



Electrode boiler

Save on energy costs and
boost your sustainability

Industrials make the switch

Savings and sustainability with industrial electrification

Saving on energy costs, complying with environmental requirements and reducing CO₂ emissions are important themes for industrial companies. The electrode boiler (e-boiler) can make the difference for you. It is a proven and inexpensive technology that you can easily use to significantly reduce your CO₂ and NO_x emissions.

Combined with your gas boiler or cogeneration unit (CHP)

You can also save up to 10% on your energy costs with the e-boiler. It can easily be integrated into your current heating systems and it works together with a gas boiler or CHP. Eneco can take the entire process off your hands, from the design and investment to operation and maintenance.



Industrial electrification has started

Up to 2030, more than a third of the CO₂ reduction target for industry can be achieved with electrification. Agreements to this effect were made in the 2019 Dutch National Climate Agreement. Electrification is all about replacing fossil fuels with electricity. Needless to say, it must be green, from sun or wind. When there is enough green electricity, steam can be produced with the e-boiler. If not, the gas boiler or CHP installation switches on.

Green electricity

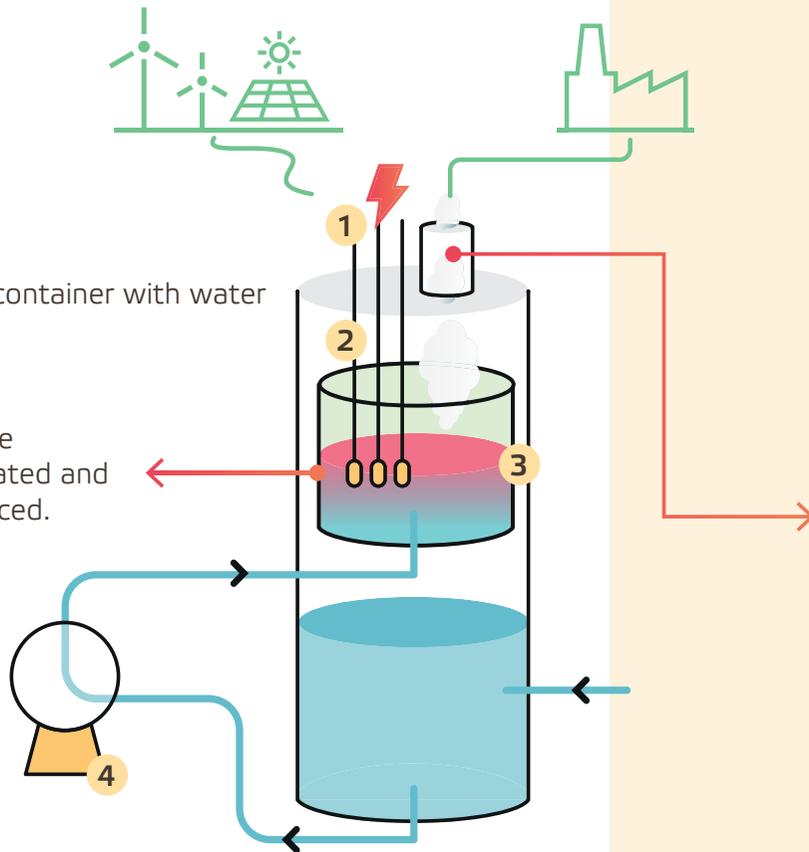
In the coming years, the number of hours during which there is enough green electricity will increase so that less and less gas will be used. For times when the wind isn't blowing or the sun isn't shining, gas will continue to be used alongside electrification. But fossil natural gas will slowly but surely be replaced by green gas and hydrogen. So electrification, and specifically the use of e-boilers, explicitly goes hand-in-hand with other measures for sustainability. Eneco will not only help you with electrification but will also be your partner for the next steps in the energy transition.



How does an electrode boiler work?

- 1 Electricity
- 2 Electrodes
- 3 Insulated container with water
- 4 Pump

The water in the container is heated and steam is produced.



