

The logo for the SET PLAN Conference 2015 is located in the top left corner. It consists of a white right-angled triangle with a thin purple border. Inside the triangle, the text "SET PLAN" is written in bold black capital letters, followed by "Conference" in a smaller black font, and "2015" in a larger black font.

**SET
PLAN**
Conference
2015

Research, innovation
and competitiveness
for the Energy Union

**NEW TECHNOLOGY TO MAKE RENEWABLE
ELECTRICITY CONTROLLABLE: STORAGE
AND RES BASELOAD PRODUCTION**

Professor Eicke Weber, Fraunhofer ISE / President of EUREC

SESSION 6

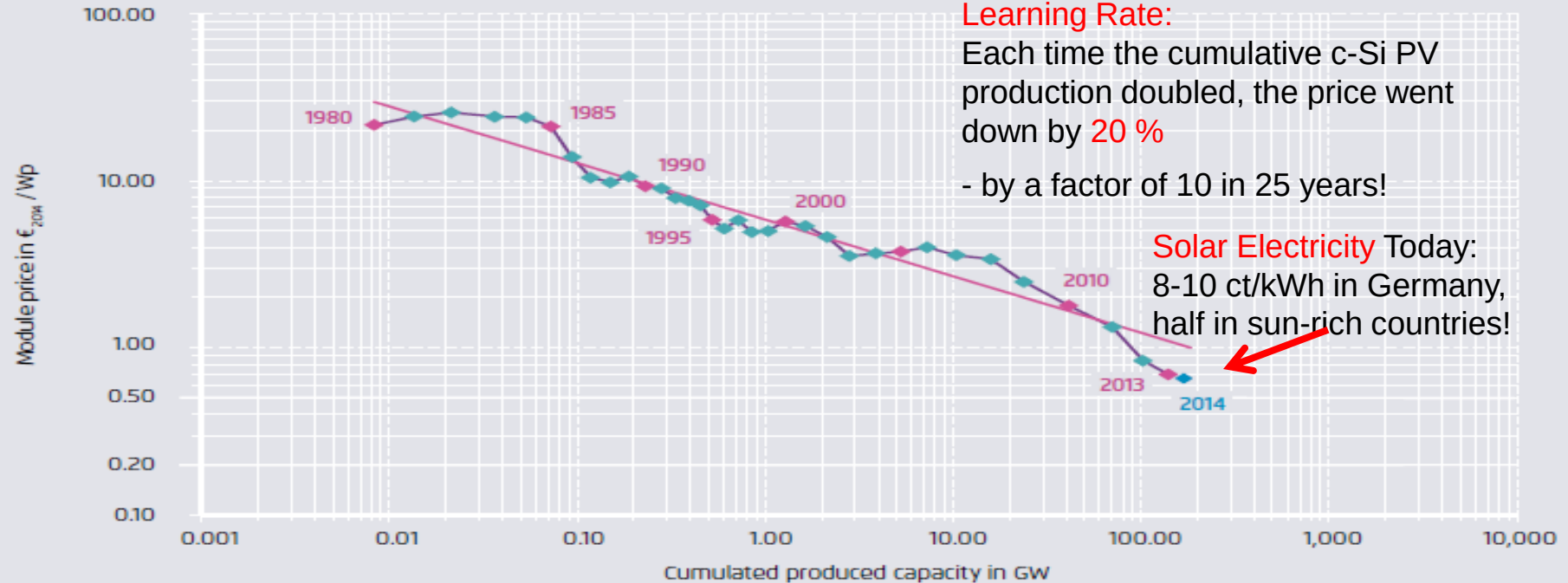
Being the world leader in developing the next generation
of renewable energy technologies

Tuesday 22 September 2015

SET PLAN

Conference Price Experience Curve of Solar Energy (c-Si Photovoltaics)

2015



Source: Navigant Consulting; EUPD PV module prices (since 2006), Graph: ISE 2014

PV Electricity Cost (LCOE) till 2050 in different regions

PV will generate lowest-cost electricity @ 2-4ct/kWh!

