

# ECOFYS

sustainable energy for everyone



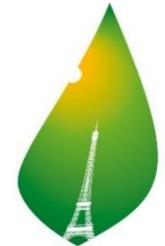
## *Finance for Innovation:* Towards the ETS Innovation Fund Energy Storage

### Setting the scene

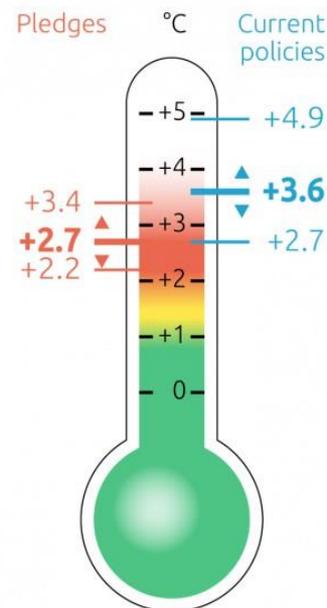
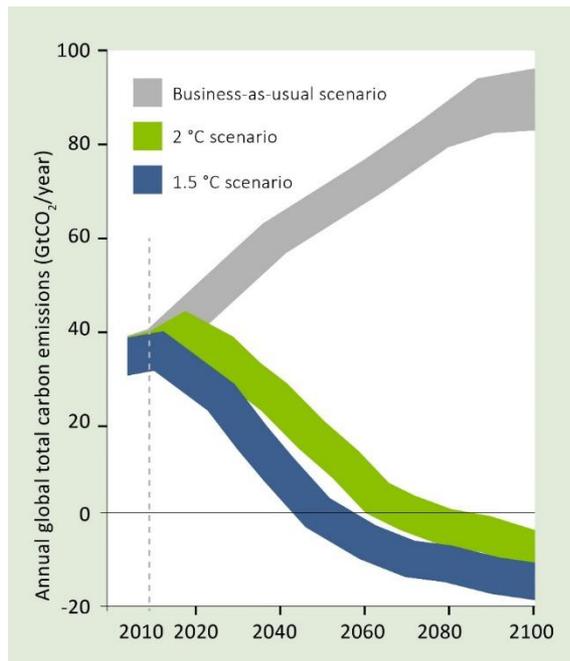
**Michiel Stork**

