



IRENA Renewable Energy Roadmap (REmap analysis) for CESEC countries

Summary of results and way forward

Unit C.1. Renewables and CCS Policy

IRENA REmap analysis approach

1. What is the outlook of renewables with current / planned policies by 2030? (Reference Case)

2. What is the additional potential of renewables beyond the Reference Case? (REmap Options)

3. Reference Case + REmap Options = REmap Case

4. What are the costs and benefits (i.e. investments, energy costs, avoided externalities) and policy implications of the REmap Case?

Reference 2030 prospects for CESEC

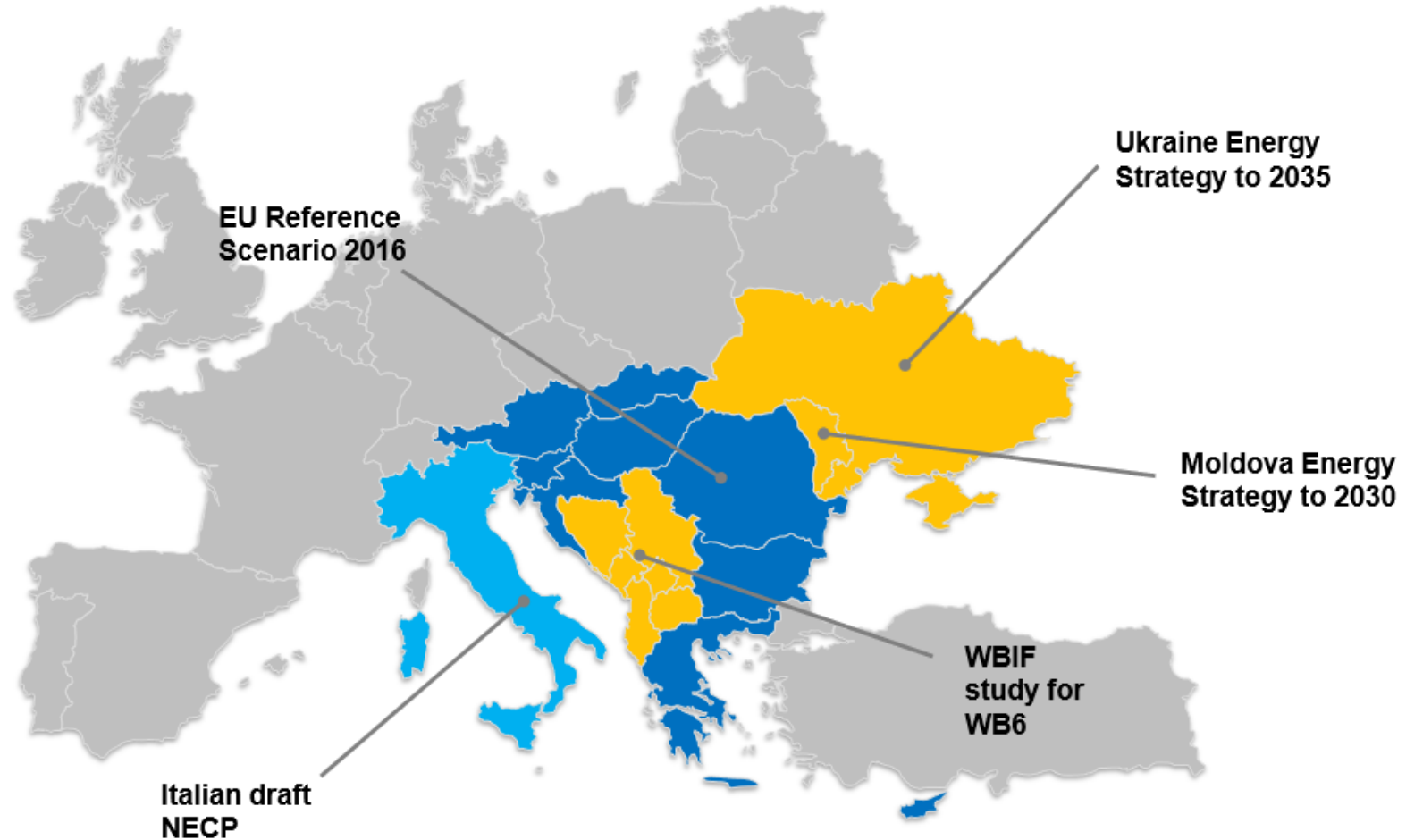
1. Reference Case

2. REmap Options

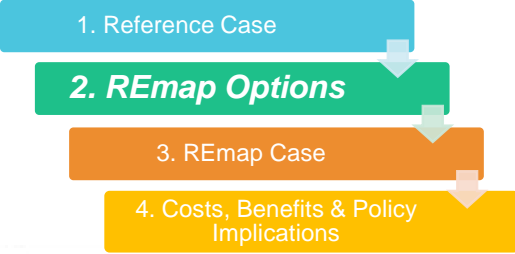
3. REmap Case

4. Costs, Benefits & Policy Implications

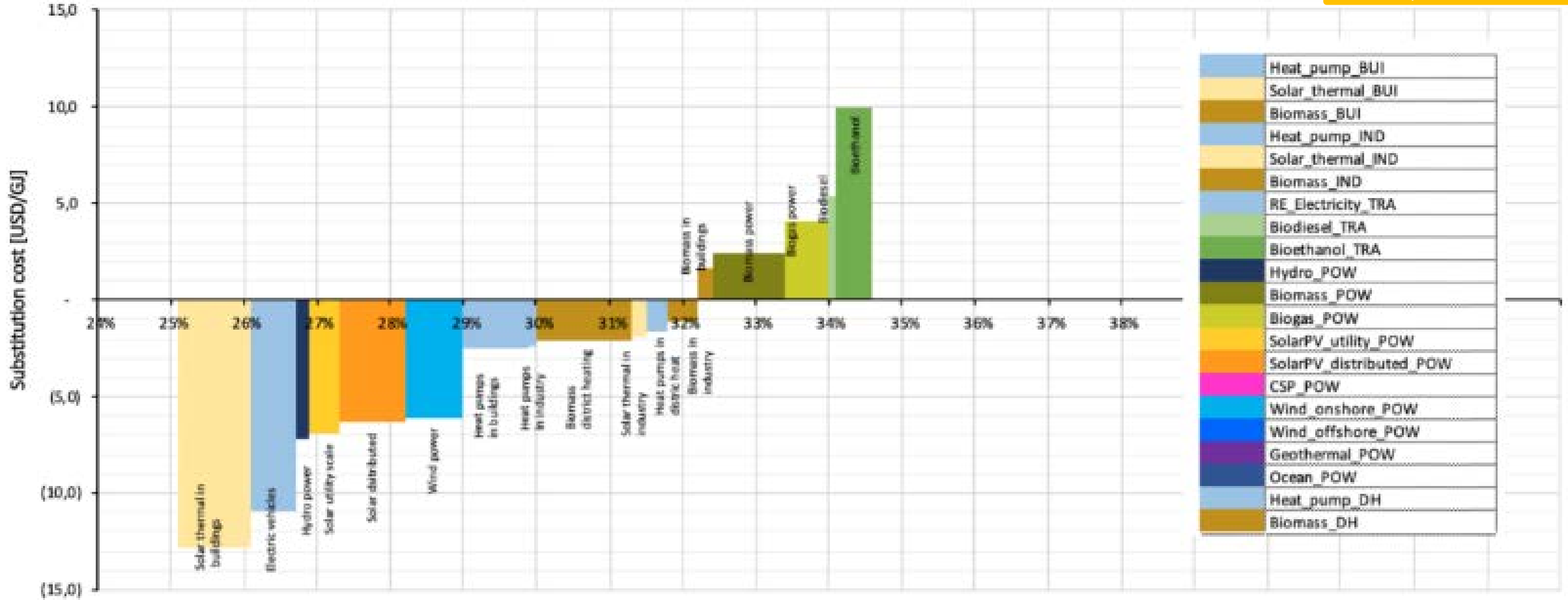
- Demand expected to remain almost flat at CESEC level (+6% from 2015), with strong increases in Energy Community parties (+30% from 2015)
- Slight reductions in fossil fuel consumption (-10%) and emissions (-13%) from 2015.
- Overall RES share in GFEC to show slow growth, from 16% in 2015 to 24% in 2030.



