

Energy transition in Werra-Meißner-District

(Hessen, Germany)

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Content

„Side effects“

Elements of energy transition

Climate protection concept W

Introduction

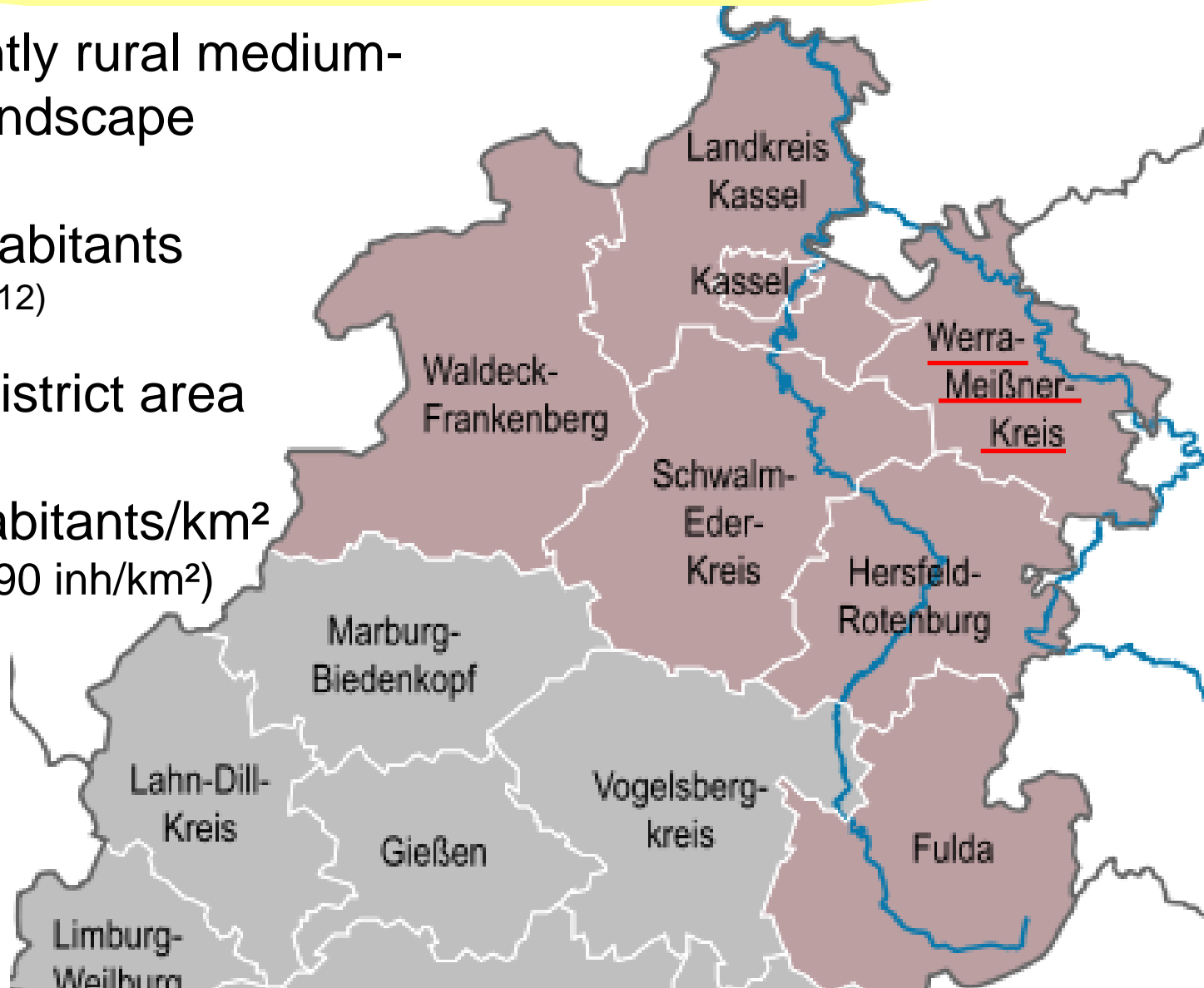
Summary

Werra-Meißner-District

in Germany, Hessen



- Predominantly rural medium-mountain landscape
- 102,592 inhabitants
(at: June 30th, 2012)
- 1,025 km² district area
- ca. 100 inhabitants/km²
(Hessen ca. 290 inh/km²)



Why do we need an energy transition?

Energy industry in the past:

- Nuclear energy: Risk is not justifiable!
- Fossil fuels (oil, coal, gas):
only limited availability and climate change!

5. Progress report of the IPCC*

(Volume 1: „The Physical Science Basis“,
27-09-2013)

Core statements:

* Intergovernmental Panel on Climate Change

■ Climate changes faster than previously expected

- Temperature in the lower atmosphere increases
- Ice glaciers are melting
- Sea level increases

