



# Towards climate neutrality in 2035

15 June 2021\*

\*December 2023: Adjustments made to align terms used with the updated Eneco List of Terms.





# Contents

<b>Foreword</b> .....	<b>3</b>
<b>1. Race against the clock</b> .....	<b>4</b>
<b>2. Eneco and customers climate neutral in 2035</b> .....	<b>8</b>
2.1 Approach: change in mindset and in the way of cooperating .....	12
<b>3. Roadmap</b> .....	<b>13</b>
3.1 Actions scope 1 & 2: reduction of emissions from our own operational activities .....	15
3.2 Actions scope 3: reduction of emissions in the value chain and at customers .....	19
<b>4. Critical success factors</b> .....	<b>27</b>
<b>5. Governance</b> .....	<b>35</b>
<b>6. External validation</b> .....	<b>36</b>
<b>Annexes</b> .....	<b>37</b>
<b>List of terms</b> .....	<b>42</b>





# Foreword

Together, we have an important task: to prevent the Earth from warming up by more than 1.5°C. If we want to keep the planet liveable for future generations, that is what we have to do.

It also motivates me personally. Having worked in the oil and gas industry for 24 years, eight of which in Asia, I have witnessed the need for a thorough energy transition at first-hand.

Stopping the accumulation of greenhouse gases in the atmosphere requires a change in human behaviour, stopping deforestation and stopping the burning of fossil fuels. Sustainability is the only option and I want to contribute to that. Making a difference for our children, every day.

## Pioneering role

The energy sector has an important pioneering role in the energy transition. Especially now we know that climate plans need to be much more ambitious if the 1.5°C target is still to be met. It is a complex issue, technologically, economically and socially. But like everything, it starts with the conviction that it can be done.

## Everyone's sustainable energy

At Eneco, we are intrinsically motivated to realise our mission of 'everyone's sustainable energy'. 15 years ago, we deliberately chose a sustainable course,

constantly raising the bar. More sustainable production of solar and wind energy and more sustainable solutions for our customers. Something to be proud of. But at the same time we realise that we must and can go faster.

## Climate neutral by 2035

Recent scientific research shows that in the worst case scenario, by 2050 the earth will have warmed up not by 1.5°C, not by 2°C, but by no less than 3°C. We want to prevent this from happening, and are taking our responsibility for this.

We set ourselves the ambition to be climate-neutral as early as 2035. Not only in our own operations, but also in the energy supplied to our customers.

This is a big challenge, we are acutely aware of that. But we believe it is possible. By further expanding our solar and wind energy capacity and supplying all our customers - consumers and businesses - with 100% green electricity by 2030. By making existing flexible capacity CO<sub>2</sub> free and by being fully committed to making the heat supply to our customers more sustainable.

## Societal support

We cannot do this alone, we have to do it together with our customers and partners. The energy transition is everyone's business.

But while for some it cannot come fast enough, for others it is not even on their minds. We must take this into account.

The climate problem is increasingly being felt in society, but there are also concerns. For example, about the costs of the energy transition and integrating renewable energy sources into scarce space. It is our responsibility to take these concerns seriously and address them as much as we possibly can.

## One Planet plan

To achieve our ambition of being climate neutral in 2035, we have a long-term strategy, underpinned by concrete plans, with clear investment choices and measurable targets - our One Planet plan.

We have put our plans to customers, NGOs and some of our strategic partners. Their feedback has strengthened our conviction that our ambition is challenging but realistic.

Two comments in this respect. Firstly, success will depend on a number of key factors: effective climate policies at national and European level, public support and technological developments. Secondly, we realise that not everything is clear yet and that on the way to 2035 we will have to adjust our plans, making them more concrete based on latest developments.

## No plan(et) B

Despite the uncertainties, we are fully committed. We do not see this as idealism; we believe that 'business for good' is also 'good for business'. That sustainable enterprise is the only future-proof and successful form of enterprise. Our past has confirmed this and the future will show it. In our hearts we all know it - there is no Planet B. There is only one Earth, and we need to take good care of it. I invite everyone to join us in making the ambition of becoming climate-neutral in 2035 a reality! ←

**As Tempelman**  
CEO Eneco





# 1. Race against the clock



## Summary

- Current efforts of the energy sector aimed at reducing greenhouse gas emissions to zero by 2050 are no longer sufficient.
- Without additional action, at the current rate of global warming we will reach the 1.5°C level by 2040. Therefore, the electricity sector must become climate-neutral sooner, according to the IEA.
- In order to meet the 1.5°C target, policymakers will have to implement within the next five years almost all the necessary policy measures (standardisation, CO<sub>2</sub> pricing and subsidies).
- We believe that with additional climate policies, combined with further cost reductions of low-carbon technologies, it will become economically feasible to achieve climate neutrality in time. →



### Race against the clock

To limit global warming to 1.5°C, we will all have to make a huge contribution. The challenge we face as a society is urgent and its scale far greater than many realise.

According to the Intergovernmental Panel on Climate Change (IPCC)<sup>1</sup>, at the current rate of global warming we will reach the 1.5°C level by 2040 (see figure 1). With further warming, serious effects on ecosystems, plants, animals and people can no longer be avoided.

### Current efforts no longer sufficient

Current efforts of the energy sector aimed at reducing greenhouse gas emissions to zero by 2050 are no longer sufficient. According to a recently published report by the International Energy Agency (IEA)<sup>2</sup>, the electricity sector in developed countries must reach “net zero” emissions as early as 2035 to limit global warming to 1.5°C.

Likewise, the Science Based Targets initiative (SBTi)<sup>3</sup>, which translates the latest scientific findings into climate targets for sectors and businesses, states that the electricity and heat sectors must approach zero by 2035 and 2040 respectively. For these sectors, affordable solutions are already available, while other sectors such as aviation and agriculture are going to need more time. →

<sup>1</sup> Intergovernmental Panel on Climate Change (IPCC, 2018); Special Report: Global warming of 1.5°C, Summary for policymakers

<sup>2</sup> IEA (2021), 'Net Zero by 2050; A Roadmap for the Global Energy Sector'.

<sup>3</sup> SBTi is an initiative of the World Wildlife Fund, UN Global Compact, CDP and the World Resources Institute.



‘The challenge we face as a society is urgent’

**Figure 1: Observed global temperature changes and the probability of limiting warming to 1.5°C under different mitigation strategies (IPCC, 2018)**

**Pace**

The vast majority of people think that something must be done to combat climate change<sup>4</sup>. But tenants, homeowners and businesses will only want to and be able to participate at the required pace if companies like Eneco offer affordable and accessible solutions, and the government fills in the policy gaps.

In order to meet the 1.5°C target, policymakers will have to implement within the next five years almost all the policy measures (standardisation, CO<sub>2</sub> pricing and subsidies) necessary to facilitate the massive scale-up of clean technologies in time. Many investments about which decisions are currently being taken have long development times and will only become operational in 8 to 10 years' time to replace fossil<sup>5</sup>.

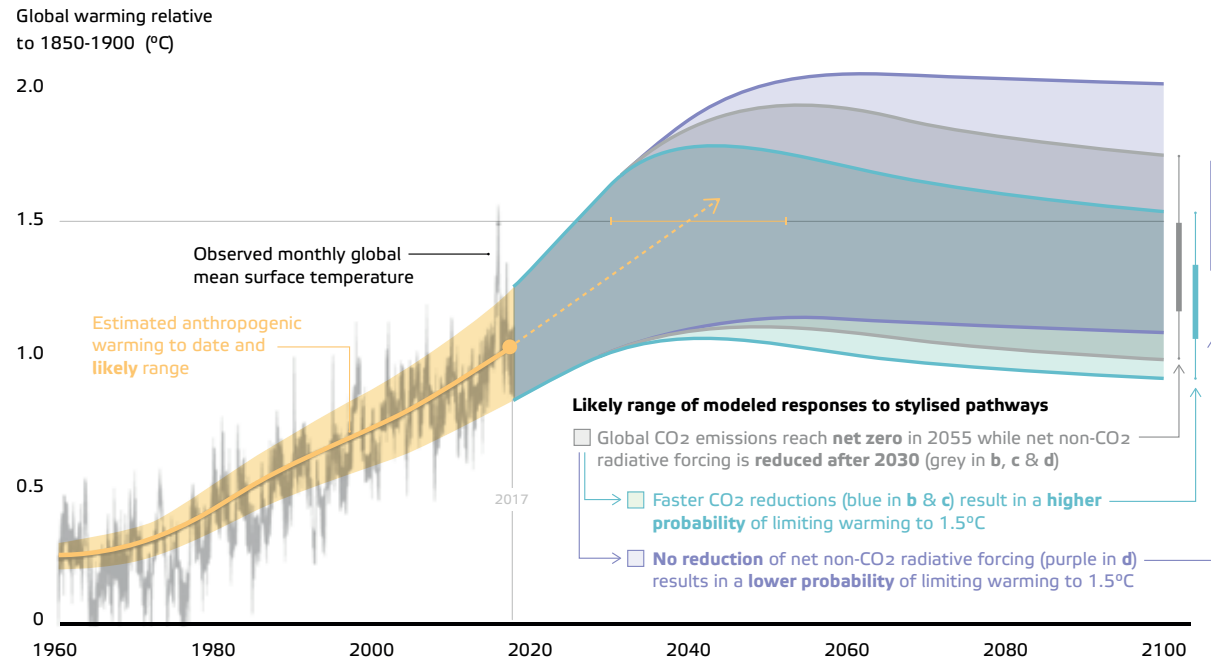
The 2030 climate targets - such as those of the European Union - may seem a long way off, but they are only achievable if a maximum effort is made in the next few years.

**New climate policy accelerates demand for sustainable solutions**

Following the global climate agreements in Paris, public support for increasing reduction efforts and climate policy

has grown significantly. Recently, new promises by major economic powers, such as the EU with Germany in the lead, China, Japan and the United States, have accelerated this.

These developments will possibly lead to a major acceleration of climate policy worldwide. This will make low-CO<sub>2</sub> products and services more attractive and accelerate the phasing out of fossil technologies. →



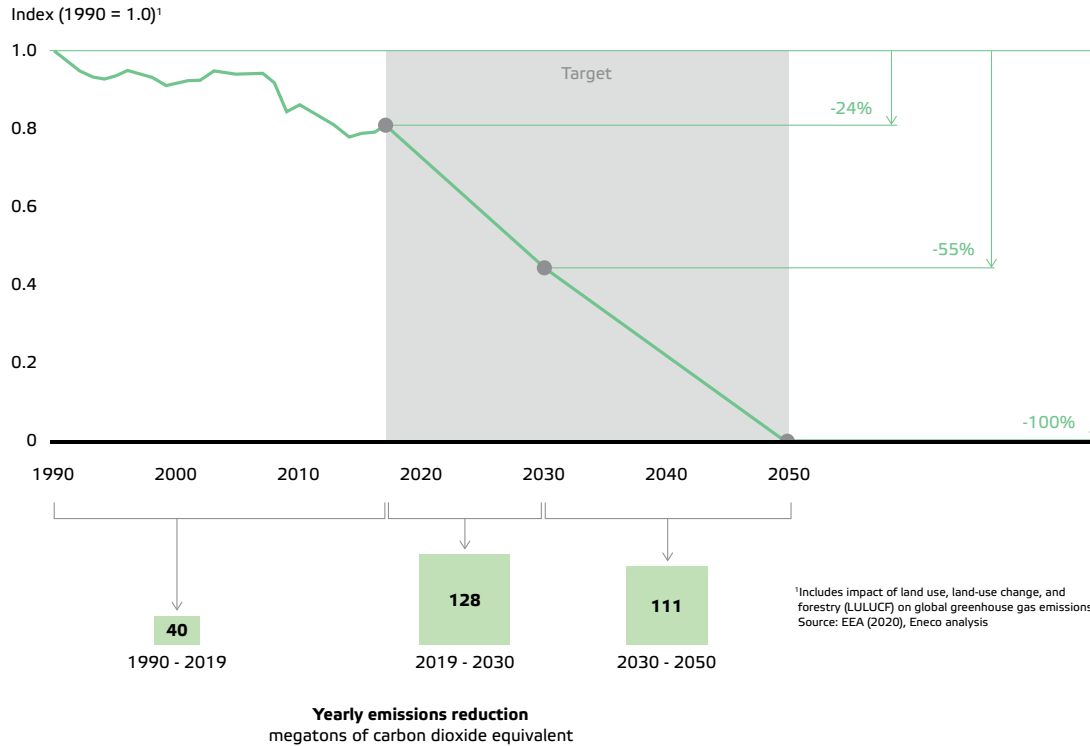
<sup>4</sup>Social and Cultural Planning Office (2020), Climate policy and society

<sup>5</sup>CE Delft (2021), "Doorlooptijden investeringen elektrificatie: Inzicht in de tijdlijn van het Klimaatakkoord" ('Lead times for investments in electrification: Insight into the timeline of the Climate Agreement')





**Figure 2: The EU needs to accelerate annual CO<sub>2</sub> reduction efforts by a factor of 3 to meet the 55% target by 2030**



**Reduction CO<sub>2</sub> needs to be accelerated by a factor of 3**

The EU has reduced net greenhouse gas emissions by 24% in 2019 compared to 1990. The recent decision to increase the climate target to 55% by 2030

means that more greenhouse gases must be reduced in the next ten years than in the last 30. While the entire EU economy must be climate neutral by 2050 in order to limit global warming to 1.5°C.

According to an analysis by the European Environment Agency (EEA), EU member states need to accelerate their annual CO<sub>2</sub> reduction efforts by a factor of 3 in the period up to 2030 to meet the 55% target compared to the period 2000-2019 (see figure 2).

**New climate legislation EU**

The EU has announced that it will present new climate legislation in 2021. This includes tightening of the European Emissions Trading System (ETS), which will lead to a sharp increase in the CO<sub>2</sub> price (approx. €50/tonne in May '21) for industry and the electricity sector. In addition, an update of the Effort Sharing Regulation (ESR) will bring the climate targets for the individual EU member states in line with the 55% EU-wide reduction target in 2030.

