

Political momentum for renewable energy policies: Lessons from the UK, Germany and Denmark

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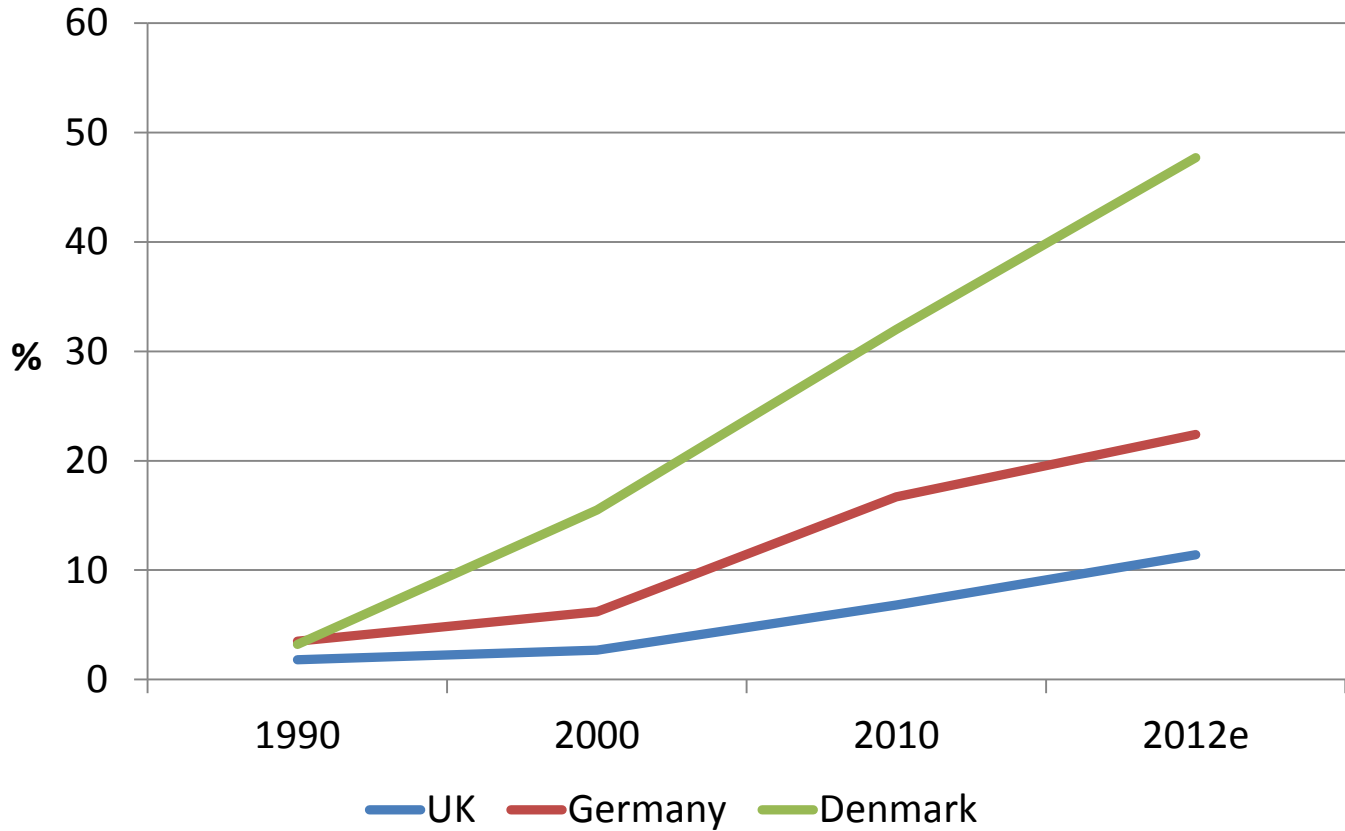
Thailand's Solar PV Roadmap Initiative
and the Governance of Energy Transition, Bangkok, April 2015



New Thinking For Energy



Electricity from renewable sources as a proportion of total production of electricity



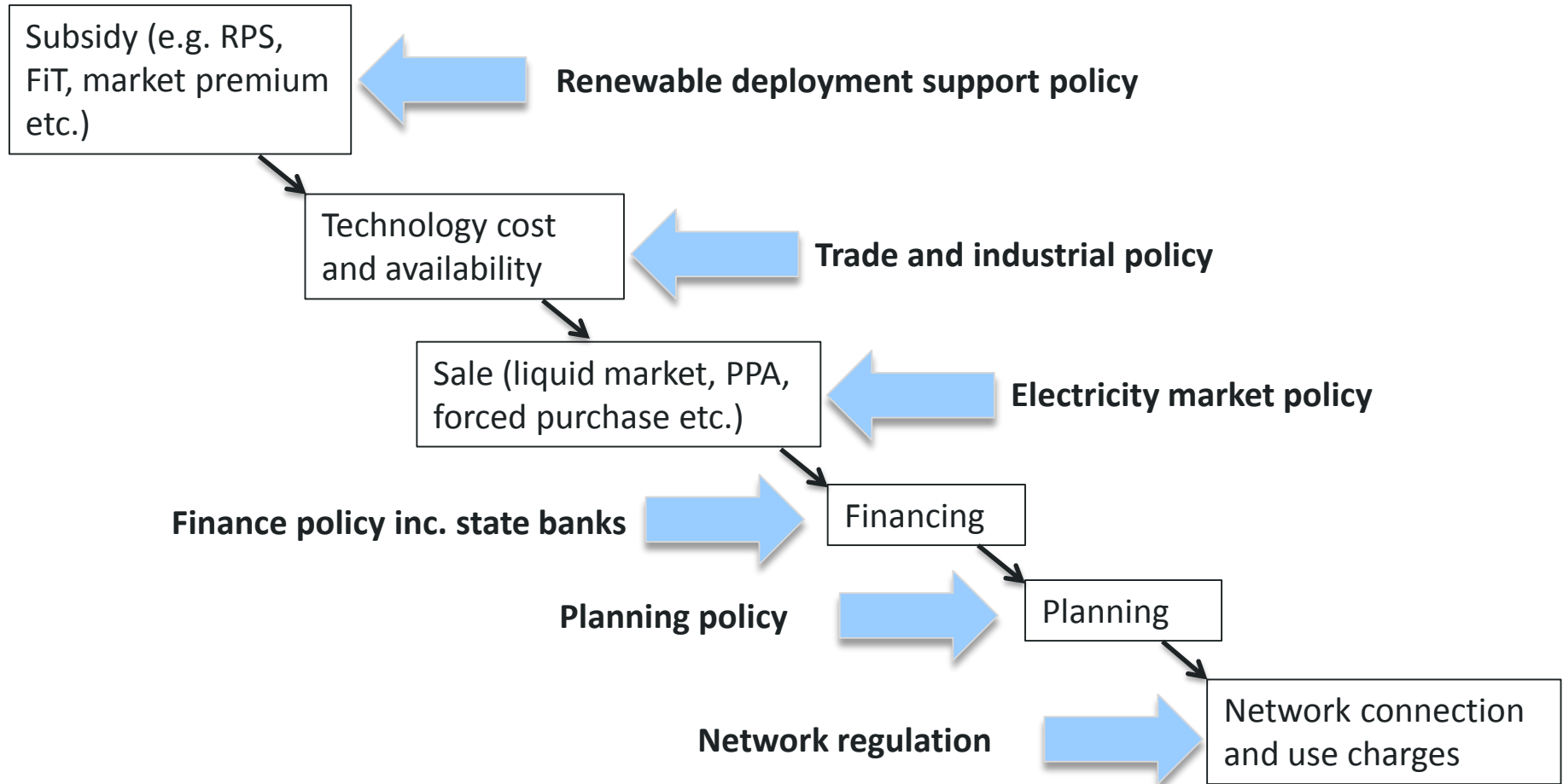
Source: IEA *Renewables Information 2013*

A political puzzle....

