

H₂ and Biomethane Network Readiness in Greece

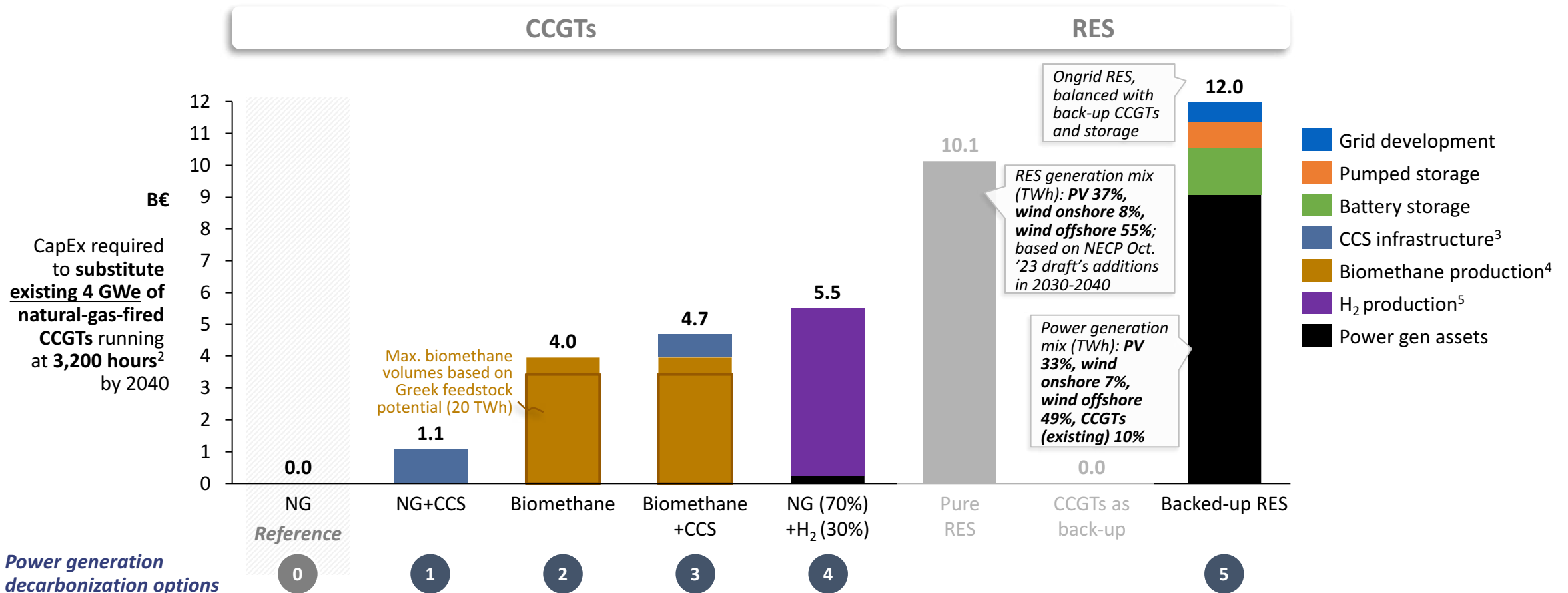
Hydrogen and Green Gases Forum, Athens, 24.06.2025



Required resources (costs) are vital for a smooth path to energy transition

The most efficient use of existing infrastructures the same...

CapEx¹ by power generation decarbonization option (2040)



