

LDC TOMORROW FUND

PROJECT UPDATES

FINANCIAL GRANTS FOR INDUSTRY INNOVATION

NOVEMBER 2009

PROJECTS BEING
REPORTED ON:

TOTAL RESOURCE
COST TO CDM
INITIATIVES - AN
ASSESSMENT

BUILDING
SUSTAINABLE
COMMUNITIES:
THE DANISH
EXPERIENCE

Applying the Total Resource Cost Test to Conservation and Demand Management Initiatives of Local Electricity Distribution Companies in Ontario: Assessment and Recommendations for Reform

Funding Granted to York University, Toronto, Ontario - Excerpt from Final Report

This study explores the impact of the Total Resource Cost (TRC) test on electricity conservation and demand management (CDM) initiatives in Ontario, particularly those developed and delivered by local electricity distribution companies. The study comprises a literature review, case studies of cost effectiveness tests applied to CDM initiatives in other North American jurisdictions, and interviews with key CDM practitioners in Ontario. Specifically, the study examines:

1. The existing institutional, policy and regulatory framework for CDM activities in Ontario, including the roles of the Ontario Energy Board (OEB), Ontario Power Authority (OPA) and local distribution companies (LDCs)
2. The current role of the TRC test in CDM decision making by the OEB, OPA and LDCs
3. The structure of Ontario's approach to the regulation and funding of utility CDM activities relative to provinces and states recognized as leaders in the CDM field
4. The impact of the TRC test as currently applied in Ontario by the OEB and OPA on LDC-led CDM activities and initiatives.

The study finds that the TRC test occupies a central place in Ontario's CDM policy framework. Historically, the TRC test was the key test in determining cost effectiveness of CDM programs by natural gas utilities; today it remains a primary screening and evaluation tool for CDM initiatives in both the natural gas and electricity sectors. The TRC test is widely used by LDCs as a planning tool to assist in screening CDM programs at the conceptual stage and as a refining evaluation tool at the design stage.

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Harry Arthurs Common and Vari Hall - York University, Toronto,

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In addition, demonstrating that a proposed CDM activity is TRC positive is the central requirement of the OPA when evaluating LDC requests for CDM program funding. The OEB applies the same requirement when reviewing LDC applications to fund CDM activities through their own rate bases. The TRC test is also central to the shared savings mechanisms (SSM) through which utilities receive a share of the savings associated with reductions in energy consumption flowing from CDM initiatives.

The study identifies a number of ways in which the TRC test as currently structured and applied may limit LDC-led CDM activities and thus prevent the realization of the full range of potentially cost effective electricity-related CDM opportunities in Ontario. Some of the issues identified in the study relate to specific aspects of the test and its application. In other cases, the issues relate to the overall policy and regulatory framework for CDM activities in the electricity sector within which the TRC test operates.

The Ontario government has made significant commitments to CDM through the June 2006 Supply Mix Directive and other directives to the OPA. However the study finds that the province's CDM policy framework remains relatively incomplete in comparison to other, leading North American jurisdictions reviewed - namely British Columbia, California and New York. In these jurisdictions, the establishment of overall CDM goals and targets has been complemented by a substantial infrastructure of supporting policies intended to encourage and facilitate CDM activities. These supporting policies offer specific direction to regulatory agencies and utilities on the evaluation and assessment of potential CDM initiatives, including the specific tests to be employed in evaluating CDM opportunities. In some cases, such as California and New York, there is direction to consider such factors as the value of environmental externalities avoided as a result of CDM initiatives in the evaluation of CDM opportunities. In other cases, like British Columbia, mechanisms have been established to account for the social benefits flowing from initiatives targeted at low-income households.

The study finds that, by comparison, the policy direction from the Ontario government to the OEB and OPA does not extend beyond setting targets and goals. It has been left to the OEB and OPA to determine how CDM opportunities should be evaluated and assessed, without further direction from the province. Perhaps not surprisingly, the OEB, on whom the bulk of responsibility for developing such frameworks has fallen, responded by building on its past practice with the TRC test. The result has been a relatively restrictive approach to the evaluation of CDM opportunities when compared with California or even British Columbia.

