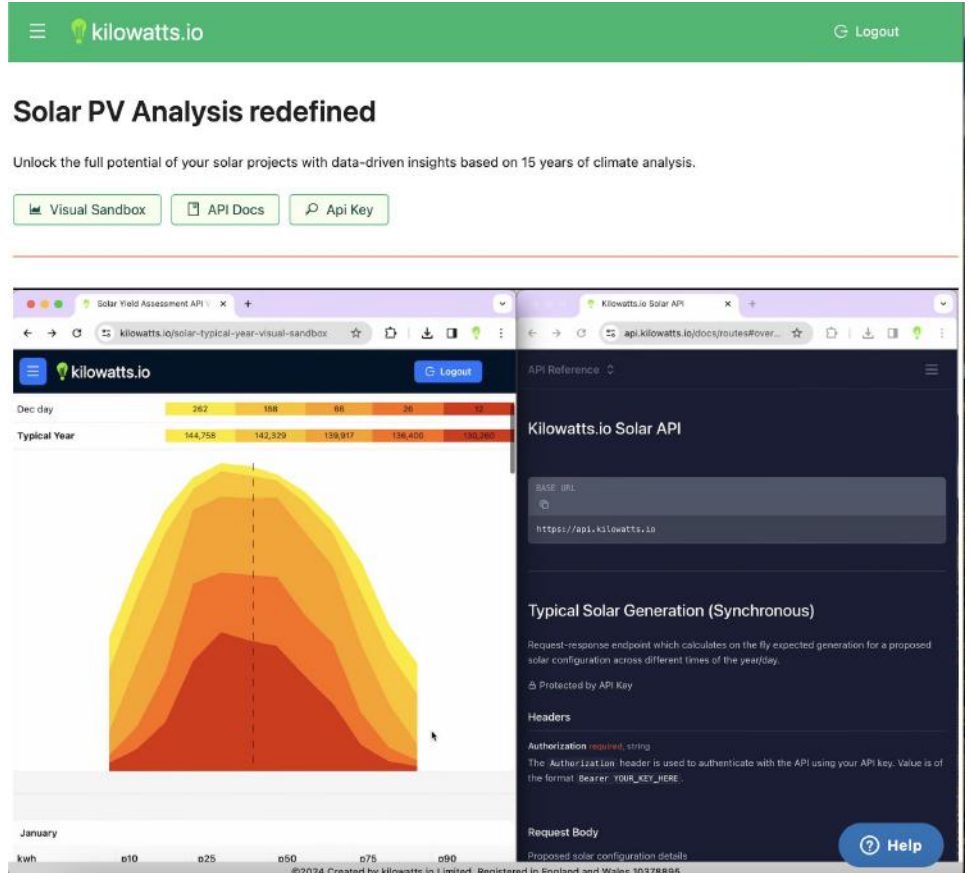


Intro: Ben Watts

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<https://www.linkedin.com/in/kilowatts/>

<https://twitter.com/KilowattsIo>



The screenshot displays the Kilowatts.io website interface. At the top, there is a green navigation bar with the Kilowatts.io logo and a 'Logout' button. Below the navigation bar, the main heading reads 'Solar PV Analysis redefined'. A sub-heading states: 'Unlock the full potential of your solar projects with data-driven insights based on 15 years of climate analysis.' Below this, there are three buttons: 'Visual Sandbox', 'API Docs', and 'Api Key'. The main content area shows a 'Solar Yield Assessment API' interface with a 'Logout' button. It features a table with data for 'Dec day' and 'Typical Year' across five categories (p10, p25, p50, p75, p90). Below the table is a large area chart showing solar generation over time, with a vertical dashed line indicating a specific point in time. The x-axis is labeled 'January' and the y-axis is labeled 'kwh'. The chart shows a peak in generation during the day, with a color gradient from red (low) to yellow (high). To the right of the main content is an 'API Reference' sidebar for 'Kilowatts.io Solar API'. It includes a 'BASE URL' field with the value 'https://api.kilowatts.io'. Below this is a section for 'Typical Solar Generation (Synchronous)' with a description: 'Request-response endpoint which calculates on the fly expected generation for a proposed solar configuration across different times of the year/day.' It also mentions 'Protected by API Key' and 'Headers' with the note 'Authorization required, string'. The 'Request Body' section is partially visible, showing 'Proposed solar configuration details'. At the bottom right of the sidebar is a 'Help' button. The footer of the page contains the text: '©2024 Created by kilowatts.io Limited. Registered in England and Wales 10378895'.

