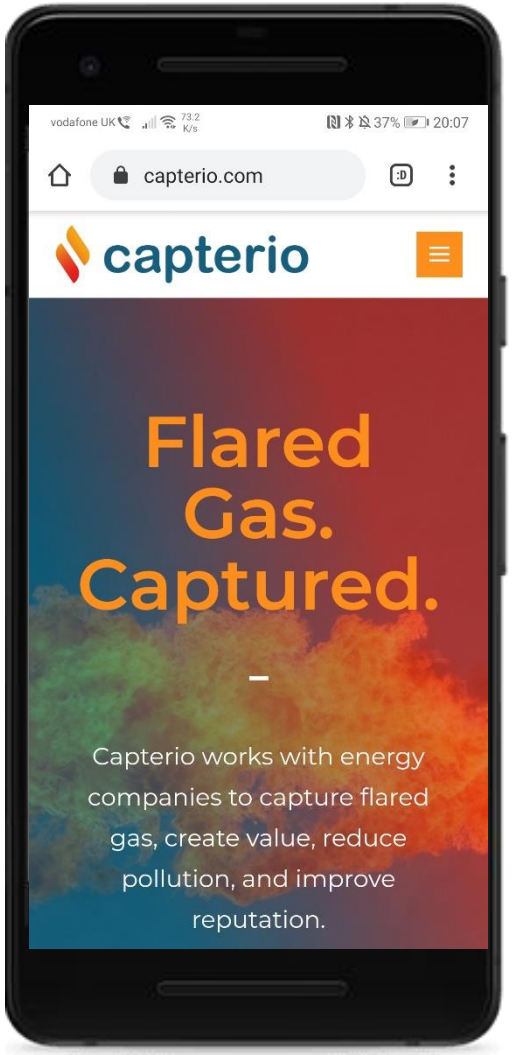
Flaring - the $20 billion decarbonisation opportunity

Mark Davis, CEO, Capterio
www.capterio.com

GeoExpro GeoTalks
6th May 2021

About Capterio: we are a project developer focussing on monetising flared gas.



www.capterio.com

capterio **Flared gas. Captured.**

We monetise flared gas to create value, reduce pollution and improve reputations

We bring together assets, technologies and financing

We invest into on-the-ground flare monetisation projects, powered by data and AI

SYSTEMIQ

www.systemiq.earth

Capterio is a spin-out from SYSTEMIQ

SYSTEMIQ aims to transform markets and business models in the area of energy, materials and land use, and drive the implementation of the Paris Agreement and the UN Sustainable Development Goals (SDGs)

Source: Capterio

Agenda

What is gas flaring and why does it happen?

What can be done to reduce flaring?

How can we accelerate change?

Let's start with some big numbers: Gas flaring is equivalent to …

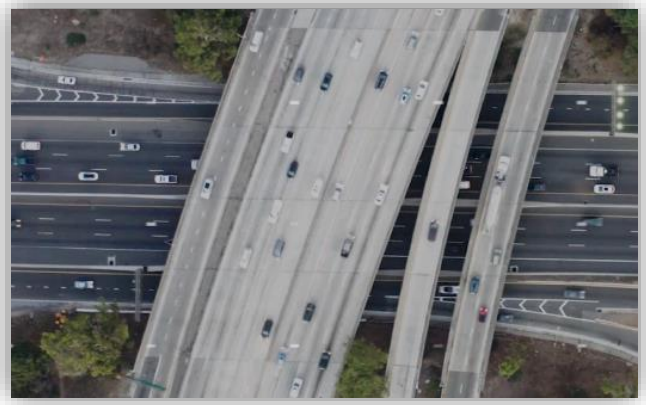
5th largest gas "country"

142 billion cubic meters per year

Afghanistan's GDP

$20 billion per year

260 million cars



1.2 billion CO_2-equivalent tonnes

Source: Capterio

This discussion is strongly relevant to COP26 and its run-up

- Biden's recent 100-day climate summit shows that there is a step-change in government commitments: most of G7 members are moving to 50% emissions cut by 2030 (and many of the G20 are making stronger commitments)

- There is also a changing global mood:
  - "1.5 degrees is the new 2 degrees"
  - "2030 is the new 2050"
  - "The markets are speaking"
  - "Coal is the new asbestos"

- Whilst the COP26 process is about law-making, it's also about real-world, pragmatic solutions – need for an "honest COP"

- The COP26 Presidency has 5 campaigns

- Flaring has a clear role and is material, 2% of global emissions. Delivering flaring is a real-world solution to a global problem

Source: SYSTEMIQ and Capterio

Gas flaring is the largest source of supply-chain emissions in oil and gas …

Oil and gas supply chain emissions

Point sources — *Diffuse*

FLARING
CO2, some CH4

Burning of waste CH4 (often incompletely) at key oil and gas processing facilities

142 BCM

VENTING
Primarily CH4

Deliberate release of CH4 at tanks, valves, pumps, compressors etc.

69 BCM

LEAKING
Primarily CH4

Accidental release of CH4 at wells, pipelines, etc.)

34 BCM

OPERATING
Primarily CO2

Gas used in operations to power facilities

END USE
CO2, some CH4

Occurs when the gas is combusted in the end use

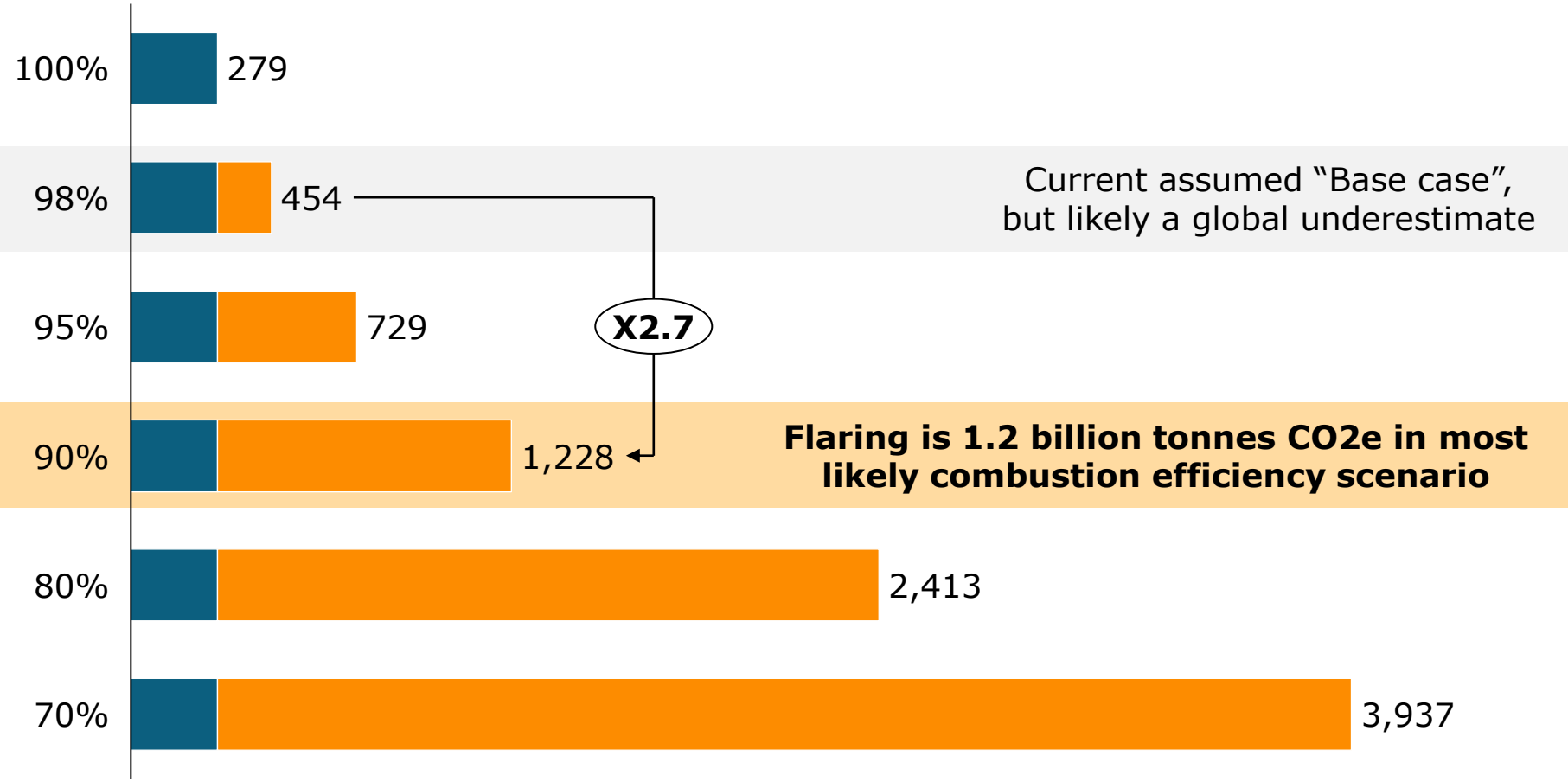
Source: Capterio

… and most flares emit much more than just CO2

Many flares have incomplete combustion …

… leading to additional emissions of methane with large GHG impact

Emissions in million tonnes per year vs combustion efficiency



Note: Does not include emissions from liquids burn. Assumes 20-year methane GWP
Source: Capterio

