



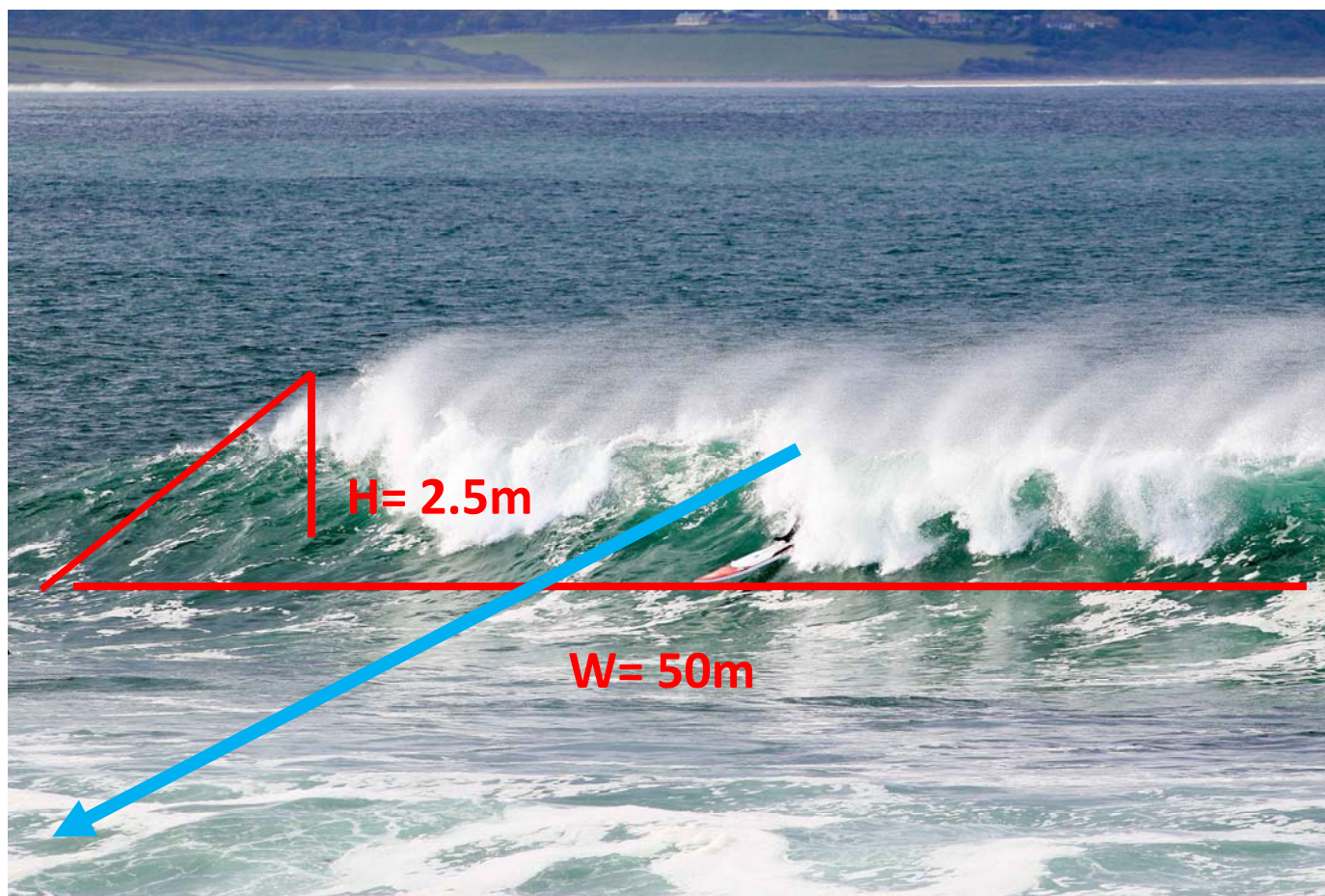
Marine Energy

Koos Uneken – Senior Project Manager

INTRODUCTION

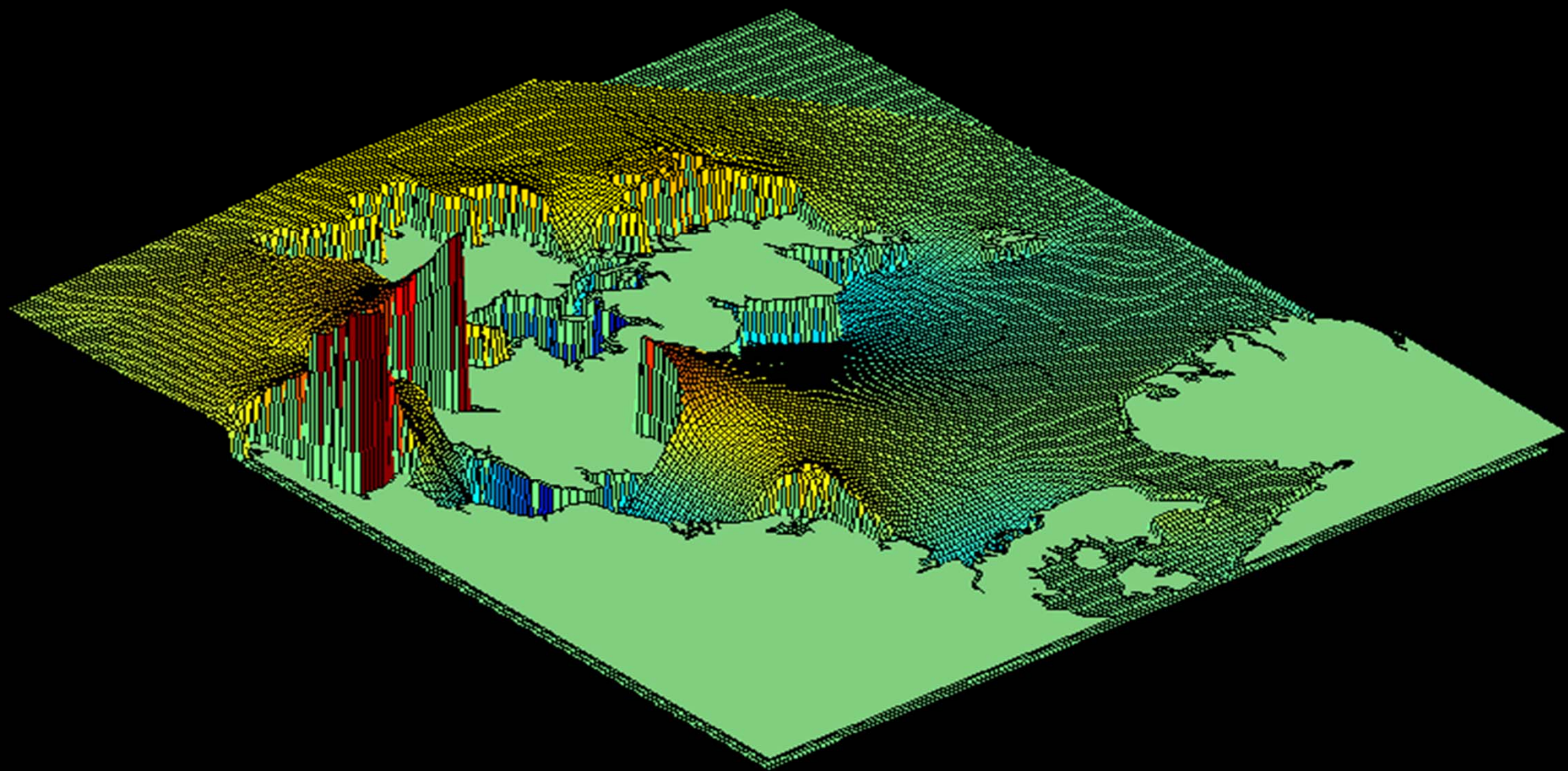


