



CIEEDAC

The 2014 District Energy Inventory for Canada



*evolving***ENERGY**
.....
GLOBAL ENERGY LEADERSHIP TRANSFORMING OUR CITIES
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CIEEDAC

CIEEDAC began in 1993 under an agreement with NRCan's Office of Energy Efficiency

- Part of **Energy and Materials Research Group** (EMRG) at School of Resource and Environmental Management at Simon Fraser University
- Primarily focused on industry data related to industry production, energy use and emissions
- Fills data gaps related to CHP (cogeneration), renewable energy and **district energy**
- Non-profit, utilizing students at EMRG and a research team.





CIEEDAC's DE Goal

- 1) Address the gap in the reporting of information about district energy (DE) systems
- 2) Understand the impact of DE on energy use, GHG emissions, investment, employment...
- 3) Advance DE deployment in Canada



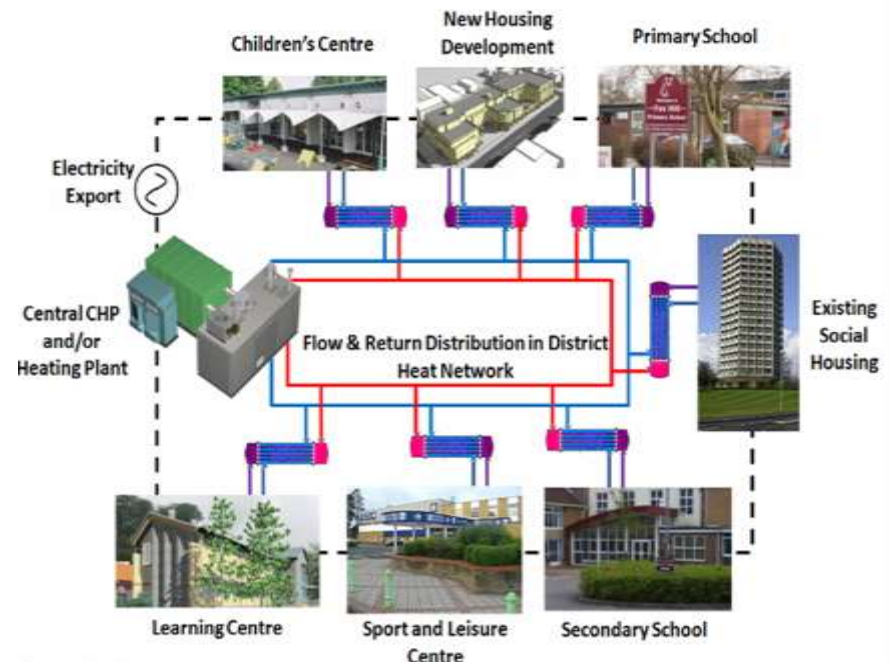
False Creek Energy Centre, Vancouver, BC



District Energy

CIEEDAC defined a district energy system to be:

...a system designed to supply thermal energy (and possibly electricity) to multiple buildings from a central plant or from several interconnected but distributed plants.



Malmo District Heating Scheme





Data History

CIEEDAC began the process in 2012, collected data in 2013 and 2014 and is currently running the 2015 survey

- Funding provided by Natural Resources Canada, CanmetENERGY program
- Initial collection gathered basic information on number of sites and their location, energy type used, service area and other principle statistics
- Data gathered in 2014 expanded the list of known systems to 128 and the number of respondents to 67





Data Highlights

- Over half of the known facilities are in Ontario (40) and BC (26)
- Over half of all facilities were commissioned since 2000
- Reporting facilities (67) served over 2,600 buildings.
 - 75% - served more than 1 building type
 - 39 - average # of buildings served per facility
 - 302 - largest # of buildings served by a single facility
- Energy supplied to heat or cool – 5.3 million MWh in 2013 (est. 1% of total building thermal energy use in Canada)
- More than half plan expansions in the near future





Graphic Look at the Data

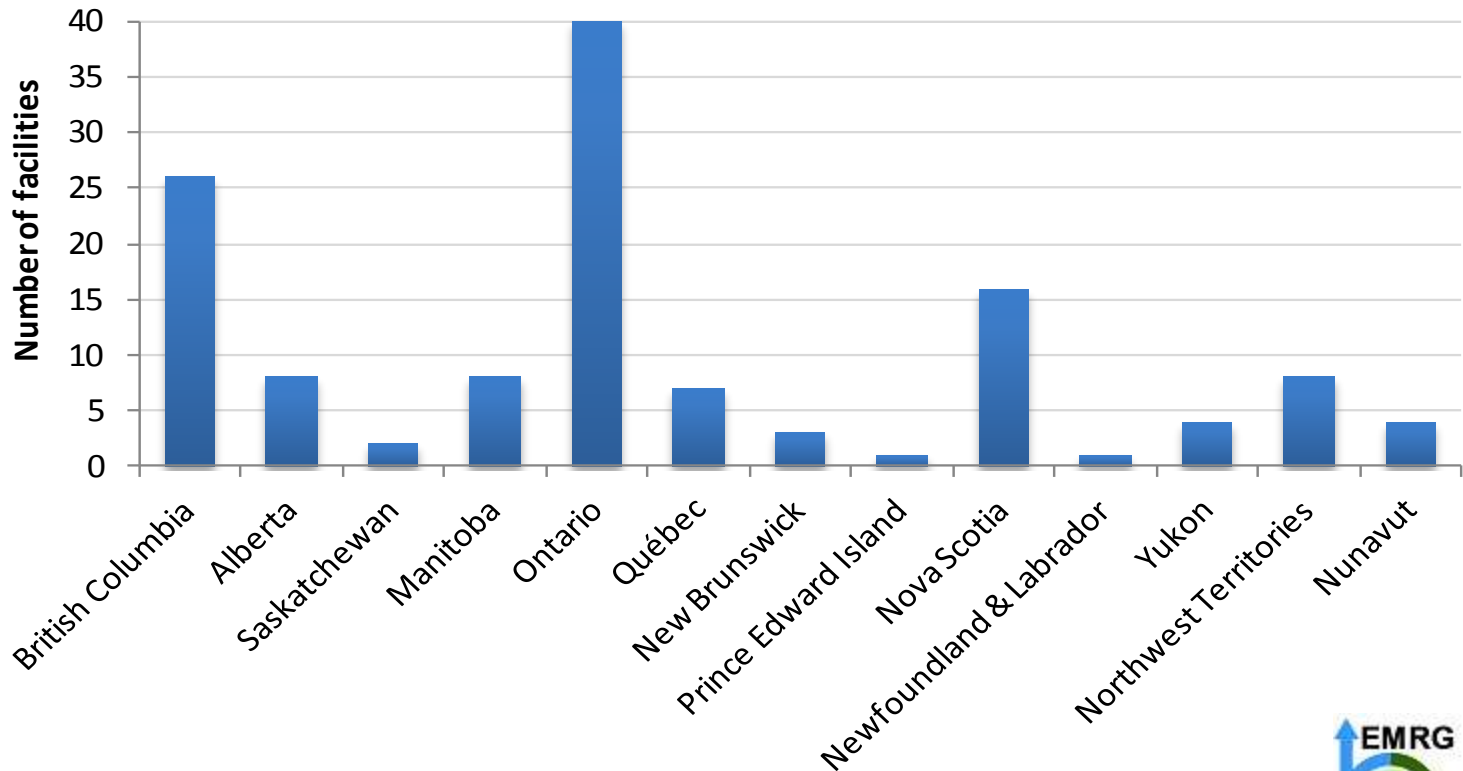
- Provincial / Regional details
- Energy Supply Types
- Energy Service and Quantity
- Community, Employment and Investment
- Growth





