IRENA
International Renewable Energy Agency

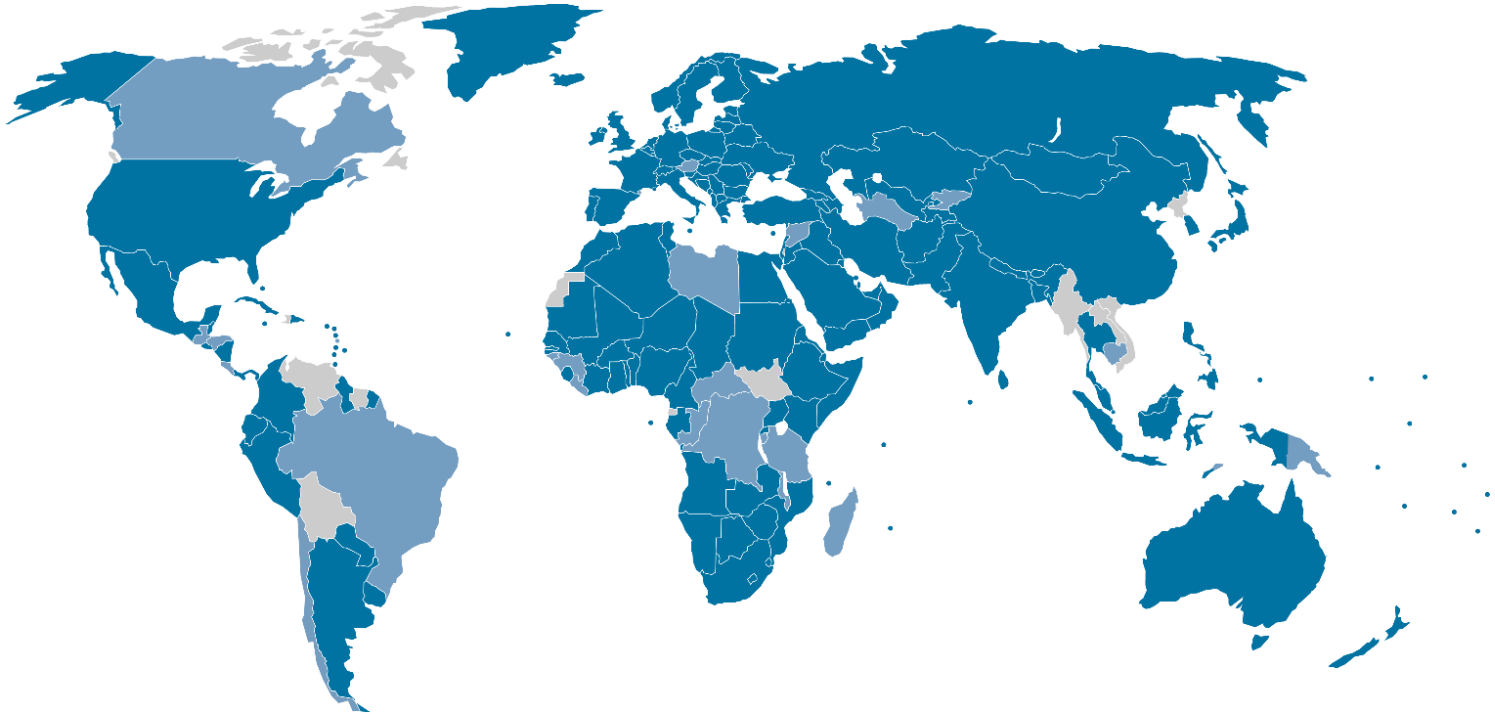
The role of modern bioenergy in the global energy transformation

