Deutsche Bank
DB Climate Change Advisors

The German CLEAN Program Story, Replication Possibilities in the US

CEN Webinar

Mark Fulton
Global Head of Climate Change Investment Research
Deutsche Bank Climate Change Advisors
http://www.dbcca.com/research

Passion to Perform

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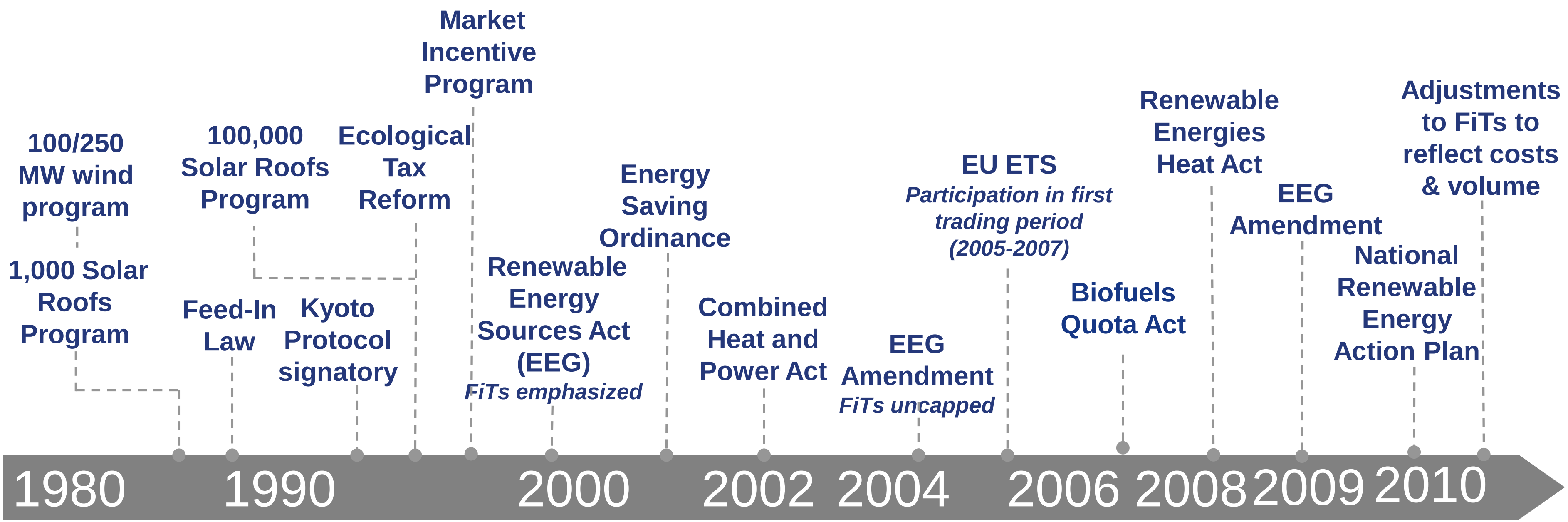
Best-in Class:
Driving Transparency, Longevity and Certainty (TLC)

Country	**Emissions Control**			**Financial Support**				**Grid Improve-ment Plan**	**Budget Strength (% of 2010 GDP)**	**Capital Investment 200 0-2010 (USD Bn)**
	Binding Emissions Target	**Renewable Electricity Standard (RES)**	**Long-term Energy Efficiency Plan**	**Feed-in Tariff (FiT)**	**Long-term Govt-based 'Green Bank'**	**Tax Benefit**	**Long-term Funding Program**			
China	✓	✓	✓	✓	✓	✓	✓	✓	-1.6%	148.3
Germany	✓	✓	✓	✓	✓	✓	✓	✓	-3.6%	393.2
United Kingdom	✓	✓	✓	✓	✓	✓	✓	✓	-11.5%	384.1
United States	⌛ COP Acc	State-level	State-level	State-level	⌛	✓	State-level	State-level	-10.0%	164.1
California	✓	✓	✓	✓	X	✓	✓	✓	-1.0%	-
Texas	X	✓	✓	X	X	✓	✓	✓	-2.2%	-
Brazil	✓	✓	✓	X	✓	✓	✓	✓	-2.2%	42.3
South Korea	⌛ COP Acc	✓	✓	✓	X	✓	✓	✓	-1.1%	31.2
India	⌛ COP Acc	✓	✓	State-level	X	✓	✓	✓	-5.5%	27.1
Australia	✓	✓	✓	State-level	X	✓	✓	State-level	-4.2%	9.8
South Africa	⌛ COP Acc	✓	✓	✓	X	X	✓	⌛	-5.3%	0.4

Notes: ⌛COP Acc = policy is a submission to the Copenhagen Accord and is not legally binding ; ⌛ = tentative / unconfirmed policy dependent on certain provisions (e.g. funding)
Source: DBCCA Analysis 2011

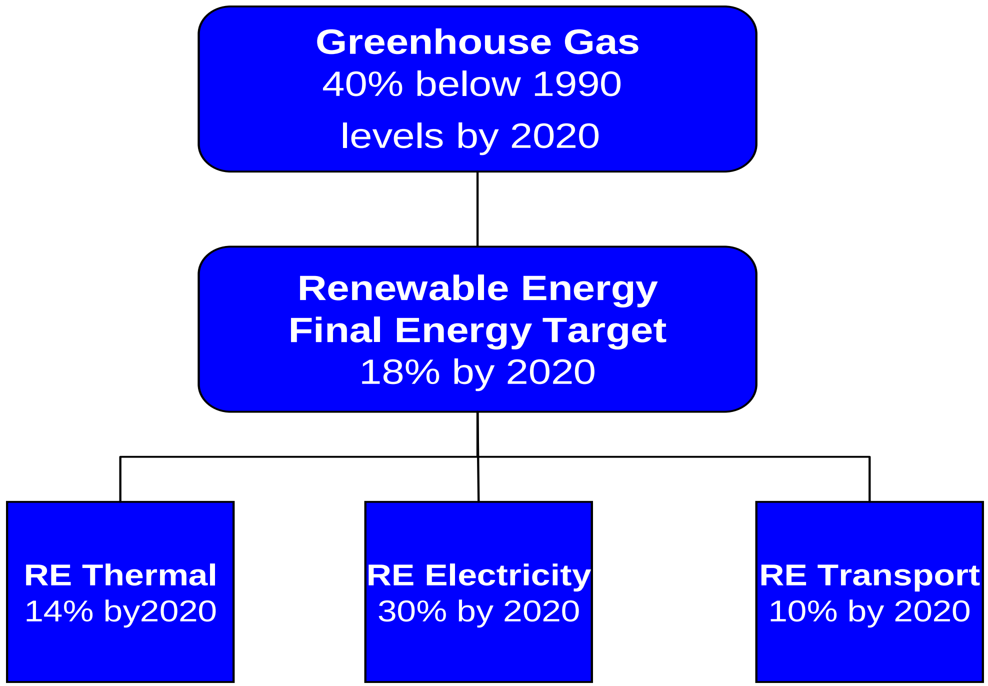
Germany Has Developed Comprehensive “Green” Legislation Over Past 20 Years …

