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Renewable energy deployment in the European Union –Vol.3

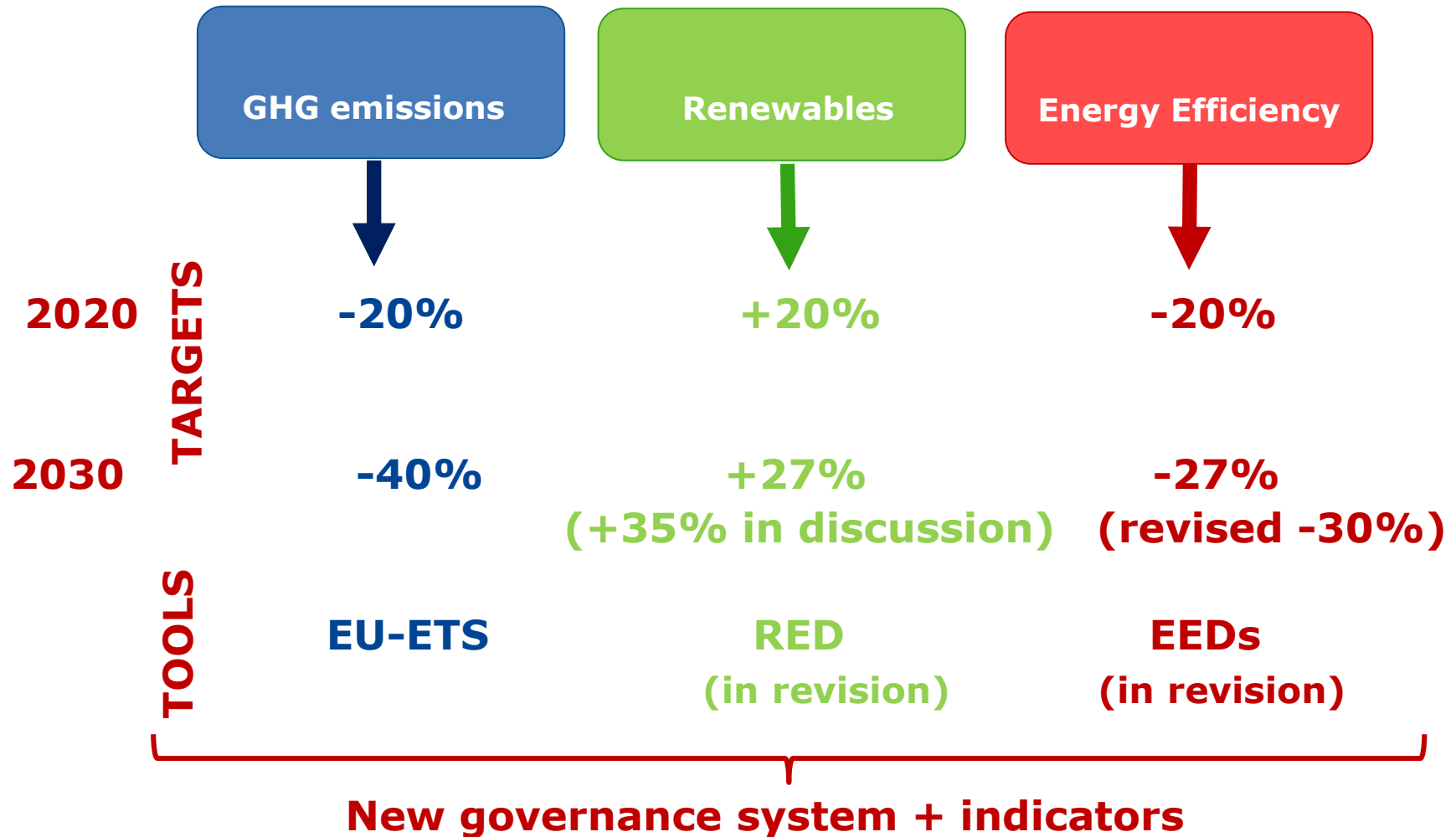
Deliverable of the WPk 755 RE-PORT

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Joint
Research
Centre

EU Climate and Energy Framework





The way towards.... **The Energy Union**

Where the EU want to go

A secure, sustainable, competitive, affordable energy for every European

What this means

Energy security, solidarity and trust

A fully integrated internal energy market

Energy efficiency first

Transition to a long-lasting low-carbon society

An Energy Union for Research, Innovation and Competitiveness

How the EU want to reach it

5

dimensions

15

actions

43

initiatives

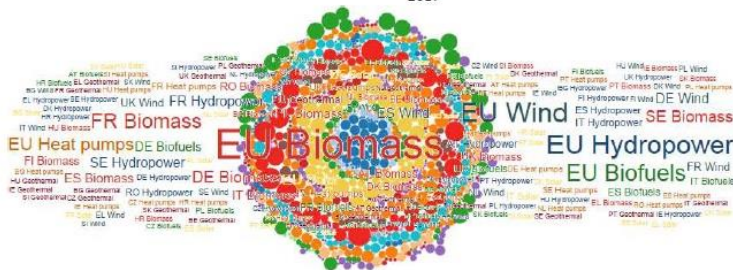
JRC SCIENCE FOR POLICY REPORT

Renewable energy deployment in the European Union

Renewable energy in the European Union further to Renewable Energy Directive reporting, Vol. 3

Banja M, Monforti-Ferrario F, Bódis K, Jäger-Waldau A, Taylor N, Dallemand JF, Scarlat N

2017



The report features:

Renewable energy progress in period 2005-2015 and the projections until 2030

European Union outlook Country snapshot Sectors overview

New Energy Scenarios (EUCO27) Overall RES share trend forecast

Key points

Progress towards the 2020 renewable energy targets **is on track** for the European Union as a whole and for most Member States;

Already in 2015 **ten Member States had met and/or exceeded their 2020 targets** for overall renewable energy share.

