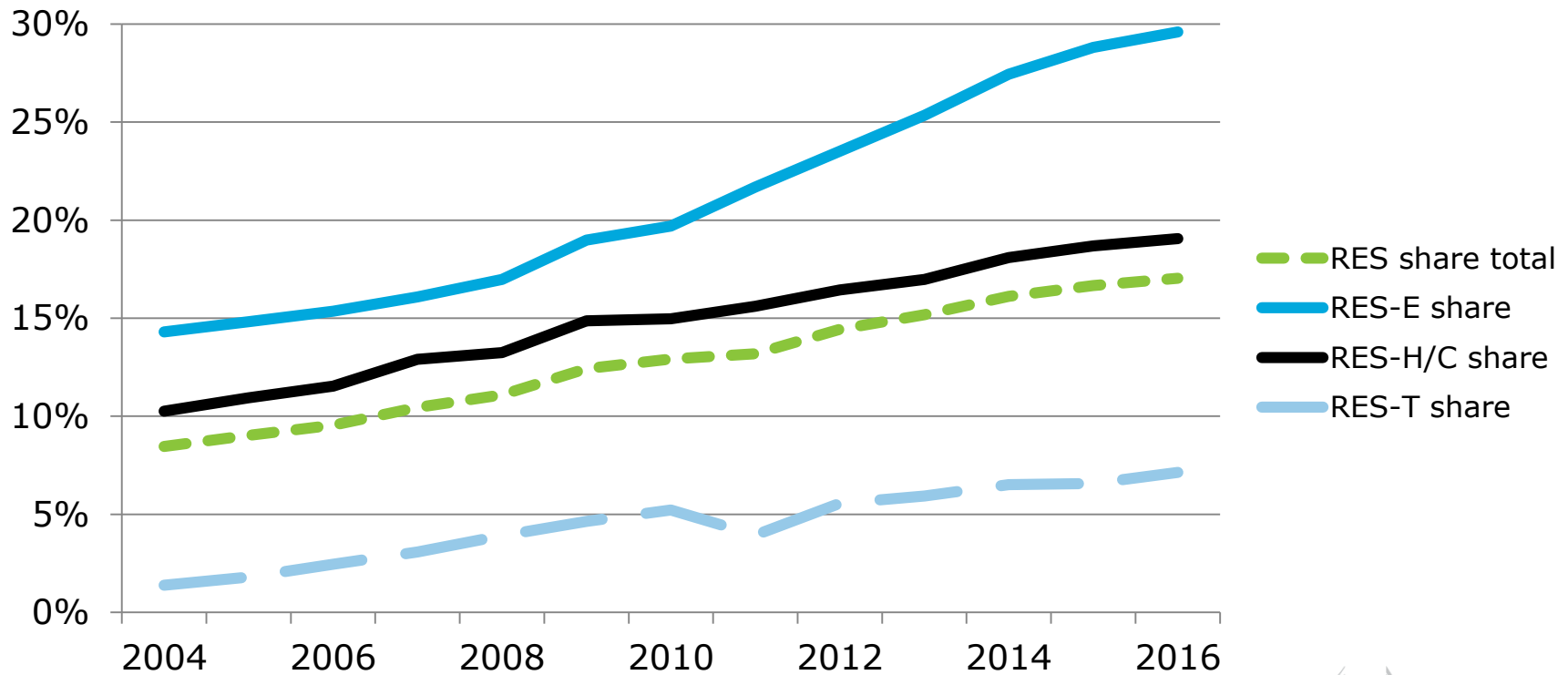
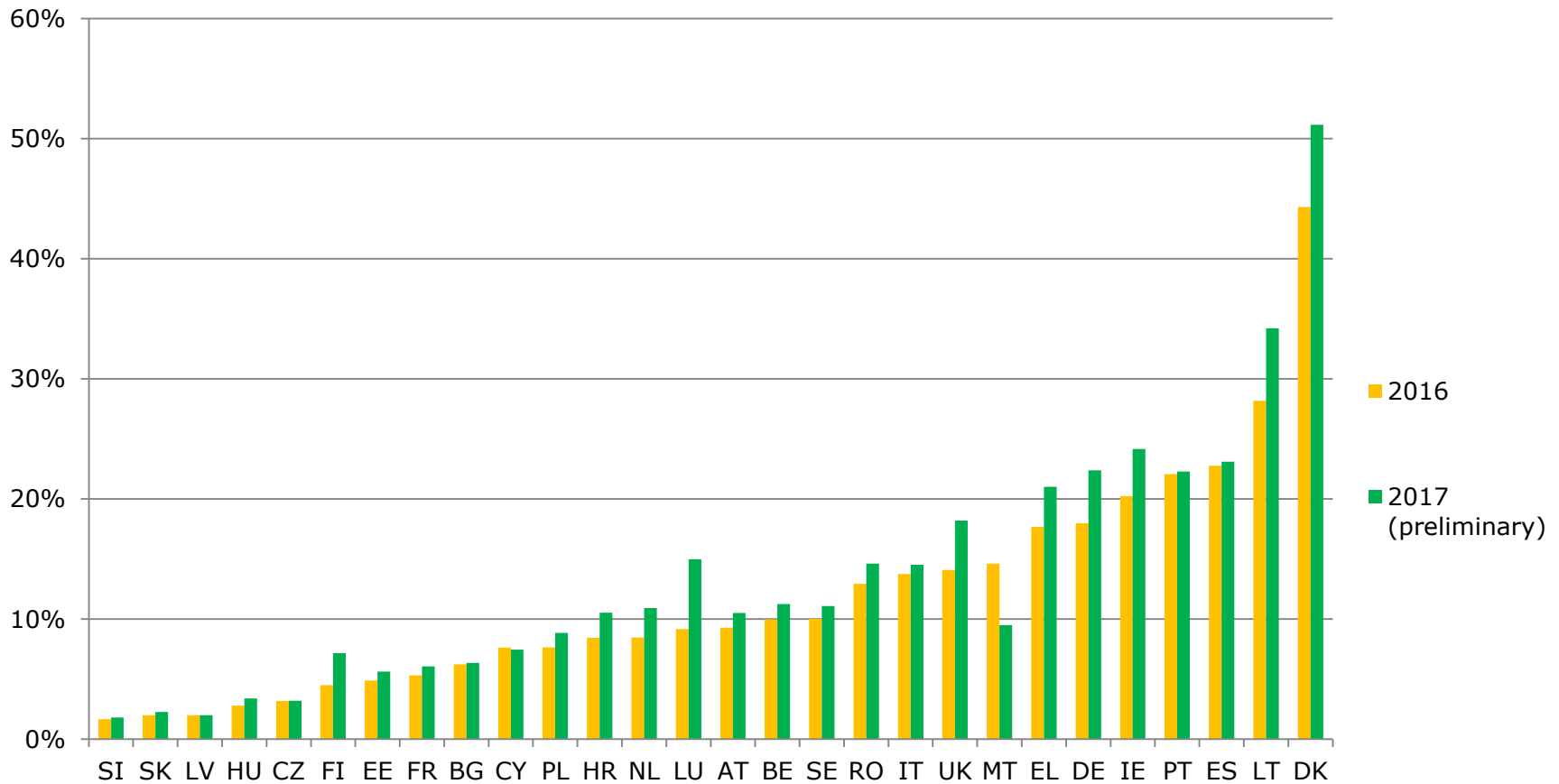