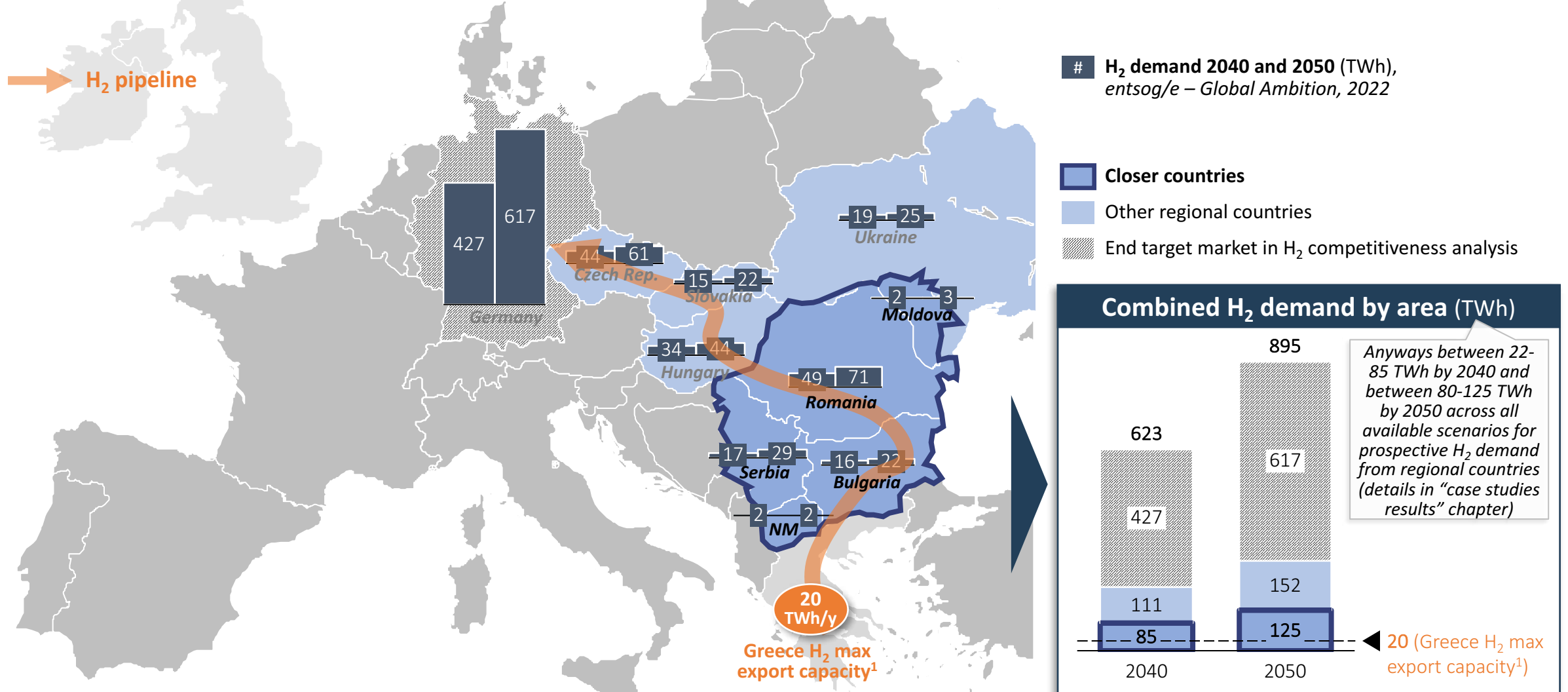
Power generation decarbonization options

Notes: 1) System-level CapEx, including infrastructure investments required to produce decarbonized gases (i.e. biomethane, green H₂) used in power generation; 2) Average 2005-2023; 3) Including CO₂ capture plant and distribution and storage investments; 4) Including anaerobic digestion plant, biogas upgrading plant, and connection to national grid / direct (local) pipe; 5) Including dedicated off-grid RES with optimal Greek mix, electrolyzer H₂ tank storage, and Greek H₂ backbone
Source: Internal analysis of the team

Germany and the SEE region appears attractive for Greek H₂ exports, with a total demand significantly higher than the 20 TWh/y Greek maximum export capacity

