

Decarbonization of the Energy Sector of Serbia 2025 - 2030

CIGRE Serbia
NECP 2025 - 2030 of Serbia and an
overview of the current development phase



cigre

For power system expertise

Colloquium CIGRE SEERC, Ljubljana, 29.02.2024

National Energy and Climate Plan

National and international legal basis

REGULATION (EU) 2018/1999 on the Governance of the Energy Union and Climate Action

POLICY GUIDELINES by the Energy Community Secretariat on the development of National Energy and Climate Plans under Recommendation 2018/01/MC-EnC

Ministerial Council Decision 2021/14/MC-EnC on incorporating Regulation (EU) 2018/1999 in the EnC acquis communautaire and amending Annex I of the Treaty
Ministerial Council December 2022 – Amendment of Annex I of the Treaty

Amendments to Law of Energy, Law on EE and Rational Use of Energy, Law on Use of RES, Amendments to Law on Mining and Geological Research (Official Gazette of RS, no. 40/21)

Law on Climate Change (Official Gazette of RS, no. 26/21)

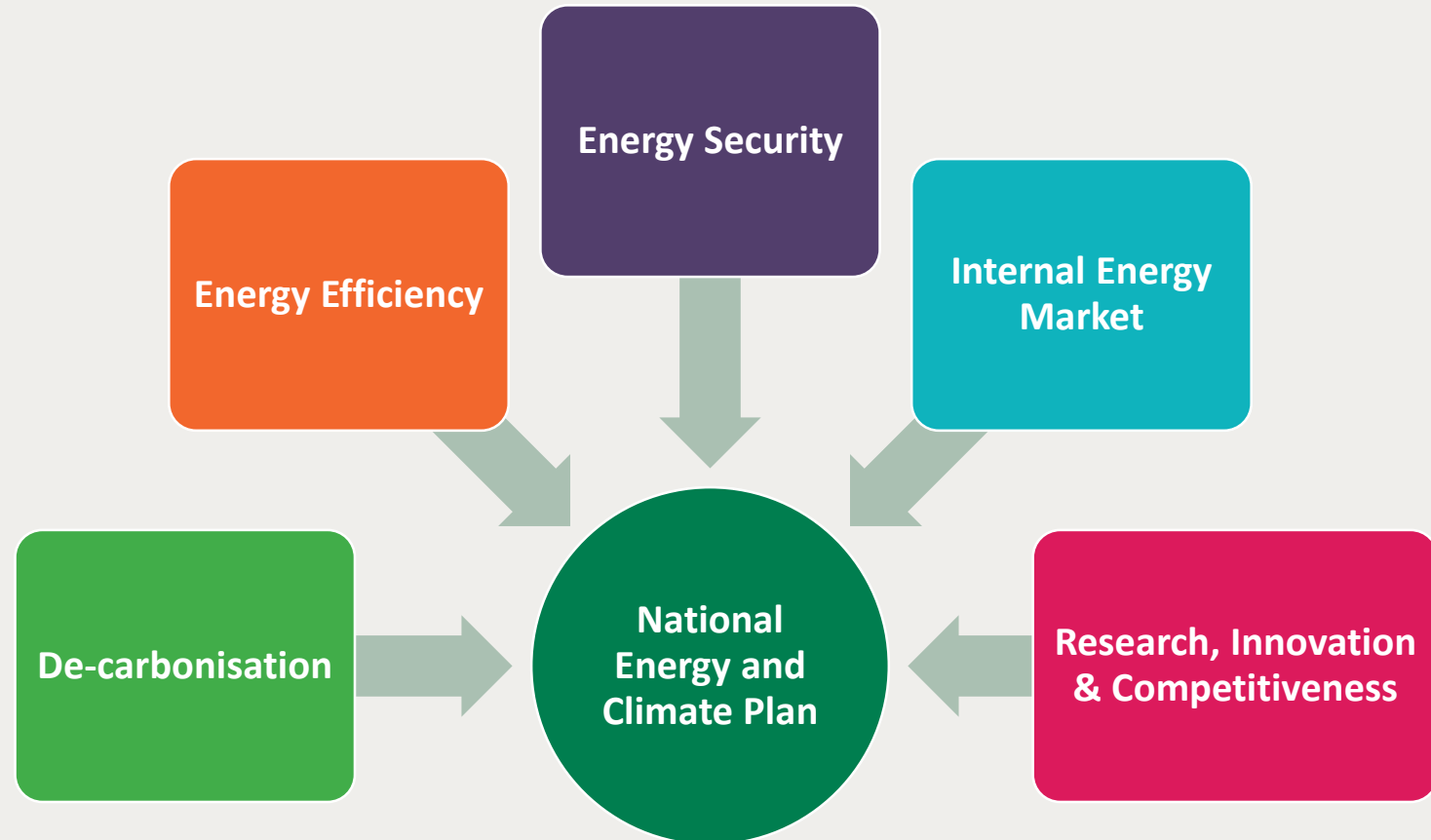
Amendments to Law on Use of RES, (Official Gazette of RS, no. 35/23)

Rulebook on the detailed content and guidelines for determining the national goals of the Integrated National Energy and Climate Plan, the method of its preparation and reporting on its implementation (Official Gazette of the Republic of Serbia, no. 49/2022)

National Energy and Climate Plan

Dimensional structure of the document

The NECPs include national objectives and targets and respective policies and measures for all five dimensions of the Energy Union

