DATA CATALOG

Approach to data on Energi Data Service

See and extract the raw data on
www.energidataservice.dk

DATA SOURCES IN ENERGINET

Settlement data (Panda, SAP bi)

Data based on settlements containing actual production and categories, exchanges, consumption on individual addresses.

- Actual production, transmission and consumption
- Balance, activated reserves

Resolution consumer level:
Hourly / yearly, aggregated

Realtime data (SCADA)

Running data from most power generators with information about types, effect, main fuel, municipality.

- Scaled total production and consumption

Resolution: Near realtime 1 min

Planned operation and marked data (DPS)

Data about the electricity market and the planned operation, prognoses, ancillary services,
main fuel types:

- Trading data and planned power exchanges
- Planned production and
- CO_2 signal

Resolution: 5 min to hourly

Gas-system

Data on gas market and gas quality measures from entry/exit point, MR stations.

- Gas composition
- Calorific value
- Biomethane share
- Flow

Resolution: 3 min -> Yearly

Infrastructure data

West and east Danish electricity transmission systems:

- Nodes
- Transmission lines
- Transformers

Resolution: To be determined

Environmental declarations

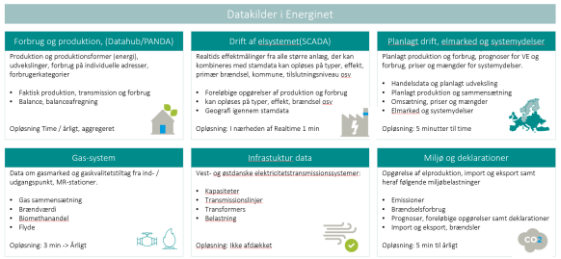
Calculation of electricity production, import and export as well as consequent environmental impacts

- Emissions
- Fuel consumption
- Forecasts, preliminary statements and declarations
- Import and export, fuels

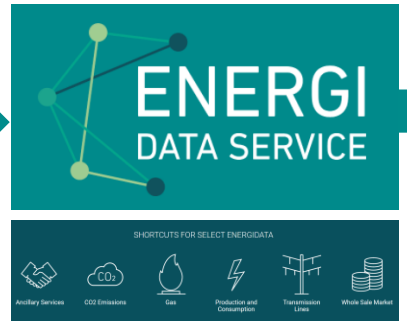
Resolution: 5 min to annually

FROM SOURCES TO VISUALISATIONS

Open data



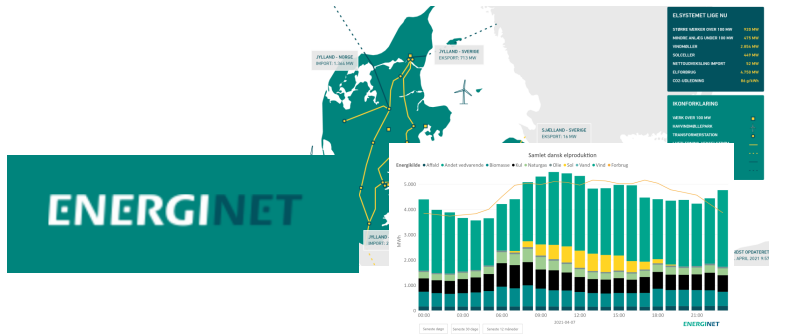
Data sources

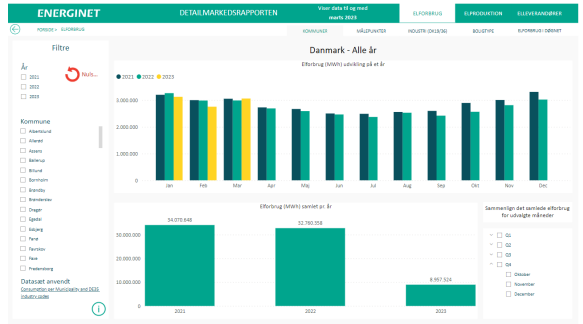


API Engine

Generic data viewer and extract functions

Data usage





Applications, standard reports etc.

