Decarbonisation of the European Power Sector

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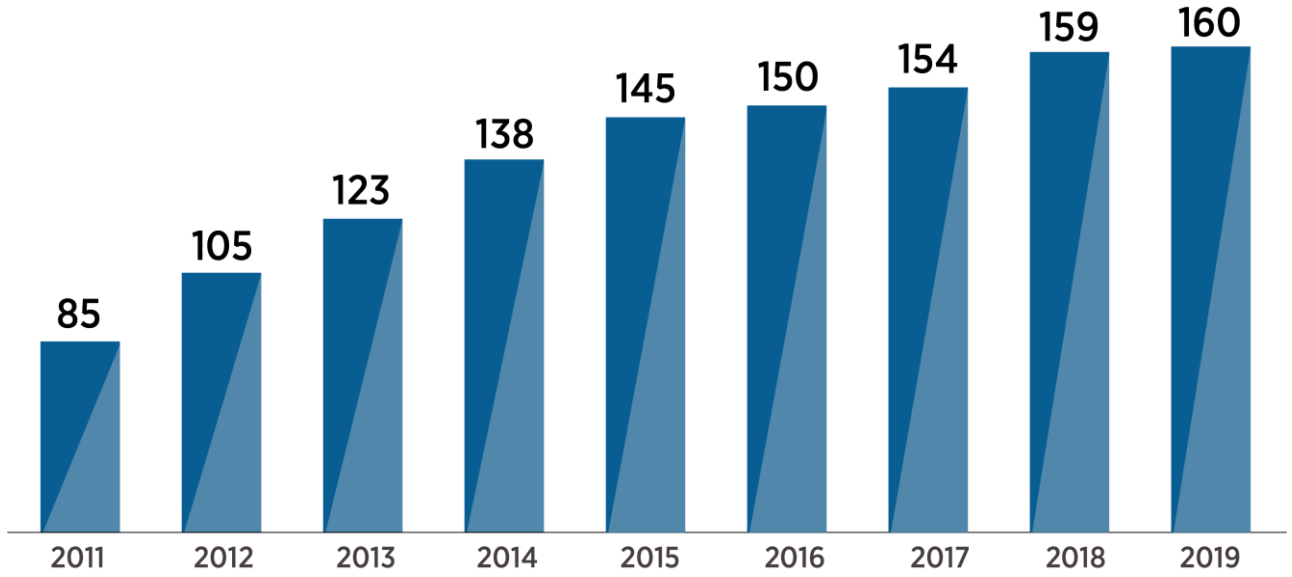
Navigating towards a zero-carbon future
London, 8 November 2019

IRENA at a glance

- Intergovernmental Organization (IGO)
- Established in 2011
- HQ in Abu Dhabi, UAE
- IRENA Innovation and Technology Centre – Bonn, Germany
- Permanent Observer to the United Nations
- Director-General – Francesco la Camera



Membership

160 members + 23 in accession

MANDATE

To promote the widespread adoption and sustainable use of **all forms of renewable energy** worldwide