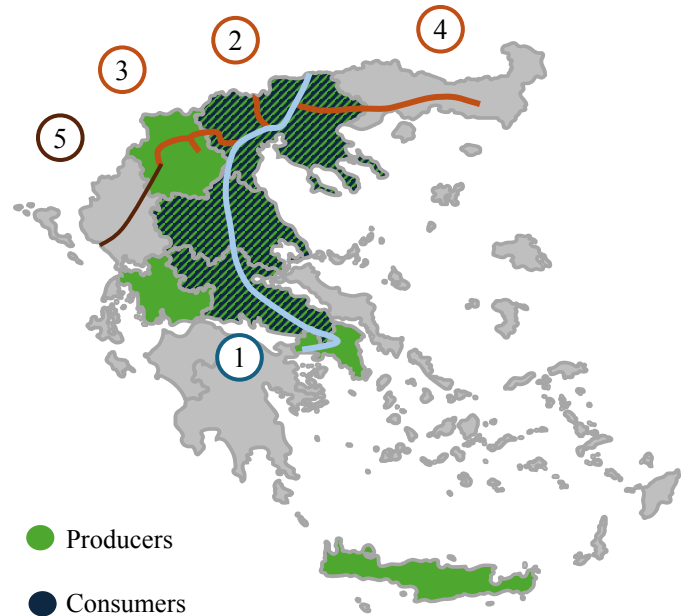


Focus on regional H₂ demand along the SEE corridor – entsog/e Global Ambition 2022 (TWh)

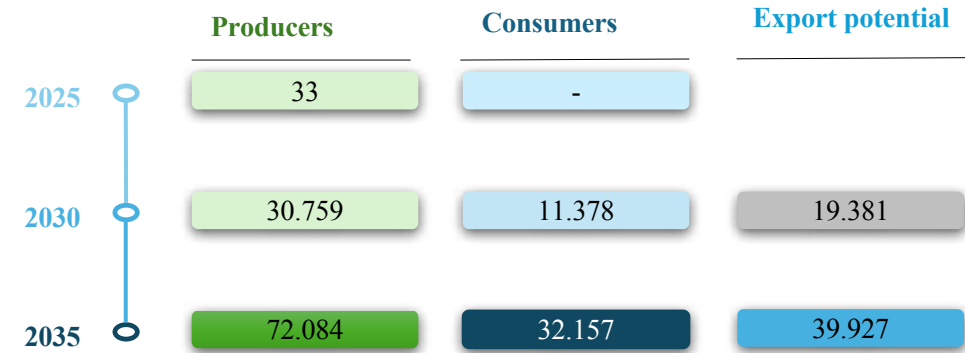


Notes: 1) Maximum technical export capacity amounting to 29 TWh/y, down to 20 TWh/y considering 1.5 typical capacity-to-delivery ratio
Source: entsog/e, UNECE, project team analysis

In Q3 2024, DESFA and Bulgartransgaz concluded a Hydrogen Call of Interest, which confirmed Greece's strong H2 net export potential