The deployment of **biomass** (both as bioelectricity and bioheat), **solar photovoltaic, wind and heat pumps** at aggregated European Union level have met and/or surpassed the planned trajectory.

Almost **30 Mtoe of final renewable energy** produced in the European Union, twice the expectations, is actually **available to be virtually transferred between the Member States** through the mechanism of statistical transfers.

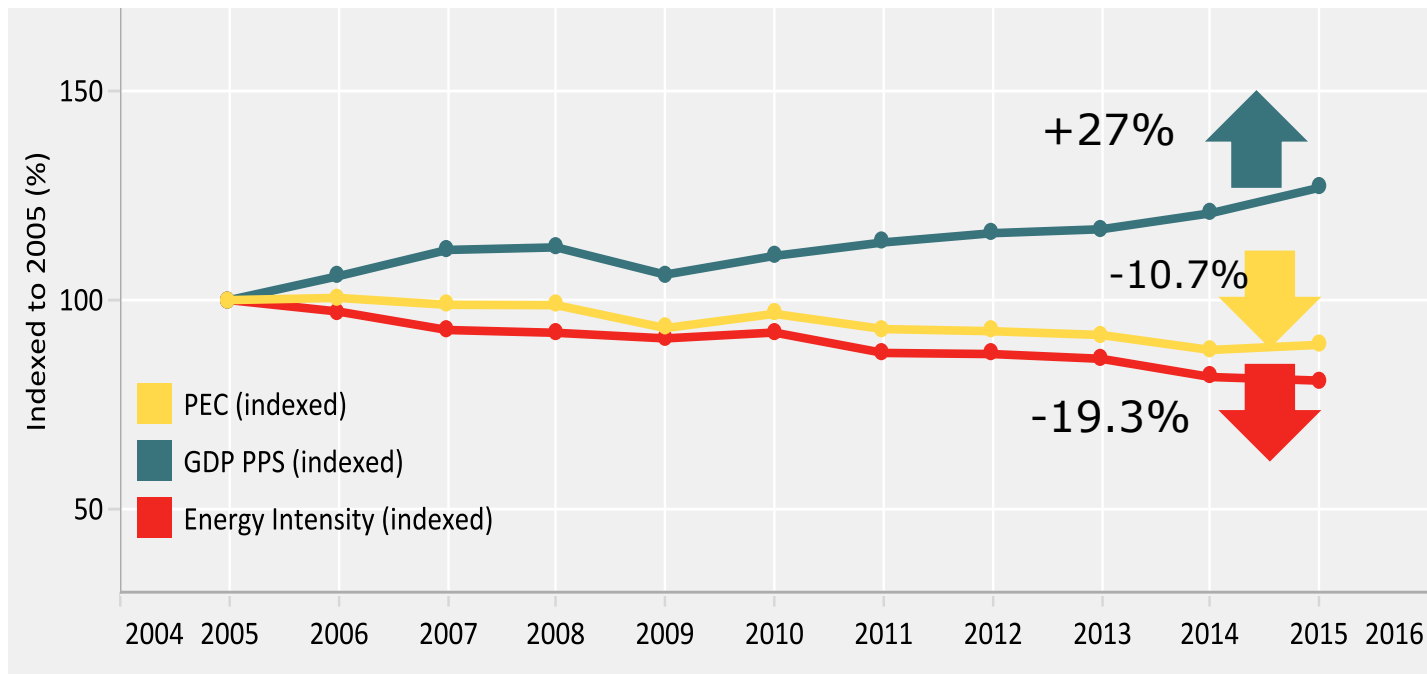
Energy in the EU, 2015

Primary energy consumption dropped by 10.7% compared with 2005

GDP PPS increased by 27% compared with 2005

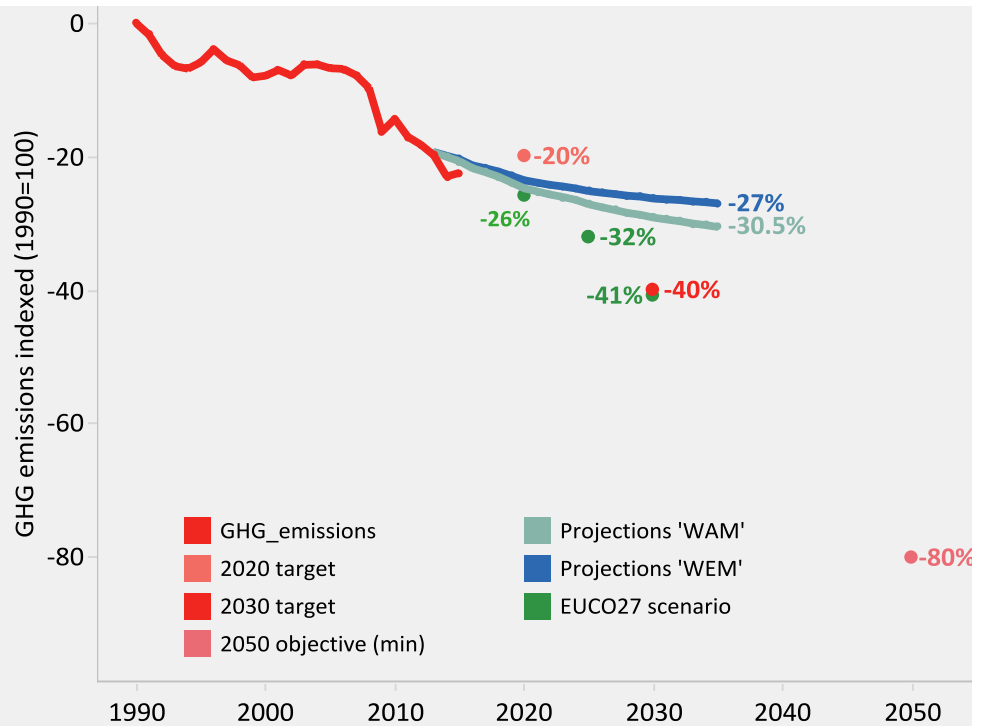
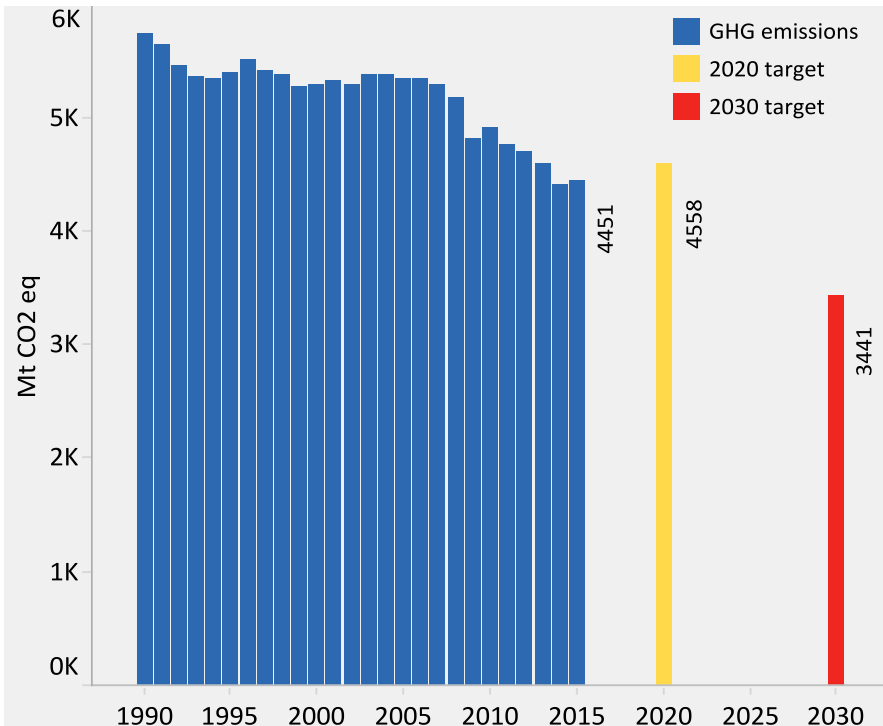
Energy intensity of the economy decreased by 19% compared with 2005

Import dependency ratio, 54%, near to 2011 level



GHG emissions in the EU, 2015

CO2 emissions (fuel combustion and cement industry) -21% below 1990
 Greenhouse gas emissions fell by -22.1% compared with 1990
 Effort Sharing Decision emissions (ESD) remained below the 2015 target
 EU ETS emissions -24.4% below 2005 level



