

Fourth National Energy Efficiency Action Plan for the Netherlands

30 April 2017

FOREWORD

This fourth National Energy Efficiency Action Plan (NEEAP) for the Netherlands was drafted as part of the obligation to report to the European Commission under the Energy Efficiency Directive (2012/27/EU), hereinafter the EED.

This Action Plan contains a description of measures to promote energy efficiency in the Netherlands, a calculation of the savings achieved and expected in the period 2011-2015 and other reporting obligations arising from the EED and EPBD. Its structure follows the recommended NEEAP template in accordance with the Commission's Implementation Decision (2013/242/EU).

The preparation of this Action Plan was overseen by the Minister of Economic Affairs and the Minister of the Interior and Kingdom Relations, with input from the Ministry of Infrastructure and the Environment. Calculations were performed and explained by Netherlands Enterprise Agency (Rijksdienst Voor Ondernemend Nederland (NEA)) (bottom-up) and the Energy Research Centre of the Netherlands (Energieonderzoek Centrum Nederland (ECN)) (top-down).

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1 INTRODUCTION

1.1 The main components of the fourth NEEAP

The Energy Efficiency Directive (EED) obliges Member States to submit a national energy efficiency action plan (NEEAP) to the Commission by 30 April 2014 and every three years thereafter. These plans must cover significant energy efficiency improvement measures and expected and/or achieved energy savings, including those in the supply, transmission and distribution of energy as well as final energy consumption.

This NEEAP was prepared in accordance with the reporting template produced by the European Commission pursuant to Commission Implementing Decision 2013/242/EU of 22 May 2013 for the reporting of legal obligations.

Chapter 2 contains a summary of the national energy efficiency targets for 2020 and savings calculated for the Energy Efficiency Directive. These savings have been calculated in two ways. The total ESD saving has been determined for the Netherlands as a whole and by sector, on the basis of national statistics and evaluation models. For selected measures, the savings are then mapped in more detail with bottom-up monitoring, allowing more direct connections to be made with policy measures. The measures monitored using bottom-up monitoring cover a large part of the total savings achieved, well above the 30% of total savings to be accounted for by bottom-up monitoring under the ESD.

Chapter 3 contains a summary of the policy measures the Netherlands has already adopted or plans to adopt for the implementation of the EED. It also discusses the government's own energy efficiency. Section 3.2.2 further contains the national plan for promoting nearly zero-energy buildings, pursuant to Article 9 of the EPBD, and section 3.2.3 contains reports on the inspections of systems (Articles 14 and 15 of the EPBD), inspection reports of installation inspections (Article 16 of the EPBD), independent experts (Article 17 of the EPBD) and independent control systems for inspections (Article 18 of the EPBD). Annex I contains a summary of the energy efficiency measures for achieving the objective under Article 7, the results of which have been included in the energy saving calculation.

This NEEAP also contains an update in Annex II of the renovation strategy for buildings, pursuant to Article 4 of the EED, and the Annual Report, pursuant to Article 24(1) of the EED, in Annex III, while Annex IV contains the equivalence report as required under Article 14(4) of the EPBD.

1.2 National framework for energy saving

Energy saving is an important tool for making the energy supply sustainable and achieving the long-term objectives in respect of reducing CO₂ emissions. Further, energy saving increases the competitiveness of Dutch business and improves the purchasing power of consumers. This makes energy efficiency an economically attractive way to reduce CO₂ emissions. The Cabinet aims to have energy efficiency implemented in a cost-effective manner so as to achieve the 2020 objectives. The Dutch government is focused on getting the potential for rational economic investments to take off. In September 2013 the Dutch government, together with over 40 other parties, including authorities, employers' and employees' organisations, financial institutions and nature conservancy and environmental organisations, concluded the Energy Agreement for Sustainable Growth (*Energieakkoord voor Duurzame Groei*) (Social and Economic Council 2013), which was signed by a

large number of parties in September 2013. By virtue of this Energy Agreement arrangements were made that complemented energy efficiency policy in a wide array of sectors. Together with a number of long-term energy-efficiency measures, the Netherlands provides an alternative implementation of Article 7 of the EED by means of the arrangements under the Energy Agreement.

2 SUMMARY OF THE NATIONAL ENERGY EFFICIENCY TARGETS AND SAVINGS

2.1 National 2020 energy efficiency targets

The indicative national energy efficiency target for 2020 is 482 PJ final end-use efficiency improvements to be achieved in the period 2014-2020 (Daniëls et al. 2013, p. 11 ff); in primary terms this is 671 PJ. These are cumulative figures (as required by the EED).

Table 2.1 contains an estimate of the primary energy consumption in 2020 (generally and by sector) according to the latest figures from the NEO 2016 (National Energy Outlook - *Nationale Energieverkenning*) (Schoots et al. 2016).

Table 2.1 Energy consumption in primary terms, generally and by sector in 2020

	Energy consumption in primary terms (PJ primary)
General	2 438
Sector	
Energy sector	540
Built environment	694
Industry and SMEs	619
Transport	450
Agriculture and horticulture	135

2.2 Supplementary national energy efficiency targets

The Energy Agreement for Sustainable Growth was drafted at the end of 2013. Its agreed objectives include an average final energy consumption saving of 1.5% a year and an additional final energy consumption saving of 100 PJ in 2020 (Social and Economic Council of the Netherlands, 2013).

2.3 Primary energy savings

Table 2.2 contains an estimate of the total saving on energy consumption per sector in 2020 according to the latest figures from the NEO 2016 (Schoots et al. 2016).

Table 2.2 Estimated total energy consumption saving in primary terms per sector in 2020 (including established, proposed, EU and autonomous policy, non-cumulative)

	Energy saving in 2020 in primary terms (PJ)
Sector	
Built environment	129
Industry and SMEs	33
Transport	62
Agriculture and horticulture	-16
Total	208

2.4 Final energy saving

2.4.1 Final energy saving achieved and saving expected in 2016

Table 2.3 summarises the energy saving objectives (final) in accordance with the ESD as set in the first NEEAP and the savings achieved.

Table 2.3 Summary of energy saving in comparison with 2007 in accordance with the ESD

	Energy saving objective		Realised*/expected# energy saving	
	<i>Absolute (GWh)</i>	<i>Percentage (%; based on average consumption 2001-2005)</i>	<i>Absolute (GWh)</i>	<i>Percentage (%; based on average consumption 2001-2005) 1</i>
2010	11 376	2	19 399*	3.4%
2016	51 190	9	57 282#	10.1%

¹ This percentage shows the difference with the reference consumption in 2020 and 2016; in other words the consumption if there were no savings.

Table 2.4 shows a breakdown by sector of the savings calculated by the top-down method in final terms.

Table 2.4 Summary of energy saving by sector (top down)

Sector	Saving realised in 2010 (GWh)	Saving expected in 2016 (GWh)
Built environment	9912	1 317
Industry and SMEs	1548	5 576
Transport	2172	10 639
Agriculture and horticulture	5706	9 750
Total	19 339	57 282

2.4.2 Methodology

For the methodology used, please see Section 2.2 (Methodology for determining the saving achieved) of the Second National Energy Efficiency Action Plan for the Netherlands as submitted on 30 June 2011 and the references therein.

3 POLICY MEASURES FOR THE IMPLEMENTATION OF THE ENERGY EFFICIENCY DIRECTIVE (EED)

3.1 Horizontal measures

3.1.1 *Schemes for alternative policy measures in accordance with Article 7(9) and (10).*

The Netherlands has opted for alternative policy measures pursuant to Article 7(9) and (10) so as to comply with the obligation under that Article. In this respect saving measures were selected that focus on the built environment (including small commercial users and medium-sized businesses), the energy-intensive industry, the agrarian sector and mobility and transport. For a description of the measures under Article 7, please refer to Annex I.

A portion of these savings measures concern long-term energy-saving policy, such as energy taxes and agreements with business and industry. The Netherlands has also introduced policy measures that arise from the Energy Agreement for Sustainable Growth (Social and Economic Council of the Netherlands 2013 - *Sociaal Economische Raad (SER)*), which brings together the activities of over 40 organisations, including central, regional and local authorities, employees' and employers' organisations, nature conservancy and environmental organisations, other social organisations and financial institutions. The Central Government is responsible for developing, implementing, executing and evaluating the policy measures identified in the agreement, and shall be accountable for doing so to Parliament.

The Energy Agreement seeks to achieve an average annual saving of 1.5 percent of final energy consumption. In that respect the parties are further in agreement with regard to a package of measures that are expected to create a further final energy consumption saving of around 100 PJ in 2020 compared to the reference scenario with no Energy Agreement (Daniels et al. 2013, p. 19).

A permanent committee within the Social and Economic Council of the Netherlands, in which all parties, including the government, participate, monitors and guarantees the results of the Energy Agreement. It was decided to step up the arrangements under the Energy Agreement in 2016 in order to ensure that the national objective of 100 PJ in additional final energy savings is met. Some of these intensification measures have already been achieved. The measures are also set out in Annex I.

At present the government is working together with parties under the Energy Agreement on further outcome-oriented agreements to achieve an additional 9 PJ in final energy savings in industry and another 10 PJ in final energy savings in the built environment. In the built environment the focus will inter alia be on behavioural changes through an improved overview of personal energy consumption among households and other small consumers. The Sustainable Energy Investment Subsidy Scheme (*Investeringssubsidie Duurzame Energie*), under which devices such as heat pumps are subsidised in the interests of sustainable energy management, is also being reinforced.

Table 3.1 shows the energy savings achieved through the implementation of alternative policy measures.

Table 3.1 Energy savings achieved through the implementation of alternative policy measures

Measure	Saving realised* in 2015 (PJ final)	Of which, saving achieved only in 2015 (PJ final)
Energy Investment Allowance (EIA)	15.313	8.409
Long-Term Agreements (LTA3)	6.557	2.284
Long-Term Agreements with major industry (LTA-EE), excl. refineries	9.435	3.889
Long-Term Agreements with the trade and services sector	0.905	0.226
Measures aimed at households	19.800	10.4
Measures aimed at the services sector	5.8	3
Correction for double-counting	10.508	6.433
Total	47.302	21.775

* savings on new activities performed in 2015 and activities performed in 2014 that also result in savings in 2015

3.1.2 Energy audits and management systems (EED: Article 8)

The obligation of large companies to perform an energy audit is set down in the Temporary Regulation Implementing Articles 8 and 14 of the Energy Efficiency Directive. Large companies are required to perform an energy audit, unless they are party to the LTA3 of the MEE agreement or an internationally-recognised energy or environmental management system (ISO 50.001 or ISO 14.001 with a supplementary ISO 14051 module). The energy audit must be repeated every four years.

The energy audit report must be sent to the competent authority (Environmental Management Act - *Wet Milieubeheer*). The authorities in question are municipalities, provinces and environmental services that perform energy-related tasks on behalf of municipalities and provinces. The competent authority assesses whether the obligations and quality requirements have been met.

A nationally-operating core team, composed of representatives of a range of competent authorities, has assessed 60 energy audits from groups that have a large number of sites (in total around 10 000), and have issued recommendations in that respect to the competent authorities of the sites concerned. In early 2017 an inventory was conducted among the competent authorities in the Netherlands. The inventory resulted in the following figures:

- Number of large companies required to perform an audit (including groups) present in the Netherlands: 4770
- Number of large companies required to perform an audit (including groups) that had submitted an audit report as of 1 February 2017: 726, of which 60 were national chain stores (ca 10 000 sites)
- Number of large companies (including groups) party to LTA3 or MEE: 325
- Number of large companies (including groups) to which ISO 50.001 or ISO 14.001 with supplementary ISO 14051 module is applicable: 22

Article 8(5) states that access of market participants offering energy services must be based on transparent and non-discriminatory criteria. The Competition Act (*Mededingingswet*) and the

monitoring thereof by the Netherlands Authority for Consumers & Markets (*Autoriteit Consument en Markt* (ACM)) ensure that that is the case.

In the built environment, energy audits are promoted through the energy label, the energy performance advice (EPA) and the energy management system. These instruments are implemented independently by qualified experts and are verified by independent bodies. For the energy label this is done on the basis of the Energy Performance (Buildings) Decree (*Besluit Energieprestatie Gebouwen*) and the Energy Performance (Buildings) Regulation (*Regeling Energieprestatie Gebouwen*).

The use of energy audits in energy-intensive and large companies is promoted by the LTA3 (*Long-Term Agreement 3*) and the Long-Term Agreement for the Energy Efficiency of ETS enterprises (MEE). The LTA3 and MEE agreements are accessible to all commercial final customers. In practice there are around 1 100 participating companies which account for about 80% of the energy used by industry and about 25% of energy use in the Netherlands. These agreements specify that all participating companies must draw up an energy efficiency plan (EEP) every four years and implement cost-effective measures from these energy-efficiency plans. The companies report annually on the measures implemented. These energy audits are evaluated by the Netherlands Enterprise Agency, providing the independent implementation and review required under the Directive.

In 2016 all participating companies drafted new EEPs for the 2017-2020 period. This means that these companies already comply with the obligation to perform a study comparable to an energy audit. The 1 100 companies consist of both small and large ones.

The use of energy audits for non-residential buildings is also encouraged under the Netherlands Enterprise Agency's programme for Energy Saving in the Built Environment (*Energiebesparing Gebouwde Omgeving*) (for non-LTA3 participants).

The State has entered into a Green Deal with the Dutch Federation of Small and Medium-Sized Enterprises (MKB Nederland) to achieve energy-efficiency in SMEs. Households are informed of the advantages of energy audits by Milieu Centraal (a Dutch consumer energy and environmental advisory council).

3.1.3 Individual metering, meter reading and billing (EED: Articles 9 - 11)

Individual metering

The 1998 Electricity Act, the Gas Act, the Heating Act and the EU Energy Efficiency Directive (Implementation) Act (respectively the *Elektriciteitswet 1998*, the *Gaswet*, the *Warmtewet* and the *Wet Implementatie Eu-Richtlijnen Energie-Efficiëntie*) contain regulations for the provision of meters.

These acts provide that small consumers of gas, electricity, cooling and heating and large consumers of cooling can have an individual meter.

Individual meters for small consumers of cooling are provided for about 14 000 dwellings which obtain cooling via a geothermal energy system. The supply of cooling is connected to the supply of heating and is necessary to ensure the heat balance in the ground. The supply of cooling in the

summer adds heat to the ground. This heat is re-used in the winter to heat the dwellings. The supply of cooling and heating is therefore necessary for the technical operation of the system. The metering of the supply of cooling will therefore not generally lead to energy efficiency as, if the consumer uses less cooling, another source will have to be found to restore the balance and that will cost money and energy. In addition to small consumers who obtain cooling from a geothermal energy system there may also be small consumers who obtain cooling from, for example, a collective cooling installation instead of a geothermal energy system. This is a very small sector of the market which covers a wide variety of situations. The potential for energy efficiency will thus generally be negligible. If it nevertheless proves to be technically possible and cost-effective to install cooling meters, a meter will of course be installed in these situations.

In principle, it is assumed that individual consumption meters can be installed cost-effectively. If there are any instances in which the installation of these individual heating meters is not cost-effective the supplier must explain why and must consider alternative cost-effective methods of measuring heat consumption. The evaluation must not be limited to the energy-efficiency benefits obtained by the supplier, but must also examine the energy-efficiency benefits to be obtained by customers with an individual meter.

The calculation of this can be based on, for example, the method described in EN standard 15459 (Energy Performance of Buildings - Economic evaluation - procedure for energy systems in buildings). If it is not technically possible or cost-effective to install an individual consumption meter, the supplier will preferably install heat cost allocators on radiators.

If this is not technically possible or cost-effective, only then can the supplier propose alternative calculation methods. This provision is already included in the Heating Act for the allocation of costs to small consumers of heating in apartment complexes. It is not currently necessary to establish further rules for cost allocation for large consumers of heating and for large and small consumers of cooling.

The Remotely-Readable Meters Decree (*Besluit op Afstand Uitleesbare Meetinrichtingen*):

- specifies the functions that a smart meter must have;
- establishes rules for securing the metering data and personal data (in combination with the Personal Data Protection Act (*Wet Bescherming Persoonsgegevens*));
- specifies that a smart meter must ensure that a customer who produces electricity with a solar panel, for example, can see how much energy has been supplied to the network;
- implements the requirement that the meter must be able to link to user applications so that readable and usable information can be exchanged with the party entitled to process that information.

Article 9(2) of the Directive provides that a customer with a smart meter must receive clear information from the supplier about the input of electricity to the network and the off-take from the network. This information must facilitate the comparison of deals offered by other suppliers. This requirement has already been implemented in the Energy Cost Statement Decree (*Besluit Kostenoverzicht Energie*). Small consumers can authorise a third party to view their metering data by means of an explicit authorisation.

Under Article 9(2)(e) of the Directive, a customer must be given advice and information at the time of installation of a smart meter. This information must lead to the proper utilisation of the features of a smart meter. The amendment to the EU Energy Efficiency Directives (Implementation) Act (*Wet*

Implementatie EU Richtlijnen Energie-Efficiëntie) proposes to oblige the installer of the smart meter at a small consumer's premises, usually the network operator, to provide this information. This information puts the customer in a better position to save energy. The party installing the smart meter must also provide information about the data on the smart meter's display and the possibilities offered by the P1 port. This is the consumer data port on the smart meter to which, for example, displays and energy management systems can be connected. A list of the energy management systems, such as www.energieverbruiksmanagers.nl, that can be connected to the smart meter can be provided. Parties other than the party responsible for installation can of course always inform customers of the energy-saving features of the smart meter.

Metering and billing

The regulations for the billing of final customers that do not have a smart meter and minimum requirements for information on the bill have already been partly implemented in the Energy Cost Statement Decree that was amended as of 1 July 2015 to the Energy Billing, Consumption and Indicative Cost Statement Decree (Besluit Factuur, Verbruiks- en Indicatief Kostenoverzicht Energie). These requirements also apply to bills for heating and cooling, even if the consumption of heating and cooling is not measured with a smart meter.

Under Article 10 of the Directive, the information contained in these bills should not be considered as constituting a request for payment. In these cases, flexible arrangements must be offered for actual payments. This regulation is consistent with practice in the Netherlands, where customers make largely equal monthly payments in advance and receive the final bill annually in arrears on the basis of their actual consumption. The cost statements that the customers receive in the interim allow them to adjust their energy consumption. These cost statements provide information about actual periodic consumption and the associated costs. The advance payment system has the advantage that the customer pays the same amount for energy every month. In view of the introduction of the smart meter there is not believed to be any economic justification for increasing the frequency of billing or the amount of billing information for customers who do not have a smart meter. Customers with a smart meter can receive a two-monthly consumption and cost statement. It is stipulated in the Energy Billing, Consumption and Indicative Cost Statement Decree that a supplier of gas or electricity is obliged to issue a two-monthly consumption and cost statement when the customer has a remotely-readable gas or electricity meter that is remotely read. Providing customers who do not have smart meters with this kind of information more often places burdens both on the customer and the energy supplier, while all customers who so choose can be provided with a smart meter in the next few years. Furthermore, this does not exclude the possibility of customers themselves agreeing with the energy supplier about the frequency of bills or billing information. The option in the Directive to have a different metering and billing policy for gas used only for domestic cooking purposes is not being employed in the Netherlands.

Article 10(2) of the Directive stipulates that customers that have a smart electricity or gas meter shall receive accurate billing information based on actual consumption. Information on, for example, consumption history, must be easily available. The customer must also be able to access detailed data on consumption over a range of consumption periods (daily, weekly, monthly, annually) online or through the meter interface for a period of 36 months or, if the contract period is shorter, for the duration of the contract. This section is only applicable to smart meters for electricity and gas. The Remotely-Readable Meters Decree contains requirements that ensure that smart meters allow for

the issuing of accurate billing information based on actual consumption. The easy accessibility of the measurement data of electricity and gas is set out in the Energy Billing, Consumption and Indicative Cost Statement Decree. A supplier of aviation and shipping fuel must also issue the billing information contained in this paragraph. Customers in these sectors are not the party that performs the actual refuelling but the party that pays the bill. These requirements are already implemented in the EU Energy Efficiency Directives (Implementation) Act. This means that further implementation for these sectors is not necessary.

Article 10(3) of the Directive provides that information about the billed energy and historical energy consumption must, to the extent it is available, be made available at the request of the customer to an energy service provider designated by that customer. Network operators must already provide small consumers of electricity and gas with quarter-hourly, hourly and daily values free of charge. It is provided for in the Energy Billing, Consumption and Indicative Cost Statement Decree that, at the request of large consumers, an energy supplier or a fuel supplier must provide the available bills and consumption and cost statements to an energy service provider designated by those final customers.

It is set out in the Energy Billing, Consumption and Indicative Cost Statement Decree that energy suppliers are obliged to inform small consumers who have a remotely-readable gas or electricity meter that is remotely read of the quantity of energy purchased according to every consumption and indicative cost statement in the preceding 36 months or in the period of the supply contract. The EU Energy Efficiency Directives (Implementation) Act provides that a network operator (for the electricity and gas sectors) or a supplier (for the heating and cooling sectors) must provide information on billed energy and consumption history to large consumers. It also includes the principle for implementing this requirement for all groups of consumers, such as in the Energy Cost Statement Decree. Article 2 of this Decree states that an energy supplier or supplier of fuel must issue a bill to a final customer at least once a year for the energy or fuel purchased.

It is set out in the Energy Billing, Consumption and Indicative Cost Statement Decree (Besluit Factuur, Verbruiks- en Indicatief Kostenoverzicht Energie) that customers can choose to receive electronic billing information and the invoice must be explained in a comprehensible manner. If a consumption or indicative bill is issued once a year, then it shall contain the contact details and the internet addresses of consumer or similar organisations that provide information on energy-saving measures, comparative consumption profiles or on the objective technical specifications of energy-consuming equipment. The information concerned includes current prices, actual energy consumption, comparisons of current consumption with the previous year's consumption and with that of similar customers, and contact information for organisations where information can be obtained about energy efficiency, benchmark information from similar customers and objective technical specifications for energy-consuming equipment.

Finally, Article 10(e) of the Directive specifies that consumers be provided with information and energy cost estimates in a timely manner on demand and in an easily understandable format enabling consumers to compare deals on a like-for-like basis. A basis is included in the EU Energy Efficiency Directives (Implementation) Act for the purpose of implementing this requirement. In practice, there are also many websites where consumers can compare energy cost estimates, deals or billing information. The ACM has reached an agreement with the energy suppliers that special offers shall henceforth be tailored, whereby the actual consumption of electricity and gas must be used as it can be found, for example, on the annual settlement. A tailored offer will prevent a situation where the actual costs are very different to those costs that were anticipated under the special offer. It has also been agreed that the suppliers shall all use clear and identical terminology. The ACM shall monitor compliance with these agreements.

Article 11(1) specifies that customers should receive all their bills and billing information for energy consumption free of charge, and have access to their consumption data in an appropriate way and free of charge. The 1998 Electricity Act, the Gas Act, the Heating Act and the EU Energy Efficiency Directives (Implementation) Act contain a basis for further implementing these provisions. Under these bases it is provided for in the Energy Cost Statement Decree that costs cannot be charged for providing the bill or the consumption and indicative cost statement. This does not rule out the possibility that energy suppliers will award to customers who choose electronic billing and billing information an advantage.

Article 11 also specifies that the distribution of the costs of billing information for the individual consumption of heating and cooling in multi-apartment and multi-purpose buildings must be performed free of charge. However, third-party costs may be passed on to a customer. This section requires implementation in the Heating Act and the EU Energy Efficiency Directives (Implementation) Act. With this bill, it is proposed to include in these acts a basis for implementing the provision of the Directive in the Energy Cost Statement Decree. The Energy Cost Statement Decree will then ensure that a supplier of heating and cooling to multi-apartment and multi-purpose buildings does not charge for the billing of individual consumption. Under the current provisions of the Heating Act, a supplier of these multi-apartment and multi-purpose buildings may still charge the metered tariff to cover the cost of managing and maintaining the heating meter or cost allocators/cost allocation. The option to pass on third-party costs to customers will not be used. The Heating Act already provides for a standard, reasonable tariff for activities which are charged in connection with the supply of heating. This would also be detrimental to the 'No More than Otherwise' (*Niet Meer Dan Anders*) principle of the Heating Act. There is no need to provide for regulation of tariffs for the supply of cooling either.

3.1.4 Information programmes and training (EED: Articles 12 and 17)

Examples of instruments and policies implemented in the Netherlands to promote behavioural change through fiscal incentives include the Energy Investment Allowance (Energie-investeringsaftrek (EIA), Article 3.42 of the 2001 Income Tax Act (Wet Inkomstenbelasting 2001)) for small entrepreneurs and the excise on mineral oils (Section 6, Chapter II of the Excise Duty Act (Wet op de Accijns) for small customers and consumers.

The Netherlands Enterprise Agency distributes information via the internet about, for example, sustainable leases for buildings (Green Leases) performance contracts for the management and maintenance of buildings, and forms of mortgage which are combined with energy-saving measures. The website www.energiesubsidiewijzer.nl has been developed by the Netherlands Enterprise Agency and provides a list of subsidies, loans and other schemes for energy efficiency.

Milieu Centraal and the National Institute for Family Finance Information (Nationaal Instituut voor Budgetvoorlichting) provide consumers with information about energy efficiency via the website www.bespaartest.nl.

On 17 October 2016 the *Energie besparen doe je nu* ('Save energy now') campaign was launched, an initiative of the Government, the VNG (Association of Netherlands Municipalities - Vereniging van Nederlandse Gemeenten), the advisory organisation Milieu Centraal and the NEA (RVO.nl). The campaign focuses on homeowners of a label C or lower residence who are considering energy-saving measures but have not yet implemented them because of, for example, the expense, the investigation required or the mess created. The campaign focuses on both owner-occupiers and owners' associations and shall run for three years. A campaign website was created to provide clear and independent information on, for example, the costs and returns generated by energy-saving measures. Links are also provided to the regional energy points of contact of municipalities and companies. The campaign also entails close cooperation with other parties, such as builders, insulating companies, energy suppliers, network operators, nature conservancy and environmental organisations, municipalities, estate agents and banks.