Eneco believes that this strong intensification of EU climate policy, combined with a further decrease in the costs of low-CO<sub>2</sub> technologies (solar, wind, storage, heat pumps, hydrogen), makes it economically feasible for us to take major steps towards becoming climate neutral together with our customers. ←

## 2. Eneco and customers climate neutral in 2035



### Summary

- We have the ambition to be climate neutral as early as 2035, together with our customers.
- The total emissions of Eneco (including the value chain) in all countries in which we are active, were 13.9 Mtonnes in 2020.
- We are aiming for an intermediate target of 60% in 2030 compared to our base year of 2019 and 100% CO<sub>2</sub> reduction by 2035.
- Eneco wants to achieve its climate ambition through three climate actions:
  - ↳ Radical electrification.
  - ↳ Phasing out natural gas in both the production and supply of energy.
  - ↳ Accelerating sustainable heat. →



### Eneco and customers climate neutral in 2035

Recent insights of the scientists at the IPCC and the IEA's Net Zero Roadmap are abundantly clear. There is still a narrow but feasible route to stay below the level of 1.5°C warming.

Together, we have a responsibility to leave a liveable planet to future generations. Therefore we have the ambition to be climate neutral as early as 2035, together with our customers. In doing so, we are going faster than the scientifically substantiated 1.5°C pathway prescribes. We have chosen to do this, because it seems possible to reduce our emissions more quickly and to remain below the 1.5°C pathway in the event of any setbacks in our reduction efforts. Thus, we also want to set the pace for the entire energy sector.

We have translated our ambition into a long-term strategy and underpinned it with concrete plans, with clear investment choices and measurable targets. Not everything is clear yet. On the way to 2035, we will adjust our plans and make them more concrete, based on the latest developments. As in recent years, we will have our results externally audited and be publicly accountable. →





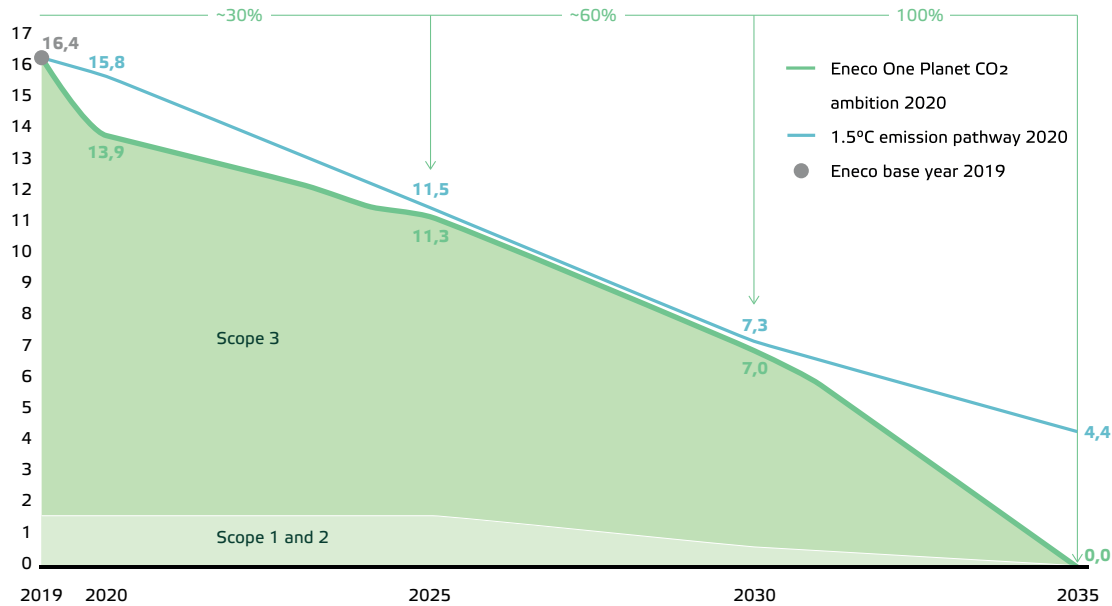
### Total emissions of Eneco including value chain

The total emissions of Eneco (including the value chain) in all countries in which we are active, were 13.9 Mtonnes in 2020. Our ambition is to become climate neutral in 2035. We are aiming for an intermediate target of 60% in 2030 compared to our base year of 2019 and 100% reduction by 2035 (see figure 3).

We can only achieve this ambition if we do it together with our customers. Almost 90% of CO<sub>2</sub> emissions come from the energy supplied to our customers, with natural gas as the main source of emissions. Our climate target therefore includes the emissions of our entire chain: scope 1&2 (emissions resulting from our own operational activities) and scope 3 (chain and customers). ←

**Figure 3: Eneco's emission pathway to climate neutrality in 2035 (scope, 1, 2 and 3)**

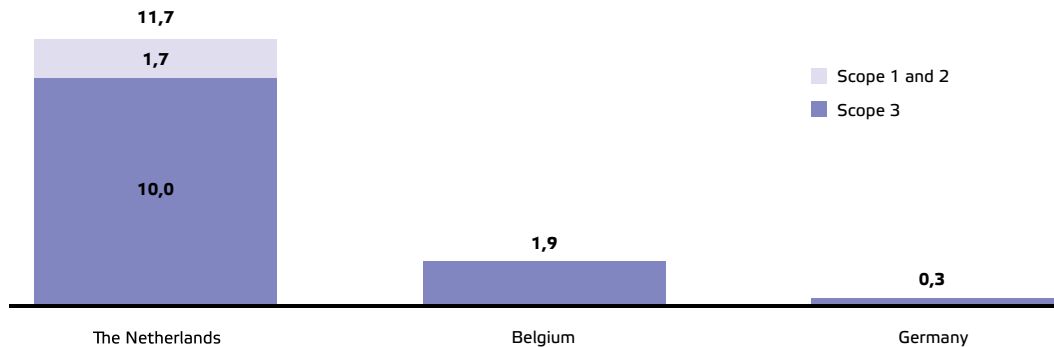
Emissions scope 1, 2 and 3 (Mt CO<sub>2</sub>)



**Note:** approximately 0.9 Mt (6%) of 13.9 Mt CO<sub>2</sub> emissions will be neutralised by carbon removals in 2035

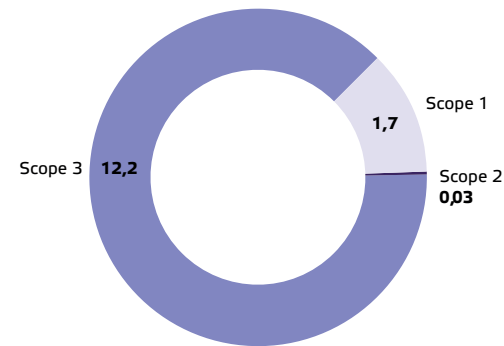
**Figure 4: Distribution of Eneco CO<sub>2</sub> emissions by country (2020)**

Emissions scope 1, 2 and 3 (Mt CO<sub>2</sub>)



**Figure 5: Distribution of Eneco CO<sub>2</sub> emissions scope 1, 2 and 3 (2020)**

Emissions scope 1, 2 and 3 (Mt CO<sub>2</sub>)





## We want to achieve our climate ambition through three climate actions:



### Radical electrification

Large-scale electrification of industry, mobility and the built environment with exclusively renewable energy from new wind and solar farms.



### Phasing out natural gas

By converting or closing our gas-fired power stations and making natural gas-powered homes and buildings more sustainable with home insulation, (hybrid) heat pumps and heat networks.



### Accelerating sustainable heat

Through innovation and investment in sustainable sources such as geothermal, aquathermal, electrode boilers, heat and cold storage (HCS), green gas and green hydrogen.





The next phase is more complex and is characterised by system integration

## 2.1 Approach

# Change in mindset and in the way of cooperating

Although we have been firmly committed to accelerating the energy transition since 2007, the ambition to become climate-neutral by 2035 requires a different approach. Fundamental breakthroughs in the way we work and in the products and services we offer. A change in mindset and in the way of cooperating with other sectors.

### Next phase: system integration

The first phase of the energy transition is over. This was mainly characterised by expanding the supply of renewable generation capacity on the electricity market, such as biomass plants and solar and wind farms.

The next phase is more complex and is characterised by system integration, requiring intensive, cross-sectoral cooperation and alignment of investments at chain level. This more demand-led transition

is necessary to maintain the investment security of an increasing share of weather-dependent energy sources and to keep the energy system in balance.

For example, by linking offshore wind farms to electrification in industry. Or by using electric cars, heat buffers and heat pumps in the built environment to store temporary surpluses of renewable electricity.

### Accelerating together

Acceleration is only possible if we do this together with customers, the local surroundings and local partners such as residents, municipalities, housing corporations and energy cooperatives. Together with them, we are working on affordable solutions, social innovations and new participation models to distribute the benefits and burdens of the energy transition fairly and make them more transparent. ←



# 3. Roadmap



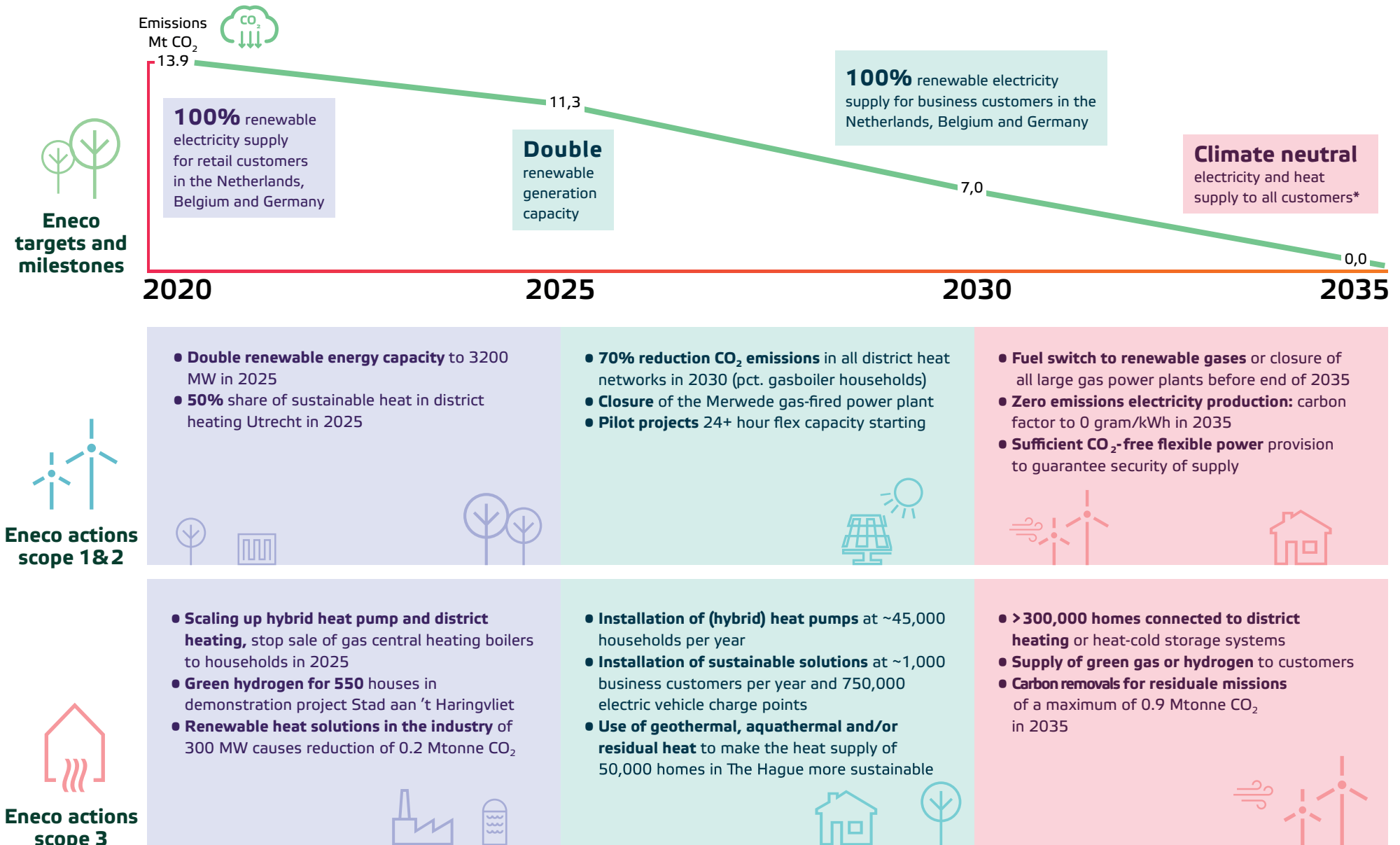
All our planned investments and product development are evaluated in terms of whether they contribute sufficiently to our climate ambition in 2035. Using the backcasting method, we determine backwards from our future goal as to what is needed now to realise it. In this way, we have developed a roadmap with concrete steps, with which we are actively shaping a sustainable future.

Figure 6 shows our climate roadmap with the main intermediate targets, milestones and planned actions. We periodically update this, based on developments in social readiness (support and market acceptance), tightening of climate policy and technical and economic feasibility.

The underlying assumptions in our climate roadmap have been externally validated by Boston Consulting Group (BCG) to determine whether the resulting choices are logical in terms of contributing to achieving our 2035 ambition<sup>6</sup>. →

<sup>6</sup> See chapter 6 for BCG's validation statement

Figure 6: Eneco's climate roadmap with concrete steps towards 2035



\* Incl. district heating, but without van peak load, < 0.02Mt. About 6% will be neutralised by carbon removals.



