> **The energy system is simply not ready for renewables**
>
> – Christophe Ballif, Director @ CSEM

75% of energy supply by renewable energies by 2040

40% of Europe’s grid is >40 years old

GRID

Problem

Renewable energies are **unpredictable** & **variable,** leading to **grid oversupply**

Grid operator must balance oversupply by **turning down renewable energy** production (“curtailing”: €1B in DE in 2022) & initiating **costly stabilisation** measures (€3.3B)

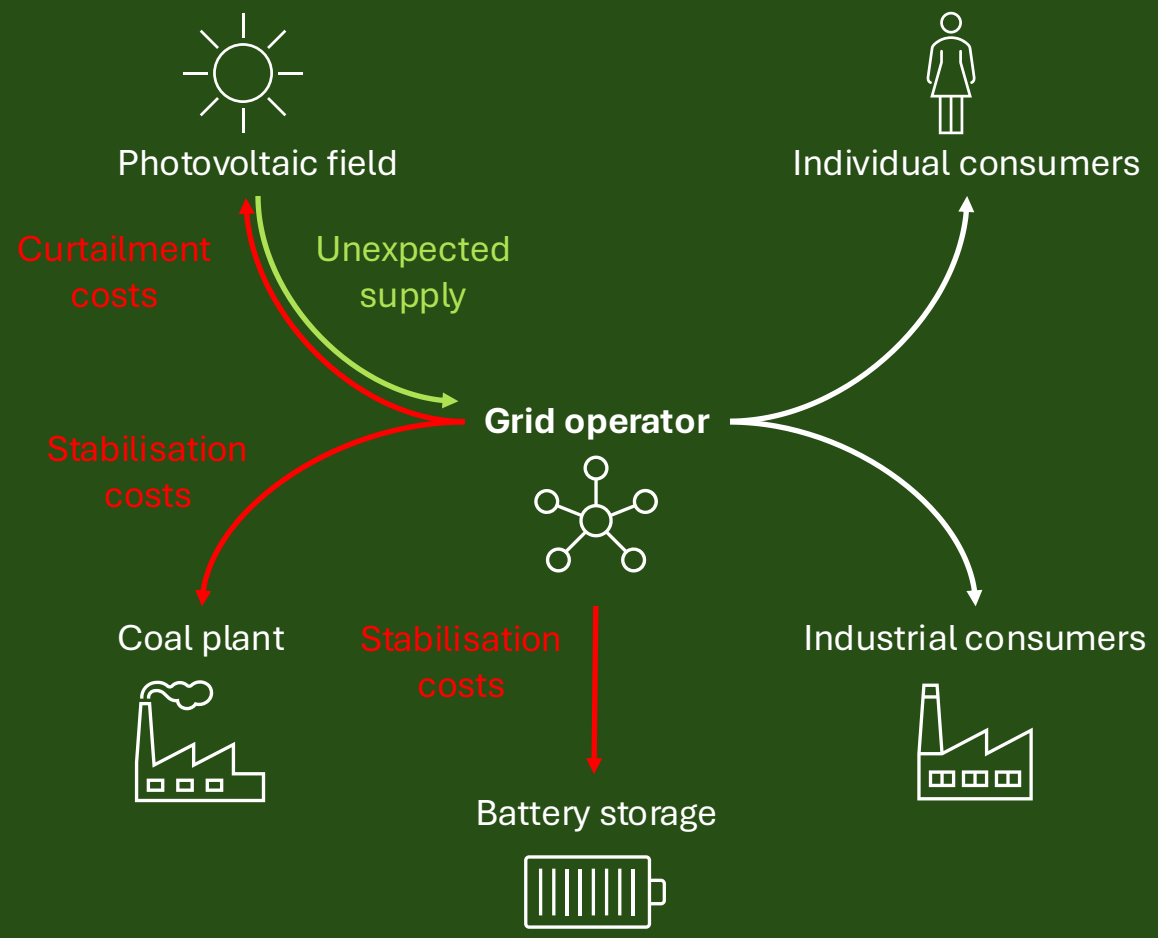
Everybody could benefit from **cheaper, cleaner energy** (SDG n°7)

Why?