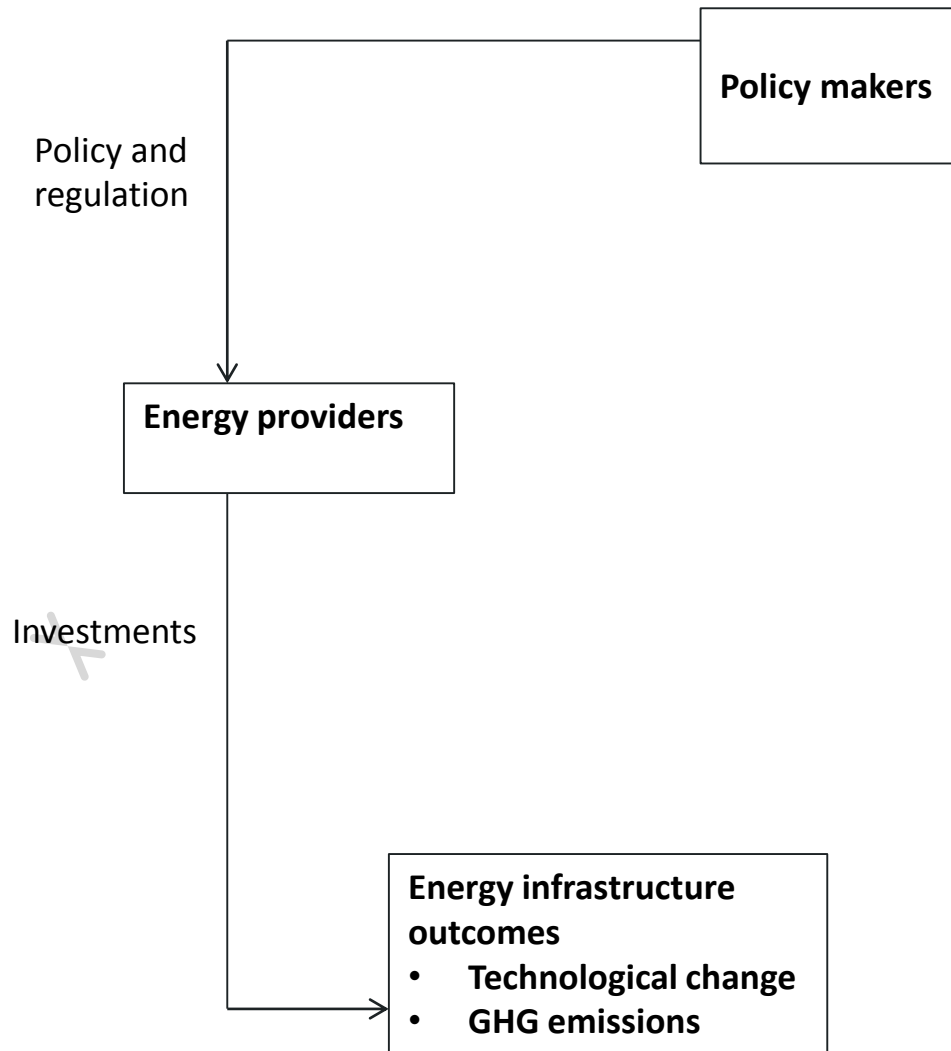
	Cost of renewables as % of GDP in 2010*	EU 2020 package target for renewable energy	National targets	Position on national renewables targets in EU 2030 package
UK	0.06	15%	No	No binding targets
Germany	0.22-0.27	18%	Yes (2025, 2035, 2050)	30% binding target
Denmark	0.09	30%	Yes (2020, 2050)	30% binding target