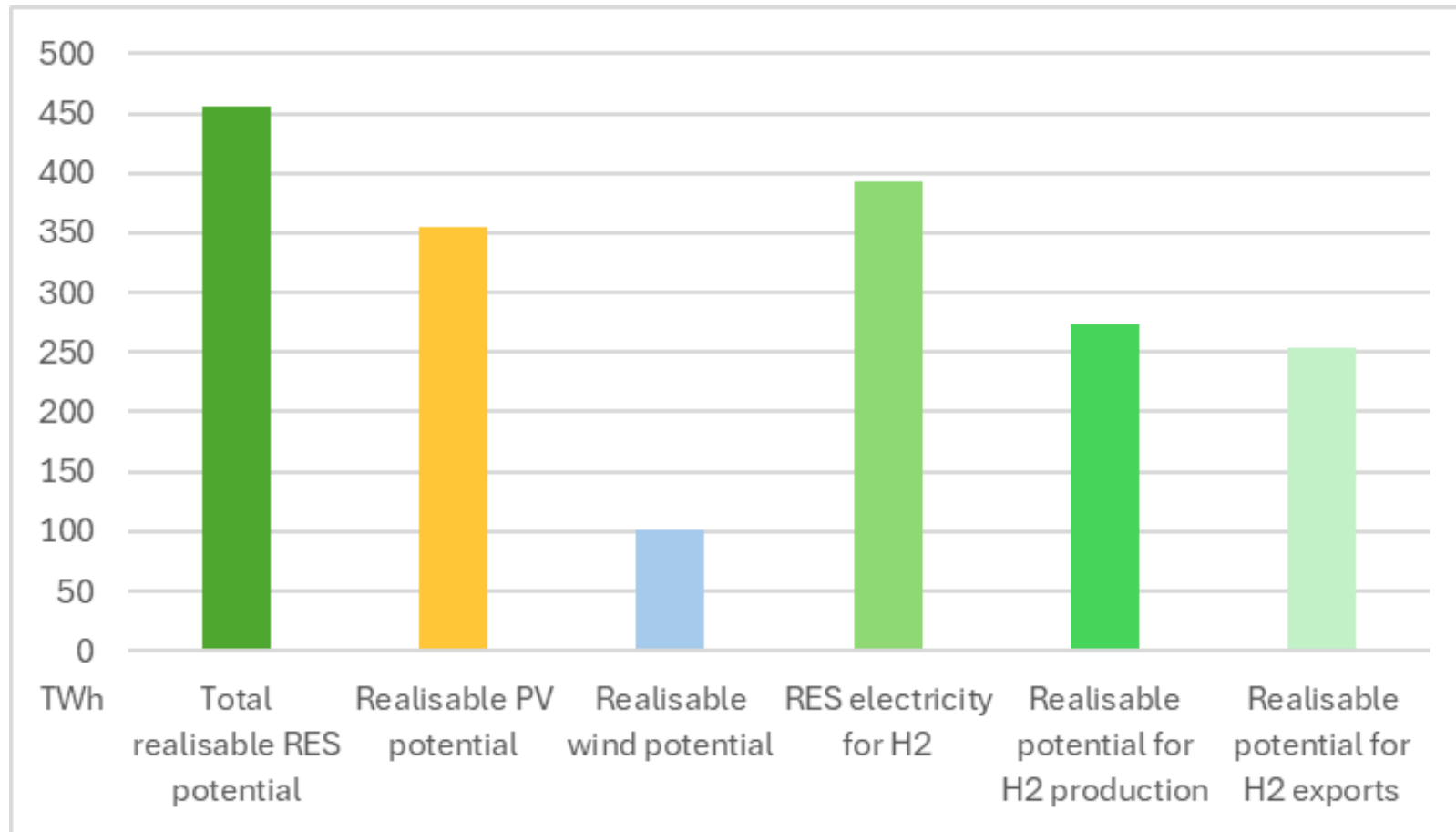


- ① H2DRIA Project
- ② Greece-North Macedonia Interconnector
- ③ Pipeline to Western Macedonia
- ④ Karperi-Komotini Pipeline
- ⑤ Komnina-Florovouni



Region	Production (MWh/d)	Consumption (MWh/d)
Thessaly	32.707	31.968
Central Macedonia	27.828	65
Western Macedonia	5.543	-
Central Greece	4.287	124
Crete	1.277	-
Attica	427	-
Western Greece	15	-
Total	72.084	32.157

