



FS Club
News Events Partnerships



FS Club



Cracking Down On Greenwashing With Satellite & Ground Sensor Networks

Tac Leung, CEO, Secured Carbon

Professor Paul Palmer, Group Leader and Professor of Quantitative Earth Observation, The University of Edinburgh

Tuesday, 10 January 2023



A Word From Today's Chairman

Simon Mills
Associate
Z/Yen Group





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Today's Agenda



- 16:00 – 16:05 Chairman's Introduction
- 16:05 – 16:25 Keynote Presentation – Tac Leung & Professor Paul Palmer
- 16:25 – 16:45 Question & Answer



Today's Speakers



Tac Leung

CEO

Secured Carbon



Professor Paul Palmer

Group Leader and Professor of
Quantitative Earth Observation

The University of Edinburgh



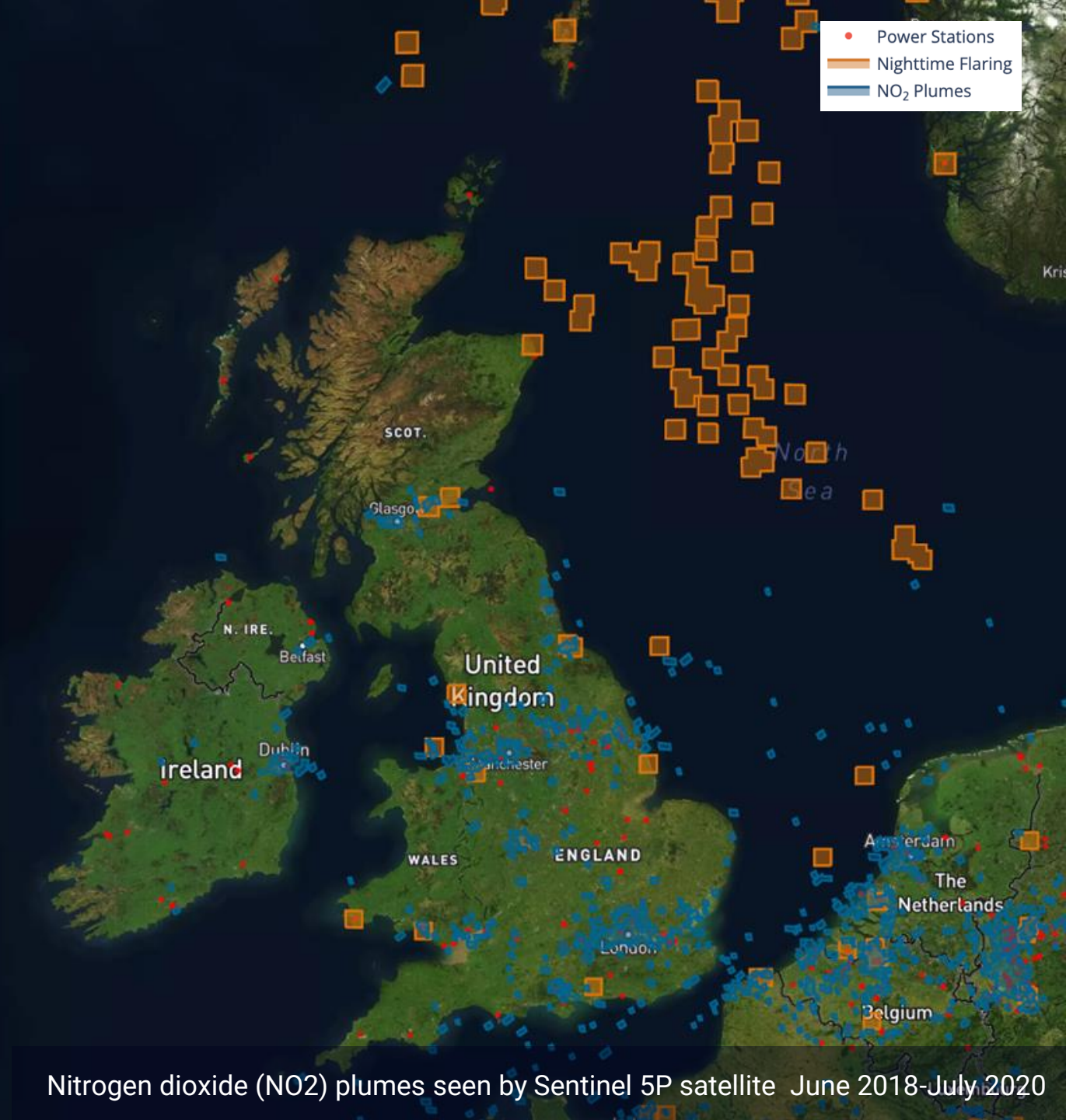
Webinar

Cracking Down On Greenwashing With Satellite & Ground Sensor Networks

10 January 2023
16:00 - 16:45 GMT

Tac Leung
CEO
Secured Carbon

Prof Paul Palmer
Group Leader and Professor of
Quantitative Earth Observation



Nitrogen dioxide (NO₂) plumes seen by Sentinel 5P satellite June 2018-July 2020



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monitors and verifies
greenhouse gas emissions



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decarbonisation projects

Environment

Finance



BondMiner®
issues performance green
bonds



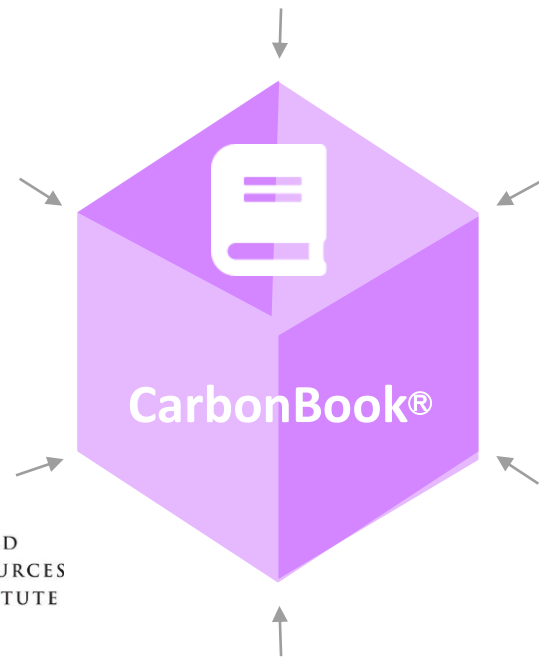
RedNote®
reports rogue
greenhouse gas emissions



OffsetMiner®
issues decarbonisation offsets



Net Zero Data Quality



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“The problem is that the criteria and benchmarks for net zero commitments have varying levels of rigor and loopholes wide enough to drive a diesel truck through.”

UN Secretary General
COP 27 in November 2022





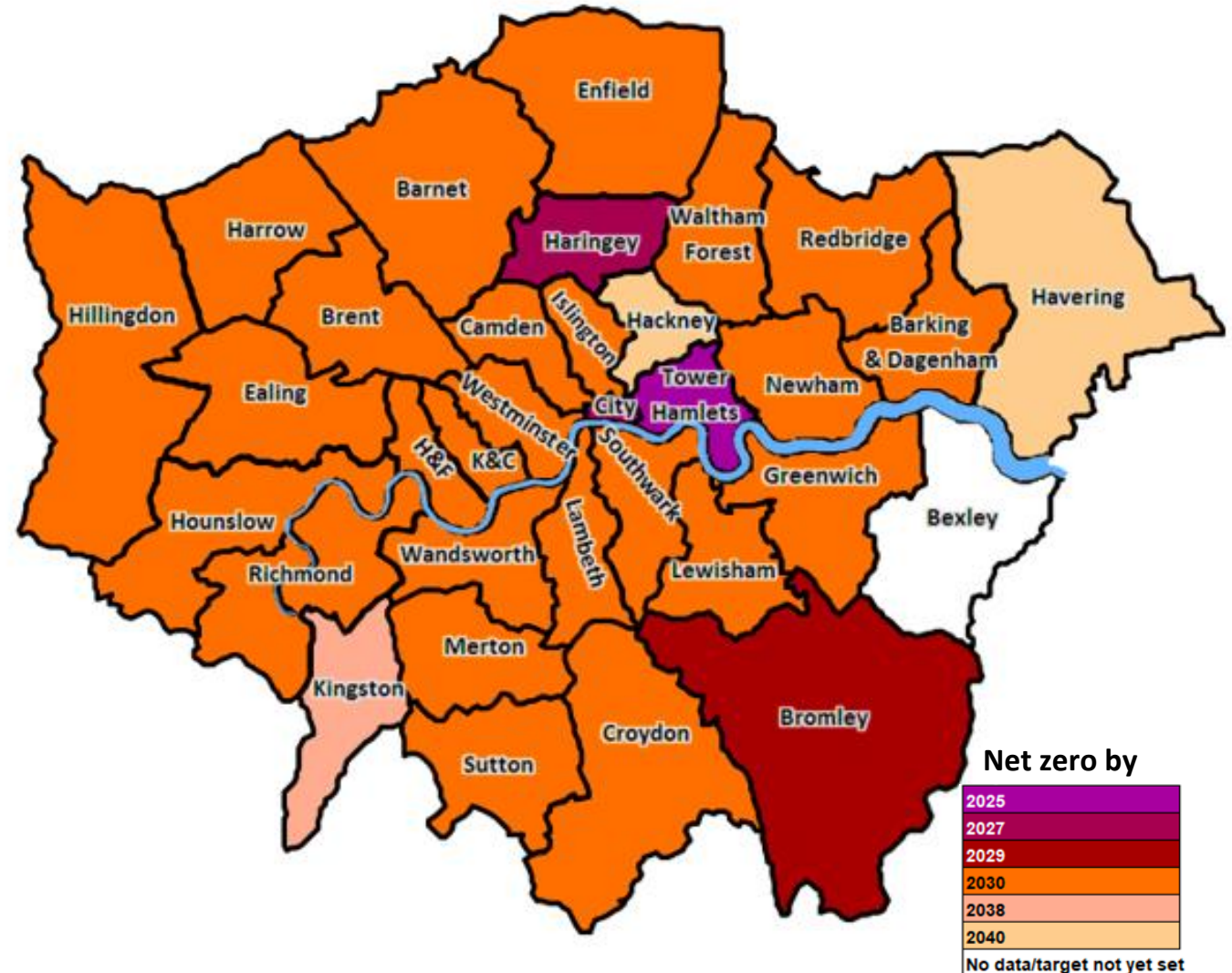
Poll 1

When is your net zero target?