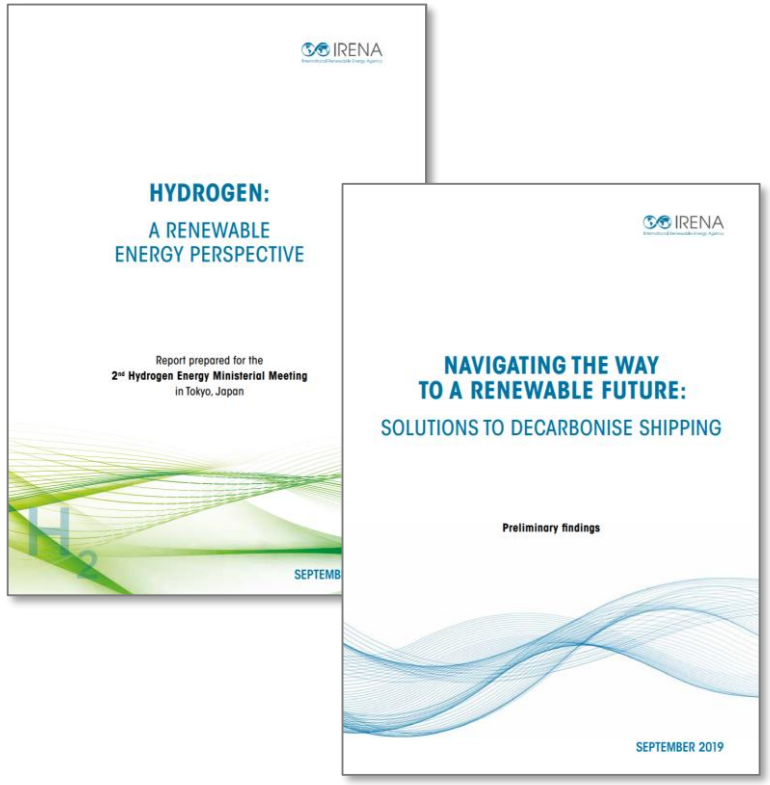
OBJECTIVE

To serve as a **network hub**, an **advisory resource** and an **authoritative, unified, global voice** for renewable energy

SCOPE

All renewable energy sources produced in a **sustainable manner**

New IRENA reports on Hydrogen and Shipping



- **Key Findings - Hydrogen**
  - Important synergies with RE – Storage and flexibility
  - Electrolysers are scaling up from MW to GW
  - Electrolyser costs to halve by 2050 (850 USD/kW today)

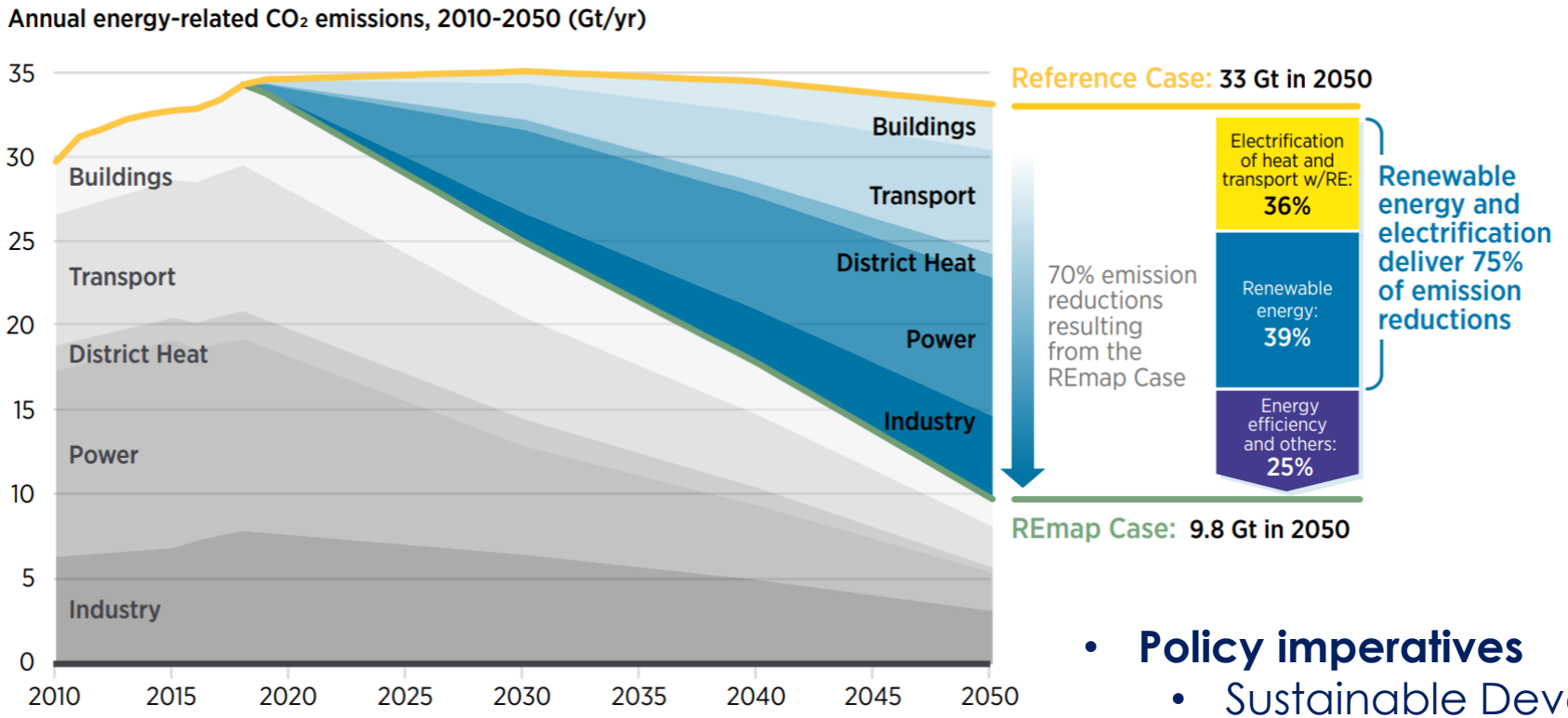
- **Key Findings - Shipping**
  - Need for global effort and cooperation of public and private sectors
  - Fuel price and availability will be decisive
  - Cost reductions in technology and RE will make alternative fuels competitive in the medium to long term
  - Life cycle emissions will have to be considered