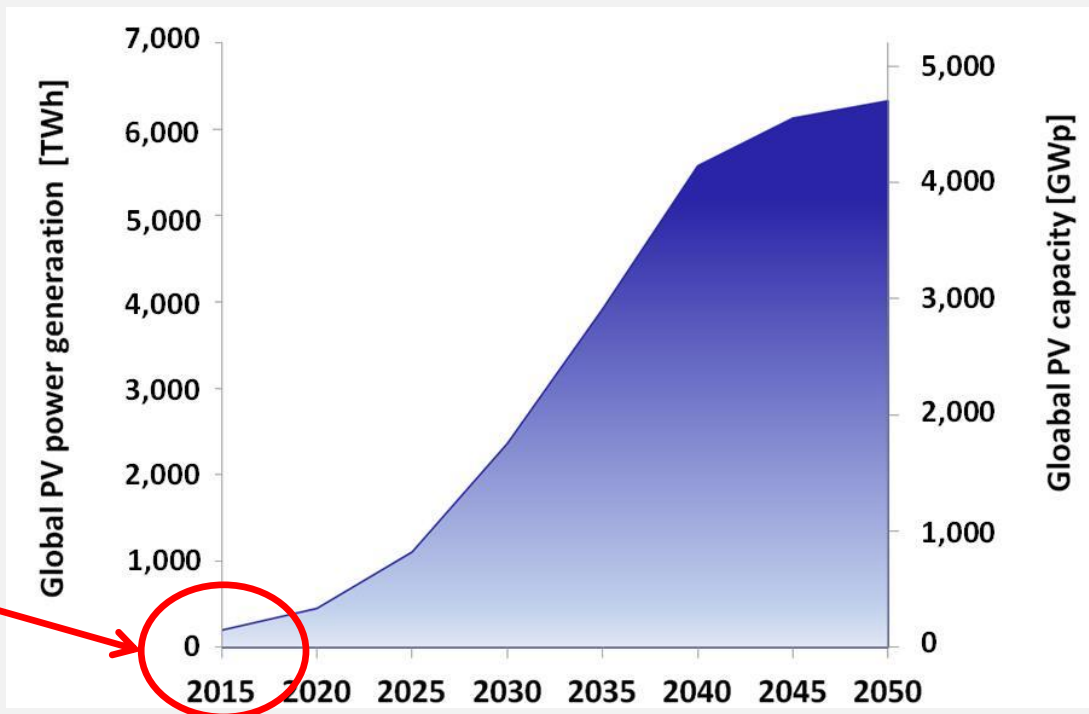


Source: ISE PV cost study 2014

Expected PV Market Growth 2015 - 2050 (IEA 2014)

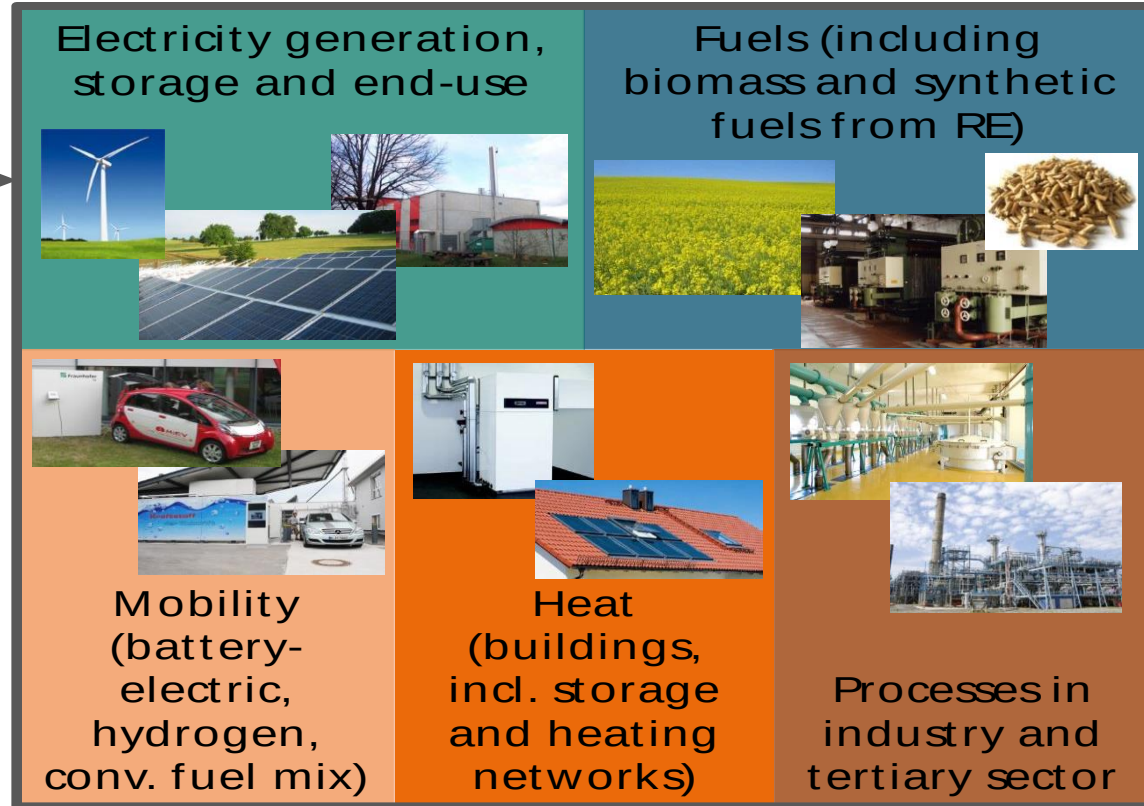
- Rapid introduction of PV globally is fueled by availability of cost-competitive, distributed energy
- In 2050 between 4.000 and 30.000 GW_p PV will be installed!
- By 2015, only less than 200 GW_p have been installed!