- 2025
- 2027
- 2029
- 2030
- 2038
- 2040
- No data/target not yet set

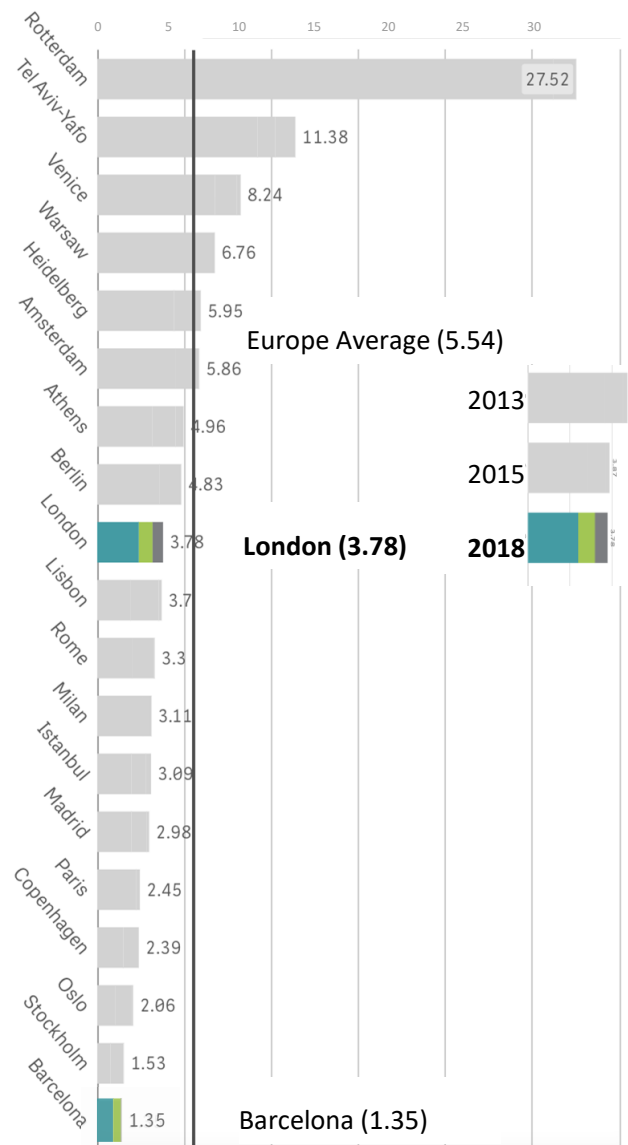
Sadiq Khan sets target for London to be net zero carbon by 2030

- Nearly 40 per cent reduction in the total heat demand of buildings
- Over 2 million homes and a 0.25 of a million non-domestic buildings to become properly insulated
- 2.2 million heat pumps in operation in London by 2030
- 460,000 buildings connected to district heating networks by 2030
- A 27 per cent reduction in car vehicle km travelled by 2030
- Fossil fuel car and van sales ended by 2030



London 2018 benchmark

Self-reported tons CO2e per capita



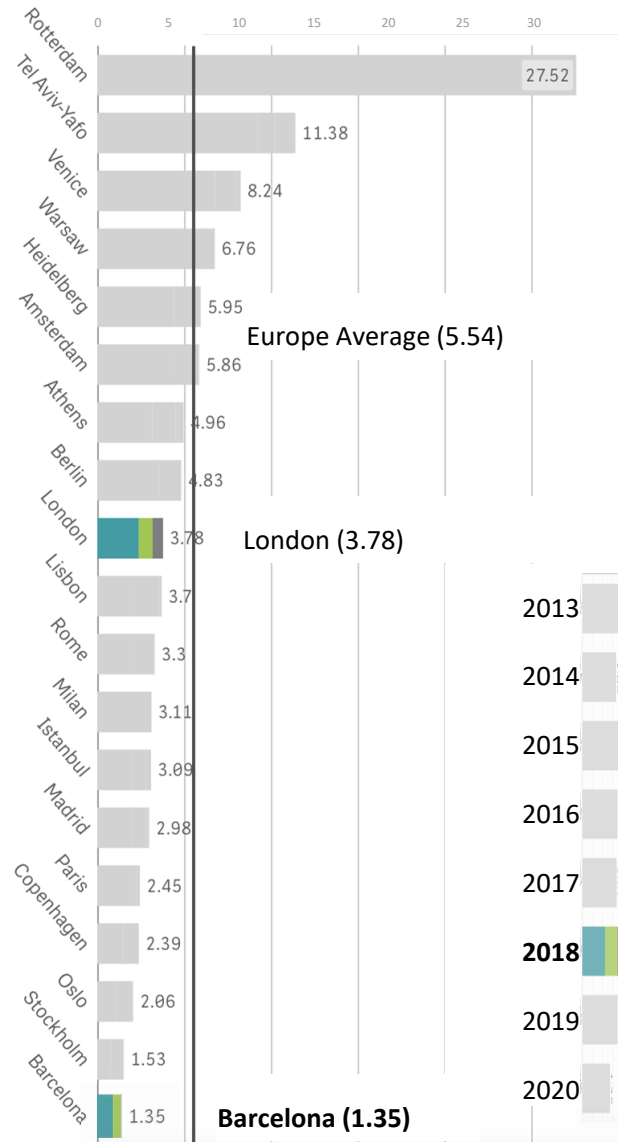
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	Scope 1	Scope 2	Scope 3
London	2.3	1.0	0.5
■ Stationary	1.4	1.0	0.0
Residential buildings	0.8	0.3	0.0
Commercial and institutional building and facilities	0.2	0.3	0.0
Manufacturing industries and construction	0.0	0.0	0.0
Energy industries	0.1	0.0	0.0
Agriculture, forestry and fishing activities	0.0	0.0	0.0
Non-specified sources	0.3	0.4	0.0
Fugitive emissions from mining, processing, storage and transportation of coal	0.0	0.0	0.0
Fugitive emissions from oil and natural gas systems	0.0	0.0	0.0
■ Transport	0.7	0.1	0.0
On-road transportation	0.7	0.0	0.0
Railways	0.0	0.1	0.0
Waterborne navigation	0.0	0.0	0.0
Aviation	0.0	0.0	0.0
Off-road transportation	0.0	0.0	0.0
■ Waste	0.1	0.0	0.5
Solid waste disposal	0.1	0.0	0.5
Biological treatment of waste	0.0	0.0	0.0
Incineration and open burning	0.0	0.0	0.0
Wastewater treatment and discharge	0.1	0.0	0.0

Barcelona 2018 benchmark

Self-reported tons CO2e per capita



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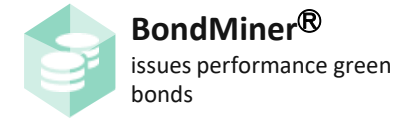
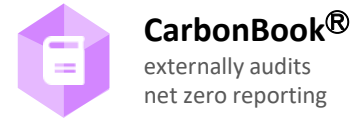
	Scope 1	Scope 2	Scope 3
Barcelona	1.3	0.4	0.0
Stationary	0.7	0.4	0.0
Residential buildings	0.3	0.1	0.0
Commercial and institutional building and facilities	0.2	0.3	0.0
Manufacturing industries and construction	0.1	0.0	0.0
Energy industries	0.0	0.0	0.0
Agriculture, forestry and fishing activities	0.0	0.0	0.0
Non-specified sources	0.0	0.0	0.0
Fugitive emissions from mining, processing, storage and transportation of coal	0.0	0.0	0.0
Fugitive emissions from oil and natural gas systems	0.0	0.0	0.0
Transport	0.6	0.0	0.0
On-road transportation	0.6	0.0	0.0
Railways	0.0	0.0	0.0
Waterborne navigation	0.0	0.0	0.0
Aviation	0.0	0.0	0.0
Off-road transportation	0.0	0.0	0.0
Waste	0.0	0.0	0.0
Solid waste disposal	0.0	0.0	0.0
Biological treatment of waste	0.0	0.0	0.0
Incineration and open burning	0.0	0.0	0.0
Wastewater treatment and discharge	0.0	0.0	0.0



“in 42% of cases the claims were exaggerated, false or deceptive and could potentially qualify as unfair commercial practices under EU rules.”

Source: European Commission study Screening of websites for ‘greenwashing’: half of green claims lack evidence.