The study identifies a number of steps that need to be taken by the province to strengthen and clarify the overall framework within which CDM activities take place. These steps include the following:

- Providing clear direction to the OPA and OEB that all cost effective and achievable CDM opportunities be pursued before consideration is given to additional supply options in electricity system planning
- Rationalizing, consolidating and stabilizing the funding regime for CDM initiatives



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- Strengthening and clarifying the institutional arrangements for the planning and delivery of CDM measures in Ontario, including the establishment of an office of energy efficiency within the Minister of Energy and Infrastructure to lead and coordinate the province's efforts
- Providing clear policy direction to the OEB and OPA with respect to the evaluation of proposed CDM initiatives, including consideration of the avoided environmental costs and risks and potential social benefits associated with such initiatives
- Promoting program innovation by providing greater flexibility to LDCs in the initial years of new, self-designed program delivery, and applying alternative evaluative frameworks to programs aimed at achieving long-term behavioural changes (e.g., education and awareness programs) that are necessary for constituency and capacity building, but that may not initially perform well under the TRC test framework.

In addition to the policy level concerns identified with respect to the application of the TRC test in Ontario, a number of concerns regarding specific parameters employed within the test emerged in the course of the literature review and interviews. These issues include the following:

- The need to modify the avoided cost structure in the TRC models used by the OPA and OEB to ensure that programs delivering deep savings and market transformations are appropriately valued, as opposed to the current emphasis on demand response and reducing peak demand
- The desirability of employing actual utility specific avoided distribution costs resulting from CDM initiatives, as opposed to standardized assumptions, for the purposes of TRC assessments wherever possible

Finally, the study recommends that the provision of greater clarity and flexibility to LDCs in the application of the TRC test to their CDM program proposals should be accompanied by a strengthened public accountability regime regarding the actual results achieved.

The study concludes that while that Ontario has made electricity CDM a central element of its electricity and climate change strategies, in comparison with other leading jurisdictions in North America its electricity CDM policy framework remains incomplete. Significant gaps remain with respect to the policy direction given to key institutional actors within the electricity system, and the CDM funding and institutional framework is fragmented and confusing. The province's new Green Energy and Green Economy Act, 2009 has the potential to compound a number of these problems, depending on how it is implemented. A more complete and integrated policy structure is needed to facilitate and encourage the realization of the full potential of CDM initiatives to contribute to the sustainability of Ontario's electricity system. The recommendations contained in the study are intended to contribute to such an effort.

SUMMARY OF RECOMMENDATIONS:

1. The Minister of Energy amend the June 2006 Supply Mix Directive to require that the Integrated Power System Plan (IPSP) to be developed by the OPA incorporate all achievable cost effective opportunities for CDM before additional supply options are considered.
2. The Ontario Energy Board Act be amended to expand the mandate of the OEB to include ensuring, 1) the pursuit of all achievable cost effective opportunities for energy conservation and energy efficiency, and, 2) with respect to the IPSP to be developed by the OPA, the inclusion of all CDM opportunities that are cost effective relative to supply options.
3. The Ministry of Energy and Infrastructure initiate a comprehensive review of CDM funding mechanisms in Ontario, including the roles of the OPA, OEB and ministry, to rationalize and consolidate the regime to facilitate and encourage long-term investments by LDCs in CDM capacity and programming.

To read the recommendations #4-#12, please visit www.mearie.ca and click on the LDC Tomorrow Fund Logo

Building Sustainable Communities: The Danish Experience

Funding Granted to the Electricity Distributors Association, of Vaughan, Ontario.

The EDA coordinated a fact-finding tour to Denmark for a number of members, to broaden LDC knowledge and understanding of the merging opportunities related to LDC's new roles, opportunities, obligations and technologies affecting LDC operations, which are mandated by the provincial government under the new Green Energy and Green Economy Act. The list of new opportunities and responsibilities for LDCs is significant, from new roles in renewable and distributed generation and smart grid development, to an increased role in the development and delivery of conservation and demand management activities.

Denmark is a leader in the field of renewable energy, distributed generation, smart grid development and sustainable communities. Lessons learned from Danish LDC counterparts will be of significant value to Ontario LDCs as they design their own business strategies to meet their new opportunities and obligations in the competitive Ontario marketplace.

To view an online video of the visit by the EDA to Denmark, visit <http://www.eda-on.ca/> and click on "Building Sustainable Communities: The Danish Experience".

The following forms part of a presentation given by John Loucks, Chair of the EDA, and Chief Operating Officer, Brantford Power.



