Impact of Changing Energy Patterns on EU Competitiveness

Giovanni Brianza – 30 April 2014

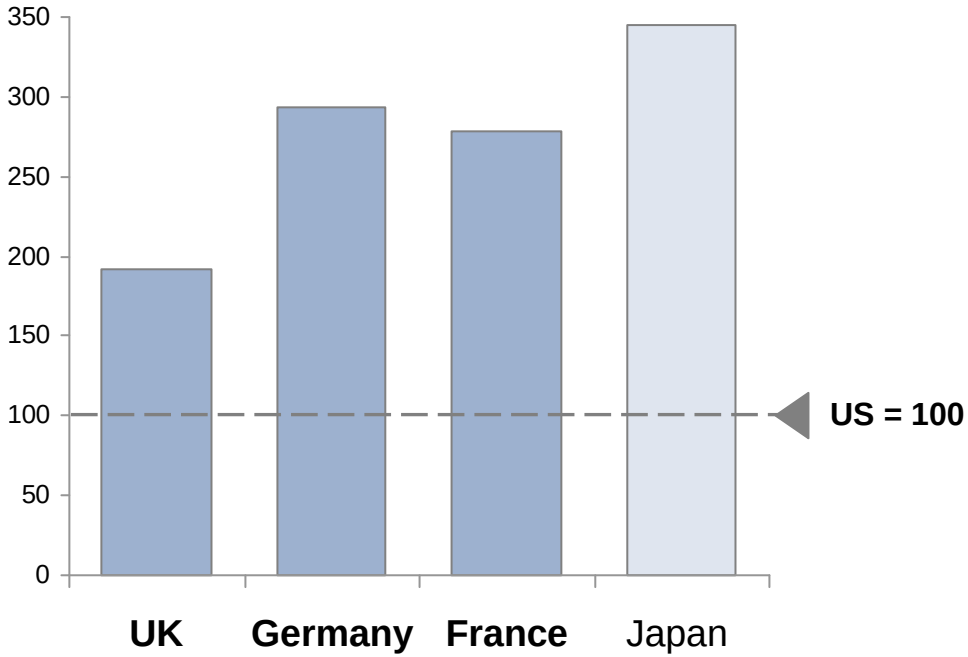
EDISON

Energy prices in EU

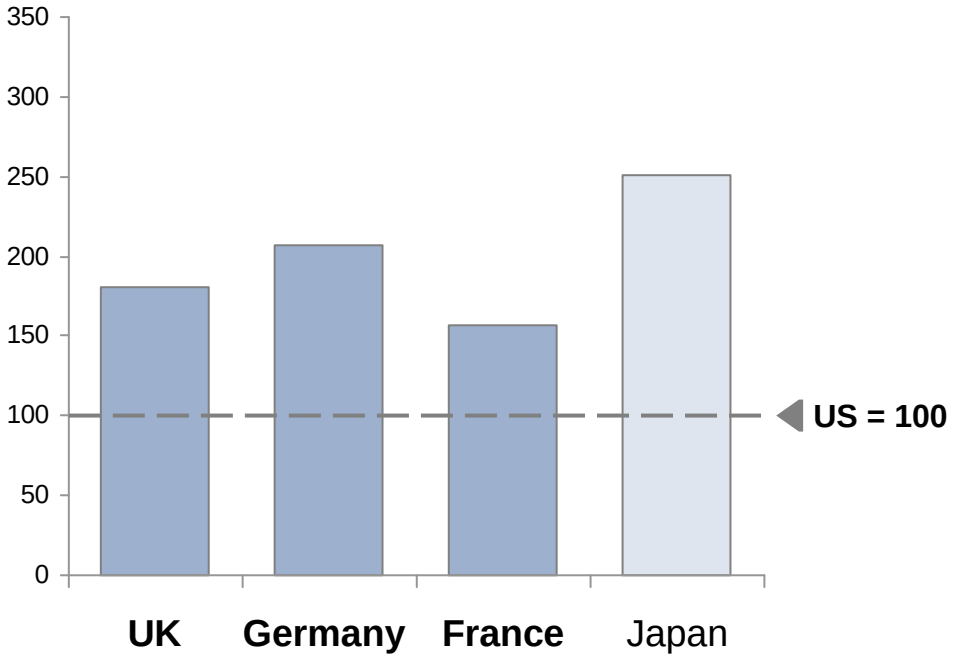
Gas prices in major EU manufacturing economies 2–3 times higher than in the US ...