* Source: OECD 2013

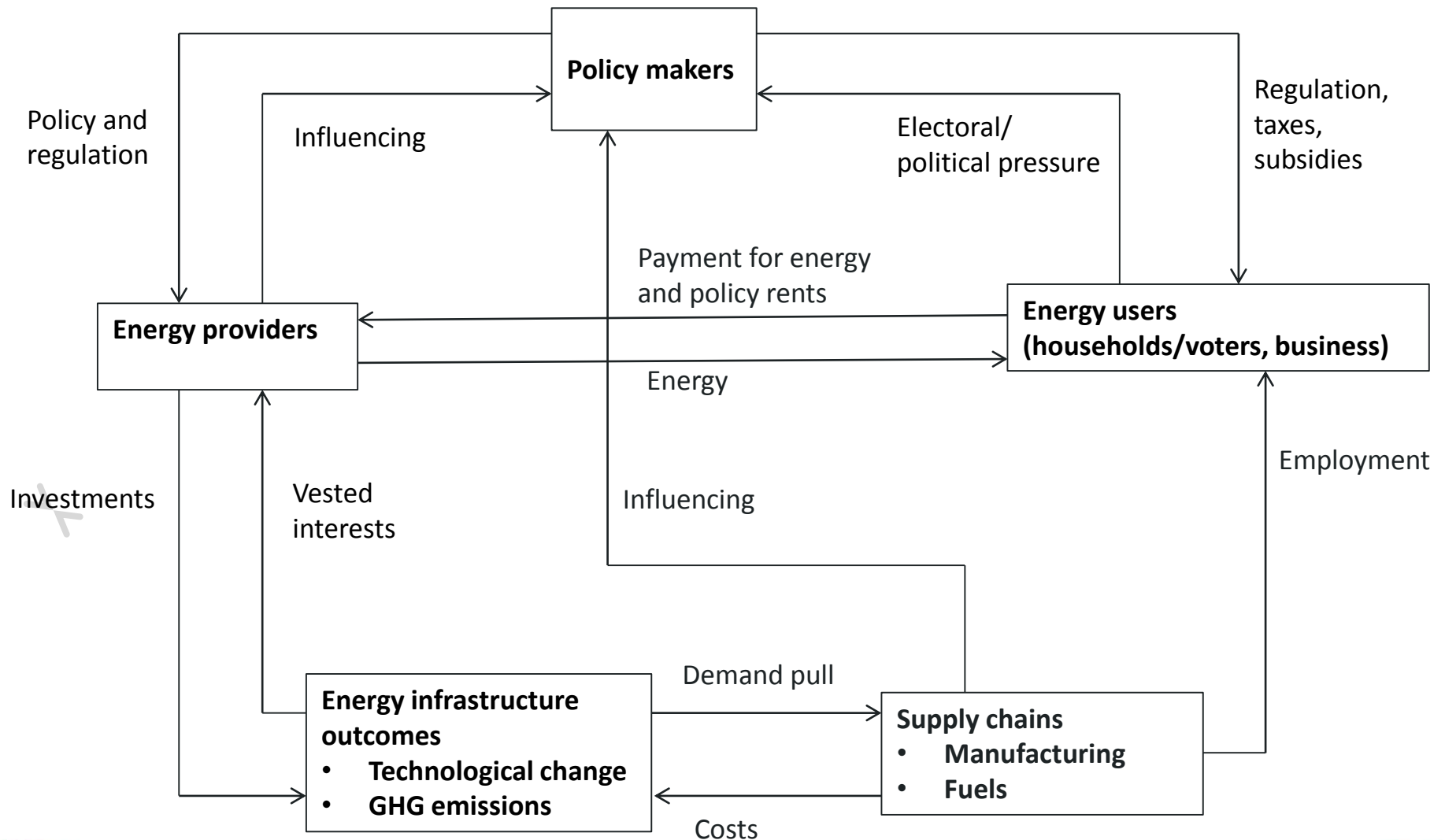
Understanding differences in policy



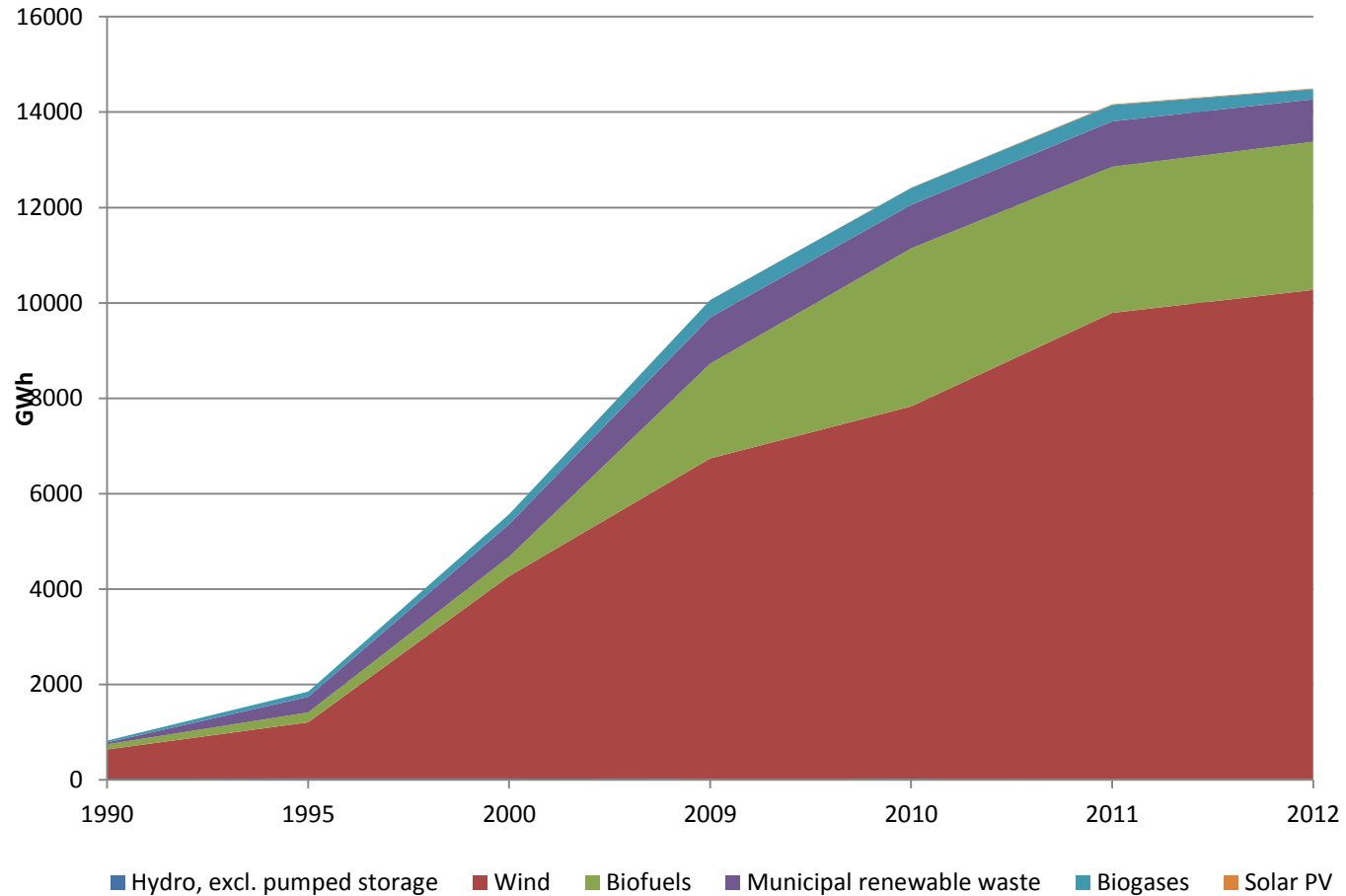
Understanding differences in policy...



...within the wider political context



Denmark



Source: IEA *Renewables Information* 2013

Denmark – Political dynamics of ownership

- **Simple, low-risk accessible deployment support policy**
 - Capital grants 1981 to 1988
 - 1984-91 FiT linked to retail price
 - 1991-2000 Fixed FiT
 - 2001-2009 Premium FiT
 - 2009- Premium FiT + balancing cost subsidy
- **Creates widely dispersed local ownership**
 - Early programmes specifically required local ownership (within 3 km of turbine), then progressively relaxed from 1985
 - Cooperative ownership dominated, building on strong institutional history; by 2001, cooperatives had installed 86% of turbines, and 150,000 households had a share in wind ownership (out of total of c.2.5 million)

Denmark – Political dynamics of ownership

- **Facilitated by supportive financial sector and policy...**
 - Small-scale investments financed through low-interest loans from mortgage banks, or backed by local municipal guarantees
 - Individual's share of interest payable on loans can be deducted against income tax
- **...and proactive supportive planning policy**
 - Planning Law 1994: Requirement on local planners to identify suitable sites for wind
 - Requirement for public hearings prior to applications for projects
 - 2009 Act includes a 'loss of value' compensation scheme for individual neighbours
- **Produces strong lobby and minimal opposition**
 - Danish Wind Turbine Owners Association (*Danmarks Vindmølleforening*) formed strong lobby early on
 - Less planning opposition ("Your own pig doesn't smell")

Denmark – Political dynamics of ownership

- **Is the model unravelling?**

- Move to premium FiT as more market oriented government came to power, and model became more commercial
- Shift towards greater ownership by individual farmers from late 1990s; by 2005 12% of capacity owned by utility/corporates, 63% farmers and 25% cooperatives
- Repowering with much larger turbines (in 1990 the average turbine capacity was around 50kW, by 2000 this had risen to 300kW and by 2012 it was almost 1MW)
- Rising opposition as ownership model changes?
- But also a counter-movement to restore local ownership and smaller scale? (Hvelplund et al 2013)

Denmark – Political dynamics within energy industry

- **Renewables imposed on grid companies**
 - Low cost grid connection for renewables was mandated and costs socialised
 - 1992 law requires on distribution network companies to connect
 - Project pays only for cost of nearest transformer; additional costs borne by network utility
- **From 2001 wind competes with existing conventional power plants**
- **But relatively little counter-lobby**
 - No large corporate interests involved
 - Distribution companies non-commercial, locally owned
 - Thermal plant also often owned by conglomerates of municipalities or cooperatives
 - Main large generator from 2005 = state owned DONG
 - Increasing involvement of utilities as scale increases and move offshore

Denmark – Political dynamics of supply chain

- **Nascent wind industry had significant support**
 - Quality certification
 - Public support to wind R&D
 - Tax relief on investment
 - Government-backed Wind Turbine Guarantee on financing for projects using Danish-made turbines
 - Customs duties protecting turbines
 - Export credit assistance, including via DANIDA
- **Leading to strong domestic employment and export earnings effects**
 - Supply chains mostly domestic; EWEA estimates 23,500 employed in wind industry in 2009, many highly-skilled
 - Two large turbine manufacturers – Vestas and Bonus (later Siemens) – but main employment is in the components and services supply chain