### 3.1 Actions scope 1 & 2

# Reduction of emissions from our own operational activities

#### Summary

We are reducing our own CO<sub>2</sub> emissions through the following scheduled milestones and actions:

- Achieving 100% CO<sub>2</sub>-free electricity production by 2035
  - ↳ Sustainable conversion or phasing out of all large gas-fired power stations;
  - ↳ Doubling our renewable production capacity to 3,200 MW in 2025 and continuing this growth in the years up to 2035.
- Investment in more than 2,000 MW of new heat sources and heat supply agreements with third party sources until 2035.
- Development of sufficient CO<sub>2</sub>-free flexible power needed to supplement non-continuous renewable electricity sources (solar and wind) in order to meet electricity demand. →

We intend to reduce CO<sub>2</sub> emissions from our own operational activities (scope 1 and 2) from 1.7 Mtonnes in 2020, to net zero by 2035.

These emissions are mainly caused by gas-fired power stations for the production of electricity and heat. Of these, the Enecogen gas plant on the Maasvlakte in Rotterdam is the only one that only produces electricity. The other gas plants primarily produce heat for our heat networks in the Netherlands. All these power plants also contribute to security of supply, supplementing weather-dependent sources.

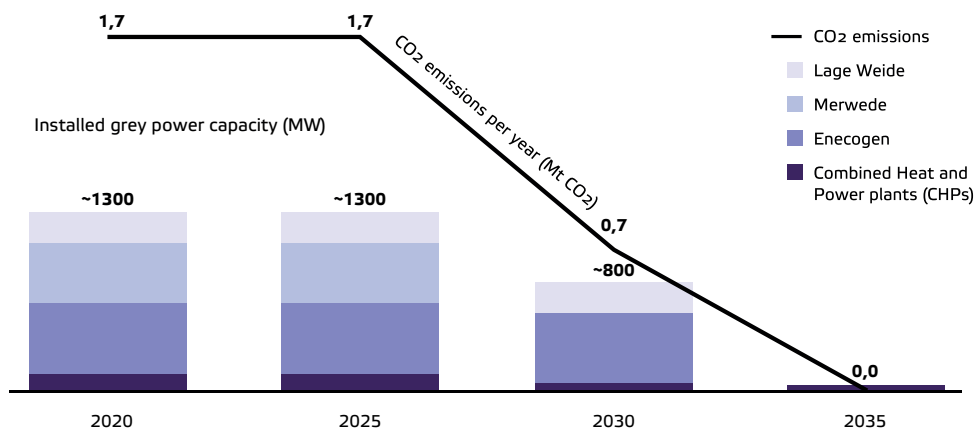
We are reducing our own CO<sub>2</sub> emissions through the following scheduled milestones and actions:

### 1. Achieving 100% CO<sub>2</sub>-free electricity production by 2035

- Sustainable conversion or phasing out of all large gas-fired power stations; this concerns a total of approximately 1,300 MW of installed capacity (see figure 7). Before 2030, the Merwede gas power plant in Utrecht and ten gas-fired combined heat and power plants (CHPs) will be made sustainable or closed. By 2035, the Lage Weide gas power plant in Utrecht and the Enecogen power plant on the Maasvlakte in Rotterdam will also be made sustainable, for example by being converted to renewable fuels, or closed down;
- Doubling our renewable production capacity to 3,200 MW in 2025 and continuing this growth in the years up to 2035.

The above actions should lead to a reduction of the carbon factor of the electricity produced to zero in 2035. →

**Figure 7: Reduction of CO<sub>2</sub> emissions from our own production to zero by phasing out gas-fired power stations by 2035 at the latest**







## 2. Investment in more than 2,000 MW of new heat sources and heat supply agreements with third party sources until 2035

- This concerns baseload, peak & back-up and storage capacity, such as geothermal energy, aquathermal energy, electrode boilers, large-scale heat pumps, heat buffers and utilisation of residual heat in the Netherlands through the Leiding over Noord heat distribution network in Rotterdam and Gasunie's WarmteLinq heat distribution network to The Hague and Leiden, among others;
- We believe that this can be done profitably because it was agreed in the Dutch Climate Agreement that the government will make SDE++ subsidies available in good time and the shift in energy tax from electricity to natural gas will continue.
- These investments in new heat sources fulfil Eneco's agreements made in the Climate Agreement (NL, 2019) to reduce the average CO<sub>2</sub> emissions of the heat supplied in the heat networks by 70% by 2030 compared to a gas-fired high performance boiler (18.9 kg CO<sub>2</sub>/GJ).
- CO<sub>2</sub> emissions from gas-fired peak and back-up sources for the heat networks were less than 0.1 Mtonnes in 2020. These will drop to around 0.02 to 0.08 Mtonnes in 2035 due to sustainability measures such as electrification, heat buffers and the use of sustainable gases. We expect that it will not be technically and/or economically feasible to bring these residual emissions to zero before 2035 and will neutralise them through carbon removals until these peak facilities are also replaced by sustainable alternatives;
- The Lage Weide gas-fired combined heat and power plant (CHP) in Utrecht is currently crucial for the security of supply of both heat and electricity (black start function). We believe it will be technically feasible to replace it by 2035 at the latest. The following is important in this regard: 1. technical availability of sufficient sustainable sources such as geothermal energy in the Utrecht area, 2. timely availability of existing housing in the inner city of Utrecht for medium-temperature heat sources with energy-saving measures, 3. sufficient availability of residual heat and 4. replacement of black start function. →





### 3. Development of CO<sub>2</sub>-free flexible power

An important part of making Eneco climate neutral is making so-called flexible capacity CO<sub>2</sub>-free. By this we mean the flexible renewable electrical capacity needed to supplement non-continuous renewable electricity sources (solar and wind) in order to meet electricity demand.

Currently, our main source of flexible capacity is the Enecogen gas-fired power plant, of which we have 50% ownership. It is our ambition to have Enecogen no longer emitting CO<sub>2</sub> by 2035<sup>7</sup>.

**This is expected to be achieved by one or a combination of the following options:**

- a. Switching Enecogen from burning natural gas to green gas;
- b. Capturing and using or storing (CCUS) the CO<sub>2</sub> resulting from the combustion of natural gas and/or green gas;
- c. Converting Enecogen into a hydrogen-fired power plant;
- d. In combination with one of the previous options, reducing Enecogen's running hours by using other forms of carbon-free flexible capacity.

None of the above options is economically viable at present and, based on current knowledge, none of them seem to be certain options even in 2035.

This means that we will be learning in the time to come. By actively engaging in green gas and hydrogen pilot schemes (a and c). By closely monitoring the developments around CCUS (b). And especially by focusing on increasing our flexible CO<sub>2</sub>-free controllable capacity (d). Because, in addition to a positive CO<sub>2</sub> impact, this can also have economic benefits in the short term.

Examples include the installation and management of batteries, the development of options for converting electricity into heat (Power-to-Heat; both on site at customers and in our heat network), curtailment of generation and (pilot schemes with) demand management, for example smart timing of electric car charging. →

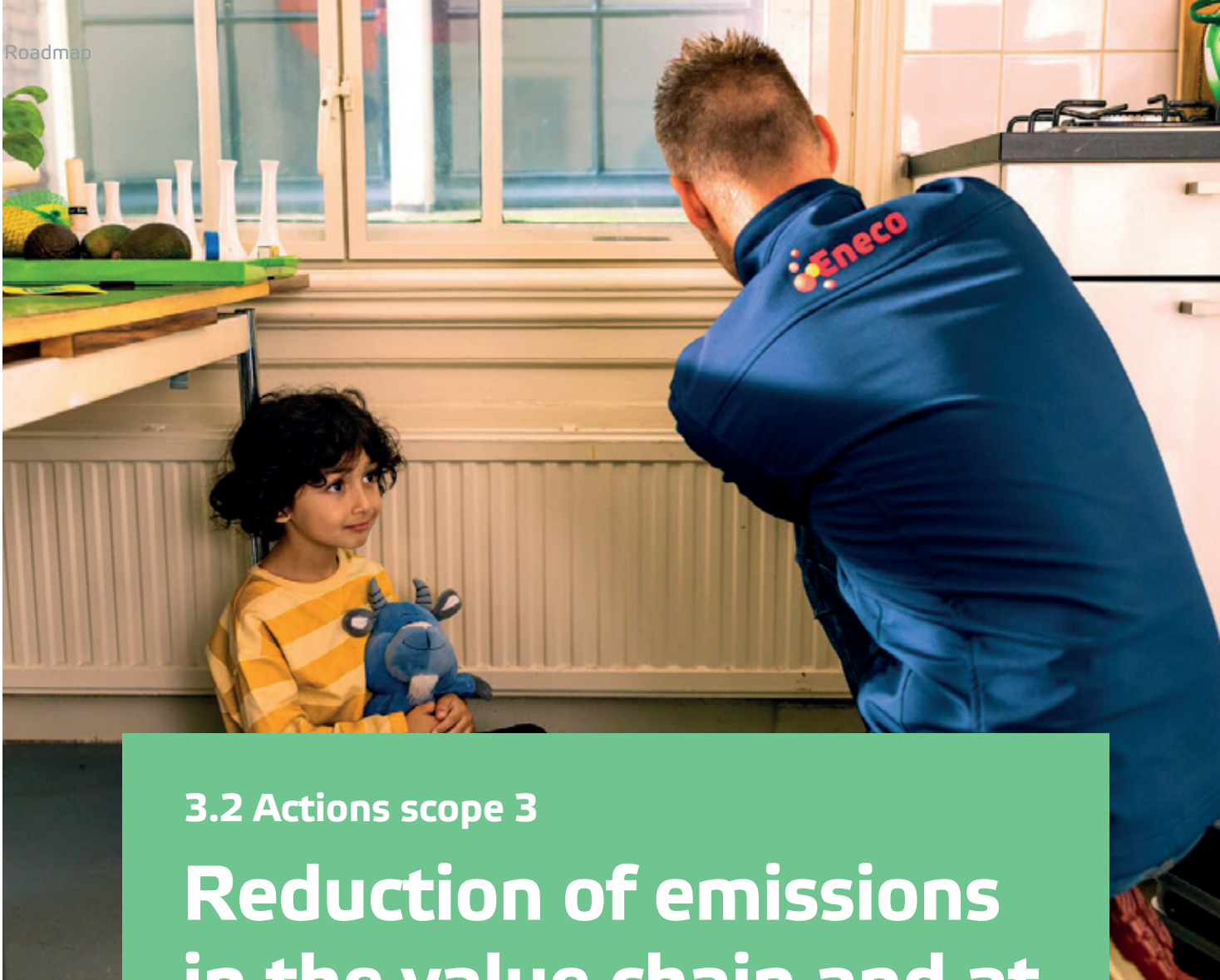
#### Heat pump for aquathermal energy

Heat from treated waste water from sewage treatment plants can be put to good use. That is why, together with De Stichtse Rijnlanden water board, we are developing a heat pump on the site of the sewage treatment plant in Utrecht. This aquathermal heat pump with a capacity of 25 MWth will be the largest in the Netherlands. Based on a final investment decision and commissioning in 2022 or 2023, the heat pump will provide 10% of the total heat demand of the Utrecht district heating network.



<sup>7</sup> See section 3.1.1: Achieving 100% CO<sub>2</sub>-free electricity production by 2035.





### 3.2 Actions scope 3

# Reduction of emissions in the value chain and at customers

#### Summary

Achieving reduction of emissions at customers by:

- Supplying only green electricity to business customers from 2030 onwards.
- Increasing (hybrid) heat pumps and district heating, stop the sale of stand-alone gas-fired boilers to consumers by 2025 at the latest.
- Accessible propositions that provide every homeowner with a sustainable alternative to natural gas-fired heat, that is economically attractive. →





In 2020, Eneco had 5.9 million customer contracts and total CO<sub>2</sub> emissions in the value chain of 12.2 Mtonnes. Of this, more than 2 Mtonnes was caused by the supply of purchased grey electricity to business customers. The remaining 10 Mtonnes was mainly released by customers through the combustion of natural gas supplied by us in the Netherlands, Belgium and Germany. And through the purchase of gas-fired (residual) heat from third-party sources for our heat networks in Rotterdam, The Hague and elsewhere.

We realise that our customers themselves decide on the speed with which they want to make their energy use more sustainable. We will encourage and help them as much as we can, but we cannot influence everything. The current policy of the EU and its member states is that our customers must be climate-neutral by 2050 anyway. Moreover, the EU has agreed on an intermediate target of 55% for 2030<sup>8</sup>.

### Additional acceleration to become climate neutral together with our customers

Our ambition to become climate-neutral in 2035, together with our customers, means an additional acceleration. As indicated above, we believe this is necessary in order to limit global warming to 1.5°C. We realise that this ambition is a great challenge that will demand a lot from all involved in society. It is not easy,

but it is necessary and it is expected to be not just technically, but also economically feasible for a large proportion of tenants, homeowners and businesses by 2035<sup>9</sup>.

More importantly, we believe that it's not just our planet that will benefit, but our customers will also get a lot in return. For example, because customers' energy bills will remain predictable and affordable with clean alternatives, despite rising taxes on natural gas. Homes also become more comfortable and can, in many cases, be cooled in summer using the same equipment. Below, we explain how, together with our customers, it is possible for us to become climate-neutral in 2035.

### Renewable electricity

We already supply the vast majority of our customers with renewable electricity. We supply 100% of our retail customers with green electricity. In the Netherlands and in Belgium more than 50% and in Germany all of our business customers are supplied with green electricity.

A large part of this green electricity is produced by our own onshore and offshore solar and wind farms, such as Luchterduinen, Borssele 3&4 and Norther. Another part of it comes from renewable projects in the Netherlands and neighbouring countries with which we have concluded long-term power purchase agreements (PPA). →

<sup>8</sup>Our customers in Germany may be quicker. The German government has recently proposed to accelerate this pathway to 65% by 2030 and to climate neutrality by 2045.

<sup>9</sup>Based on tighter climate policies in the Netherlands and Germany. For a large proportion of our customers in Belgium, it is unlikely that making the heat supply more sustainable will be economically feasible before 2035.



