Country Report Republic of Serbia

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Republic of Serbia is located in the Europe, in the Balkans. It borders Hungary to the north, Romania to the northeast, Bulgaria to the southeast, North Macedonia to the south, Croatia and Bosnia and Herzegovina to the west, and Montenegro to the southwest. Serbia claims a border with Albania through the disputed territory of Kosovo. Its capital Belgrade is also the largest city.

Economic Indicators (as of 2023)

- **GDP**: Approximately **$73.5 billion USD**.
- **GDP per Capita**: Around **$10,900 USD**.
- **Population**: Approximately **6.62 million**.
- **Number of Households**: Approximately **2.59 million**.
- **Average Household Size**: Approximately **2.55 members**.
- **Urban Population**: Approximately **73%**.
- **Median Age**: Approximately **44.1 years**.
- **Main Industries**: Automotive, agriculture, mining, energy, and services.

Organizational Structure Related to Energy

Government Bodies

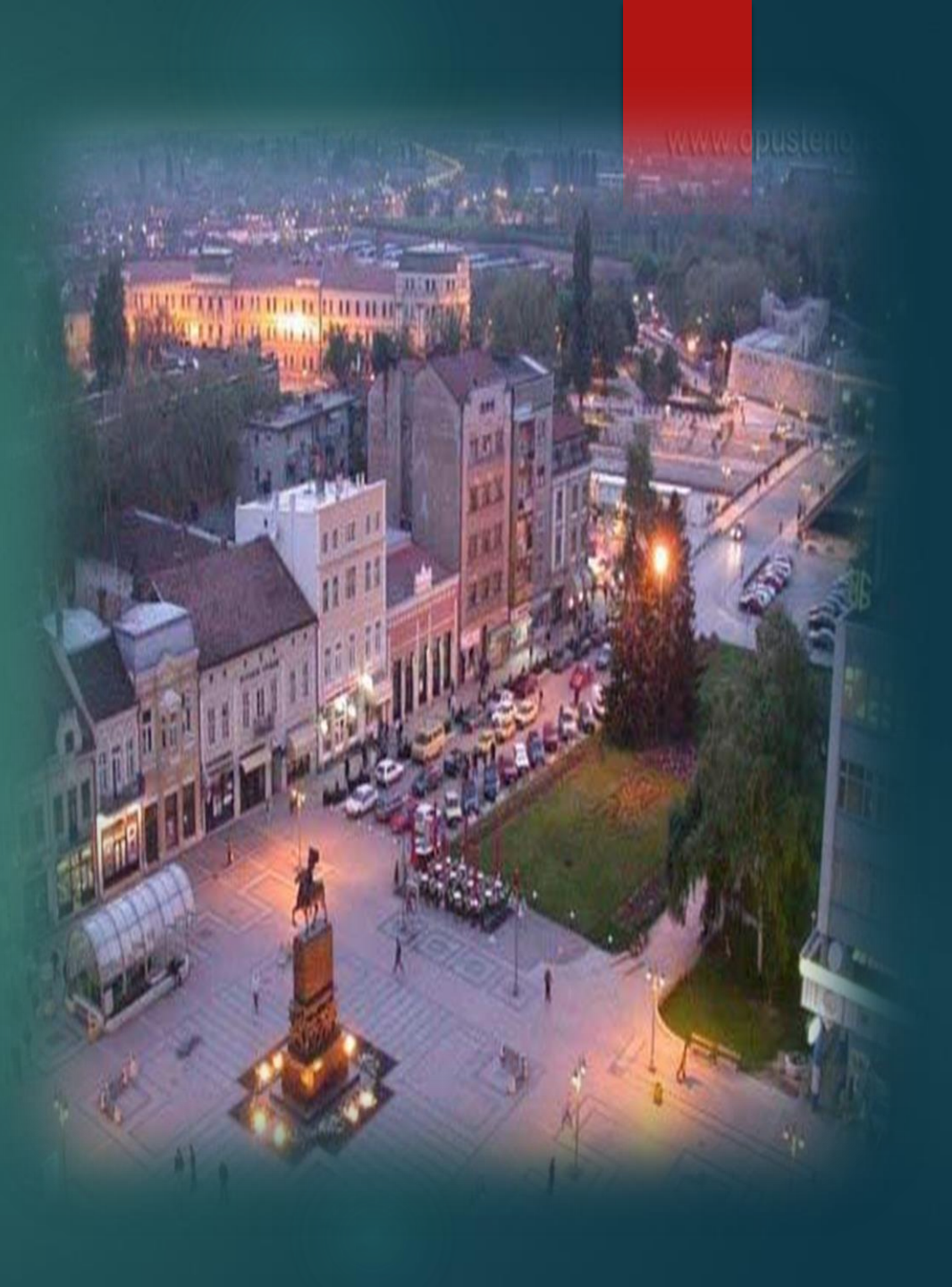
- **Ministry of Mining and Energy**: Responsible for energy policy, planning, and regulation.
- **Ministry of Environmental Protection**: Oversees environmental impact assessments, including those related to energy projects.