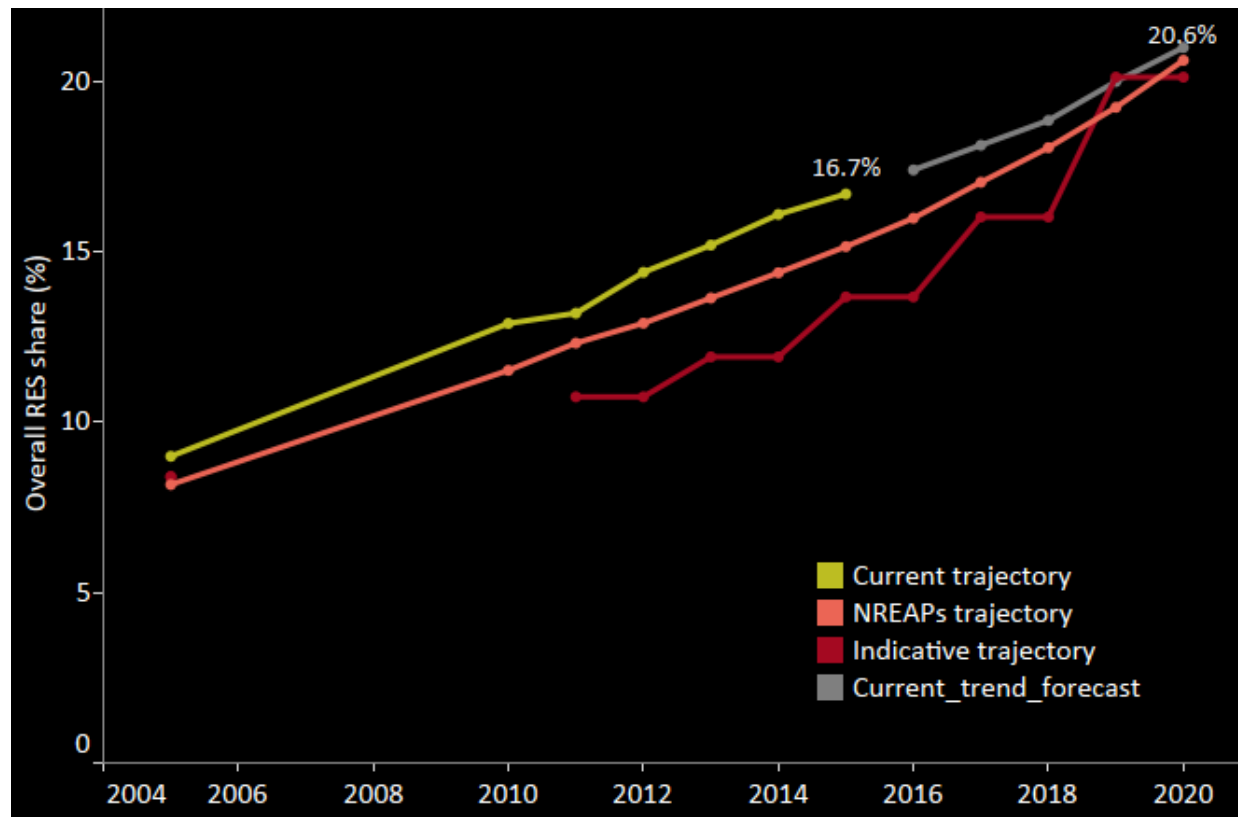
Progress of renewables in the EU

In 2015

Overall RES share **16.7%**
of Gross Final Energy
Consumption

RES-E share **28.8%**
RES-HC share **18.6%**
RES-Tr share **6.7%**

27% in 2030



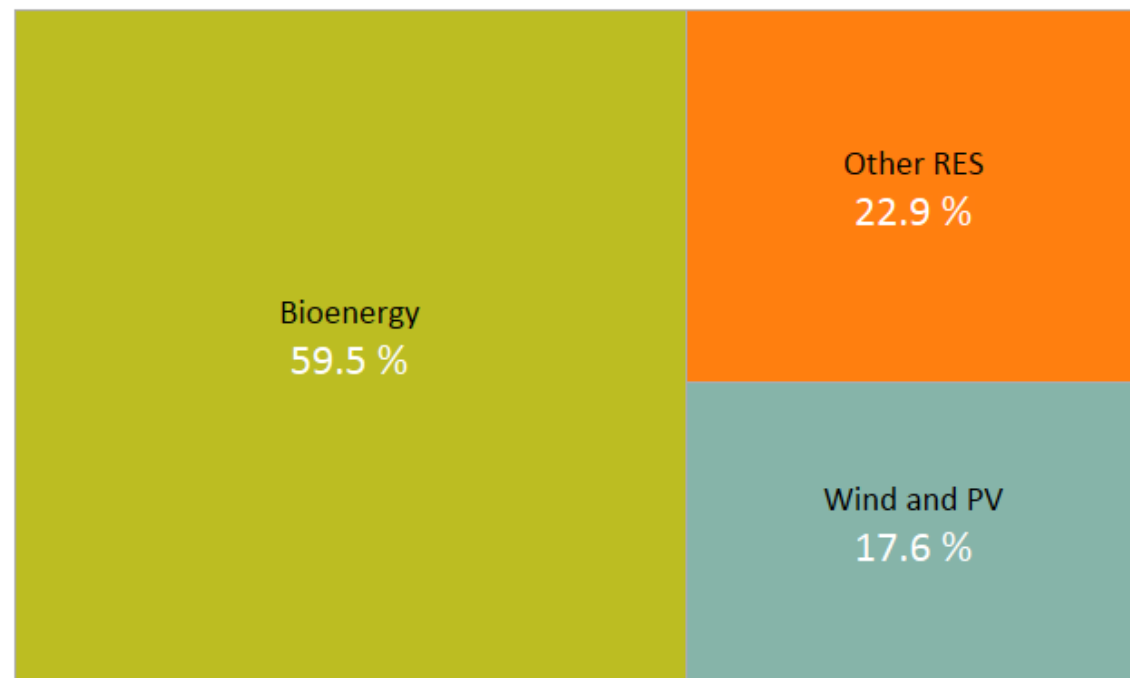
Renewable energy key drivers

Bioenergy

~ **60%** of final renewable energy
