Appendix to the reply from the Norwegian authorities to the state aid complaint concerning Norway Price December 15

Appendix 1

Table A1: Studies of Price Elasticity in Norwegian Households

Study	Data	Estimate and notes
Bye & Hansen (2008)	Hourly spot prices (for Norway as a whole) 2000 and 2004.	Short-term spot price elasticity in Norway is 0 in summer and -0.02 in winter. Elasticity is lower on weekends and outside working hours, when households account for a larger share of consumption. Long-term price elasticity (6 months) in Norway is -0.04 in summer and -0.14 in winter.
Halvorsen, B. (2012)	Meta data from Skagerak Nett 2006.	For households, short-term direct price elasticity lies between -0.06 and 0, with some uncertainty.
Minkah, Rexford Adinkra (2024)	Hour, day, week, and month 2021–2023.	-0.01 to +0.03 (hourly spot price elasticity for households). -0.08 to -0.01 (monthly spot price elasticity for households). *"Overall, the study confirms the inelastic nature of household electricity demand in Norway, with implications for policy formulation and energy efficiency strategies."*
Matthias Hofmann, Karen Byskov Lindberg (2019)	Hour data from households and offices in Oslo, 2013–2017	***"**Model results show that no price elasticity is existent on the coldest days, and therewith days with highest peak demand for electricity."* *"The analysis of different variables that influence demand concluded with that temperature is the most important explanatory variable when developing a model for estimating the short-term price elasticity."* In some periods, significant values were found: -0.011 to -0.075.
Magne Holstad & Finn Erik L. Pettersen* (2024)	Monthly	We find in our work that electricity consumption in households is reduced by -0.05 percent when the spot price for Norway increases by one NOK per kWh in the next month.
Langeland Joachim (2023)	2020-2022	In the rolling estimation, a slight non-linearity in elasticity has been identified, particularly in areas with high price growth, with elasticity ranging from -0.17 to -0.0467
Skamarken, I. K. & Waymel, M. M. C. (2024)	Norwegian households. All bidding zones	Not all are statistically significant: -0.085 in NO1, -0.183 in NO2, -0.030 in NO3, and -0.064 in NO5. NO4 is not significant.
Jonassen & Øby (2021)	2015-2021	Demand elasticity of -0.03 for the period 2015 to September 2021 for Norway as a whole. *"The overall conclusion of the study is that the demand curve is inelastic, which means that consumers are not sensitive to price changes. The supply curve, on the other hand, is elastic, and production will therefore change more than proportionally with a price change."*

Matilde Avdem Frankmo (2023)	2020-2022. Published as a Vista report	The analysis indicates that a one percent increase in the spot price from one day to the next results in an average consumption reduction of -0.03 percent among households during the period.
C. Garnache, Ø. Hernæs & A. G. Imenes. «Which Households Respond to Electricity Peak Pricing amid High Levels of Electrification?»		As a result, the total electricity price increase in the treatment group relative to the control group (taking together the grid transmission charge and spot price) ranged from 892% to 1,498%, with mean 1,242%. With a consumption reduction of 12.5% (our preferred specification; column (5)), this gives an average price elasticity of -0.010.
Idsø, Nesse & Larsen (2024)	2013–2023, Norway	Price elasticity is not significant when the temperature is below 0°C and the price is higher than 150 øre per kWh. Outside this range, price elasticity is very low, at only -0.01. Within the significant range, a higher price leads to slightly lower consumption. High price and warm (P > 150 øre per kWh and T > 0°C): -0.07. Low price and warm: -0.006. Low price and cold: -0.013. High price and cold: Not significant.
Bergland (2021) (Unpublished)	1993–2019, annual end-user prices in Norway	For households: Short term: -0.06 and long term: -0.11.
Halvorsen et al. (2005)	Annual end-user prices in Norway from 1993–1995.	Price elasticity for electricity is estimated at -0.65 for Norwegian households.

Table A2: Half-year CPI-adjusted spot prices, calculated as the average of monthly CPI-adjusted spot prices per bidding zone (September 2025-NOK). Source: Nord Pool, SSB

		Average spot prices (øre per kWh)				
Half-year	**Year**	**NO1**	**NO2**	**NO3**	**NO4**	**NO5**
1	2010	66	62	73	70	57*
2	2010	65	63	68	67	65
1	2011	70	69	69	69	69
2	2011	38	38	41	41	37
1	2012	36	35	37	37	35
2	2012	29	29	32	32	29
1	2013	44	44	44	44	45
2	2013	40	40	43	43	40
1	2014	30	30	36	36	29
2	2014	35	35	39	38	35
1	2015	29	29	30	29	29
2	2015	21	21	23	21	20
1	2016	30	29	31	29	29
2	2016	35	34	40	33	33

1	2017	35	35	36	30	35
2	2017	36	36	36	33	36
1	2018	48	47	48	48	47
2	2018	59	59	60	59	58
1	2019	52	52	50	50	52
2	2019	45	45	45	45	45
1	2020	13	13	14	14	13
2	2020	12	12	11	9	11
1	2021	58	58	43	37	58
	Average	**40**	**40**	**41**	**40**	**39**

** Bidding zone NO5 was established in March 2010. January and February 2010 are therefore excluded from the average price for NO5 in the first half of 2010.*

Table A3: Electricity costs for an average household with and without the electricity support scheme in 2026. The electricity costs exclude grid tariff and electricity tax, but include VAT — except in the bidding zone for Northern Norway (NO4). Source: RME[1]

	Electricity cost without the electricity support scheme	Received support from the electricity support scheme	Electricity cost with the electricity support scheme
NO1	13.618 kr	2.888 kr	10.730 kr
NO2	14.022 kr	3.097 kr	10.925 kr
NO3	8.037 kr	705 kr	7.332 kr
NO4	5.923 kr	40 kr	5.883 kr
NO5	11.784 kr	1.719 kr	10.064 kr

Table A4: Electricity costs for an average household with and without the Norway price scheme in 2026. The electricity costs exclude grid tariff and electricity tax but include VAT — except in the bidding zone for Northern Norway (NO4). Source: RME[2]

	Electricity cost without the Norway price scheme	Received support under the Norway price scheme	Electricity cost under the Norway price scheme
NO1	13.618 kr	6.534 kr	7.084 kr
NO2	14.022 kr	6.954 kr	7.068 kr
NO3	8.037 kr	630 kr	7.407 kr
NO4	5.923 kr	- 2.443 kr	8.367 kr
NO5	11.784 kr	4.790 kr	6.994 kr

Table A5: Average electricity consumption per household by bidding zone. The calculation are based on data for monthly household consumption per bidding zone from 2024. Source: Elhub.

Bidding Zone	Average Electricity Consumption per Household (kWh)
NO1	14.170 kWh
NO2	14.138 kWh

[1] Calculations prepared by RME for the Norwegian Ministry of Energy in connection with questions from the Norwegian Parliament regarding the 2026 state budget.

[2] Calculations prepared by RME for the Norwegian Ministry of Energy in connection with questions from the Norwegian Parliament regarding the 2026 state budget.

NO3	14.815 kWh
NO4	20.919 kWh
NO5	13.989 kWh
Nationwide	15.606 kWh

Table A6: Example hours for household electricity demand in 2025.

Households	**Consumption (MW)**	**Comment**
02.01.2025, 17:00 (Thursday)	7 990	Weekday, winter
05.01.2025, 17:00 (Sunday)	8 602	Weekend, winter (also the hour with the highest household consumption so far in 2025)
03.07.2025, 17:00 (Thursday)	2 964	Weekday, summer
06.07.2025, 17:00 (Sunday)	2 859	Weekend, summer
20.07.2025, 06:00 (Sunday)	1 576	Weekend, summer (also the hour with the lowest household consumption so far in 2025)

Table A7: Share of holiday homes in each bidding zone that had consumption above and below the various consumption thresholds in 2024. Source: Elhub

	Month	< 200kWh	< 400kWh	< 600kWh	< 800kWh	< 1000kWh	>1000kWh
NO1	1	20 %	26 %	33 %	42 %	53 %	47 %
NO1	2	20 %	28 %	38 %	49 %	61 %	39 %
NO1	3	19 %	29 %	41 %	53 %	65 %	35 %
NO1	4	29 %	50 %	68 %	81 %	88 %	12 %
NO1	5	47 %	77 %	90 %	95 %	98 %	2 %
NO1	6	51 %	79 %	91 %	96 %	98 %	2 %
NO1	7	39 %	66 %	83 %	91 %	96 %	4 %
NO1	8	45 %	75 %	89 %	95 %	97 %	3 %
NO1	9	42 %	70 %	85 %	93 %	96 %	4 %
NO1	10	29 %	50 %	68 %	80 %	88 %	12 %
NO1	11	24 %	36 %	51 %	66 %	77 %	23 %
NO1	12	21 %	30 %	40 %	51 %	62 %	38 %
NO2	1	21 %	30 %	41 %	53 %	66 %	34 %
NO2	2	24 %	37 %	51 %	65 %	76 %	24 %
NO2	3	23 %	36 %	51 %	65 %	77 %	23 %
NO2	4	33 %	58 %	76 %	86 %	92 %	8 %
NO2	5	43 %	76 %	90 %	95 %	98 %	2 %
NO2	6	47 %	78 %	90 %	95 %	98 %	2 %
NO2	7	33 %	60 %	78 %	89 %	94 %	6 %
NO2	8	43 %	76 %	90 %	95 %	98 %	2 %
NO2	9	47 %	77 %	90 %	96 %	98 %	2 %

