



NATURAL RESOURCES CANADA - INVENTIVE BY NATURE

District Energy in Canada

Ken Church

Natural Resources Canada

CanmetENERGY

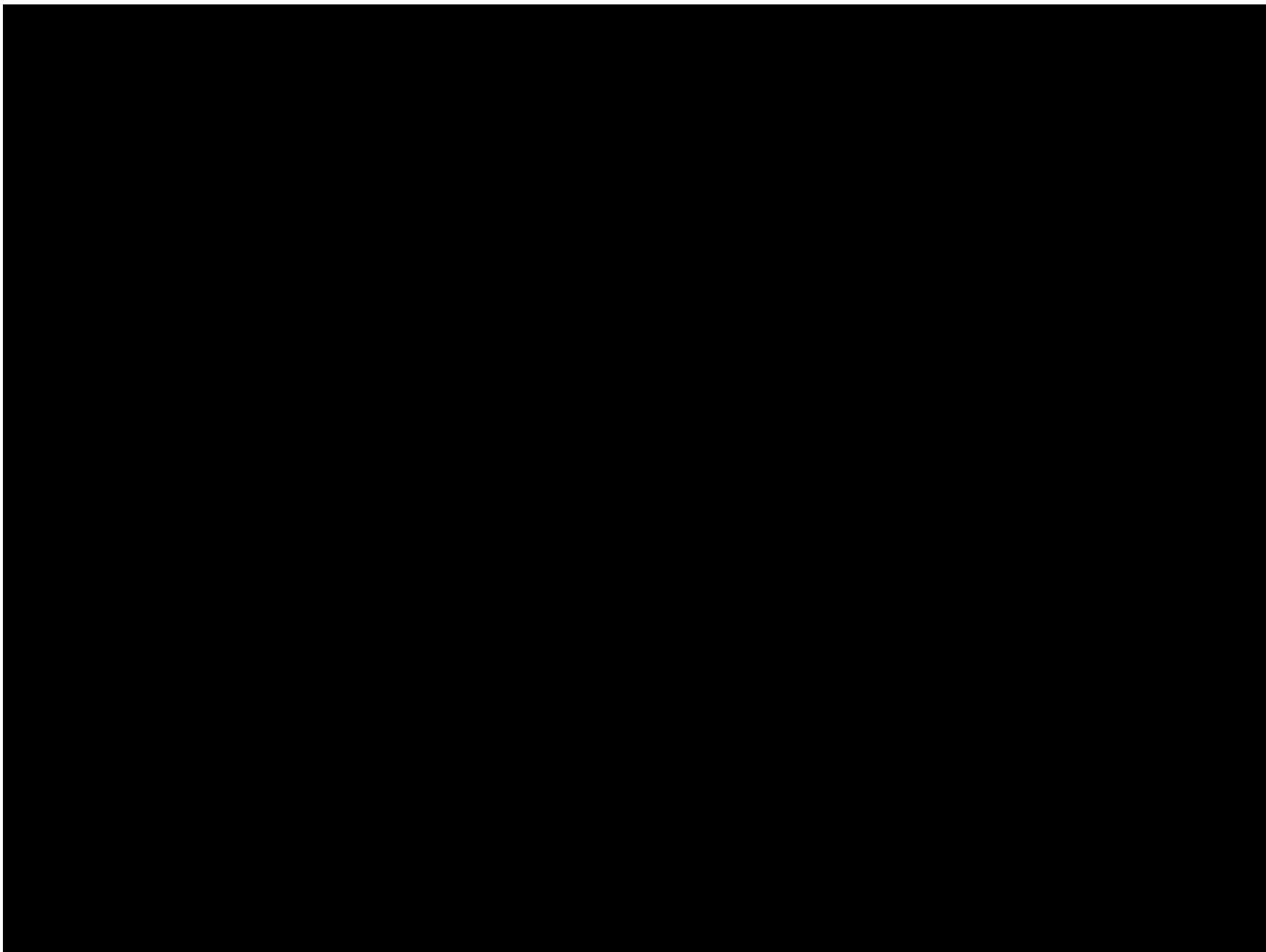
Leadership in ecoInnovation



Natural Resources
Canada

Ressources naturelles
Canada

Canada



What is District Energy?

