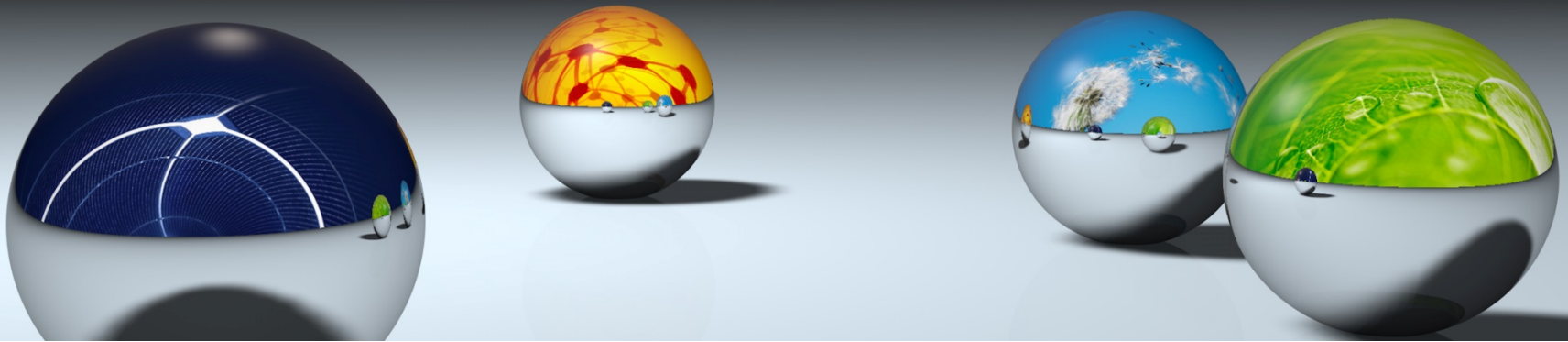




› German energy policy as key driver for energy storage

Munich, 1 March 2016

Dr. Sabine Semke

Outline

Basic ideas of the German energy transition process

- › Main targets and the monitoring process
- › Role of Renewables (electricity and heat)
- › Energy efficiency - The National Action Plan (NAPE)
- › Energy R&D (Budgets)

German Energy Concept

- › published in 2010
- › defines significant reduction of GHG emission as primary goal for the energy transition process
- › is based on two fundamental strategies
 - › the expansion of renewables and
 - › a significant reduction of the energy demand

both paths are representing activities of equal importance!

Additionally

- › **Nuclear energy phase-out (2011)**
 - › today 12 GW nuclear are still operating
 - › to be switched off until 2022

- › **Lignite (2015)**
 - 9 power units (approx. 2,7 GW) shall be taken out of continuous operation, but serve furthermore as back-up for emergency cases

Energy transition

- › 10-point agenda outlining main measures and key projects in current legislation period (June 2014)
- › annually monitoring report (gov.)
- › progress reporting service every 3rd year

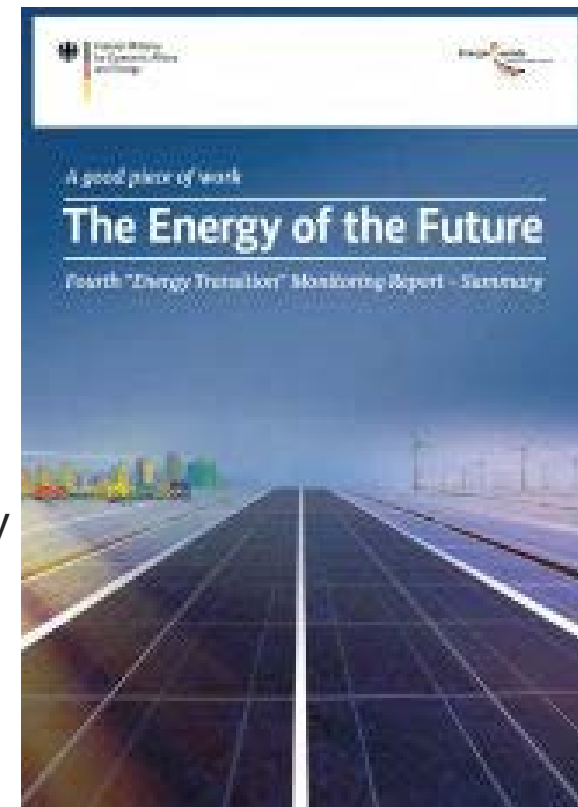
and

- › independent experts group to analyze and to comment on the monitoring results annually

