25 YEARS PROVIDING CLEAN COMBUSTION SOLUTIONS

GLOBAL RECOGNITION

Questor

Clear Solutions Clean Skies

Global Methane Initiative

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

ANAB ACCREDITED ISO/IEC 17020 INSPECTION BODY

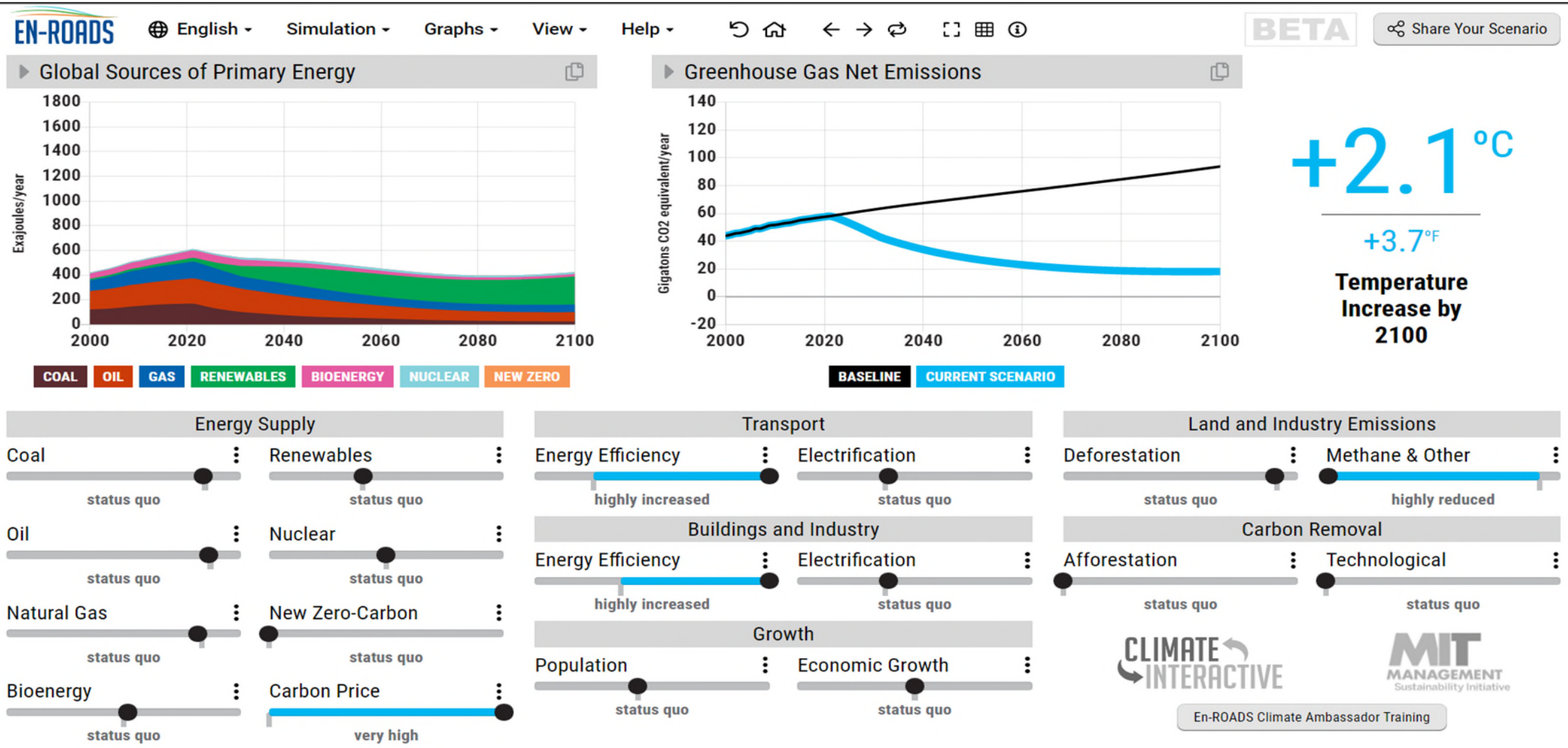
SOLAR IMPULSE EFFICIENT SOLUTIONS OUR CHALLENGE 1000

ISO

Ms. Audrey Mascarenhas BASc, M.Eng, FCAE
President and CEO

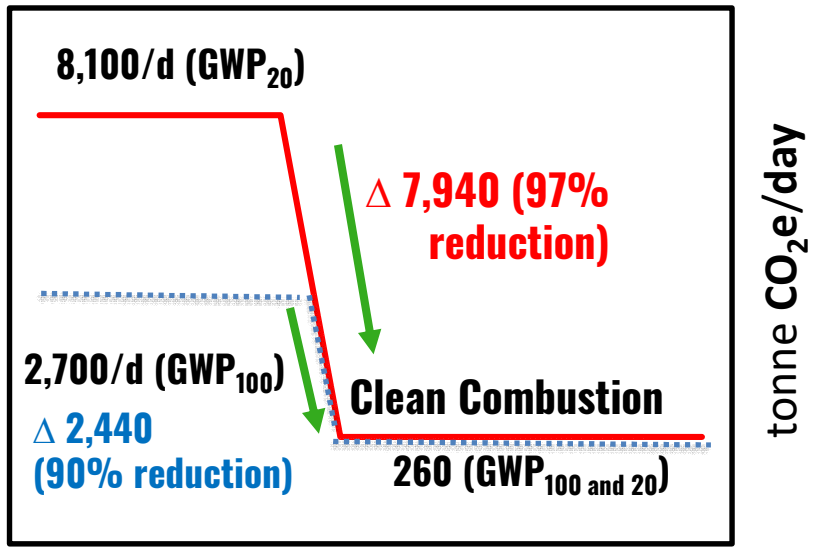
STOPPING THE TEMPERATURE RISE

IT'S METHANE AND ENERGY EFFICIENCY