BRIEF USER GUIDE

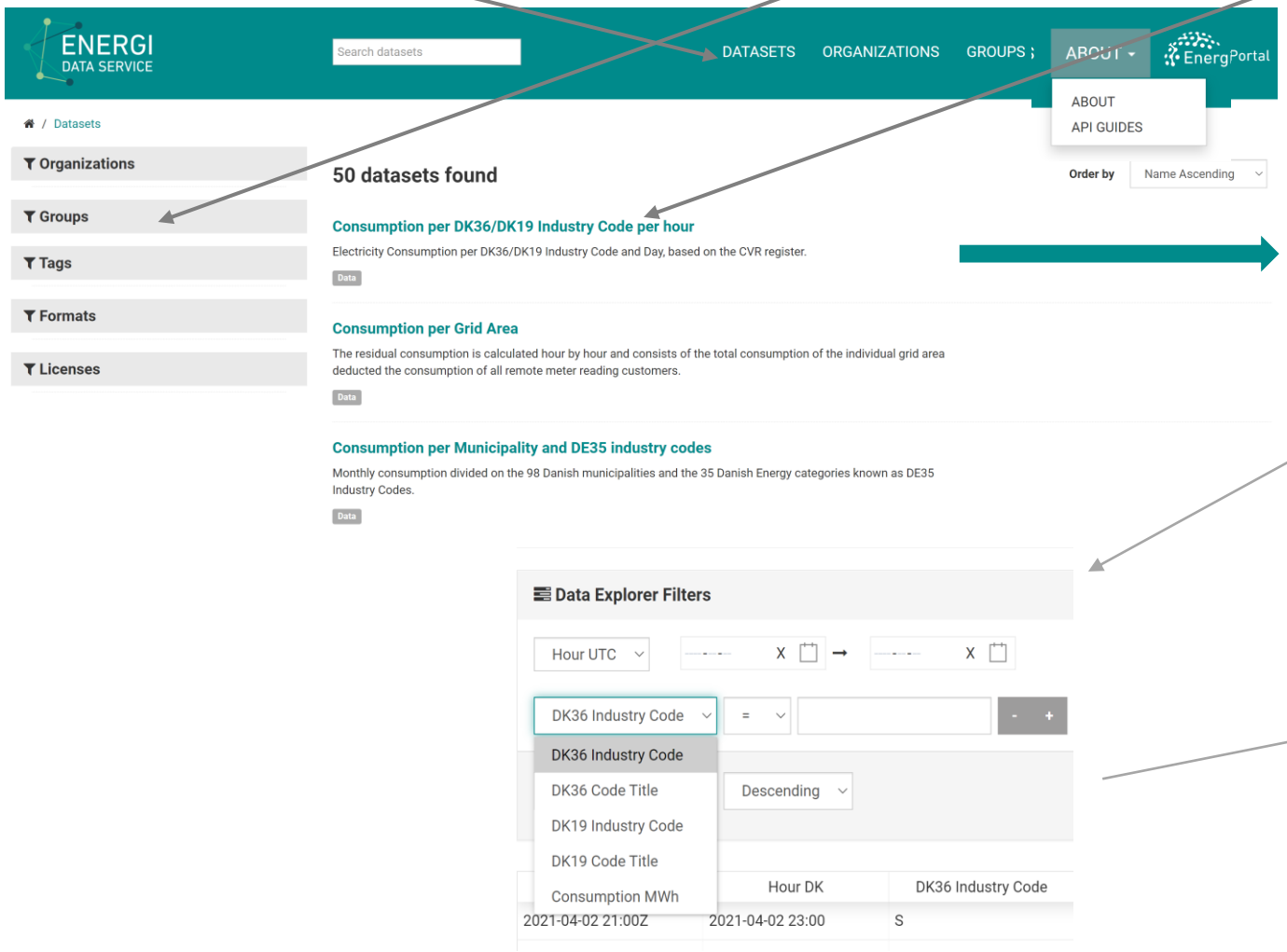
Click on datasets

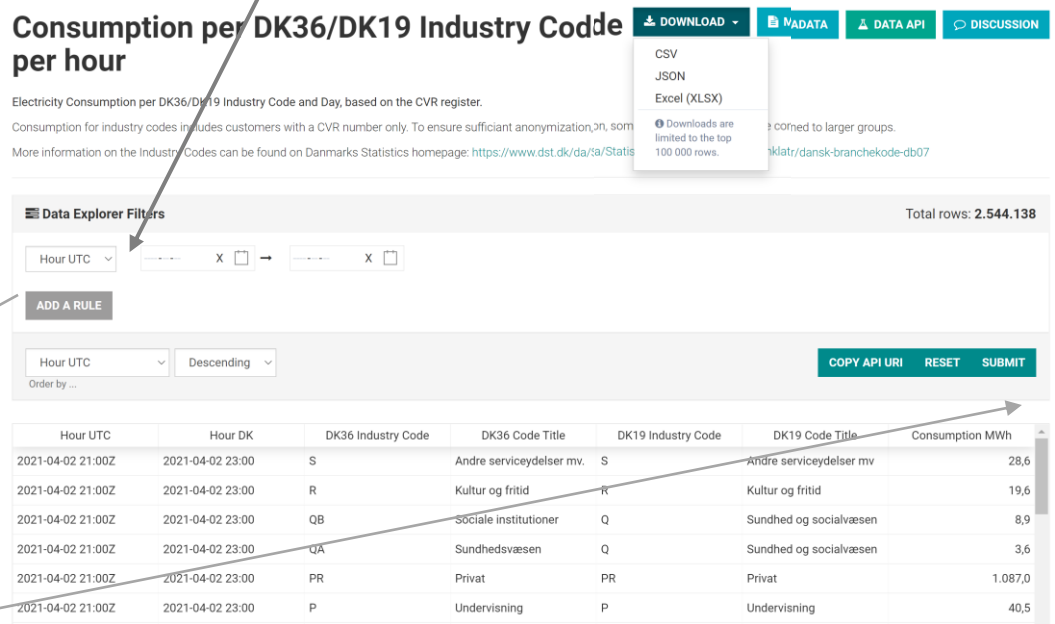
Search or filter dataset

Click on dataset

Filter data

Manual download



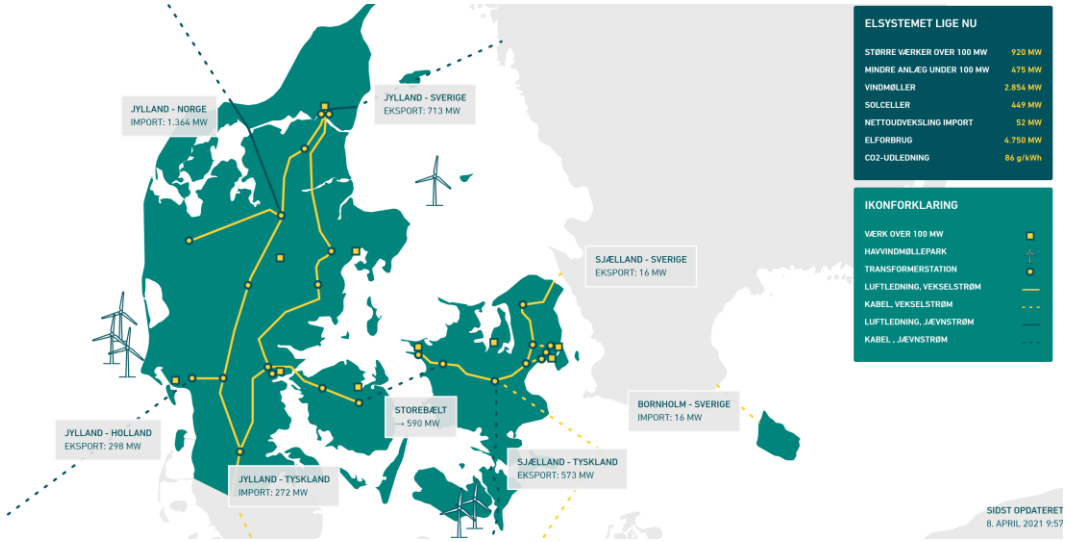


ELECTRICITY PRODUCTION

Real time measurements

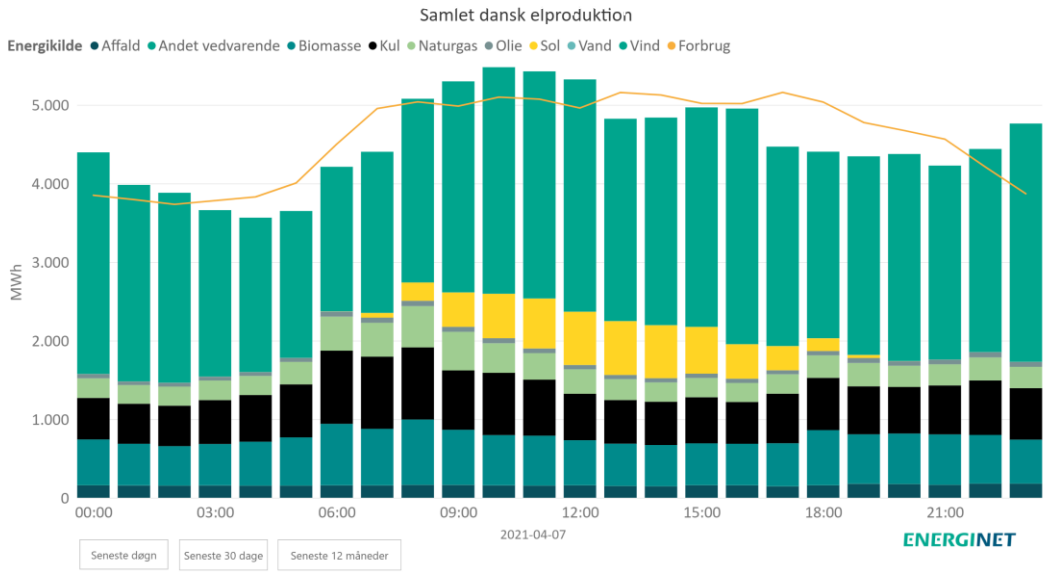
FACTS:

- Not all production facilities submit real-time data, so total production is approximate.
- Consumption is calculated as the sum of production and exchange.
- The unit is always MWh/h, which is an interpolated average power (see page 18).



