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UTS: ISF

The Changing Utility Industry and Opportunities to Improve Energy Efficiency: Insights from the U.S., Germany & Australia

Steven Nadel, ACEEE

Stefan Thomas & Dagmar Kiyar, Wuppertal Institute

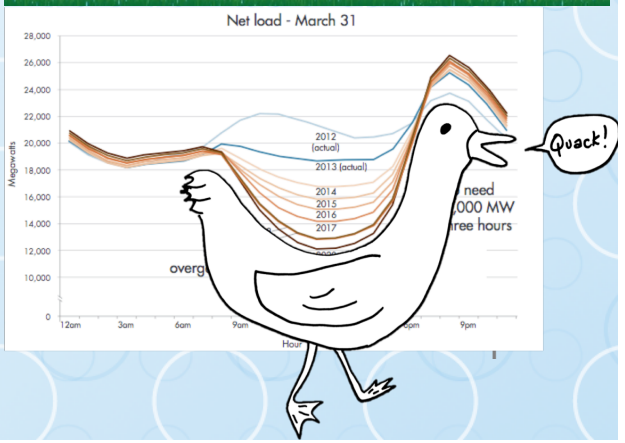
Chris Dunstan, Institute for Sustainable Futures, U Tech Sydney

ECEEE 2015









Introduction





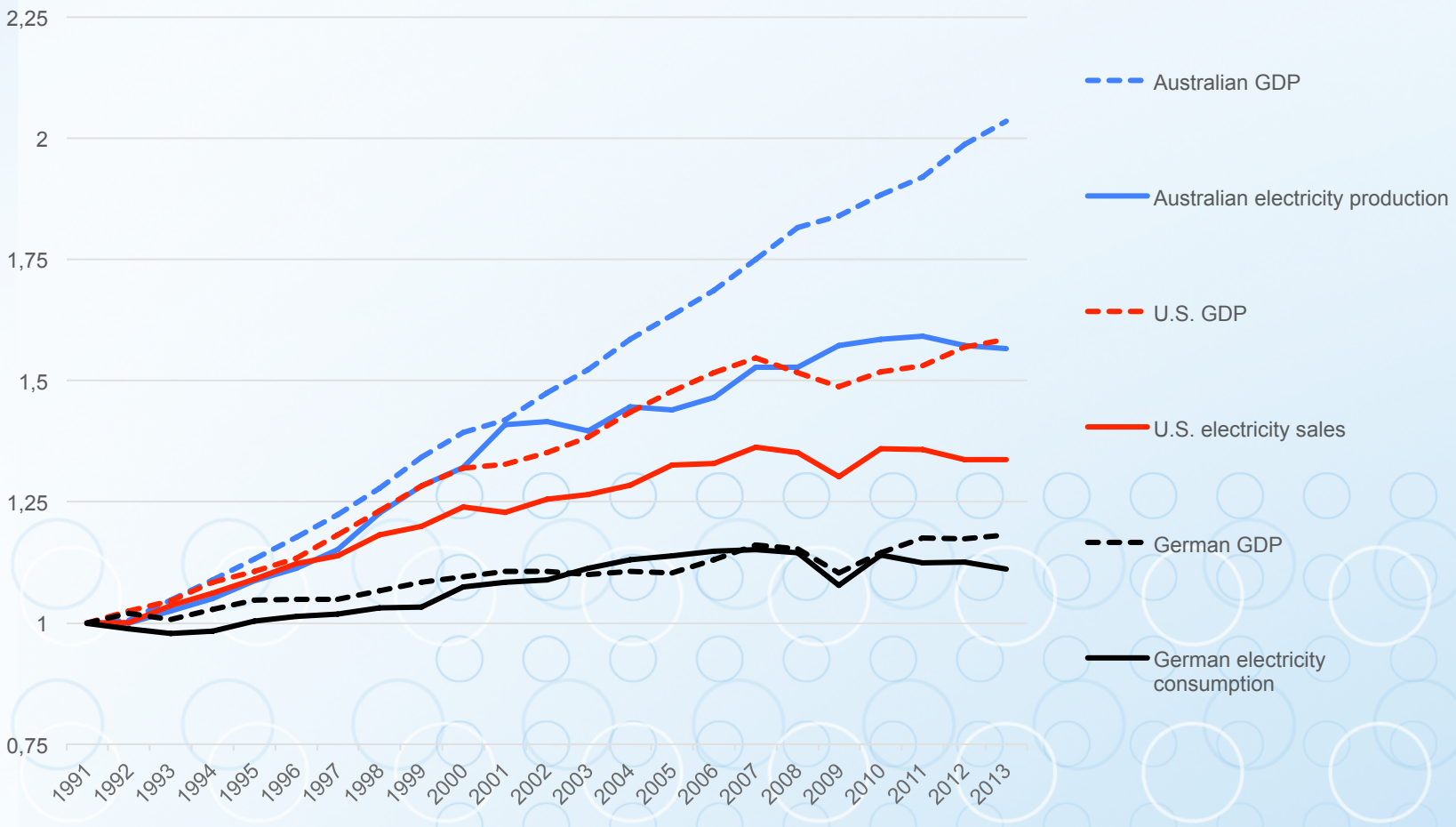
- Discussion in many countries about how the utility industry is changing and how old utility business models may be unsustainable:
  - Focus on electric sector
  - Particularly prominent in the U.S., Germany and Australia.
- This paper summarizes how these countries are approaching these issues and how EE fits in.