<http://www.bmwi.de/EN/Topics/Energy/energy-transition.htm>

!

participation process - 5 experts' platforms,
including the "Research and Innovation Platform" as advisory
body



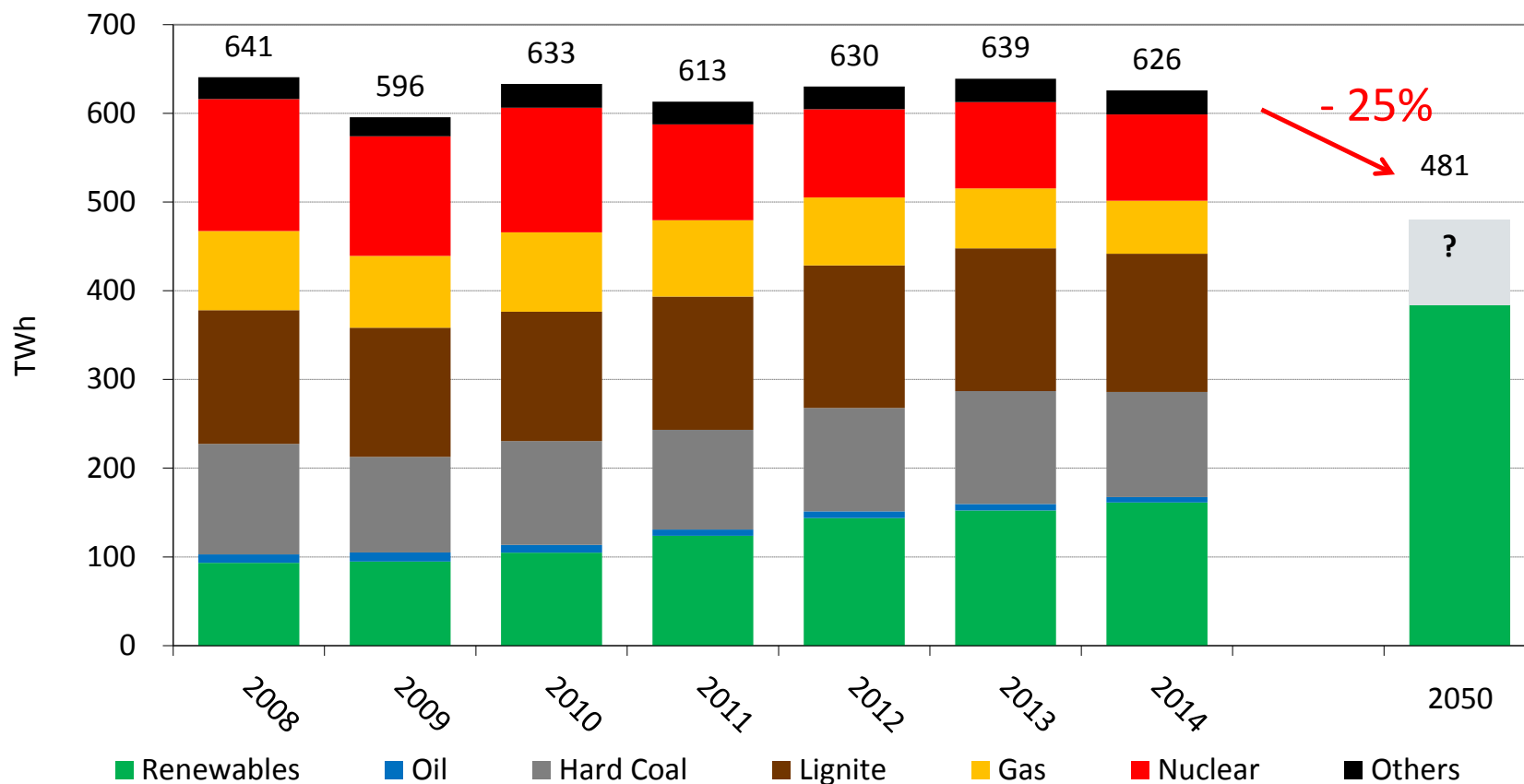
Energy Transition - Main Goals

	2014	2020	2030	2040	2050
GHG compared with 1990	-27%	At least – 40%	At least -55%	At least – 70%	At least – 80 - 95 %
Renewables share of gross final energy consumption	13,5 %	18 %	30 %	45 %	60 %
Efficiency Primary energy consumption	- 8,7 %	-20 %			- 50 %