State of play – renewables in the EU



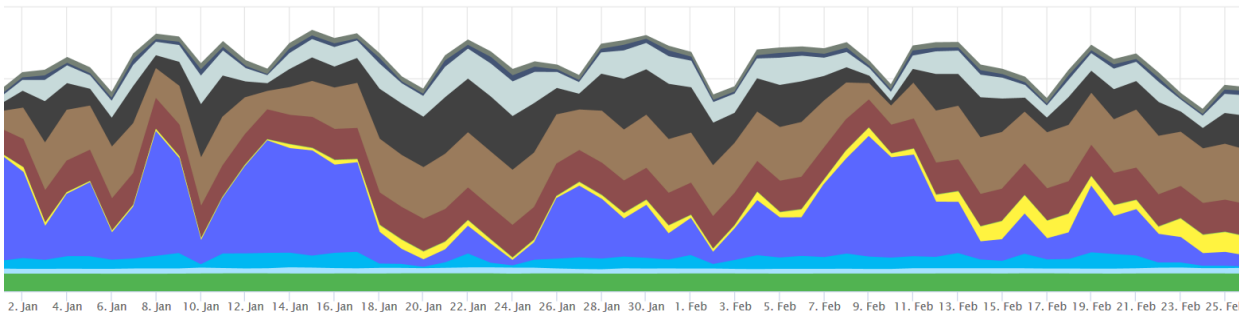
Already high shares of variable electricity



