



The Real-time electricity tracker

Presentation to AFREC

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October 10th, 2025

Agenda



1 Context & vision

- ✓ Context on real-time electricity data
- ✓ Vision

2 Real-time electricity tracker

- ✓ What is the real-time electricity project
- ✓ Demo

3 Expanding to real-time CO2

- ✓ How real-time CO2 works
- ✓ Demo
- ✓ Indicators on power security

4 Keys to make it to the tracker

Context and vision



Context & vision

General context on energy data

Outside the IEA



Quantity: There has never been so much energy data online.



Availability: many data providers now give open-source access to their data. A lot of data remains private.



Timeliness: data is now coming online in real-time.



Technology: big data and data science are progressing at a sensational pace.

Within the IEA



Infrastructure: The IEA has the infrastructure to host large volumes of data



Vision: The IEA wants to be a data-driven organisation.



Skills: Staff are motivated to gain the skills required to extract/process/model large amounts of data

Development of the real-time electricity tracker

2

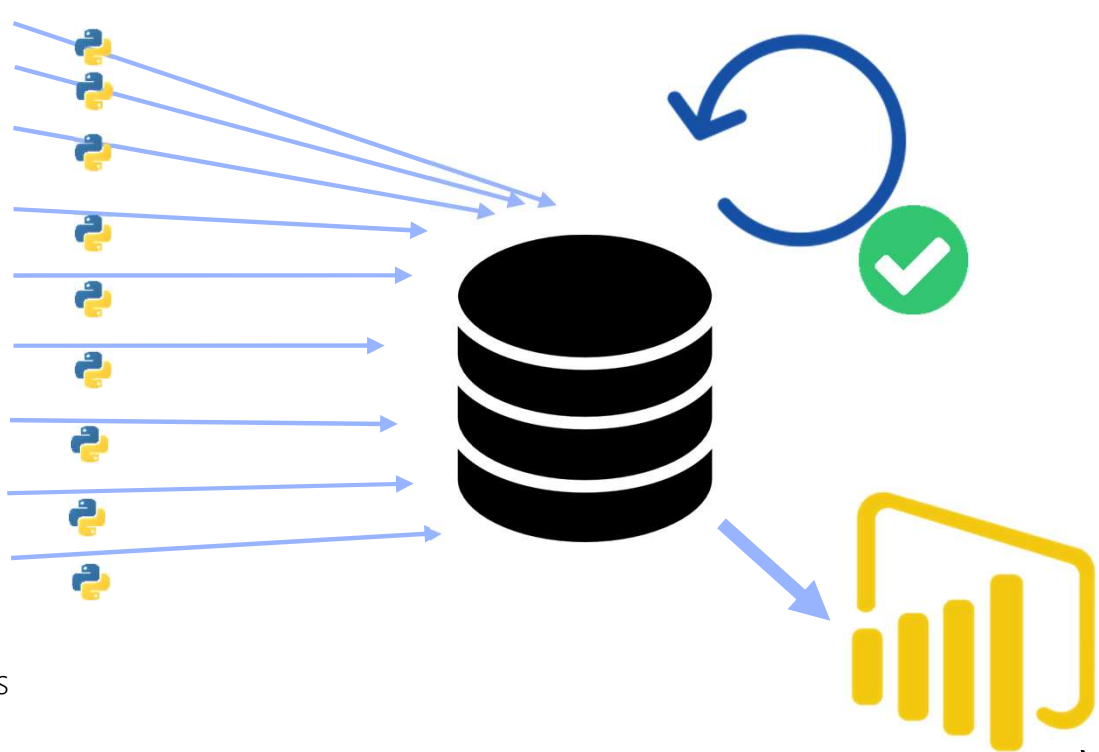


Development of the real-time electricity tracker

Automated collection

Extraction and checks

Validation and correction



...And many others

- Computers do most of the job
- Harmonised validation
- Robust data storage
Only 1 system of record
- Powerful analysis with modern BI tools
- Close to real-time data
- More data sources