Dec day	p10	p25	p50	p75	p90
Typical Year	144,758	142,329	139,917	136,400	132,266

Content

Scaled representation of hundreds
generators

Refreshes every minute

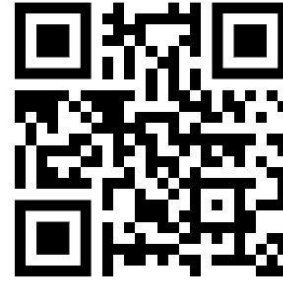
Map View

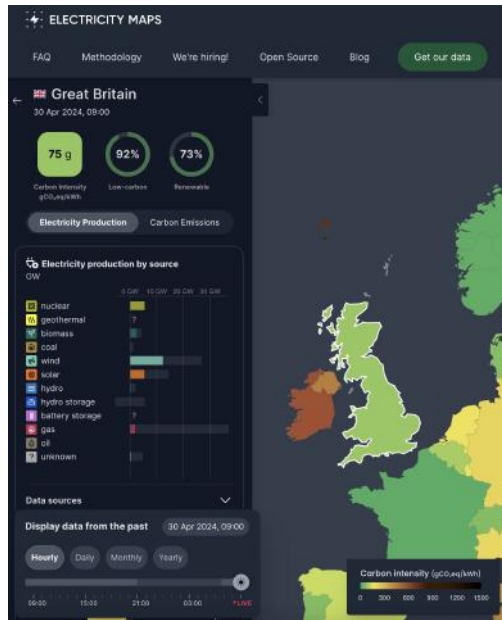
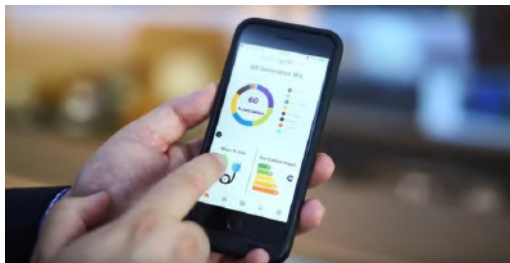
List View (Aggregated and by power station)

Traffic light (green/red) for balancing

Existing apps

Canter - balancing mechanism





Existing Apps

Aggregated by fuel type

Backward looking

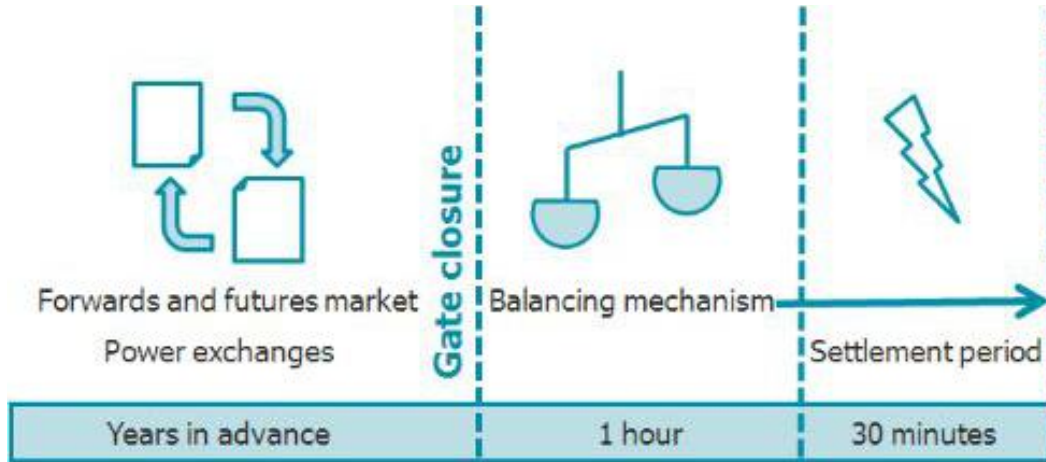
No mapping/curtailment

5-30 minute refresh interval

If more granular, typically at generation unit

Sources: <https://grid.iamkate.com/>, <https://www.gridwatch.templar.co.uk/>,
<https://www.nationalgrideso.com/>, <https://www.energydashboard.co.uk/live>,