From homepage, gets data from :
www.energidataservice.dk/tso-electricity/powersystemrightnow

Also a 5 min resolution edition:
www.energidataservice.dk/tso-electricity/electricityprodex5minrealtime



From homepage "Green transition", gets data from:
www.energidataservice.dk/tso-electricity/electricitybalancenonv

For capacities, see municiplities page 10

ELECTRICITY PRODUCTION

Settlement data from datahub

Production delivered to the electricity grid divided into:

- Central and decentralized works
- Wind power, land and sea divided by size
- Solar cells, divided into sizes
- Hydropower

Self-consumption sun and works, both approximate

Exchange:

- Divided into Norway, Sweden, Germany, Netherlands

Grid loss:

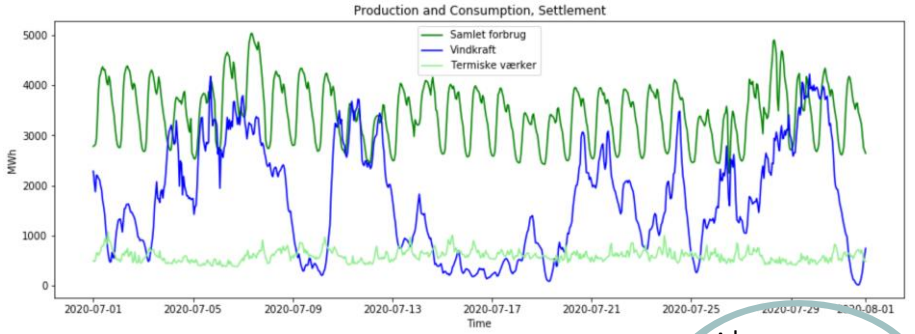
- Divided into international connections, internal transmission losses and distribution losses

Consumption:

- Gross consumption calculated as sum of production and exchange
- Electricity for heating, primarily electric boilers.

FACTS:

- Data based on datahub is transmitted for the first time after 8 days. Usually only small later updates.
- Consumption is calculated here as the sum of production and exchange.
- Does not have a breakdown by fuel, here reference is made to declarations.
- Own consumption can only be calculated approximately, the actual Danish electricity consumption is not really known exactly.
- Rarely used on websites due to slow updating, but should always be used for statistics.
- Net consumption is calculated as gross consumption minus losses.

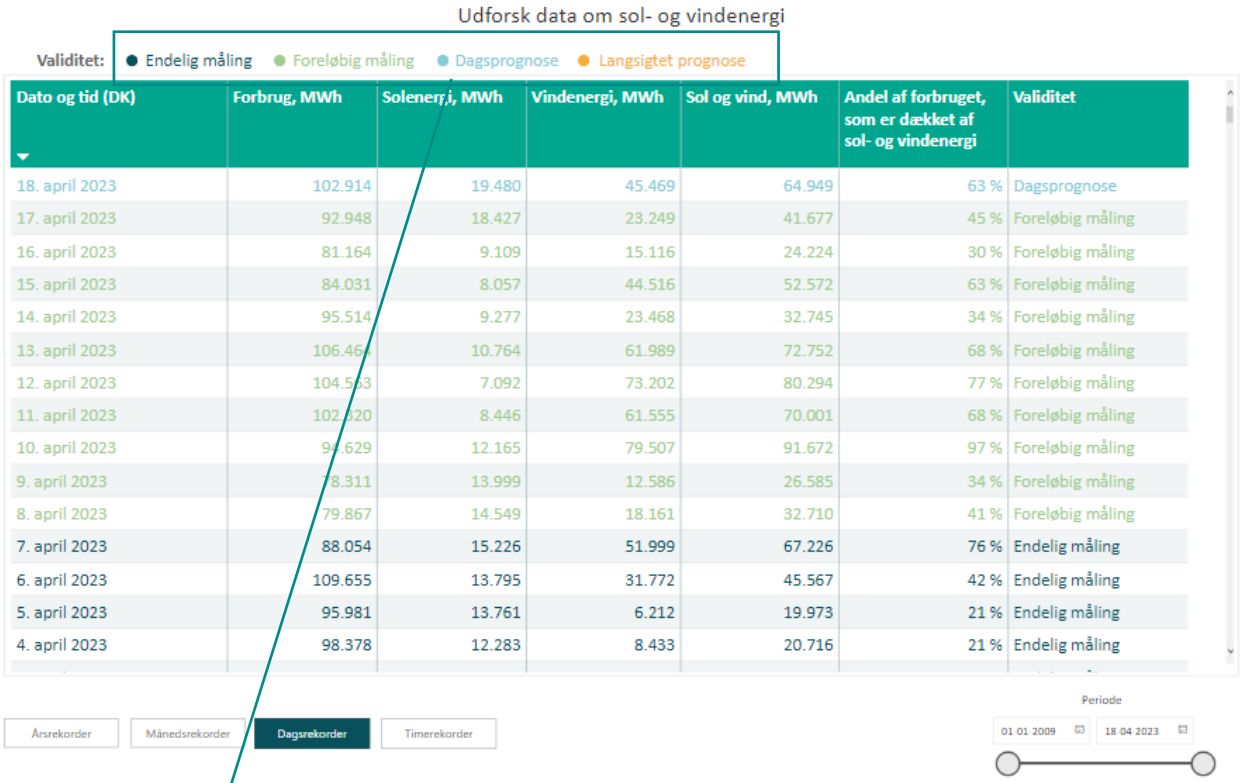


Also per municipality, see page 10

www.energidataservice.dk/tso-electricity/productionconsumptionsettlement

FROM EXPECTED TO SETTLEMENT

Production from wind and solar power, finding the all time high, see here



Dato og tid (DK)	Forbrug, MWh	Solenergi, MWh	Vindenergi, MWh	Sol og vind, MWh	Andel af forbruget, som er dækket af sol- og vindenergi	Validitet
18. april 2023	102.914	19.480	45.469	64.949	63 %	Dagsprognose
17. april 2023	92.948	18.427	23.249	41.677	45 %	Foreløbig måling
16. april 2023	81.164	9.109	15.116	24.224	30 %	Foreløbig måling
15. april 2023	84.031	8.057	44.516	52.572	63 %	Foreløbig måling
14. april 2023	95.514	9.277	23.468	32.745	34 %	Foreløbig måling
13. april 2023	106.464	10.764	61.989	72.752	68 %	Foreløbig måling
12. april 2023	104.563	7.092	73.202	80.294	77 %	Foreløbig måling
11. april 2023	102.020	8.446	61.555	70.001	68 %	Foreløbig måling
10. april 2023	94.629	12.165	79.507	91.672	97 %	Foreløbig måling
9. april 2023	78.311	13.999	12.586	26.585	34 %	Foreløbig måling
8. april 2023	79.867	14.549	18.161	32.710	41 %	Foreløbig måling
7. april 2023	88.054	15.226	51.999	67.226	76 %	Endelig måling
6. april 2023	109.655	13.795	31.772	45.567	42 %	Endelig måling
5. april 2023	95.981	13.761	6.212	19.973	21 %	Endelig måling
4. april 2023	98.378	12.283	8.433	20.716	21 %	Endelig måling

FACTS:

- Automates a time consuming process.
- Simple but smart use of open data.
- Export function built-in.