https://www.irena.org/publications/2019/Sep/Hydrogen-A-renewable-energy-perspective

https://www.irena.org/publications/2019/Sep/Navigating-the-way-to-a-renewable-future

Ongoing transformation

Ongoing energy transformation



- **Policy imperatives**
  - Sustainable Development and Economic Growth (SDGs)
  - Climate and Environmental agenda (Paris Agreement)

Source: IRENA (2019), Global energy transformation: A roadmap to 2050

Strong business case for renewables

- Policy frameworks, business and technology innovation
- Dramatic cost reduction

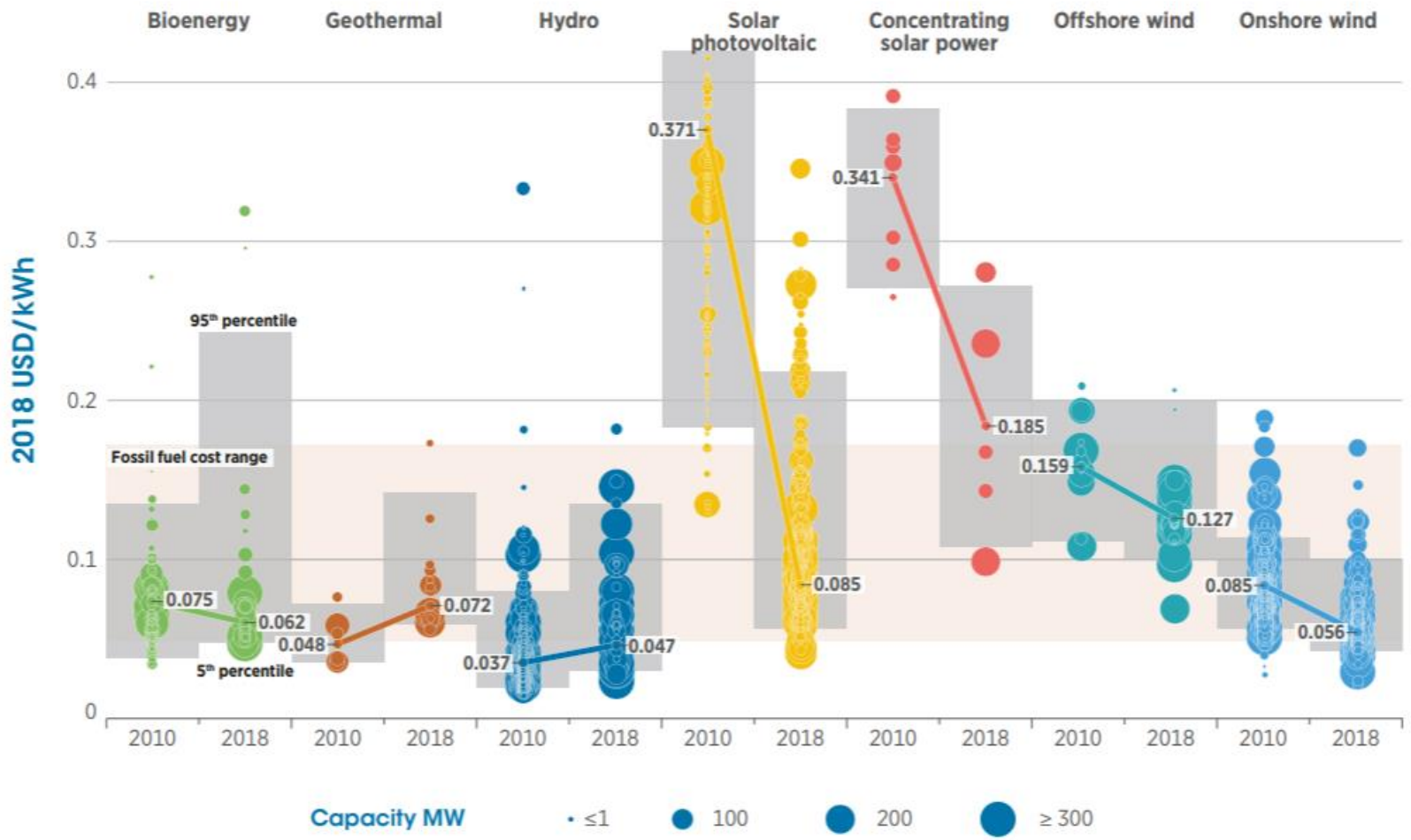
Cost reduction (2010 - 2018)

