

Energy Systems

Description

The typical North American community is supported by a bewildering collection of utilities and engineered systems, the maintenance of which represents the largest expenditure of community tax dollars. Yet, once constructed, there are few financial benefits that come to the community from such a sizeable financial investment. In the case of energy, for every dollar the community spends it is estimated that 70 to 90 cents leaves the community and never returns. However, if a community's approach to energy is broadened to include notions of self-reliance, of wealth generation and local employment, and of long term adaptability and sustainability, then the starting point in deciding on the form, size and inherent nature of the energy infrastructure fundamentally changes.

There are many different energy forms that a community can consider for returning greater value:

- Solar energy: This can supplement existing systems and cut as much as 75 percent of heat and electricity costs.
- Wind energy: Wind turbines may be best implemented as supplementary energy sources, but their cost is so low that they are particularly appropriate for expanding the local energy supply.
- Micro-hydro: Small-scale hydro installations can be easy to build and operate, and can pay back the investment in a few years.
- Co-generation: The simple capture and use of waste heat from thermal electric generation (or other industrial facilities) can reasonably be expected to save a great deal of money, especially in a cold climate, and will usually recover the equipment capital cost in a few years.
- District heat systems: In closely built sections of a community in a cold climate zone, such as town centres, this option makes good economic sense. Instead of each facility having its own heating plant and fuel supply, with all of its associated capital cost and maintenance and floor space requirements, one highly efficient central plant provides heat to several facilities. District heat can be combined with co-generation, especially in remote communities with closely located buildings. In cases where a local industry such as a mill or smelter has waste heat, this can be captured and distributed as a district heat utility.

A local community that identifies an interest in energy conservation can take many steps to improve its local performance. Matching needs with appropriate sources of energy and then

using that energy as efficiently as possible can lead to significant savings in all end-uses. Money freed up is available to add value through investment in the economy. The starting point will be a community campaign of education and mobilization for an energy-efficient community.

Benefits

Developing sustainable energy practices not only protects the environment but is good for a community's economy. With such a high percentage of traditional energy expenditures leaving the community, the energy use practices of homes, neighbourhoods, workplaces, shopping centres, public buildings and transportation systems should be seen as opportune places to plug leaks in the local economy. Decentralized production of energy and energy conservation initiatives stimulate the regional economy and generate direct employment. Local businesses may be able to provide the goods and services to support technological change and conservation. Similarly, technology transfer and conservation can produce income generating expertise. For example, conservation consulting and contracting is becoming a very viable business as energy prices rise.

Major challenges

Despite the tremendous environmental and economic advantages of sustainable energy practices, communities face a number of challenges in adopting them. To address some of these requires government and corporate leadership. For example, the market does not always provide appropriate incentives for efficiency and does not fully count the environmental and social costs.

Furthermore, there is unwillingness on the part of some utilities to replace existing generating capacity with more efficient formats, and many jurisdictions lack a publicly stated long-range energy vision. The utility commissions and provincial agencies are very powerful regulatory forces, particularly in relation to who can charge fees and how much these fees can be. While utility restructuring initiatives are underway in many Canadian provinces, communities are likely to face some major regulatory hurdles and will likely find themselves involved in public systems change efforts in order to move forward. Most large projects this will require the utilization of external regulatory expertise.

Other challenges are closer to home. Often people just don't understand the energy saving opportunities that exist. Community institutions, organizations and businesses may not yet see the benefit in promoting and/or adopting energy efficient practices.

Some practical steps

The Community Energy Workbook outlines a process:

1. Build a Energy Steering Committee representing different local interests to guide the planning process and secure initial sponsorship of local groups.
2. Draw the local Energy and Economic Picture including how much energy the community is consuming and what that means for the economy and environment.
3. Mobilize the community for energy planning through an effective education campaign.
4. Hold an Energy Town Meeting which attracts wide media coverage, puts energy on the community's agenda, and launches energy planning workshops.
5. Create Energy Task Forces to address residential, commercial/industrial and transportation sectors.
6. Conduct Task Force Workshops to identify assets, opportunities and barriers for improving local energy use and the connections between these; and to select project ideas.
7. Bring it all together to create a community action plan.

Resource organizations & contacts

- Canadian Wind Energy Association, Suite 100, 3553 31 Street NW, Calgary, AB T2L 2K7; tel. 800-922-6932. (Website: www.canwea.ca). Offers a newsletter, technical assistance, products, services, bookstore.
- Centre of Excellence for Sustainable Development (US Department of Energy), 1617 Cole Boulevard, Golden, Colorado, 80401; tel. (303) 275-4826; website (www.sustainable.doe.gov). Offers manuals, workbooks, bibliographies, data bases, case studies, links.
- Center for Renewable Energy and Sustainable Technology (Crest); www.crest.org (internet information source for sustainable energy and development information).
- Earth Energy Society of Canada, #1050-130 Slater Street, Ottawa, Ontario K1P 6E2; tel. (613) 230-2232; www.earthenergy.ca (information on benefits of ground-coupling heating systems).
- Solar Energy Society of Canada Inc., 116 Lisgar Street – Suite 702, Ottawa Ont., K2P 0C2; www.solarenergysociety.ca (technical information, conferences, trade shows, publications).
- Sustainable Communities Network (www.sustainable.org) offers information on organizations, publications, tools, case studies.

Publications

- Rocky Mountain Institute. *The Community Energy Workbook* (Boulder, CO: Rocky Mountain Institute, 1995) is available via the CED Bookshop (www.cedworks.com). This has been called a “brilliantly useful compendium of ideas, techniques and information that can radically improve our cities, awaken citizenry, and transform public policy.”

Tools & Techniques

- Solar Energy Society of Canada, *The Canadian Renewable Energy Guide* (Burnstown, Ont.: General Store Publishing House, 1999, 2nd ed.). This comprehensive resource provides information on renewal energy applications; case studies; and a directory of associations, on-line information, publications, companies, products and services.