Green hydrogen production potential in Greece

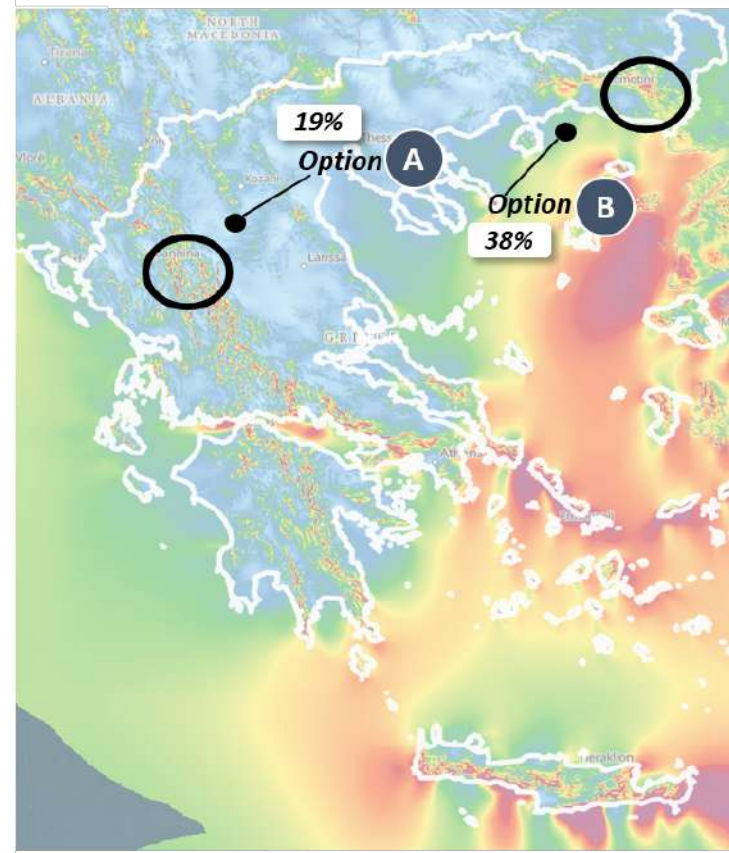
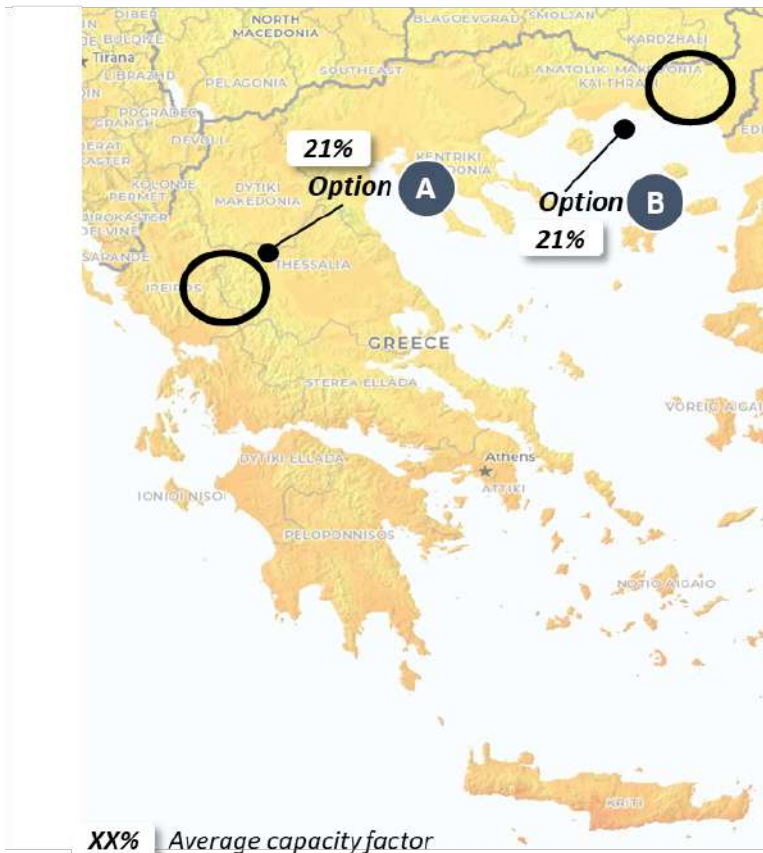


To assess options for transport of 20TWh/y of H2 from Greece to Germany, DESFA considered two suitable production areas, near Metsovo and Komotini

