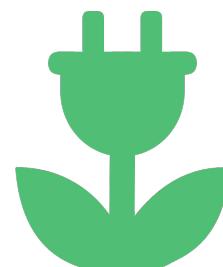




Carbon Scaling - Carbon Zero Zone

ITClass 2022/2023 Innovation assignment
Aristotelis Rapai, Chih-Chieh Lin, Haochen Wang, Zixuan Chen
August 2023

CARBONZEROZONE





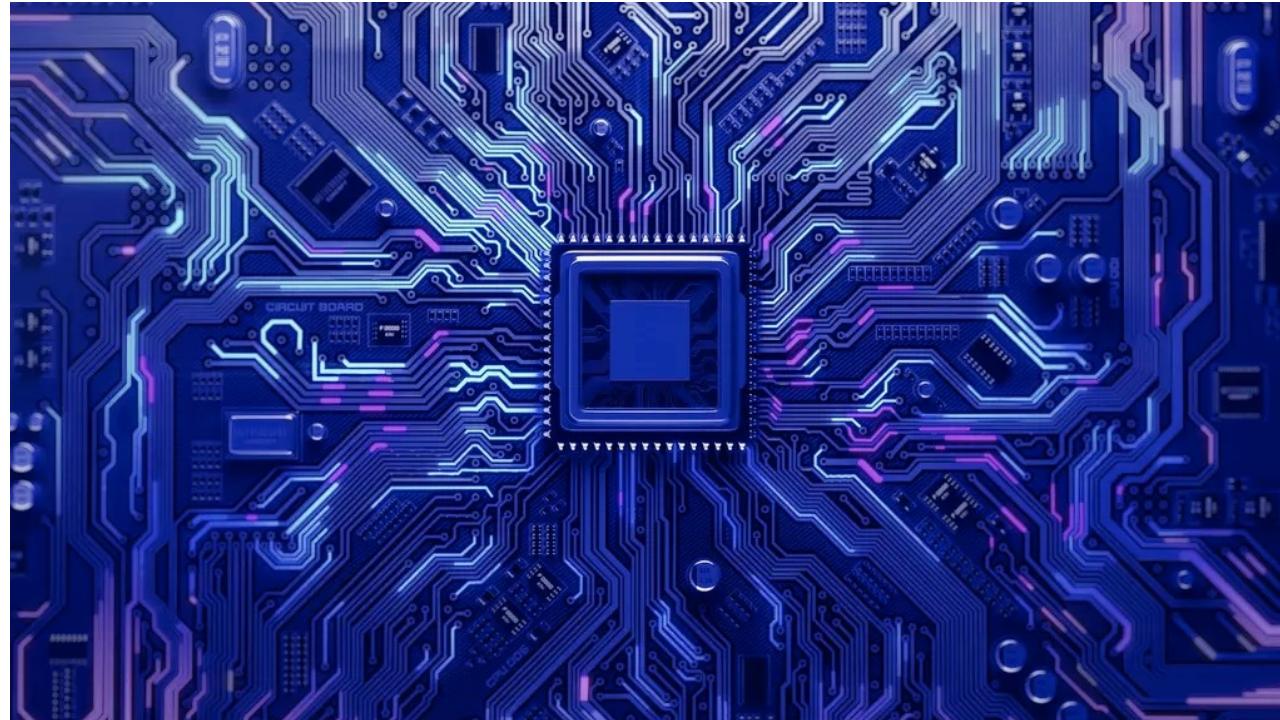
481 g
CO₂e/kWh

87 %
Gas + Coal

10 %
Green Energy

1