There are various enterprises offering energy services in the Netherlands. The independent network organisation Esconetwerk aims to put these parties in a better position to gather information about the provision of energy services and to utilise opportunities in this field. Esconetwerk's focus is on reducing the cost of setting up an energy service provision contract between the energy service provider and the owner, manager and/or user of a building and to increase the quality of the energy saving measures in these buildings. These measures provide banks and other financial institutions with information about the possibilities of participating in the financing of measures to improve energy efficiency, by setting up public-private partnerships, for example.

3.1.5 Availability of qualification, accreditation and certification schemes (EED: Article 16)

The level of competence, objectivity and reliability of energy advisors in the Netherlands is very high. There are various training programmes for energy advisors and certifying bodies are available for the certification and accreditation of the training programmes for energy advisors. An example of a certifying body is the Stichting Kwaliteitsborging Installatiesector (Foundation for Quality Assurance in the Installation Sector (KBI)). Stichting KBI is an industry organisation which, amongst other things, certifies the design, installation and management of installations and assesses means of ventilation in dwellings. Another example of a certifying body is the Stichting Coördinatie Certificatie Milieu- en Arbomanagementsystemen (Platform for Certification of Environmental and Occupational Health and Safety Management Systems (SCCM)). Stichting SCCM is working on an unambiguous certificate for ISO 14001 (environment), EMAS (environment) and ISO 50001 (energy), amongst others. The SCCM establishes certification systems for this and publishes them on its website.

The Accreditation Council (Raad voor Accreditatie) supervises the certifying bodies. This structure contributes to realising the national energy efficiency objectives. On the Stichting Milieu Centraal website, which focuses on consumers, the importance of a certified customisation consultant is highlighted.

3.1.6 Energy services (EED: Article 18)

The Netherlands Enterprise Agency website distributes information to promote the market for energy services and access of small and medium-sized enterprises to this market. This information includes a template for a performance contract for the supply of heating and/or cooling by an ESCo and a number of other performance contract templates. The website of the Netherlands Enterprise Agency also provides information about financing structures and possible subsidies, such as the EIA.

The NEA website now also contains an Awarding of Contracts Guideline (*Leidraad Aanbesteden*) and four white papers in which examples of energy performance contracts are extensively described (www.rvo.nl/esco). An infographic is also available. The examples can also be found in a database (www.rvo.nl/energiezuiniggebouwd). A national ESCo congress is also hosted. The close of 2016 saw the introduction of the approach using EPC (energy performance contract) facilitators - expert and independent consultants who can support public contracting authorities in considering and/or inviting tenders for energy services.

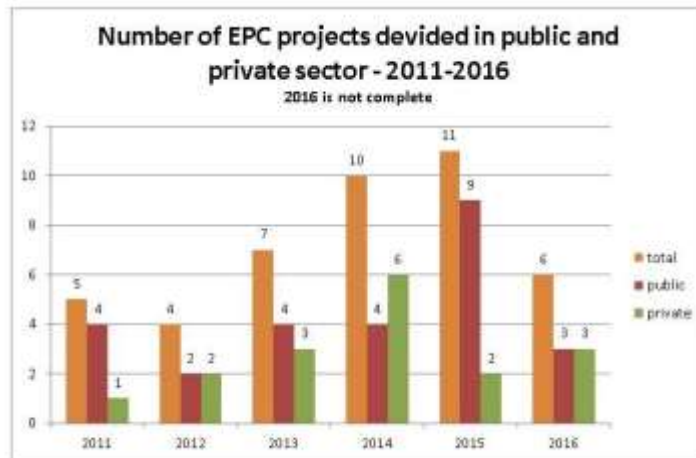
The Sustainable Housing Platform, (Platform Duurzame Huisvesting (PDH)) has created a menu of performance contracts, an online tool that allows contracting parties to easily create a customised energy performance contract. The PDH has also published an infographic with ten tips for contracting authorities and a guideline for energy legislation-compliant offices (Energiewetgeving Kantoren).

Energy service providers are listed on the internet (www.esconetwerk.nl). The list includes 41 suppliers and relevant parties. There are certainly many more service providers available in the Netherlands, but these providers are not (yet) part of this accessible network.

In 2015 some 40 ESCo's signed the Code of Conduct that was developed under the EU Transparensie programme.

The extent of the use of ESCo services is on the rise in the Netherlands. At the end of 2016 the NEA estimated, on behalf of the EU programme GuarantEE, that at that time it was aware of 57 energy performance contracts, 28 in the public and 27 in the private sector (see figure 3.1). As of 2017 energy performance contracts will also be monitored.

Figure 3.1 Growth of energy performance contracts (EPC)



They are however expected to increase significantly in the coming years because the working method fits in with a trend towards further cooperation, not simply tendering on the lowest price, but on the cost-profit ratio and finding and using core competencies (not every company is good at all aspects of operation). It is difficult to say how quickly the use of these services will rise, as it is also subject to conservative forces. Energy performance contracts have a future, but they will develop slowly.

At an EU level the NEA works together with EU partners through a range of programmes to encourage energy services and energy performance contracts:

- Transparens - Code of Conduct
- IEA Task 16 – demand-side management
- Horizon 2020 - GarantEE
- IEE - SME EnergyCheckUp

The *Green Deal MKB Projecten* (Green Deal for SME Projects) provides updated and objective information on energy-efficiency and how it can be implemented to small and medium-sized enterprises and encourages the adoption of energy-saving measures by SMEs.

3.1.7 Other horizontal energy-efficiency measures (EED: Articles 19 and 20)

The independence of the network operators is guaranteed in the 1998 Electricity Act and the Gas Act (House of Representatives, 30 212). Good market access is assured by existing energy regulations and competitive trading legislation. We are also implementing this by making an open standard compulsory for the consumer port on the smart meter. This obligation is included in the Remotely-Readable Meters Decree. This moreover gives third parties access to the measurement data obtained by the network operator via the smart meter, provided they obtain explicit consent to this from the small consumer (privacy regulations).

The problem of the split incentive in social housing is solved by the Housing Valuation System (*Woningwaarderingstelsel* (WWS)) in which investments in improving energy efficiency are encouraged by means of a points system based on the energy label. An energy-efficient dwelling results in more points under the points system than a dwelling that is not energy efficient.

From 2016, the Central Government Real Estate Agency (Rijksvastgoedbedrijf) will also always take energy costs into account in housing costs. The Central Government Real Estate Agency will therefore also take on the costs of energy for offices and will be entirely responsible for the energy management of the buildings owned by it. This avoids a split incentive. For other buildings, different market parties will work together in a Sustainable Housing Platform (Platform Duurzame Huisvesting) to remove obstacles. One possible solution to the split incentive problem is sustainable leases for buildings. The Sustainable Housing Platform has created the Green Lease Guidelines (*Leidraad Green Lease*) and the Green Lease Menu (*Green Lease Menukaart*) online tool for this purpose. The latter is a simple tool for landlords, tenants and maintenance companies for laying down agreements in leases on making buildings sustainable and energy-efficient. The amended version for municipalities was published in early 2016.

The Netherlands has established two revolving funds on the basis of the Housing Agreement (Woonakkoord) (Parliamentary papers II, 2012/2013, 32 847 no. 42) for the purposes of fleshing out the alternative policy measures pursuant to Article 7 of the Directive. A total of €150 million in public funds has been made available for them. A National Energy-saving Fund (*Nationaal Energiebespaarfonds* (NEF)) has been created with Rabobank and ASN Bank for owner-occupiers and owners' associations. The banks came on board through a public process and the fund, which was launched in 2014, is doing well. A fund for landlords has also been launched, which launched at the close of 2014 and where there is still room for improvement. Both funds assume a ratio of one-quarter public funds to three-quarters private sector money, providing a total incentive of €600 million. The government is also providing landlords in the social rental sector with a subsidy of € 400 million for investments in energy-efficiency in the 2014-2018 period with the aim of contributing to the objectives of the Energy-saving Agreement for the Rental Sector (Convenant Energiebesparing Huursector).

3.2 Energy efficiency in buildings

3.2.1 Building renovation strategy (EED: Article 4)

Article 4 of the EED requires EU Member States to establish a long-term strategy for the renovation of buildings. The basis of the Dutch response (see Annex II) to this mandatory long-term strategy is the Energy Agreement (Energieakkoord) signed in 2013 by 40 parties, public and private, with firm ambitions, objectives, intentions and agreements for energy saving in many spheres in the Netherlands. At the end of 2016 the Cabinet presented the Energy Agenda. This agenda sets out the broad long-term lines until 2050. The Energy Agenda shall have a major impact on the renovation strategy for buildings.

The point of departure of the Energy Agreement is that building owners – i.e. housing associations, citizens, companies, institutions and public bodies – have an interest in and are responsible for energy-efficiency, but that they also require support in that respect. A coordinated effort on the part of the Central Government, municipalities, contractors, builders, installation companies, banks, building owners and landlords is required. A combination of *information and awareness, facilitation and financial support* was selected.

Over the longer term the strategy for achieving CO₂-neutral low-temperature heating in the Netherlands by 2050 is set out in the Energy Agenda. The large-scale return of the use of natural gas in the built environment is a decision with major consequences. The strategies shall be further

worked out at a regional level, as the alternatives for heating spaces in the built environment can differ at regional and local levels. Energy-saving will become a part of these regional strategies.

A Guarantee Committee was instituted when the Energy Agreement was concluded in 2013, which oversees compliance with the agreements and provides insight into the results of the Energy Agreement. The Guarantee Committee ensures that the measures agreed to in the Energy Agreement are adopted, and that the agreement goes beyond intentions alone. In this scope the National Energy Outlooks (*Nationale Energieverkenning* (NEO)) were published in 2014, 2015 and 2016. The National Energy Outlook is a survey that is conducted annually and analyses Dutch energy management and sketches out plausible future developments under established and proposed policies. The measures of the Energy Agreement for Sustainable Growth are included in these assessments.

On the basis of the results contained in the 2015 National Energy Outlook, a package of intensifying measures was established in the spring of 2016, of which the label C obligation for offices is the most important for energy-saving in the built environment.

The impact of this package of intensifying measures in the built environment is estimated to amount to 10.0 PJ in 2020 (6.7-27.7 PJ bandwidth) (assessment of the package of intensifying measures for the Energy Agreement, ECN 2016). Not all of these measures in the intensification package have already been included in the 2016 National Energy Outlook because they have not yet been worked out to a sufficient degree. On the basis of the established policy and proposed (sufficiently concrete) policy, the final energy saving in the built environment is estimated to be 27 PJ per year (13-43 PJ bandwidth).

Further measures were agreed to in the autumn of 2016, in particular the obligation to phase out rental housing with a label lower than label C. This measure will result in an additional energy saving of approximately 5 PJ in comparison to the 2016 NEO.

Annex II contains all the measures with respect to energy-saving in the built environment within the framework of the Energy Agreement. This summary contains a number of examples that characterise the strategy.

The Ministry of the Interior and Kingdom Relations launched a three-year **national activation campaign** called *Energie besparen doe je nu* ('Save energy now'), which aims to encourage private homeowners to save energy in their own homes by increasing the sense of urgency and tackling frequently asked questions and objections. The campaign can cover all homeowners with a label C or lower residence. Aside from radio and television advertisements there is also a campaign website where homeowners can pose questions, examine the measures and options for subsidies and where they are referred on to **municipal energy points of contact** and product and service providers.

Bouwend Nederland (the sector organisation for Dutch construction and infrastructure companies), Uneto-VNI (the employers' organisation for the installation industry) and OnderhoudNL ((the employers' organisation for real estate maintenance) have jointly set out the outlines of the **Duurzame Aanbieder** ('Sustainable Provider') profile, which contains specific conditions for contractors who aim to offer owner-occupiers more tailored products and services for making their homes sustainable. Contractors (or consortiums of contractors) that qualify as *Duurzame Aanbieder* are distinguished from non-qualifying contractors in that respect. The *Duurzame Aanbieder* profile is available as of the end of 2016.

The guarantee bodies Stichting Bouwgarant (a quality mark institution for the construction industry), Stichting Waarborgfonds Koopwoningen (an owner-occupied housing guarantee fund (SWK)) and the house-builders' certification institute Woningborg Advies BV have developed an **energy performance guarantee** that affiliated contractors are able to use. The use of the energy performance guarantee is a precondition for participation in local/regional Innovative Approaches (*Innovatieve Aanpakken*) and for qualifying to use the *Duurzame Aanbieder* profile. The terms and conditions of each provider of an energy performance guarantee are bound to the application of this guarantee product.

On 1 September 2016 an **Energy-saving at Home subsidy scheme** (*Energiebesparing eigen huis*) was published, providing a budget of 60 million euros to homeowners who implement at least two major insulation measures. For an integral and very low-energy package (the insulation package that is associated with a zero-energy home) a bonus of €4 000 over and above the subsidy is available. A subsidy is also available for energy recommendations and for creating a green long-term maintenance programme for owners' associations.

The Ministry of the Interior and Kingdom Relations has studied the design and possible consequences of a **mandatory energy-saving for offices**. Over half of the office space (in excess of 80 million m²) presently has an energy label below that of label C. If the offices were required to attain label C by 2023, this would result in an additional saving of 8.6 PJ in that year. The average payback period is between 3 and 6.5 years. The majority of offices could attain a label C without being subjected to expensive construction modifications. Publication of this measure is scheduled for 1 January 2018 at the latest, with it taking effect and being enforced as of 1 January 2023.

3.2.2 National Plan for Promoting Nearly Zero-Energy Buildings

Under Article 9 of the EPBD, a National Plan for Nearly Zero-Energy Buildings (NZEB) is required. The National Plan for Promoting Nearly Zero-Energy Buildings sketches out the Dutch strategy for having nearly zero-energy buildings after the end of 2018 or 2020.

A number of important steps have been taken in respect of the 2012 plan. The most important ones are:

- the legislation for new buildings and existing buildings has been amended;
- the definition of nearly zero-energy has been amended and laid down;
- the energy performance of buildings (EPC) has been tightened up for the interim;
- the roadmaps have been added.

Article 9 of the EPBD states that the National Plan must include the following components:

1. A definition of nearly zero-energy buildings (NZEB).
2. Interim targets for improving the energy performance of new buildings.
3. Information on the policy pursued and measures for promoting zero-energy buildings.

Re. 1. NZEB

On 24 November 2015 some parts of the Buildings Decree 2102 (Bouwbesluit) were amended. The Buildings Decree was, inter alia, amended as follows. The term 'almost zero-energy building' was defined in Article 1.3 as 'a building with a very high energy performance, whereby the quantity of energy required is close to zero or very low and is to a very considerable degree supplied by renewable sources that are partially generated on-site or close thereto.' New subsections were

added to Article 5.2 that determined that government buildings must, as of 1 January 2019, be nearly zero-energy and that the remaining buildings must be nearly zero-energy as of 31 December 2020, thereby transposing Article 9(1)(a) and (b) of the EPBD.

In a letter to the House of Representatives dated 2 July 2015 it was stated that the term ‘nearly zero-energy building’ (*bijna energieneutraal gebouw*) would be further interpreted on the basis of three proposed new requirements. The energy performance of nearly zero-energy buildings is determined on the basis of the three new requirements: the NZEB indicators (*BENG-indicatoren*).

These three NZEB indicators are:

1. The energy requirements
2. The primary fossil fuel energy usage
3. The share of renewable energy

The following overview provides an outline of the proposed standards:

Building function	Energy requirement	Energy usage [kWh/m ² .yr]	Sustainable energy [%]
Residential building	25	25	50
Non-residential building	50	25	50
Schools	50	60	50
Healthcare buildings*	65	120	50

*Healthcare buildings where patients can stay.

The proposed requirements are not yet definitive, and in 2017/2018 it will be assessed whether the requirements are at a cost-optimal level. It is expected that the requirements will be easily financially feasible in 2021 for the majority of buildings.

Re. 2 Interim tightening up

The energy performance of new buildings has been periodically tightened up since the introduction of the energy performance coefficient (EPC). The feasibility of these tougher measures was investigated each time through feasibility studies. Not only was the financial feasibility examined in this respect, but other aspects to, such as the market maturity of new technology.

The EPC requirement for homes started in 1995 at $EPC \leq 1.4$. The tightening up of the EPC as of 1 January 2015 to ≤ 0.4 has already been implemented. Just as with homes, the EPC for non-residential buildings has also been tightened up to a level 50% greater than the 2007 levels. The next step will involve toughening up the energy performance requirement until it reaches nearly zero-energy.

Re. 3. Measures and policy

Aside from the new provisions in the Buildings Decree in respect of new buildings, the building refurbishment regulations concerning thermal insulation were also tightened up on 24 November 2015 (Article 5(6)(2) of the Buildings Decree), transposing Article 7(3) of the Directive.

Government buildings must set an example

A new Article 2.5 was, inter alia, added to the Energy Performance (Buildings) Decree by a resolution on 4 November 2015, which provides that government buildings must fulfil the recommendations contained in the energy label issued for that building within the deadline period for that energy

label. The amendments to the Energy Performance (Buildings) Decree meant that a number of provisions from the revised EPBD that had not yet been (fully) transposed were now transposed. These amendments, through which the Directive is also strictly implemented, mark a further contribution to the objectives of the revised EPBD.

Method for determining indicators

An assessment method will be developed for determining the indicators for Nearly Zero-Energy Buildings (NZEB) that takes into account the (CEN-)EPB standards that are expected to be available in 2017. In order to encourage market parties to develop buildings that comply with the NZEB requirements already at this stage, the NZEB Guide (*Handreiking BENG*) has been created. The NZEB Guide details how the NZEB indicators can be determined from the current NEN 7120 method for determining indicators.

Roadmaps

The Netherlands has created roadmaps in order to encourage the increase in zero-energy buildings in the country. The objective here is to utilise new building projects to the fullest for the purpose of the market's learning capacity. The gaining of knowledge and the learning process for developing nearly zero-energy buildings is set out in the residential housing roadmap (*ZEN programme* (Very Energy-Efficient New Buildings programme)) and in a non-residential building roadmap (*Pilot overheidsgebouwen* (Government Buildings Pilot Project)).

Communication: Informing stakeholders about NZEB

In order to encourage the development of new zero-energy buildings, a range of communications resources are employed. These include the publication of Articles that deal with NZEB requirements in various media outlets and expanding the information available on www.rvo.nl/BENG, so that the *Database Energiezuinig Gebouwd* (Energy-efficient Building Database) is used for obtaining information using current examples of energy-efficient and innovative projects. Focus group meetings are to be hosted where representatives from all the relevant market parties will be able to obtain information. A webinar and infographics will also be used to show the changes.

Reference buildings

A new set of reference buildings will be compiled that comply with the proposed NZEB requirements. These reference buildings can be used to gain an understanding of the feasibility and consequences of design choices.

Existing Buildings and Financial Arrangements

In order to encourage nearly zero-energy buildings, there are a range of subsidies and financial arrangements available in the Netherlands for the use of energy-saving measures in existing buildings.

Those measures that cover the transformation of existing buildings that are being renovated to become nearly zero-energy buildings are dealt with in the NEEAP4 report that deals with Article 4 of the EED.

3.2.3 Inspections of installations (EPBD Article 14, 15), inspection reports of installation inspections (EPBD Article 16), independent experts (EPBD Article 17) and an independent auditing system (EPBD Article 18) for inspections

In implementing the inspections for heating and air-conditioning systems, the starting point was to

have the inspections correspond, insofar as is possible, with the maintenance cycle of the regular maintenance and management of building installations.

For gas-fired heating systems of 20-100 kW, the report on equivalence as required under Article 14.4 of the EPBD is included in Annex IV.

Table 3.2 Inspections of installations, inspection reports of installation inspections, independent experts and an independent control system for inspections

	Heating systems		Air-conditioning systems
	Art. 14-1, 2, 3 gas-fired systems > 100 KW and non-gas-fired systems >20 KW	Art 14-4 gas-fired systems 20- 100 kW	Art 15-1, 2, 3 air conditioning systems > 12 KW
Inspection (art. 14 and 15) Inspection report (art. 16)	Required inspection pursuant to the Environmental Management Act, the Activities Regulation and the Activities Decree	Voluntary inspection with recommendations and generic recommendations to user groups/consumers through public campaigns, information, websites, energy label	Required inspection pursuant to the Energy Performance (Buildings) Decree and the Energy Performance (Buildings) Regulation. www.aircokeuring.nl
Independent expert (art. 17)	SCIOS-certification scheme www.scios.nl/	Quality labels/accreditation schemes for installers: OK-CV www.ok-cv.nl Sterkin, KvINI	Accredited experts in the national quality register www.qbisnl.nl
Independent control system (art. 18)	Regulatory bodies have access to a database of inspection reports	Accredited experts in the national quality register www.qbisnl.nl.	Inspectie Leefomgeving en Transport (the Environment and Transport Inspectorate) is the competent body for checking and enforcing the obligation to conduct inspections.

Since the implementation of the regulations a range of amendments have been introduced for the purpose of achieving far-reaching energy saving and energy efficiency, such as:

- Amendments to the Activities Decree/Regulation, including tightening emission requirements, amending training requirements for inspectors and the maximum period before an initial special inspection must be conducted;
- For the voluntary inspection of central heating systems, the installers are encouraged to join a quality mark under which they undertake to receive training and write exams, issue written inspection reports to the customers and report back to the certification body on performed inspections and energy-saving recommendations provided. The government has provided a grant to the sector for 2016 so that a communication campaign focussing on consumers can be conducted.
- Further communications aimed at building owners concerning required air-conditioning inspections, further control and enforcement as well as the inclusion of possible sanctions for the competent body in the regulation.

3.2.4 Other energy efficiency in the buildings sector

Table 3.3 shows part of the annual savings for the built environment. A list of the measures can be found in Annex I.3.

Table 3.3 Annual savings for dwellings (bottom-up) (excluding electrical equipment)

	2008	2009	2010	2011	2012	2013	2014	2015
Savings from residential buildings/year (GWh)	1550	1500	1400	2100	1950	2150	1950	2450
- new buildings (GWh)	0	300	250	300	250	400	350	400
- existing buildings (GWh)	1560	1200	1150	1800	1700	1750	1600	2050
Total saving in comparison with 2007 (GWh)	1550	3050	4450	6550	8500	10650	12600	15050
Total saving in comparison with 2000 (GWh)	13000	14500	15900	18000	19950	22100	24050	26500

3.3 Energy efficiency in public bodies

3.3.1 Central Government's buildings (EED: Article 5)

Article 5 of the EED obliges Member States to renovate 3% of the floor area of buildings owned and occupied by its central government each year and offers Member States the opportunity to opt for an alternative approach to achieve an equivalent objective. On the basis of Article 5(6) the Netherlands has opted for an alternative approach.

For the choice of an alternative approach, the Energy Research Centre of the Netherlands (ECN) has compared the saving delivered by the 3% renovation obligation with the saving realised by the Netherlands with an alternative approach. The ECN has set out its findings in the report *Alternatieve aanpak artikel 5 Energy Efficiency Directive* ('Alternative approach to Article 5, Energy Efficiency Directive') (Menkveld 2013). The ECN report contains macrodata about the group of government buildings covered by Article 5 of the Directive. On the basis of its investigation, the ECN has demonstrated that the existing approach already produces greater energy-efficiency than would be achieved by renovating 3% of the buildings each year.

The Central Government has adopted an array of measures for reducing energy consumption. Techniques are employed during maintenance, renovation, conversions and the construction of new buildings, such as heat recovery, thermal energy storage in the soil (for large buildings), photovoltaic solar energy, energy efficient lighting (such as LED) and ventilation, and automatic controls set according to current requirements. For projects currently being developed the large-scale use of renewable energy is being considered. At present the counter for solar panels stands in the region of 15 000 m², a figure that is set to increase with new projects.

The savings objective of an average of 2% per annum means that the Cabinet is aiming for what is in fact an energy and efficiency improvement. The shrinking of the Central Government and for a limited (as yet unquantifiable) part thereof, the downsizing in office space, means that greater savings are achieved than the saving expressed per m² GFA (gross floor area). That is why this report also states the complete consumption, aside from consumption per square meter.

The energy consumption per m² GFA for 2015 demonstrates a decrease of 4% when compared to 2014. Electricity consumption (19 MJ/m²) went down by 2.2% and the gas consumption (MJ/m²), corrected for heating degree days, decreased by around 5%. Over the entire 2008-2015 period around 21% in energy was saved per m²; an average of 3% per year. This means that the Cabinet

objective for energy saving was reached. The saving objective for government buildings as set out in Article 5 of the EED was also easily achieved.

Total electricity consumption in 2015 declined by 6% when compared to 2014. Gas consumption corrected for heating degree days decreased by 9% compared to 2014. Total consumption (of electricity and gas) decreased by 8% in 2015 compared to 2014. Over the 2008-2015 period around 30% in energy was saved; an average of 4% per year.

A large proportion of government buildings has also been provided with an energy label in accordance with the EPBD. A list of these buildings, with relevant energy information, is available to the public in the relevant register of labelled buildings (<http://www.ep-online.nl/Default.aspx>).

Table 3.4 shows how the labels are distributed.

Table 3.4 Distribution of label classes across government buildings (as of 01/01/2016)

Label class	Number of buildings
A	20
B	19
C	36
D	21
E	31
F	10
G	48
Monument – no energy label	26
Final energy label not yet known	46
Total	257

3.3.2 Other public bodies' buildings (EED: Article 5)

In addition to the obligations for government buildings, other public bodies and housing associations must also be encouraged to take saving measures. The Minister of Infrastructure and the Environment is encouraging municipal and provincial authorities to draw up a local climate agenda setting out energy efficiency objectives. A local climate agenda also contains policy for reducing energy consumption in the built environment. The *Stappenplan Klimaatneutrale Gemeentelijke- Provinciale Organisatie* ('Roadmap to a climate-neutral municipal and provincial organisation') is one of the measures developed to achieve this.

Rijkswaterstaat (the Directorate-General for Public Works and Water Management), Environmental Department, assists with the drafting of a local climate agenda. See also the websites: <https://klimaatmonitor.databank.nl/Jive/>, <http://www.waarstaatjegemeente.nl/dashboard/Energie-en-klimaat--c18/>, <http://www.lokaleenergieetalage.nl/>.

