



**VERESEN**

**London District Energy**

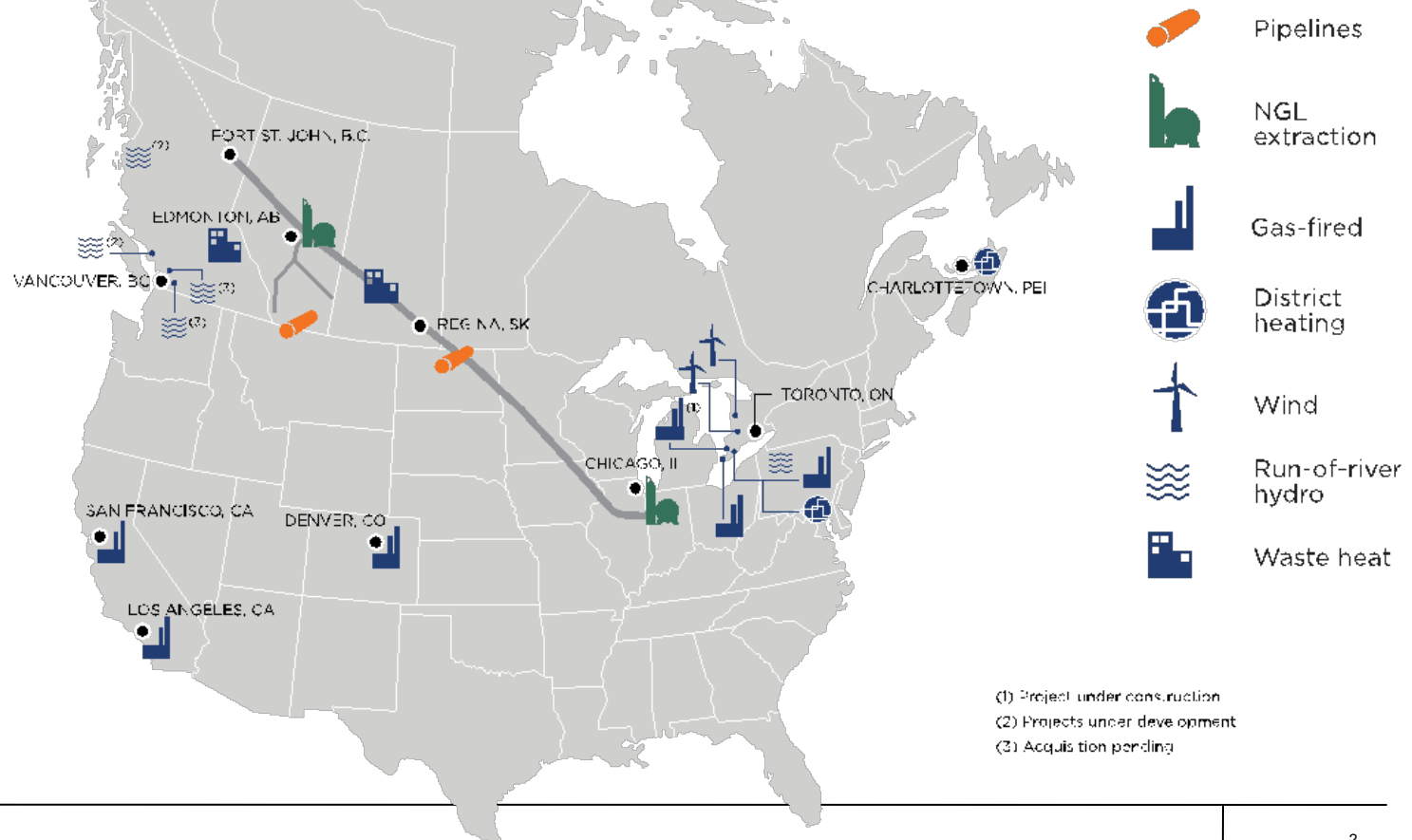
**IAGT Conference**

OCTOBER 2012

# Veresen – North America Wide

## 3 Key Businesses

- Natural Gas Pipelines
- Midstream / NGL's
- Power Generation



# Veresen – Key focus on Ontario

## Ontario at a glance

- London District Energy (18 MW)
- East Windsor Cogeneration Centre (84 MW)
- York Energy Centre (400 MW)
- Grand Valley Wind Project (20 + 40 MW)
- St Columban wind (33 MW)



# District Energy In London

## ■ Quick History

- 100+ yr old heating service (1880)
- Serves ~15% of London's downtown needs
- Added cooling (CW) in 1995
- 13 km of pipe distribution
- Serves over 60 municipal, public, and private customers;