REmap options in CESEC

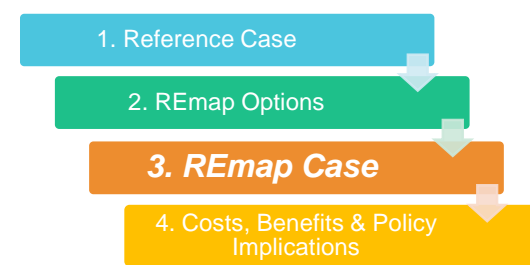


Cost-supply curve of REmap options for CESEC

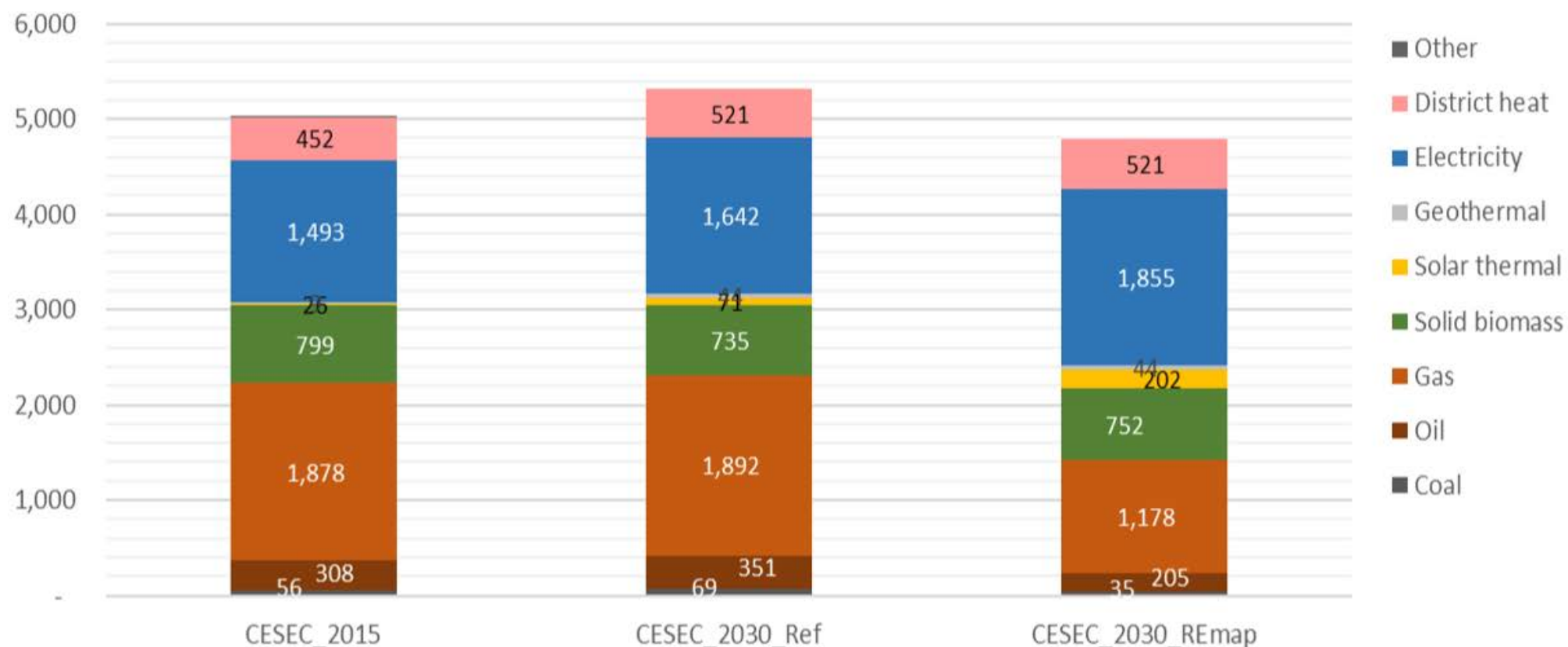


RE potential beyond reference case as % of gross final energy consumption in 2030