### Our ambition: from 2030 only green electricity for business customers

Our ambition is to sell only green electricity to all business customers from 2030 onwards. We believe this is feasible because solar and wind power is already cheaper than electricity produced in coal and gas plants. With this ambition, we anticipate the climate policy of the markets in which we operate. This is because we expect that by 2030 at least 75% of the annual electricity mix in the Netherlands and Germany will be produced using sun and wind<sup>10</sup>.

We expect that more and more customers will also want to have access to CO<sub>2</sub>-free electricity on days of the year when there is a shortage of solar and wind power. In the coming years, we will therefore increase our CO<sub>2</sub>-free controllable capacity.

### Bol.com

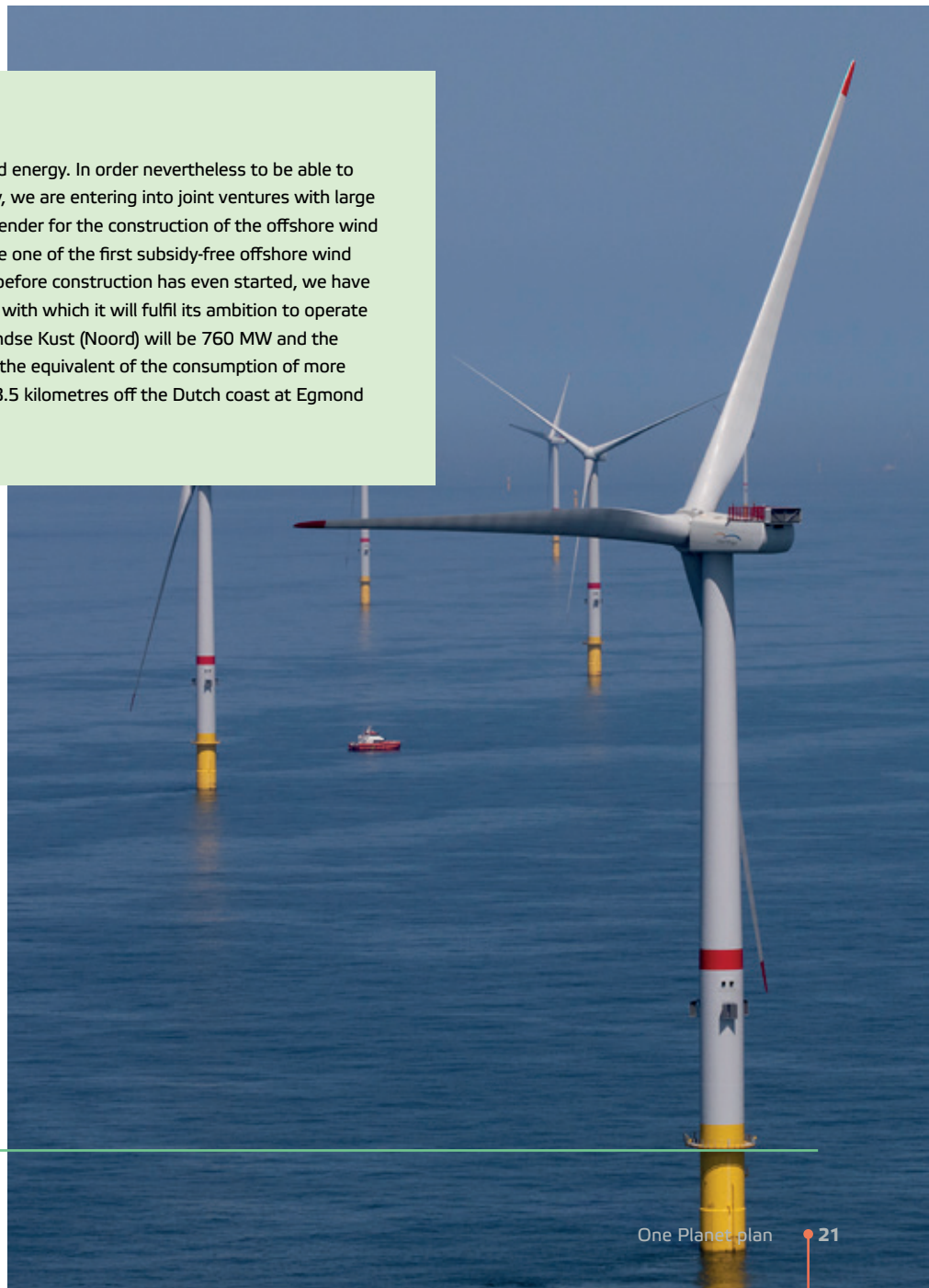
All offices, data centres and warehouses of bol.com in the Netherlands and Belgium are being powered entirely by green electricity since November 2020. An important contribution to this switch has been the installation of no fewer than 13,240 solar panels by Eneco on the roof of the new Bol.com fulfilment centre in Waalwijk. These panels can generate about 4 GWh of energy, equivalent to the annual consumption of about 1,200 households. The existing fulfilment centre was already running on local green electricity generated by Eneco wind turbines at the Waalwijk Ecopark.

### Hollandse Kust (Noord)

Less and less subsidy is available for the production of wind energy. In order nevertheless to be able to construct large wind farms and produce sustainable energy, we are entering into joint ventures with large parties. In the summer of 2020, Eneco and Shell won the tender for the construction of the offshore wind farm Hollandse Kust (Noord). Hollandse Kust (Noord) will be one of the first subsidy-free offshore wind farms worldwide. By finding a customer to buy the power before construction has even started, we have secured the return. Amazon signed a long-term agreement with which it will fulfil its ambition to operate in a climate-neutral manner by 2040. The capacity of Hollandse Kust (Noord) will be 760 MW and the wind farm will produce 3.3 TWh on an annual basis. This is the equivalent of the consumption of more than 1 million households. The wind farm will be located 18.5 kilometres off the Dutch coast at Egmond aan Zee. The park is expected to be completed in 2023.

### Virtual power plant

In addition to making the Enecogen gas plant more sustainable and installing batteries at solar and wind farms, this also involves demand management with a large group of customers together forming a virtual power plant. Surplus 'stored' renewable electricity in home batteries or electric cars can then be shared between them or used by Eneco to support the balance in electricity networks. Customers then benefit from the payment made for this and see their energy bills reduced. →



<sup>10</sup> In the Netherlands' Climate Agreement, it has been agreed that by 2019 at least 84 TWh will be produced using wsun and wind. This amounts to a share of at least 70%.



### Making natural gas and heat supply more sustainable

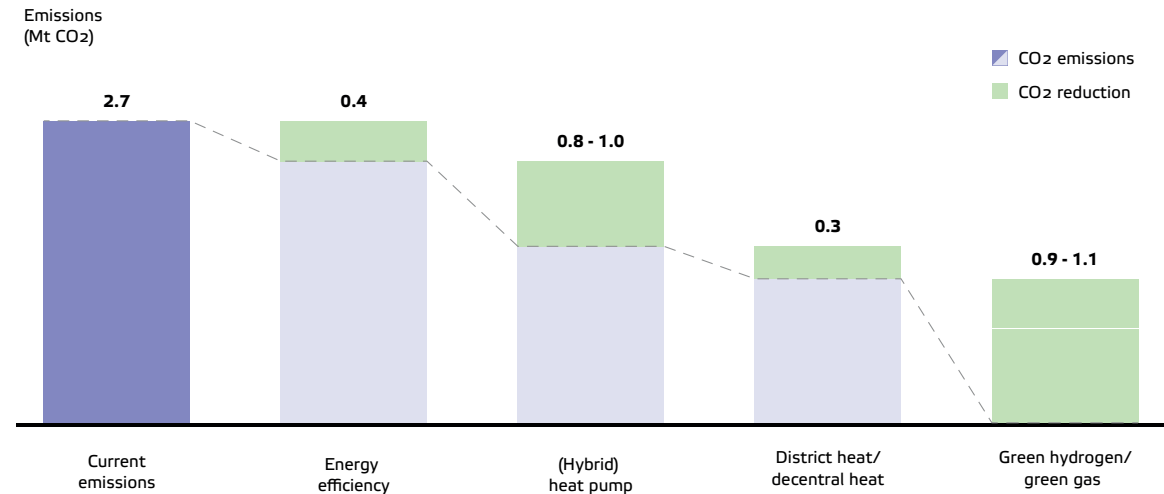
The heat transition in the built environment is a major challenge. Moreover, it is less a technical issue than a social transition. We believe we can accelerate this if, in addition to affordable and sustainable solutions, attention is also paid to other preconditions such as: a good customer experience in a wide range of situations, transparency, participation in decision-making, public-private cooperation and synergy with social and spatial improvements of the relevant neighbourhoods and districts.

### Diversified approach

Reducing CO<sub>2</sub> emissions from household heating requires a diversified approach. No two houses are the same. Not even in streets with terraced houses, as a result of modifications/renovations over the years. In order to meet the specific situations and wishes of building owners, we offer all possible sustainability strategies: electrification with (hybrid) heat pumps, large-scale district heating networks, low-temperature and medium-temperature thermal storage systems (HCS) and renewable gases, as appropriate in combination with house insulation (see figure 8).

The starting point is that customers and partners such as municipalities and housing corporations can choose the most appropriate solution, both for the consumer and for society.

**Figure 8: Estimate of the CO<sub>2</sub> reduction each of these strategies is expected to contribute for our retail customers in the Netherlands**



### Our approach is in line with the two-track policy of the Climate Agreement:

1. the **district-oriented approach** for collective heat networks in particular;
2. an **accessible step-by-step approach** for individual heat solutions.

### District-oriented approach

By 2035, we want to convert around 300,000 additional homes from natural gas to a connection to a district heating network or small-scale heat and cold storage networks. To ensure that this is also

financially attractive for customers, we offer this collective solution particularly in urban areas where this option is often cheaper than, for example, heat pumps. We are also working hard to make heat networks increasingly efficient and cost-effective.

We realise that support for heat networks is highly dependent on good cooperation with all stakeholders. Transparency about the actual costs and risks and looking for ways to connect to other needs that exist in the neighbourhood are important preconditions. →



In close and intensive cooperation with Dutch municipalities and the housing corporations, in 2021 we have signed agreements for the development of the heat transition projects Bospolder-Tussendijken in Rotterdam and Groenoord in Schiedam. The first phase will involve about 8,000 existing homes being made sustainable through a connection to a heat network. It has been agreed that the tenants can make the switch on a cost-neutral basis and will not pay more than their gas bill.

### Accessible heat transition: step-by-step approach

For customers in districts and neighbourhoods where a collective heat supply cannot (yet) be deployed under a district approach before 2035, we offer sustainability options that meet the individual wishes and possibilities of customers. With these, a homeowner does not have to completely disconnect from natural gas yet, but can take measures at natural moments using a step-by-step approach.

The average lifespan of a central heating boiler is 12 to 15 years. This means that almost all of Eneco's existing and new customers will have a natural replacement moment before 2035. A homeowner can achieve sustainability step by step with 'regret-free' solutions. For example by taking insulation measures or replacing an old written-off gas boiler with a hybrid heat pump<sup>11</sup>. This will enable a natural gas and CO<sub>2</sub> reduction of more than 50% on the short term and is an effective intermediate step towards an optimal sustainability strategy on the pathway towards 2035.

With the use of available investment subsidies (such as ISDE) and a continuation of the shift in energy tax from electricity to natural gas, the hybrid heat pump will already be an affordable option in the coming years. It is expected that the payback time of the investment will drop to 6 to 8 years by 2025, reaching a similar tipping point as solar panels in recent years. Based on the analysis of energy consumption data, among other things, Eneco is able to specify payback periods for customers and can advise on various possible actions to decarbonise customers' homes. →



### Binckhorst in The Hague

The Binckhorst district in The Hague, which was once a large industrial estate with three inland harbours, is being transformed into a modern and innovative district. Living and working are being brought together. Project developer VORM and Eneco are realising three new construction projects with an innovative energy supply: Binck Blocks, Binck City Park and One Milky Way. Eneco BinckNet® – a sustainable thermal smart grid – provides 'new-style heating and cooling' in these buildings.

BinckNet is a decentralised heat network in which thermal storage systems form the basis for the supply of heat and cold. The thermal storage systems are used to store cold from the winter to use for cooling in the summer. Heat from the summer is then used to supply heat in the winter. Other local sources, such as aquathermal and geothermal energy, can also be easily connected to the smart, innovative BinckNet. The result is a comfortable indoor climate at an attractive cost for residents and businesses.

<sup>11</sup>According to a recent study by Ecorys, the hybrid heat pump with natural gas does not lead to a lock-in situation that blocks full sustainability. <https://www.ecorys.com/netherlands/our-work/ecorys-onderzoekt-de-waarde-van-de-hybride-warmtepomp-voor-de-warmtetransitie>.

### Every customer a suitable sustainable alternative

We offer every customer a sustainable alternative that matches their (personal) situation and at logical replacement moments. As the lifespan of new gas central heating boilers may exceed our ambition in 2035, Eneco will stop the sale of stand-alone gas-fired boilers by 2025 at the latest. Customers will retain a wide choice of accessible (regret-free) solutions:

- Supply of CO<sub>2</sub>-compensated gas as standard;
- Home insulation package;
- Hybrid heat pump, with the possibility of replacing natural gas with renewable gases in the long term;
- Hydrogen-ready HE boiler; suitable for renewable gases such as hydrogen;
- Exchangeable boiler; rental of a high-efficiency gas boiler that Eneco will exchange for a fully sustainable solution (heat network, heat pump or supply of renewable gases) before 2035;
- All electric heat pump, possibly supplemented with solar panels.