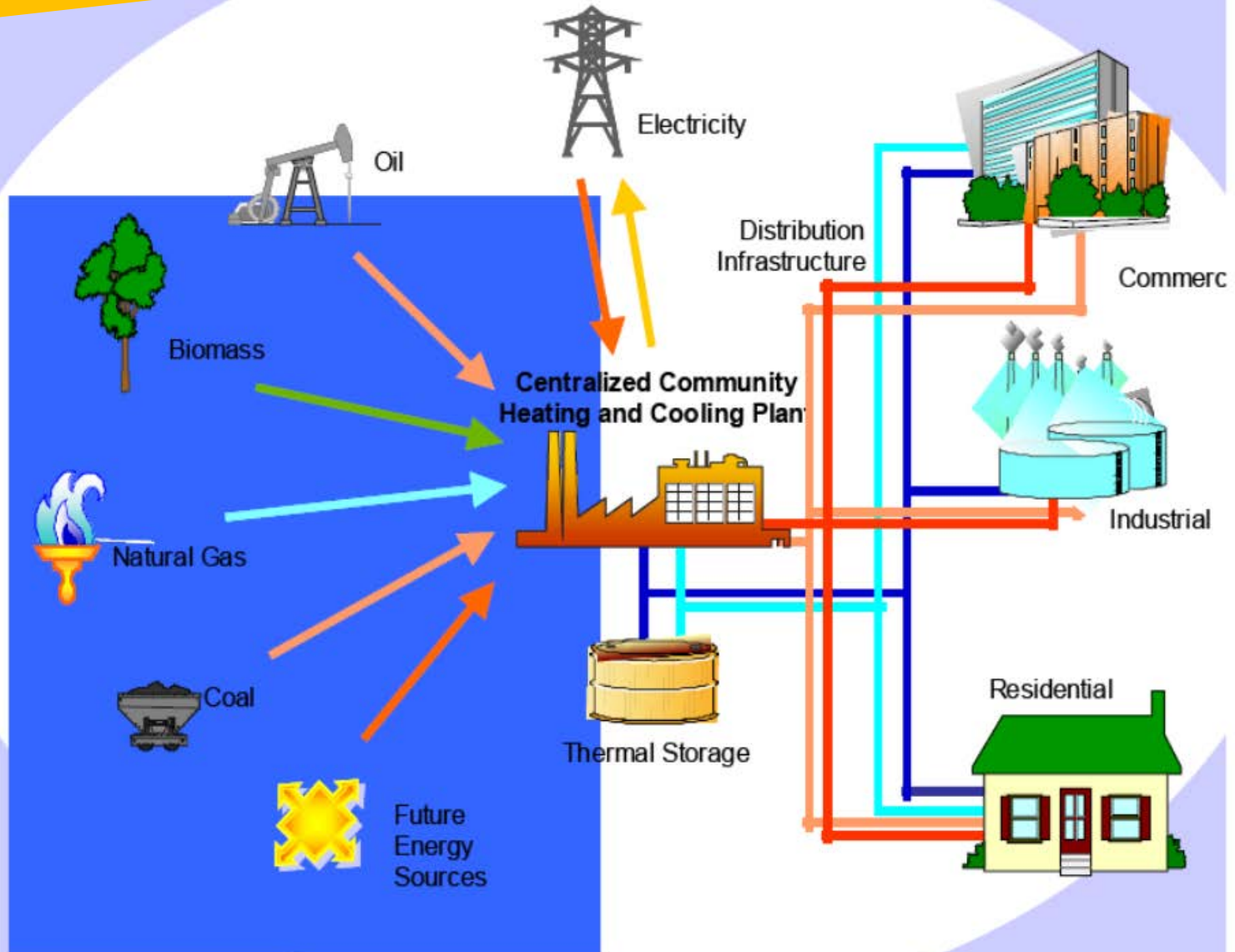
Energy Consumption
How has it evolved?

How does it impact City Hall?

Real Life Issues – Burlington

Urban Form
What can we expect now - Lifestyle
and in the future?

What is District Energy?



