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Energy Policy in the European Union within the European Green Deal Strategy

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Abstract

The article presents the energy policy of the European Union (EU) in light of its latest strategy, called the European Green Deal. The article is of particular importance to answer two main questions:
What was the importance of two energy packages in the EU energy policy, i.e., the fourth and fifth packages? The fourth package was adopted in June 2019; the fifth package – "Ready for 55" – was published in 2021 and aimed to align the EU's energy targets with the new European climate targets for 2030 and 2050.
What are the main conclusions from the presented tables and graphs regarding carbon dioxide emissions in European Union countries from 2012 to 2021? Additionally, what insights can be drawn regarding changes in electricity prices for household and non-household consumers in euros per 100 kilowatt-hour, as well as gross electricity production (in million tonnes of oil equivalent) in the analyzed years for all EU Member States?

Keywords: European Union, energy policy, energy packages, countries of the EU, household and non-household consumers of energy

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Introduction

The European Union (EU) is actively promoting Europe's transition to a low-carbon society and is updating its rules to facilitate the necessary private and public investment in the clean energy transition. This should not only be good for the planet but also for the economy and consumers.

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The increasing evidence of climate change and growing dependence on energy have underlined the determination of the EU to become the world's first climate-neutral continent and economy and ensure that the energy consumed is secure, safe, competitive, locally produced and sustainable.

These objectives are based on the energy union strategy (2015), which, together with Regulation (EU) 2018/1999 on the governance of the energy union, defines the dimensions of the EU's energy policy:

- Diversifying the EU's sources of energy, ranging from fossil fuels, through nuclear power, to renewables (solar, wind, biomass, geothermal, hydro-electric and tidal) to ensure energy security.
- Realizing a fully integrated, efficient internal energy market without technical or regulatory barriers.
- Improving energy efficiency and the interconnection of energy networks and cutting emissions.
- Moving towards a low-carbon economy in line with the commitments set out in the Paris Agreement.
- Promoting research in low-carbon and clean energy technologies and prioritizing research and innovation to drive the energy transition and improve competitiveness (European Union n.d.).

Article 194 of the Treaty on the Functioning of the European Union introduces a specific legal basis for the field of energy based on shared competencies between the EU and the EU Member States, leading them towards a common energy policy. The low-carbon transition aims to create a sustainable energy sector that stimulates growth, innovation, and jobs while improving quality of life, increasing choice, reinforcing consumer rights, and ultimately providing savings in household bills. A streamlined and coordinated EU approach ensures a genuinely continental impact in the fight against climate change. Moves to encourage renewables and improve energy efficiency are central to reducing Europe's greenhouse gas emissions and meeting Paris Agreement commitments.

Historical background

In the late 1980s, the European Commission proposed a set of policies (called directives in the EU context) on integrating the European market. One of the key ideas was that consumers could buy electricity from outside their own country. However, this plan encountered opposition from the Council of Ministers, as the policy

sought to liberalize what was regarded as a natural monopoly. The less controversial parts of the directives those on price transparency and transit right for grid operators were adopted in 1990. In November 1983, the Council of Ministers of Energy Economy, for the first time, granted the Community a power of attorney to conduct an independent energy policy (Dutton 2015, pp. 2–3). Subsequently, the EC Commission, in its report "Internal Energy Market" (May 1988), included a number of already old initiatives in the form of a program. The Working Paper on the Internal Energy Market of 1988 emphasizes that the concept of an open, internal market for electricity production implies the production of electricity under economically competitive conditions, subject only to the requirements of environmental protection and the Community's energy policy (Dutton 2015, pp. 3–5).

Start of an internal energy market

The 1992 Treaty of Maastricht, which founded the European Union, included no chapter specific on energy. Such a chapter had been rejected by member states who wanted to retain autonomy on energy, specifically those with larger energy reserves. In order to create a Western-Eastern energy alliance, in December 1994, 45 countries signed the "Treaty on the European Energy Charter", thus formulating a common catalog of goals and a code of conduct in this field. However, it has yet to be verified in practice. A directive for an internal electricity market was passed in 1996 by the European Parliament, and another on the internal gas market two years later. The directive for the electricity market contained the requirement that network operation and energy generation should not be done by a single (monopolistic) company. Having separate energy generation would allow for competition in that sector, whereas network operation would remain regulated.

Investing in a sustainable energy future for Europe

The EU is actively promoting Europe's transition to a low-carbon society and is updating its rules in order to facilitate the necessary private and public investment in the clean energy transition. This should not only be good for the planet, but also for the economy and consumers. The low-carbon transition aims to create a sustainable energy sector that stimulates growth, innovation, and jobs while improving quality of life, increasing choice, reinforcing consumer rights, and ultimately providing savings in household bills. A streamlined and coordinated EU approach ensures a genuinely continental impact in the fight against climate change. Moves to encourage renewables and improve energy efficiency are central to reducing Europe's greenhouse gas emissions and meeting Paris Agreement commitments. Through the European energy union, the EU is ensuring greater coherence in all policy areas to meet the broad objectives of creating

a reliable, affordable and sustainable energy system. The EU also provides various funding opportunities and lending schemes to help companies and regions successfully implement energy projects. The EU plays an important role on the international stage, working with other countries, regions and international organizations to tackle energy problems and ensure a reliable, competitive energy market within Europe (European Union n.d.).

Liberalization of the energy markets in the EU within the energy packages

In the 1990s, when most national electricity and natural gas markets were still monopolized, the European Union and the Member States decided to gradually open up these markets to competition. This took place as part of the six energy packages of the EU.

The first energy package was adopted between 1996 and 1998. This was the first liberalization of the national electricity and gas markets. It was based on two new directives on electricity and gas, which were to be transposed into the legal systems of the Member States by 1998 and 2000, respectively.

