

KEY FINDINGS

# *Developments in the electricity and gas markets*

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Bundesnetzagentur Bundeskartellamt



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# Monitoring report 2024 - Summary

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# **I Developments in the electricity and gas markets**

# A Electricity

## 1. Electricity network overview

The network balance provides an overview of supply and demand in the German electricity grid in 2023.

Supply comprised a total net electricity generation of 482.4 terawatt hours (TWh), including 10.1 TWh from pumped and battery storage and physical flows from other countries into Germany's general supply networks amounting to 69.2 TWh.

Demand comprised a total of 429 TWh of electricity delivered from the general supply networks to final customers. Consumption by industrial, commercial and other non-household customers totalled 302.3 TWh and by household customers 115.2 TWh. Consumption by pumped storage and battery storage amounted to 11.5 TWh. A total of 31.8 TWh of electricity was fed into networks not classed as general supply networks. Network losses totalled 27 TWh, while physical flows from Germany's networks to other countries amounted to 56.8 TWh.<sup>1</sup> The drop in consumption is due to various factors, including lower economic performance, high energy prices on the wholesale markets, the mild weather and efficiency gains.<sup>2</sup>

## 2. Electricity generation

Germany's electricity generation was considerably lower than in 2022.<sup>3</sup>

At 482.4 TWh, it was 9.2% down on the 2022 level.

The main reasons behind the decrease were the slowing economy, the mild weather, an increase in imports due to lower electricity prices in other countries, high prices for primary energy and the closure of the last three nuclear power plants.

- Generation by conventional power plants was down by 78.2 TWh (26.5%) to 216.4 TWh.
- By contrast, generation from renewable sources was up 28.8 TWh (12.2%) to 265.9 TWh.<sup>4</sup>
- Renewable generation accounted for just under 53% of gross electricity consumption (up 8 percentage points).<sup>5</sup>

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<sup>1</sup> Germany recorded the first electricity import surplus in a long time (12.4 TWh).

<sup>2</sup> Gross domestic product in 2023 down by 0.3% – Federal Statistical Office (destatis.de)

<sup>3</sup> Electricity generation in the chapter on generation refers to net electricity generation, unless otherwise indicated.

<sup>4</sup> The large increase in renewable generation is partly due to the switch to a new data basis. The analyses for 2023 are based for the first time on data from the Working Group on Renewable Energy Statistics (AGEE-Stat).

Background: uniform renewable energy statistics and better representation of the monthly possibility to switch between with and without payments under the Renewable Energy Sources Act (EEG).

<sup>5</sup> Where the share of generation from renewables in 2023 is taken to be about 56% or more, it is usually based on the "grid load" (as, for example, on the SMARD website).

- Electricity generation by lignite power stations amounted to 80.3 TWh, down 25.6% on the previous year.
- Generation by hard coal-fired power plants totalled 34.9 TWh, down 39.6% year-on-year. This was primarily due to lower wholesale prices for natural gas, carbon pricing, the slowing economy and the increase in generation from renewable sources.
- Electricity generation by natural gas power stations amounted to 65.7 TWh, just slightly down (1.9%) on the previous year.  
The main reasons for using natural gas to generate electricity in contrast to other conventional energy sources were the following:  
The lower gas prices compared with 2022 are likely to have improved the profitability of gas-fired power plants. The economic viability of gas-fired power plants benefits from the plants' flexibility in terms of being able to increase and decrease their output more quickly than coal-fired power plants.
- Nuclear generation decreased by 26.0 TWh. This reduction is due to the closure of the last three nuclear power plants, Isar 2, Emsland A and Neckarwestheim 2, on 15 April 2023.
- Electricity generation by oil power stations was down 0.6 TWh to 3.6 TWh.
- Solar generation achieved a significant increase (17.5%) despite low levels of sunshine, thanks to very high growth in capacity.
- Onshore wind generation recorded an increase of 16.3 TWh (16.7%).  
This was due in particular to growth in wind capacity and a very windy second half of the year.
- Hydropower generation was also up (35.6%) as a result of high levels of rain during the year.
- Offshore wind generation fell by 1.2% despite a moderate increase in capacity. The decrease in generation is probably due primarily to the network-related curtailments amounting to about 5.7 TWh.

#### *Combined heat and power (CHP) plants*

CHP plants generated 53.5 TWh of electricity in 2023 (down 3.9 TWh). Non-CHP electricity decreased by 53.7 TWh to 88.8 TWh. The total amount of useful heat generated was 132.6 TWh (up 8.6 TWh). The primary energy source for the generation of electricity and useful heat in 2023 was natural gas, accounting for 37.4 TWh of the total electricity and 54.7 TWh of the total useful heat produced. By contrast, the primary energy source for the generation of non-CHP electricity was lignite, which accounted for 55.8 TWh of the total.

The installed electrical capacity of the CHP plants increased in 2023 by 0.9 gigawatts (GW) to 28.8 GW. The useful heat capacity grew by 0.5 GW to 55.1 GW. Natural gas is by far the most important energy source for CHP plants. It is used to fuel plants with a total installed electrical capacity of 17.1 GW and a total useful heat capacity of 26.8 GW.

### *Electricity generation capacity*

The total installed generation capacity at the end of 2023 was 265.4 GW<sup>6</sup> (2022: 244.8 GW<sup>7</sup>). It comprised 96.2 GW of non-renewable and 169.2 GW of renewable capacity.

The installed capacity of installations eligible for payments under the Renewable Energy Sources Act (EEG) in Germany stood at 153.0 GW at the end of 2023 (2022: 144.7 GW), an increase of 8.3 GW (5.7%). The installed capacity of renewable installations not eligible for payments under the EEG was 16.2 GW.

A total of 236.0 TWh of renewable electricity was entitled to payments under the EEG in 2023, an increase of 7.4%.

### *Figures under the EEG*

Payments to renewable energy installation operators under the EEG increased year-on-year by 41.0% to €17.4bn. The average paid to operators under the EEG in 2023 was 7.4 cents per kilowatt hour (ct/kWh).<sup>8</sup>

The share of all EEG payments attributable to feed-in tariffs has decreased steadily since 2010, falling to just around 15% in 2023. The share attributable to market premiums was 75%. The share accounted for by other forms of direct selling increased to nearly 11%.

The development corridors laid down in law for biomass were achieved in 2023. The installed capacity targets set for 2030 in the EEG 2023 and the Offshore Wind Energy Act (WindSeeG) are as follows: biomass 8.4 GW, solar 215 GW, onshore wind 115 GW and offshore wind 30 GW. However, higher growth in capacity, in particular in wind capacity, is needed to meet these expansion targets for 2030.

### *Auctions*

Nearly all the auctions in 2024 were oversubscribed, resulting in strong competition in many cases. The upward trend in participation was also observed in the onshore wind auctions. The August auction was the first to be oversubscribed in seven years. The auction was for a volume of 2.7 megawatts (MW), with 239 bids submitted for a total of 2.9 MW. An unusually large number of bids for projects with older approvals was submitted compared with previous auctions.

There was also a continually high level of participation in the auctions for first-segment and second-segment solar installations. All the auctions since the beginning of 2023 have been considerably oversubscribed, with bid volumes totalling one and a half to two times the amount up for auction. The Bundesnetzagentur had issued determinations setting maximum prices for these auctions with the aim of improving framework conditions and promoting competition.

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<sup>6</sup> This includes power plants not currently in the market, for instance plants in the grid reserve or plants that have been shut down temporarily.

<sup>7</sup> The 2022 figure from the 2023 monitoring has been updated.

<sup>8</sup> The average EEG payment is calculated by dividing the total sum paid under the EEG in a year by the total amount of renewable electricity fed in during that year.



The first innovation auction of the year in May was slightly undersubscribed. The September auction was more than three times oversubscribed, with the total volume of bids submitted amounting to 1.9 MW. The significant oversubscription in the innovation auction follows on from the trend set in the auctions for ground-mounted solar photovoltaic systems. As in previous auctions, the vast majority of the bids were for combinations of solar installations and storage facilities.

The April biomass auction was also three times oversubscribed. The trend reversal that began in 2023 strengthened, with constantly oversubscribed auctions, one of the likely reasons being the Bundesnetzagentur's determination setting maximum prices. In the auctions for biomethane installations, no or hardly any bids were again submitted.

In 2022, the Bundesnetzagentur auctioned one site for an offshore wind farm in the North Sea that had been subject to a pre-investigation by the Federal Maritime and Hydrographic Agency (BSH) to analyse the marine environment, seabed, and wind and oceanographic conditions. The offshore wind farm is due to start operation in 2027 with a capacity of 980 MW. Several bids were submitted. The successful bid was one with an award price of 0 ct/kWh, for which, however, a company exercised a right of subrogation because it had originally planned an offshore wind farm on the site.

In 2023, the Bundesnetzagentur conducted two rounds of auctions for sites for offshore wind farms with a total capacity of 8,800 MW. This was the largest ever volume auctioned in a year.

Four non-centrally pre-investigated sites with a combined volume of 7,000 MW were first up for auction: three with a capacity of 2,000 MW each in the North Sea and one with a capacity of 1,000 MW in the Baltic Sea. The wind farms are due to go into operation in 2030. The awards were made for the first time in online dynamic bidding procedures. The dynamic bidding procedures were necessary because eight zero-cent bids for each of the sites in the North Sea and nine zero-cent bids for the site in the Baltic Sea had been submitted. The successful bidders were the ones willing to pay the highest amount for each site. There was lively competition for all the sites, with prices successively increasing in a total of between 55 and 72 bidding rounds. The proceeds from the auctions amounted to €12.6bn.

The second round of auctions was for four pre-investigated sites in the North Sea with a combined volume of 1,800 MW. The awards were made for the first time in bidding procedures with qualitative criteria, which took account of factors such as the decarbonisation of the offshore expansion projects and the use of environmentally friendly foundation technologies as well as how much bidders were willing to pay. The wind farms are due to start operation in 2028. The auctions for the pre-investigated sites were influenced by rights of subrogation for three of the four sites. The qualitative criteria did not have a decisive effect on the awards.

A total of 90% of the proceeds from the two offshore wind power auctions in 2023 will go towards bringing down electricity costs and 5% each towards marine nature conservation and promoting sustainable fishing. The contributions for marine conservation and fishing must be paid to the federal budget within one year. The contributions for lowering electricity costs must be paid in equal annual instalments to the transmission system operators required to connect the offshore wind farms over a period of 20 years beginning when a wind farm becomes operational.

*Current power plant capacity*

The installed generation capacity in Germany's general supply networks as at 28 October 2024 amounted to 267.9 GW (net), including 12.9 GW of capacity outside the electricity market.

*Expected new capacity and closures*

A total of 2.7 GW of new conventional generation capacity is expected to be installed by 2027.<sup>9</sup> A total of 4.7 GW of capacity is due to be taken out of operation.

### 3. Market concentration

*Electricity generation*

Market concentration in domestic electricity generation (not entitled to payments under the EEG) excluding imports saw a decrease in 2023 as far as the market shares of the largest producers was concerned. The combined market share of the five largest companies by sales (concentration ratio 5 – CR5) (in the period under review RWE, LEAG, EnBW, Uniper and Vattenfall) in the German market area, including Luxembourg, in terms of domestic electricity generation volumes in 2023 was 61.3%, compared to 63.5% in 2022, when E.ON was one of the five companies. E.ON's place has now been taken by Vattenfall.