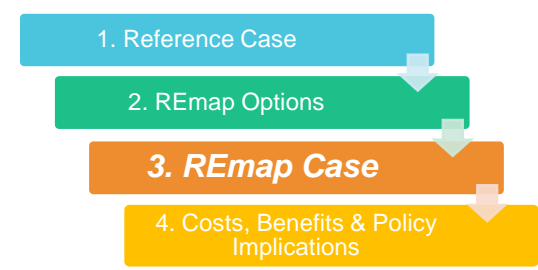
REmap options in Buildings



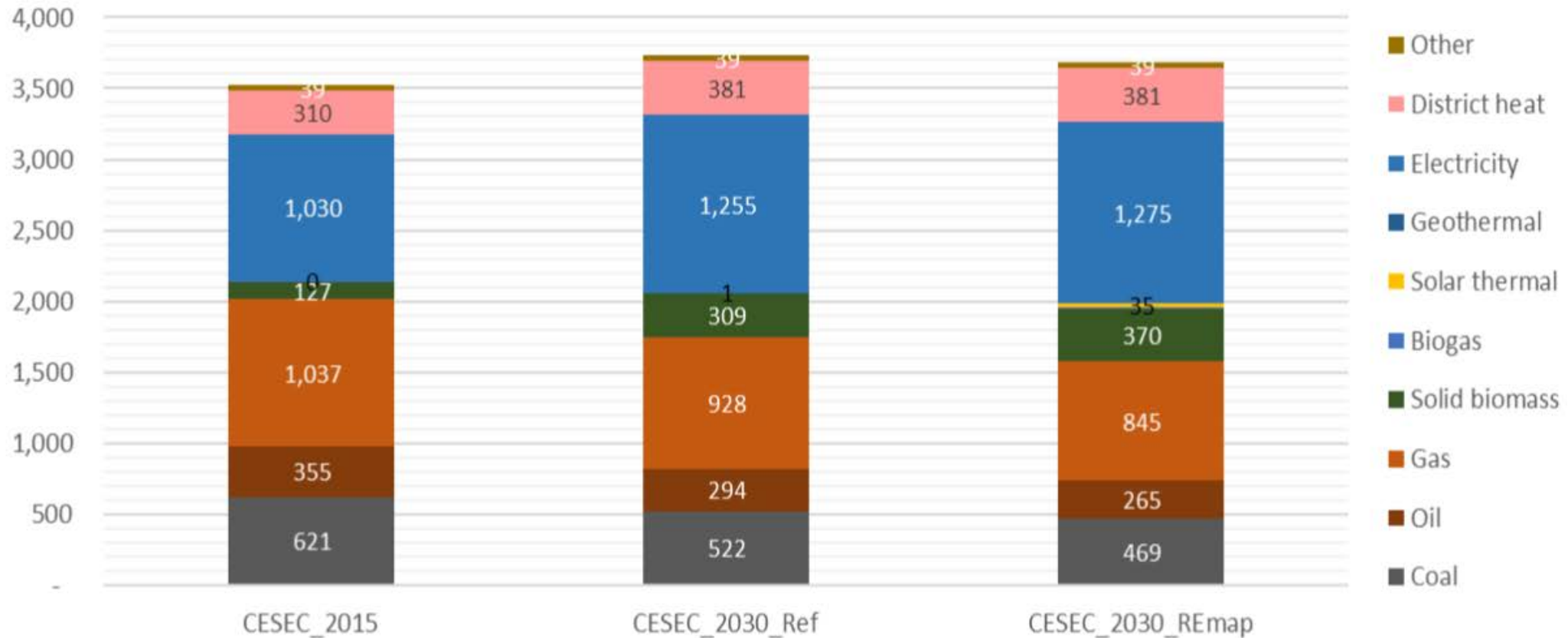
FEC in Buildings_CESEC [PJ]



REmap options in Industry

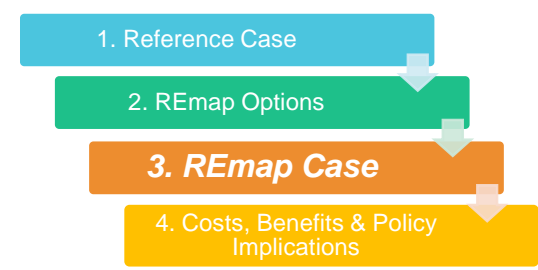


FEC in Industry_CESEC [PJ]

