

A photograph of an industrial facility, likely a refinery or chemical plant, at night. The scene is illuminated by warm lights from the facility, contrasting with the dark blue twilight sky. In the foreground, a large white sign with the Energkem logo and name is visible. The background shows complex structures of pipes, towers, and scaffolding.

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**Energkem's cleantech infrastructure: creating quality jobs and reducing greenhouse gases**



Sustainable alternative to landfilling  
and incineration increases waste  
diversion





Biofuels from waste increase energy diversity and reduce GHG emissions

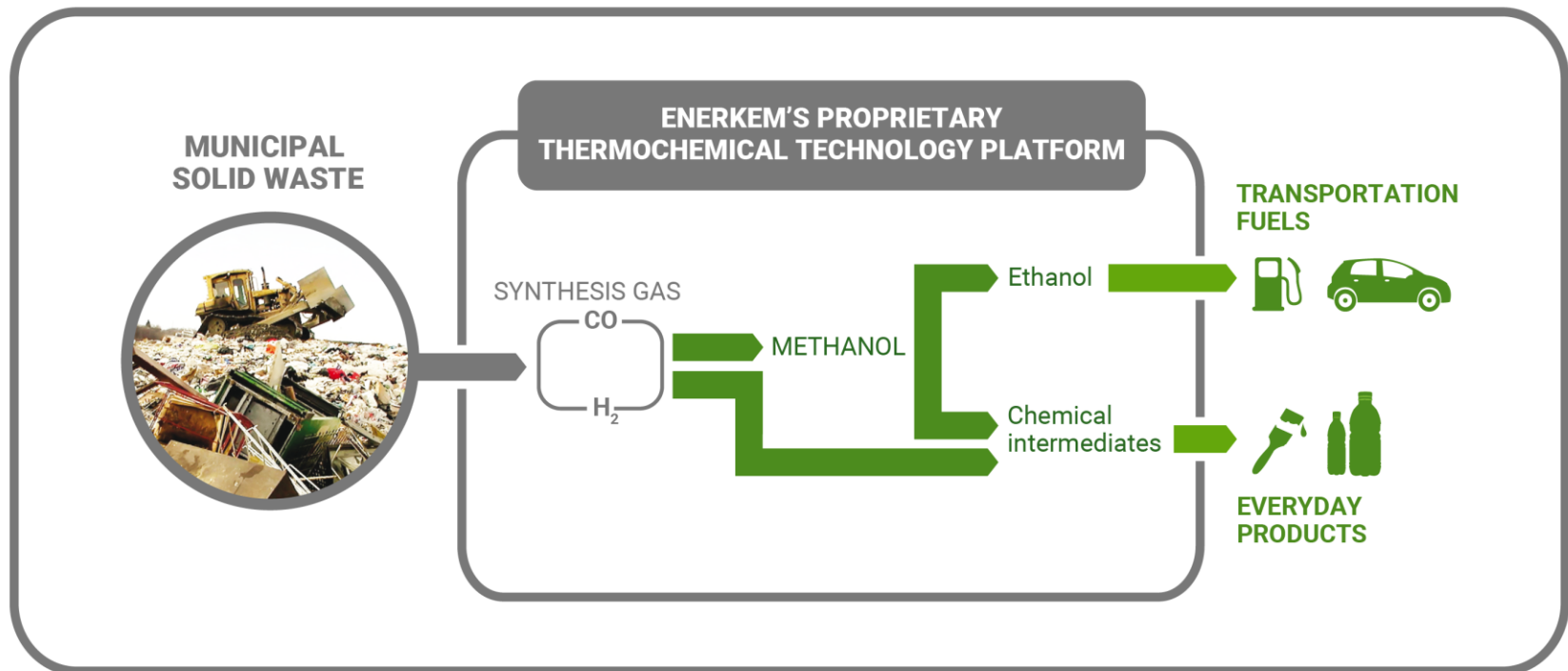


Renewable chemicals from waste  
help transition to a circular economy




# Enerkem's biorefinery process

Replacing the use of petroleum for transportation fuels and chemicals production







World's first commercial  
MSW-to-biofuels and  
chemicals facility

## ENERKEM ALBERTA BIOFUELS

|                   |                                                                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Capacity:</b>  | 42 million liters/year. Biomethanol production in 2016. Ethanol expansion in 2017.                                                               |
| <b>Feedstock:</b> | 25-yr agreement with City of Edmonton for 100,000 dry tons of posted-sorted residential waste per year – CAD\$50/MT tipping fee indexed annually |
| <b>Location:</b>  | Edmonton Waste Management Center in Edmonton, Alberta                                                                                            |
| <b>Products:</b>  | Alcohols : Biomethanol (IMPCA, ISCC); Ethanol (ASTM)                                                                                             |

# Methanol sale and delivery





# Key Success Factors

- Rigorous technology scale-up with continuous IP protection
- Strong partners and investors
- Sound business model with :
  - large and growing markets, use of sustainable and affordable feedstock, low cost approach
- Skilled and experienced team

SHERBROOKE  
LAB & PILOT



WESTBURY DEMO



EDMONTON – 1<sup>ST</sup> FULL SCALE FACILITY



COMMERCIAL SCALE-UP



VARENNES (QC) +  
INTERNATIONAL

**GREENFIELD**

**AkzoNobel**

**WM**  
WASTE MANAGEMENT

**上海城投**  
SHANGHAI CHENGTOU

Pre-commercial phase

Beginning commercial phase  
(modular manufacturing)

