



Questor Technology Inc.



**World
Indigenous
Business
Forum**

Solutions Powered By Clean Combustion

**Environmental
Protection**



**Intelligent
Solutions**



**Social
License**



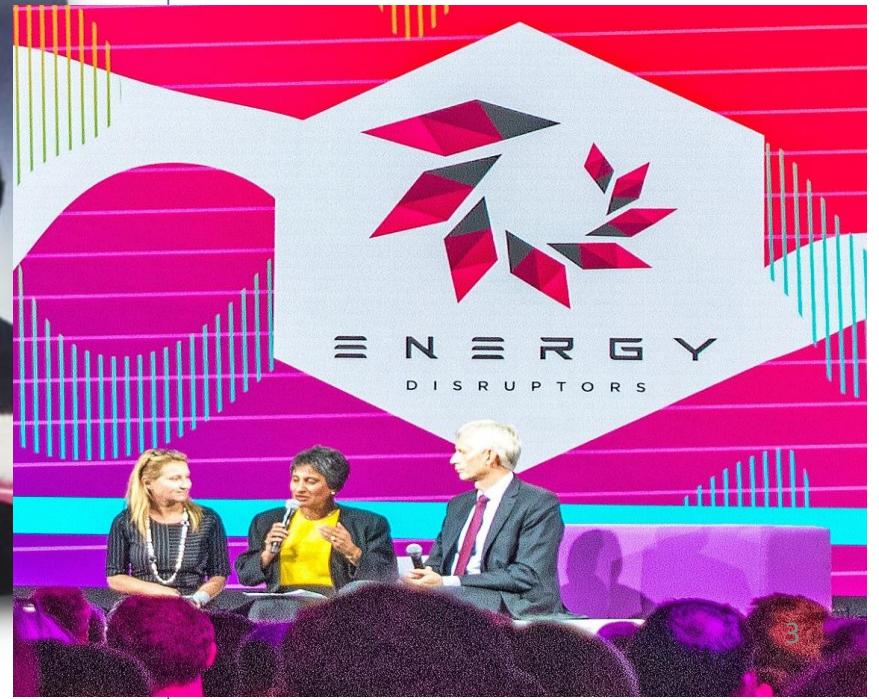
Audrey Mascarenhas

**Regeneration of Natural Resources
with Respect and Balance**

My Energy Journey

- Concert Pianist
- Pharmacist
- Doctor
- Engineer
- Entrepreneur

“ I believe Questor was the journey I was supposed to be on all along”



Background

- **Bachelor in Chemical Engineering**
- **Master in Petroleum Engineering**
- **Over 37 years of energy experience**
- **17 year career at Gulf Canada Resources (ConocoPhillips)**
- **President and CEO of Questor – 20 years**

The **ELDERS**
ARE WATCHING



David Bouchard & Roy Henry Vickers

The Problem that needed Solving



Harmful emissions; Volatile organic compounds (VOC's), HAP's, methane, PM2.5, BTEX, NOx, etc.

Temperatures are rising because we have underestimated our emissions assuming a flare is 98% efficient – methane and PM2.5

Air Quality, Carbon soot and GHG emissions



Why should we Care?

- $\text{GWP}_{100} = 25-34^{\text{a}}$
- $\text{GWP}_{20} = 84-86^{\text{b}}$
- Stays in atmosphere much shorter period than CO_2
- Forms toxic compounds VOCs and Ozone
- Ultimately forms CO_2

