



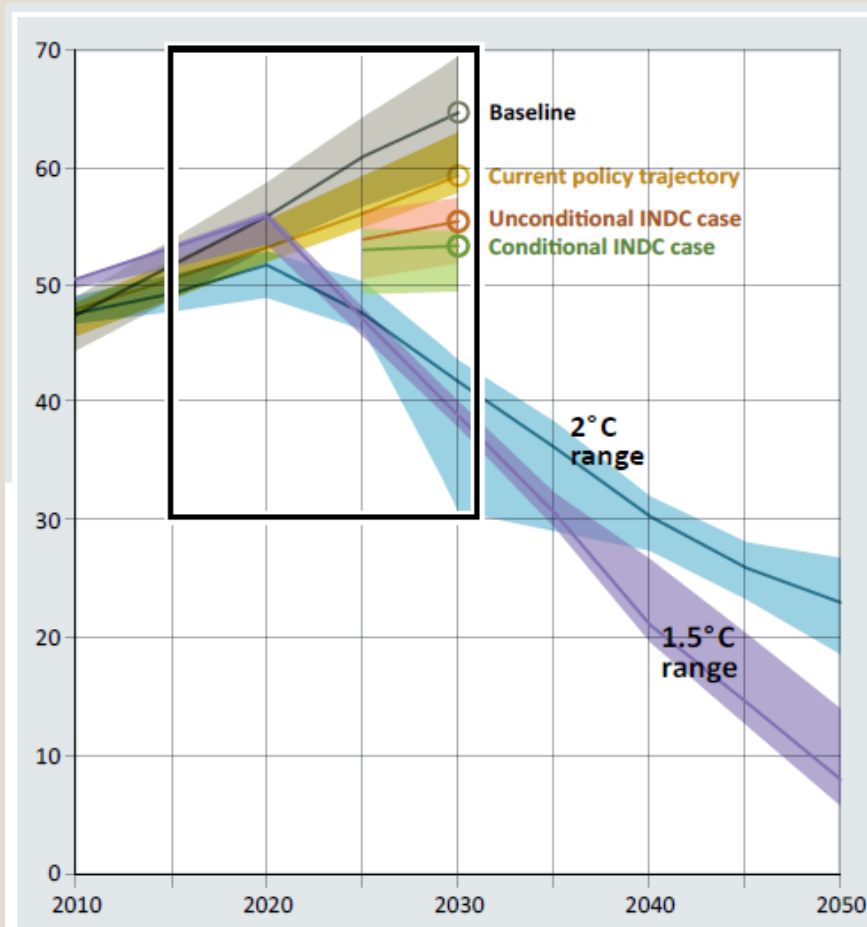
# RECENT TRENDS IN RENEWABLE ENERGY AND CARBON MARKETS

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*Seminar on Renewable Energy Development in Mongolia,  
October 2018*