INTRODUCTION



- 540 m³ water
 - 15km/h
 - = 540 tonnes
 - = 12 trucks

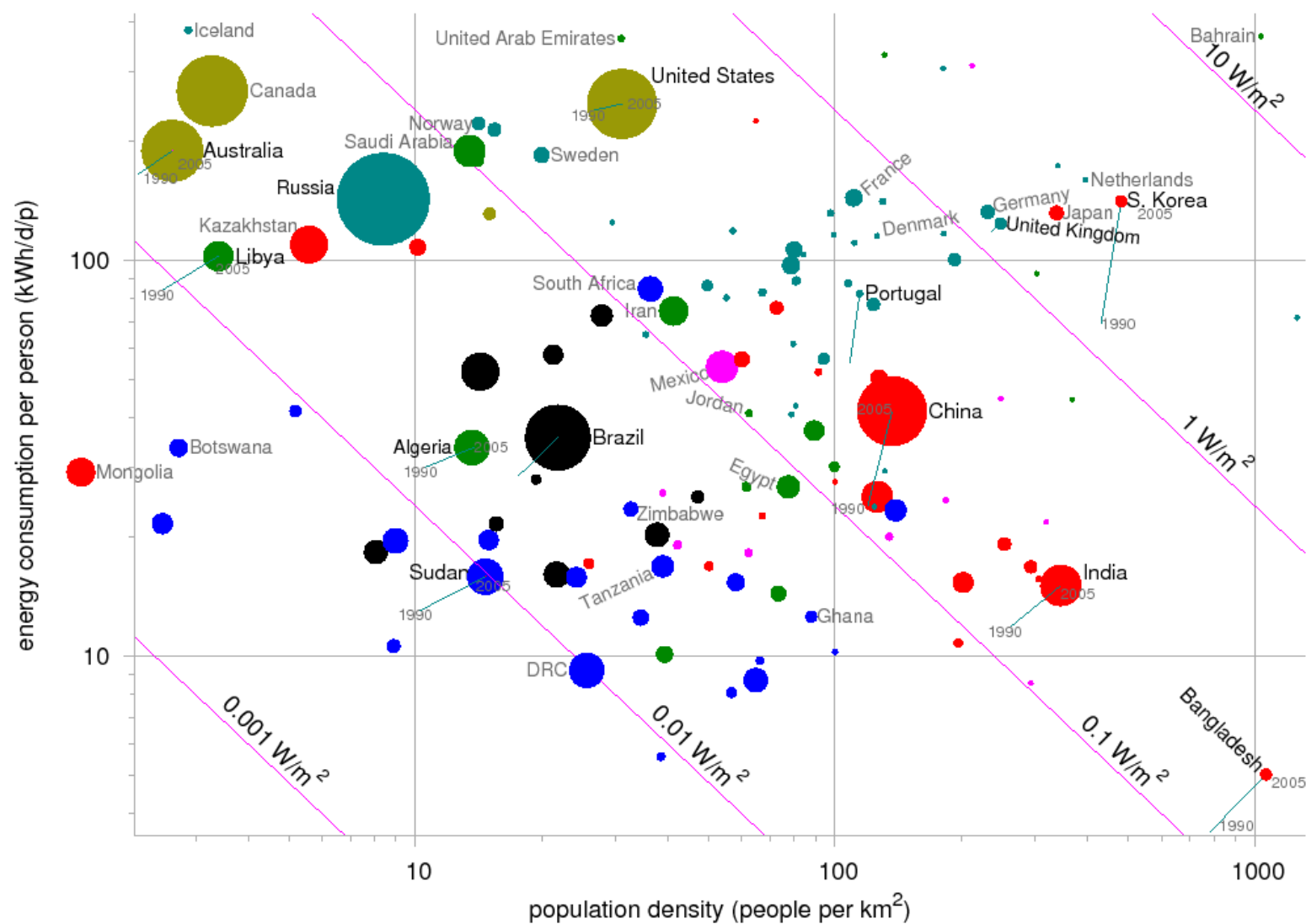




INTRODUCTION