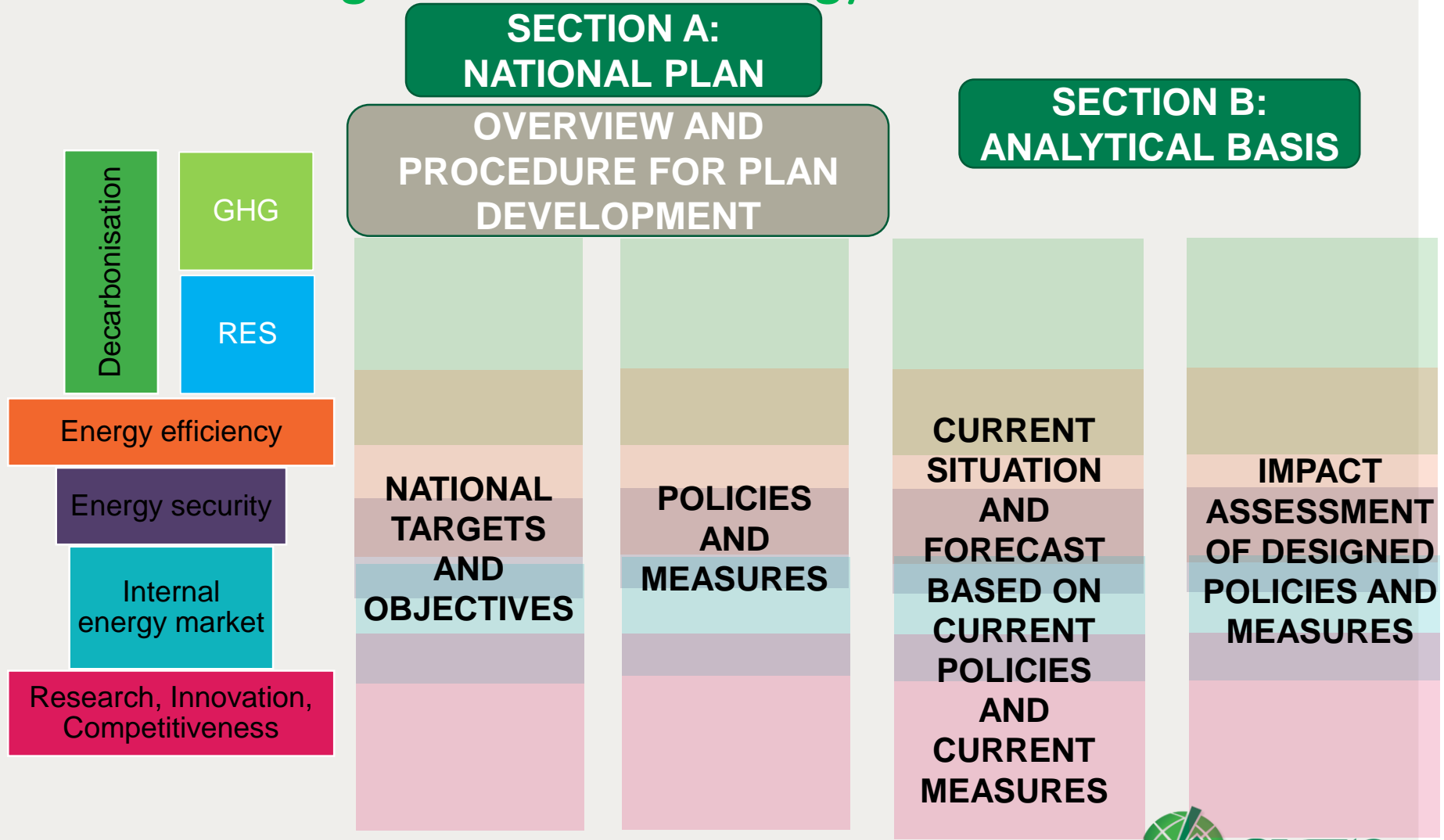


National Energy and Climate Plan

Structural Framework of the Integrated National Energy and Climate Plan

The mandatory structure and the content of the NECPs is outlined in Annex I of the Governance Regulation and includes:

- SECTION A: NATIONAL PLAN
- SECTION B: ANALYTICAL BASIS



Target/objective for 2030

Dimension	Target/objective	INECP proposed national contribution
GHG	GHG emissions reduction of total emissions in the policy scenario compared to 1990 levels	40% (47.76 MtCO ₂)
RES	Overall share of RES in GFEC	33.6%
	Contribution of biomass to the GFEC target	16.0%
	Contribution of heat pumps to the GFEC target	2.1%
	Contribution of RES electricity generation to the GFEC target (reduction to avoid excessive exports)	15.0%
	Contribution of biofuels in transportation in GFEC	0.5%
EE	Primary energy consumption	14.68 Mtoe
	Final energy consumption	9.7 Mtoe

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Key Results and Projections Respect to 1990

Overall GHG emission reduction (energy use, fugitive, industrial processes including agriculture, waste and LULUCF)

Key 2030 and 2050 findings on GHG emission reduction

➤ In 2030:

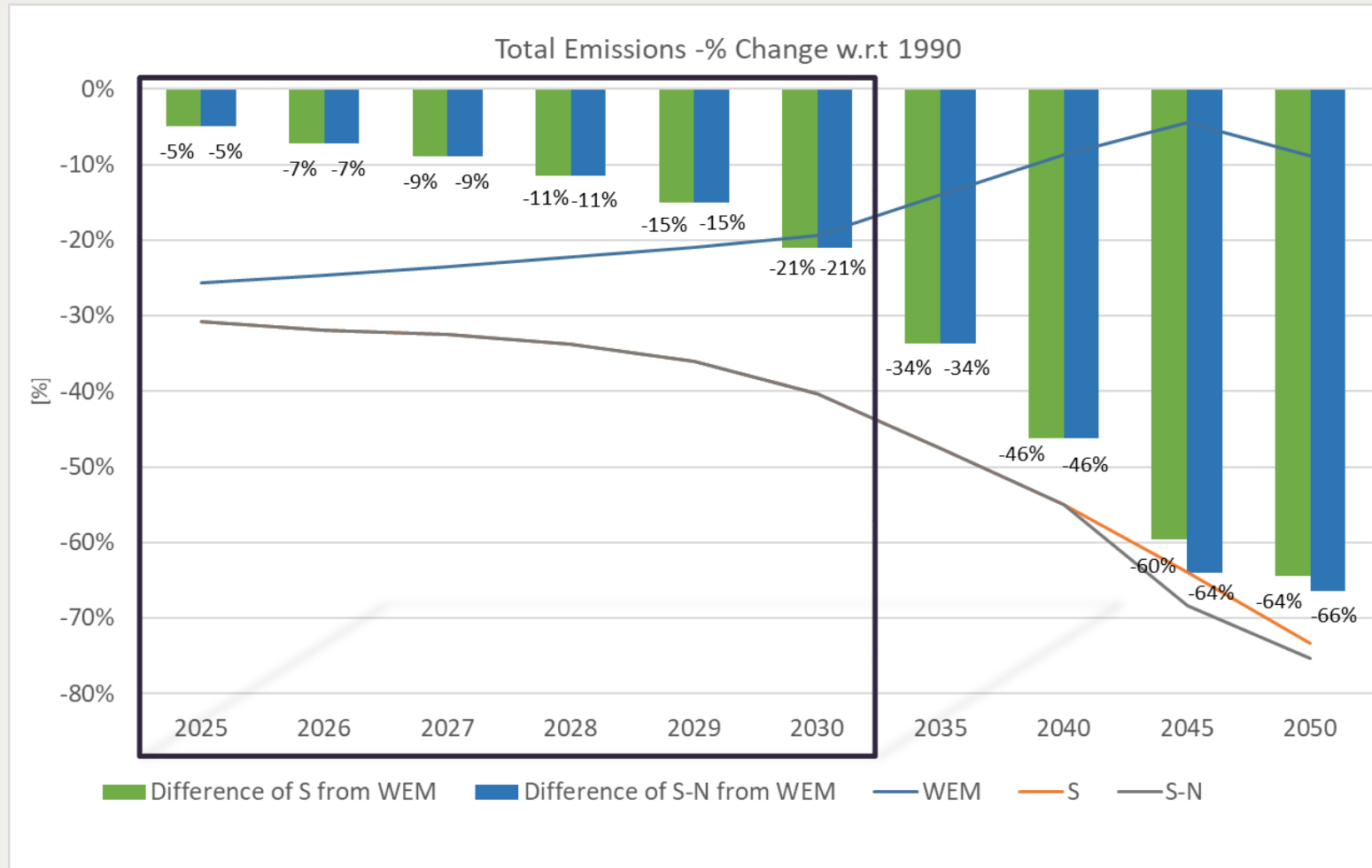
reduction of 19% compared to 1990 for WEM

reduction of 40.3% compared to 1990 for Scenario S

➤ In 2050:

reduction of 9% compared to 1990 for WEM

reduction of 73% and 75% compared to 1990 for Scenario S and S-N

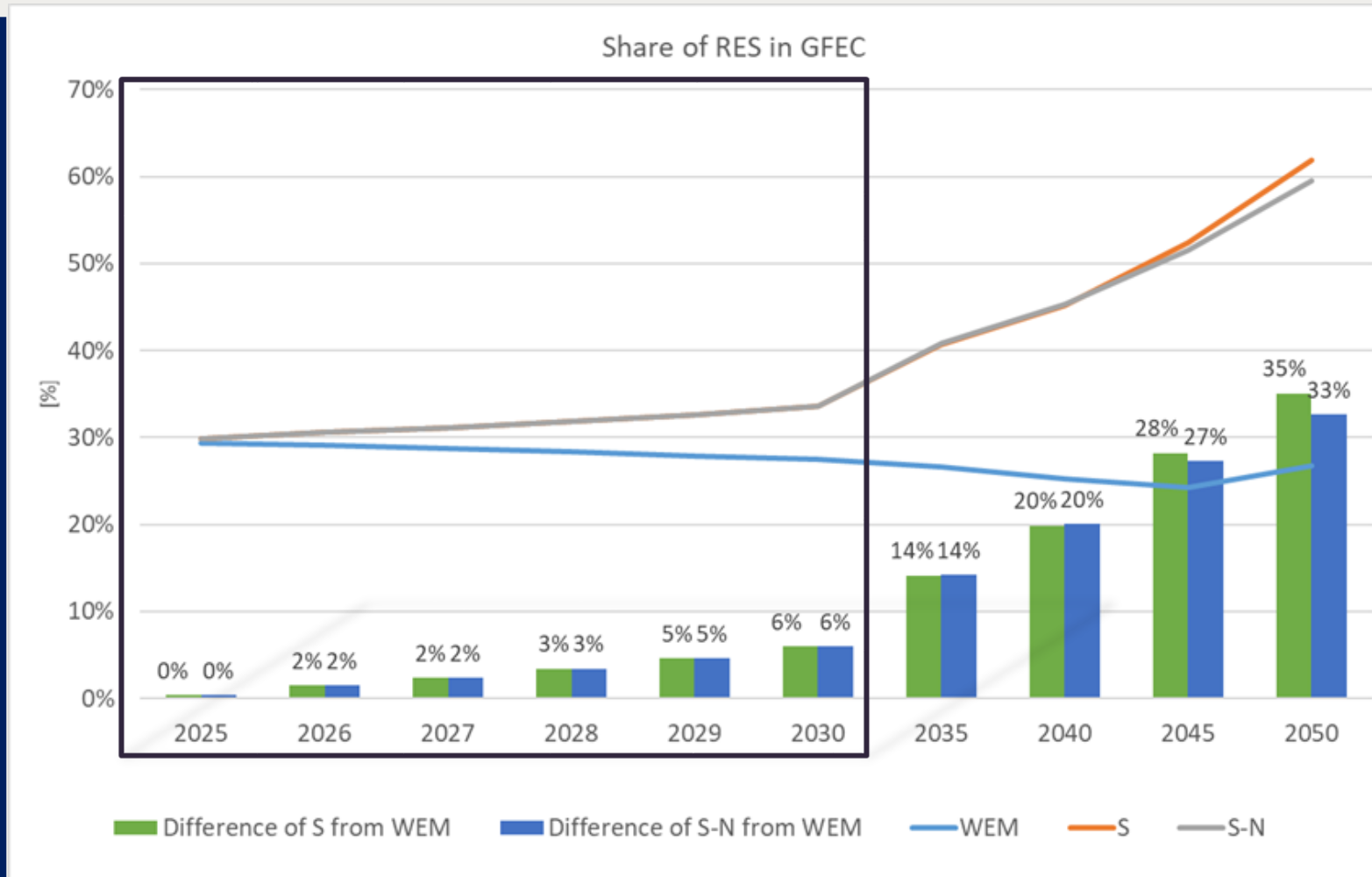


National Energy and Climate Plan

Key Results and Projections - Share of RES in GFEC and sectoral

Key 2030 and 2050 targets on RES

- In 2030:
Scenario S and S-N:
33.6% in Gross Final Energy Consumption.
- In 2050:
Scenario S: 62% in Gross Final Energy Consumption.
Scenario S-N: 60% in Gross Final Energy Consumption



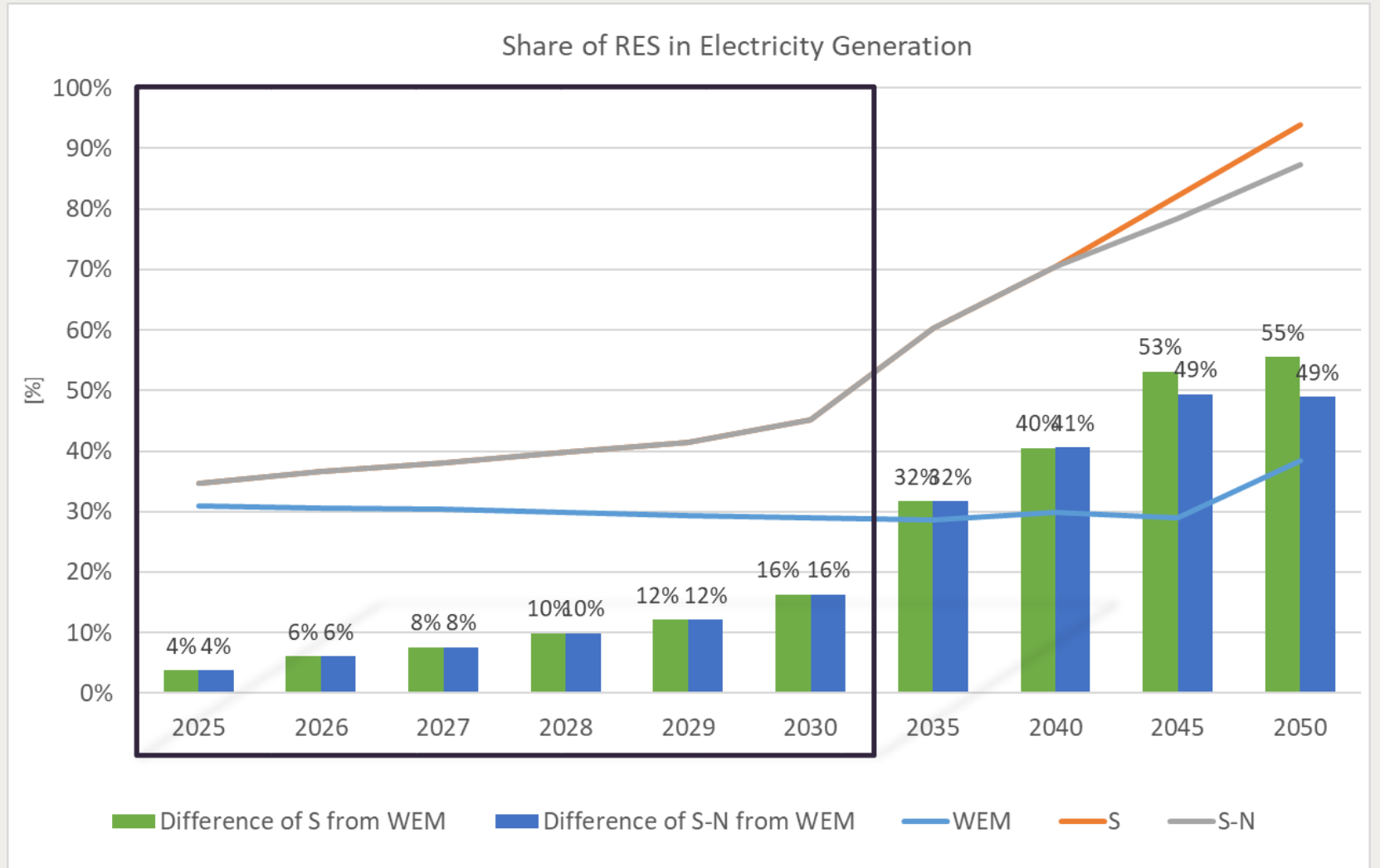
National Energy and Climate Plan

Key Results and Projections - Share of RES in GFEC and sectoral

Key 2030 and 2050 targets on RES

➤ In 2030:
Scenario S and S-N:
45% in the electricity generation.