Possible extensions:

- More all time high included.
- Export of all background data.
- Documentation of calculation principles for e.g., expected production.

- Endelig måling
- Foreløbig måling
- Dagsprognose
- Langsigtet prognose

www.energidataservice.dk/tso-electricity/productionconsumptionsettlement

www.energidataservice.dk/tso-electricity/electricitybalancenonv

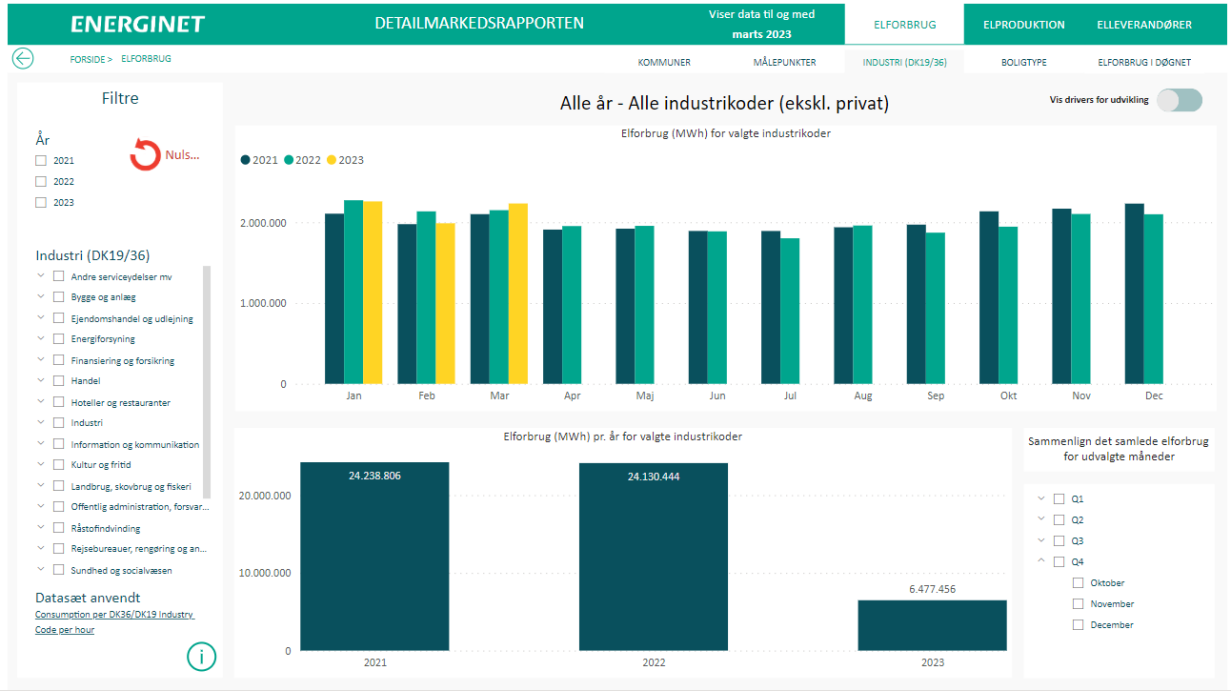
www.energidataservice.dk/tso-electricity/forecasts_hour + functions for consumption

www.energidataservice.dk/tso-electricity/capacitypermunicipality * expected production per MW

ELECTRICITY CONSUMPTION

Based on settlement data from Datahub

- DK36 business code from the SE register
- All private consumption as ”Øvrige”



FACTS:

- Released in the first edition after 8 days.
- Data is updated after 3 months. In principle, there may be corrections with up to 2 years delay.
- The sum per hour must correspond to the sum of production and exchange without own consumption minus transmission losses and distribution losses (net consumption without own consumption).
- Data from 1/1 2020.

Possible extensions:

- More detailed division of private consumption, possibly via BBR.
- More historical data.

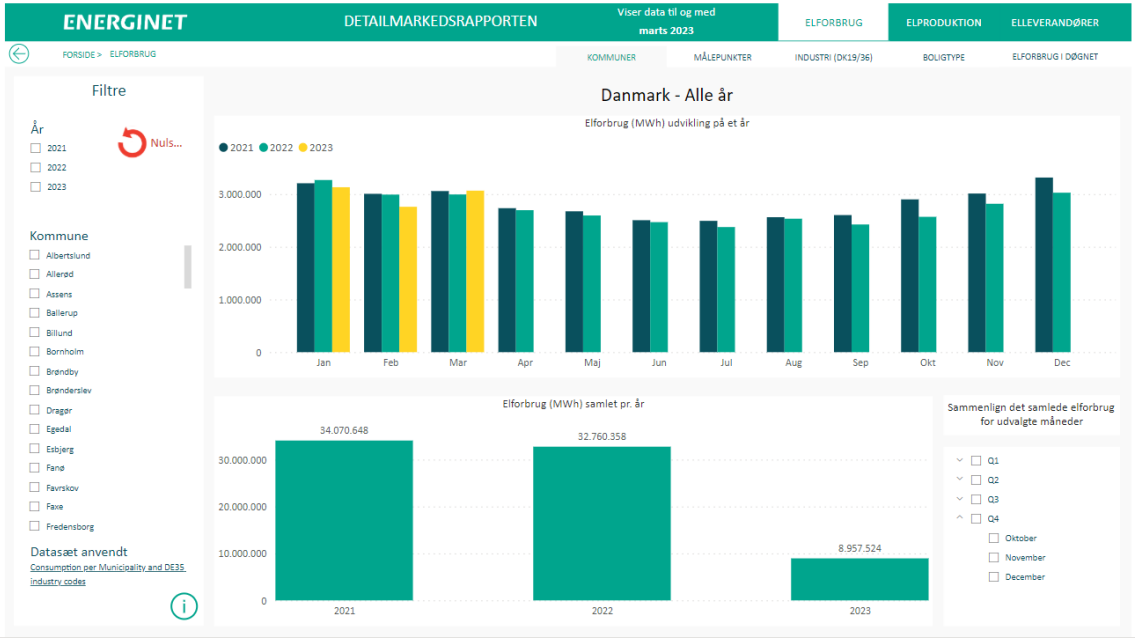
Graph from the retail market report, data based on:
www.energidataservice.dk/tso-electricity/consumptiondk3619codehour