~ **10%** of gross final energy consumption

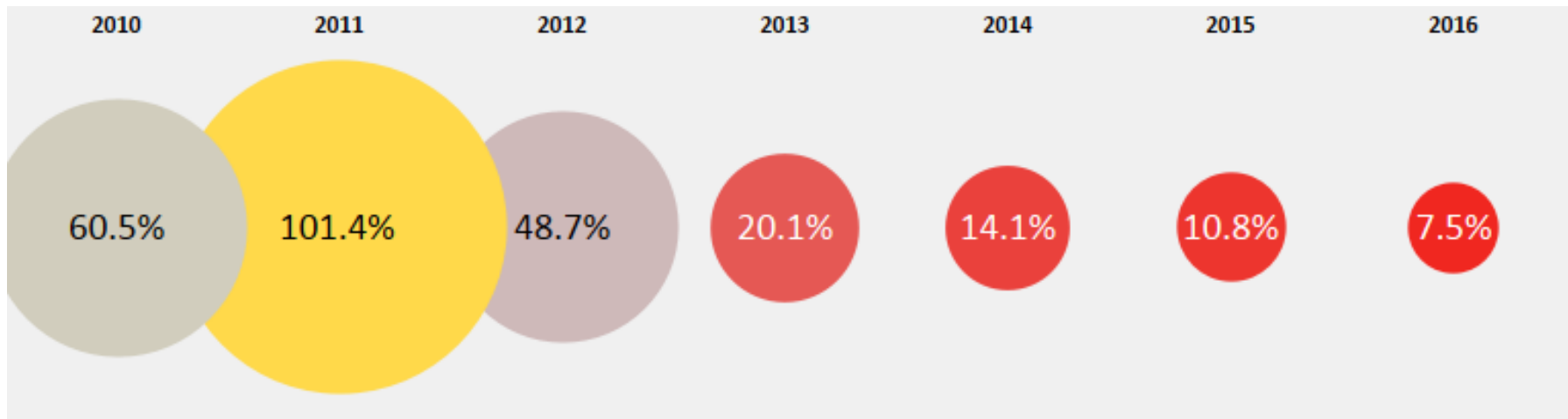
Wind power
Solar photovoltaic

~ **18%** of final renewable energy
~ **3%** of gross final energy consumption



Fastest deployment in electricity sector

Renewable electricity – **ca. 9%** annual average increase
Five Member States met and/or exceeded their 2020 planned shares



