

Netherlands Climate and Energy Outlook 2021

Summary



Planbureau voor de Leefomgeving



Rijksinstituut voor Volksgezondheid
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Netherlands Climate and Energy Outlook 2021 Summary

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PBL Netherlands Environmental Assessment Agency is the national institute for strategic policy analysis in the fields of the environment, nature and spatial planning. We contribute to improving the quality of political and administrative decision-making by conducting outlook studies, analyses and evaluations in which an integrated approach is considered paramount. Policy relevance is the prime concern in all of our studies. We conduct solicited and unsolicited research that is both independent and scientifically sound.

Summary

This year's Climate and Energy Outlook (KEV) outlines the developments in greenhouse gas emissions and the energy system in the Netherlands, in both the past, present and future. It also explains what, in this respect, is contributed by national climate and energy policy, also taking relevant developments on other policy themes into account as well as those outside the Netherlands. Once every two years, within the framework of the KEV, projections are also published on air pollutants (including nitrogen) – the next version of which is due by the end of 2022. The KEV is a joint publication by PBL Netherlands Environmental Assessment Agency, TNO Energy Transition, Statistics Netherlands (CBS) and the National Institute for Public Health and the Environment (RIVM), with contributions from the Netherlands Enterprise Agency (RVO.nl) and Wageningen University and Research (WUR).

This series of Climate and Energy Outlooks was first set up as a result of the Dutch Climate Act (May 2019), which provides a framework for the development of policies on greenhouse gas emission reduction in the Netherlands, to a level that, by 2050, is to be 95% below the 1990 level, with a 49% reduction target for 2030. The Climate Act was followed by the Climate Agreement in 2019, which provides further detail on how to achieve the target for 2030. Therefore, the focus of the KEV is on the period up to 2030. However, this year's KEV also discusses possible emission trends for the period between 2030 and 2040, because insights into developments after 2030 are important for current climate policy-making.

What policy has been included in this year's KEV?

The KEV projections are based on both adopted and proposed policy, including all policies that had officially been made public on 1 May 2021 and were sufficiently concrete by that date. In addition to these policies, this KEV also discusses those that have been proposed but not yet worked out in detail. These include the policy plans and intentions from, particularly, the Climate Agreement that had been officially announced by 1 May, but had not yet been worked out in sufficient detail to enable calculation of their future impact. Here, we provide an overview of the progress made on the elaboration of the most substantial measures on the agenda and indicate their likely effects by 2030. For the projections, these conceivable effects cannot be added exactly to the adopted and proposed policy, but they do give an indication of the order of magnitude of their contribution to the remaining reduction task for 2030.

The recent climate measures from the Budget Memorandum 2022 could not be included in this KEV, because of the short time frame. We did consider the climate and energy proposals, in a broad sense, from the 'Fit for 55' Package published by the European Commission (EC) on 14 July 2021. This EU package aims to reduce greenhouse gas emissions in the European Union by 55% by 2030. The package contains proposals that could still see significant changes over the course of the political decision-making process. Where possible, we compared the targets proposed by the European Commission against the projected developments, to provide an indication of the possible consequences for the Netherlands. The PBL study on the possible consequences of the proposed EU climate policy (*'Nederland Fit for 55? Mogelijke gevolgen van het voorgestelde EU-klimaatbeleid'* (PBL, 2021) explains the significance of the European package for Dutch policy in more detail.

Because of the greater emphasis on uncertainties, this KEV provides only a range for the national emission projections. This KEV 2021 provides only a range for the projected national emission developments, whereas the previous KEV gave a point value with a range. This time, a point value was not included because of the large uncertainties in the projections for the Dutch electricity sector. The uncertainties are due to the fact that the activities in this sector depend too much on developments in supply and demand in other countries, to which the Dutch sector is closely linked.

In order to include this substantial dependence on other countries, we used a range instead of a point value for emissions from the electricity sector. For the other sectors, industry, built environment, mobility and transport, agriculture and land use, however, we did use point values for emissions. The trends expected for these sectors are generally more robust, compared to those for the electricity sector. This KEV does point out the relatively large uncertainty in the expected policy effects for industry. For all sectors (including electricity), we also determined uncertainty ranges that include all the identified uncertainties, both in the Netherlands and abroad. The national emission range was based on all these sectoral ranges.