Visualisation and analysis

Developing the real-time electricity tracker

Leveraging real-time data for modernisation



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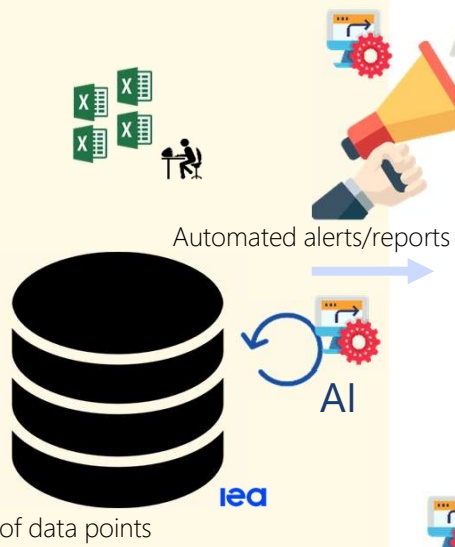
Extract and structure

Desk research
IEA member countries
Automated web scraping



- ✓ Computers replace humans when possible
- ✓ Real-time data
- ✓ More sources tapped into

Store and elaborate



Billions of data points

- ✓ Most data are stored in one place
- ✓ Billions of data points are stored
- ✓ AI elaborates the data

Model & Analyse



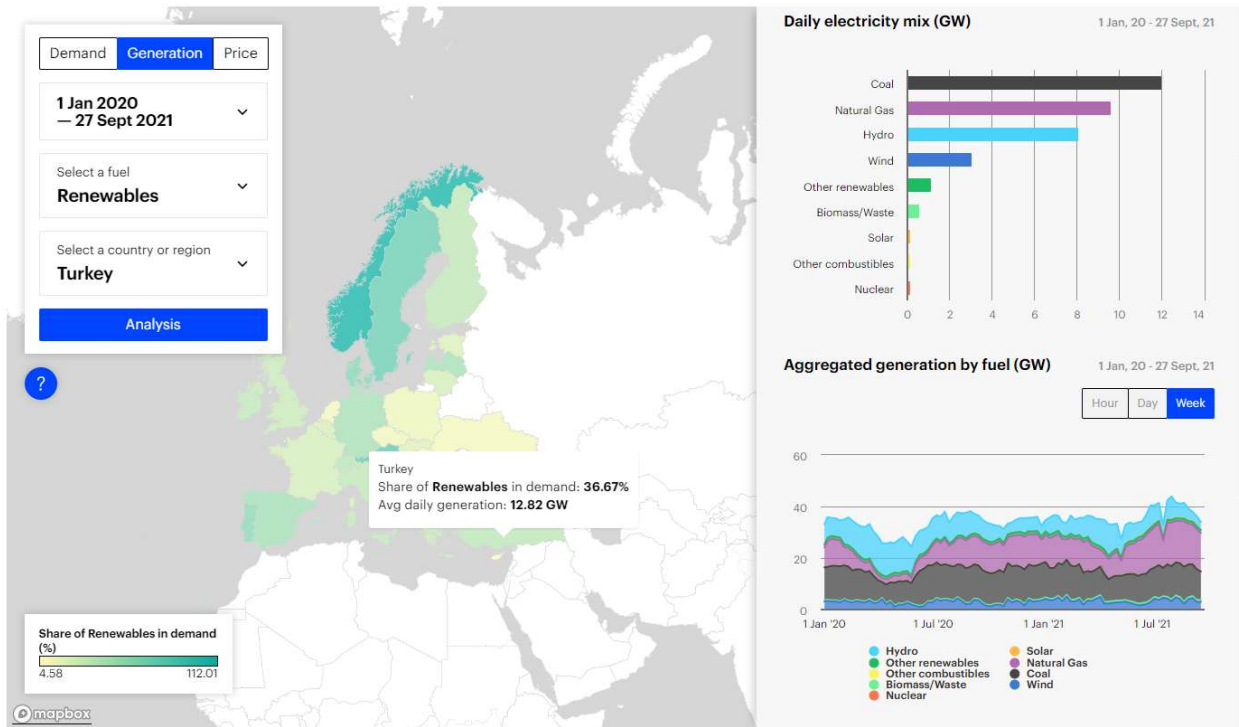
- ✓ Analysts focus on analysis
- ✓ Dynamic visualisations
- ✓ The DB talks to analysts by sending alerts and reports
- ✓ Real-time analysis is covered