Methane



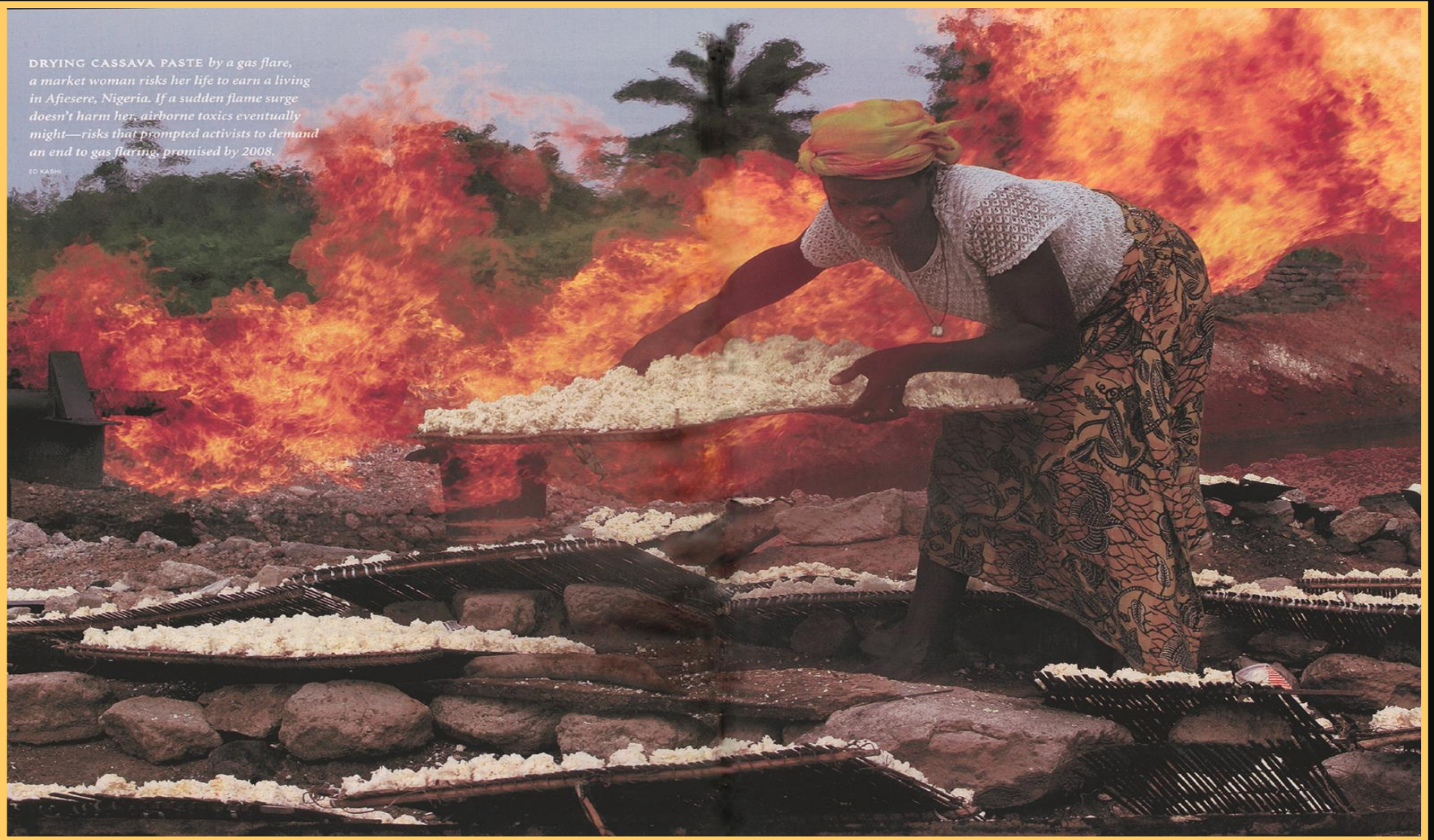
^aSource: EPA and Harvard

^bSource: EDF and Harvard

14 Billion cubic feet every day

DRYING CASSAVA PASTE by a gas flare, a market woman risks her life to earn a living in Afiesere, Nigeria. If a sudden flame surge doesn't harm her, airborne toxics eventually might—risks that prompted activists to demand an end to gas flaring, promised by 2008.

ED KASHI



Global impact

- 14 Bcf/d flared and vented emits 4.85 Gt/yr CO₂e
- Cleanly combusting all this gas reduces GHG CO₂e to 0.25 Gt/yr.

With clean combustion technology;

- *Emissions reduced 4.6 Gt/yr.*
- *CO₂e reduction < \$0.50/t*
- *Global cost of less than \$3.3 billion*
- *Takes 1,000,000,000 cars off the road*

Converting and ensuring Methane to CO₂ is the most effective way to stop the temperature rise - <\$0.50/t

What We Do



QUESTOR is a leading provider of 99.99% efficient, safe, reliable and regulatory compliant patented waste gas combustion systems across an array of industries.