Reducing gas flaring is a key commitment of many major countries and companies

Flaring minimisation is part of a larger methane brief …

"bp aims for zero routine flaring in US onshore operations by 2025"

"**Methane leaks and flaring can and must be tackled. And gas itself can and must be increasingly decarbonised**"

– Bob Dudley (BP), 10/2019

"**Flaring is one of the biggest issues as it's a waste and bad for the industry's reputation…we can do something about it."**

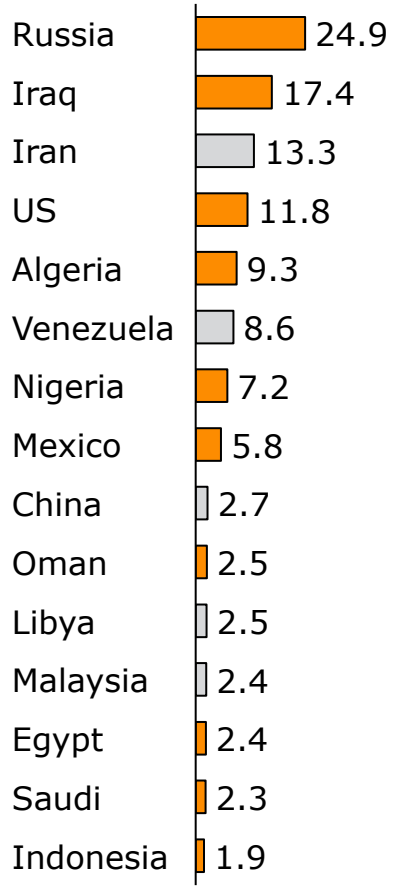
- Eldar Saetre (Equinor), 9/2019

"When you look at the future, the **Achilles heel of the gas industry is the methane emissions**, and the good news is for the industry, **this can be fixed by existing technology**, only using the best practices"

– Fatih Birol (IEA)

… and also, 73% of the world's producers have signed up to Zero Routine Flaring by 2030 initiative

Gas flaring
BCM/a, 2020

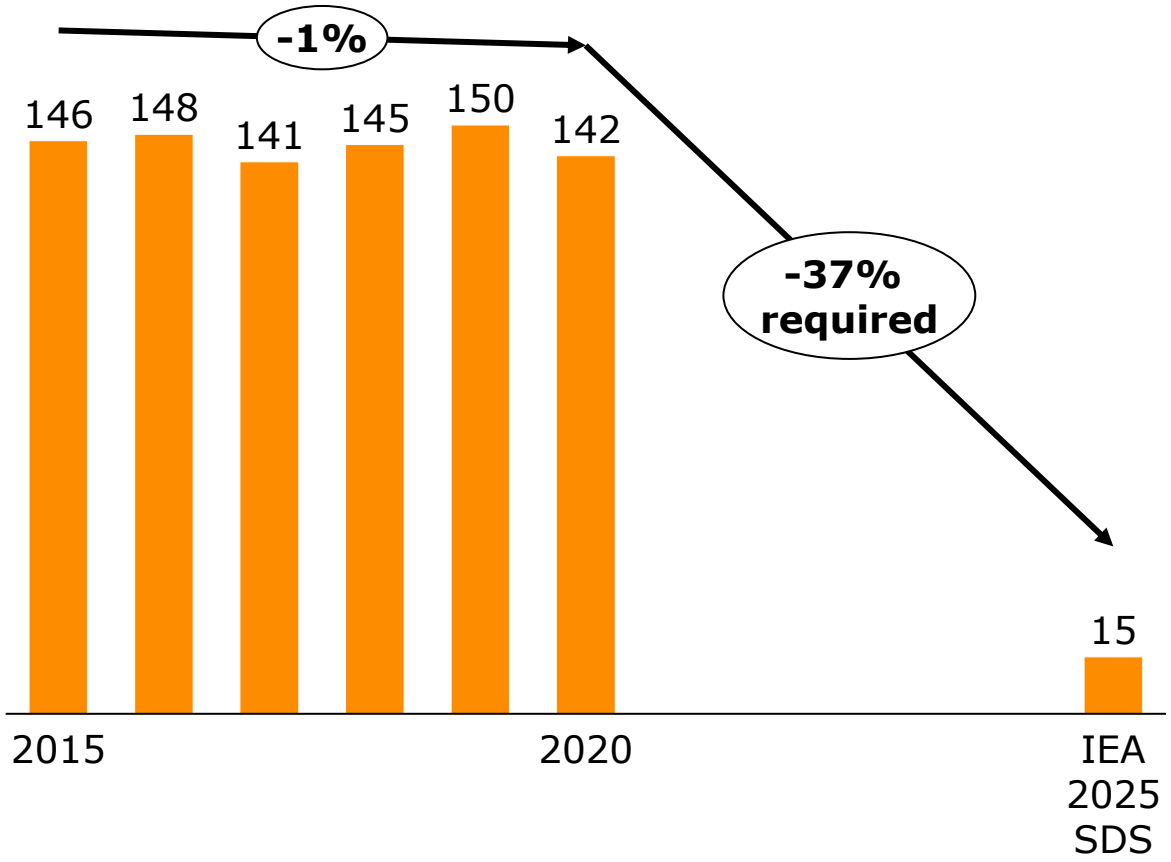


Source: World Bank GGFR programme; literature searches

… but the latest data highlights that we are not "on track" to deliver Zero Routine Flaring by 2030

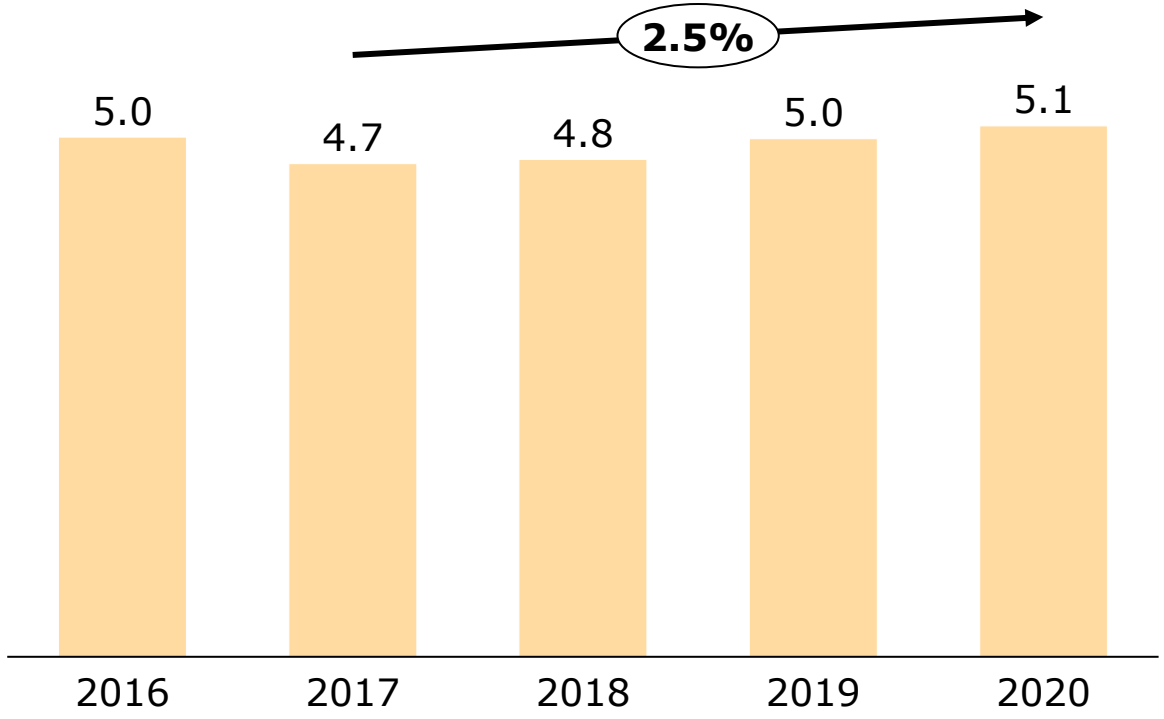
Gas flaring is down, but not "on-track" to meet IEA sustainable development scenario…