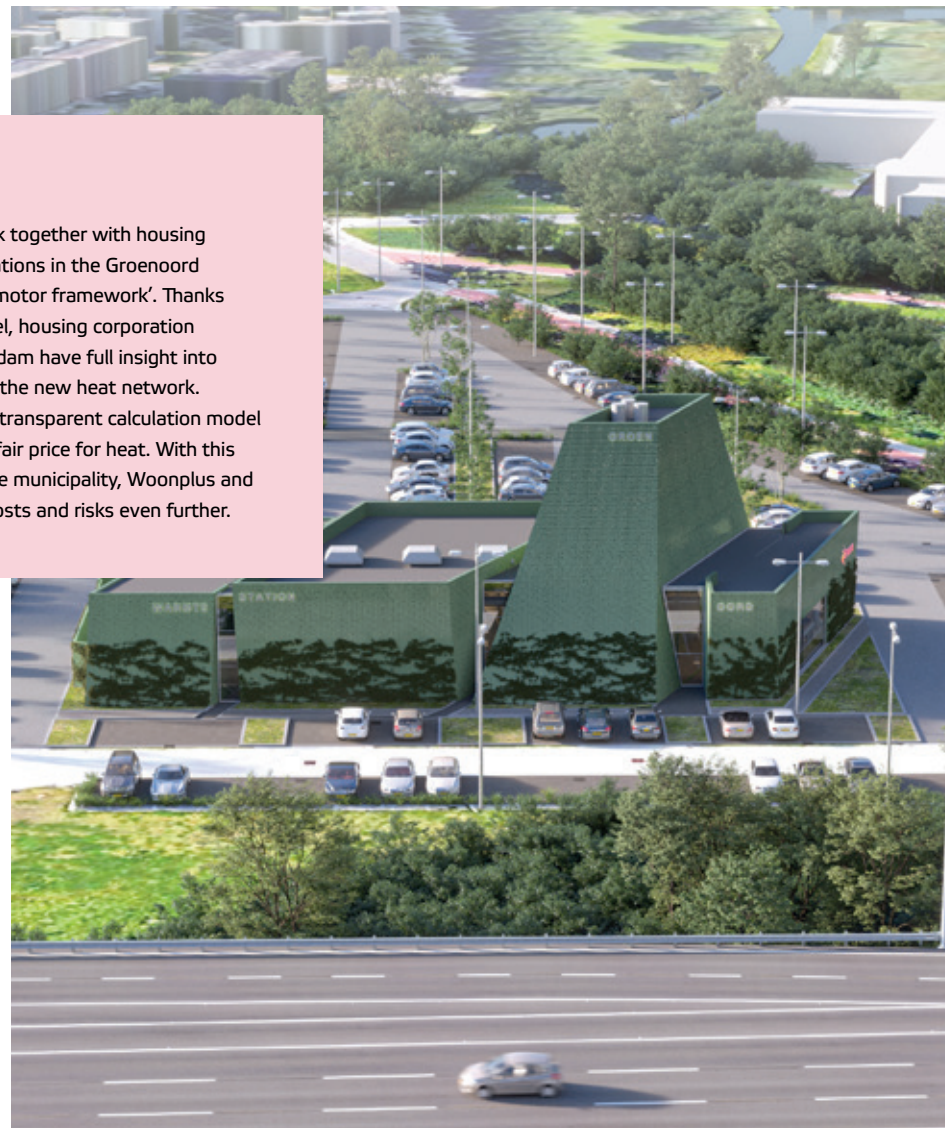
From 2025 onwards, we plan to supply around 45,000<sup>12</sup> hybrid and all-electric heat pumps to our customers each year. We believe that between 2030 and 2035 it will be technically and economically feasible in the Netherlands to replace natural gas for the hybrid heat pump with green gas or green hydrogen. Critical success factors for this will be timely technical up-scaling and implementation of necessary policies<sup>13</sup>.

### Transparent calculation model

Eneco is developing a new heat network together with housing association AEDES and housing corporations in the Groenoord district of Schiedam within the 'starter motor framework'. Thanks to Eneco's transparent calculation model, housing corporation Woonplus and the municipality of Schiedam have full insight into the costs and benefits of connecting to the new heat network. Investments are calculated in the same transparent calculation model so that all stakeholders can count on a fair price for heat. With this same model and in consultation with the municipality, Woonplus and its advisors, it was possible to reduce costs and risks even further.

### Supply of renewable gases

The supply of these renewable gases can take the form of blending in the gas network and supplying the corresponding guarantees of origin (equivalent to green electricity). In some districts it may also involve the direct supply of green hydrogen via a new hydrogen network of Gasunie and the regional network operators. Together with other partners, Eneco has already started a demonstration project in Stad aan 't Haringvliet to learn from the use of green hydrogen in 550 homes. →



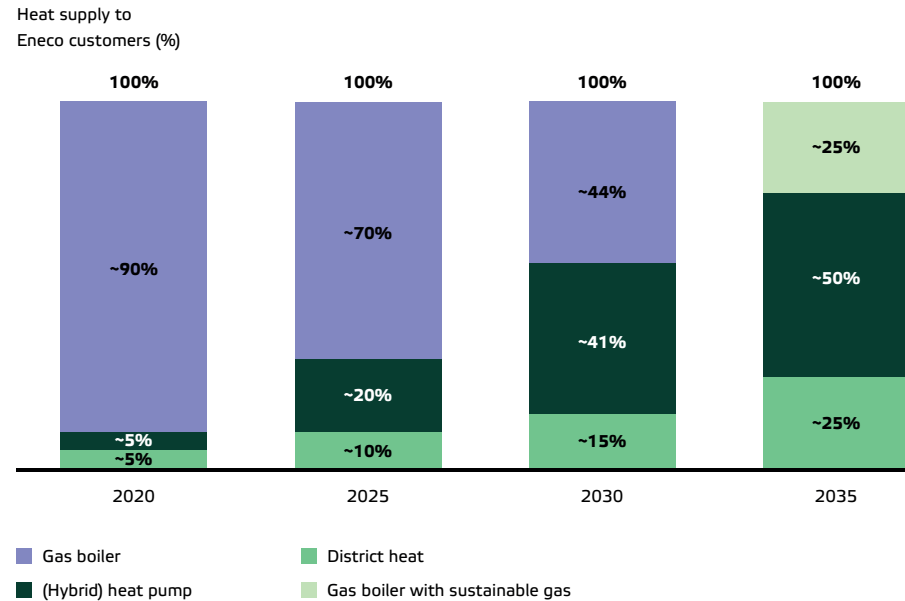
<sup>12</sup> we aim to grow this number to yearly 60,000 from 2027

<sup>13</sup> See chapter 4 Critical success factors





**Figure 9: By 2035 Eneco aims to have helped 100% of its retail customers in the Netherlands to make the switch to a sustainable heating solution**



Based on current insights, we expect that the district-oriented approach and accessible transition aimed at individual solutions will lead to the following distribution in sustainability strategies of Eneco customers in the Netherlands (see figure 9).

**Heat transition business customers**

The heat transition in the business market is a major challenge and we are just at the start of it. Nevertheless, we are already seeing opportunities for affordable solutions, for industry, new office buildings and greenhouse horticulture.

**Limited financial incentive to disconnect from natural gas for businesses**

For many businesses, especially those in existing office buildings, there is currently limited financial incentive to disconnect from natural gas:

- Business rates for gas tax are up to ~30x lower per m<sup>3</sup> of natural gas than private rates;
- a large proportion of business CO<sub>2</sub> emissions occur in the built environment, which is not covered by the current ETS or CO<sub>2</sub> pricing system;
- current policies for making the business market not covered by the ETS more sustainable, focus mainly on insulation and energy efficiency and not yet on switching to sustainable heat solutions.

To help our business customers switch, we will change our business model from a commodity focus to a 'sustainable switch strategy' under which business customers are helped to invest in sustainable assets such as thermal storage, geothermal energy, electrode boilers, heat pumps and connections to heat networks.

A special market segment concerns greenhouse horticulture in the Netherlands. The current policy is counterproductive (reduced natural gas tariff and lack of an

effective CO<sub>2</sub> price) and actually stimulates the use of gas-fired CHP plants instead of increasing sustainability.

That is a shame, because many of our customers in greenhouse horticulture see good technical possibilities for increasing sustainability. Given our large market share in this sector, we would like to take the lead in working together to achieve a broadly supported transition approach in making the sector future-proof. →

**E-boilers in industry**

Electrification of heat demand in industry offers a great opportunity to further reduce NOx and CO<sub>2</sub> emissions. This can be done with industrial heat pumps and electrode boilers. E-boilers in particular can deliver high temperatures and are relatively cost effective.

We install electrode boilers next to gas-fired boilers in industrial settings. These electrode boilers can then be switched on at times when there is a lot of sun and wind. The gas boilers then do not have to run, and in this way we reduce our customers' CO<sub>2</sub> emissions.

In the Ypenburg district, we installed an e-boiler to make the district heating more sustainable and to learn how to work with this technology. We are working closely with the supplier of the e-boilers to introduce the Dutch and Belgian markets to this simple technology.

We are working with several customers in the chemical, paper, and food industries on the integration of these e-boilers at their sites. This is a first step that we can already take with them now. Thermal storage, high-temperature heat pumps and hydrogen are technologies that will be economically viable in a few years' time and can accompany the electrode boiler on site. Thus, together with our customers, we are steaming ahead towards CO<sub>2</sub>-free heat. The next important step in the energy transition.

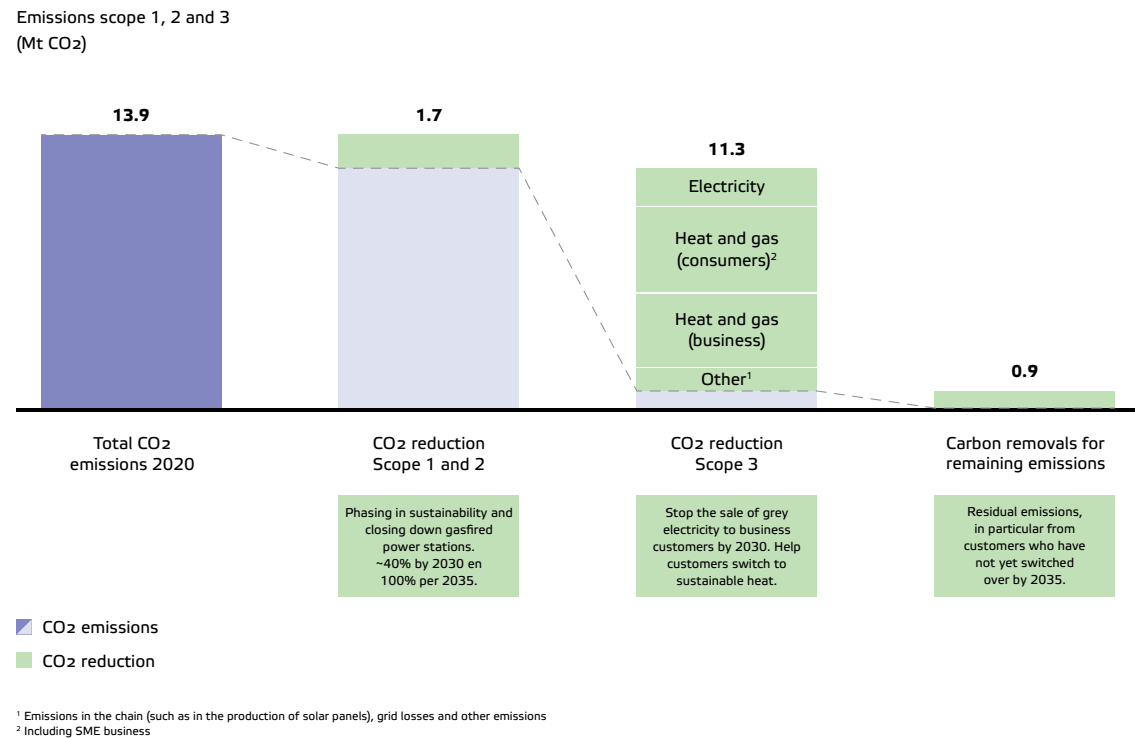


### Summary of reduction plan

The overall reduction plan is summarised as follows (see figure 10):

- We have set ourselves the goal that our own operational activities such as power plants, buildings, installations and mobility (scope 1 & 2) will be climate neutral by 2035 at the latest. This concerns a total of 1.7 Mtonnes of emissions. Of this, 99% will be achieved through conversion to sustainable solutions and about 1% by carbon removals until a definitive solution is feasible. The latter concerns about 0.02 Mtonnes of residual emissions from peak boilers for our district heating system;
- Of our total chain emissions of 12.2 Mtonnes in scope 3, we plan to reduce 11.3 Mtonnes by 2035 by helping customers switch to renewable energy. This partly pertains to the electricity we supply to business customers. A large part of this involves the greening of gas and heat supply to retail and business customers in the Netherlands and Germany. Based on current insights, we anticipate that social acceptance and customer willingness in some segments will not be sufficient in 2035 to enable all natural gas supply to be switched to sustainable solutions in time.
- This meant that we expect to neutralise 0.9 Mtonnes of emissions by carbon removals in 2035. We only use carbon removals until all customers have switched and insofar as this is consistent with the 1.5°C pathway. The remaining emissions mainly concern the supply of natural gas to customers in Belgium. The main cause is the lack of effective climate policy to make available technologies sufficiently economically feasible. In chapter 4 we indicate how this policy deficit can best be supplemented in our view.

**Figure 10: Nearly 95% of CO<sub>2</sub> emissions will be reduced by saving energy and a switch to renewable energy, the rest will be neutralised by carbon removals.**





# 4. Critical success factors



## Summary

Three critical success factors determine the feasibility of our plan:

- 1 social acceptance and customer willingness
- 2 effective climate policy
- 3 technical and economic feasibility

Favourable developments for each of these factors give us cause for optimism and the belief that it is possible to realise our climate ambition. →



Three critical success factors determine the feasibility of our plan: 1. social acceptance and customer willingness, 2. effective climate policy, and 3. economic and technical progress. Favourable developments for each of these factors give us cause for optimism and the belief that it is possible to realise our climate ambition.

Nevertheless, we will have to be ahead of the market and the expected favourable climate policy to achieve our ambition in 2035. To this end, we are taking additional actions and adjusting our capacity and business models. We will offer customers economically attractive alternative propositions that make it worthwhile to switch more quickly. We will also serve customer groups who want to lead the way with us and develop innovative solutions that remove any remaining obstacles to sustainability. This applies in particular to the heat transition in the built environment.