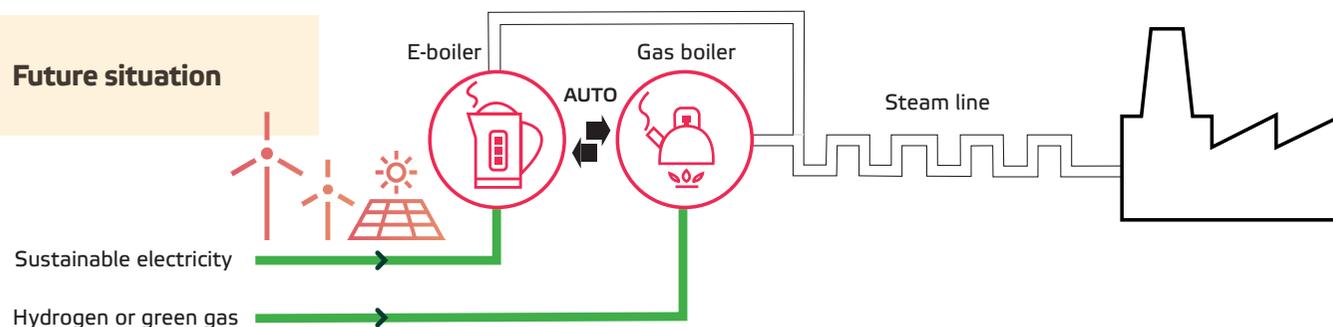
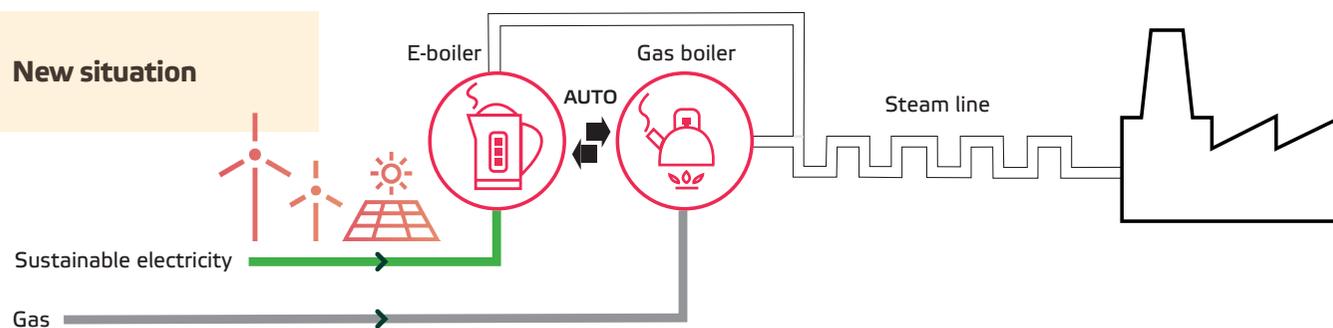
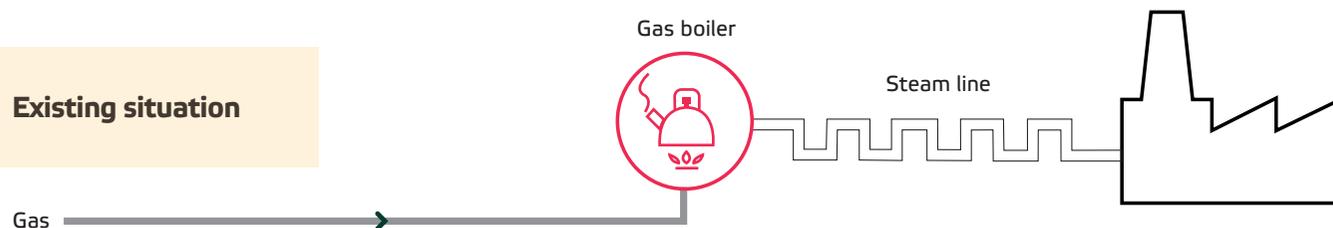
Power-to-heat technology

The e-boiler has an insulated container with water. In the container, there are electrodes that heat the water. The higher the water level in the insulated container, the larger the contact surface with the electrodes. And the larger the contact surface, the more electricity is used and the more steam is produced.

The steam leaves the vessel through the top and is immediately used in the production process.

Integrated into your system

An e-boiler converts electricity into heat, which means it is one of the Power-to-heat technologies. The e-boiler works together with your gas boiler in a hybrid system. When the e-boiler switches on, the gas boiler automatically switches to standby mode. With its in-depth knowledge of wind and sun profiles and of the electricity market, Eneco can help you determine the best times to switch on the e-boiler. That way, you can benefit from low costs for your steam. Always in keeping with your conditions for safety and technology, of course. And because we position your e-boiler next to your existing gas boiler (or CHP), you can be much more flexible in the way you use electricity or gas. The extra boiler also increases the reliability of the entire process.



SDE++ subsidy to make your steam more sustainable



When you start using an e-boiler, you may be eligible for the Stimulating Sustainable Energy subsidy (SDE++). Eneco has extensive experience in successfully applying for SDE subsidies. We'd be happy to take this task off your hands. But how does the SDE++ scheme work? The subsidy is intended to bridge the price difference between gas-produced steam and steam from an e-boiler. The maximum subsidy rate is the so called "basic amount". For the 2020 subsidy round, the Dutch government calculated that an e-boiler project is profitable (6% IRR) over 15 years at a fixed price of €72/MWh for the steam that is produced.