Global gas flaring volume, BCM



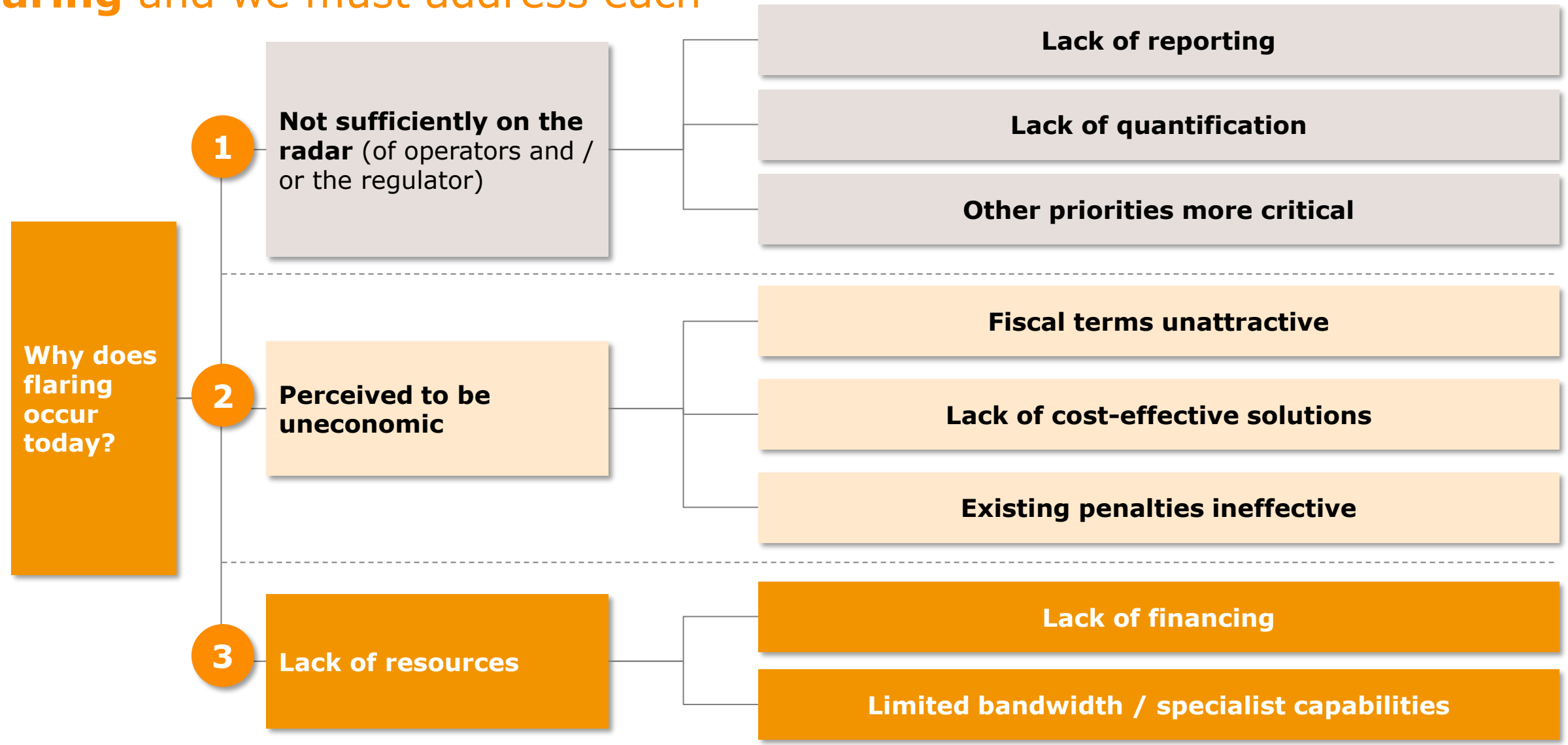
…and underlying operational performance is worse, with flare intensity at its highest in 5 yrs

Global flaring intensity, m^3 per barrel



Source: World Bank; IEA; EIA; Capterio analysis

Our research identifies 3 "system/market failures" underpin gas flaring and we must address each



Source: Capterio

Agenda

What is gas flaring and why does it happen?

What can be done to reduce flaring?

How can we accelerate change?

1 Data is the starting point to solving flaring and *FlareIntel* helps

Root causes

Not sufficiently on the radar

Perceived to be uneconomic

Lack of resources

Video

Sign up for free global access at www.flareintel.com

Source: Capterio FlareIntel: https://www.youtube.com/watch?v=vgT6g8Yvm1E

1 *FlareIntel* gives visibility into every flare worldwide

Video

Root causes

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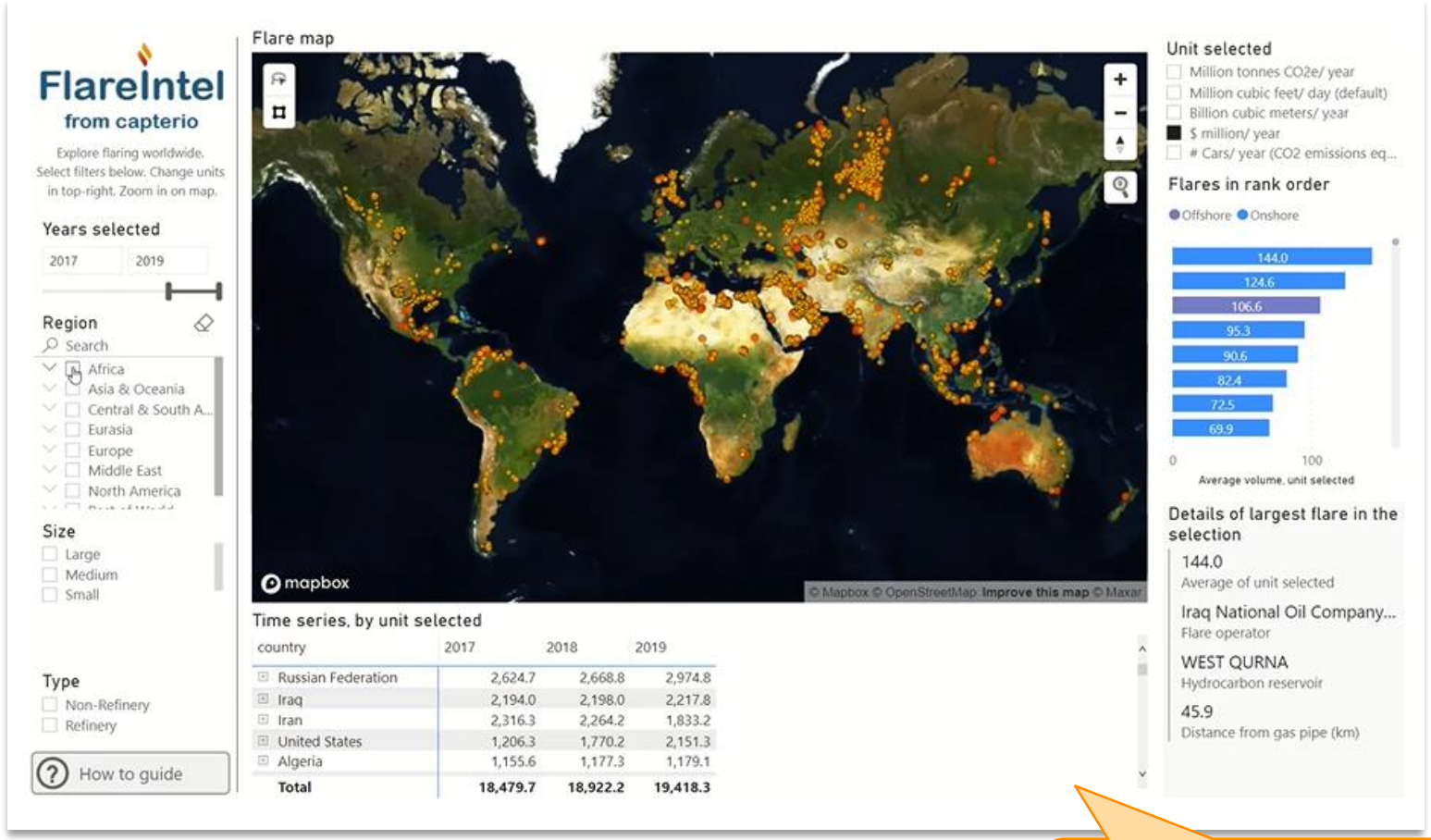