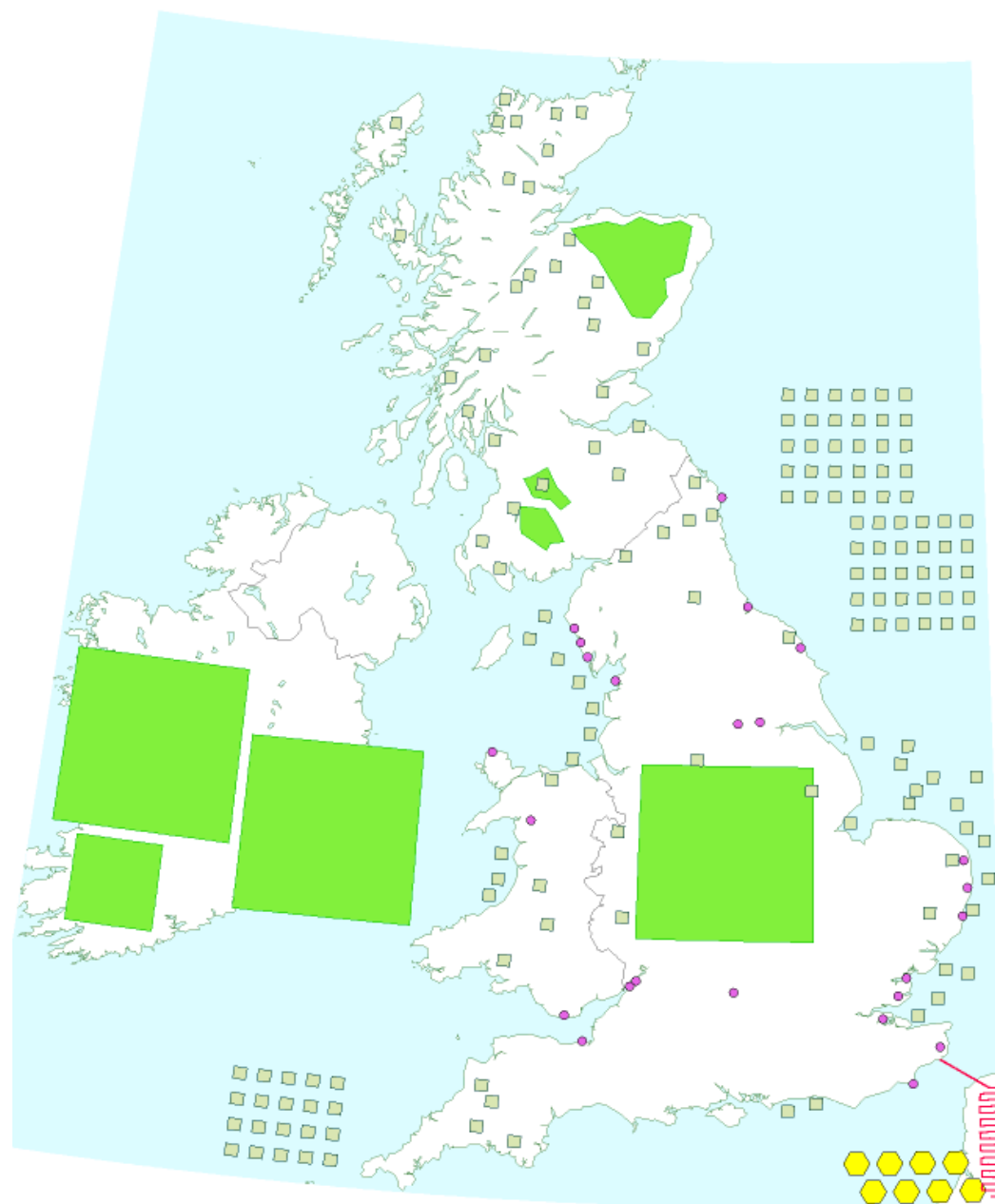


ENERGY DENSITY



ENERGY DENSITY

Wind	2.5 W/m^2
Plants	0.5 W/m^2
Solar PV panels	$5\text{--}20 \text{ W/m}^2$
Tidal pools	3 W/m^2
Tidal stream	8 W/m^2
Rain-water (highlands)	0.24 W/m^2
Concentrating solar power (desert)	$15\text{--}20 \text{ W/m}^2$



