

RESULTS AND RECOMMENDATIONS 01/2025

Electricity pricing for households in Norway and the United Kingdom – what happens when prices rise sharply?

By Simone Abram (Durham University, UK), Tor Håkon Jackson Inderberg (Fridtjof Nansen Institute, Norway), and Tanja Winther (University of Oslo, Norway)

January 2025

Norway and the United Kingdom were among the first countries in the world to deregulate their nationalised electricity sectors. In the 1990s, electricity markets were introduced, including for households. Although the development in both countries started from a similar ideological standpoint, the design of the systems took somewhat different directions. One such area is the pricing system for households, including the information customers receive on their electricity bills.

In this recommendation, we present some important differences between the electricity pricing systems in the two countries. We use household electricity bills as an illustration. We also look at the experiences from the period of high electricity prices in 2021-22, when compensation schemes were introduced by national authorities. The comparison makes clear that the respective authorities consider electricity to be a necessity. Market principles are set aside when high prices threaten to degrade the population's quality of life and weaken the industry's legitimacy.

In making recommendations for further development of electricity pricing systems for households, we consider the following imperatives: i) ensuring that different types of households have access to and can afford enough electricity to maintain quality of life (preventing energy poverty), ii) facilitating protection for household customers against unwarranted exposure to highly volatile prices, iii) developing a fair and predictable system to prevent sudden future needs for compensation schemes, iv) strengthening household incentives to implement energy-saving measures.

The target audience for this research communication includes those inside and outside the electricity industry, as research shows that most people have difficulty understanding their own electricity bill.

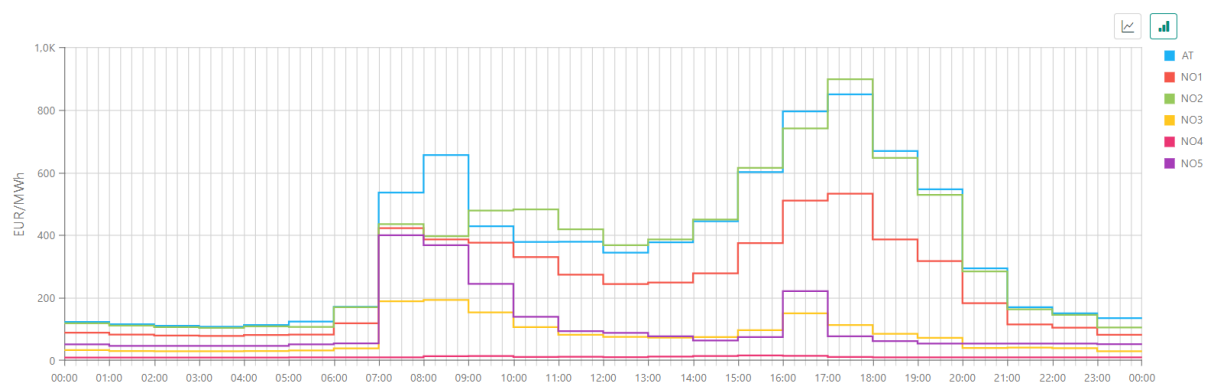
Norway: Public Ownership and a Clear Division Between Trading (Market) and Grid

Norway's energy system is heavily electrified, and primarily based on hydro-electric energy production. The national grid was integrated relatively late in the post-WWII period, and remained strongly decentralised throughout its nationalisation. Spot market pricing dates back to the 1970s,

meaning that Norway had a mixed system with parts of the large industry actors participating in a partly liberalised system even before the 1990s¹.

Market-based reform of the electricity sector in Norway was introduced with the Energy Act of 1990. This introduced a regulatory regime and exposed production, trading, and end-use of electricity to the market. Unlike in the UK, most of the Norwegian power sector remained under public ownership, including at the local government level, and primarily as a protective measure to preserve national hydropower interests.² The Act also prescribed that distribution and supply costs should be shown separately on bills.

Norwegian authorities have been and remain concerned with ensuring that the electricity market functions effectively. Effective functioning of the household energy market is measured, as in the UK, by the proxy indicator for active engagement of consumers in changing suppliers. In 2019, this amounted to 20% of households (600,000 out of a total of 3 million meters). Customers can switch suppliers through a single contact with a new supplier, and the process is reputedly smoother than in the UK. The Consumer Council publishes overviews of supplier prices. Despite this, a plethora of prices offered by suppliers makes it difficult to compare like with like, and the council therefore recommends that people choose spot price agreements over fixed price contracts. 87% of consumers were on this type of contract in 2022 (Statistics Norway 2023). With a spot price agreement, the customer is directly tied to the price in Nord Pool's spot market, which varies hourly and fluctuates significantly over the day and between seasons. The spot price also varies geographically (Norway is divided into five pricing zones) and in response to foreign demand. The customer pays a surcharge per kWh on the prevailing spot market price and/or a fixed monthly amount to cover network maintenance costs.