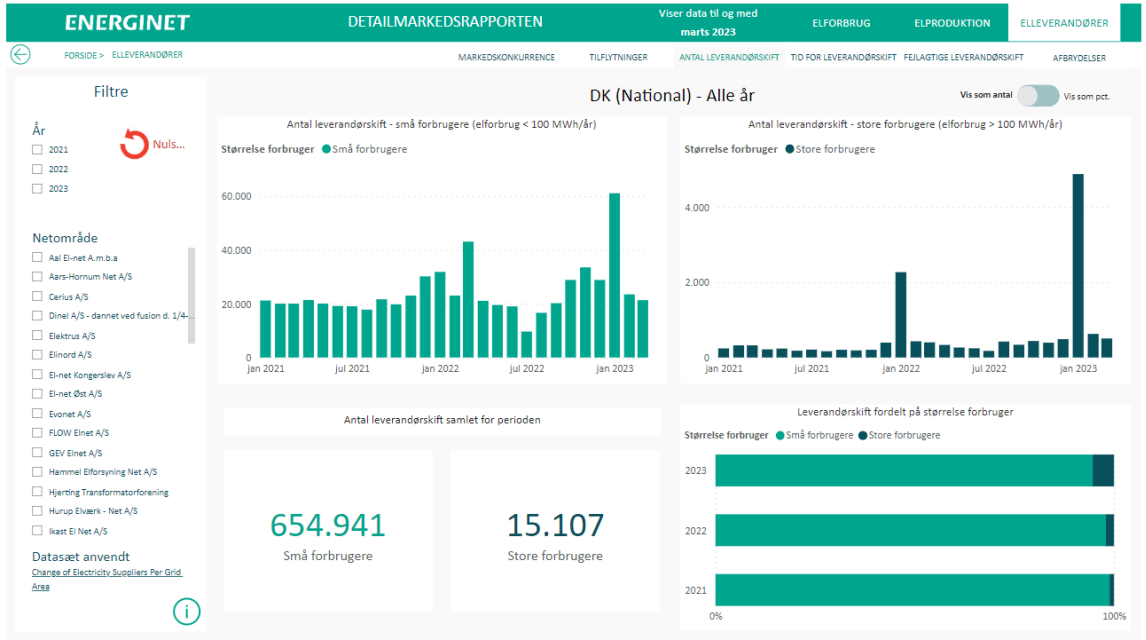
RETAIL MARKET REPORT

About the Retail market and consumption

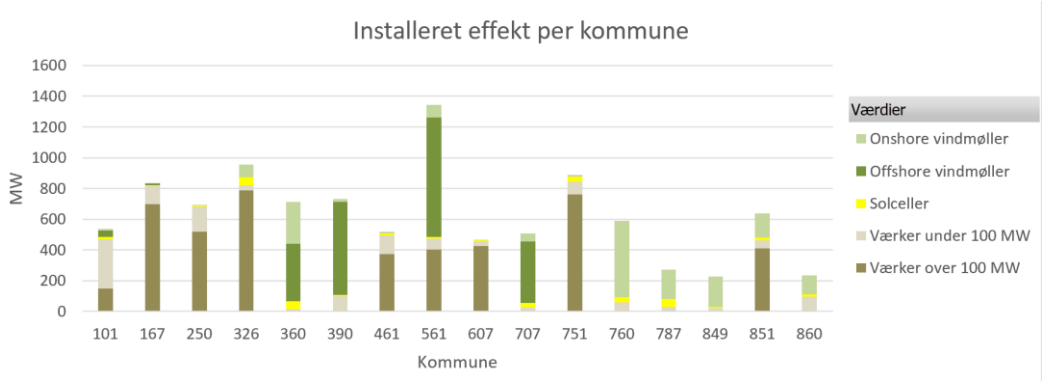
https://energinet.dk/energidata/detailmarkedsrapporten/

Data from:
www.energidataservice.dk/tso-electricity/consumptiondk3619codehour
www.energidataservice.dk/tso-electricity/consumptionpermunicipalityde35
www.energidataservice.dk/tso-electricity/herfindahlhirschmanindexhhipergridarea
www.energidataservice.dk/tso-electricity/datahubmeasuringpointstatistics
www.energidataservice.dk/tso-electricity/powersupplierchangepergridarea
www.energidataservice.dk/tso-electricity/PrivIndustryConsumptionMunicipalityMonth
www.energidataservice.dk/tso-electricity/Elspotprices
www.energidataservice.dk/tso-electricity/CommunityProduction
www.energidataservice.dk/tso-electricity/CapacityPerMunicipality
www.energidataservice.dk/tso-electricity/ElectricitySuppliersPerGridarea

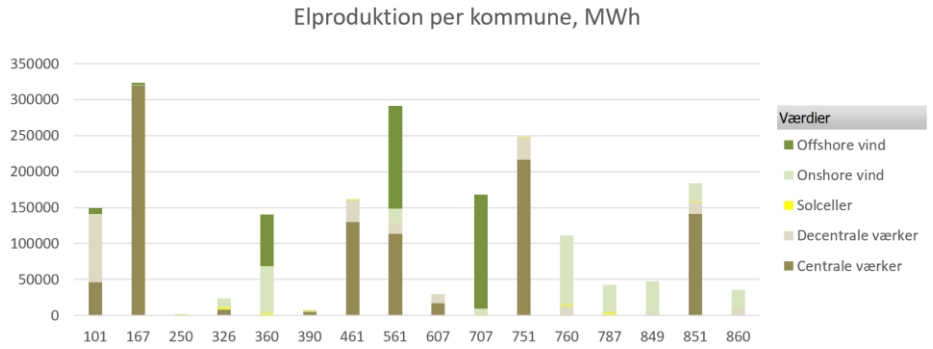




MUNICIPALITIES



www.energidataservice.dk/tso-electricity/capacitypermunicipality



www.energidataservice.dk/tso-electricity/communityproduction

And the consumption :
www.energidataservice.dk/tso-electricity/consumptionpermunicipalityde35

FACTS:

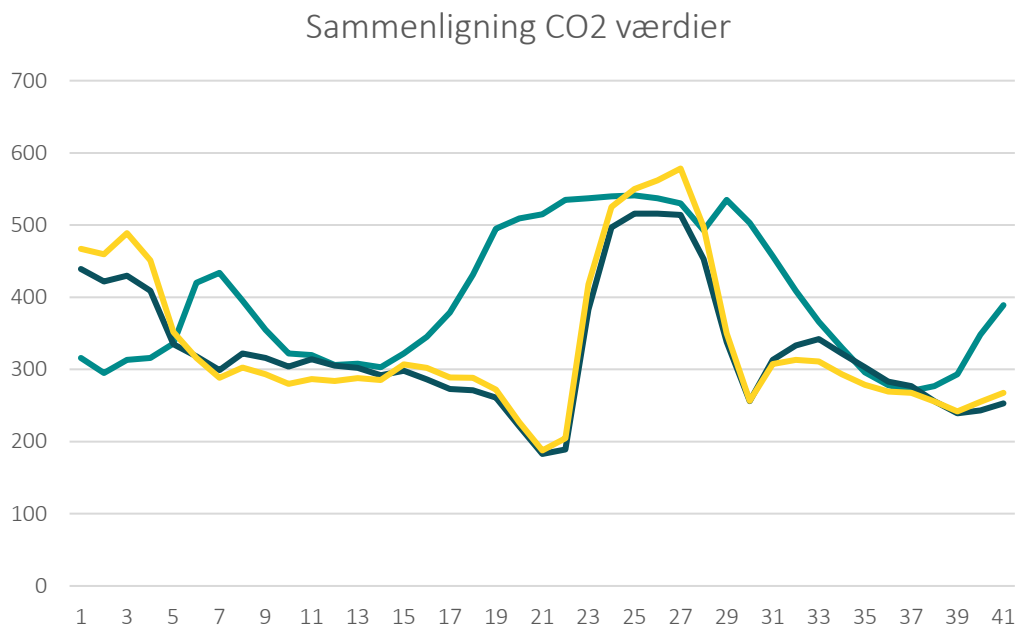
- Municipal data is currently only available on a monthly level.
- The sum per month corresponds to hourly data sets at DK1 and DK2 level.
- The month is calculated for the first time with a 9-day delay.
- Installed power per municipality is the only dataset with capacities.