Wind:
16 kWh/d/p

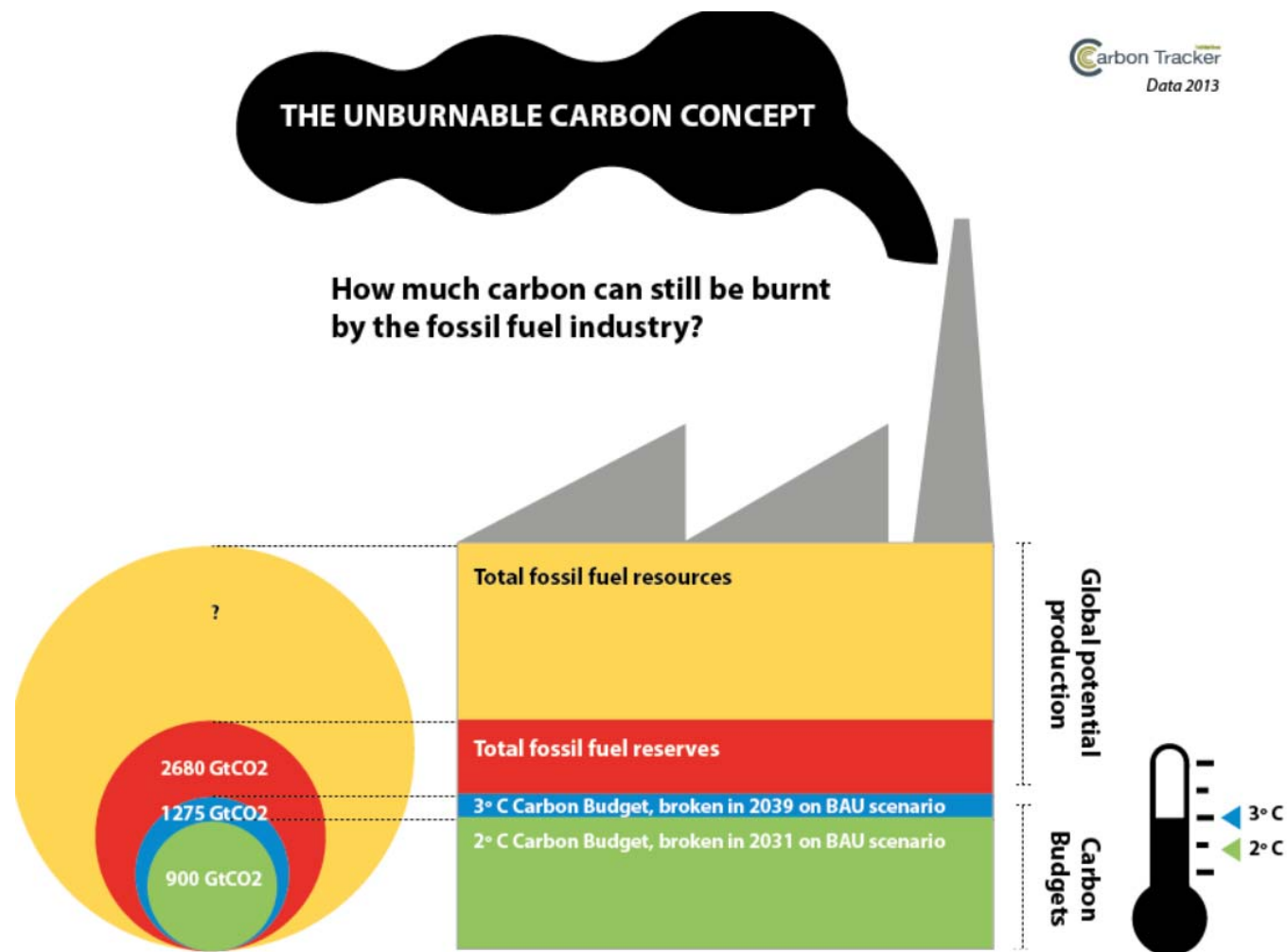
Nuclear:
16 kWh/d/p

Biomass:
16 kWh/d/p

Solar in
deserts:
16 kWh/d/p

THE LAST BARREL OF OIL WILL BE VERY EXPENSIVE

STRANDED ASSETS



SHIFT PARADIGM



BP Bosses Get Public Grilling on Climate From Largest Investors

Bloomberg | 21 mei 2019

BP Plc lined the road leading to its annual shareholder gathering in Scotland's oil capital with hoardings touting investments in renewable energy. Inside the meeting, there was a fierce debate on whether the energy major was telling the truth.

About 99% of BP's shareholders passed a resolution at the AGM asking the company to

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Norway's Equinor steers clear of binding targets in new climate pledge

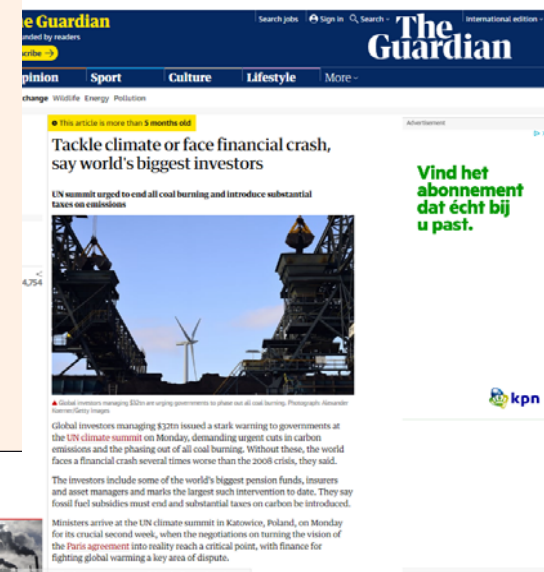


© Bloomberg

Anjli Raval and Owen Walker in London APRIL 24, 2019

Norwegian energy major Equinor has made new pledges to align its business with the Paris climate goals amid pressure from investors but fell short of promising binding long-term targets.

Under the 2015 Paris deal, almost 200 countries agreed to limit the global



WHERE WILL CAPITAL GO

Bloomberg



Markets

Norway's \$1 Trillion Fund Wins Go-Ahead for Oil Stock Divestment

By Mikael Holter and Sveinung Sleire

June 12, 2019, 1:00 AM GMT+2 Updated on June 12, 2019, 4:31 PM GMT+2

- An estimated \$7.5 billion in oil stocks slated for sale
- Norway to also dump more coal stocks and emerging market debt

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WTI Crude	53.32	↑1.39 +2.60%
Generic 1st XOV Future	71.65	↓0.00 -0.00%
ROYAL DUTCH SH-A	2,548.00	↓91.00 -3.53%

Norway's \$1 trillion sovereign wealth fund got the green-light to dump more than \$13 billion in stocks linked to fossil fuels as well as a broad range of emerging-market bonds.


With broad support, parliament on Wednesday approved a spate of changes, including a watered down plan to dump oil explorers and producers that spares the biggest global petroleum companies such as Royal Dutch Shell Plc and Exxon Mobil Corp.