## 1. Social acceptance and customer willingness

We note that the support of citizens and businesses for the introduction of (policy) measures necessary to counter serious climate change is increasing. An example of this is that climate is an important theme in elections and features in almost all political parties' election manifestos. You also see this with businesses that make 'climate promises', driven partly by their own employees, partly by their customers.

## Outlook: turning point in the years after the COVID-19 crisis

We expect that after the recovery from the COVID-19 crisis, a tipping point will be reached and businesses will lose their licence to operate if they do not show leadership in addressing the climate crisis. Consumers will switch to sustainable products if they can do so affordably and without too much hassle.

### Borealis

Eneco signed an agreement with polymer producer Borealis for the supply of wind energy from the SeaMade offshore wind farm. This brings Borealis closer to its strategic goal of half of its total electricity consumption coming from renewable energy sources by 2030 and reducing indirect carbon dioxide emissions.

Pension funds and financial institutions are under increasing social pressure to phase out fossil investments. ESG ratings<sup>15</sup> are now managed by traditional rating agencies (S&P, Moody's, Morningstar) and are used as criteria for winning tenders in the corporate market and obtaining favourable loan conditions. →



<sup>15</sup> See annex 2 for the Environmental Social Governance (ESG) ratings of Eneco.





### Affordability of sustainable solutions is an important condition

However, increasing societal support is not enough. The affordability of sustainable solutions is another important condition for customers to participate. Eneco is aware of the dilemma involved. CO<sub>2</sub> pricing and a shift in energy taxes from electricity to natural gas will, for example, make sustainable heat technologies cheaper than boilers running on natural gas. But in absolute terms, the monthly costs may increase. For many people, making it to the end of the month is a more urgent concern than sustainable heat. High purchase costs can also be a barrier to participate in the heat transition.

### Providing affordable solutions for all types of consumers

We are convinced that we can offer affordable solutions for all types of consumers by:

- Responding to logical changeover moments such as the replacement of a central heating boiler with attractive and easily accessible propositions;
- Pre-financing of sustainable solutions, in addition to rental propositions. Eneco wants to start offering these together with partners from 2022 onwards;
- Offering hybrid heat pumps, which in combination with investment subsidies will become cost-competitive with boilers and will structurally lower energy bills in the next few years;
- Giving customers quick and easy insight into their consumption, their options to save or generate energy, improve comfort and reduce energy bills, as part of our offering;
- We also aim to reduce the costs of our heat network connections through economies of scale and learning effects and by working together with central government, municipalities

and housing corporations to reduce risks (such as the risk of low demand). Recent heat transition projects by Eneco have shown that this is successful and that it has helped to achieve housing cost neutrality for tenants.

## 2. Effective climate policy

Effective climate policy is crucial for limiting global warming to no more than 1.5°C. The existing and proposed policy in Europe, in the Netherlands, Belgium and in Germany is currently insufficient for the sectors in which Eneco is active (see figure 11).

The climate damage caused by fossil products has not yet been sufficiently factored into the market prices of these products, making it difficult for some sustainable alternatives to compete. This applies in particular to replacing the use of natural gas in industry, for the heating of homes and buildings and for the peak and back-up function in the electricity sector.

### Tipping point

In other market segments, the tipping point of cost parity has already been or is about to be reached. For example, wind and solar power is already cheaper than electricity from coal and gas-fired power stations. From next year, the total lifetime cost of ownership of electric cars will in many cases already be lower than that for petrol and diesel cars. The CO<sub>2</sub> standard for car manufacturers in California, Europe and China has contributed significantly to this.

Another example of effective climate policy is that the energy consumption of appliances such as washing machines, refrigerators and lighting has been reduced by a factor of five thanks to the European Ecodesign Directive. →



**Sustainability and affordability can go hand in hand**

The common denominator of the above examples is that this is not only good for the climate, but that consumers also benefit from lower (energy) costs on balance. This win-win situation means that sustainability and affordability can go hand in hand if the right policies are in place.

Nevertheless, these successes are not yet sufficient to realise both the 55% climate objective of the EU and the 1.5°C pathway and the climate ambition of Eneco.

Figure 11 shows that under current climate policy Eneco, together with its customers, would continue to emit an estimated 6.2 Mtonnes CO<sub>2</sub> in 2035.

**Additional climate policy**

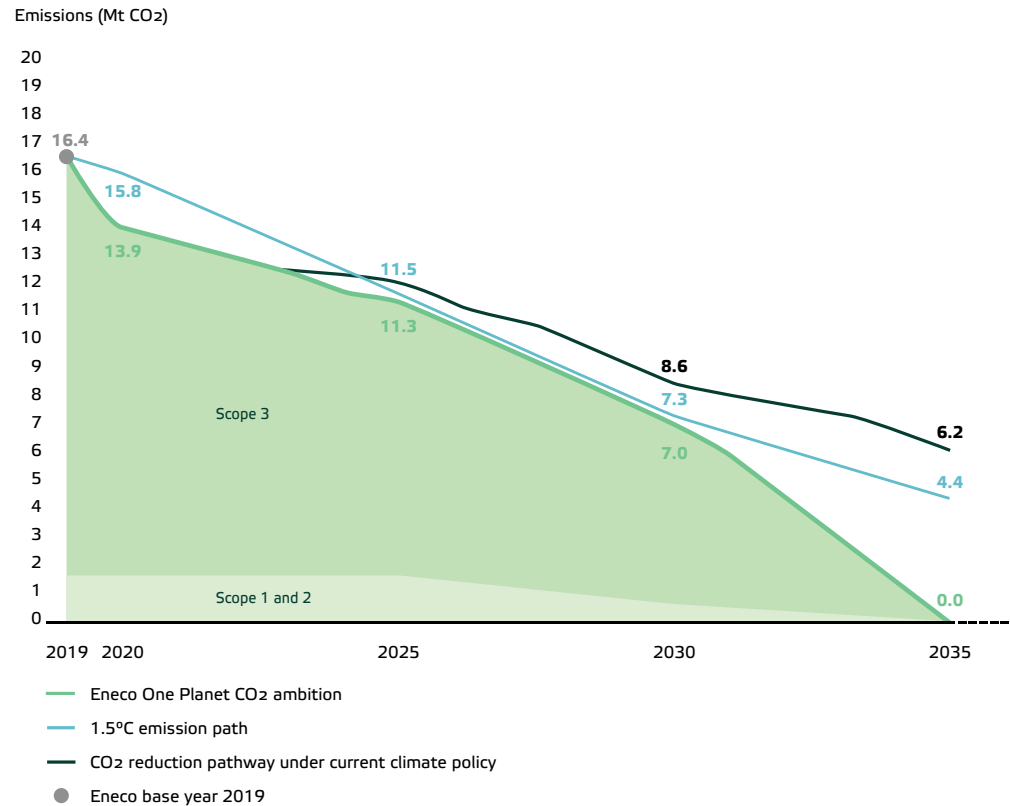
Eneco wants to use its expertise on the energy market to develop additional climate policy together with governments and other stakeholders, and to actively work on building support for it. It is important to achieve a good balance between the carrot (subsidy) and the stick (CO<sub>2</sub> price or standards) to avoid undesirable distributional effects. A good example of this is a further shift in the energy tax from electricity to natural gas, which will make electric heat pumps more attractive.

Due to the strong intensification of EU climate policy and expected additional climate policy in the member states where Eneco is active, combined with a further decrease in the costs of low-CO<sub>2</sub> technologies (solar, wind, storage, heat pumps, hydrogen), we are convinced

that the right conditions can be created for the economic feasibility of our climate ambition.

However, for the countries in which we operate, a number of policies are critical to the realisation of our plan. →

**Figure 11: Current climate policy is not sufficient to stay below the 1.5°C pathway**







### The Netherlands

In the Netherlands, the Climate Act stipulates that 49% of greenhouse gases must be reduced by 2030 compared to 1990. According to Netherlands Statistics (CBS), the reduction in the Netherlands was 24.5% in 2020<sup>16</sup>. The Netherlands is lagging behind the European average in this respect. The Netherlands Environmental Assessment Agency (PBL) has concluded that the new government must come up with a substantial package of additional policy measures in order to close the policy gap to 49% and, in the near future, to 55%<sup>17</sup>. →



We believe that the following policy measures are needed for the electricity sector, the built environment and industry:

- Continuing the implementation of the Dutch Climate Agreement and increasing the target to 55% by 2030
- Ban on the sale of stand-alone gas-fired central heating boilers from 2025, so that a hybrid heat pump becomes the minimum standard (similar to CO<sub>2</sub> standards for cars);
- Phasing out or minimum CO<sub>2</sub> standard for natural gas-fired power plants from 2035 and stimulation of CO<sub>2</sub>-free controllable capacity;
- Continuation of the shift from the energy tax on electricity to natural gas, supplemented by a tax rebate to offset the annual burden on households<sup>18</sup>;
- Increase CO<sub>2</sub> pricing for the business market not covered by the ETS<sup>19</sup> through a higher tax on gas, or inclusion in the ETS;
- Reform the energy tax and base it on the CO<sub>2</sub> content of energy carriers such as natural gas, electricity and hydrogen;
- Expand the possibilities for blending green gas and green hydrogen in the existing gas network;
- Provide incentives to households to switch to sustainable heat on the basis of 'housing cost neutrality' in accordance with the Climate Agreement.
- Securing an SDE++ budget for heat sources (geothermal, electrode boilers, large-scale heat pumps, residual heat, hydrogen, etc.) for the built environment and industry.
- Timely and sufficient availability of transport infrastructure for electricity and hydrogen.

<sup>16</sup> <https://www.cbs.nl/nl-nl/nieuws/2021/10/uitstoot-broeikasgassen-8-procent-lager-in-2020#:~:text=De%20CO2,%20De%20missies,kwartaal%20vrijwel%20gelijk%20waren%20gebleven.>

<sup>17</sup> Netherlands Environmental Assessment Agency, Climate and Energy Outlook 2020 (KEV)

<sup>18</sup> The energy tax on electricity per GJ and per tonne of avoided CO<sub>2</sub> is much higher than on natural gas, CE Delft (2021); "Evaluation of energy taxation". An alternative would be to abolish the ODE on electricity.

<sup>19</sup> Emissions Trading Scheme






### Germany

The German Energiewende is a success, but in fact it is primarily an Electricity 'Wende'. Making the heat supply more sustainable is still in its infancy. Natural gas is also still seen as a transition fuel.

However, Eneco is convinced that our 2035 climate ambition can also be achieved in Germany, particularly by helping customers switch from natural gas to sustainable heat options such as green gas and, step by step, towards (hybrid) heat pumps.

The German government recently proposed raising the climate target to 65% by 2030 and being carbon neutral by 2045. This will accelerate climate policy developments. It is very important that also in Germany there is a strong focus on shifting taxes from electricity to natural gas or CO<sub>2</sub> pricing on fossil fuels such as natural gas.



**We believe Germany needs further political reforms to meet its ambitious climate goals:**


- Increasing the existing CO<sub>2</sub> tax on fossil fuels to a game-changing level;
- Reduction of taxes such as the "EEG-Umlage" on electricity (currently 51% of the price for private customers);
- Long-term stimulation of switching from oil and gas to heat pumps;
- Stricter energy standards for buildings and obligation to use solar energy.



### Belgium

Making the heat supply to our customers in Belgium fully sustainable by 2035 will be a difficult challenge. This is mainly due to the fact that the current tax policy – in contrast to the Netherlands – is very favourable towards gas, and unfavourable towards electricity. In addition, the complex administrative relations for the various regions as well as the federal government are making it difficult to build support for an effective climate policy. And without a timely and effective policy, there is a risk that the process of making the energy system in Belgium more sustainable will be unduly delayed.

Eneco wants to actively build a 'coalition of the willing' in Belgium, together with the newly appointed Federal Government. The aim is to broaden the public debate from a nuclear exit to the realisation of climate policies aimed at the EU target of 55% by 2030. In doing so, we want to encourage the acceleration of policies and contribute to a sustainable future. →

**We think the following steps will be necessary in Belgium:**

- A fundamental shift from taxing electricity to taxing gas or an effective CO<sub>2</sub> tax;
- Broadening of subsidies on sustainable heat solutions for consumers;
- An intention and matching policy for scaling up the production of green gas;
- Reviewing the role of the gas network and investigating the possibility of converting it to transport green hydrogen;
- Commitment to the expansion of the existing offshore wind zones from the planned 4 GW to at least 6 GW.





### 3. Technical and economic feasibility

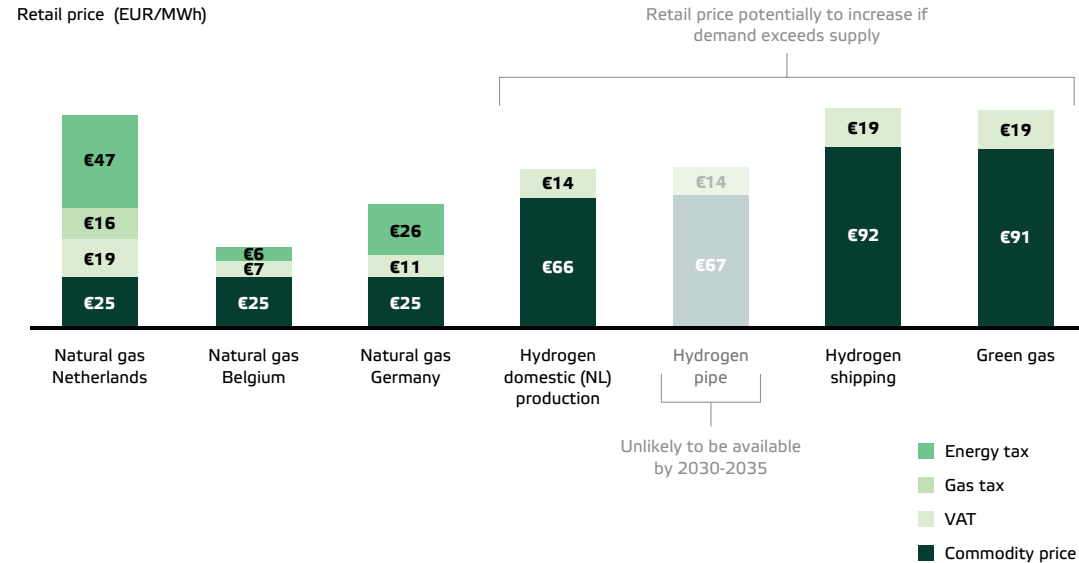
Most of the technologies needed to achieve our 2035 ambition are already available. Although technically proven, there are still uncertainties regarding the timely availability and scalability at competitive prices of geothermal energy and renewable gases such as green hydrogen and green gas. Given the strong focus of policymakers and industry on these technologies, we believe that these 'workhorses' of the energy transition will become available in time.