Summary structure

This English summary presents eight findings, the annual table of main data and the figure (Figure 1) on developments in greenhouse gas emissions up to 2030 (excluding those from land use), in relation to the targets. The findings concern the Netherlands' main climate and energy targets, which have to do with greenhouse gas reduction, energy saving and renewable energy. This year, the main data table also includes the most important climate and energy targets.

Findings

1) Climate target 2030 requires elaboration of proposed and new policy

By 2030, emissions are expected to have decreased by 38% to 48%, compared to 1990 levels, based on adopted and proposed policy (Figure 1; Main Data Table). The remaining effort to achieve the reduction target of 49% by 2030, is a decrease in emissions by 3 to 25 Mt CO₂ equivalents (i.e. 1–11 percentage points). The uncertainties in the range include the amount of imported/exported electricity, economic growth, weather conditions, technological developments and the expected policy impact.

Uncertainties regarding the expected policy impact include how and to which extent policy measures are likely to influence behaviour and investments by citizens and the business community. Government policy will be able to reduce only a small share of the large uncertainties. In order to achieve the maximum reduction by 2030, circumstances will need to be favourable with respect to all controllable and uncontrollable uncertainties. In practice, this will not necessarily be the case.

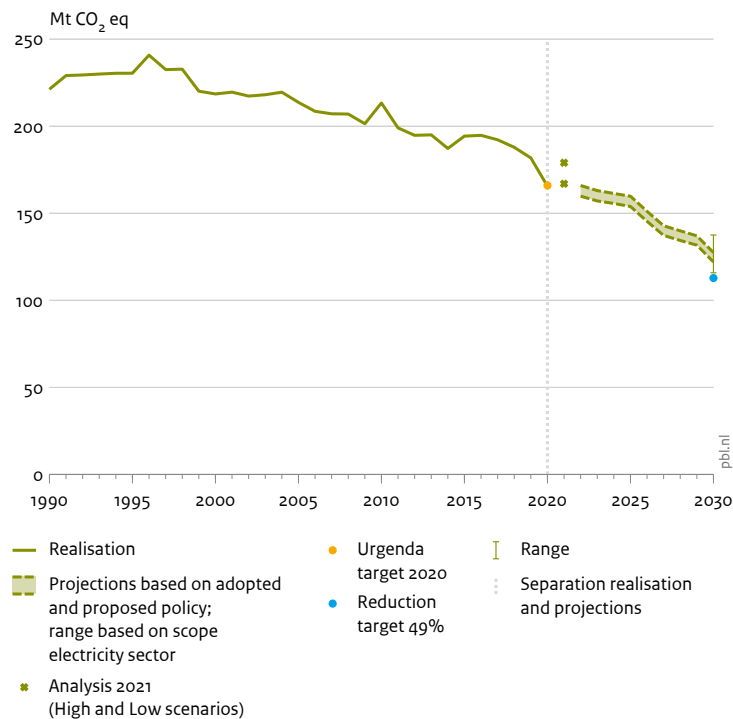
The emission reductions estimated here are substantially greater than those in the KEV 2020, which came to a reduction of 30% to 40%. This is mainly due to the fact that some of the policy instruments have been made more explicit, over the past year, and could therefore be included in this year's KEV. This predominately concerns the carbon tax in industry in combination with the expanded SDE++ scheme. For mobility and transport, it concerns the mandatory use of more renewable energy, the reinvestment of revenues from the heavy goods vehicle tax, and zero-emission zones for urban logistics. In addition to these policy impacts, the emission projections for 2030 in this year's KEV are

somewhat lower for the Dutch electricity sector. The reason for this lower emission level are the expected lower export levels of electricity due to an upward revision of the projected growth in renewable electricity generation outside the Netherlands.

Part of the remaining effort can possibly be realised if a number of measures from the Climate Agreement currently on the agenda are worked out in detail and on time. This concerns the standardisation for non-residential buildings, the natural gas-free neighbourhoods, a standardisation scheme for commuter traffic, an incentive for zero-emission heavy duty vehicles, an additional investment subsidy for low-emission animal housing with a corresponding tightening of standards, and the national cessation scheme for livestock farms. With these policies in place, an additional emission reduction of roughly 2 to 4 Mt in CO₂ equivalents by 2030 is conceivable. Another part of the stated remaining efforts may possibly be achieved by the climate measures recently published in the National Budget Memorandum 2022.