The second energy package was adopted in 2003, and its directives had to be transposed into national law by 2004, with some provisions entering into force in 2007. Since then, industrial consumers and Member States have been free to choose their gas and electricity suppliers from a wider range of competitors.

In 2009, the third energy package was adopted, which further liberalized the internal electricity and gas markets. It introduced a number of reforms, e.g., unbundling the supply and generation of energy from the operation of transmission networks (so-called unbundling). It also introduced requirements for independent regulatory authorities, established a new European Union Agency for the Cooperation of Energy Regulators (ACER), established European networks of electricity and gas transmission system operators (ENTSO-E and ENTSO-G), and strengthened consumer rights in retail markets. This package was the basis for the implementation of the internal energy market.

The fourth energy package was adopted in June 2019, consisting of one directive (Directive (EU) 2019/944 on electricity) and three regulations (Regulation (EU) 2019/943 on electricity, Regulation (EU) 2019/941 on risk preparedness, Regulation (EU) 2019/942 establishing a European Union Agency for the Cooperation of Regulators E 2019/942/EU). It introduced new electricity market rules to meet renewable energy needs and attract investment. It provides incentives for consumers and introduces a new limit below which power plants are eligible for subsidies under the capacity mechanism. It also imposes an obligation on Member States to prepare contingency plans in the event

of an electricity crisis. The Agency for the Cooperation of Regulators' competencies in cross-border regulatory cooperation are enhanced where there is a risk of national and regional fragmentation.

The fifth energy package, "Ready for 55", was published in 2021 to align the EU's energy targets with the new European climate targets for 2030 and 2050. Following Russia's invasion of Ukraine in February 2022 and after Russia completely cut off gas supplies to Europe, the EU decided to quickly phase out all Russian fossil fuel imports, implement energy-saving measures, diversify energy imports, adopt emergency measures in the electricity and gas markets, and accelerate the introduction of renewable energy sources.

The completion of the EU's internal market in the energy sector requires the removal of a number of obstacles and barriers to trade, the approximation of tax and pricing policies and measures concerning norms and standards, and the introduction of safety and environmental provisions. The aim is to ensure a functioning market with fair access, a high level of consumer protection, and an adequate level of interconnection and generation capacity.

Within the framework of the establishment or functioning of the internal market and taking into account the need to preserve and improve the environment, European Union energy policy shall aim, in a spirit of solidarity between Member States, at:

- ensuring the functioning of the energy market;
- ensuring the security of energy supply in the Union;
- promoting energy efficiency and energy saving, as well as the development of new and renewable forms of energy;
- promoting the interconnection of energy networks (Consolidate version of the treaty on the functioning of the European Union 2016, p. 5).

As announced in the Energy Union Strategy, in 2016, the European Commission presented **the Clean Energy for All Europeans package** to provide consumers with secure, sustainable, competitive, and affordable energy. It supports the decarbonization of the EU's energy sector, removes barriers to cross-border electricity trade, and enables the EU's clean energy transition, meeting the commitments made in the Paris Agreement. The regulation sets out a set of market rules for the functioning of electricity markets: prices will be set on the basis of supply and demand; recipients will take advantage of market opportunities and will be active market participants; incentives for low-carbon electricity generation will be based on market principles; barriers to cross-border electricity flows will be gradually removed; generators will be directly or indirectly responsible for the sale of the electricity they produce; new conditions will be defined under which Member States can establish capacity mechanisms and the rules for their creation.

The Directive on common rules for the internal market in electricity (Directive (EU) 2019/944) focuses on Member States and consumers, setting out a set of different rules that put the consumer at the center of the clean energy transition. Suppliers are free to set the prices at which they deliver electricity to consumers. Consumers may request the installation of smart electricity meters at no additional cost. Household and micro-enterprise customers shall have free access to one or more tools for comparing supplier offers, including dynamic electricity price contract offers.

On 14 March 2023, the European Commission proposed a reform of the electricity market structure, in particular the Electricity Regulation, the Electricity Directive and the REMIT Regulation (EU) No. 1227/2011. The proposal includes measures to incentivize long-term non-fossil energy contracts, industry access to renewables, renewable energy sharing provisions, long-term contracts for consumers, new demand and storage response support schemes, protection of vulnerable consumers in default against disconnection, extension of regulated retail prices to households and SMEs in the event of a crisis, and obligations for Member States to appoint suppliers of last resort. The regulation proposes common rules on electricity crisis prevention and preparedness to ensure cross-border cooperation, as well as common rules on crisis management, common methodologies for assessing the security of supply risks and a common framework for evaluating and monitoring the security of electricity supply.

In response to the escalation of the global energy crisis, the EU has put forward several proposals for profound structural changes in its energy markets. In March 2022, the European Commission Communication on REPowerEU immediately stated that the EU intends to gradually become independent of Russian fossil fuels. In May 2022, the REPowerEU plan was presented, proposing additional measures to save energy, diversify supplies, increase the security of energy supply, and replace fossil fuels by accelerating the deployment of renewable energy. In July 2022, the Commission proposed new rules for coordinated measures to reduce gas demand and published a communication entitled "Saving gas for a safe winter". Council Regulation (EU) 2022/1369 on coordinated measures to reduce gas demand, which entered into force on 9 August, set a voluntary (and in an emergency, mandatory) target to reduce gas consumption in Member States by 15% between 1 August 2022 and 31 March 2023. In September 2022, the Commission proposed a Council Regulation on emergency intervention to address high energy prices and lower energy bills for European citizens and businesses. Between September and December 2022, the Council adopted three exceptional temporary market-based measures: a voluntary general target of a 10% reduction in gross electricity consumption for the period from 1 December 2022 to 31 March 2023 and a mandatory target of 5% reduction in peak electricity consumption; a market revenue ceiling of EUR 180/MWh for electricity generators using renewable energy sources, nuclear energy and lignite; and a mandatory temporary solidarity levy for the fossil fuel sector.