 The problem 2
Greenhouse gas impact accounting has gaps



Climate Bonds INITIATIVE

More Than 40% Of Issuers Don't Report Green Bond Impact Metrics

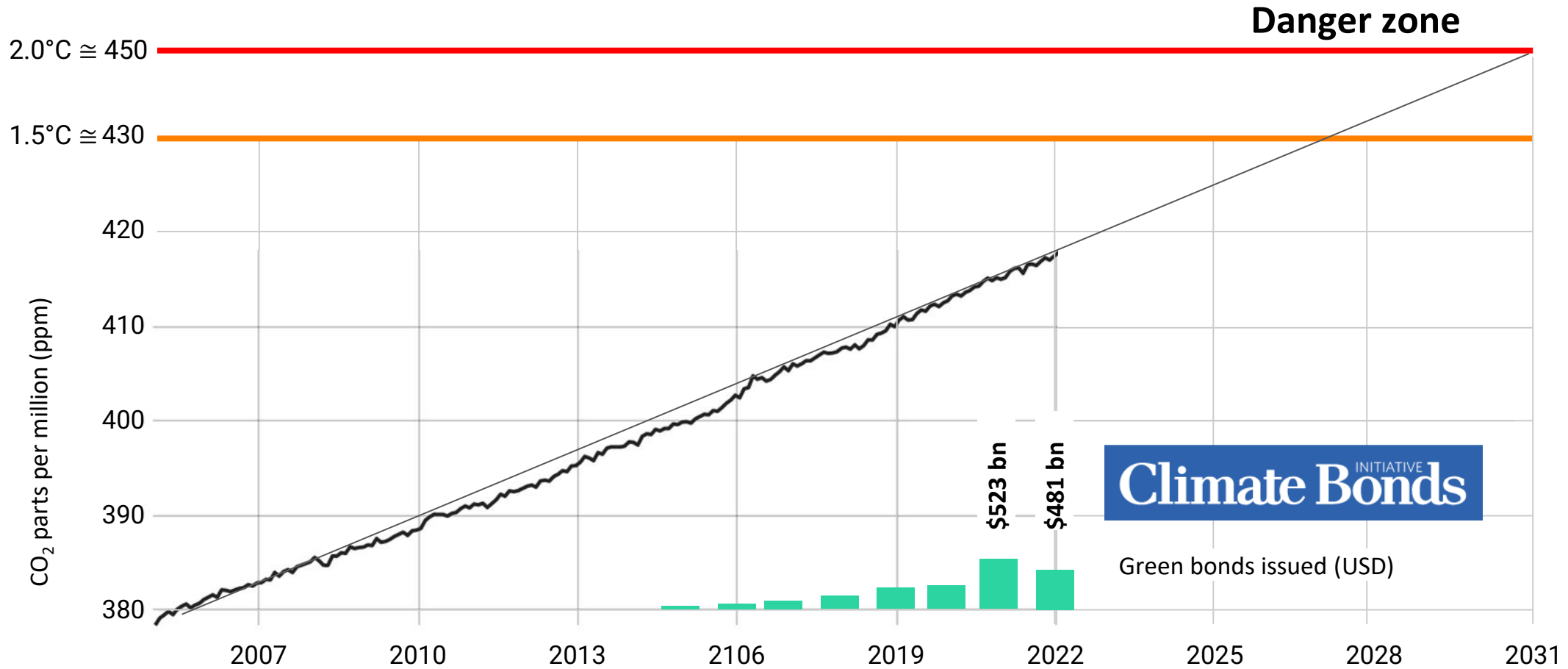
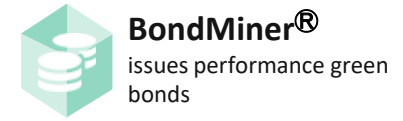
Green bond reporting by type

	Reporting scope			
	Use of proceeds	Impact	Both	At least one
Number of issuers (reporting %)	77%	59%	57%	79%
Number of bonds (reporting %)	77%	63%	62%	78%
Amount issued in USD bil. (reporting %)	88%	74%	73%	88%

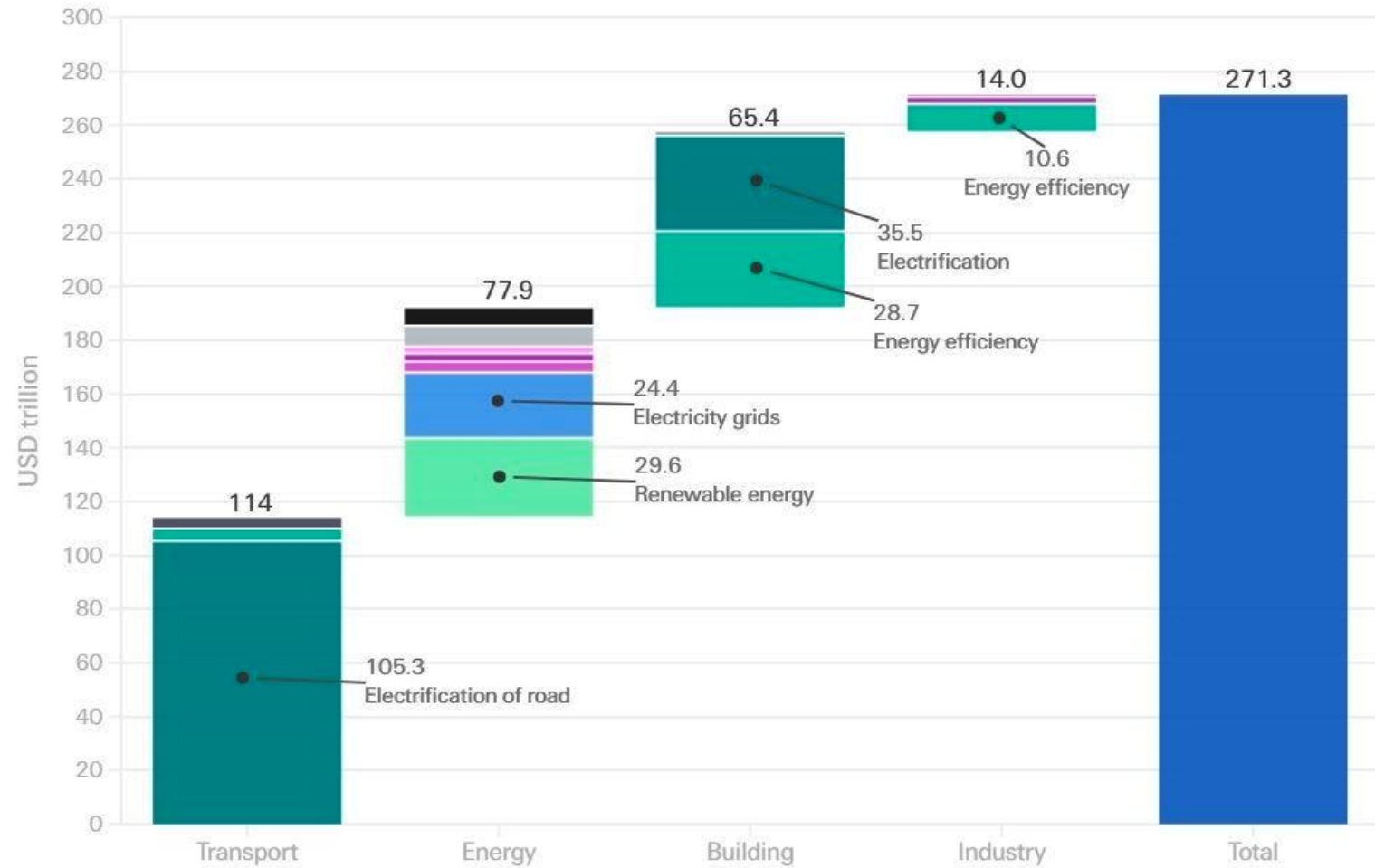
Source: Climate Bonds Initiative.

The problem 3


Climate and investment feedback loops are disconnected



Investment gap by sector and decarbonisation lever (in USD trillion)