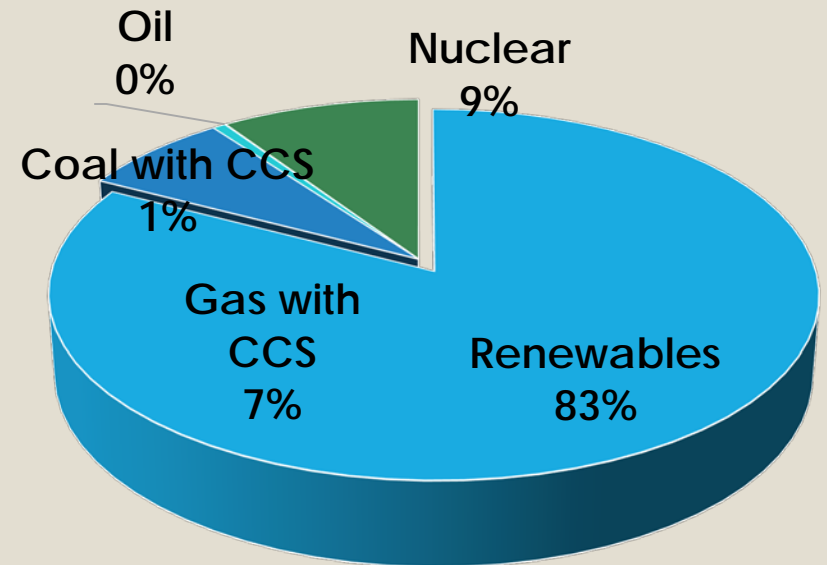


# The future is powered by renewable energies



Source: UNEP Emissions Gap Report 2017

## Electricity generation in 1.5°C pathways

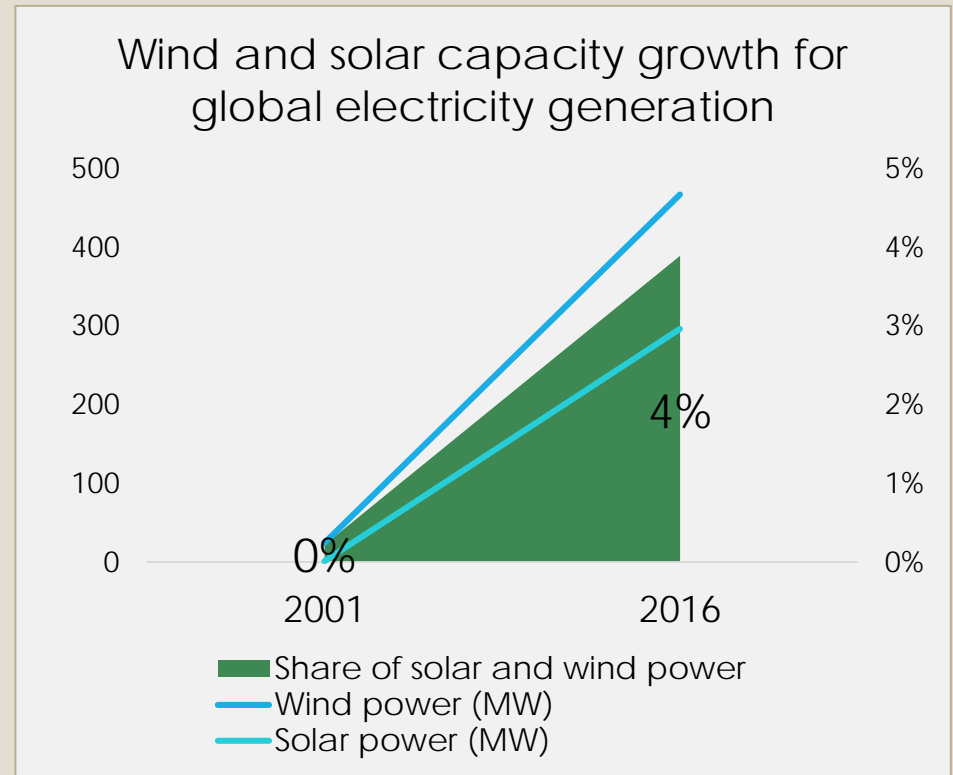


Source: data from IPCC Special Report 1.5 (2018)

# The good news...

## Energy transformation is underway

- Wind energy has grown approx. 20x within 15 years.
- Solar energy has grown approx. 300x within 15 years.
- Contribution from wind and solar energies to global electricity generation has increased 17x.