Targets

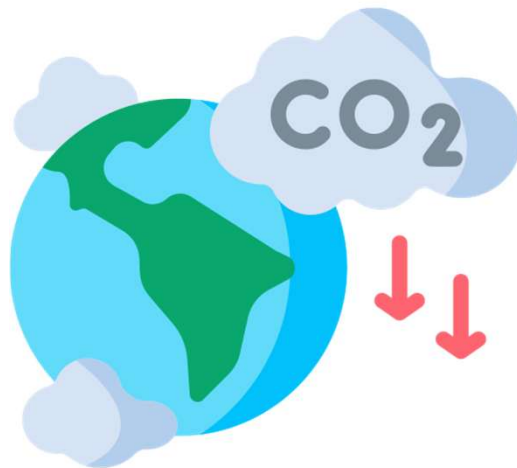
- ✓ Make all real-time electricity data comparable
- ✓ Automate and reduce manual work to the minimum
- ✓ Open the possibility of the creation of harmonised power security indicators

Development of the real-time electricity tracker

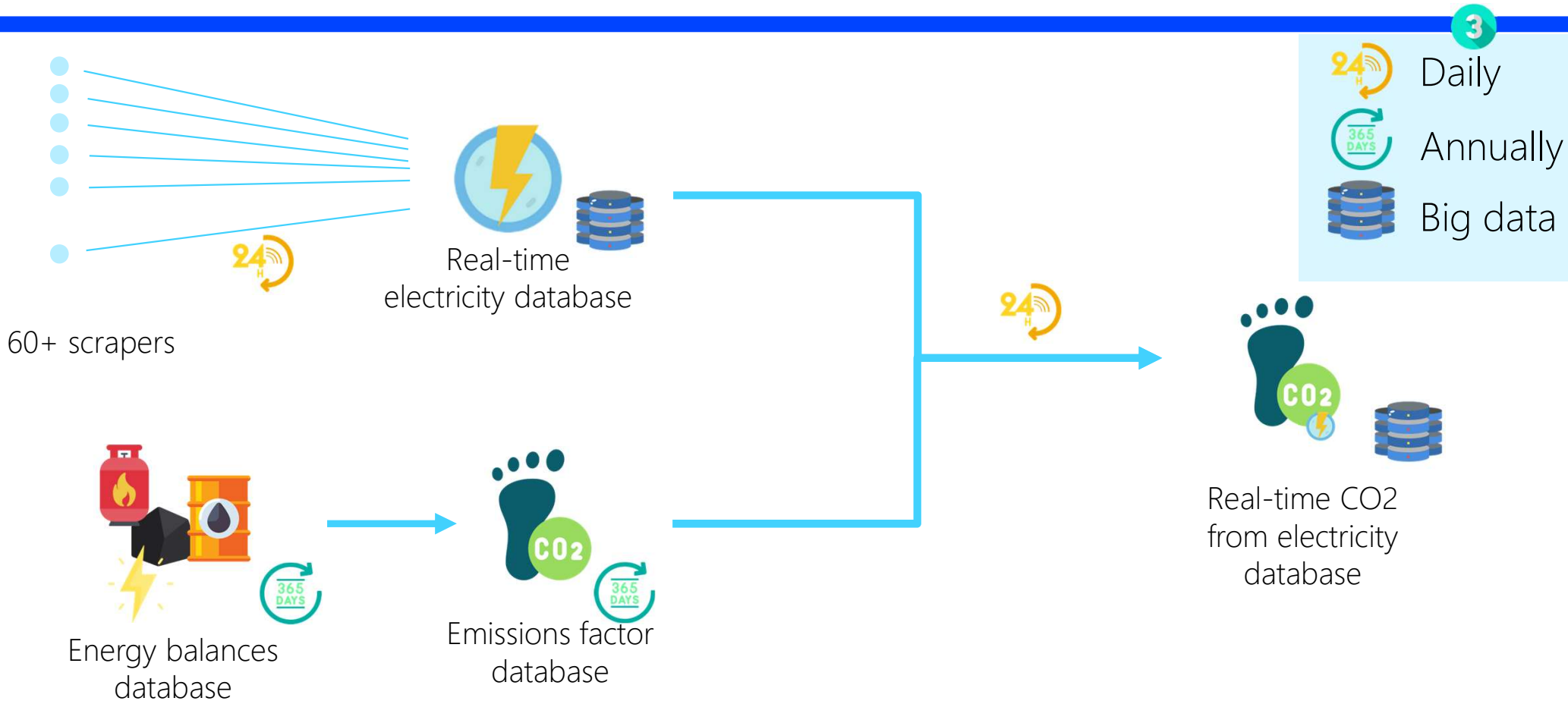
Live demo



Expanding to real-time CO2