Today, we are just at the beginning of the global growth curve!



Optimization of Germany's future energy system based on hourly modeling

Comprehensive analysis of the overall system



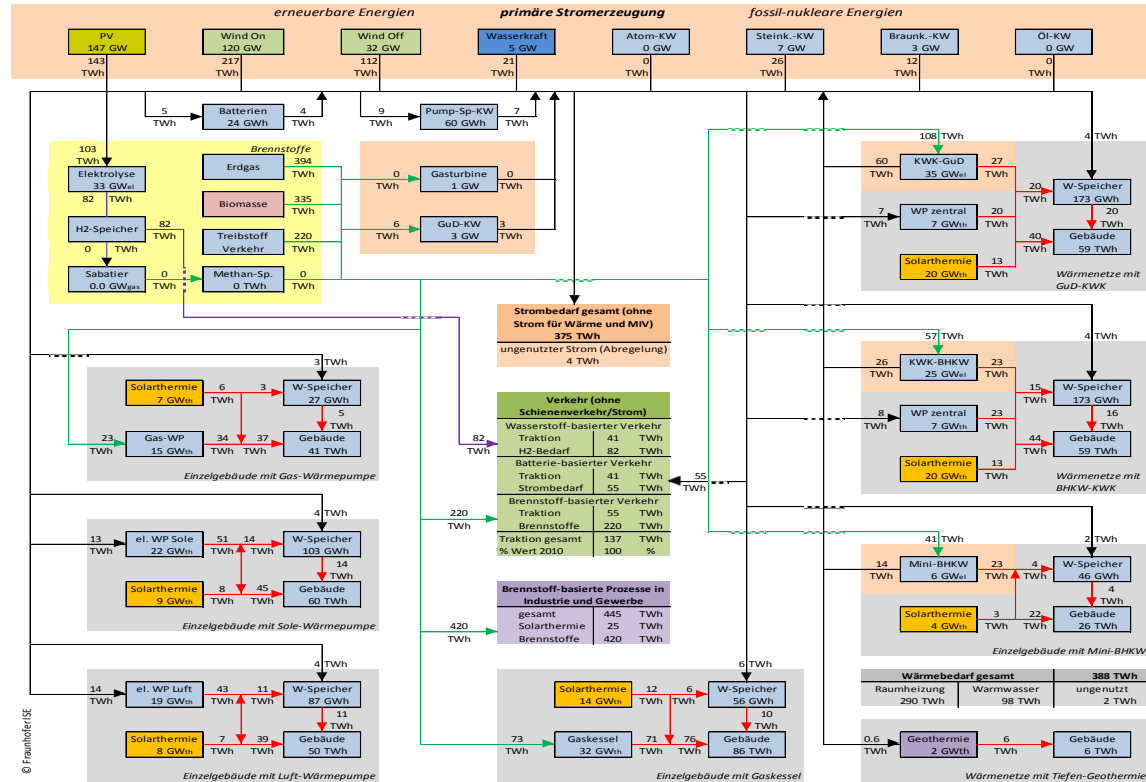
REM od-D
Renewable
Energy Model –
Deutschland

