



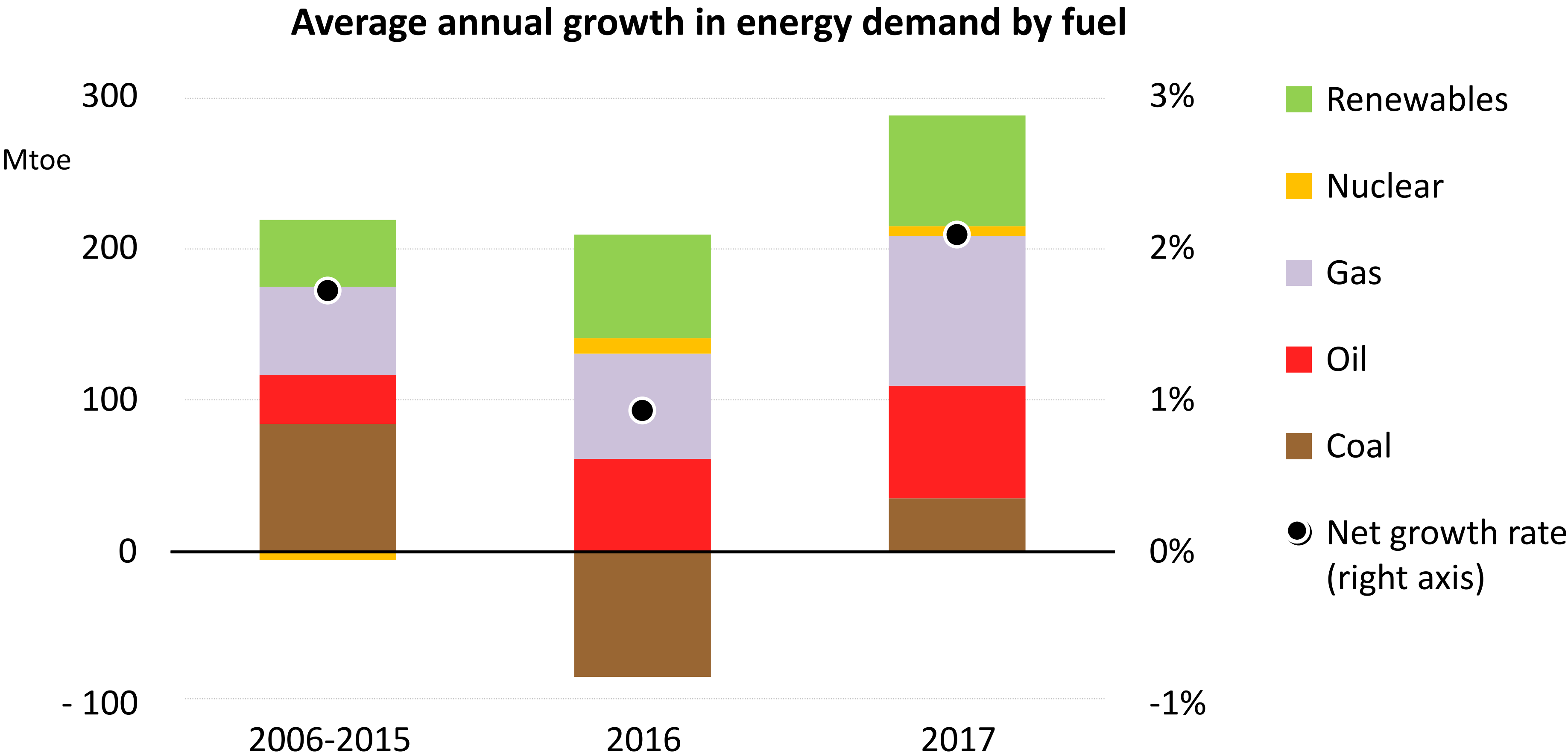
## **G20 Energy Transitions**

Key messages to the G20 Energy Ministerial

IEA Head of Energy Supply Outlook Division (ESO), Mr Tim Gould

Bariloche – 15 June 2018

# Energy use picked up in 2017



# How are clean energy technologies progressing?

## Power

- Renewable power
- Solar PV
- Onshore wind
- Offshore wind
- Hydropower
- Bioenergy
- Geothermal
- Concentrating solar power
- Ocean
- Nuclear power
- Natural gas-fired power
- Coal-fired power
- CCS in power

## Industry

- Cement
- Chemicals
- Steel
- Aluminum
- Pulp and paper
- CCS in industry

## Transport

- Electric vehicles
- International shipping
- Fuel economy
- Trucks
- Transport biofuels
- Aviation
- Rail

## Buildings

- Building codes
- Heating
- Cooling
- Lighting
- Appliances & equipment
- Data centres and networks