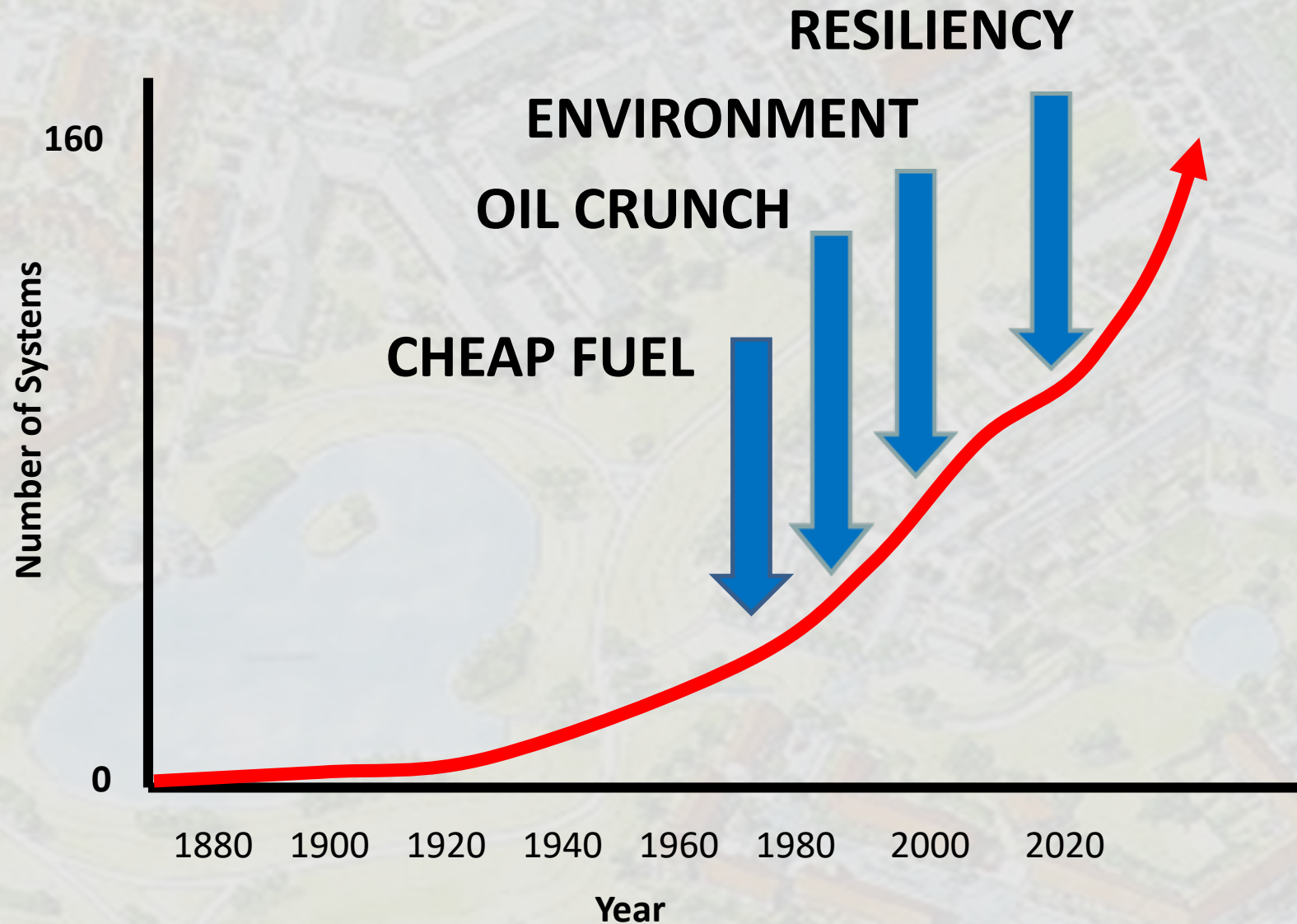
FROM PRODUCER TO CONSUMER



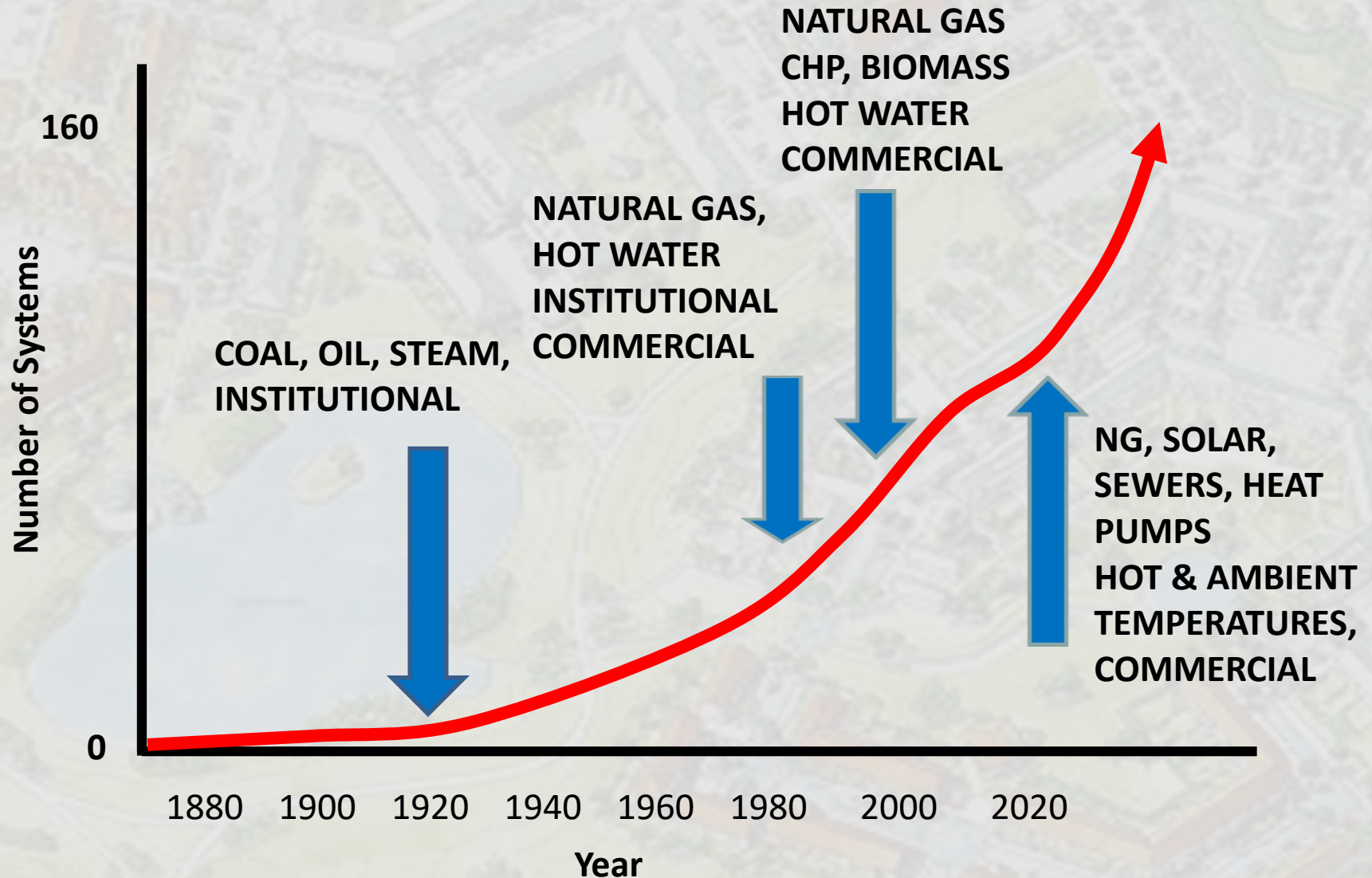
What does it cover?

