by $1.6 billion.

Any new CANDU reactor would have to undergo a thorough regulatory review, and its costs are still impossible to estimate.

Presently 34 CANDU reactors are operating in seven countries, as well as 17 'CANDU derivative' reactors in India, with more being built. 12 CANDU units have been exported to South Korea (4), Romania (2), India (2), Pakistan (1), Argentina (1) and China (2).

Nuclear – the Answer to Climate Change...not

Despite all the operational problems encountered by the nuclear industry in the last two years alone, especially in France, Germany, and Japan, nuclear energy was seriously considered as a means to address climate change and energy security at the G8 meeting in July 2008. The World Nuclear Association, along with other international bodies such as the OECD, remains completely confident nuclear power will be back on the agenda, but many factors mitigate against that:

- A new nuclear reactor is a very expensive proposition, requiring government subsidies and insurance guarantees, and a skilled workforce. Cost overruns and long lead times, coupled with uncertainties as to completion dates, are inherent in the building of any nuclear reactor. Many billions are needed for decommissioning and legacy wastes.
- The price of nuclear energy in the U.S. is approximately twice that of natural gas and unlikely to decrease. The costs of wind and solar, on the other hand, are now comparable with nuclear energy and rapidly falling as energy efficiency improves and economies of scale kick in.
- Once running, power plants are huge water consumers, and particularly vulnerable to the effects of climate change and flooding. Excessive heat in rivers and lakes can close a facility for safety reasons.
- Carbon dioxide (CO_2) is produced by burning fossil fuels in every stage of the nuclear chain – from the mining, milling, refining and enriching of uranium, to making fuel bundles for the reactors. On top of all that, the construction of nuclear power plants requires a lot of steel and cement, both derived from energy-intensive processes. When one also factors in the energy required to cool the spent fuel rods, and the emissions from all the transportation required throughout the nuclear chain, nuclear energy is anything but carbon neutral.

For high quality uranium ores, the CO_2 produced by the full nuclear chain has been calculated to be about one half to one third of an equivalent-sized gas-fired power station. For low quality ores, the CO_2 produced is equal to that produced by an equivalent gas-fired power station.

A White Elephant

In 1954 Lewis Strauss, Head of the US Atomic Energy Commission, proclaimed that nuclear power would be "too cheap to meter." The reality has in fact been the reverse. No plant has been built without incurring long lead times and cost overruns. The true financial cost has been hidden by extensive government subsidies, limits on liability for accidents, and not adding the costs for waste storage and plant decommissioning to pricing structures.

When one also weighs in the harm from radiation exposure to long-term health and the environment, and the lack of any safe way to dispose of nuclear waste, the industry is truly a white elephant.

♦

Anna Tilman is a toxics researcher and a member of the Board of the International Institute of Concern for Public Health

Sources:

Mycle Schneider et al, "The World Nuclear Industry Status Report 2009," *www.bmu.de/english/nuclear_safety/downloads/doc/44832.php*

World Nuclear Association, *www.world-nuclear.org/info/reactors.html*

Arjun Makhijani, Ph.D. Institute for Energy and Environmental Research , "Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy," August 2007

J.W. Storm and P. Smith, "Nuclear Power: The Energy Balance," 2005, http://www.stormsmith.nl/

Wild Times

Salmon Seige

by Joe Foy

It was a September day in the Fraser Valley that seemed just about perfect, with a robin's egg blue sky above, fresh breeze right off the Fraser River, jade green Coast Mountains rising before me, the icy peaks of the Cascades shining on the ridge line behind.

But as I looked out over the surface of the big river, I and everyone else there on the gravel flats knew that it wasn't a perfect day at all. In the late summer of 2009, the massive Fraser River sockeye salmon run had collapsed. Thirteen million sockeye had been predicted to return to the river after spending 4 years in the North Pacific ocean. Less than 2 million did. More than 11 million sockeye had simply vanished. The Fraser's title as the largest, most productive wild salmon river on the planet is looking shakey.

"Pull, you guys!" A big guy, with a barrel chest and a booming voice, was leading a chain of helpers as they strained to pull in a large thick rope that bowed far out into the river, then cut under its surface. The big guy was Ken Malloway – Grand Chief Ken Malloway actually, of the Sto:lo Nation. His crew were mostly the men and women of his extended family. They were doing a "beach seine" as part of a commercial fishery for wild pink salmon.

What happened next was fascinating. The big rope was attached to a big net and as it was pulled closer to the gravel beach, I could see that it was full of big fish – mighty big fish!