## Energy Integration

- Energy storage
- Smart grids
- Demand response
- Digitalization
- Hydrogen
- Renewable heat



*Multiple technologies are needed to move energy transitions forward, but relatively few of them are on track*



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DEVELOPMENT

# Energy underpins the Sustainable Development Agenda

## SUSTAINABLE DEVELOPMENT GOALS



**SDG 3.9:** Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination



**SDG 7:** Ensure access to affordable, reliable, sustainable and modern energy for all



**SDG 13:** Take urgent action to combat climate change and its impacts

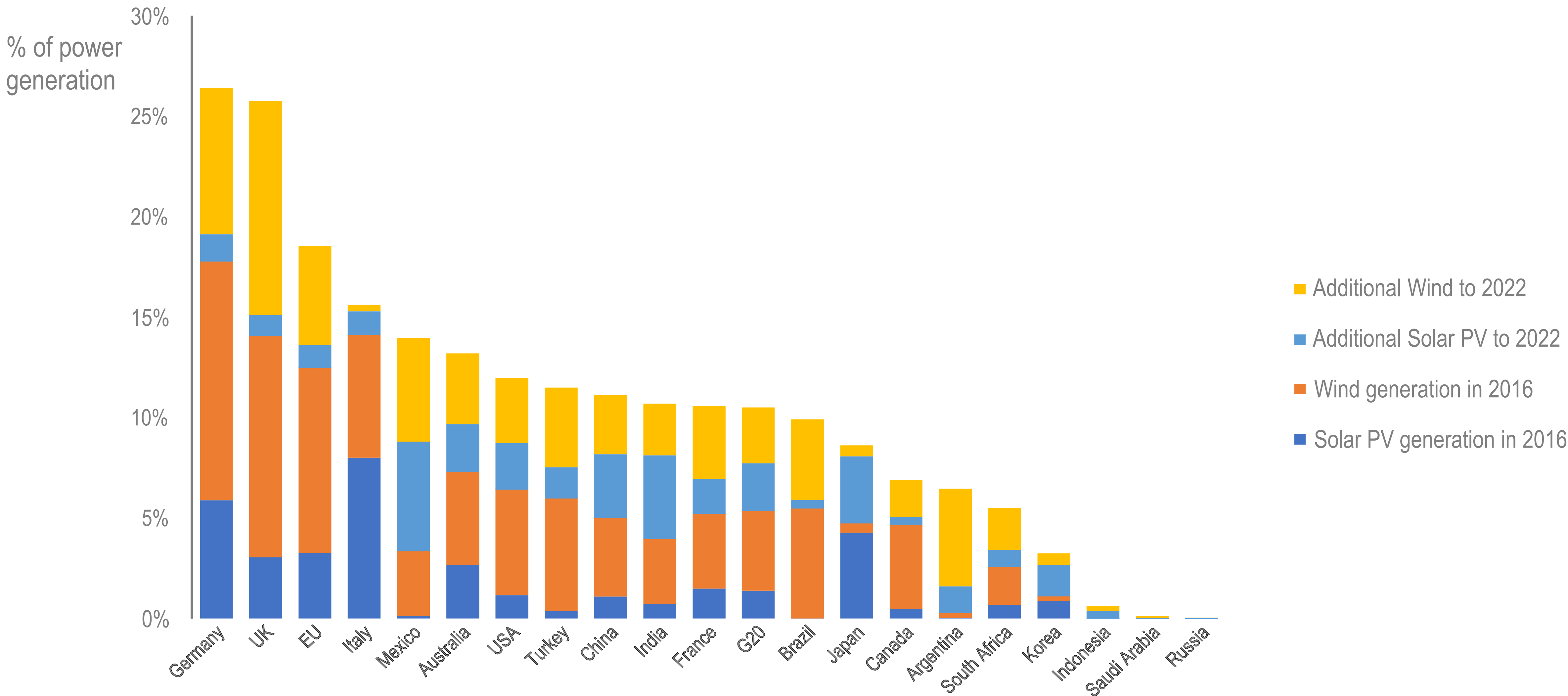


*Policymakers need to target multiple objectives, with overlaps & potential trade-offs, while also ensuring secure & reliable supply*



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# Wind & solar-rich power systems need greater flexibility





# Key messages to the G20 Energy Ministerial 2018

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## *Transitions towards cleaner, more flexible and transparent energy systems*

- There are diverse transitions reflecting different resource endowments and priorities
- Improving air quality & ensuring universal access to modern energy are essential and fully-compatible components of deep energy transitions
- There is no single clean energy technology or cleaner fuel that has all the answers: multiple solutions are required..
- .. but energy efficiency & robust energy data are crucial building blocks in all cases
- Regional cooperation can play a valuable role in supporting more flexible and secure energy systems.
- IEA stands ready to help G20 countries to navigate their energy transitions.