... and industrial electricity prices 1.5–2 times higher

Natural gas prices (index, US = 100)



2011 Industrial electricity prices (index, US = 100)



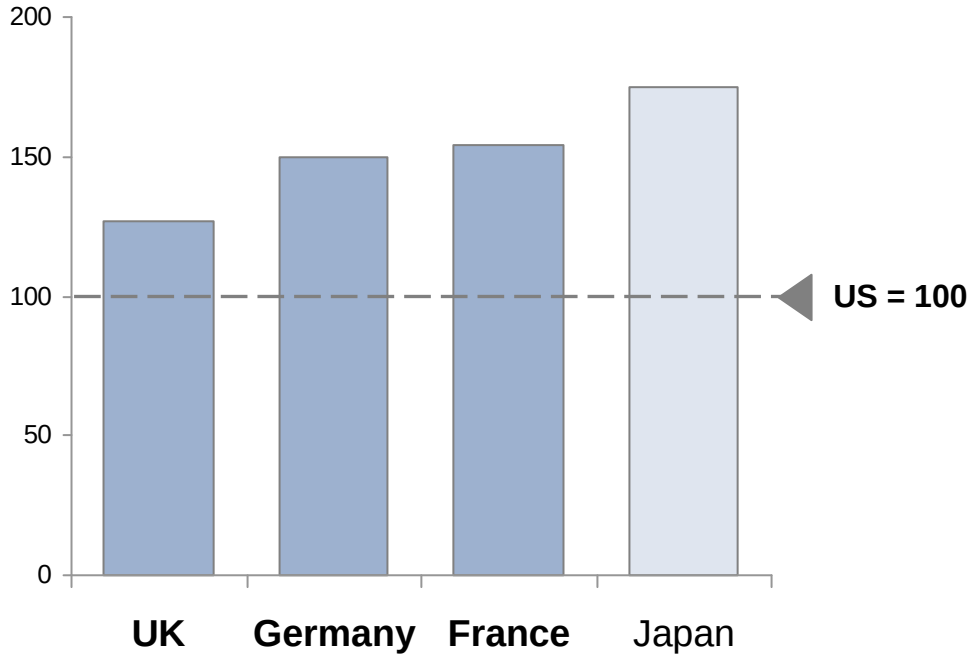
Shale oil and gas have given a significant cost advantage to US, but not to EU

Note: Energy prices based on 2011 averages
Source: IEA quarterly energy price and tax statistics; BCG analysis

