

# QUEST

Quality Urban Energy Systems of Tomorrow  
Systèmes d'énergie de qualité pour les villes de demain

## **2012 Pre-Budget Submission**

**Integrated Community Energy Solutions: A Way Forward for Sustained Economic Recovery**

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## Executive Summary

QUEST - **Quality Urban Energy Systems of Tomorrow** - is actively leading seminal research, policy analysis, outreach, and capacity building to assist communities, utilities, and the broader community-building sector improve the efficiency and effectiveness of energy delivery through an approach called “integrated community energy solutions” (ICES). This approach has been endorsed by the Council of Energy Ministers through the *Integrated Community Energy Solutions: A Roadmap for Action* (2009) and the Council of the Federation (2010).

QUEST is mobilizing communities across Canada to manage their energy use through better planning and investment. QUEST’s vision is to have every community in Canada operating as an integrated energy system by 2035.

For the 5,400 urban, rural and remote communities in Canada, energy is an increasingly valuable commodity. These communities account for nearly 60 per cent of all energy end-uses and about 50 per cent of all Canadian greenhouse gas emissions.

For communities and utilities to meet continuing population and employment growth, a significant financial challenge exists. Canada faces major costs for infrastructure renewal and expansion. Municipal infrastructure replacement costs are estimated at more than \$125 billion, and electricity infrastructure replacement and expansion costs are estimated at more than \$295 billion. Many more billions of dollars will be required for transportation infrastructure to keep freight and people moving efficiently. ICES considers how energy is supplied and consumed in community-based land-use planning, industry and commerce, transportation, water management, waste management, and other areas of energy production and end-use.

QUEST commissioned research by MKJA Jaccard and Associates Inc., University of Toronto City Centre, and The University of British Columbia School of Architecture and Landscape Architecture to estimate the economic value of integrated energy solutions. The study found that substantial savings can be achieved: \$14 to \$29 billion total by 2050 in capital spending; \$3 to \$6 billion total in energy expenditures in the service and construction sectors; and, \$12.9 to \$31 billion annually in costs to households.

ICES can help meet the Government of Canada’s 2012 budget objectives of achieving sustained economic recovery; creating quality sustainable jobs; ensuring relatively low rates of taxation; and, achieving a balanced budget in every urban, rural, remote and Aboriginal community in Canada.

### **QUEST proposes three actions that the Government of Canada could take to meet its objectives:**

1. Address Remote Urban, Rural, First Nations, Inuit and Métis Community Energy Needs with ICES
2. Strengthen National Competitiveness and International Trade by Investing in ICES
3. Close Known National Information Gaps and Remove Policy Barriers to ICES

Significant federal investment is being directed towards ensuring a cleaner energy economy and strengthening Canada’s public infrastructure. QUEST recommends that \$8 million in federal government funding be dedicated to support ICES initiatives that can lead to substantial cost savings while achieving these goals.

By supporting ICES initiatives, the federal government can help businesses and people save billions of dollars, create new jobs, grow the economy, move towards meeting the federal greenhouse gas emissions reduction objective of 60 per cent or more by 2050, and reduce energy use in communities of all sizes.

## Context

QUEST – Quality Urban Energy Systems of Tomorrow - [www.questcanada.org](http://www.questcanada.org) - is a collaborative network of organizations – from energy, technology and infrastructure industries, gas and electric utilities, all levels of government, the civil society groups and community leaders, researchers and the consulting community – actively working to make Canada a world leader in the design, development and application of integrated community energy solutions (ICES). QUEST is working to mobilize community builders across Canada, including the federal government, to effectively and efficiently manage energy use in Canada through better energy planning and investment.<sup>1</sup>

In accordance with the Council of Energy Ministers endorsement of the *Integrated Community Energy Solutions: A Roadmap for Action*; the House of Commons Standing Committee on Natural Resources report, *Combining Our Energies: Integrated Energy Systems for Canadian Communities*; the August 2010 Council of the Federation meeting where the Premiers support the development of Integrated Community Energy Solutions (ICES); and, based on Canada's Economic Action Plan that encourages investment in clean technology, energy efficiency, and public infrastructure – **QUEST is calling on the federal government to continue its actions that save money, create jobs, grow the economy and reduce energy use in communities of all sizes and types across Canada by applying an ICES approach.**

### Maintaining Competitive Communities: Addressing the Affordable Energy Challenge

Across Canada, communities account for nearly 60 per cent of all energy end-use and about 50 per cent of all greenhouse gas emissions. To meet expected population and employment growth, new investments in energy infrastructure are needed.

As investments in new and replacement energy infrastructure are made, the costs of the supply and final consumer cost for energy are expected to increase and price volatility. Increased energy prices and price volatility can place financial strain on businesses and manufacturers to maintain a competitive operating environment and on homeowners and residents in providing a comfortable and healthy living space and good quality of life. This impact will be experienced in every urban, rural and remote community across the country.