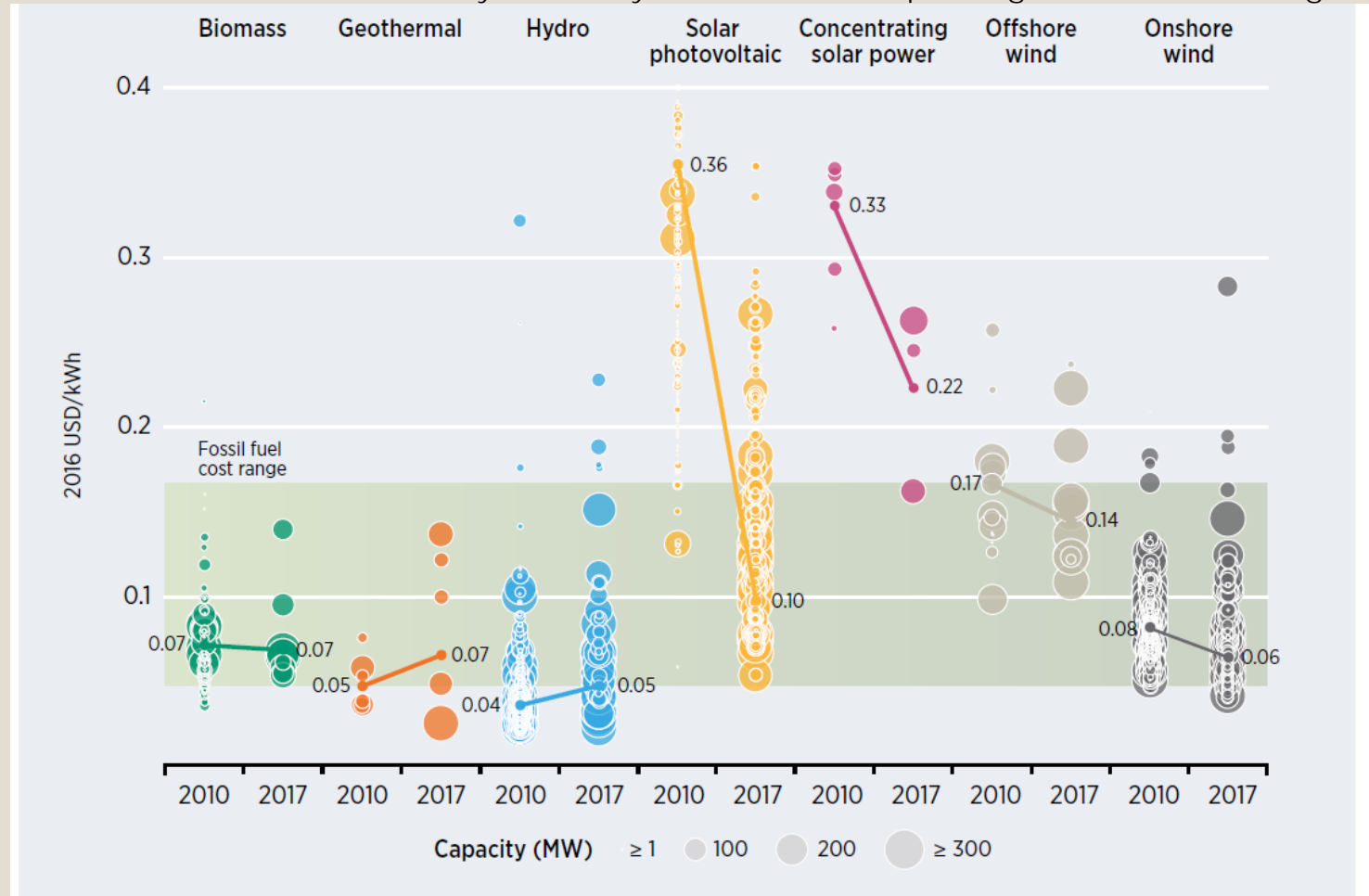


...but it needs to be faster and diversified

# Because economic barriers are disappearing...

Electricity from renewables will soon be consistently cheaper than from fossil fuels

Global levelised cost of electricity from utility-scale renewable power generation technologies



Source: IRENA Renewable Cost Database.

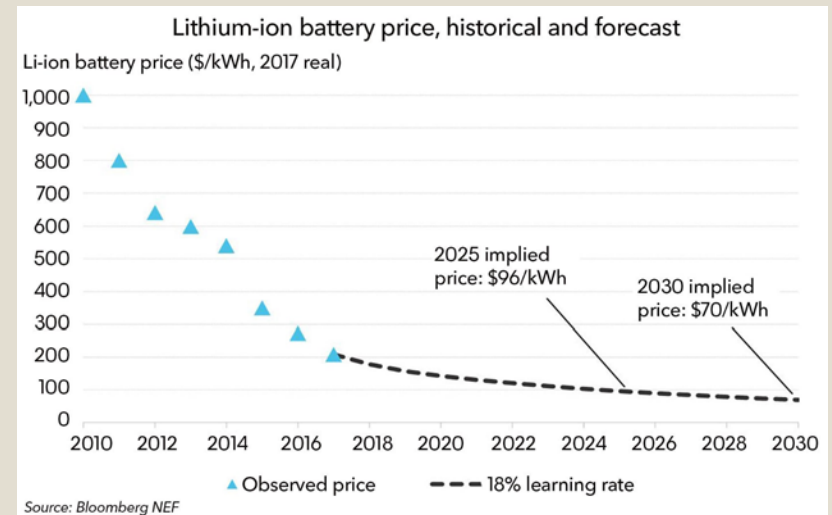
# Technology R&D continue... (1/2)