Denmark – wider political context

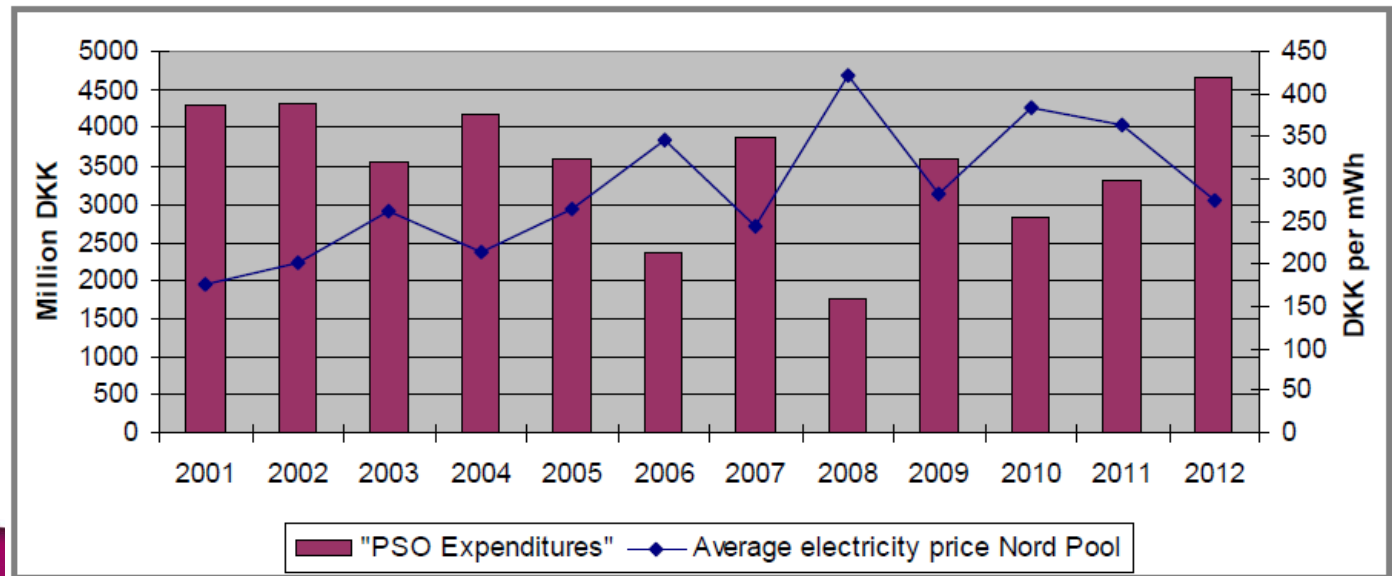
- **Electoral system**

- Proportional representation gives a strong voice to environmentally minded voters through small 'green' minded parties often in governing coalitions
- Social Liberal Party important for support of FiT in 1990s

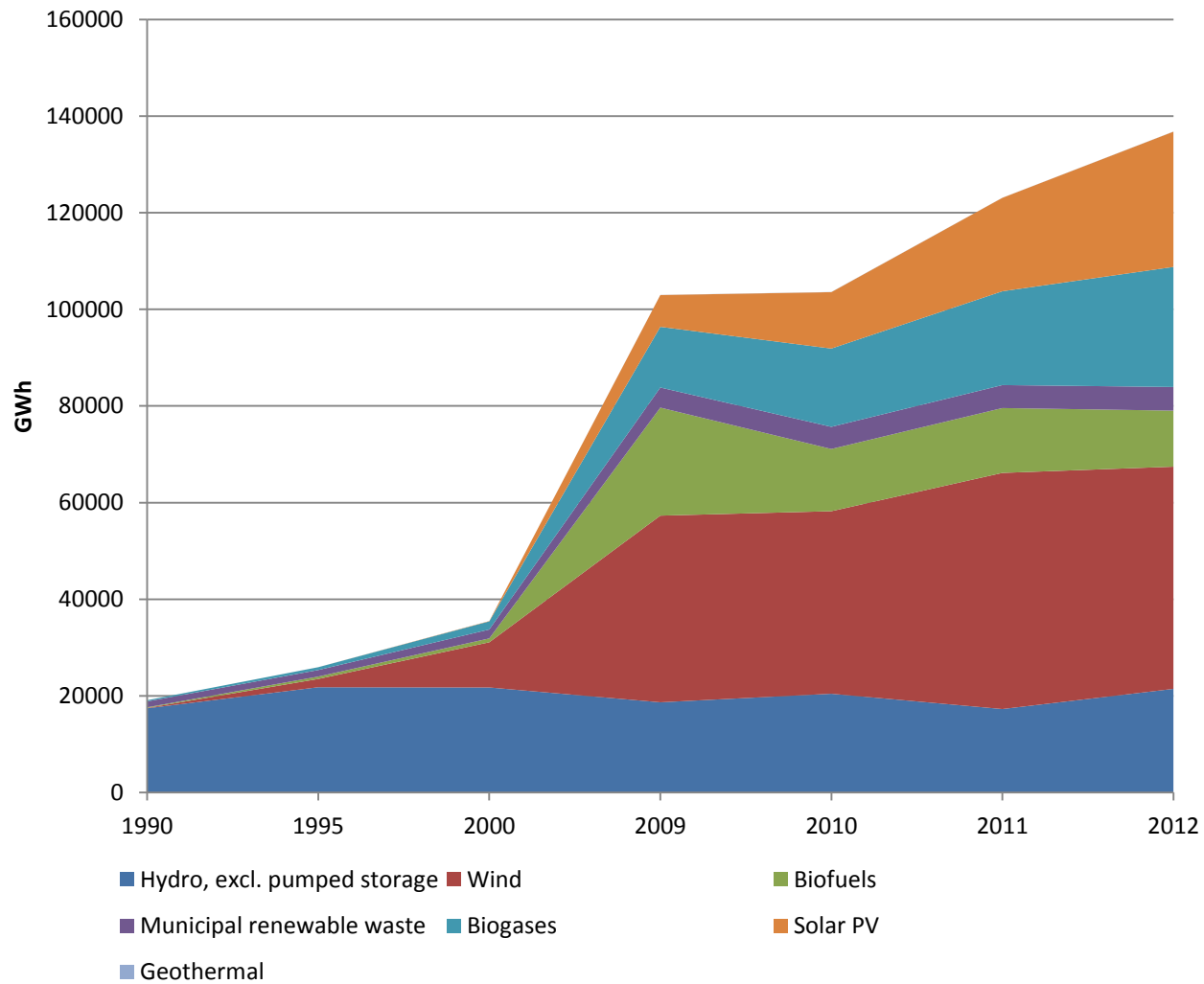
- **Low inequality and generous welfare payments**