Increased support for renewables in 2011, as Germany accelerates nuclear phase-out following Fukushima



Source: DBCCA analysis 2011

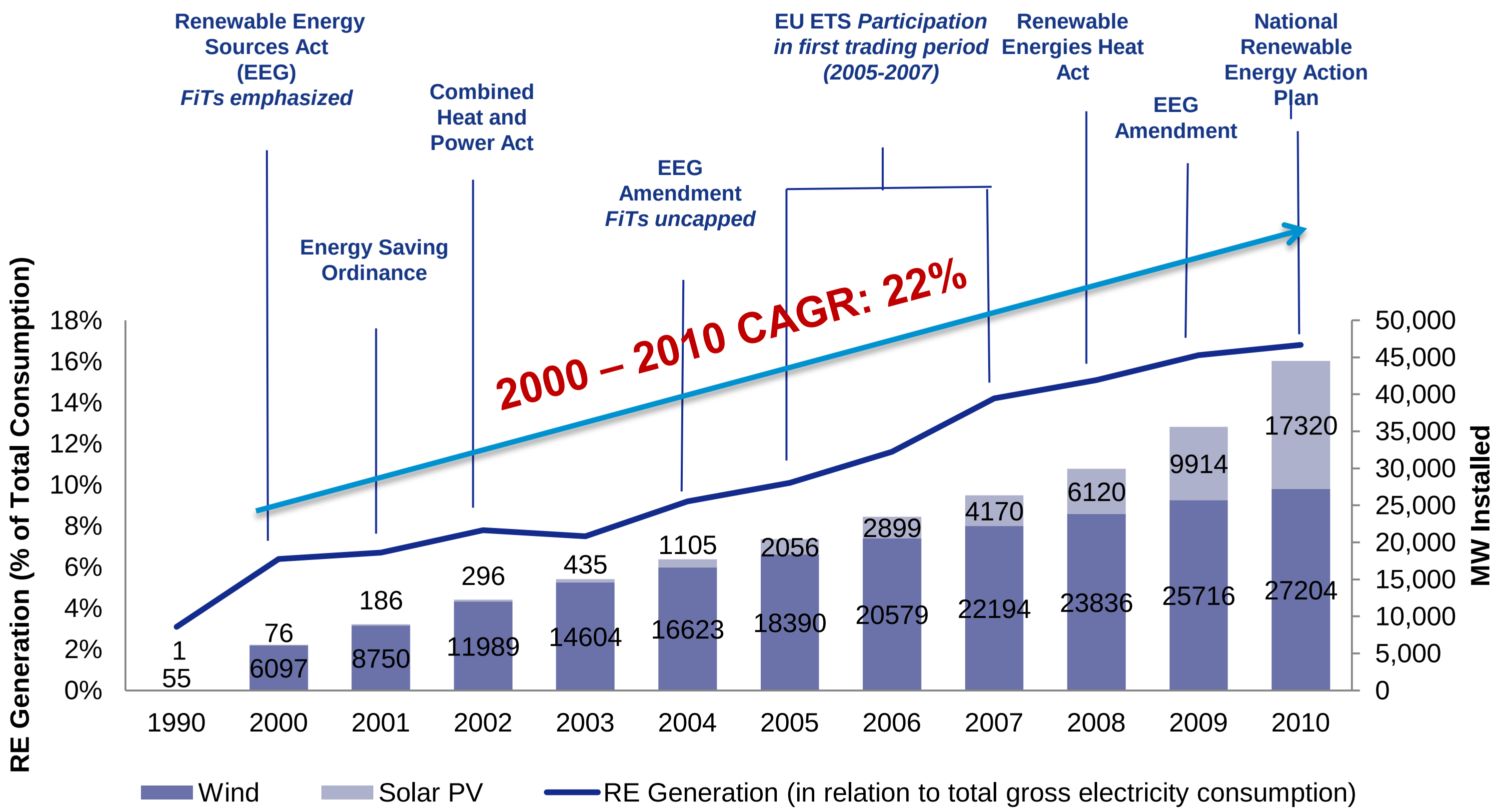
Map of Germany’s Low Carbon Targets



Source: DBCCA analysis 2011

Germany Has Led the Way in RE Deployment Through Feed-in Tariffs

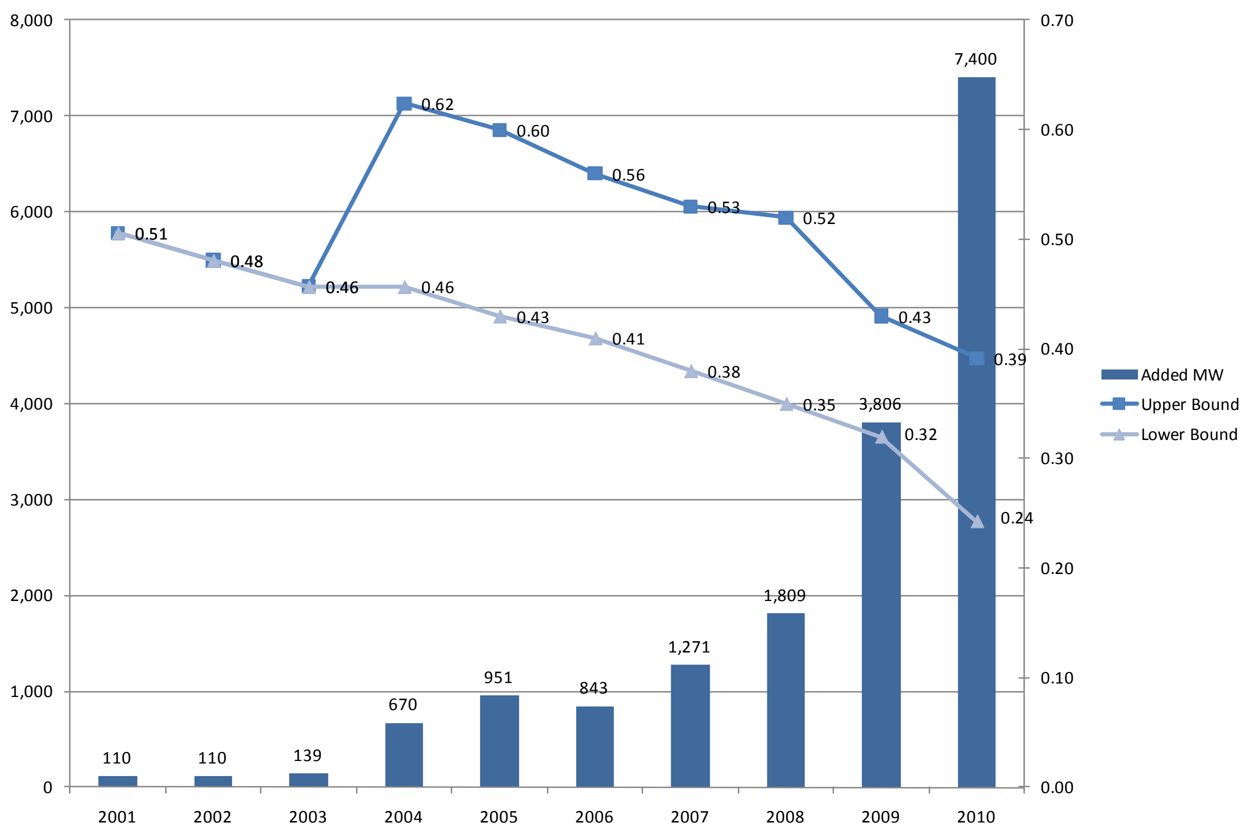
2010 annual investment in renewable energy installations exceeded $40 Bn