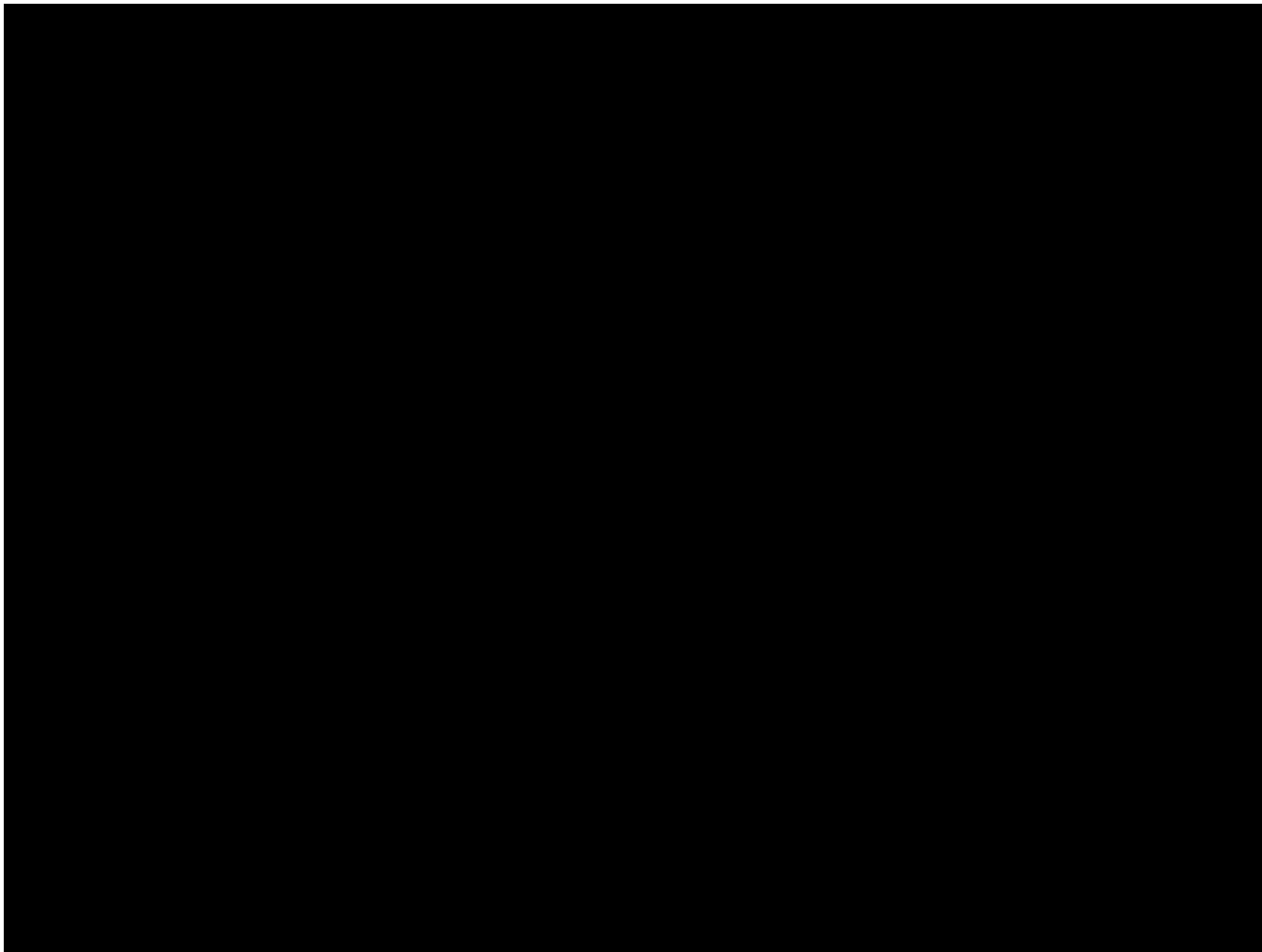


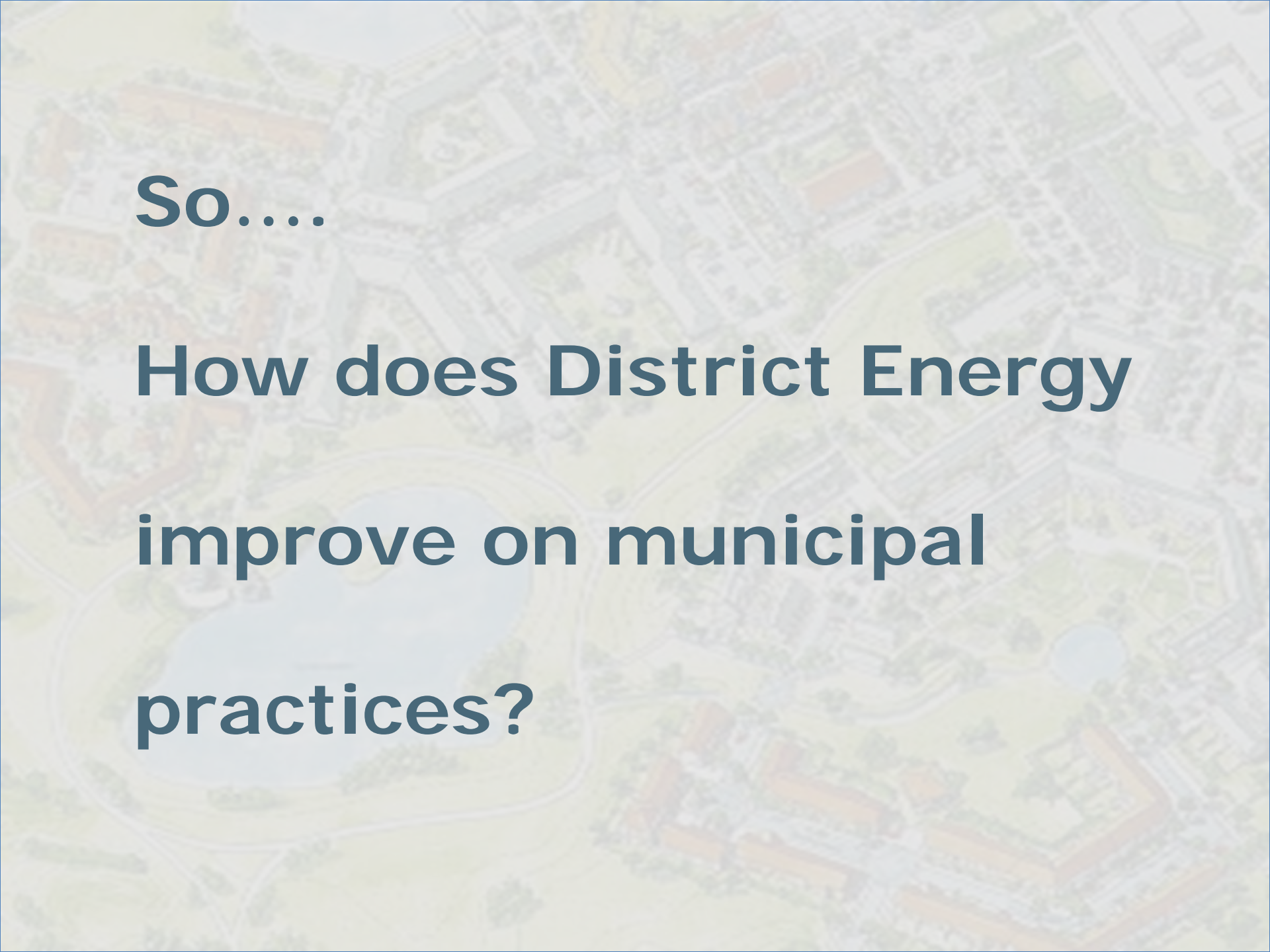
The evolution in DE



The evolution in fuels





The background of the slide is a faded, light-colored aerial photograph of a city. It shows a dense grid of streets, buildings, and green spaces. A prominent feature is a large, irregularly shaped body of water or park area in the lower-left quadrant, surrounded by a circular path or road. The overall tone is muted and serves as a subtle backdrop for the text.