Impact of labor cost

EU labor costs 1.3–1.5 times higher than in the US

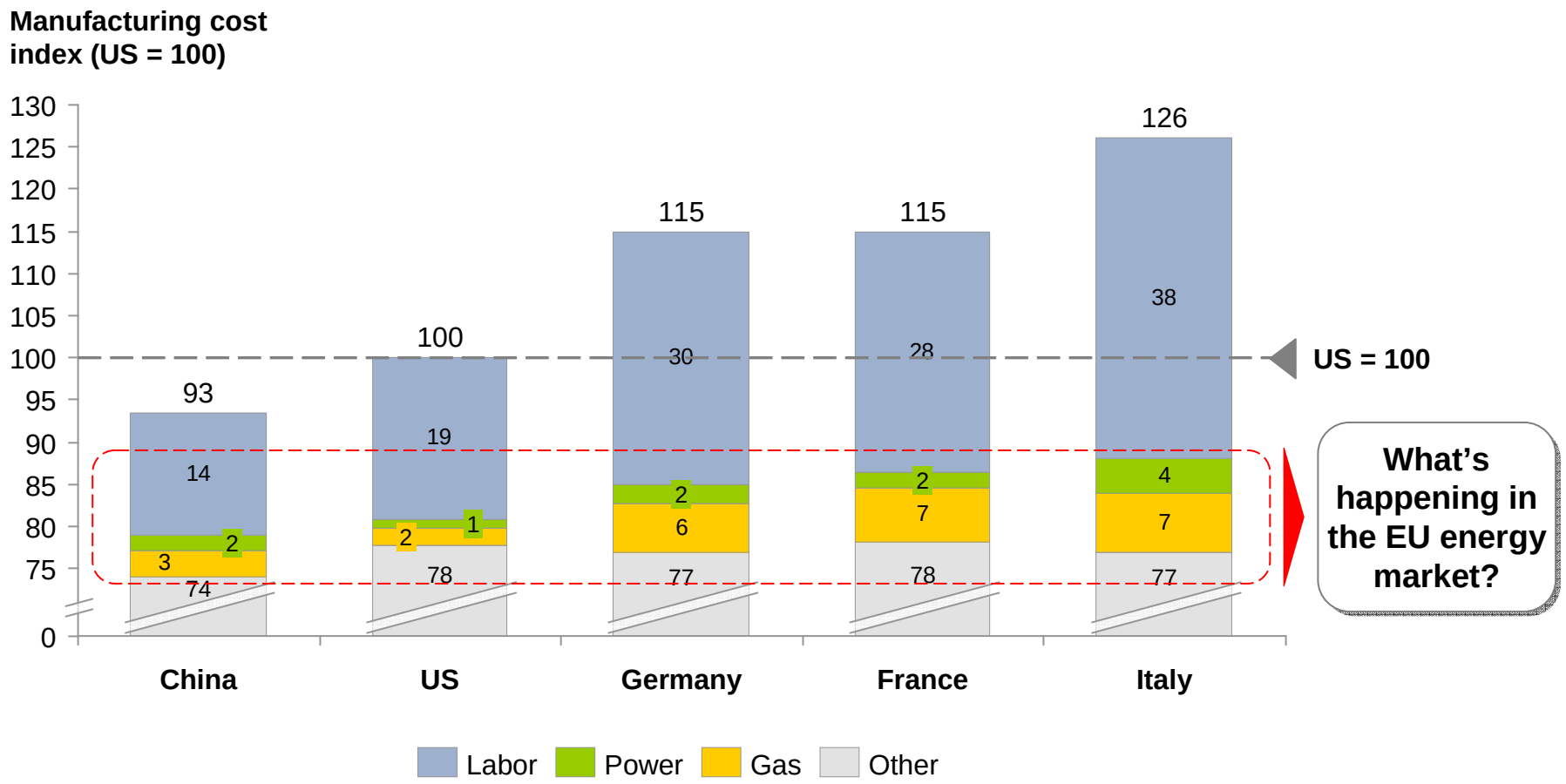
2015 productivity-adjusted wages (index, US = 100)[1]



Note: Fully loaded wages from EIU. US wages are average for southern states
1. Productivity indexed to US productivity. Projected from 2010–2015
Source: ILO; EIU; 2011 Fraser Institute Economic Freedom ratings; BCG analysis

Labor and energy costs significantly limit EU competitiveness

Average manufacturing cost structures vs. US (2015 projections)