■ Increase in extreme weather conditions

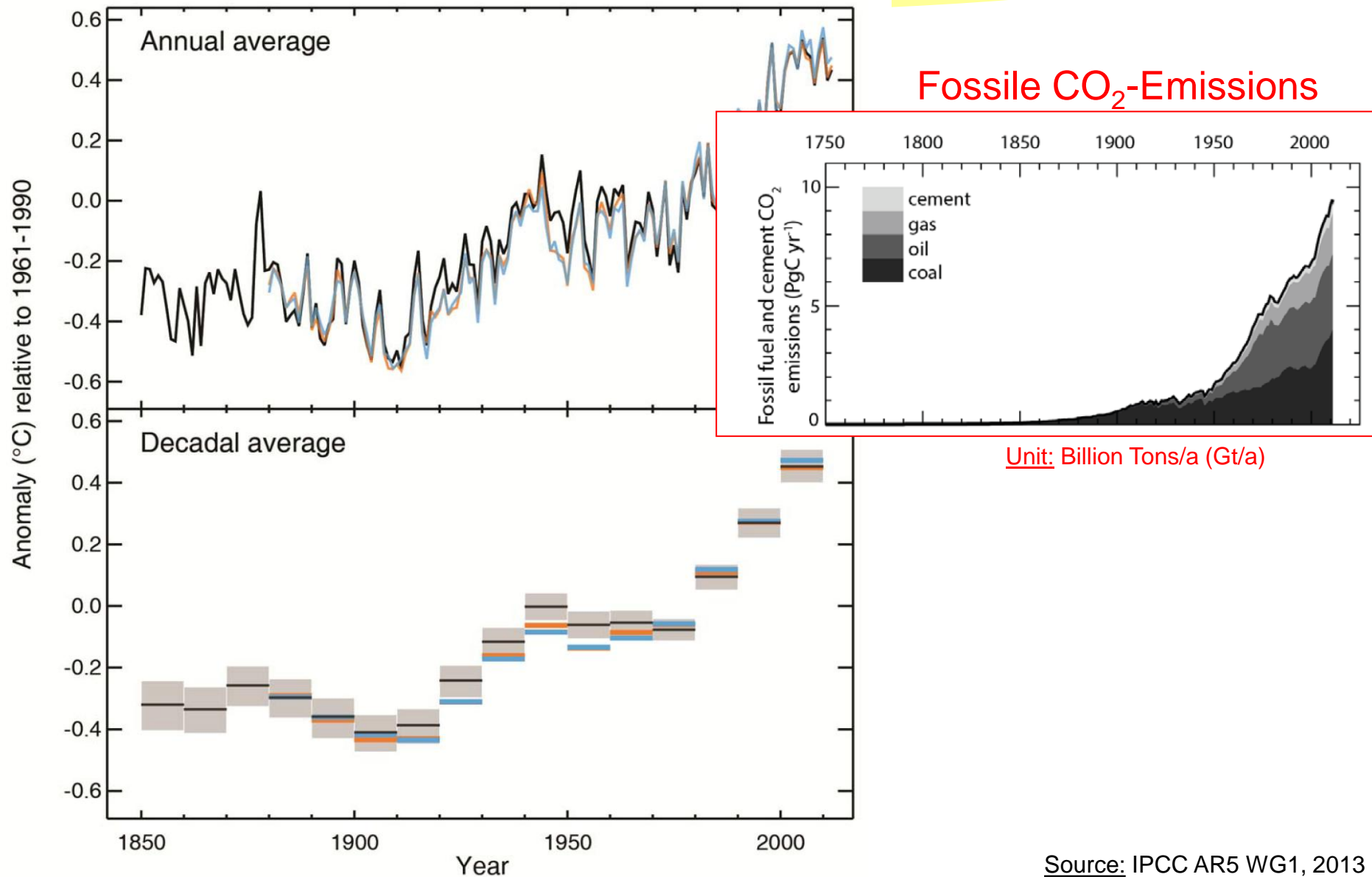
- Heat waves and droughts
- Storms and extreme rainfall

Solution:

☞ Reduce green house gas emissions drastically!



World-wide emperature changes (1850 – 2012)



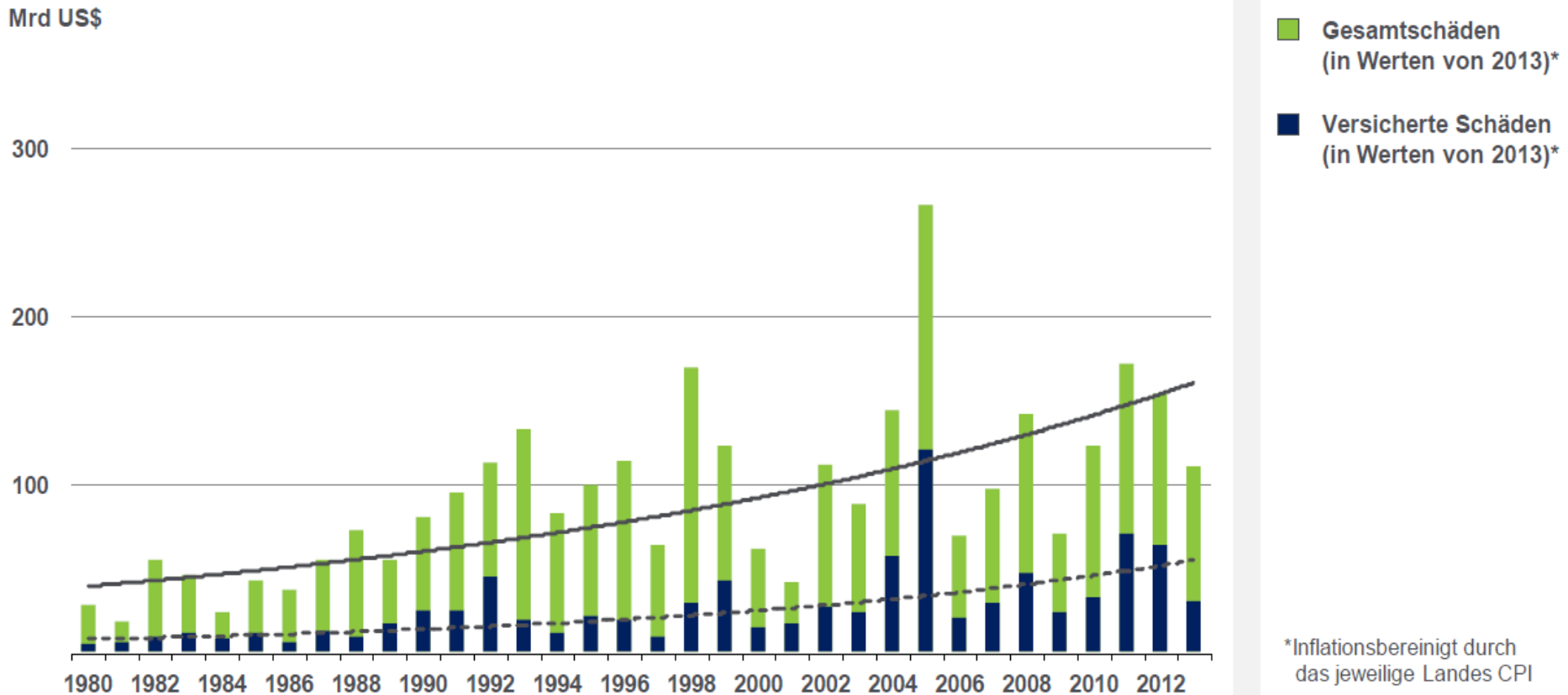
Weather related damages

NatCatSERVICE

Wetterbedingte Schadenereignisse weltweit 1980 – 2013 Gesamtschäden und versicherte Schäden