QUESTOR specializes in the clean combustion of waste gases, methane, VOC's, HAP's and BTEX, addressing air quality and GHG emissions. We recover the waste heat from clean combustion and other sources to generate power or potentially treat water.

QUESTOR's solutions improve safety, reduce costs, improve energy efficiency, achieve compliance, reduce GHG emissions while gaining public support.

QUESTOR's adaptability has resulted in unique solutions that have become industry standards in an ever-changing, competitive market.

Creating Value From Waste

Clean Emissions Solutions

99.99% Combustion Efficiency
Clean Emissions - CO₂ and Water



Pad and Well Site Operations



Drilling and Completions Operations



Gas and Oil Processing Upstream, Midstream and Downstream

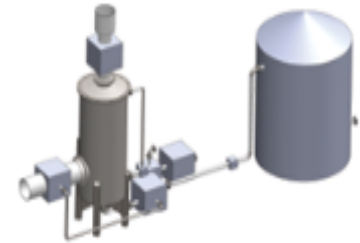
Waste Gases



Clean Combustion Device



Heat Energy



Water Vaporization
(Under Development)



ORC Heat to Power
77kW to 5MW

Solving the Problem with Respect and Balance



Colorado Leadership

Regulation 7 and Bill 181

- Initially just for VOCs
- Changed to include methane
April 14, 2014
- Statewide rule – i.e. not just in non-attainment zones
- Must use enclosed combustion to control emissions and improve air quality
- 10 CEO's minimal impact



Nexen Leadership

Calgary
34 % H₂S



“We used Questor because of the quality of the units. They’re the most effective with almost 100 per cent efficiency in burning all the gas off. It’s a proven unit,” said Seredynski.

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In late October 2004, Nexen Canada Ltd. moved a service rig to its sour gas wellsite facility, located on the east side of 84 Street NE just north of 16 Avenue NE, to complete maintenance on the well.

Nexen had suspended and isolated the wellsite in October 2003 following a routine inspection that identified maintenance requirement. The workover entailed inspecting the casing, running new production tubing and sub-surface safety landing nipple and valve to ensure the continued safe operation of

incinerator for combusting the sour gases (35 per cent H₂S) vented from the well and the inclusive method that Nexen used when planning the project allowed for smooth passage of the workover with the EUB, the City of Calgary, the Municipal District of Rockyview and the many residential stakeholders.

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Although no sour gas was released during the workover,

Questor Technology Inc.
Portable Well Test Incinerator
3,000,000 scf/day
Working on 34% H₂S Well Near Calgary
Phone: (403) 571-1530



Compton Petroleum Corporation
Suite 3100, 150-6 Avenue SW

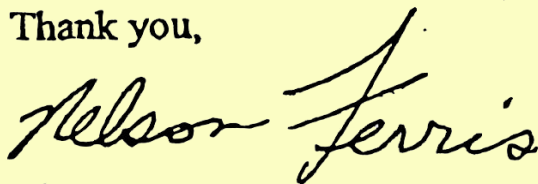
I live one kilometer downwind of a natural gas plant owned by Compton Petroleum. When this company wanted to expand their operations and applied for a permit to incinerate sour gas I was concerned about air quality and bad smells that may result. Now after several months of operations, I can say that I have never detected any smells from the plant from where I live.

To Whom It May Concern:

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The noise level comes from the plant. I can't hear it from outside my house. I can't hear it while I'm working the same day.