Conclusion

The Green Deal Industrial Plan: putting Europe's net-zero industry in the lead

Trans-European energy networks (TEN-E)

TEN-E is a policy strategy that focuses on interconnecting Member States' energy infrastructure. Under this strategy, 11 priority corridors have been identified (three for electricity, five for offshore grids and three for hydrogen) and three priority thematic areas (the deployment of smart electricity grids, smart gas grids, and a cross-border carbon dioxide network).

The TEN-E Regulation (EU) 2022/869 provides guidelines for trans-European energy networks, identifying projects of common interest of EU countries, projects of common interest for the EU and third countries, and priority projects for trans-European electricity and gas networks. New Energy Projects of Common Interest and cross-border renewable energy projects are funded by the Connecting Europe Facility – Energy (CEF-E) 2021–2027, with a seven-year budget of EUR 5.84 billion distributed through grants managed by the European Climate, Infrastructure and Environment Executive Agency. Between 2014 and 2020, the CEF-E budget of EUR 4.8 billion funded 149 cross-border energy infrastructure actions in 107 projects of common interest along eight priority corridors. The Commission prepares the list of projects of common interest in the form of a delegated act, which enters into force only if the Parliament and the Council do not object within two months of its submission.

The European Green Deal, presented by the European Commission on 11 December 2019, sets the goal of making Europe the first climate-neutral continent by 2050. The European Climate Law enshrines in binding legislation the EU's commitment to climate neutrality and the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels (European Commission 2023).

The Commission's Directorate-General for Climate Action is responsible for the following proposals:

- Increasing the ambition of the EU Emissions Trading System,
- Strengthening the Market Stability Reserve linked to the review of the EU Emissions Trading System,
- Revision of the EU Emission Trading System Directive concerning aviation (European Commission 2021).

The first pillar of the plan is about a simpler regulatory framework. The European Commission has proposed a Net-Zero Industry Act to identify goals for net-zero industrial

capacity and provide a regulatory framework suited for its quick deployment, ensuring simplified and fast-track permitting, promoting European strategic projects, and developing standards to support the scale-up of technologies across the Single Market. The framework will be complemented by the Critical Raw Materials Act to ensure sufficient access to those materials, like rare earths, that are vital for manufacturing key technologies and the reform of the electricity market design (Parlament Europejski n.d.).

The fourth pillar is about global cooperation and making trade work for the green transition under the principles of fair competition and open trade, building on the engagements with the EU's partners and the work of the World Trade Organization. To that end, the Commission will continue to develop the EU's network of Free Trade Agreements and other forms of cooperation with partners to support the green transition. It will also explore the creation of both a Critical Raw Materials Club, to bring together raw material 'consumers' and resource-rich countries to ensure global security of supply through a competitive and diversified industrial base, and Clean Tech/Net-Zero Industrial Partnerships (European Commission 2023).

The *Fifth Energy Package*, entitled *'Fit For 55'*, was published in two parts on 14 July and 15 December 2021 and is currently in the final approval phase. It brings energy targets into line with the new European climate ambition of reducing emissions by at least 55% by 2030 compared to 1990 levels and becoming carbon neutral by 2050. It focuses mainly on renewables, energy efficiency, energy taxation, buildings, air and maritime transport, buildings, gas and hydrogen markets. The Russian invasion of Ukraine of 24 February 2022 produced major market disruptions, forcing the EU to change its regulatory framework for energy. Among the measures taken that affect the market, in 2022, the Commission proposed:

- Options to mitigate high energy prices,
- The creation of a platform for joint purchases of gas,
- New gas storage rules and obligations,
- The easing of liquidity measures for energy market players,
- Electricity and gas demand reduction measures,
- Gas solidarity measures among Member States,
- New price benchmarks for LNG,
- Measures for redistributing the energy sector's surplus revenues to final customers,
- A safety price ceiling (European Union n.d.).

Tables and Figures

Table 1. Carbon dioxide emissions in European Union countries, 2012–2021 (in million tonnes)

Country/year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
*European Union**	*2,712.2*	*2,614.8*	*2,508.7*	*2,556.6*	*2,552.0*	*2,595.4*	*2,551.1*	*2,416.4*	*2,117.9*	*2,246.2*
Belgium	73.3	71.2	68.8	71.7	71.2	71.2	72.6	73.3	66.4	68.3
Bulgaria	47.1	41.7	44.5	47.1	44.5	46.7	42.5	41.1	35.5	40.7
Czechia	89.5	85.5	84.6	83.5	85.7	84.0	85.3	80.1	71.7	77.0
Denmark	71.2	70.0	64.1	64.4	67.2	67.4	69.9	66.8	57.2	52.2
Germany	694.5	703.3	660.6	670.0	666.8	657.3	637.3	576.6	497.1	533.5
Estonia	17.8	19.9	18.7	15.2	16.8	18.2	17.3	11.6	8.7	10.1
Ireland	34.0	33.6	34.2	36.0	40.0	42.0	42.6	41.6	29.0	31.8
Greece	84.2	76.7	74.0	70.3	68.4	73.7	73.4	68.0	57.5	59.0
Spain	222.8	195.8	198.8	214.5	202.0	217.8	212.1	194.5	159.3	168.7
France	253.4	253.7	232.7	234.6	235.6	239.5	230.7	226.9	196.2	212.1
Croatia	14.1	13.8	13.1	13.0	13.1	13.7	12.7	12.9	12.2	11.7
Italy	303.7	270.7	254.8	262.5	260.1	262.1	256.0	249.6	219.4	239.7
Cyprus	5.7	5.1	5.4	5.2	5.6	5.9	5.9	5.6	5.4	5.4
Latvia	7.3	7.0	6.8	7.0	6.9	7.0	7.6	7.7	6.2	6.4
Lithuania	12.3	11.3	12.0	12.6	12.3	13.2	14.3	14.7	16.2	16.7
Luxembourg	6.7	6.6	6.8	7.6	7.5	7.5	7.6	8.2	7.3	7.7
Hungary	37.2	35.5	35.9	37.8	37.5	39.5	39.8	38.5	35.5	35.8
Malta	2.7	2.4	2.4	1.7	1.4	1.5	1.6	1.7	1.5	1.5
Netherlands	149.5	148.6	148.7	154.0	153.1	150.7	147.0	143.9	126.4	127.2
Austria	48.1	46.8	44.4	45.5	44.7	47.7	45.8	49.1	43.5	46.5
Poland	282.0	278.9	270.3	272.8	281.0	293.6	294.6	283.3	269.5	291.9
Portugal	44.3	42.6	42.4	46.7	44.4	49.3	45.9	42.1	36.0	34.4
Romania	80.7	67.2	66.4	65.5	64.3	66.6	68.0	64.8	61.8	64.7
Slovenia	11.4	11.2	9.8	10.0	10.4	10.6	10.9	10.8	10.4	10.0
Slovakia	30.4	28.3	26.5	27.7	28.2	29.1	29.5	27.3	24.7	28.5
Finland	48.3	49.1	44.9	41.6	44.9	42.2	43.6	40.9	33.8	34.0
Sweden	39.8	38.6	37.0	37.9	38.4	37.4	36.4	34.7	29.8	30.7