- Cost of renewable energy support low on political agenda

- **No coal lobby and little energy-intensive industry**



Germany

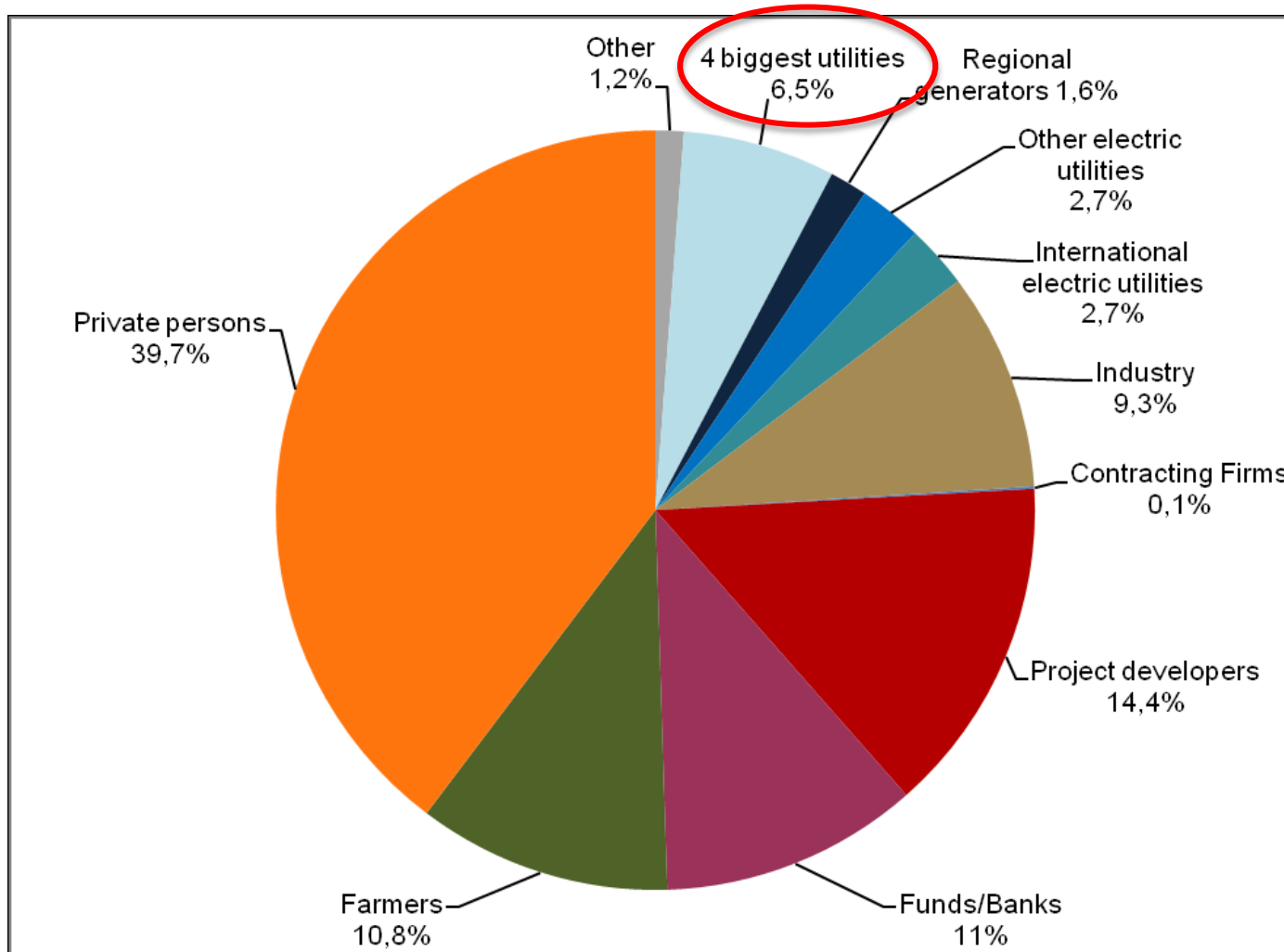


Source: IEA *Renewables Information* 2013

Germany – Political dynamics of ownership

- **Simple, low-risk accessible deployment support policy**
 - 1990-2014 Fixed FiTs, aimed explicitly at smaller actors
 - Utilities excluded in their home areas
 - Tariffs for wind skewed to low wind areas
 - Technology specific: decision taken in early 2000s specifically to support solar PV
 - 2014 onwards move to premium FiT on market price
- **Creates widely dispersed ownership**
 - Range of investors including regions (Länder), municipal Stadtwerke, small companies formed by individuals
 - >1 million owners of rooftop solar PV by 2015

Ownership of renewables (except hydro) in Germany 2010



Source:
Lauber (2013)

Germany – Political dynamics of ownership

- **Facilitated by supportive financial institutions...**
 - Subsidized loans from state-owned bank (previously Deutsche Ausgleichsbank now KfW)
 - 20 year low-interest loans up to 100% of investment costs
- **...and proactive supportive planning policy**
 - Planning law reforms 1996: wind energy becomes part of regional and municipal master plans
 - Pro-active identification of priority, restricted and excluded areas
- **Produces strong lobby and minimal opposition**
 - Interest group effects, including highly organised renewable energy associations, trade unions, manufacturing employers associations
 - When reduction in FiT rates proposed in late 1990s, Green Party mobilised a wide coalition of environmental groups, solar industry associations and companies, trades unions and regional politicians to successfully oppose the changes.

Germany – Political dynamics within energy industry

- **Renewables imposed on grid companies**
 - Guaranteed connection and priority access for renewables under the feed-in law (Mitchell et al 2006)
 - Higher voltage networks owned by 4 large utilities
- **Opposition from large incumbent utilities**
 - Stagnant demand means renewables displace conventional plant
 - Utilities opposed rather than joined renewables growth (Stenzel and Frenzel 2008)
 - 1994 – energy utility association (VDEW) argued for abolition of FiT
 - Refusal to pay FiT and connect renewables led to court cases, inc. European Court of Justice, and lobbying of European Commission to challenge FiT
 - From late 1990s utilities begin to change strategy and invest, especially in wind, especially offshore more recently

Germany – Political dynamics of supply chain

- **Wind and solar PV industries had strong support**
 - Policy paradigm allowed technology specific design and industrial policy more easily - ‘ecological industrial policy’
 - 100MW/250MW program: 10-year federal subsidy to raise technical standards in German wind industry
 - Regional (Länder) level support to wind industry
 - Public support to wind R&D, including Solar Valley *MittelDeutschland*
 - Export credit assistance
- **Leading to strong domestic employment effects**
 - Supply chains mostly domestic (until late 2000s)
 - 38,000 employed in wind (EWEA) and almost 90,000 in solar PV (Lutkenhorst and Pegels 2014)
 - Strong employment effects and industrial lobbies, but solar PV undercut by China at end of 2000s and many jobs have gone

Solar PV manufacture in former East Germany

PV equipment suppliers



PV manufacturers



PV R&D organizations



- Si feedstock
- Wafer based cell technology
- Thin film technology
- Organic cell technology
- Process & production technology
- Systems

Source: Grau et al 2011

Germany - Wider political context

- **Electoral system**

- Proportional representation gives a strong voice to environmentally minded voters through Green Party, in governing coalitions 1998-2005

- **Low inequality and generous welfare payments in 1980s but changing over time**