Provincial / Regional Data

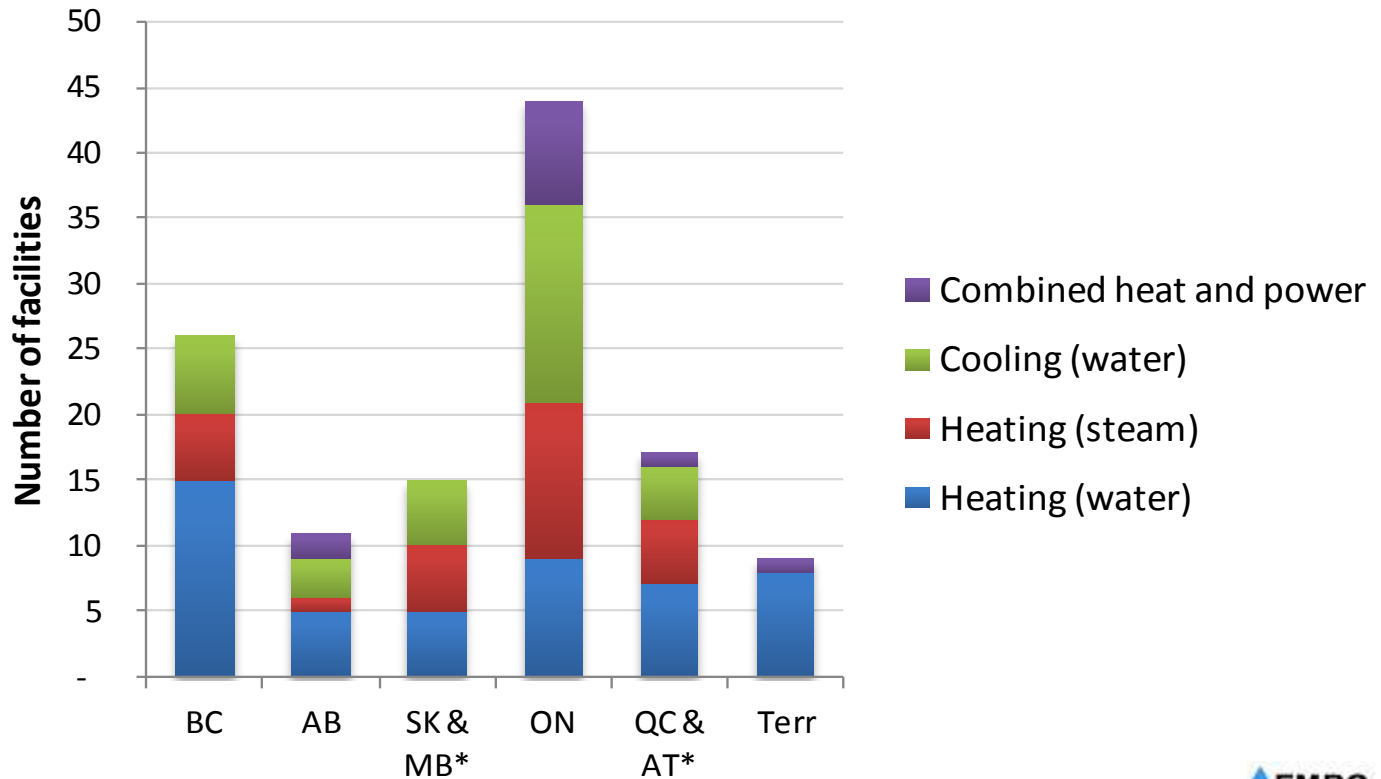
Facilities by province / territory





Provincial / Regional Data

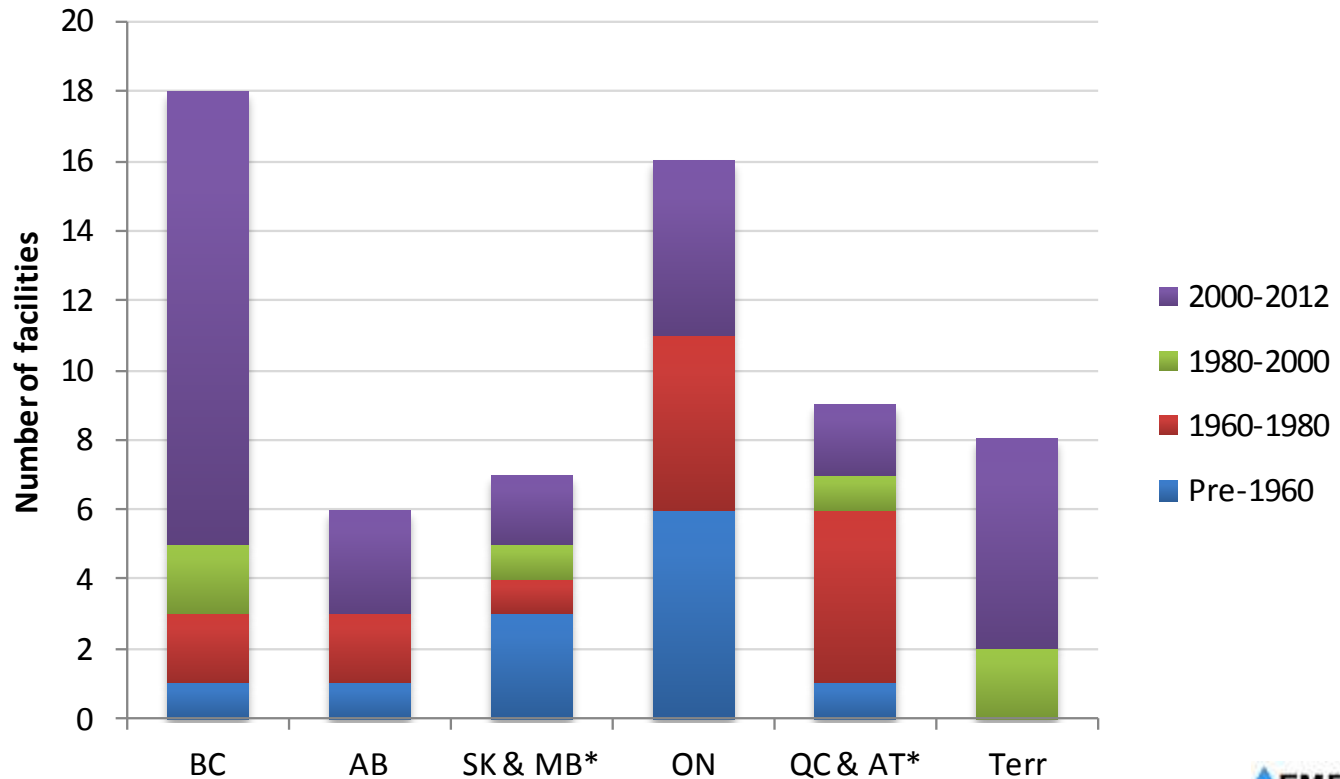
Facilities by services provided