The combined market share of the five largest companies (as above) supplying German conventional electricity generation capacity at the end of 2023 was 52.6% and thus slightly higher than the share in 2022 of 52.1%. RWE is by far the largest in the group in terms of both the amount of electricity generated and the amount of generation capacity. The development in capacity is due to the implementation of the nuclear and coal phase-out, which involves a significant amount of conventional generating capacity exiting the market, including plants operated by the five largest suppliers. Most importantly, the last three nuclear power plants exited the market on 15 April 2023, while some power plants returned to the market under statutory regulations and to lessen the effects of a reduced gas supply.

*EEG electricity*

The analysis of the volume of electricity generated entitled to payments under the EEG, which is made solely for the purposes of the monitoring, shows that the combined share of the five largest companies by sales (RWE; EnBW, E.ON, Vattenfall and Uniper) in 2023 was about 6.8%.<sup>10</sup> The fact must be taken into account that the share of the largest producers relates to all renewable installations and not solely installations eligible for

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<sup>9</sup> The new capacity only includes electricity generating plants that are currently in trial operation or under construction with a net rated capacity of 10 MW or more per site because these projects are sufficiently likely to be implemented.

<sup>10</sup> The five largest producers of EEG electricity in terms of the scope of the EEG include E.ON and not LEAG.

payments under the EEG. The five largest companies' share in electricity entitled to payments under the EEG is therefore slightly lower. Their combined market share in 2022 was about 6.3%.

#### *Market power report*

A more detailed assessment of market power would need to include an analysis<sup>11</sup> to determine the extent to which a company is “pivotal”, or indispensable, which is a decisive factor in assessing market power in the electricity generation sector in line with the Bundeskartellamt's practice.<sup>12</sup> Such a comprehensive analysis would, however, be beyond the scope of the monitoring report. An up-to-date analysis is included in the fifth market power report on the electricity generation sector that was published on 25 November 2024. The analysis involves determining the residual supply index (RSI), which indicates the degree to which a company's power plant fleet is pivotal in terms of meeting the demand for electricity. It therefore takes account of the fact that the amount of electricity consumed and that generated have to match at all times and only very limited storage options are available. The RSI is therefore an indicator of market power adapted to the specific characteristics of electricity as a product.

According to the Bundeskartellamt's latest market power report, RWE was indispensable in terms of meeting the demand for electricity in fewer periods during the twelve months up to the end of April 2024 than in the twelve months before. The degree of indispensability is around 5%, which is the threshold above which the Bundeskartellamt considers a company to have a dominant market position. However, in light of the future closure of more power plants and a potential increase in the demand for electricity in the event of an economic recovery, the decrease in the periods in which the company is pivotal is not expected to continue in the long term. In addition, an overall assessment of all structural market conditions is necessary for the analysis of market dominance. Alongside the actual degree of indispensability, the predictability of a company being indispensable is key to whether or not a company has structural market power. Econometric analyses show that it is possible for RWE to systematically predict the periods in which the demand for electricity could not be met without its capacity. Overall, the evaluations therefore suggest that RWE still has structural market power in the market for the first-time sale of electricity.

#### *Background and outlook*

The closure of the last three nuclear power plants and planned closures of coal power stations operated specifically by the five largest producers together with an increase in the generation of electricity entitled to payments under the EEG and the increasing importance of imports have led to further decreases in the aggregate market share of the five largest producers and thus the degree of market concentration. However, the reduction in available capacity as a result of closures also increases the competitive weight of the remaining capacity; this is reflected in the RSI, which is used as the basis for the analysis in the market power report. The fact must also be taken into account that power plants were only temporarily taken out of the reserve and reactivated because of the energy crisis and have already been deactivated again in some cases.

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<sup>11</sup> Bundeskartellamt: Wettbewerbsverhältnisse im Bereich der Erzeugung elektrischer Energie 2022, Marktmachtbericht, August 2023, page 7 et seq.

<sup>12</sup> Bundeskartellamt: Wettbewerbsverhältnisse im Bereich der Erzeugung elektrischer Energie 2022, Marktmachtbericht, August 2023, page 7 et seq.

### *Electricity retail markets*

As in previous years, the Bundeskartellamt assumes for 2023 that there is no single dominant undertaking in the two largest electricity retail markets. In 2023, the four largest companies by sales (E.ON, RWE, EWE and N-Ergie) on the national market for the supply of interval-metered customers sold a total of about 49.0 TWh. Their aggregate market share (CR4) was 22.2%. In 2022, they sold 50.8 TWh and their market share was 21.1%.

In 2023, the cumulative sales of the four largest companies (currently E.ON, EnBW, Vattenfall and EWE) on the national market for the supply of standard load profile (SLP) customers on special contracts (non-default contracts and excluding heating electricity) amounted to about 41.0 TWh, compared to 49.7 TWh for the same companies in 2022. The combined share of the four companies on this market in 2023 was about 38%, compared to 44.2% in 2022. The share of the four largest companies in both markets is still well below the statutory threshold for presuming (joint) market dominance (section 18(4) and (6) of the Competition Act (GWB)).<sup>13</sup>

With regard to the supply of SLP customers on default contracts, for which regional markets are defined, the local default suppliers each have a monopoly in their individual supply/network area. The cumulative sales of the four largest companies across all default supply areas in Germany (again E.ON, EnBW, Vattenfall and EWE) amounted to around 13.7 TWh of the total amount of electricity sold under default contracts of around 30.4 TWh; this corresponds to a share of about 45.1%, compared to about 45.9% in the previous year.<sup>14</sup>

With regard to the supply of customers with heating electricity, for which regional markets are also defined, the four largest companies (E.ON, EnBW, Vattenfall and Lichtblick) still have a relatively strong position both in a large number of individual supply areas and across all the supply areas.<sup>15</sup> The cumulative sales of the four largest companies across all the supply areas in Germany amounted to about 7.1 TWh of the total of 12.2 TWh for heating electricity, which corresponds to a share of 58.2%, compared to 52.2% in 2022.<sup>16</sup>

## **4. Network structure data**

The four transmission system operators (TSOs) and 815 distribution system operators (DSOs) took part in the data survey for the Monitoring Report 2024.

The circuit length at TSO level amounted to 37,700 kilometres (km) in 2023. The total number of final customer market locations in the TSOs' networks was 214. All of these market locations are interval-metered. As at 31 December 2023, the DSOs' total circuit length at all network levels was about 1.9mn km. The total number of final customer market locations in all the DSOs' network areas was about 53mn. The majority of the DSOs included in the data analysis (619 or 76%) have short to medium length networks (underground and

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<sup>13</sup> Share of 40% (for one single company) or two thirds (for joint market dominance by up to five companies).

<sup>14</sup> This is a fictitious figure that only serves to illustrate the market conditions because the Bundeskartellamt's decision-making for default supply is based on regional (network area-related) markets and not a national market.

<sup>15</sup> Lichtblick took over a large number of heating electricity customers from innogy (formerly RWE) (condition as part of the E.ON/innogy merger case (M.8870)).

<sup>16</sup> This is also a fictitious figure that only serves to illustrate the market conditions because the Bundeskartellamt's decision-making for the supply of heating electricity to customers is also based on regional (network area-related) markets and not a national market.

overhead cables) of up to 1,000 km. This means that the majority of the DSOs' underground and overhead lines are accounted for by about 194 companies.

The annual peak load in 2023 of 73.7 GW was registered on 4 December 2023 between 5.15pm and 5.30pm (2022: 78.83 GW on 1 February 2022 between 12.30pm and 12.45pm). The annual peak load is the highest simultaneous demand for electrical capacity in a year from all customers connected to the general supply networks, including line losses.

## 5. Network expansion

### *Current status of expansion in the transmission networks*

As at 31 December 2023, 119 projects with a total length of approximately 14,000 km were listed in the Federal Requirements Plan Act (BBPlG) and the Power Grid Expansion Act (EnLAG): 30 projects had already been completed and another 11 had been at least fully approved; 60 projects were still at the approval stage; and 18 projects were waiting for submission of the initial applications for federal sectoral or spatial planning.

The total length of the EnLAG projects as at 31 December 2023 was some 1,809 km:

- about 8 km were in the spatial planning procedure;
- about 120 km were in or about to start the planning approval procedure;
- 175 km had been approved and were under or about to start construction;
- 1,506 km had been completed.

The total length of the BBPlG projects was some 12,191 km:

- about 1,484 km were about to start the approval procedure;
- about 1,485 km were in the federal sectoral or spatial planning procedure;
- about 6,235 km were in or about to start the planning approval or notification procedure;
- 1,671 km had been approved and were under or about to start construction;
- 1,316 km had been completed.

### *DSOs' future grid expansion requirements*

On 30 April 2024 the DSOs published their expansion plans online at [vnbdigital.de](http://vnbdigital.de) and notified them to the Bundesnetzagentur. A preliminary analysis of expansion plans up to 2033 based on the DSOs' information shows that projects designed to increase transmission capacity with a total investment volume of about €110bn are planned or already under construction. The DSOs' estimated investment requirements for projects increasing transmission capacity up to 2045 amount to just over €200bn. Once the analysis has been completed, the Bundesnetzagentur will publish further information on the expected expansion and status of the distribution networks.

## 6. Investments by electricity network operators

In 2023, investments in and expenditure on network infrastructure by the network operators amounted to about €17,843mn (2022: €14,903mn) (both values under commercial law). The total comprised €10,388mn of investments and expenditure by the DSOs and €7,455mn by the four TSOs. Investments by the TSOs in 2023 were up by around 27% on the previous year (2022: €5,513mn, 2023: €6,989mn), while investments by the DSOs were up by 25% (2022: €5,733mn, 2023: €7,179mn). Both the TSOs and the DSOs again planned higher investments for 2024.

## 7. Electricity supply disruptions

For the year 2023, 852 network operators reported 158,360 interruptions in supply at low and medium voltage level for the calculation of the system average interruption duration index (SAIDI<sub>ENWG</sub>). This is an increase of 1,115 interruptions compared to the year before. The figure of 12.8 minutes per year per connected final customer for the low and medium voltage levels is above the previous year's average of 12.2 minutes. The reliability of supply remained at a high level in 2023.

## 8. Electricity network tariffs

There was a clear increase of more than 24% in the volume-weighted network tariffs (including meter operation charges) for household customers for 2024 (up 2.27 ct/kWh). The volume-weighted average network tariff for household customers with an annual consumption of 2,500 kWh to 5,000 kWh was 11.62 ct/kWh.

The arithmetic mean tariffs for non-household customers for 2024 are higher than the previous year's levels. The network tariffs (including meter operation charges) for commercial customers increased by about 27% to 9.42 ct/kWh (2023: 7.42 ct/kWh). The network tariffs (including meter operation charges) for industrial customers increased by around 25% to 4.12 ct/kWh (2023: 3.30 ct/kWh).

The main reason for the year-on-year increases in the DSOs' network tariffs is the large increase in network tariffs in the transmission system (see below). Other reasons include higher costs for the procurement of loss energy due to a rise in electricity prices on the exchange and the start of the fourth regulatory period. In 2024, the cost level in the cost examination with the base year 2021 is factored into the network tariffs for the first time. The network costs recognised for the operators under the Bundesnetzagentur's responsibility are higher than those recognised in the last cost examination with the base year 2016. The DSOs under the Bundesnetzagentur's responsibility also based their network tariffs for 2024 on slightly lower transport volumes overall.