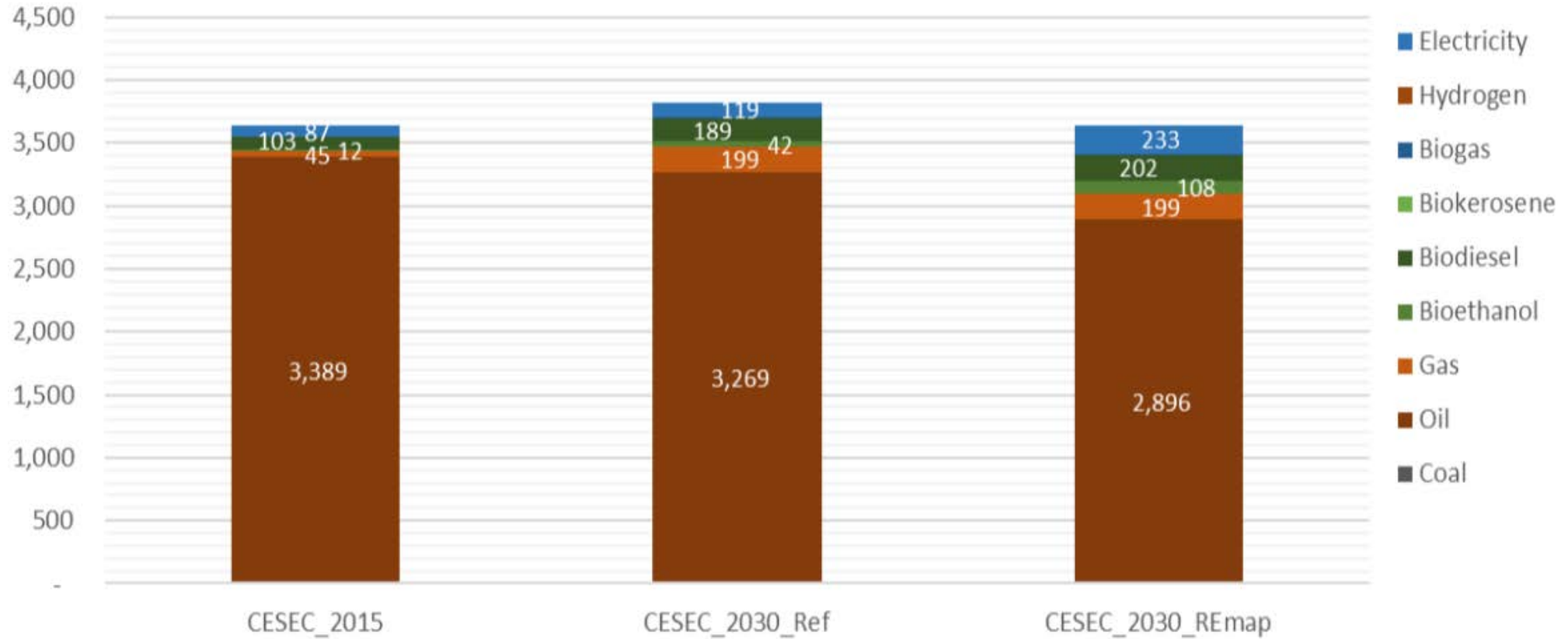


- Other
- District heat
- Electricity
- Geothermal
- Solar thermal
- Biogas
- Solid biomass
- Gas
- Oil
- Coal

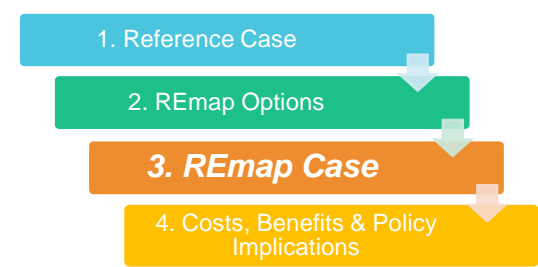
REmap options in Transport



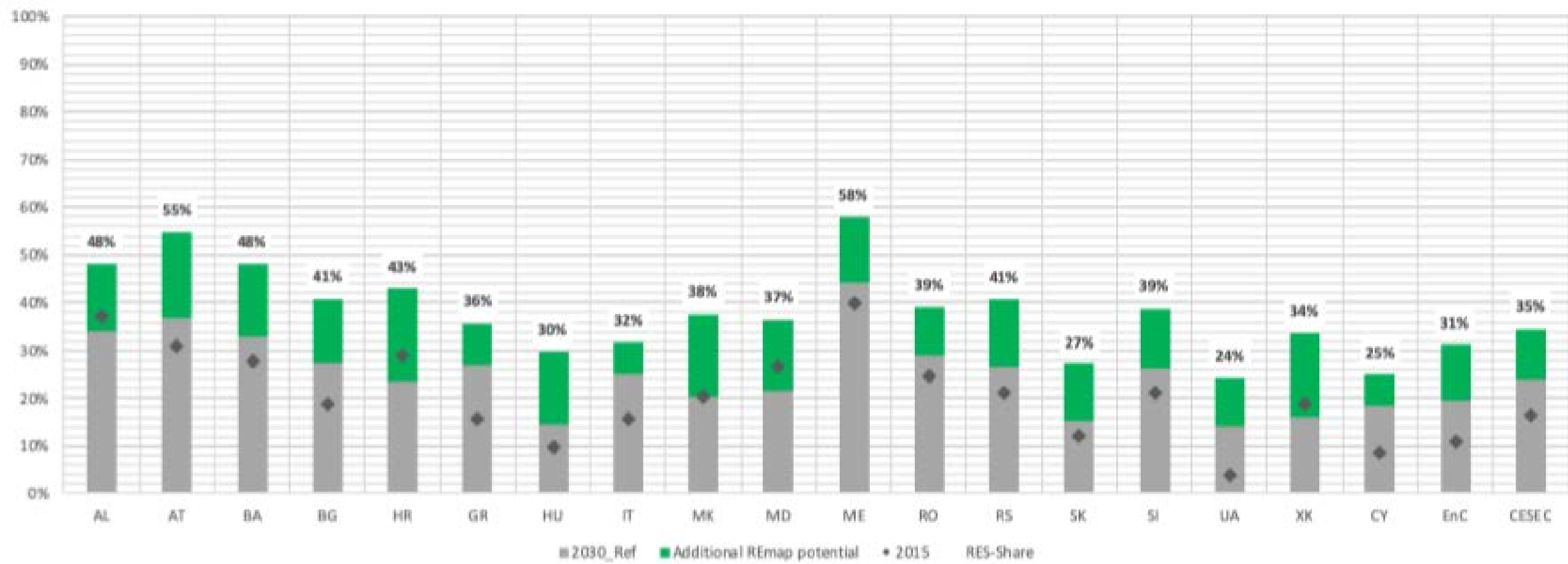
FEC in Transport_CESEC [PJ]