Example of Spot Price fluctuations over a day for different geographical pricing zones in Norway, 12 December 2024 (Nord Pool)³ After a year of relatively low electricity prices in 2024, Norway experienced significant volatility with periodically very high prices in December 2024, especially in zone NO2 (Southwest Norway).

¹ See Bolton 2021: 232.

² 88% of Norwegian hydropower production is publicly owned.

³ <https://data.nordpoolgroup.com/auction/day-ahead/prices?deliveryDate=latest¤cy=EUR&aggregation=DeliveryPeriod&deliveryAreas=AT,NO1,NO2,NO3,NO4,NO5>

The electricity grid constitutes a natural monopoly because it is most efficient to have only one system. The grid is therefore not subject to classic economic competition and is viewed as an activity separate from electricity production and trading. Grid companies became subject to strict regulation, governed by the Norwegian Water Resources and Energy Directorate (NVE) and The Norwegian Energy Regulatory Authority (RME). In 2021, requirements were introduced to establish a corporate separation between the grid segment and other parts (production and trading) of the previously integrated entities to prevent cross-subsidization and other anti-competitive activities. As a result, many grid companies have changed their names (e.g., from Hafslund Nett to Elvia, from Istad Nett to Elinett).

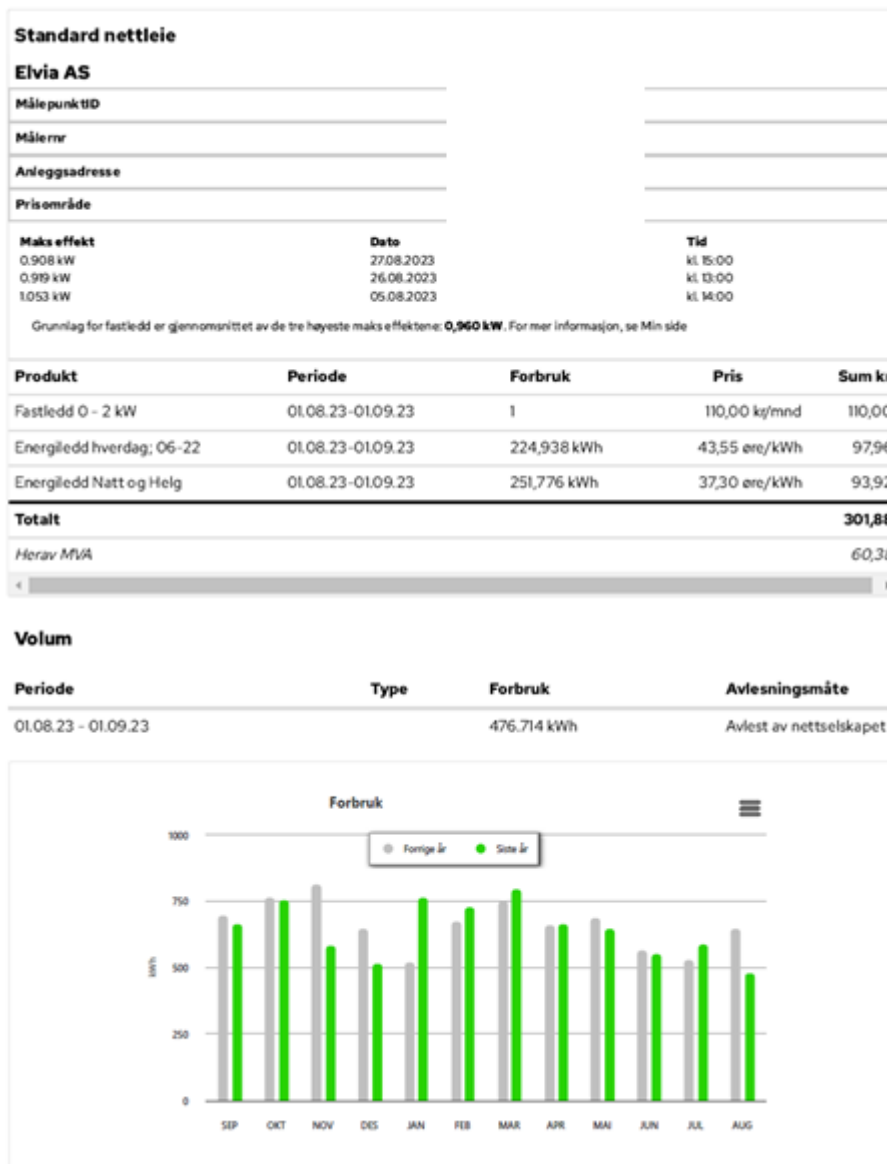
Since 2019, Norway has installed smart meters for all end-users. These meters automatically report to a central data hub called Elhub. The availability of information on customers' electricity consumption hour by hour – combined with government desires to level out electricity usage to save on grid investments – led to the introduction of a new mechanism for grid tariff pricing in 2022. Today, the grid tariff is calculated based on the customer's monthly energy consumption (NOK/kWh, energy component) as well as a fixed fee which varies depending on the customer's highest hourly consumption (the average of the three hours measured on different days with the highest hourly kWh consumption). In addition, many grid companies have introduced cheaper energy rates at night and at weekends compared to daytime/weekday rates.