Housing associations are also developing initiatives to reduce energy consumption in the built environment. This is to implement the Energy Saving Agreement for the Social Rental Sector (Convenant Energiebesparing Sociale Huursector), which the Minister for Housing and the Civil Service has entered into with the housing associations. The Agreement sets the objective for the housing association sector to achieve a label B average energy consumption by 2020, being an energy index of 1.25. This target (in terms of the energy index) was also adopted in the later Energy Agreement for Sustainable Growth which was agreed to in September 2013. The agreements are supported by the Central Government through incentivising measures, including the application of

the Housing Valuation System for Investments in Energy Saving (Woningwaarderingstelsel voor Investerings in Energiebesparing), a subsidy scheme for ascending labels, a fund for low-interest loans and, most recently, an energy performance surcharge. It is further set out in the Housing Act 2015 (Woningwet) that housing associations must make an offer on the target stated in the local *Woonvisie* (policy vision document on housing) for, inter alia, energy-saving in the built environment.

3.3.3 Procurement by public bodies (EED: Article 6)

As of 2010 the Central Government is obliged to procure sustainably. Criteria documents have been drafted for over 40 product groups in which six different topics are covered: energy and climate, materials and raw materials, water and soil, health and welfare, nature and biodiversity. Five of these product groups concern government buildings: new buildings, renovation, demolition, management and maintenance and renting and purchasing property. The consequences of the Directive in respect of these 40 product groups were investigated in 2014. The criteria documents were consequently amended and were published in April 2015 on the website of PIANOo (Nederlandse Expertisecentrum Inkoop en Aanbesteden (Netherlands Expertise Centre for Public Procurement and Tendering), part of the Ministry of Economic Affairs). Since 2015 these criteria documents have been updated on a yearly basis, with increasing use being made of the Green Public Procurement criteria set out in the EU programme. This year's update shall take place in April 2017. Moreover, PIANOo introduced a point of contact for socially responsible procurement in 2014. The objective of this point of contact is to support all parties active in public procurement in conducting socially responsible procurement. All the criteria documents are available on the PIANOo website and are transparent and accessible to both public bodies and the private sector. There is also a point of contact (by phone or email) to which public parties engaged in procurement can put any questions pertaining to socially responsible procurement.

The criteria are mandatory for the Central Government, as set out in internal policy frameworks. All other authorities are encouraged to apply the criteria, in respect of which agreements were already reached in 2010, while in 2015 a new action plan for socially responsible procurement was instituted. This plan sets out a transition from exclusion to encouraging suppliers to maximise sustainability of supply. It includes actions to develop and agree on new common goals with other authorities, including in the areas of energy efficiency and renewable energy. It also has a strong focus on implementation through knowledge-sharing, training and the setting of good examples. A new monitoring system is also being developed as part of the plan. The plan contains four prongs:

- common objectives and administrative commitment,
- a new methodology
- for monitoring and benchmarking,
- knowledge and training and governance.

In December 2016 some 100 authorities signed the Socially Responsible Procurement manifesto, committing themselves to creating and publishing a Socially Responsible Procurement action plan wherein, inter alia, attention is to be paid to efforts and objectives with regard to efficiently purchasing energy.

3.4 Other energy end-use efficiency measures in industry and transport

Tables 3.5, 3.6 and 3.7 show the annual savings for industry, including SMEs, agriculture and horticulture and the transport sector. See Annex I for a description of the measures.

Table 3.5 Annual savings of industry/SME under LTA (bottom-up)

	2008	2009	2010	2011	2012	2013	2014	2015
Primary energy consumption LTA industry (incl. EU ETS)* (GWh)	46,988	51,472	58,372	57,989	57,966	64,042	64,372	63,695
Primary energy consumption LTA industry (excl. EU ETS)* (GWh)	21,547	23,903	28,964	30,289	29,978	34,806	35,117	35,638
Saving from process measures (excl. ETS) (GWh)	346	377	910	675	421	1,031	922	584
Saving from Sustainable Energy 'behind the meter'	76	66	50	50	94	109	88	55
Percentage saving a year (%)	1.9%	1.8%	3.2%	2.3%	1.7%	3.3%	2.9%	1.8%
Total saving in comparison with 2007 (GWh)	422	789	1,683	2,359	2,824	3,760	4,682	5,265
Total saving in comparison with 2000 (GWh)	3,355	3,723	4,617	5,293	5,758	6,789	7,711	8,294

* The rise in energy consumption between 2008 and 2012 is almost entirely a result of the entry of new companies. Some new sectors have joined and around 20 companies from the Benchmark Agreement have joined the LTA.

Table 3.6 Annual savings in agriculture and horticulture (bottom-up)

	2008	2009	2010	2011	2012	2013	2014	2015*
Primary energy consumption, greenhouse cultivation sector	34,722	38,056	36,735	34,762	34,939	34,785	33,668	34,782
- Primary energy consumption (electricity) (GWh)	15,000	20,000	15,012	14,591	13,618	14,913	16,201	17,223
- Energy consumption for heat (GWh)	19,445	17,778	21,723	20,171	21,320	19,873	17,467	17,558
Improvement in energy-efficiency index in comparison with 1995	45%	41%	42%	47%	48%	48%	53%	52%
Electricity production by cogeneration (GWh final)	7,500	10,833	12,233	11,734	10,671	10,350	9,381	9,571
Heat production by cogeneration (GWh)	10,000	13,889	14,874	13,661	13,534	12,935	11,359	11,954
Total saving, demand side (cultivation-related) in comparison with EEI 2007 (GWh)	2,222	-1,111	268	3,329	2,880	3,578	6,600	5,214
Total saving, supply side (cogeneration excl. ETS installations) in comparison with EEI 2007 (GWh)	3,889	5,278	5,092	4,862	5,059	4,815	4,745	5,480
Total saving, demand side (cultivation-related) in comparison with EEI 1995 (GWh)	14,167	10,556	11,677	15,074	14,541	15,407	19,016	17,546
Total saving, supply side (cogeneration excl. ETS installations) in comparison with EEI 1995 (GWh)	7,778	9,167	8,661	8,575	8,997	9,110	9,084	9,876
Total saving, demand side (cultivation-related) in comparison with EEI 2007 (GWh)	2,222	-1,111	268	3,329	2,880	3,578	6,600	5,214
in comparison with EEI 1995 (GWh)	14,167	10,556	11,677	15,074	14,541	15,407	19,016	17,546
Total saving, supply side (cogeneration excl. ETS installations) in comparison with EEI 2007 (GWh)	3,889	5,278	5,092	4,862	5,059	4,815	4,745	5,480
in comparison with EEI 1995 (GWh)	7,778	9,167	8,661	8,575	8,997	9,110	9,084	9,876

* provisional figures

Table 3.7 Annual savings in transport (bottom-up)

Shift to efficient passenger cars (label shift plus setting of CO ₂ standards)	2008	2009	2010	2011	2012	2013	2014
Total saving in comparison with 2007 (in GWh)	115	767	943	1255	2151	2935	3483
Total saving in comparison with 2001 (in GWh)	2410	3072	3262	3589	4494	5284	5829

3.5 Promoting efficient heating and cooling

3.5.1 Comprehensive assessment (EED: Article 14)

In 2015 the Commission was informed of the study performed in the Netherlands of the potential for high-efficiency cogeneration and efficient district heating. The report *Naar een Duurzame*

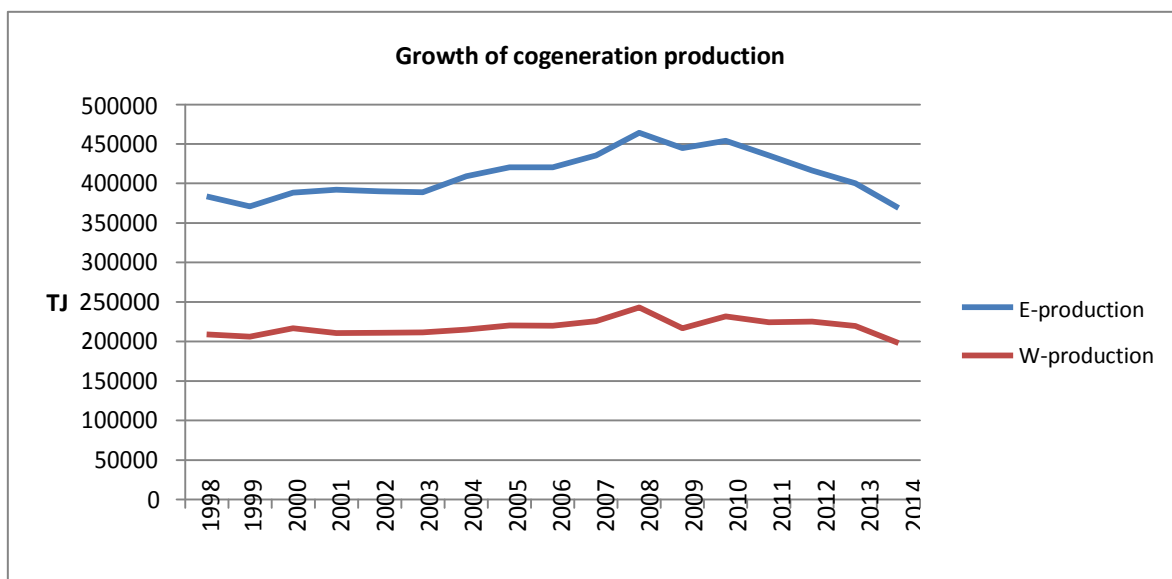
Warmtevoorziening van de Gebouwde Omgeving in 2050 ('Towards a Sustainable Provision of Heating of the Built Environment in 2050') (Wijngaart, 2012) charts the level of CO₂ reduction that can be achieved with energy-saving measures, such as insulating buildings and thermal energy storage, geothermics and regional measures. Within the framework of this study a national cost-benefit analysis (CBA) was conducted for the use of renewable heat, pursuant to subsections 1 and 3 as well as part 1 of Annex IX. The report *Toekomst Warmtekrachtkoppeling en Warmtevoorziening Industrie en Glastuinbouw* ('Future Cogeneration and Heat Supply for Industry and Greenhouse Cultivation') (Buck, 2014) provides a clear picture of the potential for cogeneration and renewable heating in the Netherlands.

The report *Positie van Warmtekrachtkoppeling in de Energie/Warmtetransitie* ('Position of Cogeneration in the Energy/Heating Transition') (NEA 2016) contains a current analysis of the position of cogeneration.

Development of high-efficiency cogeneration

The development of high-efficiency cogeneration is in accordance with the expectations stated in the study into the potential of cogeneration. In 2014 cogeneration made up 34% of the total Dutch electricity supply (26 GWe). The present market conditions of low electricity prices and relatively high gas prices are unfavourable for cogeneration. This is explained by a complex situation of simultaneously arising factors (a limited growth in demand, the increase of renewable electricity available on the network, low coal prices, relatively high gas prices and low CO₂ prices). Under these market conditions gas-fired cogeneration plants are being switched off, particularly in the industrial sector. Lower gas prices mean that cogeneration plants have assumed a slightly better market position, especially the flexible plants. Figure 3.2 shows that cogeneration production was somewhat down up until 2014.

Figure 3.2 Development of cogeneration, figures from Statistics Netherlands



Developments in efficient district heating and cooling

The policy vision document on heating (*Warmtevisie*) letter to Parliament (2 April 2015) sets out the country's vision in respect of rolling out renewable heating within the framework of the transition to a completely sustainable energy supply in 2050. The letter contains the following prongs: 1) energy-saving, 2) the efficient utilisation of (residual) heat and 3) promoting renewable heating. Within the framework of the EED the efficient utilisation of residual heat and the sustainability of district heating and cooling are of particular importance. Through this *Warmtevisie* policy document (TK) the Cabinet bucked the trend by making heating more equitable with electricity and natural gas, the improved utilisation of residual heat and raising the share of renewable heating.

Heating plans are being drawn up by the regions that will demonstrate where there is potential for available heating. The *Nationale Warmteatlas* ('National Heat Atlas') underpins these plans. It has been agreed to, within the scope of the Energy Agreement, with the provinces that these plans will be drawn up. The information concerning the demand for and supply of heating is available in the *Warmteatlas* www.warmteatlas.nl and it is updated. This information will also be available in the *Energieatlas* ('Energy Atlas').

The municipalities are to look into devising efficient and sustainable heating and cooling for the built environment on a decentralised basis. It is within this framework that strategies for an Energy Green Deal were agreed to, and the feasibility of sustainable heating is being further investigated.

An important development among the existing heating networks was the increase in the usage of residual heat from waste incineration plants for supplying the heating networks. In many cases gas-fired cogeneration installations have been replaced with a pipeline to an existing waste incinerator.

Work is ongoing on a very small scale in the heating clusters on the meaningful use of residual heat generated by industry. Identified obstacles are the lack of demand, linking demand to supply and the lack of infrastructure for heating.

The current Heating Act is presently being amended. It provides pricing and other forms of protection to consumers, while its amended version will include the provision that heating suppliers report on the sustainability aspects of the heating they provide.

The Vesta model was developed by the Planbureau voor de Leefomgeving (the Netherlands Environmental Assessment Agency (PBL)) for the national cost-benefit analysis, <http://www.pbl.nl/publicaties/2012/vesta-ruimtelijk-energiemodel-voor-de-gebouwde-omgeving>. This methodology complies with Annex 9 of the EED. The Vesta model was updated to become the MAIS (multi-actor impact simulator) model, which is based on the calculating method used in Vesta that was upgraded to Vesta+. It is now available as a policy instrument for assessing which policy instruments can be used to reduce the CO₂ emissions generated by the built environment through the introduction of, inter alia, heating networks.

Temporary Regulation Implementing Articles 8 and 14 of the EED

This temporary regulation states that operators of an installation must, in a number of situations, perform a cost-benefit analysis:

- If one intends to construct or renovate a major installation for generating electricity, then it

must be assessed in advance whether this can be an installation using high-efficiency cogeneration.

- If one intends to construct or renovate an industrial combustion installation (> 20 MW), which generates waste heat at a useable temperature, then it must be assessed whether this heat can be used to satisfy economically justified demand for heating (within the meaning of Article 2(31) of the Directive) or whether this installation can be connected to a heating or cooling network.
- If the intention is to create a new district heating or cooling network, or construct a new combustion installation (> 20 MW) as part of an existing network, then it must be assessed whether this network can be supplied with waste heat from nearby industrial installations.

The regulation sets out which companies this obligation applies to. In order to avoid unnecessary costs, the option of a 'quick scan' (a provisional analysis) is included.

The cost-benefit analysis is to be submitted to the competent authority (under the Environmental Management Act). In early 2017 an inventory was conducted among the competent authorities in the Netherlands. It demonstrated that until the end of 2016 X cost-benefit analyses had been performed.

Article 14(10) sets rules for guarantees of origin for high-efficiency cogeneration. These rules will be implemented in the Regulation on Guarantees of Origin for Electricity Generated in an Installation for High-Efficiency Cogeneration (Regeling Garanties van Oorsprong voor Elektriciteit Opgewekt in een Installatie voor Hoogrenderende Warmtekrachtkoppeling).

(<http://wetten.overheid.nl/BWBR0035971/2016-02-09>)

3.5.2 Other measures connected with heating and cooling efficiency (EED: Article 14)

The development of efficient heating and cooling networks will be promoted by means of fiscal incentives such as the EIA and the Energy Tax, but also by the LTA3, MEE, Green Deals, the Nationaal Expertise Centrum Warmte (National Heat Expertise Centre) and the setting of EPC standards. One example is an input exemption in respect of natural gas if the cogeneration installation produces at least 30% electricity and its rated output amounts to at least 60 kW. Furthermore, own use of the electricity generated by these cogeneration plants is exempt from the Energy Tax. It is agreed to in the Energy Agreement that, aside from this tax-related support, cogeneration will receive no further financial support.

3.6 Energy transformation, transmission, distribution, and demand response

3.6.1 Energy efficiency criteria for energy network regulation and electricity tariffs (EED: Article 15)

Article 15(4) of the Directive specifies that incentives must be removed from transmission tariffs for both gas and electricity that are detrimental to the overall efficiency (including energy efficiency) of the generation, transmission, distribution and supply of electricity or that might hamper participation of demand response in connection with system efficiency or in balancing markets and ancillary services procurement. The 1998 Electricity Act requires, as does the Gas Act, that the network tariffs of users are proportional to the consumption pattern of customers, with due regard for the consumption and maximum load during specific periods. This guarantees the efficient use of transmission and distribution. The network tariffs do not distinguish between (different) suppliers of balancing and related services by means of demand response measures and other users of the network infrastructure.

Annex XI.2 to the Directive specifies that tariffs or conditions for the transmission of electricity may not prevent network operators or energy retailers from offering services for demand response measures, demand management and distributed generation. Examples of these services include the shifting of peak load or reducing demand through energy efficiency measures.

The network tariffs do not distinguish between (different) suppliers of balancing and related services by means of demand response measures and other users of the network infrastructure. In practice it has emerged that market parties access the balancing market en masse and contribute to the frequency containment reserve and the frequency restoration reserve. The tariffs and conditions consequently do not constitute a hurdle for the offering of services on these markets.

Finally, it is provided that the ACM guarantees, in the regulatory method for network operators, which also comprises setting the tariffs, that the most effective quality of transmission is encouraged.

On the grounds of the above, no supplementary rules are required. Nevertheless, a collective examination within the framework of the further improvement of the efficiency of the transmission infrastructure is underway into how the tariff structure can be further improved. The rollout of the smart meter will make it possible to, for example, charge small consumers more individualised tariffs after 2020. The use of peak and off-peak times in the tariff structure is also being further explored, although it is as yet still too early to assess the effects thereof.

3.6.2 Facilitating the promotion of demand response (EED: Article 15)

Providers of demand response services must be treated in a non-discriminatory way on the market for balancing and associated services. This is already the case in the Netherlands. All producers or customers with balance responsibility, including providers of demand response services, can compete in the market for the provision of system services if, by switching installations on or off, they can contribute to balancing the system. The network tariffs do not distinguish between (different) suppliers of balancing and related services by means of demand response measures and other users of the network infrastructure. In practice it has emerged that market parties access the balancing market en masse and contribute to the frequency containment reserve and the frequency restoration reserve. The tariffs and conditions consequently do not constitute a hurdle for the offering of services on these markets.

Annex XI.3 of the Directive provides the possibility of using dynamic electricity and network tariffs for demand response measures by final customers. This is already being implemented. The tariffs for the transmission of electricity are dependent on the individual consumption pattern of customers: the consumption and network load and the voltage level of the network to which the customer is connected. There are categories of bandwidths of nominal loads for relatively small connected customers, with which different transmission tariffs are associated. The rollout of the smart meter (target: 80% of households by 2020) shall allow for settling network tariffs on the basis of individual usage, making the tariff structure even more dynamic.

Large consumers of electricity can already purchase electricity at dynamic delivery tariffs. At present it is possible, on a small scale, for small consumers that have a smart meter to purchase using dynamic delivery tariffs. It is expected that this will be possible for small consumers on a large scale as of 2019. It is still too early to be able to assess the effects hereof.

3.6.3 Energy efficiency for the design and regulation of energy networks (EED: Article 15)

The regulation covering the quality aspects of the operation of electricity and gas networks already provides incentives for optimising energy efficiency in the energy system. It is moreover provided for by law that the ACM must take account of energy efficiency when performing its tasks on the electricity and gas market. This will allow maximum use of the potential for energy efficiency in the electricity and gas networks. It also further implements Article 15(2) of the Directive, which asks Member States to assess the remaining potential for energy efficiency in the networks.

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ANNEX I. DESCRIPTION OF THE MEASURES

I.1 GENERIC INSTRUMENTS

The following measures relate to at least four sectors:

- Energy tax and the Sustainable Energy Surcharge
- Energy Investment Allowance (Energie Investeringsaftrek (EIA))
- Long-term agreements
- MIA (Environmental Investment Allowance), VAMIL (Random Depreciation of Environmental Investments)
- Green Investments
- Green Deal (all sectors)
- Environmental Management Act (built environment, industry, transport and agriculture)

I.2 BUILT ENVIRONMENT

The following measures apply to the built environment sector:

- Energy tax (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Energy Investment Allowance (see description in paragraph I.1)
- Enforcement of the Environmental Management Act for Non-residential Buildings (see description in paragraph I.1)
- Tightening of energy-performance standards (EPC)
- Energy-efficient new buildings
- Subsidy Scheme for Energy Saving and Sustainable Energy for Sports Facilities
- Investment Subsidy for Sustainable Energy (*Investeringssubsidie Duurzame Energie (ISDE)*).
- Tightening up the RC values in the Buildings Decree
- Reduced VAT rates on labour costs for installing insulation and glass
- Changes to the Housing Valuation System
- Extending mortgage options for energy saving measures
- The *Energie besparen doe je nu* ('Save energy now') campaign
- Information campaign on the energy label for homes
- The Energy performance surcharge (EPV)
- The National Energy Saving Fund (Nationaal Energiebespaarfonds)
- The Homeowner Energy-saving subsidy scheme (*Energiebesparing Eigen Huis*)
- Energy Saving Agreement for the rental sector
- The STEP subsidy (incentive scheme for energy performance in the rental sector)
- Energy Performance Inspections
- Expertisecentrum Energiebesparing (Energy Saving Expertise Centre)

I.3 INDUSTRY

The measures in the industrial sector are as follows:

- Energy tax (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Energy Investment Allowance (see description in paragraph I.1)

- Green Investing: Green Projects Regulation (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- Framework for one-on-one agreements for MEE companies

I.4 TRAFFIC AND TRANSPORT

The measures in the traffic and transport sector are as follows:

- Energy tax (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- The New Driving (HNR) 3.0 programme (*Het nieuwe rijden (HNR) 3.0*)
- Sustainable Logistics (Lean and Green Logistics)
- Sustainable Personal Mobility (Lean and Green Personal mobility)
- Choose the Best Tyres publicity campaign (*Kies de beste band*)
- Run your engine differently (*Het Nieuwe Draaien*)

I.5 AGRICULTURE

The measures in the agricultural sector are as follows:

- Energy tax (see description in paragraph I.1)
- Energy Investment Allowance (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Green Investments (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- Innovation Programme Greenhouse as Energy Source (KAE)
- Market Introduction for Energy Innovations (Marktintroductie Energie Innovaties (MEI)) subsidy module, Investments in Energy for Greenhouse Cultivation (Investerings in energie glastuinbouw (EHG)), Surety for Agriculture (Borgstelling Landbouw); SME Innovation Incentive for Top Sectors (MKB Innovatiestimulering Topsectoren (MIT))
- Internal CO₂ equalisation system for the sector

I.1 GENERIC INSTRUMENTS

The following measures relate to at least four sectors:

- Energy tax and the Sustainable Energy Surcharge
- Energy Investment Allowance (Energie Investeringsaftrek (EIA))
- Long-term agreements
- MIA (Environmental Investment Allowance), VAMIL (Random Depreciation of Environmental Investments)
- Green Investing
- Green Deal (all sectors)
- Environmental Management Act

Name	<i>Energy Tax (ET) and the Sustainable Energy Surcharge (ODE)</i>
Category	Energy tax
Geographic area	The Netherlands
Target group	All end-users who fall within the scope of the EED.
End-user activities to be influenced	Behavioural change (more efficient use of energy) and investment in energy-saving measures.
Effectiveness	The energy tax and the sustainable energy surcharge will lead to a higher end-user price for gas and electricity. Increasing the energy price makes investment in an energy-saving measure more attractive and encourages energy-saving behaviour.
Status of implementation and planning	<p>Implemented The energy tax was introduced on 1 January 1996 as the Regulatory Energy Tax (RET) and was combined with what was at that time known as the fuels tax on gas as of 1 January 2004 through the implementation of the Energy Taxes Directive (<i>Richtlijn Energiebelastingen</i>). As of 2004 specific tax incentives for green energy and cogeneration have also been scrapped. That is why the energy tax took effect that year and its regulatory nature decreased dramatically.</p> <p>In 2016 taxation shifted from electricity to natural gas so that the amount levied would better correspond to the CO₂ content of gas and electricity.</p> <p>The ODE was implemented as of 1 January 2013 in order to cover the cash expenditure resulting from the Sustainable Energy Production Scheme (SDE+) regulation. The Sustainable Energy Surcharge is raised annually as a result of the further increasing and planned expenditure on SDE+ that will see the target of 14% renewable energy in 2020 and 16% in 2023 achieved.</p>

Description

Energy Tax (EB)

The Energy Tax is a tax on gas and electricity consumption that has the side-effect of improving the cost-effectiveness of measures aimed at energy efficiency and renewable energy. Taxing gas and electricity consumption makes energy efficiency measures (by changing behaviour or investing in energy-saving measures) more attractive. The use of energy-saving techniques is more cost-effective for the investment. The price elasticity (the extent to which consumption reacts to a price

change) of the Energy Tax is low and varies from -0.1 to -0.25 in the short term. In the longer term, the elasticity is higher as a result of changes in investment behaviour.

The amount of the Energy Tax depends on a customer's energy consumption. The higher the consumption, the lower the Energy Tax levied. The Energy Tax has been increased as of its introduction in 1995 and the money collected has been, within the framework of greening and shifting the taxation system, channelled back to households and companies for the purpose of lowering direct taxes (income tax and corporation tax). In January 2010 the tax on mineral oils was transferred to the Excise Duty Act (Wet op Accijns) (Fiscale Vereenvoudigingswet 2010 - 2010 (Fiscal Simplification Act)).

Taxation was shifted from electricity to natural gas for the first time in 2016: in the lowest tax bracket natural gas is subject to more taxation, while the tax on electricity in the lowest bracket was actually lowered. The purpose hereof was so that the amount levied would better correspond to the CO₂ content of gas and electricity. A complete shift on the basis of CO₂ content will require a further shift of taxation.

Sustainable Energy Surcharge

The Stimulation of Sustainable Energy Production (Stimuleren Duurzame Energieproductie (SDE+)) regulation was introduced in 2011. The cash expenditure associated with the SDE+ has been financed since 2013 by a separate levy on electricity and natural gas - the sustainable energy surcharge (Opslag voor Duurzame Energie) In terms of its structure and intent, this sustainable energy surcharge is almost completely identical to the Energy Tax: aside from a decrease in taxation for each connection, which applies for the Energy Tax but not the sustainable energy surcharge, the latter is identical to the former in all respects. This means that the sustainable energy surcharge can be considered as an Energy Tax increase.

The proceeds from the surcharge for sustainable energy are distributed as part of the general budget allocation. Because the budget for the SDE+ increases over the years for the purpose of achieving the objective of renewable energy in accordance with the Energy Agreement and the Renewable Energy Directive, the sustainable energy surcharge will be raised annually to cover that increasing budget for the purpose of achieving a renewable energy share of 14% in 2020 and 16% in 2023.