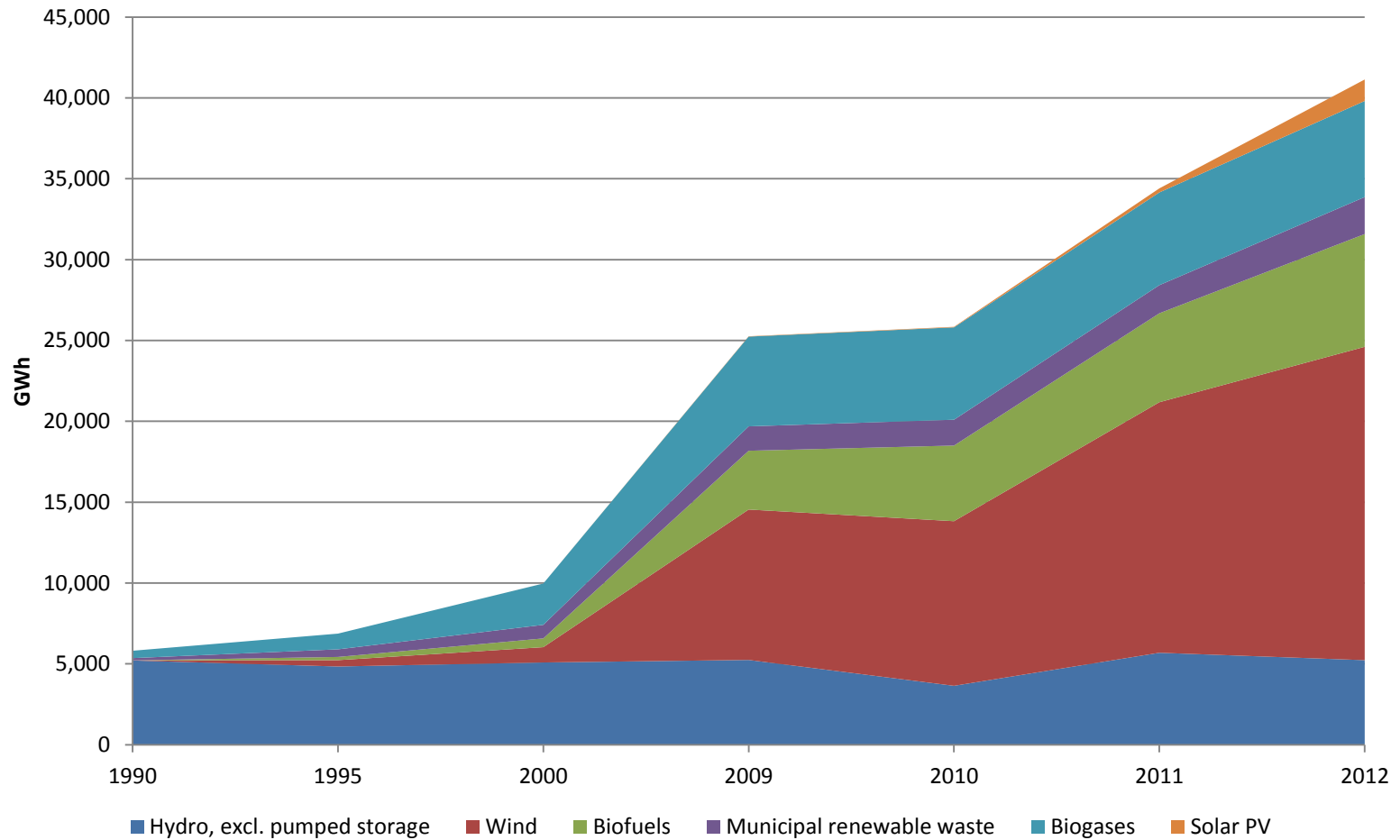
- Cost of renewable energy rises up political agenda in late 2000s and early 2010s

- **Strong coal lobby and large energy-intensive industry**



Source: Fraunhofer Institute

UK



Source: IEA *Renewables Information* 2013

UK – Political dynamics of ownership

- **Complex risky deployment support policy**

- Policy influenced by liberal market paradigm (technology-neutral. ‘government shouldn’t pick winners’)
- 1990-2002 NFFO (auctions)
- 2002-2017 RO (RPS)
- 2010- Fixed FiTs for <5MW
- 2014- CfD FiT for >5MW
- Incentivised clustering of wind in windy (sensitive) spots because this maximised ROC revenue



- **Creates concentrated ownership**

- Small actors unwilling or unable to take on risk and complexity
- Investment dominated by wind and by Big Six and large developers – in 2005 98% of wind capacity owned by corporate developers or utilities; 1% by farmers and 1% by coops (Toke 2006?)

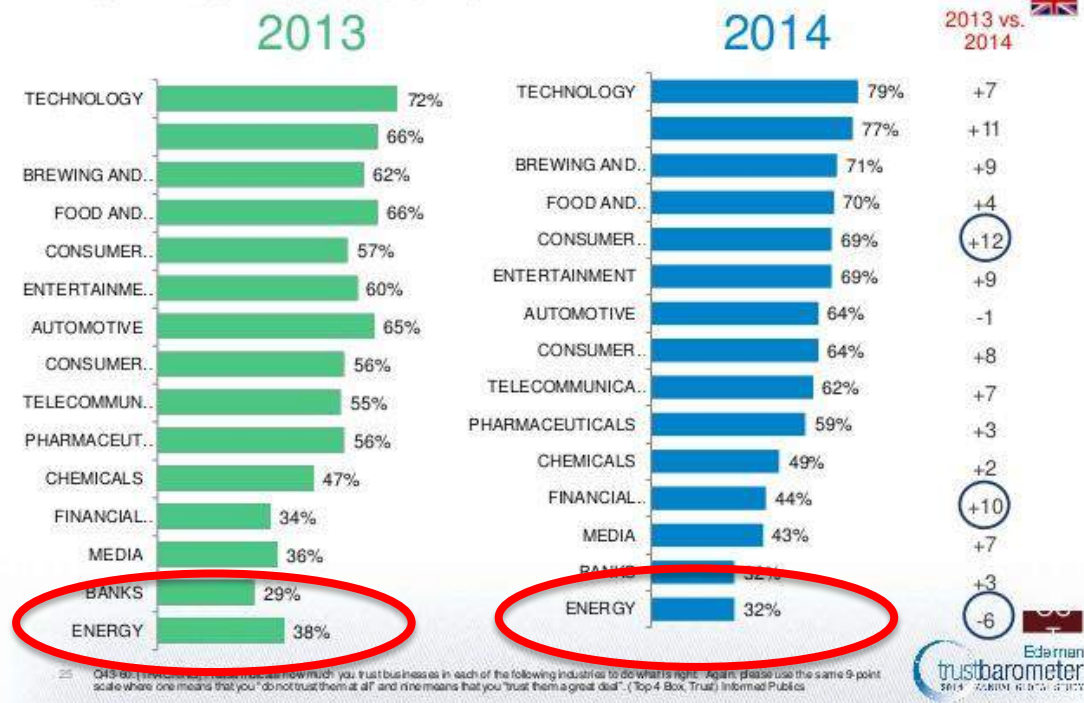
UK – Political dynamics of ownership

- **Absence of supportive finance for small-scale investment...**
 - Price risk and policy uncertainty meant investments largely financed by utilities in-house (Stenzel and Frenzel 2008)
 - No institutions for smaller scale investors
 - Post-financial crisis, retail equity/bonds for small scale wind and solar projects have taken off
- **...and absence of proactive planning framework**
 - Local authorities have responsibility for projects of <50 MW
 - Guidance differs across the 4 nations, England is most ad hoc
 - Voluntary scheme for 'community benefits' payments by wind developers

UK – Political dynamics of ownership

- **Weak lobby and strong opposition**
- Rents accrue to large developers and Big 6 energy corporates
- Energy industry heavily disliked by public, worse than banks
- Splintered renewables lobbies
- Local planning opposition - move to offshore but cost increases
- Increasingly opposition esp. to wind becomes part of right-wing political identity

CPG, CONSUMER ELECTRONICS MANUFACTURING AND TECHNOLOGY POST LARGE GAINS; ENERGY DROPS 6 POINTS TO BECOME LEAST TRUSTED INDUSTRY
TRUST IN INDUSTRIES, 2013 VS. 2014 - U.K.



