



# NUCLEAR ENERGY

## Myths & Facts

The Ontario Government intends to replace our aging nuclear reactors with new nukes, at a cost of tens of billions of dollars.

Is this the best way to meet our electricity needs?

### MYTH

**Ontario uses a lot of nuclear energy – we need it as a base-load.**

Fact

Base-load demand can be met at lowest cost by energy efficiency. Ontario is one of the most wasteful users of electricity in the world – we use 50% more electricity than people in New York State, and we're not that different economically or environmentally.

In terms of supply, our base-load needs can be met by an integrated combination of wind, water, biomass, solar, gas combined heat and power and gas combined-cycle power plants. When the wind turbines aren't turning or sun isn't shining, we will need to increase the output of the other options. Water power imports from Quebec are a great solution to back-up wind power on calm days.

### MYTH

**Ontario is desperately short of electricity. We could have another blackout at any time.**

Fact

Ontario has actually been a net exporter of electricity over the past three years. We've brought on a lot of new generation capacity (natural gas and wind), and demand within Ontario is actually falling.

The 2003 blackout had nothing to do with supply in Ontario – it was caused by a transmission line malfunction in the United States. But it took Ontario longer to recover because our nuclear plants are slow and cumbersome to restart. We were without power much longer than folks in the U.S. where the problem originated.

### MYTH

**How are we going to deal with climate change without nuclear?**

Fact

Investing in nuclear energy to deal with climate change is like smoking cigarettes to lose weight – it's a dangerous distraction.

Nuclear is the slowest and most expensive solution for addressing climate change. With its high cost, long construction time, high environmental and health risks and problems resulting from waste management, it is clear that nuclear power does not offer a viable solution to climate change. Tackling climate change through the development of nuclear power just swaps one serious problem for several others.

While electricity generated from nuclear power entails no direct emissions of CO<sub>2</sub>, the nuclear fuel cycle does release CO<sub>2</sub> during mining, fuel enrichment and plant construction. Uranium mining is one of the most CO<sub>2</sub> intensive industrial operations, and as demand for uranium grows, CO<sub>2</sub> emissions are expected to rise as core grades decline.

The solution to climate change is a mixture of energy efficiency and renewable energy that offers a quicker, more realistic and sustainable approach to reducing CO<sub>2</sub> emissions.



# MYTH

## If green energy is indeed cheaper than nuclear, why doesn't the provincial government get it?

Fact

Two reasons. The first is the power of old ideas and old ways of thinking. Conventional wisdom of the past was that the lowest cost options to meet our electricity needs were a combination of very large coal and nuclear power plants plus high-voltage transmission lines to bring the power to the electricity consumers. However, due to improvements in energy efficiency, renewable and combined heat and power technologies, the 1950s conventional wisdom is no longer true. The lowest cost options to meet our electricity needs are now energy efficiency and small-scale distributed generation. Unfortunately many of Ontario's most senior energy bureaucrats are still stuck in the 1950s.

The second reason nuclear is still considered is the power of special interests. The 2 biggest electric power companies in Ontario – Ontario Power Generation and Bruce Power – are nuclear power companies. The Power Workers Union is protecting their members' jobs. Cement, steel and nickel companies stand to gain if new nukes are built. And as long as debt payments are guaranteed by Ontario's taxpayers, insurance companies and pension funds make lots of money on issuing loans

# MYTH

## But nuke plants have to compete with other energy sources – that's how capitalism works.

Fact

The actual costs of nuclear energy are consistently misstated, incomplete and externalized. Nuclear power cannot be sustained without huge government subsidies and handouts from its very inception.

Every nuclear project that has been built in Ontario has had huge capital cost overruns that have been passed on to Ontario's electricity consumers or taxpayers – aka. corporate subsidies. Ontarian's are still paying the stranded debt for past nuclear mistakes – \$150 per person per year for a decade!