Seungwoo Kang
Bioenergy, Innovation and Technology IRENA

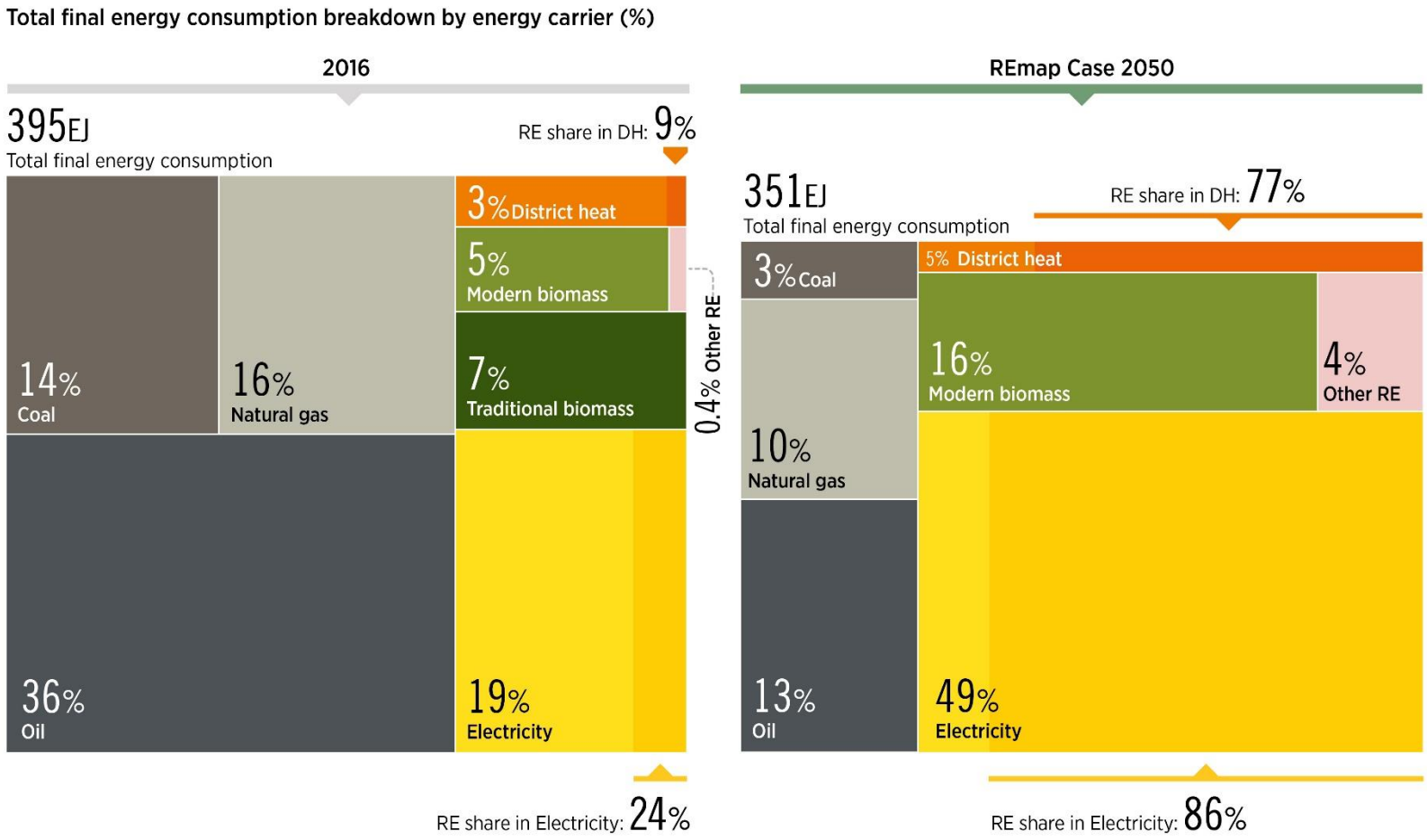
About IRENA

IRENA
International Renewable Energy Agency

- Established in 2011
- Headquarters in Abu Dhabi, offices in Bonn/Germany
- 160 members, 23 States in accession
- Promotion of the widespread adoption and sustainable use of all forms of renewable energy.



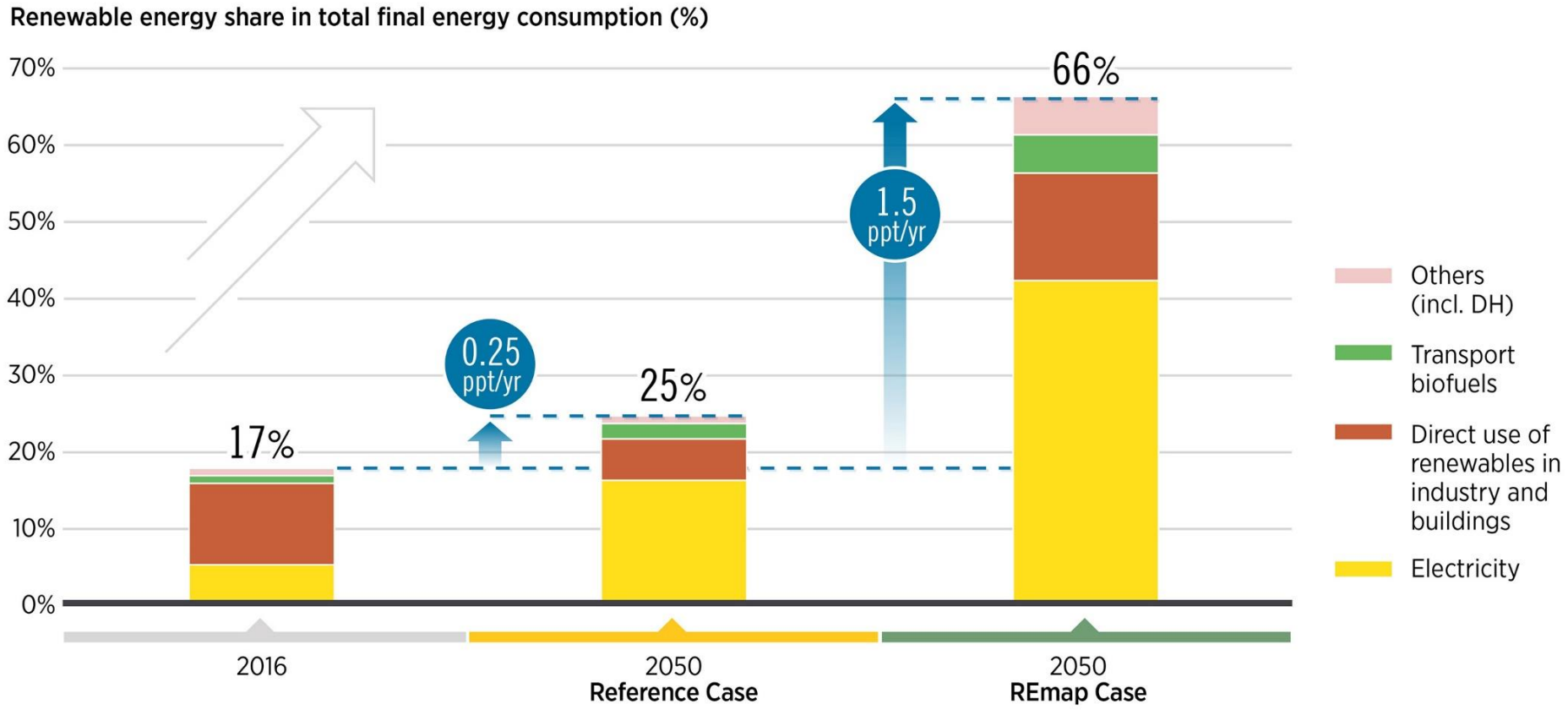
Electricity becomes the main energy carrier in energy end use by 2050 – but modern biomass also grows