So....

**How does District Energy
improve on municipal
practices?**

Today

- **Provincial Utilities** - supply side planning & infrastructure
- **Municipalities** - Municipal operations & energy efficiency
- **Local Utilities** - Distribution systems & Billing
- And.....
- **Regional** energy planning - limited in scope

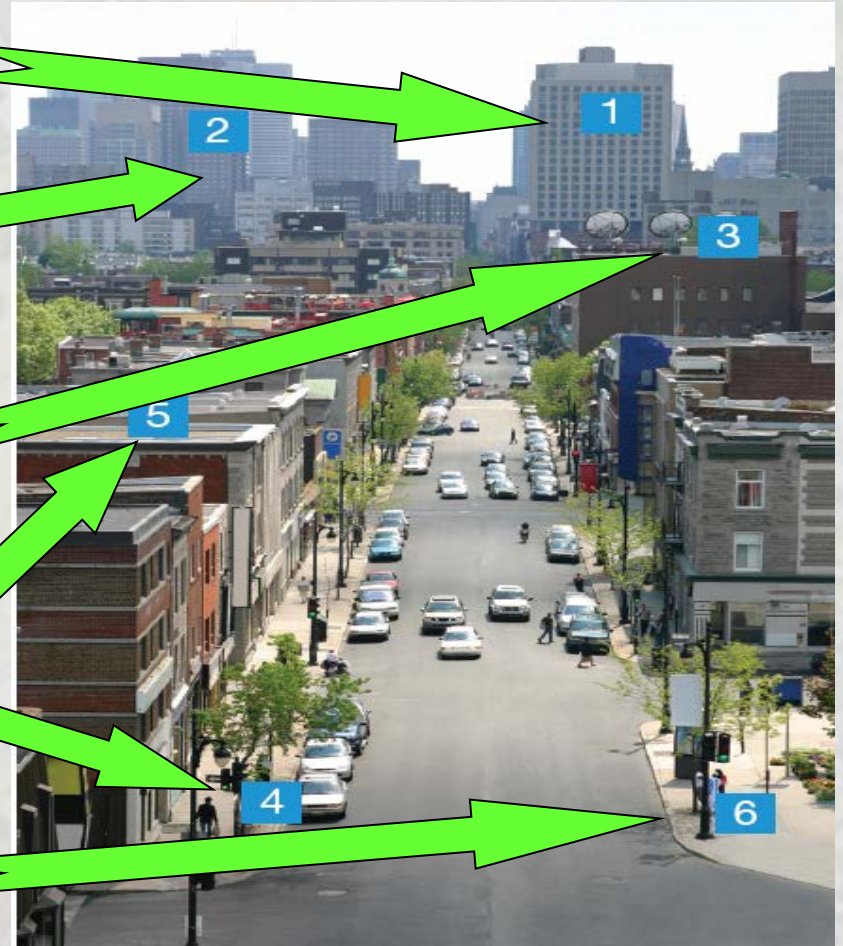
Tomorrow?

Regional / City Energy Planning that enables:

- **Management** of energy supply costs – directly and indirectly.
- **Reduction in** energy demand and consequently the need for infrastructure
- **Economic advantages** through the linkage between energy demand and urban form.
- **Application** of the long term community energy plan.

DE is a part of that integrated plan

- 1 Improved Efficiency
- 2 Right energy - Right job.
- 3 Managed heat demand
- 4 Reduced waste
- 5 Renewable resources
- 6 Use grids strategically



Where does it fit within City Hall?



Key Challenges for City Hall?

- **Infrastructure / asset management**
 - **Minimisation of cost, Reliability & Accessibility**
- **Resiliency – shock-proofing**
 - **Flexibility in design yet Environmentally benign**
- **Economic development**
 - **New jobs & Societal benefits (revenue?)**

Shared Goals – DE & Urban Planning

Infrastructure / asset management



Integrates thermal and electrical needs

Reduces waste

Reduces generation capacity through thermal storage

High system availability (99.998%)