➤ In 2050:
Scenario S: 94% in the electricity generation.
Scenario S-N: 87% in the electricity generation.

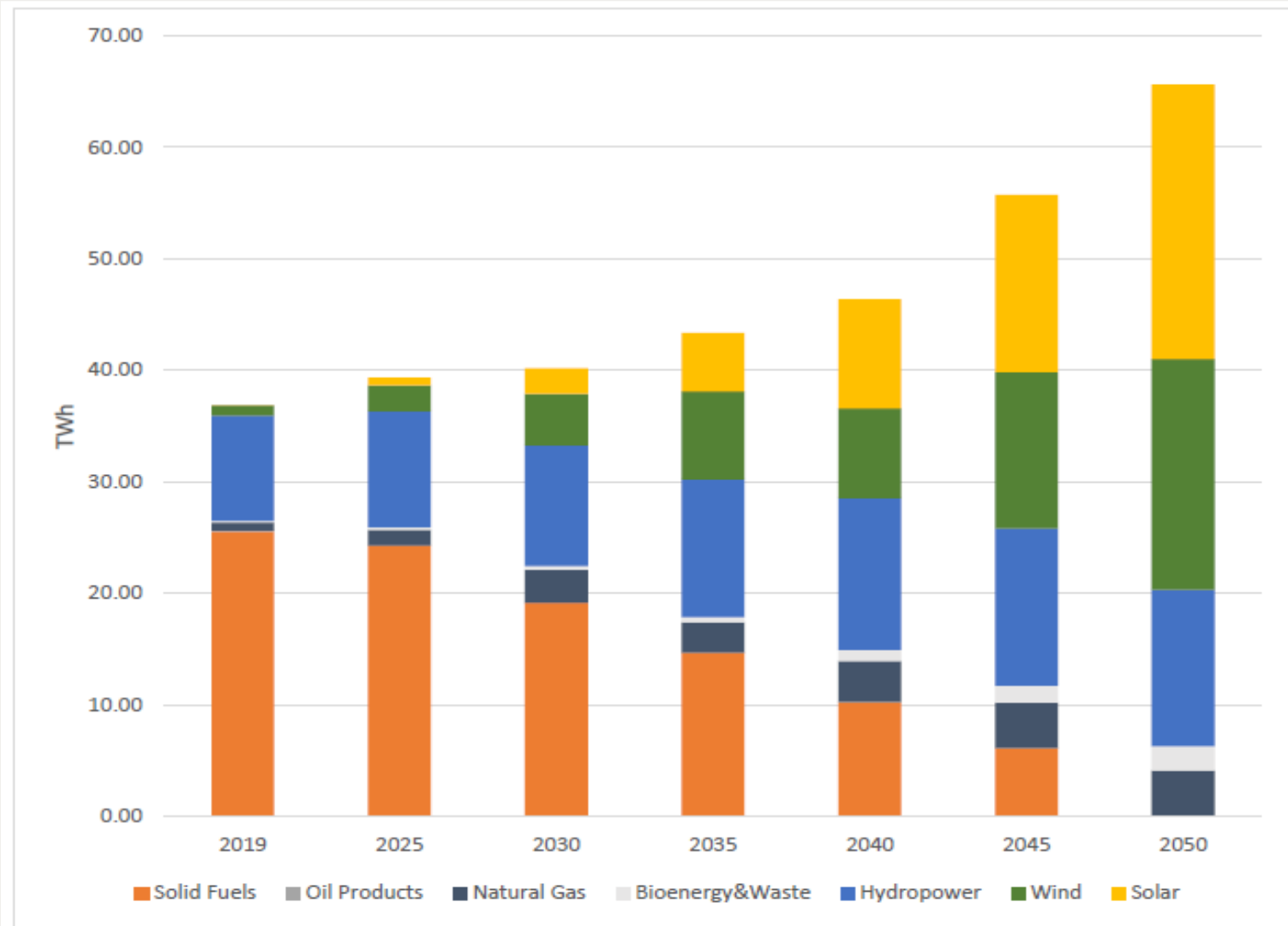


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Key Results and Projections - Electricity generation by source in Scenario S

Key 2030 and 2050 targets on RES

- In 2030:
Scenario S and S-N:
45% in the electricity generation.
- In 2050:
Scenario S: 94% in the electricity generation.



National Energy and Climate Plan

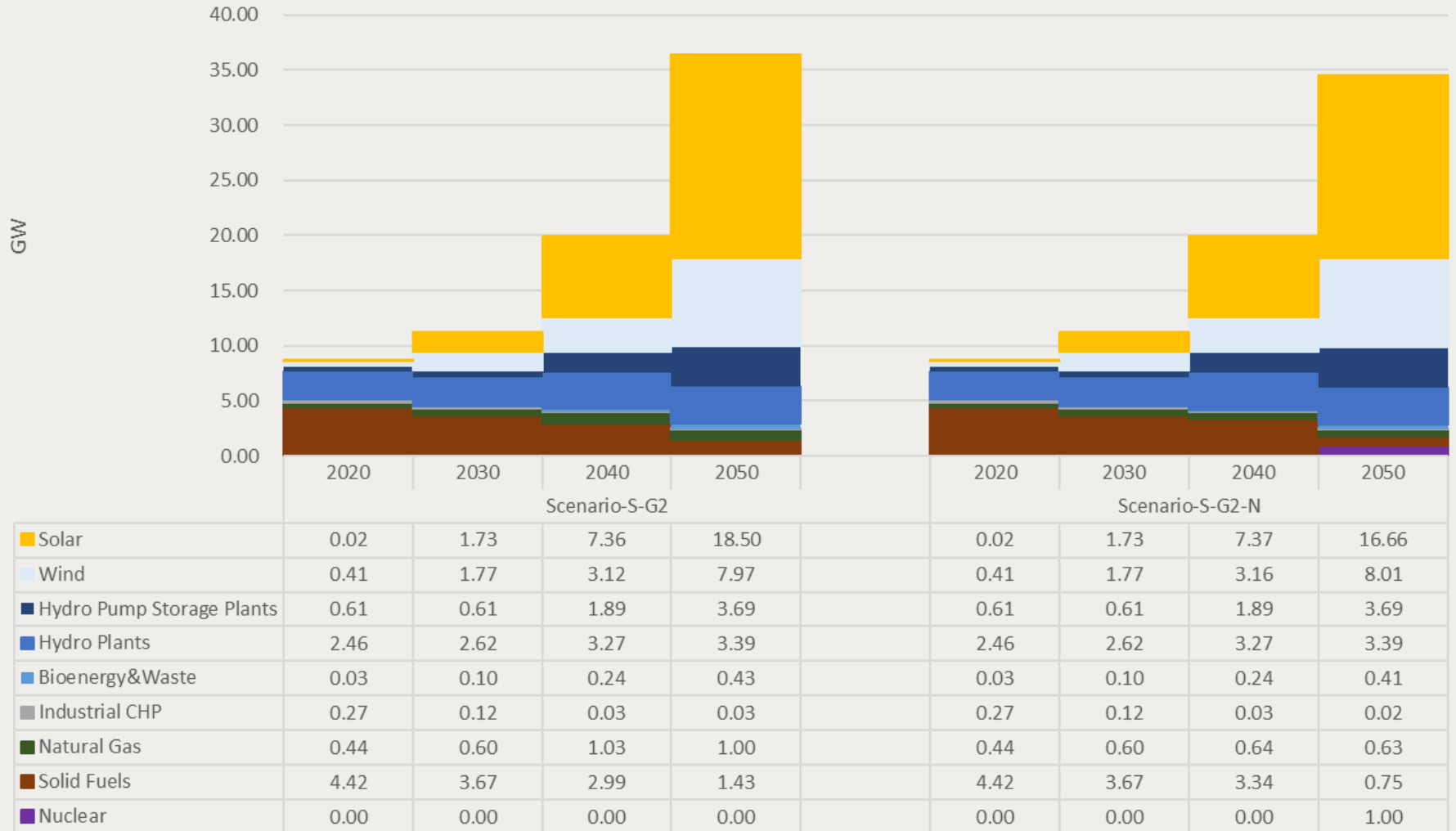
Key Results and Projections - Power System findings