Expanding to real-time CO2

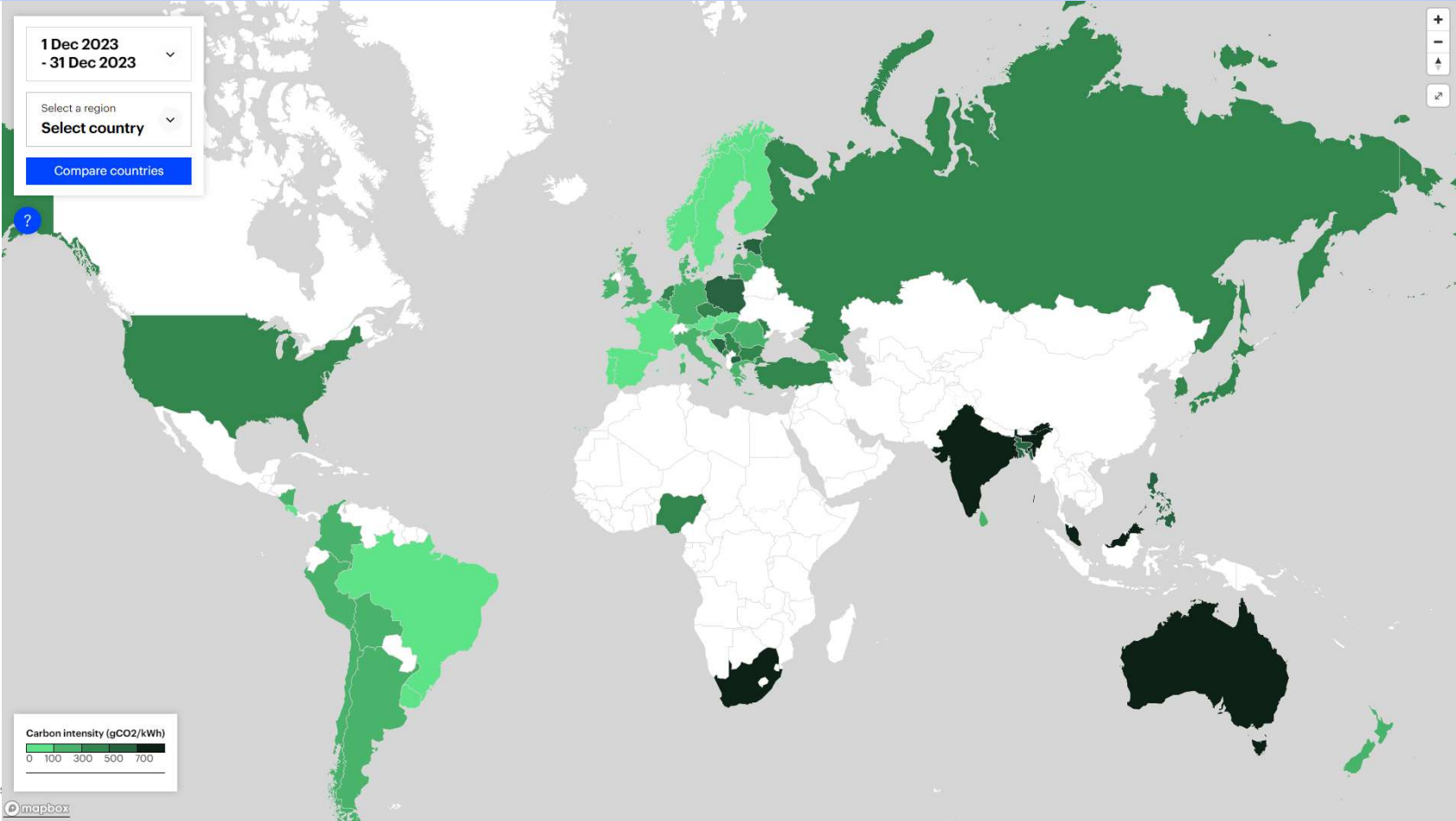


Expanding to real-time CO2

Coverage



3



Real-time electricity map

Example of security indicators that can be derived from it



Supply Adequacy and Reliability

- Reserve margins distribution
- Frequency of scarcity hours
- Curtailment ratios
- Share of dispatchable generation