Notes: Investment data converted from Euros to USD according to average of monthly USD-EUR foreign exchange rate; RE generation includes hydro
Sources: German Federal Ministry for the Environment; Bloomberg New Energy Finance 2011; DBCCA Analysis 2011

Germany Has Exerted Consistent Downward Pressure on PV Prices Through FiT Degressions

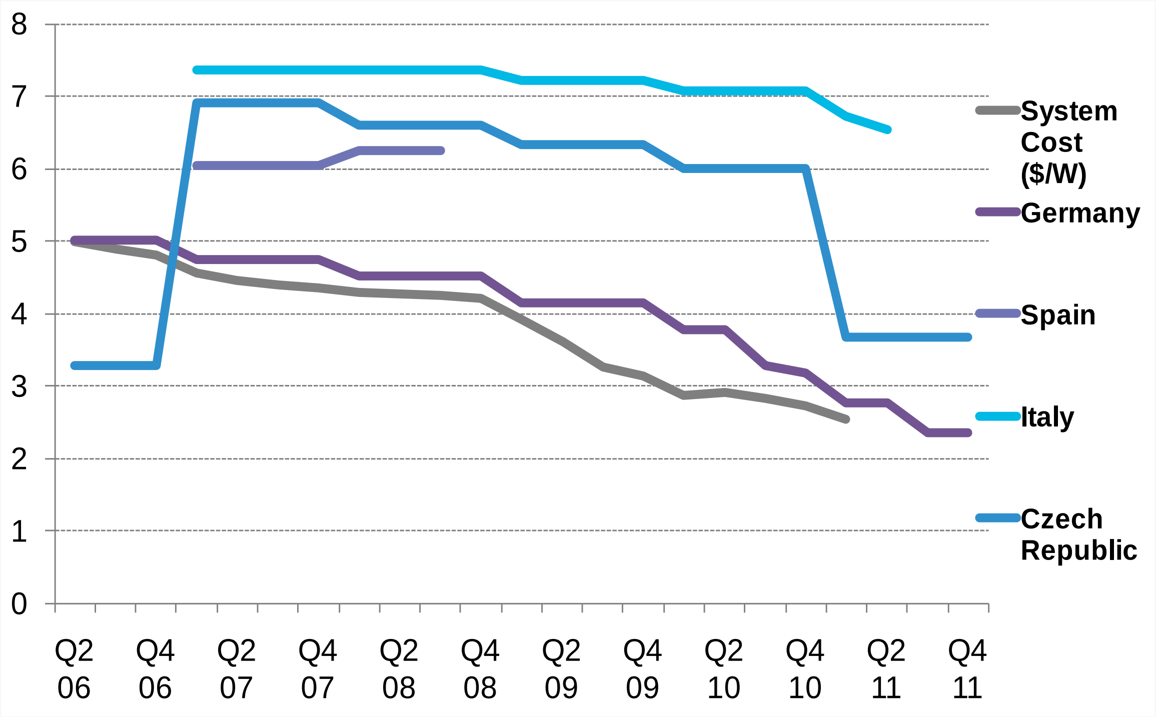
Germany's Solar PV Rates (EUR cents / kWh) and Capacity Additions
(2001 - 2010)



Source: DBCCA analysis 2011

German PV FiT Rates Have More Closely Tracked Solar System Costs Than in Other Markets

NPV of European Feed-in Tariffs and System Cost ($ / Watt)