Solar power with storage

Colored solar PV glass on walls



Battery costs are declining – solar and wind power will benefit



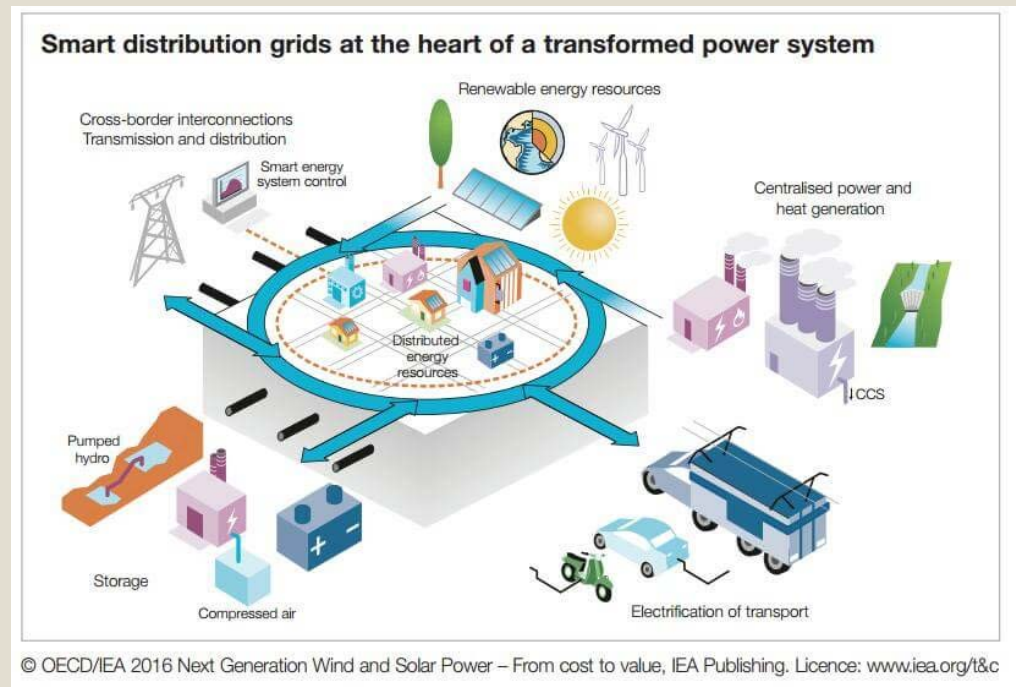
As well as energy systems innovation...

# Technology R&D continue... (2/2)

## Distributed power generation

- Smart micro grids with innovative technology, on- and off- national grid
- Reduces burden of central grid and helps scheduling of entire grid
- Solar power “prosumers” and energy storage will play a key part: generation from residential buildings, commercial buildings, etc.

## Brooklyn Microgrid project



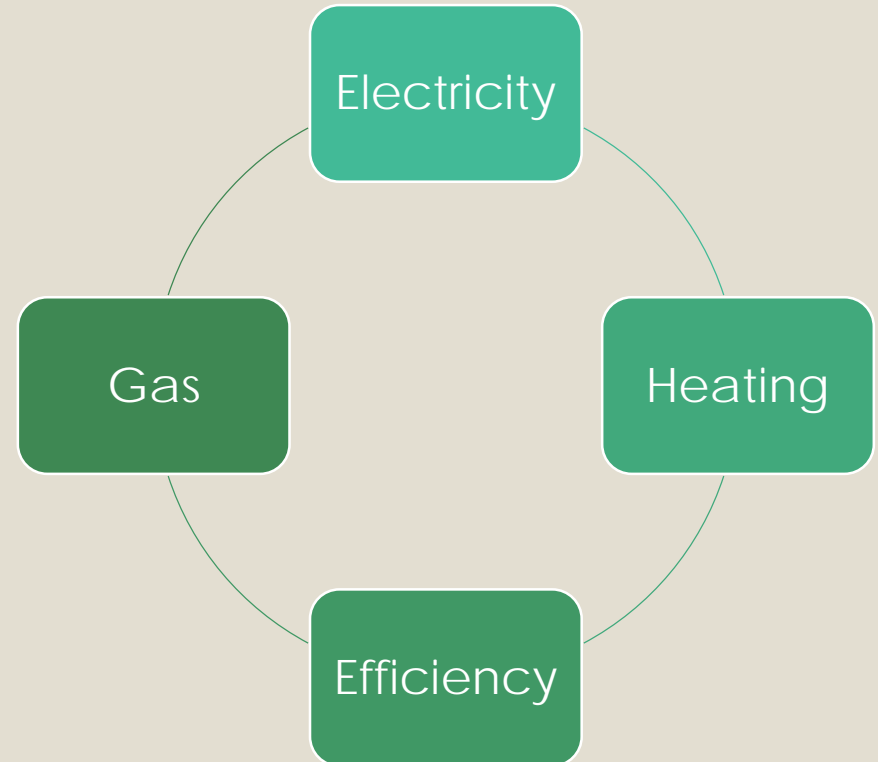
# Decarbonising heating system



- Compared with for electricity, technologies are less disseminated
- Clean electricity will only be efficient if combined with optimal energy conservation
- R&D and finance need incentives for new technology and pilot application. Policy incentives and international cooperation can help.

