



Accelerating renewable energy development: an opportunity for Europe

Roundtable “*Modern Energy as an Economic Opportunity for the Czech Republic*”

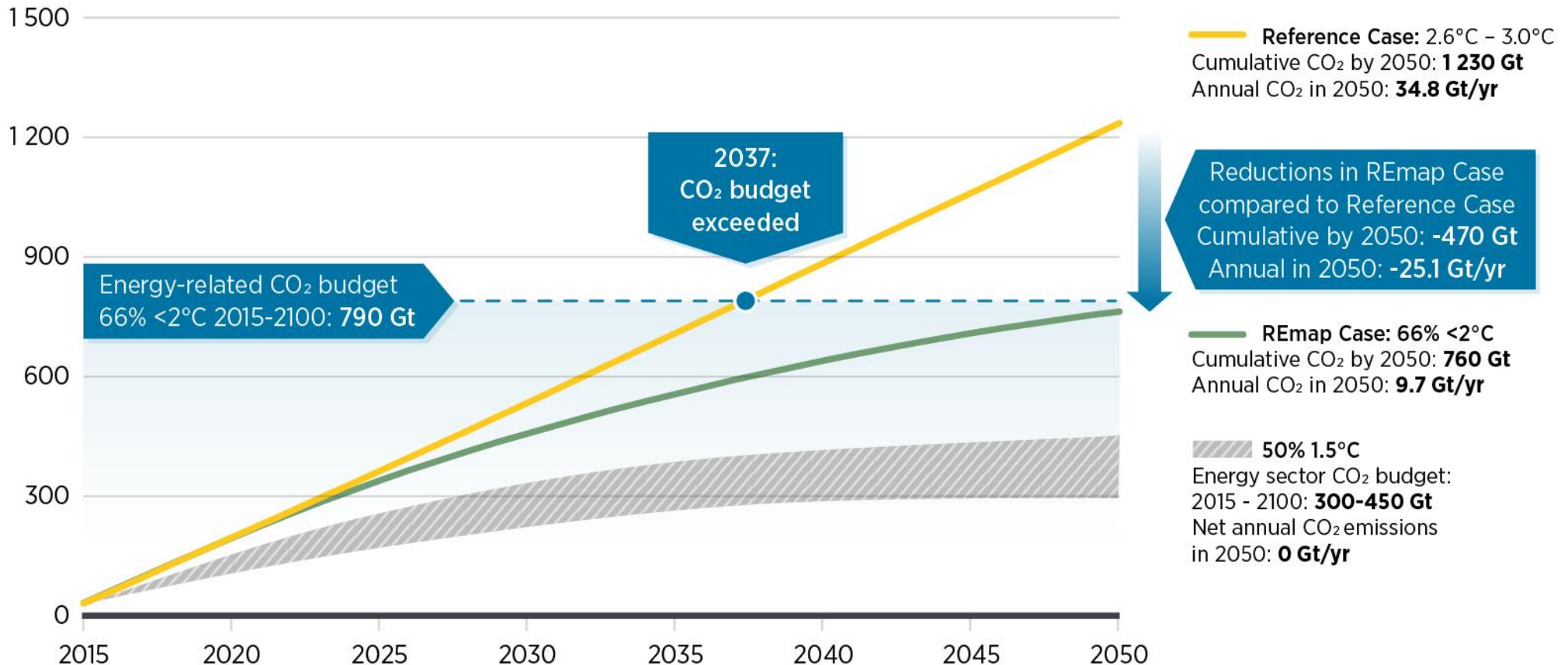
Prague, November 28, 2018

Luis Janeiro – Programme Officer Renewable Energy Roadmaps



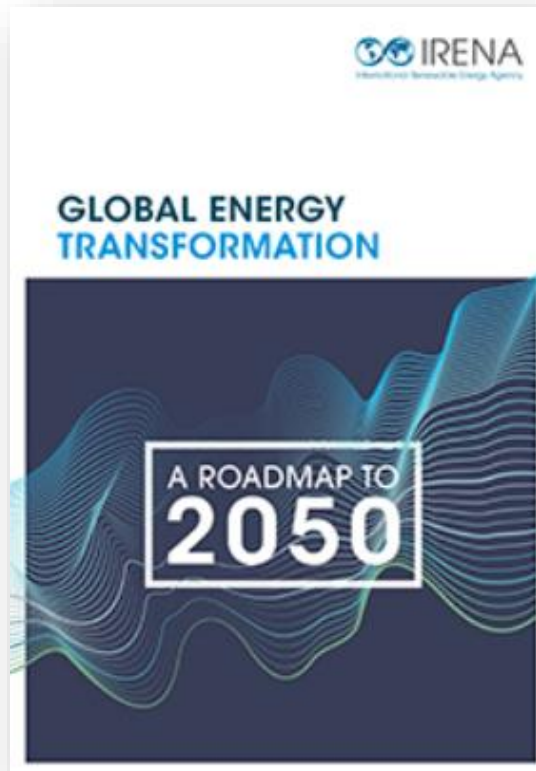
The global climate change challenge

Cumulative energy-related carbon emissions (Gt CO₂)