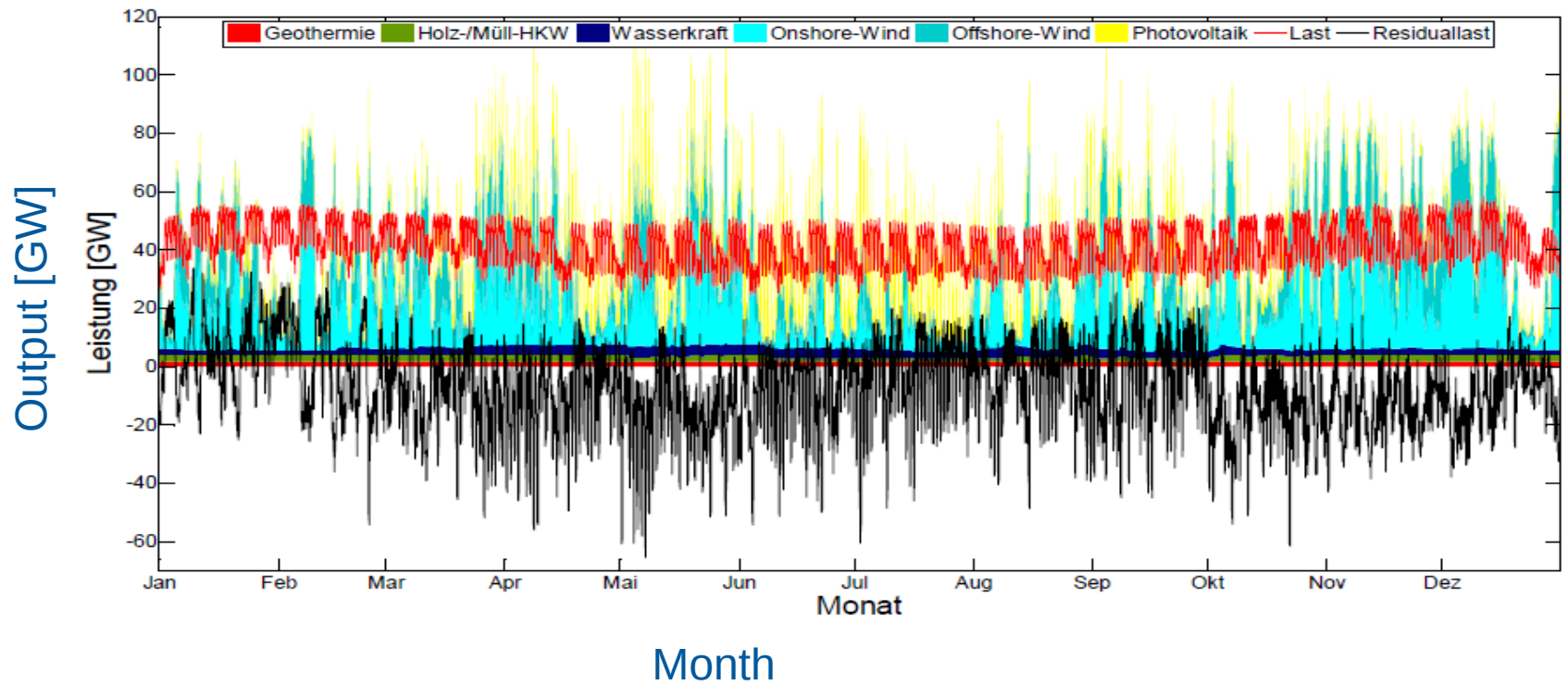
Specific end-use targets

	2014	2020	2030	2040	2050
Heat consumption in buildings (compared with 2008)	- 12,4 %	-20 %			
Gross electricity consumption (compared with 2008)	- 4,5 %	-10 %	→		- 25 %