Timeline



From an hour ahead of delivery, National Grid run the market for anything

They fine-tune generation/demand - mostly gas/wind/batteries

Prices more volatile

Increasingly important with more constraints/renewables

Baseload/Peak (EEX)

FPNs

BOALFs

Day Ahead (EEX/N2EX)

Bid Offer

Pairs

Bilateral (PPA)

Gate Closure - 1 hour before

30/04/2024 - 13:00-13:30 UTC (SP 29)

Dataset	From time (UTC)	From level (MW)	To time (UTC)	To level (MW)
Final Physical Notification (FPN)	13:00	0	13:19	0
Final Physical Notification (FPN)	13:19	0	13:23	95
Final Physical Notification (FPN)	13:23	95	13:30	95

Pair number	From time (UTC)	From level (MW)	To time (UTC)	To level (MW)	Bid price (£/MWh)	Offer price (£/MWh)
Pair 1	13:00	200	13:30	200	80	110
Pair 2	13:00	400	13:30	400	80	110
Pair 3	13:00	900	13:30	900	80	130
Pair -1	13:00	-1000	13:30	-1000	5	80

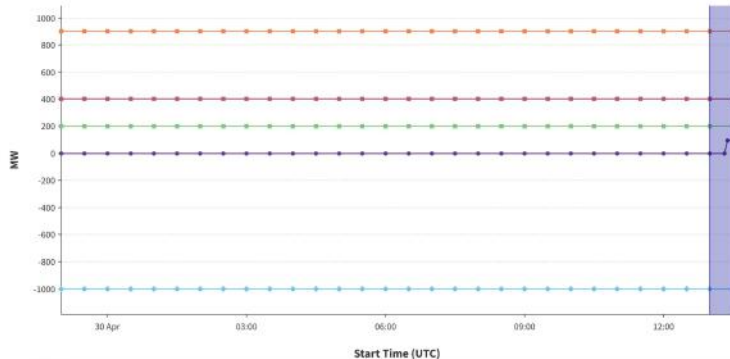
FPNs - planned generation/consumption.

3 Bid-Offer Pairs to moderate down/up

Used by pumped storage/hydro/off-takers (e.g. suppliers)

Output can vary within the 30 minutes.

This gas plant is willing to pay £80 to reduce (bid) generation, wants £110 to increase (offer).



DISCLAIMER

Production schedules can evolve, multiple times between gate closure and delivery.

There follows a typical example of the most common dynamic on the Balancing Market, where a lack of transmission capacity means that Scottish wind farms have output reduced and gas generation further south is turned up.

Other examples exist - happy to discuss

Bid (Curtailment): Wind - Seagreen

BMU ID
T_SGRWO-1

Lead party name
Seagreen Wind Energy Limited

NEG BMU Name
SGRWO-1

BMU type
T

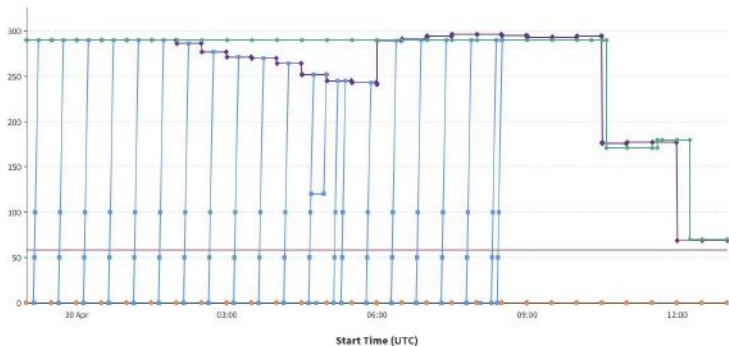
29/04/2024 - 23:00 UTC to 30/04/2024 - 13:00 UTC

Physical Dynamic Bid Offer Balancing Services Volume

Physical data

The Physical Data available is the Final Physical Notification (FPN), Quiescent Physical Notification (QPN), Maximum Export Limit (MEL), Maximum Import Limit (MIL), Stable Export Limit (SEL), Stable Import Limit (SIL), and Bid Offer Acceptance Level (BGAL)
[Learn more](#)