Key 2030 and 2050 findings

➤ In 2030:
Capacity of wind 1.77GW
Capacity of Solar PV 1.73GW
New gas fired CCGT 350MW
No new Pump Storage Plants

➤ In 2050:
Scenario S
Capacity of wind 8GW
Capacity of Solar PV 18.5GW

Scenario S-N
Capacity of wind 8GW
Capacity of Solar PV 16.6GW
Nuclear 1GW in Scenario S-N



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Key Results and Projections - Installed RES capacity per technology per scenario until 2030

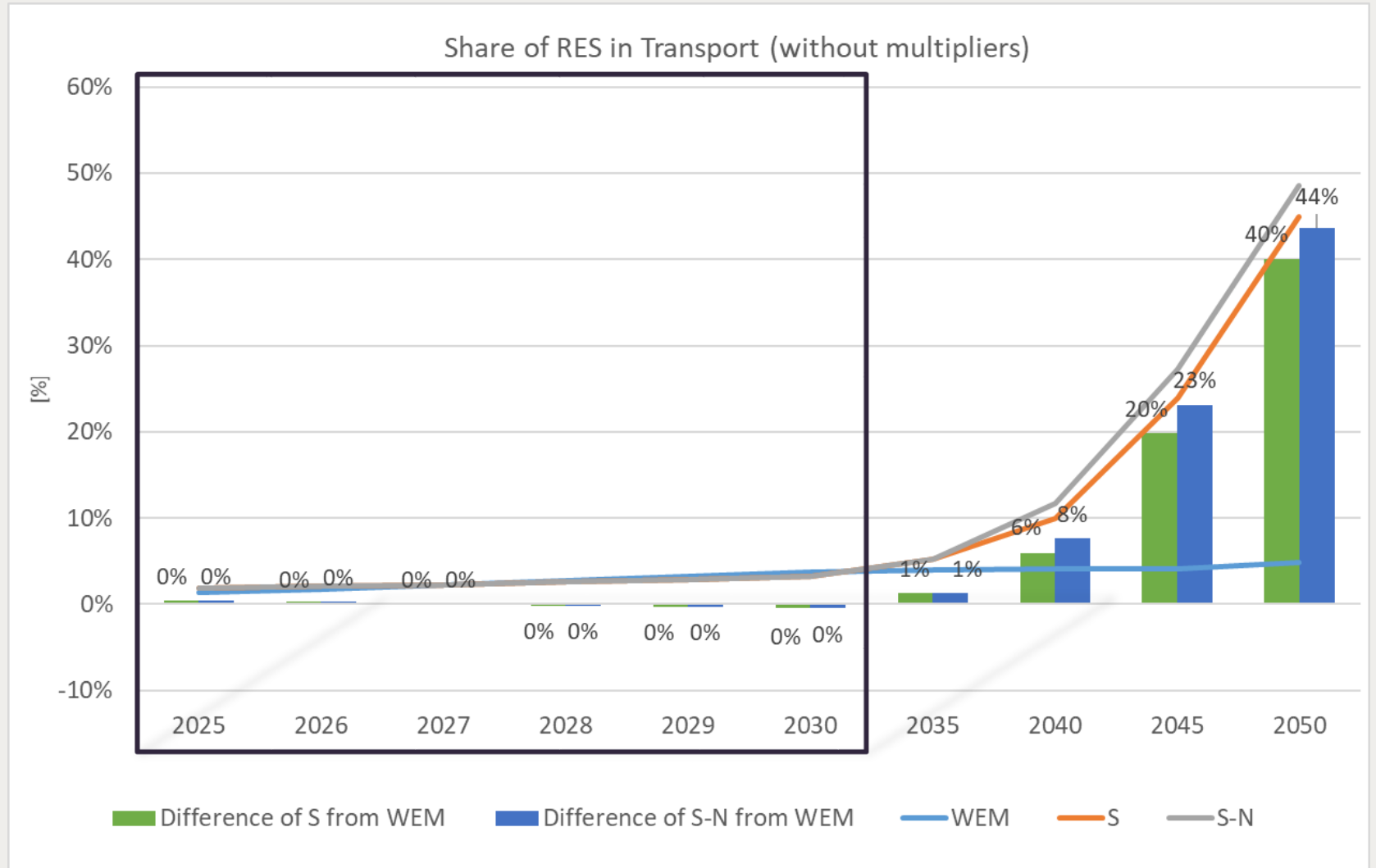
		Hydro Plants	Wind	Solar
2025	WEM	2,48	0,75	0,30
	S	2,48	0,90	0,51
	S-N	2,48	0,90	0,51
2026	WEM	2,48	0,75	0,30
	S	2,48	1,05	0,75
	S-N	2,48	1,05	0,75
2027	WEM	2,48	0,75	0,38
	S	2,48	1,21	0,99
	S-N	2,48	1,21	0,99
2028	WEM	2,48	0,75	0,38
	S	2,52	1,38	1,23
	S-N	2,52	1,38	1,23
2029	WEM	2,48	0,75	0,38
	S	2,52	1,57	1,48
	S-N	2,52	1,57	1,48
2030	WEM	2,48	0,75	0,38
	S	2,62	1,77	1,73
	S-N	2,62	1,77	1,73

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Key Results and Projections - Share of RES in GFEC and sectoral

Key 2030 and 2050 targets on RES

- In 2030:
Scenario S and S-N:
3.2% in the transport sector (7% with multipliers).
- In 2050:
Scenario S: 45% in the transport sector.
Scenario S-N: 49% in the transport sector.