Munich RE 

Mrd US\$



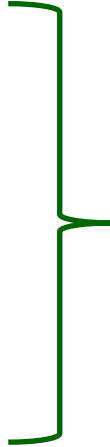
Changes in Energy

„Sustainable Energy *EEE*“

- *Energy savings*
- *Energy efficiency*
- *Energy from renewable sources*

Required energy mix:

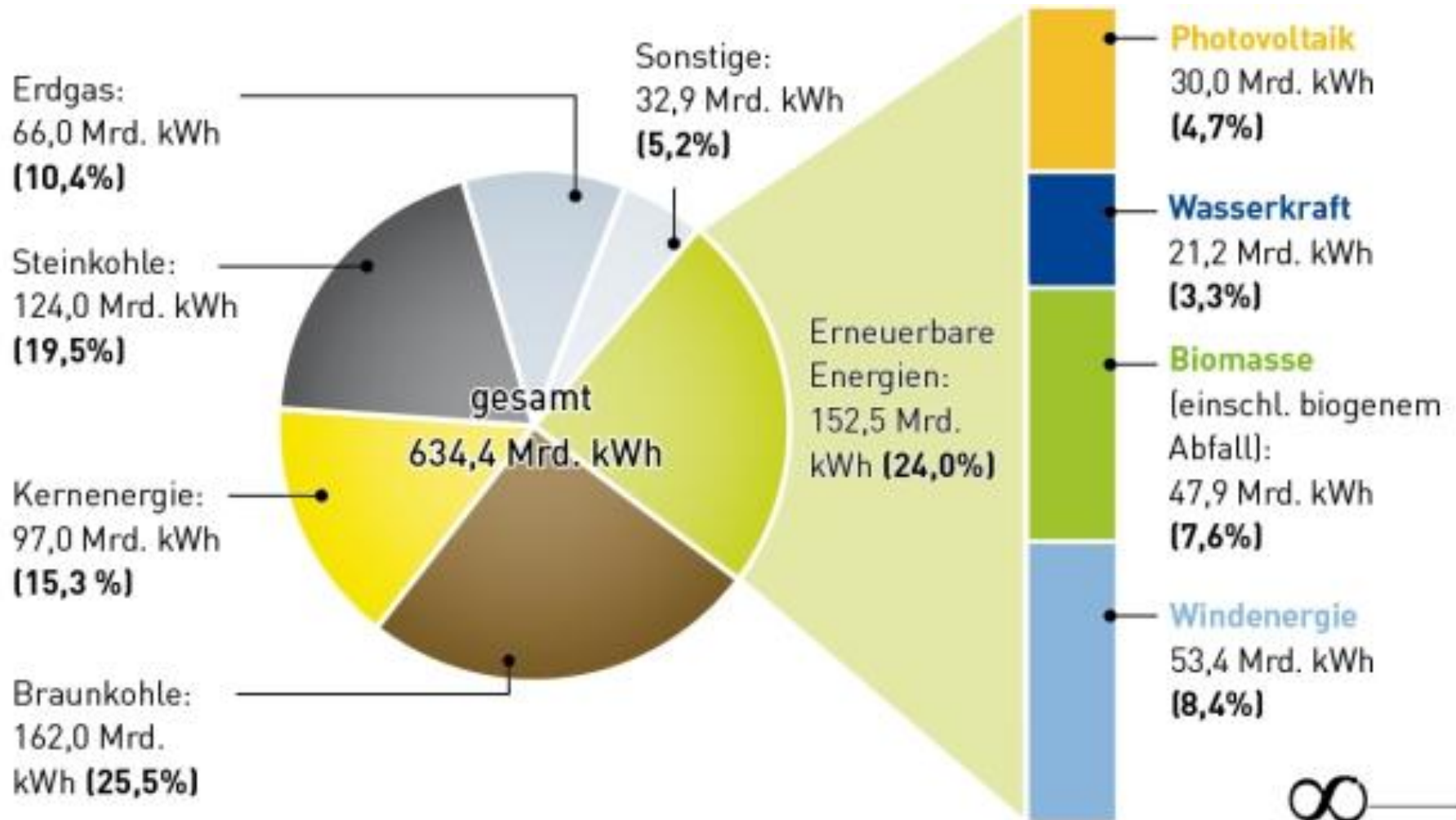
- Wind energy
- Solarenergy (PV and Solar thermal)
- Biomass (Biogas and thermic installations)
- Geothermal
- Hydro power



Take local
conditions into
account!

