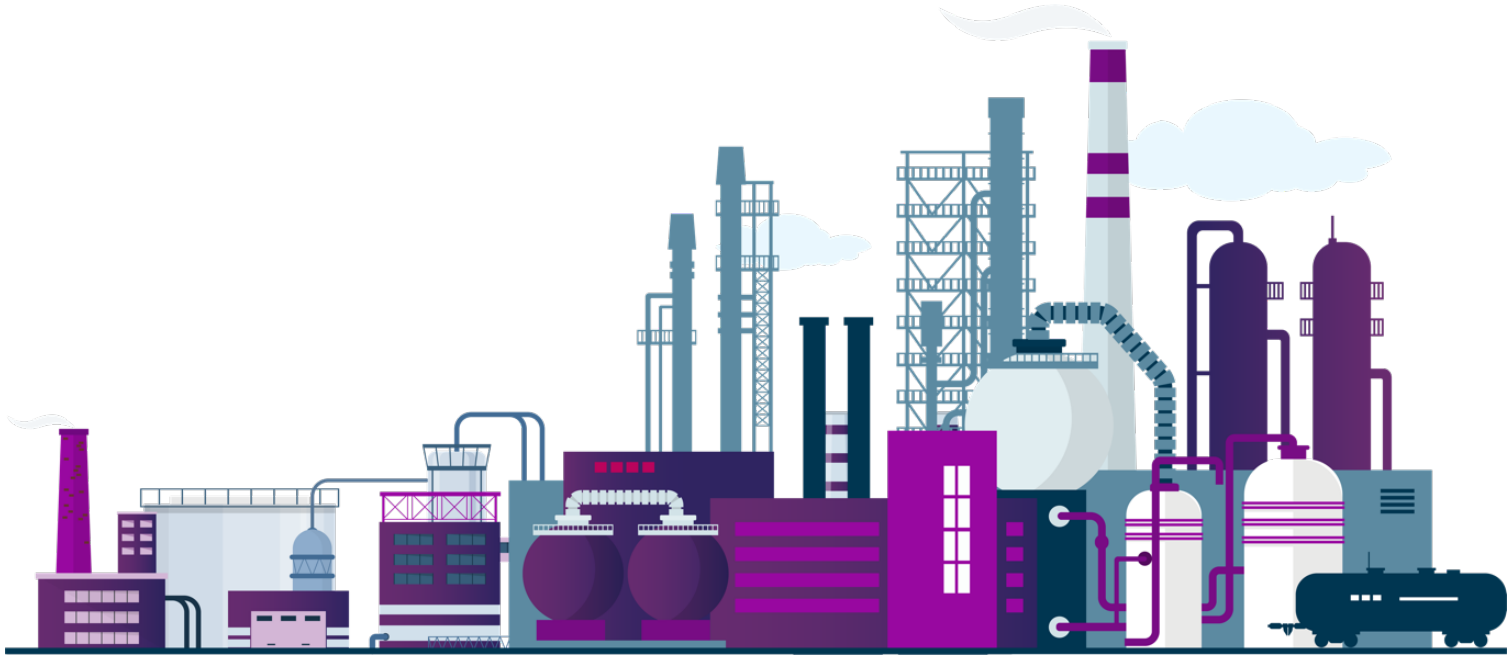
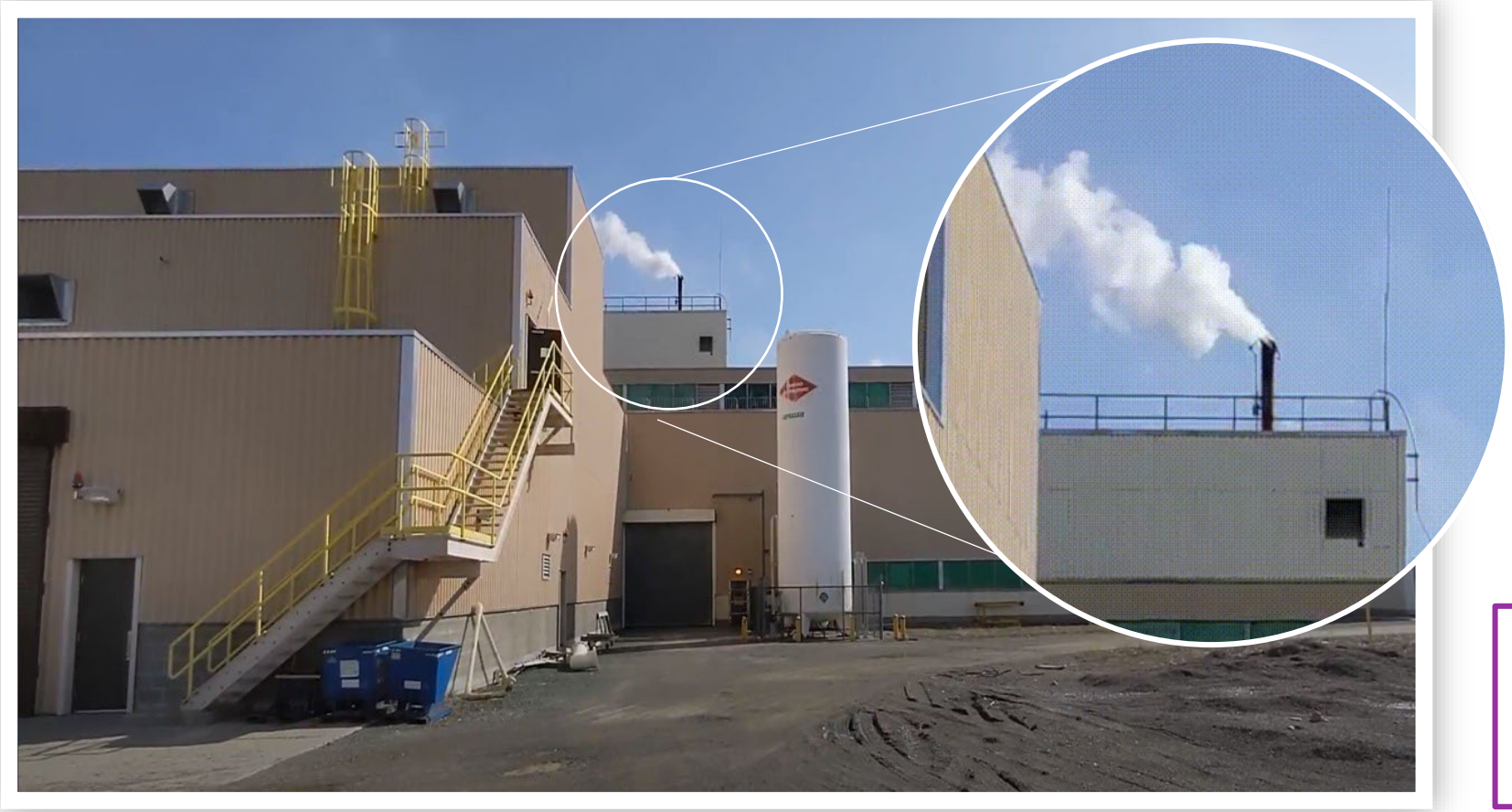
The Unlimited Potential of Hydrogen Within the Fuels Industry