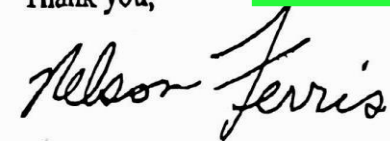
Thank you,



Nelson Ferris
Hines Creek, Alberta

Compton is monitoring

Thank you,



Nelson Ferris
Hines Creek, Alberta



22 Well Pad Site – Colorado

30% reduction in lease size, 20% reduction in pad cost,
Incremental 400 bbls/d production



Social License



WPX Energy tries an alternative to flare stacks in Eddy County

Adrian C Hedden, Carlsbad Current-Argus | Published 12:53 p.m. MT March 28, 2019 | Updated 1:01 p.m. MT March 28, 2019

Some residents mistake facility for tank battery fire

Fire appeared to erupt at a flare stack in southern Eddy County, scaring motorists and nearby in the area. Many call 911, reaching volunteer fire services already strained for resources. **But the blaze wasn't a danger. It was a measure of safety.**

They're called thermal oxidizers, and could provide a safer, more efficient way to flare natural gas.



That's why WPX Energy installed the control measure in February at a facility in the community of Otis along Derrick Road between U.S. Highways 286 and 62/180. A pipeline the company planned for the area was delayed until the end of April, meaning natural gas drawn from the well had to be flared to maintain safe pressure levels at the site. But to a casual observer, vents at the bottom of the stack could reveal frightening, especially at night.

WPX spokesperson Kelly Swan said the visual is like "a giant hot water tank with a very large pilot light". It caused dozens of calls to the Eddy County Office of Emergency Management, and volunteer firefighters were sent out to address the concerns. Eddy County Emergency Manager Jennifer Arredariz said the Office takes all calls seriously. "It does look like it's on fire," she said. "At night, it looks like something is burning out there. We continue to get phone calls from passersby. We have to treat all calls like it's a fire."

What is it?

Thermal oxidizers burn hotter and thus destroy more compounds in the gas before it is released into the air. A typical flare stack burns at about 800 degrees Fahrenheit, but the oxidizers heat up to 1,200 to 1,800 degrees, said JoDeil Mizoue, WPX environmental manager. She said that higher heat allows for 99.9 percent combustion efficiency, burning off all the methane and only releasing carbon dioxide and water vapor. Flares usually burn at about 98 percent efficiency, she said. The flaring process is especially important, she said, as a safety measure to balance the pressure of a new well. "That additional 1 percent ensures that compounds like the methane are completely destroyed," Mizoue said. "They burn clean. There's no smoke. In ensuring that they burn much hotter." Such a control is especially helpful when wells are drilled near residential areas, she said.



They're meant to burn high volumes of gas — about 5,000 cubic feet per day compared to an average "flare" that can burn between 2,000 and 3,000, Mizoue said. **It's a safer and more efficient design, she said, ideal for a residential area.** "We are looking at more gas, especially as this is a new well," she said of the facility in Otis. "The units are enclosed because they are enclosed. It's not an open flame, but they tend to glow." Mizoue explained that doors at the bottom of the facility allow for air flow, but also make the flames visible albeit not as bright as a standard flare. "It's primarily because it's in a residential area," she said of the facility. "We had concerns. We didn't want that to rumble. We also had concerns with night light. (Thermal oxidizers) just make sure the mix is perfect and it's in a controlled environment."