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Electricity Sales Declining

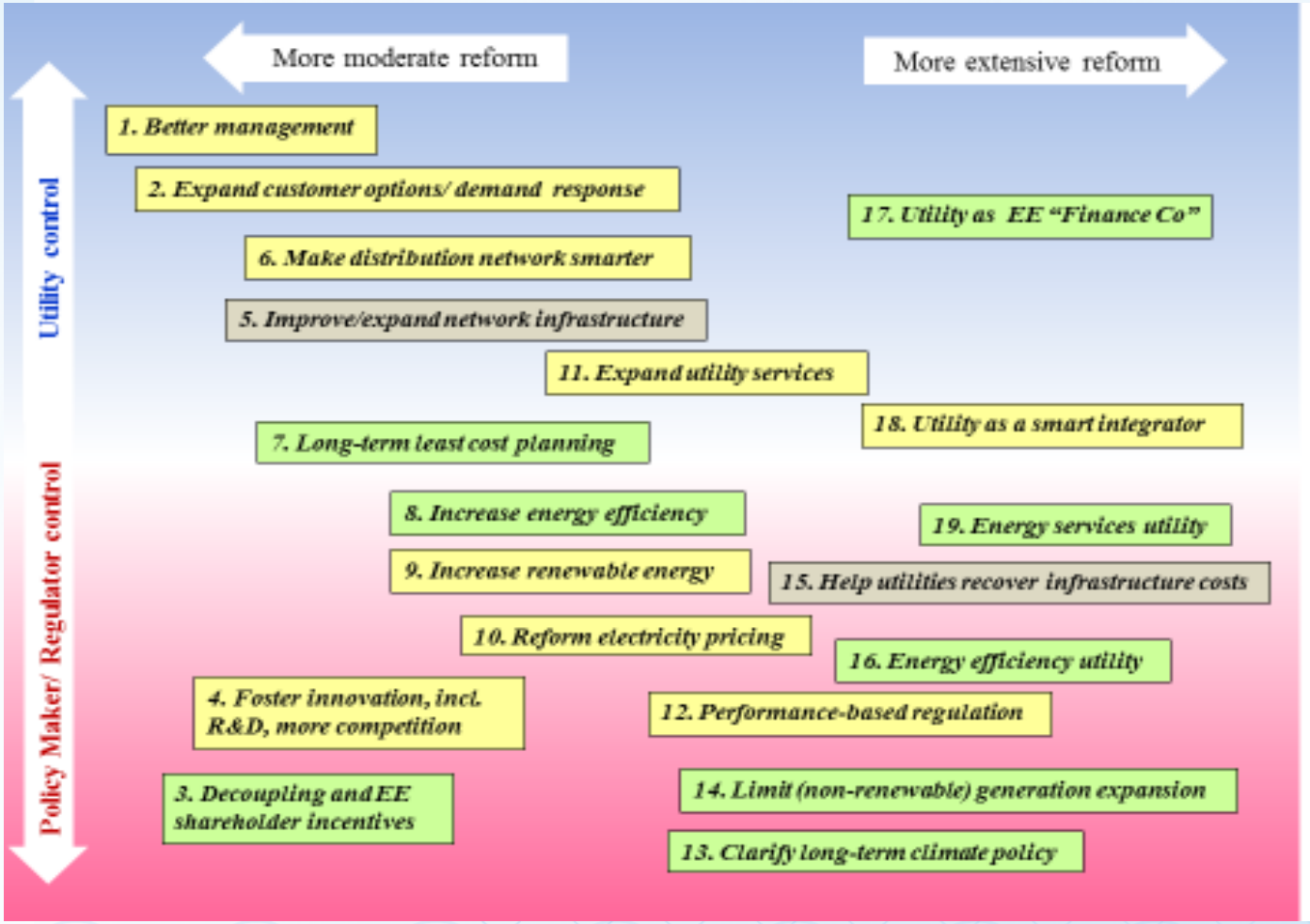


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Electricity Reform Options

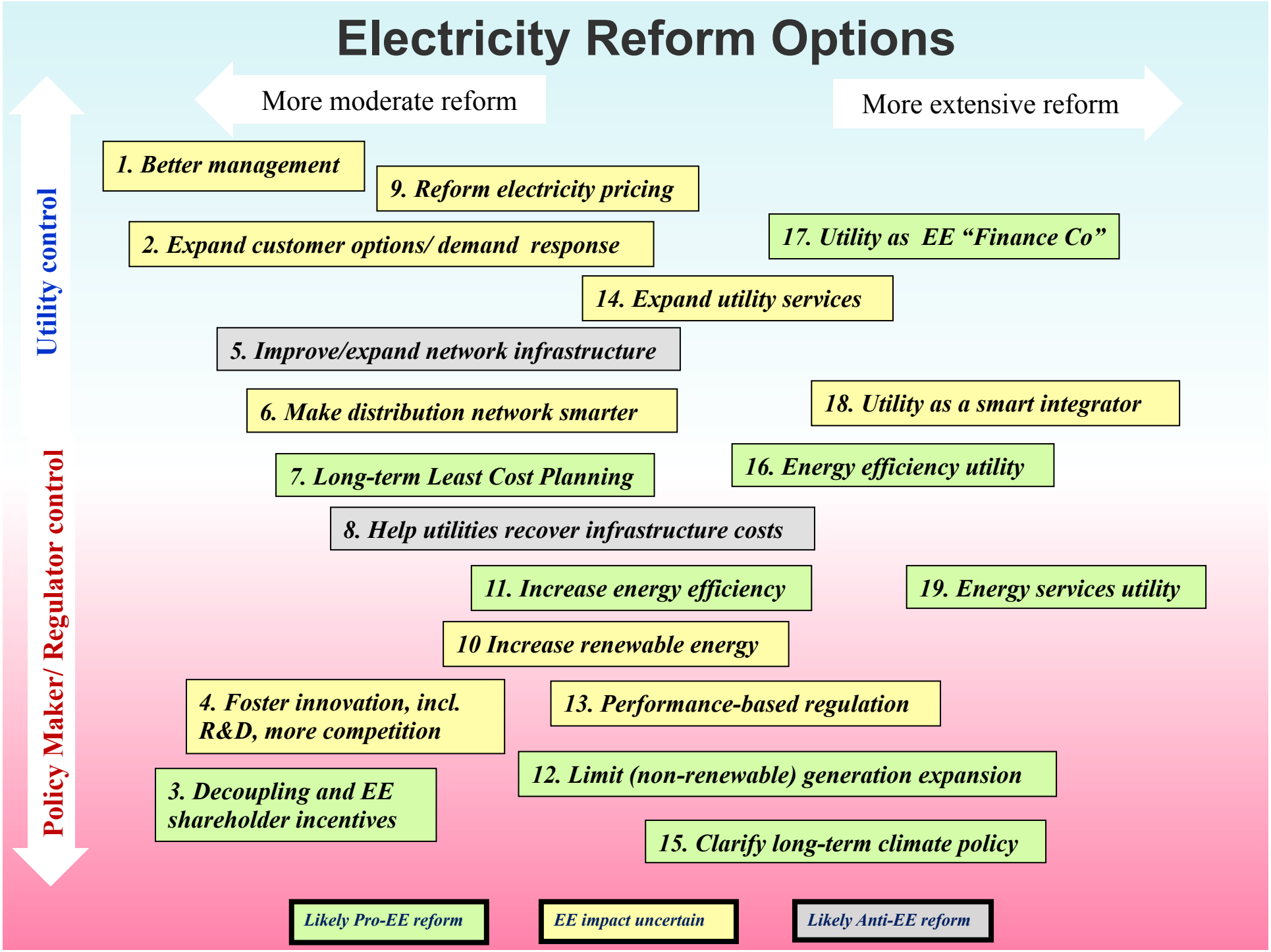


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Electricity Reform Options



US: Electricity Sector



- 54% of sales to ultimate customers are by investor-owned utilities (IOUs)
  - Regulated by state utility commissions
  - Some vertically integrated, some restructured
- 27% is by publicly-owned utilities
  - Responsible to local govts, coop boards
- 19% by power marketers
  - Particularly in restructured states

US: Recent Developments

- Sales declining
  - Recession, EE, DG
- Some utilities concerned about “death spiral”
- Electric grid aging and needs investment



- Natural gas prices down – new capacity mostly gas and renewables
- Emissions standards for existing power plants about to be finalized

