Renewable Energy in The Netherlands
May 2015
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This analyses contains information of various sources and own analyses, including various estimates. Readers are encouraged to add, to improve the quality of the information provided.
Electricity production by Solar PV reached a record level of 0.14 TWh

Installed wind capacity passed the 3000 MW threshold

Average utilization of wind capacity was 27% and for solar-PV 15%

Net power imports increased substantially and were at the level of last year

Coal was again the main source of Dutch power and contributed for 80% of the CO2 emissions from the Dutch power sector.

The Netherland became, for the first time in its history, a net gas importer

Dutch CO2 emissions were on par with May 2014

The fraction renewable energy was 5.0%, compared to 4.8% in May 2014
• May 2015 data
• Monthly profiles
• Monthly data
• Hourly data
• Miscellaneous
SELECTED ENERGY DATA FROM MAY 2015
Energy is used for many different purposes. In May 2015, the most important applications were heating/gas (19 TWh) and Transport (27 TWh). Renewables are given by comparison.
In May 2015, gas consumption was higher than last year, mainly due to lower temperatures. Energy used for transport, bunkering (shipping) and in particular feedstock is estimated to be lower than previous year.
The national CO2 emissions for May 2015, excluding power imports, feedstock and international shipping & aviation, have been estimated at 12.1 Mton. This was exactly the same as in May 2014. Main contributions came from road transport, gas and power.
In May 2015, the available capacity in wind power has passed 3000 MW.
In May 2015, power consumption was 8.7 TWh, 3% lower than in May 2015 2014. Power imports and exports were similar than last year. The usage of coal for power generation increased by 37% y-o-y. In May, the average contribution from renewables to the power system was 11.9%, compared to 10.6% in May 2014.
The CO2 emissions from imports are given for comparison, as these emissions do not contribute to the National Dutch CO2 emission level. In May 2015, 80% of the CO2 emissions from the power sector came from coal-fired power stations.
SELECTED MONTHLY PROFILES

(using daily data)
Daily power demand shows a week-end pattern. Daily gas demand (excluding gas demand for power) is mainly used for the heating market and affected by ambient temperature.
The picture clearly shows that nowadays, power in the Netherlands is primarily produced using coal.
Both wind and solar power proved to be very volatile in May.

1 GWh is sufficient to provide power for a year to 300 households.
Renewable energy peaked to 7% on May 5th, while the fraction of renewable power peaked to 20% that day. These high values have been caused by high wind speeds in combination with a public Holiday in The Netherlands (liberation day).
SELECTED MONTHLY ENERGY DATA
For the fifth consecutive month, gas demand (excluding gas demand for power production) was higher than in the same month in 2014, due to lower temperatures in 2015 compared to 2014.
Due to lower production from the Groningen gas field and declining gas production from the North Sea, Dutch gas production in 2015 is considerably lower than in 2014. 10 TWh gas is sufficient to supply heat to all houses in Amsterdam for two years.
After three consecutive months with power demand growth, demand fell for the second consecutive month in May (-3%).
Monthly, wind power production is volatile y-o-y. Wind production in May 2015 was 57% higher than in May 2014, due to increased wind capacity and more wind availability. In May 2015, wind capacity passed the 3000 MW threshold.
In May 2015, electricity production by Solar PV in The Netherlands reached a new record level of 141 GWh (0.14 TWh). This was 49% higher than in May 2014, mainly due to increased Solar PV capacity.
For the fifth consecutive month, coal utilization for power generation increased significantly.
In May 2015, power production by gas-fired power stations and cogeneration was significantly lower than in May 2014.
In May 2015, after three months with considerable imports from the Gate terminal, gas flows were at a relatively low level (again).
May 2015, the total renewable energy production in The Netherlands increased slightly compared to May 2014. Higher contributions from wind and sun have been compensated by lower contributions from biomass.
In May 2015, the percentage of renewable energy for The Netherlands, as fraction of total energy demand (EU definition), has been estimated at 5.0%, slightly higher than in May 2014.
In May 2015, Dutch national CO2 emissions were at the same level as in May 2014, after four months of increasing values. One of the reasons is that power imports, which do not contribute to the national CO2 emissions, were much higher in May than in the previous months.
SELECTED HOURLY ENERGY DATA
In May 2015, substantial gas volumes were used to fill gas storages, depicted as negative values in the figure. Maximum gas supplies (import + production) reached about 100,000 MW.
On May 1st, gas demand in The Netherlands peaked to 50.000 MW.
In May 2015, gas imports were higher than gas exports. Thus, probably for the first time in its history, The Netherlands became a gas importing country for a month.
In May 2015, little power exports were recorded while power imports soared compared to previous months.