UK- Political dynamics within the energy industry

- **Decisions on connection and charging delegated to network companies**
 - Connection decisions delegated to efficiency regulated network companies; mixed incentives for DG connection until 2010
 - ‘Shallow’ connection charges for distribution connected generation, but charging methodology not transparent or predictable
 - Grid access delays for Scottish wind until ‘Connect and Manage’ in 2009
 - Resistance to any type of coordination, but off-shore wind is an exception where the Crown Estate plays a key coordinating role (Kern et al 2014)
- **Utilities ambivalent towards renewables**
 - Vertically integrated Big 6 utilities were required to buy power from renewables, but also invested in wind However, politically ambivalent because they have split portfolio
 - No incentive to overachieve RO targets (Stenzel and Frenzel 2008)

UK – political dynamics of supply chain

- **Relatively weak support to supply chain**
 - Dominant policy paradigm strongly opposed to industrial policy (especially in HMT)
 - Public support to R&D (especially after mid-2000s)
 - Minor support through RDAs in 2000s
 - Offshore wind industrial strategy 2013 and Green Investment Bank financing support
- **And weak employment effects**
 - Supply chains mostly foreign – in 2009 only 4,000 employed in wind
 - Weak industrial lobby – may change with offshore boom

UK wider political context

- **Electoral system**

- Majoritarian voting for Westminster Parliament
- Weak 'green' party political voice (Green Party has only 1 seat and none before 2010)
- Although Scottish and Welsh Assemblies now have forms of PR

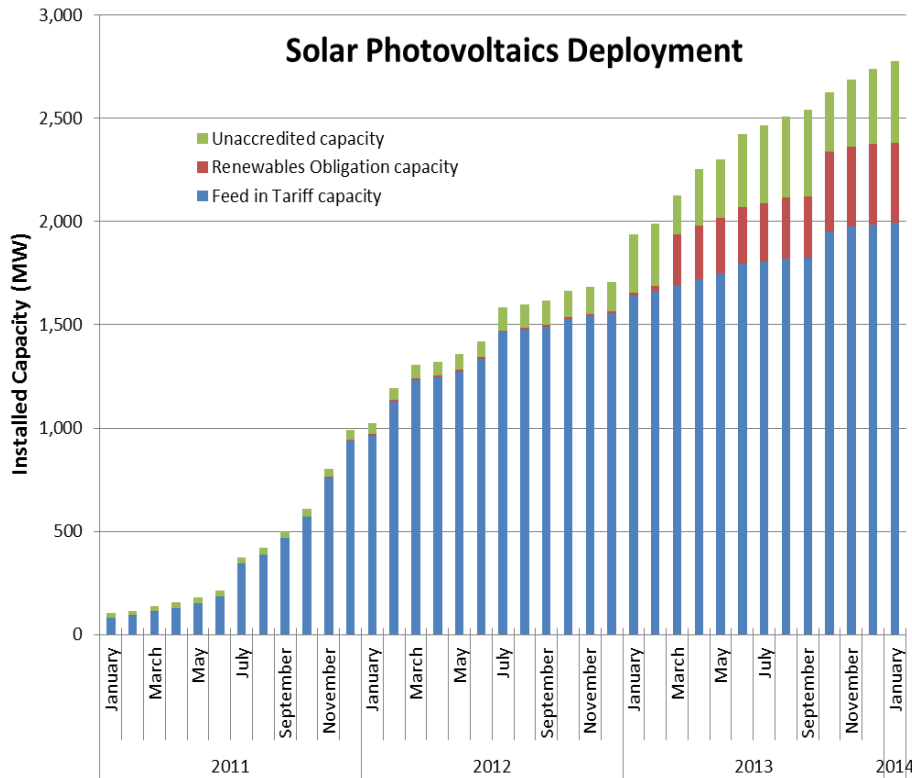
- **High inequality, stagnant/falling median real incomes and low levels of welfare provision**

- Household cost concerns strong in public debate - fuel poverty problem and excess profit narrative

- **Coal lobby destroyed in 1980s, but significant energy-intensive industry**

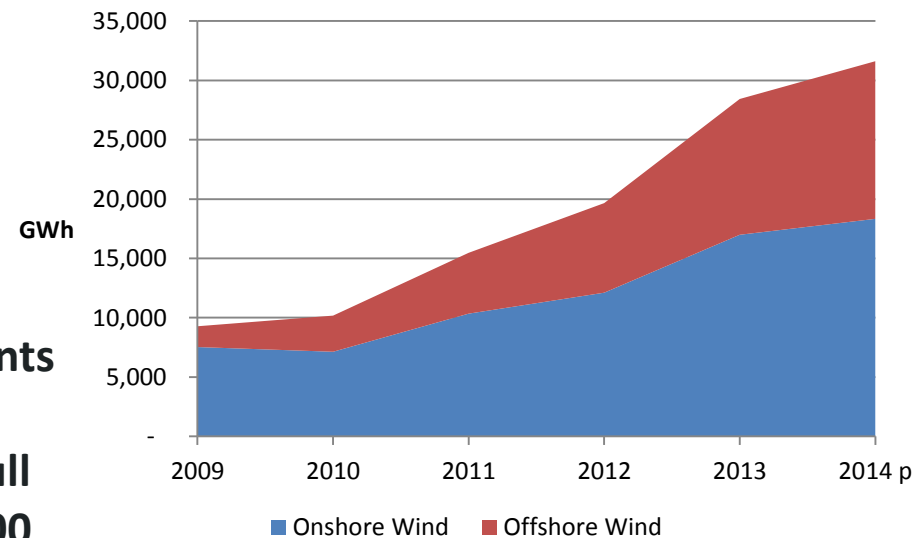
UK - Signs of change?

Source: DECC (2014) *Energy Trends* Table ET 6.4



- Surge in solar PV ownership from 2010
- ~40 energy cooperatives by 2014
- Community and Renewable Energy Scheme in Scotland

Source: Digest of UK Energy Statistics (2014) Table 6.1



- Support to offshore supply chain investments beginning to come through
- Siemens turbine manufacturing plant in Hull
- Jobs in offshore double 2010-2013 to ~7,000

Conclusion and policy implications

- Think about the *political* implications of policies, especially distribution of costs and benefits = ‘policy feedback’ (Pierson, Béland)
- Effects depend on *policy design* and *institutions*, including political institutions
- Policy feedback can be positive (leading to ‘increasing political returns’ and take-off) or negative (leading to stagnation) (Weaver 2010)
- In the absence of *any* positive feedback effects, sustaining an expensive renewables support programme may be difficult
- Renewable technologies offer lots of potential for dispersed ownership and employment effects through installation, manufacture and supply chains (although global competition is also keen)
- For PV, don’t forget rooftop in rush to solar parks (lessons from India?)