# Integrated development of electricity and heating increases cost-efficiency

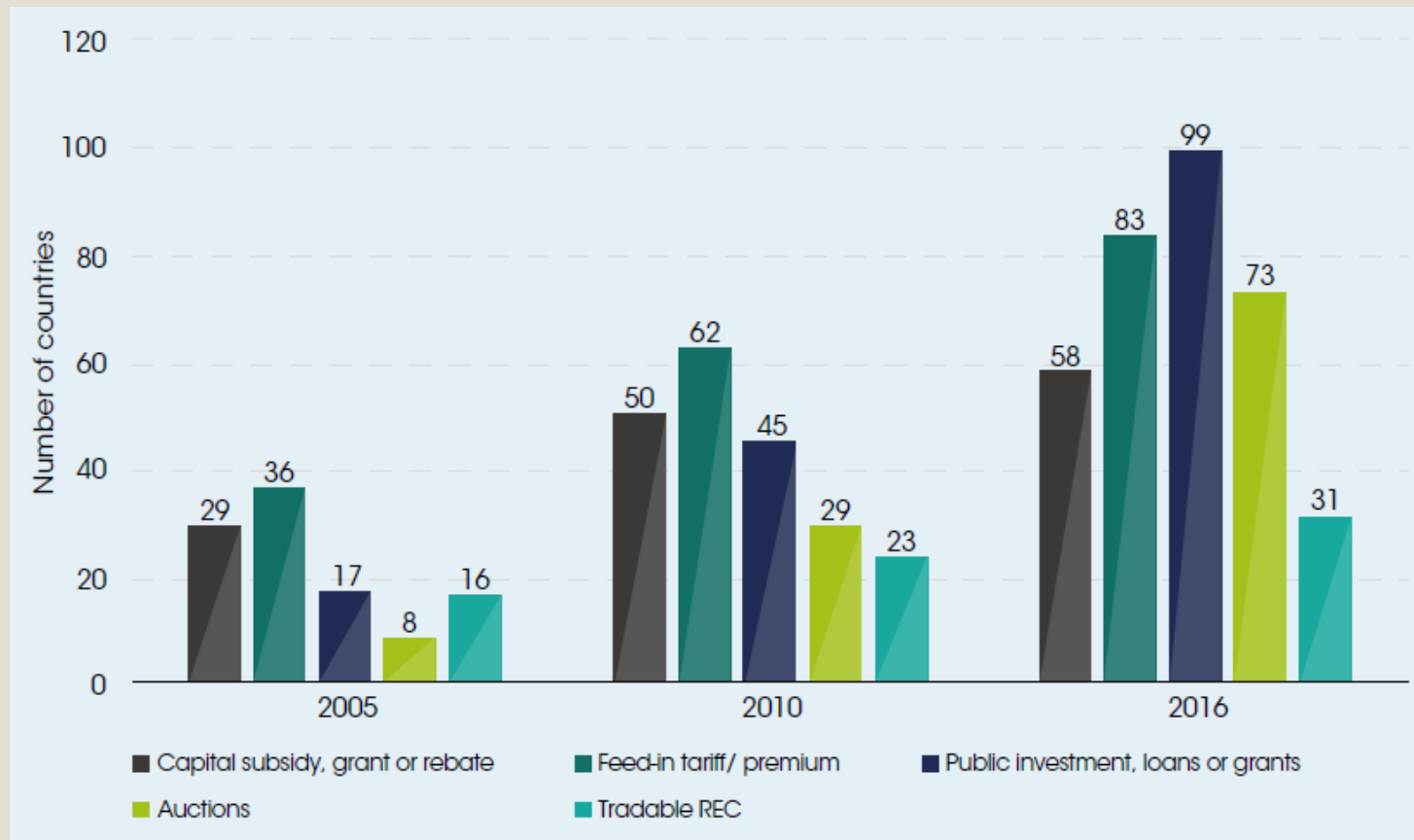
- Gas power plants equipped with Carbon Capture and Storage
- Clean electricity efficient combined with energy conservation
  - Building insulation, grid efficiency, efficiency standard for equipment
- Diversification of renewable electricity
  - Power with battery storage, distributed grid