City Hall

Convention Centre

Free Press

City Centre

CitiPlaza

St Joseph's Hospital

John Labatt Centre

Grand Theatre

JA Taylor

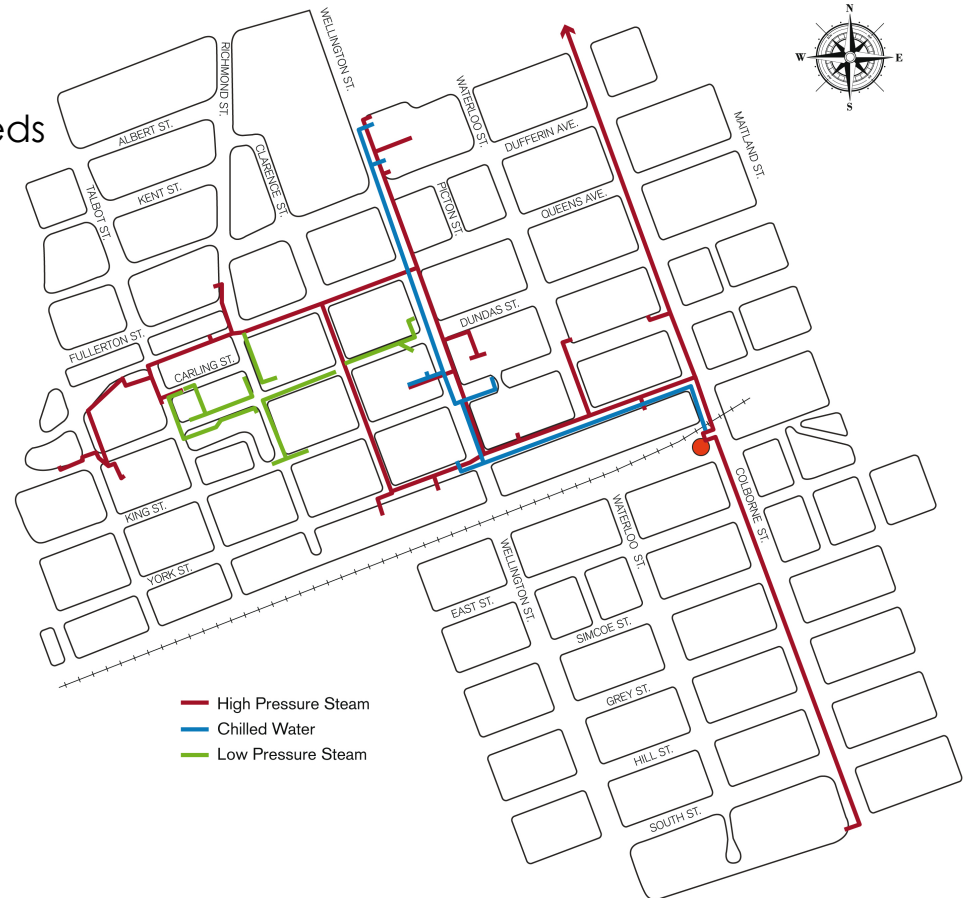
Hilton

Centennial Hall

Central Library

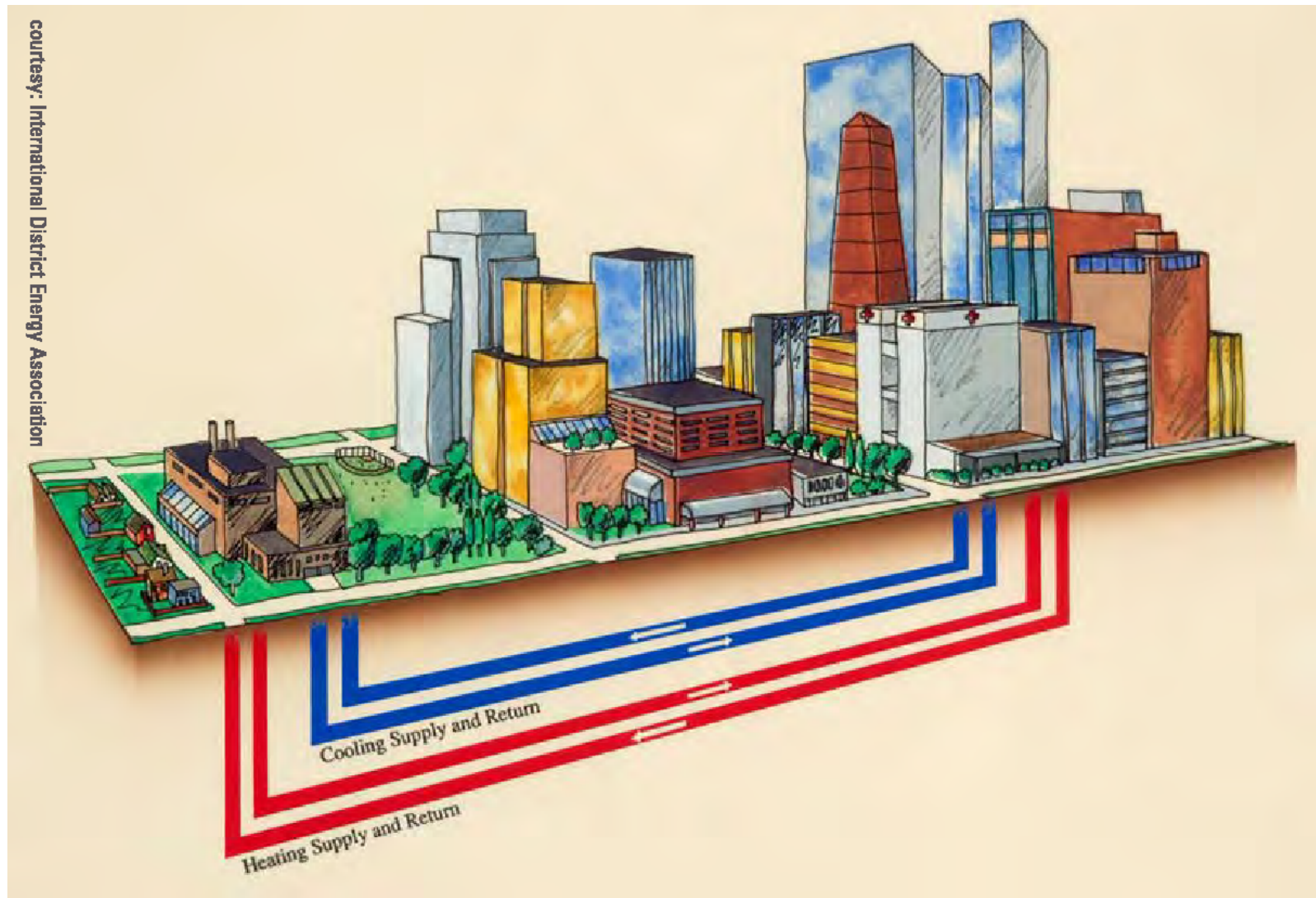
Market Tower

RBC Building





# District Energy at a Glance.

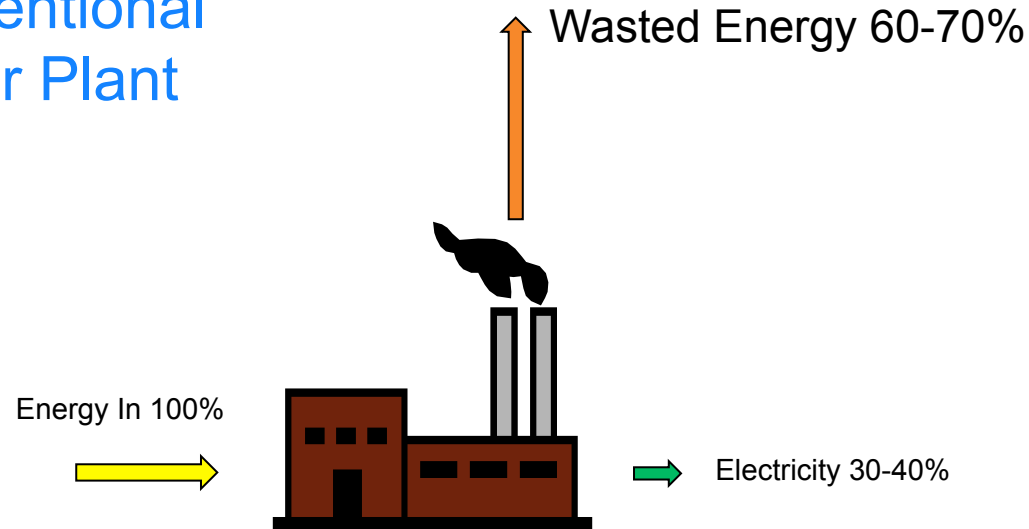


# Where is District Energy Happening?

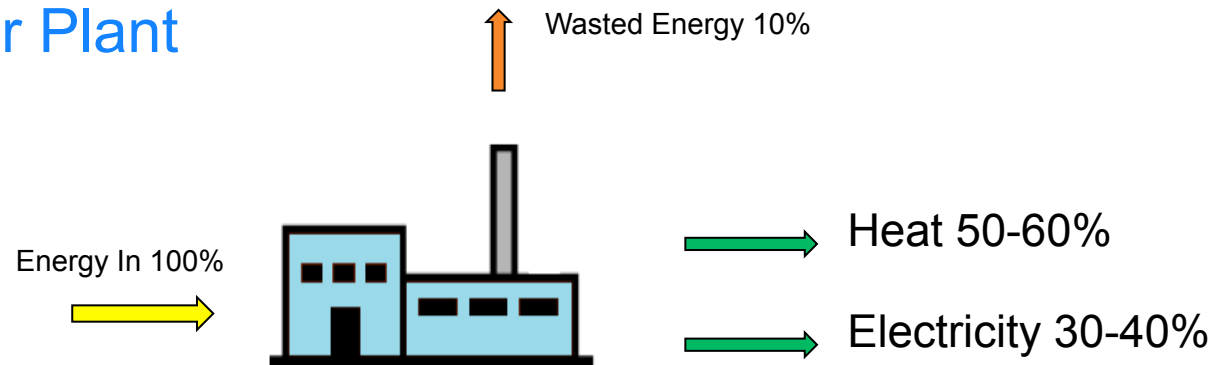
- **Ontario**
  - Toronto, Ottawa, Markham, Hamilton, Guelph, Oakville, Sudbury, London, Oshawa, Windsor, Cornwall, Kingston, East Gwillimbury.
- **Canada:**
  - Charlottetown, Halifax, St. Johns, Calgary, Montreal, Grand Prairie, Strathcona County, Fort McPherson, Arviat, Rankin Inlet.
- **Other:**
  - University campuses, hospitals, etc.
- **HOWEVER: Only 2- 3% of Canadian building stock connected to district heating or cooling systems**

# What is Cogeneration?

## Conventional Power Plant



## Cogeneration Power Plant



# London Cogen I

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**Project Summary** 18 MW natural gas-fired Cogeneration System.  
Began commercial operation in 2008.

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**Electricity** 18.3 MW Nameplate Capacity  
  
Provides 32% of downtown London's electricity demand.  
  
Electricity for 15,000+ homes.

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**Thermal Energy** 52 MW or 260,000 lb/hr thermal capacity.  
  
"Waste-heat" used to create Steam & Chilled Water for 15% of downtown building loads.