Greek hydrogen production areas considered

Solar irradiation

Wind power density



Production option A Production option B

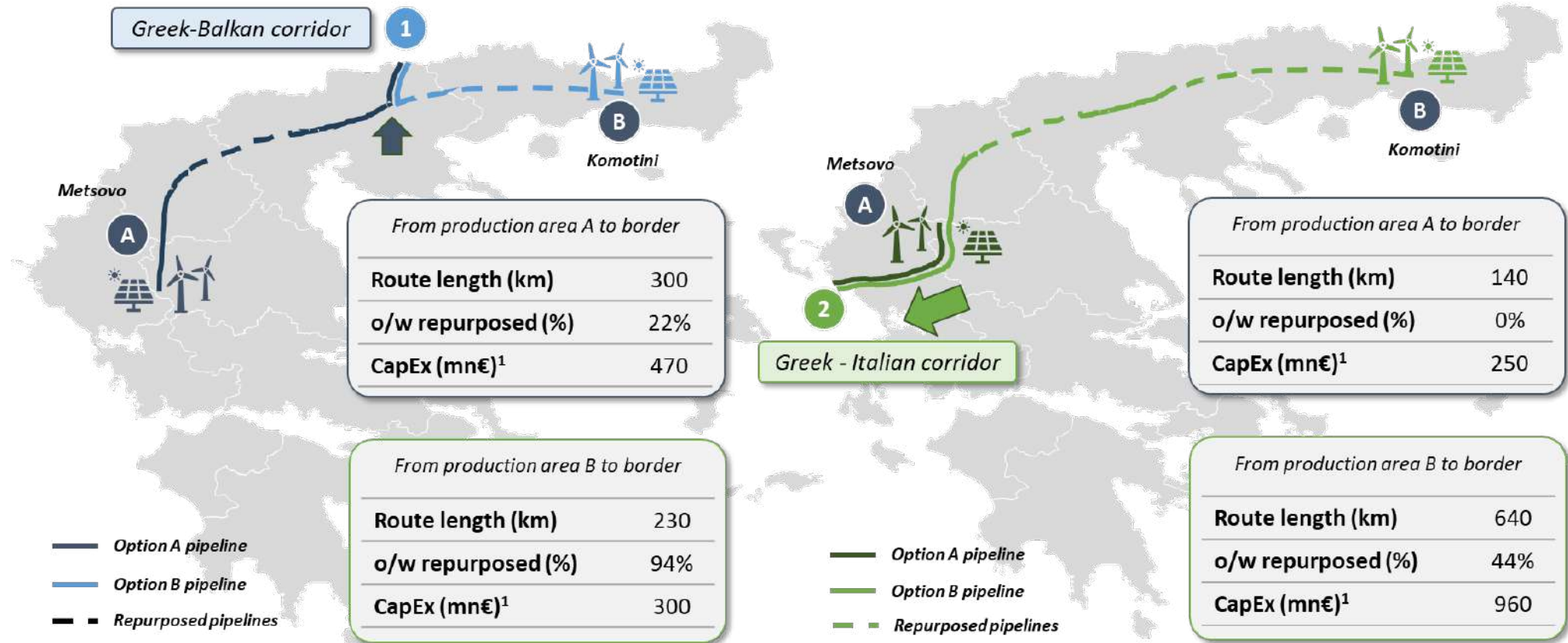
	A	B
Production site	Mountainous and hilly area of Epirus / Thessaly (near Metsovo)	In the Komotini area
Land availability	~2,200 km ²	~2,600 km ²
Wind capacity factor	19% ¹	38% ¹
Solar capacity factor	21% ¹	21% ¹
Wind projects with production license²	~1.7 GW ~90 Projects	~4.3 GW ~200 Projects
Solar projects with production license²	~2.0 GW ~70 Projects	~2.0 GW ~120 Projects

XX% Average capacity factor

Notes: 1) To maximize the RES production potential of each of the area considered, the study has assumed the installation of double-axis tracking technology for PV and latest available wind technologies (e.g. 1.8/2.0 MW turbines); 2) The feasibility of constructing all the project licensed is to be further assessed / Source: Global Solar Atlas, Global Wind Atlas, RenewableNinja,



... complemented by a national pipeline infrastructure connecting the production areas to the Greek borders ranging from 140 to 640km



Notes: 1) CapEx includes compressors - For repurposed pipelines (i.e. Western Macedonia and Karperi-Komotini) the book value @2040 has been considered

To supply the green hydrogen produced to Germany, DESFA considered two transport routes, one via the Balkan region and one via Italy

Hydrogen transport options considered (from the Greek border to Germany)



For this reason, and in light of the interest expressed by German officials in the **development of southern hydrogen supply corridors**, a dedicated **task force** was established during bilateral discussions held at TIF 2024.