Integrated into emergency plans

Shared Goals – DE & Urban Planning

Resiliency – Shock Proofing



Close to load

Integrates with mixed use & high density

Fuel and Technology flexibility

Local fuels / energy sources

Isolable from existing grid

Shared Goals – DE & Urban Planning

Economic Development



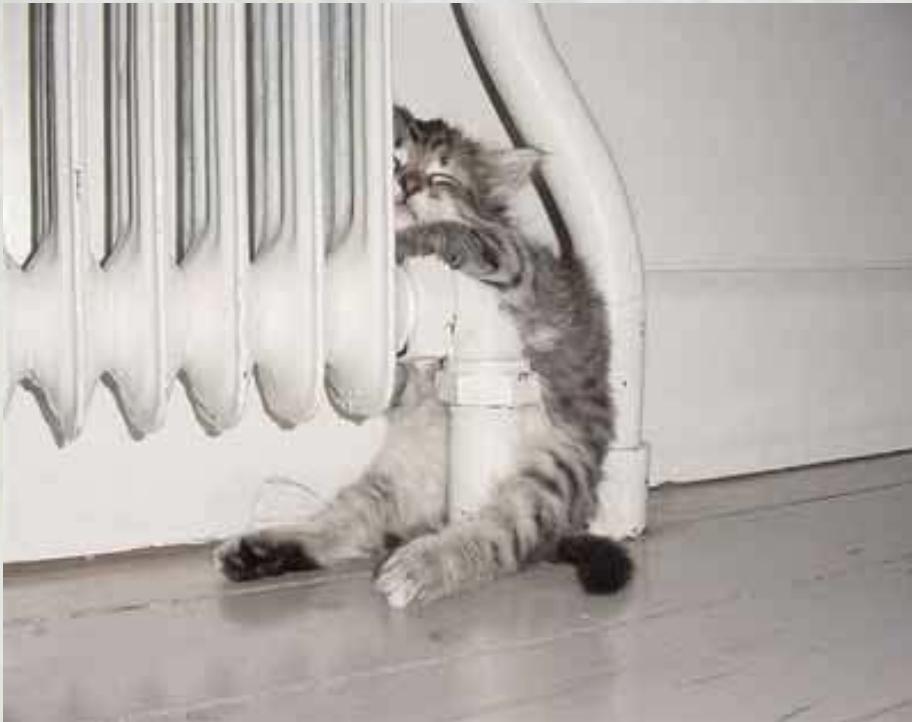
Recovers its premium in 25 years

Up to 50% increase in employment over BAU

Stable pricing for local industry

Shared Goals – DE & Urban Planning

Community Acceptance



Locally owned and operated

Community scale construction

Integrated within existing buildings

Educational component

Stable pricing

Integral part of Community Energy Plan

Burlington – Real life Application

Lynn Robichaud
Senior Sustainability Coordinator



The background is a faded aerial photograph of a suburban area. It shows a large, irregularly shaped lake in the lower-left quadrant, surrounded by green grass and some trees. To the right of the lake, there are several large, multi-story buildings, possibly apartment complexes or schools, with reddish-brown roofs. The rest of the image is filled with a dense network of streets, smaller houses, and patches of greenery.

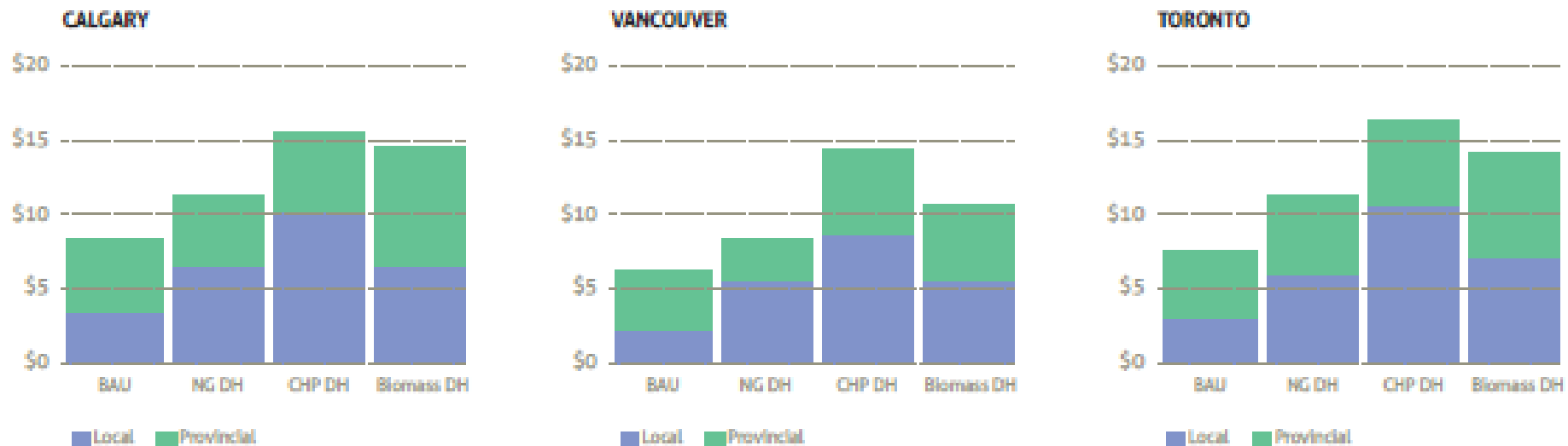
Getting past the CFO

What is driving District Energy?

- **ECONOMICS – GDP?**
- **ECONOMICS – JOBS?**
- **LEGISLATION?**

Economics – What's in it for me?

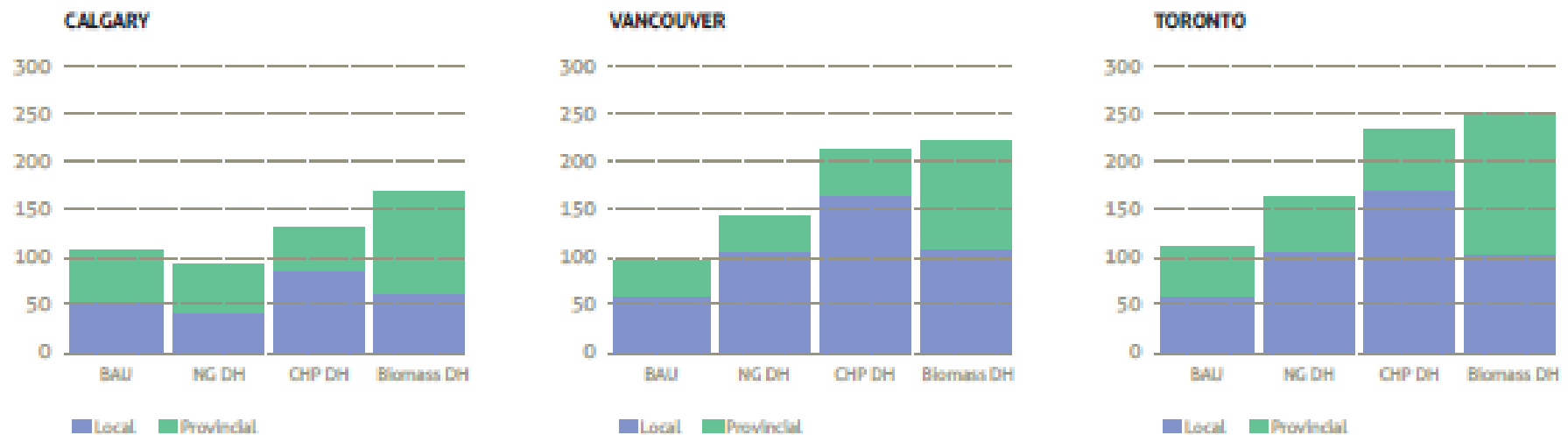
Figure 1. Net present value of GDP increase, 2014-2039 (CAN\$ millions).