Inter-dependence

- Net import dependency (% of demand)
- Frequency of import reliance events
- Price convergence with neighbours



Price stability

- Price volatility
- Scarcity price events (e.g. > €1000/MWh)
- Negative price frequency (oversupply)



Environmental and Resilience aspects

- CO2 intensity distributions
- Frequency of low CO2 and high CO2 intensity events
- Exposure to renewables' variability

Keys to make it to the tracker

4



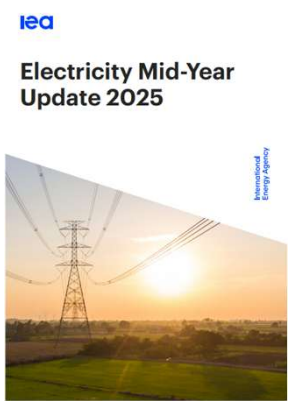
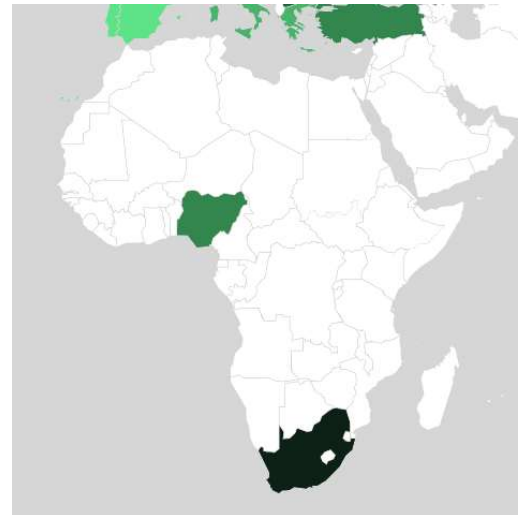
Keys for success

Why it matters for Africa



At the moment Only 2 African countries are featured on the tracker....

...but being in the tracker allows to be more easily considered in reports



Energy and Climate Change
Volume 5, December 2024, 100132

Using electrolytic hydrogen production and energy storage for balancing a low carbon electricity grid: Scenario assessments for India

Rupsha Bhattacharyya¹, A. R. K. Singh¹, K. Bhojraj², B. Grover^{1*}

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Highlights

- Analyzed India's present electricity demand to project future consumption patterns.
- Estimated excess power available from different generation mixes.
- Excess management proposed by flexible loads like electrolyzers and batteries.
- Algorithm developed to allocate excess power to flexible loads without curtailment.

Keys for success

Key directions to value Africa's real-time electricity data



Build digital infrastructure and technical capacity to maintain highly granular databases and communicate externally through APIs



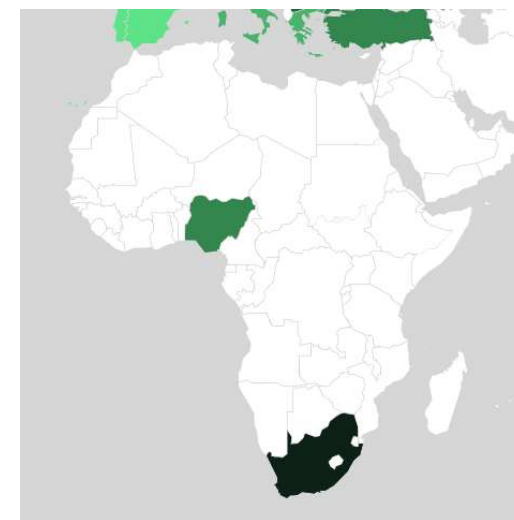
Enforce transparency rules on TSOs to ensure their data can be freely accessible, in a granular and timely manner



Ensure national statistical offices collect and aggregate the data to make it **comparable** with annual data



Coordinate with other organisations to ensure data comparability across countries and sources



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