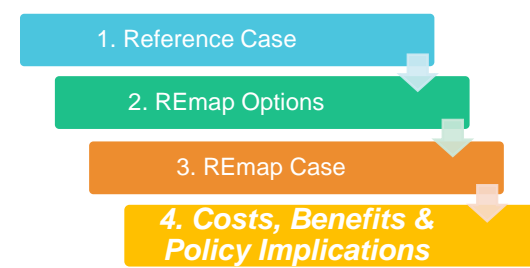
REmap options by country



Share of renewable energy in gross final energy consumption [%]



A regional energy transition to address common challenges in CESEC



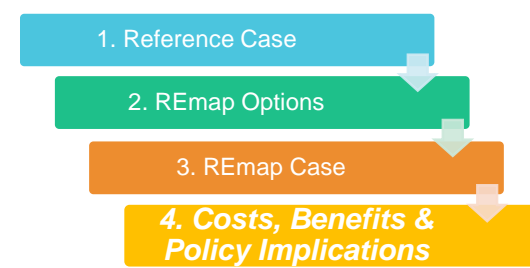
Regional Challenges

- Security of supply
- Aging energy assets
- Air pollution
- Energy affordability
- Costs of capital

Regional Opportunities

- Vast amounts of high-quality renewable resource.
- Cost-competitive technologies.
- Modernization of energy sector.
- Growth prospects, attractive region for international investors.

Multiple benefits of embracing the energy transition



Competitiveness and Clean Growth

- Long-term competitiveness of the energy system.
- Avoiding carbon liabilities and stranded assets.
- Economic growth and jobs.

Energy Security and Public Health

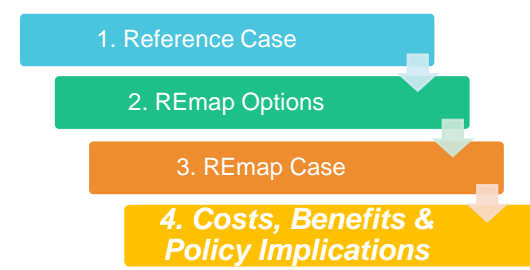
- Improved energy security.
- Reduced air pollution, improved health for CESEC citizens.
- Climate change mitigation.



REmap 2030: Avoided externalities

- Avoided environmental damages from CO2 emissions estimated at:
 - **2,7 to 11,9 EUR billion/year** in 2030.
- Avoided health damages, due to reduced air pollution estimated at:
 - **5,5 to 20 EUR billion/year** in 2030.

Decisive action is needed to unlock the potential



- At national level, focus on improving conditions for investment:
 - Level playing field for renewables, stable, transparent regulatory frameworks.
 - De-risked procedures, risk-mitigating financing mechanisms.
 - Sub-national coordination.
- At regional level, cooperation with neighbors both on ‘software’ and ‘hardware’:
 - Further regional integration of national markets.
 - Coordinated investment plans for key infrastructure.
- External support will be needed for CESEC countries with challenging socio-economic conditions:
 - Capacity building.
 - Financial assistance and risk mitigation

Renewables in the power sector



- The electrification of heat and transport will lead to increased power demand.
- Smart sector integration can facilitate the integration of more renewables in the power sector.

- Estimated > 800 GW of technical potential.
- Mature technology competitive with fossil plants. Further substantial cost reductions expected.
- Wind resource well distributed throughout the year.
- Turbine optimization leading to higher load factors.