year-to-year increase renewable electricity from **solar PV**

EU Solar PV market almost **stalled in 2014-2016**

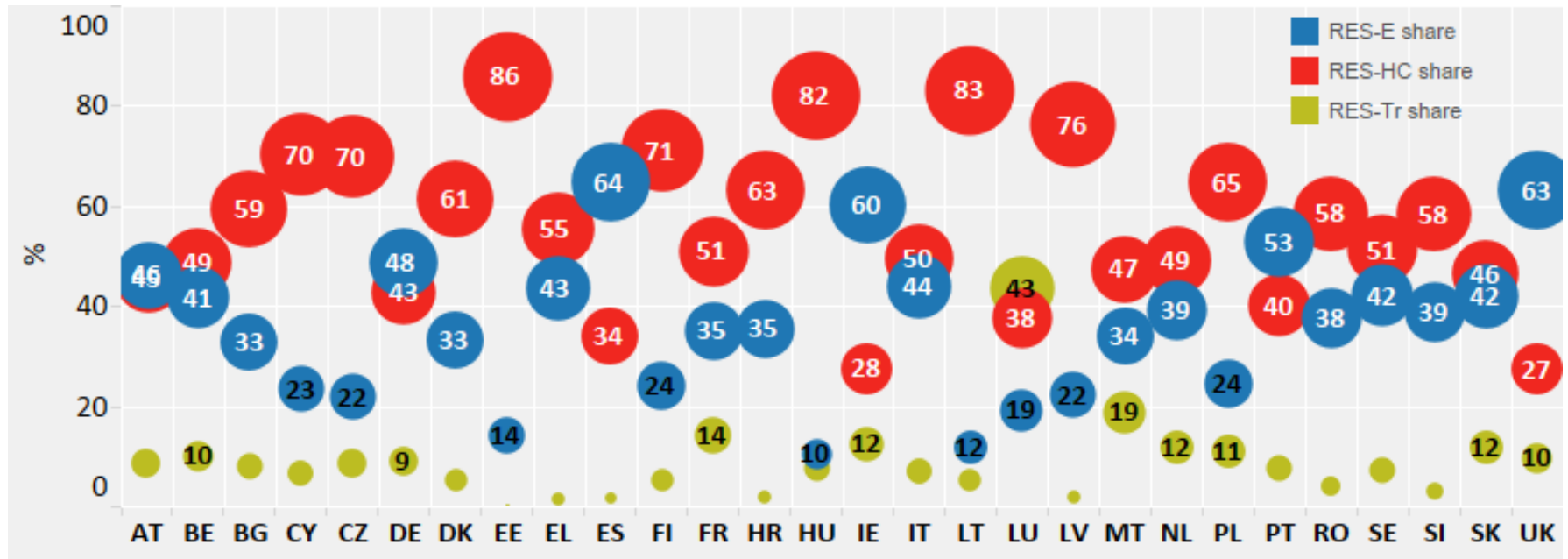
Slower progress in heating/cooling sector

Half of renewable energy is consumed for heating/cooling

Renewable heat/cold – ca. **4%** annual average increase 2005-2015

Most of Member States met and/or exceeded their 2015 planned shares

- higher use than planned of biomass
- early introduction of heat pumps



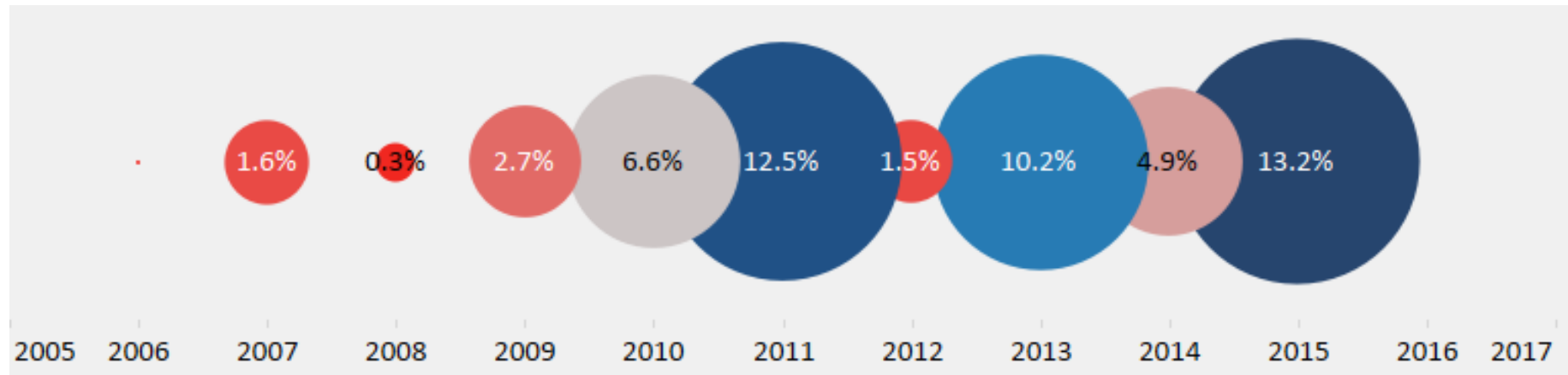
Transport sector lags behind expectations