Dashboard

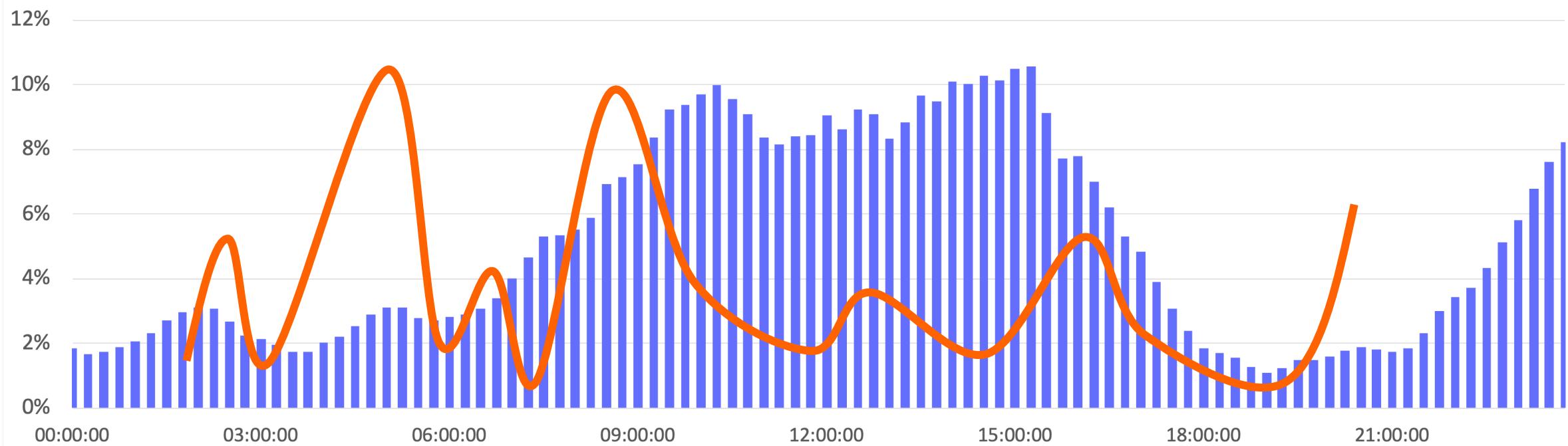


2

Unreliable Renewable Energy

Unreliable Renewable Energy

Percentage of electricity from renewable energy in NL



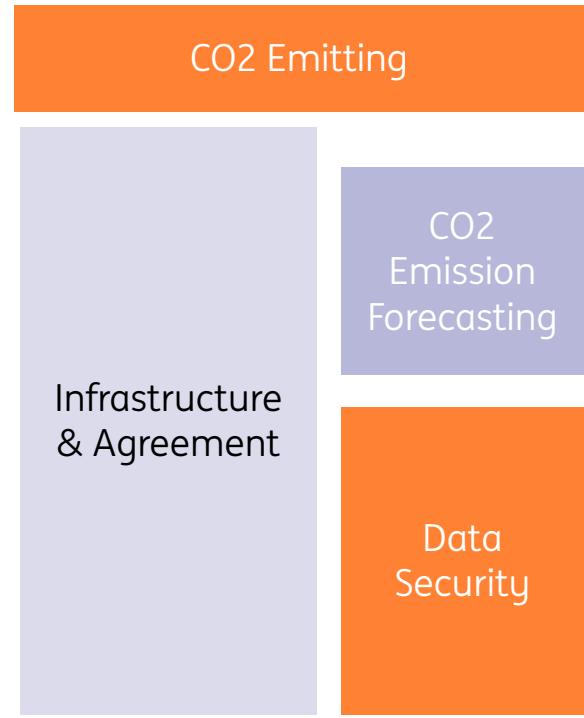
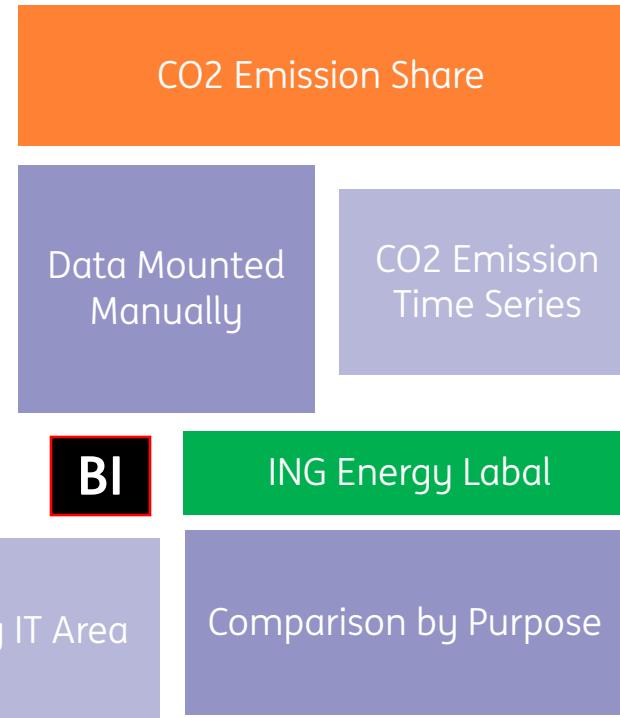
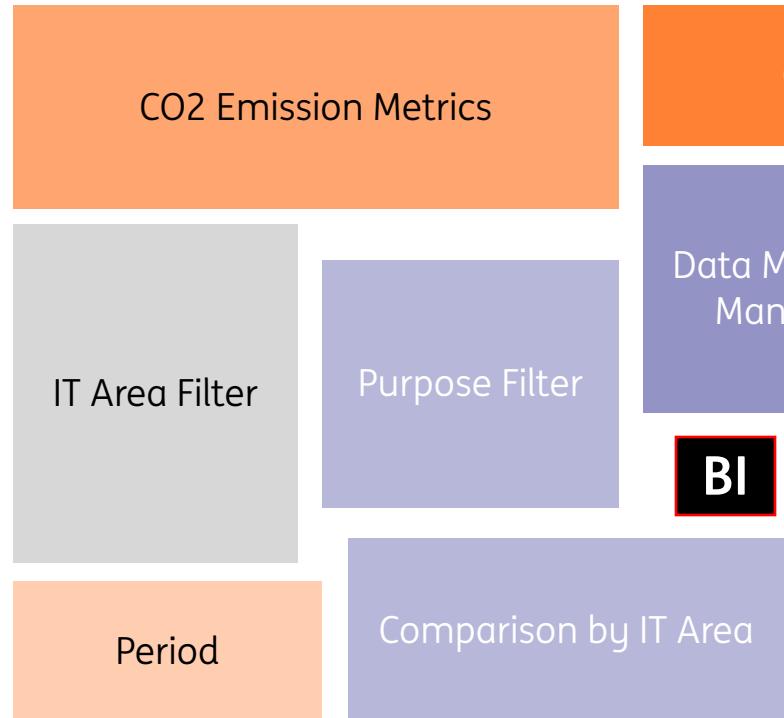
Dashboard



