

# Canada's Green Energy Future



## Efficiency and Renewable Energy Options

### Green Energy Policy

#### *NUCLEAR & COAL POWER STATIONS CAN BE PHASED OUT NOW*

**N**UCLEAR AND COAL POWER STATIONS CAN BE PHASED OUT NOW IN AN ORDERLY TRANSITION WHICH ADDRESSES job-related concerns of power workers and host communities. Moving toward environmentally sustainable sources of electrical power will produce health and economic benefits for all of Canada. A sustainable energy policy includes improved energy efficiency and the widespread use of renewable energy supplies. It also includes accounting for the full cost to society and the environment of, for example, the public health costs of power plant pollution and the cost of cleaning up contaminated areas. These costs, which are sometimes referred to as “external costs”, must be factored in to reflect the full costs of energy production and consumption.

### Global Issues

#### *ENERGY EFFICIENCY MEASURES & RENEWABLE ENERGY ARE THE KEY*

**O**N A GLOBAL SCALE, ENERGY EFFICIENCY MEASURES AND RENEWABLE ENERGY ARE THE KEY TO SUSTAINABLE development, helping to build local self-reliance and energy supply flexibility into regional economies. The solution to many of our planet’s most pressing problems, including climate change, desertification and the threat of another nuclear reactor catastrophe, is fast action on efficiency and a phase-in of renewable energy supplies such as solar and wind power.

# Nuclear Power – No Thanks

## *EXPENSIVE, UNRELIABLE & POLLUTING*

**NUCLEAR POWER DOES NOT OFFER A SOLUTION TO “GLOBAL WARMING”** (WHICH IS MORE ACCURATELY referred to as climate change). It’s part of the problem of our current reliance on dangerous and polluting non-renewable resources. Nuclear power is simply too expensive and unreliable to replace coal and it has its own serious environmental and ethical problems-routine radioactive pollution, the ongoing risk of reactor meltdowns, nuclear waste which must be isolated from the environment virtually forever, and the risk of nuclear weapons proliferation. Globally, growth of the nuclear industry has ended and its decline is starting as aging reactors are closed.<sup>[1]</sup>

In Canada, the nuclear power industry continues to rely on ongoing government subsidies and financing. To date, the federal government has spent over \$15 billion (1997 dollars) of public funds in support of the industry. This amount doesn’t include future waste and reactor decommissioning costs or the public debt amassed by provincial electrical utilities which operate nuclear power reactors. By 1999, Ontario Hydro had an accumulated debt of over \$30 billion. Two-thirds of this debt is related to its nuclear power program.

The “opportunity cost” of the federal government’s accumulated \$15 billion subsidy has been estimated to be \$161.2 billion. Opportunity cost is what the subsidies would have been worth if the government had earned a standard rate of return on its investment.<sup>[2]</sup>

# Energy Efficiency

## *THE POTENTIAL IN CANADA IS ENORMOUS*

**EFFICIENCY CAN BE APPLIED TO ALL AREAS WHERE ENERGY IS USED**, including lighting, household appliances and industrial motors.

Cogeneration is the production of heat and electrical power, while at the same time using a single fuel. This highly efficient process made up over half of all new power station capacity built in North America in the past 10 years.<sup>[3]</sup>

The best time to take advantage of energy efficiency opportunities is while purchasing products or renovating. We need to look for the most efficient models, construction materials and designs on the market. Energy service companies (ESCOs) provide efficiency retrofits and obtain their fees from the energy savings of the customer. Utilities can also provide

## PLANNING FOR EFFICIENCY

**IMAGINE THAT YOU ARE TRYING TO FILL A** sink with water, but the water keeps running out the drain. There are two solutions: keep adding more water, or put a plug in the drain.

You also need to ask yourself if you need the sink filled to the brim, and if something better can be used in the place of water.

Approaching energy planning in this way allows us to make decisions that reduce costs while protecting the environment and public health.

Often the most cost-effective watt generated is a watt saved, or a ‘negawatt’. Installation of energy efficiency technologies (plugs for the sink) are cheaper than building new energy supply, and the retrofits increase property value.

financing of efficiency upgrades on utility bills, and lease high efficiency appliances to encourage customers to make improvements.