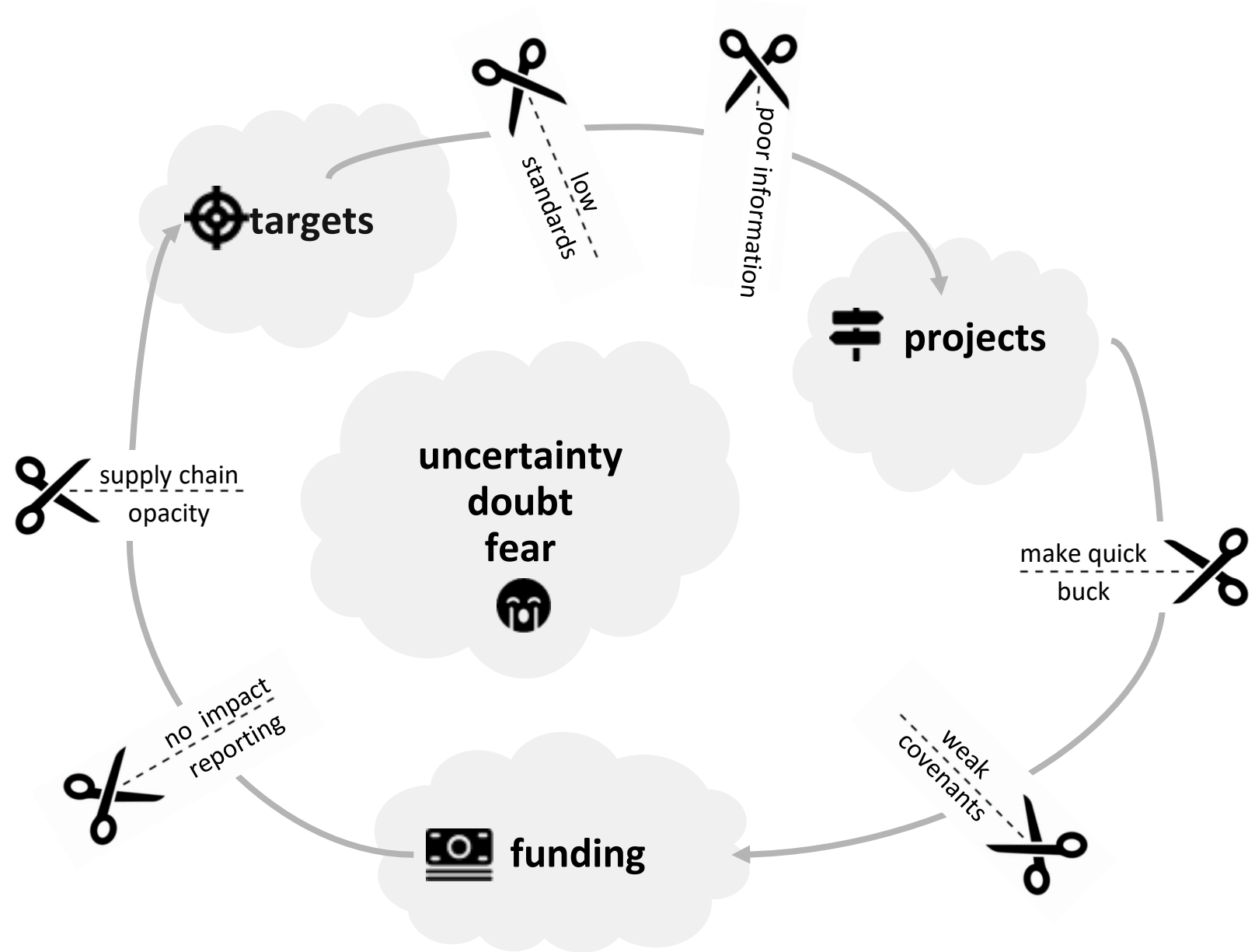
Source: Swiss Re Institute


 **The problem 4**
Carbon reduction
investment gap

Poll 2

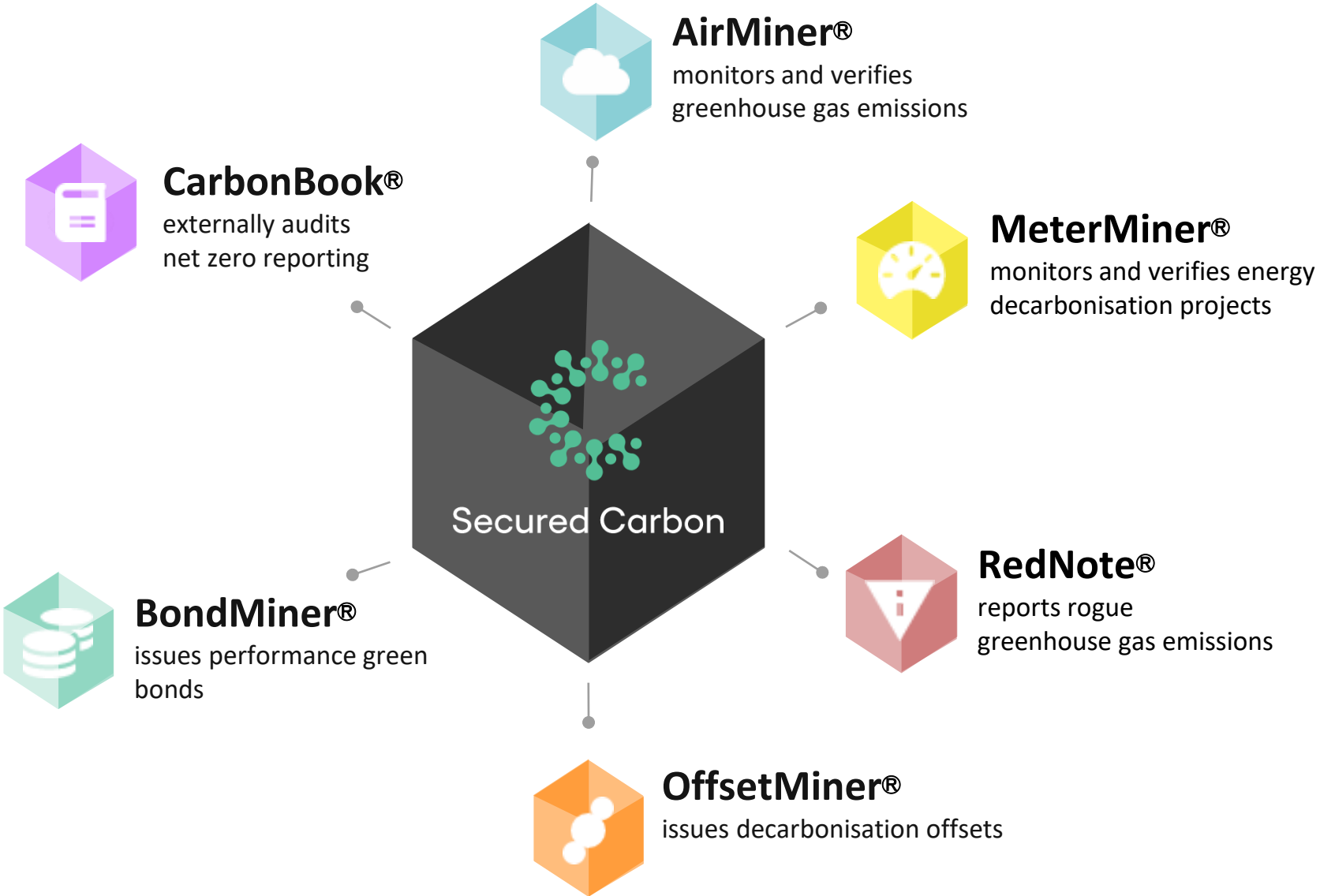
Are you invested in net zero?

- Bought green bonds
- Bought carbon offsets
- Upgraded to electric car
- Upgraded to heat pump
- Switched to green energy Other
-



 The problem 5
Investor confidence

The solution



Net Zero Data Quality



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monitors and verifies energy decarbonisation projects



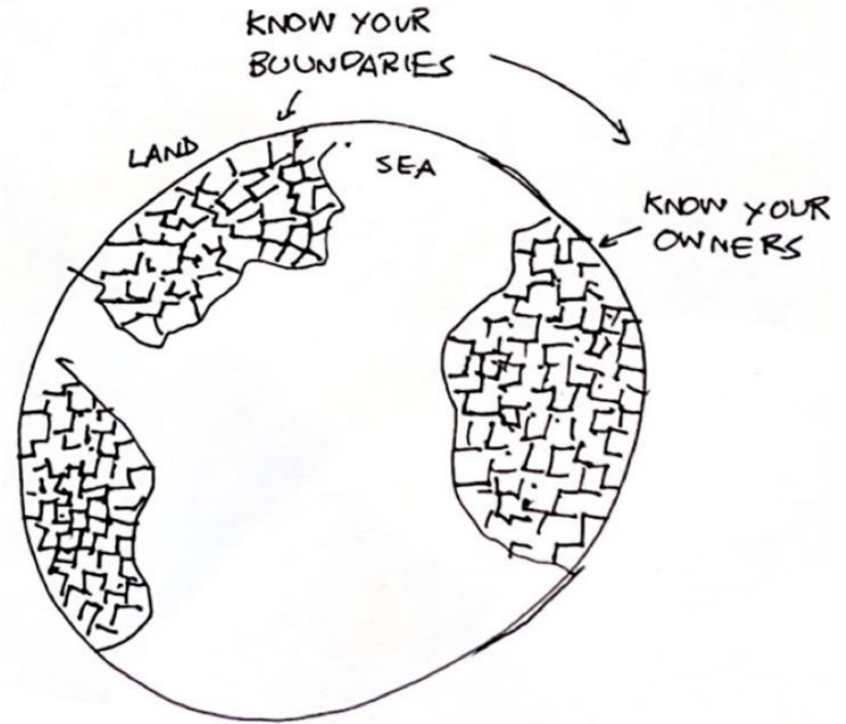
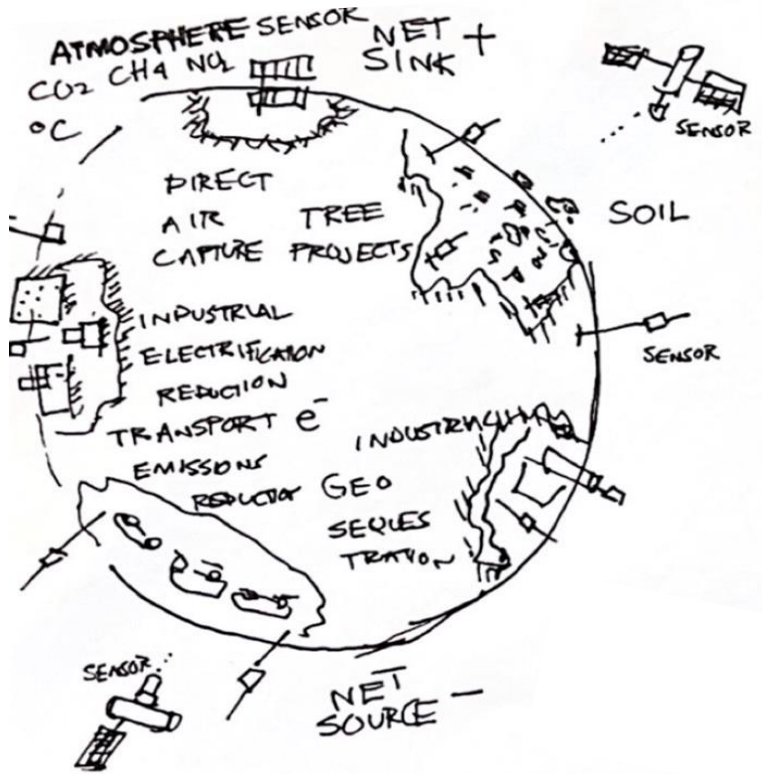
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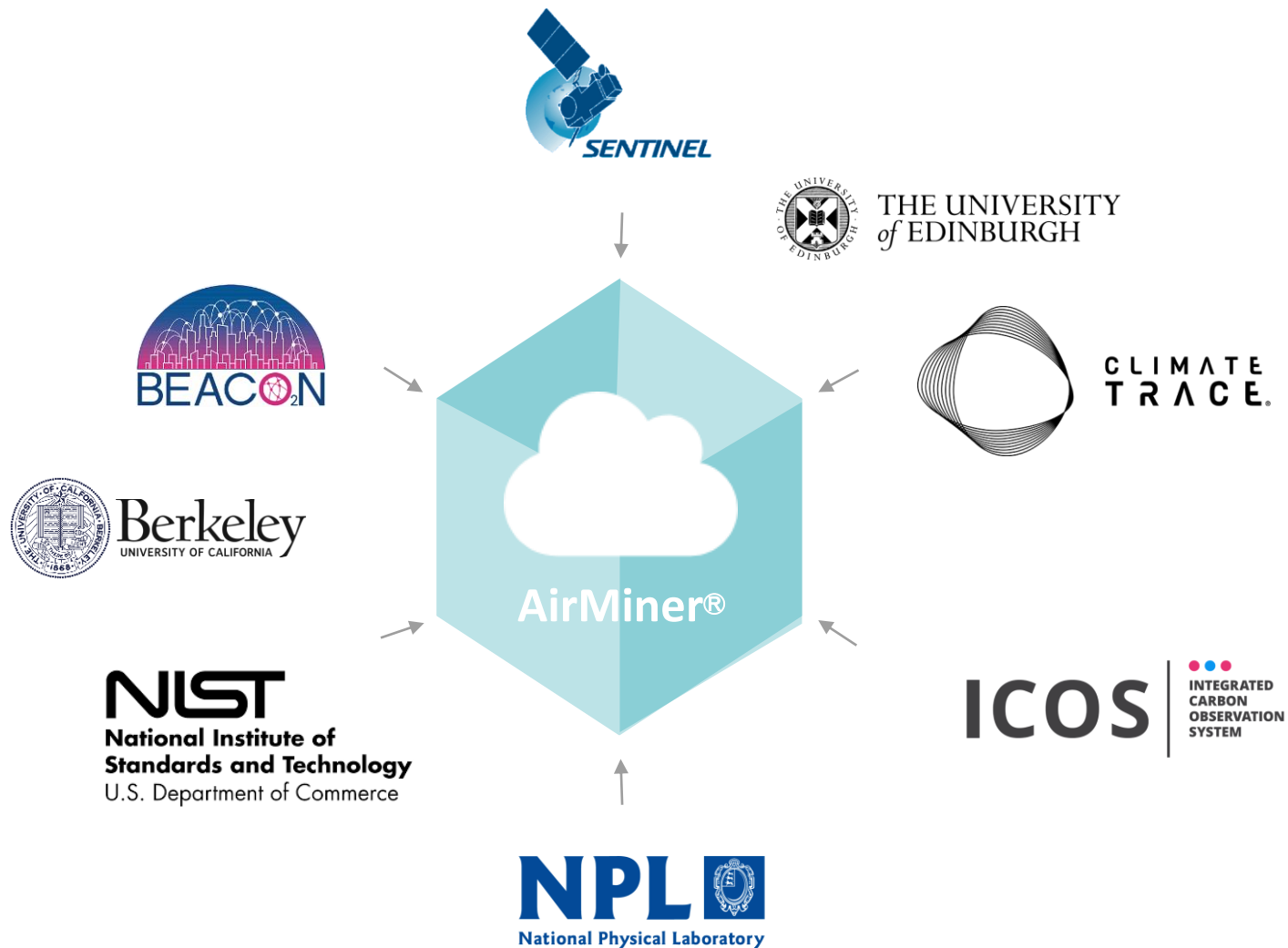