On the other hand renewable and gas-fired power companies are not allowed to pass their capital cost overruns on to electricity consumers or taxpayers. Specifically, the McGuinty Government has signed over 350 contracts with renewable and gas-fired power companies and not one of these contracts

allows companies to pass their capital cost overruns on to consumers or taxpayers.

That's why we need a Nuclear Cost Responsibility Act to make it illegal for nuclear power companies to pass their capital cost overruns on to electricity consumers or taxpayers. No more special deals. Let the free market decide if nuclear can pull its own weight.

# MYTH

## 'New' nuclear will avoid the mistakes of the past.

Fact

The cost for refurbishment of Pickering A Unit 1 was almost 5 times greater than what the experts predicted. Since it was restarted in 2005 the unit's performance has been abysmal – in 2007 its annual capacity utilization rate was only 39% despite the fact that we were promised that it would have an 85% capacity utilization rate.

In Finland, Areva is building what they said would be a "state of the art" reactor. It is billions of dollars over budget and completion is now three years late. A nuclear project in Florida was recently cancelled due to rising costs.

Ontario is considering AECL's (Atomic Energy of Canada Ltd.) Advanced CANDU Reactor. This is a prototype with no operating model anywhere in the world.

# MYTH

## Modern nuclear power plants are safe. We haven't had any accidents in Canada.

Fact

Although the nuclear industry claims it is 'emission' free, in fact it is collectively releasing millions of radioactive curies annually, referred to by the industry as "incidents". Reports documenting gaseous and liquid radioactive releases vary enormously depending upon accidental and larger-than-normal routine releases. Furthermore, nuclear plants leak and release millions of gallons of cooling water contaminated with radioactive tritium into the environment, threatening drinking water and fish habitat.

Radioactive contamination is no respecter of national borders, and nuclear power plants threaten the health and well-being of all surrounding nations and environments. The health and safety of

employees, local communities and the contamination of the environment are genuine risks. The exposure risk to workers in the uranium mining industry is also great. There is strong evidence of a positive association between low-level radiation and cancer mortality.

Also, security threats at power plants are colossal. Although security at civilian airports has been enormously improved, security at nuclear power plants is virtually unchanged, even though these facilities constitute potential weapons of mass destruction and, as such, are inviting targets for terrorists.

Ask the insurance industry why they won't insure nuclear plants. It falls to governments (e.g., taxpayers) to once again foot the bill for nuclear liability coverage.

## MYTH

### Why not diversify with nuclear AND green energy?

Fact

With spending committed to multi-billion dollar nuclear plants, and a resultant need to run these plants as close to capacity as much as possible to justify these expenditures, all other options will be squeezed to the sidelines. Already transmission lines are being reserved for nuclear to the exclusion of renewables. And while Ontario plans to develop renewables and conservation, it will slow the deployment of these post-2010 in order to make space for long lead-time nuclear projects.

The choice to be made is now – either be stuck with more nuclear energy for the next 60 years, or a transition to green energy. It's either / or.

## MYTH

### Nuclear power plants have nothing to do with nuclear weapons.

Fact

Nuclear power plants are atomic bomb factories because they produce plutonium and other by-products that are essential ingredients of nuclear bombs. Any country with a nuclear reactor can in theory produce a nuclear weapon. CANDUs produce the isotope plutonium 239, making the production of nuclear weapons relatively easy for host countries. India manufactured nuclear weapons from Canadian nuclear technology in 1974. As well, depleted uranium is a by-product of the uranium enrichment process, and is used in weaponry including nuclear weapons.

## MYTH

### Nuclear power is green.

Fact

Nuclear power plants produce extremely toxic radioactive wastes such as plutonium 239 which remains radioactive for half a million years. Even though nuclear power has been operational for nearly fifty years, the nuclear industry has yet to determine how to safely dispose of this deadly material. Producing long-lived radioactive wastes with no solution for its disposal will leave serious and irreversible environmental damage and degradation for generations to come, which is contrary to the principles of sustainability.