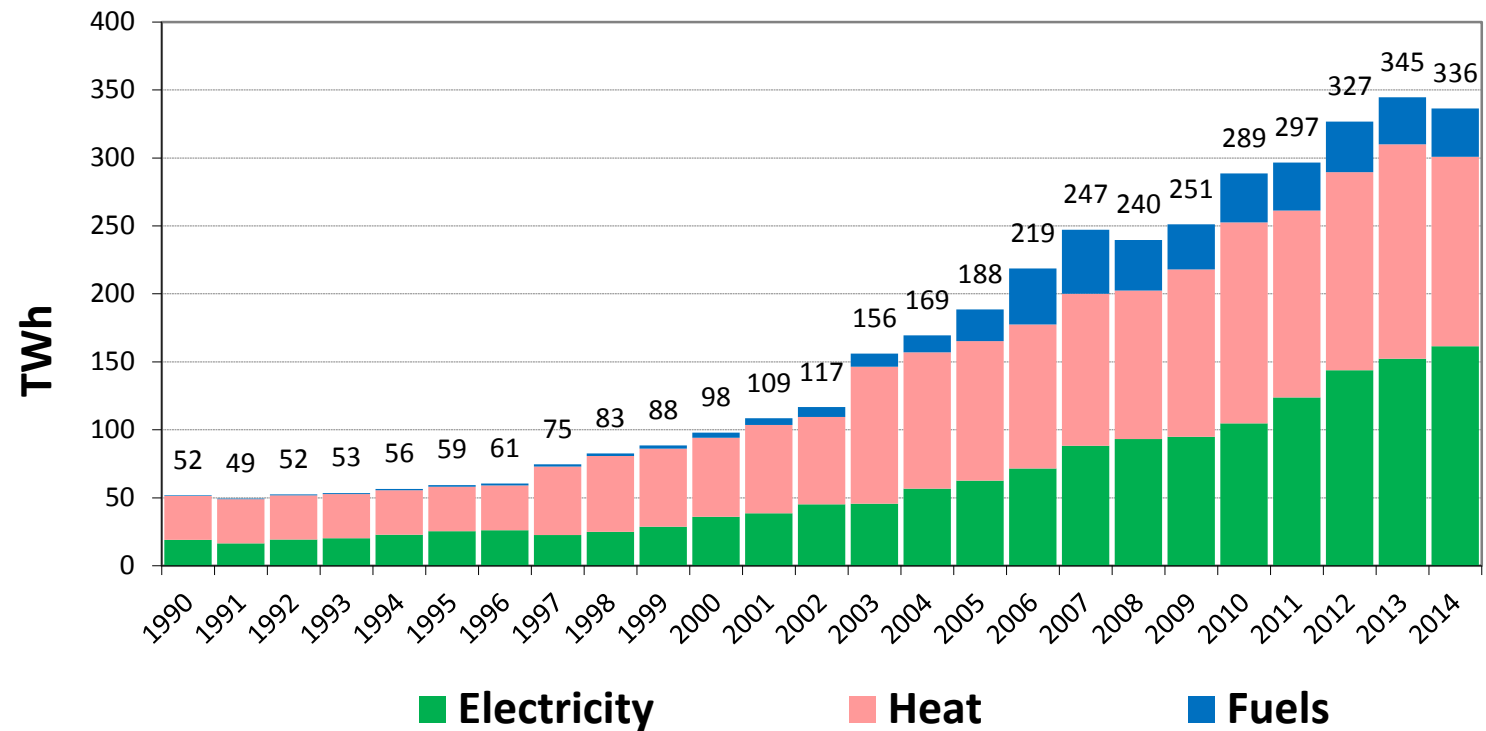
Gross electricity production



Simulation for the year 2050 (85 % RE)



Final energy consumption by renewables



Source: BMWi based on Arbeitsgruppe Erneuerbare Energien-Statistik

Renewables 2014

Shares

- › 14 % of final energy consumption (2020 target: 18%)
- › 27,5% of gross electricity consumption

Technologies

- new on-shore wind (4.7GW)
- new off-shore wind (1.900 GW)