Here, the operator of Morsø Bioenergy, is explaining that the Germans have supplied the plant as completed high technology in a number of containers that simply had to be put together, as we do with Lego bricks

Section 1

The growing urgency of climate change has led many of us in the energy industry to think increasingly about green energy. As electricity distribution companies in Ontario we have a significant role to play in building a green future. To find out what our role in a green future could look like we took a trip to the land of modern windmills, home to more than 5,000 wind turbines and a thriving green economy, the country of Denmark.

Denmark started investing in renewable energy in the 1970s in order to develop a secure source of national energy. Since then Denmark has gained worldwide recognition as a leader in green energy. It is renowned for its innovations in green technologies, its progressive energy policies and its success in promoting a conservation culture.



The Canadian delegation, together with the program organizers, Preben Maegaard from the Nordic People's Centre.

Today the country produces 130% of its own energy needs.

Denmark is now focusing on reducing its reliance on fossil fuels. Wind turbines already supply 26% of the electricity generated in the country. But in order to meet goals on greenhouse gas reduction, Denmark aims to increase its wind production to provide 40% of its electricity by 2020.

As representatives of local electricity distribution companies in Ontario, we went to Denmark to strengthen our vision of a green future and to see what role we can play in building the sustainable communities of tomorrow. We wanted to know how the Danish energy industry overcame some of the obstacles we face today in Ontario. Obstacles like the intermittency of wind and solar energy and how to address NIMBYism, the not-in-my-backyard attitude that can paralyze and impede progress.

Not only did we find some answers to these questions, we also discovered other exciting possibilities in working with renewable sources. We brought back much food for thought to inspire locally relevant ways in which the electricity distribution companies of Ontario can participate in the emerging green economy, and contribute to building a green future for our province.

Section 2

The waving arms of wind turbines dot the Danish horizon. They are everywhere. While a few industrial type wind farms do exist, most turbines in Denmark are scattered throughout the country in groups of three or four. From our perspective, they complement the landscape and are not intrusive. Less visible are the exhaust stacks of the Combined Heat and Power Plants. While not as conspicuous as wind turbines, these district heating plants are equally important to the production of renewable energy. In addition to being a stand alone source of heat and power, these CHP or district heating plants help balance the intermittent energy output of the wind turbines.

When there is too much wind in the system the CHP plants keep the grid balanced through down regulation. Rather than turning off the wind turbines in such situations, some of the CHP plants are able to use electric boilers to store excess electricity as thermal energy. This thermal energy can then be used as needed by the district heating system to provide heat for homes in the community. When the wind doesn't blow and additional electricity is required, some CHP plants are started up by the Danish system operator as up-regulating generators. One plant we visited specializes in up-regulation and runs for only 50 hours each year! This plant was operated on fossil fuels. But running for only 50 of the 8,766 hours in a year its emissions were more than offset by the renewable energy generation it supported.

Unlike this plant, however, most CHP plants we visited supplemented their use of fossil fuels with renewable sources and generated heat and power throughout the year on an ongoing basis. One CHP plant supplemented its natural gas generator with solar energy. When it was constructed the solar thermal array was the second largest in the world. We arrived late in the afternoon and even though the sun was getting low, it was still generating 2400 kW of a peak 6000 kW capacity. That's enough energy to heat 3,800 Danish homes!

The 8000 square meters of solar panels were mounted in rows in a field adjacent to the CHP facility. The grounds in and around the solar panels were very well maintained. Upon closer investigation we observed the ground maintenance staff was a herd of sheep! Their grazing ensured the grass never got long enough to cast shade over the solar panels. By using solar power in combination with natural gas, the plant was able to reduce its CO2 emissions by 1,570 tons per year and reduce its reliance on expensive natural gas. Due to the success of this technique the owners plan to double the size of their solar installation in the next few years.

Section 4

We found that Denmark is slightly behind Ontario in implementing a smart grid system. But this has not stopped them from integrating renewable energy generation into the grid all over the country. One distributor we met was able to incorporate large quantities of renewable sources into the grid without extensive smart technology. Instead he emphasized that it was important to understand the up/down regulating processes, to implement effective system monitoring software, and have good people in the control room to react to the information on a real-time basis. For now, the Danes are capable of balancing the system with only a few strategic smart grid components on their distribution networks.