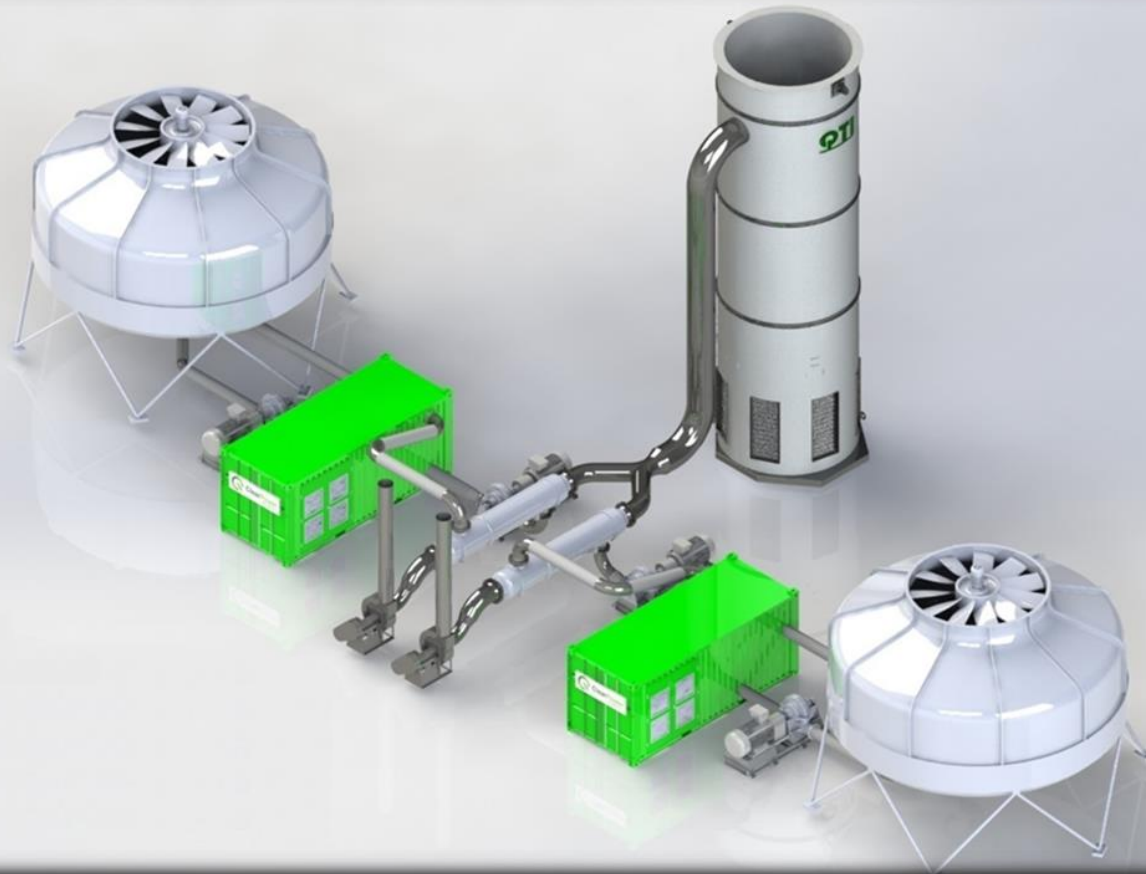
WPX is renting the thermal oxidizers from Denver-based Questor until a pipeline connection to WPX's oil well in the area is complete. That was expected by the end of April, read a WPX news release. Unit that time, the equipment remained active at the well site, secured by barbed wire fencing to keep locals off the private property. To quell local anxiety in the meantime, WPX planned to erect signs in the area to inform motorists and others of the purpose and lack of threat posed by the facility. When the pipe is coming in, and had a gap in time," she said. "All that gas will be sold. We didn't want to burn the gas, but sometimes you have to and that was the best way." Thermal oxidizers are an example of "market-driven" solutions, Mizoue said, to cut down on waste and increase revenue for oil and gas companies. "We try and do everything possible to minimize emissions," she said. "There's some situations where gas flows are not big enough for a control device like this. In this case, it was great". She said the oxidizer in Otis was the first one used by WPX, and its success would result in more appearing in the area.

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Passion – 14 Bcf/d



3MMscf/d of Flared gas to 1.5MW power

Today's Conversation

- Polarizing conversations
- Climate change is a hoax
- Can we meet the methane reduction target?
- We have to choose between Energy and Environment. Cannot have both
- If you put in tough emission regulation we will be uncompetitive
- There are no solutions.....

What is our Energy Future?

- **Our Children - happy, healthy and have a great future**
 - **Collaboration**
 - **System approach**
 - **Low hanging fruit, medium opportunities, moonshots**



Summary

- **Climate Change and air quality regulation is not going away**
- **Embrace the change and be part of the solution**
- **Questor is an example of proven cost effective technology recognized globally – 20 years**
- **Impact of less than 1cent/mcf.**
- **Creates the Social License to operate**
- **Energy future is about collaboration**

Conclusions

- My dad was probably right
- Better Engineer than a concert pianist
- My career has brought much enjoyment
- I love giving back and making a difference
- Demonstrating that Environment and Energy can be in the same sentence

“Questor is the journey I am supposed to be on”

COST REDUCTION FOR CLIENTS



PUBLIC CONFIDENCE



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ENVIRONMENTAL PROTECTION