Martin Raska, P.Eng.
VP Product
Teralta

Canadian Fuels Association Forum
October 29, 2024
Ottawa, ON



1) Capture & repurpose traditional emissions



~12 TPD of by-product hydrogen venting freely from an example site

Byproduct hydrogen is produced during industrial processes and typically vented into the air.

Industrial operations are venting clean hydrogen into the air.

2) Achieve decarbonization goals and leverage environmental attributes

Carbon intensity (CI) is a life cycle assessment (LCA) that applies to all types of hydrogen and is endorsed by the International Energy Agency.

- CI quantifies the cleanliness of the energy produced based on the grams of CO_2-equivalent released, to generate a unit of energy
- LCA methodologies have been standardized by the International Standards Organization (ISO)
- Benchmarks for CI are set by government and regulatory bodies

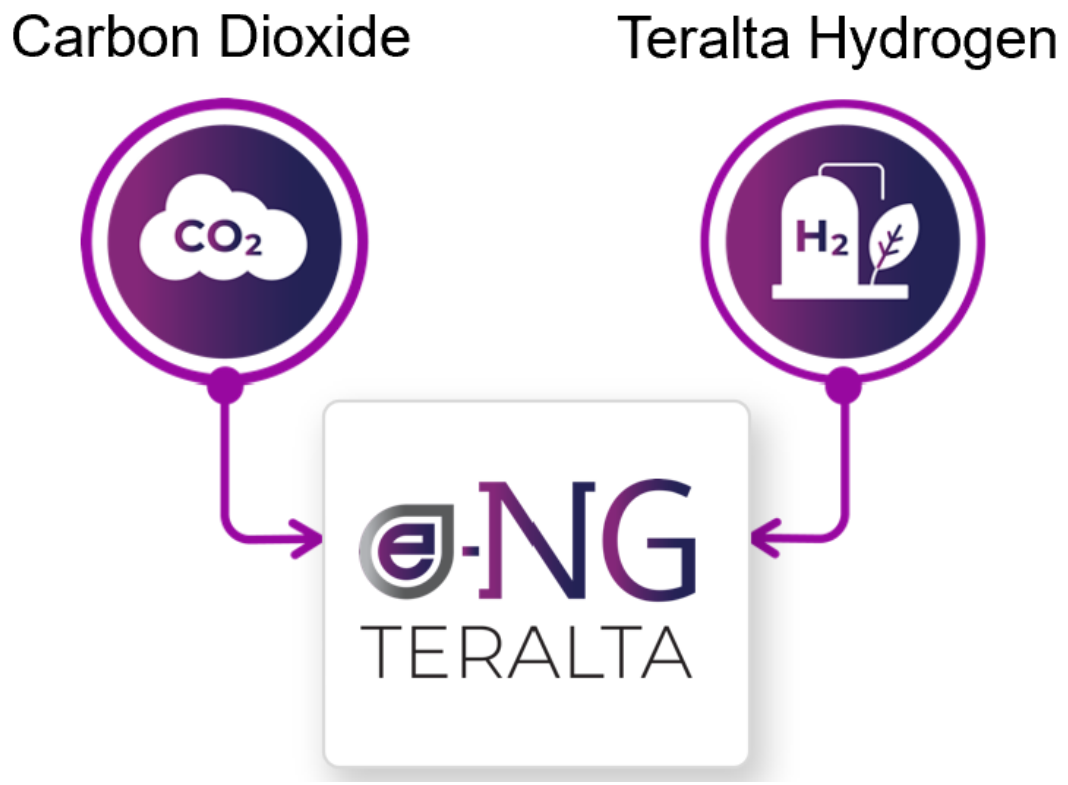
Teralta CI thresholds are significantly lower than recommended standards:

Hydrogen CI Score Comparison (based on gCO2e/MJ)

BC Hydrogen Strategy	Teralta H2 Electrolysis	Teralta H2 Steam Methane Reformer (SMR)
11.9 – 40.1	0.975	Below 36