Another challenge to meeting the energy needs of Canadians in a cost-effective manner is that energy planning and investment occurs in silos: natural gas is separate from electricity, distribution separate from transmission, and all separate from land-use, water, waste and transportation.

### Integrated Community Energy Solutions: A Way Forward for Sustained Economic Recovery

QUEST is actively leading seminal research, policy analysis, outreach and capacity building to assist communities, utilities and the broader community building sector to improve the efficiency and effectiveness of energy delivery through an ICES approach.

QUEST is responding to this energy infrastructure and investment challenge by advancing ICES. ICES involves taking advantage of opportunities to improve energy efficiency beyond individual buildings and houses to encompass whole communities. ICES considers how energy is supplied and consumed in all sectors including transportation, land-use planning, industry, water management, waste management and others.

QUEST commissioned a national study by leading Canadian energy, land use, economic and transportation experts about the value of integrated energy solutions. The study identified: **substantial savings** - Canadians could save from \$14 to nearly \$29 billion by 2050 from reductions in overall direct capital spending, as well as spending on labour and energy; **reduced energy expenditures in the service and construction sectors** - savings of \$3 to \$6 billion; and, **substantial savings for families** - Canadian households could save anywhere from \$12.9 to \$31 billion annually in overall costs and, **indirect effects—increased GDP, more jobs, shift toward a service economy.**

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<sup>1</sup> QUEST defines a community builder as anyone involved in planning, designing, approving, serving and building a community. This encompasses elected officials, planners, developers, engineers, builders and operating community, all levels of government, utilities, NGOs, consultants and a wide range of other groups.

Additional work across Canada by QUEST and its partners is identifying that Canadian products, technologies and expertise related to ICES are attracting international interest to address a wide range of energy challenges faced by developed and developing countries. Investing in community-level integrated energy solutions can simultaneously free up more of Canada's energy resources for export, while reducing the environmental impact of the energy system, creating local jobs, reduce exposure to rapidly changing market prices for energy, keep energy dollars invested locally, and improve the resiliency and capacity of communities to meet local energy needs.

**QUEST herein offers three recommendations through which the Government of Canada could take specific action:**

1. Address Remote Urban, Rural, First Nations, Inuit and Métis Community Energy Needs with ICES
2. Strengthen National Competitiveness and International Trade by Investing in ICES
3. Close Known National Information Gaps and Remove Policy Barriers to ICES development

**Recommendations:**

1. Address Remote Urban, Rural, First Nations, Inuit and Métis Community Energy Needs with ICES

*Initiate integrated energy demand management partnerships for wealth and job creation in remote urban, rural and First Nation, Inuit and Métis communities in Canada.*

Energy planning in remote urban, rural and First Nation, Inuit and Métis communities requires special consideration, largely due to the lack of regional infrastructure, historical management practices, cultural traditions, smaller populations, and lack of community capacity. Most power and heat production in Canada's remote communities is managed by federal or provincial/territorial agencies. Long-term integrated energy planning and demand side management programs (designed to reduce energy-use for power and heat) have not been extensively implemented in remote urban, rural and First Nation, Inuit and Métis communities in Canada.

The Government of Canada is committed to ensuring the sustainability of remote communities across Canada. An integrated energy demand management partnership for wealth and job creation in remote urban, rural and First Nation, Inuit and Métis communities in Canada should:

- Support federal cross-departmental initiatives to establish capacity required for the planning, design and implementation of integrated energy solutions;
- Showcase the use of diverse energy supply sources and technologies in communities and military bases;
- Encourage the use of innovative financing models that rely less on government support and encourage access to new sources of private equity – particularly from the utility and technology sector; and,
- Provide the needed training and support tools to encourage communities to undertake integrated energy solutions planning and implementation.

*Budget allocation:*

- \$5 million over 3 years directed to the establishment of the initiative.

*Rationale/Benefit:*

The level of energy used within a community largely determines the cost to live within that community (from travel to the purchase of food to the heating and cooling of a home). Remote urban, rural and First Nation, Inuit and Métis communities depend on expensive, energy intensive sources and systems.

**An initiative focused on assisting remote communities would:** • improve reliability and resiliency of energy systems essential to residents • reduce local environmental impacts and community safety risks • address challenges in delivering clean water and critical community services • provide local jobs, technical capacity and local economic development opportunities.

Investment in Canadian remote communities, particularly along coastal areas and arctic locations would further enhance the capacity of Canada to uphold its access to natural resources and further define and assert sovereignty.

## 2. Strengthen National Competitiveness and International Trade by Investing in ICES

*Accelerate market uptake through targeted innovation, research and investment for ICES.*

Among the keys to long-term economic competitiveness for communities and wealth creation for Canada is addressing investment gaps in new technology and infrastructure that have the potential to improve the cost-effectiveness of the delivery of energy and other community services. Much of the energy systems infrastructure and technology in place results in significant wasted heat and energy lost through out-dated and disconnected systems – leaky water pipes are one example - resulting in increased power consumption and lost energy for pumping and delivering water. These inefficiencies result in hidden energy costs to Canadians and are a tax on economic growth and productivity.