Provincial / Regional Data

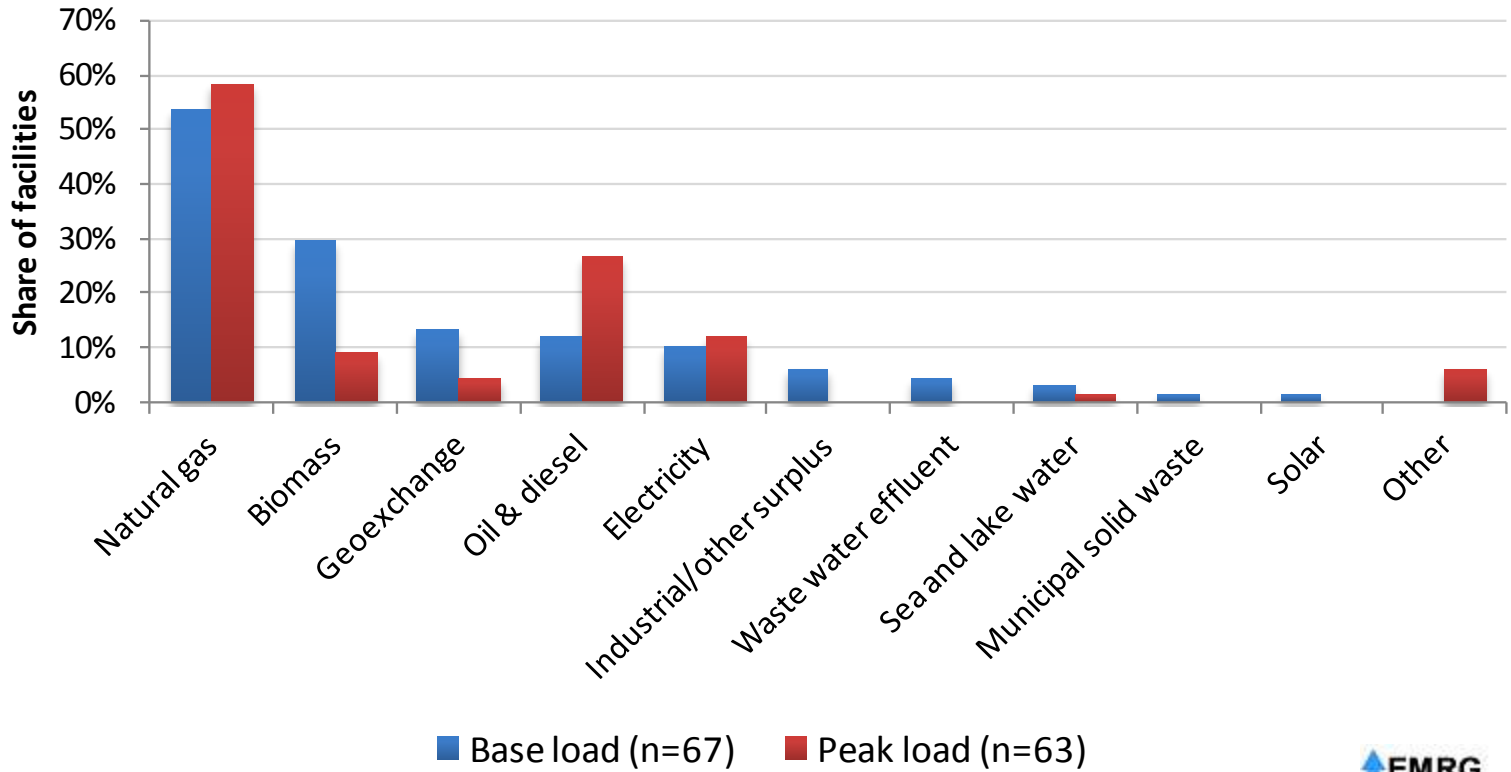
Facilities by year of commissioning





Energy Supply Data

Base and Peak Load energy supply (heat and cool)