RedNote®
reports rogue greenhouse gas emissions



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Net Zero Data Quality Assurance



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GDP to Air mapping 101



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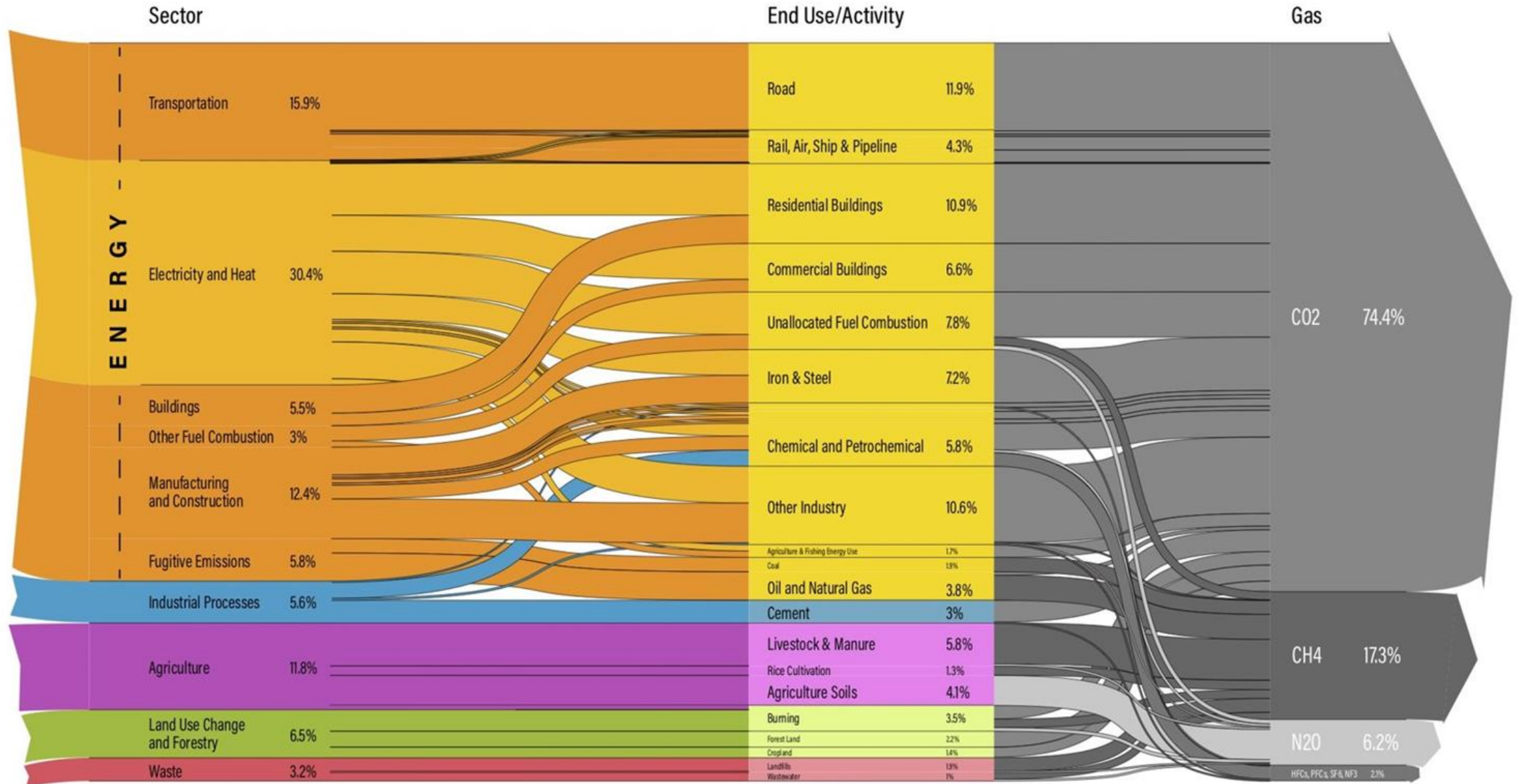
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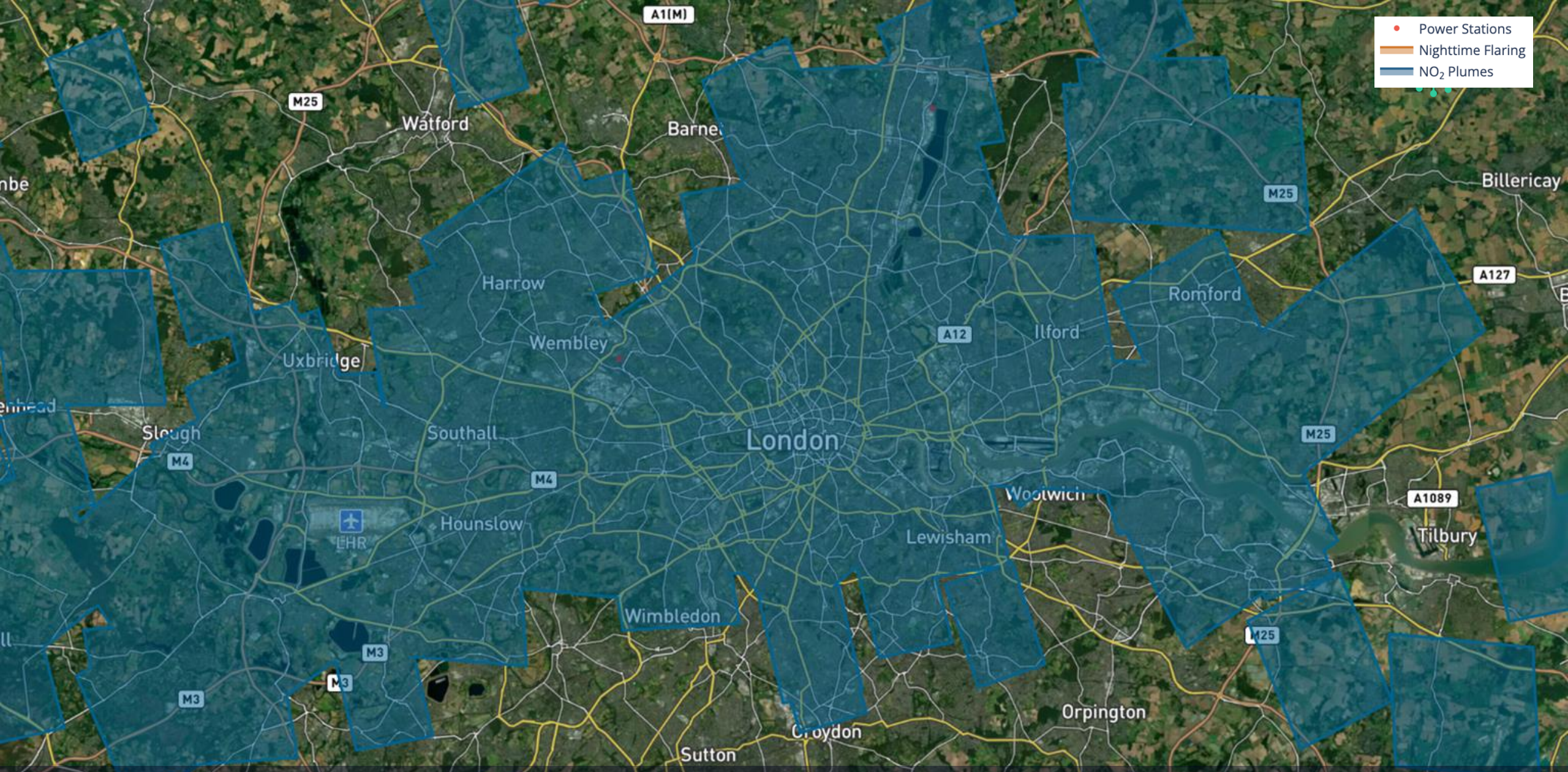
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RESOURCES
INSTITUTE**