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FlareIntel can:

- **Identify investment opportunities**
- **Calculate CO2**

FlareIntel Pro can also:

- **Provide independent view of operated flaring**
- **Deliver insight into non-operated flaring**
- **Help to monitor operation performance**
- **Enable benchmarking**

Source: FlareIntel Pro: https://www.youtube.com/watch?v=lt_nH5N7euY

1 Policies matter – as low flaring rates in Saudi and Norway show

Root causes

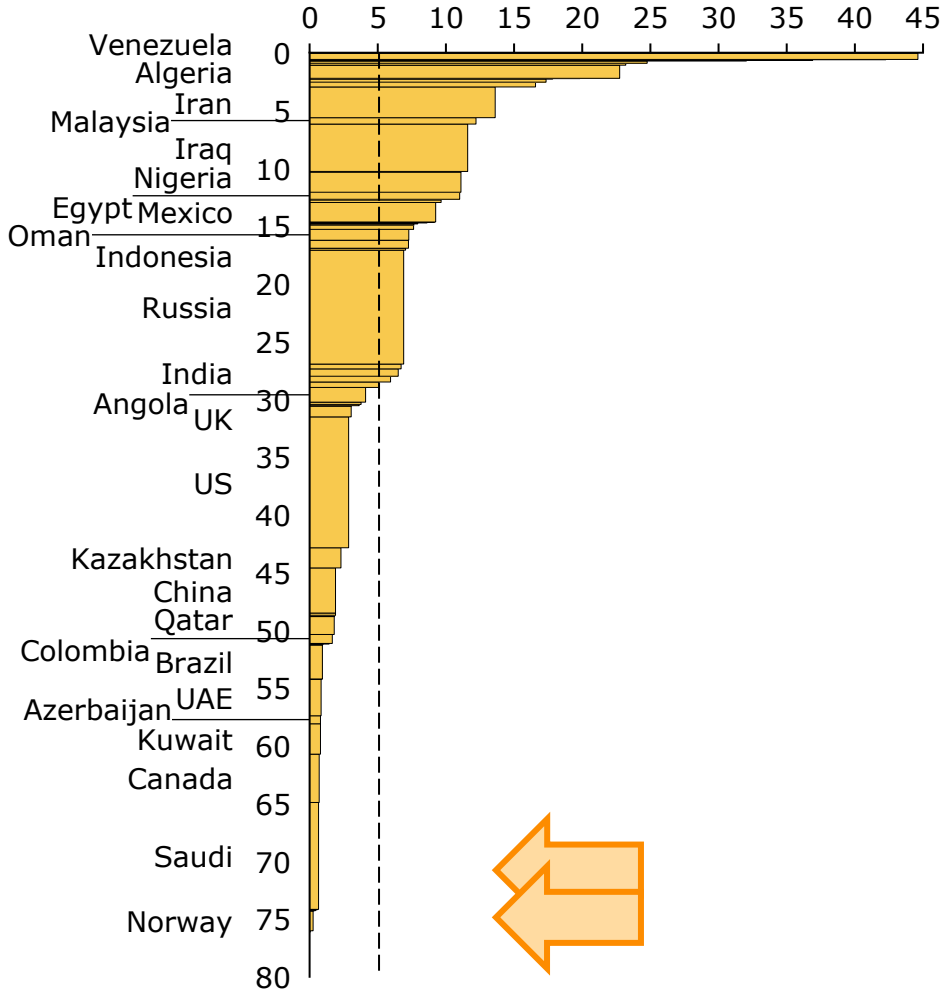
Not sufficiently on the radar

Perceived to be uneconomic

Lack of resources

Flaring intensity varies widely …