	Month	< 200kWh	< 400kWh	< 600kWh	< 800kWh	< 1000kWh	>1000kWh
NO2	10	36 %	62 %	79 %	88 %	94 %	6 %
NO2	11	28 %	47 %	65 %	79 %	87 %	13 %
NO2	12	25 %	40 %	55 %	69 %	79 %	21 %
NO3	1	23 %	31 %	42 %	54 %	66 %	34 %
NO3	2	23 %	33 %	46 %	60 %	71 %	29 %
NO3	3	21 %	33 %	48 %	62 %	74 %	26 %
NO3	4	30 %	51 %	69 %	81 %	89 %	11 %
NO3	5	44 %	72 %	87 %	94 %	97 %	3 %
NO3	6	48 %	75 %	88 %	94 %	97 %	3 %
NO3	7	38 %	64 %	81 %	90 %	95 %	5 %
NO3	8	44 %	72 %	86 %	93 %	97 %	3 %
NO3	9	40 %	67 %	83 %	92 %	96 %	4 %
NO3	10	29 %	50 %	67 %	80 %	88 %	12 %
NO3	11	26 %	40 %	56 %	70 %	80 %	20 %
NO3	12	24 %	35 %	49 %	62 %	72 %	28 %
NO4	1	19 %	24 %	32 %	42 %	52 %	48 %
NO4	2	19 %	26 %	36 %	48 %	59 %	41 %
NO4	3	17 %	25 %	36 %	48 %	59 %	41 %
NO4	4	21 %	34 %	49 %	63 %	74 %	26 %
NO4	5	31 %	53 %	70 %	81 %	89 %	11 %
NO4	6	43 %	69 %	84 %	92 %	96 %	4 %
NO4	7	37 %	63 %	79 %	90 %	95 %	5 %
NO4	8	42 %	70 %	85 %	93 %	96 %	4 %
NO4	9	34 %	58 %	75 %	86 %	92 %	8 %
NO4	10	23 %	38 %	54 %	68 %	78 %	22 %
NO4	11	20 %	30 %	44 %	58 %	70 %	30 %
NO4	12	19 %	25 %	35 %	46 %	58 %	42 %
NO5	1	17 %	24 %	33 %	42 %	53 %	47 %
NO5	2	17 %	27 %	37 %	49 %	61 %	39 %
NO5	3	16 %	26 %	38 %	51 %	62 %	38 %
NO5	4	26 %	47 %	66 %	79 %	86 %	14 %
NO5	5	43 %	73 %	88 %	94 %	97 %	3 %
NO5	6	46 %	75 %	89 %	94 %	97 %	3 %
NO5	7	37 %	64 %	81 %	90 %	95 %	5 %
NO5	8	40 %	69 %	85 %	92 %	96 %	4 %
NO5	9	37 %	66 %	82 %	91 %	95 %	5 %
NO5	10	26 %	45 %	63 %	77 %	85 %	15 %
NO5	11	21 %	34 %	49 %	64 %	76 %	24 %
NO5	12	18 %	28 %	39 %	51 %	61 %	39 %

Table A8: Share of households in each bidding zone that had consumption above and below the various consumption thresholds in 2024. *Source: Elhub*

	Month	< 1000kWh	< 2000kWh	< 3000kWh	< 4000kWh	< 5000kWh	> 5000kWh
NO1	1	30.0 %	58.1 %	77.7 %	89.4 %	95.1 %	4.9 %
NO1	2	37.9 %	69.4 %	87.4 %	95.3 %	98.0 %	2.0 %
NO1	3	43.2 %	75.4 %	91.4 %	97.0 %	98.7 %	1.3 %
NO1	4	53.1 %	84.3 %	95.8 %	98.5 %	99.2 %	0.8 %
NO1	5	76.3 %	96.2 %	98.9 %	99.4 %	99.5 %	0.5 %
NO1	6	80.3 %	97.1 %	99.0 %	99.4 %	99.6 %	0.4 %
NO1	7	84.6 %	97.9 %	99.2 %	99.5 %	99.6 %	0.4 %
NO1	8	80.6 %	97.2 %	99.0 %	99.4 %	99.6 %	0.4 %
NO1	9	74.0 %	95.8 %	98.8 %	99.3 %	99.5 %	0.5 %
NO1	10	57.7 %	88.1 %	97.1 %	98.9 %	99.3 %	0.7 %
NO1	11	44.6 %	77.1 %	92.3 %	97.4 %	98.8 %	1.2 %
NO1	12	38.9 %	70.0 %	87.7 %	95.4 %	98.1 %	1.9 %
NO2	1	21.8 %	56.7 %	81.8 %	93.8 %	97.9 %	2.1 %
NO2	2	30.7 %	70.4 %	91.5 %	97.8 %	99.2 %	0.8 %
NO2	3	34.6 %	75.3 %	94.0 %	98.6 %	99.5 %	0.5 %
NO2	4	45.3 %	85.3 %	97.5 %	99.3 %	99.7 %	0.3 %
NO2	5	72.3 %	97.3 %	99.5 %	99.7 %	99.8 %	0.2 %
NO2	6	75.5 %	97.7 %	99.5 %	99.8 %	99.8 %	0.2 %
NO2	7	80.1 %	98.3 %	99.6 %	99.8 %	99.8 %	0.2 %
NO2	8	76.8 %	97.9 %	99.5 %	99.8 %	99.8 %	0.2 %
NO2	9	70.6 %	97.1 %	99.5 %	99.7 %	99.8 %	0.2 %
NO2	10	52.4 %	90.6 %	98.6 %	99.6 %	99.7 %	0.3 %
NO2	11	38.4 %	79.2 %	95.5 %	98.9 %	99.6 %	0.4 %
NO2	12	31.9 %	70.9 %	91.8 %	97.9 %	99.3 %	0.7 %
NO3	1	25.1 %	60.1 %	83.8 %	94.6 %	98.1 %	1.9 %
NO3	2	30.4 %	68.1 %	89.7 %	97.1 %	98.9 %	1.1 %
NO3	3	37.0 %	76.0 %	93.9 %	98.4 %	99.3 %	0.7 %
NO3	4	43.8 %	82.6 %	96.4 %	99.0 %	99.5 %	0.5 %
NO3	5	68.7 %	96.0 %	99.2 %	99.6 %	99.8 %	0.2 %
NO3	6	71.2 %	96.7 %	99.3 %	99.7 %	99.8 %	0.2 %
NO3	7	76.5 %	97.9 %	99.5 %	99.7 %	99.8 %	0.2 %
NO3	8	71.9 %	97.0 %	99.4 %	99.7 %	99.8 %	0.2 %
NO3	9	63.2 %	94.5 %	99.1 %	99.6 %	99.7 %	0.3 %
NO3	10	46.2 %	85.0 %	97.1 %	99.2 %	99.6 %	0.4 %
NO3	11	35.5 %	74.2 %	92.9 %	98.1 %	99.3 %	0.7 %
NO3	12	30.8 %	66.5 %	88.4 %	96.6 %	98.8 %	1.2 %
NO4	1	15.3 %	47.3 %	73.7 %	89.5 %	96.2 %	3.8 %
NO4	2	19.2 %	55.3 %	81.5 %	94.0 %	97.9 %	2.1 %
NO4	3	22.8 %	60.9 %	85.9 %	95.9 %	98.6 %	1.4 %
NO4	4	29.1 %	69.1 %	91.0 %	97.6 %	99.1 %	0.9 %

NO4	5	46.8 %	85.9 %	97.3 %	99.2 %	99.6 %	0.4 %
NO4	6	67.0 %	95.8 %	99.2 %	99.6 %	99.7 %	0.3 %
NO4	7	74.3 %	97.6 %	99.4 %	99.7 %	99.8 %	0.2 %
NO4	8	71.7 %	97.2 %	99.4 %	99.7 %	99.8 %	0.2 %
NO4	9	55.7 %	92.5 %	98.8 %	99.5 %	99.7 %	0.3 %
NO4	10	32.5 %	74.5 %	93.6 %	98.4 %	99.3 %	0.7 %
NO4	11	24.6 %	64.2 %	88.0 %	96.7 %	98.9 %	1.1 %
NO4	12	18.0 %	51.7 %	77.4 %	91.9 %	97.2 %	2.8 %
NO5	1	28.9 %	63.9 %	85.4 %	94.9 %	98.1 %	1.9 %
NO5	2	35.6 %	72.9 %	91.5 %	97.5 %	99.0 %	1.0 %
NO5	3	40.7 %	78.3 %	94.3 %	98.3 %	99.3 %	0.7 %
NO5	4	49.0 %	85.5 %	96.9 %	99.0 %	99.5 %	0.5 %
NO5	5	74.1 %	96.9 %	99.2 %	99.6 %	99.7 %	0.3 %
NO5	6	74.0 %	96.9 %	99.3 %	99.6 %	99.7 %	0.3 %
NO5	7	81.2 %	98.1 %	99.4 %	99.7 %	99.8 %	0.2 %
NO5	8	73.6 %	96.8 %	99.2 %	99.6 %	99.7 %	0.3 %
NO5	9	68.4 %	95.6 %	99.1 %	99.6 %	99.7 %	0.3 %
NO5	10	53.3 %	88.7 %	97.8 %	99.3 %	99.6 %	0.4 %
NO5	11	41.9 %	79.3 %	94.6 %	98.5 %	99.3 %	0.7 %
NO5	12	37.0 %	72.6 %	91.1 %	97.4 %	99.0 %	1.0 %