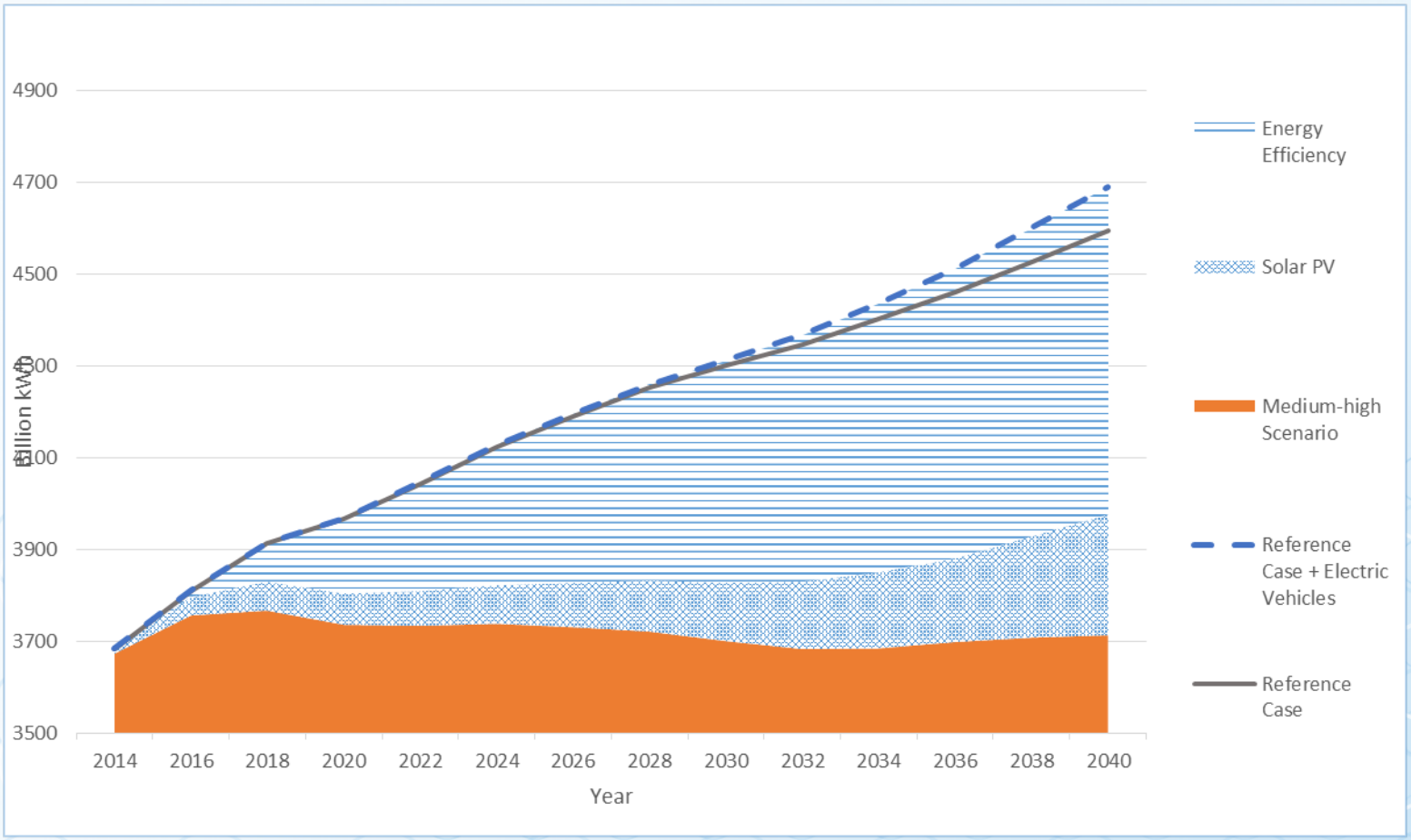


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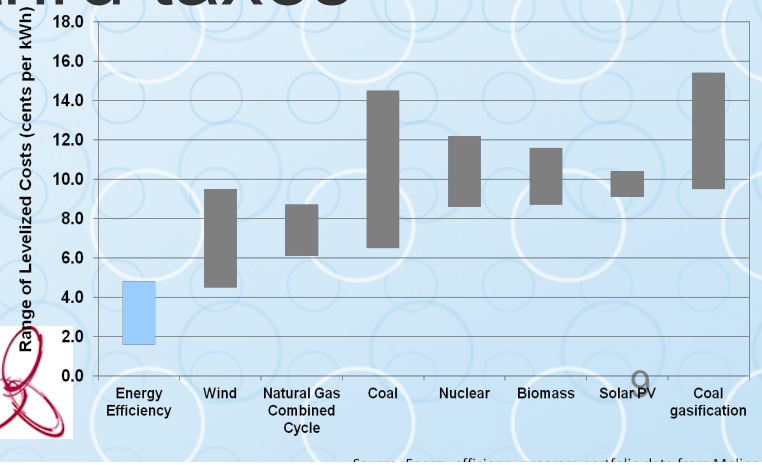
Contributions in Medium-High Change Case



Source: ACEEE analysis

US: Role of EE

- Utilities the primary operator of EE programs
  - ~$8 billion/year
  - Saving ~0.7% of sales each year
  - Average cost to utility of $0.028/kWh
- Government programs smaller – easier to fund thru rates than thru taxes



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US: Key Issues

- New directions by leading utilities and regulators – NY REV, MN E21, NRG, PGE&G
- Rate design
- New emissions regulations
  - Could spur additional efficiency
- Some utilities seeking to back away from EE
  - Sales declining
  - Conservative anti-mandate philosophy



US: Where from Here?