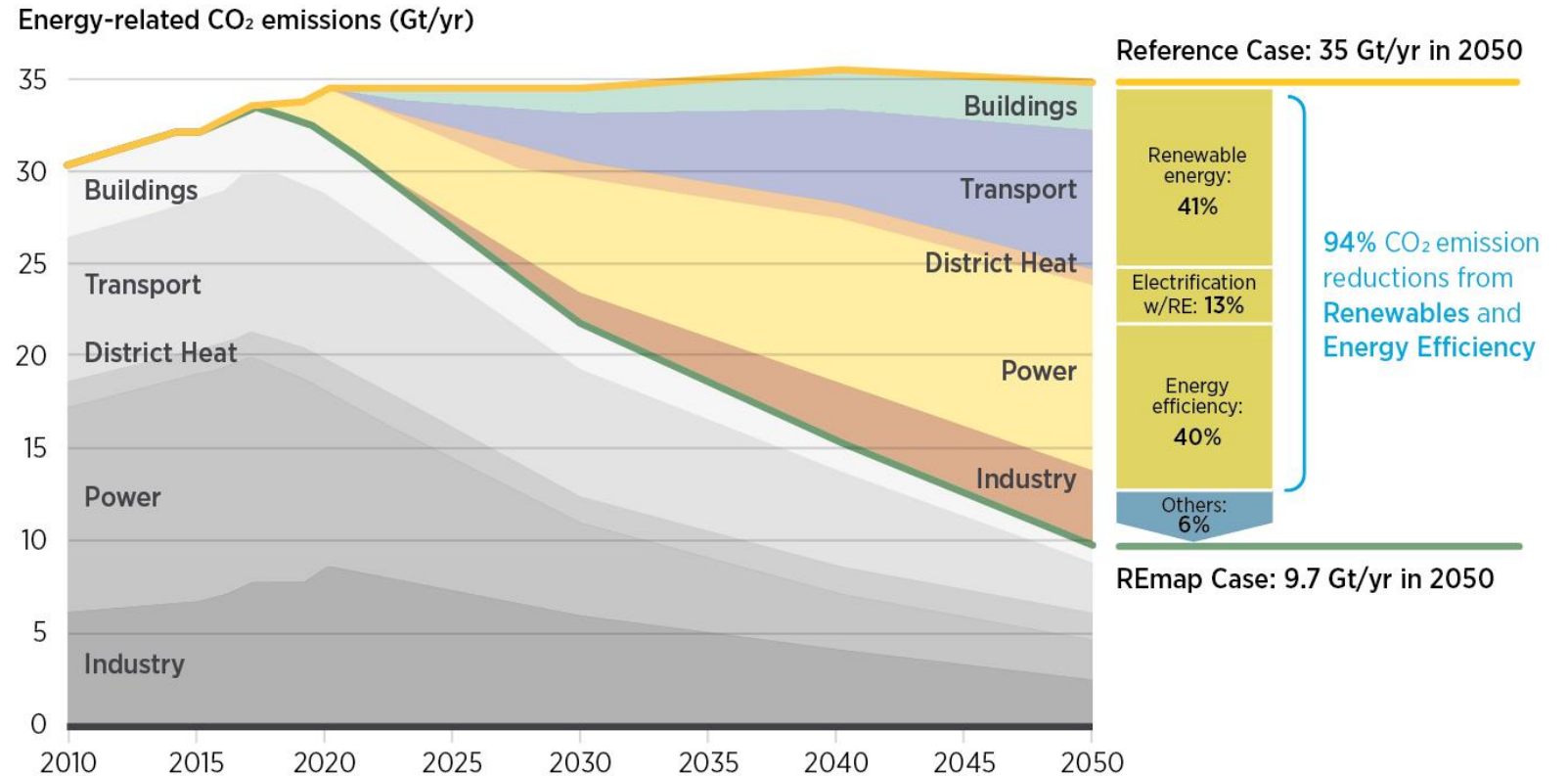


Based on current policies (set out in the Reference Case), in under 20 years, cumulative energy-related emissions will exceed the carbon budget required to hold temperature increases below 2°C. Emission reductions of 470 Gt will be needed by 2050 to reduce warming to 2°C

Renewable energy and energy efficiency can provide over 90% of the reduction in energy-related CO₂