The TSOs' tariffs were twice as high in 2024 as in 2023. In 2023 the transmission network tariffs were kept at 2022 levels through federal financing under the Electricity Price Brake Act (StromPBG). This financing was no longer in place in 2024, which meant that in particular the large increases in system service costs that depend on market prices (especially for congestion management and procuring loss energy and balancing reserves) came into play.

An analysis of 342 DSOs' provisional network tariffs for 2025 shows that average distribution network tariffs for household customers across Germany will fall by more than 3%. The main reason for this decrease is the Bundesnetzagentur's determination on distributing the additional costs incurred in networks as a result of the

integration of renewable energy generating installations (BK8-24-001-A). This will provide relief for regions with a particularly high burden of costs from renewable energy expansion from 2025 onwards. Overall, 178 DSOs will be able to pass on about €2.4bn. The average household (with an annual consumption of 3,500 kWh) in a region benefiting from a reduction in the cost burden will see a decrease in the network tariffs of up to more than €200 in 2025 compared with 2024.

The costs incurred in reducing the burden on individual regions will be distributed across the country with a “surcharge for special network use”. The surcharge for 2025 will be 1.56 ct/kWh compared to 0.643 ct/kWh in 2024; 60% of the surcharge will cover the costs of distributing the renewable energy network costs. This will add about an extra €33 a year to electricity bills for household customers with an annual consumption of 3,500 kWh.

## 9. Electric vehicles/charging stations/load control

### *Electric vehicles/charging stations*

Publicly accessible electric vehicle charge points must meet certain minimum technical requirements. The operators of charging infrastructure accessible to the public have to notify the Bundesnetzagentur of their infrastructure so that compliance with the requirements can be checked as set out in the Charging Station Ordinance (LSV). The Bundesnetzagentur publishes monthly figures and information on publicly accessible charging infrastructure based on the operators’ notifications on its website at <https://www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/E-Mobilitaet/start.html> (in German).

In 2023, as in the previous two years, there was an increase of 42% in the number of publicly accessible electric vehicle charge points. At the end of 2023, more than 125,000 publicly accessible charge points with a total power of 4.4 GW were in operation. The Bundesnetzagentur publishes comprehensive data on a regular basis at <https://www.bundesnetzagentur.de/ladeinfrastruktur> (in German).

The Bundeskartellamt’s sector inquiry on electric vehicle charging infrastructure showed that competition in a large number of local markets is restricted by a high degree of market concentration. A key reason is that the non-discriminatory award of public spaces at municipal level, which is essential to guarantee competition, is too often lacking. In addition, local operators with market power are able to exploit pricing flexibility or force competing mobility service providers out of the market and thus worsen existing market power problems.

### *Load control*

Section 14a of the Energy Industry Act (EnWG) gives DSOs at the low voltage level the ability to use consumers’ flexibility to avoid localised overloading. DSOs can conclude agreements with final customers with controllable devices such as heat pumps, private electric vehicle charge points and night storage heaters allowing the DSOs to control the consumption of the devices in return for a reduced network tariff.

In 2023 operators of a total of 2,038,917 controllable consumer devices had taken up this opportunity (2022: 1,808,565). There was another decrease in the number of night storage heating systems covered by such

agreements, while there was an increase in the number of heat pumps and electric vehicle charge points. Details of the type of controllable consumer device were not provided by the network operators for 8% of the devices.

## 10. Costs for system services

The net costs for system services, which are passed on to final customers, were lower in 2023 than in 2022 at about €5.2bn (2022: €5.8bn). Major costs were the costs for congestion management at about €3.2bn (2022: €4.2bn), contracting frequency containment reserves (FCR), automatic frequency restoration reserves (aFRR) and manual frequency restoration reserves (mFRR) at a total of €0.6bn (2022: €0.6bn), and loss energy at €1.3bn (2022: €0.8bn). Although the volume of the loss energy procured by the TSOs decreased from 10.8 TWh in 2022 to 9.8 TWh in 2023, the costs for loss energy have increased significantly. This is mainly due to the increase in the reference price, which more than compensated for the decrease in the volume of loss energy procured.

## 11. Balancing services

The annual average volume of FCR tendered in 2023 increased to 570 MW (2022: 555 MW). The downward trend in aFRR and mFRR volumes seen in recent years continued. The annual average volume of positive aFRR tendered was 1,923 MW (2022: 1,996 MW), while the average volume of negative aFRR tendered was 1,842 MW (2022: 1,901 MW). The average volume of positive mFRR tendered was 681 MW (2022: 922 MW) and the average volume of negative mFRR tendered was 372 MW (2022: 432 MW).

The average monthly volume of aFRR and mFRR used in 2023 was lower than in the previous year. April again had the highest average volume of these two types of reserves used with 182 MW, down 53 MW on the previous year.

The average volume-weighted imbalance price in the case of a short portfolio was €240.30 per megawatt hour (MWh), 47% lower than a year before. The average volume-weighted imbalance price in the case of a long portfolio was negative €38.73/MWh (2022: negative €16.54/MWh).

## 12. Congestion management

The total volume of congestion management measures (redispatching with operational and grid reserve power plants and countertrading) in 2023 was around 34,294 gigawatt hours (GWh), up 4.6% on the previous year (2022: 32,772 GWh). The total costs were provisionally put at around €3.2bn, about 24% (€1.1bn) lower than the previous year's figure despite the increase in volumes. The lower costs are mainly due to a decrease in fuel and wholesale prices.

Further details and background information on congestion management are available at [www.smard.de](http://www.smard.de).



### 13. Cross-border electricity trade

2023 was the first year in a long time in which electricity imports exceeded exports. Cross-border trade volumes for electricity amounted to 91 TWh (2022: 94 TWh), comprising about 40 TWh of exports and about 51 TWh of imports. On account of the stabilisation of electricity prices compared with 2023, the effect on the export revenues of €3,070mn (2022: €11,665mn) and the import costs of €5,462mn (2022: €9,192mn) is smaller than the effect from the volumes.

### 14. Wholesale electricity markets

The situation in the energy markets eased in 2023. Wholesale electricity prices fell considerably. The trend in the prices largely mirrors that in natural gas prices as gas-fired power plants tend to set the prices in spot trading at times of peak demand (merit order principle). There was a recovery in the trading volume and liquidity of the wholesale electricity markets in 2023 compared with 2022.

#### *Spot market trading volumes*

There was a year-on-year increase of about 23% in the total trading volume of the coupled day-ahead midday auctions (classed as spot market trading) from 196.5 TWh in 2022 to around 242.5 TWh in 2023. This increase is due among other things to the stabilisation of the energy markets and the fall in energy prices. The total trading volume comprised 204.4 TWh on EPEX SPOT, 31.73 TWh on Nord Pool and 6.3 TWh on EXAA. The volume of the independent day-ahead 10.15am auctions on EXAA for the German bidding zone amounted to about 1.4 TWh in 2023.

The total volume traded on the intraday market also rose, with a year-on-year increase of about 24.8 TWh to 103.96 TWh. There was an increase in the intraday trading volume on EPEX SPOT to 85.1 TWh, with intraday auctions accounting for about 8.7 TWh and continuous intraday trading 76.4 TWh. The volume of continuous intraday trading on Nord Pool in the Germany/Luxembourg bidding zone also increased to about 18.8 TWh in 2023, more than twice the volume in 2022 of 8.7 TWh.

#### *Futures market trading volumes*

On-exchange futures trading volumes also recorded large increases. In 2023, the on-exchange trading volume for German power futures amounted to 1,686 TWh, up about 87.8% on the previous year. This increase is also due among other things to the fall in energy prices and the stabilisation of the energy markets. Trading for German power futures in 2023 was primarily for contracts for 2024 as the fulfilment year with about 974.4 TWh. Trading for longer-term contracts for each of the subsequent years was down on the previous year.

Volumes traded off-exchange via broker platforms also recorded increases. The total volume traded by these brokers in 2023 amounted to about 2,961 TWh compared to 2,704 TWh in 2022. Developments in trading volumes can also be followed through the London Energy Brokers' Association (LEBA), although it does not represent all broker platforms surveyed. There was an increase in the volume of transactions brokered by LEBA

members. The trading volume for German power brokered by LEBA members increased by about 31% from 2,073 TWh in 2022 to 2,725 TWh in 2023.<sup>17</sup>

The volume of over-the-counter (OTC) clearing of German power futures on EEX increased by about 42% in 2023 to 1,977 TWh. This volume accounted for about 54% of the relevant total trading volume on EEX, compared to 61% in 2022. OTC clearing has accounted for the majority of futures trading since 2019. There was also an increase in the volume registered for clearing with the LEBA. The registered volume for German power futures in 2023 was about 1,957 TWh, about 72% of the total OTC volume brokered by LEBA members. This means that OTC clearing accounts for the majority of the total trading by LEBA members.

### *Spot market prices*

Prices fell considerably, above all as a result of the easing of the wholesale markets and the substitution of Russian gas through, for instance, LNG, other energy sources or reductions in consumption. The annual average baseload day-ahead price on the spot market in 2023 was about €95.18/MWh, a decrease of about 60% on the previous year's average of about €235.46/MWh.

There were again numerous extreme baseload and peak load prices in the coupled auctions in 2023. However, the range of the middle 80% of the graded baseload prices decreased from €331.44/MWh in 2022 to €90.28/MWh in 2023. There was also a large decrease in the range of the middle 80% of the graded peak load prices from €700.23/MWh in 2022 to €256.60/MWh in 2023.

Negative baseload and peak load prices were recorded on several days.<sup>18</sup> The lowest baseload price of negative €53.87/MWh and the lowest peak load price of negative €137.30/MWh were both recorded on 2 July 2023. In 2022, the lowest baseload price was negative €1.43/MWh and the lowest peak load price negative €1.49/MWh. Negative prices often occur when short-term measures are needed to meet the demand for electricity due to deviations from forecasts. The highest baseload and peak load prices were also both lower than the year before. In 2023, the highest baseload price was €202.73/MWh, about 71% down on the previous year's highest price of €699.44/MWh. It was recorded on 23 January 2023. The highest peak load price for 2023 was recorded on the same day and was €235.99/MWh, about 68% down on the previous year's highest price of €731.01/MWh.

### *Futures market prices*

There was also a large decrease in the average prices for year-ahead futures as a result of the stabilisation of the energy markets. The annual average price for German power futures traded for 2024 was €137.51/MWh,

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<sup>17</sup> See LEBA Monthly Volume Reports.

<sup>18</sup> Negative prices are price signals on the electricity market that occur when, for example, a high level of inflexible electricity generation coincides with a low level of demand. Inflexible electricity sources cannot be shut down and started up again quickly without considerable expense or need to keep operating because of other supply obligations (heat, industrial processes, balancing reserves contracts). Financial support in the case of negative prices may also be a significant factor contributing to negative prices.

about 54% down on the previous year's average for futures traded for 2023 of €298.86/MWh. The annual average price for Phelix peak year futures in 2023 was €164.77/MWh, about 59% down on the previous year's average of €400.17/MWh.

There was also a large decrease in the prices for front year futures in 2023; prices reached their highest level at the beginning of January and fell again by the end of the year. The German power peak year futures price was about €281.75/MWh at the beginning of the year and about €108.62/MWh at the end of December.