The expectation is that for every MWh of steam produced with the e-boiler, one less MWh of steam will be produced with gas. So this saves on gas costs. The government therefore corrects the basic amount of €72/MWh with the "correction amount", the annual average gas price. To ensure that the e-boiler will run on green electricity, it has been decided to subsidise 2000 full load hours. These are the hours when the electricity price is lowest and electricity is almost exclusively produced by wind turbines or solar panels.

A subsidy round is expected to take place every year. The government may still make some changes to the scheme. The latest information is available on the SDE++ website: <https://english.rvo.nl/subsidies-programmes/sde>.



Electrifying with Eneco

With an e-boiler, you can save on your current energy costs. Besides reducing your procurement costs, lower gas consumption also reduces the risk of rising energy taxes on gas and the need for maintenance. If the steam is currently being produced by a gas boiler, the use of an e-boiler makes it even cheaper. With a simple feasibility study, Eneco can show you how much you can increase sustainability and how much you can save.

All-inclusive service or your own investment

You can opt for a fully-fledged green steam supply with the Eneco e-boiler: SteamComplete. You leave everything to us: the subsidy process, the development and investment, but also the operation and maintenance. If you prefer to invest yourself, you choose Supply & Dispatch. Then Eneco supplies the green electricity at a fixed rate. Eneco takes care of the management or dispatch on the basis of the price and market developments, just as with SteamComplete. All other activities are at your own expense and risk.



What Eneco is offering you

| | SteamComplete | Supply & Dispatch |
|---|---|--|
| What is it? | Green steam supply with the Eneco e-boiler | Your own e-boiler with green electricity from Eneco |
| What you gain | Sustainability and savings with no investment and an all-inclusive service. | Invest in your own e-boiler and become more sustainable with green electricity from Eneco. |
| Eneco takes care of the following for you: | | |
| Linking the steam costs to the gas price instead of the electricity price | ✓ | ✓ |
| Purchase of electricity and GoO's for a fixed price | ✓ | ✓ |
| Determining the best way to use the e-boiler ("Dispatch") | ✓ | ✓ |
| Design of the system | ✓ | - |
| Applying for subsidy and permits | ✓ | - |
| Investment | ✓ | - |
| Realisation of the project | ✓ | - |
| Operation, maintenance and monitoring in accordance with your safety guidelines | ✓ | - |



Reasons to choose an Eneco e-boiler



Sustainability

You reduce your CO₂ emissions by up to 50%. So that you can fulfil your ambition to become more sustainable.



Savings

With optimal use of the e-boiler, you can quickly save up to 10% on your energy costs.



Reliable

The e-boiler requires very little maintenance. Moreover, the technology has proven itself and is widely used in numerous countries.



Predictable

Based on its knowledge of wind profiles and the electricity market, Eneco can accurately predict the best times to activate the e-boiler.



Eneco's e-boiler in the Ypenburg Combined Heat and Power plant



In the Ypenburg district of the Hague, houses and offices are heated with district heating. This is residual heat from electricity production and heat from gas boilers. The electricity and heat are produced with natural gas, which releases CO₂. Because Eneco wants to reduce CO₂ emissions, from now on some of the heat will be produced with the e-boiler.

Future technology

The electrode boiler in the Ypenburg CHP plant is the first e-boiler on an industrial scale in the Netherlands. The technology is playing an important role in making district heating more sustainable and meeting the heat demand in the industrial sector.

The Ypenburg CHP plant e-boiler in figures



Capacity: 12 MW
Efficiency: 99.9%
Expected production:
24,000 MWh/year or 86,000 GJ/year
Technical life span: >20 years



Gas savings
2,900,000 Nm³/year



CO₂ reduction
5,200 ton/year

From advice to operation and maintenance in five steps

In many cases, the e-boiler will be integrated into an existing steam system. Together with you, we investigate the best integration of the e-boiler in your business process. Our team of experts can provide you with a complete service, from applying for a permit or subsidy to the technical realisation and optimal use of the e-boiler.

- 1 Advisory meeting
- 2 Design and feasibility
- 3 Subsidy application (SDE++ subsidy)
- 4 Realisation
- 5 Operation, maintenance and monitoring





Renewable energy

More and more companies are making the switch to sustainable energy. Not in one go, but step-by-step. One important measure that can now be taken is electrification of the steam supply.

Together with Eneco

Eneco would be happy to take this step together with you. Eneco has become a leader in the energy transition and is one of the largest investors in sustainable energy in the Netherlands. We help companies with the challenges and opportunities presented by the energy transition. To do this, we supply sustainable energy and we offer smart energy solutions, such as Eneco SteamComplete or Eneco Supply & Dispatch.



Contact

Are you curious about what an electric boiler can do for your company? Then contact your account manager or call +31 (0)88 895 3592.

For more information or for information about our other products and services, visit www.eneco.nl/grootzakelijk.