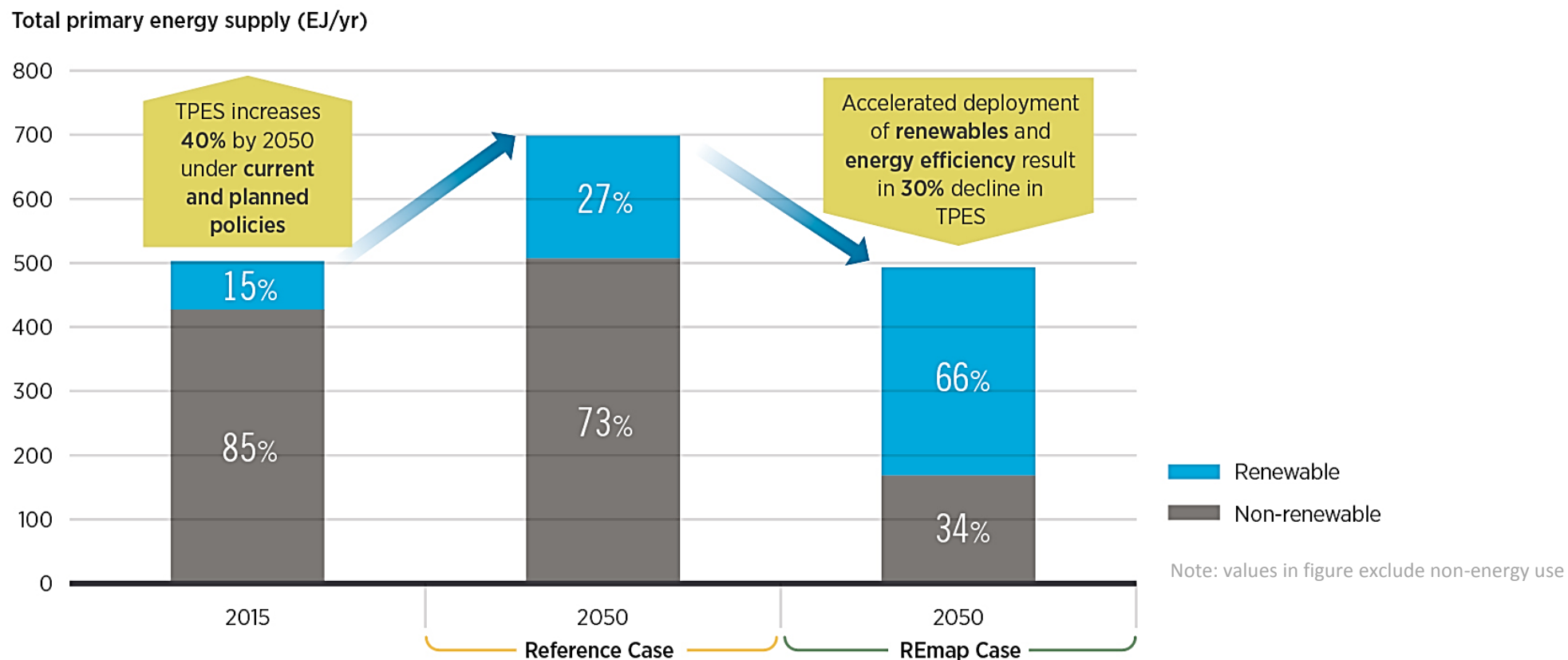
Annual energy-related CO₂ emissions and reductions, 2015-2050



Annual energy-related emissions are expected to remain flat (under current policies in the Reference Case) but must be reduced by over 70% to bring temperature rise to below the 2°C goal. Renewable energy and energy efficiency measures provide over 90% of the reduction required

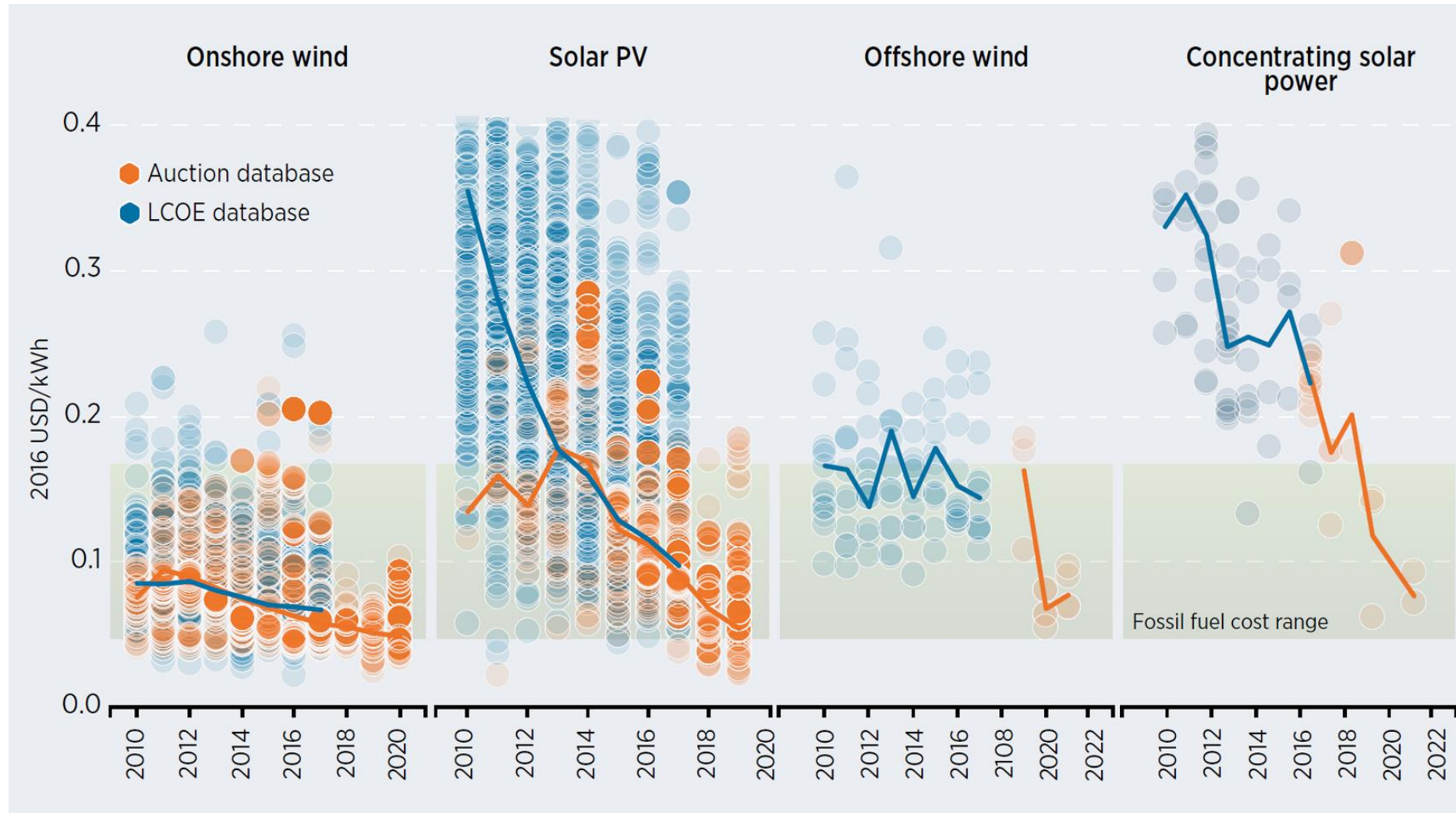
The global share of renewable energy in energy supply would need to increase to two-thirds