2000

2009

2015



**Building facilities through modular manufacturing accelerates international growth**





**Next Facility: VANERCO**

**First advanced biofuels facility in Canada to be co-located with a conventional biofuels production facility (GreenField)**





# Using waste for the production of greener chemicals

## Waste-to-Chemicals public-private partnership in Europe



# Benefits of Enerkem facilities

## ENERGY

- Reduction of use of gasoline and oxygenate (high-octane)
- Federal and provincial RFS with advanced biofuels
- Locally-produced low-carbon transportation solution

## ECONOMIC

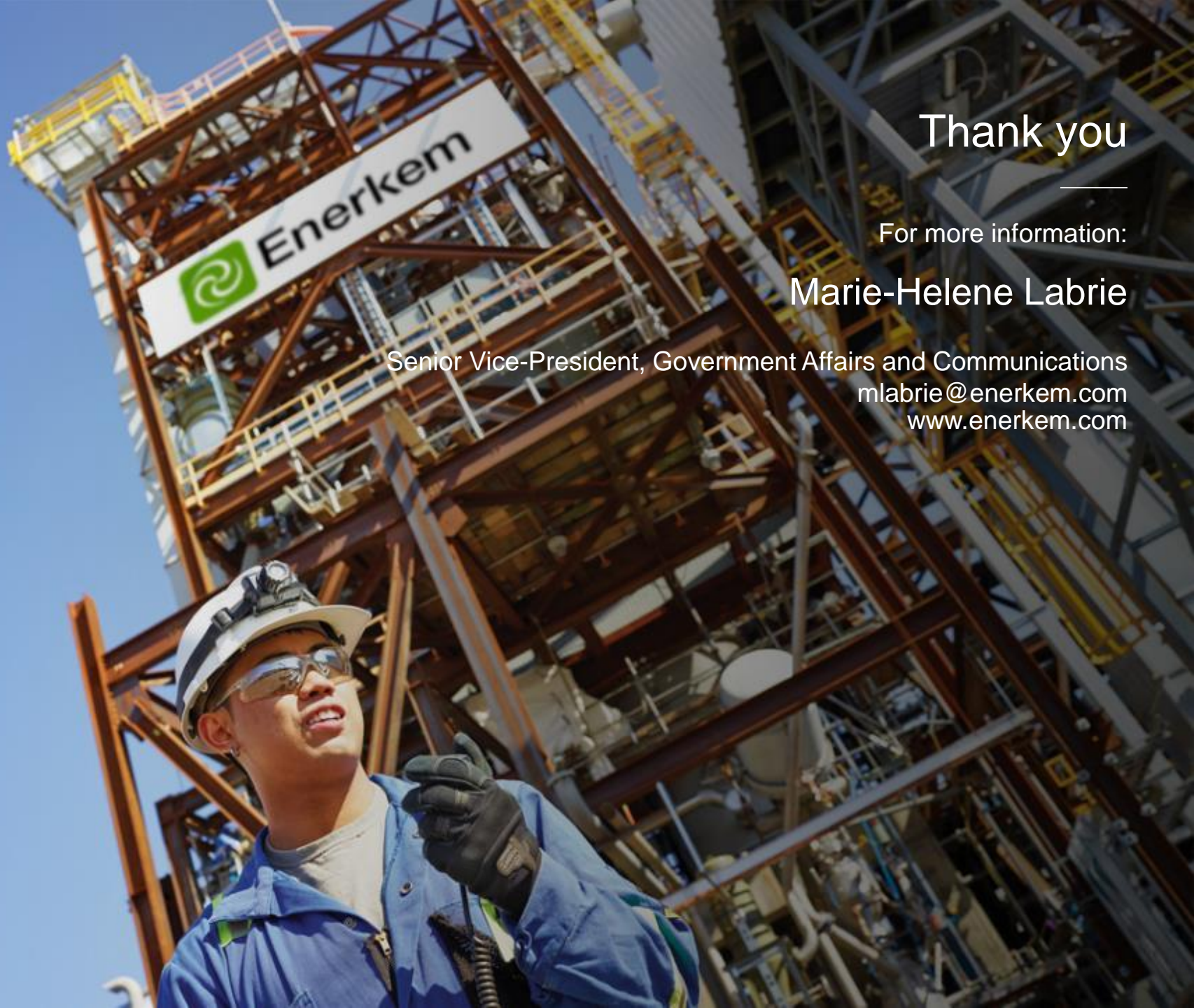
- Diversify and green economy
- Each plant\*:
  - Net annual economic impact of \$65 CAN million locally
  - High-quality jobs: 150 direct and indirect permanent jobs
- Manufacturing sector
- Cost-effective waste diversion solution for municipalities
- New export opportunities
- Positions Canada at the forefront of clean technology and advanced biofuels

## ENVIRONMENT

- Solves a waste problem and contributes to circular economy
- Methane avoidance from landfills / air pollution associated with incineration
- Reduction GHG emissions by >60% (ISCC-certified)
- Feedstock already collected and available in urban and rural areas

\* Based on an independent economic impact analysis for Edmonton plant conducted by Doyletech using their EconWin model





Thank you

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For more information:

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