# Policy incentives: certainty and long-term strategies are important for RE development

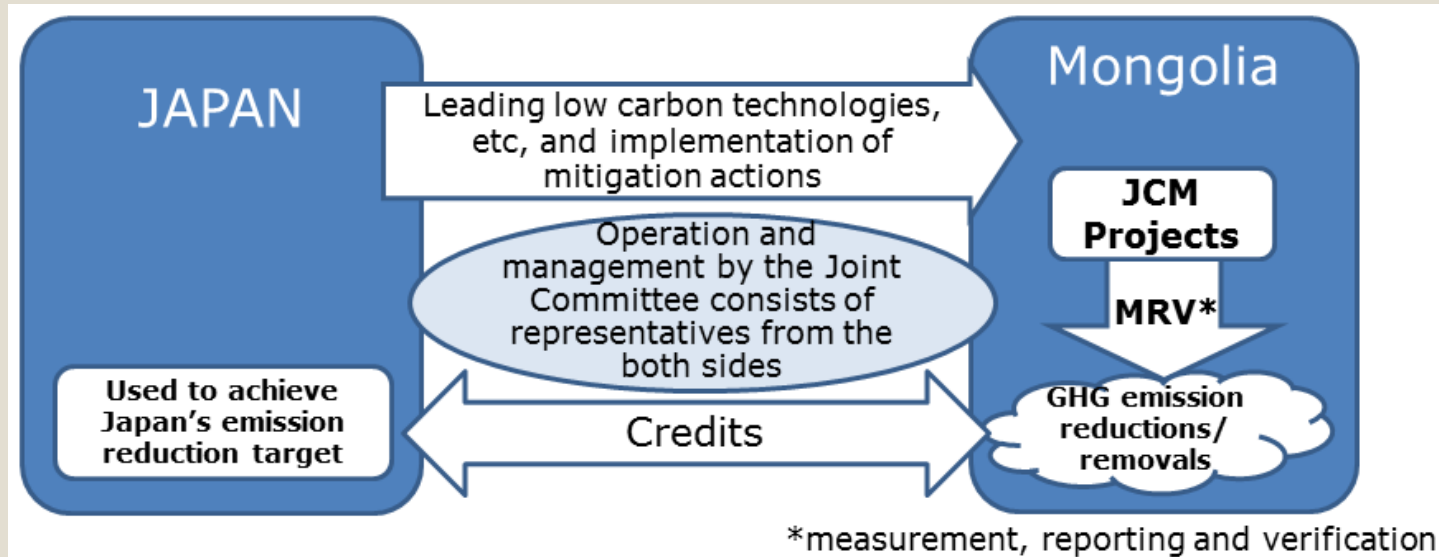
Number of countries adopting renewable energy policies, by policy type, 2004, 2010 and 2016



Source: IRENA and CPI, Global Landscape of Renewable Energy Finance, 2018

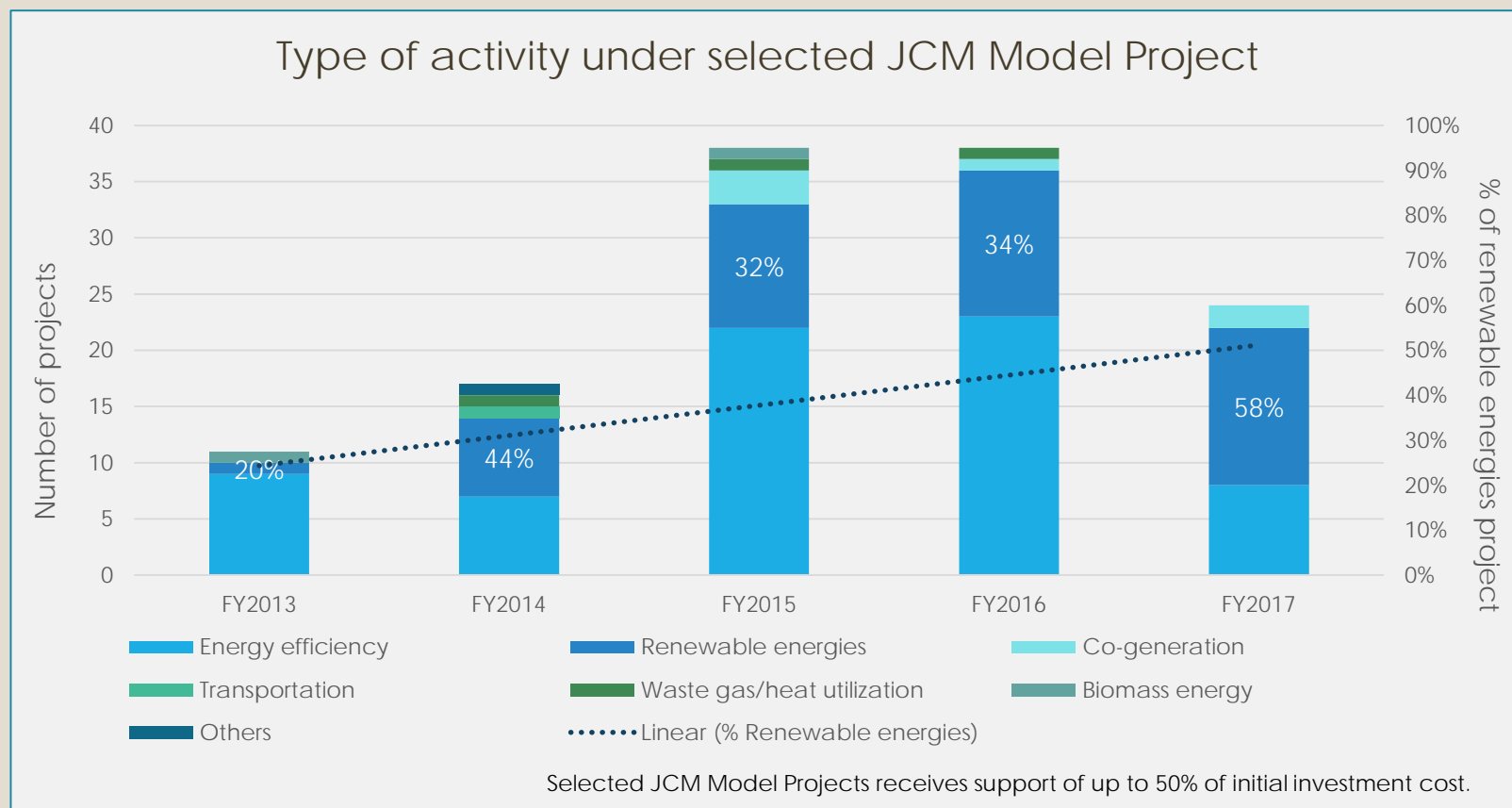
# International support from carbon markets will continue

