

Give clean energy a chance

While some incentives exist for the development of cleaner energy generation technologies, more can be done.

By Thomas R. Casten

Ontario continues to debate whether to give clean energy a chance to compete with conventional central generation. The Ontario Power Authority (OPA) offered a draft Clean Energy Standard Offer (CESOP) in June 2007, but limited eligibility to plants below 10 megawatts of capacity. The Alliance for Clean Technology (ACT) responded, asking OPA and the Energy Ministry to remove the size limit but set tough CESOP standards for fossil efficiency. Seven months later, nothing has been done.

Raise delivered efficiency of electric generation and distribution to 60 per cent, the minimum ACT definition of clean energy, and North America would convert more than 23 per cent of potential energy to useful energy.

Defining clean energy – reduced waste

Energy is a confusing, multi-meaning term. We offer a few definitions to help explain “clean energy.”

- *Potential energy*: the total energy content in any fuel.
- *Delivered energy*: the energy delivered to the end of the wire or steam pipe. The North American electric system delivers 33 per cent of the potential energy in the fuel burned.
- *Useful energy*: the useful energy service produced with *delivered energy* that supports standard of living — illuminating, space conditioning, transportation, material transformations.
- *Energy Waste*: energy that produces no *useful energy* services.

As explained in last issue’s column, in the past 47 years, the efficiency rate of conversion of potential energy into useful energy has nearly stagnated, increasing by only two percentage points. The energy system still converts most of fuel’s potential energy to energy waste.

Decades of inefficiency

The tiny improvement in efficiency since 1960 exacerbates today’s energy and environmental problems, and the continued reliance on remote electric generation blocks progress. The best electric-only generation converts 50 per cent of the potential energy to delivered energy, and the North American electric industry average efficiency is only 33 per cent. Ontario’s remote coal-fired plants burn three units of coal for each unit of delivered energy, and then release copious quantities of pollutants, including carbon dioxide — the major greenhouse gas. Added control devices to cut criteria pollutants will absorb more parasitic power and further increase carbon dioxide emissions.

Clean energy’s potential

Local generation that recycles byproduct thermal energy slashes energy waste production. ACT defines clean energy to include only generators that convert at least 60 per cent of fossil fuel’s potential energy to delivered energy — nearly double the efficiency of the North American system.

A second type of clean energy recycles industrial waste energy into delivered energy. Hot industrial exhaust contains significant potential energy that could provide nearly 20 per cent of North America’s current electricity without burning a single incremental unit of fossil fuel. Recycling this industrial waste energy creates new revenue streams for manufacturers, spurs industrial job growth, reduces electricity and thermal energy costs, and slashes emission of greenhouse gases.

Think about the clean energy opportunity. Today, North America converts only a fraction of the fuel’s potential energy to useful energy. Raise delivered efficiency of electric generation and distribution to 60 per cent, the minimum ACT definition of clean energy, and North America would convert more than 23 per cent of potential energy to useful energy, nearly doubling today’s results.



Give clean energy a chance

Governments should give clean energy a chance to compete by offering standard offer contracts for all power from clean energy plants at a slight discount to the cost of new central generation. The OPA draft CESOP offered to pay 100 per cent of avoided costs of new central power from a gas-fired central plant, including new transmission wires, but no benefit

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for avoiding new distribution wires or for saved health and environmental savings. The offer would save overall societal costs versus new central power and still encourage development of clean energy, but not if limited to small projects.

OPA proposes to issue a request for proposal (RFP) for clean energy projects above 10 megawatts, rather than Standard Offers. But RFPs with time deadlines fail to account for the complexity of clean energy projects.

Developers say they will not expend the effort to develop clean energy without a standard offer, so competition for new generation will be effectively limited to central electric-only plants by the capacity limit.

Some say developing a clean energy plant is equivalent to outsourcing someone’s kidney; it takes many months, if not years, to gain host confidence, determine where to capture waste energy, where to connect steam and electricity to the host’s process, how to assure continued production and how to persuade investors that the energy recycling process will perform as advertised and that the host facility will continue operating. This complexity does not lend itself to date-certain RFPs.

Entrepreneurs will rise to the challenge of complex energy recycling if they see an attractive power contract at the end of the process. The Ontario CESOP, without capacity limit, would induce entrepreneurs and spur a boom in clean energy. Provincial manufacturing competitiveness will improve as costs and greenhouse gas emissions drop. Without a standard offer, clean energy developers will focus on other locations. Ontario needs these developers and their investments; it is time to give clean energy a chance. ■

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