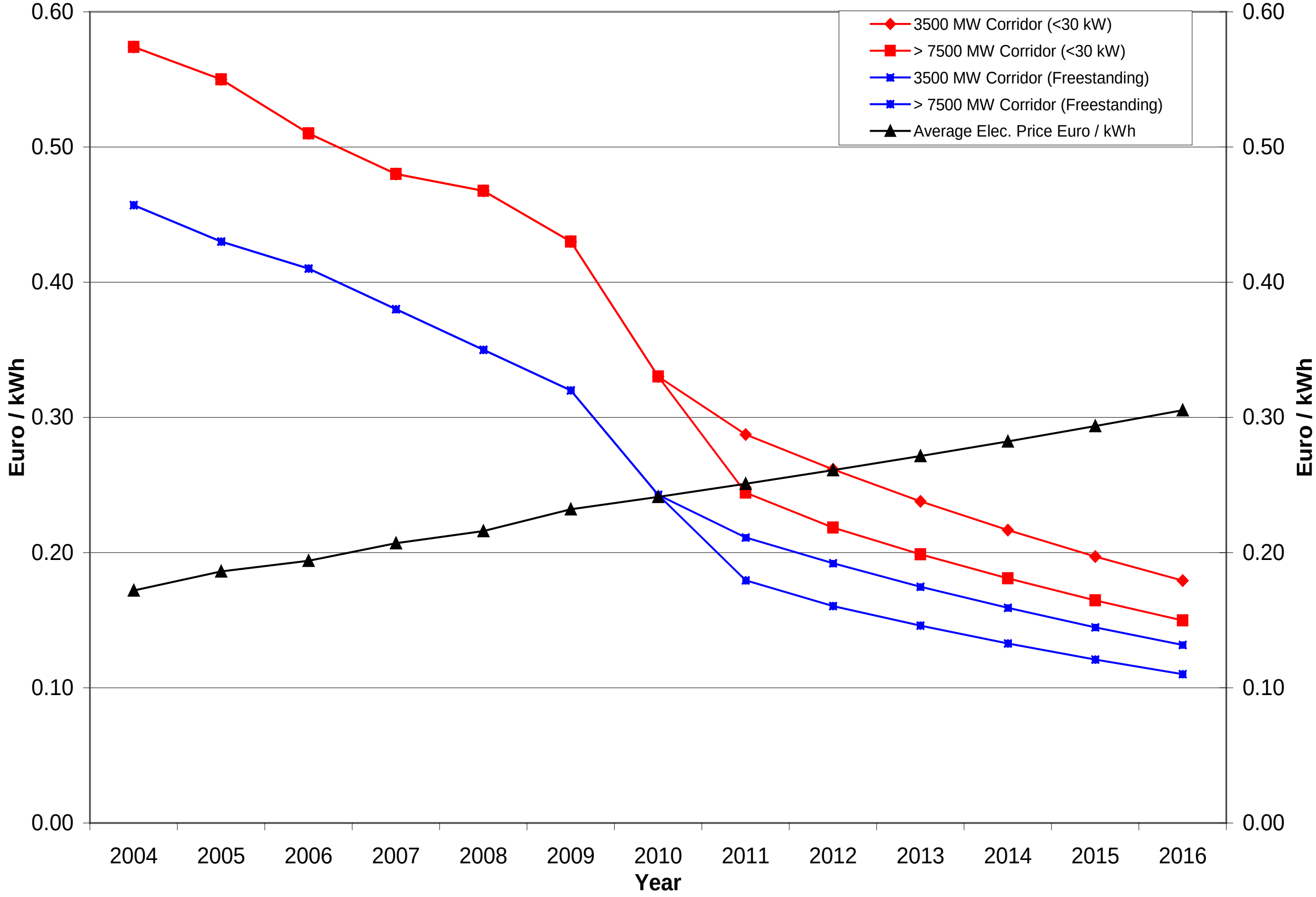
Notes: NPV calculated at 4% discount rate; system cost represents German average and excludes impacts of “value-based pricing” in high FiT markets
Source: Bloomberg New Energy Finance

Germany's Volume Sensitive Degression Schedule for Solar FiTs

Scenario	MW installed	Degression (2010)	Degression (2011)
< -2 GW	< 1500	6%	1.5%
-2 GW	1500	7%	4%
-1 GW	2500	8%	6.5%
Base case	3500	9%	9%
+1 GW	4500	10%	12%
+2 GW	5500	11%	15%
+3 GW	6500	12%	18%
> +3 GW	> 6500	13%	21%

Source: DBCCA analysis 2011

A Policy That Works: Solar PV Already Below or Close to Below Retail Electricity Rates in Germany



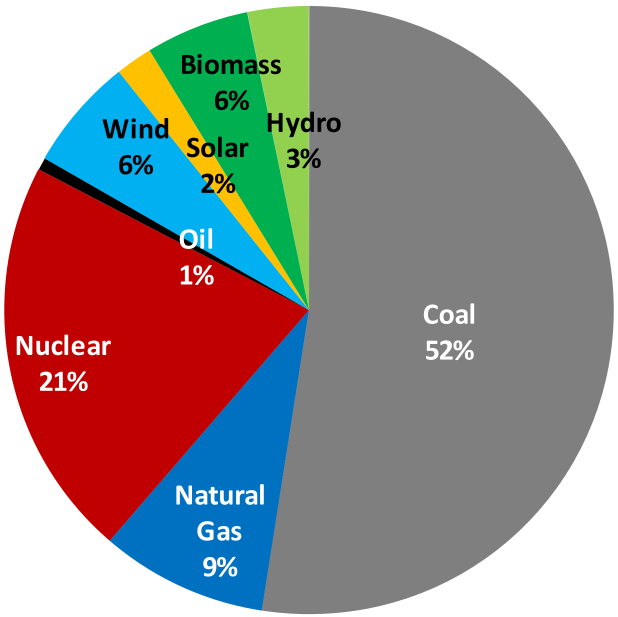
Source: DBCCA analysis 2011

Germany a Global Leader in Renewables

Share of power from renewables is expected to more than double by 2020

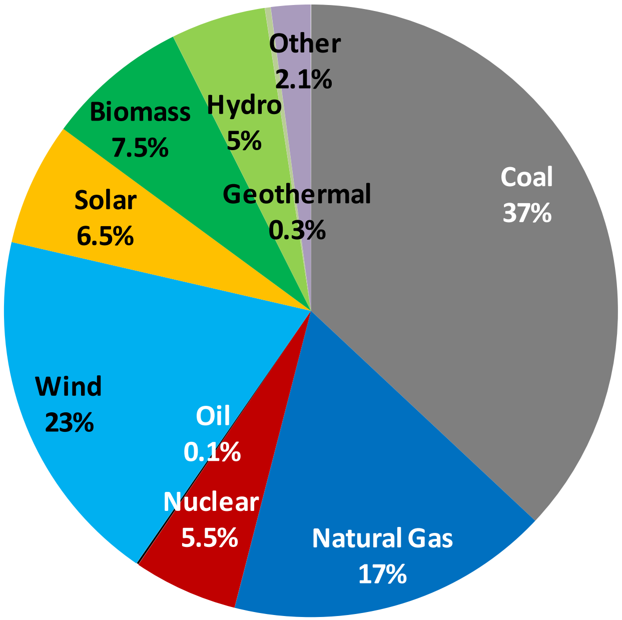
Also expect 11.4% reduction in power production by 2020 due to efficiency gains