Soon the fish were thrashing around in the shallow water. Ken's crew spaced themselves along the length of the flapping fins with Ken behind them. "Put back the coho, sockeye and sturgeon," he called out. And Ken's obviously experienced crew did just that. They gently picked up the fish from endangered populations and returned them to the river. The pinks and the spring salmon, which were from healthy runs, they kept.

Ken's pretty famous in these parts. The beach seine selective fishery is actually not an ancient form of Sto:lo fishing. It was Ken who experimented with the beach seine style, until he made it work. On that September day I could see clusters of Sto:lo families, strung out along the beach fishing in the same way as Ken's family.

If the once mighty salmon runs are destined to survive and revive, people like Ken Malloway will be one of the reasons why.

Wild Pacific salmon are under siege on all sides, and it will take new way of living with salmon – to make sure we don't end up living without salmon.

We need to greatly reduce the ocean based industrial fishery, which can scoop up endangered runs of salmon mixed in with healthy runs, and instead move to selective methods of fishing, like the river beach seine. We've seen the results of hammering endangered runs, not only in declining numbers of returning salmon to many of our streams and rivers, but in reports of starving orca, whales, and grizzly bears.

We need to wipe the stain of salmon farming from our coast. Deadly sea lice infestation, predation on young wild salmon, and disease outbreaks are a ticking time bomb. And I'm not a big fan of simply moving the salmon farms onto land either. After all, how many "farms" do you know of that exclusively feed wild things to their farm animals? Salmon farms result in the strip mining of southern oceans of wild fish used to render down into fish farm pellet feed. Salmon farms are a blight on our ocean, and the southern oceans too. Shut 'em down.

Salmon farms are a blight on our ocean and the southern oceans too.
Shut 'em down.

We need to look at all things salmon. And now, thanks to constant pressure from salmon activists and NDP MP Peter Julian, the federal government has recently announced that it will conduct a judicial enquiry into the disapearance of the Fraser River sockeye.

It's a start. We can see that a united effort to push the federal government into doing the right thing can work. I believe there is now a glimmer of hope that we can finally get the sweeping changes needed. But it will take constant vigilance and the participation of every one of us who cares about the fate of wild salmon to make the enquiry work. I figure if folks like Ken Malloway and his family can pull their weight in the fight to save the salmon, the rest of us can too.

♦

Joe Foy is Campaign Director for the Wilderness Committee, Canada's largest citizen-funded membership-based wilderness preservation organization.

Buying a car?

Don't buy barrels of trouble

Let's start with a biggie. What car over its lifespan requires you to buy so much gasoline it would fill a 17-story high stack of barrels? That's nine tonnes of dirty fuel from Big Oil. It costs you $25,000 to fill up that stack at today's European prices. Ouch. Driving this car also commits you to littering 29 tonnes of garbage. That's the weight of the eco-toxic CO_2 from burning all that gas. Those tonnes of litter take thousands of years before they stop harming our ecosystems. If that pollution were kept in the car it would crush you, the passengers, the car and even the roadway itself. It is equal to littering 3,000,000 plastic bags. That's a lot of litter.

So, what car forces you to pay for and burn so much dirty, dangerous and ever more costly fuel? A Toyota Prius, our most efficient gas car.

A mid-size car like the Honda Accord demands you spend and burn more than twice as much. A Subaru Outback even more. It could easily cost you more than $50,000 in gas before the car wears out. Its gas stack is taller than the world's tallest tree, and you will create 65 tonnes of global warming litter. It litters at the rate of one plastic bag worth of CO_2 every second as you drive down the highway.

What about those popular "fuel-sipping" sub-compacts like the Toyota Yaris and Honda Fit? Buy one and you must also buy and burn 27-stories of gasoline drums. Standing on top of this stack puts you eye-to-torch with the Statue of Liberty. When gas prices hit European levels here you'll need to fork over $40,000 for this much gas. Buying one of these small cars includes a promise to dump over 45 tonnes of CO_2 trash straight into our already out-of-whack climate.

