Cogeneration; We Need to Know

Cogeneration is the process where two or more useful energy forms are simultaneously generated from one energy supply. Usually this results in an efficiency improvement because more of the energy in the source fuel is utilized. Typically, the two useful forms are electricity and heat (thus called “combined heat and power” or CHP) but other combinations also exist: mechanical energy and heat, electricity and cooling or even electricity, heat and cooling (trigeneration). The energy forms generated are often directly used in process – to make paper, one requires both heat and electricity – but sometimes, one form is sold into the market to meet a demand elsewhere. Therefore, to understand our energy system, we need data on cogen and its application. Unfortunately, Canadian data on this process are incomplete.

Cogeneration delivers about 11% of the electricity generated in Europe; for some countries, it's over 40% (Denmark and Latvia, [www.cogeneurope.eu](http://www.cogeneurope.eu)). For Canada, data are inconclusive but it appears that perhaps as much as 7% of power generation may be from cogeneration.

And that's just it – we don't really know. And we should know, if we consider an understanding of Canada's energy system important. If Canada is to be viewed as an energy superpower, keeping data tabs on this aspect of the energy system is crucial.

Why we need to know

There are many reasons why a good grasp of cogeneration data would be important; they can be classified under two main categories:

1) Impact on environment:

   Today, any actions that impact energy use, efficiency and consequent emissions are important. To understand the benefits of cogeneration, with incumbent reductions in energy use, pollution and GHG releases, we need data on fuels used and energy generated.

   Furthermore, the displacement of new supply, minimizing distribution system extensions and reducing impacts on local environments is favoured by most local governments and communities; again, we need the data.

2) Impact on economy:

   Provided the system is properly integrated, cogeneration offers economic advantages through reduced energy bills, increased income through sales of surplus electricity or heat, reduced transmission losses, reduced capital expenditures on new supply, and the creation of jobs in the manufacture of cogeneration technology and its operation. There may also be economic benefits associated with GHG reduction credits or certificates. Additionally, cogeneration resources, as part of a distributed energy network, are seen to increase energy security.

Energy Byte: Cogeneration important to some industries

Cogeneration typically finds a good home wherever there is a demand for heat. So we see the most cogeneration in the pulp and paper and oil sands industries. In Canada, these two industries use roughly 60% of all cogenerated heat for internal processes and generate about 44% of all cogenerated electricity, a portion of which is sold back to the grid. (Source: CIEEDAC Cogeneration Database)
The data issue
CIEEDAC began analyses of cogeneration in Canada in 1998. With support from its sponsors (primarily Natural Resources Canada and Environment Canada), it began to gather data on cogeneration by searching for other databases and, between 2000 and 2008, through an online survey. Outside of the typical owner/operator data, the dataset contains information on cogeneration technologies, capacity installed, primary energy source, generation, quantity sold, thermal host and many other features of cogeneration systems. But, as funding for CIEEDAC declined, its survey was discontinued.

In 2004, Statistics Canada drafted a proposal to look at the statistical assessment of cogeneration in Canada and, in 2007, sponsored a series of stakeholder meetings to assess how these data could be incorporated into the energy data system. Issues with both assessing many other features of cogeneration and CIEEDAC declined, its survey was discontinued.

Renewed data gathering
Recently, there has been awakened interest in cogeneration, again for a number of reasons. As a result, there has been an increased interest in data related to cogeneration and CIEEDAC, as the one stakeholder capable of gathering such data, has began another round of data review and collection. It is currently looking for funding to proceed. As it stands at the time of printing, we will receive support from a federal government agency supplemented by funds from some interested utilities.

CIEEDAC has in place a number of personnel to move the process forward. These personnel will also be in charge of other data collection activities CIEEDAC hopes to undertake in the current fiscal year (see “What’s Going On?” this page). For more information, please contact John Nyboer (jnyboer@sfu.ca) or Rose Murphy (remurphy@sfu.ca).

To obtain a copy of the most recent cogeneration report, go to CIEEDAC online at SFU (www.cieedac.sfu.ca).

What's Going On?
District Energy Survey to go out
Last year, CIEEDAC completed a task to install an online database system that would allow browsers to obtain data on district energy installations across Canada. This year, CIEEDAC obtained some funding to gather data to populate this database. Support for this initiative has come from BC’s Ministry of the Environment and Natural Resources Canada.

Requests for support for Renewable Energy database underway.
Data on renewable energy in Canada are limited and scattered. Some data on some forms of renewable energy are available from online sources (e.g., wind energy data from CanWEA) but there is no single comprehensive source of such data anywhere in Canada, except for that available from CIEEDAC. These data, however, are woefully out of date. CIEEDAC’s Rose Murphy has begun an initiative that seeks to update the data by obtaining support from a number of utilities, government agencies and renewable energy associations.

First International Year of Statistics
2013 is the first International Year of Statistics. During this year, at least 2,100 agencies and organizations worldwide are participating in events and workshops that celebrate statistics, primarily because so many facets of our life – from the food we eat to the medicines we take to the energy we use – are affected by statistics. Statistics Canada (STC), one of the participating agencies, has planned a number of events including a video contest focused on generating interest in statistics, producing a video series on statistics, crowdsourcing on Twitter to get an understanding of Canadians’ information needs, and a series of panel discussions on various dimensions of statistical data.

CIEEDAC’s Dr. John Nyboer was asked by STC to participate in a panel discussion focused on Energy Data in Canada. The event, taking place in Edmonton, AB, on September 10 with over 80 participants, began with Wayne R. Smith, Chief Statistician of STC, highlighting the data work STC undertakes each year in an effort to provide good energy data on Canada as a major player in the global energy sector.

Along with 4 other panel members from different areas of the energy spectrum (Alberta gov’t, National Energy Board, Canadian Association of Petroleum Producers and STC’s Energy Division), Dr. Nyboer addressed questions on:

- Critical Issues in Energy Data: What needs to be done to maintain an appropriate data set on energy into the future?
- Sharing of Data Resources in Canada: With whom can STC interact and partner so as to maintain a consistent comprehensive data set that does not increase respondent burden.
- How can STC become a hub of energy data for Canadians?

Among other things, Dr. Nyboer addressed concerns related to the confidentiality of data on energy in its generation and end use, gaps in the data (renewable energy, district energy, technologies like cogeneration that affect energy utilization, regional data) and the various other sources of data that exist in Canada (including CIEEDAC).

For more on the International Year of Statistics, see www.statistics2013.org