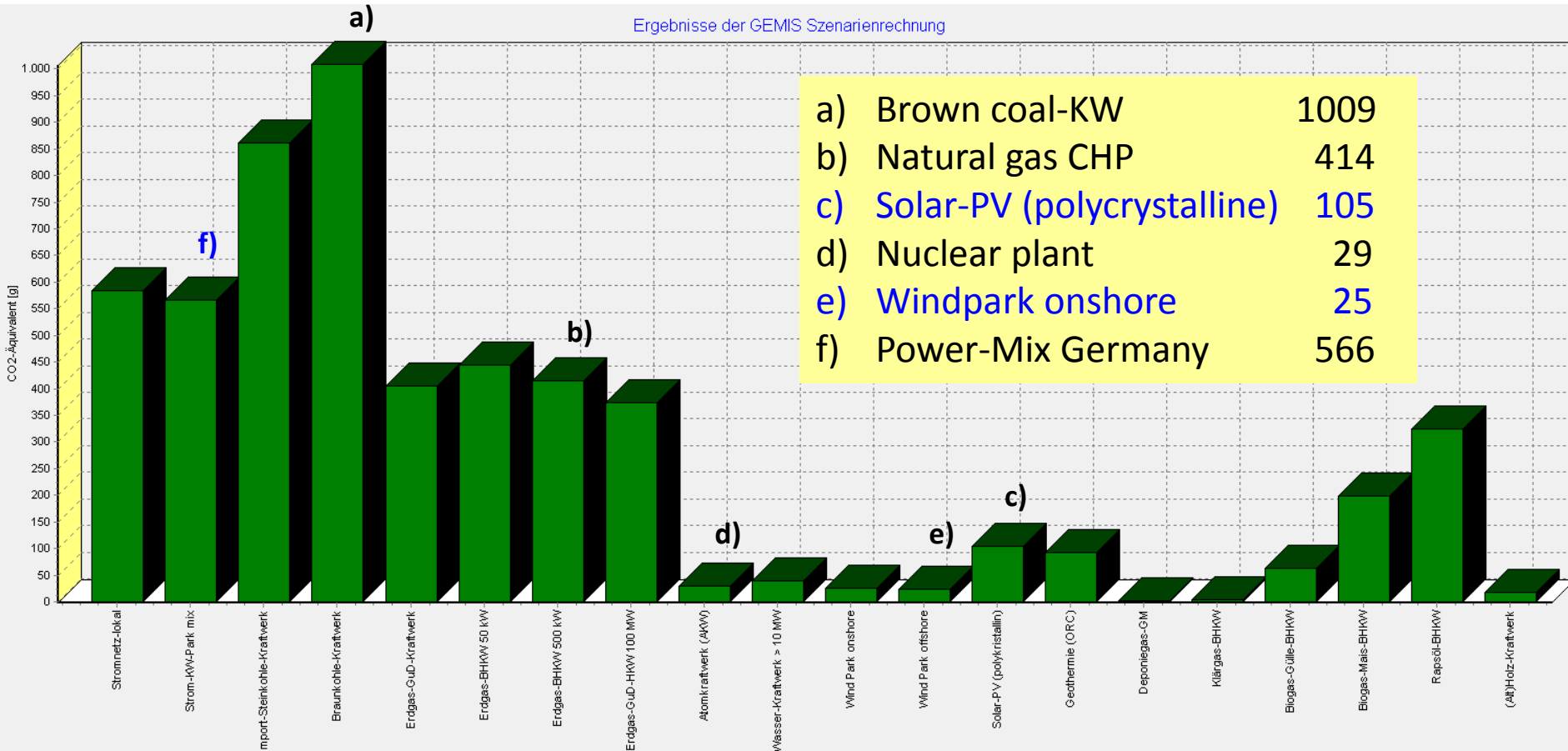


Electricity mix Germany 2013



Climate relevant power production

- g CO₂-Equivalent/kWh Electricity **incl. Supply chain** -



Conclusion: Wind energie and solar power reduce climate change

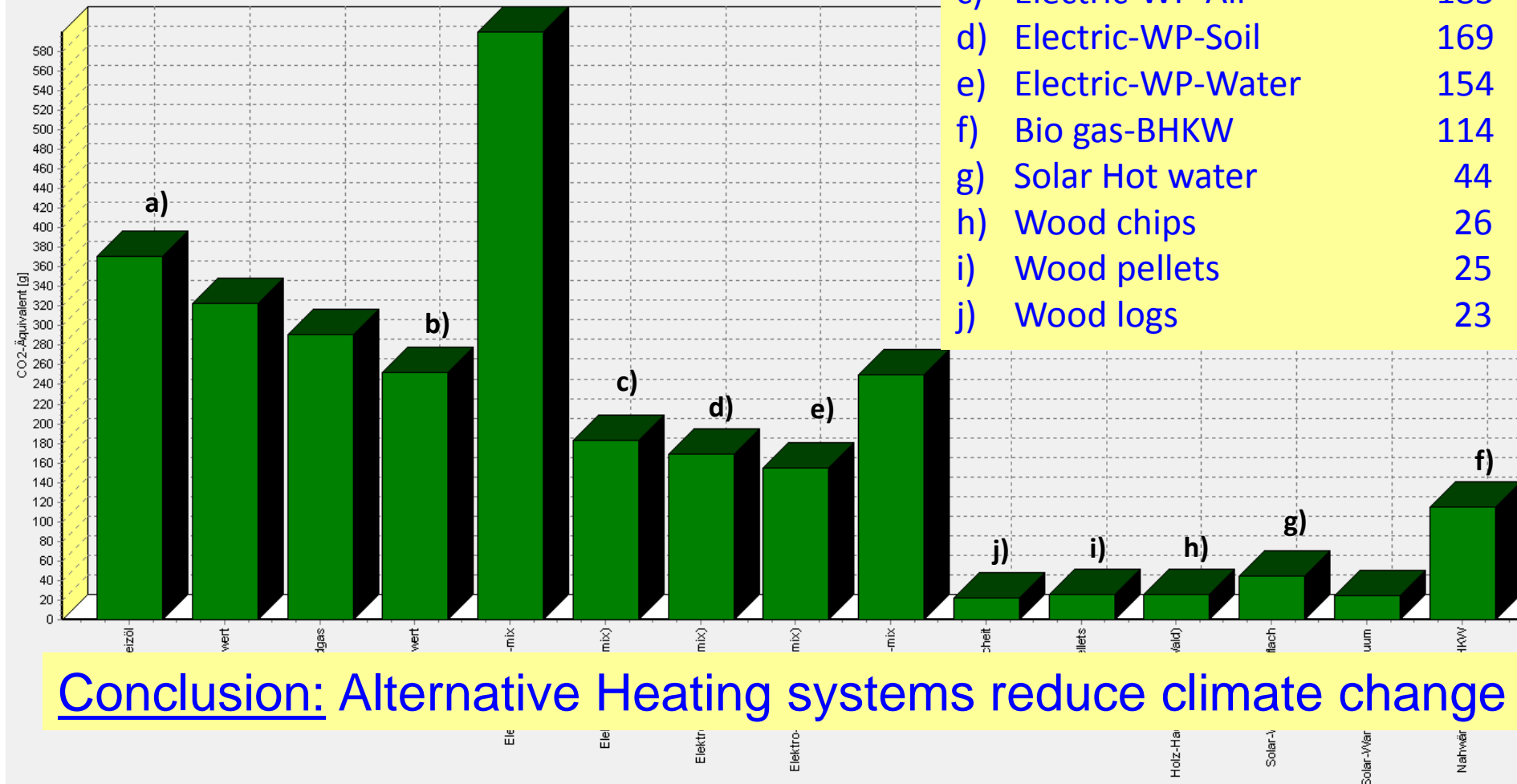
(Nuclear energy as well, though with higher risk!)