The tariffs to be set annually will cover the expenditure estimated for that year and will be imposed on households and companies, with each responsible for 50%. In respect of households the tax burden is divided equally between gas and electricity consumption and is associated with the bracket between natural gas and electricity in the lowest bracket, as detailed in the Tax Plan 2016.

With respect to companies the manner in which the tax burden is divided in the Energy Tax will be adhered to. The Tax Plan 2016 examines a more balanced division for companies that primarily do not use natural gas and for those companies that primarily use electricity. It was consequently opted to divide the tax burden for companies in such a way that when the tax burden increases for a company that goes through the first three tax brackets for natural gas as a result of consumption, this increase is approximately the same as the increase in the tax burden for a company that goes through the first three tax brackets for electricity as a result of consumption. The same balanced division of the tax burden for companies is also applied in the sustainable energy surcharge.

In 2013 it was attempted to obtain €100 million for cover through the Sustainable Energy Surcharge, while in 2017 the cover for the expenditure of the SDE+ has risen to €678 million. The expenditure will increase even further after 2017.

Households

The Energy Tax significantly increases energy prices for small consumers (up to 170 000 m³ gas and 10 000 kWh). The share of the Energy Tax and the Sustainable Energy Surcharge in the end-user price amounted to approximately 40% in 2016. The share in the end-user price of electricity amounted to around 45% in 2016. The tax is charged by the energy supplier.

Non-ETS industry

Industry that does not fall within the scope of the emissions trading system pays a higher price for natural gas and electricity than energy-intensive industry (which does fall within the scope of emissions trading).

Agriculture

The Energy Tax has a separate lower gas rate for greenhouse cultivation. This means that these companies are treated in the same way as the comparable energy-intensive consumers.

Energy Tax and Sustainable Energy Surcharge rates

The Energy Tax rates can be found in table I.1

Table I.1. Energy Tax rates

	2016 level	2017 level
	Energy Tax (euros per unit, excluding VAT)	Energy Tax (euros per unit, excluding VAT)
Natural gas		
0 – 170,000 m ³	0.25168	0.25244
170.000 – 1.000.000 m ³	0.06954	0.06215
1.000.000 – 10.000.000 m ³	0.02537	0.02265
> 10.000.000 m ³	0.01212	0.01216
Reduced natural gas rate for greenhouse horticulture		
0 – 170.000 m ³	0.04042	0.04054
170.000 – 1.000.000 m ³	0.02339	0.02346
1.000.000 – 10.000.000 m ³	0.02537	0.02265
> 10.000.000 m ³	0.01212	0.01216
Electricity		
0 – 10.000 kWh	0.1007	0.1013
10.000 – 50.000 kWh	0.04996	0.04901
50.000 - 10.000.000 kWh	0.01331	0.01305
>= 10.000.000 kWh private	0.00107	0.00107
>= 10.000.000 kWh commercial	0.00053	0.00053

Table I.2 contains the rate adjustments for the Sustainable Energy Surcharge for covering the SDE+.

Table I.2. Rate adjustments for the Sustainable Energy Surcharge and returns

	2013	2014	2015	2016	2017
Natural gas in m³	In euros per cubic meter of natural gas				
0- 170.000	0.0023	0.0046	0.0074	0.0113	0.0159
170.000-1 million	0.0009	0.0017	0.0028	0.0042	0.0074
1 million-10 million	0.0003	0.0005	0.0008	0.0013	0.0027
>= 10 million	0.0002	0.0004	0.0006	0.0009	0.0013
Natural gas in m³ at reduced rate for greenhouse cultivation	In euros per cubic meter natural gas				
0- 170.000	0.0004	0.0007	0.0012	0.0018	0.0026
170.000-1 million	0.0004	0.0009	0.0014	0.0021	0.0025
1 million-10 million	0.0003	0.0005	0.0008	0.0013	0.0027
>= 10 million	0.0002	0.0004	0.0006	0.0009	0.0013
Electricity in kWh	In euro per kilowatt hour electricity				
0- 10.000	0.0011	0.0023	0.0036	0.0056	0.0074
10.000- 50.000	0.0014	0.0027	0.0046	0.0070	0.0123
50.000- 10 million	0.0004	0.0007	0.0012	0.0019	0.0033
>= 10 million	0.000017	0.000034	0.000055	0.000084	0.000131
ODE revenue in millions of EUR	100	200	320	490	678

Name	<i>EIA: Energy Investment Allowance</i>
Category	Tax reduction and other taxes that reduce the energy consumption of final consumers
Geographic area	The Netherlands
Target group	Entrepreneurs from all sectors that pay income or corporation tax (excluding households, public bodies and the non-profit-making sector)
End-user activities to be influenced	Influences the choice of investment (encourages investment in energy-efficient equipment and equipment for generating renewable energy)
Effectiveness	The instrument reduces the financial threshold for the purchase of energy-efficient equipment.
Status of implementation and planning	Implemented in 1997; ongoing.

Description

The Energy Investment Allowance (EIA) is a fiscal measure that offers the possibility of an additional allowance on taxable profit. EIA applications can be made for the purchase of designated energy-efficient equipment. The Minister of Economic Affairs annually compiles an ‘energy list’ for that purpose in the EIA Implementing Regulation, which details the equipment that is eligible for an allowance.

The EIA enables companies to deduct a certain percentage of the investment sum from the taxable profits, which means that the payable income or corporation tax is lower. From 2013 to 2015 the EIA deduction rate was 41.5 %, meaning that the tax advantage – based on a corporate tax rate of 25 % – was roughly 10 %. As of 1 January 2016 the rate of deduction was increased to 58%, raising the tax advantage to approximately 14.5%. The result is an additional stimulus for energy saving. EIA applications can be made for the purchase or manufacturing costs of energy-efficient equipment. The energy-efficient equipment must save more energy than the prevailing equipment available on the market. This means that only the latest types of equipment are eligible for the EIA.

A general EIA application can be submitted, using an energy-saving calculation to demonstrate that equipment that is not on the energy list meets EIA standards. Proposals can be submitted for techniques to be included in a new energy list.

An investment may relate to (a part of) equipment that is eligible both for the EIA and for other fiscal measures (Small-Scale Investment Allowance (Kleinschaligheidsinvesteringsaftrek (KIA)), VAMIL and/or MIA). You cannot use both the EIA and MIA for the same investment element, although it is possible to combine the EIA or MIA with VAMIL.

The EIA is a measure introduced by the Ministries of Finance and Economic Affairs. It is administered by the Netherlands Enterprise Agency and the Tax Administration.

Table 1.3. EIA measure 2014 -2018

	2014	2015	2016	2017	2018
Available budget (in millions of EUR)	111	101	161	166	149
Rate deducted from taxable profit	41.5%	41.5%	58%	55%	55%

Name	<i>Long Term Agreements</i>
Category	Voluntary agreements
Geographic area	The Netherlands
Target group	<ul style="list-style-type: none"> • Industry • Service sector • Agriculture • Transportation
End-user activities to be influenced	The companies must produce energy efficiency plans, implement them and report on progress. They must also monitor energy consumption annually. Companies that enter into Long-Term Agreement 3 (LTA3) must set up an energy management system.
Effectiveness	
Status of implementation and planning	The Long-Term Agreements began in 1992. LTA3 and LTA-ETS run until 2020.

Description

Since 1992 the government has entered into voluntary Long-Term Agreements (LTAs) for the attainment of energy efficiency with a large number of sectors as part of its energy conservation policy for business and industry.

Industry/Service sector

Two types of Long-Term Agreement are currently running:

- LTA3 agreement: agreements with large and medium-sized companies and institutions in the industrial, agricultural and services sectors (such as academic and higher professional education institutions, banks, insurance companies and university medical centres)
- MEE Agreement: agreements with ETS companies in the industrial sector.

LTA3 and MEE run until 2020. A participating company undertakes to do the following:

- Draw up an energy-saving plan (EEP) every four years (for LTA3 companies, in consultation with the Competent Authority). In the EEP the company describes the cost-effective measures taken within its own process and within the chain. Aside from in-house operational energy efficiency, these agreements also focus on energy efficiency in the chain and on sustainable energy.
- Companies are obliged to include measures with a payback period of less than five years in their EEP.
- The company must report annually to the NEA and the industry organisation on its implementation of the EEP.

An agreement was reached with industry in 2015 on tightening up the agreements. There are now consequences for noncompliance with the agreements in the EEP, and every company receives an annual progress declaration if the planned and definite measures in the EEP have been implemented and the associated minimum saving has been achieved.

In 2015 1 056 companies that are party to agreements received a progress declaration, while a declaration was not issued to 40 LTA3 companies. The progress declaration means that a company is eligible for a refund of Energy Tax, and ETS companies can receive compensation for indirect emission costs.

The following additional agreements were reached for LTA3 companies:

- A list of measures is, insofar as is possible, compiled for each affiliated LTA sector. The companies shall implement the cost-effective energy efficiency measures on the list.
- A sector target is set on the basis of all the EEPs in a sector. This target is set out in a long-term plan (LTP).
- Within three years of joining, the company participating in the LTA3 must have an energy-management system in place and issue reports thereon.

The Long-Term Agreements entered into with various sectors can play an important role in raising awareness of the possibilities for and benefits of saving energy. The LTA and the MEE agreements encourage more economical and rational decision-making on energy-saving techniques by increasing knowledge of the possibilities. Various (general) instruments are used to support the agreement, such as the Sustainable Energy Production Incentive Scheme (Stimuleringsregeling Duurzame Energieproductie - SDE), MIA / VAMIL and EIA. The LTAs are also related to the Environmental Management Act (LTA3 only), ETS and the Energy Tax: the LTAs provide an incentive, the Environmental Management Act and ETS have a regulatory role, and the Energy Tax acts as a reward for energy emissions.

The agreements are implemented under the authority of the Ministry of Economic Affairs, the Ministry of the Interior and Kingdom Relations and the Ministry of Infrastructure and the Environment, with this implementation facilitated by the NEA.nl.

Agriculture

The Clean and Economical Agro-Sectors Agreement (Convenant Schone en Zuinige Agrosectoren) sets specific objectives for aspects such as energy efficiency improvements for greenhouse cultivation, livestock farming, arable farming and bulb and mushroom growing for the period up to the end of 2020. The flower bulb and mushroom growing sectors continued under the extension of the previous LTA, without actually entering into a formal LTA, pending the reassessment. These sector-specific LTAs use the 'instruments/measures' study, explanation and also demonstration and knowledge-transfer. The 'instruments/measures' are thus also inter-related.

The CO₂ Sector System Agreement (Convenant CO₂-Sectorsysteem) has been concluded for the greenhouse cultivation businesses, in which the sector has effectively agreed to a CO₂ ceiling with the government. The Clean and Efficient Agrosectors Agreement was reassessed in 2014, with the intention that the energy-efficiency objectives will be maintained. In the spring of 2017 the review will be completed, in part as a result of the product boards no longer being agreement partners. That does not mean that there are no energy saving measures for the participating sectors,

primarily the animal and arable farming sectors. Recognised Lists of Measures (Erkende Maatregelenlijsten) have been created for these sectors that have been embraced and promoted by the industry representatives. Moreover, work has been undertaken on applying energy innovations in these sectors, such as the refurbishment of stable and barn roofs, while the creation of Recognised Lists of Measures has led to a greater understanding of measures that are more innovative than the 'standard' options.

Transportation

Under the LTA3 Transport agreement a number of large companies in the railway sector have entered into agreements on CO₂ reduction and energy efficiency in the period up to 2020. The agreement is implemented under the authority of the Ministry of Infrastructure and the Environment.

Name	<i>Environmental Investment Allowance (MIA) and Random Depreciation of Environmental Investments (VAMIL)</i>
Category	Tax benefit
Geographic area	The Netherlands
Target group	All end-users who fall within the scope of the EED.
End-user activities to be influenced	Making investments in projects that positively affect the environment more attractive
Effectiveness	Directly affects the end-user
Status of implementation and planning	Implemented in 1992; ongoing.

Description

The Environmental Investment Allowance (Milieu-Investeringsaftrek (MIA)) and the Random Depreciation of Environmental Investments (Vrije Afschrijving Milieu-investeringen (VAMIL)) are subsidies for environmentally-friendly equipment for businesses. The Environmental Investment Allowance gives businesses the opportunity to deduct taxable profits, with up to 36% of the investment costs being deductible. The percentage of the deduction depends on the environmental effects and the prevalence of the equipment. VAMIL allows for the writing down of an investment at a random time. For investments made as of 2011 the random depreciation is limited to 75%. Faster depreciation lowers the taxable profits and one pays less tax in that year. This offers an advantage in terms of interest and liquidity. The MIA and VAMIL are two different schemes, but are often combined. Both schemes use a common list, called the Environment List (*Milieulijst*), which lists all equipment (combined, almost 400 items) eligible for the MIA and/or VAMIL. A new Environment List is released every year. This list also contains a large array of equipment for greenhouse cultivation.

MIA and VAMIL are regulations of the ministries of Finance and of Infrastructure and the Environment. They are administered by the Netherlands Enterprise Agency and the Tax Administration. The NEA supports the ministry in compiling the Environmental List and handles the technical inspection of applications. The Tax Administration rules on tax returns, and thus on the application of the MIA/VAMIL.

Name	<i>Green Investments</i>
Category	Tax benefit/interest rate cut
Geographic area	The Netherlands
Target group	All end-users who fall within the scope of the EED.
End-user activities to be influenced	Making investments in projects that positively affect the natural world and the environment more attractive
Effectiveness	Directly affects the end-user
Status of implementation and planning	Implemented in 1994; ongoing.

Description

The Green Projects scheme is a joint measure of the ministries of Infrastructure and the Environment and Finance. The Green Projects scheme has been in operation since 1995 and has been effective in its present form since 1 April 2016. The NEA assesses all applications and issues a green certificate for approved ones.

The objective of the Green Projects scheme is to encourage projects that have a positive impact upon nature and the environment but that do not come into being as a result of their low yield or high risk. The scope of the scheme covers new – and hence risky – but not yet standard technology and methods that will protect the environment to a large degree, that exceed the statutory standards and for which the introduction of their application encounters obstacles of a financial and economic nature. New technology or methods refers to technology and methods that have less than 5%-10% application so they are located between the development phase and the (very) limited application phase.

The financial sector is more reticent when it comes to making investment capital available for projects where innovative technology or methods are applied than it is in respect of investments in standard technology and methods. This is because innovative technology or methods have not yet been used in practice for an extended period (and are consequently not tried and tested). Moreover, relatively high investment costs and technical and economic risks are at issue.

This scheme sees capital from private savers and investors made available for financing high risk projects that will benefit environmental and nature policy and which would otherwise not be undertaken. In this manner the intention is to both encourage entrepreneurs to develop innovative and sustainable projects and to stimulate the financial sector to fund these projects. An added bonus is that the involvement of citizens in such projects is increased.

As standard projects are providing increasingly higher environmental returns, thanks to experience, leading by example and legislation, this means that under the scheme the requirements for projects eligible for the Green Projects scheme must and can also become greater. There have been numerous changes to the scheme since its introduction in 1994. The entire scheme was subjected to scrutiny in 2006 and it was comprehensively revised, resulting in it being updated and linking it

to policy priorities. The methodology has not changed, such as the required cooperation between savers/investors, banks and project managers.

The Green Projects scheme relies on a limited tax benefit for the private investor in respect of the capital invested in Green Projects. The investors make their capital available to the green banks and green funds at a rate that is below the standard rate, as they are compensated by the Dutch state by means of a tax benefit of up to 1.9%. Because the investors make the funds available at a lower rate to the green funds, these can in turn lend this capital at an interest rate below the standard. As this tax benefit is passed on, an interest rate cut is available to green projects, and so capital costs are decreased. This offsets the lower returns generated by sustainability projects (the price effect). Because the lion's share of a project is generally financed by debt capital, a lowering of interest rates for the debt capital means that the rise in returns on equity capital is much greater, relatively speaking. This means that a relatively limited interest rate cut can have a large impact upon the decision to invest. An interest cut for project funding can also mean that less equity capital has to be brought in in advance, equity capital that can be used to develop further new projects.

The green funds are moreover obliged to invest, at any time, 70% of the contributed capital in innovative projects that comply with the criteria under the Green Projects Regulation (Regeling Groenprojecten) Because funding is earmarked, further loans are available for green projects that would otherwise not have been available (the quantity effect). Green funds do not have to invest their capital in full, as they are generally subjected to specific fluctuations in respect of their invested capital, because loans are repaid and loans are provided and they must always be able to buy back their own shares.

Name	<i>Green Deal</i>
Category	Voluntary agreements
Geographic area	The Netherlands
Target group	All end-users
End-user activities to be influenced	Investments in energy-saving and renewable energy measures.
Effectiveness	
Status of implementation and planning	Concrete implementation of Green Deal agreements started in autumn 2011; ongoing

Description

The Cabinet entered into Green Deals with society for energy, with the emphasis on energy efficiency and local generation of renewable energy. Citizens, companies and others are increasingly finding their own solutions for smarter and more sustainable energy management, for example by saving energy or generating it themselves, or by clean energy use. These are often energy projects that pay for themselves, but they do not always get off the ground. Problems encountered by citizens, companies and other parties in setting up energy projects include inadequate staffing, insufficient information, confusion about permits, unclear or conflicting regulations or failure to find cooperating partners.

The government helps solve these problems using Green Deals in a number of ways, for example by giving advice, bringing parties into contact with each other and removing obstacles in legislation and regulations. By entering into a Green Deal with initiating parties, the government aims to take action to solve these problems and give the project a fresh chance.

To get the market moving, the government is looking for pioneering initiatives. These could be:

- Initiatives that contribute to increased energy efficiency and the realisation of renewable energy policy and that are attractive from an economic point of view. These initiatives must be in the implementation or application phase.
- Initiatives capable of producing results in the short term, preferably within the term of office of the present Cabinet.
- Initiatives that preferably have the potential to be repeated, so that comparable projects can be started up without government intervention.

Name	<i>Enforcement of Environmental Management Act</i>
Category	Enforcement
Geographic area	The Netherlands
Target group	Companies and institutions in various sectors, including non-residential building, industry, agriculture and food, shipping and transport. Building owners and users/tenants.
End-user activities to be influenced	Enforcing the statutory obligation to adopt energy-saving measures with a payback time of less than 5 years.
Effectiveness	No monitoring data available.
Status of implementation and planning	The acceleration of the implementation of the Environmental Management Act has been launched.

Description

The Environmental Management Act and its implementation in the Activities (Environmental Management) Decree (Activiteitenbesluit) obliges companies that consume in excess of 50 000 kWh of energy or more than 25 000 m³ of gas to adopt energy saving measures with a payback time of 5 years or less (Article 2.15 of the Activities (Environmental Management) Decree).¹ Aside from industry, this obligation also applies to all non-residential buildings, such as offices, healthcare institutions, shops and schools. The competent authority – mostly the local municipality – can enforce compliance with the Activities (Environmental Management) Decree. A pilot project for the Energy Performance Inspection has also been launched.

Recognised List of Measures

Pursuant to an agreement under the Energy Agreement, a Recognised List of Measures (RLM) has been compiled for each business sector. If a company or institution has taken those measures listed in the RLM, then the competent authority for the Environmental Management Act assumes that the company or institution complies with the energy saving obligation as set out in the Activities (Environmental Management) Decree. This makes it easier for companies to comply with the requirements under the Environmental Management Act concerning saving measures with a payback time of 5 years or less. In 2015 the first batch of Recognised Lists of Measures was published, while in 2016 a second group of business sectors received a Recognised List of Measures.¹ A third set of list is set to be delivered.

Intensification of the Environmental Management Act

In the years preceding the Energy Agreement it emerged that in practice the monitoring of ‘mandatory’ energy saving measures was insufficient. The government has concluded an agreement with the environmental agency Omgevingsdienst NL for the purpose of having additional

monitors. The monitoring activities were launched in the fourth quarter of 2016 and the Central Government has guaranteed that these will continue for a period of 2 years, together with other energy saving measures.

I.2 BUILT ENVIRONMENT

The following measures apply to the built environment sector:

- Energy Tax (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Energy Investment Allowance (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- Tightening of energy-performance standards (EPC)
- Energy-efficient new buildings
- Subsidy scheme for energy saving and sustainable energy for sports facilities
- Tightening up the RC values in the Buildings Decree
- Reduced VAT rates on labour costs for installing insulation and glass
- Changes to the Housing Valuation System
- Extending mortgage options for energy saving measures
- The *Energie besparen doe je nu* ('Save energy now') campaign
- Information campaign on the energy label for homes
- Renovations so that homes become near zero-energy dwellings
- The National Energy Saving Fund (Nationaal Energiebespaarfonds)
- Homeowner Energy-saving subsidy scheme (Energiebesparing Eigen Huis)
- Energy Saving Agreement for the rental sector
- The STEP subsidy (Incentive scheme for energy performance in the rental sector)
- Energy Performance Inspections
- Expertisecentrum Energiebesparing (Energy Saving Expertise Centre)

Name	<i>Tightening of energy-performance standards (EPC)</i>
Category	Building requirements and enforcement
Geographic area	The Netherlands
Target group	<ul style="list-style-type: none"> • Construction companies • Property developers
End-user activities to be influenced	Continuously improve the energy-efficiency of new buildings
Effectiveness	High
Status of implementation and planning	Runs until end of 2015

Description

On 1 January 2015 the EPC for new residential buildings was tightened from 0.6 to 0.4, as established in the Building Decree. As of 01/01/2015 the EPC requirements were tightened to be 50% stricter than they were in 2007.

The cost-optimisation studies for nearly zero-energy requirements (NZEB) are scheduled for 2018. These NZEB requirements will then be applicable as of 01/01/2021. New government buildings must already be constructed in a nearly zero-energy manner as of 1 January 2019.

The foundation for this tightening up of standards is set out in the research report *Aanscherpingsstudie EPC woningbouw en utiliteitsbouw* ('Study into Tightening up EPC residential and non-residential buildings') (WE/Arcadis, 20 December 2013). On the basis of the construction forecast assumed in this report, the direct energy saving as a result of the tightening is estimated to be 1 to 1.5 PJ_{prim} per annum.

The EPC has been part of Dutch climate policy since 1995 and sets minimum performance requirements in respect of energy in new buildings.

Name	<i>Energy-efficient new buildings</i>
Category	Voluntary agreements (agreements until 2015), statutory tightening in 2015 and proposed tightening for residential buildings on 31 December 2020.
Geographic area	The Netherlands
Target group	<ul style="list-style-type: none"> • Construction companies • Property developers • Landlords • Banks
End-user activities to be influenced	Continuously improve the energy-efficiency of new buildings
Effectiveness	High
Status of implementation and planning	Ongoing

Description

To support the tightening of energy performance requirements the Central Government and market participants (Bouwend Nederland, NEPROM (Nederlandse Vereniging van Projectontwikkeling Maatschappijen (the Association of Dutch Development Companies)) and NVB (the Association of Developers and Building Contractors)) entered into an agreement (the *Lente Agreement*) in 2008. This agreement was overhauled in 2012. The objective of the Lente Agreement was to decrease standardised energy consumption across the entire range of new buildings (residential and non-residential buildings) by 50% as of 1 January 2015 (in respect of the 2007 new buildings requirements) as a path towards Nearly Zero-Energy New Buildings.

The Lente Agreement expired in 2015. On 1 January 2011 the EPC requirement for new housing was tightened from 0.8 to 0.6 (see 3.1), a cut of 25%. On 1 January 2015 the EPC requirement for new housing was further tightened from to 0.4, a cut of 50% in total. These measures were accepted relatively easily by the market, and the Lente Agreement consequently achieved its objective.

The ZEN measure has been in place since 2015 and is the follow-up programme to the Lente Agreement. Aedes, Bouwend Nederland, NEPROM and the NVB are all participating parties. ZEN stands for *Zeer Energiezuinige Nieuwbouw* (Extremely Energy-efficient New Buildings), and takes near zero-energy buildings (NZEB) to ones that actually produce energy. The four parties intend to ensure that occupants are satisfied by paying close attention to comfort, health, delivery quality and, of course, affordability. In order to avoid a situation where each party is forced to reinvent the wheel every time, they share their knowledge and are able to innovate together.

Zen is backed by the Ministry of the Interior and Kingdom Relations. The four sector associations hope to effect a switch in the housing market through the ZEN project.

The upshot is that energy saving in new buildings will no longer be seen as an expense, but actually as a unique buying point on the part of the consumer. Simultaneously, it is hoped that ZEN will

ensure a fluid transition for the construction industry to the future requirement of nearly zero-energy new buildings as of the start of 2021. The objective is to ensure that the parties are properly prepared as of that time to build in accordance with the new nearly zero-energy requirement.

In the meantime the Ministry of the Interior and Kingdom Relations is working on toughening up the statutory new buildings requirements. Requirements for housing will include the obligation that homes become nearly zero-energy as of 31 December 2021.

Name	<i>Subsidy Scheme for Energy Saving (Subsidieregeling Energiebesparing) and sustainable energy for sports facilities</i>
Category	Subsidy
Geographic area	The Netherlands
Target group	Sports associations
End-user activities to be influenced	Encouraging energy saving and sustainable energy generation
Effectiveness	
Status of implementation and planning	Takes effect on 1 January 2016 and runs through to 2020

Description

As of 1 January 2016 a new subsidy scheme was opened for renewable energy and energy saving in sports facilities. A sum of €6 million per annum has been made available for this scheme. Sports associations that invest in renewable energy generation and energy saving can obtain a subsidy for up to 30% of their investment costs.

Name	<i>Investment Subsidy for Sustainable Energy (Investeringssubsidie Duurzame Energie (ISDE)).</i>
Category	Subsidy
Geographic area	The Netherlands
Target group	Households and commercial users
End-user activities to be influenced	Encouraging the acquisition of solar water heaters, heat pumps, biomass boilers and pellet stoves
Effectiveness	In 2016 there were already subsidy applications for around 27 000 installations.
Status of implementation and planning	Takes effect on 1 January 2016 and runs through to 2020

Description

As of 1 January 2016 a new subsidy scheme was launched for the installation of small renewable heating sources. Through this new subsidy scheme private persons and commercial users that wish to generate their own sustainable energy receive financial support when purchasing an installation. This results in energy saving and the reduction of CO₂ emissions. A sum of €70 million has been made available for both 2016 and 2017. Households and small commercial users can receive an allowance for the purchase of heat pumps, biomass boilers, solar water heaters, pellet stoves and small wood-fired boilers.