FILTER



Map Totals List App

✪ Saltend	22 MW	305 MW / 1.1 GW
✪ South Wales		296 MW / 503 MW
✪ Seagreen	641 MW	278 MW / 926 MW
✪ Lynemouth		262 MW / 258 MW
✪ Immingham	86 MW	256 MW / 349 MW
✪ Langage	250 MW	250 MW / 407 MW
✪ East Midlands		245 MW / 459 MW
✪ Seabank	242 MW	240 MW / 1.1 GW
✪ Whitelee		232 MW / 488 MW
✪ East Anglia		222 MW / 340 MW
✪ Race Bank		220 MW / 530 MW
✪ Pembroke	219 MW	219 MW / 2.2 GW
✪ Kilgallioch		203 MW / 203 MW
✪ South West		197 MW / 1.1 GW
✪ Pen y Cymoedd		195 MW / 228 MW

Example taken: 12:59 30th April 2024

Offer: Gas - Seabank

BMU ID
T_SEAB-1

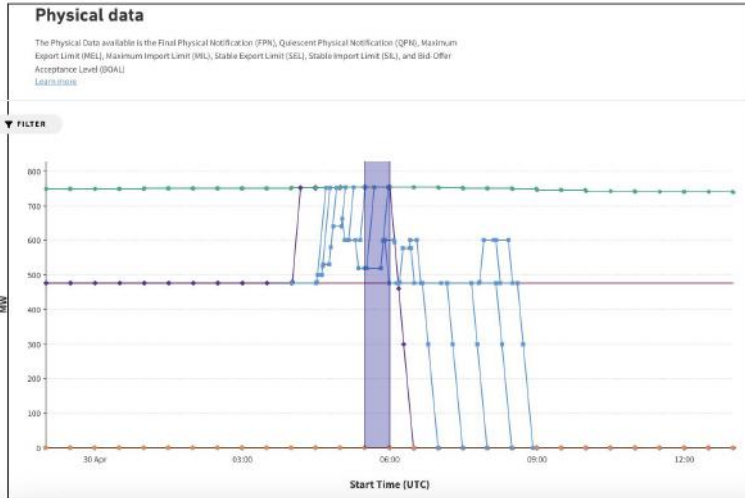
Lead party name
Seabank Power Limited

NGC BMU Name
SEAB-1

BMU type
T

29/04/2024 - 23:00 UTC to 30/04/2024 - 13:00 UTC

Physical Dynamic Bid Offer Balancing Services Volume



Map Totals List App

✈ Duddon Sands	328 MW / 371 MW -
✈ Burbo	314 MW / 323 MW -
✈ South Wales	299 MW / 503 MW ↑
✈ Saltend	283 MW / 1.1 GW -
✈ Lynemouth	262 MW / 258 MW -
✈ East Midlands	254 MW / 459 MW ↑
✈ Seabank	349 MW 240 MW / 1.1 GW -
✈ Race Bank	224 MW / 530 MW ↑
✈ Whitelee	223 MW / 488 MW -
✈ East Anglia	222 MW / 340 MW -
✈ Dudgeon	210 MW / 210 MW -
✈ Kilgallioch	203 MW / 203 MW -
✈ Langage	200 MW / 407 MW -
✈ South West	196 MW / 1.1 GW ↑
✈ Pen y Cymoedd	191 MW / 228 MW -

Previous Page 2 of 13 Next

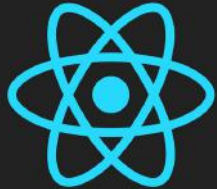
Example taken: 12:59 30th April 2024

Kilowatts Grid

Code (<https://github.com/kilowatts-io/kilowatts-grid>)



App



React Native

 Expo



React Native Skia

Cloud



aws

CDK



ELEXON BSC
INSIGHTS SOLUTION

ESO

3rd parties

What next?



Open source: help with issues/new features

[GitHub - kilowatts-io/kilowatts-grid: Open source live power market data for Great Britain](https://github.com/kilowatts-io/kilowatts-grid)

1. New Geographies
2. Demand
3. Smaller Units
4. Time-travel, historic aggregations
5. Backend Python / Frontend React-Native - may suit different people