Source: US Economic Census; BLS; BEA; ILO, BCG analysis

The energy market and the utilities in EU are facing major challenges

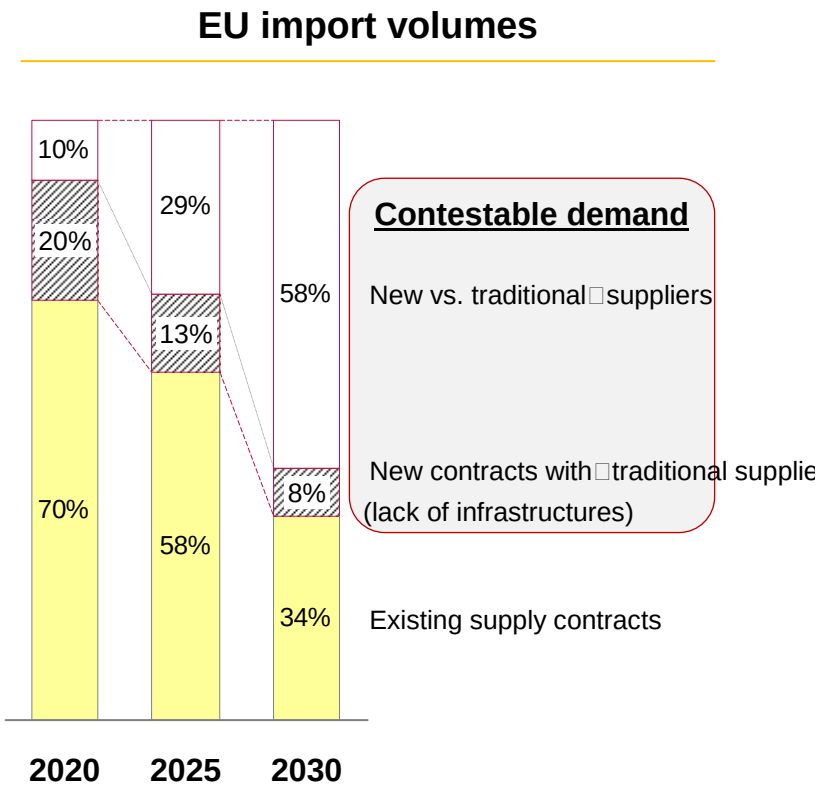
Stagnating demand	**Electricity CAGR '10-'30** **Gas CAGR '10-'30**	**+0.3% in '10-'20** **+0.7% in '20-'30** **vs. +2.2% in '90-'10** **+0.6%**	• Growth 4-5 times lower vs. '90-'10 • Increase in energy efficiency • Low GDP growth • Shift in economic mix
Penetration of renewables	**Capacity (%) '30** **Generation (%) '30**	**55% (+25% vs. '10)** **44% (+23% vs. '10)**	• Renewables increasingly supported by favorable economics
Pressure on thermo-nuclear sources	**Generation '30 vs. '10**	**- 600 TWh** **~20% decline vs. '10**	• Decline equivalent to closure of about 380 CCGT plants[1] • Thermo-nuclear generation progressively crowded out
Limited retail client value	**Dual Client**	**Limited client value**	• Value of power client at risk • Increasing churn and insolvency rates eroding attractiveness

Which opportunities?

1. Assuming a CCGT 400 MW plant operating at 4000 hours / years
Source: BCG analysis

A window of opportunity to enhance gas competitiveness

- **Gas competitiveness improvement essential to enhance both utility performance and manufacturing cost structure**
- **EU utilities may tackle a window of opportunity for supplier diversification to enhance gas competitiveness**
  - Progressive development of a contestable demand, following LT contract expiry, opportunity to reduce dependency on traditional gas suppliers
  - Traditional gas suppliers will continue to play anyway a major role in any scenario
- **Development of import infrastructures remains the enabler for full supply diversification and security of supply**



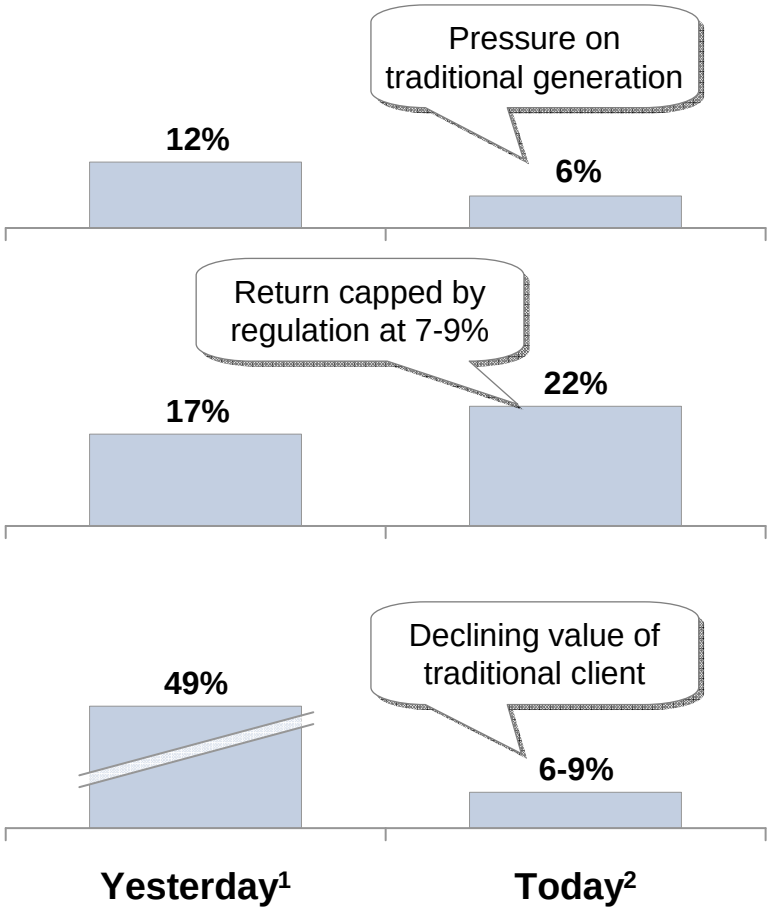
In the power business, EU utilities should consider exploring other options to enhance value creation