Climate relevant heat generation

- g CO₂-Equivalent/kWh Heat incl. Supply chain -

Source: GEMIS 4.7 (2012)

Ergebnisse der GEMIS Szenario



Conclusion: Alternative Heating systems reduce climate change

Energy sources

Adaptation of electricity management

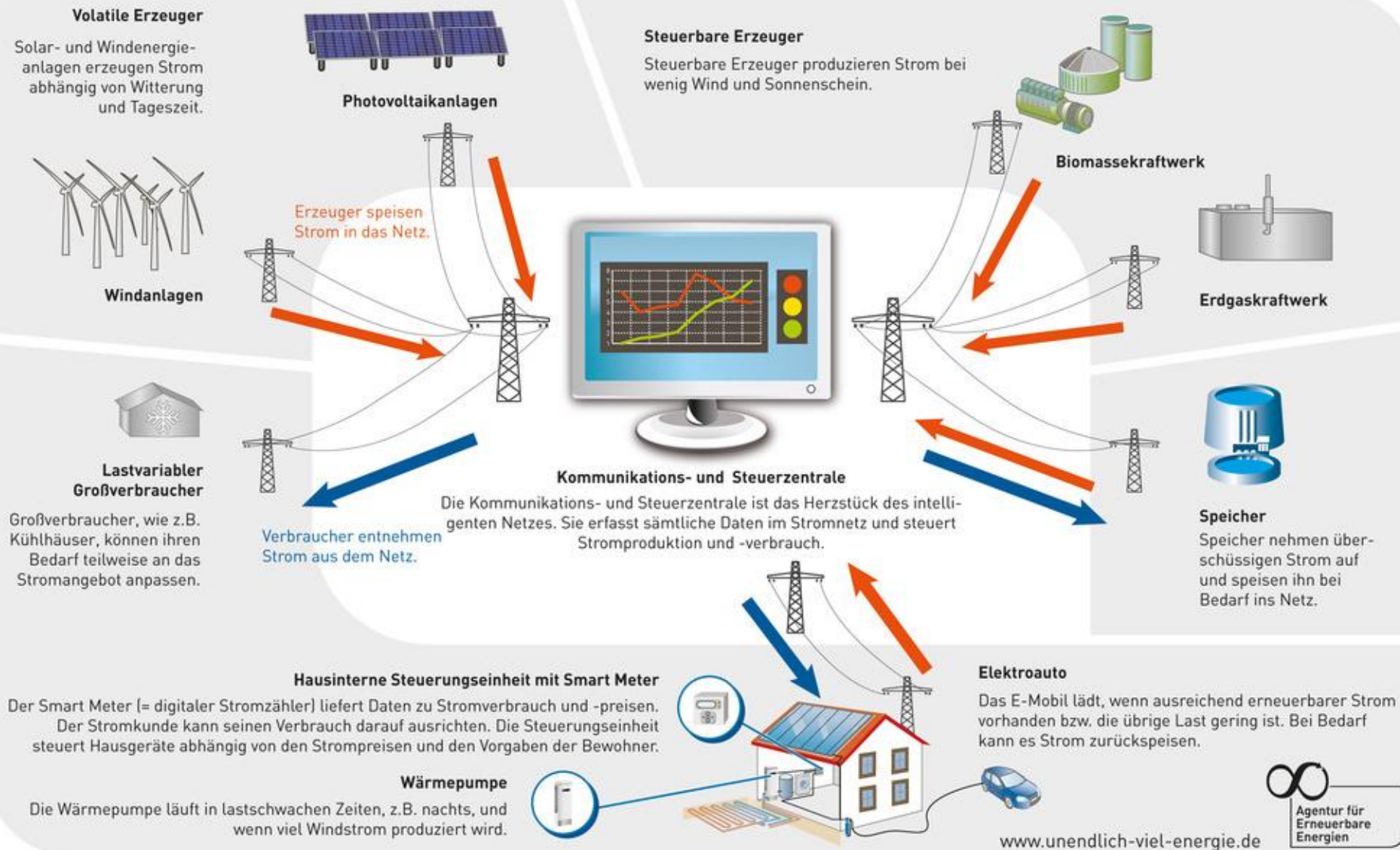
- Adaptation of user behavior (when do we use electricity?)
 - Intelligent Electricity meter „smart meter“
- Adaptation of power grid
 - Intelligent grid „smart grids“
- Development / expansion of storage technologies

Goal: A high as possible decentralized electrical self-sufficiency!