Decisions are made **reactively**

Delay between grid oversupply and ability to adjust supply by electricity providers

Poor coordination in the ecosystem



Solution

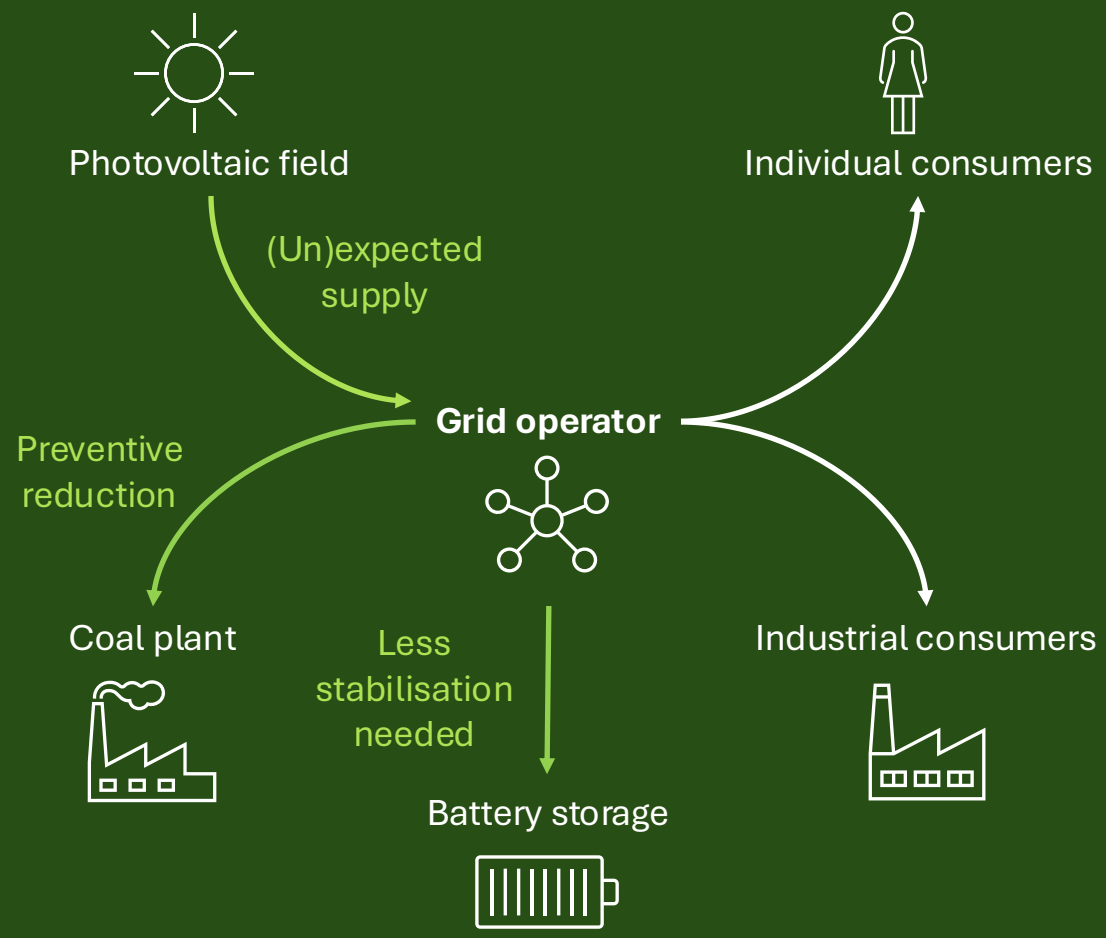
> *We initiate a **paradigm shift** by empowering grid operators to take **proactive** rather than reactive decisions*

How?