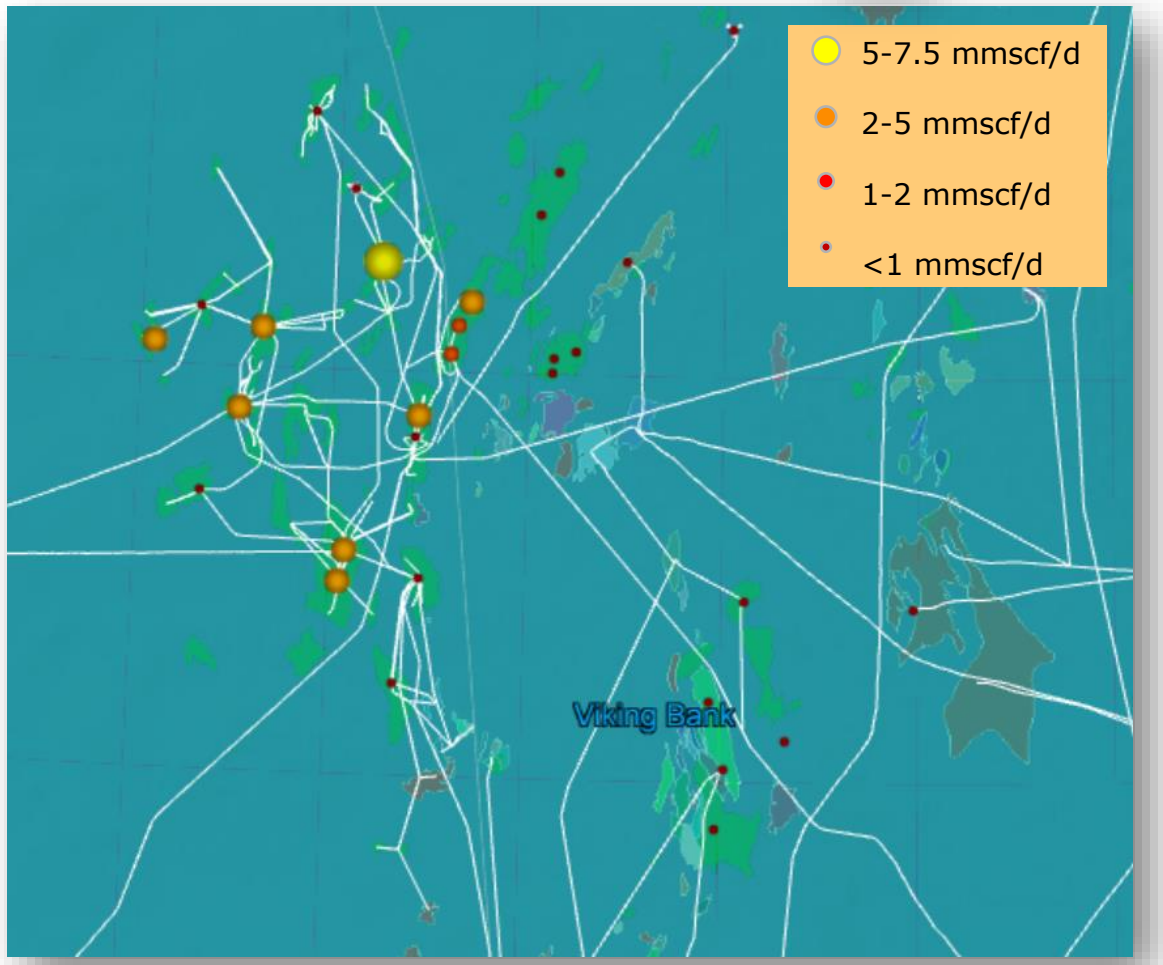
m^3 per barrel



… but policies influence practices

UK

Norway



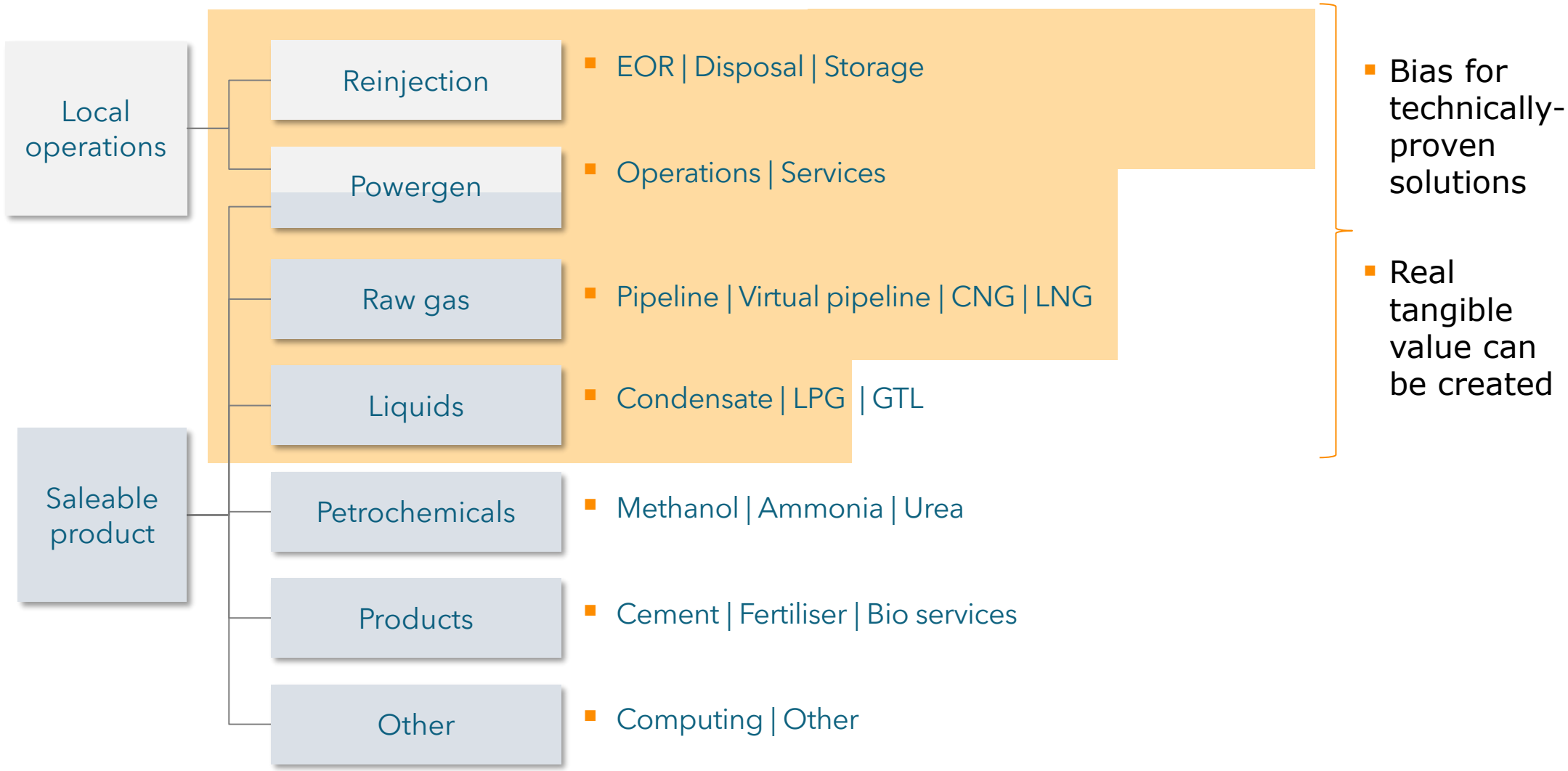
Source: Capterio analysis; World Bank; EIA crude oil including lease condensate production; FlareIntel

2 Many technically-proven solutions can create real value

Root causes

- Not sufficiently on the radar
- **Perceived to be uneconomic**
- **Lack of resources**

Examples of gas flaring solutions



- Bias for technically-proven solutions
- Real tangible value can be created

Source: Capterio

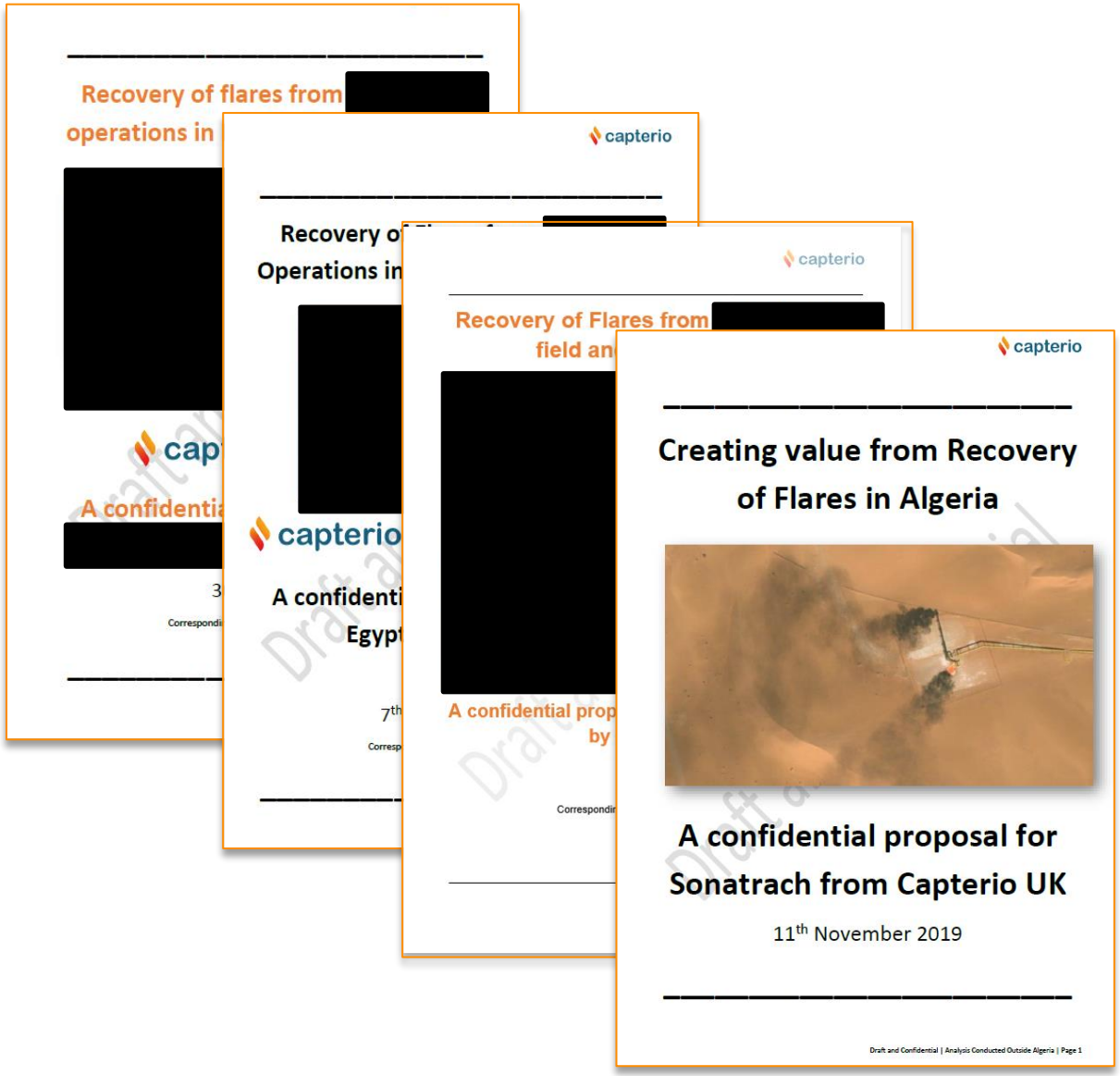
2 Flare capture projects often highly investable real-world solutions