## Example: The Joint Crediting Mechanism



- UNFCCC- and country-operated market mechanisms (such as the JCM) will co-exist in Paris era.
- International negotiations prioritize avoiding double counting of issued units between participating countries.
- Clarity in domestic policy on carbon markets is important.
- Countries will benefit from formulation of policies on carbon markets usage and technology priority.

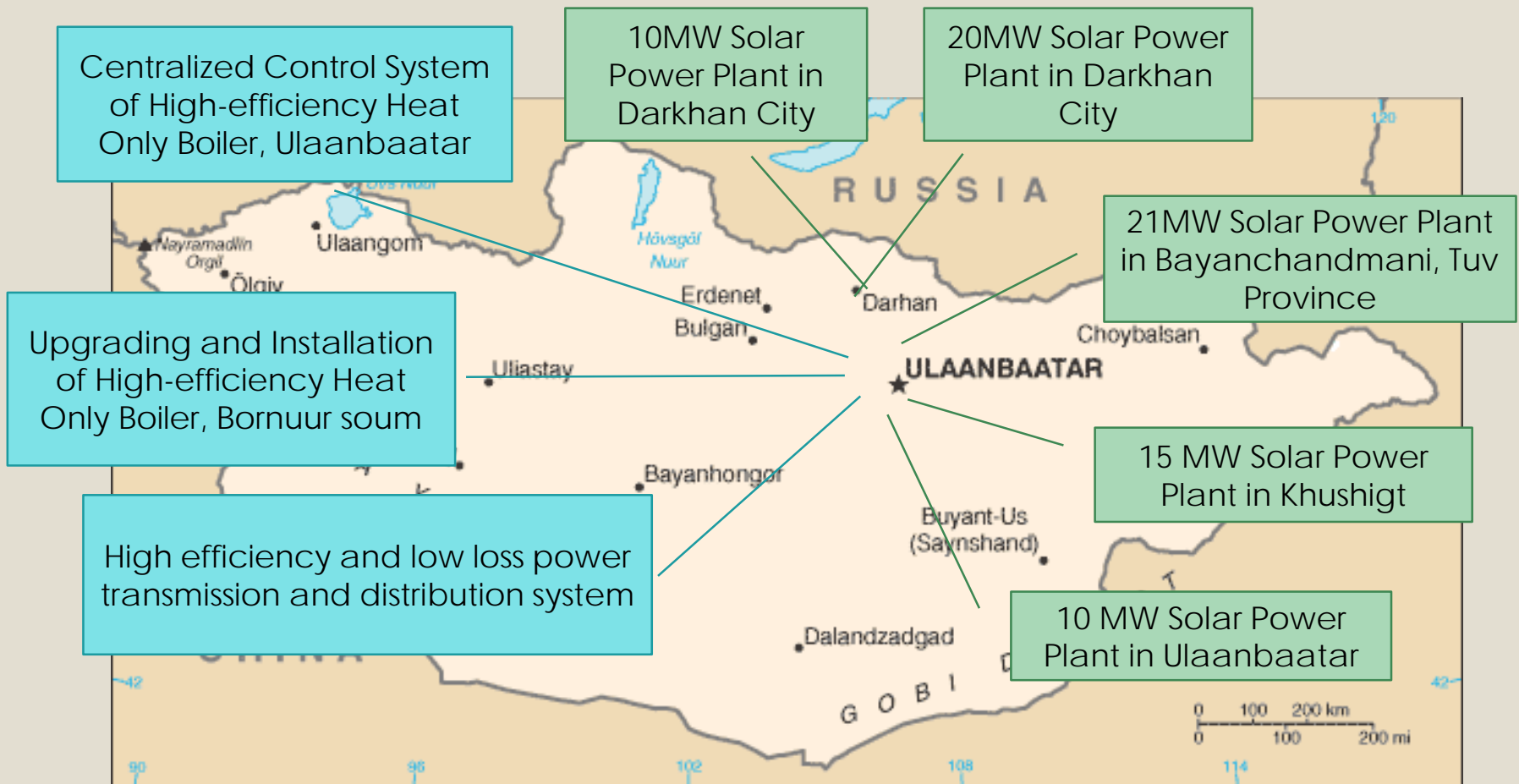
# International support from carbon markets will continue: support from the JCM