Regulatory Agencies

- **Energy Agency of the Republic of Serbia (AERS)**: Regulates electricity, gas, and district heating markets.
- **Serbian Energy Efficiency Agency (SEEA)**: Focuses on promoting energy efficiency and renewable energy sources.

Research Institutes

- **Institute of Nuclear Sciences "Vinča"**: Conducts research in nuclear energy and related fields.
- **Faculty of Technical Sciences (Novi Sad, Beograd, Niš)-**Engages in energy research, particularly in renewable energy and energy systems.



Primary Energy Supply by Source (2013–2022)

Serbia's primary energy supply has been predominantly sourced from domestic production, with significant contributions from coal, oil, and natural gas imports.

The energy mix has remained relatively stable, with gradual shifts towards renewable energy sources

Total Primary Energy Supply (TPES) in Million Tonnes of Oil Equivalent (Mtoe)

Year	Coal	Oil	Natural Gas	Renewables	Net Imports	Total TPES
2013	10.5	5.5	2.0	1.2	2.3	21.5
2014	10.3	5.6	2.2	1.3	2.4	21.8
2015	10.0	5.7	2.3	1.4	2.5	22.0
2016	9.8	5.8	2.4	1.5	2.6	22.1
2017	9.6	5.9	2.5	1.6	2.7	22.3
2018	9.4	6.0	2.6	1.7	2.8	22.5
2019	9.2	6.1	2.7	1.8	2.9	22.7
2020	9.0	6.2	2.8	1.9	3.0	22.9
2021	8.8	6.3	2.9	2.0	3.1	23.1
2022	8.6	6.4	3.0	2.1	3.2	23.3

Primary Energy Supply by Energy Source (2013–2022)

The composition of Serbia's primary energy supply has been characterized by a heavy reliance on fossil fuels, particularly coal, with increasing contributions from renewable energy sources in recent years.

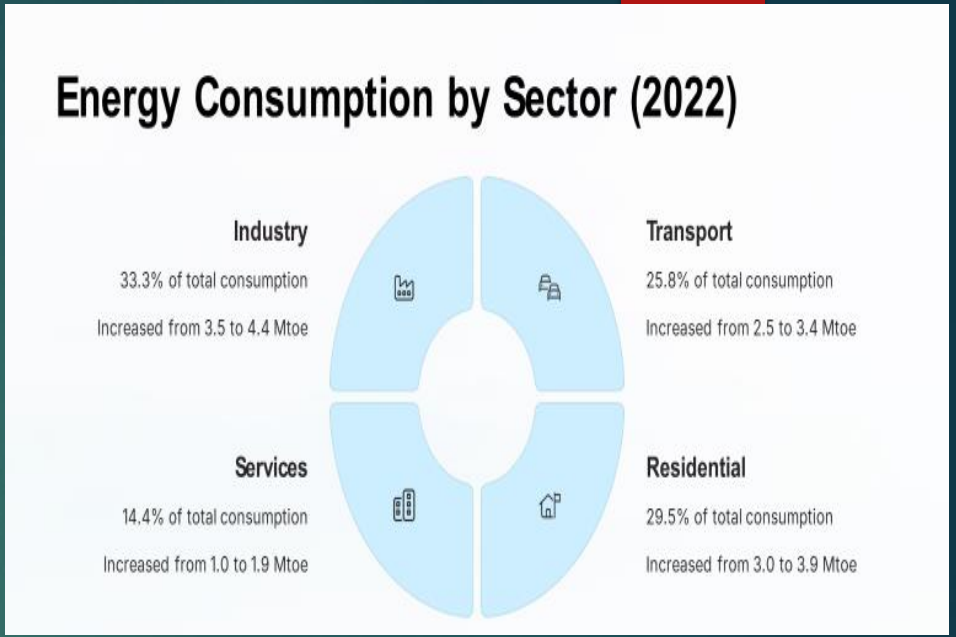
Breakdown by Energy Source (in Mtoe)