It is, as yet, difficult to estimate the size of the contribution of the recent European climate proposals from 'Fit for 55' to future emission reductions. First, these proposals are still subject to significant changes. Second, in many cases, Member States will have to translate the proposals into national legislation or draft additional policies for the intended targets. What that will ultimately look like is as yet unknown. For example, the tightening of the current EU Emissions Trading System for the electricity sector and large industry and its extension to also include shipping, will lead to higher CO₂ prices, although, in the Netherlands, this will probably not lead to substantial additional emission reductions up to 2030. The impact of the proposals that intervene in the pricing of energy use and CO₂ emissions in the built

Figure 1
Greenhouse gas emissions, excluding land use



Source: : Pollutant Release and Transfer Register (realisation); KEV projections 2021

environment and road transport sectors, such as the introduction of an emissions trading system and the revision of the Energy Tax Directive, depends on their integration into the existing Dutch tax framework.

The proposed stricter standards for emissions from passenger and light duty vehicles could lead to a limited additional emission reduction by 2030, compared to the projected impact of adopted and proposed policy. The EU proposals for higher ambition levels with regard to energy saving and renewable energy imply measures for the Netherlands that will also lead to additional emission reductions. However, what this would look like on a national level is still unclear. For a more detailed analysis of the possible consequences of the package of proposals, we refer to the PBL policy brief on possible consequences of the proposed EU climate policy (*‘Nederland Fit for 55? Mogelijke gevolgen van het voorgestelde EU-klimaatbeleid’*) (PBL, 2021).

Given the remaining reduction effort of 3 to 25 Mt CO₂ equivalents by 2030, the limited contribution of the policies currently on the agenda, the as yet unknown contribution of the climate measures from the Budget Memorandum 2021 and the ‘Fit for 55’ proposals, it is clear that the Netherlands faces a major reduction challenge for the coming years. It will be important, in this respect, to vigorously implement adopted policy and to achieve both the existing national climate targets and the more far-reaching EU climate ambitions within the next eight years. New policies developed in this context for 2030 will increasingly have to take the long-term transition into account, if the Netherlands is to become climate-neutral by 2050. It is important to keep a close eye on the connection with other policy-relevant themes (e.g. the nitrogen problem and spatial planning) and the social consequences of the policy (e.g. affordability for citizens and the business community).

2) Current target ESR sectors feasible, but new EU proposal calls for considerable additional effort

The European Commission’s Effort Sharing Decision (ESD) and Effort Sharing Regulation (ESR) regulate the emissions for the Netherlands for the activities that are not included under the EU Emissions Trading System (EU ETS) for large energy-intensive industry and the electricity sector. These concern the emissions from small non-energy-intensive industry, the built environment, mobility and transport, and agriculture; here, we refer to them as the ESR sectors. By 2020, the Netherlands had to reduce emissions by 16% compared to 2005 levels (according to the ESD).

For 2030, a reduction target of 36%, compared to 2005 levels (ESR), still applies. In addition, the ESD and ESR set an annual, time-bound, emission ceiling for each Member State, with the option of exchange between years. The binding commitments for the Member States, therefore, consist of a cumulative commitment over the period in question.

This KEV concludes that the cumulative ESD reduction target of 921 Mt CO₂ eq for the 2013–2020 period has been more than achieved, with a total of no more than 798 Mt CO₂ eq (Main Data Table 3). The current cumulative ESR target of 903 Mt CO₂ eq for the 2021–2030 period is also within reach (Main Table 3), according to the projections based on adopted and proposed policies.

These projections for cumulative emissions from the ESR sectors are around 36 Mt below those in the previous KEV (2020). More than half of this amount is related to a formal amendment by the European Union, as a result of which, in the Netherlands, the ESR emissions have increased, in the base year of 2005. Less than half of the 36 Mt is related to emission reductions due to, on the one hand, the concretisation of mobility policy, a formal accounting adjustment in the fertiliser sector and a few minor new insights into methods and statistics, and, on the other hand, slightly higher emission levels in the agricultural sector, compared to those in the KEV 2020.

As part of the 'Fit for 55' package, the European Commission proposes to increase the Dutch ESR reduction target for 2030 from 36% to 48%, compared to 2005 levels. This means that, by 2030, emissions from the ESR sectors need to be reduced by a further 15 Mt CO₂ eq, by 2030, on top of the current target. Based on this EU proposal, the cumulative emission reduction for the 2021–2030 period would be 841 Mt CO₂ eq. Compared against the projections in the previous KEV, based on adopted and proposed policy, this means a further reduction of 62 Mt CO₂ eq between 2021 and 2030.