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Carbon**



- Power Stations
- Nighttime Flaring
- NO₂ Plumes



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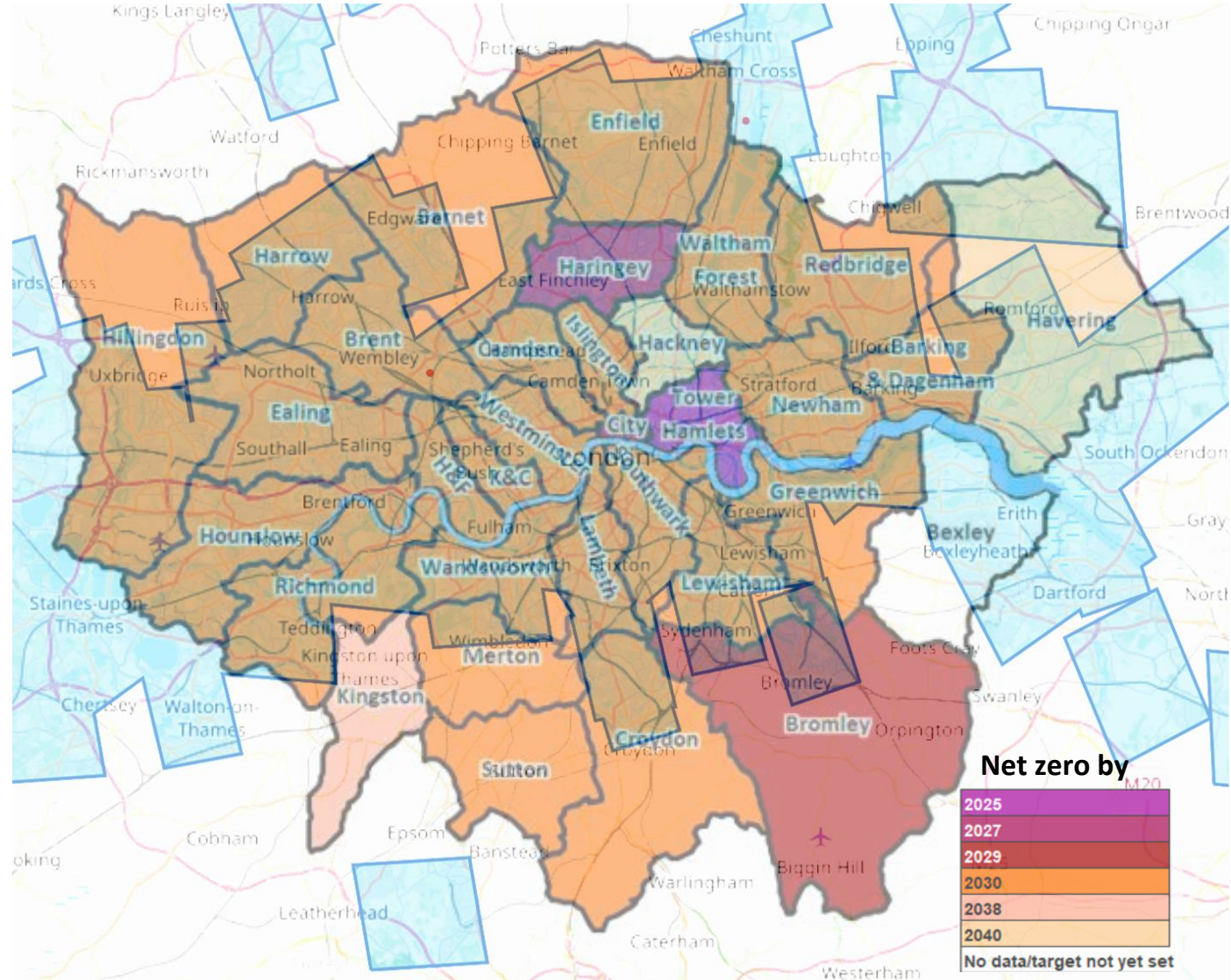
THE UNIVERSITY
of EDINBURGH



NO₂ plumes show combustion hotspots 2018-2020

Sadiq Khan sets target for London to be net zero carbon by 2030

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- Over 2 million homes and a 0.25 of a million non-domestic buildings to become properly insulated
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NO₂ plumes show combustion hotspots 2018-2020

- Power Stations
- Nighttime Flaring
- NO₂ Plumes



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monitors and verifies greenhouse gas emissions

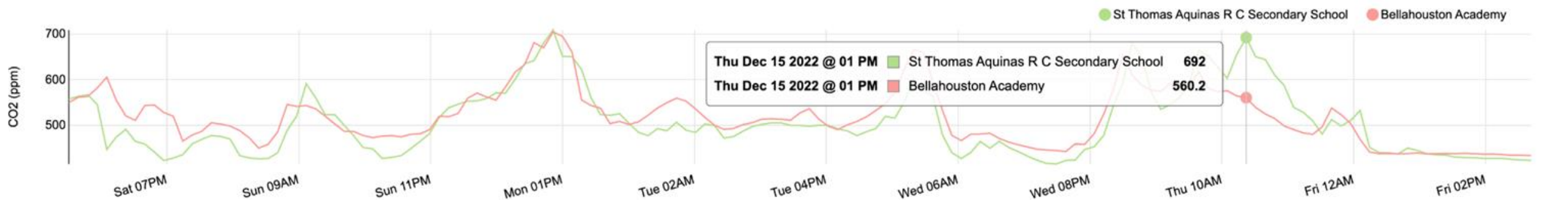
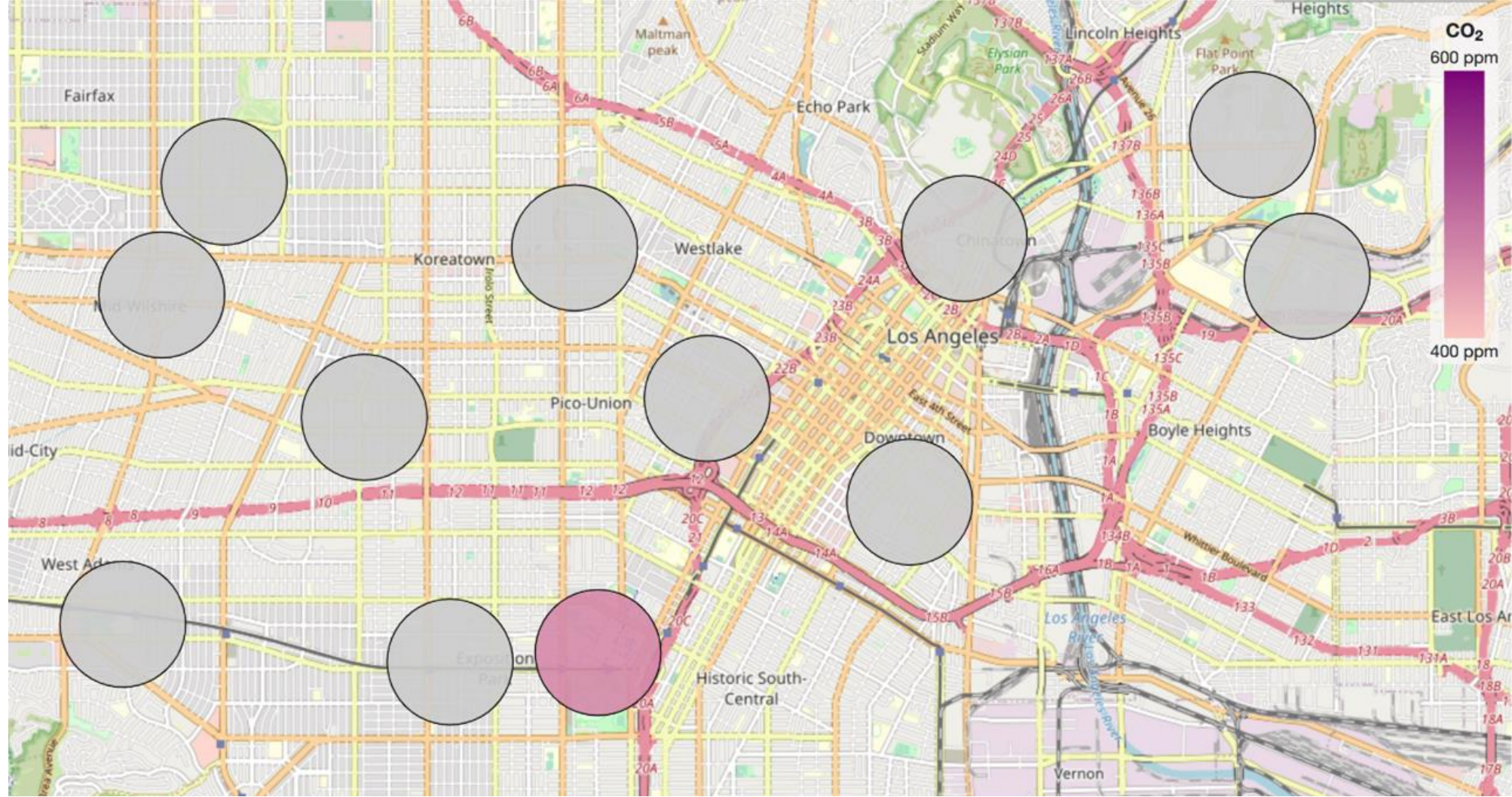