The potential for energy efficiency in Canada is enormous. The federal government established the Office of Energy Efficiency in 1998 to oversee a range of existing and new programs aimed at promoting, and in some cases, funding energy efficiency measures.<sup>[4]</sup>

Concerns about the potentially devastating effects of climate change have increased pressure to use less fossil fuel in order to reduce carbon dioxide emissions, a key ‘greenhouse gas’. In 1997 Canada signed the Kyoto Protocol which calls for a 6% reduction from 1990 levels of greenhouse gas emissions by 2012. The Royal Society of Canada’s ‘Canadian Options for Greenhouse Gas Emissions Reduction’ (COGGER) report found that “improved energy efficiency is the key to stabilising energy-related carbon dioxide emissions over the next two decades”.<sup>[5]</sup>

# Nuclear Power

## NOT A SOLUTION TO CLIMATE CHANGE

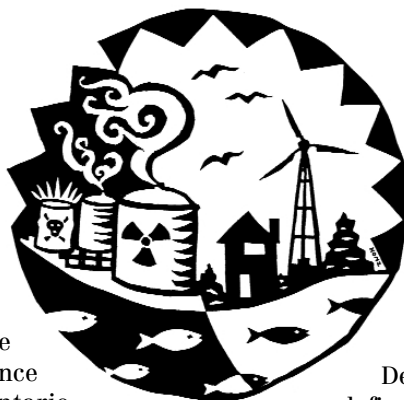
GLOBALLY, THE NUCLEAR INDUSTRY IS IN decline. Countries like Sweden, Germany and Switzerland are committed to phasing out nuclear power. In North America, there have been no new nuclear reactor sales since 1978. A 1999 poll taken in Ontario, Canada's largest province and where the majority of nuclear power reactors are located, showed that only nineteen percent of respondents ranked nuclear power as their preferred electricity option (Angus Reid poll, February 1999).

As part of its survival strategy, the nuclear power industry is exploiting global concern over climate change and is attempting to promote nuclear power as a solution.

Over the years, several studies have shown that investment in nuclear power does not adequately address the problem of climate change.<sup>[6]</sup> For example, in the Royal Society of Canada's *Canadian Options for Greenhouse Gas Emissions Reduction* study nuclear power is not once mentioned as a viable energy alternative to fossil fuels.<sup>[7]</sup> Moreover, a U.S. study found that every dollar invested in energy efficiency displaces seven times as much CO<sub>2</sub> emissions as the same dollar invested in nuclear power.<sup>[8]</sup>

In spite of this, the Government of Canada has been aggressively pushing for the inclusion of nuclear energy as part of a CO<sub>2</sub> reduction strategy in various climate change forums — a strategy which deliberately ignores radioactive waste and other nuclear pollution issues. Proponents of nuclear energy were pushing for its inclusion as part of the Clean Development Mechanism (CDM) at the 6th Conference Of the Parties (COP6) which took place in November 2000. However, a decision on what to include in the CDM was deferred when the conference ended without an agreement.

The Clean Development Mechanism (CDM), will allow Canada and other signatories to the 1997 Kyoto Protocol on greenhouse gas reductions to receive 'emissions credits' for projects undertaken in developing countries.<sup>[9]</sup>



While the mechanics of the Clean Development Mechanism are still being defined, the CDM would allow the Canadian government to undertake or participate in projects abroad that reduce CO<sub>2</sub> and other greenhouse emissions. Even though emissions would be reduced in a foreign country, Canada as a project participant would be entitled to a share of the total emission reduction 'credit' and could use this credit when accounting for its overall emissions reduction compliance with the Kyoto protocol.

The Clean Development Mechanism has been described as a market-based concept—essentially a variation on the idea of 'tradeable emissions'. The tradeable emissions concept has been criticized for its potential to allow states and large transnational corporations to continue undertaking highly polluting activities by moving emissions credits from one place to another. In Canada, there are concerns that the CDM will be used by the federal government to market Canadian nuclear reactors in developing countries as part of a CO<sub>2</sub> 'emissions reduction credit' program.

There are clear alternatives to the tradeable emissions shell game which do not rely on either coal or nuclear power generation. In April 2000, the David Suzuki Foundation published a groundbreaking study entitled *Power Shift: Cool Solutions to Global Warming*.