Root causes

Not sufficiently on the radar

Perceived to be uneconomic

Lack of resources



- 54% of all flaring is within 20 km of an existing gas pipeline
- Many flare gas capture projects have intrinsically attractive economics:
  - IRR 20%-60% range
  - Million tonnes per year emissions reduction scale
  - Monetisable on carbon markets
- Creating approaches unlock value

Source: Capterio

3 Third parties can bring specialist capabilities and financing

Root causes

Not sufficiently on the radar

Perceived to be uneconomic

Lack of resources

- Mismatch of "intent" and "execution capacity"
- Many flare reduction projects require "small" investments and are "non-core"
- Industry needs innovative approaches that bring third-party capital and resources

"2 years ago we would have said 'we can do it ourselves' – but we didn't. Now is the right time for third party funding"

- IOC

"In today's capital-constrained world we are very interested to find innovative commercial structures"

- IOC

"We are missing business models to take companies and scale them"

– Pratima, OGCI CEO

Source: Capterio

Agenda

What is gas flaring and why does it happen?

What can be done to reduce flaring?

How can we accelerate change?

Delivering success will require at least 3 actions

1

Show the benefits – economically and environmentally

2

Celebrate and scale the wins

3

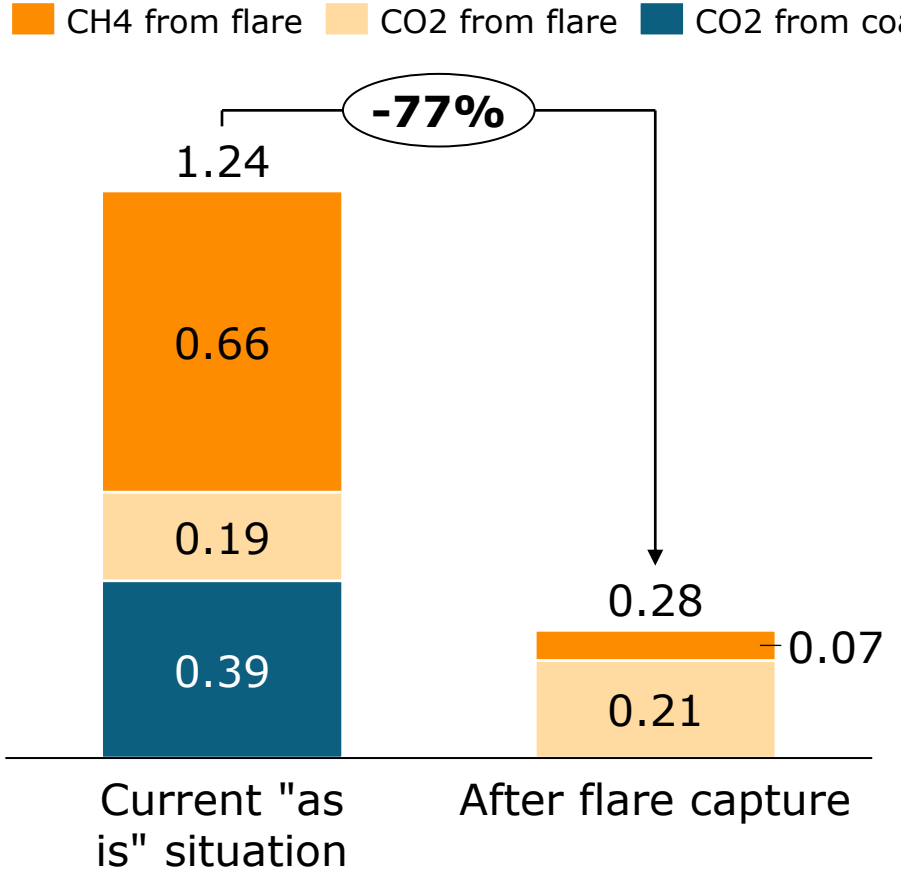
Ensure accountability and delivery

Source: Capterio

1 The twin benefits of flare capture projects are compelling

Emissions reduction is material …

CO2-equivalent emissions,
million tonnes for a 10 million scf/day flare



… and tangible value creation is delivered

Photo of a project delivered by our team in Ukraine

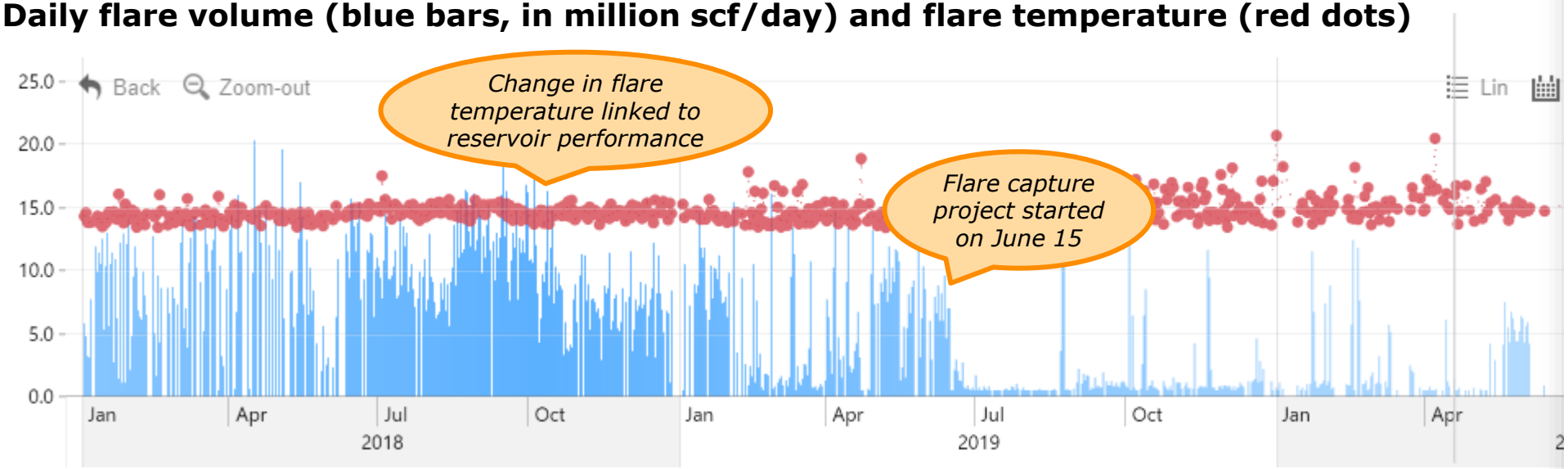
- Attractive IRRs
- Material cost savings
- Improve health and safety
- Jobs and national revenues create
- Improved license to operate
- Contributions to energy transition / NDCs

Source: Capterio

2 By celebrating our progress we increase the "likelihood of the exponential"

NAFTOGAZ GROUP

Daily flare volume (blue bars, in million scf/day) and flare temperature (red dots)