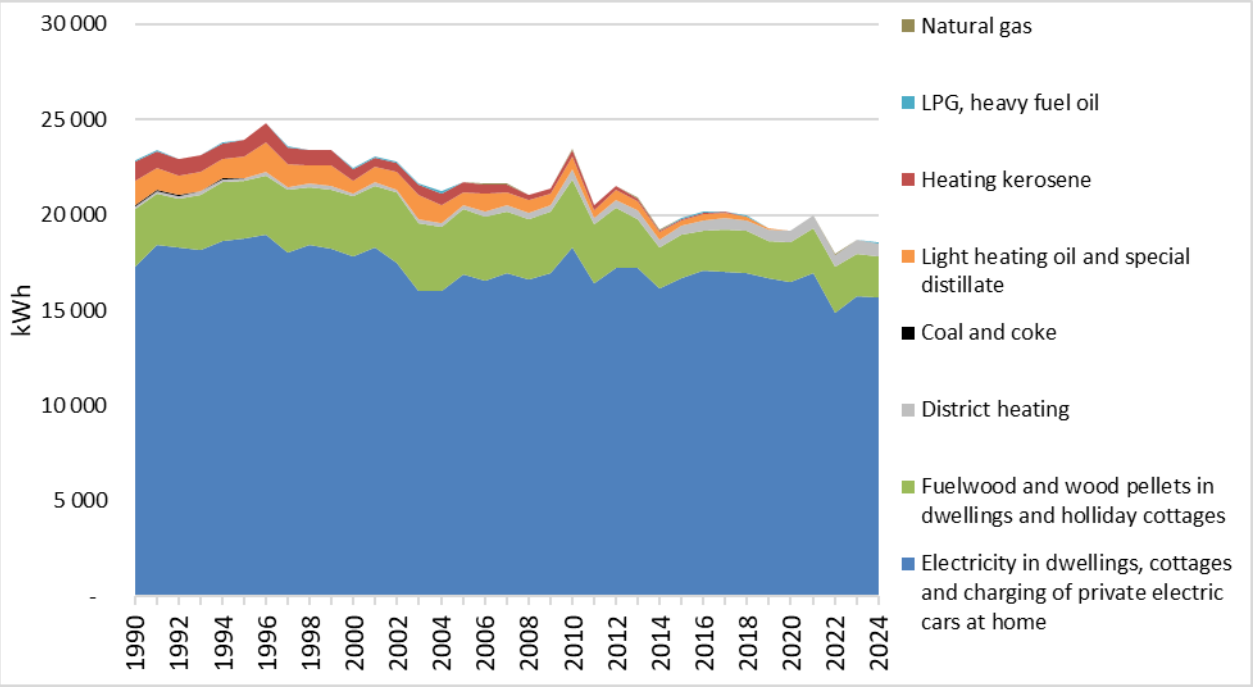

Figure A1: Historical energy use in dwellings and holiday homes (including electric vehicle charging) in Norway per household by energy source. Statistics Norway (2025c).

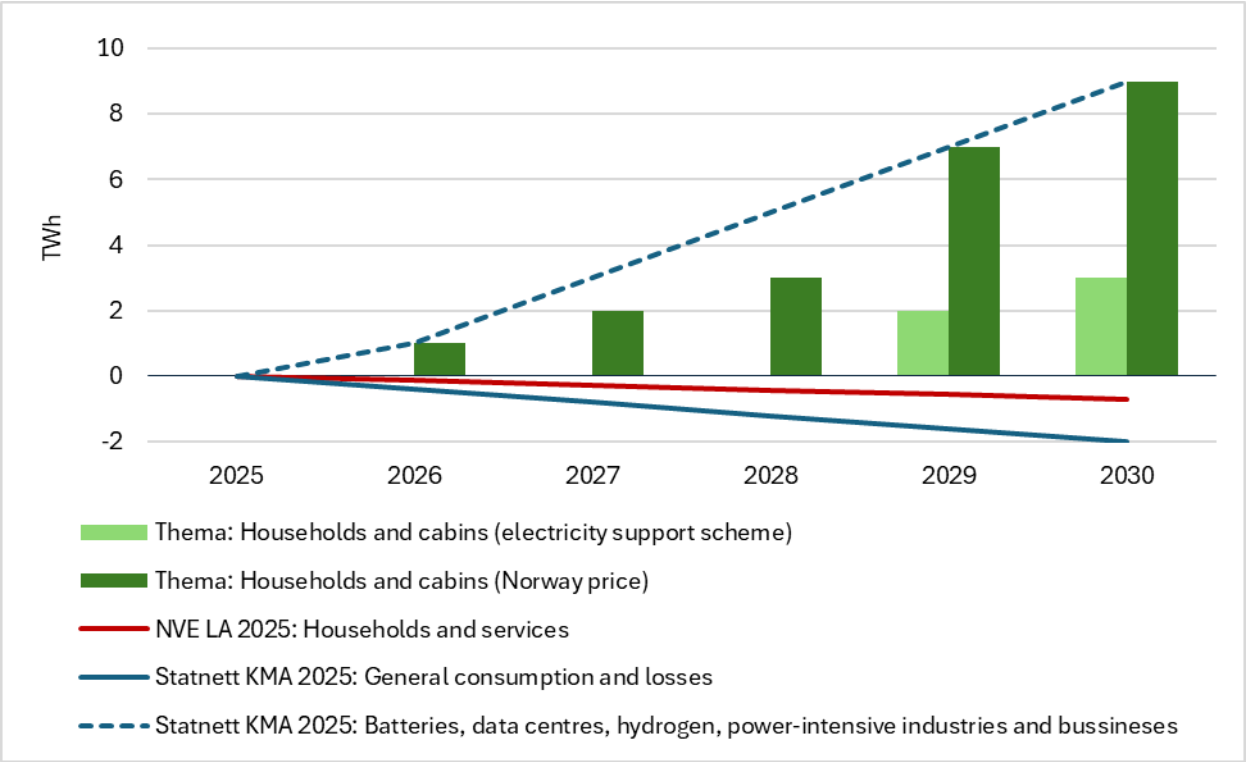

Figure A2: Estimated change in household electricity consumption towards 2030. *TWh. Source: Thema (2025b), Statnett (2025a), and NVE (2025b).*

For NVE, the consumer group 'households and services' (Base) is used as the basis. For Statnett, households are included in 'general consumption' (Medium), which is therefore used as the basis. For Thema, the consumption trajectories for households and cabins on page 19 of the appendix '94452 - Attachment II - Consequences of state-run electricity price hedging (Norgespris)' are used as the basis.

For Thema, the change in consumption is calculated by comparing Thema's estimated household consumption under market prices in 2026 with the consumption trajectories under electricity support and under the Norwegian price model.

For comparison, Thema's alleged growth in household consumption due to Norway Price amounts to a volume that corresponds to the total consumption growth from batteries, data centres, hydrogen, power-intensive industry and commercial sector in Statnett's analysis (KMA 2025 Medium analysis, dottet line).

However, in their short-term analysis Statnett points out:" *In the updated Medium scenario, Norwegian electricity consumption increases by 16 TWh by 2030. The growth is primarily driven by data centres, petroleum, and transport. Industry and hydrogen see a moderate increase. Energy efficiency measures (ENØK) lead to a decline in general consumption,*[3] *even with Norway Price"* (Statnett, 2025a, p. 30).

[3] General consumption consists of households and service sector

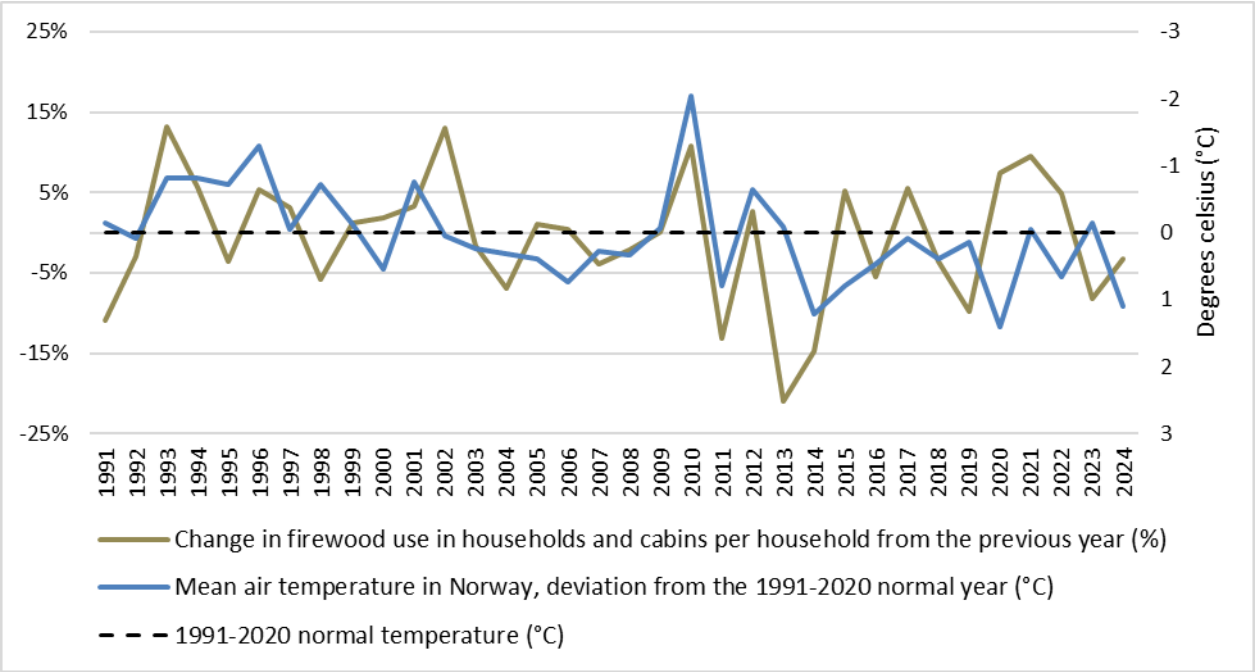

Figure A3: Change in annual firewood consumption in households and holiday homes per household from the previous year (Statistics Norway, left y-axis) and annual deviation from normal temperature in Norway (Norwegian Climate Service Centre (2025), right y-axis [NOTE! Inverted axis]).