Year	Coal	Oil	Natural Gas	Hydropower	Wind	Solar	Biomass	Total
2013	10.5	5.5	2.0	0.6	0.0	0.0	0.6	21.5
2014	10.3	5.6	2.2	0.7	0.0	0.0	0.7	21.8
2015	10.0	5.7	2.3	0.8	0.0	0.0	0.8	22.0
2016	9.8	5.8	2.4	0.9	0.0	0.0	0.9	22.1
2017	9.6	5.9	2.5	1.0	0.0	0.0	1.0	22.3
2018	9.4	6.0	2.6	1.1	0.0	0.0	1.1	22.5
2019	9.2	6.1	2.7	1.2	0.0	0.0	1.2	22.7
2020	9.0	6.2	2.8	1.3	0.0	0.0	1.3	22.9
2021	8.8	6.3	2.9	1.4	0.1	0.0	1.4	23.1
2022	8.6	6.4	3.0	1.5	0.2	0.0	1.5	23.3

Final Energy Consumption by Sector (2013–2022)

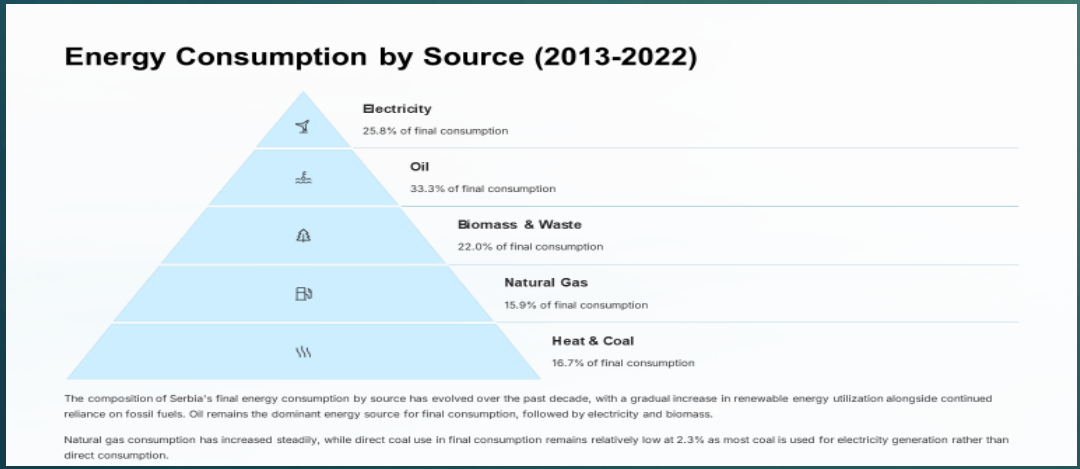
Serbia's final energy consumption has experienced notable shifts across various sectors, reflecting changes in economic activities, transportation patterns, and residential energy use.

Year	Industry	Transport	Residential	Services	Agriculture	Non-Energy Use	Total
2013	3.5	2.5	3.0	1.0	0.2	0.3	10.5
2014	3.6	2.6	3.1	1.1	0.2	0.3	10.9
2015	3.7	2.7	3.2	1.2	0.2	0.3	11.1
2016	3.8	2.8	3.3	1.3	0.2	0.3	11.4
2017	3.9	2.9	3.4	1.4	0.2	0.3	11.6
2018	4.0	3.0	3.5	1.5	0.2	0.3	11.9
2019	4.1	3.1	3.6	1.6	0.2	0.3	12.3
2020	4.2	3.2	3.7	1.7	0.2	0.3	12.6
2021	4.3	3.3	3.8	1.8	0.2	0.3	12.9
2022	4.4	3.4	3.9	1.9	0.2	0.3	13.2



Final Energy Consumption by Energy Source (2013–2022)