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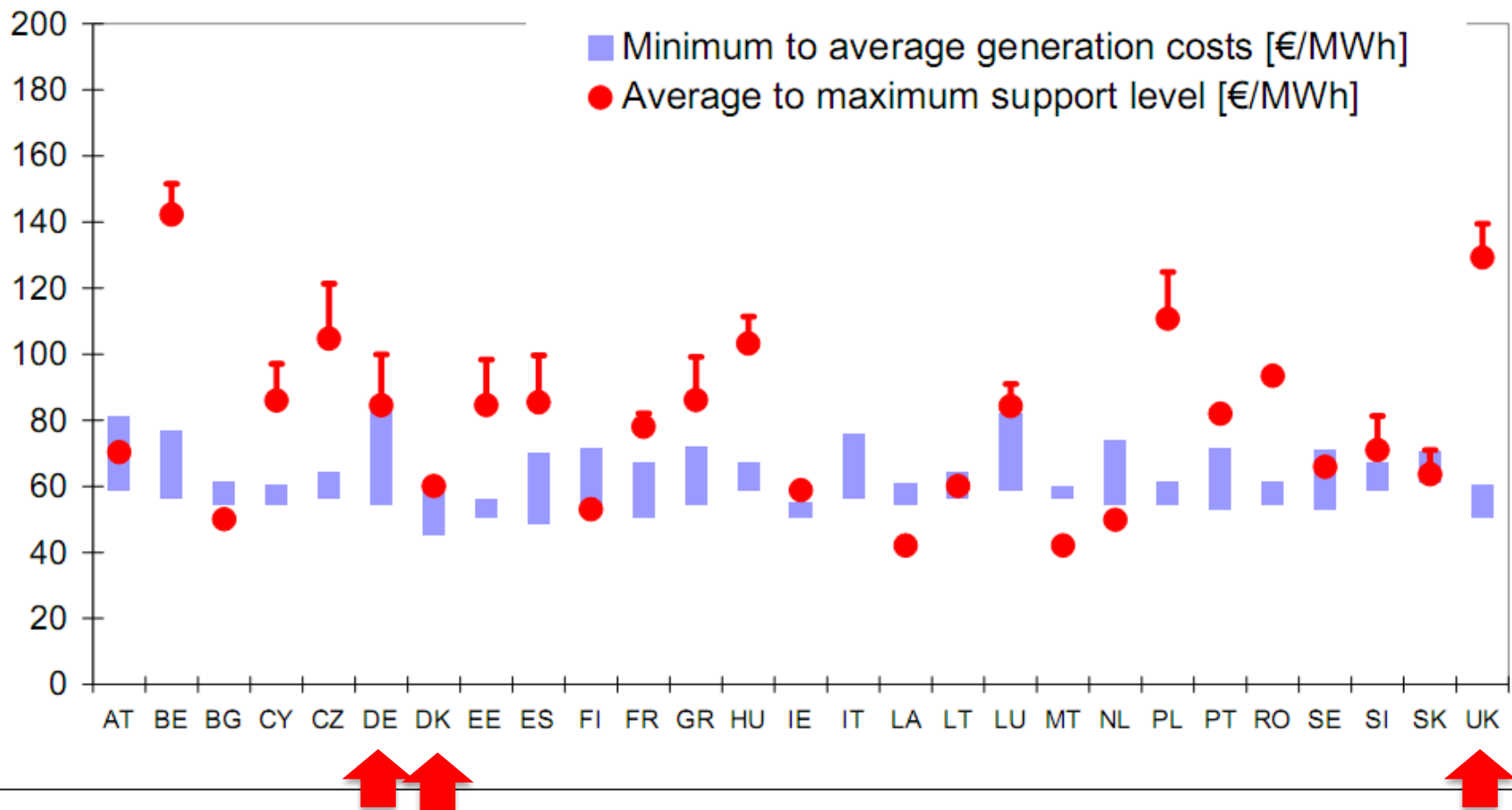
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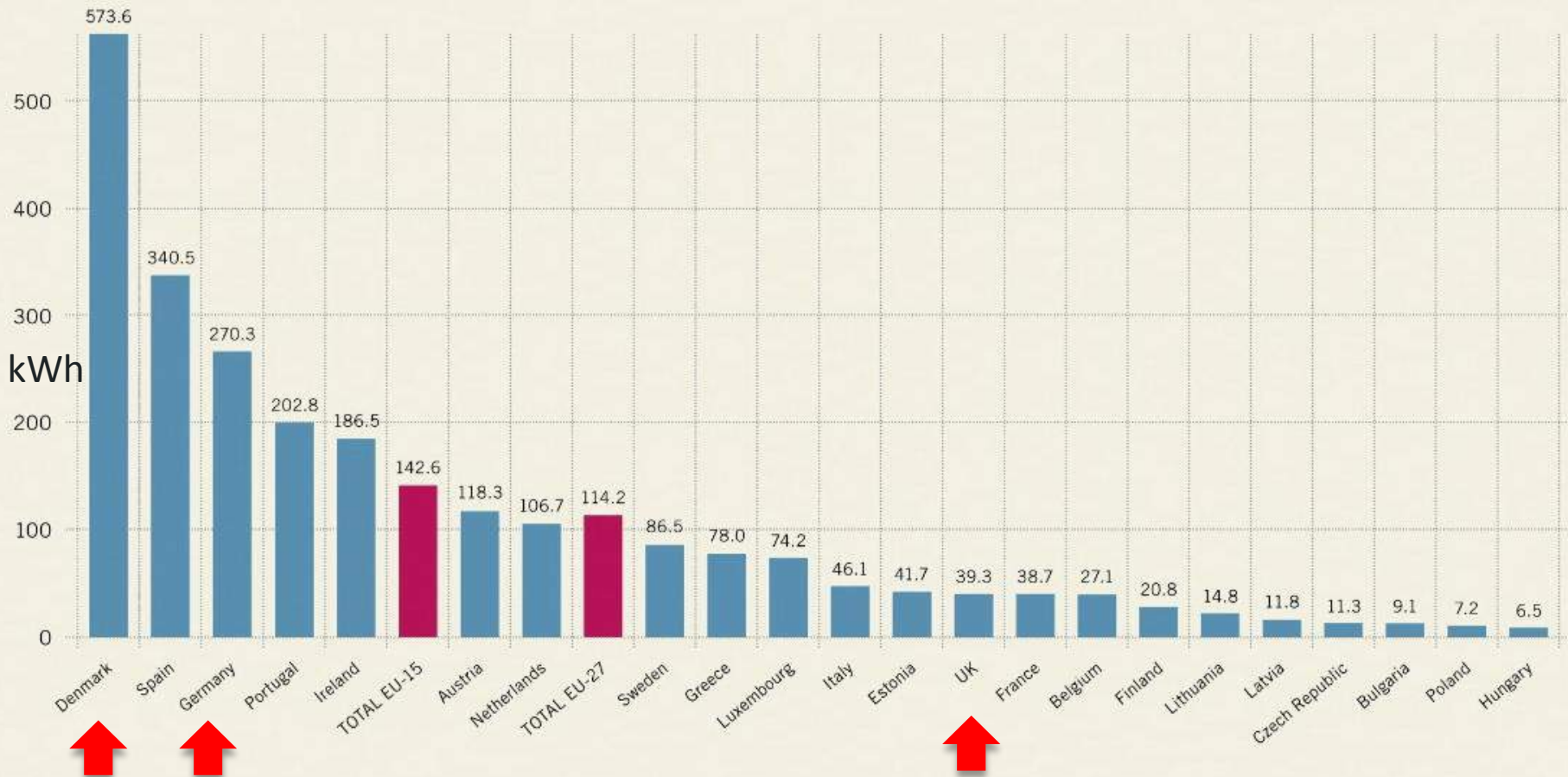
Extra slides

Higher costs not due to inefficient support policies



Source: OPTRES, 2007

Wind generation per 1,000 inhabitants in 2007



Source: EWEA