Electrification of energy services in transport and heating would need to increase substantially by 2050. When electricity becomes the world's main energy carrier, it would be mostly supplied from renewables (86%).Modern bioenergy use grows from 5% of final consumption in 2016 to 16% in 2050.

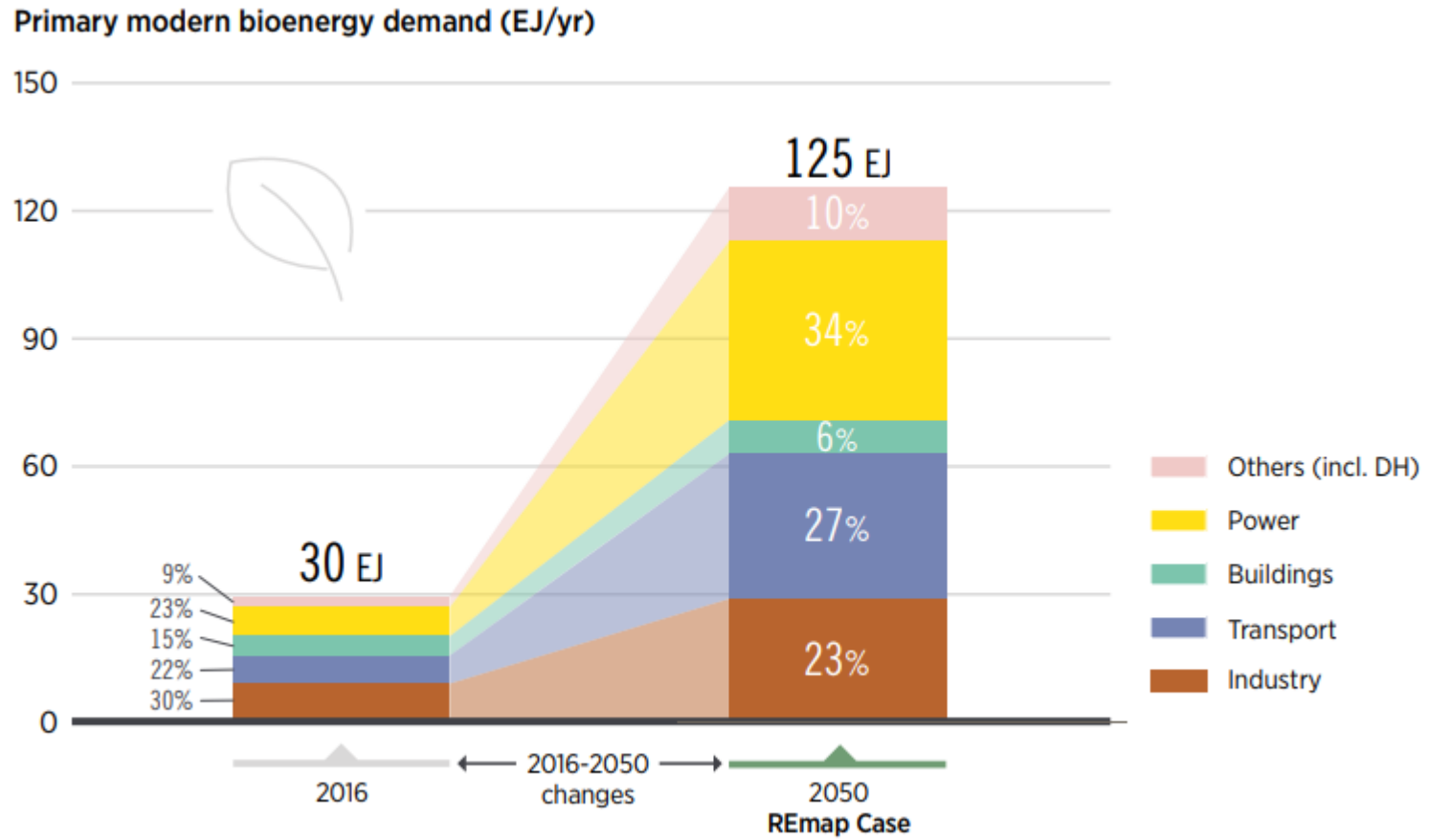
IRENA's REmap decarbonization pathway

The share of renewables must grow to 66% of final consumption in 2050



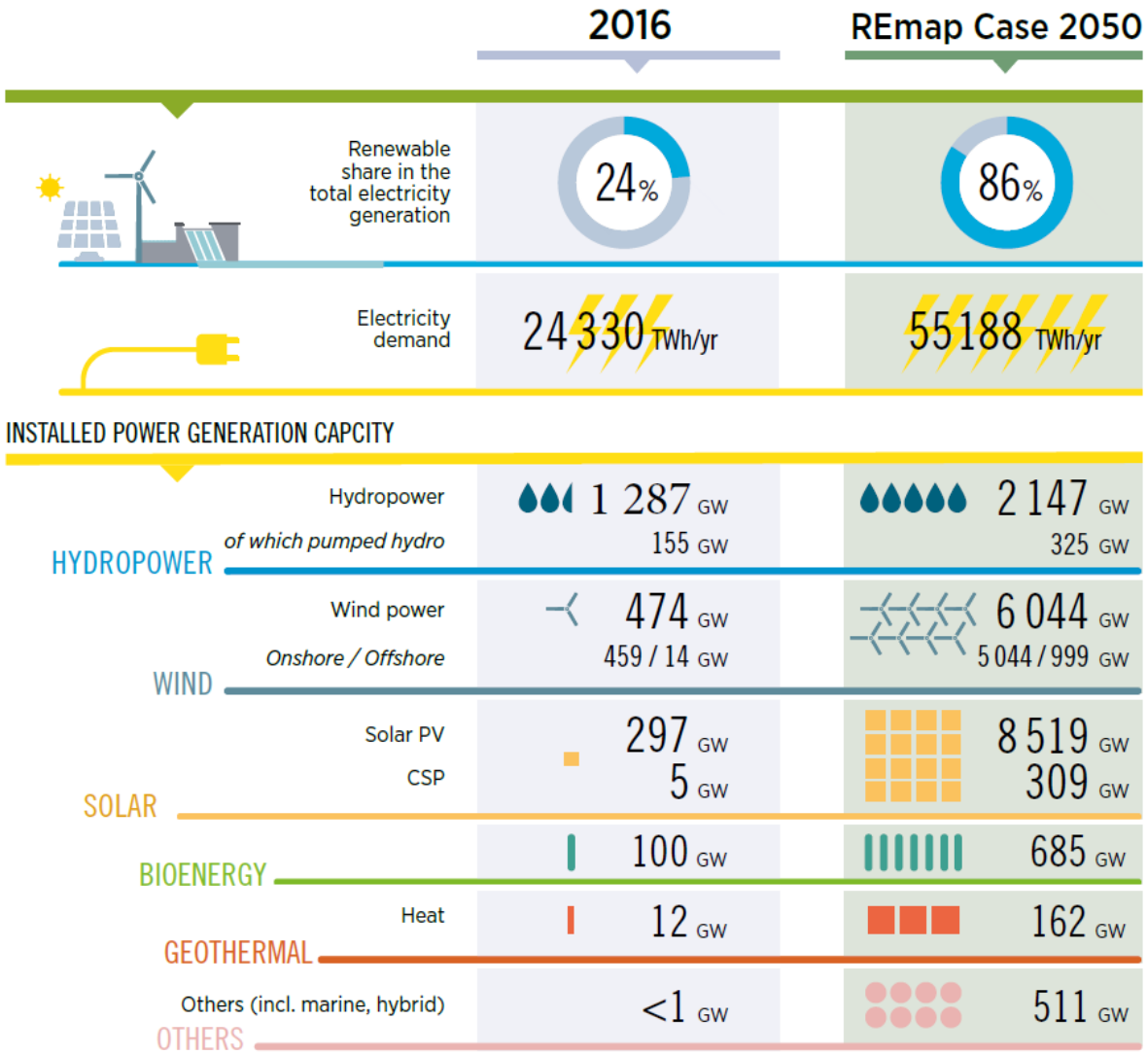
Cost reductions of renewable electricity drive the increase in electricity final use. In sectors like transport bioenergy needs to grow and complement electrification.

Bioenergy has a decisive role in the energy transition



Primary modern bioenergy demand would grow from around 30 EJ in 2016 to 125 EJ by 2050. Liquid biofuels consumption would reach 652 billion litres, up from 129 billion in 2016. Biofuels would have important roles in aviation and marine energy supply by 2050, as well as providing thermal energy in industry and fuel for power generation.