The more stringent proposed target, therefore, represents a significant additional reduction challenge. However, there are a number of policy developments that could contribute to achieving this target. The national policy proposal that was formulated on this subject (which will only apply to the ESR sectors), if worked out in detail and implemented, could reduce ESR emissions by 2 to 4 Mt CO₂ eq by 2030. The cumulative nature of the target means that the earlier the proposed measures would be worked out and implemented, the more they will contribute to achieving the target. Rapid decision-making and implementation could

conceivably result in a cumulative reduction of 10 to 20 Mt CO₂ eq, between 2022 and 2030. In addition, the climate measures in the Budget Memorandum 2022 could also contribute to this task.

Based on current EU regulations, the Netherlands may compensate part of the ESR reduction target with emission credits from land use over the same period. According to this KEV outlook, the volume of these land-use credits under the adopted and proposed policy will amount to a cumulative 11 Mt CO₂ eq, for the 2021–2030 period. The recent EU climate proposals in 'Fit for 55' with regard to land use will probably lead to somewhat lower credits of around 7 to 8 Mt CO₂ eq (cumulative). As indicated above, the extent to which other recent proposals from the European 'Fit for 55' package will contribute to the Netherlands' future emission reductions is as yet difficult to estimate.

In view of the above, the Netherlands faces a substantial additional reduction task for the ESR sectors, for the 2021–2030 period. If the Climate Agreement plans, climate measures from the Budget Memorandum 2022 and the EU 'Fit for 55' package are worked out in detail, they could contribute to achieving this additional task. How much of a contribution is, as yet, unclear. For achieving the ESR target, the earlier in time the measures are implemented, the more they will contribute to this cumulative target. However, the experience of recent years indicates that it is not easy to achieve rapid and sizeable emission reductions in the ESR sectors.

3) Emissions in 2020 around the Urgenda target, likely higher in 2021; risk of exceedance remains up to 2025

Based on preliminary emission statistics, emission reductions in the Netherlands, in 2020, were 25% [24%–26%], compared to 1990 levels

(see Figure 1, Main Data Table). Emission reductions, thus, were around the Urgenda target, which required the Netherlands to reduce greenhouse gas emissions by at least 25%, between 1990 and late 2020. In early 2022, when the statistics for 2020 will be finalised, it will be possible to really determine whether the Netherlands has met its Urgenda target. The substantial emission reduction in 2020, of more than 16 Mt CO₂ eq, compared to 2019, is partly due to developments in the energy sector, such as the termination of the Riverstone coal-fired power plant, unfavourable market conditions for the other coal-fired power plants, an increase in renewable electricity and, partly, to a COVID-19-related reduction in emissions, particularly in the mobility and transport sector.

However, the expectation for 2021 is that emissions will again be higher than the Urgenda target would require. This is partly due to the lower temperatures in the first half of 2021, compared to 2020, and the higher level of activity in both industry and the electricity sector. In an outlook study for the second half of 2021, using two emission scenarios, emission reduction in 2021 will be 19% under the High scenario and 24.5% under the Low scenario compared to 1990 levels. The extremely high natural gas prices of mid October 2021 could not be included in this analysis, but as yet there are no clear indications that these will have a greater impact on emissions than already assumed in the Low scenario.

Between 2022 and 2025, under currently adopted and proposed policies, greenhouse gas emissions will decrease steadily in several sectors, although these estimates are uncertain. In view of all the uncertainties, this year's KEV estimates the risk of exceeding the Urgenda target to remain, although it is getting smaller, up to 2025. For this KEV, we were unable to analyse the extent to which the climate measures from the

Budget Memorandum 2022 will be contributing to emission reductions in the period up to 2025.

4) Current compulsory EU energy saving target possibly within reach, new proposal requires substantial effort

The energy saving target in Article 7 of the EU's Energy Efficiency Directive (EER) may be within reach. This target obliges the Netherlands, using specific national saving measures, to realise 924 petajoules in final energy savings, cumulatively over the 2021–2030 period. This amount lies within the estimated range of 815–994 petajoules in final energy saving, which is based on both adopted and proposed policy. In particular, the CO₂ tax on industry, with electrification and additional final saving, will contribute to a total saving that is greater than that estimated in the previous KEV.