Generation

Infrastructure

Retail

Utility proforma ROACE evolution (%)



Opportunities for utilities in EU

- Invest in Renewables
- Exploit capacity markets

Capped returns?

- New infrastructures
- New services

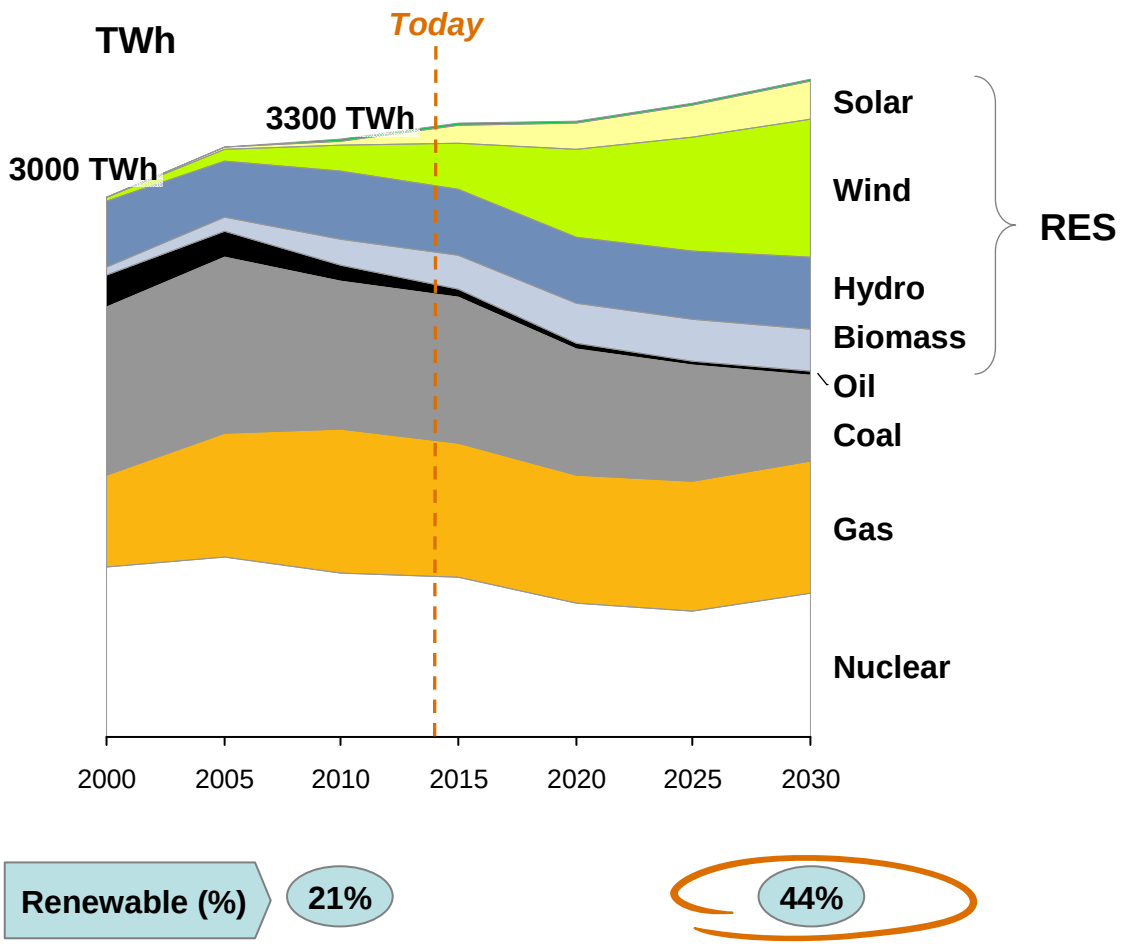
- Energy efficiency
- Retail services
- Commercial excellence