The distinction between trading and grid tariffs in Norway is evident on household electricity bills. Even where customers receive a single combined bill, it is always clearly indicated which costs relate to trading and which to grid tariffs. In some cases, bills are sent separately from the electricity supplier and the grid owner, in clear contrast to the UK where grid infrastructure is relatively invisible on bills. Charges constitute the third element of the electricity bill alongside value added tax (VAT) at 25% (households in Northern Norway have an exemption), electricity tax (which varies by season, from 9.51 to 16.44 øre per kWh),⁴ and a levy to the Energy Fund (1.25 øre per kWh).⁵ The final electricity bill thus consists of three main components: electricity price, grid tariff, and charges. In situations with "normal" electricity prices in Norway, the costs for each component make up roughly one-third each.

Electricity bills are supposed to include a graph that shows the customer's consumption for the current year compared to the previous year. They also include other information and are designed to encourage customers to seek more knowledge. Below, we present examples of Norwegian electricity bills to illustrate important aspects of the Norwegian pricing system from the customers' perspective, before we look at the situation in the United Kingdom.

⁴ [Avgift på elektrisk kraft - Skatteetaten \(in Norwegian\)](#)

⁵ From approximately 0.06885 to 1.19026 GBP per kWh, and a levy of 0.0905 GBP. Exchange rates as of 12.05.2025 09:21 as found on <https://www.oanda.com/currency-converter/live-exchange-rates/>.



Example of a monthly invoice from a grid company, Norway. Consumption is read automatically, and the invoice is attached to the payment request in the customer's online banking. The customer used in this example also has district heating, which is why electricity consumption is relatively low. In Norway, it is common to use electricity for heating, and average electricity consumption is 10,899 kWh for apartments, 17,090 kWh for terraced houses, and 25,776 kWh for detached houses.⁶

⁶ [Normalt strømforbruk | Elvia \(in Norwegian\)](#)



Faktura AvtaleGiro

Fakturadato: 3. sep. 2024

Fakturanummer:

Målnummer:

Målepunkt-id:

Spotprisområde:

	Mva	Total inkl. mva
Strømforbruk: hele august 2024 1 210,10 kWt à 15,96 øre/kWt.	38,63 kr	193,17 kr
Påslag: hele august 2024 1 210,10 kWt à 2,95 øre/kWt (elsertifikat og handelsavgifter).	7,14 kr	35,70 kr
Tibber-abonnement: hele august 2024 31 dager à 49,00 kr/mnd.	9,80 kr	49,00 kr
		Sum
		277,87 kr
		Hvorav mva 25% 55,57 kr

Nettleie fra Glitre Energi Nett AS er ikke en del av denne fakturaen. Strømsøtten blir håndtert og eventuelt kompensert på nettleiefakturaen. Avtale: Smart strømvale. Les mer om [faktura fra Tibber her](#).

Example of a monthly invoice from an electricity supplier (market), Norway. This customer also has district heating, which is why electricity consumption is relatively low.

United Kingdom: Privatisation, Electricity Incorporated into Energy Bills

Liberalisation in the UK has been through a number of phases from the domestic consumer's perspective. Privatisation was initiated, after several years of discussion, by the Electricity Act 1989⁷. As with the Norwegian deregulation debate, the official goals were to achieve a more competitive electricity market, improve efficiency, reduce costs, and provide consumers with better services. At this point, the national energy system was heavily dependent on thermal power stations (primarily coal plus nuclear) and natural-gas dominated domestic central heating (as it still does).