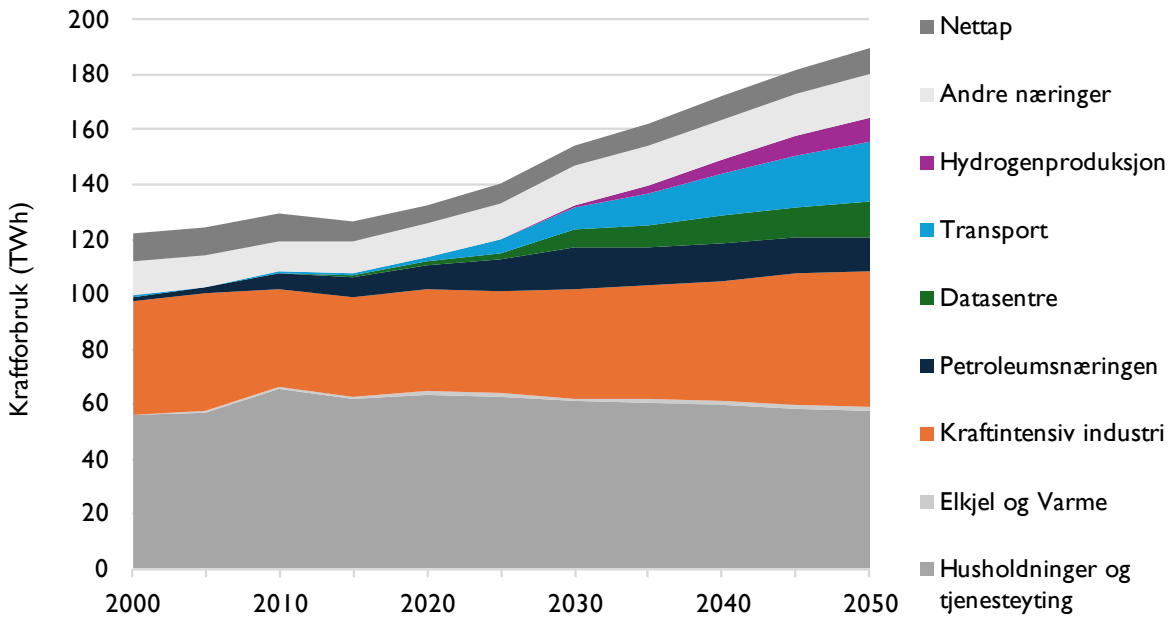

Figure A4: Historical and prognosed electricity consumption growth. TWh per year. Source: NVE (2025b).

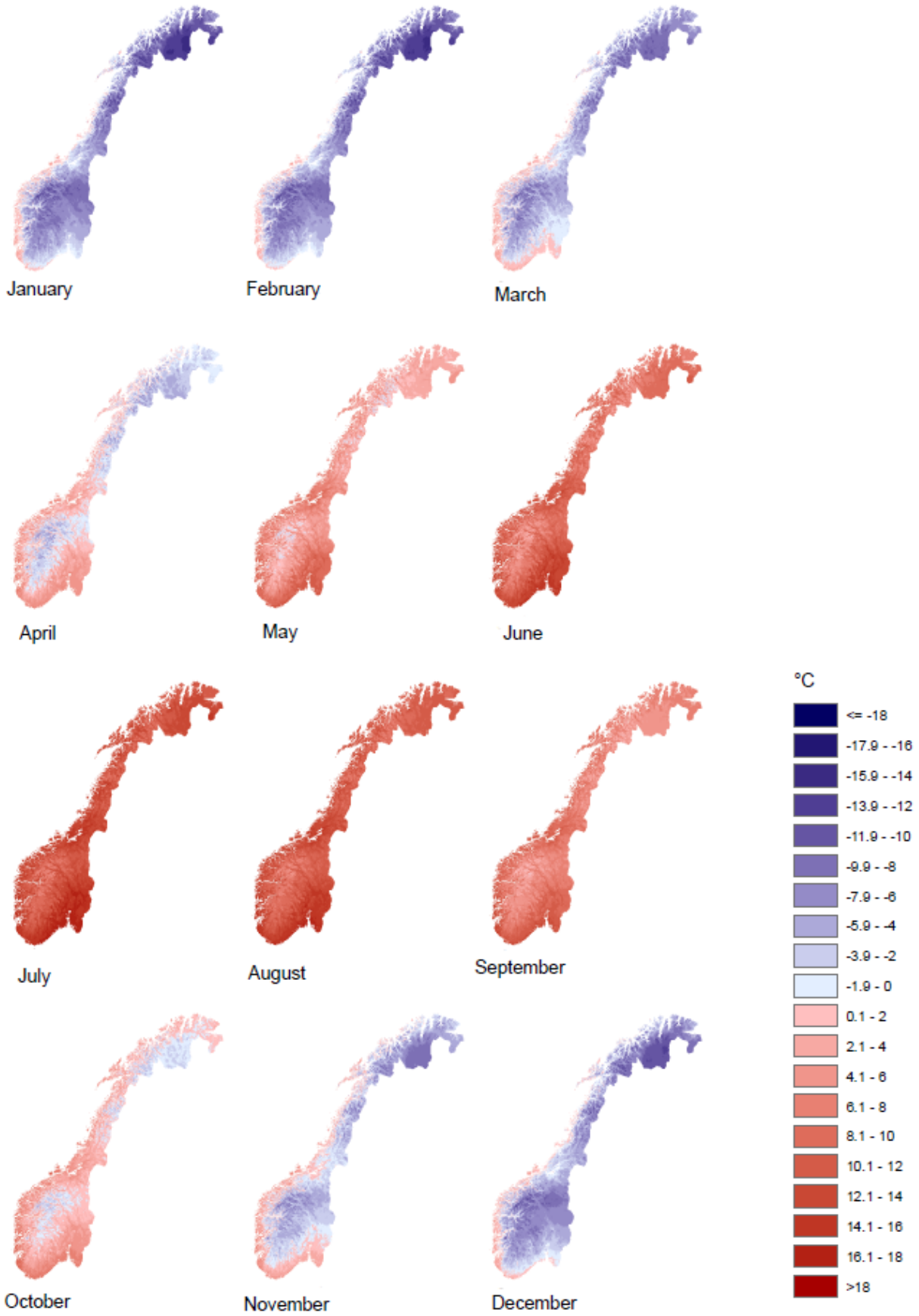

Illustration A1: Mean temperatures (°C) per month in Norway for the period 1991–2020. Source: Norwegian Climate Center Service (2025)

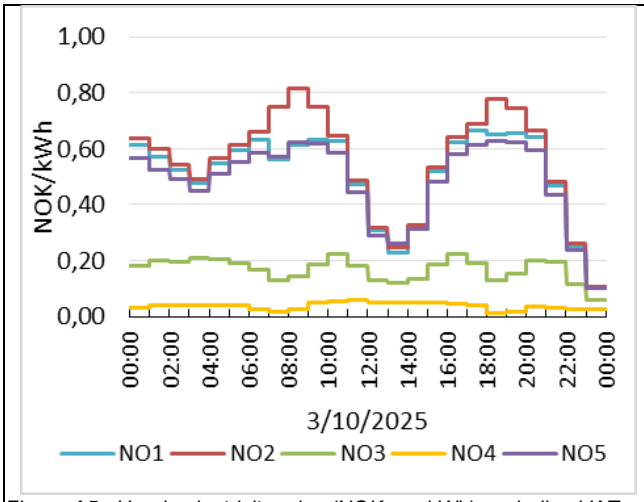

Figure A5: Hourly electricity price (NOK per kWh) excluding VAT on October 3, 2025. Source: Nord Pool via the Norwegian Consumer Council.

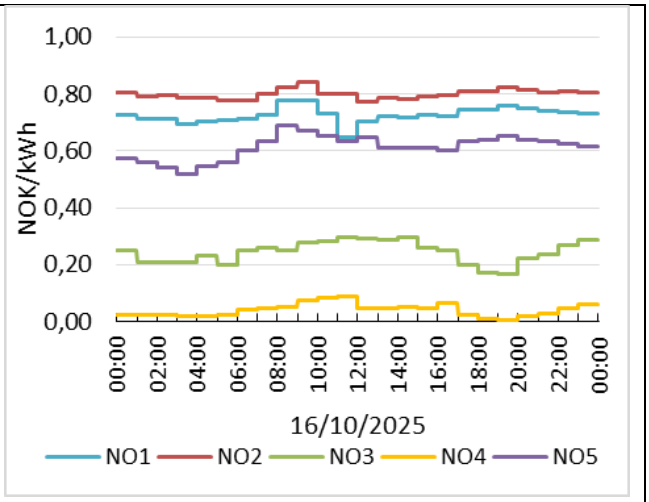

Figure A6: Hourly electricity price (NOK per kWh) excluding VAT on October 16, 2025. Source: Nord Pool via the Norwegian Consumer Council.