Only two Member States (FI, SE) exceeded their 2020 targets in transport

Biofuels: no clear EU wide trend

Sustainability: large volume of biofuels cannot contribute to the target

The part of transport sector covered by renewables has become more electric (above **10%**) with regard to the fuel composition
2.1% of EU's renewable electricity is used in transport sector

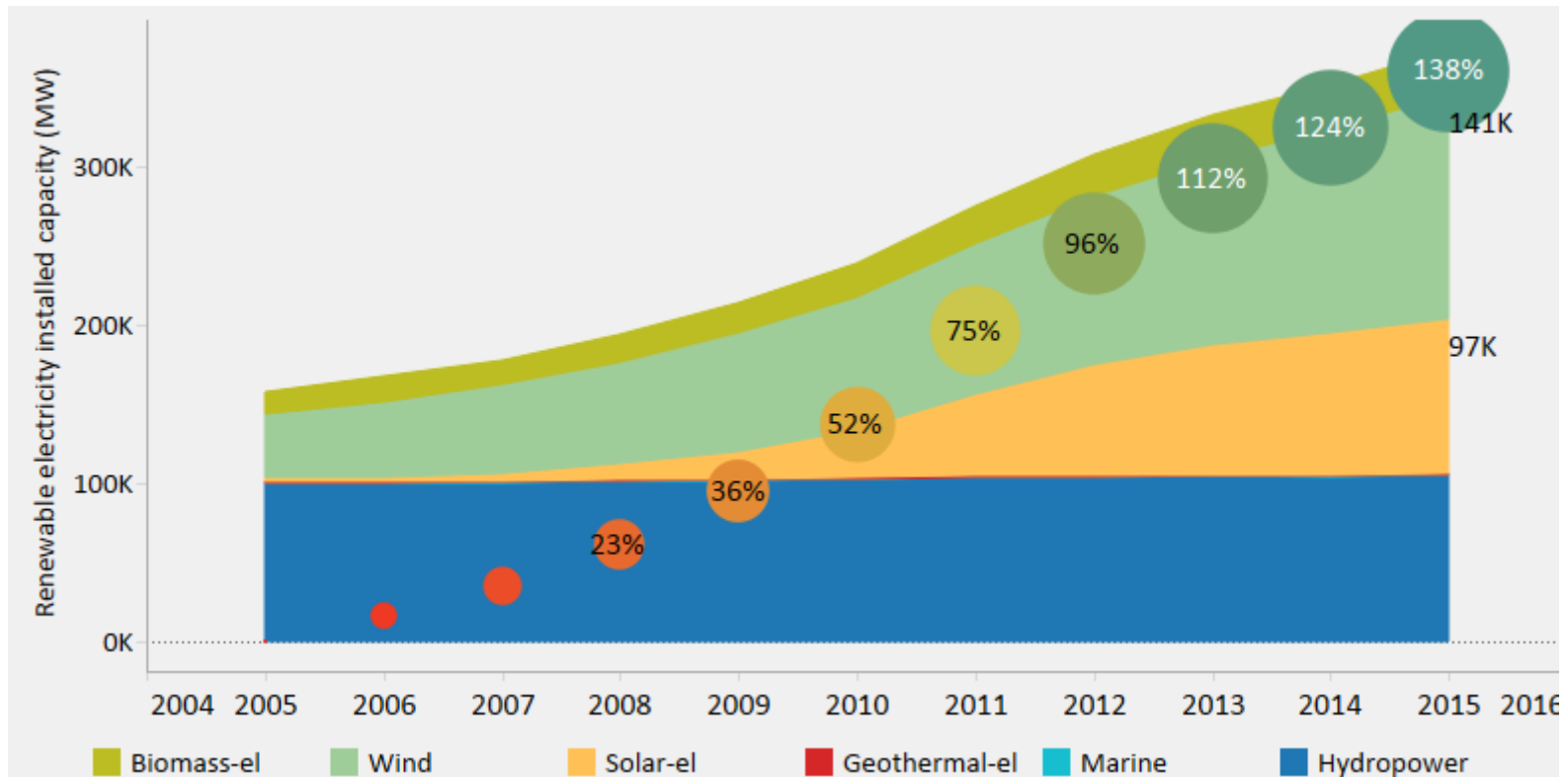


year-to-year increase renewable electricity use in transport

Renewable capacity, 2015

Final RE capacity up by 6.3% compared with 2014 - **374 GW**
38% of EU's total installed capacity