Germany's Electricity Supply Mix
2010A



17% RE

Germany's Electricity Supply Mix
2020E



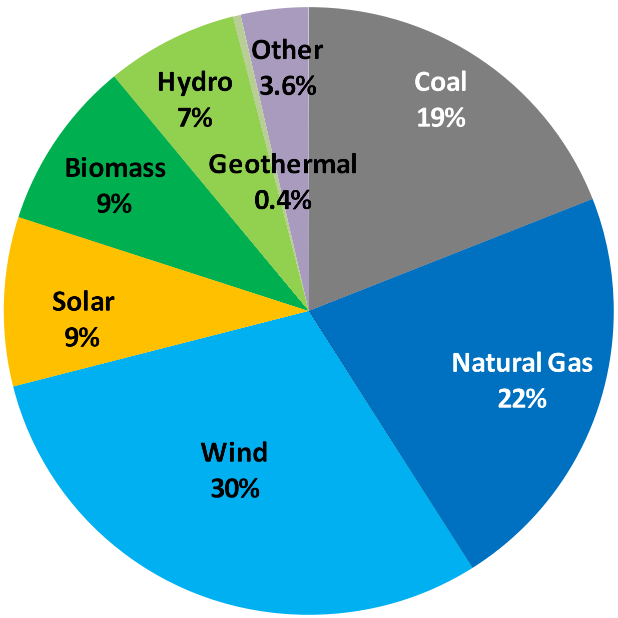
38% RE

Note: Totals may not add due to rounding; Germany's National Renewable Energy Action Plan (NREAP) targeted 38.6% RE by 2020; "Other" includes waste-to-energy, biogas and landfill gas

Sources: EWI; GWS; Prognos; DB Research

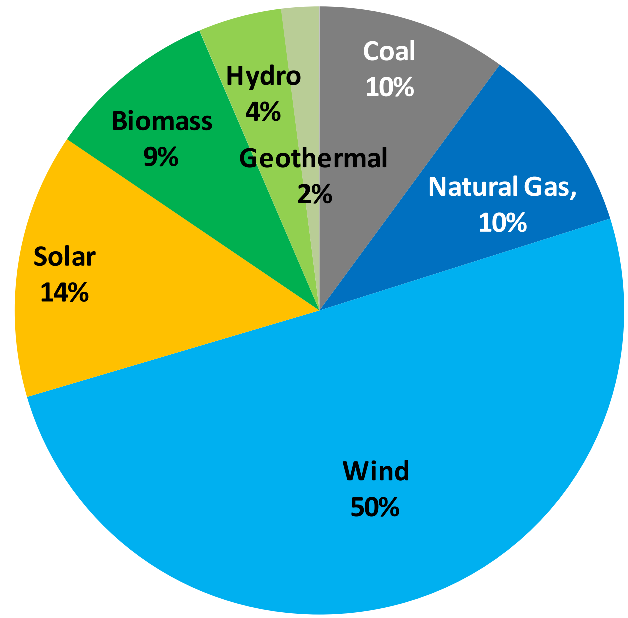
German Government Has Ambitious RE Forecasts

Germany's Electricity Supply Mix
2030A



55% RE

Germany's Electricity Supply Mix
2050E



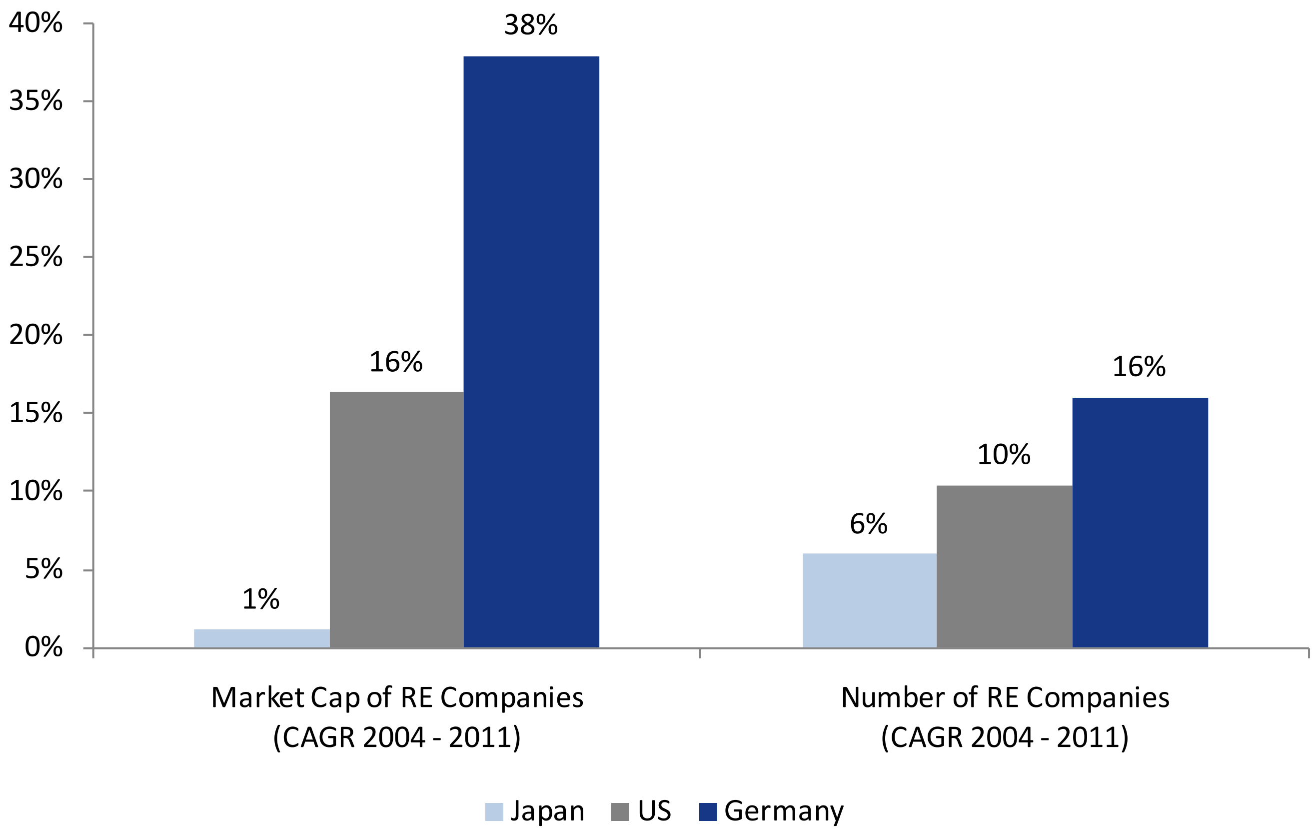
80% RE

Notes: Totals may not add due to rounding; Germany's "Energy Concept" Plan(2010) targeted 50% RE by 2030 and 80% by 2050 - upward revisions are post-Fukushima and accelerated nuclear phase-out plan; "Other" includes waste-to-energy, biogas and landfill gas

Sources: German "Energy Concept" Plan 2010, German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety; EWI; GWS; Prognos; DB Research; , DBCCA Analysis 2011