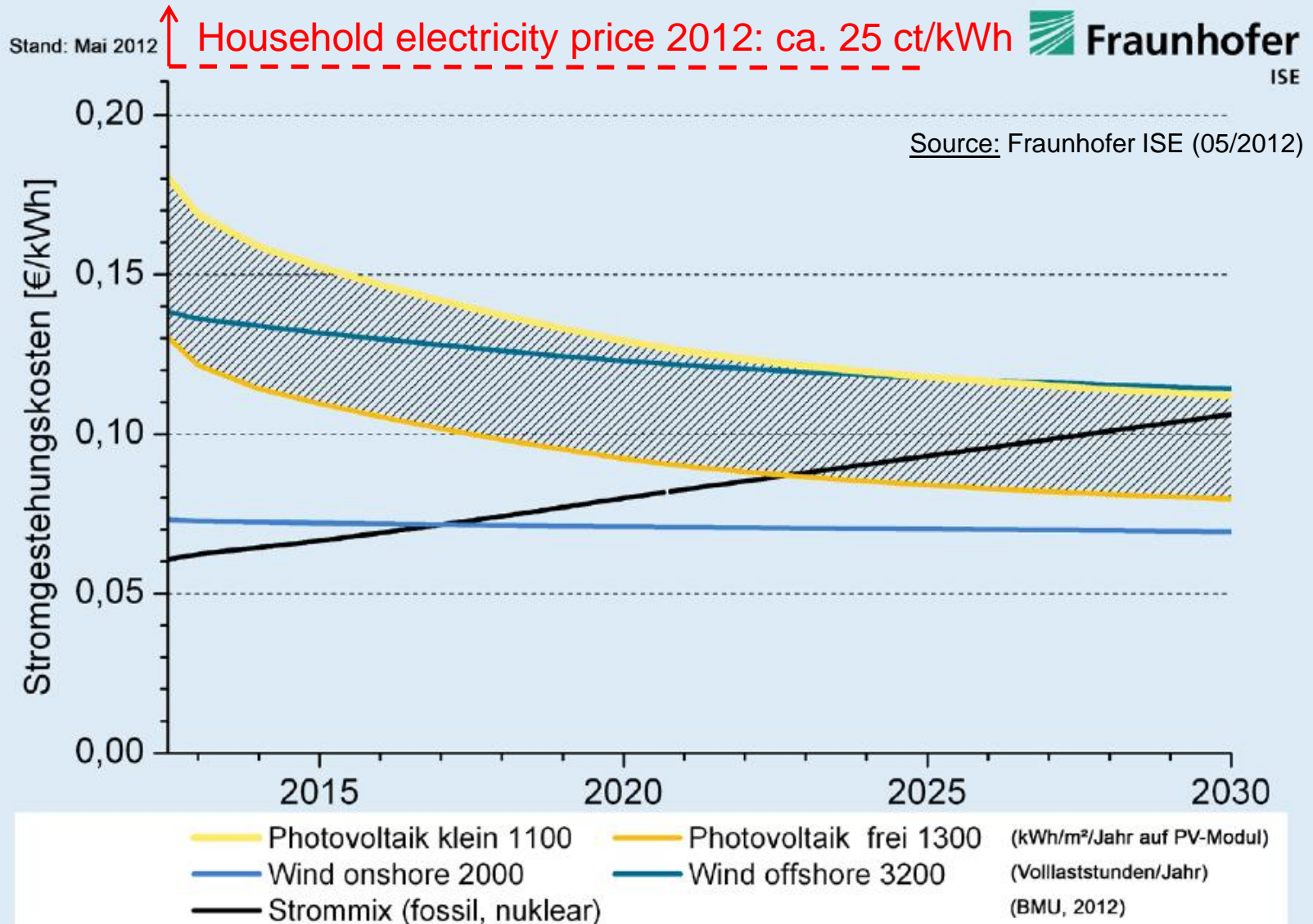
The intelligent electricity grid



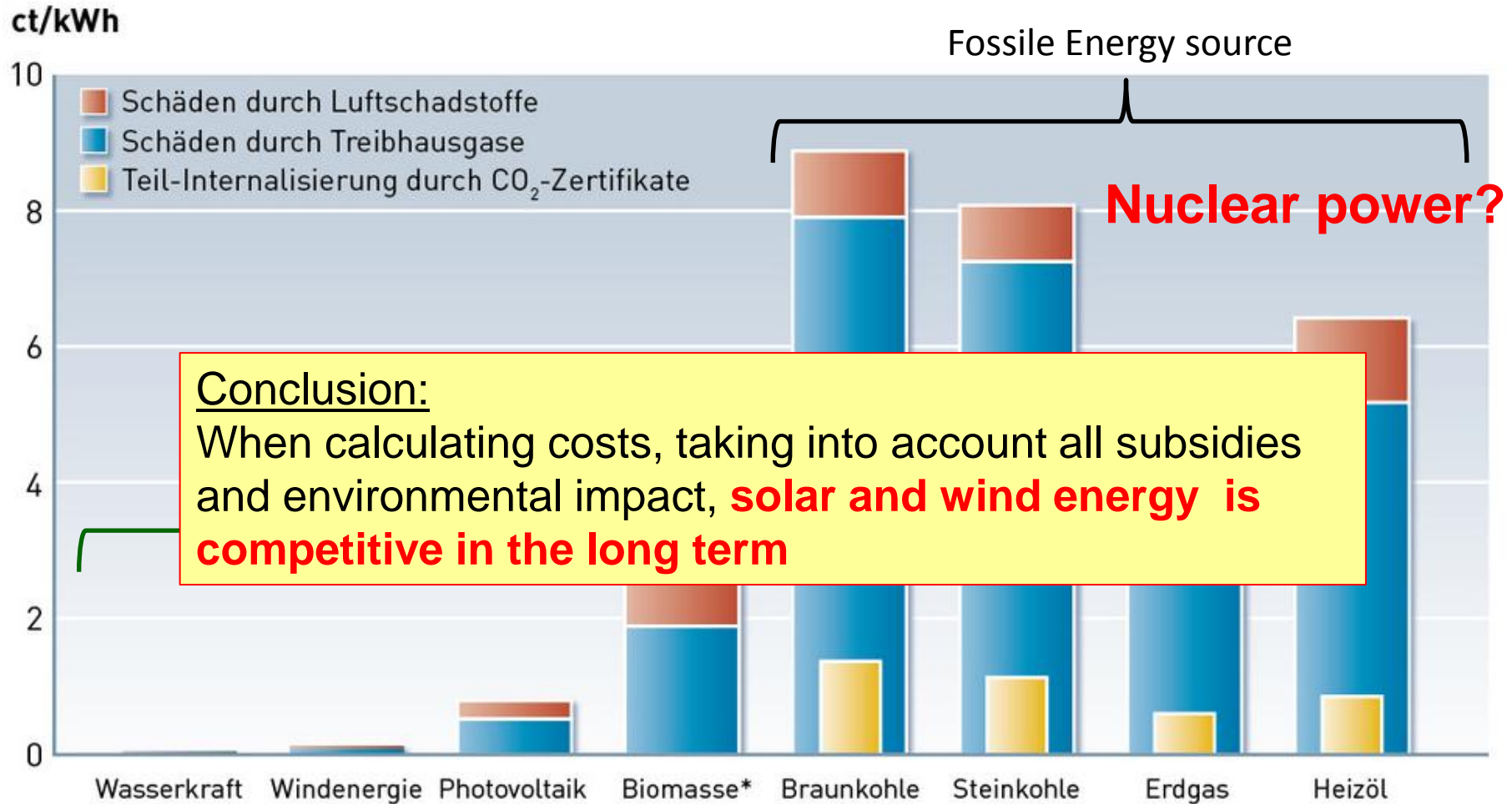
WERRA-MEISSNER-KREIS



Power generation costs



Costs of power production for environmental degradation 2010



*Durchschnittswert, Bandbreite 1 bis 5 ct/kWh

Quelle: BMU/Fraunhofer ISI

Stand: 8/2011, CO₂-Zertifikatskosten im Jahr 2010

www.unendlich-viel-energie.de

„Side effects“ of energy generation

- Independent energy supply
- Jobs
- Regional value