Source: IGES JCM Database (October 2018)

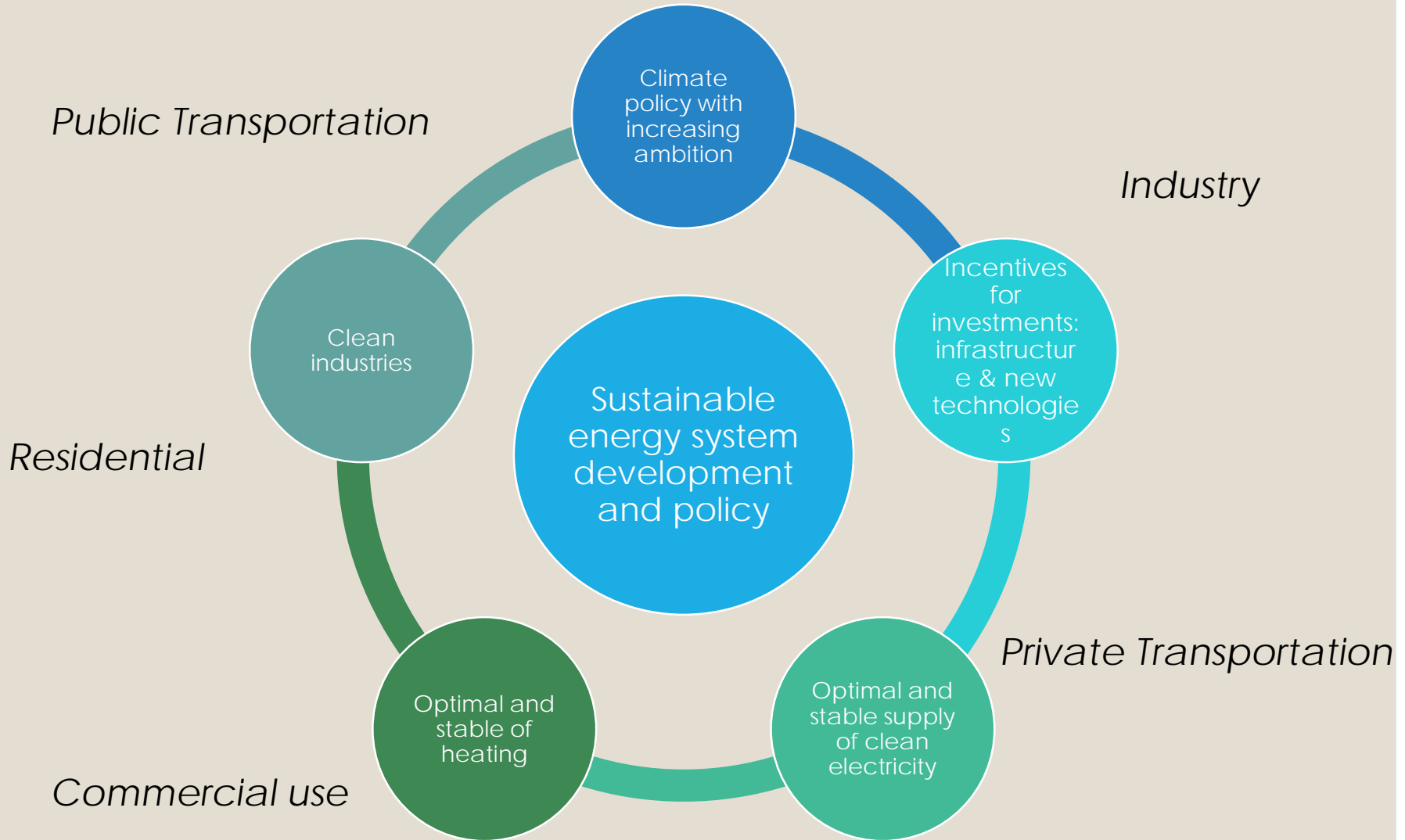
Renewable energies are attractive for carbon markets, and innovation is important for funders.

# Projects supported by JCM are being implemented



New project selected under ADB JF JCM scheme: Solar power generation system with advanced storage battery and energy management system (EMS)

# Integrated energy system development



*Towards a decarbonised future*

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