eurelectric

DECARBONISATION PATHWAYS: EUROPEAN ECONOMY

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Stakeholder consultation high level event
Session II: Economy, finance, investment
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EUROPEAN ELECTRICITY INDUSTRY LONG-TERM VISION

WE WILL

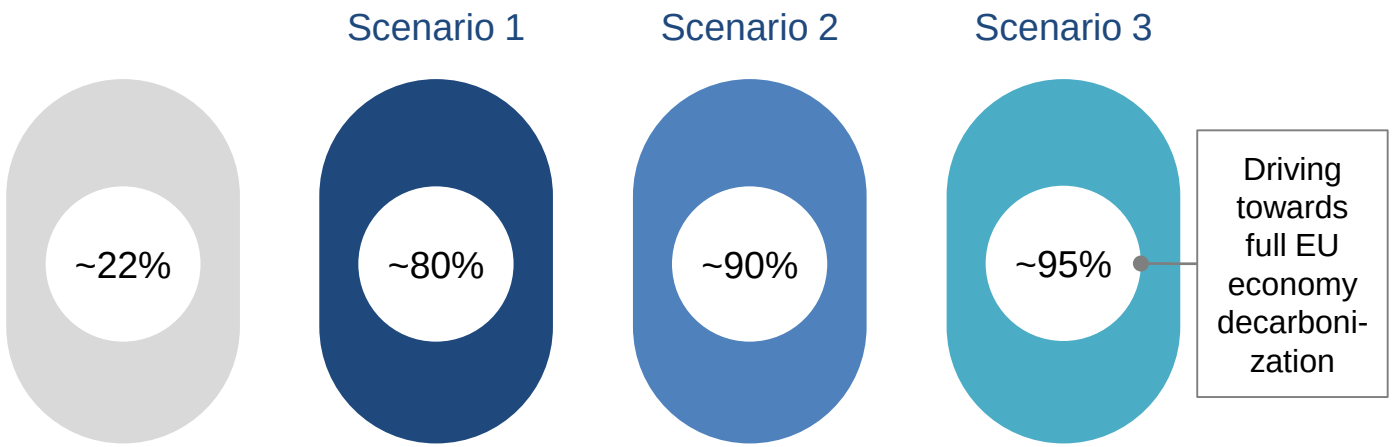
- INVEST in clean power generation and transition-enabling solutions, to reduce emissions and actively pursuse efforts to become carbon-neutral well before mid-century […]

- TRANSFORM the energy system to make it more responsive, more resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities

eurelectric designed 3 deep EU decarbonization scenarios

2015 - Baseline | 2050 scenarios

EU economy decarbonization achieved vs. 1990[1,2]



4 underlying pre-requisites and drivers per scenario:
level of ambition, technology development, consumer behavior and regulation

