



Community Energy - A Learning Framework for Community based Low Carbon District Energy

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Purpose: Framework for Developing Community-based Energy Systems

- A collaborative initiative between Natural Resources Canada and APEC economies to develop interactive and inter-disciplinary educational framework to assist in the development of District Energy (DE) systems at the community level.
- The framework will emphasise the economic benefits as well as the use of local and renewable resources to develop low carbon community based energy systems.
- The framework will provide information to raise the level of community and stakeholder understanding and support detailed and confident interactions between community and consultant.

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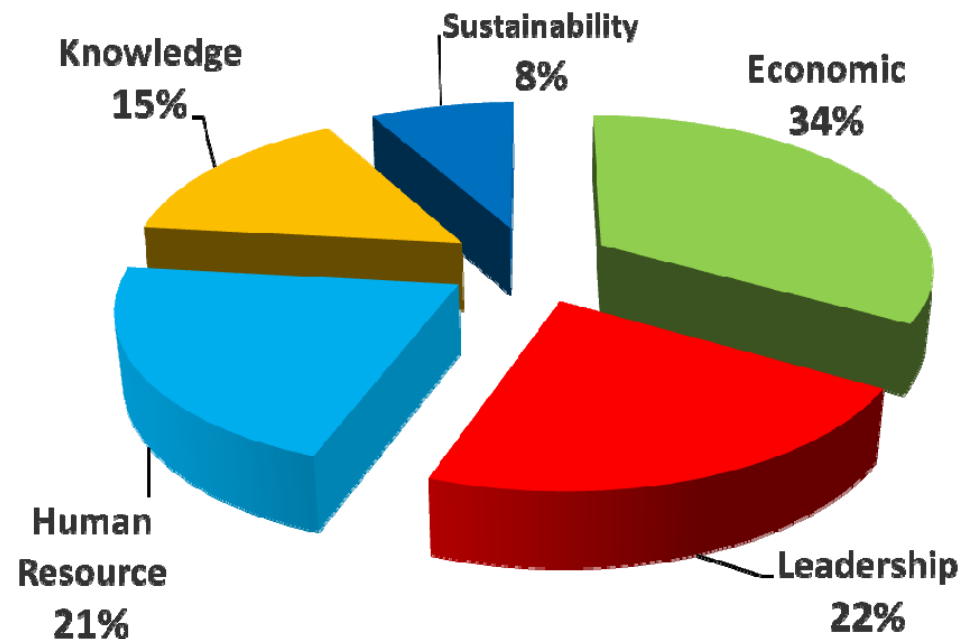
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Background:

Barriers to moving a Community's Energy Vision Forward

- Research by Natural Resources Canada's CanmetENERGY and the Canadian District Energy Association (CDEA)* revealed that (in Canada) the lack of basic developmental information and business awareness are the primary challenges (Knowledge, Sustainability & Leadership) to the implementation of effective community-based low carbon energy systems such as district energy (DE).
- Discussions with others suggests that the barriers also exist in member economies



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* An Action Plan for Growing District Energy Across Canada
https://www.cdea.ca/resources?solsort=ds_created%20desc



Key Information Gaps:

- Developing a community's energy vision is hindered by the lack of:
 - Understanding of the development continuum, from energy vision to design, implementation, operation and maintenance.
 - Understanding of the value and social, economic and environmental impacts of local resources and energy distribution systems and how the benefits enhance energy sustainability, security and efficiency within the community by contributing to employment and investment opportunities.
 - Comprehensive understanding of the impact of technologies, energy resources, generation and distribution techniques by policy and decision makers, financiers, planners and developers.