Forecasting of **excess production** in specific locations at **5 mins time granularity** up to **6h in advance**

Helping grid operators realise **up to 4B cost savings** in stabilisation & curtailment costs

Enabling a **smarter grid** through **data-driven decisions**



↗ Cost savings ↗ CO2 savings

Existing solutions

No existing forecasting with both **spatial** AND **temporal** granularity

SIEMENS
Spectrum Power

LFENERGY
OpenSTEF

energy & meteo systems

SUNCAST

What we bring

API to access forecast of surplus renewable energy on the grid

Solution **compatible** with established systems in the industry

Scalable solution for other downstream uses

Aligns with EU's roadmap/targets for grid interoperability

Expert & market validation

Christophe Ballif, CSEM Director Sustainable Energy Center

"Supply prediction is a highly relevant topic that is not yet fully solved. I see impulses in the industry that **grid operators would be interested**."

Pierre-Jean Alet, CSEM Group Leader Digital Energy Solutions

"Even precise **15-minute forecasts fail** in flexible markets. A 5% error on a 100 MW is enough to **destabilise the grid**."

Mourad Afroune, RTE Project Manager

"In 2023, 30% of curtailment was due to **forecast errors**. Because our tool misses local events (e.g., fast weather shifts), granular forecasts are **urgently needed** and we **don't have this in-house**"

Demo time!

>90%

Accuracy on model trained to forecast solar power in Germany over the next 6h (state of the art)

Proof of concept

It is technically feasible to have precise forecasting on the desired time horizon

Roadmap

Including more features

More precise predictions

- Cloud coverage
- Precipitation
- Pressure

Increasing spatial precision

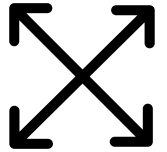
Better decisions

- Forecasts for specific local producers
- Reroute from right energy producer

Increasing temporal granularity

Higher reactiveness

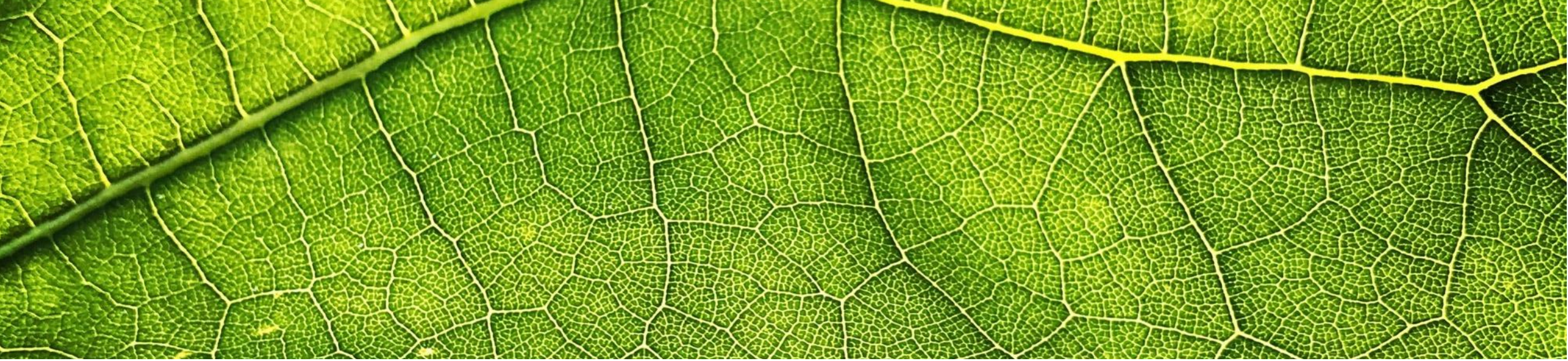
- Partnerships with weather data providers



Expanding applications

Target other markets

- Traders
- Energy providers
- Datacenters
- Smart meter companies



GRID Efficient forecasting. Nothing superfluous.