This task force consists of **high-level executives from the relevant ministries and Transmission System Operators (TSOs) of both Greece and Germany**.

Its primary objective is to conduct a comprehensive assessment of various potential options for hydrogen transportation towards central Europe.

Notes: 1) the exercise allocates only the portion of CapEx needed to transport the estimated volumes supplies (with a 1.5 capacity factor); 2) Off-shore pipeline CapEx and compressor to be further investigated;

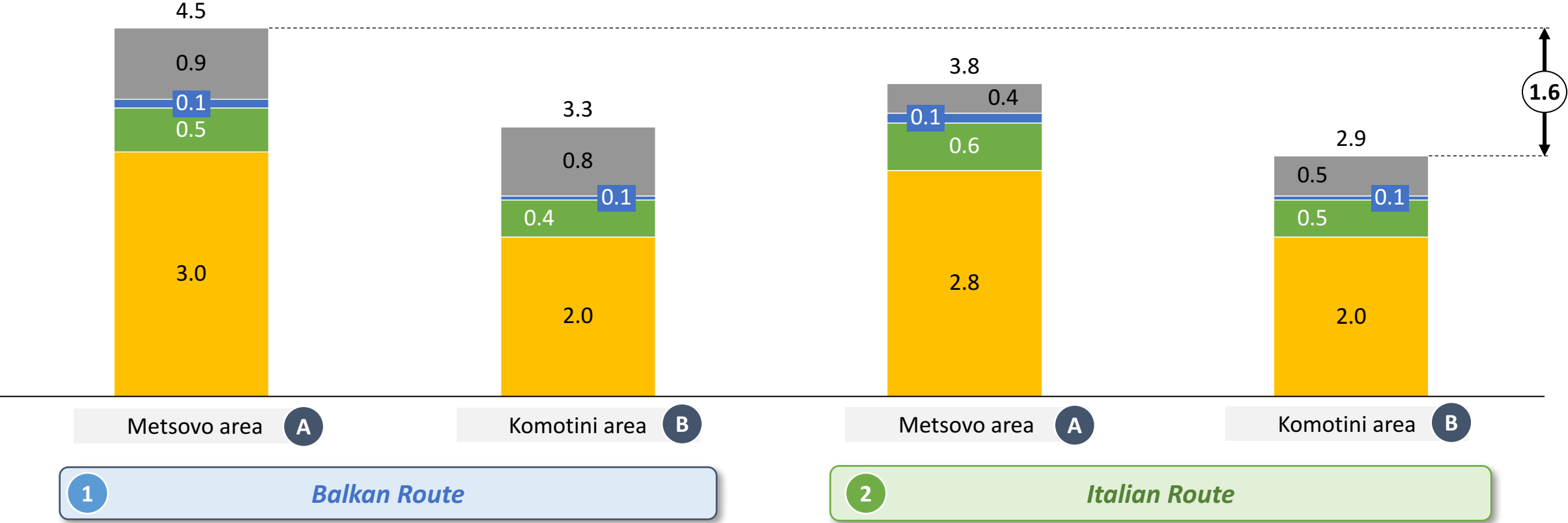
Eventually Greece could deliver ~20TWh of H₂ to Germany at a cost ranging between 2.9 and 4.5€/kg, with the Italian route resulting the most competitive



Simulation results (LCoH delivered by 2040, €/kg of H₂ delivered, real values)

■ Transport
 ■ Storage
 ■ Electrolyzer
 ■ LCOE

Estimated delivered volumes of ~20TWh (@2040)



Green H2: A new ecosystem maturing in Greece through DESFA's H2DRIA & Komnina-Florovouni projects



Thank you

Michalis Thomadakis,