## 15. Retail electricity markets

### *Contract structure of non-household customers*

In 2023, about 1,297 electricity suppliers (individual legal entities) provided information on the market locations served and on the amount of electricity supplied to interval-metered customers (2022: 1,370).<sup>19</sup>

In 2023, interval-metered customers were supplied with just under 220.7 TWh of electricity at 407,101 market locations, compared to about 240.2 TWh at 391,977 market locations in 2022. One reason for the increase in the number of market locations is that some energy suppliers have now classified a large number of SLP market locations as interval-metered market locations because the amount consumed corresponds to that at an interval-metered market location. There was a large decrease in the overall volume despite the increase in the number of market locations because of reductions in consumption and the economic downturn. A total of 99.8% of this amount was supplied under non-default contracts. It is still unusual, but not impossible, for interval-metered customers to be supplied under default supply or fallback supply. A total of 0.41 TWh of electricity was supplied to interval-metered customers under default or fallback supply. This is about 0.2% of the total volume supplied to interval-metered customers.

About 23.1% of the total volume delivered to interval-metered customers was supplied under a contract with the default supplier on non-default terms and about 76.7% under a contract with a legal entity other than the local default supplier. In 2022, 21.6% of the total volume was supplied under non-default contracts with the default supplier and 78.3% under contracts with other suppliers. However, long-term developments show overall that default supply and non-default contracts with the default supplier are playing an increasingly less important role in the acquisition of interval-metered customers in the electricity sector.

### *Contract structure and competitive situation for household customers*

There was a slight decrease in the number of different electricity suppliers from which household customers could choose. In 2023, final customers could choose between an average of 153 suppliers (not taking account of corporate groups) (2022: 157). The average number of suppliers for household customers in Germany was 129 (2022: 136).

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<sup>19</sup> The electricity suppliers include many affiliated companies, hence the number of suppliers is not equal to the number of competitors acting independently of each other.

In 2023, 36% of the total volume delivered to household customers was supplied under a contract with a supplier other than the local default supplier. Overall, about 64% of the volume is still provided by default suppliers (under either default or other contracts). About 25% of the volume delivered to household customers was supplied under a default contract, about the same as in the year before (2022: 24%). About 38% of the total volume delivered to household customers was supplied under a non-default contract with the local default supplier (2022: 37%). The strong position held by default suppliers in their service areas was therefore unchanged from the year before. The share of green electricity in the total volume of electricity supplied to household customers in Germany increased in 2023 to 54% (2022: 43%).

#### *Supplier switches by non-household customers*

The volume-based switch rate across all consumption categories above 10 MWh/year in 2023 was 13.2%, compared to 12.6% the year before. The numbers-based switch rate in 2023 was 14.6%. The switch rate for non-household customers has been more or less unchanged for several years. The fall in energy prices, to which non-household customers are able to react more swiftly, may be one of the reasons for the increase in the rate in 2023. The monitoring survey does not analyse what percentage of non-household customers have switched supplier once, more than once or not at all over a period of several years.

#### *Supplier switches by household customers*

There was a clear increase in the number of supplier switches in 2023 to just over 6mn. The switch rate based on the total number of household customers was 12% (2022: 8%). This is due to the decrease in retail electricity prices for new customers. Switching behaviour in 2022 was an exception as customers remained with their existing contracts because of the much more limited choice of switching options and the large increase in electricity prices.

#### *Contract switches by household customers*

In 2023, the number and volume of changes of contract with the existing supplier remained at the previous year's levels. About 3mn household customers (with a total consumption of about 7.8 TWh) changed their existing contract with their supplier (2022: 3mn with a total of 7.5 TWh).

#### *Terminations and disconnections*

In 2023, suppliers (default suppliers and their competitors) terminated a total of 258,909 customer contracts because, for example, customers were late paying their bills. Overall, 94% (244,014) of these terminations were for non-default contracts. The average level of arrears that led to a supplier terminating a contract with their customer was €143. A smaller proportion (6% or 14,895) of the terminations were for default contracts. The termination of a default supply contract is only permitted under stringent statutory conditions. The supplier must not be under an obligation to provide default supply, and it must be economically unreasonable for the default supplier to continue supply.

The number of disconnections carried out by the network operators in 2023 was 204,441, representing a decrease compared to the previous year (2022: 208,506). The number of disconnection notices issued by suppliers to household customers is very much higher. The number of notices issued was approximately 3.8mn, of which about 739,000 were passed on to the network operator with a request for disconnection (2022: 3.7mn

notices and 676,000 requests). The fact must be taken into account that the statutory conditions for disconnecting customers were different in 2023. This could have had an effect on the number of disconnections and on the number of disconnection notices and requests for disconnection.

#### *Prepay systems*

Closely related to the topic of disconnections and terminations is also that of prepay systems under section 14 Electricity Default Supply Ordinance (StromGVV), such as cash meters and smart card readers. The default supplier is entitled to require advance payment for electricity consumption in a billing period if, based on the individual circumstances, there are grounds to assume that the customer will not meet their payment obligations or meet them in time. According to 310 electricity suppliers, a total of some 12,300 household customers on default contracts had cash or smart card meters, or comparable prepayment systems, in 2023 (2022: 13,000). In 2023, 2,140 prepay systems were newly installed and 1,695 existing ones were removed. The numbers of such systems are therefore still very low. Costs for meter operation of a cash or smart card meter, or a comparable prepayment system, averaged €22 per year and meter in 2023.

#### *Electricity prices for industrial customers – annual consumption of 24 GWh*

The total price, without VAT and possible reductions, for a (typical) industrial customer's annual consumption of 24 GWh as at 1 April 2024 was 20.16 ct/kWh, down by 3.09 ct/kWh or about 13% on the previous year's price of 23.25 ct/kWh. There was a decrease above all in the component controlled by the supplier (energy procurement, distribution and margin) from 16.70 ct/kWh in 2023 to 12.78 ct/kWh in 2024, presumably due largely to the fall in wholesale prices. By contrast, the net network tariff increased year-on-year from 3.30 ct/kWh to 3.92 ct/kWh.<sup>20</sup>

These prices apply to an industrial customer with an annual consumption of 24 GWh not eligible for any of the statutory reductions available. The price component not controlled by the supplier (such as levies and taxes) for an industrial customer eligible for these reductions would be 0.95 ct/kWh instead of 7.12 ct/kWh. Industrial customers meeting the requirements in the relevant statutory provisions (such as the Energy Financing Act (EnFG)) are eligible for reductions in the network tariff, concession fee, electricity tax, the surcharges under the CHP Act (KWKG) and section 19 of the Electricity Network Tariffs Ordinance (StromNEV) and the offshore network surcharge. The eligibility requirements differ for each of the possible reductions. The monitoring survey does not collect data on whether there are any cases in practice in which all the possible maximum reductions are, or can be, claimed.

#### *Electricity prices for commercial customers – annual consumption of 50 MWh*

In the second category of a typical commercial customer's annual consumption of 50 MWh, the average total price without VAT on the reporting date of 1 April 2024 was 30.52 ct/kWh, down by 2.54 ct/kWh or about 8% on the previous year's price of 33.06 ct/kWh.<sup>21</sup> This fall is largely due to the decrease in the price component controlled by the supplier, which fell by 4.45 ct/kWh or 21% from 21.04 ct/kWh in 2023 to 16.59 ct/kWh. The lower price for this category is likewise due to the decrease in the procurement costs as a price component as a

<sup>20</sup> The figures for industrial customers are based on information from 171 electricity suppliers (2022: 192).

<sup>21</sup> The figures for commercial customers are based on information from 812 electricity suppliers (2022: 905).

result of the fall in wholesale prices. Overall, this price component controlled by the supplier makes up about 54% of the total price, compared to about 64% the year before. It should be noted that in these consumption categories the arithmetic mean does not reflect the considerable spread of the network tariffs and the heterogeneity of the network operators.

### *Electricity prices for household customers*

Data was collected from the suppliers operating in Germany on the prices for household customers as at 1 April 2024. There was a decrease in the average price (including VAT) to 41.59 ct/kWh (2023: 45.19 ct/kWh). This average is calculated by weighting the prices for the individual contract models for an annual consumption of 2,500 kWh to 5,000 kWh to obtain a reliable indicator for the electricity price for household customers in Germany.

The electricity price is made up of a component controlled by the supplier (energy procurement, distribution and margin) and a component not controlled by the supplier (such as levies and taxes). The component not controlled by the supplier accounted for 56% of the price as at 1 April 2024 and was much larger than in the previous year (2023: 48%), while the component controlled by the supplier accounted for about 44% and was therefore considerably smaller (2023: 52%). The reason is the decrease in wholesale prices in recent years, which has had an effect in particular on the energy volumes procured under long-term arrangements by suppliers. These volumes (procured one, two or three years in advance) make up about 90% of the total procured by suppliers for 2024.

The average price for household customers on default contracts with an annual consumption of 2,500 kWh to 5,000 kWh fell in 2024 to 45.62 ct/kWh (2023: 47.88 ct/kWh). The average price for customers on a non-default contract with their default supplier is 41.03 ct/kWh (2023: 44.81 ct/kWh). The price for customers on a contract with a supplier other than their local default supplier decreased by about 9% to 39.86 ct/kWh (2023: 43.99 ct/kWh). In 2024, prices for customers with a supplier other than their local default supplier were therefore lower than prices with the default supplier.

The data available to the Bundesnetzagentur from the monitoring survey provide an overview of longer-term monthly developments in electricity prices for household customers. A distinction is made between the prices for new and for existing customers. An index is calculated using a model that takes into account current electricity prices on the exchange, surcharges, taxes, network tariffs, fees, and distribution costs and margin. The calculations show a decrease in the electricity price for new customers of about 3% between January 2024 and October 2024 (and of 41% between January 2023 and October 2024). The electricity price index for each month is published on the SMARD transparency platform under “Energy data compact – Retail”. Index values for electricity and gas prices for household customers beginning in January 2021 are available. The charts on the platform also include inflation-adjusted index values to show the actual effects of the constant changes in electricity prices on the cost burden for households.

### *Surcharges*

In 2023, the network operators passed on about €4.25bn in surcharges to the network users. This total comprises the offshore network surcharge (€1.92bn), the section 19 StromNEV surcharge (€1.12bn) and the KWKG surcharge (€1.21bn).

The EEG surcharge was reduced to 0 ct/kWh with effect from 1 July 2022. Since 2023, financial assistance for the expansion of renewable energy has been part of the federal budget.

The interruptible loads surcharge was levied for the last time for 2022 because the relevant ordinance is no longer in force.

#### *Electricity price brake – supervision by the Bundesnetzagentur and the Bundeskartellamt*

The Electricity Price Brake Act (StromPBG) served to implement provisions of European law. The aim of the StromPBG was to lessen the burden on electricity customers. The relief was to be financed mainly through a levy on the surplus revenue earned by operators of electricity generating plants who had benefited from the increase in electricity prices on the wholesale markets.

The price brake applied from 1 March 2023 until 31 December 2023, with back payments for January and February 2023 being made in March 2023. The Bundesnetzagentur is responsible for ensuring that the levy on surplus revenue is paid correctly and for overseeing the overall system of incoming and outgoing payments under the StromPBG.

The levy on surplus revenue earned by operators of electricity generating plants is one way of refinancing the relief payments. These plant operators were required to submit a self-assessment with details of the surplus revenue they had earned in two accounting periods and to pay the levy on the surplus revenue to the operators to whose networks their plants were connected. The first accounting period was from December 2022 to March 2023 and the second from April to June 2023, after which the scheme for the levy on surplus revenue under the StromPBG ended.