* 27 countries (from 2020), (e) estimated, (s) Eurostat estimate
Source: own elaboration based on Eurostat (2023).

Table 2. Carbon dioxide emissions in European Union countries in 2012 and 2021 (in thousand tonnes) and their growth (in %)

Country/year	2012	2021	Growth (%)
Belgium	73,292.2	68,313.7	– 6.8
Bulgaria	47,139.1	40,728.8	– 13.6
Czechia	89,526.6	76,988.2	– 14.0
Denmark	71,209.7	52,215.5	– 26.7
Germany	694,542.2	533,461.5	– 23.2
Estonia	17,783.5	10,080.1	– 43.3
Ireland	33,979.5	31,792.3	– 6.4
Greece	84,214.8	58,982.0	– 30.0
Spain	222,785.9	168,656.6	– 24.3
France	253,422.3	212,106.5	– 16.3
Croatia	14,145.7	11,743.6	– 17.0
Italy	303,729.4	239,652.9	– 21.1
Cyprus	5,712.9	5,421.7	– 5.1
Latvia	7,306.6	6,435.9	– 11.9
Lithuania	12,263.7	16,670.4	35.9
Luxembourg	6,738.7	7,654.9	13.6
Hungary	37,160.9	35,791.8	– 3.7
Malta	2,744.7	1,485.5	– 45.9
Netherlands	149,516.3	127,215.8	– 14.9
Austria	48,148.9	46,488.6	– 3.4
Poland	282,013.4	291,917.1	3.5
Portugal	44,290.8	34,416.1	– 22.3
Romania	80,716.1	64,741.2	– 19.8
Slovenia	11,357.3	10,015.9	– 11.8
Slovakia	30,415.1	28,478.6	– 6.4
Finland	48,262.0	34,036.1	– 29.5
Sweden	39,814.2	30,737.4	– 22.8

(e) estimated, (s) Eurostat estimate
Source: own elaboration based on Eurostat (2023).