BEACON



Berkeley
UNIVERSITY OF CALIFORNIA

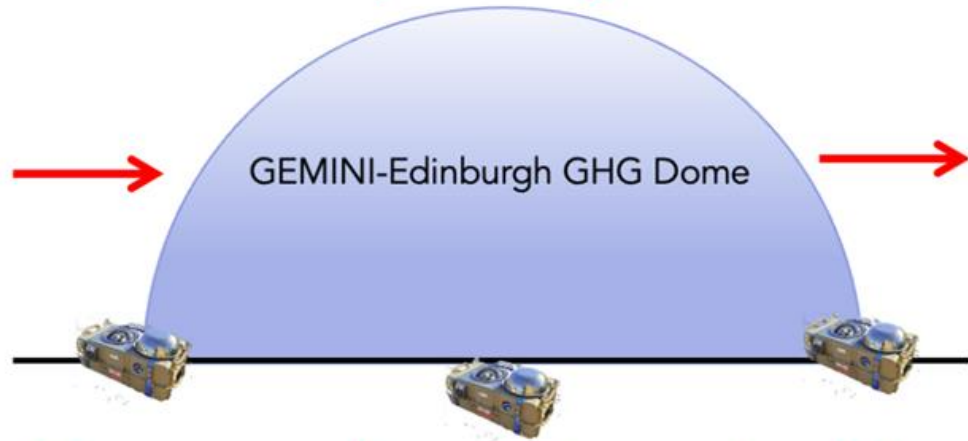
Berkeley Environmental
Air Quality CO₂ Network
Los Angeles



GEMINI: Greenhouse gas Emissions Monitoring network to Inform Net-zero Initiatives for Edinburgh

Calibrated network due to roll out in Autumn 2023

Dome concept for CO₂ and methane



What goes out - what comes in = net city emissions



Augmented by street-level mapping of GHGs and air pollutants



NRT data streams enabled by 100s of IoT sensors linked via LoRaWAN

Phased roll out from late Spring 2023



Solutions to measure
asset-scale
methane emissions
with
traceable
uncertainties



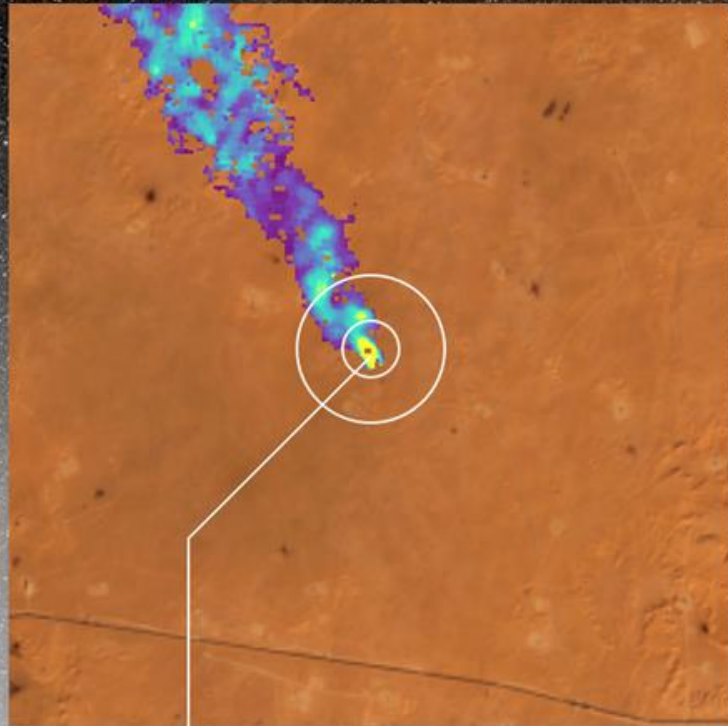
Sentinel
Satellite network



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monitors and verifies
greenhouse gas emissions



Detecting and reporting robust estimates of methane emissions across diverse scenes



North-East Algeria
28/02/2020
6030±826 kg/hr

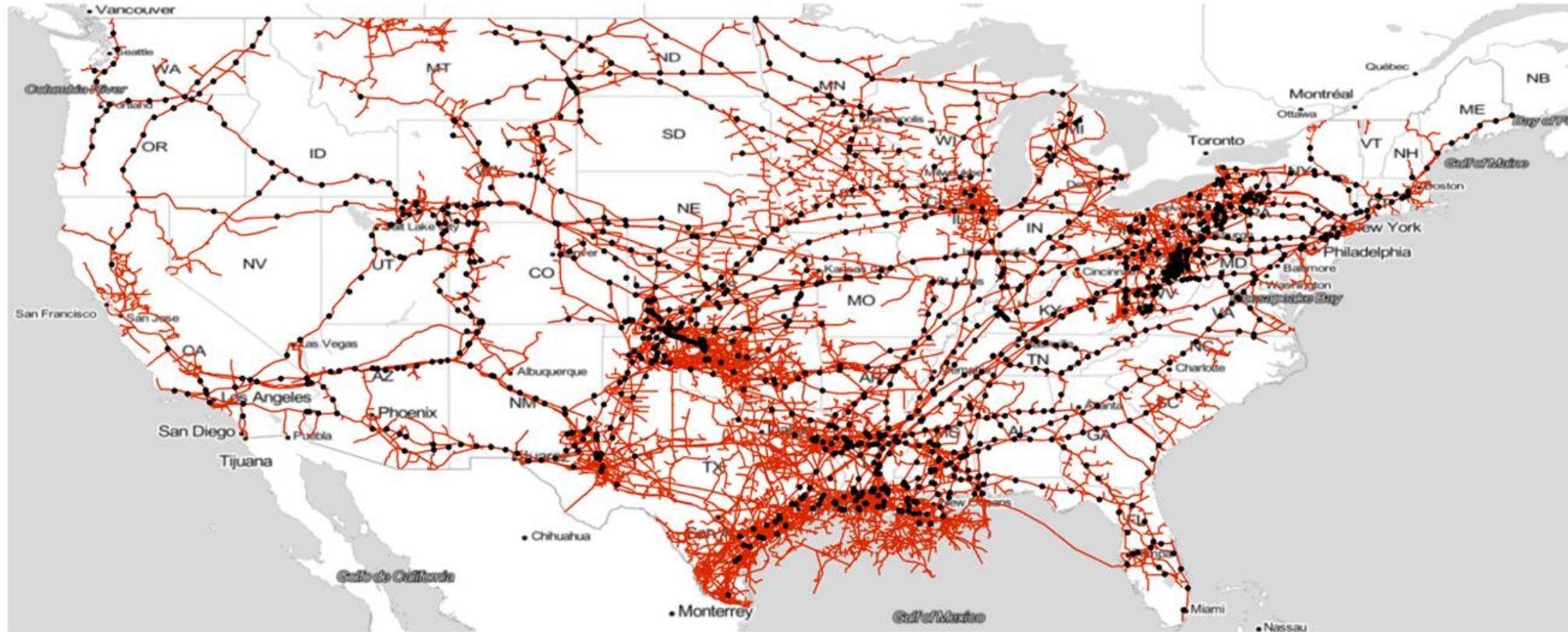
Kansas, United States
03/11/2020
18,526±3094 kg/hr



Zhongwei, China
21/02/2020
5237±775 kg/hr



Gas wells and pipelines over the contiguous US



Source:

- Oil and natural gas wells: <https://hifld-geoplatfrom.opendata.arcgis.com/>
- Natural gas pipelines: <https://hub.arcgis.com/>