*Power Shift* describes how it is possible to reduce greenhouse gas emissions in Canada by 50% (at 1995 levels) by 2030. Solutions include commercial and residential retrofits and innovations in the transportation sector.<sup>[10]</sup>

The study authored by energy expert Ralph Torrie shows that it is possible using available technologies to shut down large scale coal, oil and nuclear plants by 2030.

# Wind Power

## *THE WORLD'S FASTEST GROWING ENERGY SOURCE*

**WIND MILLS HAVE AT LEAST A 1,000 YEAR HISTORY. THIS ANCIENT KNOWLEDGE HAS BEEN COMBINED** with sophisticated engineering and is now a cost competitive renewable energy supply. Wind turbines can be used to pump water or generate electricity. Wind farms with multiple turbines connected to the electricity grid can deliver electricity at four to five cents per kilowatt.hour.<sup>[11]</sup>

Wind power is the world's fastest growing energy source, with production quadrupling in the past decade.<sup>[12]</sup> Canada has about 80 megawatts of wind power, primarily in Quebec and Alberta. The Canadian Wind Energy Association (CanWEA) estimates that wind power can easily provide up to 20% of Canada's total electricity needs. There is in fact far more wind energy potential in Canada than our total current use of electricity.<sup>[13]</sup>

Wind power output is variable, depending on the wind itself. This is often raised as a key problem by utilities which expect high reliability. However, the World Watch Institute notes that "large amounts of wind power can be integrated into power systems without in any way threatening reliability".<sup>[14]</sup>

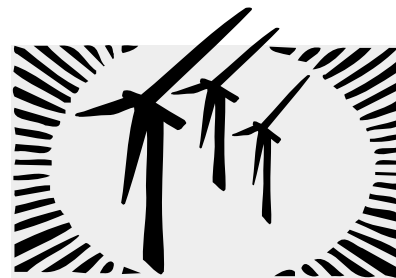
Combined wind and solar systems can improve reliability and cost because they complement each other in our climate. Wind turbines take up very little space on the ground, since 97-99% of the land below the turbines on a wind farm is available for other uses, such as agriculture, transportation and recreation. In fact, wind turbines, much like all renewable energy supplies, lend themselves well to decentralized applications at the location where the electricity is used.<sup>[15]</sup>

# Solar Energy

## *THE FUEL IS FREE*

**SOLAR ENERGY IS PLENTIFUL AND THE FUEL IS FREE. WELL KNOWN** design and construction methods can take advantage of 'passive' solar power in new buildings. Air-tight construction, with suitable insulation and high efficiency windows means passive solar design can cover most heating needs. Passive cooling makes use of natural lighting, outdoor shading, appropriate insulation, glazed windows and reflective materials for outside walls and roofs.<sup>[16][17]</sup>

A Natural Resources Canada study noted that the total technical potential of passive solar in Canada was equivalent to over 10,000,000 megawatt.hours of electricity per year, 1/3 of which was readily achievable.<sup>[18]</sup>



## WORLD LEADERS IN WIND POWER

**GERMANY AND DENMARK ARE WORLD** leaders in wind power. Germany's wind program only started in 1991 and now includes about 35 times more installed wind capacity than Canada.

Germany's renewables program was set up under new laws established after the Chernobyl nuclear disaster to encourage the renewable energy industry.<sup>[20]</sup>

Denmark has about 18 times more total wind power capacity than Canada, which translates into about 80 times more on a per capita basis.<sup>[21]</sup>

'Active' solar power uses collectors to capture energy and transform it for direct use or storage. Solar thermal systems are used to heat air, water or other fluids. The most cost-effective use of solar thermal power in Canada is to pre-heat ventilation air for commercial and industrial scale buildings. Solar hot water and pool heating systems are also cost competitive.<sup>[19]</sup>

The initial capital cost for these technologies can be a major deterrent for individual buyers and small businesses. Financing programs, including options to pay off the investment using electricity bill savings, are needed to encourage widespread installation. Energy savings can be realized after a few years of operations, depending on the system scale and design.

Current designs of photovoltaic (PV) cells convert sunlight into electricity at about 15% efficiency, while

# A SUSTAINABLE ENERGY POLICY FOR CANADA LOOKS LIKE THIS

---

- \* **CANADA'S ENERGY NEEDS ARE INCREASINGLY MET THROUGH ENERGY EFFICIENCY MEANS AND** renewable energy sources such as wind, solar, tidal and small scale hydro energy. As nuclear and fossil fuels are phased out, renewables and energy efficiency are phased in.