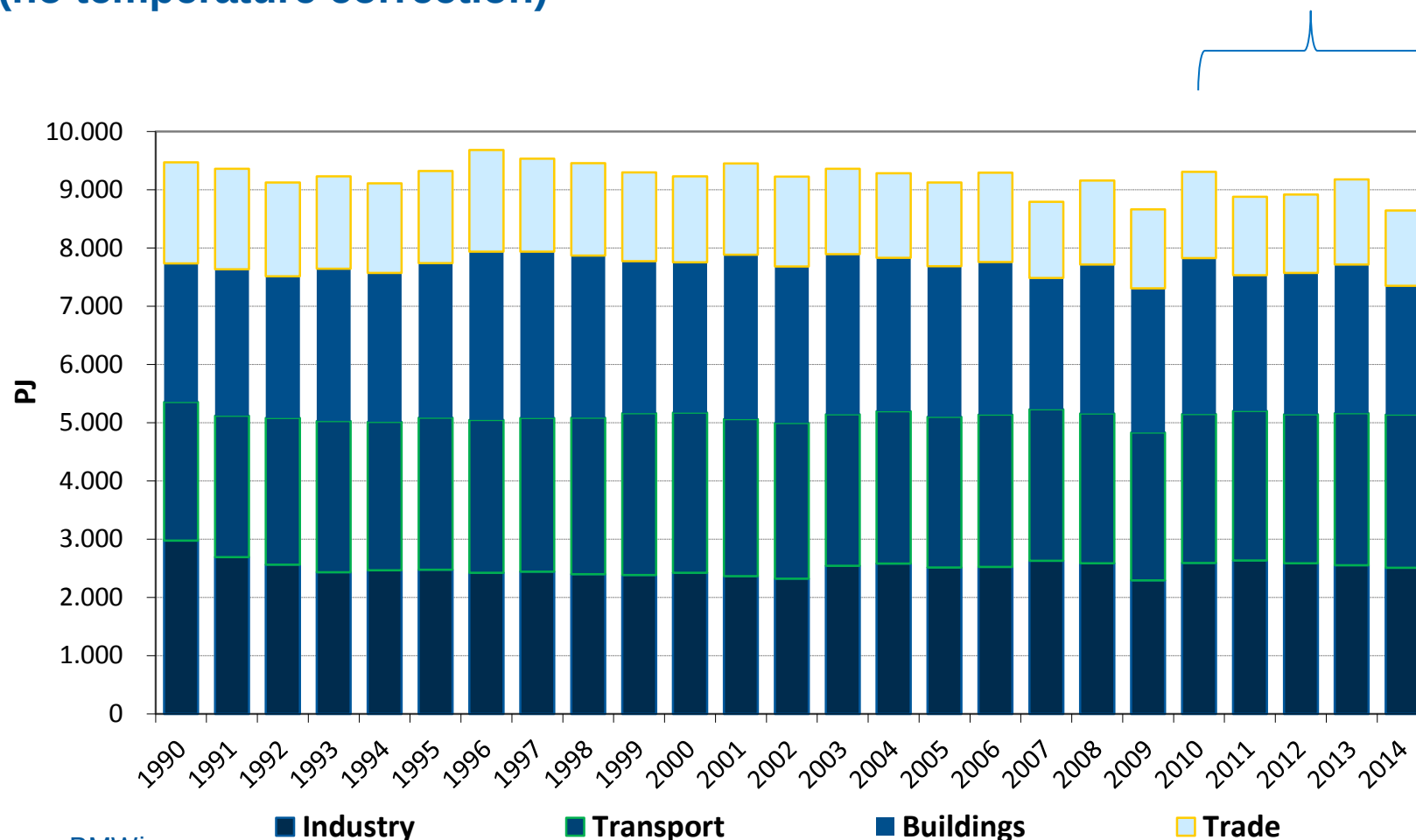
wind and biomass similar priority,
followed by PV

Photo: P. Markewitz



Energy consumption in PJ (no temperature correction)

Revitalisation of the economy



Energy demand – end use sectors

- › Launch of the **National Action Plan on Energy Efficiency (NAPE)**
 - › defines the end-use strategy
 - › covers buildings and industry sector
 - › comprises immediate measures and forward-looking processes
 - › funding programs, regulations, labelling etc.
- › **strengthens energy R&D**
- › tackles **storage of electricity and heat** as important measure
e.g. with market incentives in combination with renewables
(Launch of battery programm on 19 February 2016!)
- › <http://bmwi.de/EN/Service/publications,did=701906.html>

Role of storage in the future energy system

› **Electricity sector**

- › maintain security and quality of electricity system
- › intelligent grid control and adjustment
- › reduce renewables' curtailment
(right of grid operators to disconnect renewable systems from the grid)

› **Heat sector**

- › efficiency gains e.g. in combination with solar thermal or demand side management

› **Transportation sector**

- › successful introduction of e-mobiles and
- › hydrogen vehicles

Combination of mobile storage with electricity grid services!