The Act moved national grid infrastructure into the hands of a regulated grid operator (National Grid), and in England and Wales, the Central Electricity Generating Board (CEGB) was broken up,

⁷ see Rhodes et al. 2014 for detail



with different parts of the business sold to a number of private companies for production. Distribution was marketized by converting the twelve regional Boards into independent companies which were later sold, and their role as suppliers was deregulated and opened up to broad competition. Scotland and Northern Ireland had different structures, but similar processes applied.

From the outset, British households were encouraged to participate in the new energy markets, initially by purchasing shares during the privatisation process and subsequently by choosing or switching supplier companies. However, for several decades, the number of households switching electricity suppliers remained very low; most customers stayed with their incumbent supplier, as in Norway. Despite the new division introduced between trading and grid, the terms and conditions largely remained the same. This means that the electricity bills sent to British households state the total price for electricity, aggregated grid charges (fixed daily 'standing charges') and VAT (5% on energy services).

By the beginning of the 2000s, the market for electricity suppliers had become dominated by six large companies with little real competition. Following regulatory changes by Ofgem (Office of Gas and Electricity Markets⁸) to promote competition, several new start-up companies entered the market. These included private entities but also local authorities that set up companies to support vulnerable consumers. Some of these, particularly those motivated by ethical or social goals, introduced consumption-only pricing, where grid costs were integrated into use-costs, with no 'standing charge' appearing on bills. This enabled customers to manage their costs (although that could in some cases effectively mean self-disconnecting to save money).

Overall, the proliferation of suppliers resulted in pricing regimes that were increasingly difficult to compare. Additionally, both gas and electricity consumption could trigger discounts if purchased from the same company, though respective gas and electricity consumption are clearly indicated on bills. The unclear market situation for consumers led the regulator, Ofgem to impose a requirement for every supplier to offer a comparable price structure, to simplify the process of comparison for consumers. They also promoted price comparison websites that calculate prices according to the consumer's predicted consumption. The 'roll-out' of smart meters in the UK is a story in its own right that we will not elaborate upon here, except to note that it is uneven, lags well behind other Northern European countries, and data is not widely accessible.

The example of a British electricity bill below summarises important features of energy pricing in its complexity.

⁸ Ofgem is an independent national regulatory authority with the goal of protecting consumers and delivering a greener and fairer energy system. For more information, visit www.ofgem.co.uk.

Your account in detail

Your previous balance on 5 Nov 2023

£113.88

Total energy costs

Gas

Gas meter number:

5 Nov 2023 - 31 Dec 2023

1086.79kWh at 6.491p per kWh

£70.54

05159 - you gave us your meter reading

05253 - last estimate read on old billing system

94 gas units at 40.7 calorific value

Standing charge

£16.07

57 days at 28.210p per day

1 Jan 2024 - 22 Jan 2024

520.26kWh at 6.991p per kWh

£36.37

05253 - estimated meter reading at price change

05298 - last read on old billing system

45 gas units at 40.7 calorific value

Standing charge

£6.20

22 days at 28.191p per day

5 Nov 2023 - 22 Jan 2024

Total Gas costs

£129.18

Gas VAT at 5.00%

£6.45

Total gas costs (including VAT)

£135.63

Electricity

Electricity meter number:

4 Nov 2023 - 31 Dec 2023

75kWh at 25.310p per kWh

£18.98

08008 - you gave us your meter reading

08083 - last estimate read on old billing system

Standing charge

£31.19

57 days at 54.720p per day

1 Jan 2024 - 22 Jan 2024

31kWh at 26.480p per kWh

£8.21

08083 - estimated meter reading at price change

08114 - last read on old billing system

Standing charge

£12.03

22 days at 54.701p per day

5 Nov 2023 - 22 Jan 2024

Total Electricity costs

£70.41

Electricity VAT at 5.00%

£3.52

Total Electricity costs (including VAT)

£73.93

Total energy costs (including VAT)

£209.56

Your payments

20 Nov 2023

Direct Debit

£113.88 CR

Total payments - Thank you

£113.88 CR

Your new balance on 22 Jan 2024

£209.56

You're using more gas compared to
this period last year:

1607.05 kWh

5 Nov 2023 - 22 Jan 2024

1540.05 kWh

5 Nov 2022 - 22 Jan 2023

You're using less electricity compared to
this period last year:

106 kWh

5 Nov 2023 - 22 Jan 2024

106.25 kWh

5 Nov 2022 - 22 Jan 2023

Example of a quarterly invoice from an energy supplier in the United Kingdom (gas and electricity). Note that electricity costs cover both electricity (market) and grid charges (standing charge). A typical annual energy consumption for households in the United Kingdom is 11,500 kWh for gas and 2,700 kWh for electricity.⁹

The overall electricity price in the United Kingdom remained relatively stable in the period following deregulation and has done so until recently. This contrasts with how Norwegian households, through their spot price agreements, were directly exposed to fluctuating electricity market prices. However, in both countries, people felt the effects of the energy scarcity in Europe in 2021-22 in the form of high prices.

⁹ [Average gas and electricity usage | Ofgem](#)

High electricity prices affect people differently, but the measures in both countries demonstrate that electricity is perceived as a necessity

In this section, we consider the impact of high energy prices during the 'energy crisis' in 2021-22, for consumers who had been exposed to energy markets for 35 years. High electricity spot-market prices in Norway had immediate effects on many households. To protect them, the government introduced a compensation scheme, initially with a moderate level of support. The scheme ensured that when the spot price exceeded 73 øre/kWh (excluding VAT),¹⁰ the state covered 90% of the costs above this level. Support was provided up to a consumption limit of 5,000 kWh per month, which is relatively high compared to average Norwegian household consumption of approximately 1,600 kWh per month. In practice, the scheme was close to a price cap, or maximum price, for electricity.

The price support scheme in Norway has been criticised for removing the market price signal for electricity consumption and thus reducing incentives for energy saving measures. It has also been documented that the scheme has regressive fiscal effects by providing more support to those who use more electricity. Officially, this is a temporary scheme, but there are no signs that the government plans to phase it out—in January 2025 the scheme was extended, with an increased threshold for when it should apply from 73 to 75 øre/kWh. The subsidy is deducted from other electricity costs and is made visible on the electricity bill.

In the United Kingdom, many of the "new" energy companies established during liberalisation went bankrupt because they had insufficient forward hedging in the market but were tied into longer billing periods and heavily regulated tariff structures. When electricity prices suddenly soared, they were obliged to continue supplying gas and electricity to consumers at prices set in the previous quarter, but with very high procurement costs. Insufficient revenues to cover this gap led to insolvency. The larger and more established companies had stronger forward price hedging and could raise prices in the following quarter or contract period. The government's response to the collapse of energy companies was to transfer customers to these established suppliers.¹¹ The costs of doing this were then distributed through the standing charge, which is added to the electricity bills of all households, resulting in further increased electricity costs with a regressive element (since standing charges were effectively levelized across the main suppliers, and are not linked to consumption rates).

The high electricity prices, combined with general economic challenges in the UK, including a breakdown in various local services due to prolonged austerity, placed many households in a difficult situation. This was variously described as households facing choices between heating and eating, or, worse, freezing and starving. As this escalated into a political crisis, the government first introduced a support scheme from October 2022, where grid-supplied gas and electricity customers automatically received a £400 deduction on their bill over the year¹². This required the government to mandate the regulator to implement a price cap¹³ alongside a demand for a more transparent pricing model for consumers. However, because all providers offered tariffs at the set price cap (per

¹⁰ Approximately 0.05285 GBP as of 12.05.25.

¹¹ An exception was Bulb, a company that was too large to be included in this system. Bulb was acquired by Octopus with support from the regulator, Ofgem.

¹² With the notable difficulty that support for non-grid consumers, such as those dependent on oil, or those – often most vulnerable – with pre-payment meters rather than bills, were excluded from the programme for a considerable period before emergency interventions were (partially) secured.

¹³ [What is the energy price cap and how are gas and electricity bills changing?](#)

kWh), it also reduced the price signal as an incentive to save and hindered competition on price. For a brief period, the household electricity market was replaced by a system that in many ways resembled the situation before liberalisation, with limited competition and a temporary suspension of supplier-switching. A couple of years later, a more functional market was reestablished, but due to widespread dissatisfaction with continually rising prices, especially regarding the standing charge, discussions are now underway about the possibility for customers to choose between a tariff that includes a fixed grid charge and electricity price and another tariff where all costs are bundled into the electricity price.¹⁴

Summary and Learning Points

Energy market liberalisation has followed different trajectories in the UK and Norway, with results that can be discerned by reading household bills. In other words, the different structures of liberalisation have had different impacts on consumer conditions, affordability and stability of energy finance at domestic and commercial levels. Throughout the energy crisis, with rapid and unpredictable increases in energy costs, it became apparent in both countries that price increases rapidly became politically untenable as well as economically uncomfortable. Hence each government introduced forms of price cap or financial support that was implemented through household bills. We would argue that this indicates that energy is perceived as a necessity and that authorities see the need to secure legitimacy for the power sector.