Source: DEEM analysis, Natural Resources Canada.

Economics – What's in it for me?

Figure 2. Employment potential by technology choice, 2014-2039 (person years).



Source: DEEM analysis, Natural Resources Canada.

An aerial photograph of a suburban neighborhood with houses, streets, and a large pond in the lower-left quadrant. The image is faded and serves as a background for the text.

So.....

Who else has District Energy?



Natural Resources
Canada

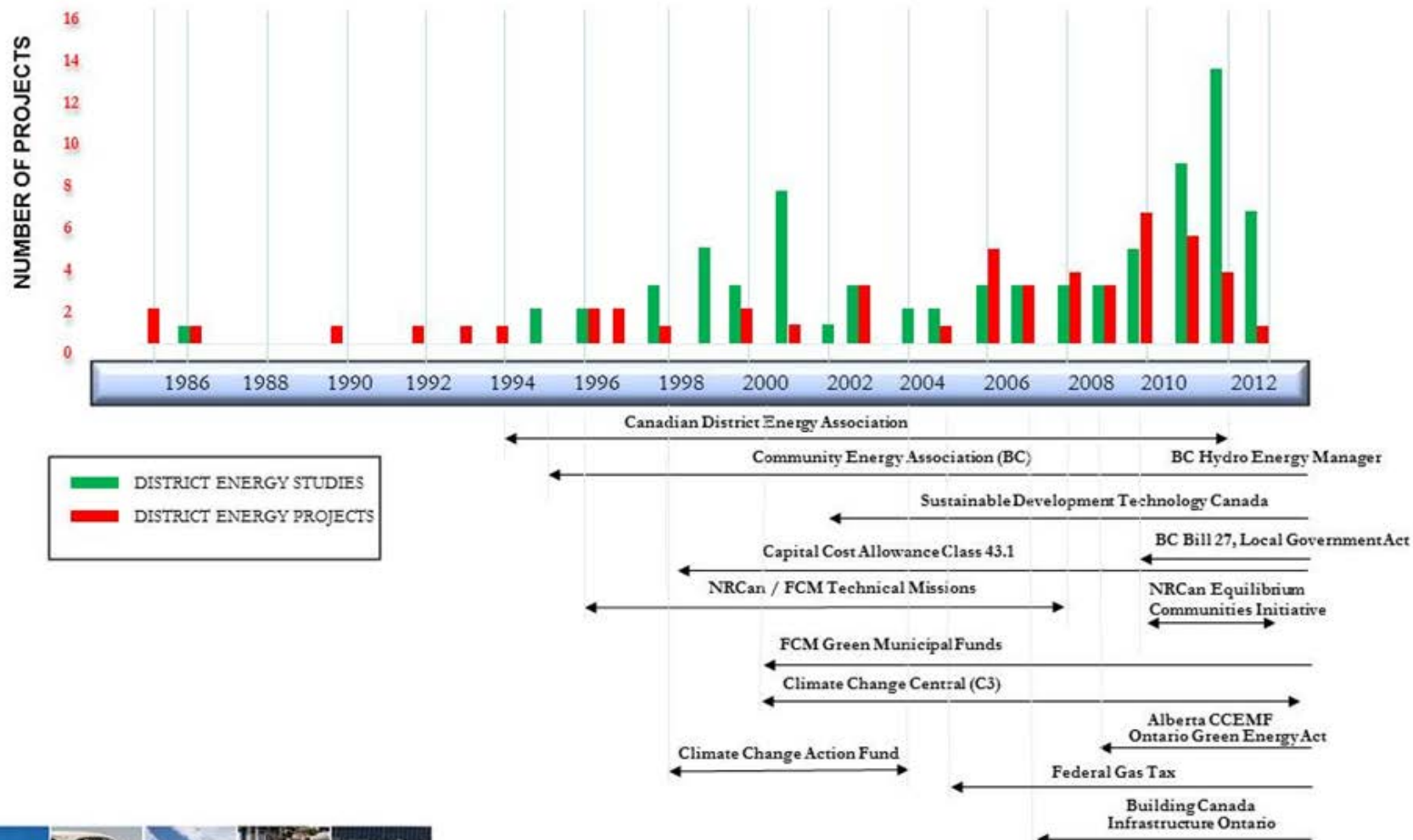
Ressources naturelles
Canada

CanmetENERGY

Leadership in ecoInnovation



DISTRICT ENERGY IMPACT STUDIES AND IMPLEMENTATION



Canada

Who has District Energy?



Who else?



MARKHAM ON

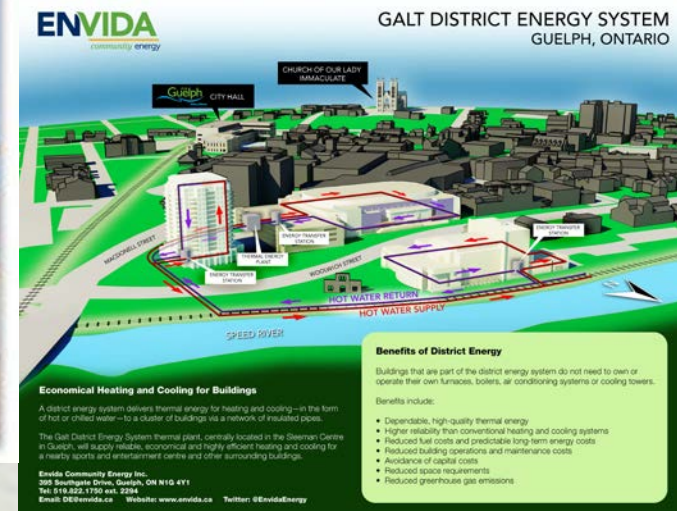


CORNWALL ON



WINDSOR ON

GUELPH ON



ENVIDA
community energy

**GALT DISTRICT ENERGY SYSTEM
GUELPH, ONTARIO**

Economical Heating and Cooling for Buildings

A district energy system delivers thermal energy for heating and cooling—in the form of hot or chilled water—to a cluster of buildings via a network of insulated pipes.