Additional RE capacity: Wind contribution **55%** PV- **35%**



Progress in countries, 2015

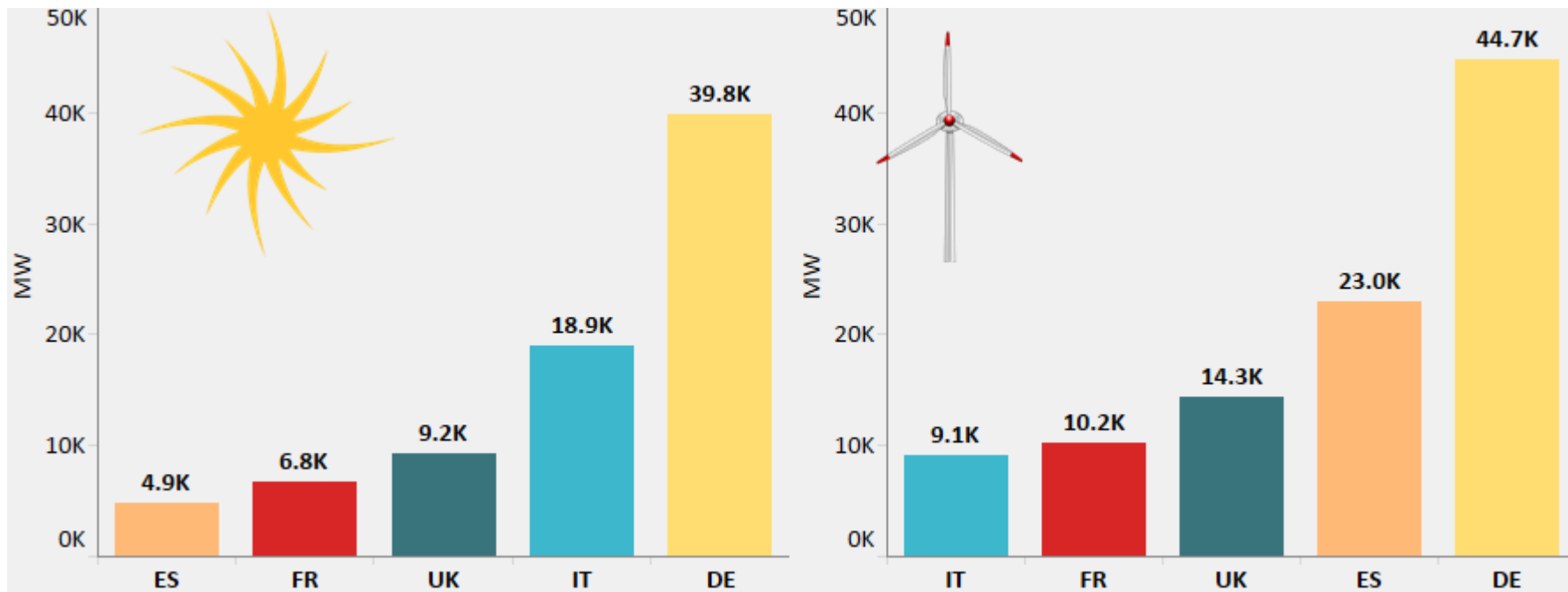
Germany the main renewables market: **>84 GW** wind & solar PV installed

Solar PV capacity in Italy: **555 times fold** over 2005-2015

UK was home of **half of newly solar PV** capacity in the EU

Spain the second country after Ireland: **wind the main source of RE**

Denmark: wind accounted for **~40%** of its gross electricity consumption

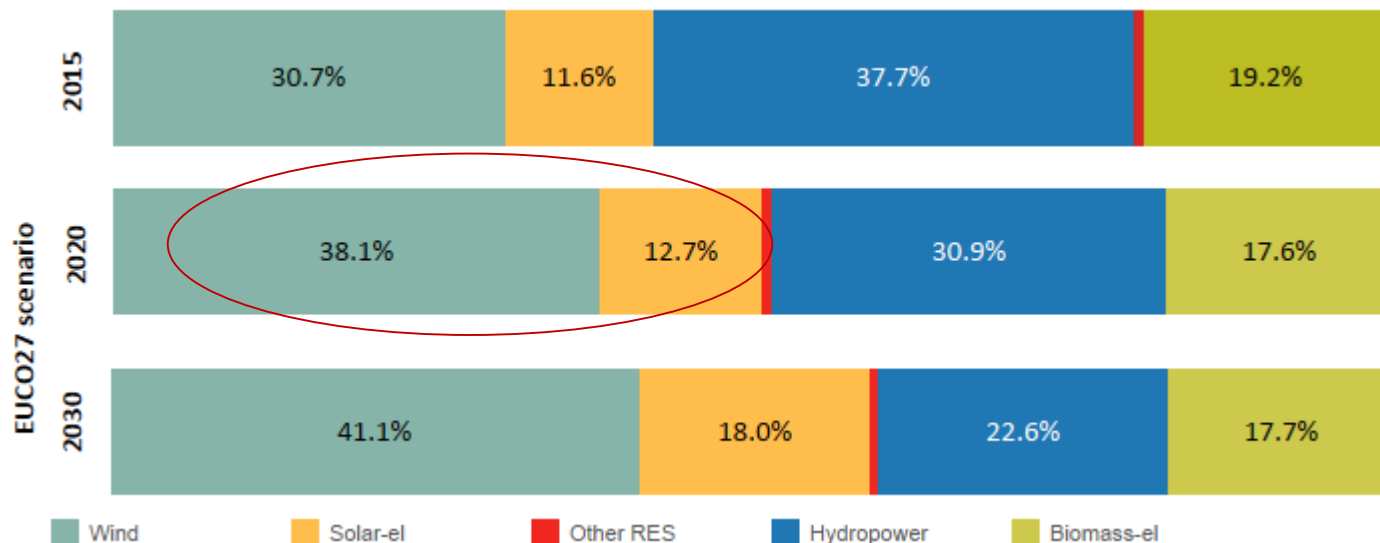


Wind and solar PV will continue to lead the progress of renewable electricity

Biomass : the **main source** of renewable energy in 2020

Wind and solar PV: ~**50%** of renewable electricity in 2020

Solar-el and wind power are projected to grow by **1.4** times and by **1.5** times respectively, over 2015 -2020



The way forward.....