Energy Supply Data

Base Load energy supply (heat and cool)

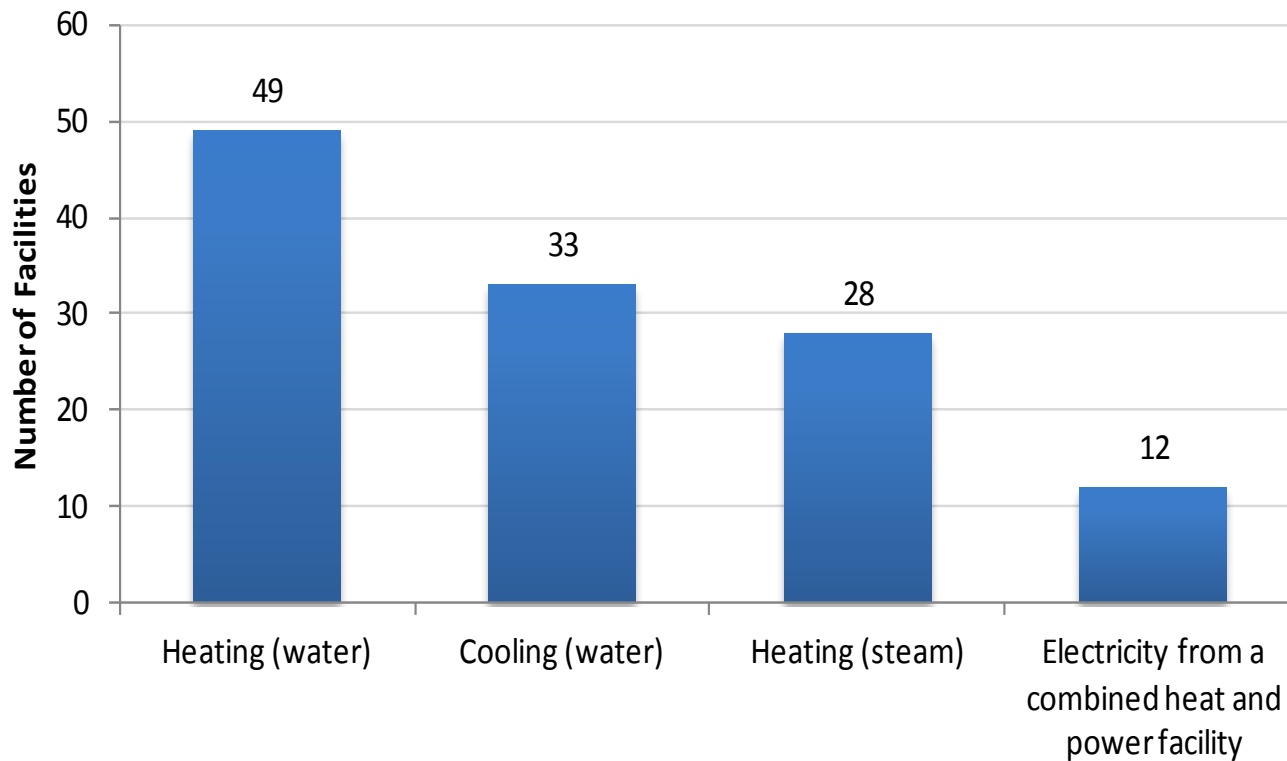
Fuel type	Number of facilities	Share
Natural gas only	25	37%
Biomass only	13	19%
Geoexchange only	6	9%
Natural gas and electricity	6	9%
Industrial/other surplus and diesel	4	6%
Wastewater heat recovery (and geoexchange)	3	4%
Oil and natural gas	3	4%
Biomass and natural gas or oil	2	3%
Water for cooling, natural gas (and geoexchange)	2	3%
Electricity and geoexchange	1	1%
Municipal solid waste and biomass	1	1%
Solar only	1	1%
Total	67	100%





Energy Service and Quantity

Facilities by type of service



Service provided (n=67)