TPES and the share of renewable and non-renewable energy under the Reference and REmap cases



Under current and planned policies (the Reference Case) TPES is expected to increase almost 40% by 2050. To achieve a pathway to energy transition (the REmap Case), energy efficiency would need to reduce TPES slightly below 2015 levels, and renewable energy would need to provide two-thirds of the energy supply.

Renewables are becoming competitive in a broad set of conditions. Cost improvements expected to continue...




IRENA costing database of 15,000 large scale RE power projects and 1.5 million rooftop PV systems

Covering half of all existing and planned RE capacity

Solar and wind power are at the core of the Global Energy Transformation


Wind and PV electricity share in generation mix 2015 and 2050



22%
Solar PV
(2050)



3%
Solar PV
(today)

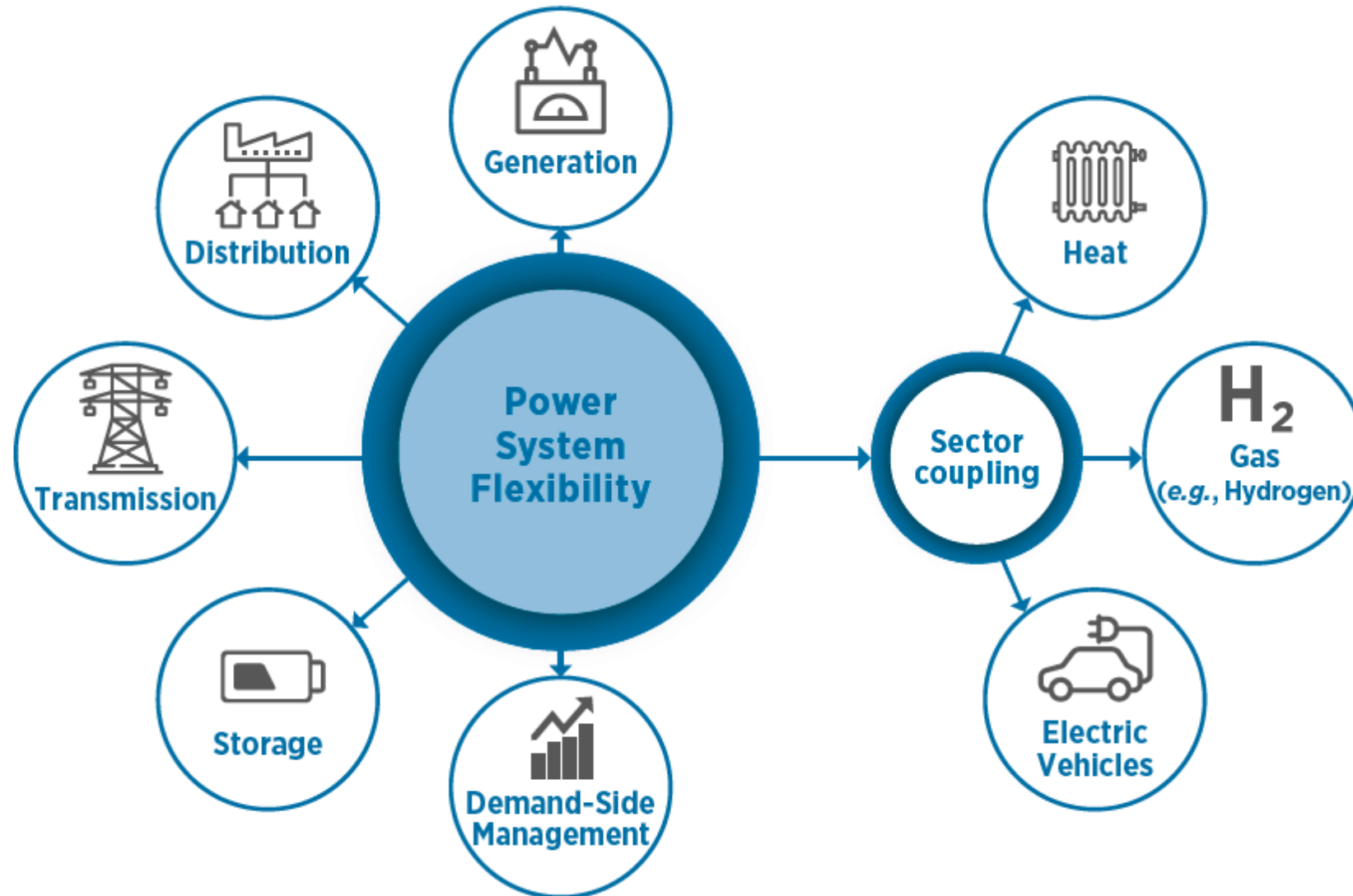


36%
Wind
(2050)



7%
Wind
(today)

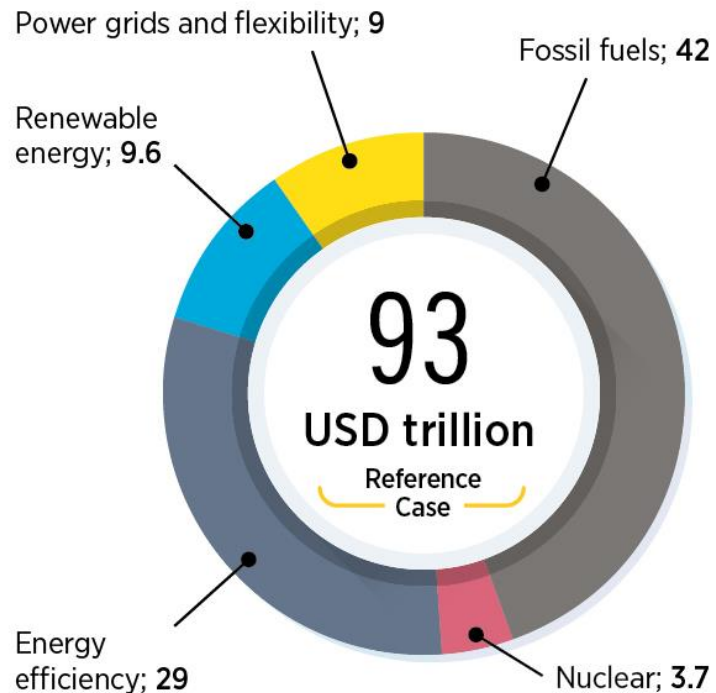
A holistic view of the energy system is needed



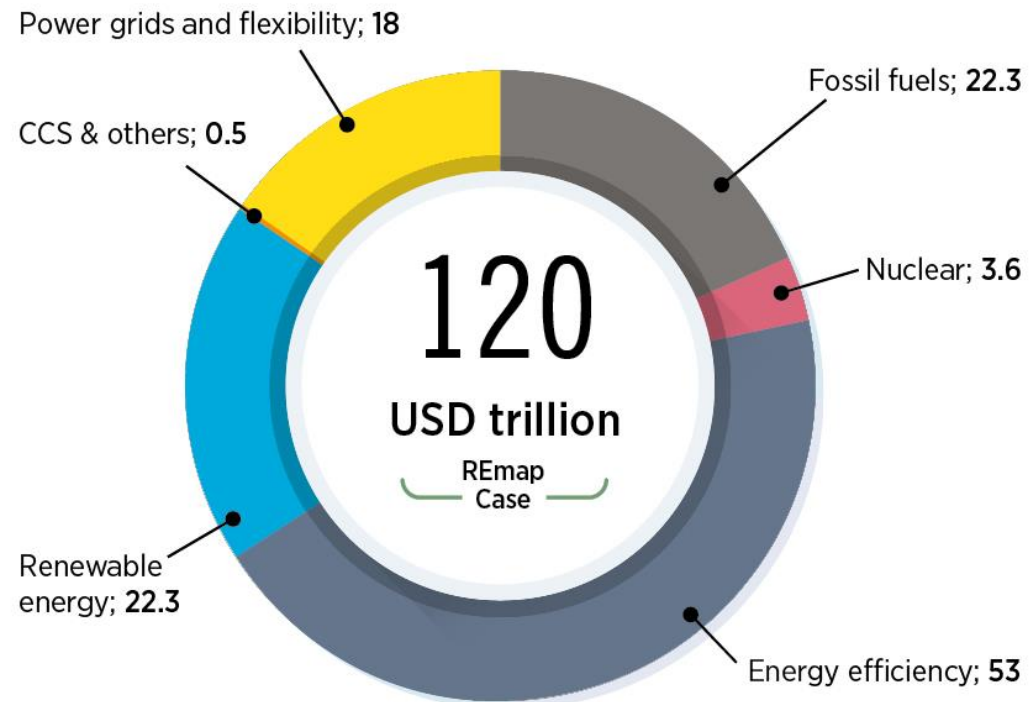
Investment will need to shift to renewable energy and energy efficiency

Cumulative investment - Reference and REmap cases, 2015-2050

Reference Case energy sector investments between 2015-50 (USD trillion)