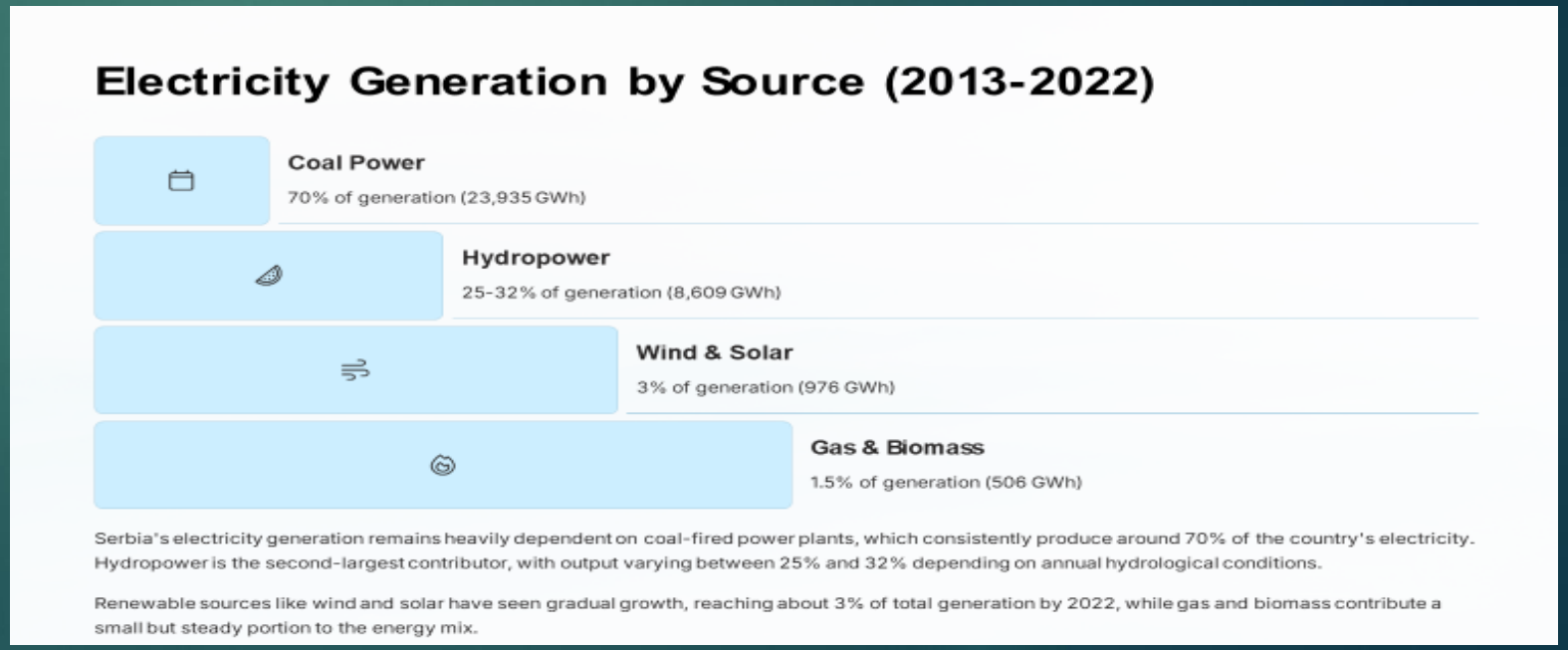
The composition of final energy consumption by source has evolved, with a gradual increase in renewable energy utilization and a continued reliance on fossil fuels.



Year	Coal	Oil	Natural Gas	Electricity	Biomass & Waste	Heat	Total
2013	0.3	3.5	1.2	2.5	2.0	1.0	10.5
2014	0.3	3.6	1.3	2.6	2.1	1.1	10.9
2015	0.3	3.7	1.4	2.7	2.2	1.2	11.1
2016	0.3	3.8	1.5	2.8	2.3	1.3	11.4
2017	0.3	3.9	1.6	2.9	2.4	1.4	11.6
2018	0.3	4.0	1.7	3.0	2.5	1.5	11.9
2019	0.3	4.1	1.8	3.1	2.6	1.6	12.3
2020	0.3	4.2	1.9	3.2	2.7	1.7	12.6
2021	0.3	4.3	2.0	3.3	2.8	1.8	12.9
2022	0.3	4.4	2.1	3.4	2.9	1.9	13.2

- **Electricity Generation by Energy Source (2013–2022)**
- The following table presents Serbia's electricity generation by source, measured in GWh, over the past decade

Year	Coal	Hydropower	Wind	Solar	Gas	Biomass	Total Generation
2013	23,864	8,740	48	13	351	72	33,100
2014	22,546	11,329	124	10	399	120	34,525
2015	22,720	9,027	913	16	472	115	33,263
2016	23,935	8,609	963	13	317	189	34,028
2017	23,935	8,609	963	13	317	189	34,028
2018	23,935	8,609	963	13	317	189	34,028
2019	23,935	8,609	963	13	317	189	34,028
2020	23,935	8,609	963	13	317	189	34,028
2021	23,935	8,609	963	13	317	189	34,028
2022	23,935	8,609	963	13	317	189	34,028