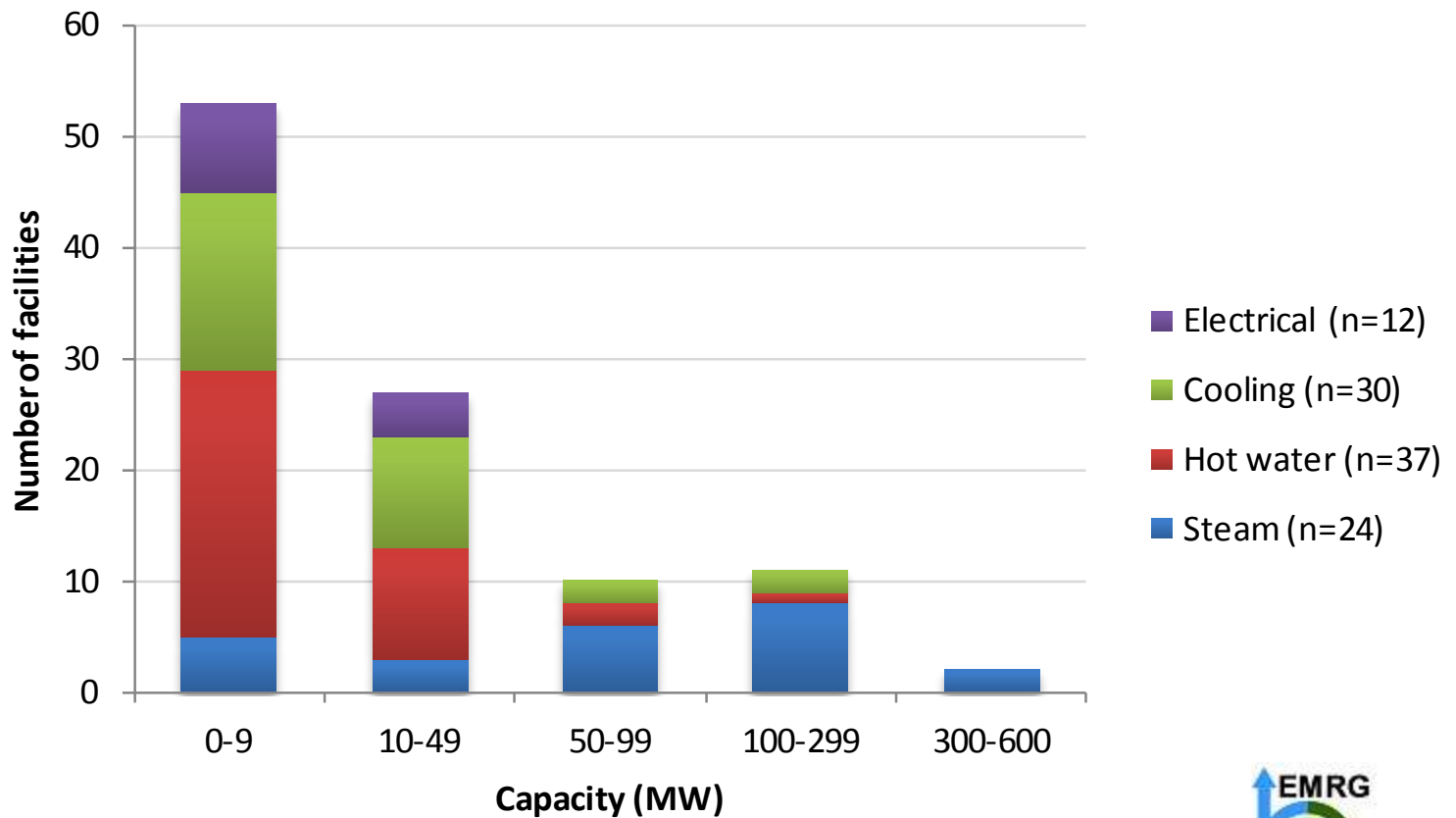
John Nyboer
CIEEDAC





Energy Service and Quantity

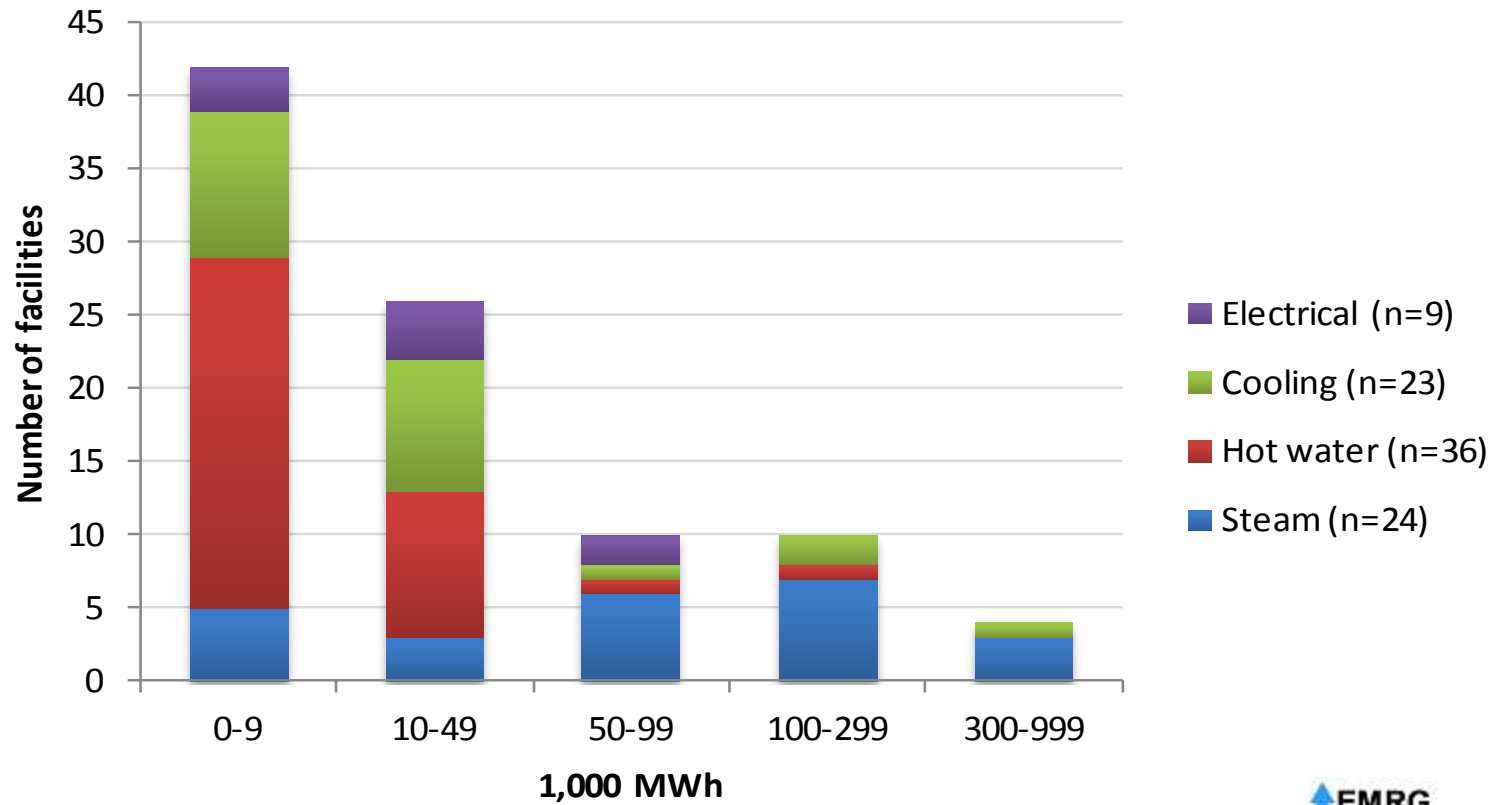
Facilities capacity and type of service





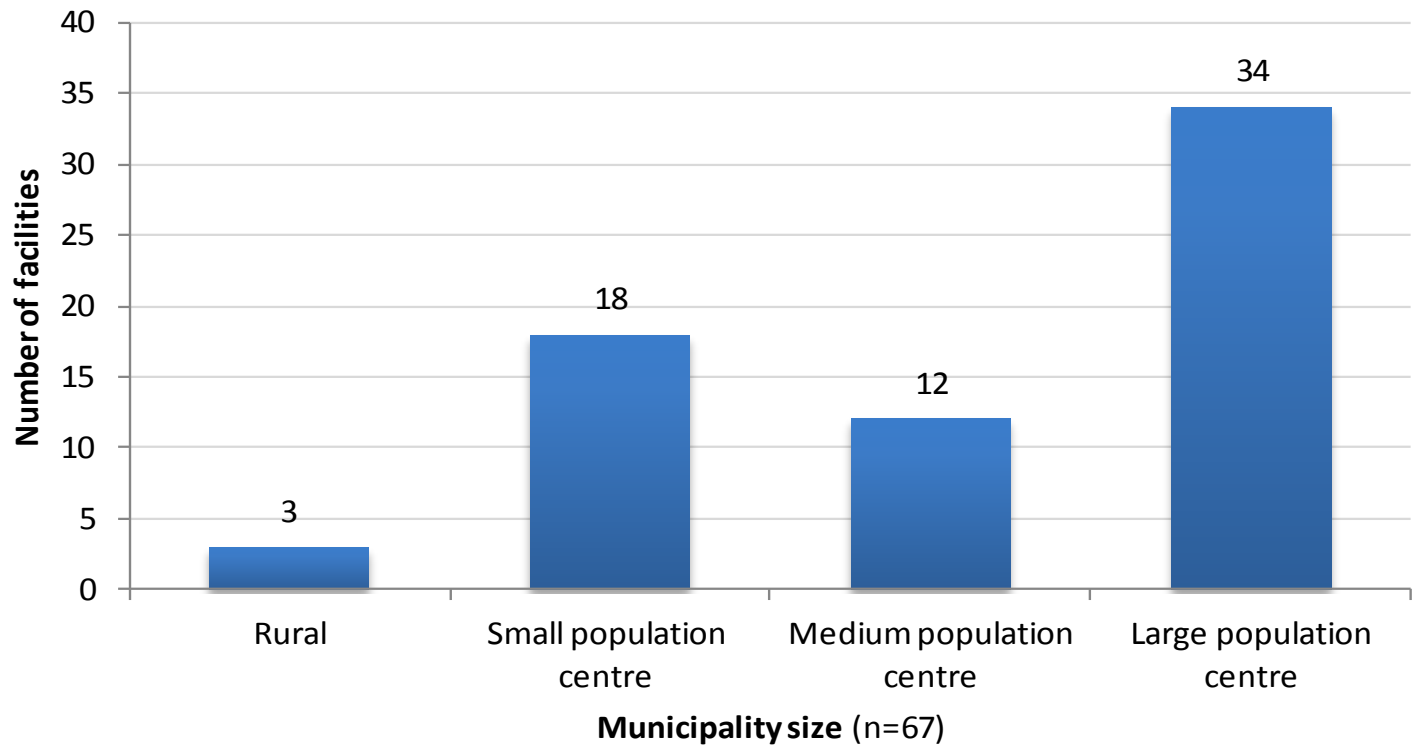