It's nonetheless a milestone for western Europe's biggest oil-producing country and the global investment community. The decision has also been seized on by climate activists eager to choke off capital to fossil fuel producers.

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World's Most Powerful Nation to Do With Norway's \$1 Trillion Fund




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Fiat Chrysler pools fleet with Tesla to avoid EU emissions fines

Tough new targets for average CO2 output from cars will be introduced next year

Patrick McGee in Frankfurt and Peter Campbell in London APRIL 7, 2019

125



Fiat Chrysler Automobiles has agreed to pay Tesla hundreds of millions of euros so the electric carmaker's vehicles are counted in its fleet in order to avoid large fines for breaking tough new EU emissions rules.

The move will allow FCA to offset CO2 emissions from its cars against Tesla's, lowering its average figure to a permissible level. From next year, the EU's target for average CO2 emissions from cars is 95g per kilometre.

In 2018, average emissions were 120.5g per kilometre, according to data supplier Jato Dynamics. FCA averaged 123g last year, according to UBS, which said the carmaker had the "highest risk of not meeting the target".

Analysts at Jefferies forecast FCA could face fines in excess of €2bn in 2021 when the new targets become law. A study by PA Consulting last year said

FT GLOBAL PHARMACEUTICAL & BIOTECHNOLOGY CONFERENCE

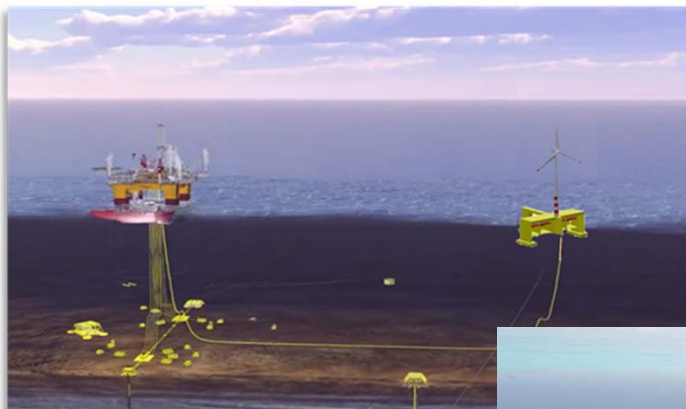
11-12 November 2019 | London

REGISTER NOW

SUBSIDIES

Governments shall not penalize (tax CO₂ emission) but incentivize renewable energy (provide feed-in tariffs)

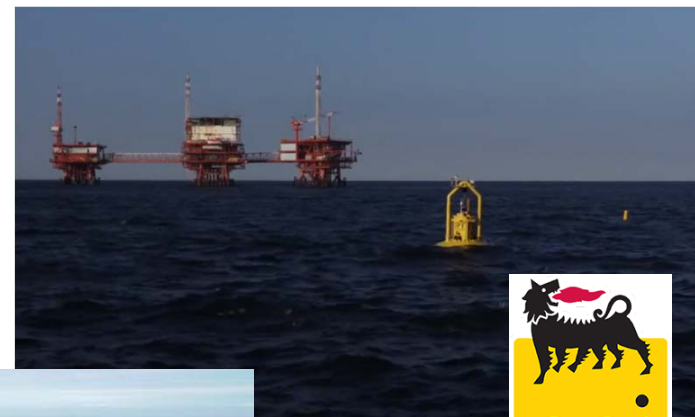
SHIFT OF PARADIGM



Equinor
accounts for 50
USD per CO₂
tonnes for each
investment
decision



Johan Sverdrup will become one of the most carbon-efficient oil and gas fields in the world.