The network operators received a total sum of about €411mn in levy payments in the first accounting period and about €3mn in the second period. This means that according to current information a sum of around €414mn was received from surplus revenue in accordance with the StromPBG and used to relieve the burden on final customers. This sum does not include payments from plant operators involved in ongoing court proceedings.

The Bundesnetzagentur checks the plant operators' self-assessments and payments in order to determine the exact amount payable. It also takes action as provided for by the StromPBG against plant operators who did not submit a self-assessment or complete self-assessment, or who did not or not correctly pay the levy on surplus revenue, in order to set the amount to be paid. The Bundesnetzagentur is currently conducting proceedings in 160 cases in which plant operators had neither submitted a self-assessment nor made payments. An additional 250 plant operators had not made the required levy payments. Further proceedings are ongoing involving plant operators who had not submitted a self-assessment or made payments correctly in accordance with the requirements of the StromPBG.

As a result, the total sum of levy payments is not yet final and may change depending on ongoing and forthcoming proceedings.

By contrast, the Bundeskartellamt's task of the special control of abusive practices under the StromPBG and the Brake on Gas and Heat Prices (EWPBG) covers the market for the supply of electricity, gas and heat to final customers, which is downstream from the generation market. The Bundeskartellamt checks the electricity,

gas and heat supply companies' pricing to see whether the companies have abused the regulations for relief payments.

The statutory regulations set a maximum price payable by consumers up to the end of 2023 within a fixed volume quota. This reference price varied depending on the type of energy and the customer group. Suppliers were able to have the difference between the statutory reference price and the price agreed between the supplier and the customer reimbursed by the state.

The energy price brake legislation prohibited energy suppliers from abusing the regulations designed to reduce the burden on consumers through their pricing. In particular, suppliers applying for reimbursement payments were prohibited from increasing their unit prices without proper reasons, which could arise from market-based prices and costs or price and cost components not controlled by the supplier in terms of regulation.

So far, the Bundeskartellamt has initiated 20 proceedings in the electricity sector to check compliance with these regulations. The companies concerned account for around €1.6bn of the total amount of reimbursements paid in the electricity sector. This corresponds to about 13% of the total reimbursed by the state to electricity suppliers.

In the event that a company is found to have abused the regulations, the Bundeskartellamt can, for example, impose a fine or order that the company pay back the reimbursement. However, it will not be possible to make a final assessment until the companies have submitted their final statements on reimbursement amounts to the competent authorities. Most of the companies have only received advance payments so far, and many companies do not yet have final figures relating to costs and consumption and state aid-related adjustments for certain interval-metered customers.

#### *Consumer advice and protection*

The energy consumer advice service is the national point of contact for consumers who want information on their rights in the energy sector, applicable legal regulations or dispute resolution options. In the first half of 2024, the Bundesnetzagentur received a total of 31,894 telephone, email, online, letter and fax queries and complaints (compared to 34,207 in the same period in 2023). This number is about the same as the Bundesnetzagentur received in the whole of 2022. More than half of the queries and complaints were made by telephone.

The majority (more than 70%) of the queries and complaints received were about electricity. Just under 20%, slightly less than in 2023, were about gas. A total of 5% were about both sectors.

One of the main topics of interest in both sectors was prices. This was triggered in particular by the electricity and gas price brakes. Consumers had specific questions about eligibility for relief, general questions about the effects of political developments on energy prices, and detailed questions about their monthly payments and energy bills. There were also general questions about energy contracts and consumers' bills.

There was an increase in interest about switching energy suppliers and in questions about disconnecting from gas, installing heat pumps and the possibility of using solar PV installations and wallbox chargers.



Up-to-date consumer information and further information on the topics mentioned here are available online at [www.bnetza.de/verbraucherservice-energie](http://www.bnetza.de/verbraucherservice-energie) (in German).

## 16. Heating electricity

### *Contract structure and supplier switching*

The volume of electricity supplied for heating was lower than in the previous year. Possible reasons include customers cutting back on the amount of electricity they use and customers replacing their old heating systems with modern heat pumps or other types of heating. According to the volumes reported by about 874 suppliers of heating electricity (2022: 879 suppliers), about 12.1 TWh of heating electricity was supplied to customers at just under 2.07mn market locations. This corresponds to an average supply of just under 5,884 kWh per market location. This compares to the previous year's figures of just under 6,612 kWh per market location and a total volume of 13.1 TWh supplied to 1.98mn market locations.

The volume supplied for night storage heating systems amounted to just under 7.8 TWh at 1.24mn market locations. This compares to a volume for heat pumps of just over 4.3 TWh at about 0.82mn market locations. Night storage heating accounts for the largest share of consumption, with about 64.2% of volume and 60.0% of market locations. The share of heat pumps compared to night storage heating has steadily increased over the years. The total number of market locations supplied with electricity for heat pumps increased year-on-year by about 11%, while the total number of night storage heating systems was about the same. This is also reflected in the shares in the total volume sold and the number of market locations supplied for heating electricity. In 2023, heat pumps accounted for as much as 40% of market locations (2022: 37.6%) and 35.8% of the volume (2022: 34.2%).

The share of heating electricity supplied in 2023 by a legal entity other than the local default supplier was slightly lower than the year before. In 2023, about 38.0% of the total volume of heating electricity supplied was accounted for by suppliers other than the default supplier (2022: 38.1%). There was also a slight decrease in the percentage of heating electricity market locations not served by the default supplier from 36.2% to 34.7%. The share accounted for by non-default suppliers in 2023 is therefore lower than in the previous years.

According to the data provided by the DSOs, the supplier switching rate in the heating electricity segment based on the number of market locations was considerably higher than in the previous year. In 2023, supplier switches involved about 252,000 heating electricity market locations with a total heating electricity volume of about 1,047 GWh. The switch rate in terms of volume is 9.3%, compared to just 4.1% in 2022. One of the reasons for the increase in the switch rate is presumably the fact that all of DeineWärmenergie GmbH's customers switched to E.ON in 2023. In addition, the Bundeskartellamt had found in 2022 that only very few alternative offers or very expensive new-customer contracts were available from most heating electricity suppliers.<sup>22</sup>

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<sup>22</sup> Westenergie/Rheinenergie/rhenag proceedings B8-134/21 (margin no 139)

*Price level*

According to the data provided by the suppliers, the arithmetic mean of the total gross price (including VAT) for night storage heating was 32.06 ct/kWh as at 1 April 2024, down by about 12% on the previous year's level of 36.31 ct/kWh. The arithmetic mean of the total gross price for electricity for heat pumps was 34.33 ct/kWh, also down by about 7% on the previous year's level of 36.90 ct/kWh.<sup>23</sup> Information on the total gross price for electricity for heat pumps with a separate meter was collected for the first time. The arithmetic mean of this price was 31.93 ct/kWh. Section 22 EnFG set the CHP and offshore surcharges payable for electricity for heat pumps with a separate meter to zero. The price for heat pumps with a separate meter is therefore lower than the price for night storage heating.

The main reason for the fall in heating electricity prices is the decrease in procurement costs as a result of the easing of the energy crisis. The part of the electricity price for night storage heating systems that is controlled by the supplier, which comprises procurement costs, distribution costs and the supplier's margin, decreased year-on-year by about 20% from 22.90 ct/kWh to 18.33 ct/kWh. The part of the electricity price for heat pumps controlled by the supplier also decreased by about 20% from 23.25 ct/kWh to 18.58 ct/kWh as at 1 April 2024. The components controlled by the supplier make up about 57% of the total price of electricity for night storage heating systems and about 54% of the total price for heat pumps, with the remainder in each case accounted for by taxes, surcharges and concession fees.

## 17. Electricity metering

The undertakings reported a total of 53,858,982 meter locations for electricity. The German state of North Rhine-Westphalia has the highest number of meter locations, with more than 11mn.

A total of about 5.2mn final customers are affected by the mandatory installation of smart metering systems within the meaning of section 29 in conjunction with sections 31 and 32 of the Metering Act (MsbG). The majority of these are final customers with an annual electricity consumption of between 6,000 and 10,000 kWh at nearly 2mn meter locations. There are also nearly 1.4mn meter locations for consumer devices covered by section 14a EnWG. A total of 419,800 mandatory smart metering systems across all final customer categories were installed, up by 194,700 on the year before. In addition, about 130,100 optional smart metering systems were installed for customers with a consumption of less than 6,000 kWh. As in previous years, there was also an increase in the installation of mandatory modern metering equipment.

In 2023, there was again a clear trend away from electromechanical meters in the SLP customer category, which includes all household customers. Overall, the number of electromechanical meters has fallen by nearly 3mn. There was consequently a large increase in the number of modern metering devices as defined in section 2 para 15 MsbG that are not connected to a communications network. Modern metering equipment is now in use at a total of about 21.3mn meter locations.

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<sup>23</sup> The figures are based on information on electricity prices for night storage heating systems from 798 suppliers (2022: 856) and for heat pumps from 591 suppliers (2022: 876).

Total investment in and expenditure on metering increased in 2023 by about €93mn to some €847mn, about €89mn below the forecast. This year's forecast of a total of €1.05bn is higher than the figure forecast in previous years. The total investment volume of some €847mn in 2023 includes about €479mn for smart metering systems and modern metering equipment, up by approximately €98mn on the year before. The forecast for 2024 indicates another clear increase to about €690mn.

## 18. Demand-side management

A total of 422 companies with 893 sites provided data in the 2023 survey on demand-side management addressed to 450 companies with an annual electricity consumption of more than 50 GWh. The electricity consumption of these companies amounted to 123 TWh, corresponding to 61% of total industrial consumption in 2022.

The main reasons given for using a demand-side management system were optimising the costs of network tariffs followed by optimising the costs of purchasing electricity. The biggest obstacles were said to be inflexible production processes, the need to fully utilise production capacity continually because of supply obligations, and linked production processes.

This is also reflected in the number of companies able to reduce their load in response to the spot market. Many companies do not currently see marketing their flexible loads on the electricity market, for instance in the event of very high electricity prices on the exchange, as an option. Load reduction in response to prices on the spot market is only possible at 78 of the 893 sites. The majority of the sites (762 sites or about 85%) had no plans for future measures to reduce or further reduce loads using demand-side management.

## B Gas

### 1. Gas network overview

In 2023, according to the monitoring data approximately 140.2 TWh<sup>24</sup> of gas was delivered to final customers from the transmission system operators' (TSOs) network (2022: 154.5 TWh). The volume of gas delivered was some 9% less than the level of the previous year. Total gas delivered from the network of the distribution system operators (DSOs) amounted to 650.1 TWh<sup>25</sup> in 2023 and was around the same level as the previous year (2022: 641.4 TWh).

The total amount of gas available in the German network was about 1,009 TWh in 2023. Of this, 42 TWh came from domestic sources, while 968.3 TWh was imported. In 2023, the annual storage balance – the difference between the gas that entered and exited storage in a year – was minus 12 TWh. The negative storage balance figure means that, overall, less gas was withdrawn from storage than was injected into it. Moreover, 10.2 TWh of biomethane was fed into the German natural gas system in 2023.

Just over 187 TWh of the gas available was exported to Germany's neighbours in 2023. Final customers were supplied with 790.3 TWh of gas in Germany (2022: 795.9 TWh).

Some major final customers (industrial customers and gas-fired power stations) procure their gas themselves from the wholesale market without going through suppliers. These final customers then approach the network operator as a shipper (paying the transport tariffs themselves). The quantity of gas procured directly on the market in this way amounted to 62.3 TWh (2022: 59.9 TWh), equivalent to about 44% of the total quantity of gas delivered by TSOs to final customers. As regards gas distribution systems, the amount of gas procured without a conventional supplier contract amounted to 36.6 TWh (2022: 34.8 TWh), corresponding to a share of just under 6% of the DSOs' total gas supplies.