- Estimated > 400 GW of technical potential.
- Cost reduction of ~ 77% since 2010.
- Mature technology -> 80% of new solar capacity installed worldwide, cheaper than conventional.
- Further substantial cost reductions expected.



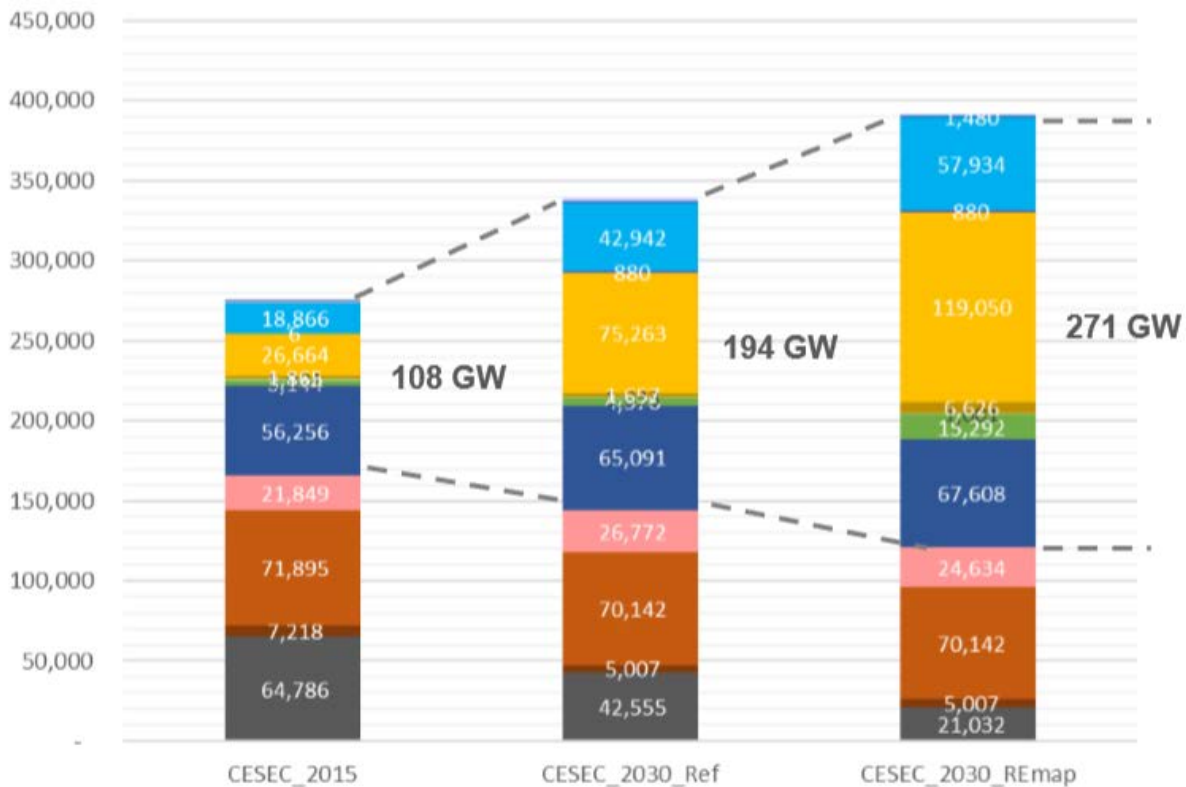
- Estimated > 30 GW of technical potential.
- Key asset for energy security.
- Firm capacity.
- Synergies with heat sector (CHP district heating)