- Awaiting more information
  - Is sales decline permanent?
  - How do initial experiments with new business models go?
  - More states & utilities will act when have answers
- Expanded EE programs more likely than reduced programs
  - Emissions regulations
  - Savings targets & shareholder incentives
  - EE as a valued service

Germany: Electricity Sector

- Generation, transmission/distribution network, and supply (sales to final customers) are unbundled (EU legislation)
  - Generation and supply fully competitive and unregulated in principle.
- Network has a performance-based revenue regulation, with partial decoupling of revenues from power/ electricity transmitted.



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Germany: Current Situation



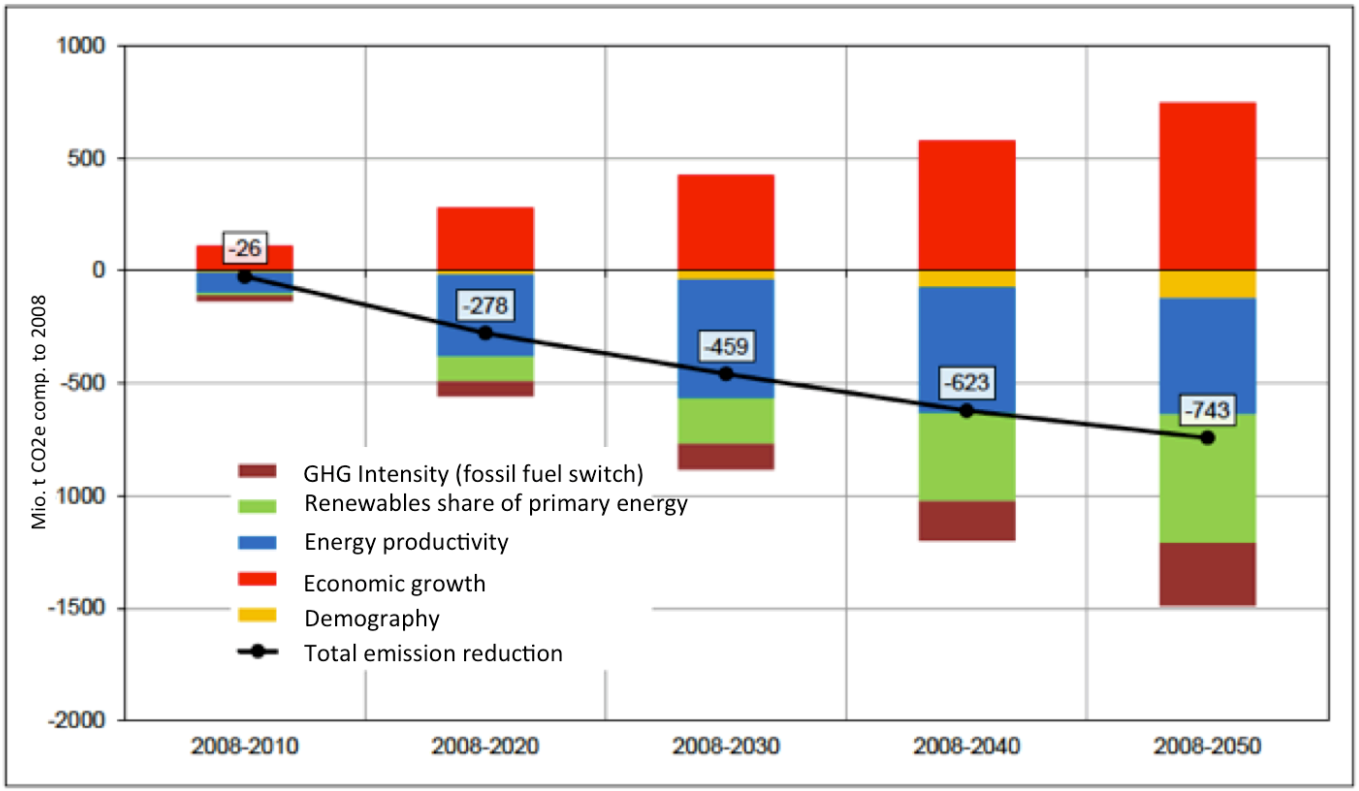
- Long tradition of policies promoting renewable energy and partly EE
  - 27% of power from renewables in 2014; aim for 80% by 2050
  - Driven down wholesale power prices and also stock prices
- Phasing out nuclear power by 2022
- Combined Heat & Power Act –> 25% by 2020 (but likely to miss target)