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# London Cogen I – Dispatch Model

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<b>OPA Combined</b>	Self dispatches based on market conditions & heat rate.
<b>Heat and Power</b>	Cogen Heat rate changes with steam load.
<b>(CHP) I</b>	Capacity payment, deemed revenue.

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<b>Grid Connection</b>	Tied Directly to London Hydro Distribution System
	Turbine Generates at 13.8kV
	Tied to HONI Talbot Transformer Station at 27.6kV
	Provides voltage support to London Hydro Downton Grid.

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# London Cogen II

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## **Project Summary**

15 MW Cogeneration Turbine – Provides Steam for heating and imbedded electricity for Downtown London.

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## **CHPSOP?**

Successful through initial phases of application process.

Unknown future of program.

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## **Energy Security for London**

Opportunity to “Island” London's Core in blackout and emergency scenarios, providing emergency power to critical infrastructure during widespread blackout.

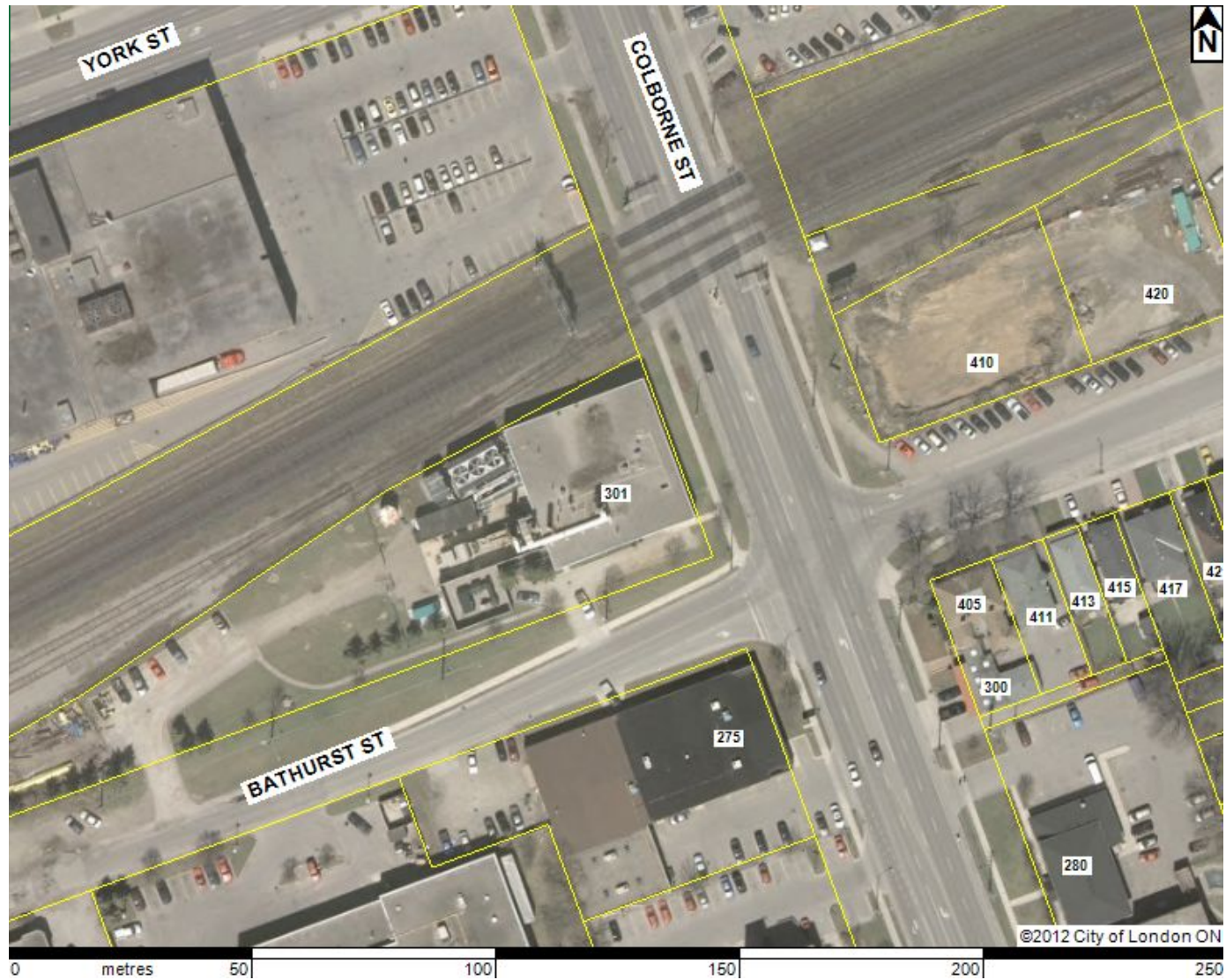
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## **City of London & London Hydro Partnership**

Working with municipality and London Hydro.