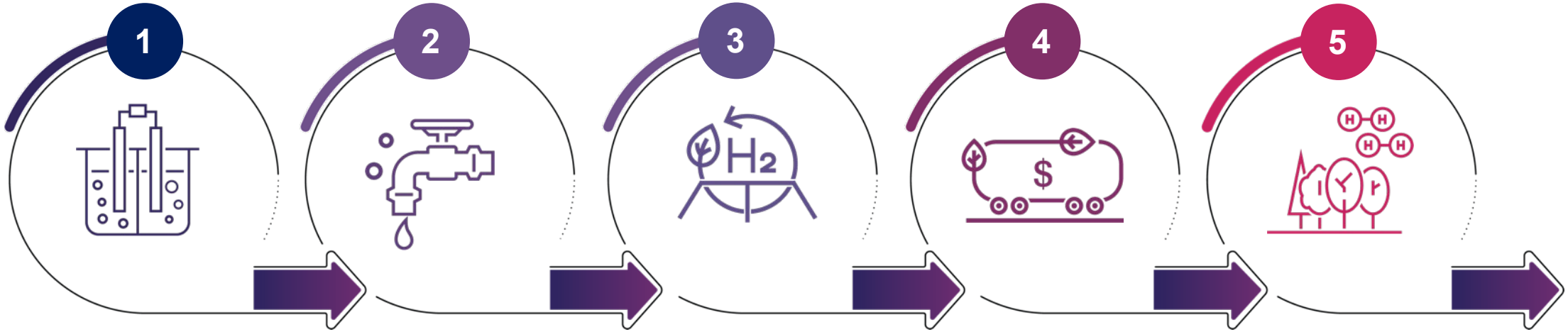
3) Use hydrogen-based derivatives (e-NG) versus traditional fuel

- Teralta e-NG is synthetic natural gas and is a hydrogen derivative
- It is produced by combining clean, stranded hydrogen and recycled CO2 through methanation
- Molecular composition of e-NG is identical to fossil natural gas and leverages existing infrastructure for transport and storage



3) Use hydrogen-based derivatives (e-NG) versus traditional fuel

Hydrogen is produced as a by-product of brine electrolysis. Teralta captures the stranded hydrogen, repurposing it as e-NG for delivery to the end customer.



CAPTURE

Stranded hydrogen and CO2 is recovered

UPGRADE

e-NG is created by combining the stranded hydrogen with the recovered CO2

INJECT

e-NG is injected into the natural gas grid for delivery to the offtaker

TRANSFER

Ownership and environmental attributes are transferred to the offtaker

IMPLEMENT

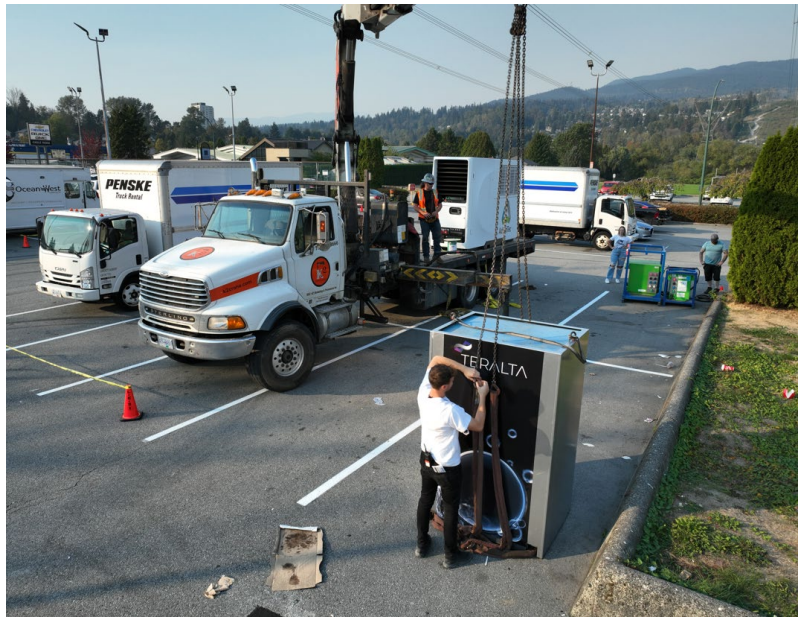
e-NG displaces fossil natural gas, reducing emissions and generating environmental attributes

4) Build your own hydrogen energy supply

Establish your own “behind the fence” grid. Modify existing infrastructure so it is able to support a cleaner hydrogen-powered energy model.

BENEFITS:

- Independence from the grid (consistent supply and cost if stranded source)
- An abundant source of clean, green energy (very low carbon footprint)



TERALTA

Q&A