#### Renewable gases

We see the use of renewable gases as an option after 2030 to replace natural gas in the built environment in places where direct electrification with full heat pumps or heat networks is not a solution. For example, due to lack of space in a home. In these cases, we see an important role for green hydrogen and/or green gas after application of home insulation and a hybrid heat pump. In this combination, much less volume of renewable gases is needed.

A critical assumption for renewable gases to be economically feasible is that the energy tax in the Netherlands on natural gas will continue to rise by at least 1.5 cent per m<sup>3</sup> per year until 2030 and that the tax on renewable →

**Figure 12: By 2035, hydrogen and green gas will possibly only be in the money in the Netherlands**



**NL:** 2021 Energy tax of ~€34/MWh. Increase of energy tax based on an annual €1ct/m<sup>3</sup> increase for the period 2020-2025 (current policy), and an assumption of an annual €1.5ct/m<sup>3</sup> increase for the period 2026-2030. ODE increase based on a total €1ct/m<sup>3</sup> increase by 2025 relative to 2021

**BE:** 2021 Energy tax of ~€6/MWh, no additional policies assumed towards 2035 as of today

**GER:** 2021 Energy tax of ~€19/MWh, increase of energy tax based on increase of CO<sub>2</sub>-taxation for household heat from €25/ton in 2021 to €65/ton in 2026

**Source:** National governments, Eneco, BCG Analysis



gases will remain limited based on a tax base on CO<sub>2</sub> volume. In order not to increase the burden on people and companies on balance, we are in favor of simultaneously lowering other taxes, such as on labor or on the consumption of electricity.

Sufficient availability of green hydrogen and gas after 2030 for the built environment is still uncertain. In addition, it is still uncertain whether green gas will have sufficient support in society, in view of the debate on biomass.

If green gas is available, it will be an attractive option because its specifications are the same as those of natural gas and no adjustments would be needed elsewhere in the chain.

### Green hydrogen

- Eneco believes that, with the right tax policy, green hydrogen will become economically feasible in the Netherlands after 2030 and a cost-effective option in many neighbourhoods compared to other heat technologies.

- Domestic demand is likely to exceed potential production just to replace current grey hydrogen in industry. Import routes are therefore important for our ambition.
- Availability to the built environment also depends on the ways in which the hydrogen can be delivered: via blending or via dedicated distribution networks.
- Current regulation includes the possibility of blending 0.5%. Increasing this to 2% seems feasible without major adjustments in the chain<sup>20</sup>. However, this would not provide

sufficient volume to supply green hydrogen customers who will not be able to switch to other sustainable alternatives before 2035. A higher blending percentage of up to 20% or sufficient roll-out of hydrogen distribution grids will therefore be necessary.

- Pilot projects for hydrogen grids are under way, such as the demonstration project with 550 homes in Stad aan 't Haringvliet in which Eneco is participating.

### Green gas

- In the Climate Agreement, the Netherlands agreed to an ambition of 2 billion m<sup>3</sup> of green gas. This requires a successful upscaling of the (critical) gasification technology that is currently in the demo phase.
- Long-term uncertainty: logistical network for biomass, and green gas prices high enough to attract biomass.

### Geothermal energy

- Finally, whether the gas-fired heat plants for the heat network in Utrecht can be replaced in time by base-load heat from geothermal energy is still a challenge. The technology is proven, but feasibility of specific projects is very locally determined by the subsoil and can be a potential bottleneck, especially as regards the replacement of our gas-fired heat in Utrecht. We are currently investigating the possible scenarios for sustainable heat supply in Utrecht. ←

<sup>20</sup> <https://www.iea.org/reports/hydrogen-in-north-western-europe>



# 5. Governance

To achieve Eneco's climate ambition 2035, we work with a carbon budget that is reduced annually and against which Eneco's investment decisions are tested.

## Key elements of our climate governance are:

- Eneco's annual carbon budget (in absolute Mtonnes) for the period 2021 to 2035 will be based on approved targets by the Science Based Targets initiative (SBTi) consistent with the 1.5°C pathway for scope 1, 2 and 3. We will report annually to SBTi on the progress and achievement of our 5-year intermediate CO<sub>2</sub> reduction targets.
- The group-wide carbon budget is an integral part of the regular business strategy and planning process including intermediate milestones and (non)financial control.
- The remuneration policy for both the management board and all other Eneco employees will be partly based on the realisation of the 1.5°C emission pathway and the carbon budget at group level in accordance with the SBTi methodology.
- The contribution of CO<sub>2</sub> emissions is a key criterion in the investment selection process.
- M&A and investments in CO<sub>2</sub> emitting activities (e.g., the acquisition of a customer portfolio with 'grey supply') remain possible, provided the investment includes a credible decarbonisation plan and its funding is covered by the investment.
- In Eneco's annual report, we report on progress on and the realisation of the climate plan. ←



# 6. Validation by Boston Consulting Group

In June 2021, Eneco announced its strategy to reduce CO<sub>2</sub> emissions in scope 1, 2 and 3 from 13.9 Mt in 2020 to 0 in 2035, of which 0.9 Mton (~6.5%) will be neutralised by carbon removals. Eneco's intermediary goal is to reduce CO<sub>2</sub> emissions by 60% by 2030<sup>21</sup>.

BCG praises Eneco's ambition to be a frontrunner in the energy transition and play an important part in limiting global warming to maximum 1.5°C.

BCG has validated the assumptions that underpin the full scope of this strategy on fairness and coherence, specifically from four different angles:

- Current and proposed government policies related to energy generation (Eneco scope 1) and customer consumption (Eneco scope 3)
- Technological availability and progress of sustainable energy-solutions
- Readiness and willingness of customers in the B2C and B2B segments
- Eneco's ability to build up capabilities for accelerated CO<sub>2</sub> footprint reduction relative to the market and government policy

BCG based this validation on available information dated May 21, 2021, including existing Eneco data, public information and BCG expertise.

Eneco's goal to be climate neutral by 2035 is coherent with the Eneco's vision and mission. We conclude that 65-75% of scope 1, 2 and 3 CO<sub>2</sub> abatement is in line with current and proposed government policies, technological progress, market readiness and Eneco capabilities:

- Scope 1 and 2: Abatement of emissions from Eneco activities to close to 100%
- Scope 3 – Power: Abatement of emissions from power usage by Eneco customers to 100%
- Scope 3 – Gas and heat: Abatement of a share of emissions, specifically in the Dutch and German consumer markets

Further CO<sub>2</sub> abatement towards 100% will require a combination of additional government policies and additional actions by Eneco. These include, for example, developing propositions that address current customer

pain points with regard to decarbonization, timely securing of supply of sustainable gas for the built environment and prioritizing heat solutions for (new) customers who want to accelerate their decarbonization.

Key risks and challenges in reducing net CO<sub>2</sub> emissions by 100% by 2035 are decarbonization of (gas-based) heat in large parts of the B2B market, decarbonization of heat in the built environment in Belgium, sufficient supply of green gas and/ or green hydrogen to decarbonize the remaining gas demand of Eneco customers by 2035, and timely expansion of Eneco district heat in the Netherlands. Also, given that Eneco has the ambition to reduce CO<sub>2</sub> faster than the government dictates, realization of the strategy will depend on the degree to which Eneco is able to transform its business model and quickly scale up new, sustainable and competitive customer solutions. ←

<sup>21</sup> Relative to 16.4 Mt in 2019



# Annexes

## 1. One Planet plan

Since 2015, Eneco has laid down its sustainability targets in the One Planet plan. We report on the progress and realisation of the objectives in the plan in the annual report and on the Eneco website. The first One Planet plan ran until 2020. The objectives in this plan have been achieved.

The ambition to become climate neutral by 2035 is part of the new One Planet plan. The new plan also includes our objectives in the areas of biodiversity, circularity and society. More information can be found on the website [eneco.com](http://eneco.com)

## 2. ESG ratings Eneco

Eneco focuses on three complementary ESG<sup>22</sup> rating bureaus. Figure 13 shows an overview of the scores in 2020.

### Carbon Disclosure Project (CDP)

Eneco is one of the best-performing companies worldwide in the field of combating climate change, according to CDP, the international standard for climate reporting. In 2020 Eneco was awarded an A score in the CDP's annual report that provides insight into the climate footprint and ambitions of companies. In 2020, 9526 companies

participated in the CDP, 278 of which received an A rating. This places Eneco in the top 3% of the best-performing companies worldwide.

CDP has been making the climate footprint and ambitions of companies transparent for over 20 years. They request detailed information and then assign a score from D to A.

### EcoVadis




In 2020, Eneco received the Platinum rating from EcoVadis. This places us in the top 1% of

the best-scoring companies in our industry in terms of sustainability performance. EcoVadis assesses how a company scores on the environment, labour and human rights, ethics and sustainable procurement.

### Sustainalytics

Our ESG score on Sustainalytics puts us in the top 10% of best-performing companies worldwide with respect to sustainability. Sustainalytics is a global player in assessing companies for sustainability at the request of investors. →

Figure 13: Overview ESG-rating scores Eneco

ESG rating agency	Owner	Rationale & Coverage	Scope	Score Eneco 2020	Target 2025
	Morningstar	Discount options in the case of RCFs (Revolving Credit Facility) Participating businesses: > 13,500	All SCR topics	<b>Top 11% energy sector</b>	Top 10% energy sector
	CDP Global is an NGO	Leading climate rating agency for investors Participating businesses: 9,526	Climate	<b>A leadership level Top 3%</b>	A
	Founders • CVC • Bain & Company	Required by key customers: • NS • KPN • Proximus • Akzo Nobel • Avery Dennison site • ING Participating businesses: > 75,000	All SCR topics	<b>Platinum Top 1%</b>	Platinum Top 1%

<sup>22</sup>Environmental Social and Governance.

### 3. Eneco's 1.5°C pathway according to Science Based Targets initiative (SBTi)

The SBTi translates the scientific insights of the IPCC and the Energy Technology Perspectives (ETP) according to the IEA<sup>23</sup> into objectives for companies.

Climate targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the objectives of the Paris Agreement – to limit global warming to well below 2°C above pre-industrial levels and to make efforts to limit warming to 1.5°C.

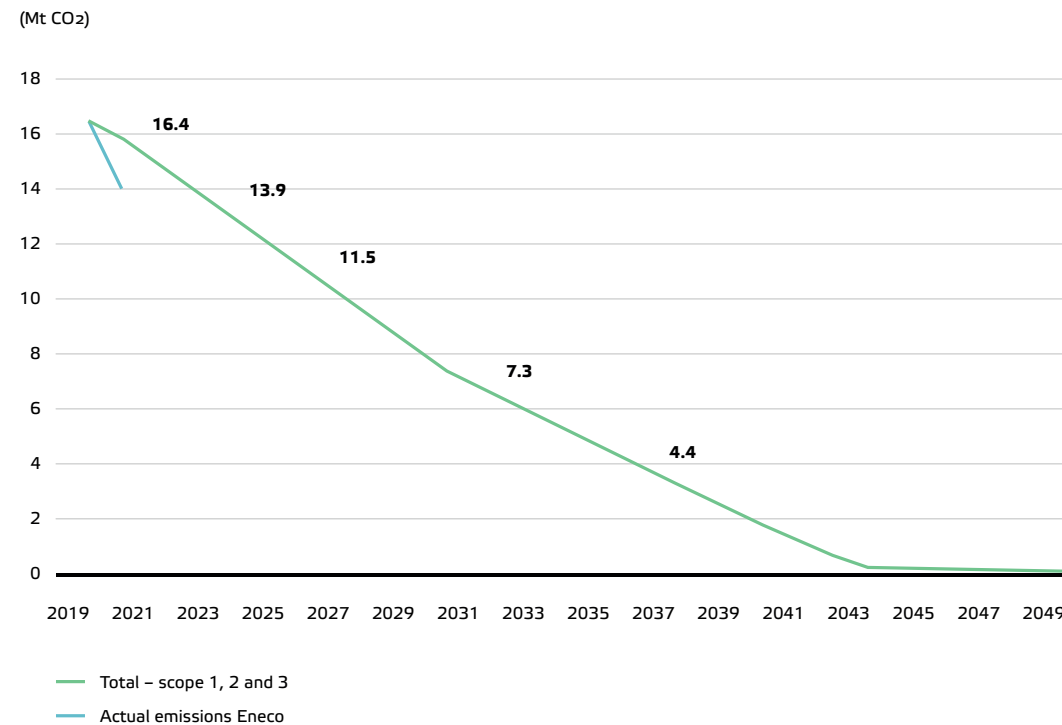
Eneco was the first Dutch company with approved targets in 2017. Based on the methodology of the SBTi, a carbon budget for our company including our suppliers and customers has been determined.

In 2019, Eneco adjusted its targets to absolute targets for scopes 1, 2 and 3 based on the 2°C pathway. The current update of the targets based on the 1.5°C pathway are also being submitted to the SBTi.

Recently, SBTi developed a 1.5°C pathway for the electricity sector, based on the so-called Sectoral Decarbonisation Approach (SDA). SDA is a method based on the IEA's ETP, which looks at which technologies are already economically feasible. The SDA method is available for some of the most carbon-intensive activities, such as road transport, aviation or electricity generation.