Furthermore, there are 200 million tons of sand-like uranium tailings in Canada, mostly in Ontario and Saskatchewan. These radioactive wastes will remain hazardous for hundreds of thousands of years. They contain several of the most powerful carcinogens known: radium, radon gas, polonium, thorium and others. Storing these materials in a safe undisturbed state for thousands of years will be extremely difficult and is something we have zero experience doing.

## MYTH

### All energy sources have downsides.

Fact

While there are some reasonable concerns around wind turbines (noise and wildlife issues), or solar panels (energy intensive to construct), the impact is relatively small compared to nuclear.

Nuclear generators are prone to insolvable infrastructural, economic, social, and environmental problems. They face immense capital costs, rising uranium fuel prices, significant lifecycle greenhouse gas emissions, and irresolvable problems with reactor safety, waste storage, radiation, water pollution, weapons proliferation, and vulnerability to attack.

Indeed nuclear impacts are growing as the quality of accessible uranium ores decline, requiring larger and more wasteful mines, and the concrete and steel required for reactor construction increase substantially in the wake of more stringent safety regulations and terrorism concerns.



**MYTH**  
Wind turbines and other green energy are also going to be affected by credit crunch and rising material costs.

**Fact** Nuclear power plants need huge amounts of capital and have never been built without government financial guarantees. In Ontario, we've had wind projects that have moved from proposals to operation in 2-3 years with no capital cost overruns.

Nuclear plants require very specialized materials and very complex systems. Nuclear grade steel and concrete is not the same stuff you buy for a wind turbine. And nuclear plants need more and more of it because security requirements are now so much larger.

**MYTH**  
Renewables aren't ready to meet all our electricity needs.

**Fact** Our report called Ontario's Green Future outlines how we can build a 100% renewable electricity grid by 2027. This is how in a nutshell:

- Energy conservation and efficiency
- Maximize the efficiency of our natural gas consumption through combined heat and power plants (small and large scale)
- Procure more renewable resources: on- and off shore wind power, biomass and hydro.
- Water power imports from Quebec can provide billions of kilowatt hours of clean, safe electricity.

Ontario's on-shore wind power potential is 10 times greater than our total electricity consumption, and southern Ontario's solar potential is actually better than Germany's, the world's solar power leader.

**MYTH**  
Demand for electricity is rising.

**Fact** Actually, it's falling. Ontario's peak demand for electricity fell by 6% during the summer of 2008 compared to the summer of 2007, and an additional 4.7% the previous year. This demonstrates the enormous potential of conservation and load shifting.

**MYTH**  
But think of all the jobs we'd create with new reactors.

**Fact** Nuclear power is the most capital intensive, most expensive way possible to create new jobs. A transition towards labour-intensive renewable energies and efficiency programs promises job gains.

Ontario could retool its lagging manufacturing industry to become a leader in manufacturing solar panels and wind turbines for both domestic and export markets. Jobs in installing, operating, and maintaining renewable energy systems tend to be more local in nature and could thus benefit a broad range of communities. Furthermore, thousands of Ontarians could be employed weatherizing homes and buildings across the province, reducing our climate footprint while saving energy and associated costs.

Internationally, the growth of renewables is outpacing forecasts and creating millions of new jobs. In the U.S., the renewables and energy efficiency industries generated 8.5 million jobs, over \$900 billion in revenue and more than \$100 billion in industry profits in 2006 while providing an important stimulus to the lagging U.S. manufacturing sector. This is job creation on a massive scale.

**MYTH**  
Renewables aren't cost competitive yet.

**Fact** Oh yes they are! With the exception of solar energy (which isn't far behind), renewables and efficiency are much cheaper than nuclear.

Cost Comparison of Energy Supply:

- Energy Efficiency: 2.7 cents per kwh
- Biomass: 5.5 to 9.7 cents per kwh
- Natural Gas Combined Heat & Power: 5.7 to 9 cents per kwh
- Hydro electricity from Quebec: 9 cents per kwh
- Wind: 10 to 13 cents per kwh
- Nuclear: 21 cents per kwh (does not include liability, waste, plant decommissioning or stranded debt)