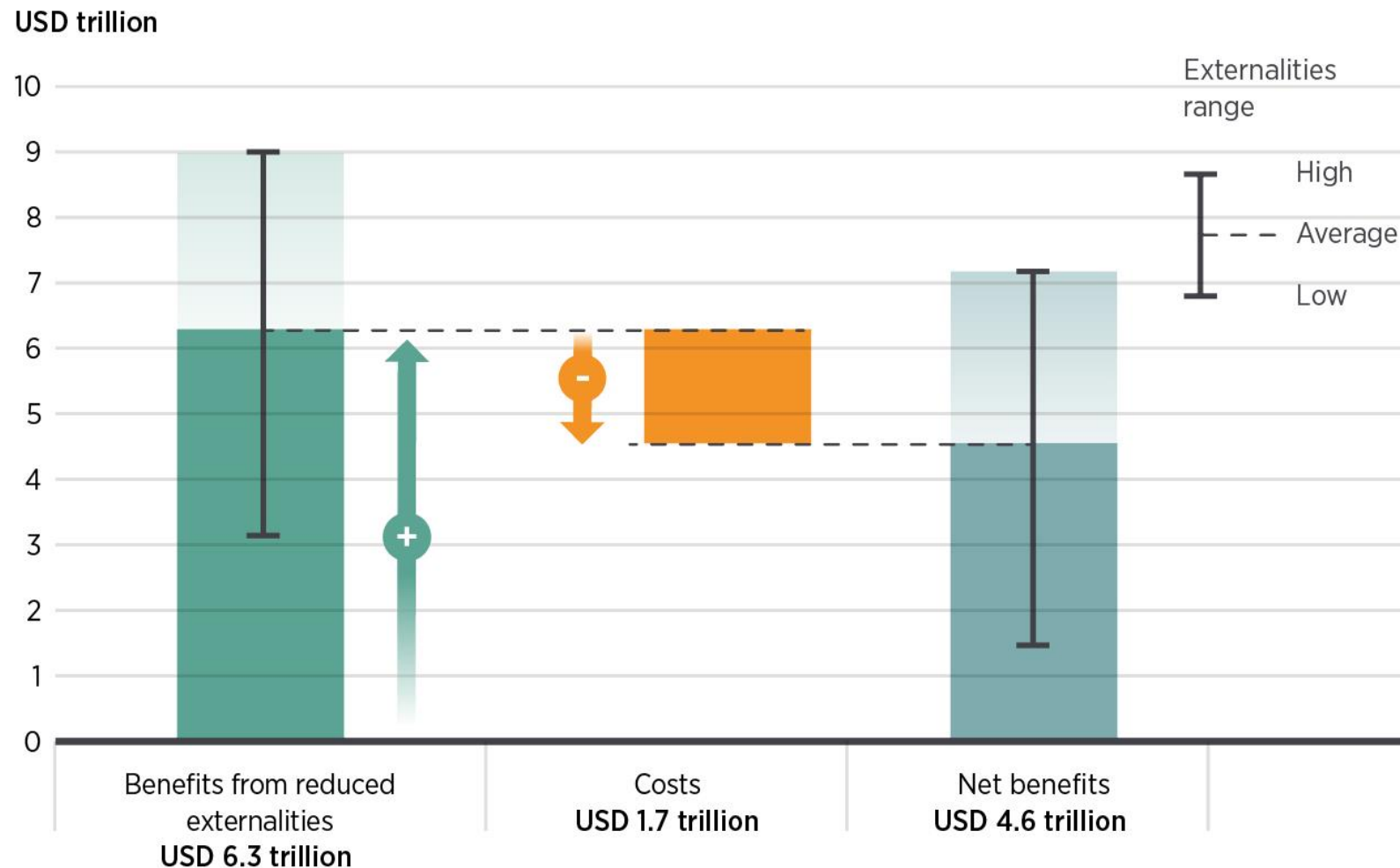
REmap Case energy sector investments between 2015-50 (USD trillion)