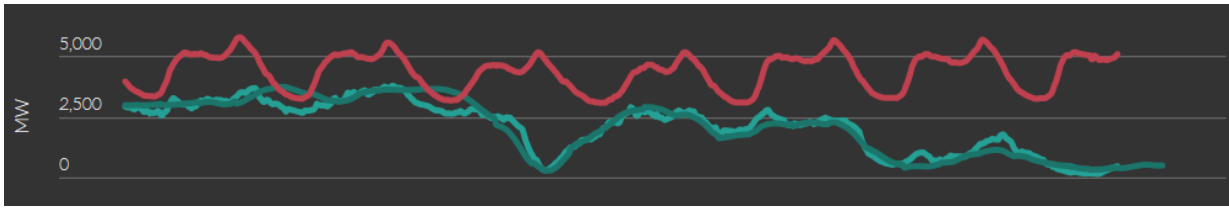


European
Commission


Already high shares of variable electricity



Germany
electricity mix,
Jan-Feb 2019



Wind in Irish
electricity mix,
21-27 Feb 2019

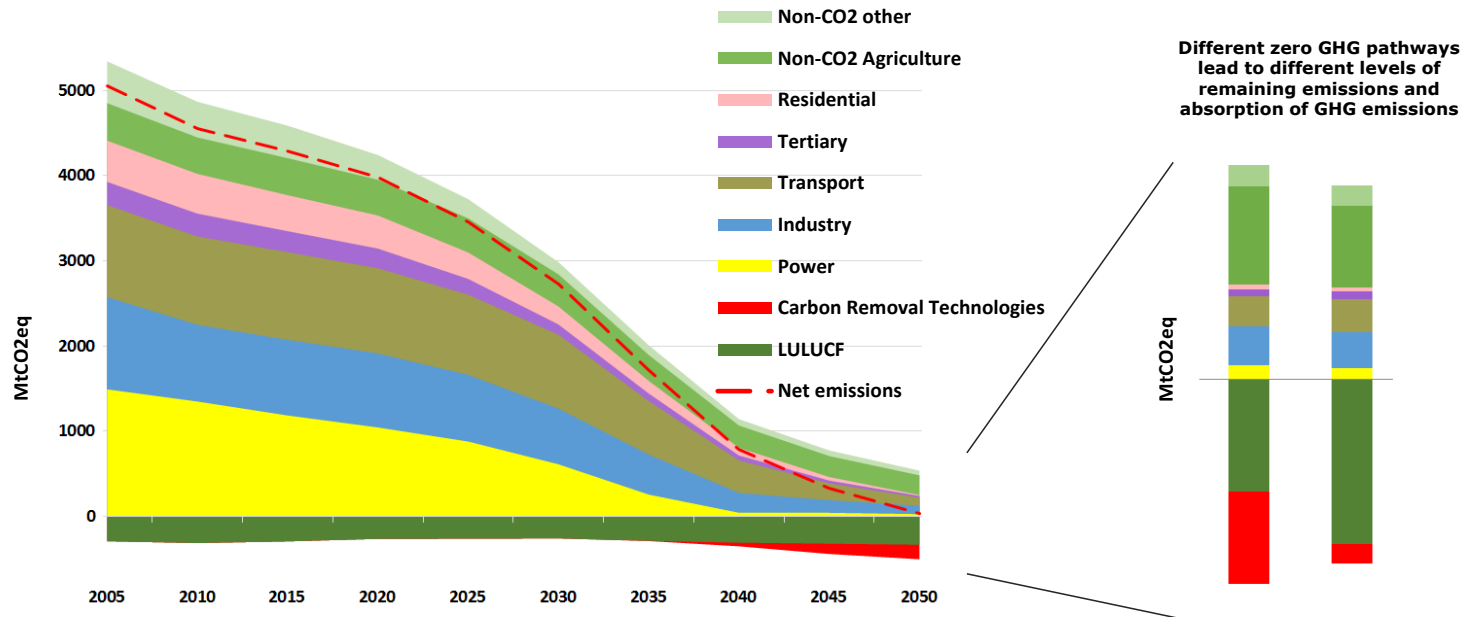
 **World Economic Forum** @wef · 11 Apr 2018
 #Portugal produced over **100%** of its electricity from **renewables** in March
wef.ch/2EwJboB #energy