Name	<i>Tightening up the RC values in the Buildings Decree</i>
Category	Legislation
Geographic area	The Netherlands
Target group	Building companies/contractors
End-user activities to be influenced	New buildings and making existing buildings more energy efficient
Effectiveness	Positive
Status of implementation and planning	Ongoing as of 2015

Description

As of 01/01/2015 the thermal insulation requirements (RC values) for new buildings and comprehensive renovations were tightened up to achieve new levels: RC = 3.5 m² K/W for floors, RC = 4.5 m² K/W for walls and RC = 6 m² K/W for roofs. For windows and doors the heat transmission rate was tightened up to U at a maximum of 1.65 W/m² K.

As of 24/11/2015 the thermal requirements, where insulation has been renovated or replaced, have been tightened up to achieve new levels: RC = 2.5 m² K/W for floors, RC = 1.3 m² K/W for walls and RC = 2 m² K/W for roofs. For windows and doors the heat transmission rate was tightened up to U at a maximum of 2,2 W/ m² K.

Name	<i>Reduced VAT rates on labour costs for installing insulation and glass</i>
Category	Tax benefit
Geographic area	The Netherlands
Target group	Homeowners
End-user activities to be influenced	Encouraging energy-saving investments
Effectiveness	Aimed directly at the homeowner
Status of implementation and planning	Ongoing as of 2009

Description

This measure involves a reduced VAT rate on labour for work performed on housing for the purpose of energy saving. The reduced VAT rate is applicable to the labour component in the process of installing insulation material and (insulating) windows. The VAT rate is reduced from 21% to 6%. Until 1 January 2014 the reduced rate for insulation activities also applied to the materials and to all other maintenance and renovation work, but as of 1 January 2014 the reduced rate only applies to the labour involved in installing insulation material. However, there was also an expansion in the measure - as of 1 January 2014 the labour component involved in the installation of (insulating) windows also falls under the reduced VAT rate. All consumers in the Netherlands pay VAT when acquiring energy saving measures, which is why the reduced VAT rate is applied very frequently for energy saving measures.

Name	<i>Changes to the Housing Valuation System</i>
Category	Legislation
Geographic area	The Netherlands
Target group	<ul style="list-style-type: none"> • Landlords • Tenants
End-user activities to be influenced	Encouraging energy-saving investments
Effectiveness	
Status of implementation and planning	Took effect on 1 January 2011

Description

The Housing Valuation System was changed on 1 July 2011. Under this change, the Housing Valuation System now appraises the energy performance of the home (on the basis of the energy label) to promote investments in energy-saving measures. The Housing Valuation System sets the maximum rent on the basis of the characteristics of the home. By including the energy label in the Housing Valuation System the maximum rent of the home is linked to its energy label. The change to the Housing Valuation System came into effect on 1 July 2011 for homes with an energy label and for homes that must have an energy label under the regulations. A transitional period up to 1 January 2014 applied for homes which do not yet have an energy label; from 1 January 2014 the Housing Valuation System with an energy label applies to all rental homes. As of 1 October 2015 the Housing Valuation System was amended (the WOZ (Valuation of Immovable Property Act) value was preferred as a basis for the rental sum), marking the end of the planned evaluation, immediately after the conclusion of the transition period.

As of 1 January 2015 there has been a distinction between the Energy Label (expressed as a letter) and the Energy Index (expressed as a figure). The energy label is determined in a simplified manner, while the Energy Index is determined more precisely in a manner that corresponds to the way in which energy performance was determined for a certified labeller prior to 01/01/2015. Only the Energy Index may be used for determining the rental sum. The EI classes as of 1 January 2015 were chosen to correspond as closely as possible with the former Housing Valuation System, on the basis of the label classes.

Name	<i>Extending mortgage options for energy saving measures</i>
Category	Financial
Geographic area	The Netherlands
Target group	Homeowners
End-user activities to be influenced	Encouraging energy-saving investments
Effectiveness	Aimed directly at the homeowner
Status of implementation and planning	Ongoing as of 2012

Description

Persons with a mortgage who implement energy-saving measures in their own homes are able to borrow an increased sum for that investment.

In this respect a mortgage provider can omit that portion of a mortgage that is used for energy saving measures – up to a sum of €9 000 – when determining the financing charges (within the frame of the creditworthiness check). A sum of up to €9 000 can also be omitted if it involves the purchase of a home with a valid energy label of at least (A++) that was issued before 1 January 2015 or a home with an energy index or an energy performance coefficient of up to 0.6. Further, a sum of €27 000 can be omitted if a mortgage is issued for financing a zero-energy (*Nul op de Meter*) home and an energy performance guarantee is issued for that home for a period of at least ten years. This section is only applicable to mortgages provided to consumers with a qualifying income of at least €33 000.

The scheme is updated yearly.

Name	<i>The 'Save energy now' campaign (Energie besparen doe je nu)</i>
Category	Information and activating
Geographic area	The Netherlands
Target group	Private homeowners
End-user activities to be influenced	Encouraging energy saving measures for homes.
Effectiveness	Aimed directly at the homeowner
Status of implementation and planning	Launched on 17 October 2016 for a three-year period.

Description

On 17 October 2016 the *Energie besparen doe je nu* ('Save energy now') campaign was launched, an initiative of the Central Government, the VNG (Association of Netherlands Municipalities - Vereniging van Nederlandse Gemeenten), the advisory organisation Milieu Centraal and the NEA (RVO.nl). The campaign focuses on homeowners of a label C or lower residence who are considering energy-saving measures but have not yet implemented them because of, for example the expense, the investigation required or the mess created. Studies have demonstrated that three-quarters of people underestimate the returns from insulation. The campaign focuses on both owner-occupiers and owners' associations.

It runs for three years. Through television and radio commercials and using online channels, the level of urgency among the target group for taking energy saving measures is raised and the barriers experienced by homeowners when it comes to investing in energy saving measures are lowered. During the initial period that lasted until the close of 2016, insulating measures were the point of focus, thanks to the Homeowner Energy Saving Subsidy (Subsidie Energiebesparing Eigen Huis). In future parts of the campaign the focus could shift to issues such as other measures or specific target groups, possibly owners' associations where decision-making procedures take longer.

A campaign website was created to provide clear and independent information on, for example, the costs and returns generated by energy-saving measures. Links are also provided to the regional energy points of contact of municipalities and companies. The campaign also entails close cooperation with other parties, such as builders, insulating companies, energy suppliers, network operators, nature conservancy and environmental organisations, municipalities, estate agents and banks. Campaign material was developed that can be used by various parties in their communications on energy saving.

Name	<i>Information campaign on the energy label for homes</i>
Category	Awareness-raising campaign
Geographic area	The Netherlands
Target group	Homeowners
End-user activities to be influenced	Awareness of a home's energy performance
Effectiveness:	
Status of implementation and planning	A one-off campaign that has been completed

Description

In early 2015 around five million homeowners received a letter from the Central Government containing a 'provisional energy label'. This was a one-off campaign. The provisional label did not have a formal status, and its intention was to:

- make homeowners aware of the requirement for an energy label and the most decisive indicators for a home's energy performance
- invite homeowners to apply for a definitive energy label using the online app.

The provisional energy label was an indication of the building's energy performance, based on the most common energy values for homes built in the same period and of the same construction type, using data from official government databases and WoOn (Woononderzoek Nederland – the national housing survey).

It is evident from public surveys that the provisional energy label stimulated people. Of the 1 020 homeowners who were questioned, 46% said that as a result of the provisional energy label they were planning to look up information on energy saving measures or had already looked it up; 32% of respondents said they were also planning on implementing energy saving measures.

Name	<i>The Energy performance surcharge (Energieprestatievergoeding (EPV))</i>
Category	Legislation
Geographic area	The Netherlands
Target group	Landlords Tenants
End-user activities to be influenced	Encouraging investments in energy saving by landlords
Effectiveness	
Status of implementation and planning	In effect since 1 September 2016

Description

The Energy performance surcharge bill was adopted on 17 May 2016 and took effect on 1 September 2016. Landlords who renovate their properties so that they are nearly zero-energy or zero-energy can charge an energy performance surcharge to their tenants so as to earn back major investments in the rental property. The landlord and the tenant must reach an agreement on the sum of the fee.

Name	<i>Nationaal Energiebespaarfonds (National Revolving Fund for Energy Saving)</i>
Category	Loans
Geographic area	The Netherlands
Target group	<ul style="list-style-type: none"> • Homeowners • Housing associations • Owners' associations
End-user activities to be influenced	Encouraging investments in energy-saving in existing buildings
Effectiveness	Funds directly reach the target groups
Status of implementation and planning	<p>The National revolving Fund for Energy Saving for owner-occupants has been operational since 21 January 2014.</p> <p>Since June 2015 it also provides loans to owners' associations consisting of 10 or more apartments.</p> <p>The fund for landlords has been operational since 2014.</p> <p>De Stichting Fonds Duurzaam Funderingsherstel (Fund for the Sustainable Repairing of Foundations) was established on 28 March 2017. At present the finishing touches are being made to the Investment Scheme (<i>Investeringsreglement</i>), agreements between the Fund for the Sustainable repairing of Foundations and the lenders and the funding. The fund is expected to be operational in May/June 2017.</p>

Description

The Central Government uses revolving funds for loans for energy-saving measures in the built environment (existing buildings). This measure encourages energy-saving and employment and ensures that housing remains affordable for Dutch households if energy prices rise. €170 million euros of Central Government funds is available for the three funds together (owner-occupiers, landlords and owners' associations). The fund for owner-occupiers was launched in early 2014 with € 225 million of co-financing from Rabobank and ASN Bank. The terms and conditions for citizens were revised a number of times and owners' associations were also included in order to boost the fund. The Nationaal EnergiebespaarFonds (National Revolving Fund for Energy Saving) further lowered the interest on energy saving loans in the first half of 2016, thanks to a government grant of €10 million. By November 2016 almost €57 million in loans for energy saving measures had already been issued.

Name	<i>Energy-saving at Home subsidy scheme (Subsidieregeling Energiebesparing Eigen Huis)</i>
Category	Subsidy
Geographic area	The Netherlands
Target group	Owner-occupiers and owners' associations
End-user activities to be influenced	Energy saving in private housing stock
Effectiveness	Directly affects the target group
Status of implementation and planning	Available for 2016, 2017 and 2018

Description

Owner-occupants and homeowners' associations have been able to apply for a subsidy from the Netherlands Enterprise Agency since 15 September 2016 as a stimulus to extend energy saving measures. A total of over €56 million has been made available as a subsidy for energy saving measures. The funds have been spread across the years 2016, 2017 and 2018 in the budget.

The subsidy, which comprises approximately 20% of the investment, will only be issued when at least two of the following energy saving measures are performed, under the conditions set out in the subsidy scheme: wall insulation, cavity wall insulation, roof insulation, floor or ground insulation and replacing windows with low-emissivity glass. When at least two energy saving measures are implemented under this requirement, the owner-occupier or owners' association can also receive an additional subsidy for further energy saving measures, such as insulating doors or customised recommendations. The measures and associated requirements largely correspond to the measures and requirements for the National Energy-saving Fund (*Nationaal Energiebespaarfonds* (NEF)) This means that the subsidy and loan can be combined to cover the entire investment.

Owner-occupants and owners' associations that implement an extremely energy efficient package of measures receive a bonus over and above the subsidy of €4 000 per home. As a rule, such a package is considered to be renovating a home, for example, so that it becomes zero-energy.

Aside from this subsidy, €4.5 million is available in subsidies specifically for owners' associations for energy recommendations, a long-term maintenance plan involving energy saving measures (green LTMP) and process guidance. This is pursuant to a recommendation from the Social and Economic Council working group on energy saving by owners' associations. The intention of this subsidy is to provide guidance to owners' associations in the transition to energy saving measures.

Name	<i>Energy Saving Agreement for the rental sector</i>
Category	Voluntary agreements
Geographic area	The Netherlands
Target group	<ul style="list-style-type: none"> • housing associations • private landlords • tenants • municipalities
End-user activities to be influenced	To make existing homes more energy efficient and to encourage energy efficient new housing and replacement housing
Effectiveness	Directly affects the target group
Status of implementation and planning	In effect until 31/12/2020.

Description

In the Energy Saving Agreement (Covenant Energiebesparing Huursector) for the rental sector concluded on 28 June 2012, targets were set out for both the social rental sector (housing associations) and the private rental sector. For the social rental sector (around 2.4 million homes) this means energy consumption at the level of label B on average, or an energy index of 1.25 in 2020. For the private rental sector it holds that 80% of the homes must be awarded label C at least. These targets were adopted in the later Energy Agreement for Sustainable Growth which was agreed to in September 2013. The agreements are supported by the Central Government through stimulating measures, including the application of the Housing Valuation System for Investments in Energy Saving, a subsidy scheme for ascending labels, a fund for low-interest loans and, most recently, an energy performance surcharge. It is further set out in the Housing Act 2015 that housing associations must make an offer on the target stated in the local *Woonvisie* (policy vision document on housing) for energy saving in the built environment and must also reach performance-related agreements in this respect every year, in which the tenants' association also plays a role. The housing corporation shall provide the required financial information to both parties.

The agreement was assessed in 2016, and while most of the agreed-to actions were launched, the savings achieved and expected did not match that anticipated. This was confirmed in the latest calculations performed by the Energy Research Centre of the Netherlands (ECN), which monitors the progress of the Energy Agreement. As a result, the Minister announced that statutory measures will be prepared focusing on phasing out poor labels (worse than C). With regard to the results of the private rental sector, the Minister announced that a monitor would be created to obtain better information on the progress.

Name	<i>The STEP subsidy (Incentive scheme for energy performance in the rental sector)</i>
Category	Subsidy
Geographic area	The Netherlands
Target group	Social rental sector
End-user activities to be influenced	Increase the efficiency of homes in the social rental sector
Effectiveness	Directly affects the target group
Status of implementation and planning	€400 million subsidy available for landlords in the social rental sector for investments during the 2014-2018 period

Description

The government is providing landlords in the social rental sector with a subsidy of € 400 million for investments in energy-efficiency in the 2014-2017 period with the aim of contributing to the objectives of the Energy Saving in the Rental Sector Agreement. The STEP-subsidy encourages a substantial wave of short-term investments to make residential rental properties energy-efficient.

The scheme has not been extended until the close of 2018, and it has also been relaxed as of 1 July 2016 with the following changes:

- The subsidy sums have been raised. This increase applies to new applications and with retroactive force for subsidies already awarded.
- In order to encourage extremely energy efficiency renovation, a subsidy is now also awarded for renovations that exceed the Energy Index (EI) of 1.20. This means that extremely energy efficient renovations such as nearly zero energy homes or energy-neutral homes receive a greater subsidy than previously.
- The minimum improvement under the Energy Index is, for a number of specific cases, lowered from class 3 to class 2. This means that more houses will be eligible for a subsidy. The link to the agreements in the Energy Agreement do however remain in place (in 2020 average label B in the social rental sector and a minimum label C for 80% of private rental properties).

Name	<i>Energy Performance Inspections</i>
Category	Building requirements and enforcement
Geographic area	The Netherlands
Target group	200 000 companies that must comply with the Environmental Management Act and fall under the Activities Decree.
End-user activities to be influenced	Companies creating an energy saving plan
Effectiveness	
Status of implementation and planning	National rollout of energy performance inspections started on 18 May 2016

Description

The Environmental Management Act obliges companies and institutions to perform energy saving measures with a payback time of no more than five years. In practice, however, it remains a fact that companies have not done enough and that the competent authority has not taken sufficient action to monitor compliance. This is why agreements were reached in the Energy Agreement on a package of instruments that will accelerate the implementation of energy saving measures. A part of this package is a pilot project that involves Energy Performance Inspections (*Energie Prestatie Keuring*). These inspections are a commercial and transparent approach involving regular inspections, repairs and checks, and they are frequently likened to periodic motor vehicle inspections.

Nine Energy Performance Inspections were conducted as pilot projects in 2014 and 2015. They were officially launched on 18 May 2016.

A company that has passed an Energy Performance Inspection complies with the requirements under the Environmental Management Act, and the inspector is consequently discharged of its enforcement duties. Another objective of the inspections is to encourage companies and institutions to remain active in respect of energy saving.

Name	<i>Expertisecentrum Energiebesparing (Energy Saving Expertise Centre)</i>
Category	Information
Geographic area	The Netherlands
Target group	Companies, in particular smaller, energy intensive ones
End-user activities to be influenced	Energy saving in business processes and in real estate
Effectiveness	Positive evaluation
Status of implementation and planning	The ECE was commissioned for 2015-2016 (as of 01/08/2015). As of 2017 the ECE has been alternatively positioned

Description

The ExpertiseCentrum Energiebesparing (the Energy Saving Expertise Centre (ECE)) was born out of the Energy Agreement and it was launched on 1 August 2015.

The ECE is an independent and flexible networking and knowledge body. Its aim is to encourage companies to save energy and use energy more efficiently, which is done by making knowledge applicable and developing suitable approaches in conjunction with its network partners.

Cooperation is the keyword when it comes to the methods employed by the ECE team: cooperating with parties 'in the field' that are already playing an active role or that have a sense of responsibility when it comes to encouraging energy saving behaviour. These 'intermediary organisations', such as sector organisations, authorities, market parties, suppliers of expertise and regional implementation services, can all become partners of the ECE. The ECE and its partners (a 'coalition of the willing') together make up the ECE.

In 2017 the ECE was converted into a Programme Office, with pilot projects still ongoing. The following were added to it: a) facilitation of LTA companies and b) the development of new approaches and projects revolving around the themes of insulation, steam, the indoor climate, efficient lighting and dealing with business parks.

I.3 INDUSTRY

The measures in the industrial sector are as follows:

- Energy Tax (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Energy Investment Allowance (see description in paragraph I.1)
- Green Investing: Green Projects Regulation (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- Framework for one-on-one agreements for MEE companies

Name	<i>Framework for company-specific (one-on-one) agreements for MEE companies</i>
Category	Voluntary agreements
Geographic area	The Netherlands
Target group	Industry
End-user activities to be influenced	<p>Companies have the opportunity to enter into supplementary agreements with the government concerning energy efficient measures with a payback period of over five years. The government looks at the actions it can perform for each one-on-one agreement in order to clear any obstacles so that the measure can be undertaken.</p> <p>The Framework was created as a result of the agreement arising from the Energy Agreement to achieve 9 PJ in additional final energy saving.</p>
Effectiveness:	Five company-specific agreements have now been signed.
Status of implementation and planning	The Framework is fully operational. However, the signed one-on-one agreements are not sufficient for achieving the objective in the Energy Agreement. At present the government is working with the parties concerned on a new framework for achieving that 9 PJ by 2020.

I.4 TRAFFIC AND TRANSPORT

The measures in the traffic and transport sector are as follows:

- Energy Tax (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- The New Driving (HNR) 3.0 programme (*Het nieuwe rijden* (HNR) 3.0)
- Sustainable Logistics (Lean and Green Logistics)
- Sustainable Personal Mobility (Lean and Green Personal mobility)
- *Kies de beste band* publicity campaign (Choose the Best Tyres)
- Run your engine differently (*Het Nieuwe Draaien*)

Name	<i>The New Driving (HNR) 3.0 programme (Het nieuwe rijden (HNR) 3.0)</i>
Category	Training and education
Geographic area	The Netherlands
Target group	Car users and learner drivers; intermediary organisations (fleet managers, driving schools, sector organisations, etc)
End-user activities to be influenced	Driving behaviour and buying behaviour
Effectiveness	Differs: most activities are aimed directly at the end-user, while other activities aim to reach the end-user through intermediary organisations
Status of implementation and planning	Ongoing (since 1999) HNR 1.0: 1999 – 2011 (SenterNovem on behalf of the Ministry of Transport, Public Works and Water Management) HNR 2.0: 2011 – 2014 (Instituut voor Duurzame Mobiliteit (Institute for Sustainable Mobility), with a grant from the Ministry of Transport, Public Works and Water Management/ Ministry of Infrastructure and the Environment)

Description

The New Driving programme (*Het Nieuwe Rijden* (HNR)) was undertaken by SenterNovem (later AgentschapNL) in the 1999-2010 period on behalf of the then Ministry of Transport, Public Works and Water Management. The programme was set up at the time to encourage professional and other drivers to adopt a more energy-efficient driving and purchasing behaviour. A combination of information, education and financial incentives encourages drivers to adopt a more efficient driving style, check the tyre pressure at regular intervals and purchase more efficient cars. The term *het nieuwe rijden* (the new driving) became widely known, thanks to mass communications, and figures from its practical application show that the HNR has saved at least 6% in fuel.

Over the 2010-2014 period the Ministry provided a grant of €4 million to the Instituut voor Duurzame Mobiliteit (the Institute for Sustainable Mobility (IvDM)) for the purpose of having market parties proceed with the programme (HNR 2.0), and 19 CO₂-reducing projects and initiatives were acquired from the market and were given support during that period. Every project contributed to the reduction of CO₂ emissions in Dutch traffic by increasing awareness with respect to the HNR and inducing professional and other drivers as well as fleet managers to adopt it. Over a period of four years HNR 2.0 led to a reduction of one megaton (1 million tons) of CO₂.

In 2013 it was agreed within the Social and Economic Council Energy Agreement that the private sector (with the RAI (the Dutch Association of the Bicycle and Automotive Industries) as the

initiator as well as BOVAG and the ANWB) would define a next step in passenger transport for The New Driving (HNR 3.0) after the completion of HNR 2.0 (mid 2014). Under HNR 3.0 the focus is on 'direct' communication with the end-user (the driver) through a website, dealerships, driving lessons as well as through other communication channels. An information counter/website for HNR 3.0 (www.hetnieuwerijden.nl) plays an important role in this respect. Consumers and professional drivers can in due course see how the HNR can become a part of their driving behaviour, for each brand and type of vehicle, on the website. This website is to be launched in the first quarter of 2017.

Name	<i>Sustainable Logistics (Lean and Green Logistics)</i>
Measures	Companies are supported in reducing the CO ₂ emissions of their logistics chain. They receive a Lean and Green award if they achieve this.
Category	Voluntary agreements
Geographic area	The Netherlands
Target group	Companies with a logistics chain
End-user activities to be influenced	Reducing the CO ₂ emissions of their logistics chain.
Effectiveness	Positive
Status of implementation and planning	Ongoing (Connekt has been running this independently since 2014)

Description

Lean and Green is an incentive programme for companies and public bodies run by [Connekt](#). With Lean and Green Logistics organisations show that they are working actively to make their logistical process more sustainable. It encourages organisations to grow towards a higher level of sustainability by taking measures that not only deliver cost-savings, but also reduce environmental pollution. If an organisation with an Action Plan can demonstrate that it can achieve a 20% CO₂ reduction in five years' time, it is eligible for the Lean and Green Award. Organisations that have actually achieved their 20% CO₂ target receive the Lean and Green Star as a symbol of the achievement of their Lean and Green objective. With Lean and Green, organisations show that they are actively working to make their mobility process more sustainable.

Stickers on the vehicles indicate membership of the scheme. Many large companies such as Heinz and Bavaria have joined. Within this programme new methods are also being developed and promoted via the L&G network and knowledge is being exchanged by its ambassadors (company logistics managers).

Since Lean & Green Logistics was launched in 2008 the programme has expanded into a network of over 500 companies wherein they are encouraged to adopt evermore further-reaching measures, including in conjunction with other companies in the logistics chain. There have been follow ups to the programme in five other European countries. All these logistics front runners for sustainable mobility play an active role in one way or another in Lean & Green. <http://lean-green.nl/nl-NL/logistics/>

Name	<i>Sustainable Personal Mobility (Lean and Green Personal mobility)</i>
Measures	Companies are supported in reducing the CO ₂ emissions of their employees (commuting and commercial traffic) by 20%. They receive an award if they achieve this.
Category	Incentive scheme /voluntary agreements
Geographic area	The Netherlands
Target group	Large and notable companies.
End-user activities to be influenced	Choice of transport, employee driving behaviour (commuting and commercial traffic).
Effectiveness	Positive
Status of implementation and planning	Launched in 2013

Description

Lean and Green is an incentive scheme for companies and public bodies run by [Connekt](#). After the success of the Lean and Green Logistics programme it was agreed under the Social and Economic Council of the Netherlands agreement that this scheme should be extended to personal mobility. The aim is to help 300 companies in 2014 to prepare an action plan to reduce the CO₂ emissions caused by their personal mobility by 20%. They receive an award for a concrete action plan, after assessment by the Netherlands Organisation for Applied Scientific Research (TNO), and a star for realising the plan. Work is presently being undertaken on a 'Two star' level. Stickers on the vehicles/publicity on the website indicate that a company is a member of the scheme. Some 180 companies are affiliated with the scheme, and it has been financially self-sufficient as of 2017. Within this programme new methods are also being developed and promoted via the L&G network and knowledge is being exchanged by its ambassadors (company logistics managers) <http://lean-green.nl/nl-NL/personal-mobility/wat-is-lean-and-green-personal-mobility/>.

Name	<i>Choose the Best Tyres publicity campaign (Kies de beste band)</i>
Category	Education, raising awareness
Geographic area	The Netherlands
Target group	Drivers and the retail sector
End-user activities to be influenced	Selecting better quality tyres. Ensuring the tyre pressure is correct.
Effectiveness	Highly cost-effective and better tyres at the correct pressure can result in a reduction of up to 1.7 Mton of CO ₂ at no additional costs.
Status of implementation and planning	The campaign was launched in April 2015 and awareness of it grew considerably over a short period (around 20%). Tyre sales have already demonstrated a slight increase in the sale of better tyres.

Description

The Ministry of Infrastructure and the Environment facilitates the campaign and acts together with a number of stakeholders such as ANWB, BOVAG, Stichting Band op Spanning (a foundation for encouraging correct tyre pressure), Stichting N&M (a foundation for nature and the environment), RecyBEM/NVR (the Dutch Federation of the Rubber and Plastics Industry) and VACO (the Dutch Tyre and Wheel Association). The campaign houses many driver and retail sector-focused actions. One of these is to request that companies, public bodies and car leasing companies with their own fleets sign the *Verklaring Gebruik Beste Banden* ('The Best Tyres Declaration'). Under this declaration they undertake to replace worn-out tyres with tyres of the best quality available and to keep them at the correct pressure. A campaign such as this one requires multiple years to be effective and to achieve a larger proportion of its potential gains. The campaign was evaluated in September 2016 and it was decided that in any event it would continue through to 2018. It will be subjected to a re-evaluation in 2018.