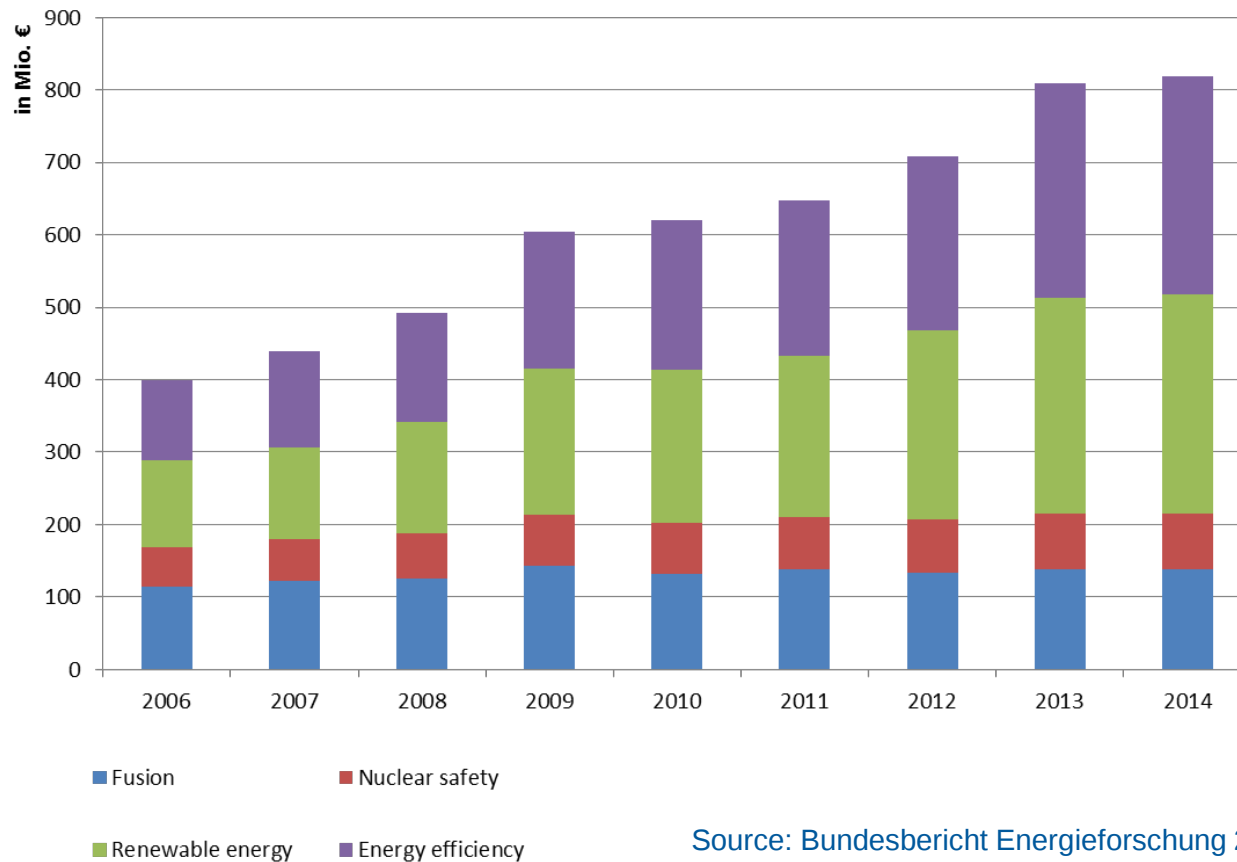
Storage in energy R&D

- › One of the main R&D topics in the 6. Energy R&D Programme
- › Applications
 - › electricity and heat
 - › power-to-gas, power-to-x
 - › mobile applications
- › Basic science, materials research, development of components and systems, demonstration and pilotplants