We also note a degree of conflict between ensuring that all households have an acceptable level of access to essential energy services (such as heat and power) and providing incentives for energy saving (given that the price signal currently serves as the primary measure). To achieve a balance of these goals, it will be important to recognise that households are not a homogeneous group and for robust systems to be developed that accommodates price fluctuations.

Additionally, we have the following criteria that should be considered in the future design of energy pricing systems for households:

- Different types of households should have access to and be able to afford sufficient electricity to maintain a reasonable level of quality of life (prevent energy poverty).
- The system should enable household customers to opt out of exposure to volatile prices if they wish to, and have access to transparent and easily interpreted information on tariffs and contract agreements (including making it simpler for customers to compare fixed price agreements).
- The system should be fair and predictable, preventing sudden future needs for compensation schemes.
- Household incentives and support for implementing energy-saving measures should be strengthened. That is, signals other than price signals should be enabled for energy efficiency.

¹⁴ [Energy bills: Plans for new tariffs with no standing charge](#)

- Measures of market function should move beyond measuring the number of customers who switch, and consider household costs and company profits as measures of effectiveness.

References

Bolton, R. (2021). *Making Energy Markets: The Origins of Electricity Liberalisation in Europe*. Palgrave Macmillan.

Deller, D., Giulietti, M., Loomes, G., Price, C. W., Moniche, A., & Jeon, J. Y. (2021). Switching Energy Suppliers: It's Not All About the Money. *The Energy Journal*, 42(3), 1-26. <https://doi-org.ezphost.dur.ac.uk/10.5547/01956574.42.3.ddel>

He, Xiaoping & David Reiner. (2015). Why Consumers Switch Energy Suppliers: The Role of Individual Attitudes. *The Energy Journal*, Vol. 38, No. 6: 25-53.

Inderberg, T. H. J., Palm, J., & Matthiasen, E. H. (2024). Flexible electricity consumption policies in Norway and Sweden: Implications for energy justice. *Energy Research & Social Science*, 110, 103466.

Rhodes, C., D. Hough & L. Butcher (2014). Privatisation Research paper 14/61 20 November 2014. House of Commons Library. ISSN 1368-8456

Sæle, H. & M. Aasen (2021). Ny nettleiemodell for norske husholdninger. Strømvaner, oppfatninger om ny prismodell for nettleie og motivasjon for å endre strømforbruk. SINTEF Rapport 2021:01468. [2021-01468.pdf \(unit.no\)](https://www.sintef.no/globalassets/publikasjoner/sintefrapporter/2021-01468.pdf)

Yang, M., C. Yuanying, K. Mamaril, A. Berry, X. Shi & L. Zhu (2020). Communication-Based Approach for Promoting Energy Consumer Switching: Some Evidence from Ofgem's Database Trials in the United Kingdom. *Energies* 13, no. 19: 5179. <https://doi.org/10.3390/en13195179>

Winther, T. & Ø. Sundet (2023). Flexibility for whom? Householder and stakeholder perspectives on justice regarding the introduction of dynamic grid tariffs in Norway. *Energy Efficiency* 16, 75. <https://doi.org/10.1007/s12053-023-10153-1>

Useful links

<https://yougov.co.uk/politics/articles/17122-large-numbers-think-switching-energy-provider-isnt>

<https://obr.uk/box/the-cost-of-the-governments-energy-support-policies/>

<https://www.sustainabilitybynumbers.com/p/electricity-pricing>

<https://www.ssb.no/energi-og-industri/energi/statistikk/elektrisitetspriser/artikler/rekordhoy-strompris-i-2022--dempet-av-stromstotte>



<https://www.nve.no/reguleringsmyndigheten/nytt-fra-rme/nyheter-reguleringsmyndigheten-for-energi/totalt-byttet-norske-husholdninger-stromleverandor-nesten-600-000-ganger-i-2019/>

[include-resultater-og-anbefalinger-2022-03-ny-nettleiemodell-for-norske-husholdninger.pdf \(uio.no\)](#)

<https://www.ofgem.gov.uk/press-release/finding-better-deal-your-energy-getting-easier-today>