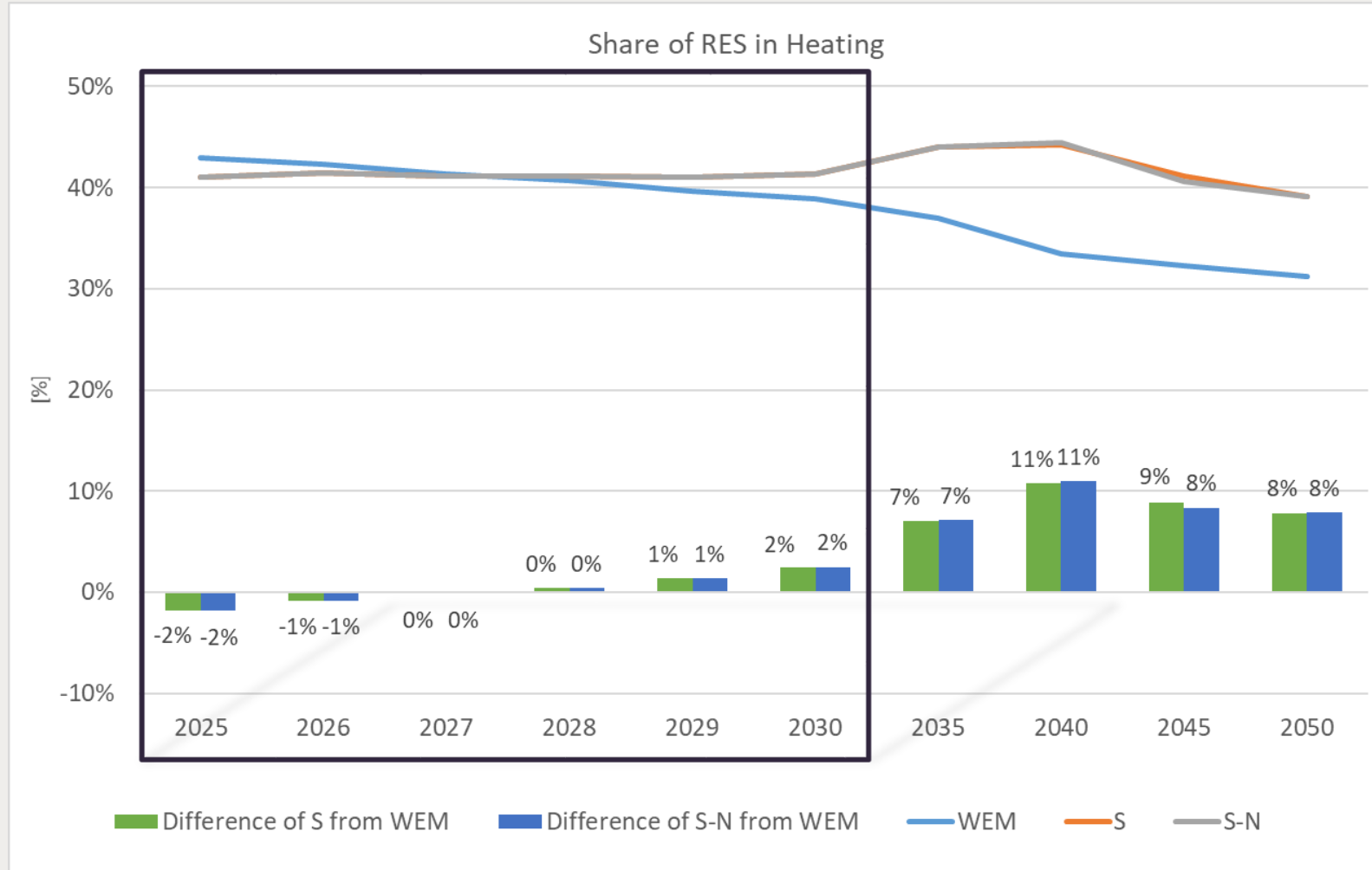
National Energy and Climate Plan

Key Results and Projections - Share of RES in GFEC and sectoral

Key 2030 and 2050 targets on RES

➤ In 2030:
Scenario S and S-N:
41% in the heating sector.

➤ In 2050:
Scenario S: 39% in the heating sector.
Scenario S-N: 39% in the heating sector.

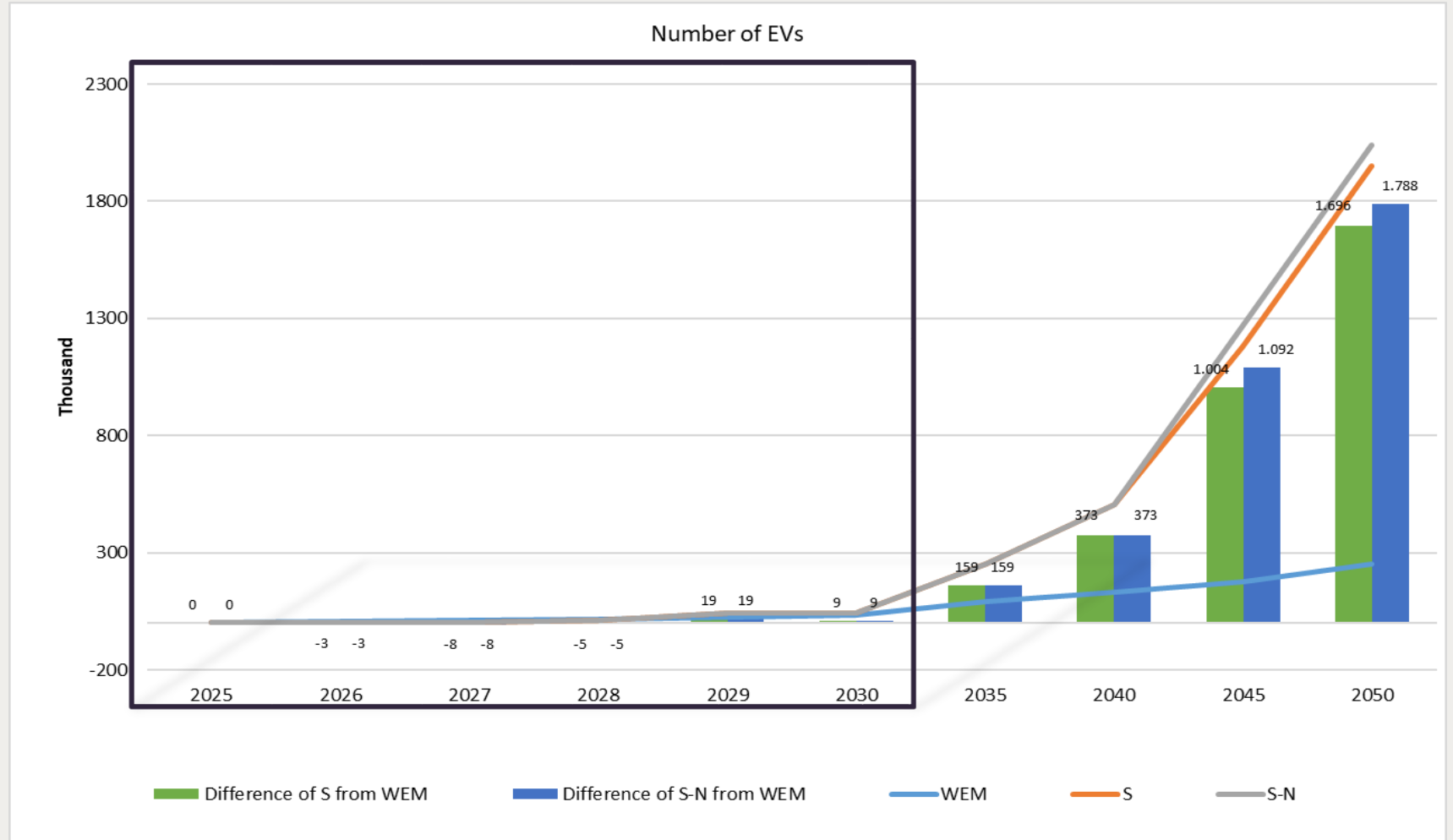


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Key Results and Projections - Number of EVs