Solar PV

77%

30%

Onshore Wind



Overview of EU RE policy

Early efforts to promote renewable energy

- **1970's**
  - First EU attempts at promoting RES
  - Driven by need for energy security
  - Calls for R&D to curb oil dependence
- **1980's**
  - RE promotion incorporated to EU regional policy
  - Regional programmes for exploiting endogenous resources
  - First FiTs appear
- **1990's**
  - Climate drives the agenda
  - First tendering schemes appear

R&D driven by a few pioneer countries: DE, NL, DK, SE, FI

Policy developments mostly at national level

EU efforts dwarfed by pioneer countries: DE, DK, ES

Despite this, actions at EU level facilitated conditions

Development of EU RE policy

- **1997 - White paper on RES**
  - Sets RE targets for EU by 2010
    - 12% of energy consumption
    - 22% of electricity consumption
  - Indicative targets for each state

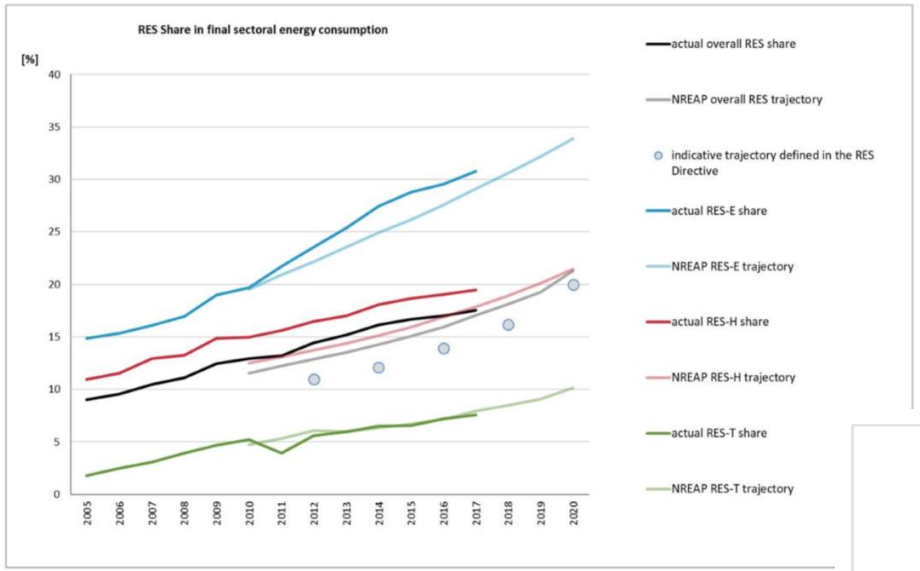
Lack of progress > comprehensive legislative framework