Sources: TenneT, own analyses
May 2015 was characterized by a highly volatile wind pattern. The utilization rate of the available wind capacity was 27%.
In May Solar-PV reached a new Dutch record level of 141 GWh. Solar-PV peaked to more than 800 MW, up from its previous record of 700 MW in April. In May, the average utilization rate of the solar PV installed was 15%.
The following set of slides presents for each month in 2015 the hourly contributions of various energy sources to total power consumption in The Netherlands.
In the week of 20-24 January, power generation peaked, due to the net exports that occurred. The majority of the additional power generation has been generated by gas-fired installations.
Like in January, low wind availability coincided with net exports of power.
Relatively low imports of power occurred in March. On several Saturdays, some net exports were recorded.
Relatively low imports of power occurred in April. On several occasions, mainly on Saturdays, net exports were recorded. April showed several days with high coal-fired generation, while gas-fired generation was low.
In May, high net imports and high coal utilization squeezed gas-fired power generation.
The following set of slides presents for each week in 2015 the hourly contributions of wind and solar-PV to the total power consumption in The Netherlands.
Hourly Solar-PV and Wind Generation 2015

Sources: TenneT, CertiQ, PolderPV.nl, KNMI, etc., own analyses
Hourly Solar-PV and Wind Generation 2015

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Hourly Solar-PV and Wind Generation 2015

![Hourly Solar-PV and Wind Generation 2015 Graph](image)

Sources: TenneT, CertiQ, KNMI, PolderPV.nl, etc., own analyses
Hourly Solar-PV and Wind Generation 2015

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Sources: TenneT, CertiQ, PolderPV.nl, KNMI, etc., own analyses
Hourly Solar-PV and Wind Generation 2015

Sources: TenneT, CertiQ, Windstats, Klimaatmonitor, PolderPV.nl, KNMI, own analyses
Hourly Solar-PV and Wind Generation 2015

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Hourly Solar-PV and Wind Generation 2015

2015

MWh

13-Apr 14-Apr 15-Apr 16-Apr 17-Apr 18-Apr 19-Apr

Rest Wind solar-PV

Sources: TenneT, CertiQ, Windstats, Klimaatmonitor, PolderPV.nl, KNMI, own analyses
Hourly Solar-PV and Wind Generation 2015

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Hourly Solar-PV and Wind Generation 2015

MWh

2015

0 2000 4000 6000 8000 10000 12000 14000 16000 18000 20000
18-May 19-May 20-May 21-May 22-May 23-May 24-May

Rest Wind solar-PV

Sources: TenneT, CertiQ, Windstats, Klimaatmonitor, PolderPV.nl, KNMI, own analyses
Hourly Solar-PV and Wind Generation 2015

Sources: TenneT, CertiQ, Windstats, Klimaatmonitor, PolderPV.nl, KNMI, own analyses
The effective temperature (temperature including wind shield factor). The beginning of May registered colder temperatures than last year. For comparison, effective daily temperatures of May 2014 are presented as well.

Sources: KNMI, own analyses
Fuel Specific CO2 Emissions

Characteristic CO2 emissions used in this presentation.
This presentation is based on numerous sources which present data on energy demand and supply in The Netherlands. These data, however, do not cover the entire energy system. Some approximations and scaling factors were thus needed. The author would like to thank students from Hanze University of Applied Science in Groningen and various energy experts in The Netherlands which gave suggestions for improvements of the methods used. Currently, the aggregated results of this work are in good agreement with data supplied by the Dutch National Office of Statistics (CBS). It is believed by the author that the detailed results in this presentation give a fair presentation of the complex reality of the Dutch energy system.

Nevertheless, the author invites readers to comment on the data provided with the objective to further improve this work. After all, good and reliable data are at the heart of any successful policy to make our world more sustainable.