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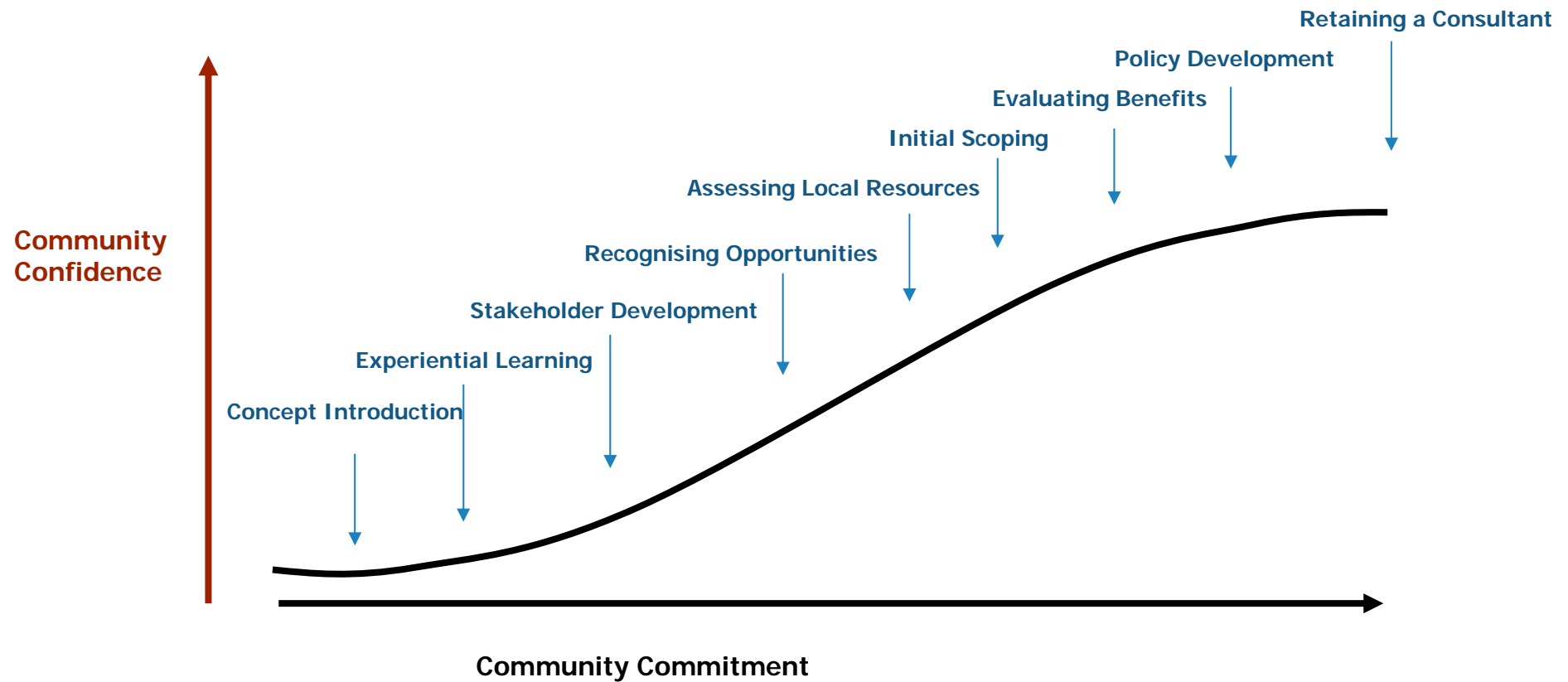


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Scope of Proposal



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Suggested Material

- Introductory workshop materials
- Technology Fact-sheets
- Energy System & Business Case Studies
- Scoping Tools, Models & Methods
- Resource Assessment Procedures & Templates
- Financial and Economic Templates
- Bibliography & Contacts

The framework would draw upon existing material or develop new material where gaps exist.

Exact content to be decided by a APEC –EWG Steering Committee
Material would be available through the EWG website

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Methodology

- Steering Committee (APEC economies & invited experts), Terms of Reference for Steering Committee members, facilitation consultant.
- Issue RFP, assess respondents and select facilitation consultant.
- Review existing District Energy learning materials. Assess scope, completeness and relevance.
- Exploratory workshop (Vancouver?) to define scope of materials & barriers
- Finalise timeline, framework material, and schedule for review by Steering Committee.
- Develop the framework scope
- Identify potential authors and issue RFP. Review, select and issue contracts.
- Draft material compiled and reviewed for completeness by Steering Committee
- Wrap-up workshop for APEC members to demonstrate the framework
- Final material completed and delivered to member economies for dissemination.

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Budget & Schedule

Budget Requested

Labour	\$110,000
Travel	\$ 20,000
Publication	\$ 10,000
Total	\$140,000 US

In-Kind

Canada	\$140,000
Co-Sponsors	\$

Schedule

- Start April 2013
- End December 2014

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Natural Resources Canada



- Natural Resources Canada's CanmetENERGY is the Canadian leader in clean energy research and technology development. With over 450 scientists, engineers and technicians and more than 100 years of experience, we are Canada's knowledge centre for scientific expertise on clean energy technologies.
- CanmetENERGY is the largest energy science and technology organization working on clean energy research, development, demonstration and deployment. Our goal is to ensure that Canada is at the leading edge of clean energy technologies to reduce air and greenhouse gas emissions and improve the health of Canadians. We are a leader in science and technology delivery within the federal government, serving as a provider and catalyst for a sustainable energy future for Canada.
- Our involvement with international bodies such as APEC and IEA enables to support the development of energy policy, codes and regulations and act as a window to federal financing and work with our partners to develop more energy efficient and cleaner technologies
- Existing experience includes the development of learning materials for the Canadian District energy sector, the Equilibrium Communities initiative, Community Archetypes and District Energy Economic models.
- For more details <http://canmetenergy.nrcan.gc.ca/buildings-communities/2218>