NON-ROUTINE AND MAINTENANCE OPERATIONS

Questor unit eliminating the venting of 5MMSCF/day of Methane



Methane:
GWP_{20} = 84 tonne CO_{2e}
GWP_{100} = 28 tonne CO_{2e}

Ref: (IPCC-AR5)

PIPELINE BLOWDOWN – COLLEGE STATION, TX. 5MMSCF/D

SITES DESIGNED FOR NO FLARING AND VENTING

ZERO METHANE AND ZERO POLLUTION

COMPRESSOR STATION - NEW YORK STATE

Non-Routine and Maintenance

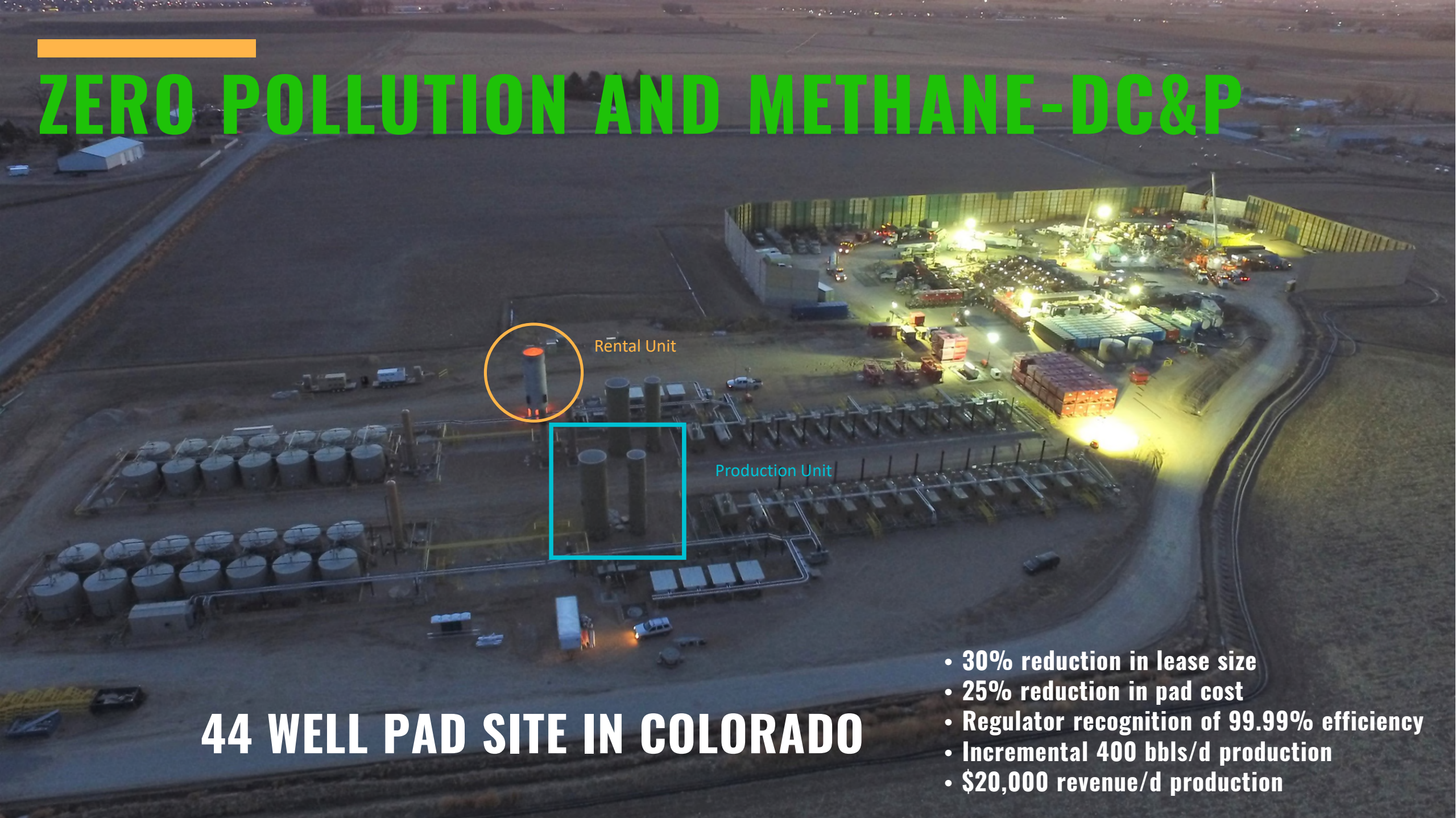
- Maintenance – pipeline, engines,
- Pipeline blowdowns and pigging
- Soft starts
- Equipment failure