In the 'Fit for 55' package, the European Commission proposes to increase the Netherlands' mandatory target in Article 7. An indicative calculation shows that the Netherlands could face an additional reduction task of approximately 400 petajoules on top of the current target. Given the projected energy saving for this period, additional national saving measures would therefore be required to comply with this new obligation.

Although the national CO₂ tax will lead to additional saving, other measures cause energy consumption to increase again. Examples of such measures include carbon capture and storage and the production of green hydrogen. The latter measure is expected to only play a role after 2030. This does not make a difference for the obligations under Article 7, because those only relate to the additional reduction through a set of specified saving measures. However, it does make a difference to

Article 3 of the EER because, here, target values for total final and primary energy consumption apply.

EU Member States chose these target levels themselves. With its adopted and proposed policy, the Netherlands will not be achieving these targets for primary and final consumption. The EU 'Fit for 55' package also includes more stringent targets for Article 3, although exactly what this will mean for the individual Member States is as yet unclear.

Notwithstanding the fact that these are non-binding targets for the Member States, in the event of an EU-wide shortfall, the European Union could call on the Member States, via a safeguarding mechanism, to tighten their individual contribution targets.

5) Current targets on renewable energy within reach, increase in renewable heating insufficient

Formally speaking, the Netherlands is likely to have achieved the EU target of a 14% share in renewable energy in its gross final consumption, in 2020. The domestic share of renewable energy in 2020 was just over 11% (see Main Data Table 2). For the remaining reduction task (i.e. close to 3%), the Netherlands has come to an agreement with Denmark for a so-called statistical transfer. This statistical transfer must be reported to the European Commission by 31 December 2021. The renewable energy statistics for 2020 will be finalised at the end of 2021.

According to adopted and proposed policy, the share in renewable energy will increase from just over 11% in 2020 to over 16% in 2023, around 20% in 2025 and 26% [23%–28%] in 2030. The target of 16% in renewable energy by 2023, therefore, is still within reach, as it was in the KEV 2020. The projected share in renewable energy is close to the indicative target that the Netherlands is aiming for in the European

context, namely at least 19.6% by 2025 and 27.0% by 2030. If the Dutch Government is looking for more certainty with respect to achieving these indicative targets, any policy adjustments will need to be made in a timely fashion. Experience related to the renewable energy target for 2020 has shown that it can easily take several years before policies have a visible impact.

The increase in the use of renewable energy, therefore, will continue after 2020. This increase can largely be explained by an increase in renewable electricity, although this is slowed down by restrictions, particularly those regarding the connection of solar panels (solar PV) to the regional electricity grids. The share in renewable electricity will grow from around 26% in 2020 to around 75% by 2030. The increase in the share of renewable heating will be far less, with an expected increase from 8% in 2020 to 12% by 2030. This share is smaller than that in the KEV 2020, because less heat will be produced from biomass, according to this year's KEV. The estimated annual growth rate for renewable heat of 0.4 percentage points is much smaller than the indicative annual target of 1.1 pp in the Renewable Energy Directive, or 1.3 pp when also including residual heat.

Although the rapidly growing use of heat pumps is contributing to the increase in renewable heating, this increase is being held back by the slow roll-out of heat networks in the existing built environment and greenhouse horticulture, and by the limited amount of green gas that is injected into the natural gas network. The projections on the sustainability of heating networks is also uncertain, because the government has announced plans to phase out the SDE++ subsidy for heat production from biomass for buildings, although no concrete timetable has been set. In the event of such a phase-out, alternatives

will need to be considered, such as geothermal heating and thermal energy from water. These technologies are more expensive, more innovative and smaller in scale than biomass, which means that the transition to sustainability may be more expensive or take longer than outlined in the current KEV projections.