Energy Service and Quantity

Facilities annual generation by type of service





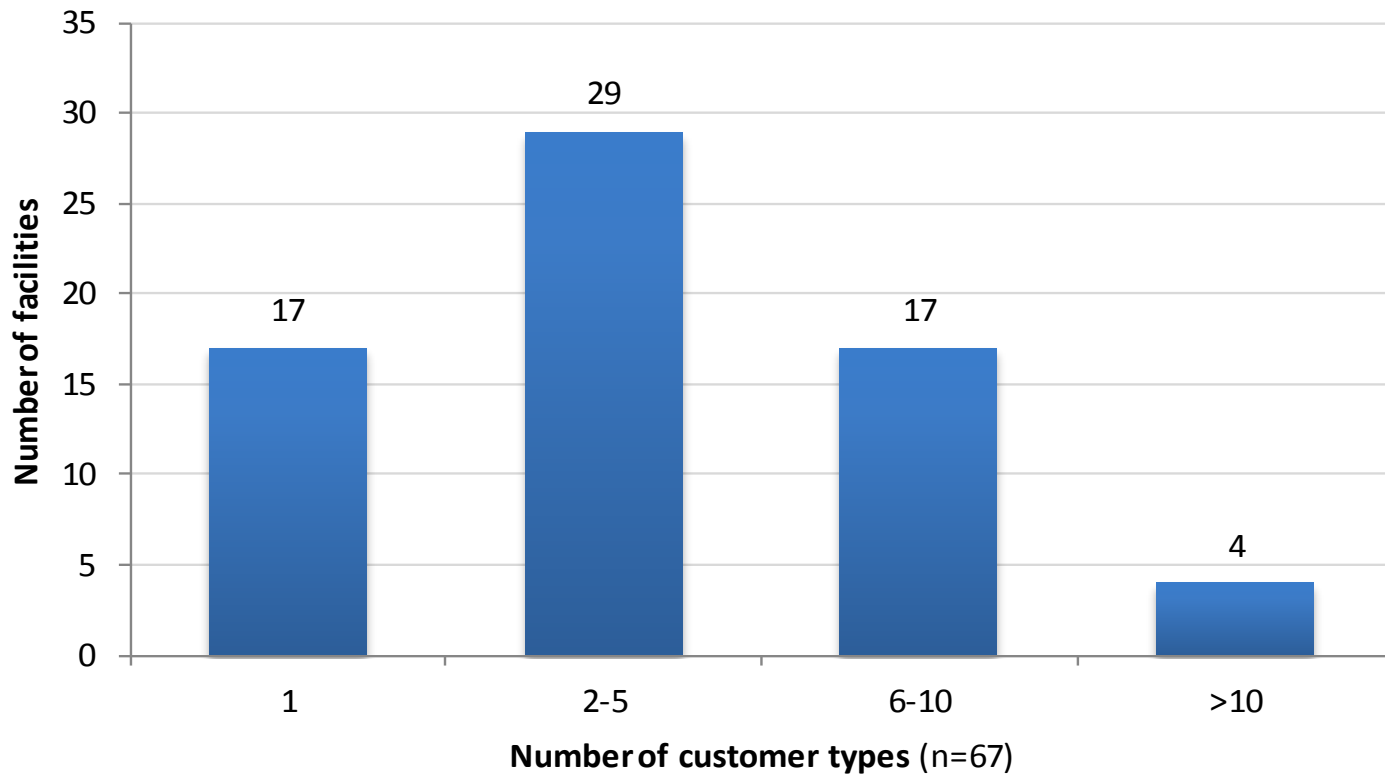
Community, Employment and Investment *Facilities by size of municipality*