Extensions:

- Production and consumption at hourly level.
- Special consumption at the hourly level per industry code presents challenges in relation to the GDPR.
- Production per hour is currently being tested.

CO2 DATA

Forecast and realtime:



FACTS:

- Both CO2 forecast and real-time inventory are based on a last year's emissions per kWh produced per plant.
- Forecasts are based on the player plan and are issued together with results for the Day ahead trade.
- The final declaration of CO2 can only be calculated in the middle of the following calendar year, when the actually burned fuels are known.
- The deviations from the current inventory to the final inventory of CO2 are typically below 10 grams per kWh.

Improvements:

- Better structural link between forecasts, current calculations and declarations.

CO2 prognose EDS www.energidataservice.dk/tso-electricity/co2emisprog

CO2 Emission EDS www.energidataservice.dk/tso-electricity/co2emis

CO2 Opgørelse Miljødeklaration (see declarations page 12)

YOUR DECLARATION

Calculate it here: https://din-deklaration.eloprindelse.dk/

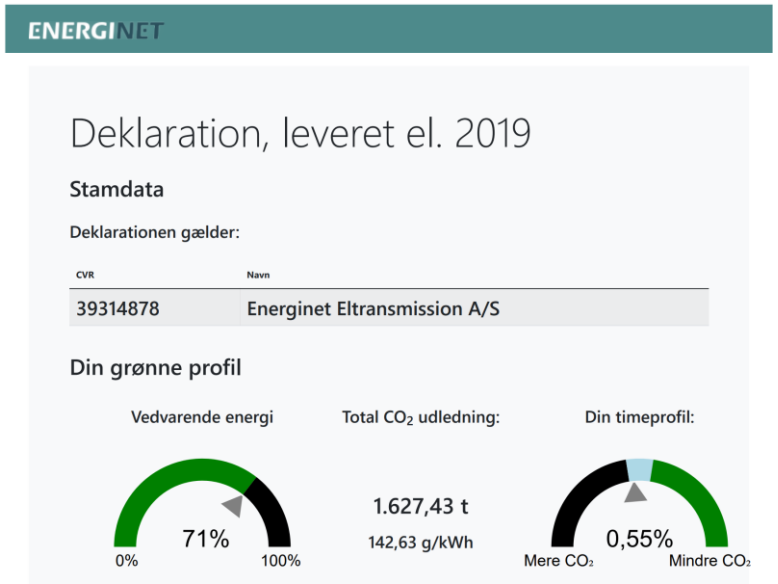
- The declarations are used e.g., for green accounts.
- The data sets mentioned, together constitute the hour declaration.

FACTS:

- The function acts as a third party and connects individual customers' meter data with the declarations published on Energi Data Service.
- The declarations are at the hourly level but are currently only published annually.

Improvements:

- Ongoing publication of preliminary declaration.
- At the same time, more detailed data on Danish electricity production are published.



www.energidataservice.dk/tso-electricity/declarationemissionhour

Hvor kommer din strøm fra?

Brændselstype	Vestdanmark	Østdanmark	Tyskland	Norge	Sverige	Holland	Procentvis
Vind	22,91%	9,56%	4,35%	0,27%	1,76%	0,06%	**38,91%**
Sol	1,25%	1,02%	1,43%	0,00%	0,00%	0,00%	**3,70%**
Vandkraft	0,03%	0,00%	0,53%	6,74%	6,17%	0,00%	**13,48%**
Biomasse	4,45%	7,37%	1,30%	0,00%	0,00%	0,00%	**13,12%**
Affald	1,45%	2,32%	0,19%	0,00%	0,00%	0,00%	**3,96%**
Naturgas	3,01%	1,56%	1,18%	0,01%	0,00%	0,57%	**6,33%**
Kul og Olie	4,73%	2,02%	4,20%	0,00%	0,65%	0,43%	**12,04%**
Atomkraft	0,00%	0,00%	2,25%	0,00%	6,16%	0,04%	**8,46%**
Total	**37,84%**	**23,85%**	**15,43%**	**7,02%**	**14,74%**	**1,12%**	**100.00%**

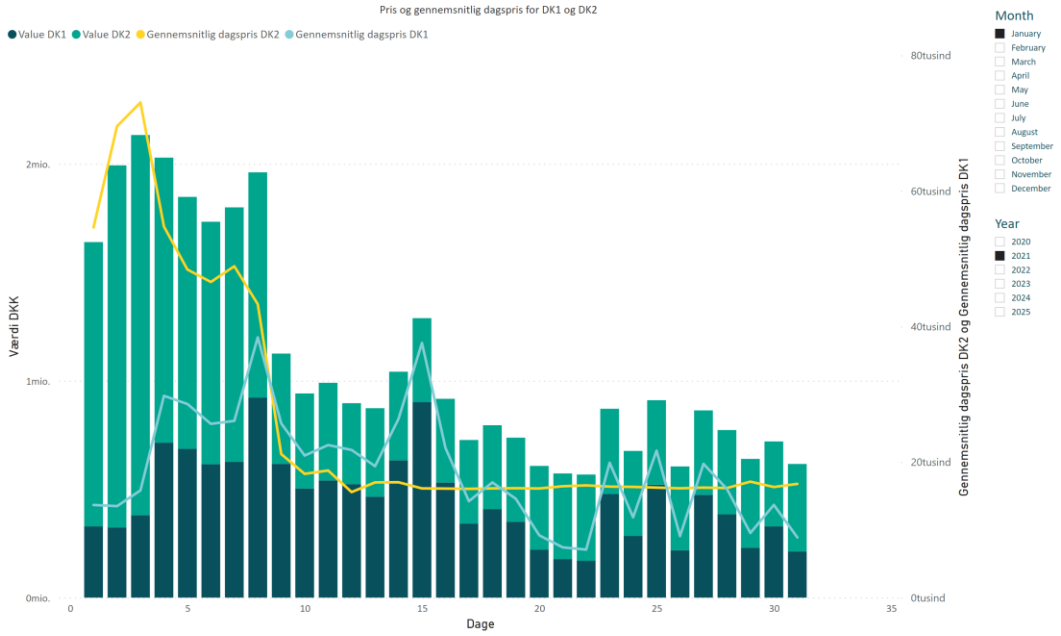
www.energidataservice.dk/tso-electricity/declarationcoveragehour