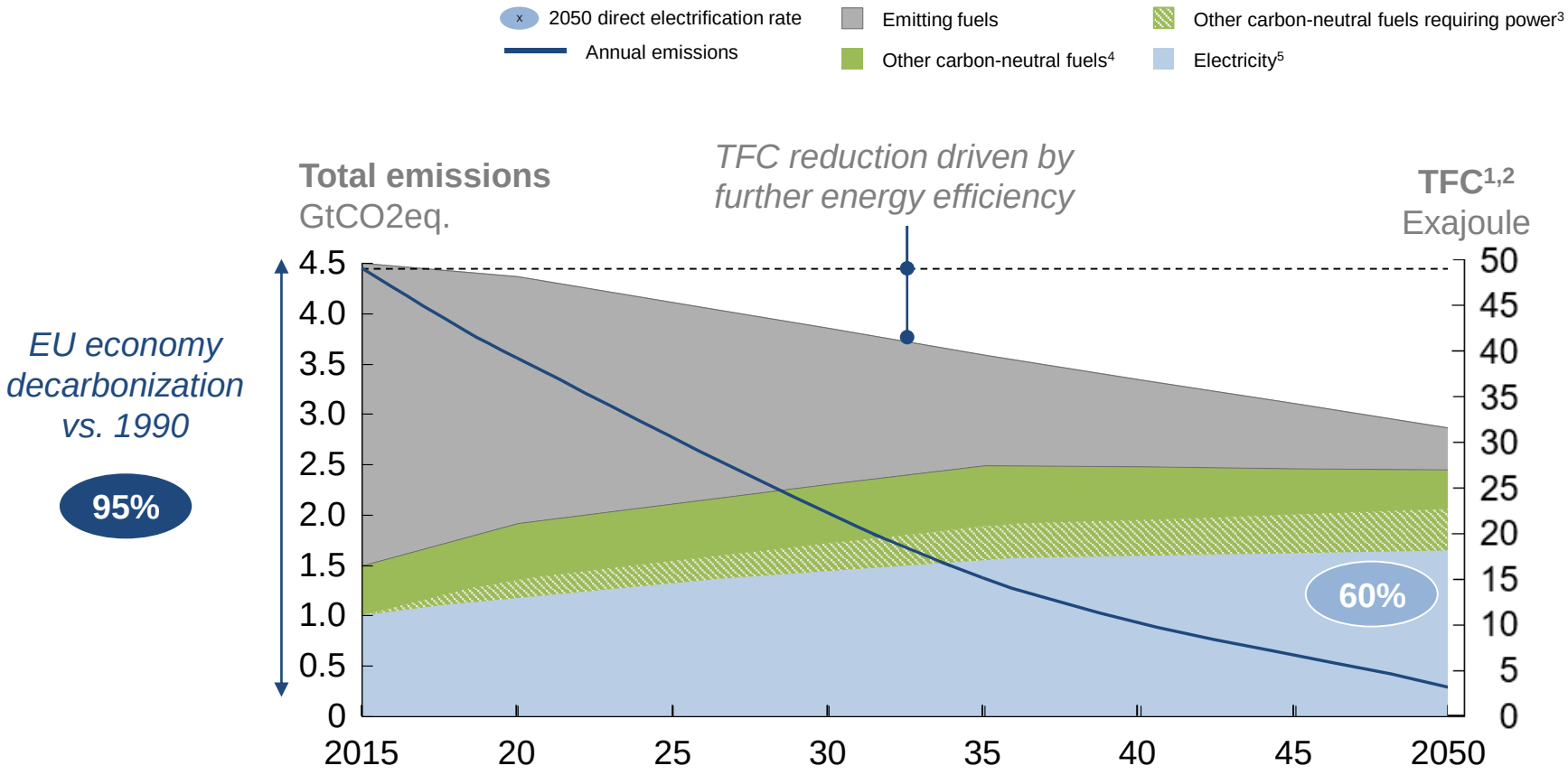
1 Emissions out of scope are expected to contribute proportionally to the decarbonization effort required in each scenario
2 Decarbonization will be different by sector depending on relative costs and available technologies, industry contributing least with below 80% of emission reduction in all scenarios

Direct electrification results by scenario

		2015 Baseline	2050 Scenario 1	2050 Scenario 2	2050 Scenario 3
Total EU economy	EU economy decarbonization vs 1990	22%	80%	90%	95%
	Direct electrification rate	22%	38%	48%	60%
Total transport	Direct electrification rate	**1%**	29%	43%	63%
Total buildings	Direct electrification rate	**34%**	45%	54%	63%
Total industries	Direct electrification rate	**33%**	38%	44%	50%

95% decarbonization through strong electrification, energy efficiency, and support from other non-emitting fuels