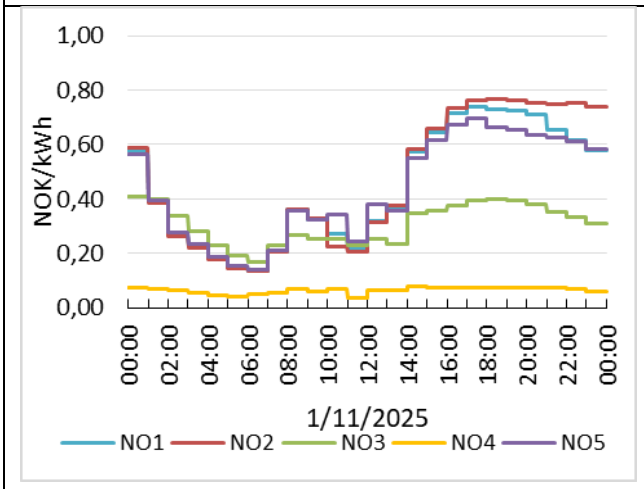

Figure A7: Hourly electricity price (NOK per kWh) excluding VAT on November 11, 2025. Source: Nord Pool via the Norwegian Consumer Council.

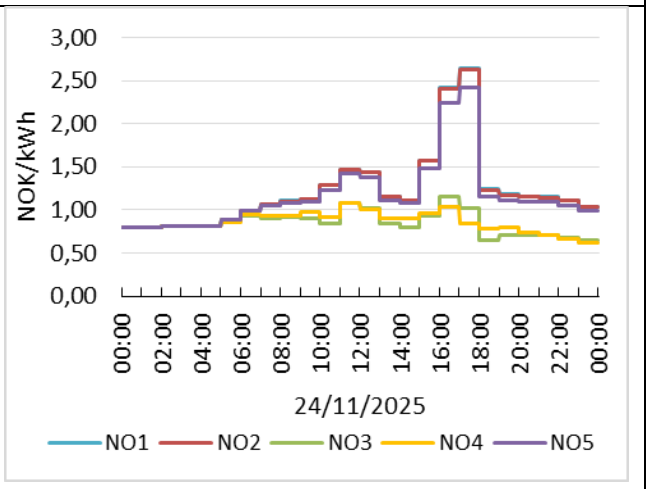

Figure A8: Hourly electricity price (NOK per kWh) excluding VAT on November 24, 2025. Source: Nord Pool via the Norwegian Consumer Council.

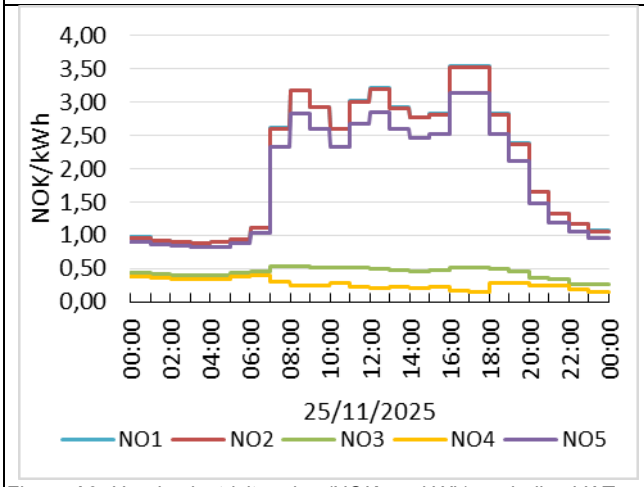

Figure A9: Hourly electricity price (NOK per kWh) excluding VAT on November 25, 2025. Source: Nord Pool via the Norwegian Consumer Council.

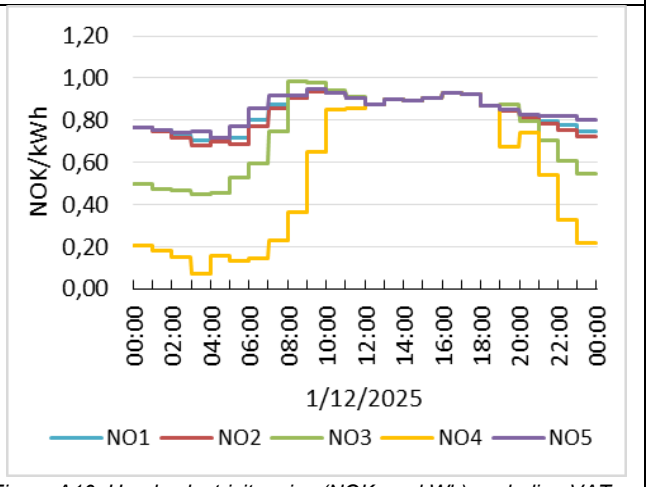

Figure A10: Hourly electricity price (NOK per kWh) excluding VAT on December 1, 2025. Source: Nord Pool via the Norwegian Consumer Council.

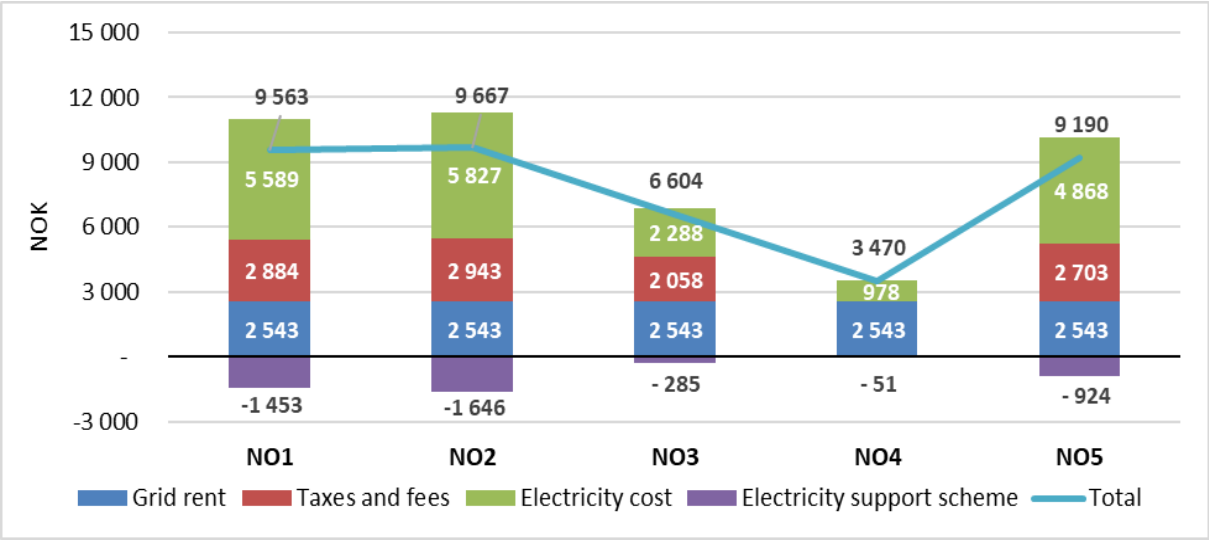

Figure A11: Estimated total electricity cost in Q1 2025 for a household customer with an hourly spot price agreement and an annual consumption of 20,000 kWh, broken down by bidding zone. The electricity cost includes the cost of electricity, grid tariffs, taxes, and electricity support. For NO4, the taxes in the figures are shown as zero because, in large parts of NO4, VAT and electricity tax are not charged. Source: NVE (2025). Kraftsituasjonen – Første kvartal 2025. https://www.nve.no/media/18323/kraftsituasjonen_2025q1.pdf

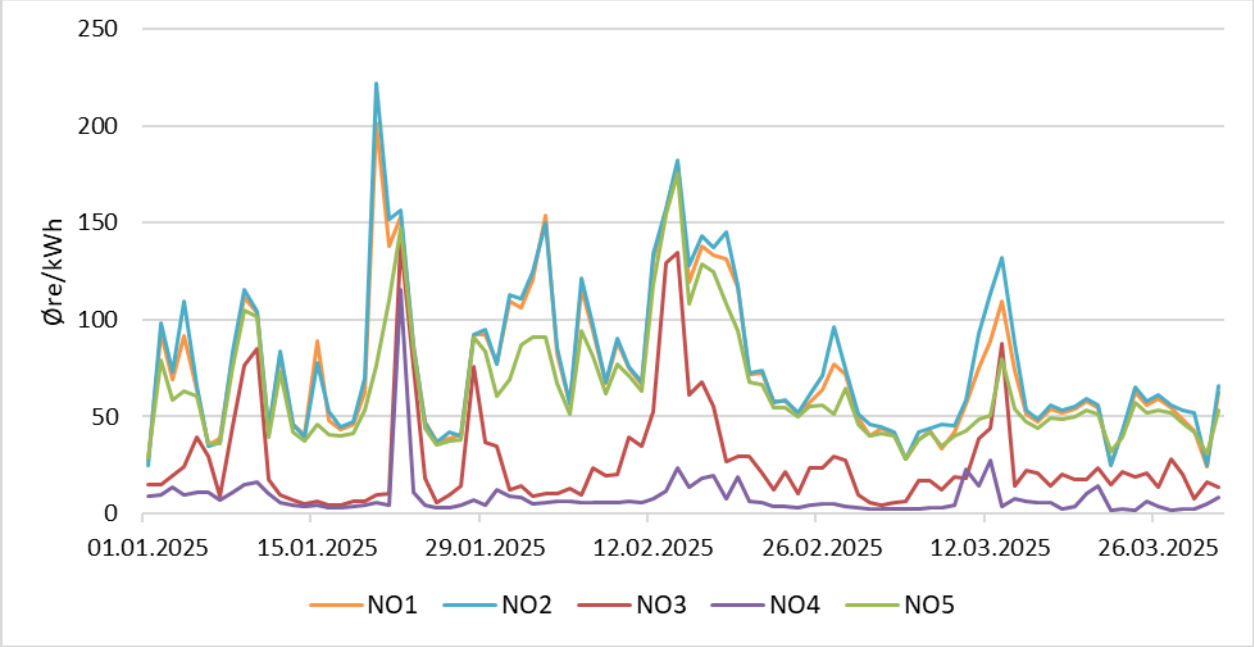

Figure A12: Electricity prices in bidding zones NO1, NO2, NO3, NO4, and NO5 in Q1 2025. Øre per kWh. Source: Nord Pool.