Customer centricity

1. Yesterday data refer to financial statement figures of Enel Produzione Spa, Enel Distribuzione Spa and Enel Energia Spa in 2005
2. Today figures refer to financial statement figures of Enel Produzione Spa, Enel Distribuzione Spa and Enel Energia Spa in 2012
Source: BCG analysis

Renewables have and are expected to take a large share of the EU generation market

EU power generation (2000–2030)

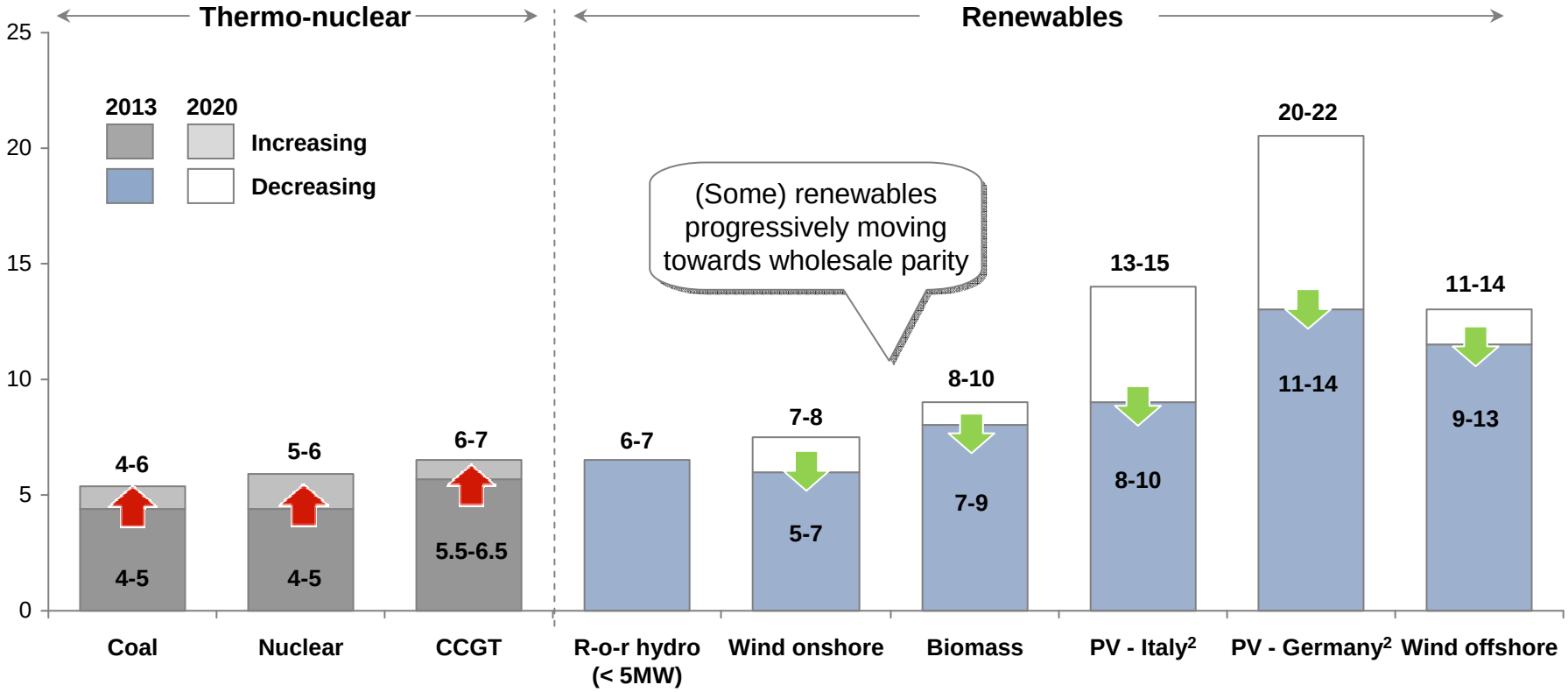


Renewables (RES) growth has been boosted by "generous" incentive programs, which in turn have contributed to increase energy costs and reduce competitiveness …

Source: EU Energy, Transport and GHG Emissions Trends 2050 Reference Scenario 2009 and Scenario 2013; BCG Analysis