Routine Process

- Dehy Still Column, Tank, Amine, Process Units, PSV's, ESD's, etc.

Questor Technology Inc

ZERO POLLUTION AND METHANE-DC&P



44 WELL PAD SITE IN COLORADO

- 30% reduction in lease size
- 25% reduction in pad cost
- Regulator recognition of 99.99% efficiency
- Incremental 400 bbls/d production
- $20,000 revenue/d production

WASTE HEAT TO POWER OPPORTUNITY

HARNESS HEAT

- Harness the heat from our combustion unit
- Heat from boilers and engine flue gas
- Other process streams
- Large quantity of low-grade heat currently wasted

SUPERIOR TECHNOLOGY

- Zero emissions power
- Consistent operation (Available 24/7)
- Small footprint
- Simple battery (hot water tank)

ATTAINABLE PATH TO NET ZERO

$CO_2 + H_2O + N_2 + Heat$

GHG 264 tCO2e
GHG Reduced 7,736 tCO2e (97%)
Cost: $0.10/tCO2e

ELECTRICITY (ORC) 7.5MW

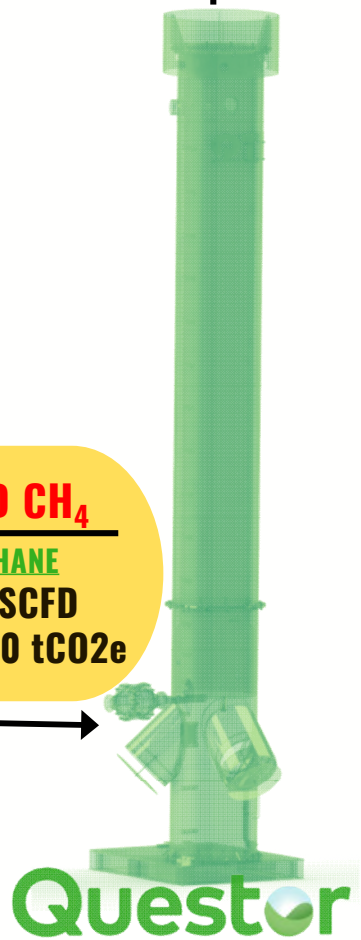
WATER TREATMENT

PROCESS HEAT

Carbon credits: $143M
Value of generated power: $8M

VENTED CH_4

METHANE
5 MMSCFD
GHG 8100 tCO2e



HEAT

$CO_2 + N_2$

GHG 187 tCO2e
GHG Reduced 77 tCO2e (98%)
Cost: $0.45/tCO2e

N_2

CO_2

CLEAN H_2O

Cost of CO_2 capture $15-30/$tCO_2e$

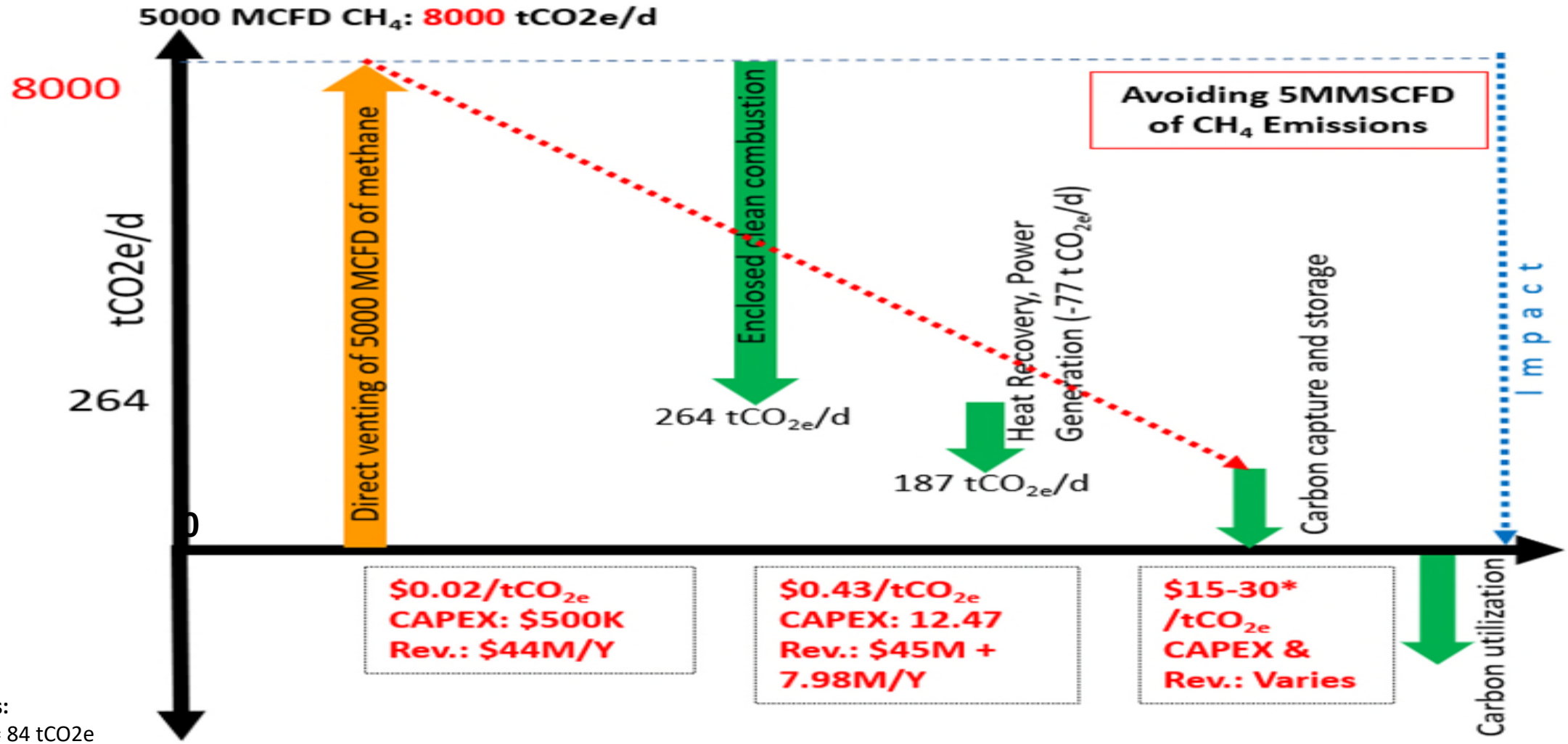
ZERO EMISSIONS

Avg. Wt. Cost: $1.00/$tCO_2e$

CAPEX: $12.5M
Payout <1 year

1 - Clean Combustion | 2 - Heat Utilization | 3 - Capture/ Separation | 4 - Utilization/ Storage | 5 - Result