Canada's export of energy technology shifts to sustainable energy efficiency technologies and renewable energy supply options—no more nuclear reactors are exported and uranium exports are phased out as uranium mining ceases in Canada.

High efficiency natural gas cogeneration plants are used to bridge the transition to reliance on renewable energy supplies.

- \* **MANDATORY EMISSIONS CAPS ARE SET FOR ALL FOSSIL-FUELLED POWER STATIONS** (including electricity imports) to combat acid rain and smog—the dirtiest coal plants are shut down.

- \* **NO NEW NUCLEAR OR COAL POWER STATIONS ARE BUILT AND URANIUM AND COAL MINING IS** phased out permanently. Job related concerns of miners and affected communities are concurrently addressed.

- \* **THE EIGHT PICKERING A AND BRUCE A NUCLEAR POWER REACTORS IN ONTARIO ARE KEPT** closed for good. There is no need to restart these aging stations (the oldest commercial reactors in Canada).

The remaining 14 nuclear power reactors (12 in Ontario and one each in New Brunswick and Québec) are permanently closed. These stations are retired instead of retubing them when the time comes. Job related concerns of power workers and host communities are concurrently addressed.

- \* **GOVERNMENT SUBSIDIZATION OF NUCLEAR AND FOSSIL FUEL INDUSTRIES ENDS.**

laboratory models are reaching 30% efficiency. PV systems use batteries to store electricity for use after dark and on heavily clouded days. The cells are self-contained, require little maintenance, and are expected to last at least 30 years. Costs for PV electricity are about 40 cents per kilowatt.hour, making this technology cost effective in areas not serviced by power lines, when one considers the cost of power line extensions or alternate fuels.

New designs which incorporate PV cells into building materials such as roofing tiles will make PV systems more cost effective for general use.<sup>[22]</sup> Canada has over 20,000 PV systems installed with a total capacity of about 3 megawatts.<sup>[23]</sup> On January 1, 1999 Germany launched the “100,000 roofs” PV system program, aimed at generating 300 megawatts of capacity by 2005.<sup>[24]</sup>

## Biomass

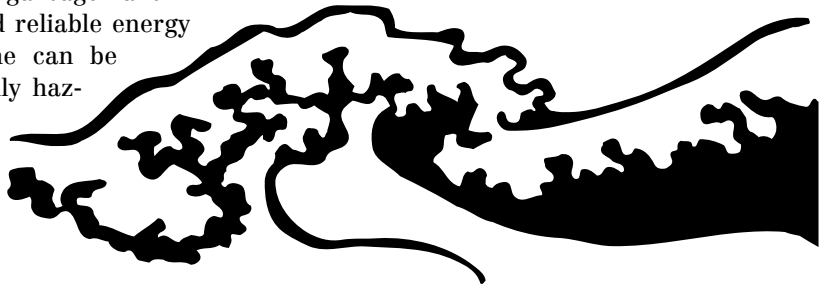
### *THE LARGEST SOURCE OF RENEWABLE ENERGY WORLDWIDE*

**BIOMASS POWER IS DERIVED FROM THE ENERGY STORED IN WOOD AND** other plant matter through burning or processing. It is the largest source of renewable energy used world-wide and contributes about 17% to Canada's industrial energy supply—mostly in the form of waste wood used in the pulp and paper industry. Wood is also used extensively for cooking and heating. Biomass fuels which can substitute for diesel and supplement gasoline are made from dedicated crops such as corn, while methane gas is produced from the digestion of organic waste, including from within municipal garbage landfill sites. Biomass is an important and reliable energy source. However, landfill methane can be contaminated with other potentially hazardous gases. Moreover, dedicated crop production for biomass fuel should not rely on pesticides, fertilizers and irrigation to sustain growth.