Green IT



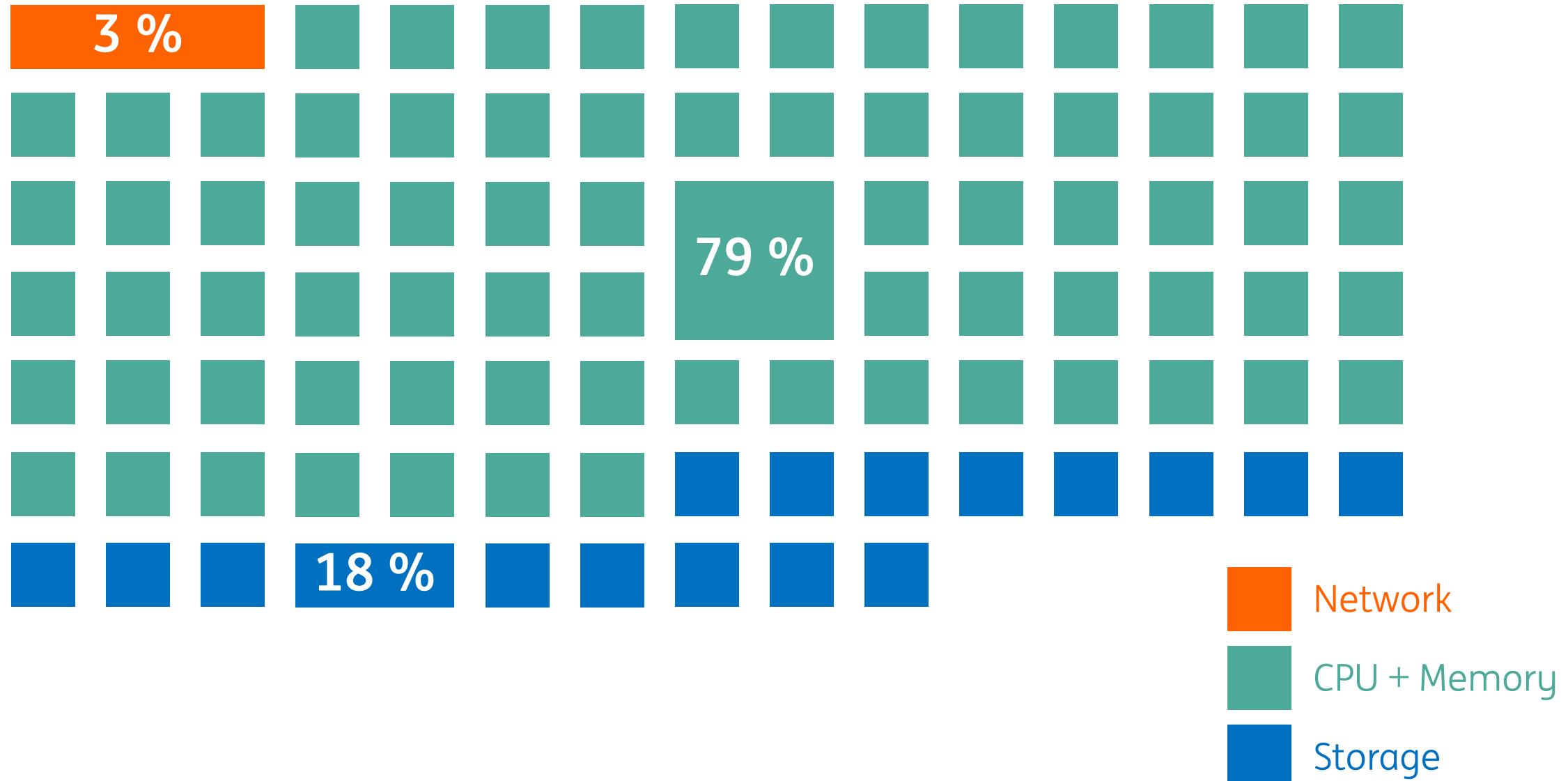
Provisioning only



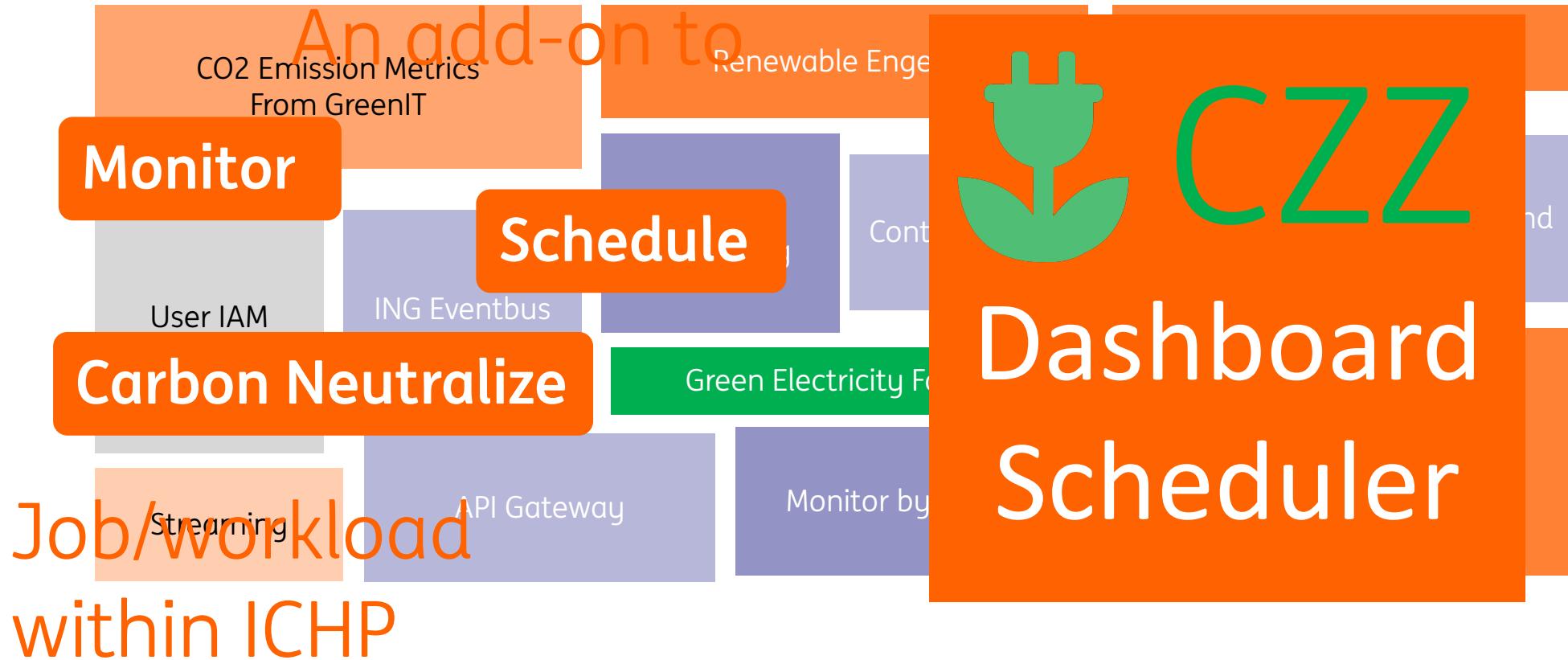