ANCILLARY SERVICES

System service releases are under review

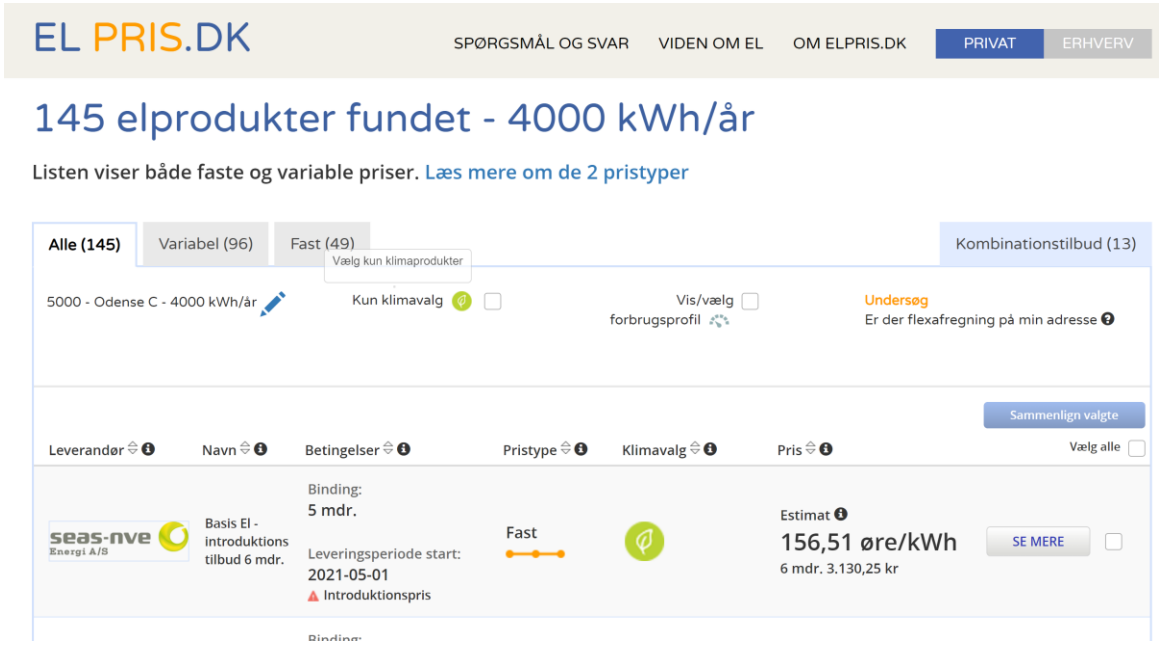
The data catalog will be updated with revised data sets

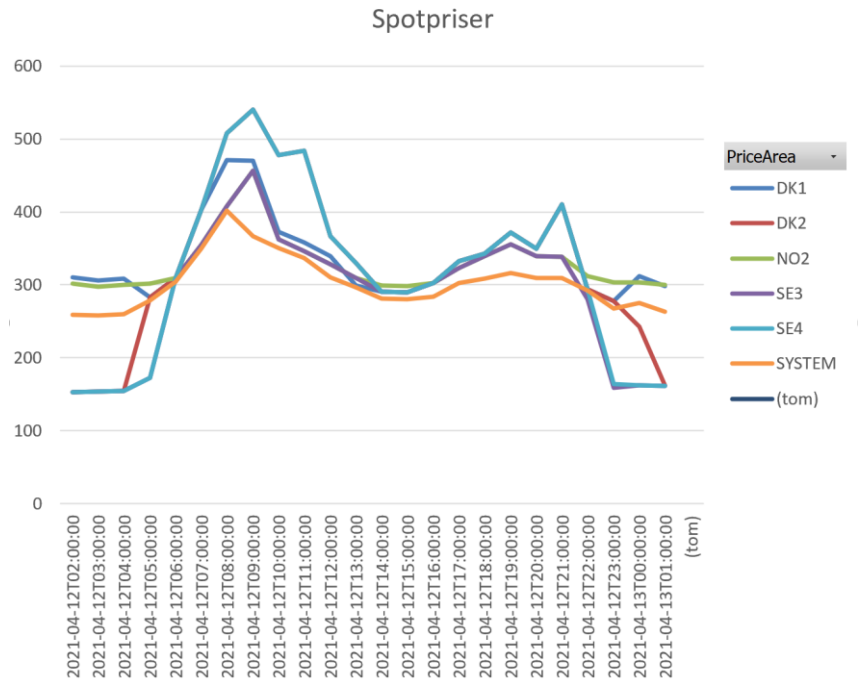
www.energidataservice.dk/tso-electricity/mfrrreservesdk1 (and DK2)
www.energidataservice.dk/tso-electricity/ffrdemanddk2
www.energidataservice.dk/tso-electricity/realtimemarket
www.energidataservice.dk/tso-electricity/fcrreservesdk1 (and DK2)
www.energidataservice.dk/tso-electricity/inertianordicsyncharea



HourDK.1	Behov MWh	Pris DKK	Pris MWh per time	Reserveret MWh
1. februar 2021	6.816,00	475.585,40	1.651,00	6.905,30
2. februar 2021	6.816,00	663.203,90	2.281,00	6.948,80
3. februar 2021	6.816,00	444.054,30	1.484,00	7.078,20
4. februar 2021	6.816,00	321.070,10	1.104,00	6.963,90
5. februar 2021	6.816,00	186.092,60	647,00	6.909,10
6. februar 2021	6.816,00	66.545,60	221,00	7.054,00
7. februar 2021	6.816,00	47.170,03	161,95	6.987,20
8. februar 2021	6.816,00	237.420,85	814,57	7.023,70
9. februar 2021	6.816,00	263.147,45	898,09	7.021,40
10. februar 2021	6.816,00	312.871,71	1.081,80	6.936,70
11. februar 2021	6.816,00	80.086,90	277,00	6.955,90
12. februar 2021	6.816,00	436.772,38	1.519,75	6.903,00
13. februar 2021	6.816,00	300.437,02	1.031,83	6.998,90
14. februar 2021	6.816,00	223.723,22	769,02	6.982,40
15. februar 2021	6.816,00	270.771,08	935,74	6.975,00
16. februar 2021	6.816,00	279.091,21	956,56	7.008,50
17. februar 2021	8.580,00	2.021.205,25	3.686,89	8.873,90
18. februar 2021	6.816,00	212.961,56	726,04	7.028,70
19. februar 2021	6.816,00	186.981,19	647,70	6.937,00
20. februar 2021	6.816,00	114.585,71	395,00	6.930,90
21. februar 2021	6.816,00	119.059,39	409,10	6.990,10
22. februar 2021	6.816,00	151.690,33	526,28	6.918,70
23. februar 2021	6.816,00	141.810,28	492,36	6.922,50
24. februar 2021	6.816,00	107.993,39	371,98	6.946,50
25. februar 2021	6.816,00	55.198,50	192,00	6.922,00
26. februar 2021	6.816,00	89.064,02	308,85	6.944,70
27. februar 2021	6.816,00	101.294,73	349,51	6.949,50
28. februar 2021	6.816,00	82.023,88	283,63	6.968,00
Total	**192.612,00**	**7.991.911,97**	**24.223,65**	**196.984,50**