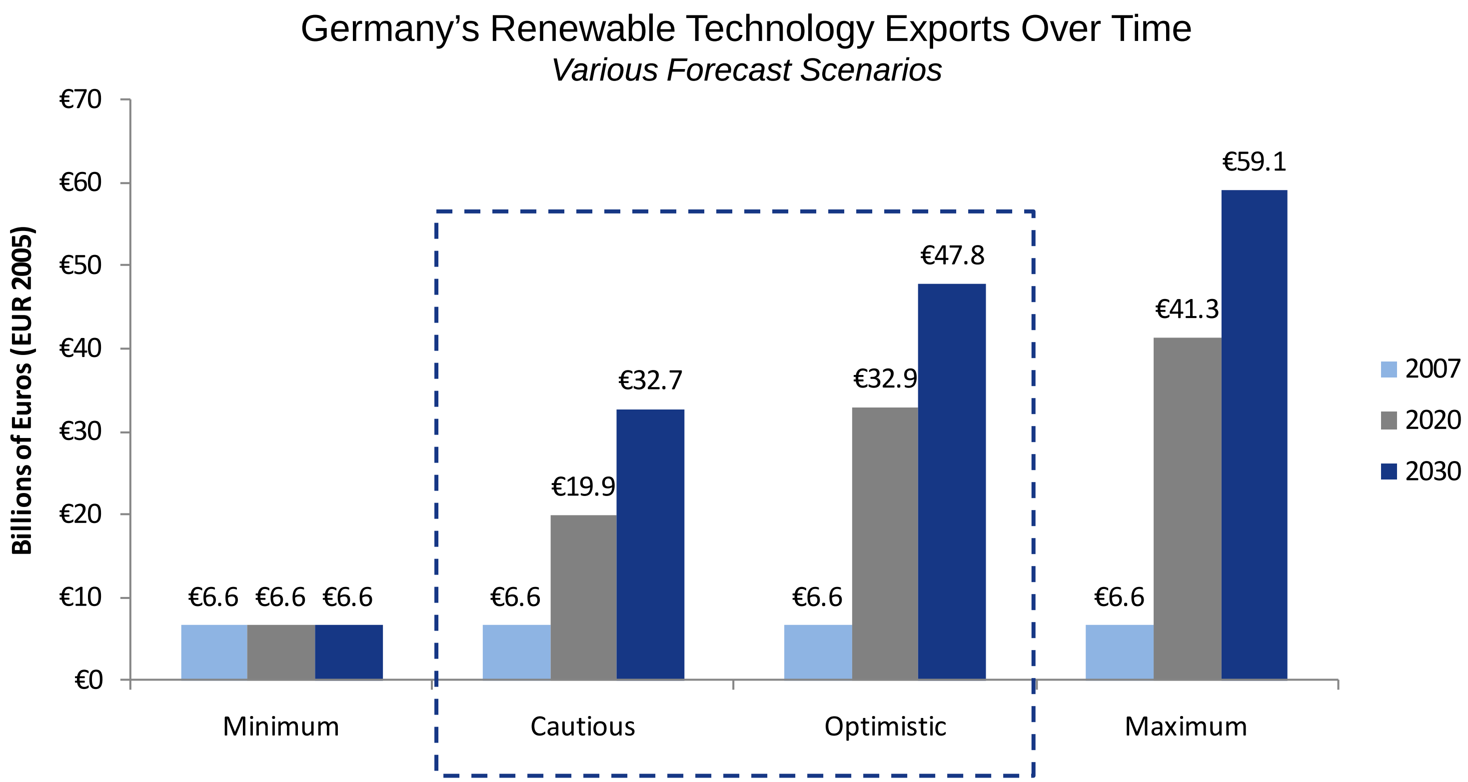
Rapid Growth in German Clean Energy Industry

Growth in Market Cap and Number of Renewable Energy Companies
(CAGR, 2004 – 2011)



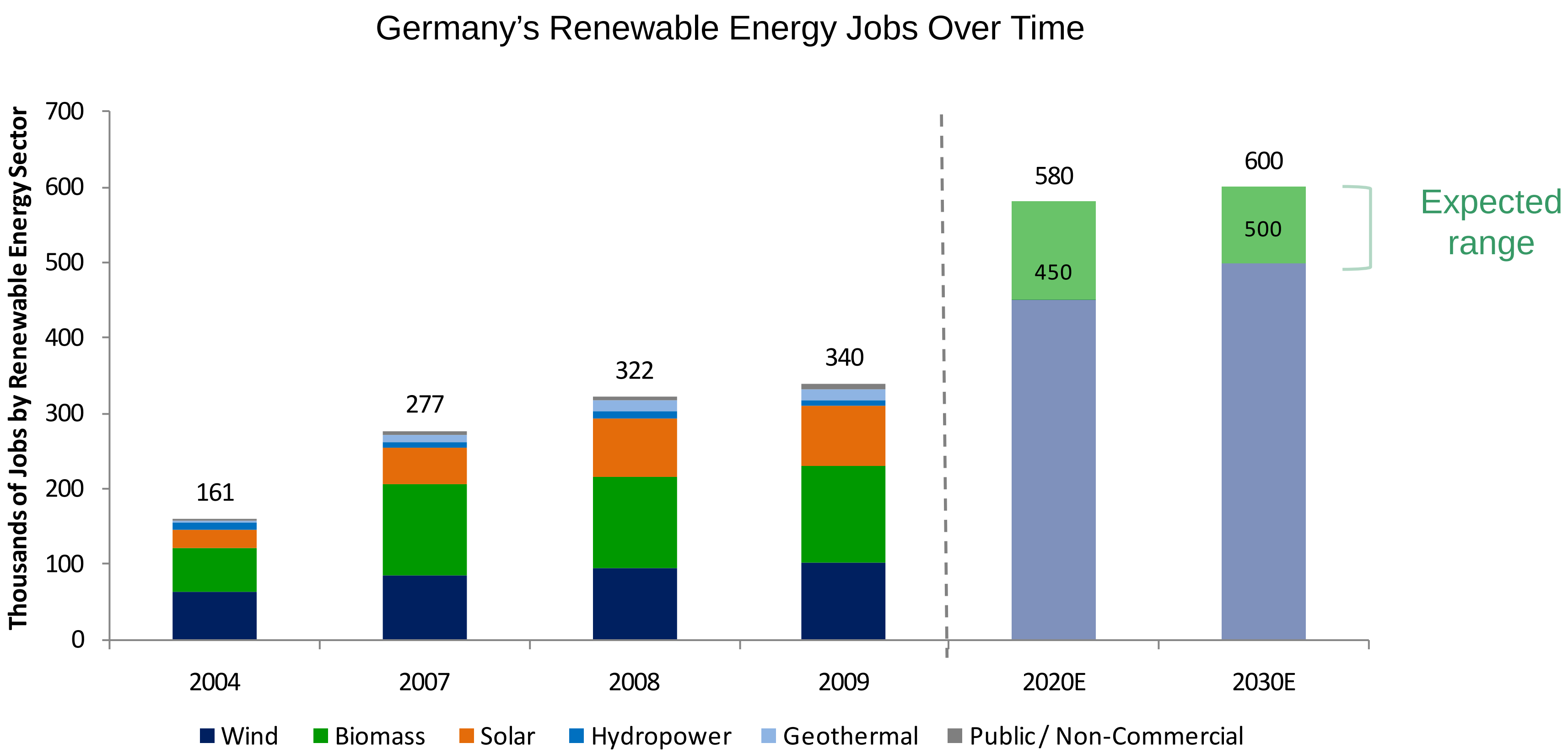
Note: Includes all quoted companies tracked by Bloomberg New Energy Finance with an exposure of 50% or greater to clean energy; market capitalization data calculated as of year-start (2004 and 2011)
Sources: Bloomberg New Energy Finance, Bloomberg