## Tidal Energy

### *POWER FROM THE EBB AND FLOW OF TIDES*

**TIDAL POWER COMES FROM THE GRAVITATIONAL PULL OF THE MOON AND** Sun on the Earth. The ebb and flow of the tides can be used to turn electrical turbines. North America's first tidal power station was opened in 1984 on the Annapolis River which leads into Nova Scotia's Bay of Fundy. It is estimated that the Bay of Fundy, notorious for its tidal activity, has 6,000 megawatts of potential installed capacity.<sup>[27]</sup> Tidal energy is considered cost competitive and three other power station sites in Nova Scotia and New Brunswick have been identified.<sup>[28]</sup>



## Hydro

### *SMART ON A SMALL SCALE*

**FALLING WATER IS A SOURCE OF CONTINUOUS ENERGY. OVER 60% OF** Canada's electrical energy comes from hydro-electric sites. Small hydro-electric stations can avoid or minimize the ecological and social problems inherent in larger facilities where huge dams are constructed and large areas of land are permanently flooded. Micro-hydro stations, classified as installations under 200 kilowatts, are the least expensive form of renewable energy, at less than 5 cents per kilowatt.hour. The potential for additional micro-hydro installations exists wherever water drops more than one metre.<sup>[25]</sup> Canada's micro-hydro supply totals about 1,600 megawatts, mostly produced by independent generating companies. About 70 companies are in the small hydro business in Canada.<sup>[26]</sup>

## Hydrogen

### *FUEL OF THE FUTURE?*

**HYDROGEN CAN BE OBTAINED THROUGH ELECTROLYSIS OF WATER. BY** passing an electric current through water, hydrogen gas can be extracted. The hydrogen releases energy when recombined with oxygen to form water. However, it takes more electricity to obtain hydrogen than the energy it releases. The source of electricity for the electrolysis of water is crucial—it shouldn't rely on non-renewable nuclear or coal-fired power stations. Photovoltaic (PV) solar electrolysis offers an appropriate match, especially when installed in a decentralized fashion, with rooftop PV attached to an electrolysis unit and gas compressor.

Hydrogen fuel can also be distributed by pipeline and burned like natural gas for everything from heating and cooking to transportation and industrial processing. Hydrogen fuel has three times more energy content than gasoline by weight, but is 10 times bulkier even when highly compressed.

# It's Time to Get Serious about Sustainable Energy Options

## WHAT YOU CAN DO

---

There are many actions to choose from

- ✱ **BUY GREEN ENERGY. WHEN COMPETITION IN THE ELECTRICITY SECTOR HAPPENS IN YOUR AREA,** make sure the electricity bill provides enough information so that ratepayers can choose green energy suppliers.
- ✱ **MAKE SURE YOU ARE TAKING FULL ADVANTAGE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY** technologies at your home and workplace.
- ✱ **WRITE TO YOUR PROVINCIAL ENERGY MINISTER TO REQUEST THAT TOUGH POLLUTION CAPS BE** placed on all fossil plant emissions, including any imported fossil power, to combat acid rain and smog.
- ✱ **SUPPORT CAMPAIGNS TO MAKE SURE THE NUCLEAR REACTORS ARE SHUT DOWN PERMANENTLY** instead of retubed when the reactor cores wear out, or closed sooner if other expensive repairs are needed.
- ✱ **SOME JURISDICTIONS ARE EXAMINING A SYSTEMS BENEFIT CHARGE TO SUPPORT EFFICIENCY** programs and a Renewable Portfolio Standard for a renewable energy quota. Ask your local or provincial utility where they stand on these issues.
- ✱ **WRITE TO THE PRIME MINISTER OF CANADA, THE RIGHT HONOURABLE JEAN CHRÉTIEN, AND** ask him to phase out nuclear power and halt nuclear exports. Ask his government to implement a sustainable energy policy instead (*postage free to House of Commons, Ottawa, ON K1A 0A6*).

Burning hydrogen in air (rather than pure oxygen) results in the production of nitrogen oxide, which in turn combines with sunlight to form smog. Hydrogen burners can be adjusted to virtually eliminate nitrogen oxide emissions, but with reduced efficiency.<sup>[28]</sup>

Fuel cells are designed to get at the energy in hydrogen without burning it, through an electrochemical reaction. The hydrogen is recombined with oxygen to form water, and releases energy in the process. Advances in fuel cell technology are currently aimed at transportation uses, and include lighter weight cells and more compact hydrogen storage systems.<sup>[30]</sup> Applications for use in commercial and residential buildings are also being developed.