Appendix 2: The Ministry's Main Objections to the Complainants' Analytical Basis

1. Introduction

The consultancy firm Thema, commissioned by the complainants, has prepared and presented a total of five reports on the consequences of the Norway Price scheme, four of which are attached to the complaint (see annexes to the complaint). These reports constitute the basis for the complainants' claims regarding the effects of Norway Price. The Ministry notes that the various reports differ in terms of what is analysed and, in their results, and that there is generally little transparency regarding the underlying assumptions that are essential to the analysis. There are also discrepancies between the assumptions and estimates presented in the reports and the figures referenced by the complainants in

the complaint text, particularly concerning price elasticity and consumption response. It is therefore not straightforward to know which estimates that on the complainants are basing their complaint on.
The Ministry wishes to point out that the attached Thema reports rely on several unrealistic assumptions that are critical to the model outcomes. The most significant objection concerns the uncritical use of price elasticities, which cannot be substantiated by recent research in the field or by actual household behaviour. This results in an exaggerated consumption response and unrealistic estimates, even though the Thema reports themselves acknowledge the considerable uncertainty surrounding price elasticity. Furthermore, a partial model is used without market adaptation from businesses, industry, and the public sector, which leads to unrealistic estimates of price development.

1.1 Elasticity Assumptions That Exaggerate Long-Term Effects Are Poorly Grounded in Recent Norwegian Data

The price elasticity of household electricity consumption depends on many factors, including the time of year and characteristics of individual households, such as size, income, housing situation, and substitution possibilities. Additionally, price elasticity is context-dependent, as households' basic heating needs vary significantly with outdoor temperature throughout the year and between different weather years, and because awareness of electricity prices and potential measures to reduce consumption may fluctuate.

In the long term, the most important variables influencing household electricity consumption are economic growth, floor area, and demographic development. Traditionally, households are assumed to be among the least elastic consumers, as most electricity use is tied to essential needs.
Thema assumes high elasticities for Norwegian households in its analysis, using a short-term price elasticity of -0.15 and a long-term elasticity of -0.6 for households (from Vista 2022), and -0.8 for businesses in its illustrations. These assumptions have a significant impact on the projected increase in consumption in TWh. For example, an increase of close to 9 TWh for households—from 43 TWh in 2026 with electricity support to 52 TWh in 2030 under the Norway Price scheme. Thema's elasticity estimates are based on "Vista Analyse and DNV (2022): The Impact of High Electricity Prices on the Norwegian Economy" which, based on a literature review of international studies and one Norwegian study, recommends a long-term price elasticity of -0.6 for households. Vista's justification is as follows:
"Our best estimate for long-term elasticity is -0.65 for households (for end-user prices). This is slightly higher than the estimates from meta-studies (-0.365 in Labandeira et al. (2017) and -0.577 in Zhu et al., 2018). We have emphasized the estimate (-0.65) from Halvorsen et al. (2005) and the estimate for Sweden (-0.668) in Pellini (2021)."

Of these studies, Halvorsen et al. (2005) is the only Norwegian one. It is based on data from over 30 years ago (Statistics Norway's consumption surveys from 1993–1995). Among the households in the sample, about 80 percent had access to firewood, around 5 percent could use heating oil, and about 25 percent could use paraffin for heating. Heating options for Norwegian households have changed significantly since then; for example, the use of heating oil and paraffin has been banned. Additionally, dependence on electricity for various purposes has increased substantially over the past thirty years.
The elasticity estimates used by Thema are partly based on international studies. As the Ministry also points out in its response, international studies cannot realistically represent the price response of Norwegian households, and their transferability must be considered limited. In most countries inside and outside Europe, households primarily use gas or other energy sources to meet their essential needs for heating/cooling and hot water and therefore have much lower electricity consumption than Norway. Furthermore, Norway has different climatic conditions, with longer and colder winters compared to most of the countries used for comparison. In the article *"The Short-Term Price Elasticity, Temperature Elasticity, and Wind Speed Elasticity of Electricity: A Case Study from Norway"*, it is noted that: "*The Norwegian electricity market distinguishes itself from other countries' energy markets in several notable*

ways. Therefore, there is a risk that conclusions about the Norwegian electricity market, based on research conducted in other countries, may be incorrect or inaccurate."

To the extent that price elasticities from other countries may be somewhat relevant for Norwegian households, it would be the price elasticity of other energy sources used for heating, in countries with similar climate conditions.

The Ministry emphasizes that the Thema reports, which form the basis of the complaint, include important caveats regarding price elasticity:

*"Electricity is largely a necessity good, and households respond less to changes in electricity prices than to changes in the prices of other goods." (*Attachement II to the complaint named "C*onsequences of state-run electricity price hedging",* containing the report *"Consequences of "Norgespris" in Norway and the Nordics", Attachment II, p. 8)*

"Even long-term price elasticity is highly uncertain, with widely varying estimates." (Thema-report Virkninger av Norgespris, Attachment I, p. 16)

"It is highly uncertain how much household consumption will respond to a price change." (Thema-report Consequences of "Norgespris" in Norway and the Nordics, Attachment II, p. 8)

Though highly uncertain, the selected price elasticities, in turn, result in a calculated consumption response as shown in Table A9, which is used to justify the complaint.

Table A 9: Changes in electricity consumption of households and holiday homes due to Norway Price: Thema's estimates in the attached analyses

Year	Compared with	Change in electricity consumption	Assumption / note	Source
2030	Market price 2026	+8.9 TWh	Elasticity rises from -0.15 in 2026 to -0.6 in 2030 (real prices); includes reduced VAT on the grid tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 16)
2030	Market price 2030	+9.1 TWh	Elasticity rises from -0.15 in 2026 to -0.6 in 2030 (real prices); includes reduced VAT on the grid tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 16)
2030	Electricity support scheme 2026	+8.7 TWh	Elasticity rises from -0.15 in 2026 to -0.6 in 2030 (real prices); includes reduced VAT on the grid tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 16)
2030	Electricity support shceme 2030	+5.8 TWh	Short-run price elasticity -0.15; includes reduced VAT on the grid (network) tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 16)
2030	Norway price 2026	+7.5 TWh	Elasticity rises from -0.15 in 2026 to -0.6 in 2030 (real prices); includes reduced VAT on the grid tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 16)
2029	Compensation-alternative (mdg) 2029	3 to 7 TWh	70-100% of households choose Norway Price. Includes a 4.4 øre reduction in the electricity consumption tax and removal of the 1 øre Enova fee. Real prices.	Thema: Alternativer til Norgespris (Attachment III, p. 13

2028	Compensation-alternative (mdg) 2028	2 to 2.7 TWh	70-100% of households choose Norway Price. Includes a 4.4 øre reduction in the electricity consumption tax and removal of the 1 øre Enova fee. Real prices.	Thema: Alternativer til Norgespris (Attachment III, p. 13)
2026	Market price 2026	+1.4 TWh	Short-run price elasticity -0.15; includes reduced VAT on the grid (network) tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 16)
2026	Market price 2026 (Dry year, 2010)	+3.4 TWh	The increase in a dry year is larger than in a normal year due to higher prices (larger discount) and lower temperatures. Short-run elasticity -0.15.	Thema: Consequences of state-run electricity price hedging (Attachment II, p. 32)
2026	Market price 2026 (Wet year, 2020)	-2 TWh	The reduction in a wet year is because households pay more than they would with the market price. It is also assumed that household consumption is lower to begin with due to milder temperatures in wet years.	Thema: Consequences of state-run electricity price hedging (Attachment II, p. 28)
2026	Compensation-alternative (mdg) 2026	+1 to 1.3 TWh	70-100% of households choose Norway Price. Includes 4.4 øre reduction in the electricity consumption tax and removal of the 1 øre Enova fee. Real prices.	Thema: Alternativer til Norgespris (Attachment III, p. 13)

Table A10: Change in electricity consumption in other businesses due to Norway Price

Year	Compared with	Change in electricity consumption	Assumption / note	Source
2030	Market price 2030	-5 TWh (-6 TWh)	Businesses. Elasticity rises from -0.15 in 2026 to -0.8 in 2030; includes reduced VAT on the grid tariff.	Thema: Virkninger av Norgespris (Attachment I, p. 25)
2026	Market price 2026	-0.5 TWh	Short-run price elasticity -0.15. Businesses, public sector and industry.	Thema: Virkninger av Norgespris (Attachment I, p. 24)

Recent Assessments of Price Elasticity Among Norwegian Households

Table A1 in Appendix 1 reviews recent research and assessments of price elasticity among Norwegian households. The studies vary in terms of the time intervals analysed—ranging from hours, days, and months to longer periods. Most studies indicate that short-term price elasticity for electricity is very low, as electricity consumption in Norwegian households is closely tied to heating needs and primarily varies with outdoor temperatures. Even studies with somewhat longer time spans, as months, suggest low elasticities. As shown in Table A1, the estimated are centred around values of – 0.03 – 0.05, some above, some slightly over. However, it should be noted that the various studies also use different definitions of short and long term.