The physical share of renewable energy in mobility and transport will increase from 6% in 2020 to 14% by 2030. This is due to the expected increase in the use of biofuels and in electric transport, for which the required electricity will partly be renewable. The KEV assumes that fuel suppliers will be complying with Dutch regulations on renewable energy in transport, which obliges them to ensure that an increasing share of the energy they supply to the transport sector is renewable; this share is to increase from 16.4% in 2020 to 27.1% by 2030. These percentages are higher than the physical share mentioned above, because, under Dutch legislation (accounting rules), some biofuels can be counted twice and for renewable electricity this is even as much as four times. The new annual obligation for renewable energy in the transport sector, over the 2022–2030 period, will incrementally be met by renewable electricity. The KEV assumes that the charging and refuelling infrastructure will not be a significant obstacle to the roll-out of zero-emission vehicles. However, the increase in the number of electric vehicles could slow down if, for example, the supply of electric charging stations would lag behind. Whether the implementation of the agreements in the National Charging Infrastructure Agenda (NAL) will lead to a sufficient number of charging facilities is still subject to further investigation.

In the ‘Fit for 55’ package, the European Commission proposes to increase the binding target for the 2030 renewable energy share from 32% to 40% at the EU level. Member States are not under any direct obligation to follow this proposal, but they are required to indicate what contribution they would like to make to achieving this new target. For the Netherlands, the European Commission mentions a 36% share of renewable energy as a cost-effective contribution. Given the share of 26% [23%–28%] expected in this year’s KEV for 2030, a sizeable additional policy task remains. Although this is a non-binding contribution, in the event of a Europe-wide shortfall, the Commission can call on Member States to tighten their contribution via a safeguarding mechanism. The ‘Fit for 55’ package also proposes some binding quantitative sub-targets for the use of renewable energy.

For example, a binding obligation is proposed for the use of at least 50% green hydrogen in industrial hydrogen consumption by 2030 and to increase the use of renewable energy for heating and cooling by 1.1 percentage points, per year (see the PBL policy brief referred to above). These obligations imply new policy that may also involve increasing the total share of renewable energy in the Netherlands.

6) A break in the trend: national CO₂ tax and SDE++ incite industry to apply carbon capture and storage and electrification

The new policy for large-scale industry is causing a break in the trend in the expected greenhouse gas emissions from industry. This concerns the new CO₂ tax on industry in combination with the SDE++ scheme (Stimulation of Sustainable Energy Transition), thus causing a carrot–stick situation, with the carbon tax being the stick and the SDE++ the carrot.

With the introduction of the CO₂ tax on 1 January 2021, Dutch policy, for the first time, offers a strong generic incentive to reduce industrial greenhouse gas emissions. The CO₂ tax puts a minimum price on the emission of greenhouse gases by industrial companies under the EU ETS and a number of them outside the EU ETS. That minimum price will increase from EUR 30 to 125 per tonne of CO₂ eq, between 2021 and 2030. Every year, companies will receive a certain amount of CO₂ allowances, or carbon credits. In 2021, companies will start with allowances for 120% of the emissions as specified within their ETS benchmarks, which will decrease, linearly, ultimately to 68.9% by 2030. Companies are allowed to trade these carbon credits amongst themselves.

Alongside the CO₂ tax, the SDE++ covers the unprofitable part of emission reduction projects. For companies that fall under the EU ETS, this refers to the costs in addition to the CO₂ price in the ETS. For non-renewable reduction options in industry, the annual maximum SDE++ cash outlay in 2030 will be EUR 550 million. In case the ETS price is higher, the subsidy amount per project will be lower and the cash expenditure ceiling will be less likely to limit the number of projects that can receive SDE++ subsidy.

The expected additional reductions at companies to which the CO₂ tax applies will amount to between 9 and 16 Mt CO₂ eq by 2030, compared to the situation without the CO₂ tax and SDE++ scheme. The largest share consists of carbon capture and storage (CCS) with 5–11 Mt, followed by electrification with 2–4 Mt, energy saving with 1–2 Mt and N₂O emission reductions of about 1 Mt. However, the uncertainties are large. Long project lead times, long-running permit procedures and whether or not the infrastructure will be available on time, all play an important role.

Another uncertainty arises from the degree to which the Dutch CO₂ tax is in line with the EU ETS rules, according to which companies could also use foreign green gas certificates to comply with their reduction obligations. Using these certificates will not lead to emission reductions in the Netherlands. CO₂ emissions in the electricity sector from residual gases in the steel sector also fall under the CO₂ tax. Applying CCS to these residual gases will lead to an emission reduction mainly in the electricity sector and much less in industry.