(Financing, Planning, construction, operation, maintenance)
→ *Money stays in the district!*

→ **Structural promotion of the region**



Climate protection concept Werra-Meissner-District

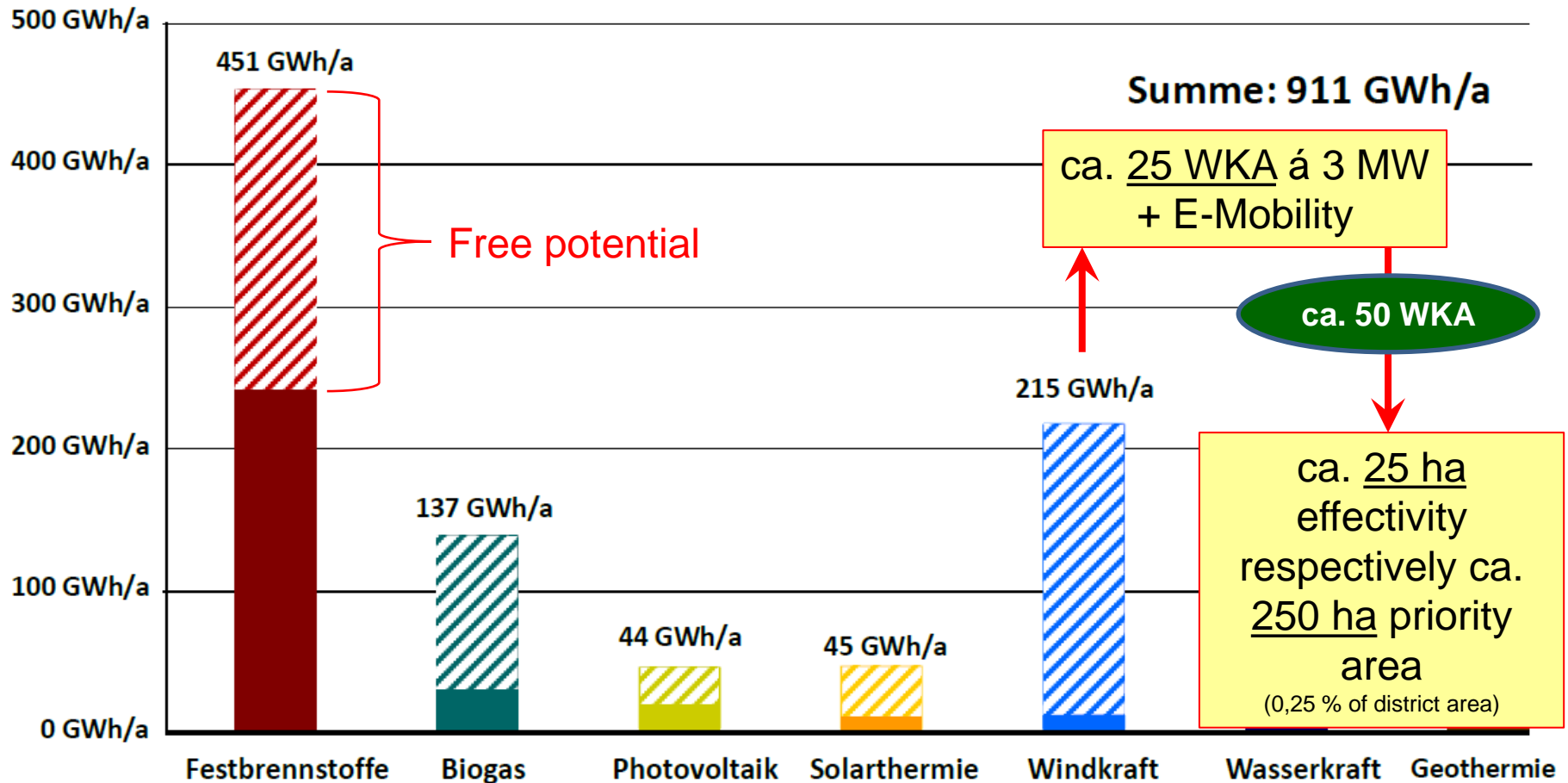


- Unanimously determined by district council on february 27th, 2012
- Goal: **100% renewable energy by 2050**
- Contents:
 - Energy consumption 2010 „is - state“
 - Energy and CO₂-savings potential 2050
 - Costs of CO₂-reduction
 - Regional value
 - Recommended actions