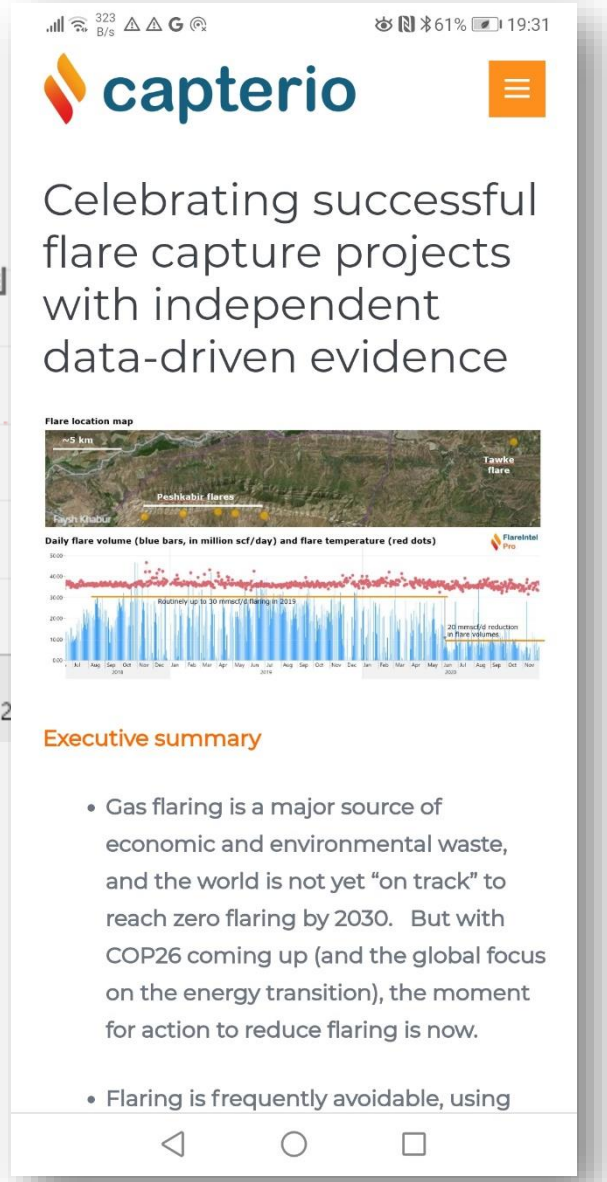


Other examples in our case study paper

CRUSOE

PHAROS ENERGY

DNO EST - 1971

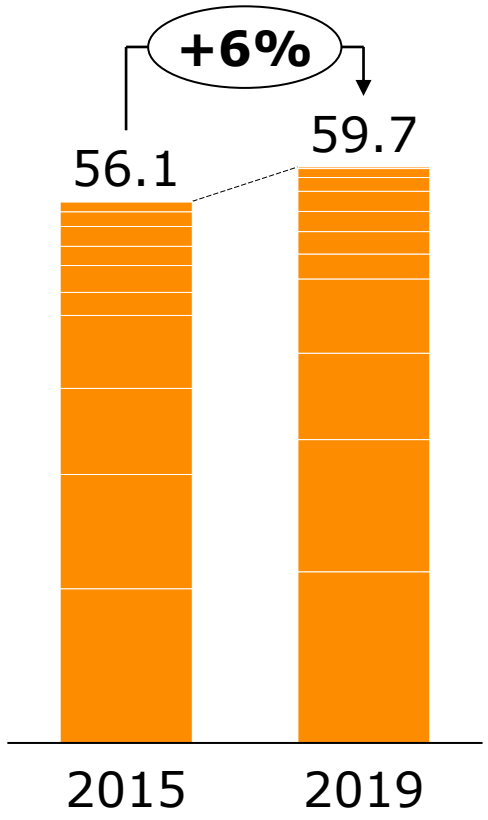


Source: Capterio; FlareIntel Pro

3 The narrative is also increasingly about accountability and delivery

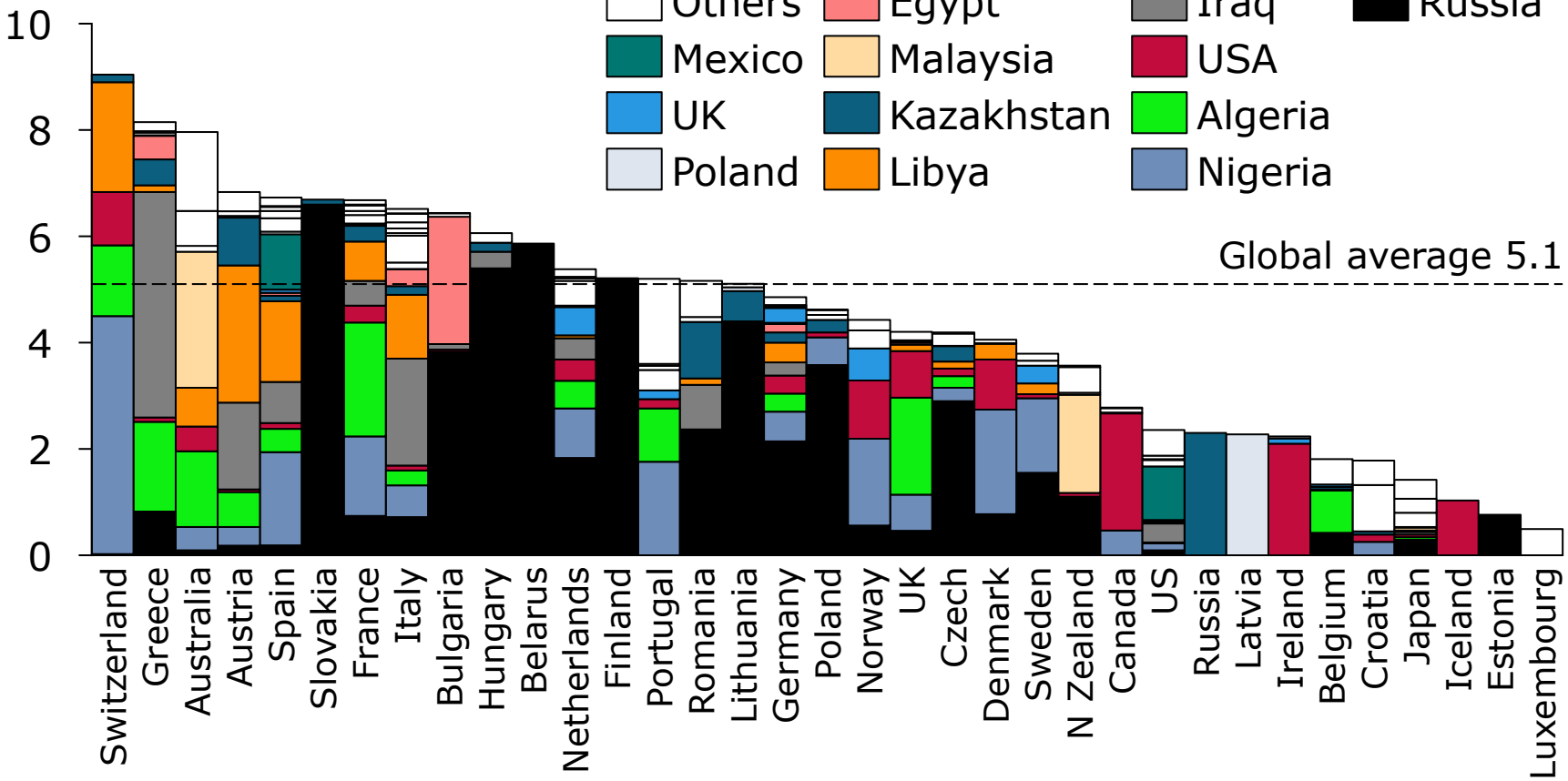
Flaring is up since Paris … despite commitments

Flaring, BCM per year



… and consumers are increasingly aware of their embedded emissions and will pay a premium for low-carbon products