# Why are we here?

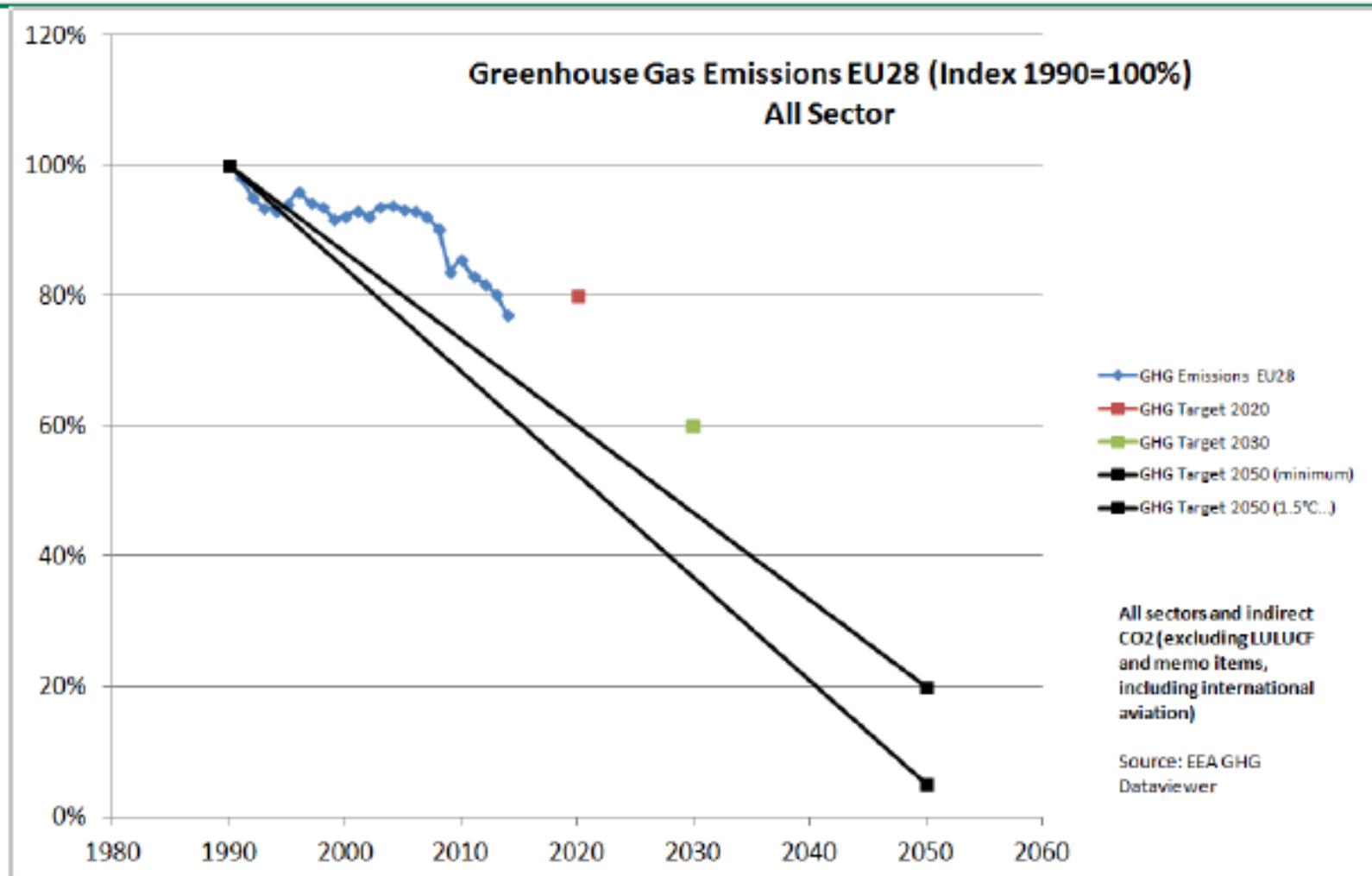
- > **195 countries** unanimously signed the Paris Agreement
- > **“Well below” 2°C**, pursuing efforts to limit temperature increase to 1.5°C
- > This means **rapid developments!**



COP21 · CMP11  
**PARIS 2015**  
UN CLIMATE CHANGE CONFERENCE



# Further decarbonisation is needed



# Energy Storage: Why?

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Energy storage can support the EU's plans for the Energy Union by helping to **ensure energy security** and a well-functioning internal market, and helping to **bring more carbon-cutting renewables** online. By using more energy storage, the EU can **decrease its energy imports, improve the efficiency** of the energy system, and **keep prices low** by better integrating variable renewable energy sources.

<https://ec.europa.eu/energy/en/topics/technology-and-innovation/energy-storage>

# Energy Storage Trends

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The deployment of energy storage is expected to increase in the years to come.

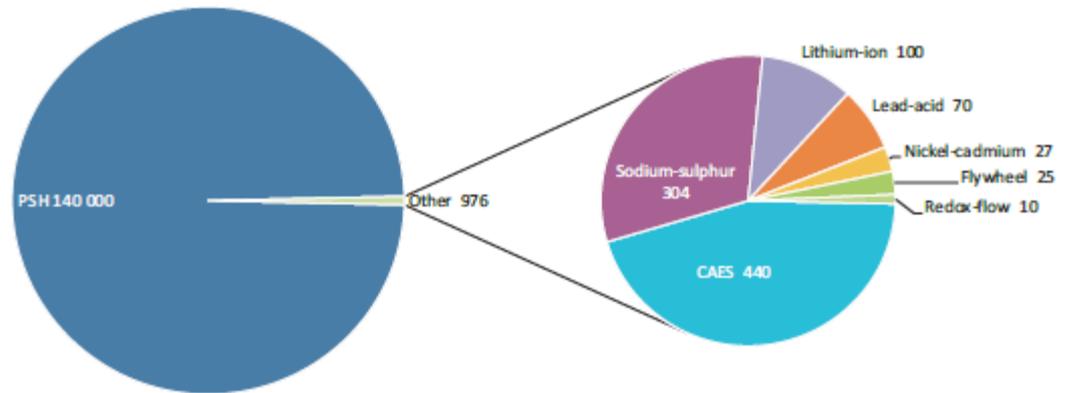
In the EU, until 2050, around 100 billion USD investments in electricity energy storage needed (IEA Technology Roadmap Energy Storage, 2014).