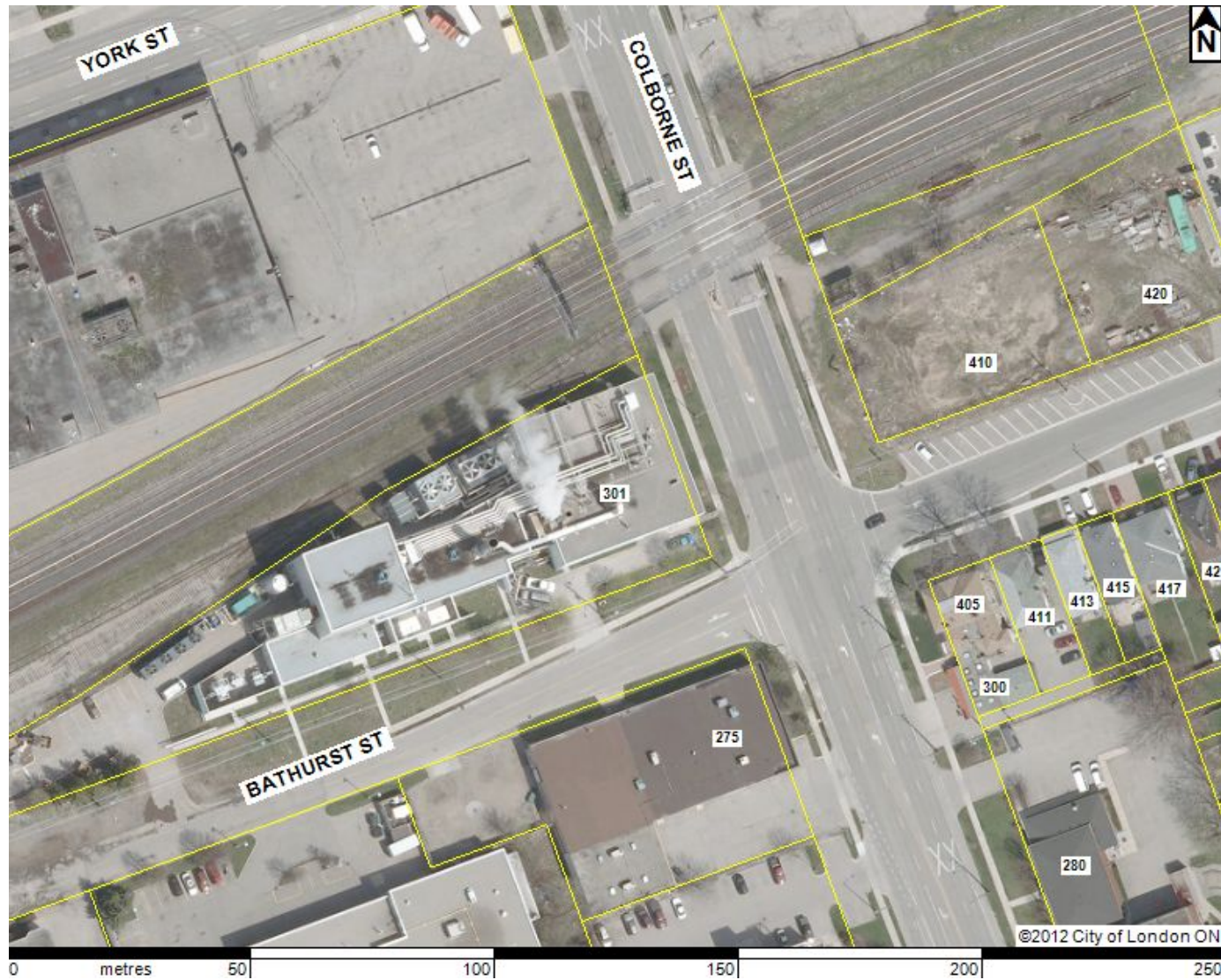
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# London District Energy - 2007