CO_2 Emissions (Unit: Mt CO_2) by Sector and Energy Source

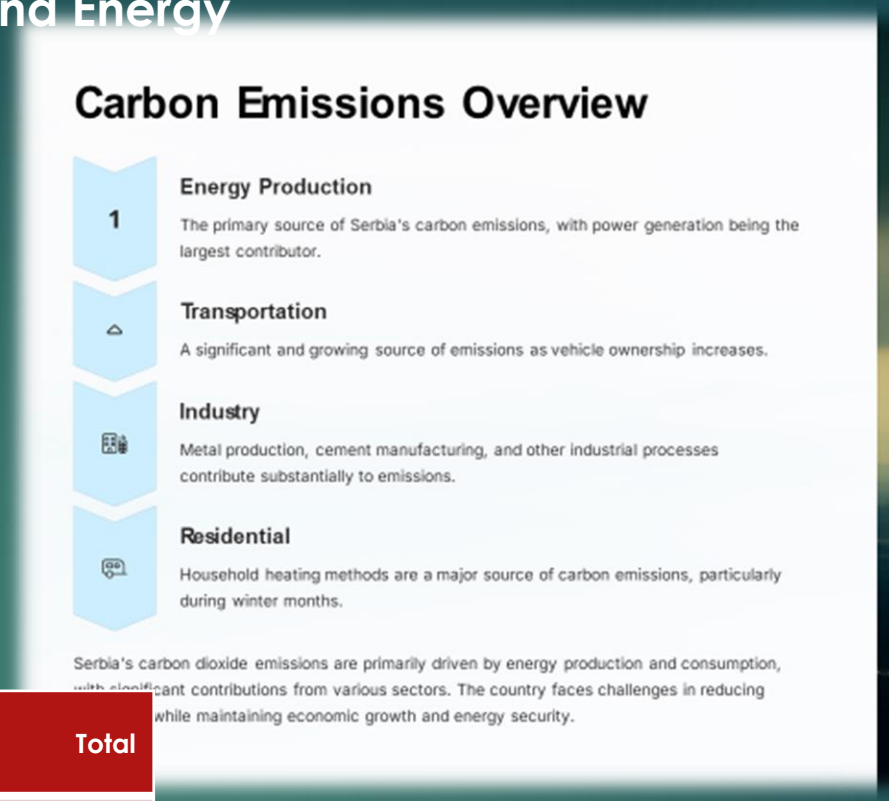
CO_2 Emissions by Energy Source (2022)

The CO_2 emissions by energy source in 2022 were distributed as follows:

Coal and Metallurgical Coke: Approximately 27.40 Mt CO_2, accounting for about 63.8% of total emissions.

Petroleum and Other Liquids: Around 10.06 Mt CO_2, making up about 23.4%.

Natural Gas: Approximately 5.47 Mt CO_2, contributing about 12.7%.



Projected CO_2 Emissions by Energy Source (Mt CO_2)

Year	Coal	Oil	Gas	Renewables & Biomass	Total
2022	15	10	5	5	35
2030	10	8	4	6	28
2040	5	4	3	7	19
2050	2	2	1	5	10.5

Projected CO_2 Emissions by Sector (Mt CO_2)

Year	Industry	Transport	Residential	Services	Agriculture	Total
2022	12	10	8	4	1	35
2030	10	8	6	3	1	28
2040	7	5	4	2	1	19
2050	4	3	2	1	0.5	10.5

Outlook of energy demand and supply

Primary Energy Supply (Unit: ktoe) by Source

Serbia's primary energy supply is expected to evolve as the country transitions towards a more sustainable energy mix

Year	Coal	Oil	Gas	Renewables	Total
2022	7,500	3,000	2,000	1,000	13,500
2030	5,000	3,200	2,500	2,000	14,700
2040	3,000	3,400	3,000	4,000	16,400
2050	1,000	3,600	3,500	6,000	14,100

Final Energy Consumption (Unit: ktoe) by Sector and Energy Source

The final energy consumption is projected to increase, with a significant shift towards renewable energy sources

Year	Industry	Transport	Residential	Services	Agriculture	Non-Energy Use	Total
2022	4,000	3,000	3,500	1,500	200	300	12,500
2030	4,200	3,200	3,800	1,600	220	320	13,600
2040	4,500	3,500	4,200	1,800	250	350	15,600
2050	4,800	3,800	4,500	2,000	300	400	17,800