A number of federal programs and initiatives already exist that are encouraging investment in clean energy, energy efficiency and expanding export market opportunities. QUEST and its partners believe there is an opportunity to work with government to better deliver these initiatives.

Direction should be given to:

- Federal departments and crown corporations to work cooperatively with QUEST and national sector agencies and associations to advance common approaches for the planning and delivery of ICES as it relates to land-use, water, air, waste, transportation and energy systems.
- Natural Resources Canada to evaluate the business case for consumer and market investors for investing in ICES initiatives as a viable option to conventional practices in association with QUEST and its research network.
- Ensure that federal financing support is directed to Canadian exporters of ICES technology, products and services.
- Ensure that dedicated federal funds are available for research, innovation and showcasing clean technologies and ICES activities.
- Expand accelerated capital cost allowance to cover all ICES-related activities.

*Budget allocation:*

- \$1 million over 2 years directed to establish common approaches for the planning and delivery of ICES and to validate the business case for ICES.

*Rationale/Benefit:*

The government of Canada has demonstrated leadership in working with the provinces on the development of the Council of Energy Ministers *Integrated Community Energy Solutions: A Roadmap for Action*. Implementation of the roadmap will require coordination of valuable and limited public resources and initiatives.

**Better integration of federal priorities and programs would:** • facilitate the application of new technologies and approaches for effectively delivering and managing energy delivery • improve regional economic competitiveness • attract venture capital • capitalize on cross-cutting opportunities with various sectors, including transportation, waste services, building efficiency and water services • contribute to achieving the federal government greenhouse gas emissions reduction objectives.

## 3. Close Known National Information Gaps and Remove Policy Barriers to ICES

*Support the development of congruent codes, standards, regulations and data needs for ICES.*

Interest in the application of ICES has grown steadily over the past few years across Canada, but there remain information gaps that create challenges for the evaluation of supportive policies and opportunities, technology standards and industry initiatives. Prevalent is providing relevant Canadian data to address questions on the application of ICES and informative practices to bridge public and private sector knowledge. One documented example concerns energy use and associated greenhouse gas emissions information for goods movement (freight) at the

community level. Goods movement accounts for nearly 38 per cent of Canada's total greenhouse gas emissions for all modes of transportation.<sup>4</sup>

To help government departments, research institutes, energy practitioners, investors, entrepreneurs and industry associates share and strengthen knowledge about ICES to resolve today's community energy challenges, we propose that:

- A common set of tools be established to enable utilities and communities to better plan and implement ICES;
- Federal departments and crown corporations work with QUEST, national sector agencies, associations and other levels of government to resolve conflicting codes, standards, regulations and guidelines that limit the application of ICES; and,
- Federal departments (Natural Resources Canada, Industry Canada and Infrastructure Canada) work with QUEST and national sector agencies and organizations to confirm an approach for the modeling, collecting, measurement and reporting of energy data at the community level.

*Budget allocation:*

- \$2 million over 2 years directed to resolve conflicting codes, standards, regulations and guidelines that limit the application of ICES and to confirm an approach for the modeling, collecting, measurement and reporting of energy data at the community level.

*Rationale/Benefit:*

Technology is moving fast – codes, standards and regulatory barriers need to be identified and addressed in a coordinated fashion to unleash innovation and application of new technology. **Having congruent policies would:** • promote energy literacy • remove market barriers to investment in ICES concepts, technologies and planning • expand the value chain through value-added job opportunities for ICES.

Locating and assembling information needed to identify, evaluate and select and implement ICES can be costly and time-consuming. Relevant national and community data is often not available, and information that is collected is not standardized in a way that can be easily replicated. **Standardizing the collection and measurement of energy data would:** • allow for benchmarking among communities across Canada • allow for informed investment and decision-making; contribute to better decisions for the establishment of incentive and investment programs • bolster existing federal government programs, such as financing and tax credit packages.

**About QUEST:**

The QUEST mission is to foster a community-based integrated approach to land-use, energy, transportation, buildings, waste and water and to reduce related greenhouse gas and air pollutant emissions and waste. The QUEST vision is that by 2035 every community in Canada is operating as an integrated energy system, and accordingly, all community development and redevelopment incorporates an integrated energy system.

QUEST is achieving its mission and vision by working with community builders to:

- Encourage a balanced and informative conversation about energy.
- Support the development of expertise and capacity across Canada for ICES.
- Prepare inclusive and independent applied research for the broader public interest.
- Advance improvements in energy systems and how people think about and use energy.
- Create a collaborative framework for communities to understand and work on their energy futures.



<sup>4</sup> Commission for Environmental Cooperation. (2011). *Destination Sustainability: Reducing Greenhouse Gas Emissions from Freight Transportation in North America*.