7) Progress Climate Agreement differs per sector – from significant to limited

The progress on implementation of the Climate Agreement differs per sector. This year's KEV examines this progress in broad terms, and compares it against the indicative residual emissions, per sector, which formed the starting point for the draft Climate Agreement in 2019. Although these residual emissions have no formal status and do not fully add up to the full 49% target for 2030, they do provide some indication of the progress made on the Climate Agreement. We can see that, for example, the implementation process of the adopted and proposed policies in the electricity sector and industry are the most advanced. In the electricity sector, the phase-out of coal-fired power plants had already been worked out before the Climate Agreement was formally adopted in 2019.

In addition, concrete agreements have been made to end the stimulation of renewable electricity production after 2025. In industry, the CO₂ tax was legally introduced on 1 January 2021, in combination with the expanded SDE++ subsidy. As a result, significant emission reductions are expected in industry by 2030. For both the electricity sector and industry, indicative residual emissions of 12.4 Mt for the electricity sector and 39.9 Mt for industry by 2030 may be achievable. However,

uncertainty about the projected emission reductions in both sectors are considerable.

Over the past year, progress was also made in the mobility and transport sector, with the concrete implementation of the Climate Agreement policy on the mandatory use of more renewable energy, reinvestment of the revenues from the heavy duty vehicle tax and zero-emission zones for urban logistics. As a result, the indicative residual emissions of 25 Mt in the mobility and transport sector are expected to be closer but not yet fully within reach. The Climate Agreement already stated that, around 2024, additional policies should be considered to stimulate zero-emission passenger cars after 2025. In the built environment and agriculture, only limited progress was made last year in implementing the measures from the Climate Agreement.

Various studies and pilots have already been started, the results of which are to contribute to the development of measures. The limited degree of progress means that some earlier estimates on possible emission reductions from Climate Agreement plans must be adjusted downwards. For example, the target of making 1.5 million existing homes and buildings more sustainable by 2030 is no longer realistic because the implementation of the policy package for natural gas-free neighbourhoods has been delayed. The indicative residual emissions from the built environment (15.3 Mt) and agriculture (22.2 Mt) are not expected to be achieved with the adopted and proposed policies. In the sectors of mobility and transport, built environment and agriculture, as mentioned above, there are also policies on the agenda which – if developed in a concrete and timely manner – could conceivably lead to additional emission reductions by 2030. Even with this, the indicative residual emissions for these sectors will probably not be achieved.

Land use has a special position in the Climate Agreement; it does not count towards the 49% reduction target and has been assigned the task of reducing greenhouse gas emissions by 1.5 Mt by 2030, through newly implemented policy. However, most of the agreements and plans in the Climate Agreement have not yet been worked out in sufficient detail, which is why this KEV considers them to be policies that are ‘on the agenda’. If and when these policies are fleshed out, however, the reduction target may come within reach.

8) Drastic changes on the natural gas market, security of supply a possible issue

The Dutch natural gas market is changing rapidly. In 2010, national gas production (81 billion cubic metres) was still one and a half times the national consumption level; whereas in 2018, the Netherlands became a net importer of natural gas and, by 2030, the expected production of 7 billion m³ is less than a quarter of the expected domestic consumption. The change from net exporter to net importer makes the Netherlands dependent on other countries, which leads to risks of security of supply and affordability.

Natural gas production is decreasing not only because the Groningen gas field production is being cut back, but also because production is decreasing in the so-called small fields at sea and on land, as well. The decrease is partly compensated by a decrease in natural gas consumption. Between 2020 and 2030, total Dutch natural gas consumption is expected to decrease by 6–16 billion m³, while production in the Netherlands will decline by 14 billion m³. The increase in Dutch biogas or hydrogen production as a gas supply source, with the adopted and proposed policy up to 2030, will be negligible when compared to total gas demand. Developments related to renewable alternatives to meet the demand for gas is an important part of a climate policy that is aimed at climate neutrality. To bridge the period in which there are insufficient renewable alternatives and the Netherlands thus remains dependent on gas imports, it is important to carefully consider how the security of supply and affordability of natural gas could be guaranteed.