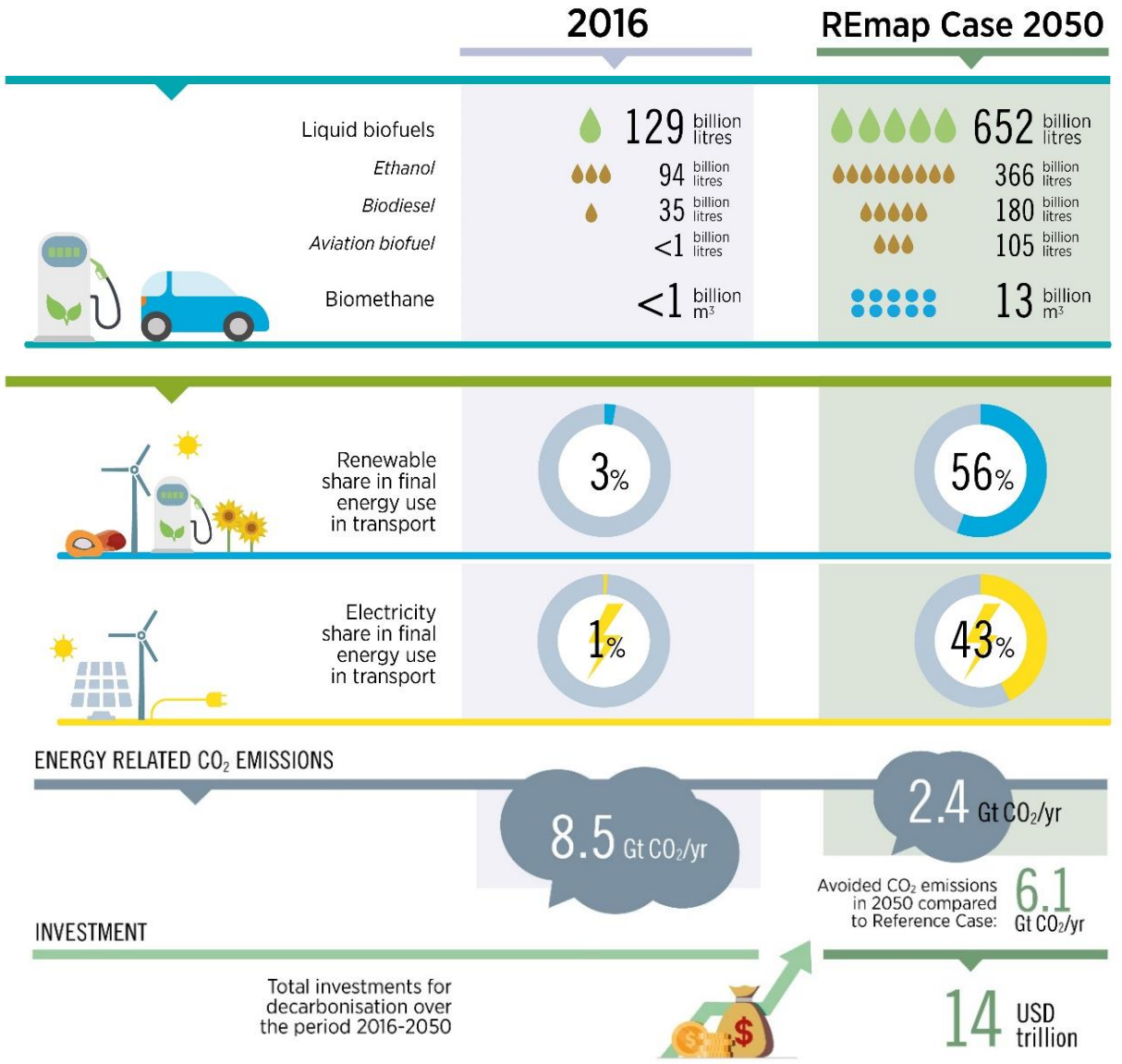
Power sector key indicators



- In the power sector the installed capacity of biomass grows from 100 GW to 658 GW.
- Biomass-based industries have an important role to play in that growth.
- But also stand-alone biomass power plants must be scaled up.