UK renewable energy capacity surpasses fossil fuels for first time
 Renewable capacity has tripled in past five years, even faster growth than the 'dash for gas' of the 1990s
theguardian.com

Our Vision for a Clean Planet by 2050

- EU leads in clean energy transition and GHG emissions reduction. Ambitious 2030 targets. 60% reductions in 2050 with current policies – not in line with the Paris Agreement.
- Radical transformations necessary: central role of energy system, buildings, transport, industry, agriculture.
- There are a number of pathways for achieving a climate neutral EU, challenging but feasible from a technological, economic, environmental and social perspective.



Detailed assessment supported by scenario analysis

Long Term Strategy Options

	Electrification (ELEC)	Hydrogen (H2)	Power-to-X (P2X)	Energy Efficiency (EE)	Circular Economy (CIRC)	Combination (COMBO)	1.5°C Technical (1.5TECH)	1.5°C Sustainable Lifestyles (1.5LIFE)
Main Drivers	Electrification in all sectors	Hydrogen in industry, transport and buildings	E-fuels in industry, transport and buildings	Pursuing deep energy efficiency in all sectors	Increased resource and material efficiency	Cost-efficient combination of options from 2°C scenarios	Based on COMBO with more BECCS, CCS	Based on COMBO and CIRC with lifestyle changes
GHG target in 2050		-80% GHG (excluding sinks) ["well below 2°C" ambition]				-90% GHG (incl. sinks)	-100% GHG (incl. sinks) ["1.5°C" ambition]	
Major Common Assumptions	<ul style="list-style-type: none"> Higher energy efficiency post 2030 Deployment of sustainable, advanced biofuels Moderate circular economy measures Digitilisation 				<ul style="list-style-type: none"> Market coordination for infrastructure deployment BECCS present only post-2050 in 2°C scenarios Significant learning by doing for low carbon technologies Significant improvements in the efficiency of the transport system. 			
Power sector	Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization (demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.							
Industry	Electrification of processes	Use of H2 in targeted applications	Use of e-gas in targeted applications	Reducing energy demand via Energy Efficiency	Higher recycling rates, material substitution, circular measures	Combination of most Cost-efficient options from "well below 2°C" scenarios with targeted application (excluding CIRC)	COMBO but stronger	CIRC+COMBO but stronger
Buildings	Increased deployment of heat pumps	Deployment of H2 for heating	Deployment of e-gas for heating	Increased renovation rates and depth	Sustainable buildings			CIRC+COMBO but stronger
Transport sector	Faster electrification for all transport modes	H2 deployment for HDVs and some for LDVs	E-fuels deployment for all modes	Increased modal shift	Mobility as a service			<ul style="list-style-type: none"> CIRC+COMBO but stronger Alternatives to air travel
Other Drivers		H2 in gas distribution grid	E-gas in gas distribution grid					Limited enhancement natural sink