Campaign website: www.kiesdebesteband.nl

Verklaring Gebruik Beste Banden website: www.betere-banden-nu.nl

Name	<i>Run your engine differently (Het Nieuwe Draaien)</i>
Category	Green Deal
Geographic area	The Netherlands
Target group	Public bodies, civil and hydraulic engineering companies, agricultural companies, construction companies, sector organisations
End-user activities to be influenced	Adjusting working methods, purchasing behaviour, contracts
Effectiveness	Mobile machinery is responsible for 8% of the CO ₂ emissions by the traffic and transport sector. The aim is to achieve a reduction of 10% of CO ₂ emissions by 2020.
Status of implementation and planning	The parties concluded the Green Deal in May 2016. Working groups are occupied with a range of topics. The first progress report will be issued in 2017.

Description

On 26 May 2016 28 parties, including the ministries of Infrastructure and the Environment and Economic Affairs, concluded the Green Deal. The objective of the Green Deal is to reduced CO₂ emissions by 10% over the period it is in effect (2016-2020). In order to achieve this the participating parties undertake a number of actions in various fields. One of the ways in which fuel consumption can be lowered is by changing the behaviour of train and equipment operators.

Further, contracting parties must be incentivised to perform their work in an energy efficient manner. Attention is also paid to: teaching energy-efficient usage in training courses, using biofuels and using cleaner and better-maintained equipment. Meanwhile, there is a call for more energy-efficient machinery on an EU-wide scale. Further information on this Green Deal can be found at <http://www.greendeals.nl/gd203-het-nieuwe-draaien/>.

I.5 AGRICULTURE

The measures in the agricultural sector are as follows:

- Energy Tax (see description in paragraph I.1)
- Energy Investment Allowance (see description in paragraph I.1)
- Long-term Agreements (see description in paragraph I.1)
- Green Investments (see description in paragraph I.1)
- Enforcement of the Environmental Management Act (see description in paragraph I.1)
- Innovation Programme Greenhouse as Energy Source (KAE)
- Market Introduction for Energy Innovations (MEI) subsidy module, Investing in Greenhouses as an Energy Source (EHG) subsidy module, Guaranteed Loans for Agriculture (BL); SME Innovation Incentives in Top Sectors (MIT)
- Internal CO₂ equalisation system for the sector

Name	<i>Greenhouse as an Energy Source Innovation programme and action plan (Innovatie- en actieprogramma kas als energiebron (KAE))</i>
Category	Research, innovation, proof of principle, monitoring front runners
Geographic area	The Netherlands
Target group	Greenhouse cultivation
End-user activities to be influenced	Development and application of innovations that enable energy saving and the use of sustainable energy Both the market and research institutes are involved.
Effectiveness	CO ₂ -emissions in 2015: 5.7 Mton Energy efficiency in greenhouse cultivation for 2015 resulted in a 58% cut in primary fuel consumption when compared to 1990
Status of implementation and planning	The development and implementation programme is focused on the objectives of the 2014-2020 energy transition for greenhouse cultivation long-term agreement Launched in 2002, ongoing

Description

The goals and ambitions of the energy transition for greenhouse cultivation long-term agreement: By 2020 newly constructed greenhouses must be climate-neutral in respect of growing, while concepts must be developed for existing greenhouses that will see agriculture performed with the halving of fossil fuel consumption, without such impacting on profit and competitiveness. The aim is that the energy supply is fully sustainable and cost-effective by 2050.

The target is a maximum of 6.2 Mton of CO₂ emissions in 2020, to be achieved by means of far-reaching energy saving measures and the use of sustainable energy. This means -2.6% per year over the 2013-2020 period, as well as 11 PJ in additional energy-saving, as agreed to in the Energy Agreement. The Greenhouse as an Energy Source programme focuses on achieving these targets and ambitions. The nucleus thereof is far-reaching energy saving measures and the use of sustainable energy.

The government, the corporate sector and knowledge institutes work together under the Greenhouse as an Energy Source programme to create long-term innovations and measures that will save energy over the short and the long term. The priorities are:

- the Next Generation Growing acceleration plan (*versnellingsplan Het Nieuwe Telen*), which focuses on far-reaching energy saving concepts (10-30%)
- the Geothermal acceleration plan (*versnellingsplan Aardwarmte*), focusing on the use of that potential in greenhouse cultivation
- innovation breakthroughs, focusing on the development of innovative energy saving cultivation and greenhouse concepts, and
- regional energy gains, focusing on regional cooperation.

The programme employs a variety of instruments for this purpose, such as research, development, proof of principle, monitoring in the field, communication and knowledge exchange, courses and financial support.

Name	<i>Market Introduction for Energy Innovations (MEI) subsidy module, Investing in Greenhouses as an Energy Source (EHG) subsidy module, Guaranteed Loans for Agriculture (BL); SME Innovation Incentives in Top Sectors (MIT)</i>
Category	Grant and other schemes
Geographic area	The Netherlands
Target group	Agriculture, greenhouses in particular
End-user activities to be influenced	Encouraging investments in energy efficiency or the use of renewable energy
Effectiveness	High
Status of implementation and planning	Ongoing schemes

Description

There are two subsidy programmes within the greenhouse cultivation sector to promote the development of energy-efficient measures and efficient energy systems.

The Investment in Energy (***Investeringen in Energie*** (EHG)) subsidy module offers companies active in greenhouse cultivation a subsidy of 25% for specific measures (contained in an annually-revised list) for increasing energy efficiency (or generating or using renewable energy), for which the maximum subsidy can differ per investment. Clusters of companies can also apply for a subsidy.

The Market Introduction for Energy Innovations (***Marktintroductie Energie-innovaties*** (MEI)) subsidy module is intended for investments in innovative energy systems for greenhouses that reduce CO₂ emissions and primary energy consumption. Investments in energy efficient innovative greenhouses can also be subsidised. In this respect there are specific requirements contained in the scheme. They must be innovative energy systems or innovative greenhouses that have only just been introduced. The subsidy amounts to 30% for large companies and 40% for small and medium-sized ones. If the calculation method under Article 41(6) (a) or (b) is used, large companies can receive a 40% subsidy.

Two generic schemes are also used for the purposes of energy efficiency.

Then there is also the SME Innovation Incentives in Top Sectors (***MKB Innovatiestimulering Topsectoren*** (MIT scheme)), which does not focus specifically on energy efficiency but can be used in respect of innovations for energy efficiency. The Ministry of Economic Affairs uses the MIT scheme for Horticulture and Propagation Materials (*MIT-regeling Topsector Tuinbouw en Uitgangsmaterialen*) to encourage SMEs to cooperate and innovate within this top sector. The objective is to become a global leader in sustainable solutions by 2020. The Ministry of Economic Affairs uses the MIT scheme for Agriculture and Food (*MIT-regeling Agri en Food*) to encourage SMEs to cooperate and innovate within the foodstuffs industry. The objective is to further bolster the international position of this top sector.

Finally there is the Guaranteed Loans for Agriculture (**Borgstelling Landbouw** (BL)) facility. It replaced the Agriculture Guarantee (Garantstelling Landbouw (GL)) on 1 January 2017 and it allows the government to act as guarantor for a part of a bank loan. The BL is faster and has a wider scope than the GL. The bank makes the application, and the maximum guarantee has been doubled to €1.2 million. More types of investments can now also fall under this facility (plants and working capital are now also included). For innovative investments a maximum guarantee of €x.5 million can now be obtained (Green Label greenhouse, new greenhouse concept).

Name	<i>Internal CO₂ equalisation system for the greenhouse cultivation sector</i>
Category	Set out in laws and legislation based on agreements within the CO ₂ greenhouse cultivation agreement
Geographic area	The Netherlands
Target group	Greenhouse cultivation
End-user activities to be influenced	Raising awareness of energy consumption and encouraging investment in energy saving by introducing a ceiling and market price for CO ₂
Effectiveness	For individual measures, limited. For certainty in respect of achieving the CO ₂ ceiling across the sector, large
Status of implementation and planning	Ongoing: Laws and legislation and emission allocations agreed to and set out. As of 2015 the CO ₂ emissions related to the supply of electricity to the network also fall under this

Description

Greenhouse cultivation is the largest energy-consumer in the agriculture sector. To regulate CO₂ emissions, a CO₂ equalisation system has been set up for this sector. The ceiling for the system is set by the government. The introduction of a market price for CO₂ encourages companies to invest in saving energy.

The basis for the emissions is the gas consumption set off against heat and CO₂ production. The CO₂ price is based on the price in the ETS.

All greenhouse cultivation companies, with the exception of those participating in the EU-ETS (as of 2015, around 15), participate in this system. The CO₂ equalisation system will not be linked to the EU-ETS.

ANNEX II. UPDATE ON ARTICLE 4 STRATEGY

1. Introduction

In December 2012 the EED, the Energy Efficiency Directive, was adopted. It was introduced with the aim of reducing energy consumption by 20% in 2020. This energy-efficiency strategy focuses on a wide variety of policy areas; this Annex discusses the long-term strategy required for the renovation of buildings, as described in Article 4 of the EED.

2. EED, Article 4

Renovation of buildings

Article 4 of the EED requires European Member States to establish a long-term strategy for the renovation of buildings.

Renovation of buildings

Member States shall establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private. This strategy shall encompass:

- (a) an overview of the national building stock based, as appropriate, on statistical sampling;*
- (b) identification of cost-effective approaches to renovations relevant to the building type and climatic zone;*
- (c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations;*
- (d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions;*
- (e) an evidence-based estimate of expected energy savings and wider benefits.*

A first version of the strategy shall be published by 30 April 2014 and updated every three years thereafter and submitted to the Commission as part of the National Energy Efficiency Action Plans.

The basis of the Dutch response to this mandatory long-term strategy is the Energy Agreement signed in 2013 by 40 parties, public and private, with firm ambitions, objectives, intentions and agreements for energy saving in many spheres in the Netherlands over the short, medium and long term. In addition to implementing the Energy Agreement, the Netherlands will be continuing to implement other standing policy on energy saving over the next few years.

At the end of 2016 the Cabinet presented the Energy Agenda. This agenda sets out the broad long-term lines until 2050. These shall be made more specific in the near future and after 2020 will continue and bolster the momentum started by the Energy Agreement.

Notes

Questions a) and b) are answered by Annexes 8.a. Energy saving: a combination of home and occupant – Analysis of the Energy WoON 2012 module, and 8.b. Improving the reference picture of the non-residential sector (stock, energy use, saving potential, investment costs, labour).

Questions c), d) and e) are answered on the basis of the Energy Agreement and the Energy Agenda.

The various relevant parts for the renovation strategy for the built environment are dealt with and discussed in sections 3 to 7. Annexes

8.d. Background Document to the Development of the Social and Economic Council of the Netherlands Energy Agreement (*Achtergronddocument bij Doorrekening SER Energieakkoord - Sector Gebouwde omgeving*).

8.e Assessment of the Energy Agreement Intensification Package and annexes 8.f 1-6 (National Energy Outlooks 2014-2016, Evaluation of the Energy Agreement 2016 and the Progress Report 2016) provide further information on calculating the implications of the Energy Agreement, its effects and the expected and achieve energy savings in the built environment.

3. The Energy Agreement and the Energy Agenda

3.1 The Energy Agreement

In September 2013 the Energy Agreement for Sustainable Growth was signed by over 40 parties in the Netherlands who are active in the field of energy efficiency and sustainable generation. In this agreement the parties establish the basis for a broad, robust and future-proof energy and climate policy.

The Energy Agreement makes a strong commitment to energy efficiency. This is extremely important because energy efficiency not only contributes towards security of supply and the reduction of CO₂ emissions, but also reduces the energy bills of citizens and companies and gives a strong boost to employment, particularly in the building sector.

These agreements are intended to produce a total collective saving of 100 PJ in 2020 and will also fulfil the European obligation to save an average of 1.5% of final energy consumption in the period 2014-2020.

Energy saving in the built environment

Energy saving in the built environment is an important part of the Energy Agreement, as there are opportunities to make significant energy savings in this area. The parties who have signed the agreement have reconfirmed the existing objectives:

- the objectives from European Energy Efficiency Directive (EED), the Energy Performance of Buildings Directive (amended) and the Ecodesign Directive;
- existing buildings: move 300 000 existing residential buildings and other buildings a year up two label stages;
- new buildings: nearly zero-energy from 2020 (and from 2018 for government buildings) in accordance with the EPBD Directive;
- rental: average label B in social rental sector and a minimum label C for 80% of private rental properties in 2020.

The first bullet point is particularly important: the Energy Agreement reconfirms the objectives from the EED. The second and fourth bullet points are particularly important for Article 4 of the EED; and where renovation no longer applies, new building ensures the provision of nearly zero-energy housing (third bullet point).

The Energy Agreement aims to reduce CO₂ emissions by 80-95% in 2050 and to achieve 16% renewable generation in 2023. Under the global climate agreements, the Netherlands has undertaken to achieve at least a 40% CO₂ reduction in 2030. The Energy Agreement aims to achieve at least an average energy label A for buildings in 2030. Under the EPBD Directive, all new buildings must be nearly zero-energy by 2020.

3.2 The Energy Agenda

At the end of 2016 the Cabinet presented the Energy Agenda. This agenda sets out the broad long-term lines until 2050. Energy saving in the built environment is included here under 'Energy for heating spaces'.

Energy for heating spaces in the built environment

The most important pillars of the policy for CO₂-neutral low-temperature heating in 2050 for the Netherlands, as set out in the Energy Agenda, involve the far-reaching reduction of the demand for heating by means of energy saving and a dramatic decrease in the use of natural gas through encouraging and integration of sustainably generated electricity and sustainable heating. The Cabinet is preparing statutory mandatory measures, such as a minimum energy label for housing corporation accommodation and offices. It is being explored whether they can also be applied to other property sectors. The Cabinet is further continuing and expanding the stimulus for reducing consumption by means of information, subsidies (such as the Homeowner Energy-saving Incentive Scheme (*Stimuleringsregeling Energiebesparing Eigen Huis*)) and supporting innovative approaches. In the next few years statutory and administrative parameters will be created for the purpose of dramatically reducing the use of natural gas in the built environment, inter alia by means of regulating large-scale heating networks in a comparable manner to electricity and gas networks and by holding municipalities (partially) responsible for the strategic implementation.

4 Strategy and implementation

4.1 Strategy

The point of departure of the Energy Agreement is that building owners – i.e. housing associations, citizens, companies, institutions and public bodies – have an interest in and are responsible for energy-efficiency, but that they do require support in that respect. A coordinated effort on the part of the Central Government, municipalities, contractors, builders, installation companies, banks, building owners and landlords is required. A combination of information and awareness, facilitation and financial support was selected.

Over the longer term the strategy for achieving CO₂-neutral low-temperature heating in the Netherlands by 2050 is set out in the Energy Agenda. The large-scale return of the use of natural gas in the built environment is a decision with major consequences. The strategies shall be further worked out at a regional level, as the alternatives for space heating in the built environment can differ at a regional and local level.

Energy-saving will become a part of these regional strategies.

4.2 Implementation

A Guarantee Committee was created when the Energy Agreement was concluded in 2013, which is responsible for monitoring compliance with the agreements and provides details on the outcomes of the Energy Agreement. The Guarantee Committee ensures that the measures agreed to in the Energy Agreement are adopted, and that the agreement goes beyond intentions alone. The results achieved by the Energy Agreement will be evaluated at set times; a decision can be made to adjust the measures to be taken if the result achieved is inadequate. All parties who have signed the Energy Agreement are represented on the Guarantee Committee, which is chaired by an independent chair (Dr E.H.Th.M. Nijpels).

In this scope the National Energy Outlooks (Nationale Energieverkenning (NEO)) were published in 2014, 2015 and 2016. The National Energy Outlook is a survey that is conducted annually and analyses Dutch energy management and sketches out plausible future developments under established and proposed policies. The measures of the Energy Agreement for Sustainable Growth are included in these assessments.

On the basis of the results contained in the 2015 National Energy Outlook, a package of intensifying measures was established in the spring of 2016, of which the label C obligation for offices is the most important for energy-saving in the built environment.

The impact of this package of intensifying measures in the built environment is estimated to amount to 10.0 PJ in 2020 (6.7-27.7 PJ bandwidth) (Assessment of the package of intensifying measures for the Energy Agreement, ECN 2016). Not all of these measures in the intensification package have already been included in the 2016 National Energy Outlook because they have not yet been worked out to a sufficient degree. On the basis of the established policy and proposed (sufficiently concrete) policy, the final energy saving in the built environment is estimated to be 27 PJ per year (13-43 PJ bandwidth).

Further measures were agreed to in the autumn of 2016, in particular the obligation to phase out rental housing with a label lower than label C. This measure will result in an additional energy saving of approximately 5 PJ in comparison to the 2016 NEO. It is being endeavoured, together with the energy suppliers, installers and network operators, to create a task-setting agreement between the energy suppliers, installers, network operators and the government. This agreement shall give rise to an energy saving market and result in an additional final energy saving of 10 PJ in 2020.

Effect of individual measures

An overview can be found in table II.1 of the expected energy saving resulting from measures in the Energy Agreement. This only concerns measures that were sufficiently worked out in May 2016, not those measures that were agreed to as a result of the NEO 2016.

Table II.1 An overview of the expected energy saving resulting from measures in the Energy Agreement.

Sector, Instruments	2016		2020	
	Determined	Determined and adopted	Determined	Determined and adopted
Built environment, Total	2 [1-4]	4 [2-8]	12 [6-20]	27 [13-43]
Households, general total	1 [0-2]	1 [0-2]	5 [2-10]	5 [2-10]

Sector, Instruments	2016		2020	
	Determined	Determined and adopted	Determined	Determined and adopted
Smart meters	0.5 [0.2-1.1]	0.5 [0.2-1.1]	2.4 [1.2-5.6]	2.4 [1.2-5.6]
Tightening up Ecodesign	0 [0-0]	0 [0-0]	0 [0-0]	0.7 [0-0.7]
ISDE HH (additional) Tax shift to bracket	0.5 [0.1-0.8]	0.5 [0.1-0.8]	2.3 [0.7-3.9]	2.3 [0.7-3.9]
Owner-occupied housing sector total	1 [0-1]	1 [0-1]	3 [1-4]	3 [1-5]
Owner-occupied housing sector approach	0.6 [0.2-0.8]	0.6 [0.2-0.8]	2.9 [1.1-4.2]	2.9 [1.1-4.2]
Financing arrangements	0 [0-0]	0.1 [0.1-0.1]	0 [0-0]	0.4 [0.3-0.6]
Rental sector total	0 [0-0]	0 [0-1]	1 [1-2]	2 [1-6]
STEP scheme	0.1 [0.1-0.3]	0.1 [0.1-0.3]	0.7 [0.5-1.3]	0.7 [0.5-1.3]
Stroomversnelling	0.1 [0.1-0.1]	0.3 [0.1-0.4]	0.3 [0.3-0.3]	1.3 [0.3-2.1]
Local agreements	0 [0-0]	0 [0-6]	0 [0-0]	0 [0-3]
Services total	1 [0-1]	2 [1-3]	3 [2-4]	16 [9-22]
ISDE HDO	0.1 [0.1-0.1]	0.1 [0.1-0.1]	0.4 [0.3-0.5]	0.4 [0.3-0.5]
Sports facilities subsidy	0 [0-0]	0.1 [0-0.1]	0.3 [0.2-0.4]	0.3 [0.2-0.4]
Enforcement of Environmental Management Act	0.5 [0.3-0.7]	1.8 [1.1-2.5]	2.4 [1.5-3.4]	12.5 [7.5-17.5]

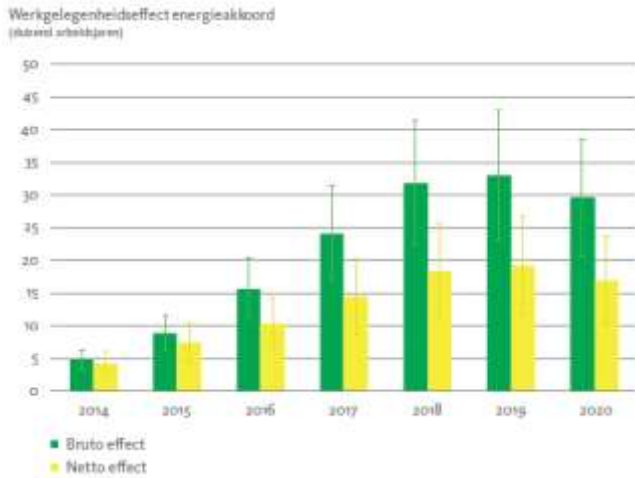
Sector, Instruments	2016		2020	
	Determined	Determined and adopted	Determined	Determined and adopted
Tightening up Ecodesign	0 [0-0]	0 [0-0]	0 [0-0]	0 [0-1]
Mandatory label C offices	0 [0-0]	0.5 [0.3-0.6]	0 [0-0]	2.7 [1.4-3.2]

Source: Nationale Energy Outlook 2016

Employment

The objective of the Energy Agreement is to create 15 thousand additional (net) fulltime jobs and 90 thousand man-years between 2014 and 2020. It is evident from the figures for employment that the energy transition is picking up. Fulfilling the 15 000 fulltime job-target is within reach, in particular through the growth of employment in renewable energy and energy efficiency. Figure II.1 shows the gross and net employment effect of the Energy Agreement. Cumulative net employment will now reach the 90 000 man-hours target, according to the model.

Figure II.1 Gross and net employment effect of the Energy Agreement



Source: Nationale Energy Outlook 2016

Werkgelegenheidseffect energieakkoord (duizend arbeidsjaren)	Employment effect of the Energy Agreement (thousand man-hours)
Bruto effect	Gross effect
Netto effect	Net effect

5. Owner-occupied housing

In the owner-occupied housing sector the following actions have been instituted and results achieved (Energy Agreement for Sustainable Growth: 2016 progress report; Parliamentary letter on the Energy Agreement 2016 progress report):

- In February 2016 Energie Nederland launched its campaign *Sta op uit je stoel* ('Get out of your chair'), which aims to encourage citizens and companies to save energy. For a two-week period commercials were aired on television and radio. Energy companies highlight their energy saving products on a campaign website.
- The Ministry of the Interior and Kingdom Relations launched a three-year **national activation campaign** called *Energie besparen doe je nu* ('Save energy now'), which aims to encourage private homeowners to save energy in their own homes by raising the sense of urgency and tackling frequently asked questions and objections. The campaign could cover all homeowners with a label C or lower residence. Aside from radio and television advertisements there is also a campaign website where homeowners can pose questions, examine the measures and options for subsidies, and where they are referred on to municipal energy points of contact and product and service providers. Sector organisations for energy suppliers and the Ministry of the Interior and Kingdom Relations liaised on how the campaign can be used as part of the many **regional information initiatives**. These regional initiatives develop their own informational activities with the look and feel of the national campaign. The municipalities use **energy points of contact** to inform owner-occupiers in their regions of the benefits of energy saving, the range of products and services available in the region and the option for financial support. These energy points of contact are active in nearly all municipalities. Most municipalities started communicating with inhabitants and companies in this respect in October, which was linked to the national activation campaign.
- Following up on the recommendation of the Regiegroep Energiebesparing Koop (the steering group for energy saving in purchased homes), the **Stuurgroep Energiebesparing Koopsector**

(the steering group for energy saving in the owner-occupied housing sector) guarantees cooperation between the VNG, the Ministry of the Interior and Kingdom Relations, Bouwend Nederland, Uneto-VNI, OnderhoudNL and the nature and environmental federations for encouraging energy saving in the regions. The steering group acts as the commissioning party in the development of various approaches and instruments.

- In the summer of 2016 the municipalities were asked to submit, together with the private sector, proposals for **Innovative Approaches** (*Innovatieve Aanpakken*). This covered actual projects that accelerate the sustainability of the owner-occupied housing sector at a local and regional level by means of developing Product-Market combinations that occupants utilise when making their homes more sustainable as they become zero-energy. The Innovative Approaches build on the energy points of contact and the alliances of suppliers.
- The Vereniging van Nederlandse Gemeenten (association of Netherlands municipalities (VNG)) has taken the initiative to create **maps that show the potential** (*potentiekaarten*) for energy saving and renewable energy options on streets and in neighbourhoods in the Netherlands. These electronic maps are intended for construction companies and installers and contribute to the understanding of energy-related policy issues among municipalities. In the summer of 2016 Statistics Netherlands started creating these maps containing information at a neighbourhood level, and they will be available in electronic form by the end of 2016.
- Bouwend Nederland (the sector organisation for Dutch construction and infrastructure companies), Uneto-VNI (the employers' organisation for the installation industry) and OnderhoudNL ((the employers' organisation for real estate maintenance) have jointly set out the outlines of the **Duurzame Aanbieder** ('Sustainable Provider') profile. It contains specific conditions for contractors who aim to offer owner-occupiers more tailored products and services for making their homes sustainable. Contractors (or consortiums of contractors) that qualify as *Duurzame Aanbieder* (Sustainable Contractor) are distinguished from non-qualifying contractors in that respect. The *Duurzame Aanbieder* profile will be available as of the end of 2016.
- The guarantee bodies Stichting Bouwgarant (a quality mark institution), Stichting Waarborgfonds Koopwoningen (owner-occupied housing guarantee fund (SWK)) and the house-builders' certification institute Woningborg Advies BV have developed an **energy performance guarantee** that affiliated contractors are able to use. Use of the energy performance guarantee is a precondition for participation in local/regional Innovative Approaches and for qualifying to use the Sustainable Contractor profile. The terms and conditions of each provider of an energy performance guarantee are bound to the application of this guarantee product. In general, a few individual measures or small measures with a limited effect fall outside of that. For owner-occupiers who choose such, and also for the purposes of additional security, Uneto-VNI, OnderhoudNL and Bouwend Nederland are developing the guarantee for energy label stages over the next few months.
- The **Nationaal EnergiebespaarFonds** (National Revolving Fund for Energy Saving) further lowered the interest in energy saving loans in the first half of 2016, thanks to a government grant of €10 million. Inhabitants of the province of Overijssel can now borrow at lower rates, thanks to an agreement between that province and the NEF. The fund has now issued approximately €50 million in energy-saving loans to owner-occupiers and owners' associations.