Slide courtesy Hans-Martin Henning 2014

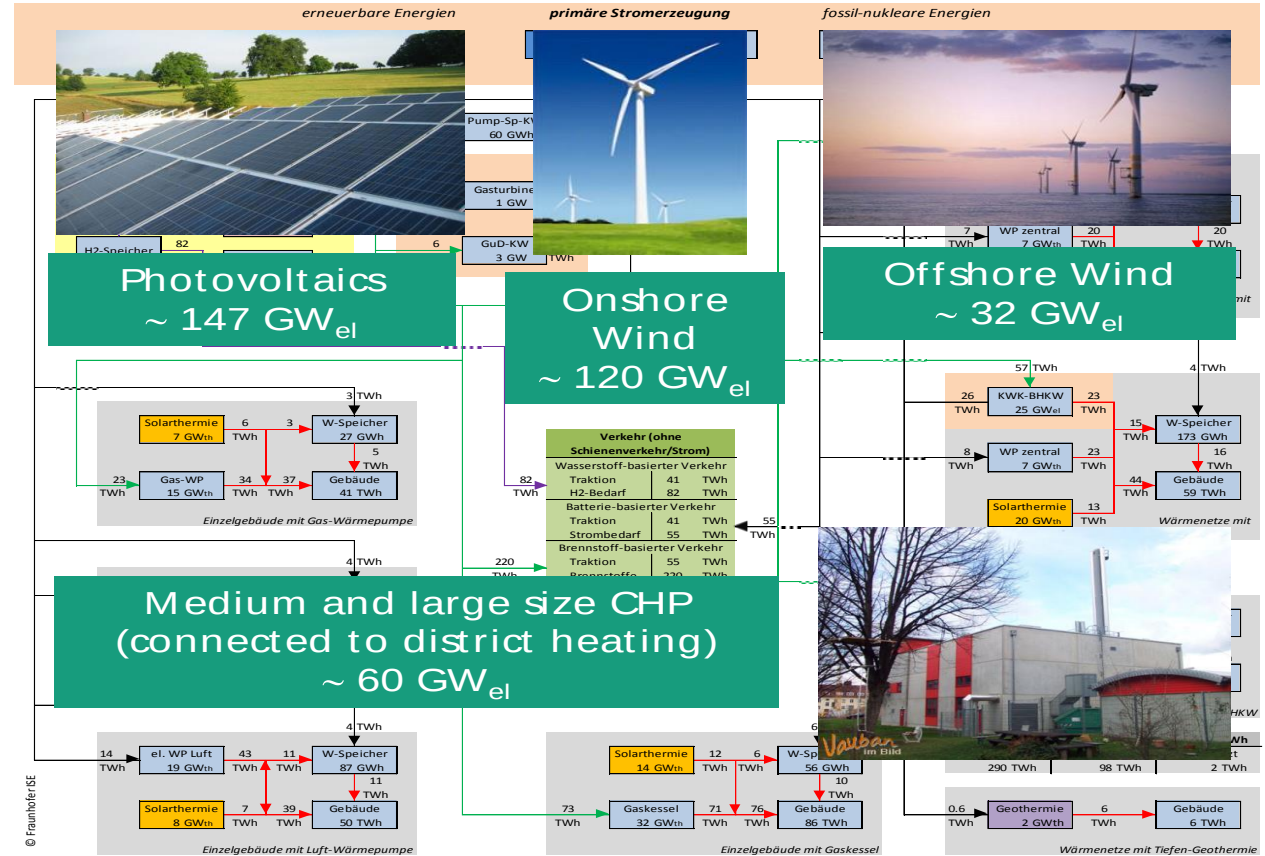
Optimization of Germany's future energy system based on hourly modeling

REM od-D Renewable Energy Model – Deutschland

Slide courtesy Hans-Martin Henning 2014



Electricity generation



Slide courtesy Hans-Martin Henning 2014

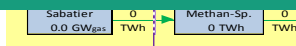
Storage



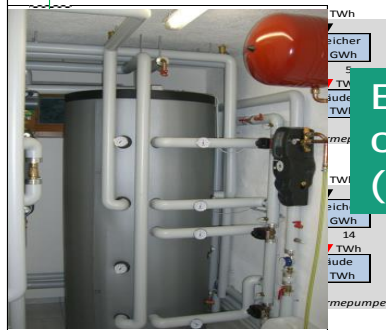
Stationary batteries
Total ~24 GWh (e.g. 8 Mio
units with 3 kWh each)



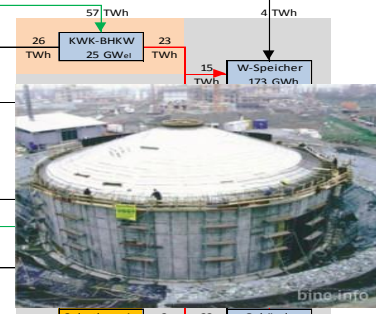
Pumped storage
power plants
42 units with a
total of 60 GWh



Electrolysers with total
capacity of 33 GW_{el}
(needed for mobility)



Heat buffers in buildings
Total ~320 GWh (e.g. 7 Mio
units with 800 Litres each)