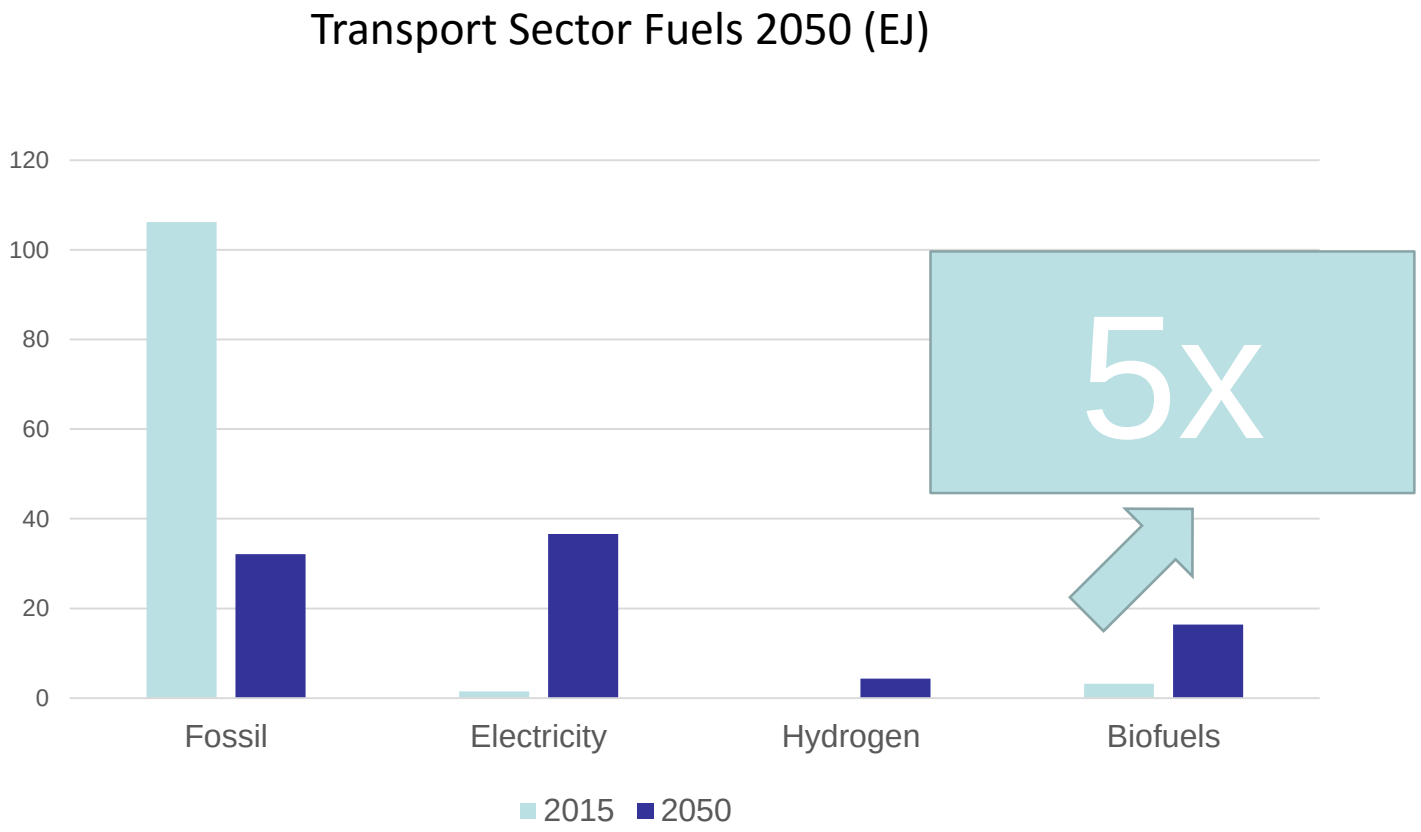
Transport sector key indicators

- Biofuels grow from 129 billion liters in 2016 to 652 billion liters in 2050.
- Ethanol almost quadruples to 366 billion liters.
- Transport sector represents around 25% of global greenhouse gas emissions.
- REmap reduces emissions by 70%.



The climate equation cannot be solved without increasing production of liquid biofuels for the transport sector

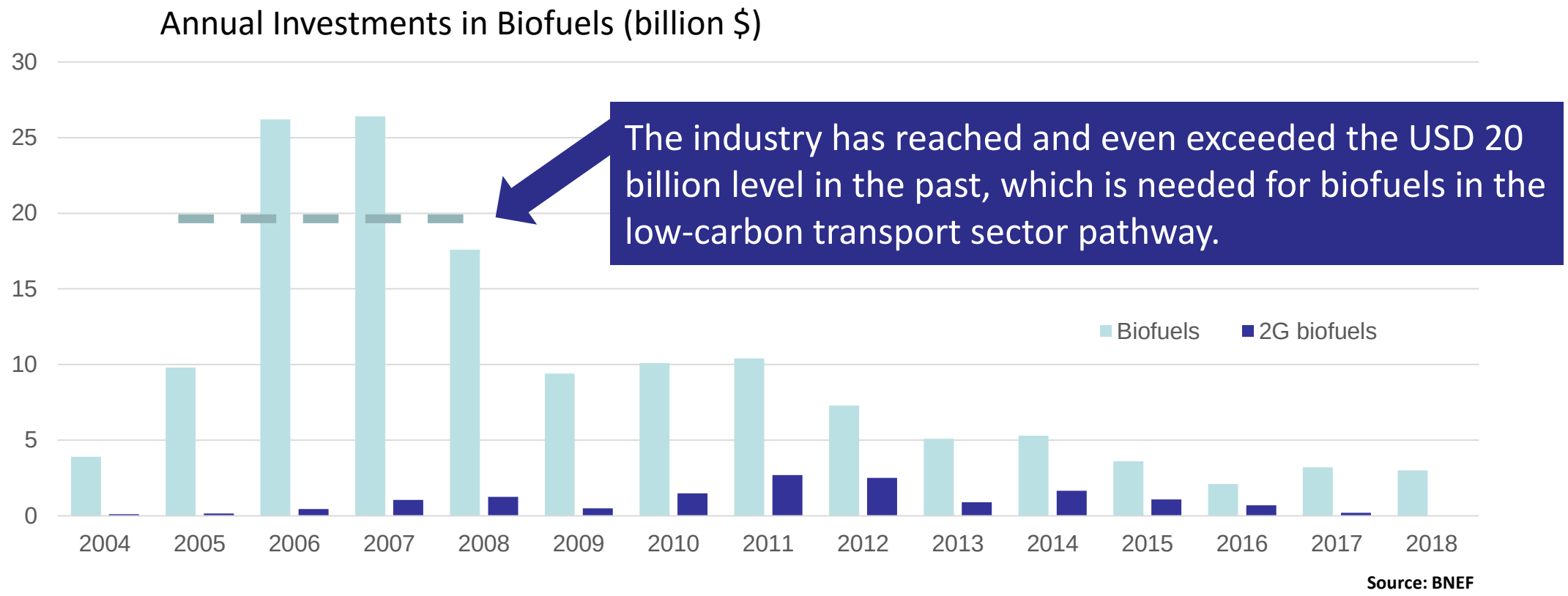
Five-fold production of bioliquids is needed by 2050