- On 1 September 2016 an **Energy-saving at Home subsidy scheme** (*Energiebesparing eigen huis*) was published, providing a budget of € 60 million for homeowners who implement at least two major insulation measures. For an integral and extremely low-energy package (the insulation package that is associated with a zero-energy home) a bonus of €4 000 over and above the subsidy is available. A subsidy is also available for energy recommendations and for creating a green long-term maintenance programme for owners' associations.
- It is being endeavoured to create a **task-setting agreement** between the energy suppliers, installers, network operators and the government. This agreement shall give rise to an energy saving market and result in an additional final energy saving of 10 PJ in 2020. It has been agreed that the agreement will be worked out and signed by 1 May 2017. Should this not be achieved, then an alternative measure shall be considered. A component of the agreement is that if the parties are not on course for achieving the objectives of the agreement by the end of 2018, then additional mandatory measures can be adopted for the market parties.

6. Rented housing

In the rented housing sector the following actions have been instituted and results achieved (Energy Agreement for Sustainable Growth: 2016 progress report; Parliamentary letter on the Energy Agreement 2016 progress report):

- The **Energy performance surcharge bill** was adopted on 17 May 2016 and took effect on 1 September 2016. Landlords who renovate their properties so that they are nearly zero-energy or zero-energy can charge an energy performance surcharge to their tenants so as to earn back major investments in the rental property. The landlord and the tenant must reach an agreement on the sum of the fee.
- The Energy Performance in the Rented Housing Sector Incentive Scheme (**Stimuleringsregeling Energieprestatie huursector STEP**) was improved on 1 July 2016, and it is now expected to be used at a greater level. Among these measures was to extend the duration of the scheme until the end of 2018, to raise the subsidies for each improved step and to make higher subsidies available for very energy-efficient renovations.
- The VNG, Woonbond (the Union of Tenants) and Aedes (the federation of social housing institutions in the Netherlands) are expediting ambitious **performance agreements** in respect of sustainability by municipalities, corporations and tenants' associations. After affordability, energy-related home improvements are the most significant matter that was the subject of performance agreements between August 2014 and December 2015. Since the start of 2016 the local performance agreements are also reported annually in the Housing Council Statement (Staat van de Volkshuisvesting).
- It is estimated that **750 zero-energy renovations** were performed in the rented housing sector, of which 700 were launched by Stroomversnelling.
- At the initiative of VNO-NCW (a Dutch employers' federation), the Netherlands Investment Institution (Nederlandse Investeringsinstelling (NLII)) analysed the business case for **zero-energy renovations**. A lack of financial resources does not constitute a considerable obstacle to a large-scale rollout in the rented housing sector. Important issues include the lack of certainty among housing associations on the duration of the energy performance surcharge and the netting scheme, the organisational complexity of such a renovation and the fact that costs are still relatively high.

- The Ministry of the Interior and Kingdom Relations shall examine the form and possible consequences of **phasing out rental accommodation with an energy label worse than label C.**

7. The property sector

In the property sector the following actions have been instituted and results achieved (Energy Agreement for Sustainable Growth: 2016 progress report):

- The Ministry of the Interior and Kingdom Relations has studied the design and possible consequences of mandatory energy-saving for offices. Over half of the office space (in excess of 80 million m²) presently has an energy label below that of label C. If the offices were required to attain label C by 2023, this would result in an additional saving of 8.6 PJ in that year. The average payback period is between 3 and 6.5 years. The majority of offices could attain a label C without being subjected to expensive construction modifications. Publication of this measure is scheduled for 1 January 2018 at the latest, with it taking effect and being enforced as of 1 January 2023.
- The Ministry of Infrastructure and the Environment and the VNG have given substance to the performance agreements identified in the Energy Agreement that concern the enforcement of the energy saving obligation in the Environmental Management Act by creating 22 regional energy saving agreements that are now in effect. Guaranteeing the monitoring of compliance with the Activities Decree constitutes a part of these approaches.
- The Green Deal for sustainable schools is in effect. Seven ambassadors have presented their experiences of energy saving to municipalities and school boards. A helpdesk and a website are both up and running and the subsidy scheme to which school boards can apply for assistance in the consulting expenses was opened on 1 October 2016. Educational material dealing with the theme of energy has been disseminated. Three school boards have announced they wish to be part of zero-energy renovations for a school building.
- The Energy Saving and Sustainable Energy for Sports Facilities (Energiebesparing en Duurzame Energie Sportaccommodaties) subsidy scheme has been launched for a five-year period, with an annual budget of six million euros made available for it. In 2016 the subsidy scheme was exhausted within a few weeks. Together with the Association of Sports and Municipalities (Vereniging Sport en Gemeenten), NOC*NSF (Nederlands Olympisch Comité * Nederlandse Sport Federatie – the Dutch Olympic committee and sports federation) and the Sport guarantee fund, 18 regional meetings were hosted where information was provided on opportunities, existing subsidy schemes and forms of financing.
- The Central Government Real Estate Agency (Rijksvastgoedbedrijf) is starting three zero-energy pilot projects and is exploring energy saving measures in central government offices and other state buildings.

8. Annexes; literature

Parts a) to e) refer to those parts of Article 4 of the EED.

- Energiebesparing: Een samenspel van woning en bewoner – Analyse van de module Energie WoON 2012.* Casper Tichelaar (ECN), Kees Leidelmeijer (RIGO), August 2013, ECN-E-13-037.
- Reference image improvements for the non-residential sector:
 - inventory data
 - energy usage

- potential for savings
- investment costs
- labour input

J.M. Sipma (ECN), December 2013, ECN-E-13-069.

- c. *Het Energieakkoord: Wat gaat het betekenen? Inschatting van de gemaakte afspraken* of http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2013-het-energieakkoord-wat-gaat-het-betekenen-1087_0.pdf
- d. *Achtergronddocument bij doorrekening SER Energieakkoord – sector Gebouwde omgeving*. C. Tigchelaar, ECN-E-13-045.
- e. *Beoordeling Intensiveringspakket Energieakkoord*, A.W.N. van Dril, M. Menkveld (ECN), May 2016 ECN-N-16-008
- f. Energy Agreement for Sustainable Growth
 1. Progress report 2016 (Energy Agreement Guarantee Committee)
 2. National Energy Outlook 2016 (Energy Agreement Guarantee Committee)
 3. Intensification of the Energy Agreement, May 2016 (Energy Agreement Guarantee Committee)
 4. Evaluation, 2016 (KWINK Groep)
 5. National Energy Outlook 2015 (Energy Agreement Guarantee Committee)
 6. National Energy Outlook 2014 (Energy Agreement Guarantee Committee)

ANNEX III. 2017 ANNUAL REPORT, PURSUANT TO EED (24)(1)

Annual report	2017
Reporting year	2015
Member State	The Netherlands

a) Data based on national indicators

(see annex for table in full)

Number	Data field	AR Indicator	Unit
B1	3094	(i) primary energy consumption	PJ
B2	1792	(ii) total final energy consumption	PJ
B3	531.9	(iii) final energy consumption - industry	PJ
B4	440.9	(iii) final energy consumption - transport	PJ
B5		final energy consumption in pipeline transport	ktoe
B6	390.8	(iii) final energy consumption - households	PJ
B7	427.9	(iii) final energy consumption - services	PJ
B8		final energy consumption - agriculture	ktoe
B9		final energy consumption - other sectors	ktoe
B10	69,637	(iv) gross value added - industry	Million euro, chain-linked volumes, reference year 2005 (at 2005 exchange rates)
B11	460,047	(iv) gross value added - services	Million euro, chain-linked volumes, reference year 2005 (at 2005 exchange rates)

B12	327,228	(v) disposable income for households	Million euro
B13	593,496	(vi) gross domestic product (GDP)	Million euro, chain-linked volumes, reference year 2005 (at 2005 exchange rates)
B14	109.63	(vii) electricity generation from thermal power generation	TWh
B15	29.84	(viii) electricity generation from CHP	TWh
B16	191.95	(ix) heat generation from thermal power generation	ktoe
B17		Waste heat produced in industrial installations	ktoe
B18	44.14	(x) heat generation from CHP	TWh
B19		Waste heat recovered from industrial installations	ktoe
B20	961.57	(xi) fuel input for thermal power generation	ktoe
B21	192.5	(xii) passenger kilometres	pkm
B22	25,319	(xiii) tonnes kilometres	tkm
B23	16,900,726	(xv) population	Persons
B24		Total number of households	Households
B25		Energy transmission and distribution losses (all fuels)	ktoe
B26		Heat generation from district heating plants	ktoe
B27		Fuel input in district heating plants	ktoe

Comments on decrease in energy consumption:

34	Industry	
35	Transport	Increase of 2 PJ from shipping
36	Households	Increase of 18 PJ due to higher energy use for heating as the winter in 2014 was milder than in 2015
37	Services	Increase of 14 PJ due to higher energy use for heating as the winter in 2014 was milder than in 2015

Reporting on CHP

For reporting relating to CHP, see the enclosed Excel spreadsheet.

b) Policy changes

1. Amendments to Article 7 – Alternative measures

1.1 Fiscal measures

1.1.1 Changes to energy tax

The rates for the Energy Tax have been adjusted as of 2017². The following tables set out the rates for 2016 and 2017 in euro cents per unit:

	2016 level	2017 level
	Energy Tax (euros per unit, excluding VAT)	Energy Tax (euros per unit, excluding VAT)
Natural gas		
0 – 170,000 m ³	0.25168	0.25244
170,000 – 1,000,000 m ³	0.06954	0.06215
1,000,000 – 10,000,000 m ³	0.02537	0.02265

2

http://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen_tarieven_milieubelastingen?projectid=6750bae7-383b-4c97-bc7a-802790bd1110

> 10,000,000 m ³	0.01212	0.01216
Reduced natural gas rate for greenhouse horticulture		
0 – 170,000 m ³	0.04042	0.04054
170,000 – 1,000,000 m ³	0.02339	0.02346
1,000,000 – 10,000,000 m ³	0.02537	0.02265
> 10,000,000 m ³	0.01212	0.01216
Electricity		
0 – 10,000 kWh	0.1007	0.1013
10,000 – 50,000 kWh	0.04996	0.04901
50,000 – 10,000,000 kWh	0.01331	0.01305
>= 10,000,000 kWh private	0.00107	0.00107
>= 10,000,000 kWh commercial	0.00053	0.00053

1.1.2 Changes to the Sustainable Energy Surcharge

The table below shows the changes in the rate of the Sustainable Energy Surcharge (Opslag Duurzame Energie (ODE)) under the Sustainable Energy+ subsidy scheme (Subsidieregeling Duurzame Energie+, SDE+) from 2013 (year of introduction).

	2013	2014	2015	2016	2017
Natural gas in m³	In euros per cubic meter of natural gas				
0- 170,000	0.0023	0.0046	0.0074	0.0113	0.0159
170,000-1 million	0.0009	0.0017	0.0028	0.0042	0.0074
1 million-10 million	0.0003	0.0005	0.0008	0.0013	0.0027
>= 10 million	0.0002	0.0004	0.0006	0.0009	0.0013
Natural gas in m³ at reduced rate for greenhouse cultivation	In euros per cubic meter of natural gas				
0- 170,000	0.0004	0.0007	0.0012	0.0018	0.0026
170,000-1 million	0.0004	0.0009	0.0014	0.0021	0.0025
1 million-10 million	0.0003	0.0005	0.0008	0.0013	0.0026
>= 10 million	0.0002	0.0004	0.0006	0.0009	0.0013
Electricity in kWh	In euros per kilowatt-hour of electricity				
0- 10,000	0.0011	0.0023	0.0036	0.0056	0.0074

10,000- 50,000	0.0014	0.0027	0.0046	0.0070	0.0123
50,000- 10 million	0.0004	0.0007	0.0012	0.0019	0.003
>= 10 million	0.000017	0.000034	0.000055	0.000084	0.000131
ODE revenue in millions of EUR	100	200	320	490	678

1.1.3 Changes to the Energy Investment Allowance (EIA)

As of 1 January 2017 the allowance percentage has been reduced from 58% to 55%.

Changes to the EIA scheme between 2014 and 2018:

	2014	2015	2016	2017	2018
Available budget (in millions of EUR)	111	101	161	166	149
Rate deducted from taxable profit	41.5%	41.5%	58%	55%	55%

1.2 Other adjustments to alternative measures

See NEEAP4 for an overview of existing policy measures, changes to existing policy measures and new policy measures.

1.3 Changes to implementation.

See NEEAP4 for an overview of existing policy measures, changes to existing policy measures and new policy measures.

c) Floor area of buildings

41-1	Total building floor area [m ²] of the buildings with a total useful floor area over 250 m ² owned and occupied by the Member States' central government	Not available at time of submission
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d) Energy savings achieved in renovated buildings, Article 5(6)

42-2	Amount of energy savings [ktoe] <u>achieved</u> in the previous year in eligible buildings owned and occupied by their central government as referred to in Article 5(6)	
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e) Energy savings achieved under Article 7(9)

Energy savings achieved as a result of alternative measures under Article 7(9)

	Policy measure (notified)	Savings <u>achieved</u> [ktoe] in 2015 (<u>n-2</u>)	Total <u>expected</u> savings [ktoe] by 2020 (voluntary)
44-2	Energy Investment Allowance (EIA)	200.85	
44-3	Long Term Agreement industry	54.55	

44-4	Long Term Agreement big industry (MEE), excl. refineries	92.89	
44-5	Long Term Agreement service sector	5.40	
44-6	Policies targeted at households	248.40	
44-7	Policies targeted at the service sector	71.65	
44-8	Corrections for double counting and corrections	153.6	
44-12	Total savings	520.09	

* based on statistics for 2013

Dutch implementation of EPBD (14)

Summary

In order to improve the efficiency of heating systems it has been agreed within the EU that these systems shall be regularly inspected, pursuant to Article 14 of the recast EPBD (2010/31/EU). The Netherlands has opted to introduce an alternative for mandatory inspections for gas-fired heating installations with a capacity of 100 kW, in accordance with the EU Directive.

Because it made this choice, the Netherlands is required to submit to the Commission a three-year report showing that the alternative solution is at least as effective as the option set out in the EPBD. For other systems (gas-fired heating installations with a rated output of 100 kW or more, and systems that use other fuels), and also for air-conditioning systems, the Netherlands did introduce the mandatory inspections proposed by the EC and it is not necessary to demonstrate equivalence.

As a result of its efforts over many years to improve boilers and heating systems, the Netherlands already possesses an exceptionally efficient stock of such systems. The impact of new policy is therefore likely to be low, irrespective of the approach taken. The HR107 boiler, a highly efficient modulating-condensing gas boiler, has, for example, been widely used in the Netherlands for some time now. It is expected that within the next five years almost all boilers installed will be of this type. This means that substantial energy savings are achieved, but that naturally also means there is less potential for further measures aimed at improving the efficiency of heating systems.

A major proportion - at least 70% - heating systems in Dutch homes are periodically maintained. In the private housing sector in particular, there was a feeling in 2012 that the number of maintenance contracts was declining. In 2012, 56% of private landlords or private homeowners had a maintenance contract, and it was assumed that maintenance was rarely performed on the heating systems of the remaining 44%. A survey conducted by Motivaction in 2015 showed that the percentage of maintenance contracts stood at 55%, so there was no major decline. The same survey moreover revealed that 84% perform regular maintenance, but it is not always on the basis of a contract. Amongst professional home rental companies and owners' associations, contracts with professional parties for maintaining heating systems were in place for almost all the housing stock (98%) in 2012. There are no indications that this percentage has changed.

The Dutch alternative approach for implementing Article 14 consists of a voluntary analysis of the system efficiency of heating systems, developed and offered by the private sector in collaboration with the authorities as a complement to and improvement of the existing maintenance contracts. These voluntary inspections are offered during regular and incidental maintenance and comprise an analysis of the energy efficiency of the entire heating system - i.e. the boiler, thermostat or temperature control, distribution and delivery system.

It was expected that under this alternative solution at least 60% of all installation and maintenance companies would offer voluntary analyses of the system efficiency of boilers when performing regular maintenance, and that around 40% of building owners to whom it was offered would request that it be conducted. That would mean that around 24% of all buildings would be voluntarily analysed in respect of system efficiency and that the analyses would lead to system improvement measures being performed in approximately 70% of the cases by 2020. As a result the

total energy demand for heating buildings will be around 0.77% (2.7 PJ) lower in 2020 than if this policy was not introduced, with the associated reduction in CO₂ emissions standing at 151 kton.

In order to bolster and improve the existing maintenance of gas-fired heating systems with a rated output of 20-100 kW, the Netherlands has supported the development of OK-CV. OK-CV is a voluntary quality label that was introduced in 2015 and was developed by UNETO-VNI (the employers' organisation for technical installation companies), the VFK (the association of boiler makers) together with the Netherlands Enterprise Agency (NEA) and the Ministry of the Interior and Kingdom Relations. OK-CV is overseen by the Stichting Onderhoud Voor Installaties (the Foundation for Installation Maintenance (OVI)). The OK-CV label for safe and efficient heating is issued by companies that inspect and maintain boilers subject to strict requirements. The companies use Energy Service Specialists who perform the boiler maintenance and set it, perform measurements, determine whether the capacity of the boiler properly matches the radiators, issue written recommendations on energy efficient use and safety with respect to the boiler installation and register the maintenance in a central database.

Results achieved

Over 18 months after launching, OK-CV has achieved the following results:

Between March 2015 and October 2016 a total of 7 123 OK-CV inspection reports were issued. In the first year the number of inspections exhibited a constant and rapid rise and reached a peak of 1 895 inspections per quarter in the first quarter of 2016. After that the quarterly number of inspections decreased, to 1 250 inspections in the third quarter of 2016. There are 220 companies registered with OK-CV, with some 220 establishments that should, in principle, offer inspections. These companies have a total of 387 Energy Service Specialists trained and registered for performing OK-CV inspections. Of those member companies 45 (20% of the registered companies) have actually performed inspections, using a total of 57 Energy Service Specialists (15% of those registered). However, just four companies with a total of five active OK-CV Energy Service Specialists are responsible for performing over half of all inspections conducted.

The OK-CV inspection report contains nine types of energy saving recommendations for heating, hot water and the system that an Energy Service Specialist can provide - they are printed on the inspection report and can be checked/ticked. The Energy Service Specialist can also provide his/her own recommendations. The number of OK-CV inspection reports that contain saving recommendations is small: a total of 262 inspection reports contain a saving recommendation (3.7% of all reports issued). In only 104 cases does this savings recommendation actually pertain to a savings recommendation for heating, hot water and ventilation. More than half of the recommendations were made by just one Energy Service Specialist.

It is notable that the energy saving recommendations issued barely refer to the printed recommendations on the OK-CV inspection report. They were only referred to 27 times, and four of the printed options are never mentioned in the OIK-CV database. A recommendation to buy a more efficient pump for underfloor heating and other, diverse saving recommendations were more frequently provided. It is also notable that in only 10 inspections (out of a total of over 7 000 boilers, of which almost 1 000 were 15 years or older) was it recommended that the boiler be replaced, in particular as it can be assumed that, on the basis of market averages, during the duration of the OK-CV period, some 700 of those boilers would have been replaced. The following paragraph contains a possible explanation why relatively few energy saving recommendations were

issued.

A check was conducted on approximately one-fifth of the buildings for which saving recommendations (for heating, hot water and/or ventilation) were provided whether the recommendations were followed up on. It emerged that in approximately one-tenth of cases the recommendations were followed up on and in another one-tenth a follow-up action was planned in the next few years. It must be stated that a few interviewed installers stated that they provide many more energy saving recommendations than are registered in the OK-CV database and in general see that recommendations have been implemented much more frequently than demonstrated by the random sampling. The recommendations involved are however often those that can be followed up on at a relatively low cost. Installers say they do not always register their recommendations, and there are also possible issues with inputting data into the OK-CV database. Further investigation cannot be studied due to the lack of (access to) data.

On the basis of the results obtained to date and the trend established among inspections performed and recommendations issued, by 2020 there would be over 25 000 OK-CV inspections performed and some 1 000 recommendations, if OK-CV were to stay at its present level. Around 200 of those recommendations would also be acted on, which means that there would be improved energy efficiency in regard to those 200 installations on the basis of OK-CV. During the 2015-2020 period some two million installations will also be autonomously replaced, and in the Netherlands a modern HR107 boiler is almost always the replacement boiler. The additional effect that OK-CV will have on energy consumption in 2020 is consequently not measurable.

Conclusions

The number of installations that are periodically maintained in the Netherlands and the level of implementation of high efficiency boilers is already high, even though not mandatory. There is no evidence of maintenance lessening. Because of the minimum market implementation of OK-CV, the quality of the periodic maintenance did not measurably improve as a result of OK-CV. The recommendations linked to the OK-CV inspection that were to largely introduce additional savings measures, were not properly registered.

In consultation with OK-CV, it will be assessed in the near future how the stricter registration of recommendations can be implemented. It will be discussed with the market whether more inspections and recommendations under the quality mark could be expected if licensees were obliged to perform all maintenance in accordance with OK-CV. The OK-CV communication campaign is still ongoing.

Despite these improvements, it is not expected that the number of inspections will increase to such an extent in the near future that it will make a big difference.

The Dutch authorities are continuing to work on more sustainable alternatives to gas-fired heating systems in homes. In the 2015 Energy report the Dutch government indicated that the energy transition would focus further cutting the use of natural gas for heating buildings and greenhouses in the next few decades. In the energy dialogue involving citizens and society in general, gas-free areas constitute an important theme, while publications and examples of gas-free areas receive much attention. The Energy Agenda (December 2016) contained the following measures for reducing the use of natural gas.

- In principle, no new gas infrastructure will be constructed in new neighbourhoods. The Gas law will be accordingly amended. This will prevent the challenge from becoming an even bigger one.
- The obligation to connect gas to houses under the Gas Law is to be replaced with a broader right to be connected to energy infrastructure for heating.
- The municipalities will be responsible and have the necessary authorisations to decide on local energy supply, in collaboration with the network operator.
- The preparations are being made for in due course regulating large-scale heating networks in a comparable manner to electricity and gas networks, which will allow for a more integral weighing up of these energy infrastructures.

A revolving fund (Nationaal Energiebespaarfonds) and new subsidy schemes (Homeowner Energy Saving Scheme and the Sustainable Energy Investment Subsidy Scheme) have now been set up to encourage energy-efficient measures and sustainable systems for consumers. In the Energy Agenda the Cabinet has ruled in favour of further continuing and expanding the stimulus for reducing consumption by means of information, subsidies, low-interest loans and supporting innovative approaches.

Introduction

In order to improve the efficiency of heating systems it has been agreed within the EU that these systems shall be regularly inspected, pursuant to Article 14 of the recast EPBD (2010/31/EU). The Netherlands has opted to introduce an alternative for mandatory inspections for gas-fired heating installations with a capacity of 100 kW, in accordance with the EU Directive.

The Dutch government has moreover substantiated Article 14 of the recast EPBD through a combination of measures:

- The Decree on Emission Limit Values on Medium-Sized Combustion Installations (Besluit Emissie-eisen Middelgrote Stookinstallaties (BEMS)) (inspection of boilers with a rated output of >100 kW and of non-gas-fired boilers of 20 kW and above).
- Installation Performance Scan, as a complement to the Energy and Built Environment programme (Energie & Gebouwde Omgeving), the Long-Term Agreements (LTA), Sustainable Energy in the Netherlands (Duurzame Energie in Nederland (DEN)) and BEMS/Activities Decree.
- Support campaigns to further support the share of high efficiency boilers in homes.

Because it chose an alternative interpretation for a portion of the heating systems, the Netherlands is required to submit to the EC a three-year report showing that the alternative solution is at least as effective as the option set out in the EPBD. For other systems (gas-fired heating installations with a rated output of 100 kW or more, and systems that use other fuels), and also for air-conditioning systems, the Netherlands did introduce the mandatory inspections proposed by the EC and it is not necessary to demonstrate equivalence.

This progress report must describe the impact to date of the alternative Dutch approach using the reporting format and calculating methodology that is also used in the United Kingdom for its reports to the European Commission.

The report comprises the following elements:

- Introduction
- Background to the Dutch implementation of EPBD(14)
- Expected results of the 'Dutch approach'
- The developments of OK-CV
- Results achieved for OK-CV
- A recalculation of the impact of mandatory inspections as set out in EPBD(14)
- Conclusion and recommendations
- For further information on existing Dutch policy and background details, please refer to the report *Gelijkwaardigheid van alternatieve oplossing Art 14 REPG* (Equivalence of alternative solution to EPBD (14)), May 2013.

Background to the Dutch implementation of EPBD(14)

In reaching its decision on EPBD(14), the Netherlands performed an analysis of three policy variants:

- A baseline scenario in which no new policy is implemented;
- An alternative solution for mandatory inspections as introduced by the Netherlands;
- Mandatory inspections of heating systems as described in the recast EPBD.

The **baseline scenario** – where no new policy is implemented – means there will be no new policy initiatives and no additional work is expected for improving the efficiency of heating systems in the Netherlands. The effects of existing policy, including EPBD measures that focus on building legislation and the recently introduced Ecodesign Directive for boilers, will however affect new and existing heating systems. Under this option it is expected that the total energy demand for heating

buildings will be around 358 PJ in 2020 and the associated CO₂ emissions would be 20 Mton.

The **alternative approach** consists, aside from the above policy, of a voluntary analysis of the system efficiency of heating systems, developed and offered by the private sector in collaboration with the authorities. These voluntary inspections are offered during regular and incidental maintenance and comprise an analysis of the energy efficiency of the entire heating system - i.e. the boiler, thermostat or temperature control, distribution and delivery system.

Under this alternative solution it is expected that some 24% of buildings would be voluntarily analysed in respect of system efficiency by 2020. These analyses are expected to lead to system improvement measures being performed in approximately 70% of the cases. The total energy demand for heating buildings under this scenario will be around 0.76% (2.5 PJ) lower in 2020 than if this policy was not introduced, with the associated reduction in CO₂ emissions standing at 141 kton.

By way of comparison, the expected impact of **mandatory inspections** was also charted. This would involve, in addition to existing policy, extending the mandatory boiler inspection under the Environmental Management Act/Activities Decree to gas boilers with an output of 20 kW or more (instead of the current lower limit of 100 kW). This inspection is also included in the Stichting Certificatie Inspectie en Onderhoud Stookinstallatie methodology (Foundation for Certification Inspection and Maintenance of Heating Systems (SCIOS)). It is also included in the Decree on the Energy Performance of Buildings.