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APEC Concept Note

Please submit through APEC Secretariat Program Director. Concept notes of more than 3 pages (including title page) or incomplete submissions will not be considered.

Project Title:	District Energy Development - Guiding Framework
Source of funds (Select one): <input checked="" type="checkbox"/> Operational Account <input type="checkbox"/> TILF Special Account <input type="checkbox"/> APEC Support Fund	
Committee / WG / Sub-fora / Task-force:	Energy Working Group / New & Renewable Energy Technology
Proposing APEC economy:	Canada
Co-sponsoring economies:	New Zealand, Chinese Taipei
Expected start date:	April 2013
Expected completion date:	December 2014
Project summary: Describe the project in under 150 words. Your summary should include the project topic, planned activities, timing and location: <i>(Summary must be no longer than the box provided. Cover sheet must fit on one page)</i>	To advance the concepts of renewable energy driven district energy networks there is a need for increased awareness and understanding at the local and regional level. This understanding enables the development of community energy networks and grids utilizing renewable energy to realize social and economic benefits beyond simply the use of low carbon energy. The proposal develops a series of educational modules aimed at local government, addressing key issues relating to fuel selection and the design, development and business management of a renewable energy driven thermal network. Workshop material will be developed or adapted using expertise from APEC member economies enabling officials and staff to raise awareness of sustainability issues and techniques of socio-economic benefit within their community. Subject matter will include: identification and selection of renewable and local resources for both heating & cooling, design & marketing, policy, economic & business models, related urban planning, retrofits and new developments.
Total cost of proposal: (APEC funding + self-funding) USD \$280,000	Total amount being sought from APEC (USD): \$140,000 By category: <i>Travel:</i> \$20,000 <i>Labour costs:</i> \$110,000 <i>Hosting:</i> <i>Publication & distribution:</i> \$10,000 <i>Other:</i>

Project Proponent Information and Declaration:

Name: Ken Church & Anna Munro

Title: Team Leader – Communities Group; Senior Manager – Business Development

Organization: Natural Resources Canada

Postal address: 580 Booth Street 13D-4, Ottawa, Ontario Canada K1A 0E4

Tel: (613) 947 8952 **Fax:** (613) 996 9909 **E-mail:** kchurch@nrcan.gc.ca

I declare that this submission has been prepared in line with the **Guidebook on APEC Projects**. If approved, I agree to develop the project in line with APEC project requirements.

Name of Project Proponent

Date: November 14, 2012

Project Synopsis

1. Relevance:

- The implementation of district energy enables the economic deployment of renewable energy on the large scale but within the capacity of the community. At this scale the initiatives are locally manageable yet benefit from economies of scale not present within a distributed energy approach.
- District Energy and renewable energy is seen by many APEC economies as enabling the development of low carbon communities. The transition towards low carbon communities can be initiated at the level of local government since they recognise the social and economic advantages of accessing and managing renewable and other local resources.
- Municipalities in many economies are often constrained in their capacity to initiate these energy initiatives. Their use of local resources for energy production enhances local economies while integrating with regional or state run utilities, ensuring overall reliability.
- APEC members have a goal of enhancing energy security through a widescale adoption of renewable or low carbon energy to reduce their dependency on fossil energy supplies. This approach facilitates economic development, green jobs and human resource development, all components of the APEC Leaders' Growth Strategy.
- Awareness building will lead to the accelerated implementation of community based renewable energy / district energy networks and the alignment of standards and regulatory procedures and eventually market development for the renewable energy industry.

2. Objectives:

- To provide a practical procedural framework for a diverse group of stakeholders that addresses barriers and knowledge gaps inherent in their disparate roles in the development and distribution of renewable technologies.
- Enhance the common understanding between stakeholders and assist them in decision making by developing an awareness of the impact of design, development, ownership, financing and energy pricing issues and how they affect the economic viability of the system.
- To share knowledge and experience between experts within APEC member economies to ensure that content and applicability of the framework builds interest and provides relevant opportunities to communities.
- To encourage economic growth in both the renewable energy and district energy sectors within member economies through the development of low carbon energy systems.