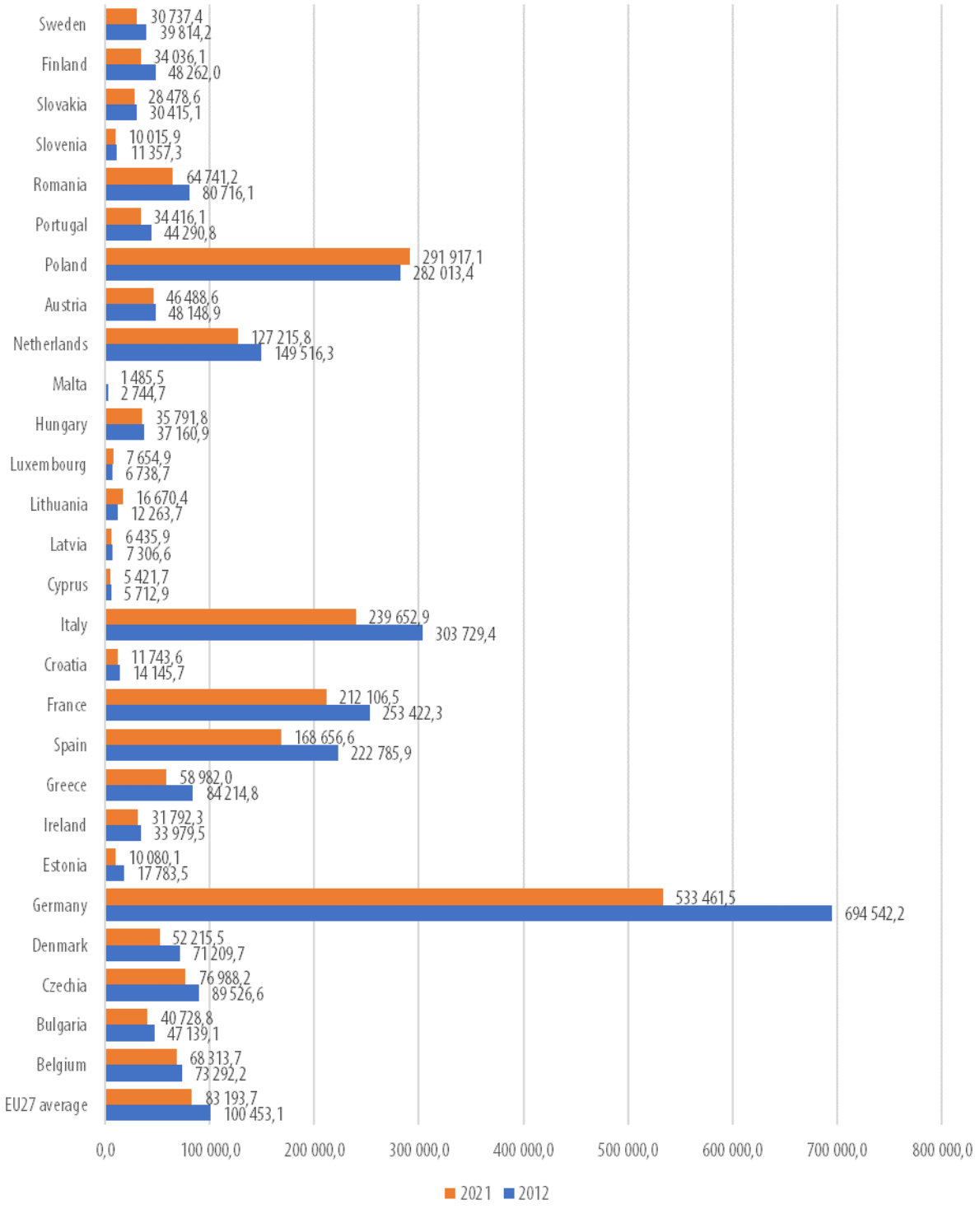

Figure 1. Carbon dioxide emissions in European Union countries and EU average in 2012 and 2021 (in thousand tonnes)

Source: own elaboration based on Eurostat (2023).

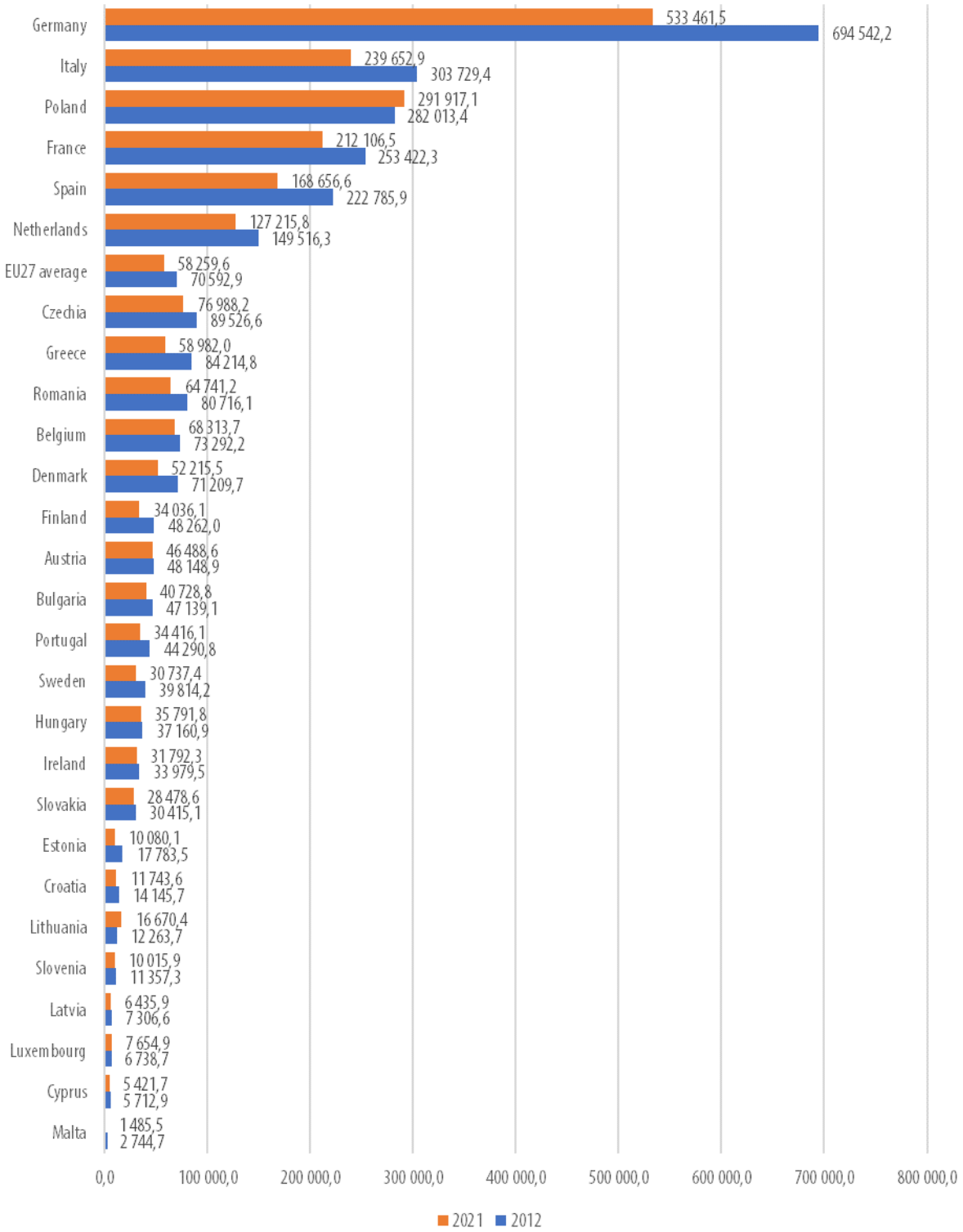

Figure 2. Carbon dioxide emissions in European Union countries and EU average 2012 and 2021 (in tonnes)

Source: own elaboration based on Eurostat (2023).