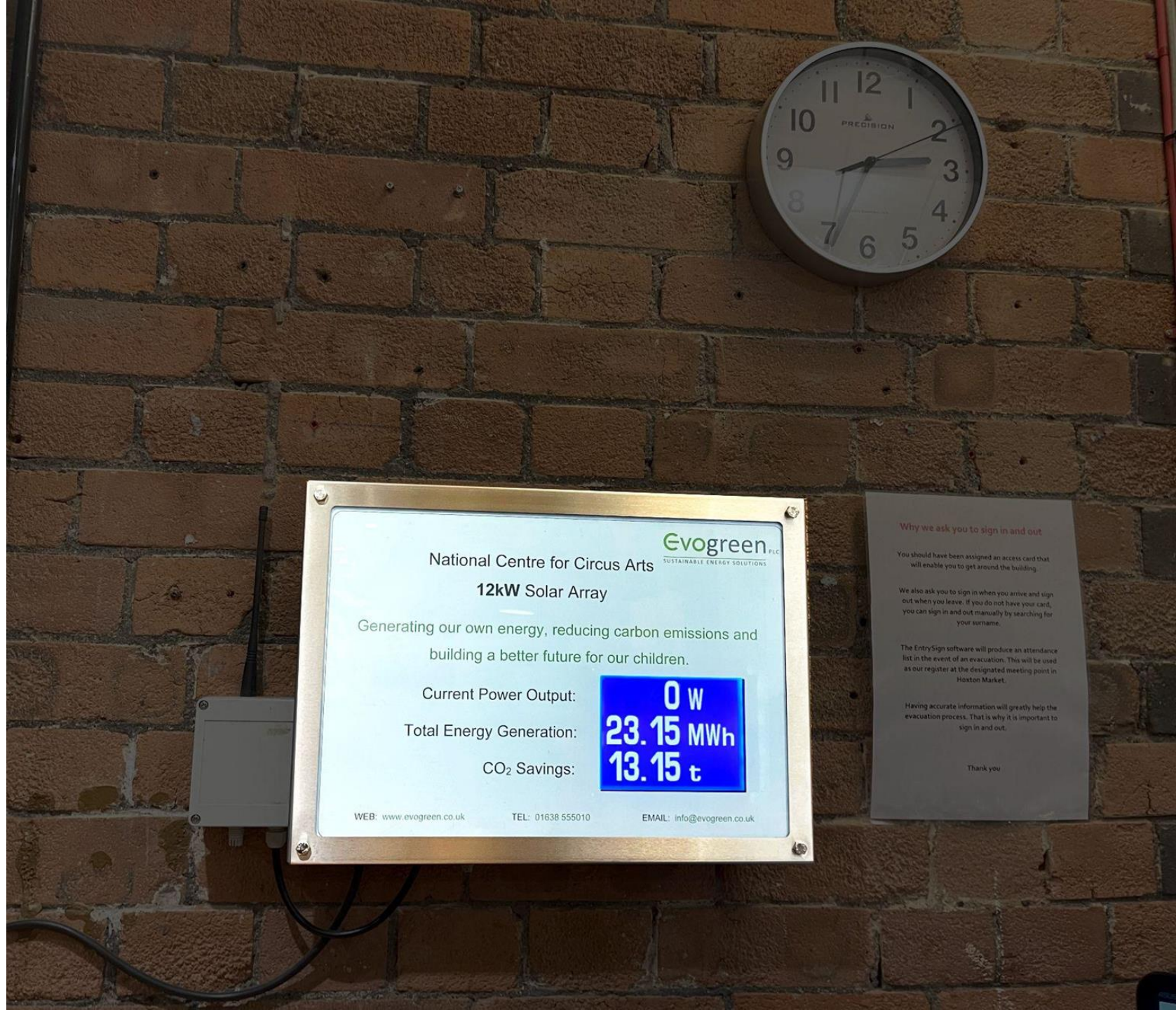
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MeterMiner®

monitors and verifies energy
decarbonisation projects



Poll 3

Which is most useful?

- CarbonBook
- AirMiner
- MeterMiner



MeterMiner®
monitors and verifies energy
decarbonisation projects



AirMiner®
monitors and verifies
greenhouse gas emissions



CarbonBook®
externally audits
net zero reporting



Secured
Carbon

Poll 3



MeterMiner®
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decarbonisation projects



AirMiner®
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greenhouse gas emissions

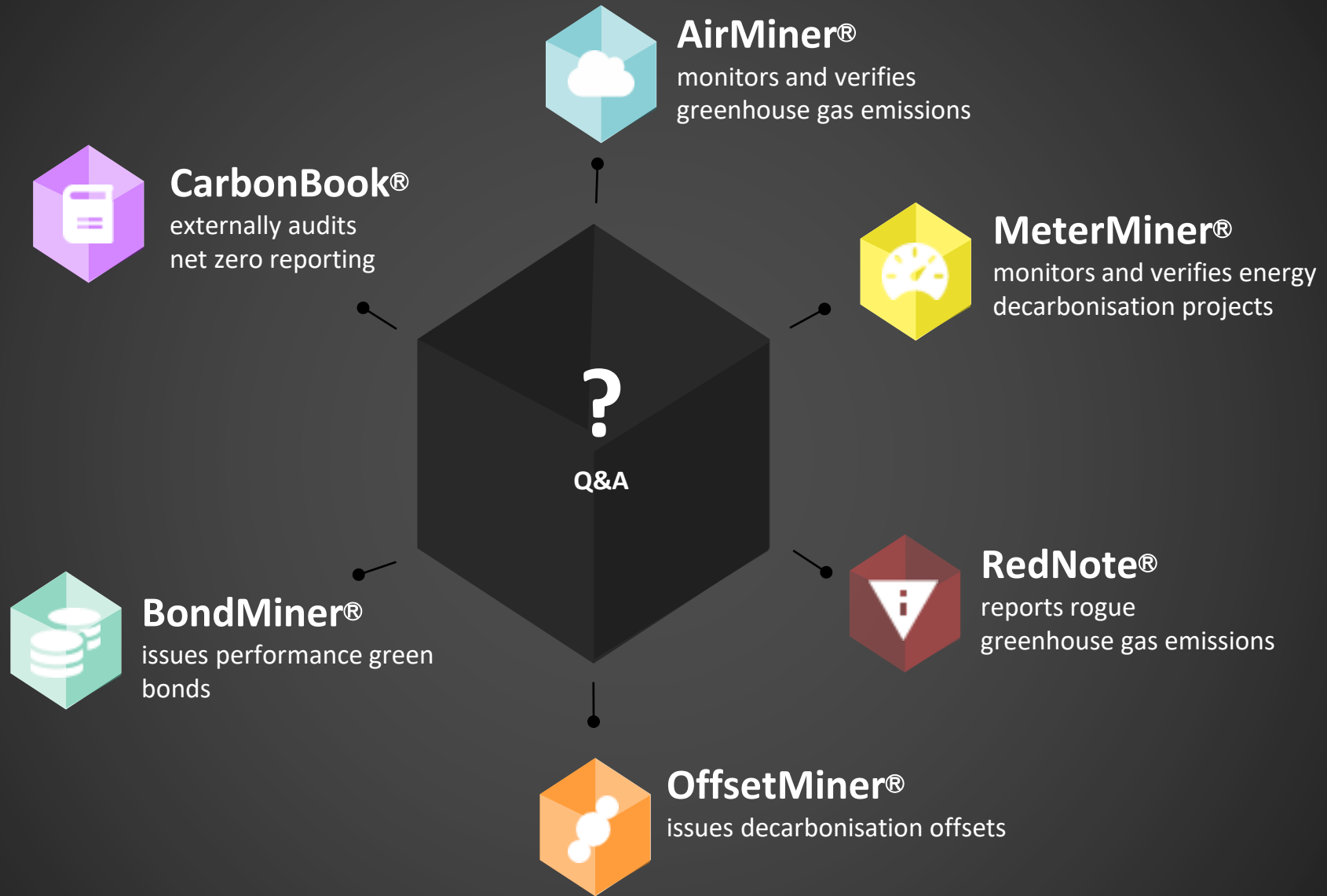


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net zero reporting



Punish rogue CH₄ emitters?

- Large fines in fiat
- Fines in negative carbon credits - \$1600/tonCO₂e
- Fund low-income decarbonisation projects
- Cap with bitcoin miners
- Other





Secured Carbon

COALITION + ACKNOWLEDGMENTS

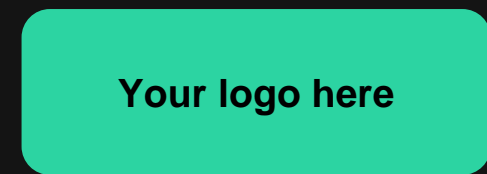
CLIMATE DATA SCIENCE



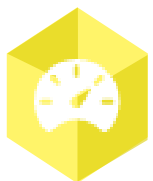
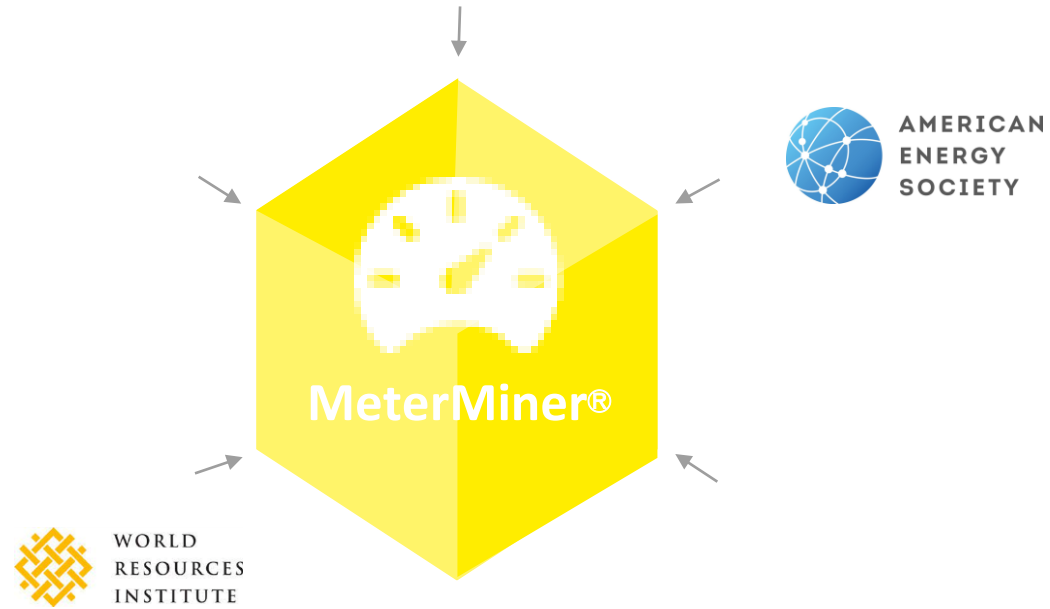
CARBON ACCOUNTING



FINANCIAL MARKETS



Appendix



MeterMiner®

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decarbonisation projects



Comments, Questions & Answers





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Forthcoming Events

- Wed, 11 Jan (11:00-11:45) China's Worlds: What Does Xi Jinping Want For His Country
- Thu, 12 Jan (11:00-11:45) The Curious Economics Of Authenticity
- Tue, 17 Jan (11:00-11:45) Alchemy: The Surprising Power Of Ideas That Don't Make Sense
- Wed, 18 Jan (11:00-11:45) Workers Voices – Fulfilling The S Ambitions In ESG

Visit <https://fsclub.zyen.com/events/forthcoming-events/>

Watch past webinars <https://www.youtube.com/zyengroup>