The total quantity of gas supplied by general supply networks in Germany fell in 2023 to 790.3 TWh. The quantity of gas supplied to household customers as defined in section 3 para 22 of the Energy Industry Act (EnWG) fell by just under 9% to 232.9 TWh (2022: 254.9 TWh). Gas supplies to gas-fired power stations with a nominal capacity of at least 10 MW decreased by just under 4% to 82.1 TWh (2022: 85.4 TWh).

### 2. Market concentration

In 2023, market concentration did not change significantly, at least not on the individual gas retail markets. The shares of the four largest companies in gas sales to standard load profile (SLP) customers decreased slightly while the equivalent shares in the market for interval-metered customers rose slightly. At the same

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<sup>24</sup>The amount notified by the gas transmission system operators in the data survey for energy monitoring.

<sup>25</sup>The amount notified by the gas distribution system operators in the data survey for energy monitoring.

time, gas sales in Germany in 2023 decreased overall, continuing the trend set in the previous year. This decline is presumably still due to increased cost-cutting efforts by households and industry as well as to the relatively mild winter.

In light of the large shifts in the gas markets, the Bundeskartellamt has placed more focus on the wholesale market and the monitoring was extended accordingly.

#### *Gas wholesale market*

Various perspectives can be taken to determine market concentration. European and German administrative practice so far has been to take the overall trading volume, the nomination volume at the virtual trading point, the network operators' offtake volumes or the volumes delivered by gas suppliers as possible starting points. In each case the problem arises of trading volumes being counted multiple times and of differentiating between the distribution business and purely commercial transactions (with or without physical performance). Therefore a quantitative analysis is made of the relative importance of each wholesale company based on various indicators without making a conclusive market delimitation. Close examination is made in two aspects, one being the situation at the entry nominations at the cross-border interconnection points from where natural gas is fed into the German distribution network. The other is the importance assigned to the largest companies in procurement and sales based on a survey of the gas wholesalers. Companies with large shares in the total volumes are active in all the areas monitored, with the combined share of the three largest companies in each area higher than 50%, and in some cases considerably higher.

#### *Underground gas storage facilities*

The share of a company in the total working gas volume in the underground natural gas storage facilities is another important indicator of concentration on the gas markets. The underground storage facilities connected to the German gas network and relevant to the depiction of concentration had a maximum usable volume of working gas of about 289.6 TWh on 31 December 2023 (31 December 2022: 297.1 TWh). The aggregate working gas volume of the three companies with the largest storage capacities (CR3) was about 210.3 TWh on 31 December 2023 (31 December 2022: 194.6 TWh), which corresponds to a share of about 72.6% of the total volume. This figure can only be compared to a limited extent with the figure from the previous year (65.5%) as the German gas storage market has undergone a restructuring due to the effects of the war in Ukraine. This resulted in the three largest storage facility operators of the previous year being considered formally as just two companies and thus the next largest operator was included in the CR3 calculation. This explains – at least in part – the considerable increase in what was already a high market concentration in this area.

#### *Gas retail markets*

During the 2023 reporting year, sales from suppliers to SLP customers totalled 324.0 TWh of gas (2022: 346.1 TWh) and to interval-metered customers 361.1 TWh (2022: 418.7 TWh), which was around 10.4% lower total sales than in 2022.<sup>26</sup> As well as measures taken to reduce gas consumption and safeguard supply

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<sup>26</sup>“Sales” here and in the whole section on gas retail markets refers to the amount delivered by suppliers to their customers in units of energy.

and a warmer than average winter, these figures can be explained by the high and volatile market prices which led to lower demand. Of the total amount supplied to SLP customers in 2023, about 271.9 TWh was under non-default contracts (2022: 294.1 TWh) and 52.0 TWh for those on default contracts (2022: 52.1 TWh).<sup>27</sup>

The cumulative sales of the four largest companies to SLP customers were 82.4 TWh, of which about 68.5 TWh was under non-default contracts, while to interval-metered customers they were about 99.9 TWh. The aggregate market share of the four largest companies by sales was thus 25.4% for SLP customers (2022: 28.2%) and 27.7% for interval-metered customers (2022: 26.2%). Compared with the previous year, the market share for the supply of SLP customers has therefore fallen slightly, whereas for the supply of interval-metered customers it has risen slightly. However, these two aggregate market shares remain well below the statutory thresholds for presuming market dominance (section 18(6) of the Competition Act (GWB)).<sup>28</sup>

### 3. Market area conversion

Over the next few years, gas supplies in north-western Germany will continue to be converted from L-gas to H-gas. The new natural gas supply structure will affect more than four million household, commercial and industrial customers with an estimated 4.9mn appliances burning gaseous fuels. All of these appliances must gradually be converted from L-gas to H-gas. Gastransport Nord, Gasunie Deutschland Transport Services, Nowega, Open Grid Europe and Thyssengas are the TSOs directly affected by the market area conversion. Between 2023 and 2027, about 4,300 more conversions will be carried out for interval-metered customers and about 2.1mn for SLP customers.

Overall, the market area conversion is on schedule and making good progress. More information on it may be found in section IIIB3.

### 4. Gas imports and exports

#### *Gas imports*

The total volume of natural gas imported into Germany in 2023 was 968 TWh. Imports to Germany were thus down by 473 TWh from the previous year's figure of 1,441 TWh. The most important sources of imported gas in Germany in 2023 were Norway, the Netherlands and Belgium, with a total volume of 883 TWh or about 91% of all imports to the country. The volume of Russian pipeline gas deliveries in 2023 was 0 TWh (2022: 314 TWh or 21% of imports). The Netherlands, as an established and liquid European trading hub and point of arrival for liquefied natural gas (LNG) shipments and a country with connections to natural gas fields in Norway and the United Kingdom, is an especially significant source of imports for Germany. LNG imports accounted for 70 TWh.

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<sup>27</sup>The percentage of interval-metered customers on default contracts is in the per mille range and is therefore not taken into account.

<sup>28</sup>When considering these percentages, it should be noted that the monitoring survey of gas suppliers has a high but not complete market coverage, so the figures are only approximate.

*Gas exports*

In 2023, the total volume of natural gas exported by Germany was 187 TWh. Based on the previous year's figure of 514 TWh, exports from Germany fell by 327 TWh. Natural gas is mainly exported to Poland, Austria and Switzerland.

## 5. Biogas

A total of 242 plants injected biogas into the network in 2023 (2022: 238). The total contractually agreed input capacity in 2023 was 2.722mn kWh/h (2022: 2.624mn kWh/h). The injection of biogas in 2023 was 10.2 TWh (2022: 10.4 TWh).

The costs incurred from the connection of biogas injection facilities are spread among all networks in the market area in accordance with the requirements of section 20b of the Gas Network Tariffs Ordinance (GasNEV). The costs for biogas passed on by gas network operators to all network users amounted to about €254.7mn in 2023 (2022: €180mn). That was the equivalent of about €0.0249 per kWh of biogas injected (2022: €0.0177/kWh). More information on the injection of biogas may be found in section IIIB4.

## 6. Underground gas storage facilities

Germany's gas storage facilities are key to the supply of gas, especially in the winter months. The total maximum usable volume of working gas in underground storage facilities as at 31 December 2023 was 290 TWh (2022: 286 TWh). Of this, 138 TWh (2022: 140 TWh) was accounted for by cavern storage, 129 TWh (2022: 125 TWh) by pore storage and 23 TWh (2022: 21 TWh) by other storage facilities.

The target storage level of 85% for 1 October was already reached by mid July 2024. The 1 November target of 95% was reached in early September 2024. Storage levels on 4 November 2024, the editorial deadline for the monitoring report, stood at more than 98%. The charge valid under section 35e EnWG to secure the storage level requirements for gas storage facilities (gas storage neutrality charge) was €1.86/MWh from 1 January 2024. Since 1 July 2024, it has risen to €2.50/MWh. More information on gas storage facilities may be found in section IIIB5.

## 7. Network structure data

All 16 TSOs took part in the 2024 Monitoring Report data survey. As at 31 December 2023, the total length of the notified gas transmission network was around 45,800 km. The gas transmission network included 3,500 exit points for delivery to final customers, redistributors or downstream networks including the points at which gas can be taken off for delivery to storage facilities, hubs and conditioning or conversion plants. The number of registered final customer market locations in the transmission system was 533.

As at 4 November 2024, a total of 687 DSOs that were required to take part in the monitoring were registered with the Bundesnetzagentur, all of whom took part in the 2024 monitoring survey. As at 31 December 2023, the total length of pipelines in the gas distribution system including house connections was just over 557,000 km and included around 11mn exit points for delivery to final customers, redistributors or downstream networks, including the points at which gas can be taken off for delivery to storage facilities, hubs and

conditioning or conversion plants. There were 14.5mn registered final customer market locations in the gas distribution network of the surveyed DSOs, including around 12.9mn market locations of household customers as defined by section 3 para 22 EnWG. The majority of gas DSOs have short to medium length systems of up to 1,000 km, and 93 DSOs have gas systems with a total length of more than 1,000 km.

There are a total of around 6,700 entry points to the gas distribution networks, of which 219 are for emergency entry only. A look at the number of market locations served by the DSOs shows that only 27 DSOs supply more than 100,000 each. Of the total of 14.5mn market locations supplied by the DSOs in Germany, some 45% (6.5mn or 300 TWh offtake volume) of the total gas supplies are served by DSOs that supply more than 100,000 customers. The majority of DSOs active in Germany supply between 1,000 and 10,000 gas customers.

## 8. Gas network expansion

Germany is aiming for climate neutrality by 2045. To achieve this, the pace of the transition from natural gas to green and climate neutral gases, such as hydrogen, has to speed up considerably and the necessary infrastructure has to be made available. The inclusion of LNG requires the existing gas networks to be adapted as well. These developments have had a major influence on the Gas Network Development Plan (NDP) 2022-2032, reflecting these new realities.

Following the submission of the draft Gas NDP 2022-2032 by the TSOs, the Bundesnetzagentur carried out a written consultation of all actual and potential network users from 16 May to 13 June 2023. The Bundesnetzagentur then took this as the basis to examine the Gas NDP 2022-2032 submitted. A request for amendment to the Gas NDP 2022-2032 was then issued by the Bundesnetzagentur on 21 December 2023. Following publication of the request for amendment, the TSOs implemented the requested changes in the final Gas NDP 2022-2032 by 20 March 2024.

In the request for amendment, the Bundesnetzagentur confirmed 133 of the measures submitted by the TSOs, with an investment volume of around €4.1bn. The confirmed measures include additional pipelines totalling 925 km and additional compressor capacity amounting to 149 MW.

## 9. Investments by gas network operators

*TSOs*

In 2023, investments in and expenditure on network infrastructure by the 16 German TSOs amounted to €1,651mn (2022: €820mn). Of this, €1,413mn (2022: €587mn) was accounted for by investments in new builds, upgrades and expansion projects and €238mn (2022: €233mn) by investments in network infrastructure maintenance and renewal. The projected total investment for 2024 is €1,376mn.

Expenditure on network infrastructure maintenance amounted to €425mn in 2023 for all TSOs (2022: €446mn). The TSOs' planned expenditure for 2024 is €464mn.