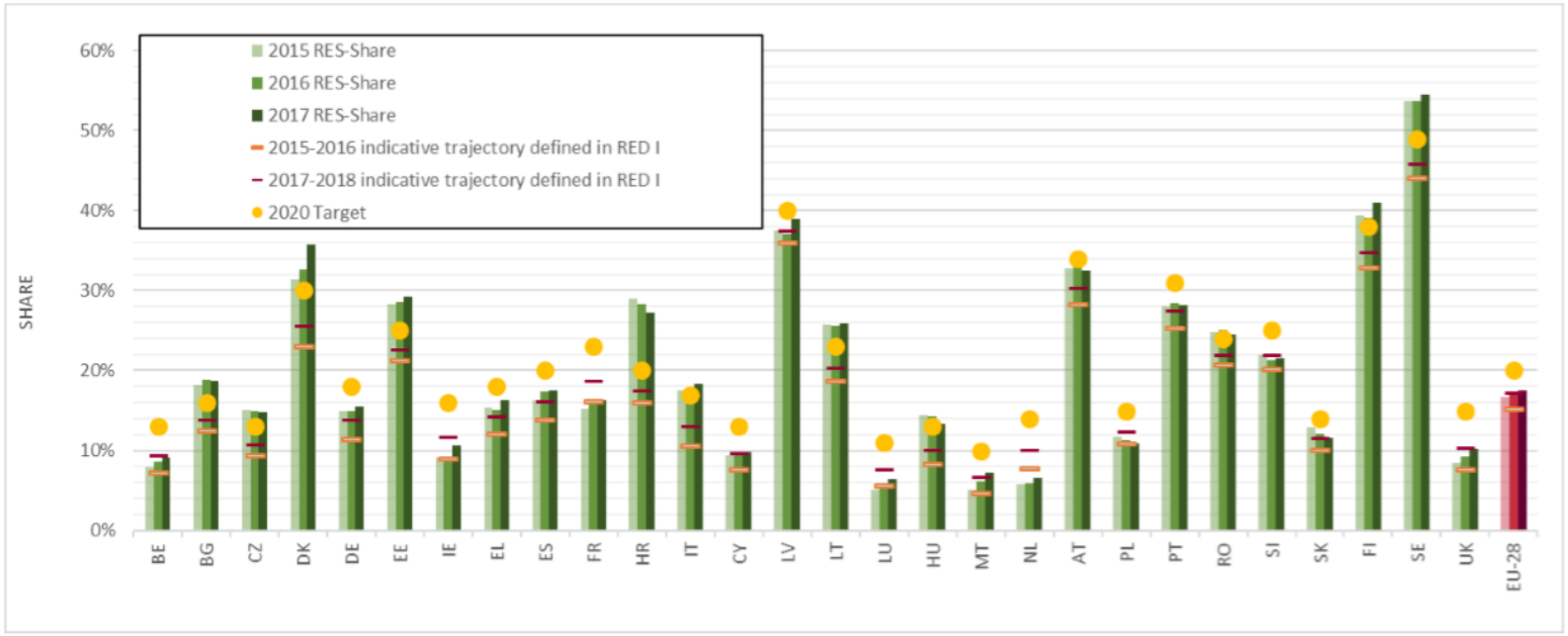
- **2009 – Renewable Energy Directive (RED)**
  - 20-20-20 targets by 2020 (emissions, savings, RES)
  - Maps mechanisms:
    - Support schemes, GOs, joint projects, cooperation schemes
  - Binding national targets
    - Laid out in National RE Action Plans
    - Measured with biennial Progress Reports

- **2013 – Overhaul of subsidies**
  - From FiTs to FiPs, tenders and quota obligations

2018 – RED II
- 32% RES by 2030
- 14% RES in transport
- Only EU level targets
- Updated sustainability criteria

Current status





Source: https://ec.europa.eu/commission/sites/beta-political/files/report-progress-renewable-energy-april2019_en.pdf

Lessons learned

Lessons learned

- **A small number of countries pioneered the development of RE in Europe**
  - Many other countries benefitted and still benefit.

- **A clear and reliable policy framework is essential**
  - Stability and reliability of policy framework are more important than payment levels
  - Instruments should aim at market growth not high profits
  - It is crucial to ensure a high stability of policy and a sound investment climate
  - Non-economic barriers for policy design must also be taken into account

- **Success in deployment of RE is a product of many aspects, not a single policy or incentive**
  - Ambitious objectives
  - Economic incentives – (portfolio of instruments: FiTs, FiPs, GOs, tax credits/exceptions)
  - Regulations – priority access to grid
  - Soft policies(persuasion) - R&D, training, simplified procedures

Important considerations in the context of shipping

- **Similarities with power sector**
  - Long-lived assets, high upfront capital costs
  - Could likely benefit from technology-specific support mechanisms to reduce costs

- **Not all RES are the same**
  - Hydro, PV and wind are mature, while ocean energy and bioenergy are lagging
  - The future fuel pathway for shipping is still unclear.

- **Differences with power sector**
  - Shipping sector competes internationally
  - Shipping is outside national climate policy regimes
  - Different techno-economic challenges
    - RE: capital costs, variability
    - Shipping: fuel costs and availability

- **Need for alignment between private and public actors globally**

Thank you

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