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

Global biofuel investments are on a declining trend

Investment in renewables and biofuels must ramp up

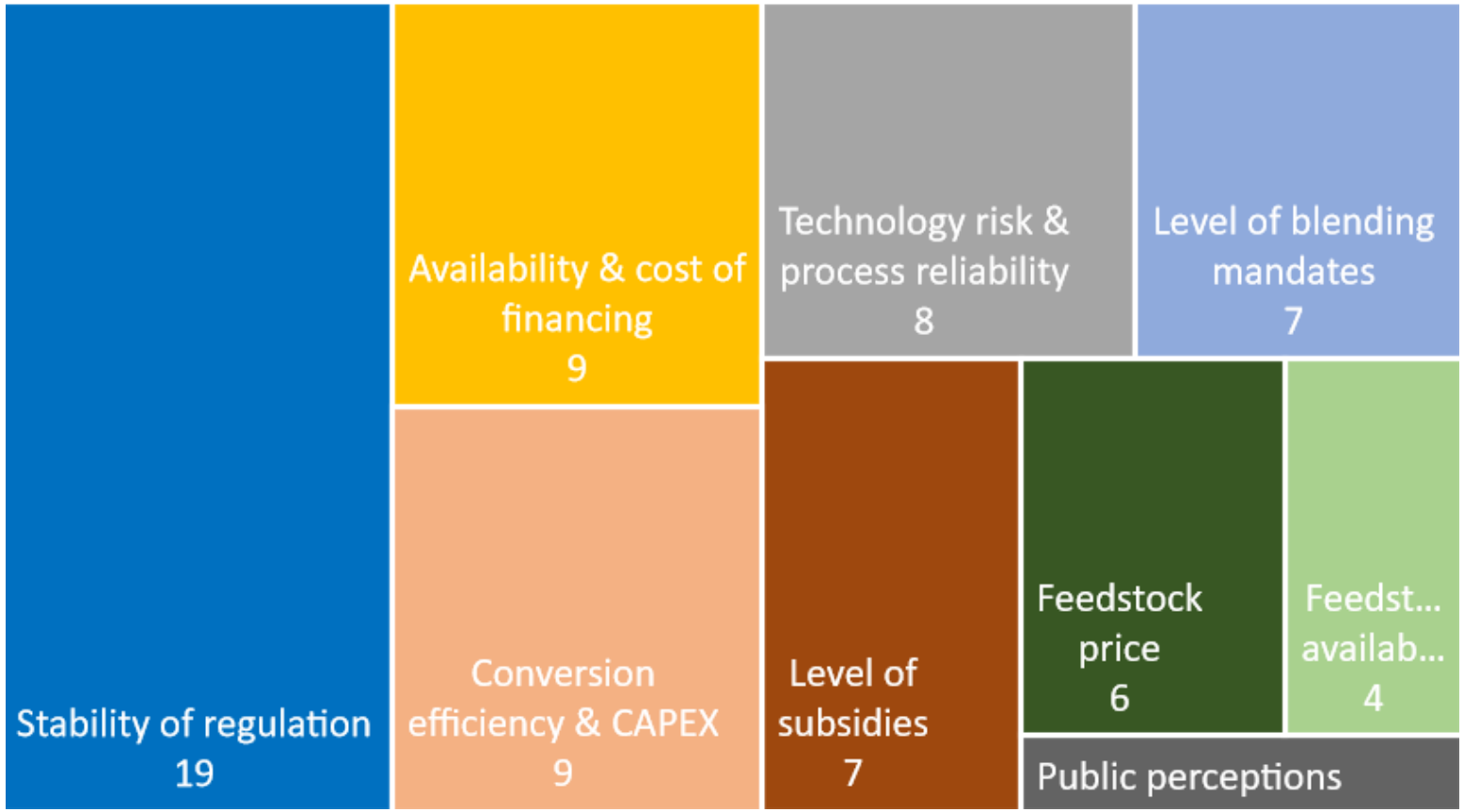


More than 100 refineries would be needed annually at an investment of USD 20+ billion/yr.

More than 10% of bioliquids should be allocated for aviation.