Coming from Ontario, where strict guidelines determine the distance at which power plants and wind turbines must be located, we were surprised to find a CHP plant right beside a school. In fact, they shared a driveway! The plant's engine was painfully loud when we were inside the plant examining its facilities, but nothing could be heard outside. Nothing but some birds, children playing and, of course, the occasional sound of a car going by.

Building Sustainable Communities: The Danish Experience - *Continued from Previous Page* **Funding Granted to the Electricity Distributors Association, of Vaughan, Ontario.**

Wind turbines were also placed in surprising locations. They were close to houses, near schools, in urban areas and barely off shore in water where people swam and sailed. We were assured that there have been no reports of health concerns from people living in close proximity to turbines. The northwestern municipality of Thisted provides a good example of this. Thisted has 285 wind turbines scattered throughout an area that is less than 100 km x 15 km. With a population of 50,000, most people in Thisted live close to a wind turbine. They take great pride in their renewable initiatives. They are a municipality powered 100% by renewable energy.

Of course, cases of NIMBYism are also present in Denmark. Middlegrunden project, an off shore wind facility of 20 turbines, is located just off the shore of an urban beach in Copenhagen. When the project was first proposed it received a lot of resistance. Much of this resistance melted when the decision making power was shared with the public through a cooperative system of ownership. A great deal of resistance to the turbines had to do with the unsightly view of the grid configuration in which the wind turbines were to be placed. Seriously considering such criticisms, the turbine configuration was re-designed into a gentle arc. Placed in this configuration the turbines look more like a sculpture than an industrial installation, and have become a striking landmark in the Copenhagen harbour.

To read the Sections #5, please visit www.mearie.ca and click on the LDC Tomorrow Fund Logo.



How to Submit a Proposal

As the manager of the LDC Tomorrow Fund, the MEARIE Group is pleased to invite applications for funding of projects that will benefit LDCs in Ontario. The process for requesting funding is relatively straight forward provided the criteria as listed below are met.

THE CRITERIA TO EVALUATE PROPOSED PROJECTS TO BE CONSIDERED FOR FUNDING INCLUDES:

1. Applications must be related to the development of commercial opportunities within the electricity market in Ontario.
2. Projects are expected to be beneficial to the majority of LDCs in Ontario over the short and mid-terms in the new competitive market.
3. Projects must represent advancement of technology, procedures, knowledge, and experience.
4. Recipients of funding must be prepared to share results and make presentations on the results of the project.

WHAT TO INCLUDE:

A Project Plan including the following information must be submitted in order for a project to be considered for funding:

- ▲ Applicant name
- ▲ Location(s) of applicant
- ▲ Funding request
- ▲ Disbursement timing
- ▲ Project description
- ▲ Identification of innovative potential
- ▲ Financial & other contributions by the applicant
- ▲ Deliverables
- ▲ Parties involved
- ▲ Project benefits to LDCs
- ▲ Transferability of results
- ▲ Budget for the project
- ▲ Other sources of funds
- ▲ Identification of commercial opportunities

THE REVIEW PROCESS

The following outlines the complete review process for successful applications. At any stage, the proposal may be returned to the applicant for clarification or more information.

Step 1

- Applicant submits proposal to the Fund Manager
- Initial assessment conducted by the Fund Manager

Step 2

- Fund Manager submits proposal to the Trustees
- Trustees make a decision on the proposal

Step 3

- The Fund Manager informs applicant of the decision
- Agreement developed between Trustees & applicant
- Funds will be authorized for release

FOR MORE INFORMATION ON THE LDC TOMORROW FUND, PLEASE CONTACT HELMAR PRENT, VP, FINANCIAL AND BUSINESS SOLUTIONS AT (905) 265-5316 OR AT hprent@mearie.ca

LDC TOMORROW FUND

The purpose of the LDC Tomorrow Fund is to fund research projects and finance energy innovation and opportunities for Local Electricity Distribution Companies (LDCs) in Ontario. The Fund is designed to support initiatives that enhance the competitiveness and success of LDCs in Ontario. Funding is in the form of non-repayable grants.

Application for funding is open to LDCs, government agencies, academic institutions and others who work in the electricity industry. The MEARIE Group is appointed by the LDC Tomorrow Fund Trustees to act as Fund Manager. Decisions for approval for funding are made by the trustees.

If you need further information, please visit www.mearie.ca and click on the Financial Solution link. Alternatively, you can contact Helmar Prent of The MEARIE Group at 905-265-5316 or by email at hprent@mearie.ca.