Among the studies examining long-term price elasticity in Norwegian households, one is an *unpublished* study by Bergland (2021), which also uses annual end-user prices and is referenced by the complainants and Thema, although not used in the analysis. Unlike Halvorsen et al. (2005), Bergland (2021) uses more aggregated data (consumption per capita in households) and a more recent dataset (1993–2019). The estimated price elasticities in Bergland (2021) are significantly lower: -0.06 in the short term and -0.11 in the long term. This may indicate that long-term price elasticity among Norwegian households has decreased in recent years, with fewer substitutes for heating energy than households had access to in 1993–1995.

However, assessing very long-term price elasticity is challenging. Over extended periods, significant and fundamental changes can occur in economic development, building stock, demographics, and the electricity market. Isolating the specific effect of electricity prices—and adjusting for ongoing weather conditions—becomes increasingly difficult the longer the time frame considered.

The consequences of uncritically applying a price elasticity of 0.6 are clearly illustrated when projected onto the historical development of household electricity consumption, as well as future trends, as illustrated in figure.

Price Elasticity During Periods of Capacity Constraints and Impact on Other Countries
The complainants also argue that the Norway Price scheme could increase the likelihood of strained capacity situations, and that this would affect electricity prices and the power situation in Norway's neighbouring countries. Regarding household price elasticity during peak load periods, the Ministry refers to several studies in Table 1, which typically find very low or no price elasticity when heating demand is high. This implies that periods of capacity constraints will continue to be triggered by temperature fluctuations, regardless of the introduction of Norway Price.

For example, *Hofmann and Lindberg (2019*) use hourly prices to examine whether peak load consumption responds to prices (load shifting). The data is from Oslo, where households and office buildings account for 83 percent of electricity consumption. They conclude that peak load consumption is nearly completely inelastic. On the coldest winter days (colder than -10°C), elasticity is zero, while for temperatures between -10°C and 0°C, they estimate elasticity at -0.011 and -0.075. Hofmann and Lindberg (2019) thus conclude that price signals do not contribute to reducing consumption on the coldest days. One reason may be that on the coldest days, all available heating sources are already in use.

Similarly, *Idsø, Nesse, and Larsen (2024*) find no significant price elasticity when it is cold and prices are high.

The ministry will also like to address Item (21) in the complaint letter (Annex I), which claims that *«Recent research illustrates that households do respond to (hourly) price signals – reducing their electricity consumption with approximately 3% during times of high electricity prices.»* With reference to a more recent study by Hofman & Lindberg (2024)[4]: *Evidence of households' demand flexibility in response to variable hourly electricity prices – Results from a comprehensive field experiment in Norway*.

Hofman and Lindberg (2024) finds that Norwegian households reduced their electricity demand by, on average, 2.92 % in hours with high prices. However, the «price response» where not driven by changes in spot prices, but by rewards. The experiment was conducted with highly electrified households with

[4] Evidence of households' demand flexibility in response to variable hourly electricity prices – Results from a comprehensive field experiment in Norway - ScienceDirect

usage characterised by electric heating and charging electric cars, that also was familiar with dynamic electricity price contracts. They were also given a one-day advance notification via SMS or push message before experiment days. Some of the other findings by Hofman and Lindberg (2024):

- Significant average response of 0.085 kWh/h or 2.92 percent in peak hours.
- Prices over 15 NOK per kWh increase the response, *below this value no significant increase compared with the reference price.*
- The price response is not statistically significant for temperatures below -10°C, which may result from the limited number of observations for these cold temperatures.
- No response can be observed for temperatures between 5 and 10°C.

1.2 The Thema Report Is Only a Partial Analysis

Thema conducts a partial analysis, where increased electricity consumption by households is assumed to raise market prices, without accounting for consumption responses in other sectors, and in several cases not in neighbouring countries either. The report itself states that "the final price effect will be smaller," as other actors will adjust their consumption in response to price changes. Nevertheless, the main conclusions (price increases in Norway and the Nordic region) are presented as if these mechanisms are not present.

An increase in electricity prices will normally lead some businesses—especially energy-intensive industries — to adjust their consumption. By omitting this effect, Thema overestimates the extent to which prices will rise for other customers, particularly in dry years or other periods with prolonged high prices.

Furthermore, Thema assumes that increased demand does not lead to increased production, nor that higher demand and prices would result in the establishment of new businesses. It also assumes no investments in flexibility measures, even after ten years. In reality, such developments would dampen price growth in the market if Norway Price were to lead to higher and more volatile prices, as claimed by the complainants.

1.3 Unrealistic Assumptions That All Households in Norway Choose Norway Price

It is assumed that all household customers in Norway choose the Norway Price scheme. This assumption contributes to inflated budget estimates and projected consumption growth. The Ministry notes that currently (December 6, 2025) only 53.7 percent of households and 69.5 percent of holiday homes in Southern Norway (bidding zones NO1, NO2 and NO5) have opted for Norway Price. In other regions, the choice of Norway Price will depend on future price developments. Current price levels and forward prices for the coming years suggest that this is an unrealistic assumption. Many of Thema's results are calculated "without considering the consumption cap," despite the fact that the cap is part of the scheme's design and serves to mitigate potential effects.

1.4 Incorrect Basis for Comparison

Most calculations are compared against market prices without electricity support, rather than against the current electricity support scheme that Norwegian households have been covered by since December 2021. Thema itself notes that several figures are "compared with market price, not electricity support," which systematically exaggerates the marginal effect attributable to Norway Price.

1.5 Unrealistic Hydropower Modelling in Weather Scenarios

In both wet and dry years, Thema's analysis assumes no transfer of water between years in multi-year reservoirs. It states "without the possibility to transfer water between years." This is unrealistic in relation to the fundamental optimization of water values and the actual reservoir management by producers in

Norway. This contributes to inflated price and risk assessments in dry years. Hydrology and reservoir management are foundational to price formation in Norway, and the flexibility of the Norwegian power system helps to dampen demand fluctuations. This is disregarded in Thema's assumptions about reservoir management.

1.6 Thema's Price Estimates Are Significantly Higher Than Other Analyses

Thema uses its own price trajectory for expected electricity prices in the Nordic region. This trajectory is higher than both NVE's baseline scenario (Long-Term Power Market Analysis for 2025) and Statnett's short-term analyses up to 2030 (Short-Term Market Analysis 2025). This is possibly due to assumptions about fuel price developments in Europe, but also because Thema assumes a weaker power balance for Norway than NVE and Statnett do in their baseline scenarios. With higher prices, as in Thema's trajectory, the price gap to their assumption about Norway Price also becomes larger. This affects the expected consumption response compared to a scenario without Norway Price.

1.7 Duration and Adjustment of the Norway Price Scheme

Thema has calculated the impact of Norway Price up to 2035, assuming a fixed price throughout the period. The Ministry points out that the Norway Price scheme is set to last until December 31 2029, and that the price level will be adjusted annually starting from January 1, 2027. The price setting each year will take into account future price developments as well as the objective of the scheme.

Finally, the Ministry would like to point out errors in the complaint letter compared to the reports attached to the complaint;

- **Item 41 in the complaint letter (Annex I):**

Claim: «*First, it seems clear that the scheme will lead to increased consumption of electricity by Norwegian households. According to the THEMA report dated March 18, 2025, for example,* ***consumption will rise by 1.2% in 2026, and by 7.4% in 2030*** *as compared with a scenario in which the scheme was not introduced.»*, with reference to page 20 of Attachment II.

Comment from the Ministry: Page 20 of attachment II **does not show that the yearly consumption will rise by 1.2 percent in 2026 and 7.2 percent in 2030** (*Thema: Consequences of state-run electricity price hedging*). It shows a partial analysis of 2026 and 2030 of increased household consumption and demand flexibility during peak loads. What the figure on page 20 of Attachment II actually shows is a 1.2 percent and 7.2 percent increased load (GW), only during peak loads in 2026 and 2030, without considering reduced activity in businesses, the public sector and industry as a result of higher electricity prices.

- **Item 42 in the complaint letter (Annex I):**

Claim: «*Higher electricity consumption by household customers secondly has certain inevitable effects. It will necessarily increase the market price (spot price) at times where it is higher than Norway Price, because the existing incentive for consumers to not consume electricity (in such a situation) is significantly weakened. An estimate of this effect is contained in the THEMA report dated March 18 2025, suggesting that market prices in Norway will increase by up to* ***3.7% in 2026,*** *and* ***8.8% in 2030*** *as a result of the scheme, leading then to an increase of electricity expenses for entities that are not covered by the scheme, such as businesses. Similarly, it will lead to a significantly higher market prices in neighboring countries (Denmark, Sweden, Finland). These potentially grave consequences appear to have motivated a number of authorities, associations and companies from neighboring countries to voice their concerns in the public consultation, testifying to the fact that the effects of Norway Price likely will extend beyond Norway» (Thema, 2025b, p. 15).*

Comment from the Ministry: Page 15 of Attachment II does not show that the market prices in Norway will increase by up to 3.7 percent in 2026, and 8.8 percent in 2030 as a result of the scheme. It shows a price difference of **3.7 EUR/MWh in 2026** and **8.8 EUR/MWh in 2030**.