… but now Renewables are likely to continue to grow thanks to technological improvement and related cost reduction

Levelised cost of electricity €ct/kWh[1]

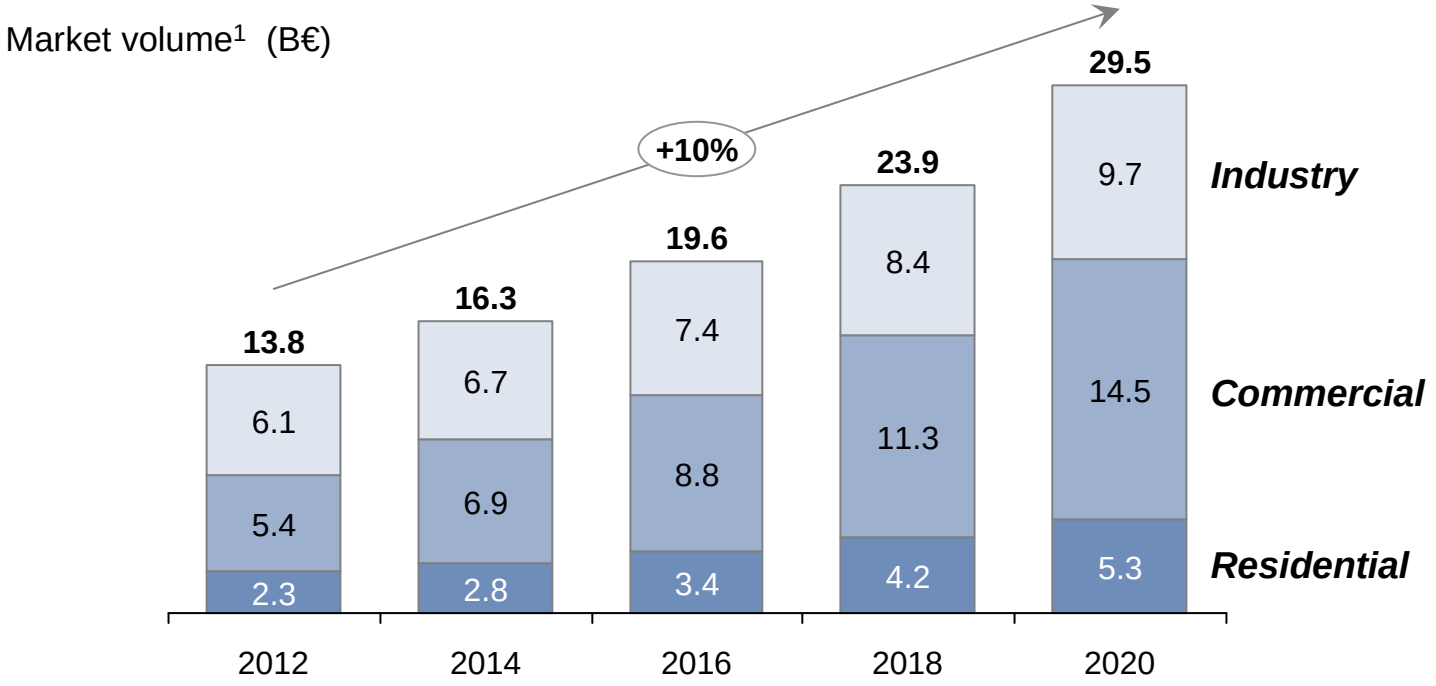


Incentives progressively less relevant for renewables development

Note: Cost of capital set at 7% for all technologies
1. CO_2 cost assumed at = for all energy sources; 2. retail scale, assuming 900 full load hours per year in Germany, 1,300 in Italy (1150 hrs in North Italy, 1450 in the South of Italy)
Source: EEG, EPIA, Fraunhofer iSE, IEA, IRE Universitat Stuttgart, BCG analysis

Energy Efficiency and related services market expected to steadily grow in the coming years

Energy Efficiency market projections in EU



Clear opportunity for utilities to leverage on customer centricity to address Energy Efficiency and related services … but with a selective sustainable approach (not simply based on incentives) and with a presence on the whole value chain

1. Market size includes sales of EE specific equipment, sales of EE services and EE contracting
Source: Pike Research; BCG analysis