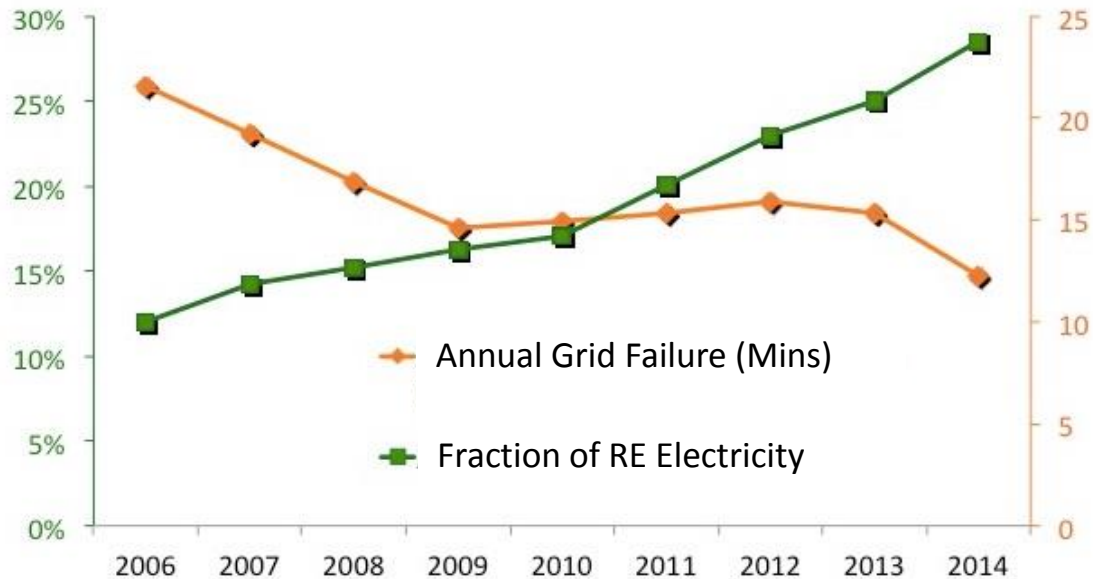


Large scale heat storage in
district heating systems
Total ~350 GWh (e.g. 150
units with 50.000 m³ each)

Slide courtesy Hans-Martin Henning 2014

How to run a stable energy system based on more and more fluctuating renewable energy?

- The annual electricity grid failure decreased 2006 – 2014 in Germany, despite the rapidly increasing fraction of fluctuating renewable energy.
- Increasing amounts of fluctuating RE require smart, automated grid stabilization technologies, that superior to the old system with rare, unexpected failures!



Source: Bundesnetzagentur (2014); Graph: Hans-Josef Fell 2015

SOME WORDS ON THE SET PLAN COMMUNICATION C(2015) 6317 (EUREC position)

- **We like:**
  - Heading towards one recognised stakeholder group per sector (“ETIP”)
    - Draft Work Programme 2016-17 maintains support for sector-specific European Technology Platforms
    - Researchers from industry and the public sector draw up R&I priorities together in the European interest. Short- to long-term considerations are balanced.
  - Possibility of direct contact with the SET Plan Steering Group
    - “The SET Plan management should engage with all actors,” says Communication
    - Stakeholders will guide them on the shape of their funding programmes
  - Recognition that “Better cooperation and coordination at EU level depends on improved transparency and exchange of information”

SOME WORDS ON THE SET PLAN COMMUNICATION C(2015) 6317 (EUREC position II)

- **We still want:**
  - The EC to reveal its thought processes, especially on the choice of Horizon 2020 call topics
    - EC has direct control of Horizon 2020, one of EU's single biggest sources of energy R&D funding
    - Recognised ETIPs should be formally consulted on H2020 Work Programme topics (their input would be published)
    - EC should provide *formal feedback* on the ideas (which would also be published)

- SUMMARY
- 1 Establishing a stable electricity system with high fraction of RE
    - Large RE capacities in wind & solar required, far exceeding peak demand
    - Base load capacities counterproductive
    - Flexible capacities like gas-fired CHP, power-to-heat, power-to-gas needed
    - Storage takes increasing role; recent price drop of Li-ion batteries (Tesla) will accelerate the process of transformation of the global energy systems
  - 2 Europe should appreciate the *great economic opportunities* arising from the transformation of our energy system, as example for the world!
  - 3 EUREC welcomes SET plan reforms
    - ETIPS as funded entities with clear responsibilities towards EC
    - Stronger instruments needed for innovation transfer into the market (EIC)

Interested in coming?

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EUREC

The Association of European
Renewable Energy Research Centres

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SHAPES ON THE HORIZON:
Ideas for Horizon 2020's Mid-Term
Review and a Look Beyond

3 December 2015 - p.m.

Brussels, Belgium

For more information

on the event programme and venue, please
contact Céline Suchet: suchet@eurec.be

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