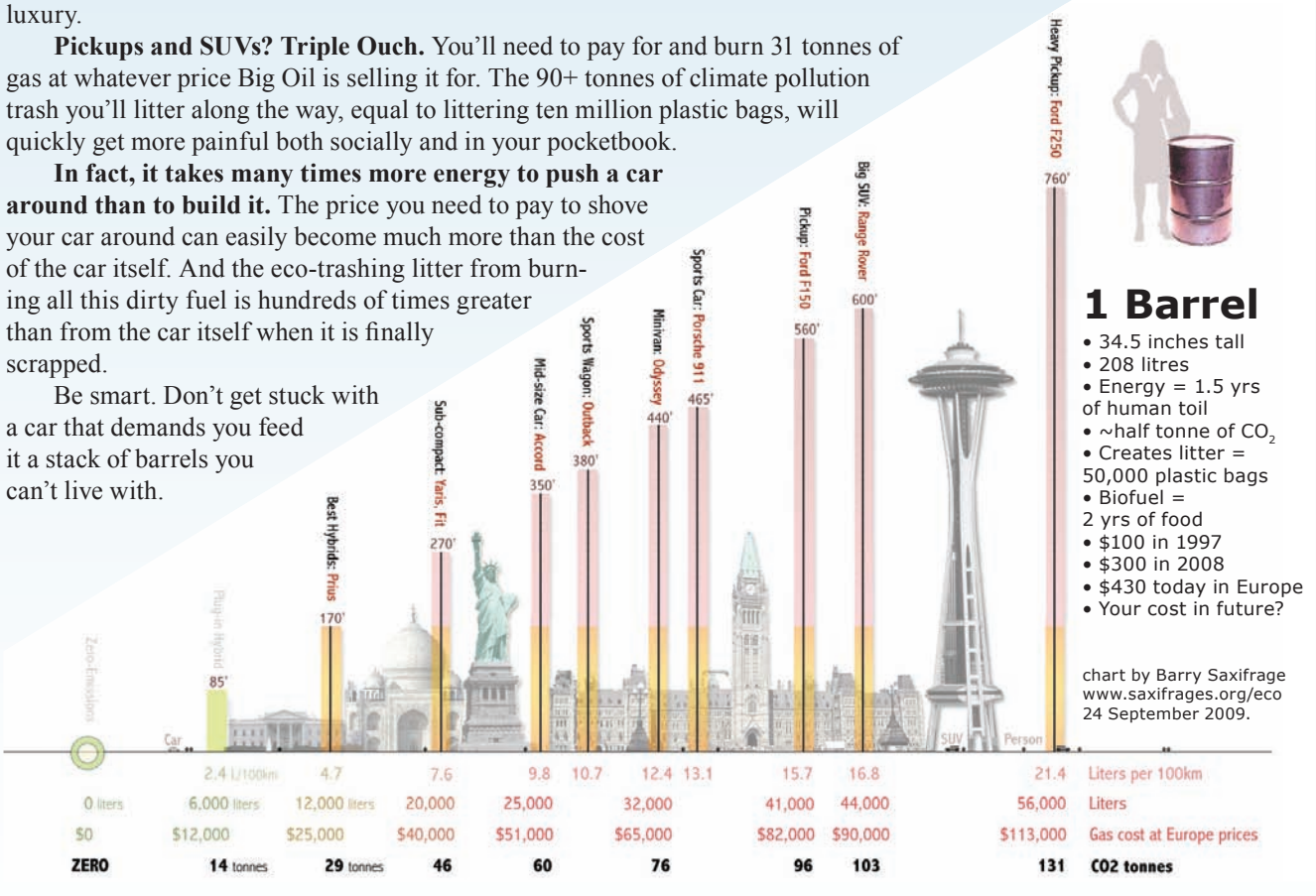
As the chart below shows, the required stack of gasoline barrels you commit to pay for and burn rises painfully as you opt for more size and luxury.

There is nothing "mini" about a minivan's 153 barrel demand. It requires you buy and burn energy equal to 26 people working full time for a decade. It is going to cost you tonnes for that luxury.

Pickups and SUVs? Triple Ouch. You'll need to pay for and burn 31 tonnes of gas at whatever price Big Oil is selling it for. The 90+ tonnes of climate pollution trash you'll litter along the way, equal to littering ten million plastic bags, will quickly get more painful both socially and in your pocketbook.

In fact, it takes many times more energy to push a car around than to build it. The price you need to pay to shove your car around can easily become much more than the cost of the car itself. And the eco-trashing litter from burning all this dirty fuel is hundreds of times greater than from the car itself when it is finally scrapped.

Be smart. Don't get stuck with a car that demands you feed it a stack of barrels you can't live with.



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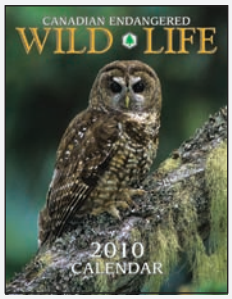

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