## “Making It in the Market”

### *ONTARIO HYDRO WALKED AWAY FROM ITS NUCLEAR DEBT*

**MANY ELECTRICITY MARKETS ARE BEING RESTRUCTURED TO ALLOW** wholesale competition among suppliers and to allow ratepayers to choose their energy suppliers (retail competition). This trend means huge new opportunities for energy efficiency and renewable energy options, but it has also created new roadblocks.

The full cost to society and the ecosystem of non-renewable energy use is more than what we pay per kilowatt/hour. For example, a recent study

found that each year up to 16,000 Canadians die prematurely due to air pollution from burning fossil fuels.<sup>[31]</sup>

In 1999, the Ontario government split the provincial power utility, Ontario Hydro, into smaller units. Ontario Power Generation, one of the successor companies to Ontario Hydro, was relieved of \$21 billion of its \$30 billion debt in an unprecedented bailout (at least two-thirds of this debt was incurred in connection with Ontario Hydro's nuclear program). Moreover, only about \$2 billion of Ontario Hydro's \$18.7 billion (1998 dollars) estimate for reactor decommissioning and waste disposal was accounted for on its books. This immense bailout gives nuclear power an unfair advantage in the marketplace, which is scheduled to be opened to competition in late 2000.

All ratepayers, even those who choose to buy green energy, will pay for the 'stranded' nuclear debt.<sup>[32]</sup> The stranded debt is being assumed by the Province of Ontario. Canadians as a whole also continue to pay for nuclear power through their federal taxes. Green energy policies are required to ensure that reliance on polluting non-renewable energy supplies is phased out. Some jurisdictions have instituted a 'Renewable Portfolio Standard' (RPS) which requires all energy suppliers to meet a certain quota for the amount of renewable energy they produce. This guarantees a certain market share for renewable energy. Another mechanism being used is the 'Systems Benefit Charge' (SBC), a fee on all electricity sales which would be dedicated to promotion of efficiency measures.

These measures are required because the market forces of supply and demand will not necessarily guarantee that energy choices are made from an environmental and public health perspective. Labelling on electricity bills to show the source of electricity and its pollutants is an important measure to help ratepayers make informed choices.

Another measure that can encourage renewables is 'net billing' which allows an electricity metre to run backwards while an energy system provides excess power to the grid, and run forward when back-up power is required.

## RECOMMENDED READING

*Cool Energy: Renewable Solutions to Environmental Problems*, rev. ed., by Michael Brower. Massachusetts: The MIT Press, 1993

*Power Surge: Guide to the Upcoming Energy Revolution*, by Christopher Flavin and Nicholas Lenssen. New York: W. W. Norton & Co, 1994

*Background Report: Renewable Energy Policy Review*, by Natural Resources Canada. Ottawa: Natural Resources Canada, 1994

*Canadian Renewable Energy Guide*, by Duncan Noble and Robert Swartman. Ontario: General Publishing House, 1995

*Power Shift: Cool Solutions to Global Warming*, by David Suzuki Foundation. Vancouver BC, April 2000. A copy of the report is available at <<http://www.davidsuzuki.org/pdf/powershift11.pdf>>



Produced by the

**Campaign for Nuclear  
Phaseout**

**Campagne contre  
l'expansion du  
nucléaire**

412-1 Nicholas Street  
Ottawa, Ontario K1N 7B7

tel.: (613) 789-3634

fax: (613) 241-2292

web: [www.cnp.ca](http://www.cnp.ca)

e-mail: [cnp@web.ca](mailto:cnp@web.ca)