Key 2030 and 2050 findings on Electric Vehicles

- cumulative number of electric vehicles is equal to 44.8 thousands in 2030.
- cumulative number of electric vehicles is equal to 507 thousand in 2040.
- cumulative number of electric vehicles is almost 2 million in 2050.



National Energy and Climate Plan

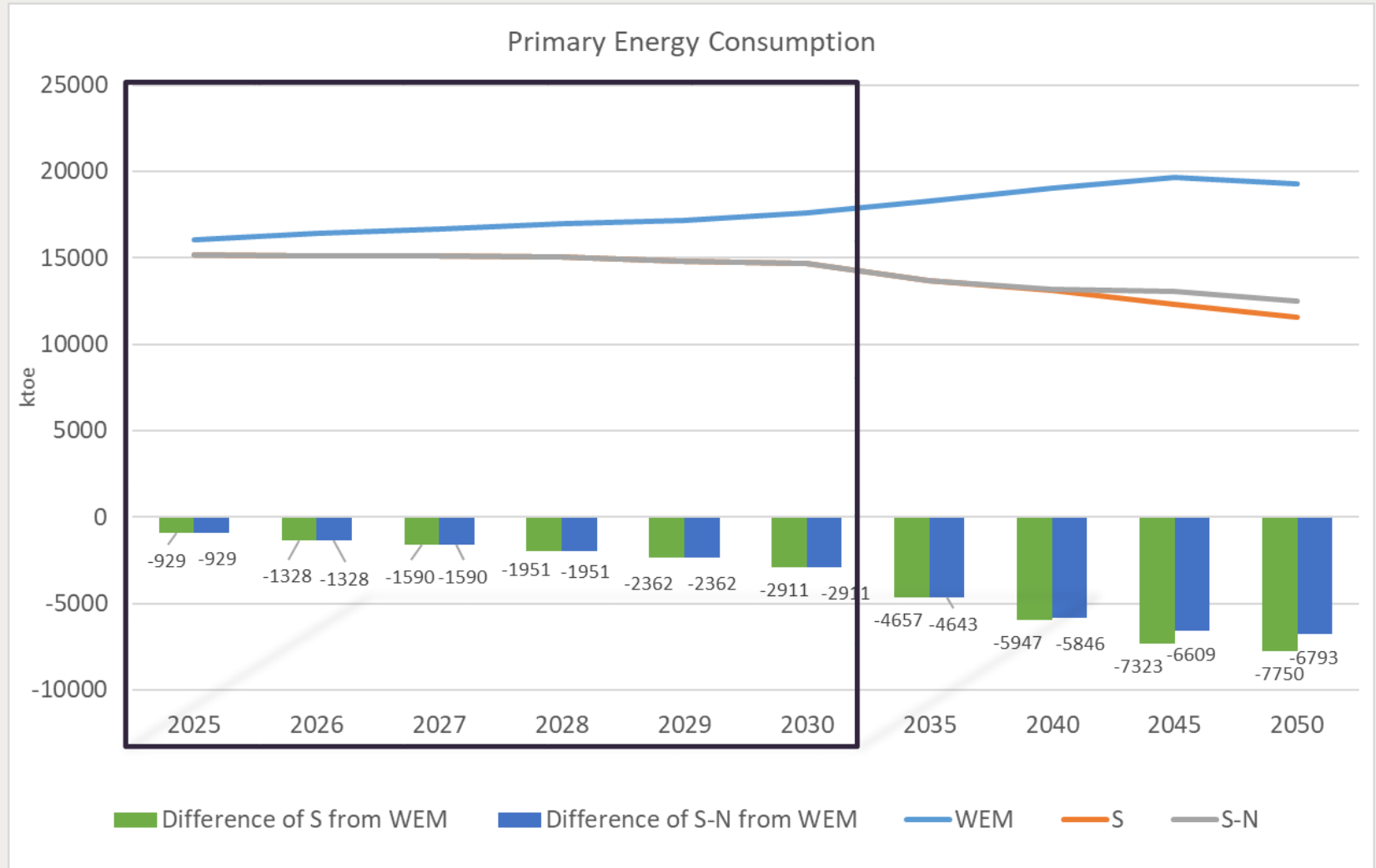
Key Results and Projections - Primary Energy Consumption