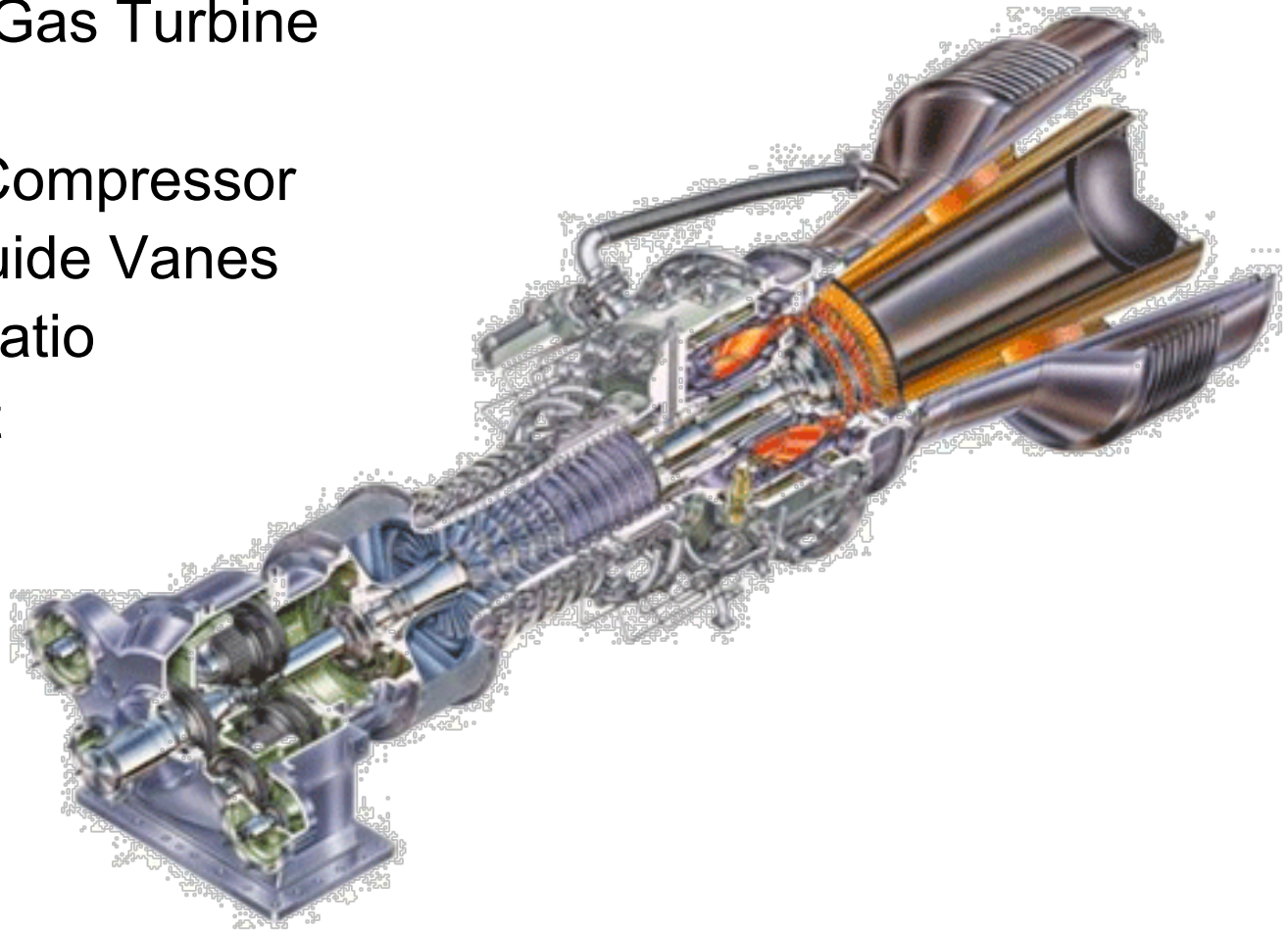


# London District Energy - 2011



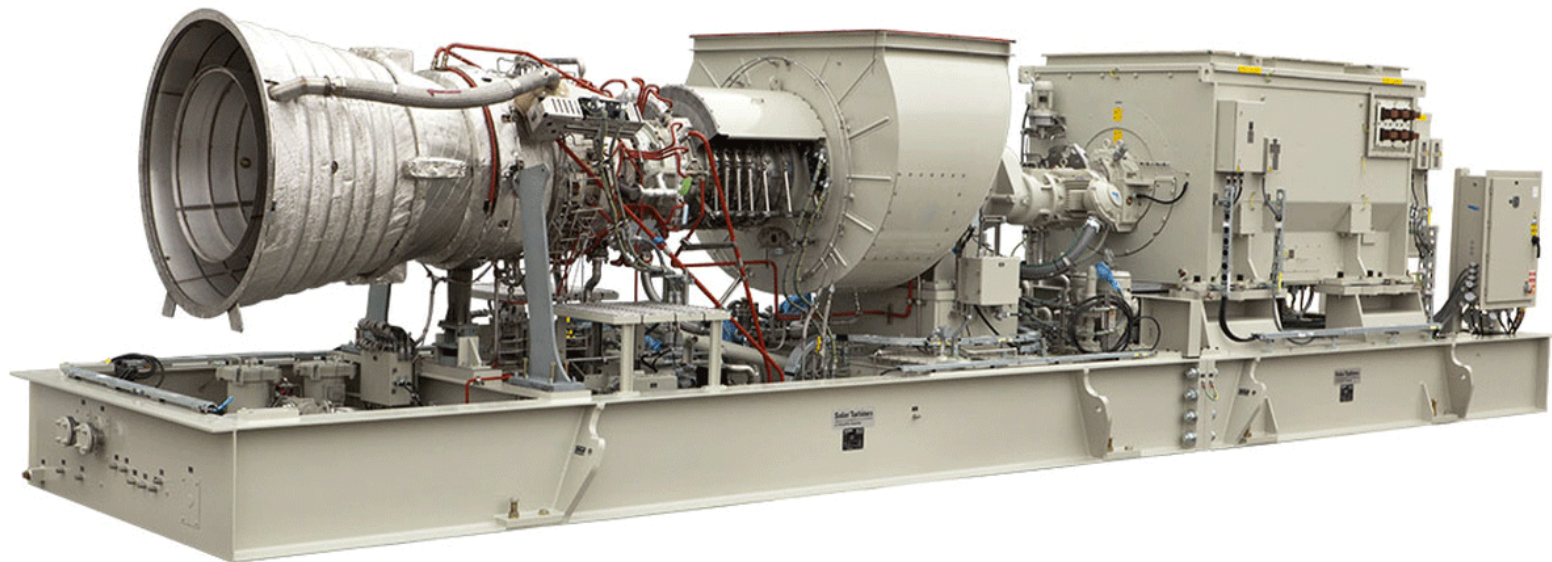
# LDE Plant Tour – Prime Mover

- Solar Titan 130 Gas Turbine
- Single-Shaft
- 14 Stage Axial Compressor
- Variable Inlet Guide Vanes
- 16:1 Pressure Ratio
- 15.3 MW Output