Photo: P. Markewitz

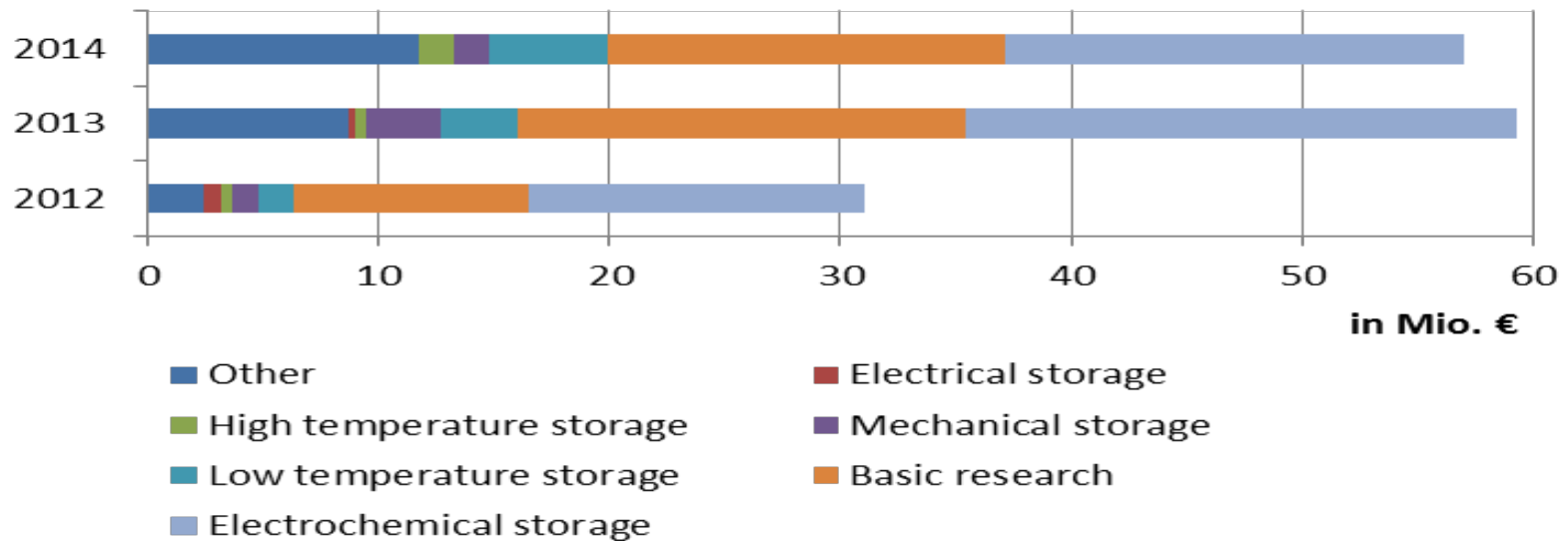


R&D budget (Gov. project- and institutional funding)



Source: Bundesbericht Energieforschung 2015

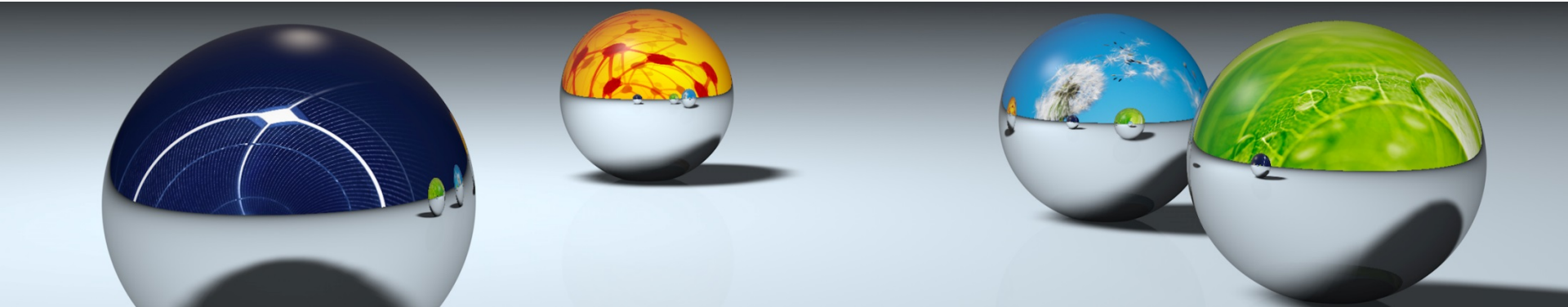
R&D budget related to energy storage



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Thank you very much!



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