Static data management

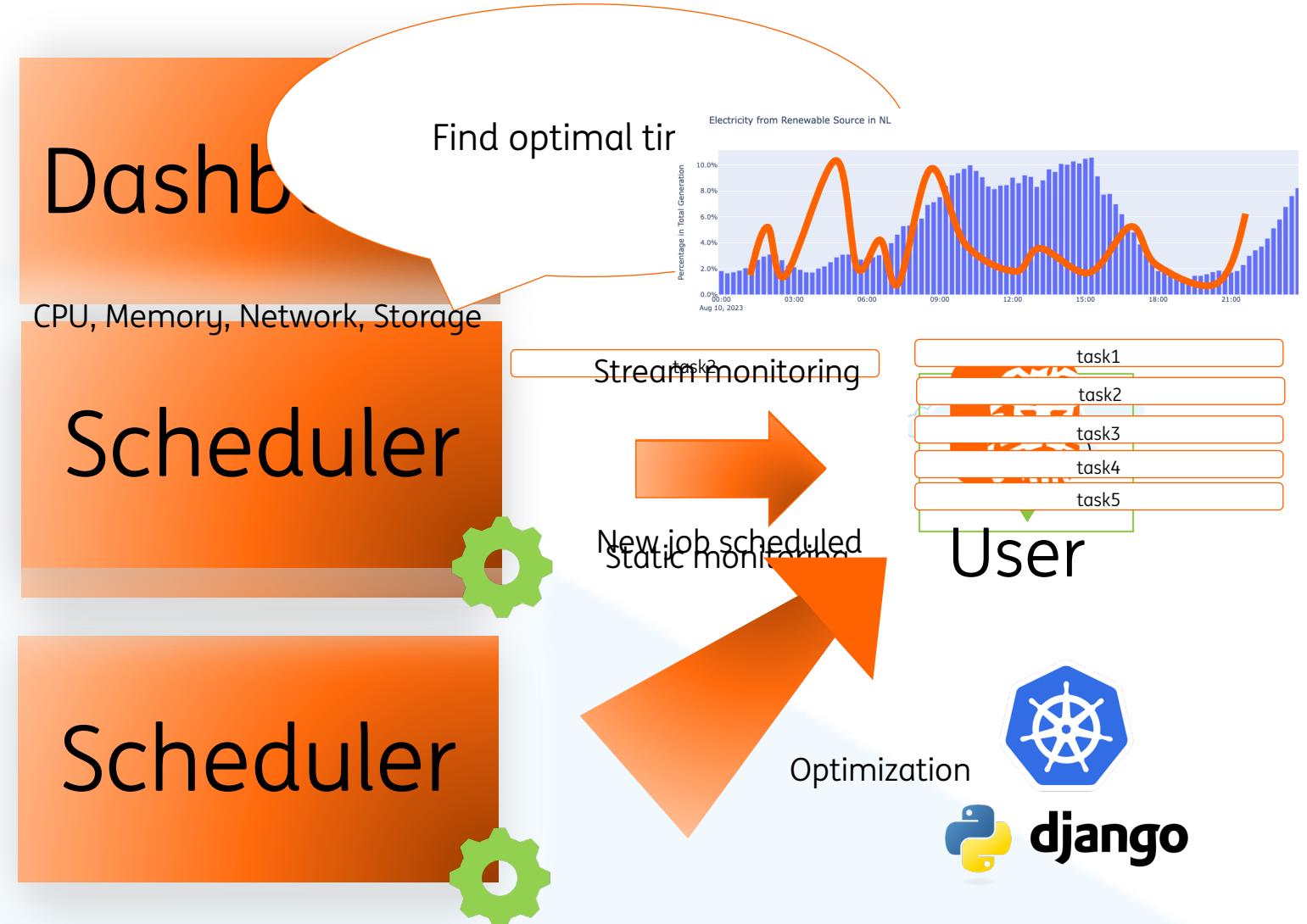
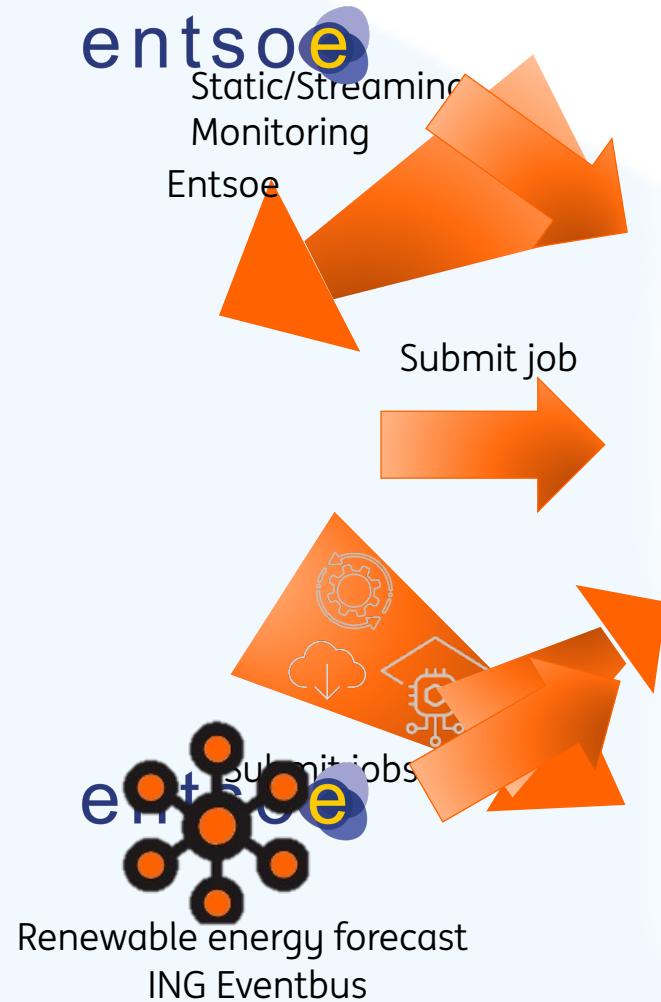
Without electricity sources