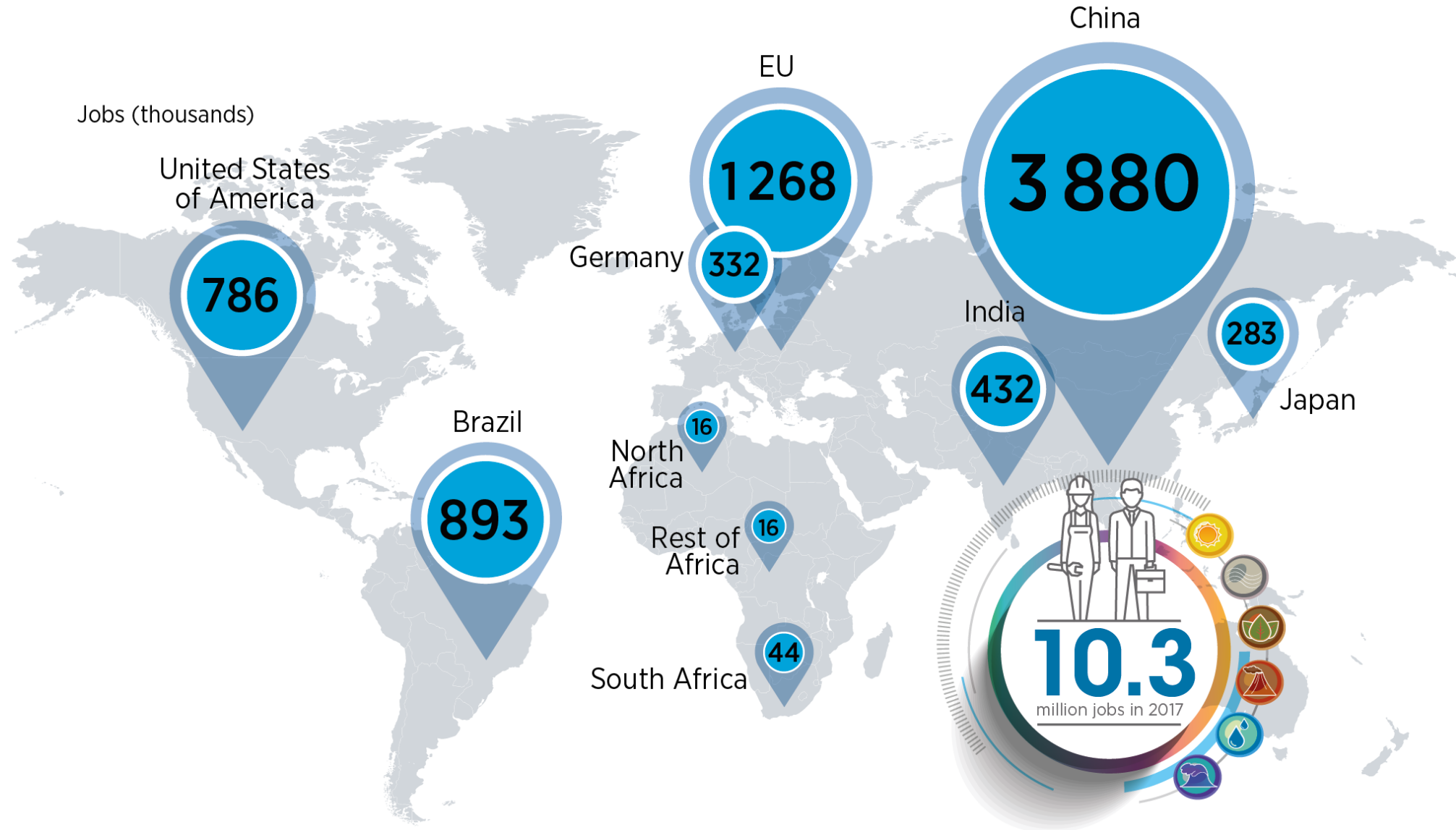
Under the REmap Case, cumulative investment of USD 120 trillion must be made between 2015 and 2050 in low-carbon technologies, averaging around 2% of the period average global GDP per year. This is USD 27 trillion more than the Reference Case.

Reduced negative externalities far outweigh the costs needed to achieve a global energy transformation