The Galt District Energy System thermal plant, centrally located in the Stearns Centre in Guelph, will supply reliable, economical and highly efficient heating and cooling for a nearby sports and entertainment centre and other surrounding buildings.

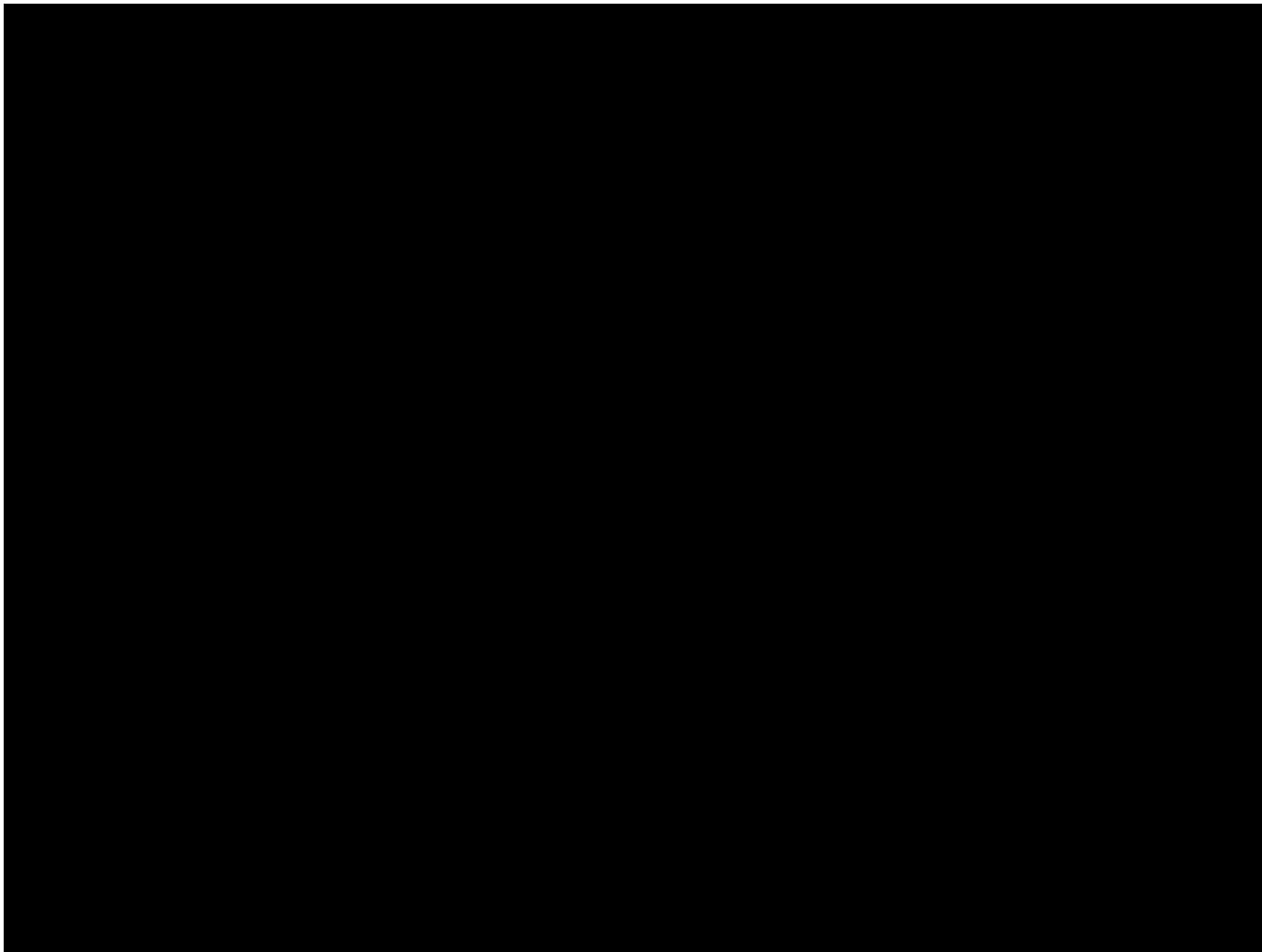
Envida Community Energy Inc.
395 Southgate Drive, Guelph, ON N1G 4Y1
Tel: 519.822.1750 ext. 2254
Email: DE@envida.ca Website: www.envida.ca Twitter: @envidade

Benefits of District Energy

Buildings that are part of the district energy system do not need to own or operate their own furnaces, boilers, air conditioning systems or cooling towers.

Benefits include:

- Dependable, high-quality thermal energy
- Higher reliability than conventional heating and cooling systems
- Reduced fuel costs and predictable long-term energy costs
- Reduced building operations and maintenance costs
- Avoidance of capital costs
- Reduced space requirements
- Reduced greenhouse gas emissions



To Conclude...

DISTRICT ENERGY IS:

- **REAL & GROWING**
- **INTEGRAL PART OF THE MOVE TOWARDS A LOW CARBON ECONOMY**
- **A VERY SOLID ECONOMIC LEVER FOR THE COMMUNITY**

Thank you.

**Ken Church
Natural Resources Canada
Ken.church@Canada.ca
(613) 947 8952**

**Lynn Robichaud
City of Burlington
Lynn.robichaud@Burlington.ca
(905) 335-7600 x7931.**