Power distribution in a data center

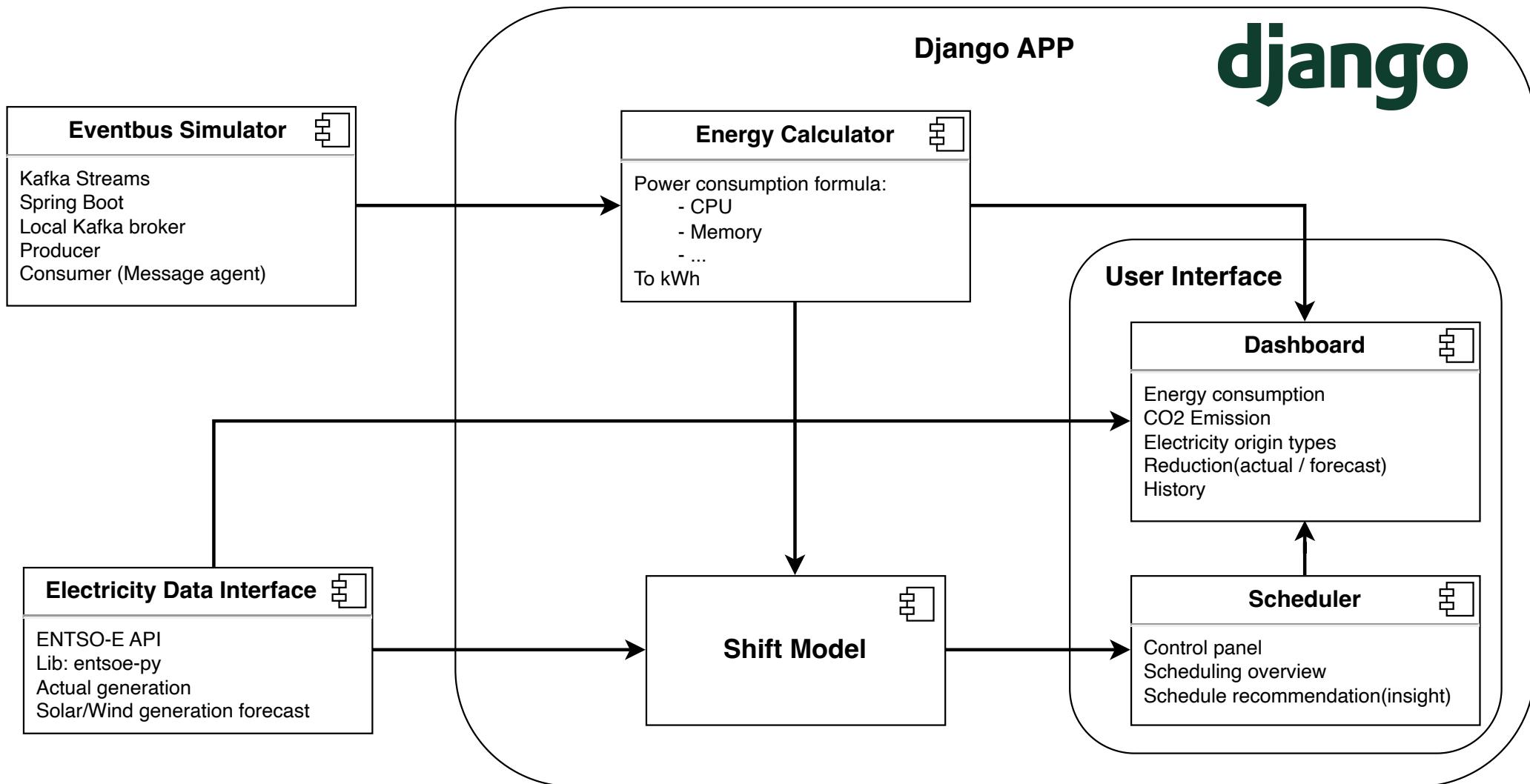


CarbonZeroZone Duty



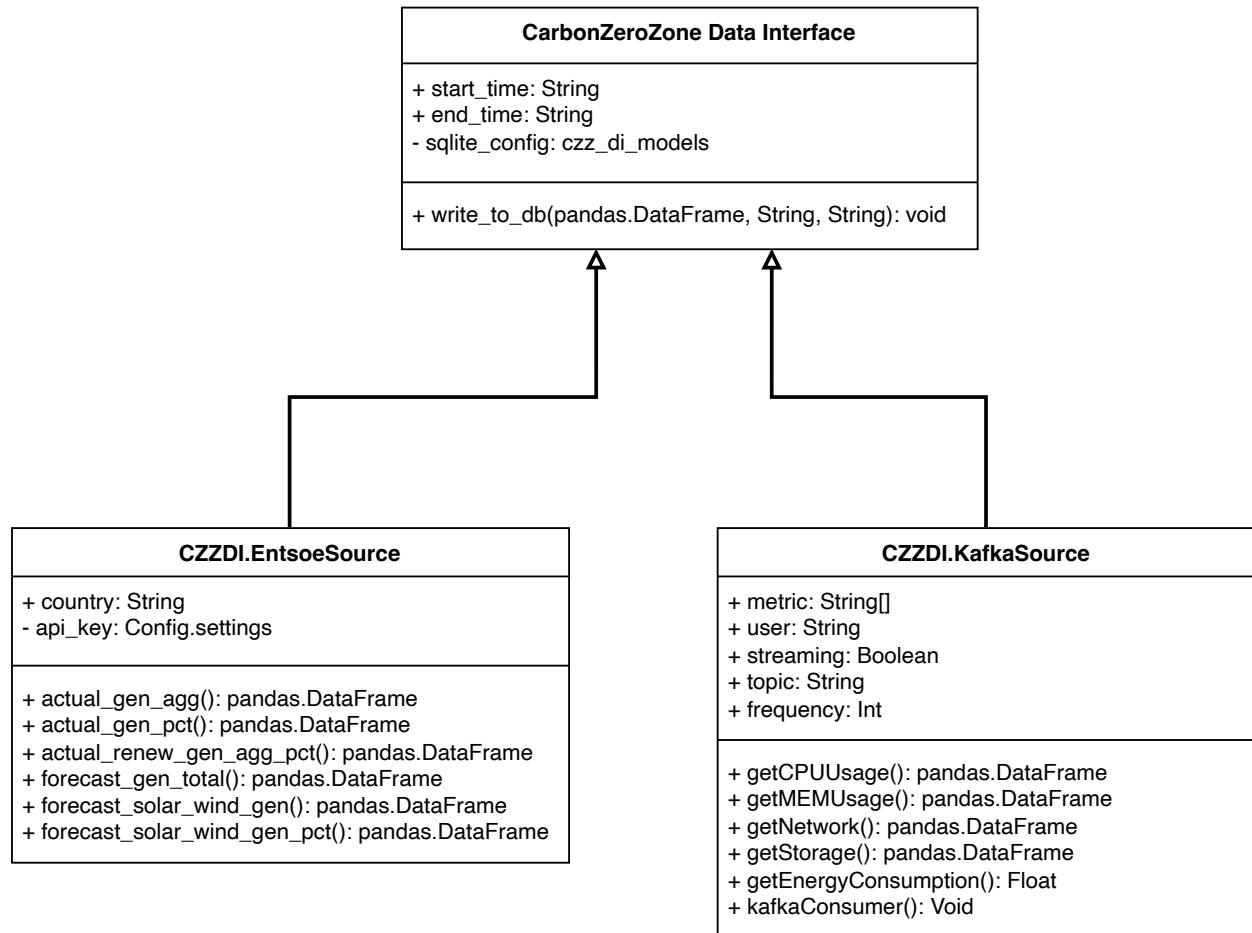


CZZ Service Architecture

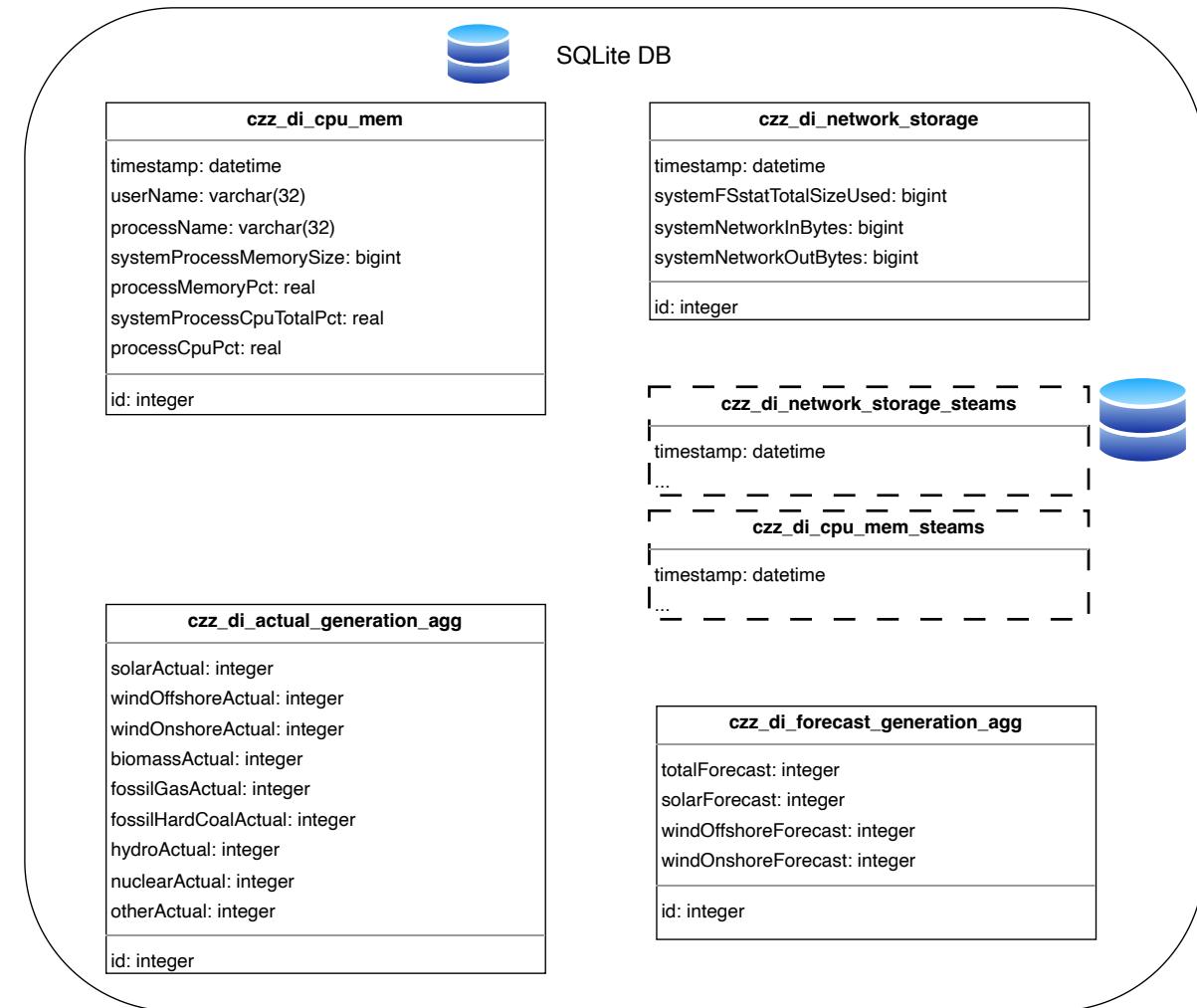