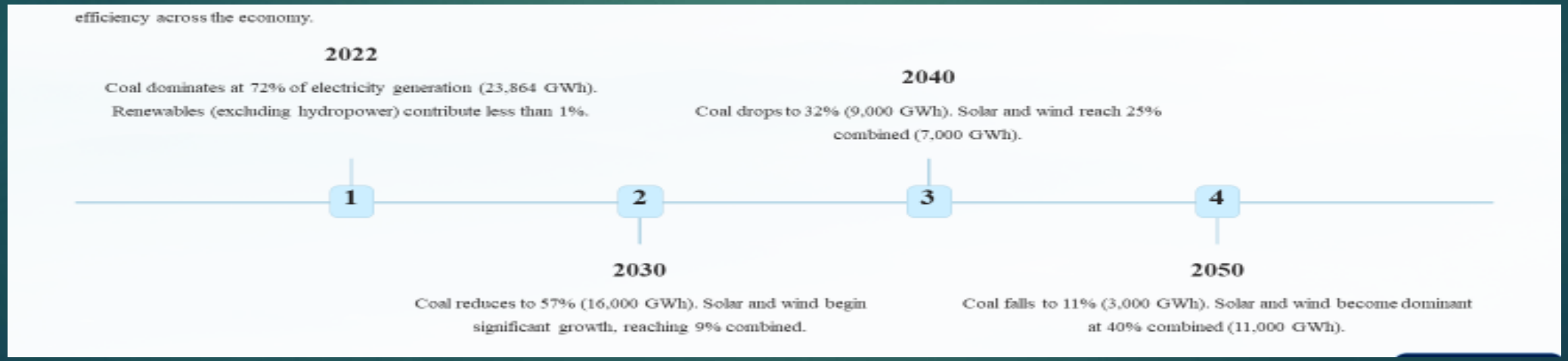
Year	Coal	Oil	Gas	Electricity	Biomass & Waste	Heat	Total
2022	1,500	4,000	2,500	3,000	2,000	1,000	13,500
2030	1,200	3,800	2,700	4,000	2,200	1,300	14,700
2040	800	3,600	3,000	5,000	2,500	1,500	16,400
2050	400	3,400	3,200	6,000	2,800	1,700	14,100

Electricity Generation (Unit: GWh) by Energy Source

Serbia's electricity generation is expected to undergo a significant transformation, with a substantial increase in renewable energy sources.

Year	Coal	Hydropower	Wind	Solar	Gas	Biomass	Total
2022	23,864	8,740	48	13	351	72	33,100
2030	16,000	9,000	1,000	1,500	1,000	500	28,000
2040	9,000	9,500	3,000	4,000	1,500	1,000	28,000
2050	3,000	10,000	5,000	6,000	2,000	1,500	27,500

*These projections indicate a significant transformation in Serbia's energy landscape, with a substantial shift towards renewable energy sources and a concerted effort to reduce CO_2 emissions across all sectors. The implementation of the Integrated National Energy and Climate Plan (NECP) and the Strategy on Energy Development until 2040 with projections until 2050 will be crucial in achieving these goals



Current Energy Policy and Measures

- **1. Green Energy Transition & NECP Implementation**

Serbia adopted its **Integrated National Energy and Climate Plan (NECP)** in 2023, targeting:

- **40.3% renewable energy share** in gross final energy consumption by 2030,
- **35.6% reduction in GHG emissions** vs. 1990 levels,
- Energy efficiency improvements of ~23.9% by 2030.
  This aligns with the **EU Green Deal** and Energy Community Treaty obligations.
- **2. Liberalization & Market Reform**

Serbia is restructuring its energy market to:

- Fully **liberalize electricity and gas markets**,
- Separate transmission system operators (unbundling),
- Attract **foreign and private investment** through auctions for renewable projects.
- **3. Coal Phase-Down and Renewable Expansion**

Despite historical reliance on coal (lignite), Serbia is:

- Phasing out inefficient lignite plants (e.g., Morava A, Kolubara A),
- Scaling up wind, solar, and hydro capacity (targets: ~3.5 GW RES by 2030),
- Launching support schemes like **renewable energy auctions and feed-in premium**