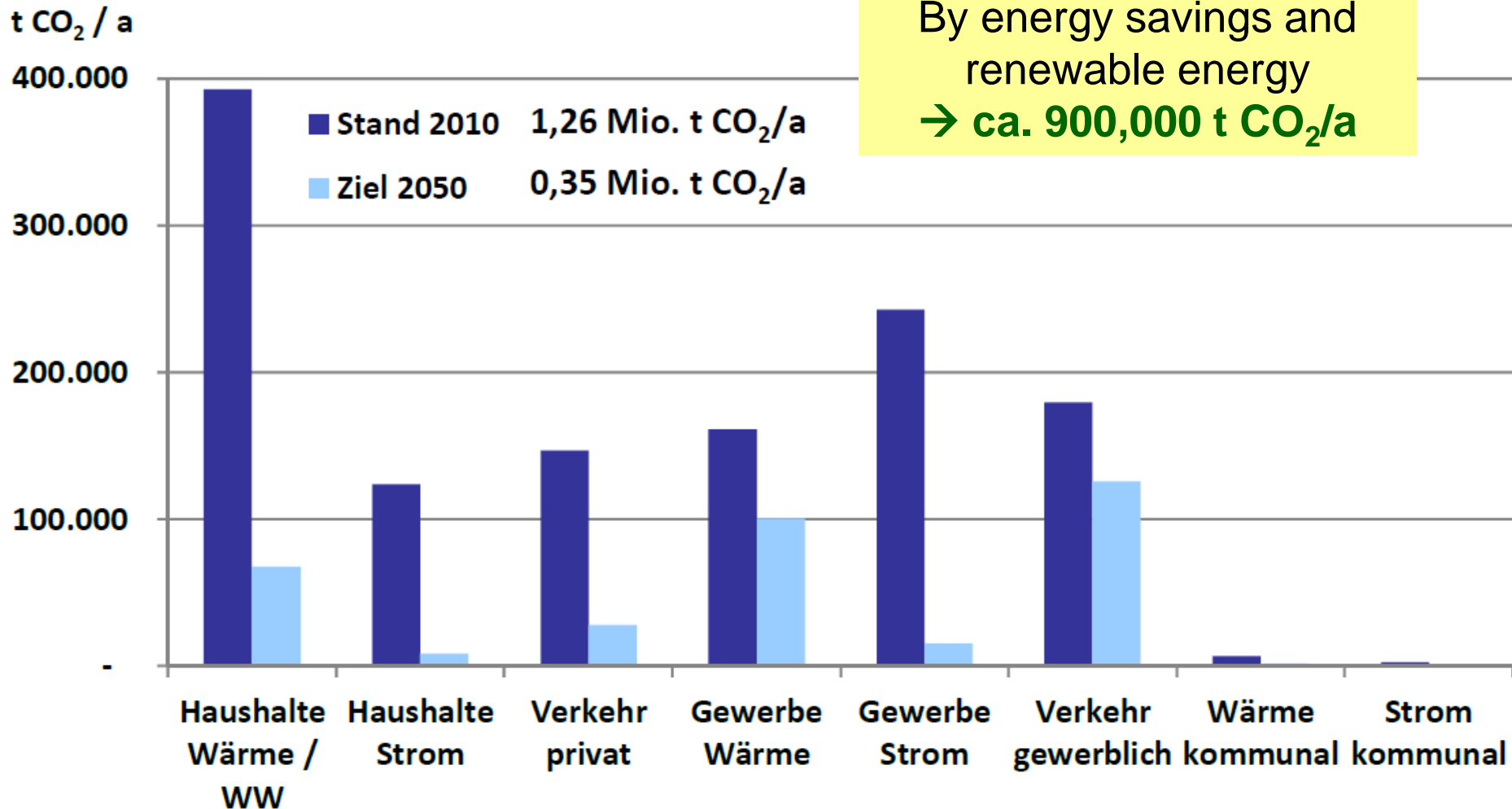
Download: www.werra-meissner-kreis.de

Regenerative Energy potential



Regionales regeneratives Energiepotenzial im Werra-Meißner-Kreis
(genutzte Anteile dunkel dargestellt)

CO₂-Savings in WMK



Investments / Value

Measures of climate protection concept



- Operational- / investment costs 150 million Euro/a
→ ca. 4.000 Euro/household WMK
- Regional value 75 million Euro/a
- Avoided external energy costs 113 million. Euro/a
→ ca. 200 million total in WMK

Recommended actions (summary)



WERRA-MEISSNER-KREIS

Short-term

Medium-term

Long-term

Energy savings

Insulation/Energy savings *Private homes*

Energy efficiency *Trade and Industry*

Modernizing heating *Private homes*

Modernizing street lights

Insulation/Energy savings *Community/District*

EE

Electricity: Wind power / Photovoltaic

Heat: Solarthermic / Green wastes / Forest wood / Straw

Electricity and heat: Biogas *From Bio-wastes and us Bioabfall and renewable resources*

Mobility

Car-pooling / „registered hitchhiking“

Improvement of bike infrastructure

Extra public transportation / E-mobility

Summary

- Energy transition in WMK has begun
- **EEE:** Energy savings – Energy efficiency – Energy from renewable sources
- **Energiemix:** Wind, Sun, Biomass, Water, Heat from soil
- *„As soon as possible, but with sense of proportion“*
- Participation of citizens → Citizen Energy Cooperation founded
- Regional value

***District Administration coordinates and supports –
implementation of the energy transition lies with the citizens
and communities***



Thank you for your attention