Significant continued cost reductions are expected for many of the energy storage technologies.

# Globally, energy storage is still very much PSH

## Technology Roadmap

Energy storage

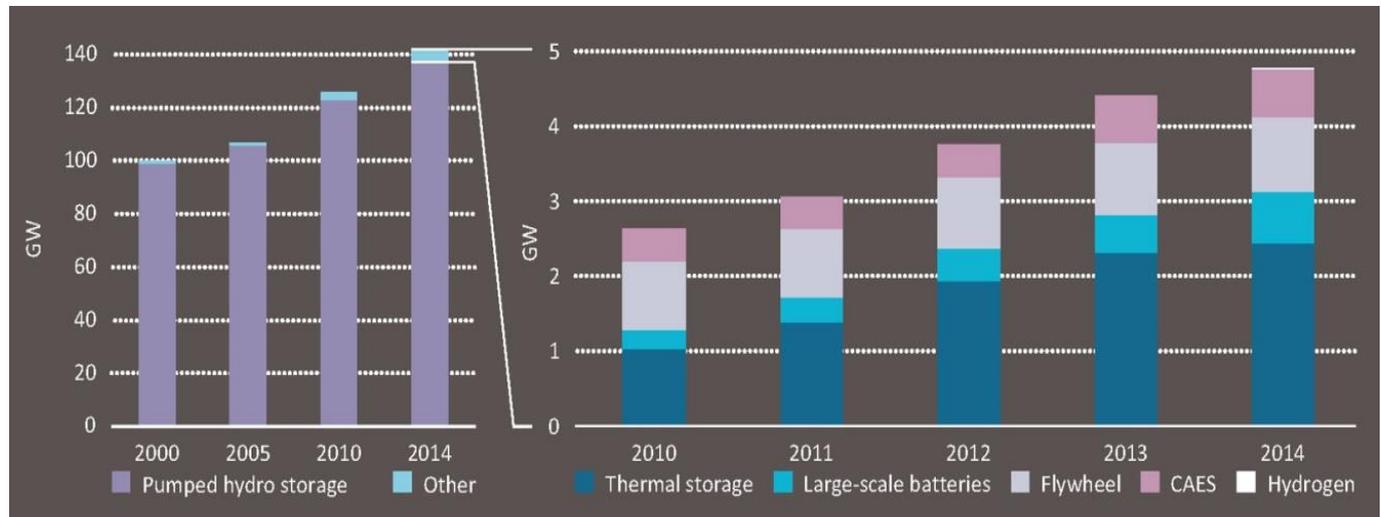


*Worldwide installed electricity storage capacity*

Joint EASE-EERA

Recommendations for a

**EUROPEAN ENERGY STORAGE TECHNOLOGY DEVELOPMENT ROADMAP TOWARDS 2030 – UPDATE**



*Worldwide installed energy storage capacity*

# Energy Storage is a multifaceted animal

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A variety of applications:

- Variable supply resource integration
- Seasonal storage
- ...

Require different performance on a variety of parameters:

- Output: Thermal / Electricity
- Size
- Discharge rate
- Cycles
- Response time

To provide different services:

Temporal imbalances (hours to days), regional imbalances, long term storage needs (weeks to months)

Competing with various alternatives...

# Energy Storage Technologies

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- Chemical
- Electrochemical
- Electrical
- Mechanical
- Thermal

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# **sustainable energy for everyone**