Table 3. Electricity prices for household and non-household consumers – bi-annual data for 2021 and 2022 (in euros per 100 kilowatt-hours)

Country/time	Household consumers per 100 kilowatt-hours		Non-household consumers per 100 kilowatt-hours		Household consumers Increase 2021-S2–2022-S2	Non-household consumers Increase 2021-S2–2022-S2
	2021-S2	2022-S2	2021-S2	2022-S2		
European Union*	–	27.94	–	25.34		
Belgium	30.02	45.19	16.43	28.17	**+15.17**	**+11.74**
Bulgaria	10.91	11.49	17.6	20.64	**+0.58**	**+3.04**
Czechia	18.71	39.20	12.53	23.85	**+20.49**	**+11.32**
Denmark	28.73	53.70	31.16	43.65	**+24.97**	**+12.49**
Germany	32.88	34.75	20.97	25.80	**+1.87**	**+4.83**
Estonia	19.6	23.81	16.75	28.21	**+4.21**	**+11.46**
Ireland	27.99	–	20.72	30.61	–	**+9.89**
Greece	20.86	25.91	17.62	23.64	**+4.95**	**+6.2**
Spain	28.78	34.52	17.30	27.72	**+5.74**	**+10.42**
France	19.7	21.06	12.59	14.95	**1.36**	**+2.36**
Croatia	13.25	14.93	13.04	27.44	**+1.68**	**+14.40**
Italy	26.13	39.23	21.70	39.07	**+13.10**	**+17.37**
Cyprus	23.17	33.63	22.76	37.03	**+10.46**	**+14.27**
Latvia	19.61	–	–	–		–
Lithuania	15.01	24.74	15.91	32.57	**+9.73**	**+16.66**
Luxembourg	19.01	19.45	11.28	19.20	**+0.44**	**+7.92**
Hungary	10.12	10.92	13.62	32.41	**+0.80**	**+18.79**
Malta	15.81	14.94	–	–	**– 0.87**	–
Netherlands	13.73	9.75	14.69	21.41	**+3.98**	**+6.72**
Austria	22.52	23.56	15.44	23.86	**+1.04**	**+8.42**
Poland	16.54	17.09	13.87	19.69	**+0.55**	**+5.82**
Portugal	22.85	23.47	16.86	18.12	**+0.62**	**+1.26**
Romania	16.11	34.21	15.09	36.55	**+18.10**	**+21.46**
Slovenia	16.38	18.86	12.65	21.88	**+2.48**	**+9.23**
Slovakia	16.29	18.91	17.20	30.51	**+2.62**	**+13.39**
Finland	16.05	19.78	10.35	16.63	**+3.73**	**+6.28**
Sweden	20.53	22.27	11.86	17.95	**+1.74**	**+6.09**

* 27 countries (from 2020), (–) not available, 2021-S2 – second half of 2021, 2022-S2 – second half of 2022
Source: own elaboration based on Eurostat (2024a).

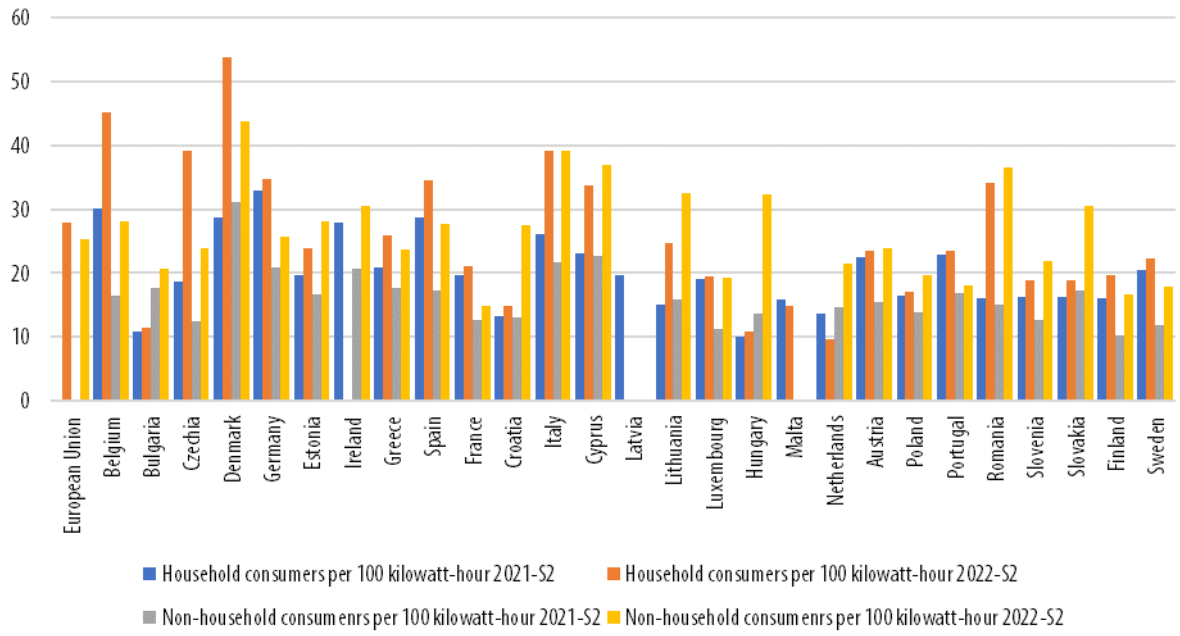

Figure 3. Electricity prices for household and non-household consumers – bi-annual data for 2021 and 2022 (in euros per 100 kilowatt-hours), 2021-S2 – second half of 2021, 2022-S2 – second half of 2022

Source: own elaboration based on Eurostat (2024a).