The outlook for renewable energy in the European Union is clear – they **will continue to grow** as they are now well-established across most of the EU Member States.

But how quickly and with which policy support?

It is crucial that **European Union reaches its 20%** target for renewable energy deployment by 2020, and creates a firm basis for future development, **especially if a non-binding bottom-up approach is agreed for delivering the 2030 target.**



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Report visualization

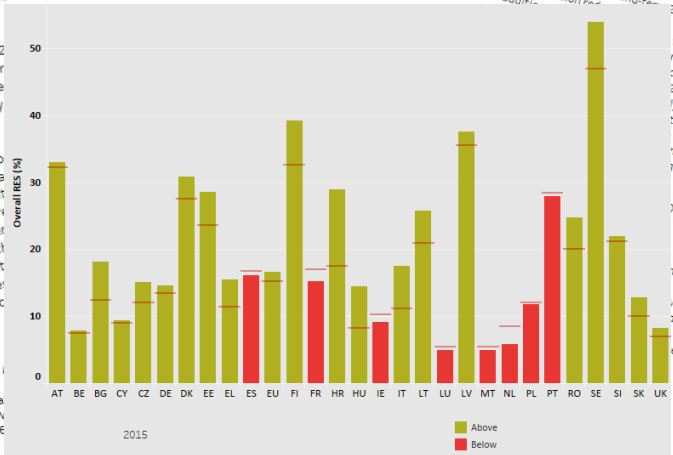
Click here to see the visualization



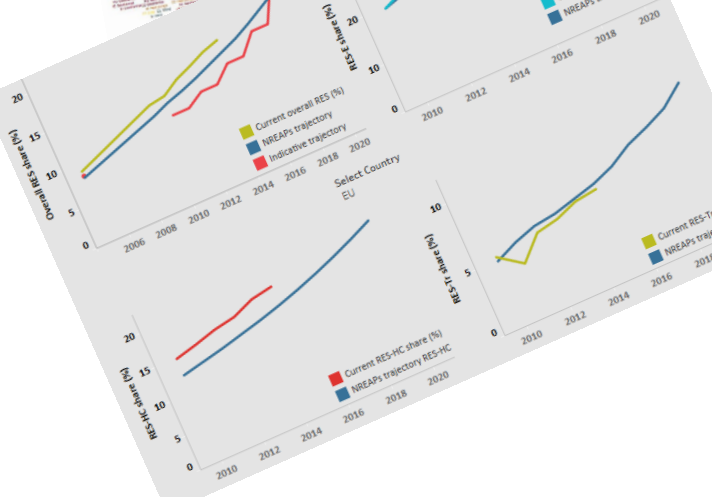
The report presents an overview of renewable energy development and progress expected by 2020, as forecasted in the EU Member States' reporting under the Renewable Energy Directive and projected in the EU Reference 2016 and EU CO27 scenarios.

The report compares the progress achieved between 2015, as reported by EU Member States in their progress reports and the Eurostat SHARES Tool, with the expectations as set out in their national renewable energy plans.

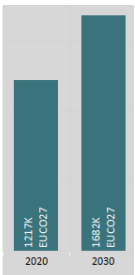
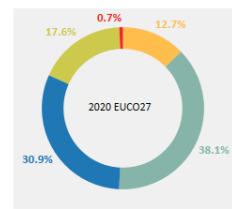
The report goes on to describe in detail each Member State's overall contribution to the development of renewable energy since 2005. The findings draw on the Member States' reporting under the Renewable Energy Directive, the progress made in the use of each renewable energy source in each country has made in the use of each renewable energy source and the contribution of renewable energy in each country to the heating/cooling, electricity and transport sectors. Findings are presented in a standardised table for comparison between different countries.



The EU Reference Scenario 2016 (REF2016) is set up to meet the binding energy and climate targets for 2020 showing that:
- Current policies and market conditions will deliver neither our 2020 targets nor our long-term 2050 objective of 80 to 95% GHG emission reduction
- In addition, the 2050 objective of 80 to 95% GHG emission reduction will deliver neither our 2020 targets nor our long-term 2050 objective of 80 to 95% GHG emission reduction



	2010	2011	2012	2013	2014	2015	200K
Hydropower	333	197	-104	-145	-429	-454	200K
Marine	-2	-2	-10	-20	-23	-32	400K
Geothermal-el	-32	-23	-52	-60	-68	-74	800K
Geothermal-th	-125	-212	-305	-402	-563	-674	1200K
Solar-el	217	1333	2690	3309	3740	4032	1600K
Solar-th	11	-56	-186	-451	-664	-986	2000K
Wind	-956	-1404	-1652	-1847	-2273	-2004	2400K
Biomass-el	813	629	1016	719	634	709	2800K
Biomass-th	15575	8648	11935	12669	7574	9381	3200K
Heat pumps	1484	1625	1484	1406	1578	1314	4000K
Biodiesel	-358	-5313	-3406	-3730	-3225	-3819	4800K
Bioethanol	-47	-1744	-1542	-1692	-2105	-2465	5800K
Other biofuels	-135	-140	-124	-41	-57	-127	6800K
Renewable electricity-tr	-166	-152	-271	-257	-319	-278	7800K



	2010	2011	2012	2013	2014	2015
Geothermal	-157	-234	-357	-461	-632	-748
Solar	228	1277	2504	2858	3076	3046
Biomass	16388	9278	12951	13388	8208	10090
Biofuels	-540	-7197	-5072	-5462	-5386	-6411

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