# LDE Plant Tour – Prime Mover





# LDE Plant Tour – Prime Mover

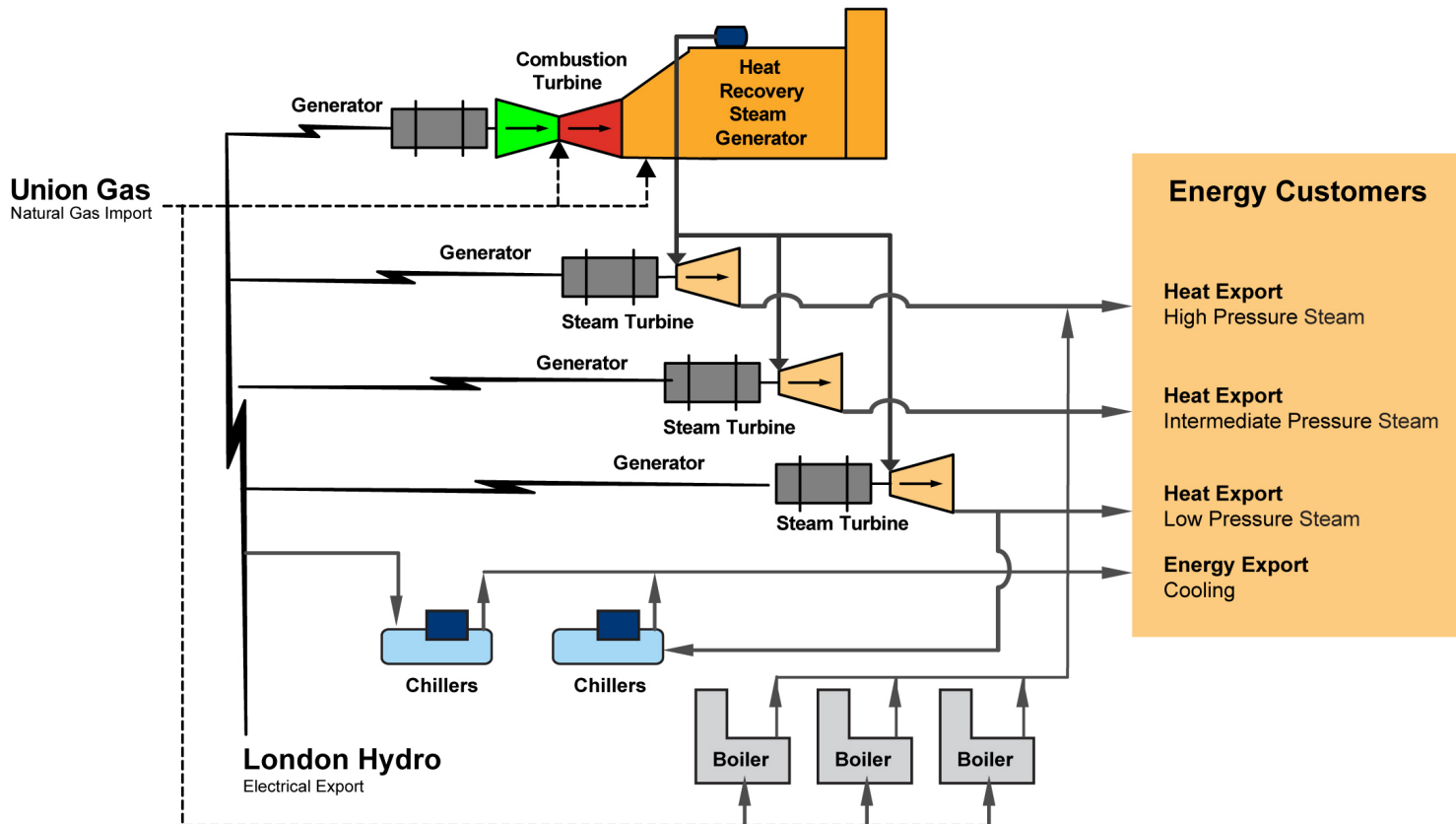




# LDE Plant Tour – Prime Mover



# LDE Plant Tour – Plant Process

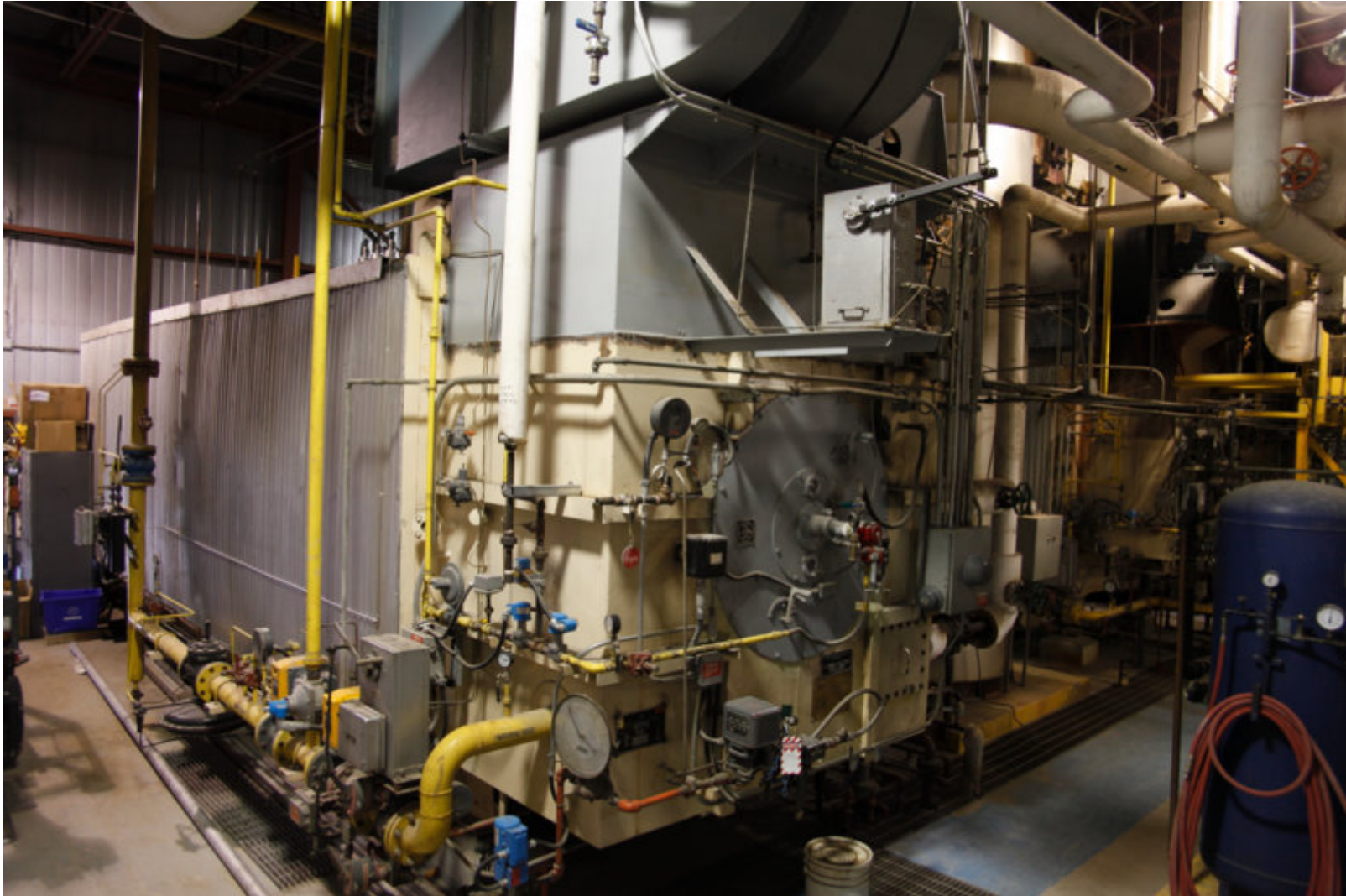




# LDE Plant Tour – Water Treatment

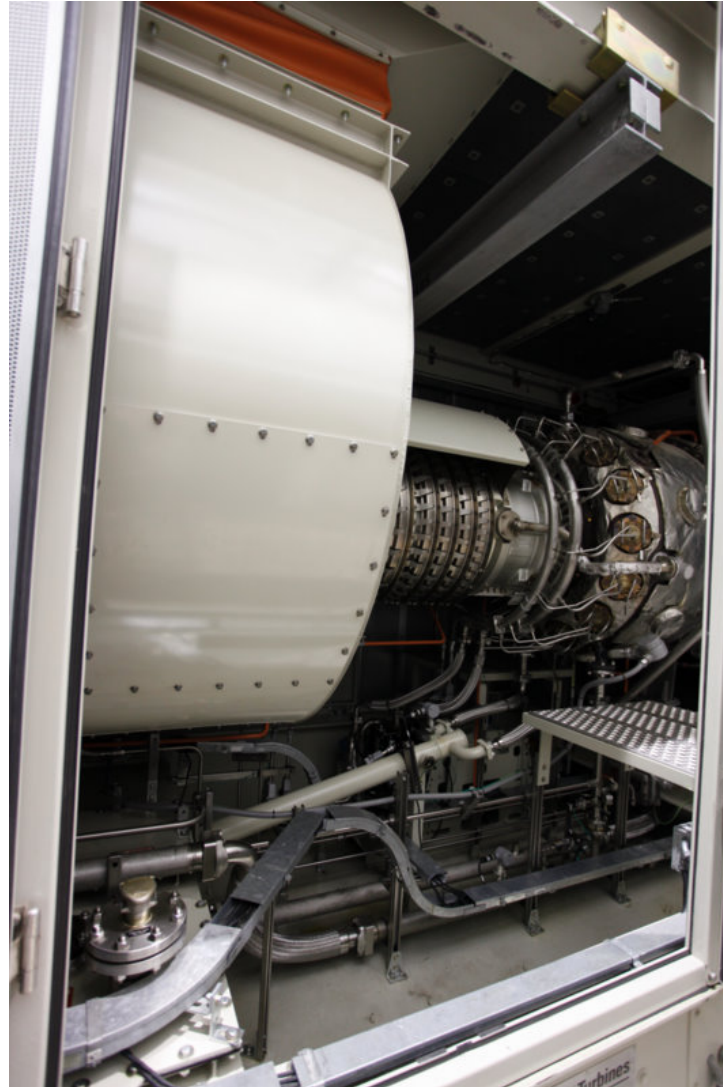


# LDE Plant Tour - Boilers





# LDE Plant Tour – Generating Turbine



# LDE Plant Tour – Steam Generating Turbines





# LDE Plant Tour – Duct Firing and HRSG



# LDE Plant Tour – Cooling Towers





# LDE Plant Tour – Absorption Chiller





# London District Energy

Thank you!

Questions?

