

Energy storage for demand response netherlands

The Netherlands is an important transit and trade hub for natural gas, oil, electricity and coal and has extensive cross-border and subsea oil and gas pipelines and electrical interconnections. Dutch ports play a key role in global and regional energy trade and have one of the largest concentrations of oil refining and marine bunkering fuels in Europe and a major liquefied natural gas (LNG) terminal. The Netherlands is also home to the Title Transfer Facility (TTF), the largest gas-trading hub in Europe.

The largest electricity emissions reductions are expected to come from a ban on coal-fired generation, which requires coal plants to cease operating, or convert to alternative fuels, by 2030. Major reductions are expected from an accelerated deployment of renewable generation supported by SDE+, SDE++ and other measures. An effective offshore wind policy framework is driving rapid deployment and aims for 49 TWh of generation by 2030. Net-metering for small-scale PV has contributed to strong residential PV deployment.

Regional Energy Strategies aim to drive emissions reductions by supporting 35 TWh of onshore renewable electricity and a transition to low-carbon heating. Local governments, in co-operation with network operators, the private sector and social organisations, are developing these strategies to resolve barriers related to costs, spatial planning, social acceptance, cost impacts and integration of renewables. The government provides technical and financial assistance for the development and execution of the strategies.

Support measures for reducing transport sector emissions include policies pushing for the adoption of zero-emission vehicles (battery electric and hydrogen fuel cell vehicles) for personal, public and freight transport. These include tax incentives that encourage zero-emission vehicle purchases and measures supporting the development of infrastructure for EV charging and hydrogen fuelling stations. The Netherlands also aims for a broader shift to a more efficient and diverse mobility sector that supports walking, biking, mobility services and other measures to reduce emissions.

As a European Union (EU) member state, the Netherlands is subject to numerous energy sector targets based on EU directives. The Dutch National Energy and Climate Plan (NECP) defines measures to support the achievement of 2030 targets for GHG emissions reductions, renewable energy and energy efficiency set under the EU Clean Energy Package. The measures in the NECP are based primarily on the 2019 Climate Agreement.

Natural gas is arguably the most important energy source in the Netherlands. In 2018, natural gas accounted for 90% of residential heating demand, 76% of domestic energy production, 51% of electricity generation, 43% of TPES and 34% of TFC. However, Dutch energy policy is pushing to rapidly reduce the role of gas in the energy system to support the transition to a low-carbon economy and to protect public safety in relation to earthquakes caused by gas production.

Several major policy measures have been implemented to reduce gas demand. The Natural-gas Free Districts Programme supports the transition of 1.5 million homes from gas to low-carbon heating by 2030. The Gas Act was amended in 2018 to change the existing obligation to connect new homes and buildings to the gas network into a ban on new gas connections. Numerous support programmes and requirements aim to reduce gas demand through energy efficiency or the deployment of renewables, particularly in the built environment and industry.

The phase-out of Groningen gas production has notable impacts in relation to energy security. Groningen produces low calorific gas (L-gas), which covers a significant share of gas demand in the Netherlands, Belgium, and bordering regions of France and Germany, and is particularly important for meeting seasonal heating demand. The Netherlands has several policy measures specifically targeted at ensuring L-gas supply in the near term, while working to quickly reduce L-gas demand, including through regional co-operation.

The modelling results show that the flexible power trade potential is rather substantial--and even dominant--depending on the level of interconnection capacity and market integration across EU member states. In addition, we briefly discuss complementary results by means of the NL energy system model OPERA, notably on demand response as a potentially large domestic flexibility option.

We report on the progress made with regard to the climate and energy transition, analysing the current and future impact of policy on greenhouse gas emission reduction and exploring various options for achieving the reduction targets.

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