Table 4. Gross electricity production (in million tonnes of oil equivalent)

Country/year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
*European Union**	***252.3***	*250.8*	*245.6*	*249.4*	*251.2*	*254.0*	*252.6*	*249.6*	*239.5*	***249.9***
Belgium	**7.1**	7.1	6.2	6.0	7.3	7.4	6.4	8.0	7.6	**8.6**
Bulgaria	**4.1**	3.8	4.1	4.2	3.9	3.9	4.0	3.8	3.5	**4.1**
Czechia	**7.5**	7.5	7.4	7.2	7.2	7.5	7.6	7.5	7.0	**7.3**
Denmark	**2.6**	3.0	2.8	2.5	2.6	2.7	2.6	2.5	2.5	**2.8**
Germany	**53.9**	54.8	53.8	55.6	55.8	56.1	54.9	52.1	49.3	**50.4**
Estonia	**1.0**	1.1	1.1	0.9	1.0	1.1	1.1	0.7	0.5	**0.6**
Ireland	**2.4**	2.2	2.2	2.4	2.6	2.7	2.7	2.7	2.8	**2.7**
Greece	**5.2**	4.9	4.3	4.5	4.7	4.8	4.6	4.2	4.1	**4.7**
Spain	**25.6**	24.6	24.0	24.1	23.6	23.7	23.6	23.5	22.6	**23.6**
France	**49.2**	50.0	49.2	49.8	48.5	48.3	50.0	49.0	45.7	**47.7**
Croatia	**0.9**	1.2	1.2	1.0	1.1	1.0	1.2	1.1	1.2	**1.3**
Italy	**25.7**	24.9	24.0	24.3	24.9	25.4	24.9	25.2	24.1	**24.8**
Cyprus	**0.4**	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**0.4**
Latvia	**0.5**	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.5	**0.5**

Country/year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Lithuania	**0.4**	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	**0.4**
Luxembourg	**0.3**	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	**0.2**
Hungary	**3.0**	2.6	2.5	2.6	2.7	2.8	2.7	2.9	3.0	**3.1**
Malta	**0.2**	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	**0.2**
Netherlands	**8.9**	8.7	8.9	9.4	9.8	9.9	9.8	10.4	10.6	**10.5**
Austria	**6.2**	5.9	5.6	5.6	5.9	6.1	5.9	6.4	6.2	**6.1**
Poland	**13.9**	14.1	13.7	14.2	14.3	14.7	14.6	14.1	13.6	**15.4**
Portugal	**4.0**	4.4	4.5	4.5	5.2	5.1	5.1	4.6	4.6	**4.4**
Romania	**5.1**	5.1	5.6	5.7	5.6	5.5	5.6	5.1	4.8	**5.1**
Slovenia	**1.4**	1.4	1.5	1.3	1.4	1.4	1.4	1.4	1.5	**1.4**
Slovakia	**2.5**	2.5	2.3	2.3	2.3	2.4	2.3	2.4	2.5	**2.6**
Finland	**6.0**	6.1	5.8	5.9	5.9	5.8	6.0	5.9	5.9	**6.2**
Sweden	**14.3**	13.2	13.2	13.9	13.4	14.1	14.0	14.5	14.1	**14.8**

* 27 countries (from 2020)
Source: own elaboration based on Eurostat (2024b).

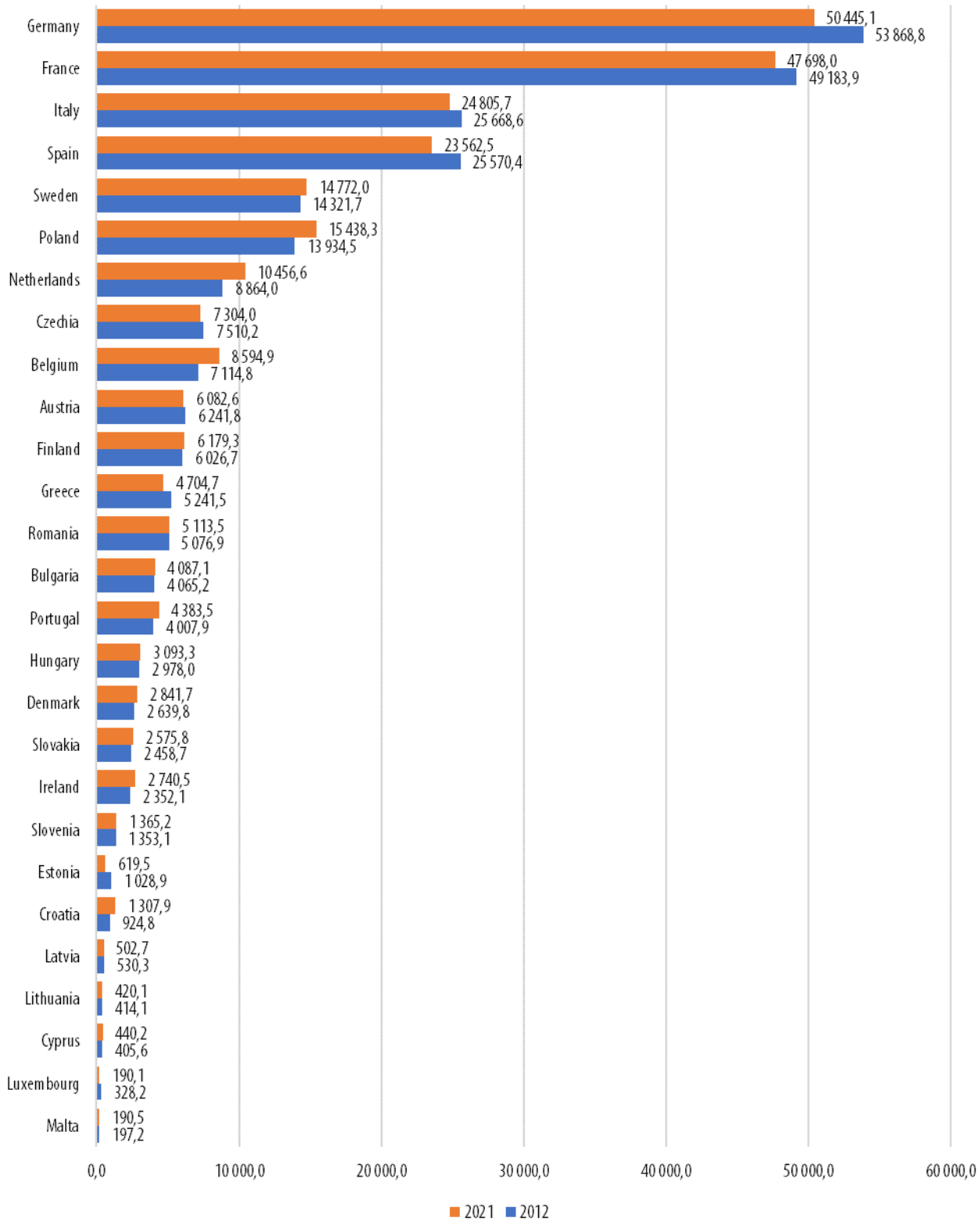

Figure 4. Gross electricity production in 2012 and 2021 (in thousand tonnes of oil equivalent)

Source: own elaboration based on Eurostat (2024b).