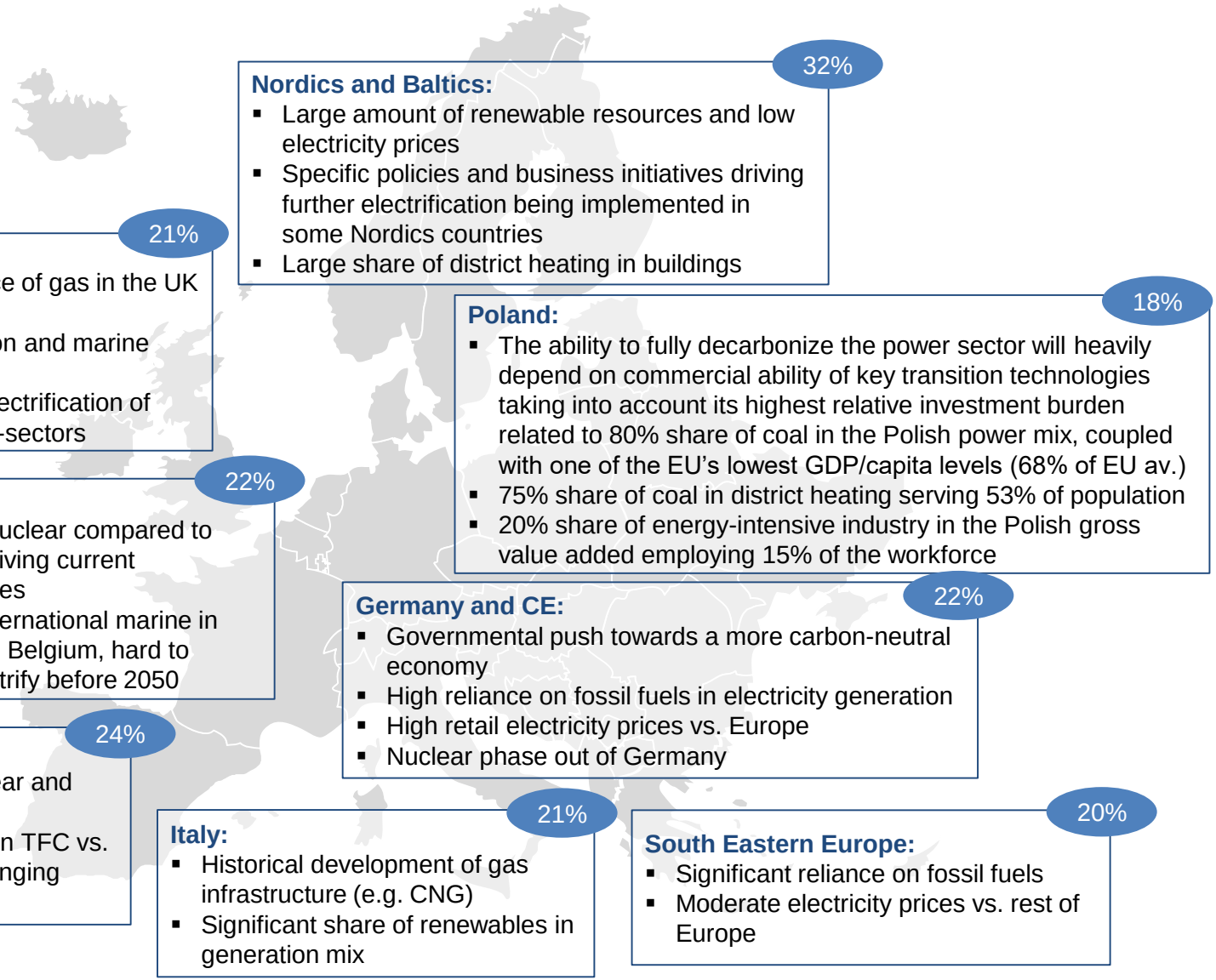
Impact of electrification on Total Final Energy Consumption (TFC) and EU economy emissions



1 Includes 32 countries in scope: EU28 + EEA; ENTSOE report additionally includes Turkey and other Eastern European countries adding up to a total of ~3,300 TWh
2 Electricity consumption from transformation sectors not included; 3 Includes non-emitting fuels that trigger indirect electrification through power-to-X (H2, synth fuels) as well as non-emitting fuels that trigger increased electricity demand to be produced such as biofuels; 4 Includes all other non-emitting fuels/sources such as geothermal, solar thermal, and others; 5 Direct electricity consumption

Different starting points in the energy transition

2015 baseline – direct electrification rate



Nordics and Baltics: 32%
- Large amount of renewable resources and low electricity prices
- Specific policies and business initiatives driving further electrification being implemented in some Nordics countries
- Large share of district heating in buildings

UK - Ireland: 21%
- Historical importance of gas in the UK and oil in Ireland
- Low share of aviation and marine within TFC mix
- High potential for electrification of some industrial sub-sectors

Poland: 18%
- The ability to fully decarbonize the power sector will heavily depend on commercial ability of key transition technologies taking into account its highest relative investment burden related to 80% share of coal in the Polish power mix, coupled with one of the EU's lowest GDP/capita levels (68% of EU av.)
- 75% share of coal in district heating serving 53% of population
- 20% share of energy-intensive industry in the Polish gross value added employing 15% of the workforce

France - Benelux: 22%
- Large share of nuclear compared to other regions, driving current electrification rates
- High share of international marine in Netherlands and Belgium, hard to significantly electrify before 2050

Germany and CE: 22%
- Governmental push towards a more carbon-neutral economy
- High reliance on fossil fuels in electricity generation
- High retail electricity prices vs. Europe
- Nuclear phase out of Germany

Iberia: 24%
- Significant share of nuclear and renewables
- Highest share of marine in TFC vs. other regions, with challenging electrification

Italy: 21%
- Historical development of gas infrastructure (e.g. CNG)
- Significant share of renewables in generation mix

South Eastern Europe: 20%
- Significant reliance on fossil fuels
- Moderate electricity prices vs. rest of Europe