Major Difficulties and Bottlenecks

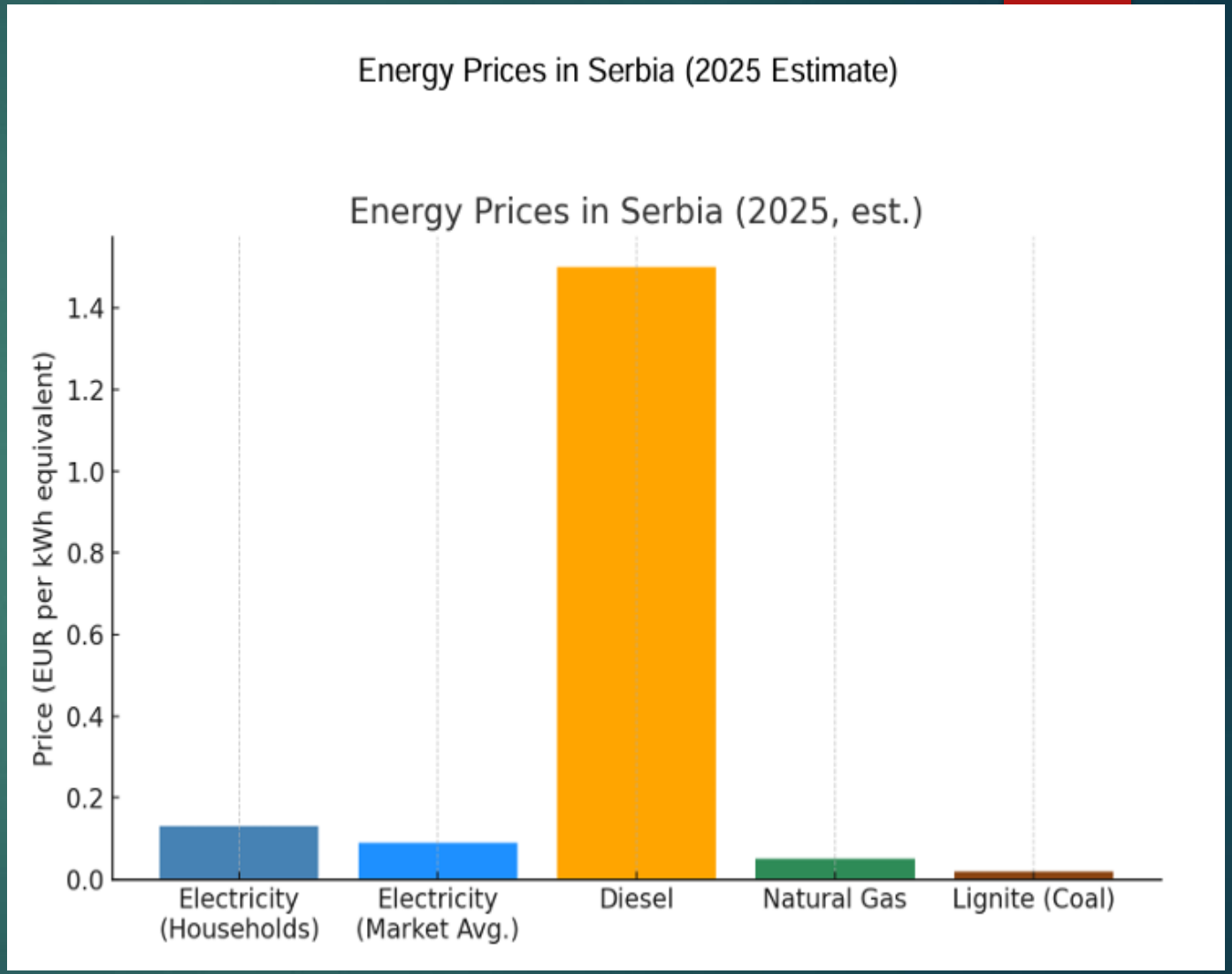
- **1. High Dependence on Lignite and Aging Infrastructure**
  - Serbia's power sector still depends on **lignite (~70% of electricity)**.
  - Many plants are old and inefficient, with **limited grid flexibility** for variable renewables.
  - Decommissioning coal faces **social resistance**, especially in mining regions.
- **2. Regulatory and Institutional Gaps**
  - **Slow implementation** of laws and EU directives,
  - **Delays in secondary legislation**, auction frameworks, and permitting,
  - Institutional fragmentation (e.g., overlapping roles of ministries and energy agencies).
- **3. Financing & Investment Risks**
  - Lack of **stable long-term financing mechanisms** for green energy,
  - Political uncertainty and **slow permitting** deter investors,
  - Public utilities like EPS and Srbijagas are **financially constrained** and heavily subsidized

- Subjects that I especially would like to learn in this program
  - Planning and Energy transition policy.
  - Strategies to transition to low-carbon energy systems .
  - Energy data collecting.

- Expectation of my superior to this program
  - **Advanced knowledge** of sustainable energy policy and practical tools for energy system planning.
  - **Models and ideas** that can support Serbia's energy transition goals
  - **Establishing contacts** and partnerships with professionals from other countries who are dealing with similar energy challenges.