## ENDNOTES

---

- [1] U.S. Department of Energy, "International Energy Outlook-1999", Washington, D.C., March 1999
- [2] Dave Martin, Dave Argue "Nuclear Budget Watch", Campaign for Nuclear Phaseout, Ottawa, Ontario, 1997
- [3] Internet Site, October 1999: The Canadian Sustainable Energy Web Site, <<http://www.newenergy.org/>>, "Renewable Energy and Sustainable Energy Systems in Canada – Cogeneration"
- [4] Office of Energy Efficiency, Natural Resources Canada, 580 Booth Street, 18th Floor, Ottawa, ON K1A 0E4 Fax: 613-943-1590 Web site: <<http://oe.e.nrcan.gc.ca/>>
- [5] Royal Society of Canada, "Final Report of the COGGER Panel", Ottawa, Ontario: the Royal Society of Canada, 1993, p.1
- [6] See for example: <<http://www.antenna.nl/wise/cop6/related/index.html>>
- [7] Royal Society, 1993
- [8] Bill Keepin and Gregory Kats, "Greenhouse Warming: comparative analysis of nuclear and energy efficiency abatement strategies", *Energy Policy*, vol.16, no.6, December 1988
- [9] For background on the CDM, see for example: Michael Toman and Marina Cazorla, *The Clean Development Mechanism: A Primer, Resources for the Future*, Washington, D.C. 1998, web site: <<http://www.weathervane.rff.org/features/feature048.html>>
- [10] David Suzuki Foundation, *Power Shift: Cool Solutions to Global Warming*, Vancouver, B.C.: April 2000, p.9. A copy of the report is available at <<http://www.david.suzuki.org/PDF/powershift11.pdf>>
- [11] Ontario Hydro, "Incorporating Renewable Energy Technologies into Your Buildings", brochure, Toronto, Ontario, March 1996
- [12] Christopher Flavin, "Bull Market in Wind Energy", *Worldwatch*, March/April 1999, p.25
- [13] Canadian Wind Energy Association, "Quick Facts", CanWEA, #100-3553-31 Street NW, Calgary, AB T2L 2K7, Tel: 403-289-7713 Fax: 403-282-1238 Web site: <<http://www.canwea.ca>>
- [14] Christopher Flavin and Nicholas Lenssen, *Power Surge: Guide to the Upcoming Energy Revolution*, New York: W.W. Norton & Co., 1994, p.125
- [15] Jim Salmon, CanWEA President, "Wind generators take up little space" letters, *Toronto Star*, Sept. 21, 1998, p.A13
- [16] Flavin, *World watch*, p.26
- [17] Flavin, p.26; CanWEA, "Quick Facts"
- [18] "Renewables face barriers", *SOL*, Issue #106, June 1998, Solar Energy Society of Canada, 116 Lisgar Street, Suite 702, Ottawa ON K2P 0C2 Tel: 613-234-4151 Fax: 613-234-2988, Website: <<http://www.solarenergysociety.ca/>>
- [19] Ontario Hydro, "Incorporating Renewable Energy Technologies into Your Buildings", brochure, Toronto, Ontario, March 1996
- [20] Flavin, *Worldwatch*, p.25
- [21] "Quick Facts", CanWEA / Flavin, *Worldwatch*, p.26
- [22] Ontario Hydro, "Incorporating Renewable Energy Technologies," 1996
- [23] Natural Resources Canada, "Policy aspects of renewable energy in the OECD", Ottawa, Ontario, 1996, p.8
- [24] *Sustainable Energy News*, No.24, February 1999, p.5, International Network for Sustainable Energy (INFORSE), P.O. Box 2059, DK-1013, Copenhagen K, Denmark Tel: +45-33-121307 Fax: +45-33-121308 Web site: <<http://www.info.rse.dk/>>
- [25] Ontario Hydro, brochure, March 1996
- [26] Natural Resources Canada, 1996, pp.7, 68
- [27] Michael Brower, *Cool Energy: Renewable Solutions to Environmental Problems*, Revised Edition, Massachusetts: MIT Press, 1993, p.124
- [28] Natural Resources Canada, 1994, p.87
- [29] Forbes Aird, "Faucet Fuel", *Harrowsmith* #99, Sept./Oct. 1991, p.67
- [30] "Ballard fuel cell produces water and electricity to power motor", *Toronto Star*, May 18, 1996, p.G2
- [31] *Finding Solutions*, David Suzuki Foundation, Vancouver, British Columbia, December 1998
- [32] Government of Ontario, "Direction for Change: Charting the Course for Competitive Electricity and Jobs in Ontario", November 1997. See: <[http://www.est.gov.on.ca:80/english/en/en\\_pdf/en\\_direction\\_for\\_change.pdf](http://www.est.gov.on.ca:80/english/en/en_pdf/en_direction_for_change.pdf)> and: Government of Ontario, Bill 35, the Energy Competition Act, first introduced in June 1998 passed October 1998. See: <<http://www.gov.on.ca/MBS/english/publications/about/search.html>> The act is available in print only through Publications Ontario.