PATH TO NET ZERO



Assumptions:

CH_4 GWP_{20} = 84 tCO2e

- USEPA eGrid2018 emission factors for power generation
- Generation of 7500 MW electricity
- Cost of electricity: $0.12/kWH (US average cost for businesses, Aug 2022)
- *Reference: Is carbon capture too expensive? – Analysis - IEA

NET ZERO AT AN OIL BATTERY

- 300 mscf/d flared at 95% efficiency
- Cleanly combusting the gas at 100% efficiency reduces GHG emissions 2190 tCO_2e/yr.
- Generate 200kW from the waste heat reduces GHG emissions 1000 t CO_2e/yr. At $0.08/kWh this generates a revenue of $140k/yr.
- Assuming a 10-year project life
  - Capital $1MM
  - Revenue $1.4MM
  - 31,900 t CO2e reduced at 0 to -$13/t
- Assuming a carbon offset is worth $50/t – $1.6MM or >100% ROI

Assumptions:

- Gas composition: C_1: 80%, (based on a real case)
- GWP of methane: 28
- Electricity Grid Displacement Factor: 0.57 tCO_{2e}/MWH (ref: AEP, Carbon Offset Emissions Factor Handbook-2019)

$3.6 BILLION WILL REDUCE 1GtCO_2e/YR

Methane global warming potential is 84x higher than CO_2 over 20 years.

Forms toxic compounds, VOC's and Ozone and ultimately CO_2

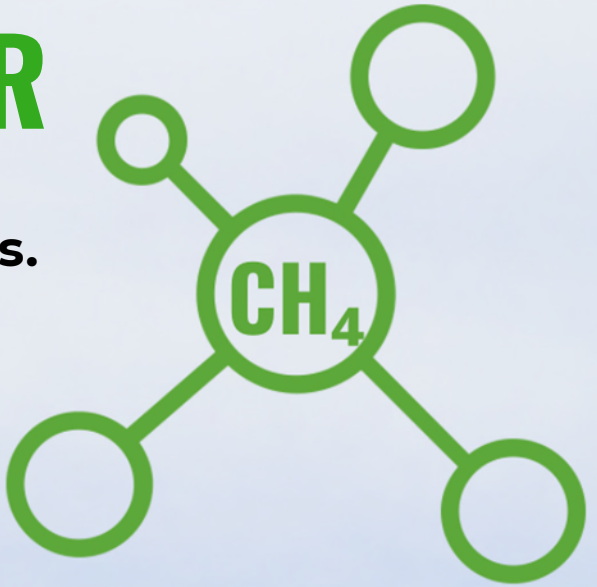
14.5 billion cubic feet of gas is flared and vented daily [1]

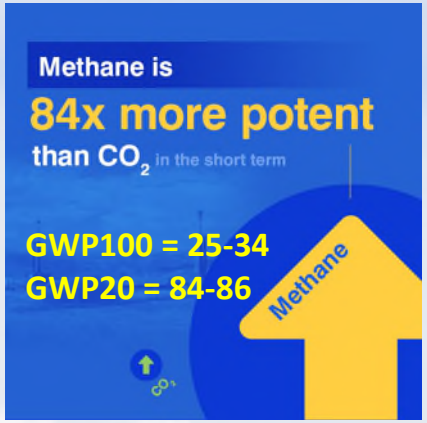
4,833 Questor Q5000 units could handle this volume

Cleanly combusting these streams instead of flaring and venting

Cost $3.63B ➡ 2.6MMt CO_2e/d or 1Gt CO_2e /yr.

Over a 10-year project life < $0.50 / t CO_2e





Assumptions

- 65% flared and 35% vented - 80% methane in the stream
- Flare combustion efficiency is 80%
- 3MMscf/d can be cleanly combusted in a Questor Q5000 at 99.99%
- GWP of 25 over a 100 year period

1. Global Gas Flaring Tracker Report, GGFR, The World Bank, July 2020

STRANDED ASSOCIATED GAS

- Air Quality Impact
- Harmful emissions
- Greenhouse gas emissions
- Significant waste of energy
- Community impacts
- Quality of life

Questor

Clear Solutions. Clean Skies

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QUICK UPLOAD

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