Global biofuel investments are on a declining trend

Ranking the barriers to investment in advanced biofuels

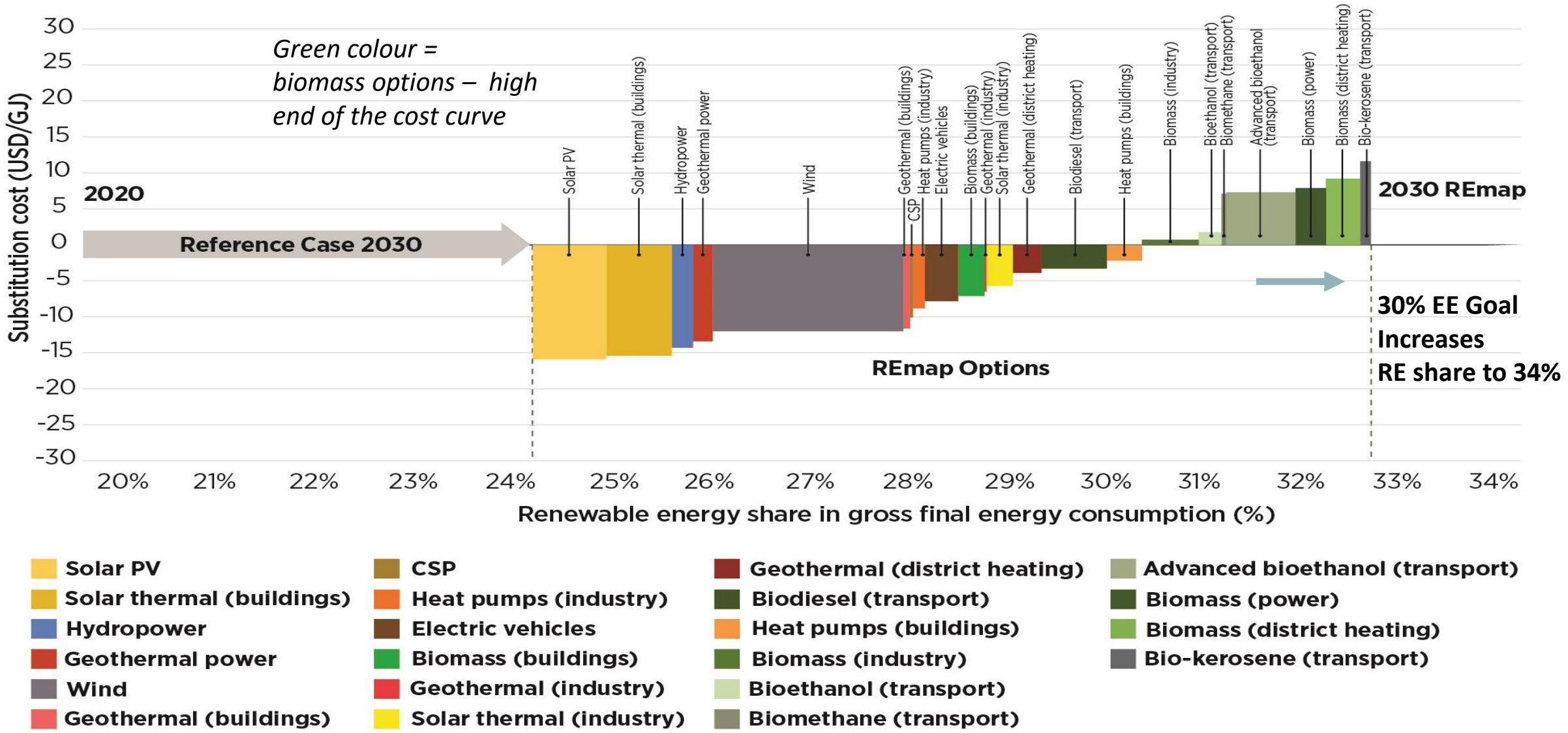


Area is in relation to perceived importance
Based on an IRENA survey of barriers to investment

- The most important group of barriers relates to lack of stable regulation, including mandates and subsidies.
- It is followed by the cost competitiveness of advanced biofuels production, including ”conversion efficiency & CAPEX” and ”feedstock price”.
- And the cost and availability of financing.

Europe: REmap options in 2030

Significant bioenergy potential



Note: PV = photovoltaic; CSP = concentrated solar power

South East Europe Regional Initiative

Abu Dhabi **Communiqué** on Accelerating the Uptake of Renewables in South East Europe

Abu Dhabi, 13 January 2017

Action Areas

- Mapping renewable energy resources
- Long-term planning for RE deployment
- Enabling frameworks: technical, policy, regulatory, institutional
- Access to finance for renewable energy projects
- Integration of variable renewable energy sources to power system
- Socio-economic benefits of renewable energy

Actions needed now

- Eliminate fossil fuel subsidies and implement carbon pricing to reduce the cost gap that often exists in many transport fuel markets.
- Adopt supporting policies that are robust and long-term to foster 1st- and 2nd-generation biofuels, providing more certainty to industry and investors.
- Put in place direct financial incentives and de-risking measures to reduce the cost of financing to bioenergy investment given the high-level of perceived risk, especially in advanced biofuels.
- Remove existing barriers and incentivise emerging low-carbon technologies for acceleration the deployment
- Phase out traditional biomass as cooking fuel and replace with clean and efficient cookstoves (biogas, modern solid biomass and electricity)

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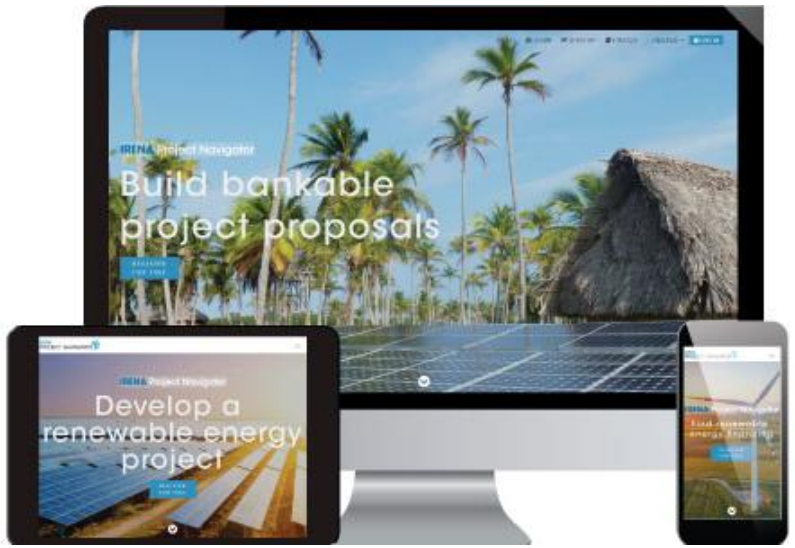
Project facilitation – IRENA Project Navigator

A leading IRENA project facilitation platform providing comprehensive and practical information and guidance to assist in the development of bankable renewable energy projects. It features project development guidelines with tools and best practices covering the lifecycle of renewable energy projects based on sun, wind, geothermal and bioenergy resources and builds on IRENA technology expertise & networks.



www.irena.org/navigator

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Project development guidelines on:

- Woody biomass
- Biogas (anaerobic digestion)
- Biomass for islands (Q4 2019)