Stock Price of a German Utility



Germany: Contributions to Climate Change Mitigation Scenario

Component analysis of the development of energy related greenhouse gas emissions (Climate change scenario 90)



Source: Calculations by Fraunhofer ISI and Institute for Applied Ecology (Öko-Institut)

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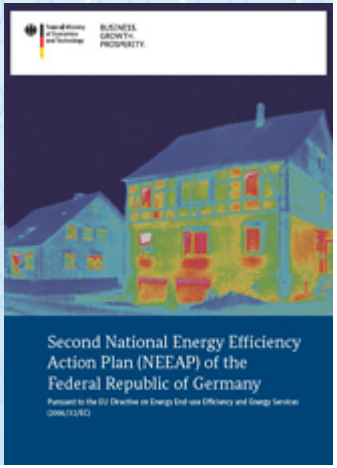
Germany: Role of EE



- "Energy Concept" with >120 measures
  - Plan on 10% absolute decline in electricity consumption by 2020 and 25% by 2050
  - Allows room for electric vehicles and heat pumps (savings target for primary energy: x2)
- For EED, govt. intends to use alternative measures (govt.-funded EE) instead of obligation on supply companies
  - Don't want to raise rates on top of RES levies
- Hope energy companies will promote EE but so far no supportive regulatory framework

Germany: Recent Developments

- Changes in market structure – market share of “big 4” declining; E.ON split-up; remunicipalization e.g. in Hamburg and almost Berlin (cf. Wagner, 3-191-15)
- New National EE Action Plan; includes competitive tendering model for EE programs & industrial EE networks
- Local movement for 100% renewable energy



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Germany: Where from Here?

- Policy-makers need to clarify the role of energy supply industry in EE + DR
- Consideration of capacity market, w. DR?
- Phase-out coal? How?
- Further testing of smart grid, demand response and storage