CZZ Data Interface

Data API

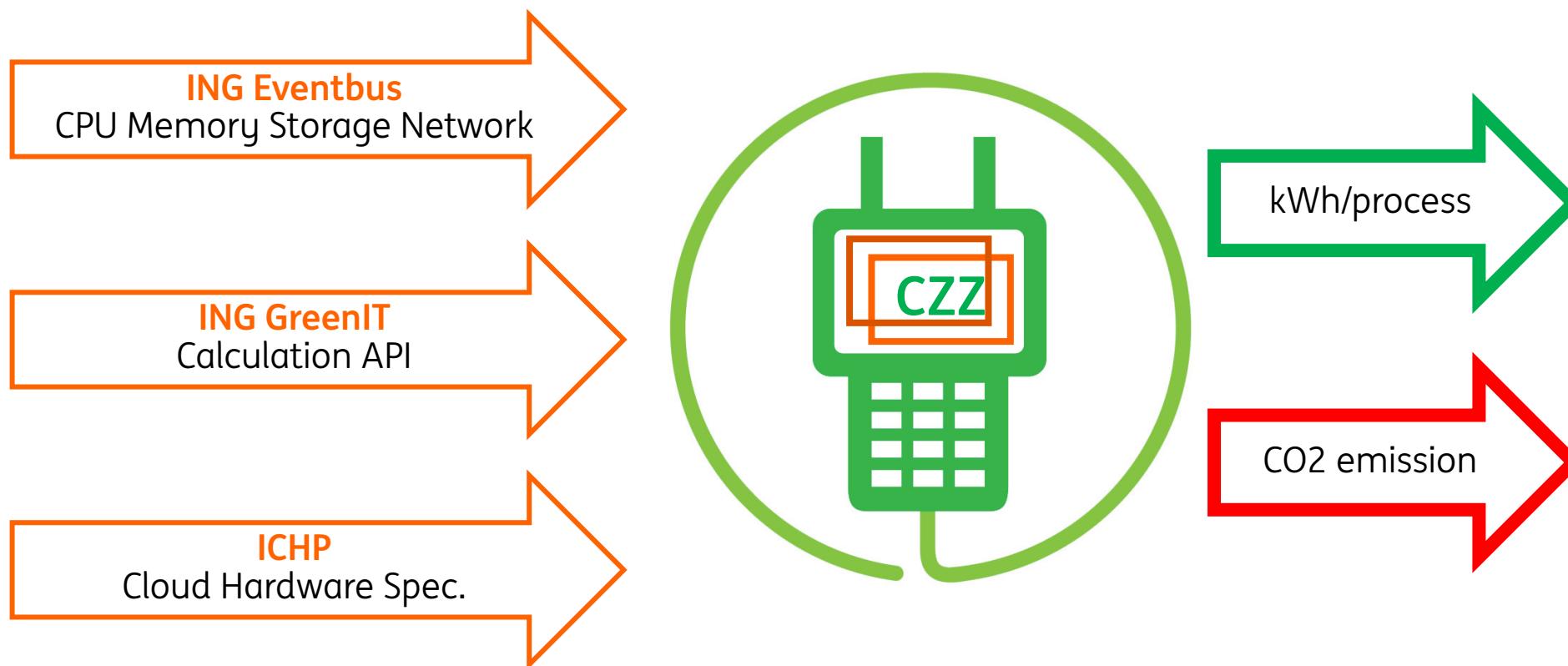


Data Management



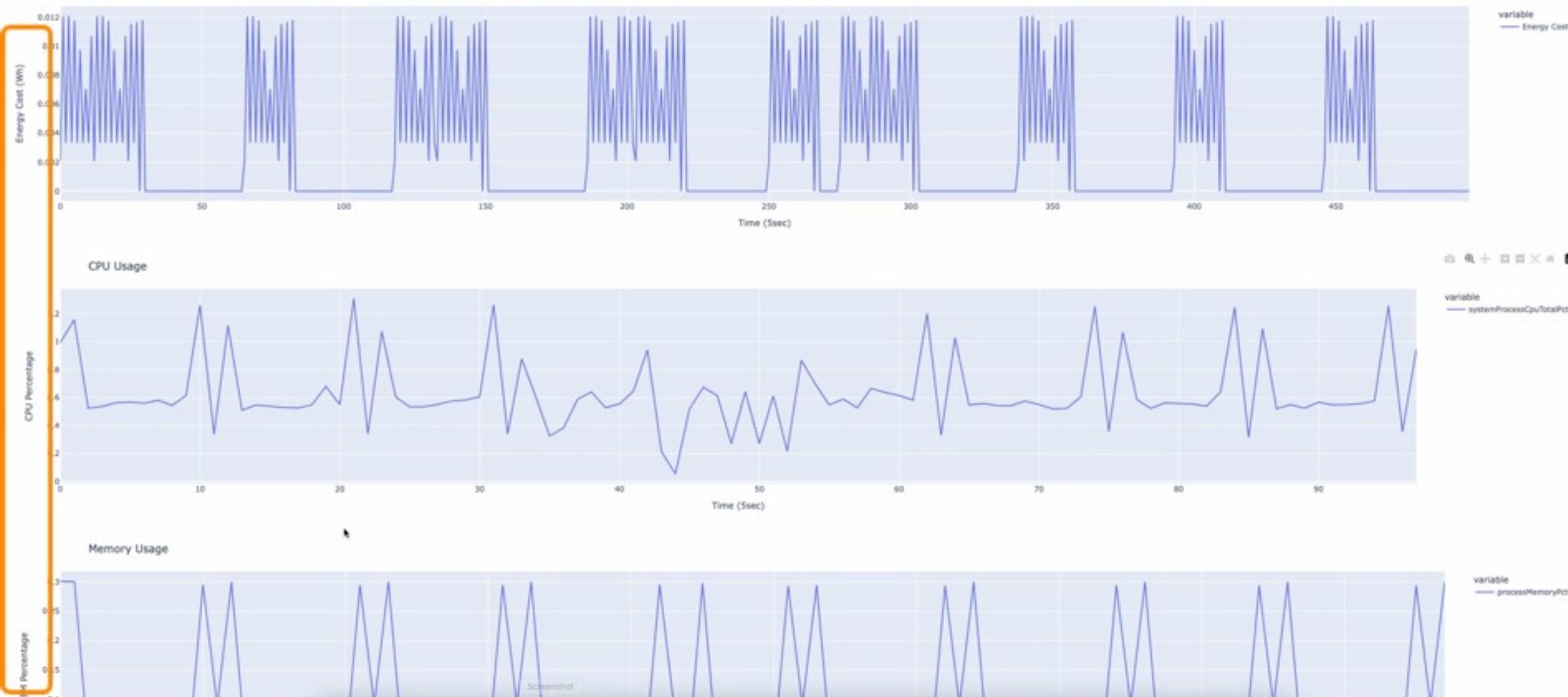
CZZ Energy Calculator

Total Energy = Compute kWh + Storage kWh + Network kWh + Memory kWh



Streaming Monitor Data Dashboard

4 metrics



Impact



Actual Use 10% Scheduler

energy cost

Green Energy

for processes

↓CO₂

- Sustainability
- 2 Problems
- Our Solution

Future Work



- Consider **overload situation**
- Extend scheduling period
- Integrate with GreenIT
- TPA outbound proxy to Enstoe API
- Apply in ICHP, IPC

CARBONZEROZONE

Schedule it

Shift it

Save it