Community, Employment and Investment

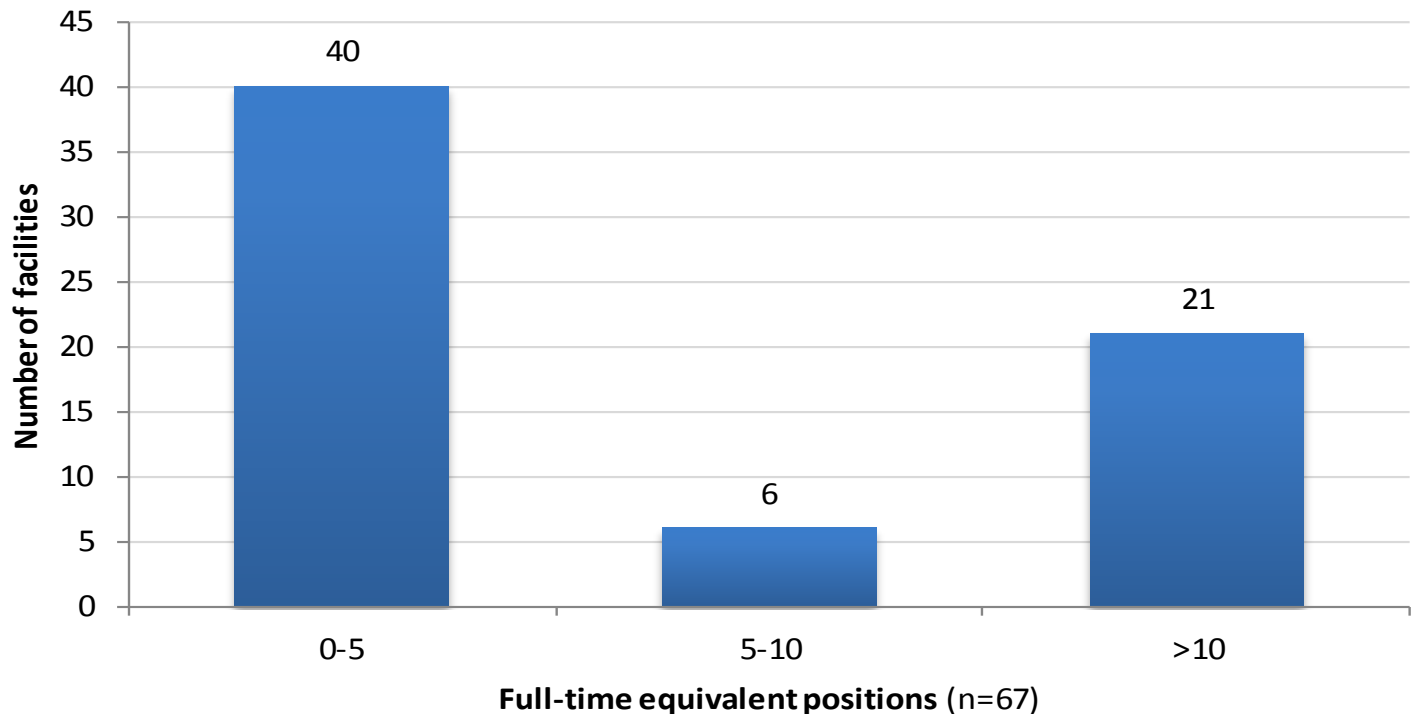
Number of customer types served by a facility





Community, Employment and Investment

Number of full time equivalent positions by a facility





Community, Employment and Investment

Facilities by system owner

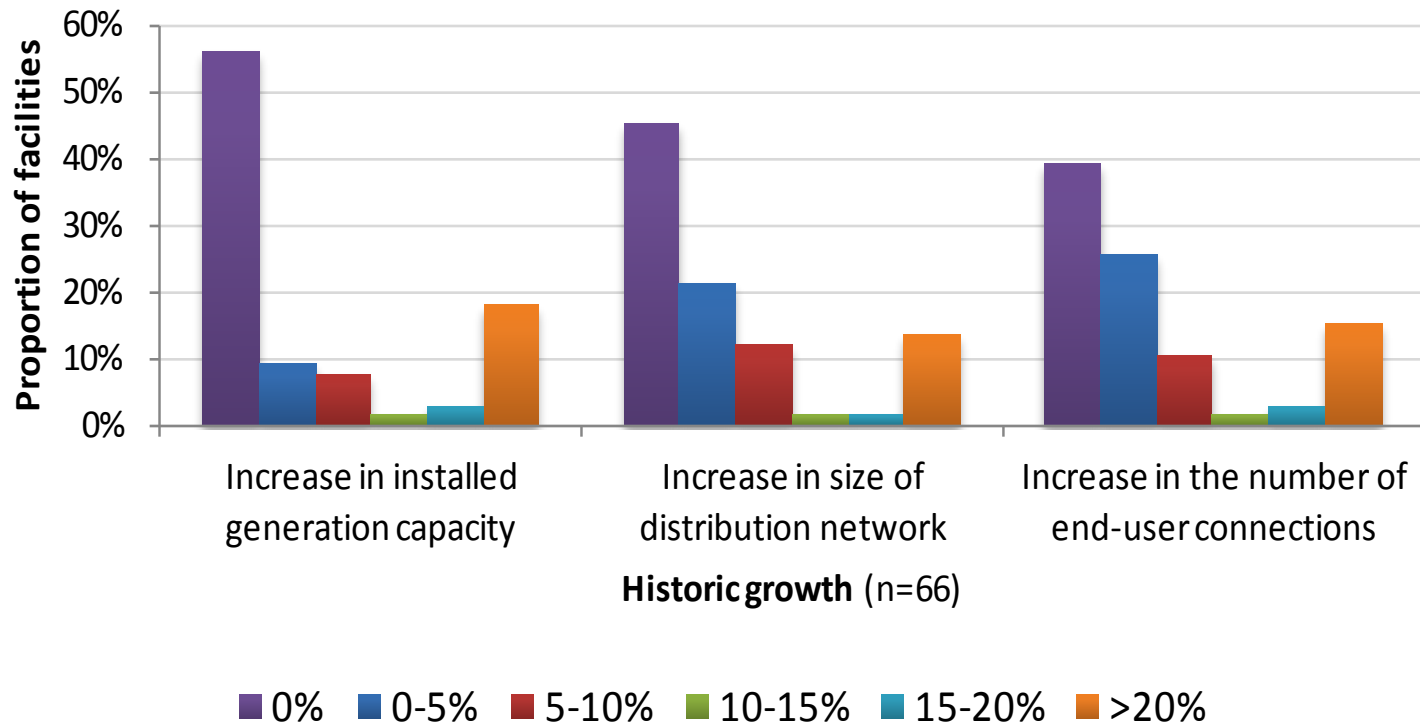
System owner	Number of facilities	Share
Institutionally owned, either by academia, healthcare, or other institutional body	21	31%
Municipal government	13	19%
Private corporation	13	19%
Crown corporation	5	7%
Federal government	7	10%
Cooperative ownership	1	1%
First Nations government	4	6%
Provincial government	1	1%
Public corporation owned, where shares can be sold on stock exchanges	2	3%
Total	67	100%