SPATIAL PLANNING

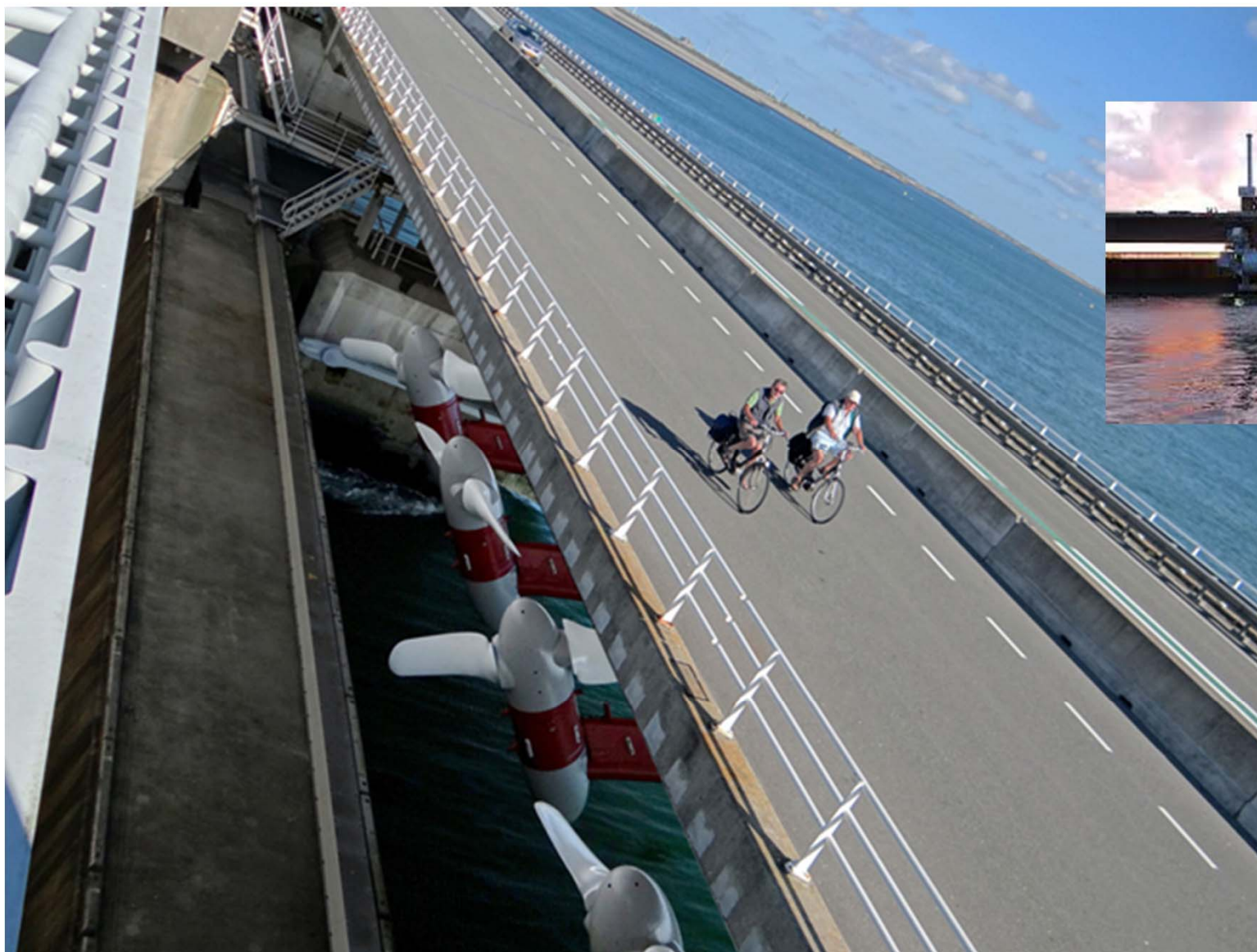
Investors will only step into Ocean Energy projects when those projects are embedded in national and regional spatial plans for long periods



Windparken Noordzee

-  Bestaande windparken
-  Windenergiegebieden 2023





Concept: Energising Deltas