Sales of German Renewable Energy Companies Will Be Increasingly Export-Based



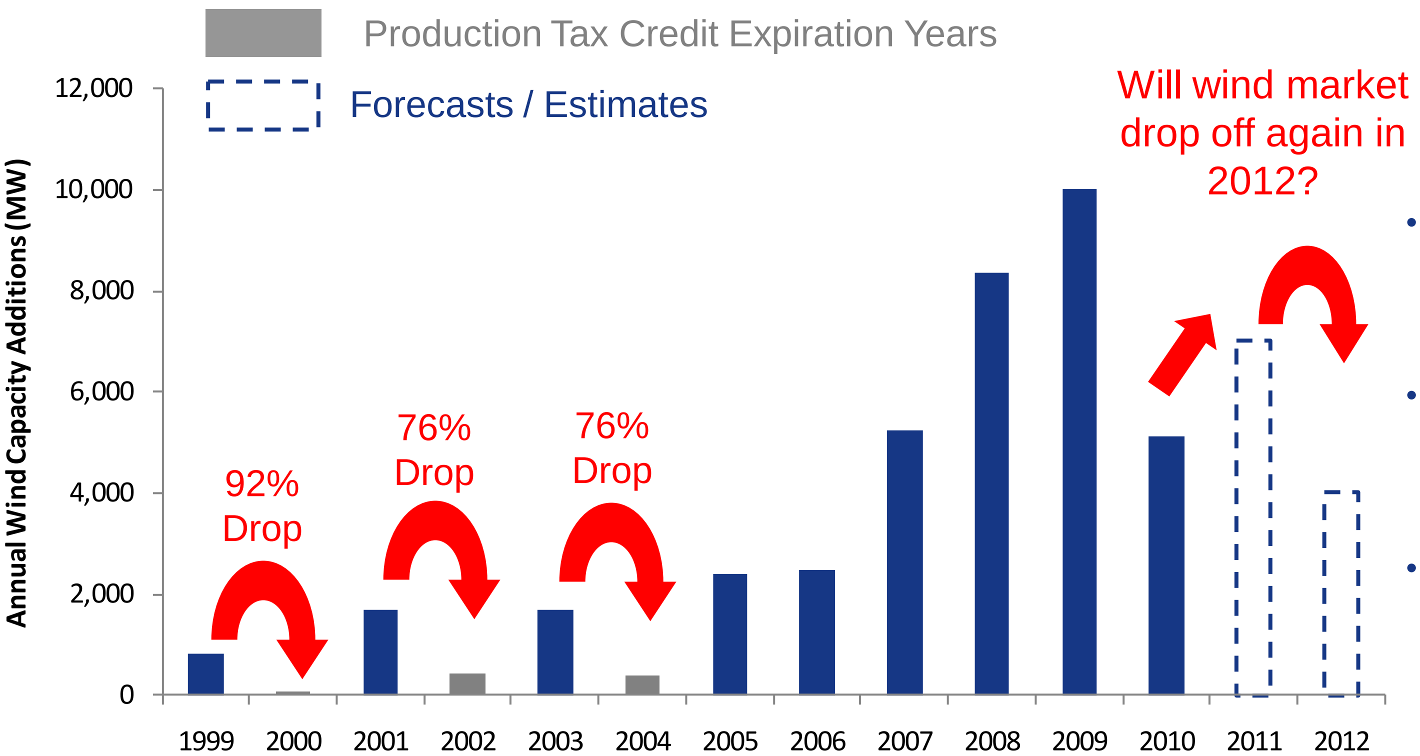
Source: German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2010

Germany's Renewable Energy Sector Employed 339,500 in 2009, a 2x Increase from 2004



Source: German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2010

US Has History of Inconsistent Federal Policy Support for Renewables …



- Section 1603 Treasury Cash Grant – **Extended in December 2010 for 1 year only**
- Advanced Energy Manufacturing Tax Credit **– Expired end-2010**
- Sections 1703 & 1705 Loan Guarantees **– Expiring in 2011**

Further extension of the Section 1603 Treasury cash grant program can help to create and preserve "green" jobs