Growth

Historic growth, last 5 years



Historic growth (n=66)

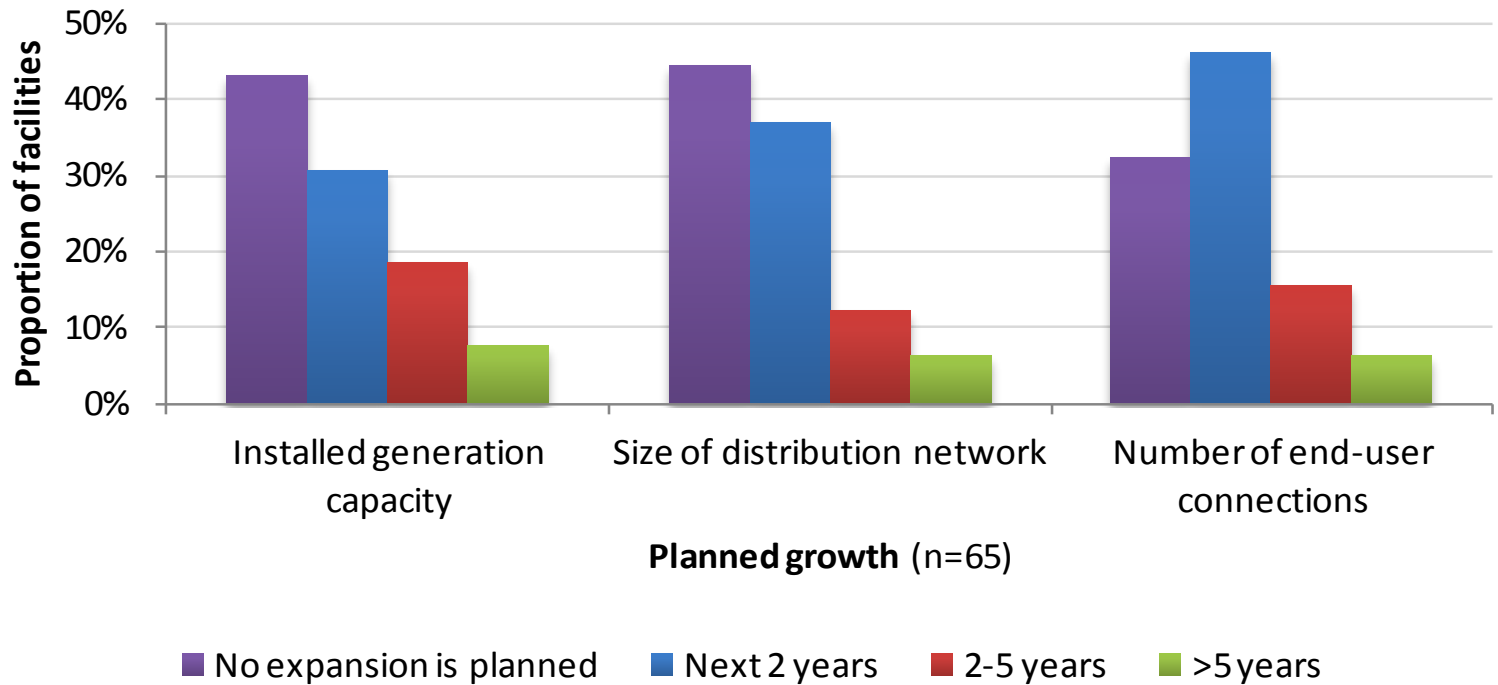
■ 0% ■ 0-5% ■ 5-10% ■ 10-15% ■ 15-20% ■ >20%





Growth

Planned Growth





Next Steps

CIEEDAC generates an **Annual Report** on the data. The report contains some analysis and reveals data shortfalls. In order to advance DE deployment we are seeking to gather data to better address:

- Investment opportunities and benefits for the private sector
- Community benefits and employment
- Energy savings associated with DE compared to the alternative heating / cooling supply
- Associated GHG reductions in a “climate” sensitive world
- Energy use and capacity utilization





Thank you!

CIEEDAC wishes to thank:

Natural Resources Canada, CanmetENERGY for
consistent support and annual funding.

All DE respondents to CIEEDAC's survey.

The Annual Report is available at:

www2.cieedac.sfu.ca/media/publications/District_Energy_Inventory_Report_Final_2015.pdf

The Data are available at:

www.cieedac.sfu.ca/DB_DEnew/