Key 2030 and 2050 findings on Energy Efficiency

➤ In 2030:
Scenario S and S-N:
Primary Energy Consumption 14.68 Mtoe

➤ In 2050:
Scenario S:
Primary energy consumption 11.5 Mtoe

Scenario S-N:
Primary energy consumption 12.5 Mtoe



National Energy and Climate Plan

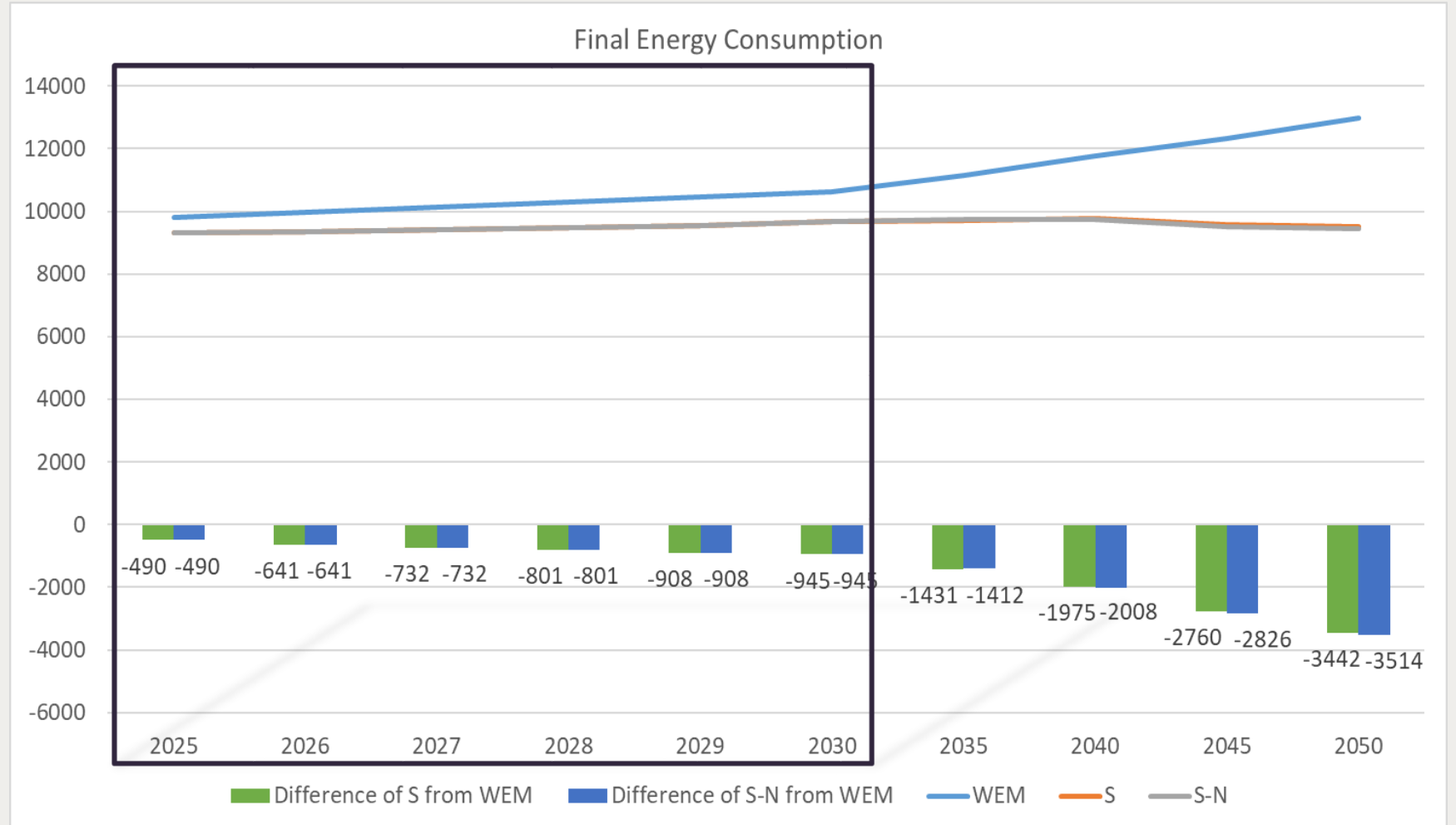
Key Results and Projections - Final Energy Consumption

Key 2030 and 2050 findings on Energy Efficiency

➤ In 2030:
Scenario S and S-N:
Final Energy Consumption 9.7 Mtoe

➤ In 2050:
Scenario S:
Final Energy Consumption 9.52 Mtoe

Scenario S-N:
Final Energy Consumption 9.45 Mtoe



Part of Energy Legislation in Serbia

- Law on energy ("Official Gazette of RS" no. 145/14, 95/18-dr. law, 40/21, 35/23-dr. law and 62/23);
- Law on the use of renewable energy sources ("Official Gazette of RS" no. 40/21 and 35/23);
- Decree on the conditions of delivery and supply of electricity ("Official Gazette of the RS" No. 84/23 - hereinafter the Decree);
- Regulation on network rules related to connection to the network of high-voltage DC systems ("Official Gazette of RS" No. 104/22);
- Regulation on network rules relating to the connection to the network of customers' facilities ("Official Gazette of RS" No. 104/22);
- Decree on network rules related to the connection to the network of production units ("Official Gazette of RS" No. 95/22);
- Rulebook on the method of proving fulfillment of the conditions by which the delay in connection to the transmission, distribution, or closed distribution system does not apply to power plants that use variable energy sources ("Official Gazette of the RS" No. 76/23);
- Rulebook on energy permit ("Official Gazette of the RS" no. 15/15 and 44/18 - other law);
- Rulebook on the content and method of technical inspection of the building, the composition of the commission, the content of the commission's proposal on determining the suitability of the building for use, monitoring the soil and the building during construction and use, and minimum warranty periods for certain types of buildings ("Official Gazette of the RS" No. 27 /15, No. 29/16 and No. 78/19).
- Decision of EMS JSC on determining the maximum power thresholds for production modules of type B, C and D (cl. sign 1 4 0, number 000-00-ROU-2/2024-00) in accordance with the Regulation on network rules related to connection to the network of production units ("Official Gazette of RS", number 95/22) which was approved by AERS by Decision number 30/2024-D-01/2, dated February 1, 2024.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- According to the Law on Energy, which was valid until April 30, 2021, EMS JSC received requests (applications) for the integration of RES for about 4,500 MW, and all these requests are in the process, from the preparation of the connection study to the conclusion of the contract for the construction of the connection, and some of them are and implemented, such as the Wind Power Plant Krivača, which is on the transmission grid in test operation from December 2023.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- ❑ The new Law on RES was amended in 2023.
- ❑ According to the new Law on RES, variable RES (wind power plants and solar power plants) are obliged to participate in secondary frequency regulation with an available capacity of +/- 10% of the installed capacity of the wind or solar power plant.
- ❑ All these power plants are subject to the obligation from the new Law on RES that they must build battery storage whose installed capacity is 10% of the installed capacity of the wind power plant or solar power plant.
- ❑ In the following period, the ancillary services market will be opened in Serbia, where wind and solar power plants will be obliged to offer frequency regulation services to EMS JSC.
- ❑ After the selection at the public tender, EMS JSC will enter into contracts with wind power plants and solar power plants for the provision of ancillary frequency regulation services.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- ❑ According to the new Law on RES, until December 1, 2023, the request for connection to the transmission system was supplemented by 51 applicants with a total installed capacity of 7,500 MW of wind power plants and solar power plants.
- ❑ EMS JSC must prepare connection studies in four months, from December 20, 2023, to April 22, 2024, and hand them over to the applicants, after which the applicants will declare whether or not they accept the proposed method of connection to the portable system of the Republic of Serbia.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- ❑ The Ministry of Mining and Energy of the Republic of Serbia signed a Memorandum of Understanding between the Republic of Serbia, represented by the line ministry, and the company Shanghai Fengling Renewables and Serbia Zijin Copper, which sets out to implement the single largest project and investment in the field of renewable energy sources in Serbia.
- ❑ The project involves the construction of a plant in the vicinity of Bor with a total capacity of 2 gigawatts - 1,500 MW wind power plant and 500 MW solar power plant, as well as a factory for the production of green hydrogen, with a capacity of about 30,000 tons per year.
- ❑ In four years, i.e. by the end of 2028, the entire project should be completed, i.e. all 2,000 MW and the green hydrogen production capacity of 30,000 tons per year should be reached.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- ❑ The Government of Serbia has adopted a Decree on the selection of a strategic partner for the implementation of the project for the construction of solar power plants with a capacity of 1,000 MW with batteries of at least 200 MW and announced a call for the selection of investors.
- ❑ The strategic partner must undertake to complete the construction of solar power plants by June 1, 2028, at the latest.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

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Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- ❑ By April 30, 2023, the exist applications to connect to the Distribution system of Serbia for a total of about 2,000 MW of installed capacity of wind and solar power plants.

Overview of the current development phase of Electricity Energy Sector

Overview of Ongoing Process to Connection on Transmission System of EMS JSC

- When we summarize it all, that's a total of about 17 GW installed capacity of applications for connections of wind power plants and solar power plants to the Electricity Power System of Serbia.

Thank you for your attention

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