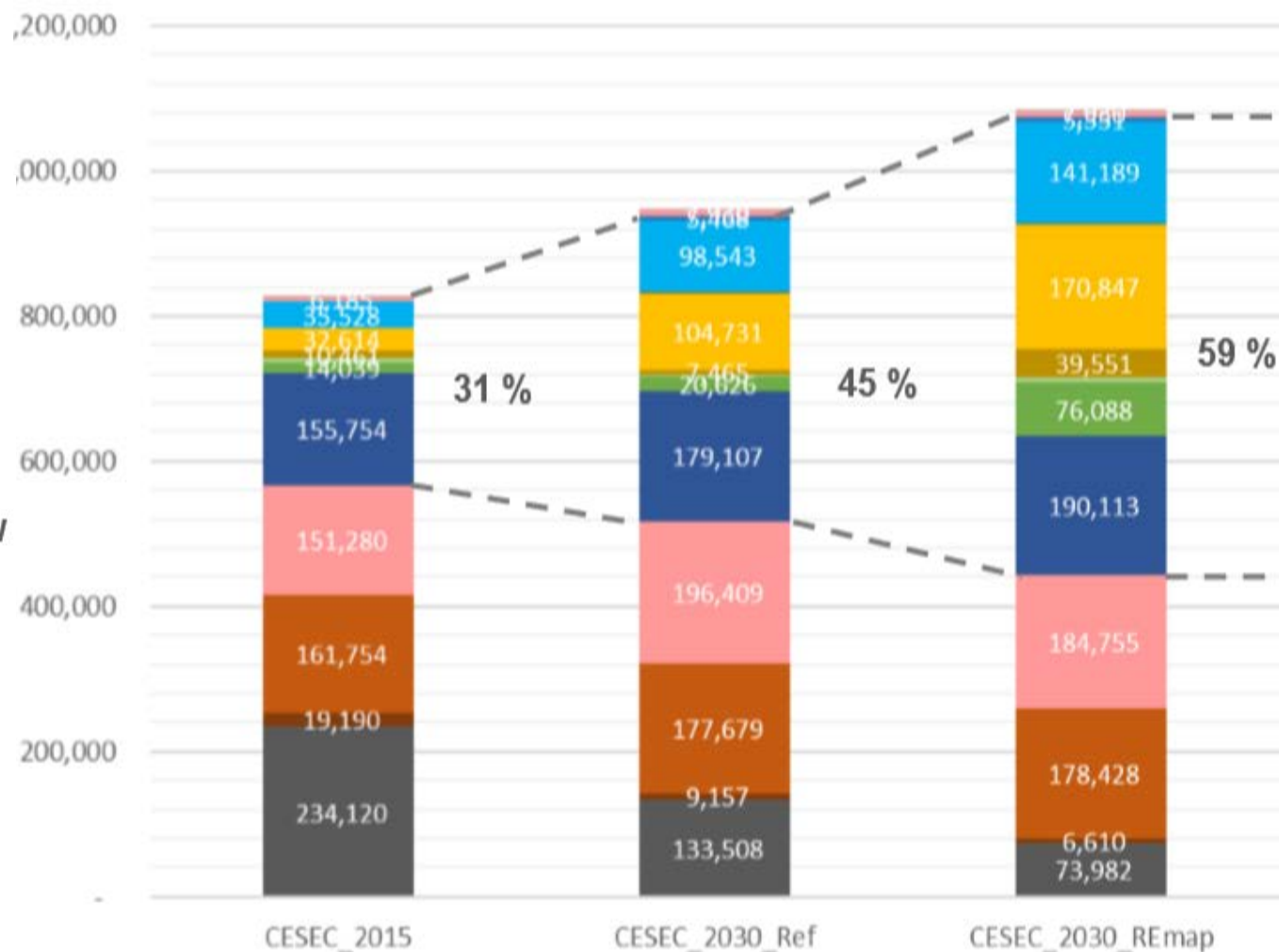
- Estimated > 70 GW of potential in CESEC.
- Key asset for energy security.
- Strong complementarity with wind and solar.
- Cost-effective integration of renewables.

Renewables in the power sector

Power generation capacity_CEEC [MW]



Power generation_CEEC [GWh]



- Gas
- Wind onshore
- Coal
- Solid biomass
- Other
- Hydro (excl. pumped hydro)
- Ocean
- Nuclear
- Solar PV
- Geothermal
- Wind offshore
- Biogas
- CSP
- Liquid biofuels

Pan-European power sector modelling

– high level findings

The REmap case could be feasible at regional level, with planned interconnectors (more detailed country-specific modelling is required to fully assess operability at country level)

Observed impacts of higher shares of renewables in integrated market:

- Limited structural curtailment of renewables.
- Larger volumes of electricity traded across interconnectors (6% up vs. Reference)
- Downward pressure on marginal prices.
- Increased cycling of conventional plants and pumped hydro facilities.

Coordinating security of supply at regional level can avoid planned reinvestments in fossil generation capacity.

Further integration of power systems should be linked to introduction of carbon pricing to avoid carbon leakage.

Way forward/Next Steps

CESEC

- Launch of IRENA REmap Study at CESEC ministerial in April 2020
- Provide new input in CESEC discussions
- EC study on RES potentials and regional infrastructure planning

European Commission

- Green New Deal and Green Agenda for Western Balkans
- Clean Energy Package targets Energy Community
- Continued work EC-IRENA

Thank you



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