Main data Climate and Energy Outlook 2021 (adopted and proposed policy)¹

Main Table 1: Prices and energy

	2005	2015	2020 ²	2030
GDP (index 2019=100) ³	85	95	100	118 [107–129]
Oil price (USD/barrel) ⁴	70	57	43	78 [61–126]
Natural gas price (EUR ct/m ³) ⁴		22	13	22 [16–32]
Coal price (EUR/t) ⁴	69	63	57	64 [50–92]
CO ₂ price (EUR/t) ⁴		8	25	62 [32–98]
Wholesale price electricity (EUR/MWh) ⁴	54	43	32	[32–68]
Natural gas extraction (billion Nm ³) ⁵	68	50	21	7
Natural gas demand (billion Nm ³)	47	38	41	[25–35]

Main Table 2: Renewable energy and energy saving

	2005	2015	2020 ²	2030
Renewable energy share (%)	2,5	5,7	11,1	26 [23–28]
<i>Targets renewable energy share (%)</i>			14	27
Renewable energy (PJ)	57	117	220	526 [455–557]
Gross final energy use (PJ)	2,304	2.071	1.981	2,001 [1,749–2,226]
Energy saving EU Article 7, cumulative (PJ) ⁶				[814–994]
<i>EU target Article 7, cumulative (PJ)</i>				924

1 Ranges are given between square brackets.

2 Preliminary data CBS.

3 Prognoses GDP sources: CPB, Central Economic Plan 2021 (CEP); CPB, Actualisatie Verkenning middellange termijn 2022–2025 [medium-term outlook] (MLT).

4 Constant prices 2020.

5 Source: realisations Nlog.nl, projected Gasunie Transport Services (GTS). The Nm³ unit, normally, is cubic metres, a cubic metre of natural gas at 1 bar and 15 degrees Celsius.

6 Energy saving conform Article 7 concerns the cumulated saving over the 2021–2030 period.

Main Table 3: Greenhouse gas emissions, total and sectors (AR5) ⁷

	1990	2015	2020 ⁸	2030
Total greenhouse gas reduction, compared to 1990 level, excl. land use (%)	0	12	25 [24–26] ⁹	[38–48]
<i>Doel (%)</i>			25	49
Greenhouse gas emissions, total (Mt CO₂ eq)				
Total, excl. land use	221	194	166	[116–138]
Total, incl. land use	227	199	170	[119–141]
Total CO ₂ , excl. land use	163	165	138	[91–113]
Total OBKG ¹⁰ , excl. land use	59	30	28	[24–25]
Greenhouse gas emissions per sector (Mt CO₂ eq)				
Electricity	39.6	53.1	32.9	[8–21]
Industry	86.4	54.7	53.5	40 [34–46]
Built environment	29.9	24.4	21.6	19 [16–22]
Mobility	32.2	34.5	30.7	29 [25–32]
Agriculture	33.1	27.5	27.0	26 [23–26]
Land use	6.1	4.9	4.4	3.5 [2.9–3.9]

⁷ The greenhouse gas emission in the KEV 2021 have been determined using data from the AR5 report on the warming potential (IPCC, 2014); see Chapters 1 and 3. Appendix 4b also includes greenhouse gas emissions that have been determined using data on the warming potential from the AR4 report (IPCC, 2007).

⁸ Preliminary data RIVM/Pollutant Release and Transfer Register.

⁹ The range of a rounded 24%–26% was calculated using the warming potential from the AR5 report (Chapters 1 and 3). When using the data on warming potential from the AR4 report, this range would come to a rounded 24% to 27%.

¹⁰ OBKG = other greenhouse gases, such as methane, nitrous oxide and F-gases.

Main Table 4: Greenhouse gas emissions EU ETS and ESD/ESR sectors¹¹

	2005	2015	2020 ⁷	2030
Emissions EU ETS sectors (Mt CO ₂ eq)	80.3	94.1	74.1	[35–52]
Emissions ESD/ESR sectors (Mt CO ₂ eq)	133.4	100.3	91.5	84 [77–89]
Cumulative emissions ESD/ESR sectors (Mt CO ₂ eq) ¹²			798	903
EU target cumulative emissions ESD/ESR sectors (Mt CO ₂ eq)			921	903

¹¹ EU ETS is the EU Emissions Trading System for large industry and the electricity sector. ESD and ESR represent activities and emissions outside this EU ETS. These concern the non-energy-intensive industry, the built environment, mobility and transport, and agriculture.

¹² The realised ESD emissions over the 2013–2020 period were added together and are given under 2020. The ESR emissions estimated for the 2021–2030 period were added together and are given under 2030. The EU target for 2021–2030 was determined on the basis of the current ESR reduction target for the Netherlands of 36%, compared to 2005 levels.

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