1.8 Household consumption growth under different scenarios in the Thema reports:
Thema states that temperature-corrected household electricity consumption in 2023 was 37.8 TWh, a year in which all Norwegian households received electricity support and the average spot price in Southern Norway ranged between 0.76 and 0.90 NOK per kWh[5] (Thema, 2025b, p.9). Thema further states that household consumption in 2030 is projected to be 42.7 TWh in the market price scenario, 46 TWh with electricity support, and 51.8 TWh with the Norway Price scheme (Thema, 2025b, p. 19 & 41).

This implies an increase in consumption to 2030 (compared with the starting point in 2023), of 14 TWh in the alternative with Norway Price, 8 TWh with continued electricity support only, and 4.7 TWh if electricity support is removed and households face market prices in 2030. An increase of 14 TWh corresponds to approximately 5.350 kWh of additional consumption per household per year. By comparison, household electricity consumption per capita in Denmark is 1.830 kWh per year, according to Thema (Thema. 2025a, p.3). In addition, Thema estimates that per household consumption with Norway Price increases by a further 1.650 kWh (4.3 TWh) in dry years (Thema, 2025b, p. 32 & 41).

Appendix 3: The Electricity Price Committee and Other Reports Leading Up to Norway Price and Electricity support scheme

The Ministry of Petroleum and Energy carried out five external assignments that examined various aspects of the power situation in 2021–2022.

The following reports were conducted:

- **Statistics Norway** assessed the impact of rising electricity prices on households and conducted an evaluation of the existing support scheme presented by the Government in December 2021.

  https://www.ssb.no/energi-og-industri/energi/artikler/okonomiske-konsekvenser-av-hoye-kraftpriser-og-stromstonad

- **DNV** and **Vista Analyse** carried out an analysis of the effects of high electricity prices on the Norwegian economy.

  https://www.regjeringen.no/contentassets/0f626d2e10ef48e591d2ceefce3546dc/vista-analyse-dnv-rapport-2022-34-virkninger-av-hoye-strompriser.pdf

- **AFRY** and **Menon Economics** evaluated several measures, including a maximum price in the wholesale market, reservoir restrictions, export limitations, grid expansion, end-user market interventions, and a model for a state-owned power supplier.

  https://www.regjeringen.no/contentassets/0f626d2e10ef48e591d2ceefce3546dc/afry_menon_oed_endelig-rapport.pdf

- **THEMA Consulting** reviewed the status of the Nordic financial markets with regard to price hedging opportunities for Norwegian power suppliers.

  https://www.regjeringen.no/contentassets/0f626d2e10ef48e591d2ceefce3546dc/te-22-19-fastprisavtaler-og-prissikringsmulighetene-til-kraftleverandorer-i-norge-l1381718.pdf

[5] Yearly average spotprice (NO1/NO2/NO5) excluding taxes, VAT and grid rent. Source: Nord Pool.

- **SINTEF** conducted an analysis of reservoir management during autumn 2021 and the effects of Norwegian power exports, including restrictions on reservoir usage.

  https://www.regjeringen.no/contentassets/0f626d2e10ef48e591d2ceefce3546dc/rapport-kraftsituasjon-2021-22-.pdf

In addition, a number of analyses and assessments were carried out by **NVE** and **Statnett** during this period, related to the ongoing situation, characteristics of the power system, and work on mitigation measures.

The Electricity Price Committee

To assess the current system for determining electricity prices, the Government established the **Electricity Price Committee** on February 15, 2023, an independent expert committee. The committee's main task was to **examine and discuss various models that could contribute to more stable, predictable, and competitive electricity prices for households, industry, and businesses, while also ensuring continued investment in renewable energy (Strømprisutvalget, 2023)**. The expert committee consisted of individuals with specialized knowledge of the economic, legal, and physical characteristics of the Norwegian power system.

The fundamental function of the electricity market is to ensure secure access to electricity for consumers and societal functions at the lowest possible cost, both in the short and long term. The models the committee was asked to evaluate had to safeguard Norway's energy security over time and provide necessary incentives for production, reservoir management, electricity exchange, and consumption behaviour aligned with these goals.

The Electricity Price Committee submitted its report on October 12, 2023. The report was widely circulated for consultation when it was presented, with the deadline set for December 15 same year. The Ministry of Energy received 146 consultation responses – 24 from private individuals and 41 from municipalities and county authorities. The report is attached to the letter, along with an unofficial English translation of the summary prepared by the committee afterwards

Below is an overview of what the committee was asked to assess and describe:

- **How various proposals for changes in electricity price formation in the wholesale market would affect the Norwegian power system**, energy security, incentives to invest in new renewable power production, electricity exchange, and end-user prices. It also included assessing how changes in the wholesale market would impact other short-term balancing markets and futures markets for electricity.
- **Describe the relationship between price formation in the wholesale market and the end-user electricity market.** Provide a status update on competition and the availability of contracts in the Norwegian end-user market, and assess which short- and long-term measures could ensure consumers access to lower and more predictable prices within the framework of the EEA Agreement.
- **Report on crisis measures and long-term reforms related to electricity price formation in the European power market**, and how the implementation of proposed or discussed measures in the EU and European countries could affect electricity pricing in Norway. This includes both expected impacts from the European market and potential effects if similar measures were introduced in the Norwegian system.
- **Discuss the main factors that will influence electricity prices in the long term in Norway and in connected countries.** Also, assess the challenges posed by the current pricing model as surrounding countries transition to very high shares of renewable energy production.

The committee evaluated fifty different measures aimed at shielding electricity consumers from price increases — ranging from major market reforms to various types of support schemes. Each measure

was assessed in terms of its impact on the electricity market and whether it would conflict with the provisions of the EEA Agreement.

In the wholesale market, the committee considered measures such as reducing the use of transmission capacity with foreign countries, direct interventions in reservoir management, price-targeted interventions, and improvements in market information to support better decision-making by market participants.

In the end-user market, the committee assessed measures such as politically determined price caps, politically determined discounts on electricity prices, and direct income transfers to consumers.

The committee concluded that if measures are to be introduced to directly influence electricity prices, they should be implemented in the end-user market. It emphasized that interventions in the wholesale market would require significant regulatory changes and could have negative consequences for the power system and energy security. Therefore, the committee recommended that any measures aimed at securing lower and more predictable prices for consumers should be implemented in the end-user market.

Both the current electricity support scheme and the proposed Norway Price are examples of such end-user market measures, in line with the committee's recommendations.

Appendix 4: Media clipping references

"The Bogeyman Norway Price: It is the electrification of oil platforms and new industries – not the Norway Price – that will be decisive for Norway's power balance."
(Editorial, Dagens Næringsliv (Norwegian Business Daily) 1.10.2025)
https://www.dn.no/leder/dn-mener-busemannen-norgespris/2-1-1878792?zephr_sso_ott=BGptbV

"Critics of the Norwegian price model claim that fixed rates lead to waste. That's not true." (Robert Næss, Chief Investment Officer, Nordea. Aftenposten 1.10.2025)
https://www.aftenposten.no/meninger/debatt/i/5E9d8E/kritikerne-av-norgespris-hevder-at-fastpris-gir-sloesing-det-stemmer-ikke

"A Defense of Norway Price" (Kjell Roland, economist and member of the Energy Commission, TU (Teknisk ukeblad) 8.2.2025)
https://www.tu.no/artikler/et-forsvar-for-norgesprisen/555633

«The Norwegian price model does not challenge the Energy Act. Lower and more predictable electricity costs are good news for both consumers and the future of the Energy Act"
(Herdis Helle, PhD, lawyer at the Norwegian Confederation of Trade Unions (LO), Andreas C. Halse, associate lawyer at Elden, advisor at Agenda, Rett 24, 24.3 2025)
https://rett24.no/articles/norgespris-utfordrer-ikke-energiloven

"*The Norwegian electricity price model provides predictability – but a heat pump lowers your electricity bill*" *(Energiaktuelt AS*):
https://www.energiaktuelt.no/norgespris-gir-forutsigbarhet-men-varmepumpe-gir-lavere-stroemregning.6730011-575509.html

"Heat pump 2025 – how to make the most of the Norwegian price model, Enova subsidies, and grid tariffs, while enjoying cooler summers and warmer winters" (Energiverket):

https://energiverket.no/varmepumpe-2025-slik-utnytter-du-norgespris-enova-stotte-og-nettleie-og-far-svalere-somre-og-varmere-vintre/

"Heating with firewood or electricity – yes, please, both!" (NRK, 6.10.2025):
https://www.nrk.no/vestfoldogtelemark/vedfyring-eller-strom_-ja_-takk-begge-deler_-1.17589990

“Divided opinions on the impact of the Norwegian price model: – Some expect a modest decrease” (E24, 5.10.2025):
https://e24.no/energi-og-klima/i/KMd5p4/uenige-om-norgespris-effekt-forventer-en-viss-nedgang