DATAHUB PRICES AND SPOT PRICES





www.energidataservice.dk/tso-electricity/datahubpricelist

www.energidataservice.dk/tso-electricity/elspotprices

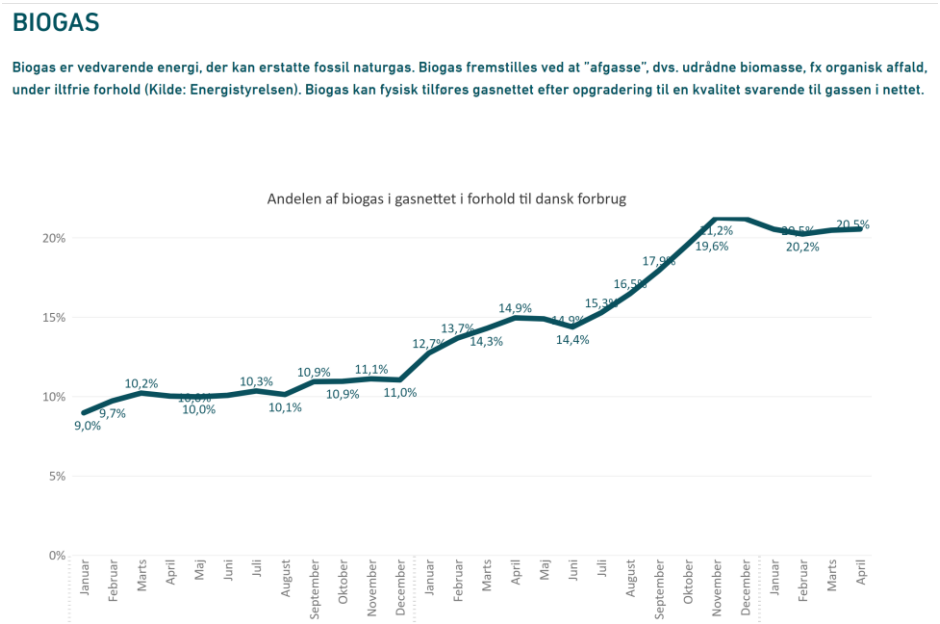
GAS FLOW AND BIOGAS

FACTS:

- The biogas share is calculated as deliveries divided by average consumption one year back.

Gas

www.energidataservice.dk/tso-gas/gassystemrightnow



www.energidataservice.dk/tso-gas/gasflow

GAS QUALITY AND COMPOSITION

Learn more about gas quality here: https://energinet.dk/Gas/Gaskvalitet

Dataset on EDS:

www.energidataservice.dk/tso-gas/entryexitgasquality

www.energidataservice.dk/tso-gas/gascomposition

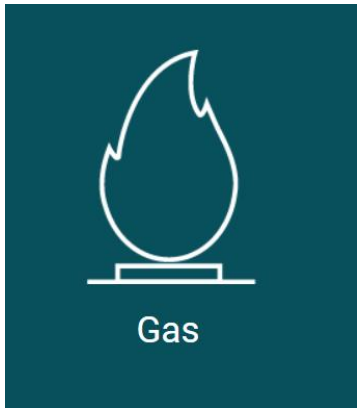
www.energidataservice.dk/tso-gas/gascompositionmonthly

www.energidataservice.dk/tso-gas/gascompositionyearly

www.energidataservice.dk/tso-gas/mrstationsgasquality

Gas calorific values:

www.energidataservice.dk/tso-gas/calorificvalues



Sådan måles gaskvaliteten

Gassammensætningen måles med gaskromatografer, som med ca. 10 minutters mellemrum måler gassens hovedkomponenter. Herudfra kan en lang række brandtekniske parametre bestemmes:

Nedre brændværdi
Naturgassens nedre brændværdi er udtryk for den varmemængde, der udvikles ved forbrænding, når temperaturen af forbrændingsluften og naturgassen inden forbrændingen er 25ºC, når forbrændingsprodukterne (røggassen) er nedkølet til 25ºC, og når det vand, der dannes ved forbrændingen, er til stede i form af damp. Den nedre Brændværdi oplyses i kWhn/mn3 eller MJn/mn3. Den nedre brændværdi beregnes ud fra gassammensætningen.

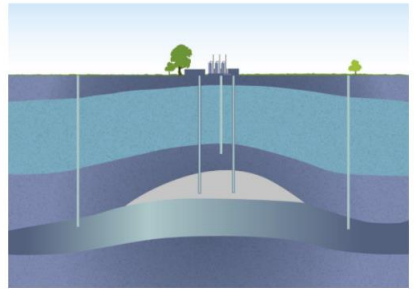
Øvre brændværdi
Naturgassens øvre brændværdi er udtryk for den varmemængde, der udvikles ved forbrænding under konstant tryk af en m3 gas, når gas og luft til forbrændingen har temperaturen 25°C, idet forbrændingsprodukterne bringes til 25°C, og det ved forbrændingen dannede vand er til stede i flydende tilstand. Den øvre Brændværdi oplyses i kWhø/mn3 eller MJø/mn3. Den øvre brændværdi beregnes ud fra gassammensætningen.

Wobbe indeks
Wobbe indeks siger noget om den varmeeffekt, en brænder udsættes for ved forbrænding af et brændstof. Jo højere wobbe indeks, jo højere varmeeffekt og dermed jo højere belastning af brænderen. Belastningen af en brænder er således direkte proportional med wobbe indeks. Forskellige gasser med samme wobbe

GAS STORAGE

Learn about the data here:

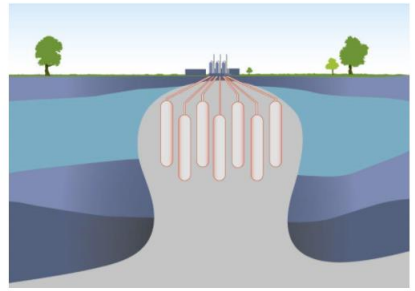
https://gasstorage.dk/Operational-data



AKVIFERFORMATIONEN VED STENLILLE

Dataset in EDS:

www.energidataservice.dk/gas-storage-denmark/storagecapacity
www.energidataservice.dk/gas-storage-denmark/storageavailablepct
www.energidataservice.dk/gas-storage-denmark/storagenomination
www.energidataservice.dk/gas-storage-denmark/storageutilization



SALTHORSTFORMATIONEN VED LILLE TORUP

MWh/h compared to MWh

MWh/h are always used where the energy is calculated from power measurement

- MWh / h = average power per hour.
- The shorter the measurement periods, the greater the coalition between MWh / h and MWh.
- MWh is approximately equal to MWh / h where the time resolution is hours.