3. Alignment:

- The project aligns itself with both the 2011 Leaders Honolulu Declaration and the 2010 Growth Strategy
- In 2011 the leaders declared the need to "...speeding the transition toward a global low-carbon economy in a way that enhances energy security and creates new sources of economic growth and employment". In the same declaration APEC Leaders committed to "Promote energy efficiency by taking specific steps related to transport, buildings, power grids, jobs, knowledge sharing, and education in support of energy-smart low-carbon communities".
- The 2010 APEC recognised the linkages between Balanced, Inclusive, Sustainable, Innovative and Secure growth. As part of Sustainable Growth the leaders proposed that "APEC economies should encourage new green industries and jobs, including by introducing market-based mechanisms as an important tool to achieve sustainable growth and address climate change. APEC should help to establish a low-carbon society in which we maintain economic growth while protecting the environment. It can do so by taking steps to facilitate the diffusion of clean energy technologies and systems, including by reducing barriers to trade and investment in energy efficient products, conducting international joint research, building capacity, promoting public-private partnerships, and providing appropriate incentives for investment in energy efficient and low-carbon energy supply, buildings, industry, and transport".
- By increasing awareness and encouraging the development of renewable based energy networks member economies can address many of the commitments listed above.

4 **Methodology:**

Responsibility for the development of the educational / informational material will be led by Canada and enhanced by participating APEC members and an expert consultant. The APEC funding sought for the project will be used to coordinate these activities and to prepare and present the finished material. In-kind and financial support offered by Canada includes the exploratory workshop, likely in Vancouver to define the exact scope of the framework. The project is outlined as following:

- Develop a Steering Committee comprised of material experts and expert parties from APEC economies. Establish the Terms of Reference for committee members and for an operating agent and / or facilitation consultant to assist the process.
- Issue RFP, assess respondents and select facilitation consultant.
- Review existing learning materials for review at the workshop. The materials will relate to the development of sustainable community-based energy systems and would be suitable to community stakeholders. Assess scope, completeness and relevance of the materials for existing or new developments.
- Develop and conduct exploratory workshop. Invitees would include the Steering Committee and invited experts who would develop the scope of the framework materials pertaining to APEC economies. This might include: assessment of local resources (solar, biomass, waste energy, etc), design tools, conversion technologies, local energy practices and policies, verified case studies of existing systems, digital presentations, financial and pro-forma templates, checklists and guidelines for community evaluations and feasibility studies, workshop notes, etc.
- Compile workshop findings defining framework scope, timeline and recommendations as to the form of material for inclusion on APEC-EGNRET website. Review of findings by Steering Committee.
- Develop scope of work for each area of required materials. Identify potential authors and issue RFP. Review and select appropriate authors and issue contracts.
- Manage the production of the materials through regular project progress meetings. Identify gaps and omissions and revise accordingly.
- Compile draft material and review for completeness by Steering Committee members and/or invited experts for applicability to the target audience.
- Revise and deliver final material to website manager or to APEC-EGNRET member economies for dissemination.

Timeline – April 2013 – December 2014

Stakeholders – The aim of the work is to raise awareness amongst the communities and energy utilities of member economies. Stakeholders will therefore be representatives of municipalities and local communities, utility associations, member economies and engineering associations.

Previous Activities:

Natural Resources Canada - CanmetEnergy (NRCan) has developed and applied renewable energy technologies across Canada including computational tools and training materials for community use. They have worked with the Canadian District Energy Association to develop a learning framework for district energy in Canada. The development of learning modules is aimed specifically at the municipal audience and would be adapted to the needs of APEC economies.

Natural Resources Canada (Canadian Forest Service) has worked extensively with the biomass sector and communities with regards to the management and sustainable use of woody biomass and bioenergy technology options for rural and aboriginal communities.

NRCan is a member of the International Energy Agency Implementing Agreement on District Heating and Cooling since 1987. APEC member states, Korea and the USA also participate in the Implementing Agreement.

Communications:

For widest access to the material, a centralised location such as the existing APEC-EGNRET website could be used. This would allow steering committee members to access the materials linking them to organisations and associations within their economies. Steering committee members would be at liberty to use the materials in conferences and presentations as they see fit, further broadcasting the information.