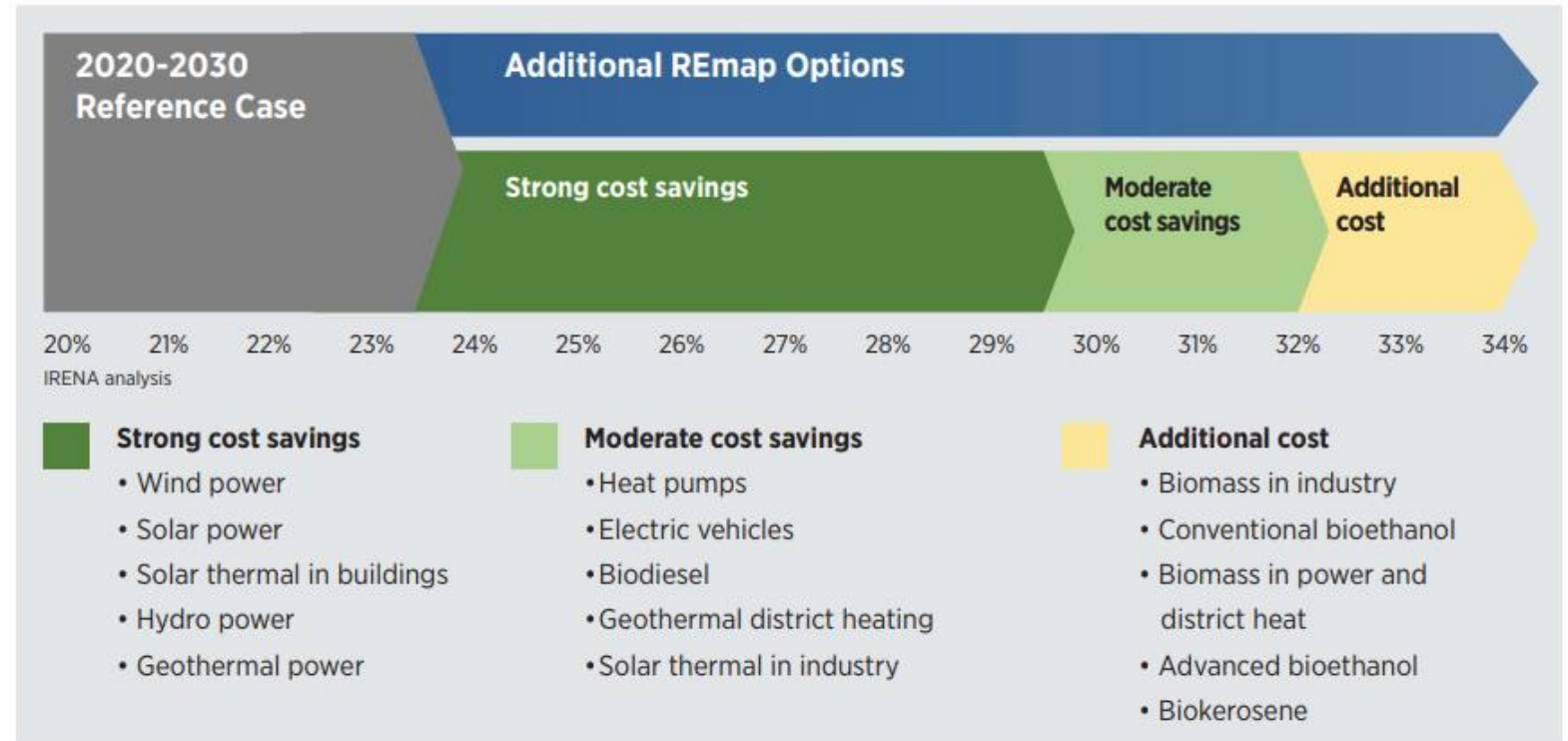
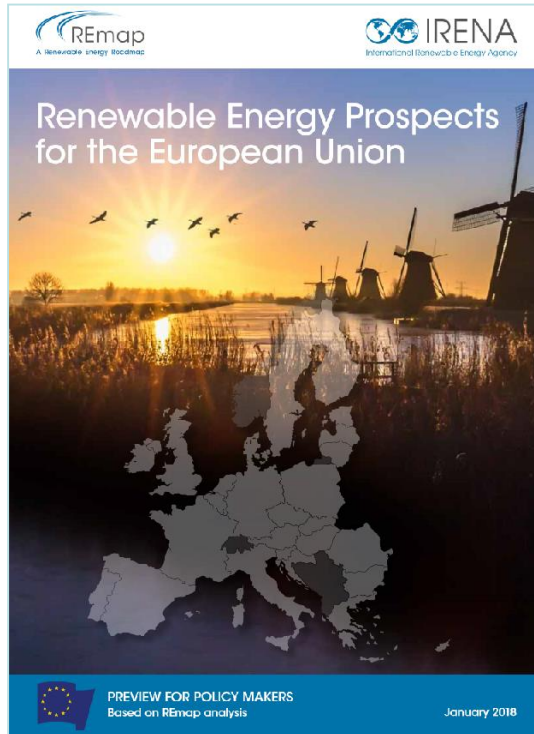
Annual costs of the energy transition set against reduced externalities
(air pollution and CO₂ damages) - REmap Case compared to the Reference Case in 2050



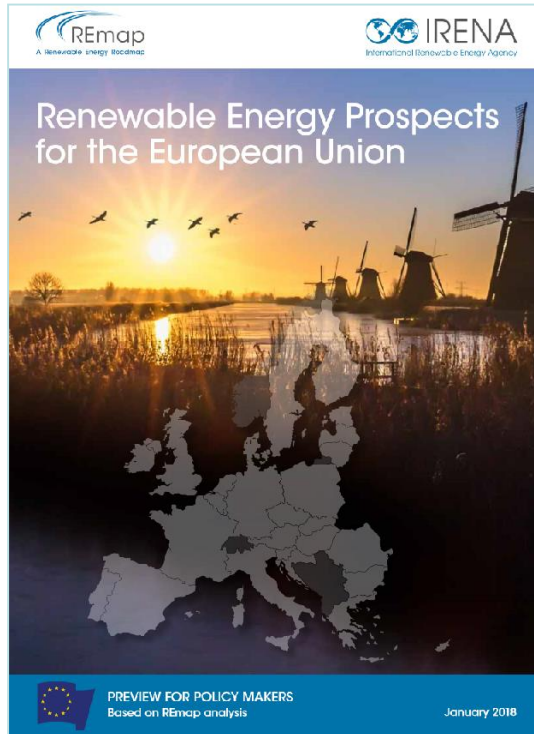
Renewables added half a million jobs more in 2017, to reach more than 10 million



The European Union can double its current share of renewables to reach 34% by 2030



Accelerating renewables in the European Union makes economic sense



- **EUR 21 billion/year savings** in terms of energy costs by 2030.
- **Savings total EUR 44-113 billion per year by 2030**, when reduced externalities from CO2 emissions and improved air quality are considered.



- Very large potential for **efficient electrification with heat pumps** in buildings and industry.
- **Solar thermal** can be scaled up substantially.
- Significant **additional biomass heat potential**.



- **Large potential for scale up of:**
 - **Solar PV** (both distributed and utility scale)
 - **Wind power**
- Significant potential for **biomass in power**.



- **Electrification of light duty vehicles and buses** is quickly becoming economically attractive.
- **Biofuels**, both conventional and advanced, for applications hard to electrify.