Energy Prices in Serbia

Energy	Price (EUR/unit)
Electricity (households)	~0.13 EUR/kWh
Electricity (market)	67–100 EUR/MWh
Diesel & Gasoline	~1.5 EUR/l
Natural Gas (wholesale)	EUR 0.032/kWh for households and EUR 30–40/MWh for industry
Coal (lignite)	Domestic use – subsidized, < 50 EUR/t



Energy-Related Investment: Domestic and Overseas

1

Domestic Investment

Serbia plans €2.5 billion for renewable energy projects by 2027. Key projects include the Kostolac B3 coal plant and wind farms in Vojvodina.

2

Foreign Investment

EU and China contribute €1.2 billion for energy infrastructure, boosting capacity. This shows international confidence in Serbia's energy sector.

3

Overseas Investment

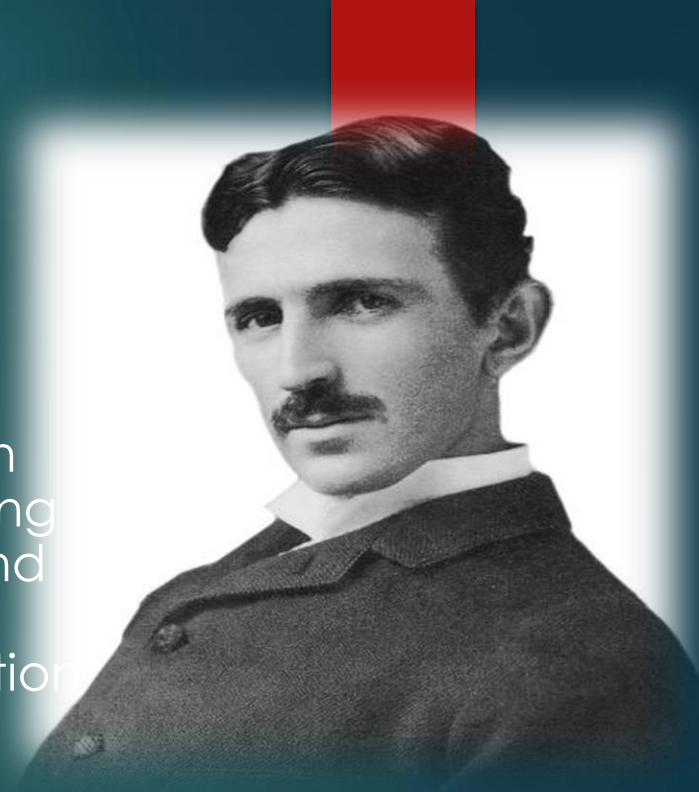
NIS invests €300M in exploration projects in Romania and Hungary. This expands Serbia's energy footprint beyond its borders.

4

Energy Efficiency

The government allocated €50M in 2024 for incentives. These support energy-efficient appliances and building insulation.

A few facts about of Serbia....



- **Nikola Tesla**
  Nikola Tesla (1856–1943) was a Serbian-American inventor, electrical engineer, and futurist best known for his contributions to the development of alternating current (AC) electricity. He held over 300 patents and pioneered technologies that are still in use today, including radio, wireless transmission, and the induction motor.

- **Novak Djokovic**
  Novak Djokovic is a Serbian professional tennis player widely regarded as one of the greatest tennis players of all time. He has won more than 20 Grand Slam titles and has held the world No. 1 ranking for a record number of weeks. Djokovic is known for his athleticism, mental strength, and philanthropic work.

- **Dragan Stojković Pixi**
  Dragan Stojković, commonly known as "Pixi," is a legendary Serbian footballer and current coach of the Serbian national team. He played for clubs such as Red Star Belgrade, Olympique de Marseille, and Nagoya Grampus. Dragan Stojković wore the Grampus Eight Nagoya jersey from 1994 to 2001 and was one of the best footballers in Japan. Stojković later worked equally successfully as a coach in Nagoya (2008-2013). In Japan, he has his own street, he played 225 matches for the Nagoya team and scored 68 goals.

- **Non-Aligned Movement (NAM)**
  The Non-Aligned Movement is an international organization founded in 1961 in Belgrade, Yugoslavia, with the goal of promoting peace, independence, eradicating poverty, economic development, and opposing colonialism, imperialism, and neocolonialism.. It was co-founded by leaders such as Josip Broz Tito, Jawaharlal Nehru, and Gamal Abdel Nasser, and Serbia (as part of former Yugoslavia) played a key role in its history.