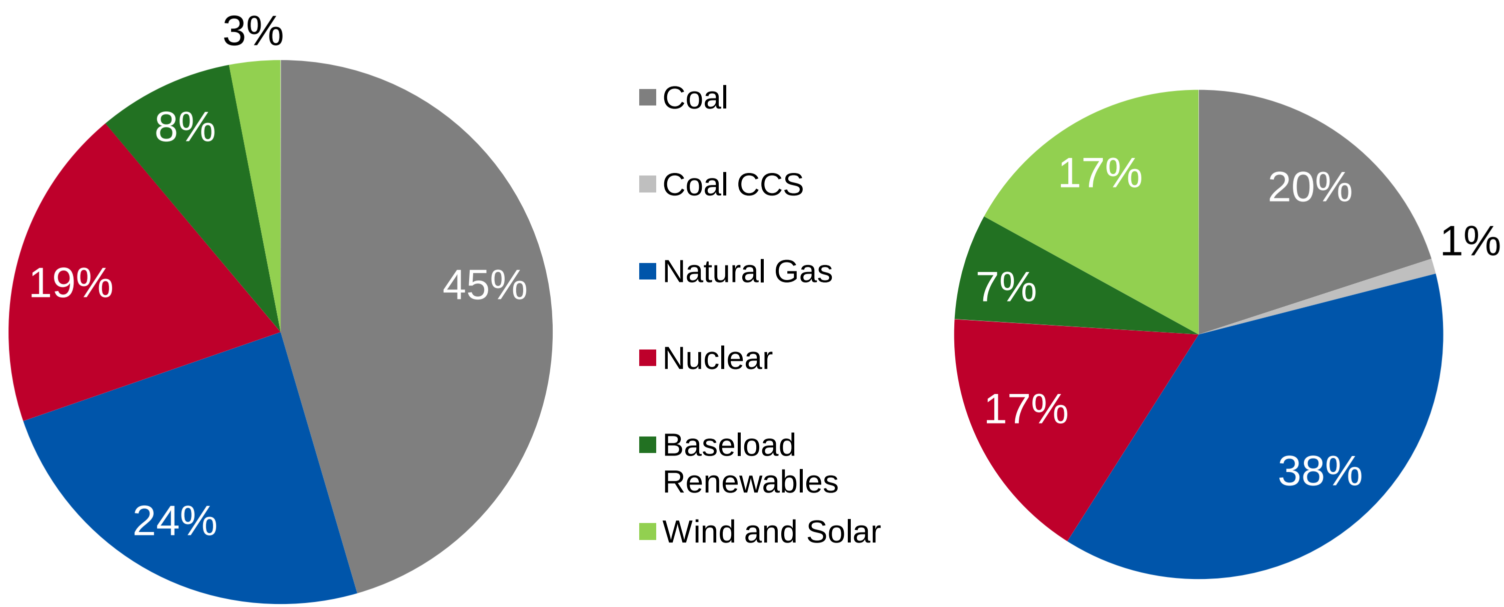
Sources: AWEA, 2011; Bloomberg New Energy Finance, 2011

2010-2030: US Electricity Supply Mix Becomes Greener and More Gas-Intensive

Assumes from 2010-2030 energy efficiency measures limit growth in electricity demand to 0.7% CAGR

US Electricity Supply Mix 2010A (% Total TWh)

US Electricity Supply Mix 2030E (% total TWh)



11% RE
24% Nat Gas

24% RE
38% Nat Gas

Note: 2010 values sum to to 99% due to 1% electricity supply from petroleum (not shown),
Sources: EIA; DBCCA Analysis 2011

~500,000 Net New Jobs in 2030 as Compared with 2010

Annual Net New Job Additions by Sector and Type, 2010-2030

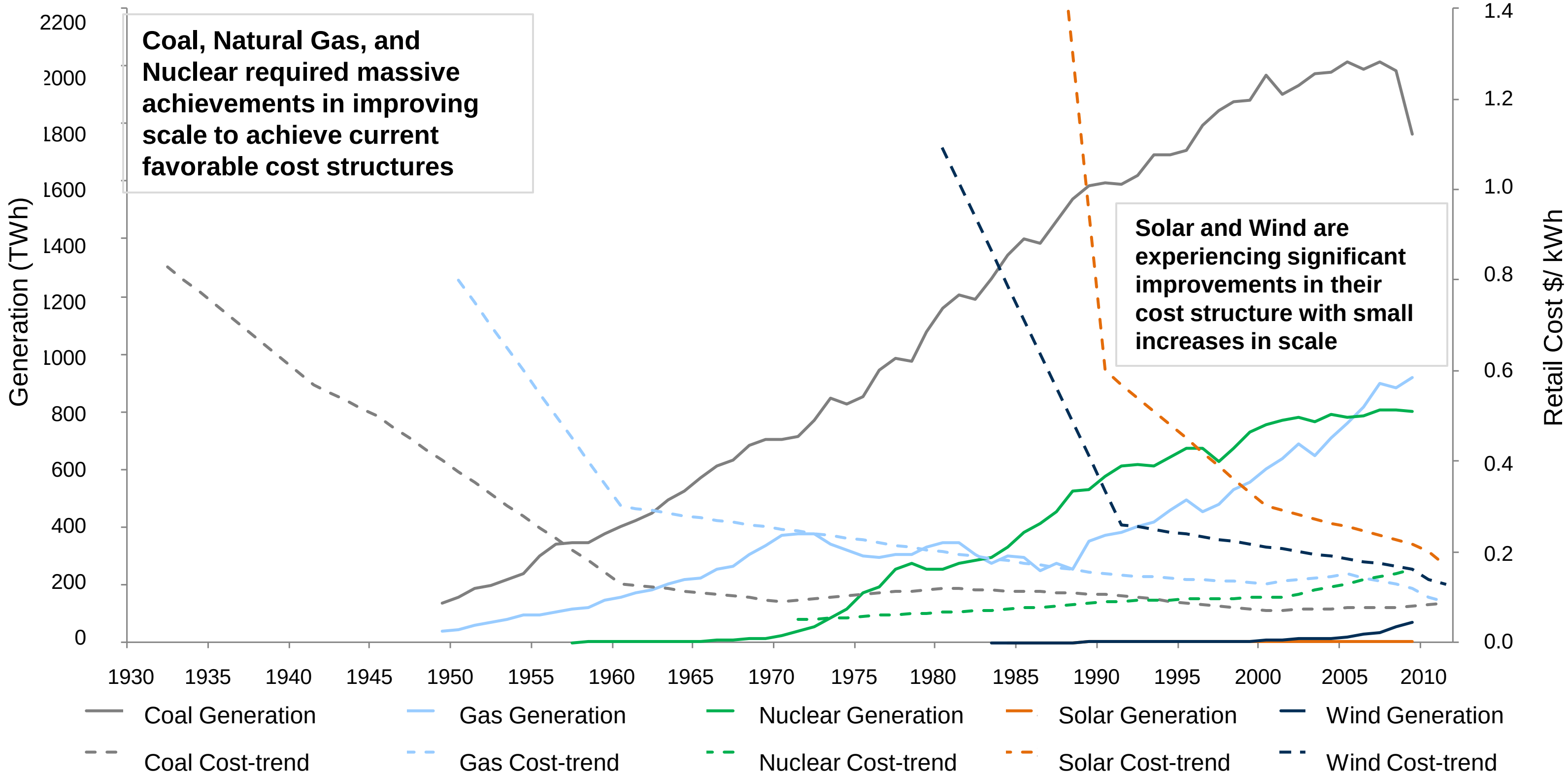
Sources: WPK Model, DBCCA analysis 2011.

Renewables are trending towards grid parity

Conventional technologies have started out at very high cost and have only achieved cost reduction with economies of scale

Solar and Wind are still more expensive than fossil generation and require interim support until adequate scale is reached

U.S. Electricity Generation and Retail Cost by Energy Source 1930 – 2010



Source: Hudson Clean Energy Partners Analysis, 2011

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