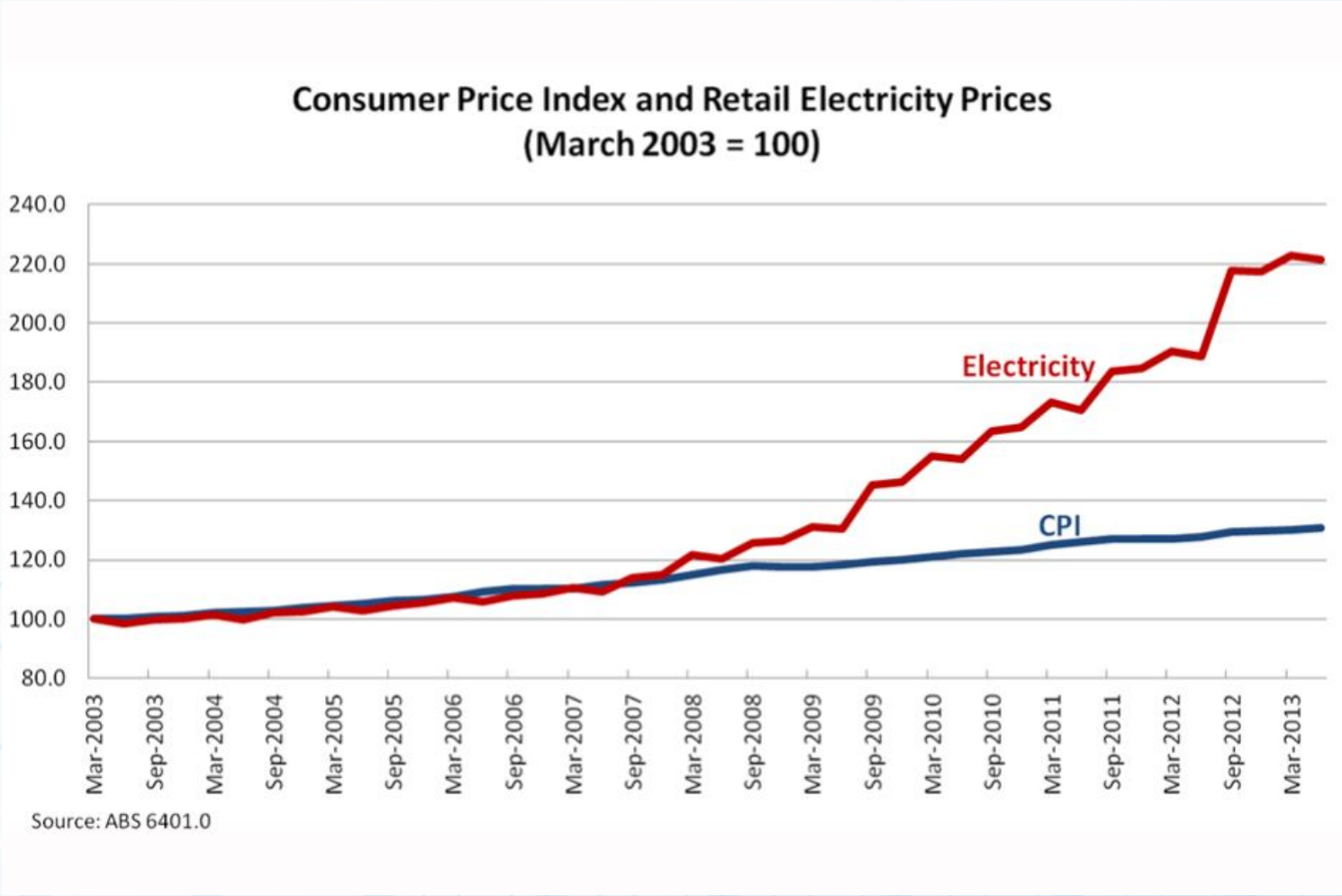
Australia: Recent Developments

- Carbon tax established by one government and abolished by next government
  - Bad timing- electricity prices were climbing steeply



- New government also (trying to) dismantle other parts of Clean Energy Future package dealing with EE and RE

Electricity Prices in Australia



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Australia: Electricity Sector

- Electricity supply industry unbundled
  - T&D – mostly state-owned regulated monopolies, gradual privatisation
  - “Gentailers” – generation and retail, investor-owned

EnergyAustralia AGL Energy in action. origin

- 80% of generation is coal



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Australia: Role of EE

- Energy retailers
  - Energy-saving targets in largest states 2006-2013
  - “20%” R.E. Target cut
  - Green retailers entering market
- Electricity network businesses
  - Had EE and CC funds in past
  - Some networks trying to sell EE & demand management
  - Trying to develop new business models
  - Regulator decoupling thru revenue caps (not price caps)



Australia: Where from Here?



- Emerging elements for reform:
  - Recent interest in **Energy Productivity**-
    - 40% improvement by 2030 target
  - Regulators considering Demand Management Incentives for network companies (potential game changer!)
  - Energy savings targets could be revitalized and extended to other states
  - Growing consensus that current path not sustainable and change is needed
- Need clear and stable regulatory signals

Discussion

- Electricity sector going thru major changes in all 3 countries driven by declining sales, distributed generation and CC policy
- EE leads vary
  - German government, driven by CC
  - US utilities, lower cost
  - Australia, lead unclear but high costs a driver
- EE efforts increasing in Germany and probably US
- All 3 countries looking more to markets and service providers



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Conclusions





- Future uncertain
- Government, utilities and private sector must work together for optimal results
- Energy efficiency supporters need to keep abreast of changes, and find ways for energy efficiency to prosper, as the future unfolds in sometimes unexpected ways



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