Table 5. Gross electricity production in 2012 and 2021 (in thousand tonnes of oil equivalent)

Country/year	2012	2021
Belgium	**7,114.8**	**8,594.9**
Bulgaria	4,065.2	4,087.1
Czechia	7,510.2	7,304.0
Denmark	2,639.8	2,841.7
Germany	**53,868.8**	**50,445.1**
Estonia	1,028.9	619.5
Ireland	2,352.1	2,740.5
Greece	5,241.5	4,704.7
Spain	**25,570.4**	**23,562.5**
France	**49,183.9**	**47,698.0**
Croatia	924.8	1,307.9
Italy	**25,668.6**	**24,805.7**
Cyprus	405.6	440.2
Latvia	530.3	502.7
Lithuania	414.1	420.1
Luxembourg	328.2	190.1
Hungary	2,978.0	3,093.3
Malta	197.2	190.5
Netherlands	**8,864.0**	**10,456.6**
Austria	6,241.8	6,082.6
Poland	**13,934.5**	**15,438.3**
Portugal	4,007.9	4,383.5
Romania	5,076.9	5,113.5
Slovenia	1,353.1	1,365.2
Slovakia	2,458.7	2,575.8
Finland	**6,026.7**	**6,179.3**
Sweden	**14,321.7**	**14,772.0**

Source: own elaboration based on Eurostat (2024b).

Conclusions from tables and figures

Table 1 and Figure 1 present carbon dioxide emissions in European Union countries, 2012–2021 (in million tonnes).

Between 2012 and 2021, the European Union reduced carbon dioxide emissions into the atmosphere from 2,712.2 to 2,246.2 million tonnes. Decreases were recorded in all EU countries except Lithuania, Luxembourg and Poland.

Table 2. Carbon dioxide emissions in European Union countries in 2012 and 2021 (in thousand tonnes) and its growth (in %).

A comparison of carbon dioxide emissions in European Union countries in 2012 and 2021 (in thousand tonnes) and their growth (in %) shows that only Poland recorded an increase, while particularly large decreases in emissions took place in Greece, Italy, Lithuania, Malta, Portugal, Finland and Sweden.

Table 3. Electricity prices for household and non-household consumers – bi-annual data for 2021 and 2022 (in euros per 100 kilowatt-hours).

Table 3 (and Figure 3) show that concerning household consumers, the semi-annual data for 2021–2022 indicate that the most significant price increases were recorded in Denmark (+24.97), the Czech Republic (+20.49), Romania (+18.10) and Italy (+18.10) (+13.10), while a decline in price growth was recorded only in Malta (–0.87). As regards non-household consumers, the relevant semi-annual data for 2021–2022 indicate that the highest price increases were recorded in Romania (21.46), Hungary (+18.79), Italy (17.37), Croatia (+14.40), Cyprus (+14.27), Denmark (+12.49), Belgium (+11.74), Estonia (+11.46), Czech Republic (11.32), Spain (++10.42).

Table 4. Gross electricity production (in million tonnes of oil equivalent).

Table 4 presents the value of electricity production in the European Union and its member states between 2012 and 2021. It shows that in the analyzed years, there was a decrease in production in the EU from 252.3 to 249.9 million tonnes. In contrast, production increased in Belgium, Ireland, Croatia, Poland, Portugal, Slovakia, Finland, Sweden and Hungary.

Table 5 shows EU countries with a high increase in electricity production between 2012 and 2021. They include Poland, the Netherlands, Sweden, Belgium and Finland. Meanwhile, Germany, Spain, France and Italy recorded a decrease.

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Polityka energetyczna w Unii Europejskiej w ramach strategii Europejskiego Zielonego Ładu

Celem artykułu jest przedstawienie polityki energetycznej Unii Europejskiej w świetle jej najnowszej strategii Europejski Zielony Ład. W artykule szczególne znaczenie ma udzielenie odpowiedzi na dwa główne pytania.

Pierwsze pytanie brzmiało: „Jakie znaczenie w polityce energetycznej UE miały dwa pakiety energetyczne, tzn. czwarty i piąty pakiet?". Czwarty pakiet został przyjęty w czerwcu 2019 r. a pakiet piąty – „*Ready for 55*" został opublikowany w roku 2021. Piąty pakiet energetyczny miał dostosować cele energetyczne UE do nowych europejskich celów klimatycznych na lata 2030 i 2050.

Drugie pytanie dotyczyło tego, jakie są główne wnioski z przedstawionych tabel i wykresów, dotyczące zarówno emisji dwutlenku węgla w krajach Unii Europejskiej w latach 2012–2021, jak i zmian cen energii elektrycznej dla gospodarstw domowych i odbiorców niebędących gospodarstwami domowymi w euro za 100 kilowatogodzin. Zaprezentowana została również wartość produkcji energii elektrycznej brutto (w mln ton ekwiwalentu ropy naftowej) w analizowanych latach dla wszystkich krajów członkowskich UE.

Słowa kluczowe: Unia Europejska, polityka energetyczna, pakiety energetyczne, kraje UE, wartości zużycia energii przez gospodarstwa domowe i niebędących gospodarstwami domowymi odbiorców energii