Eneco uses the SDA method for its electricity-related activities. For the other activities, the 'Absolute Contraction Approach' is used. The Absolute Contraction Approach (ACA) is a one-size-fits-all method that ensures that companies that set targets achieve absolute emission reductions in line with global decarbonisation pathways. The 1.5°C pathway requires an annual reduction of 4.2% of the absolute emissions of the activity in question. →

Figure 14: 1.5°C pathway for Eneco

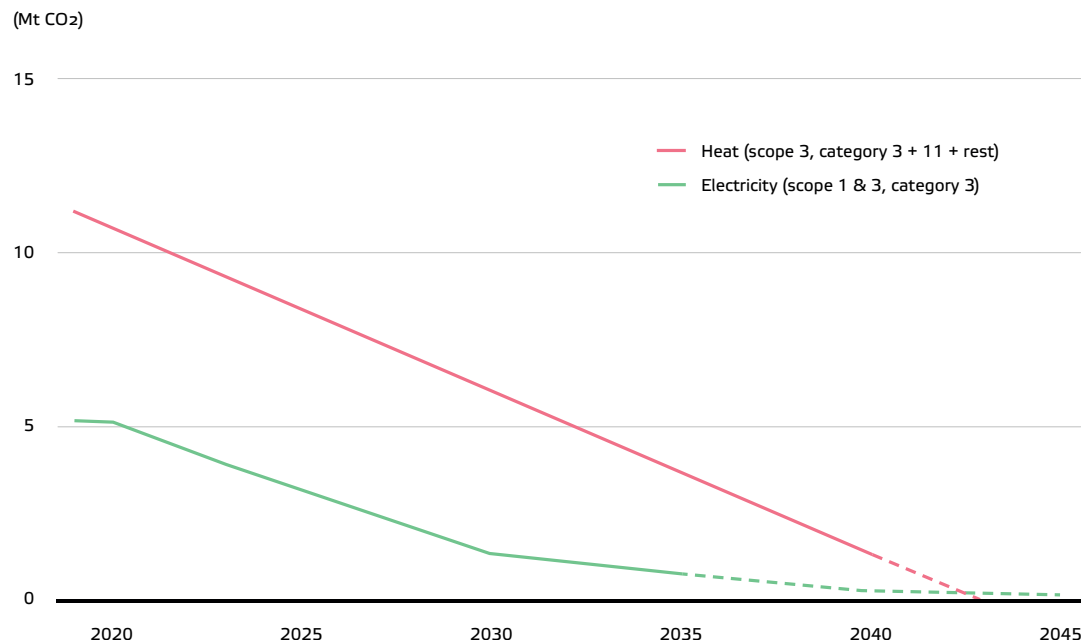


<sup>23</sup>International Energy Agency.





**Figure 15: Eneco 1.5°C absolute emission pathways**



Eneco’s ambition to be CO<sub>2</sub> neutral by 2035 is therefore more ambitious than stipulated in our 1.5°C pathway.

The 1.5°C pathway is more ambitious for electricity than for the heat demand. All direct emissions related to electricity supply should be zero by 2035, while for heat demand this is 2040. Frontrunners in the sector will therefore have to be carbon-neutral sooner.

Remaining emissions are caused by upstream activities of mining, transport and construction of assets (such as wind turbines).

SBTi sets different criteria (SBTi-criteria.pdf sciencebasedtargets.org) for the targets to be used: This results for us in targets in the following categories:

- Absolute emissions (scope 1, 2 and 3 in Mtonnes CO<sub>2</sub>/year)
- Relative emissions - electricity (scope 1 and scope 3, category 3 in kg CO<sub>2</sub>/MWh)
- Absolute emissions - natural gas (scope 3, category 11 in Mtonnes/year)

Eneco reports these emissions annually in its annual report (absolute emissions) and on its website. We also report these emissions and

carbon strategy annually in the CDP climate change questionnaire, for which we achieved the highest score in 2020, the ‘A’ level.

SBTi stipulates that a climate objective falls within a time frame of between 5 and 15 years with at least one interim objective per 5 years that must be achieved.

An annual overshoot of 0.1°C (±7%) is permitted. An overshoot currently has no effect on the CDP score.

The use of carbon removals is limited in →

use by SBTi, so the focus is on carbon reduction. The 0.9 Mtonnes of carbon removals fits within SBTi's usage limit.

Eneco chooses to deploy carbon removals to neutralise residual emissions within the following preconditions:

- Our ambition is to keep our absolute emissions below the CO<sub>2</sub> budget of our 1.5°C pathway. Primarily, we are aiming to achieve the annual CO<sub>2</sub> budget based on our 1.5°C pathway. We calculate any surpluses or deficits in the annual CO<sub>2</sub> budget over a period of 5 years. Should the CO<sub>2</sub> budget for that 5-year period prove to be insufficient, Eneco can decide to neutralise the excess emissions with carbon removals. Eneco realises that the use of carbon removals does not necessarily mean that the interim SBTi target will be met in this way.
- Neutralisation through carbon removals can take place up to a maximum of 0.9 Mton per year. Preferably this is temporary, but at least as long as necessary until the remaining emissions can be reduced through further sustainability. ←







### Sustainable milestones Eneco 2007-2020

In 2007, Eneco was the first of the large energy companies to opt for a sustainable course. Below is an overview of some of the milestones we have reached so far:



Since 2011, all private and small business customers have been supplied with green electricity from Eneco.



In 2011, Eneco became the first energy company in the world to join the International Climate Saver Programme of the World Wide Fund for Nature.



In 2012, Eneco introduced the smart thermostat Toon, which gives customers insight into their own energy consumption and costs at any time of the day. Eneco quickly grew to become the market leader in this segment.



In 2014, the first heat was delivered via Leiding over Noord. A 16.8-kilometre network transports residual heat from the AVR waste and energy plant in Rozenburg via Vlaardingen and Schiedam to the Rotterdam district heating network.



In 2015, Eneco was one of the founding members of the Dutch Sustainable Energy Association (NVDE). The NVDE is the platform for cooperation within the sustainable energy chain and the discussion partner for government and politics.



In 2016, Eneco reached the milestone of 1 gigaWatt (1,000 megawatt) of sustainable generation capacity; equivalent to the annual electricity consumption of about 850,000 households.



Eneco launched the Tesla Powerwall on the Belgian market in 2016.



In early 2017, Eneco acquired a 50% stake in LichtBlick, a green challenger in the German energy market. In 2018, Eneco became 100% owner.



Many large companies with climate ambitions are choosing Eneco as their sustainable energy partner. Since January 2017, all the trains of Dutch railway company NS have run on wind power supplied by Eneco. This made NS the first transport company in the world to be 100% climate-neutral.



Since 1 January 2018, all parts of Royal Schiphol Group have also been running entirely on sustainable Eneco electricity generated in the Netherlands.



In 2018, Eneco introduced the product Eneco StukjeZon®. This product enables everyone to benefit from solar energy. Even if you do not have a suitable roof for solar panels or do not have the opportunity to invest in them. Customers can buy 'pieces of sun' from the solar farm in Veendam and thus reduce their energy bills.



Since 2018, Eneco has been working with the crowdfunding platform Ecco Nova. On the platform, businesses and consumers can invest in sustainable projects through crowdlending and bonds. For instance, Eneco realised the largest solar roof in Belgium for ArcelorMittal in Ghent in cooperation with Ecco Nova. In the Netherlands, people can invest via the platform in the wind farm Hogezaandse Polder in the Hoeksche Waard region.



In 2020, Eneco concluded a ten-year agreement with Belgian plastics manufacturer Borealis to help reduce their carbon footprint. By 2021, Borealis' sites will be powered by wind energy from the SeaMade wind farm in the North Sea.



In 2020, it was announced that CrossWind, a joint venture between Eneco and Shell, will build the offshore wind farm Hollandse Kust (North); one of the first offshore wind farms worldwide not to receive subsidies. The wind farm is expected to be operational from 2023 and will then have a generation capacity comparable to the average annual electricity consumption of more than 1 million households.

# List of terms

## List of terms in alphabetical order

- **Biogas** is a combination of carbon dioxide and methane gas and is produced from renewable sources such as manure or organic waste. Biogas must first be processed before it can be fed into the gas grid or used as transport fuel (source: <https://groengas.nl/groen-gas/wat-is-groen-gas/>).
- **Biomass** is the biodegradable part of products, wastes and residues from agriculture, horticulture, forests, the sea or industrial and municipal waste. Eneco uses biomass to produce renewable steam for industry (with renewable electricity as a by-product) and renewable heat for our heat networks. Eneco's applies the rule of thumb that biomass is only used if there are insufficient other sustainable alternatives available. Eneco uses certificates approved by the European and Dutch governments to demonstrate that the biomass we process, trade and/or use meets international sustainability criteria and chain management requirements. An example of such a certificate is Better Biomass.
- **Carbon factor** is the CO<sub>2</sub> intensity of electricity produced using our own means of production, for which we have operational control (ghg-protocol-revised.pdf (ghgprotocol.org) page 18).
- **Carbon removals**: measures that companies take to remove carbon (equivalents) from the atmosphere and permanently store it within or beyond the value chain. Examples include, but are not limited to:

↳ Direct Air Capture and Storage (DACs)

↳ Bioenergy with carbon capture and storage (BECCS) (source SBTi)

- **Climate neutral**, Climate neutral, also referred to as net-zero. These terms indicate that greenhouse gas emissions do not contribute to climate change along the entire chain (scope 1, 2 and 3 in accordance with the GHG Protocol). This is done by reducing emissions (e.g. through saving energy, generating and supplying sustainable energy) at least according to a 1.5°C reduction pathway and by neutralising remaining emissions through the permanent removal of CO<sub>2</sub>eq from the atmosphere (in accordance with SBTi Corporate Net-Zero Standard).
- **CO<sub>2</sub>-free flexible capacity** is the flexible renewable electrical capacity required to supplement non-continuously producing renewable sources of CO<sub>2</sub>-free electricity, such as electricity from sun and wind, until the electricity demand is met.
- **CO<sub>2</sub> offsetting**: Actions that companies take to help society avoid or reduce greenhouse gas emissions outside of their value chain. Offsetting measures are not included in the company's GHG accounting in accordance with the GHG Protocol.
- **CO<sub>2</sub>-offset gas**: When CO<sub>2</sub> emissions from the natural gas consumed are offset by the purchase of CO<sub>2</sub> credits, this is called 'CO<sub>2</sub>-offset gas'. The websites of Eneco's energy suppliers contain more information about the purchased CO<sub>2</sub> credits. For more information, please see 'CO<sub>2</sub> offsetting'.
- **ESG ratings**: Environmental Social & Governance (ESG) ratings represent an environmental, social and corporate governance assessment. They mean that factors such as energy consumption, climate, availability of raw materials, health, safety and good corporate governance are taken into account in company

decisions. ESG ratings are intended to measure a company's resilience in the face of long-term, material risks.

- **EU ETS**: The European Emission Trading System is an emissions trading system with which the EU aims to reduce greenhouse gas emissions cost-effectively in order to achieve climate targets. Emissions trading is the trading of emission allowances, which give the right to emit a certain amount of greenhouse gases. Buyers and sellers trade emission allowances, and that is how a CO<sub>2</sub> price comes into being. Eneco's gas-fired electricity and CHP plants are covered by the EU ETS. Plants covered by the EU ETS must submit one emission allowance for every tonne of CO<sub>2</sub> emitted. As the number of available emission allowances decreases every year, scarcity is created in the market.
- **Green electricity**, also called renewable and sustainable power, is the supply of electricity for which a Guarantee of Origin (GoO) for electricity is debited. A GoO for electricity shows that a certain share or quantity of electricity has been produced from renewable sources (source: European Directive 'On the promotion of the use of energy from renewable sources').
- **Green gas** is a gas mixture based on biogenic waste streams, or biomass, that has the same quality and characteristics as natural gas. Green gas is made by upgrading biogas so it has the same quality as natural gas. Green gas is produced from renewable sources. Like green electricity, green gas is supplied certified with GoO's in accordance with the European Directive On the Promotion of the Use of Energy from Renewable Sources.
- **Green hydrogen** is made from water using green electricity. The electrolysis process causes water (H<sub>2</sub>O) to split into oxygen (O<sub>2</sub>) and hydrogen (H<sub>2</sub>). This process therefore does not release any CO<sub>2</sub> at all (source: H2Platform website).
- **Internal operations**: By internal operations we mean the work-related mobility of our employees and the energy used for our premises.
- **Renewable energy sources** wind energy, solar energy (solar thermal and photovoltaic), geothermal energy, ambient energy, tidal energy, wave energy and other ocean energy, hydropower, and energy from biomass, landfill gas, sewage treatment plant gas and biogas (source: European Directive 'On the Promotion of the Use of Energy from Renewable Sources').
- **Residual heat**: Unavoidable thermal energy generated as a by-product in industrial or commercial processes which, without connection to a heat network, would end up unused in air or water (source: draft Dutch Collective Heat Supply Act, Article 1).
- **Scoping** is done on the basis of the standards of the Greenhouse Gas Protocol: ghgprotocol-revised.pdf (ghgprotocol.org) and Corporate-Value-Chain-Accounting-Reporting-Standard\_041613\_2.pdf (ghgprotocol.org)
  - ↳ Scope 1 emissions: direct emissions from sources wholly or partly owned and controlled by the reporting company. Emissions from sources with shared ownership and operational control are allocated based on ownership.
  - ↳ Scope 2 emissions: indirect emissions from purchased electricity, steam, heating or cooling consumed by the reporting company.
  - ↳ Scope 3 emissions: all indirect emissions (as far as not included in scope 2) that occur in the value chain of the reporting company.
- **Sustainable gases**: This refers to green hydrogen and green gas.
- **Sustainable heat source**: Renewable energy source or heat source from which residual heat is released (source: draft Dutch Collective Heat Supply Act, Article 1).



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