Embedded flaring m^3 per barrel

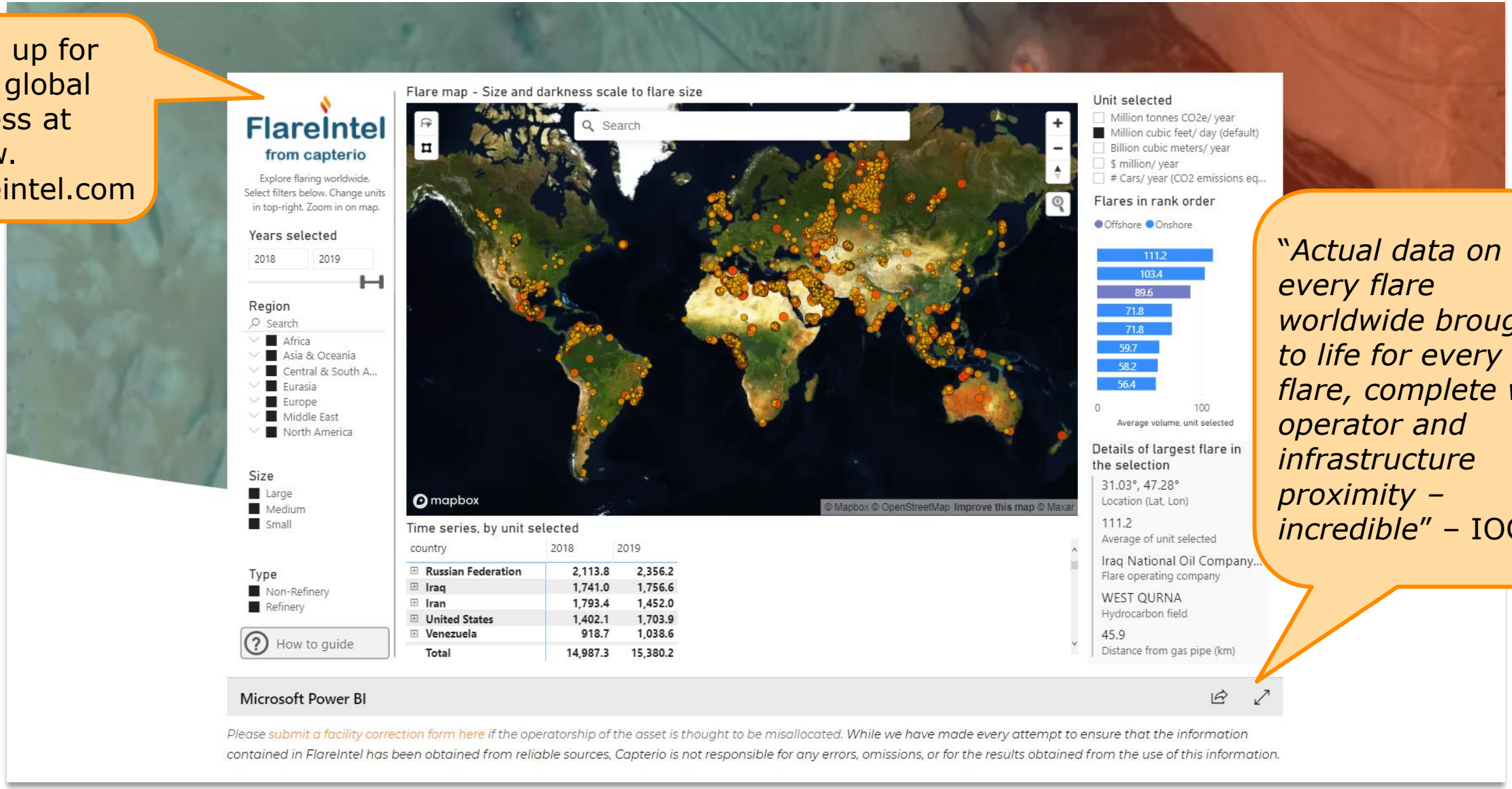


Source: World Bank Gas Flaring Report (2021); Capterio analysis

3 You can use *FlareIntel* to accelerate accountability now

FlareIntel

Sign up for free global access at www.flareintel.com



"*Actual data on every flare worldwide brought to life for every flare, complete with operator and infrastructure proximity – incredible*" – IOC

Source: Capterio; FlareIntel Pro

In summary – much of the world's flaring can be solved and we look forward to accelerating the pace of change

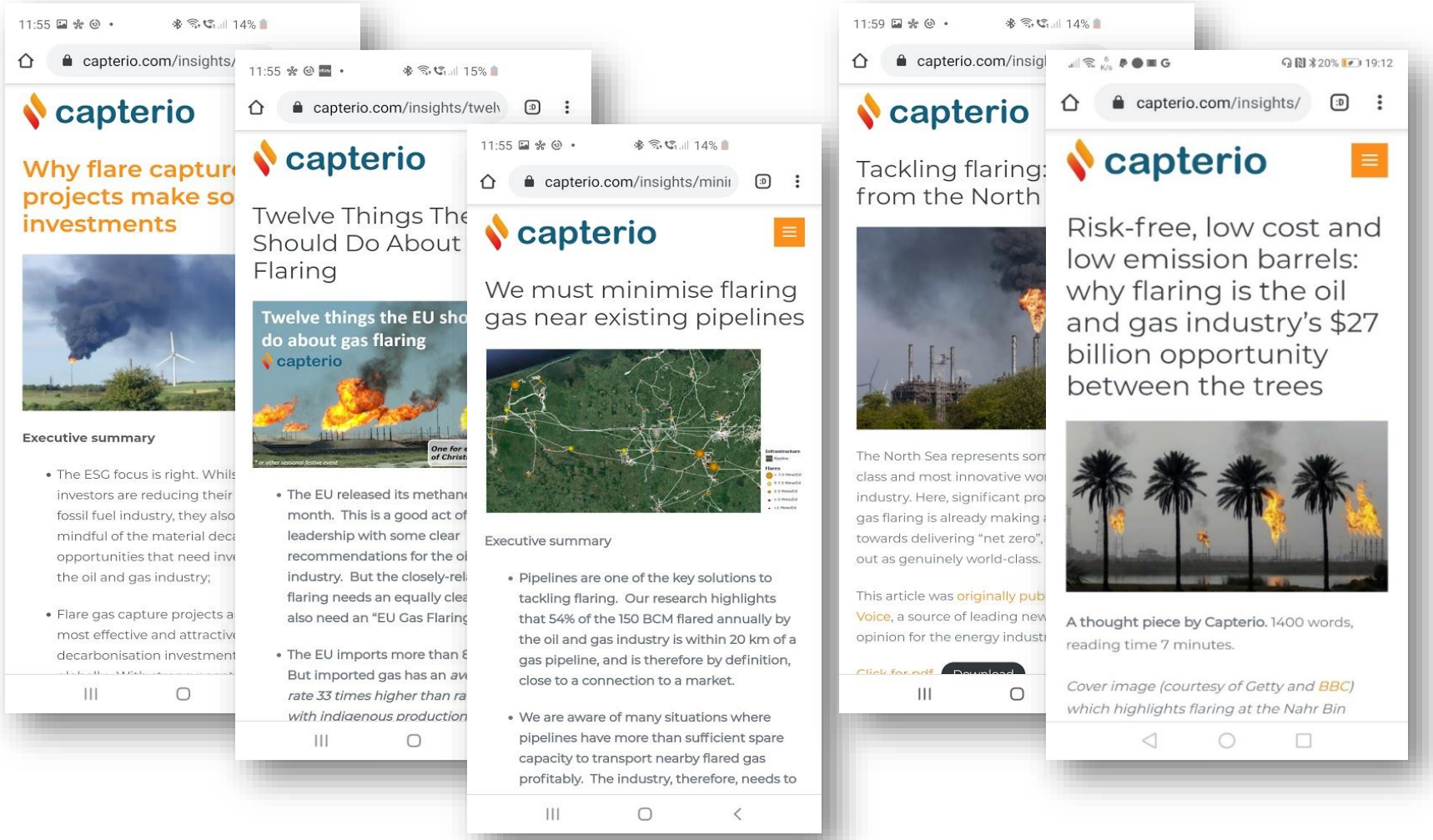
We've discussed three questions today …	…. and have some clear answers
What is flaring and why does it happen?	Deliberate burning of natural gas due to market/system failures
What can be done to reduce flaring?	Use data to identify investment opportunities and track change. Deploy proven technology with new innovative business models
How do we mobilise change?	Show the benefits, celebrate success – and scale – and ensure accountability

Sign up for free global access at www.flareintel.com

Source: Capterio

Your also might find our many "thought pieces" interesting to read www.capterio.com/insights

Capterio insights



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Source: Capterio

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