*DSOs*

Over 600 gas DSOs reported a combined investment volume of €1,170mn in network infrastructure for 2023 (2022: €1,445mn). Investments in new builds, upgrades and expansion accounted for €530mn of the total (2022: €795mn), while €640mn went into maintenance and renewal (2022: €650mn). The projected total investment for 2024 is €1,377mn.

Service and maintenance expenses, based on the data provided by the DSOs, totalled €1,216mn in 2023 (2022: €1,191mn). The projected investment in servicing and maintenance for 2024 is €1,326mn.

The level of DSO investment depends on the length of their gas pipeline network and the number of market locations served as well as other individual structure parameters, including, in particular, geographical conditions. While 113 of the surveyed gas DSOs reported investments of between €1mn and €5mn, 50 gas DSOs made investments totalling more than €5mn.

Of the surveyed gas DSOs, 231 reported total expenditures in the bracket between €100,001 and €500,000, while 53 gas DSOs reported expenditure totalling more than €5mn.

## 10. Capacity offer and marketing

In the 2022/2023 gas year, the total firm entry capacity offered across the Germany-wide market area Trading Hub Europe (THE) was 549.2 GWh/h (2021/2022: 548.7 GWh/h). About 37%, or 203.4 GWh/h, of the total entry capacity was firm, freely allocable capacity (FZK; 2021/2022: 212.8 GWh/h).

In the 2022/23 gas year, the total firm exit capacity offered across the Germany-wide market area (THE) was 352.9 GWh/h (2021/2022: 367.5 GWh/h). It should be noted that not every TSO offers all capacity products. The aggregated values therefore cannot be projected onto each individual TSO.

Across Germany, the TSOs reported a nominated quantity of 1,285 TWh in 2023 at all entry points where there is a nomination obligation (2022: 1,699 TWh). In contrast, nominated quantities at exit points were considerably lower, totalling 367 TWh (2022: 806 TWh). The reason for the significantly lower figure on the exit side is that gas for domestic use in particular is withdrawn from the transmission network at exit points where there is no nomination obligation. The exit points where there is a nomination obligation are cross-border and market area interconnection points and connection points to storage facilities and domestic production. Network connection points to final customers, on the other hand, are not subject to a nomination obligation. More information on available capacity may be found in section IIIC4.

## 11. Gas supply disruptions

In 2023, the average interruption in supply per connected final customer was 1.26 minutes (2022: 1.52 minutes), which is somewhat below the long-term average of 1.52 minutes a year. This figure shows that the German gas network continues to have a high quality of supply. There was a large variation in the interruption times among the federal states, ranging from 0.17 minutes in Berlin to 6.68 minutes in Schleswig-Holstein. More information on gas supply disruptions may be found in section IIIC5.

## 12. Gas network tariffs

The average volume-weighted network tariff including the charges for metering and meter operation for household customers was 1.93 ct/kWh as at 1 April 2024. This was a rise of about 2% from the previous year (2023: 1.89 ct/kWh). For commercial customers, as at 1 April 2024 the arithmetic mean of the network tariff including the charges for metering and meter operation was 1.59 ct/kWh (2023: 1.48 ct/kWh). For industrial customers, as at 1 April 2024 the arithmetic mean of the network tariff including the charges for metering and meter operation was 0.62 ct/kWh (2023: 0.39 ct/kWh).

For the Germany-wide market area THE, the gas transmission system operators published a new postage stamp tariff as of 25 May 2024. The annual tariff for firm, freely allocable entry and exit capacity will be €6.71/(kWh/h)/a from 1 January 2025. Thus the tariff for the booking of firm, freely allocable entry and exit capacity will be significantly higher in 2025 than it was in 2024 when the annual tariff was €5.10/(kWh/h)/a.

The distribution network tariffs for 2025 provisionally reported on 15 October 2024 show a sharp increase across all customer groups. The figures are based on a random sample of network operators under the responsibility of the Bundesnetzagentur. No firm statements on the precise extent of the increase can be made at the time of going to press. The average increases in network tariffs are mainly caused by the new depreciation options of KANU 2.0, the lower than expected sales volumes compared with the previous year and the rise in upstream network costs.

## 13. Balancing gas and imbalance gas

As gas is mainly purchased on the exchange, procurement prices for external balancing gas are on the same level as general market prices.

The gas auction system was launched on 1 October 2022. Companies can offer volumes of gas via the balance responsible party. THE, which is responsible for the German gas market area, can now accept offers to reduce gas consumption in the event of shortages, which will stabilise the networks if needed.

A balancing neutrality charge for interval-metered and SLP customers is payable, in line with the GaBi Gas 2.0 determination, to make up the expected shortfall from the use of balancing gas and imbalance gas. It is borne by the balance responsible parties that serve exit points connecting users with either standard load profiles or interval metering. From 1 October 2023, both these charges will continue to be €0/MWh.

## 14. Wholesale gas markets

The situation in the natural gas markets changed significantly following Russia's – ongoing – war on Ukraine. This primarily involved the gradual cessation of direct supply with Russian gas. It took some time for this to be replaced with other natural gas imports and, since the end of 2022, with increased deliveries of LNG. Although some normality returned to the markets towards the end of the second half of 2022, wholesale prices were much higher in the year as a whole and were very volatile. This trend continued in 2023, albeit at a somewhat lower level.

*Wholesale trading volume*

On the European gas trading exchanges, as shown in the example of the European Energy Exchange AG and its subsidiaries (jointly referred to as EEX)<sup>29</sup>, the trading volume remained at a high level throughout 2023. The total volume of trade, including cleared volume, in the THE market area since its formation was about 1,703 TWh in 2023, corresponding to a slight decline of around 3% from the previous year (2022: 1,754 TWh). The volume traded on the spot market fell in 2023 by 23.5% to about 846 TWh compared with about 1,106 TWh in 2022. The focus of spot trading in 2023, as in the previous years, was on day-ahead contracts. The futures trading volume rose from 649 TWh in 2022 to about 856 TWh in 2023, corresponding to an increase of 32%.

*Wholesale prices*

The (unweighted) annual average for THE in the European Gas Spot Index (EGSI) published by EEX was €40.88/MWh in 2023. The reference price in the previous year was €124.98/MWh, which corresponds to a price reduction in 2023 of around 67.3%. The EGSI monthly average throughout 2023 fluctuated between €29.78/MWh in July and €63.46/MWh in January. The decline in the EGSI, which first appeared in the third and fourth quarters of 2022, continued in 2023.

The European Gas Index Deutschland (EGIX) is based on exchange transactions concluded in the relevant front-month contracts (THE). In 2023, the EGIX ranged from €30.01/MWh in August to €113.76/MWh in January. The (unweighted) average of the 12 monthly values was €48.42/MWh, the equivalent of about a 63.6% reduction year-on-year from €132.94/MWh.

*Over-the-counter wholesale trade*

The ten broker platforms participating in this year's data monitoring reported having brokered natural gas transactions for delivery to Germany for an uncleared total volume of 2,157 TWh (2022: 2,010 TWh), of which 759 TWh was for contracts with delivery in 2023 and a delivery time of at least one week. The total volume of the brokers rose about 7.3% in comparison with 2022.

Short-term transactions on the spot market with a delivery period of less than a week only made up about 10.3% of the trading reported by the broker platforms for 2023 (2022: 8.6%), with the other 89.7% (2022: 91.4%) relating to the futures market. Transactions for the current and the next year were thus again the clear focus of the brokers in natural gas trading.

*Trading at virtual trading points*

The gas volumes nominated at the THE virtual trading point dropped to 3,098 TWh in 2023 from 3,639 TWh the year before, with about 92.1% of the nomination volume being taken up by H-gas and the remaining 7.9% by L-gas.

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<sup>29</sup>There are other gas exchanges as well as the leading one, EEX, such as CME Group and ICE. There are plans to include these in the energy monitoring in the coming years.

As in the years before, the monthly nomination volumes display seasonal variations. In the months of June to September 2023, the monthly nomination volume at the virtual trading point was no more than 181.1 TWh. The lowest nomination volume was about 173.9 TWh in September 2023 and the annual peak was 307.1 TWh in January 2023.

The number of active trading participants<sup>30</sup> in the German market area in 2023 averaged 439 per month for H-gas (2022: 415) and 187 per month for L-Gas (2022: 192), thus when compared with the previous year the H-gas average rose slightly and the L-gas average fell slightly.

## 15. Gas retail trade

### *Number of suppliers*

A total of 13 electricity and gas suppliers told the Bundesnetzagentur during 2023 that they would stop supplying household customers. By the editorial deadline of this report on 4 November 2024, two electricity and gas suppliers had ended their activities in 2024. As of the end of 2024, five more electricity and gas suppliers will have ceased their supplier activities. The percentage of gas distribution systems in which more than 100 gas suppliers were active remained unchanged in 2023 at around 63%. Across the country, each household customer could choose from an average of 109 gas suppliers (2022: 111 gas suppliers). Some 140 gas suppliers were operating nationwide throughout Germany<sup>31</sup> in 2023.

### *Procurement strategies of gas suppliers*

Despite the striking developments in the wholesale markets, no significant differences between the procurement strategies of 2021 and 2023 may be identified. Around half of the of the gas suppliers taking part in the survey had a mixed procurement strategy of short-term and long-term procurement. About 45% of the gas suppliers had only long-term procurement, while just over 5% used only short-term procurement to acquire the gas volumes needed.

### *Contract structure of non-household customers*

Interval-metered customers were supplied with just over 361.1 TWh of gas in 47,381 market locations in 2023.<sup>32</sup> These are all non-household customers (industrial and commercial customers, gas-fired power plants). Over 99% of this supply took place on non-default contracts with the default supplier (96.4 TWh) and

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<sup>30</sup>An active participant in the virtual trading point is one who has made at least one nomination in the relevant month.

<sup>31</sup>The activity is considered nationwide if the gas supplier delivers gas to consumers in all 16 German federal states. The figure for 2023 is not comparable with figures from previous reports as the calculation methodology has changed.

<sup>32</sup>In the 2023 reporting year, 971 gas suppliers (individual legal entities) provided data on the market locations served and volume consumed by interval-metered customers in Germany, ie almost exclusively non-household customers (2022: 904). These gas suppliers include affiliated companies, hence the number of suppliers is not equal to the actual number of independent competitors.

contracts with suppliers that are not the default supplier (264.3 TWh).<sup>33</sup> It is unusual, but not impossible, for interval-metered customers to be supplied under default supply or fallback supply. Around 0.3 TWh of gas was supplied to interval-metered customers under default or fallback supply. This is less than 0.1% of the total volume supplied to interval-metered customers.

About 26.7% of the total volume delivered to interval-metered customers was supplied under a contract with the default supplier on non-default terms (2022: 23.3%) and about 73.2% was supplied under a contract with a legal entity other than the default supplier (2022: 76.6%). These figures show that default supply plays only a marginal role in the supply of interval-metered customers with gas and also that the local default supplier is of only secondary importance in the supply of customers via non-default contracts.

#### *Contract structure of household customers*

In 2023 the gas consumption of household customers was 234.5 TWh. The temporarily high gas prices for household customers led to changes, especially in 2022, in the existing contract structure for these customers. In 2023 the proportion of default contracts rose slightly to 19%. The proportion by volume of non-default contracts with the default supplier remained at the previous year's level of 47%. The proportion of contracts with a supplier other than the local default supplier fell slightly to 34%.