The total energy demand for heating buildings under this scenario will be around 0.16% (0.7 PJ) lower in 2020 than if this policy was not introduced, with the associated reduction in CO₂ emissions standing at 37 kton.

It was clear from the analysis that the alternative solution that the Netherlands introduced would result in substantially greater energy savings than the mandatory boiler inspection, and at costs that were clearly lower. The improved integration of inspections with regular maintenance, the focus on improvements to the boiler and delivery system that consequently became possible and the connection, at natural times, to heating system improvements are the most significant explanatory factors for this larger impact.

Expected results of the Dutch 'alternative approach'

The expected impact of the mandatory inspections on the efficiency of stock of heating systems in the Netherlands was as follows, in addition to the impact on existing policy:

- At least 60% of all installation and maintenance companies offer voluntary analyses of the system efficiency of heating systems when performing regular maintenance, at an average price of €30.
- Analyses are offered at intervals of 4 to 8 years, being every third time maintenance is performed.
- Around 40% of building owners that were offered an analysis had it performed:
 - around 10% due to complaints about the system;
 - around 20% because the boiler was older than 12 years;
 - around 10% because the installer believed the heating system was not operating optimally.

- An analysis will in the most cases point to possible cost-effective improvements:
 - around 40% of the analyses performed will point to the water distribution system not being properly set and that the heating system will function better by 'adjusting the water pressure';
 - around 20% of analyses performed will point to the incorrect placement and/or size of the radiators, and that the system will function better if the radiators are replaced, changed or supplemented;
 - around 40% of the analyses performed will point to the thermostat not being properly set and that the heating system will function better by replacing the thermostat (with a modern modulating one);
 - around 20% of analyses performed will point to the (cost-effective) early replacement of an old boiler (conventional or improved efficiency boiler) with a modern HR107 boiler.

N.B. Different recommendations can occur independently, which means that the total can exceed 100%.

- The expected response of building owners to recommended system improvements is as follows:
 - of the recommended 'adjustment to the water pressure', 80% will be performed;
 - of the recommended radiator changes, 40% will be performed;
 - of the recommended thermostat replacements, 50% will be performed;
 - of the recommended boiler replacements, 50% will be performed;
- With due regard to the requirements under the Buildings Decree (to obtain a minimum boiler efficiency when changing the heating system), radiators and thermostats are only changed if a high efficiency boiler is present or if it can be installed at the same time. The setting of the distribution system is not considered to be a system change, and is consequently not affected by the requirements of the Buildings Decree.
- All the measures resulting from voluntary system analyses, together with the expected frequency and the energy saving as a percentage, are listed in the table below.

Installers offering voluntary analyses		Consumers having offered analyses performed		Recommend ed measures		Performed measures		Energy saving per measure		Expected energy saving in 2020 (as a % of total energy consumption)
60%	x	40%	x	Adjusting the water pressure					=	0.23%
				40%	x	80%	x	3%		
				Changing the radiators						0.10%
				20%	x	40%	x	5%		
				Replacing the thermostat						0.14%
				40%	x	50%	x	3%		
Replacing the boiler early					0.29%					
20%	x	50%	x	12%						

Under this alternative solution it is expected that some 24% of buildings would be voluntarily analysed in respect of system efficiency by 2020. These analyses are expected to lead to system improvement measures being performed in approximately 70% of the cases.

The developments of OK-CV

In order to bolster and improve the existing maintenance of gas-fired heating systems with a rated output of 20-100 kW, the Netherlands has supported the development of OK-CV. OK-CV is a voluntary quality label that was introduced in 2015 and was developed by UNETO-VNI (the employers' organisation for technical installation companies) and the VFK (the association of boiler makers) together with the Netherlands Enterprise Agency (NEA) and the Ministry of the Interior and Kingdom Relations.

The OK-CV label for safe and efficient heating is issued by companies that inspect and maintain boiler systems subject to strict requirements. These companies use Energy Service Specialists who perform the maintenance. The Energy Service Specialist:

- Inspects and maintains boilers in accordance with the requirements of the manufacturer and sets it so that it functions optimally.
- Performs measurements, such as measuring the CO value (carbon monoxide) and the CO₂ value (carbon dioxide) and compares the results to the manufacturer's values. If there are major differences the boiler could be unsafe. The Energy Service Specialist will then find the causes thereof.
- He/she will ensure that the boiler capacity matches the radiators and any other delivery sources, such as convectors.
- Provides written recommendations on the energy efficient use and safety of your central heating installation. Those recommendations are contained in the assessment report that the building owner receives from the Energy Service Specialist.
- The energy Service Specialist registers the maintenance of your boiler in a national databank. By means of random sampling the Stichting OK voor Installaties (OK Systems Foundation) regularly checks whether maintenance has been performed in accordance with all the rules of OK-CV.

At its launch, OK-CV handled the marketing for OK-CV among installers and consumers. During October and November 2016 OK-CV conducted national and regional campaigns in order to provide name recognition of OK-CV. This was done using printed matter (daily newspapers and magazines), on radio (Radio 538, Sky Radio and Radio 10) and through online advertising banners. The follow-up campaign was conducted in December 2015 and January 2016 so that people could find their closest OK-CV licensee, using printed material (national and regional daily newspapers, magazines and Articles) and online by means of retargeting. The results were good, and research conducted by De Persgroep showed that the campaign reached the target group (owner-occupier, 20-50 years old) and the website was well-visited. The results of the campaign are:

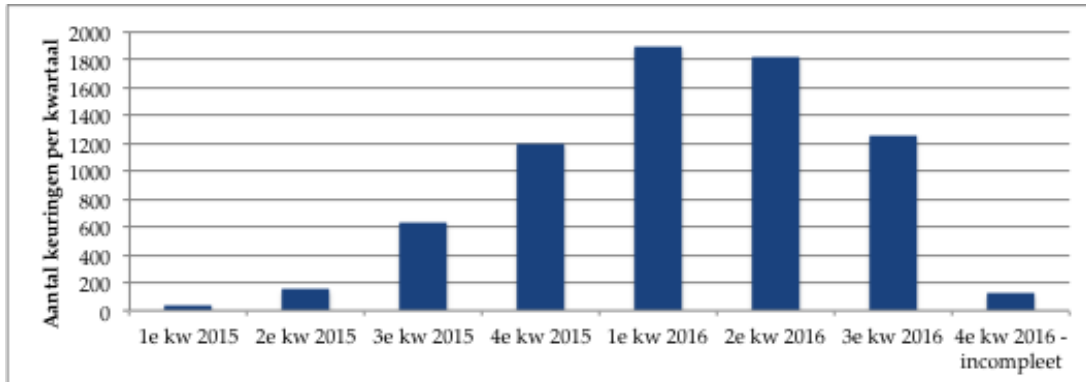
- Printed matter: 4 200 000 in phase 1, 2 100 000 readers in phase 2
- Online: 7 749 880 views in phase 1 and 30 844 403 views in phase 2
- Radio: 4 585 261 listeners

Results achieved for OK-CV

After the quality mark was developed and OK-CV has been in use for over 1.5 years, the first results can be charted. The database of performed inspections that Stichting OK voor Installaties keeps for OK-CV was used for this, as well as the follow-up studies performed by OK-CV among member installers in order to uncover (1) their vision of and the importance of OK-CV and (2) to inventories the degree to which building owners opted to make investments in a better heating system as a result of the OK-CV recommendation.

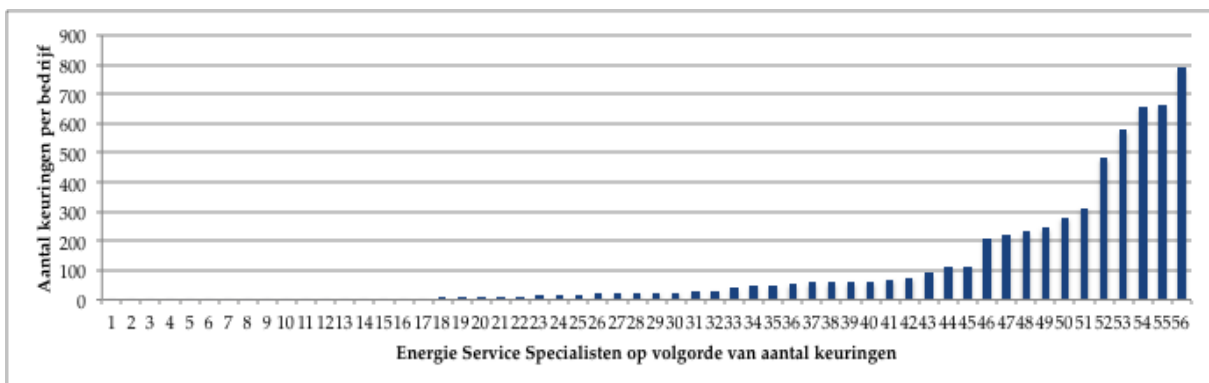
Number of inspections performed.

Between March 2015 and October 2016 a total of 7 123 OK-CV inspection reports were issued. In the first year the number of inspections exhibited a constant and rapid rise and reached a peak of 1 895 inspections per quarter in the first quarter of 2016. After that the quarterly number of inspections decreased, to 1 250 inspections in the third quarter of 2016 (the fourth quarter was not sufficiently covered by the study to pronounce on it).



Aantal keuringen per kwartaal	Number of inspections per quarter
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There are 220 companies affiliated with OK-CV, with some 220 establishments that should, in principle, offer inspections. These companies have a total of 387 Energy Service Specialists trained and registered for performing OK-CV inspections. Of those member companies 45 (20% of the registered companies) have actually performed inspections, using a total of 57 Energy Service Specialists (15% of those registered). The number of inspections performed per company and per Energy Service Specialist varies dramatically, with ten companies that have performed one inspection in the last 18 months and one company with one Energy Service Specialist who performed 1 266 inspections in that period. Just four companies with a total of five active OK-CV Energy Service Specialists are responsible for performing over half of all inspections conducted.



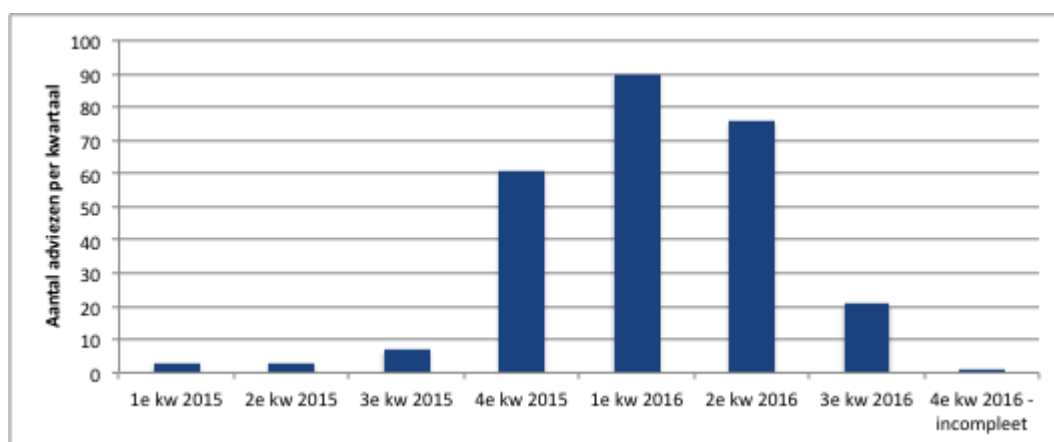
Aantal keuringen per bedrijf	Number of Inspections per company
Energie Service Specialisten op volgorde van aantal keuringen	Energy Service Specialists according to no. of inspections

Number of opinions delivered.

The OK-CV inspection report contains nine types of energy saving recommendations for heating, hot

water and the system that an Energy Service Specialist can provide - they are printed on the inspection report and can be checked/ticked. The Energy Service Specialist can also provide his/her own recommendations. The OK-CV database only contains a text field where energy saving recommendations can be inputted, and no separate fields for the printed recommendations. When completing the database, Energy Service Specialists must state in the energy saving recommendation field what recommendations they provided, and it is assumed that the printed options are included therein. Given the way that the database is set up, this step could be skipped so that energy saving recommendations that were provided are being under-reported. It is assumed that the quality control performed by Stichting OK voor Installations with respect to inspections conducted guarantees that all information, including printed energy saving recommendations, is properly reported in the database.

The number of OK-CV inspection reports that contain saving recommendations is small: a total of 262 inspection reports contain a saving recommendation (3.7% of all reports issued). In only 104 cases does this savings recommendation actually pertain to a savings recommendation for heating, hot water and ventilation. There were also 138 recommendations to install solar panels or to insulate the home – more than there were for improvements to the central heating system. However, these recommendations do not fall under the objectives of OK-CV and evidently are not part of the competences of OK-CV-trained Energy Service Specialists either. Finally, 43 of the provided recommendations are general technical comments and are not saving or safety recommendations. The number of OK-CV inspections where actual energy saving recommendations were provided consequently amounts to 1.5%. The distribution per quarter follows the trend of the total OK-CV inspections performed: a rise over 2015, peaking in the first quarter of 2016 and then a gradual decline.



Aantal adviezen per kwartaal	No. of recommendations per quarter
4 kw 2016 incompleet	4 th quarter incomplete

The distribution of energy saving recommendations per company is even more skewed than for the OK-CV reports:

- 24 of the companies, employing 31 of the Energy Services Specialists that performed OK-CV inspections, did not provide a single energy saving recommendation (in over 2 000 inspections);
- 8 of the companies, employing 13 of the Energy Services Specialists, provided a total of one recommendation per Energy Service Specialist (in approximately 1 300 inspections);

- 11 of the companies, employing 11 of the Energy Services Specialists, provided two to six recommendations per Energy Service Specialist (in approximately 2 700 inspections);
- 1 of the companies, employing 1 of the Energy Services Specialists provided 19 single energy saving recommendations (in almost 800 inspections);
- 1 of the companies, employing 1 of the Energy Services Specialists provided 192 single energy saving recommendations (in almost 219 inspections);

It must be stated with respect to the above that around half of the recommendations provided actually concerned energy saving for heating, hot water and/or ventilation, or safe stoking, with the exception of the Energy Service Specialist that provided three-quarters of all recommendations, where only a third pertained to the system.

In July and August 2016 OK-CV also conducted a brief telephonic survey of the affiliated installation companies for the purpose of this report. Ten randomly selected companies were asked about their experiences with OK-CV and providing energy saving recommendations. The results varied dramatically:

- 1 large licensee already provided energy performance recommendations before becoming an OK-CV licensee. There were consequently no differences in terms of the maintenance inspections;
- 1 large licensee stated that it provided almost no energy performance recommendations at all, not even under OK-CV. This was due to customer demand, processing and the attitude of the ESS;
- 2 medium-sized licensees and 1 small licensee stated that they provided a great deal of energy performance recommendations. This was due in part to the opportunity to perform more work and also in part to the environment. This means there is a major difference between maintenance inspections outside of the OK-CV and under it.
- 1 medium-sized licensee and 1 small licensee stated that they do regularly provide energy performance recommendations, but they are almost never follow-up on by the client;
- 3 large licensees stated that they provided no energy performance recommendations because they market did not demand them.

What is notable is that, in spite of the varied experiences, many more energy performance recommendations are provided than is shown in the database. For example, the database contains only two companies that provided more than six energy performance recommendations, while half of the companies in the small sample state that they provide a 'great deal' or such recommendations. This also contrasts with the fact that 90% of the companies affiliated with OK-CV did not register a single OK-CV inspection in the database, and only two companies registered more than six recommendations. This could indicate a (major) under-reporting in respect of the recommendations provided. However, Ok-CV inspection reports actually performed are not available (they are held by the company performing the inspection and not provided to OK-CV), rendering further study impossible.

Type of recommendations made

It is notable that the energy saving recommendations issued barely refer to the printed recommendations on the OK-CV inspection report. They were only referred to 27 times, and four of the printed options are never mentioned in the OIK-CV database.

Type of printed recommendation	Number of times provided	
	Total	excl. outliers
1 Check gas pipes		
2 Replace open device		
3 Acquire a high-efficiency boiler	10	8
4 Adjust settings	6	
5 Replace electric boiler		
6 Pump switch for underfloor heating	3	2
7 Water saving shower head	1	1
8 Request energy performance advice (EPA)		
9 DC ventilation box	7	1

Aside from these printed recommendations, a range of other recommendations were provided, some of which concerned the installation and many of which did not:

Type of printed recommendation	Number of times provided	
	Total	excl. outliers
Efficient pump for underfloor heating	34	6
Various recommendations on energy saving and/or safety	47	24
Solar panels	100	4
Home insulation	38	2
General technical comments or recommendations	43	24

When analysing the recommendations provided it is further notable that there were few recommendations to replace the boilers – only ten – despite the fact that some of the boilers were very old. According to the database at least 31 boilers were 20 years or older, and there was not a single recommendation to replace these. Because these are probably all older generation high efficiency boilers or not high efficiency boilers, replacing them would almost certainly result in energy saving. (N.B. there are likely more boilers older than 20 years, but much of the information on the age of the boilers is provided in such wide terms that it is barely usable for analyses). Of the 848 boilers that were at least 15 years old, the recommendation to replace them was provided for only five. While a portion (perhaps the majority) of them are HR107 devices, a substantial portion are still approaching their technical lifespan, making it striking that there were no recommendations to replace them.

In view of the standard replacement rate for boilers (on average, once every 15 years), it can also be assumed that in the 18 months that OK-CV was operational, some 700 of the boilers for which an OK-CV report was issued would be replaced. This raises the question why the OK-CV Energy Service Specialists did not pay more attention to this matter in their reports.

It is also notable that recommendations were more frequently given in respect of energy saving that had little or nothing to do with the heating system (installing solar panels or insulation) rather than in respect of the heating system itself. It should be noted that the majority of these recommendations (96%, for solar panels) were provided by one Energy Service Specialist – a fact that is most likely not coincidental, as three-quarters of all recommendations came from this individual. This is contrasted by the fact that, leaving this outlier outside the picture, only 42 energy-saving recommendations were issued in 6 900 inspection reports, only 12 of which related to the pre-determined type of recommendations. This figure is so low that it appears unlikely that energy saving recommendations are actually part of the OK-CV approach as it is put into practice.

The number of OK-CV inspections performed is so much lower than was expected that a comparison of the impact is close to pointless. According to the description of the alternative approach as presented by the Ministry of the Interior and Kingdom Relations to the European Commission, the number of inspections that would be performed was estimated to be 24% of all systems per year, or around 1.8 million inspections a year. The actual number of inspections performed (mid-2015 to mid-2016) is 5 500, or 0.3% of the estimate. Meanwhile, the number of recommendations provided is, in a relative sense, even lower – it was believed that in most cases saving recommendations would be provided together with the inspections, such as the early replacement of a boiler in 20% as well as a range of other recommendations. But in reality the figure is dramatically lower, with the

total number of recommendations provided standing at 1.5% for all inspections, and recommended boiler replacement for just 0.14% of all inspections – comparatively speaking, 140 times less than was expected, and in an absolute sense the number of recommendations provided at a national level stands at zero.

On the basis of the above, one can only conclude that OK-CV had no energy saving effect on a national level. Even if the number of inspections performed should increase to a significant degree – such as a hundred-fold to around 0.5 million per annum – then the energy saving impact would still be considerably less than expectations, given the small number of inspections that are accompanied by energy saving recommendations.

Following up on recommendations

The extent to which energy saving recommendations were followed up on was determined by asking installation companies in November 2016 whether recommendations (provided between March 2015 and February 2016) were actually implemented for 22 buildings. A total of eight installation companies that performed the inspections were surveyed – three selected companies that had provided three recommendations could not be reached for the survey.

Because the distribution across the installation companies of recommendations provided as well as the distribution of the types of recommendations were both skewed and the survey number was small, it was opted not to perform a random selection but instead to use a spread of types of recommendations as well as companies. So the following selection was made in respect of enquiring into recommendations;

- 4 systems for which 2 different types of recommendations were provided;
- 3 of the 10 recommendations to replace the boiler;
- 2 of the 3 recommendations concerning underfloor heating pump switches;
- 2 of the 7 recommendations concerning MV ventilation boxes;
- 4 of the 34 recommendations on efficient pumps for underfloor heating, with 2 recommendations per Energy Service Specialist selected;
- of the 47 other recommendations on energy saving, a maximum spread across the types of recommendations and Energy Service Specialists was opted for.

Due to the small number of recommendations provided and the skewed distribution of recommendations, the results certainly cannot be considered as generally applicable (even if all the recommendations were assessed, this would remain an issue for many types of recommendations, given the limited number of recommendations of each type provided and the large concentration of recommendations originating with one Energy Service Specialist). But the average still provides an indication of the extent to which the provision of recommendations under the CV-OK approach leads to system improvements.

For the 22 buildings for which a total of 26 recommendations were provided, the extent of follow-ups was as follows:

- 2 of the recommendations (9%) have already been implemented (1 x replacement of a high efficiency boiler; 1 x installation of a pump switch for underfloor heating);
- 2 of the recommendations (9%) have not yet been implemented, but they are planned for the next few years (1 x replacement of a high performance boiler; 1 x controller to be installed);
- 17 recommendations (74%) for 14 buildings have not been implemented;
- 2 recommendations (9%) for a building where the installation company is unaware whether or not they were implemented;

- 3 recommendations for 3 buildings where the installation company was unavailable for this survey.

It is notable that both of the implemented recommendations and one of the planned recommendations came from one installation company and Energy Service Specialist, and that six of the eight surveyed companies in this sample did not provide any recommendations.

When enquiries were made on the recommendations provided, a range of installation companies stated that they provide many energy saving recommendations – many more than are registered in the OK-CV database. They also stated that, on a company average, some 70% of the energy saving recommendations are adopted by the customer. Recommendations for which a relatively small investment is required are implemented much more frequently than those that call for a larger investment.

The companies had various reasons why such a large proportion of their energy saving recommendations were not found in the database: some companies make recommendations to their customers but only made note of it in exceptional cases; some note their recommendations on the hardcopy inspection reports but don't always transfer them into the database; some companies note everything in their work-order system (Syntess) but state they cannot link it properly to the OK-CV database, resulting in lost information. It is notable that both the hardcopy and the iPad versions of the OK-CV inspection report contains checkboxes for nine predetermined recommendations but that these do not appear in the OK-CV database, which means that we cannot exclude that the database does not record these pre-printed recommendations at all.

It was expected that 40% to 80% of the provided recommendations would (depending on the recommended measure) actually be implemented, so the actual fulfilment is much lower than the target – even if it is possible that actual implementation is greater and the OK-CV database did not record many recommendations.

Saving effect to be expected in 2020 on the basis of the current trend

On the basis of the results obtained to date and the trend established among inspections performed and recommendations issued then, if they continue at the average level of the previous four quarters (and the current downward trend does not continue), there would be around 6 200 additional inspections and around 100 additional energy saving recommendations a year, resulting in over 25 000 OK-CV inspections performed and some 1 000 recommendations provided by 2020. The implementation of recommendations is, according to the sample, in the order of 20% (including planned but not yet implemented recommendations), which means that in due course around 200 systems will be improved in respect of energy consumption as a result of OK-CV. This must be compared to the fact that some 2 million systems will be equipped with new boilers and associated modifications, together with system optimisation, during that period as a result of autonomous developments (the end of the boiler's lifespan). So the additional impact of OK-CV must be estimated as the additional improvement of 0.01% of all systems, in respect of which no observable impact can be attributed on a national level.

A recalculation of the impact of mandatory inspections as set out in EPBD(14)

The results to date can lead to modifying assumptions, such as the number of inspections that lead to energy saving recommendations and the extent to which building owners subsequently implement recommendations or have recommendations implemented. In view of the limited

number of inspected systems for which saving recommendations were provided, a downward adjustment may seem a given, but the number of recommendations issued under CV-OK is so low that one can rightfully doubt whether it was actually endeavoured to provide meaningful energy saving recommendations, and one can constantly not ascertain that the limited success of OK-CV means that there are no meaningful energy saving recommendations to give. One must thus state that, although the current results are cause for revising the earlier assumptions, there is insufficient information for introducing substantiated changes. This means that a recalculation does not serve a useful purpose at present.

Conclusions

The number of installations that are periodically maintained in the Netherlands and the level of implementation of high efficiency boilers are already high, even though not mandatory. There is no evidence of maintenance lessening. Because of the minimum market implementation of OK-CV, the quality of the periodic maintenance did not measurably improve as a result of OK-CV. The recommendations linked to the OK-CV inspection that were to largely introduce additional savings measures, were not properly registered.

In the near future attention will be paid to improving the registration of recommendations in OK-CV. It will be discussed with the market whether more inspections and recommendations under the quality mark could be expected if licensees were obliged to perform all maintenance in accordance with OK-CV. The OK-CV communication campaign is still ongoing.

Despite these improvements, it is not expected that the number of inspections will increase to such an extent in the near future that it will make a big difference.

The Dutch authorities are continuing to work on more sustainable alternatives to gas-fired heating systems in homes. In the 2015 Energy report the Dutch government indicated that the energy transition would focus further cutting the use of natural gas for heating buildings and greenhouses in the next few decades. In the energy dialogue involving citizens and society in general, gas-free areas constitute an important theme, while publications and examples of gas-free areas receive much attention. The Energy Agenda (December 2016) contained the following measures for reducing the use of natural gas.

- In principle, no new gas infrastructure will be constructed in new neighbourhoods. The Gas law will be accordingly amended. This will prevent the challenge from becoming an even bigger one.
- The obligation to connect gas to houses under the Gas Law is to be replaced with a broader right to be connected to energy infrastructure for heating.
- The municipalities will be responsible and have the necessary authorisations to decide on local energy supply, in collaboration with the network operator.
- The preparations are being made for in due course regulating large-scale heating networks in a comparable manner to electricity and gas networks, which will allow for a more integral weighing up of these energy infrastructures.

A revolving fund (Nationaal Energiebespaarfonds) and new subsidy schemes (Homeowner Energy Saving Scheme and the Sustainable Energy Investment Subsidy Scheme) have now been set up to encourage energy-efficient measures and sustainable systems for consumers. In the Energy Agenda the Cabinet has ruled in favour of further continuing and expanding the stimulus for reducing consumption by means of information, subsidies, low-interest loans and supporting innovative approaches.