Detailed assessment supported by scenario analysis

Long Term Strategy Options

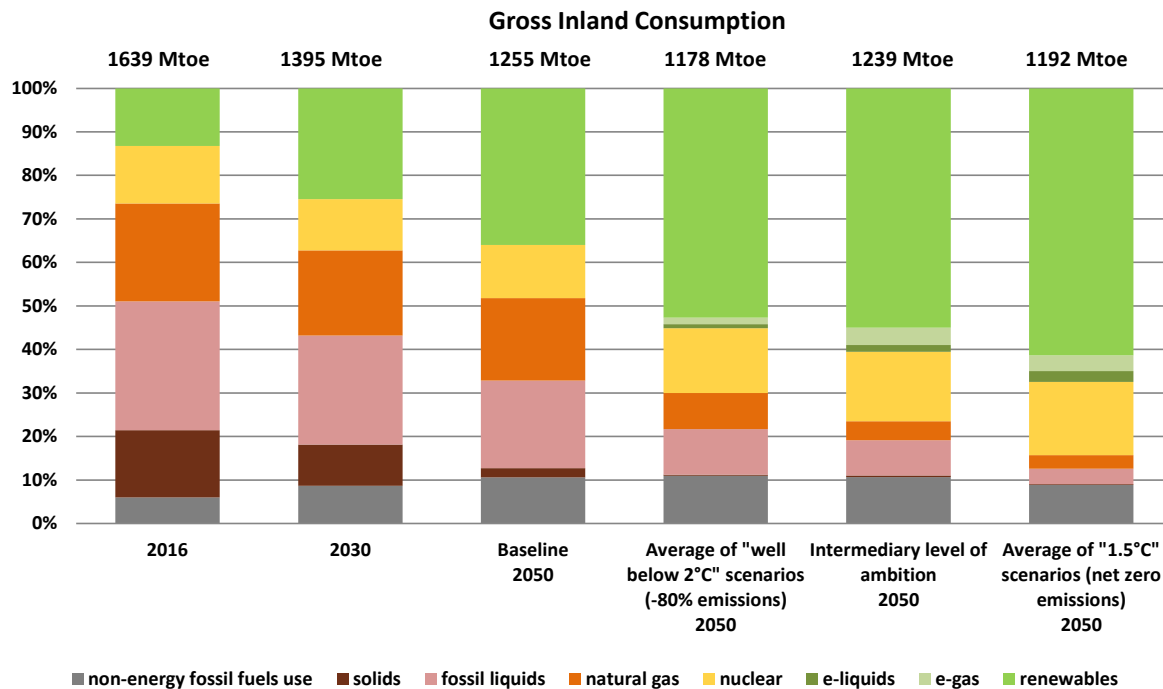
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7 Building Blocks

1. Energy efficiency
2. Deployment of renewables
3. Clean, safe & connected mobility
4. Competitive industry and circular economy
5. Infrastructure and inter-connections
6. Bio-economy and natural carbon sinks
7. Tackle remaining emissions with carbon capture and storage

Deployment of renewables

Primary energy in 2050 largely coming from renewable sources



Deployment of renewables

The share of electricity in final energy demand will at least double, more than 80% of it will be renewable.

Renewable electricity allows production and deployment of carbon-free energy carriers such as hydrogen and e-fuels to decarbonize heating, transport and industry.

Decentralized, smart and flexible power system.

Reduction of energy import dependence, cumulative savings from reduced import bill of € 2-3 trillion over the period 2031-2050.

Socio-economic benefits

- Significant additional investment: modernise the economy
- EU economy to double by 2050 in all scenarios. 1.5°C scenarios: +2%GDP
- Employment: 'Green jobs' already represent 4 million jobs in the EU.
- Public health, citizen and cities participation.
- Ensure “just transition” for sectors such as coal mining and fuel extraction and others that will transform (e.g. energy-intensive industries and automotive sector)

Priorities for action

- Accelerate the clean energy transition
- Strengthen the central role of citizens and consumers
- Roll out carbon-free, connected and automated mobility
- Boost industrial competitiveness, ensure competitive markets
- Promote a sustainable bio-economy, safeguard our natural resources
- Strengthen infrastructure and make it climate proof
- Accelerate R&I and entrepreneurship on zero-carbon solutions
- Promote sustainable finance and investment
- Invest in human capital, education and training skills
- Align growth-enhancing policies (competition, labour, skills, cohesion, taxation, etc.) with energy and climate policies
- Fair transition, coordinate with Member States and regions
- Continue international collaboration, bring all on board, share knowledge