Of the 243.5 TWh of gas consumed by private households, 44.5 TWh was under default contracts, 110.1 TWh under non-default contracts with a default supplier and 79.9 TWh under contracts with a supplier other than the local default supplier.

#### *Supplier switches by non-household customers*

The number of market locations of non-household customers with a supplier switch dropped from around 17,800 in 2022 to around 16,900 in 2023 (down 4.9%). The offtake volume of gas affected by a supplier switch dropped to 40.9 TWh from 52.5 TWh the previous year (down 22.1%).

Customers with at least 0.3 GWh/year (including gas power stations) are all non-household customers. The volume-based supplier switching rate fell in 2023 to 9.3% from 10.4% in 2022.

#### *Supplier switches by household customers*

The number of supplier switches by household customers rose in 2023 to a new high of 1.8mn, from the previous year's figure of 1.15mn switches. The switch rate was 14%. The volume of gas affected by supplier switching was 36.1 TWh in 2023. Gas customers were able to save around €470 per year by changing from the default supplier to a competitor. Average savings amounted to €210 per year.

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<sup>33</sup>In accordance with section 36 EnWG, default supply only relates to household customers. Where "default supply" is used in the section below for non-household customers, it refers to "fallback supply".

*Contract switches by household customers*

In 2023 around one million gas customers chose a contract switch<sup>34</sup> with their existing gas supplier (2022: 760,000). The volume-based contract switching rate was around 8%.

*Gas disconnections*

The number of disconnections carried out by the network operators in 2023 was 28,059, representing an increase of about 22% compared to the previous year (2022: 22,987). In addition to the rise in gas prices, delayed disconnections are one of the main reasons for the increase. During the Covid pandemic the applicable right to refuse performance was temporarily not enforced, but was resumed in 2023. The overwhelming majority of disconnections occurred when customers were late paying their bills. Most disconnections were carried out in the second and third quarter of the calendar year; that is to say, outside the heating season. Around half of the gas suppliers surveyed also said they had voluntarily decided not to disconnect their customers. Suppliers often accommodated customers by offering them individual payment arrangements. The number of household customers who had difficulty in meeting payments and took up the option of making repayments in instalments nearly doubled in 2023 to 65,000 (2022: 36,000).

The average length of time between an actual disconnection and a reconnection was 28 days according to network operators. More than 3,700 disconnections were for more than 90 days. The reasons for these longer periods of disconnection may have been customers' long-term inability to pay, vacant properties or faulty customer equipment that could not be reconnected for safety reasons.

There was an increase of around 5% in disconnection requests from gas suppliers to network operators in 2023 to 178,000 from 169,000 in 2022. Conversely, the number of disconnection notices issued by gas suppliers fell by around 15% in 2023. The absolute number of disconnection notices was 927,000 in 2023 (2022: 1.1mn). As there is sometimes a gap between the issuing of a disconnection notice and the actual disconnection, it may be assumed that some of the disconnections notified in 2023 only took place the following year. Also, it must be taken into account that the statutory conditions for disconnecting customers were different in 2023. This could have had an effect on the number of disconnections and on the number of disconnection notices and requests for disconnection.

According to the gas suppliers, the time from the first, unsuccessful demand for payment and the first reminder is 14 days on average. Between the first reminder and the disconnection request there is an average of 30 days, but in some cases this is much longer.

Disconnections always incur additional costs. While some gas suppliers only pass on the costs of the network operator that carried out the disconnection/reconnection, a proportion of suppliers additionally charge their customers for carrying out a disconnection. The network operators charged gas suppliers an average fee of about €60 (excluding VAT) for disconnecting a supply. They charged suppliers an average fee of about €70

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<sup>34</sup>A customer's change to a new gas tariff with the same gas supplier at their own request.

(excl VAT) for reconnecting a supply. Gas suppliers charged an average of €3 plus reminder fees for sending a reminder to household customers who were late paying their bills and there are usually two dunning levels.

#### *Terminations*

Despite issuing disconnection notices and orders, only a small number of gas suppliers actually terminate supply contracts with their customers. Moreover, the termination of a default supply contract is only permitted under stringent conditions. There must be no obligation to provide basic services or the requirements to disconnect gas supply must have been met repeatedly and the customer must have been warned of contract termination because of late payment. In 2023, gas suppliers (default suppliers and their competitors) terminated their contractual relationship with a total of 64,259 gas customers (2022: 55,233) due to the customers' failure to fulfil a payment obligation. About 95% of these terminations related to contractual relationships outside the default supply. Reasons frequently cited for terminating contracts included reaching the final dunning level and missing two or three partial payments without any prospect of fulfilling the claims.

#### *Prepay systems*

Closely related to the topic of disconnections and terminations is also that of prepay systems under section 14 of the Gas Default Supply Ordinance (GasGVV), such as cash meters and smart card readers. The default supplier is entitled to require advance payment for gas consumption in a billing period if, based on the individual circumstances, there are grounds to assume that the customer will not meet their payment obligations or not meet them in time. According to 38 gas suppliers, around 850 household customers had cash or smart card meters, or comparable prepayment systems, in 2023 compared to around 900 in 2022.

In 2023, 105 prepay systems were newly installed and 229 existing ones were removed. The numbers of such systems are therefore still very low. Costs for meter operation and metering averaged €27 and €15, respectively, per year and meter. The yearly standing charge for gas customers was €130 on average, while the average unit price for gas charged using a prepayment meter was 13 ct/kWh.

#### *Gas prices for industrial customers for annual consumption of 116 GWh*

The average total price (excluding VAT) for an annual consumption of 116 GWh ("industrial customer") on the reporting date of 1 April 2024 was 6.22 ct/kWh, a significant reduction year-on-year (1 April 2023: 7.75 ct/kWh). One cause of this price decline could be that the ongoing war in Ukraine no longer appears to be having as significant an effect on the energy markets as it was the previous year. Other possible reasons for the falling price could be a reduction in demand caused by a weaker economy, the move from gas to alternative resources in production processes and efficiency gains.

The overall price is composed of an average of 9.6% of components that cannot be controlled by suppliers: network tariffs, charges for metering and meter operation and concession fees. Another non-controllable component for suppliers is the gas tax of €0.55 and the carbon levy of €0.8163.<sup>35</sup> The gas tax and carbon levy together make up about 21.9% of the average total price (excluding VAT), down from 14.1% in 2022.

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<sup>35</sup>The carbon levy was first introduced in 2021.

About 67.3% (2023: 80.7%) of the overall price is the components controlled by the supplier (gas procurement costs, distribution costs and margin). THE's current gas balancing neutrality charge for RLM customers is €0/MWh for the period from 1 October 2023 to 30 September 2024. The gas storage neutrality charge increased from 0.145 ct/kWh to 0.186 ct/kWh on 1 January 2024.

#### *Gas prices for commercial customers for annual consumption of 116 MWh*

For the annual consumption of 116 MWh ("commercial customer") about 30.3% (2023: 22.2%) of the overall price was made up of cost items not controlled by the supplier, such as network tariffs, the gas tax, concession fees and the carbon levy. Around 69.7% (2023: 77.8%) relate to items that allow scope for business decisions. The arithmetic mean of the overall price (excluding VAT) of 10.39 ct/kWh has fallen by around 14.2% from the previous year's average price of 12.11 ct/kWh.

The average net amount of the non-controllable components rose from 2.70 ct/kWh in the previous year to 3.00 ct/kWh, mainly due to a rise in network tariffs and a higher carbon levy.

The residual price component controlled by the supplier fell from 9.42 ct/kWh as at 1 April 2023 to 7.24 ct/kWh as at 1 April 2024, thus by around 21.6%. The residual amount was still higher than the previous year. As already mentioned in the context of industrial customers, the war in Ukraine appears to be having less impact on the gas price than in the previous year. Moreover, a fall in demand caused by an economic slowdown, production processes being converted from gas to other resources and efficiency gains are having an effect on the gas price for commercial customers.

THE's current gas balancing neutrality charge for SLP customers is €0/MWh for the period from 1 October 2023 to 30 September 2024. The gas storage neutrality charge increased from 0.145 ct/kWh to 0.186 ct/kWh on 1 January 2024.

#### *Gas prices for household customers*

The volume-weighted, average gas price for household customers across all contract categories was 12.50 ct/kWh as at 1 April 2024 and thus fell by just over 15% in a year-on-year comparison (2023: 14.80 ct/kWh) even though the reduced rate of VAT of 7% no longer applied from the end of 2023. In the average price across all contract categories, the largest price component "energy procurement, distribution and margin", which makes up around 57%, fell from 10.77 ct/kWh to 7.12 ct/kWh. The share of the state-controlled price components such as value-added tax, natural gas tax, the carbon levy and concession fees following the end of the temporary VAT reduction is 27.6% (2023: 14.4%). The proportion of network tariffs was 15.5% in 2024 (2023: 12.8%).<sup>36</sup> The average network tariffs thus rose about 2% from 1.89 ct/kWh to 1.93 ct/kWh.

The volume-weighted average gas price for customers on a default contract as at 1 April 2024 was 14.01 ct/kWh, corresponding to a decrease of around 14% compared to the previous year (2023: 16.25 ct/kWh). On 1 April 2024, the volume-weighted price for customers under a non-default contract

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<sup>36</sup> Including upstream network costs, charges for metering and for meter operations.



with the default supplier was 12.73 ct/kWh, about 12% less than the level of the previous year (2023: 14.52 ct/kWh). The volume-weighted price for a contract with a supplier other than the local default supplier as at 1 April 2024 was 11.33 ct/kWh, just over 21% less than the previous year (2023: 14.44 ct/kWh).

Price data for the fallback supply recorded as at 1 April 2024 showed that the average was 15.62 ct/kWh (2023: 18.42 ct/kWh), about 15% less than the previous year. The proportion of suppliers with higher fallback supply prices was around 25% from 1 April 2023 to 31 March 2024.

The data available to the Bundesnetzagentur from the monitoring survey provide an overview of longer-term monthly developments in gas prices for household customers. A distinction is made between the prices for new and for existing customers. An index is calculated using a model that takes into account current gas prices on the exchange, surcharges, taxes, network tariffs, fees, and distribution costs and margin. The gas price index for each month is published on the SMARD transparency platform under “Energy data compact – Retail” (<https://www.smard.de/en/energy-data-compact/energy-data-compact>). Index values for gas prices for household customers beginning in January 2021 are available. The charts on the platform also include inflation-adjusted index values to show the actual effects of the constant changes in gas prices on the cost burden for households.

#### *Consumer advice and protection*

The energy consumer advice service is the national point of contact for consumers who want information on their rights in the energy sector, applicable legal regulations or dispute resolution options. Current data and information may be found in the subsection “Retail” in the section “Developments in the electricity markets” (see section **Fehler! Verweisquelle konnte nicht gefunden werden.**).

## **16. Gas metering<sup>37</sup>**

The undertakings reported a total of 14.29mn meter locations for gas. North Rhine-Westphalia was the German state with the most meter locations (over 3.64mn), followed by Lower Saxony (2.14mn) and Baden-Württemberg (1.33mn).

#### *Investments*

Total investment and expenditure on gas metering decreased in 2023 by about €55mn to some €173mn, about €77mn below the forecast. The forecast for 2024 totals €330mn, significantly higher than the level of previous years. Of the total of about €173mn in 2023, around €36mn went to investments in new installations, upgrades and expansion, €63mn to investments in maintenance and renewal, and about €73mn on expenditure.

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<sup>37</sup> Data based on responses from 666 undertakings.

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