

Nuon and the energy transition

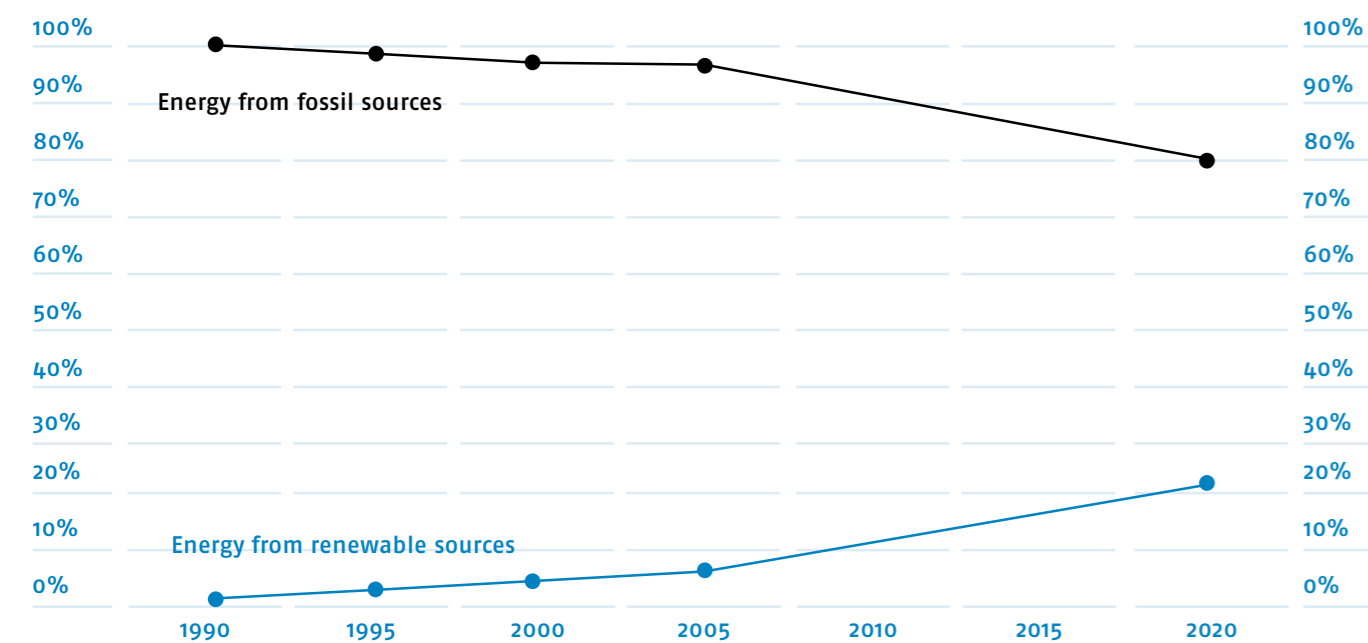
In the coming decades we will switch over step by step to a renewable energy supply. This period is known as the energy transition. The Dutch government has set targets for this transition: the energy supply in the Netherlands has to become greener. The government is working hard with industry, knowledge institutions and social organisations to achieve this target. Nuon fully endorses the government's objective. We also have the ambition to operate as a totally climate-neutral enterprise.

Three pillars

To allow the transition to take place as smoothly as possible, Nuon is focusing simultaneously on three pillars:

- More economical: saving energy by stimulating the use of low-energy bulbs, fitting insulation, installing energy-efficient central heating boilers and giving energy-saving advice.
- More sustainable: investing in the development of renewable energy, e.g. electricity production from biomass and solar energy, offshore wind farms and promising new energy technologies.
- Cleaner: using fossil fuels as cleanly and efficiently as possible, for instance by developing CO₂-capture technology.

The development of renewable energy in comparison with energy from fossil sources



Source: CBS and the ambitions of the governmental programme 'Schoon en Zuinig'.

Like to know more about Nuon Magnum?

For more information you can go to www.nuon.nl/magnum. Here you can find everything about Nuon Magnum and its environment and about coal gasification and CO₂-capture technology. You can also send an e-mail to magnum.mc@nuon.com.

Nuon Magnum

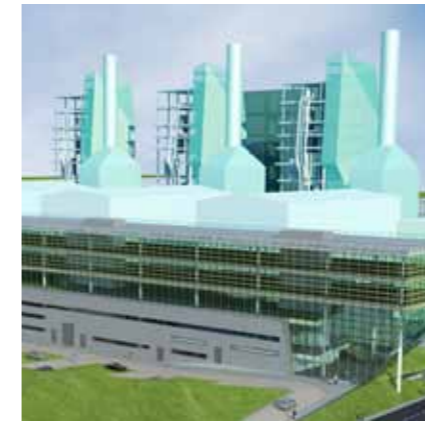
New-style power plant

Affordable, reliable and as clean as possible

The demand for energy continues to grow. To be able to meet the rising energy demand Nuon is building a new power plant in Eemshaven, in the province of Groningen: Nuon Magnum. An affordable, clean and reliable power plant that will ensure we can continue relying on energy in the decades to come.



A modern power plant that produces electricity from gas, coal and biomass.



Nuon Magnum fase 1



As clean as possible

Renewable energy is the future. Nuon is therefore investing continually in developing it. However, the current production capacity of renewable energy is insufficient to meet the demand for energy. In addition, renewable energy is hard to control, because we are totally dependent on moments when the sun shines or the wind blows. So for the time being, fossil fuels are still indispensable for the production of our energy. But of course these fuels must be used as cleanly as possible. For that very reason Nuon is building a new type of power plant in Eemshaven.

New type of power plant

Nuon Magnum is a modern power plant that can produce electricity from gas, coal and biomass. An innovative coal gasification unit enables the fuels to be used in the cleanest possible manner. And an advanced CO₂-capture unit ensures that CO₂ emissions are

substantially reduced. Moreover, thanks to this power plant Nuon will be able to take advantage of the availability of renewable energy. This makes Nuon Magnum an affordable, clean and reliable solution in the transition from fossil fuels to renewable energy.

Construction in phases

The power plant is being built in two phases. In the first phase Nuon is building the gas-fired part of the power plant. The coal gasification unit and the CO₂-capture unit follow in phase two, but the definitive investment decision for this has not yet been taken. With a production capacity of some 1,200 megawatt (MW) Nuon Magnum will be able to satisfy the electricity needs of more than two million households.

Nuon Magnum: the basic facts

- Production capacity of 1,200 MW, enough for two million households.
- Flexible use of natural gas, coal and biomass.
- Considerably less CO₂ emission than conventional power plants.
- Advanced technology that also allows other products such as hydrogen to be produced.

Years of experience

The concept of Nuon Magnum is based on the many years of experience that Nuon has gained at its Willem-Alexander power plant in Buggenum in the province of Limburg. There are now five coal gasification power plants in the world and this was the first of them. It has been in operation since 1993 and has been co-firing biomass since 2006. Nuon is still the only company in the world to do this. The combination of coal gasification and co-firing biomass results in a CO₂ reduction of 22% in comparison with conventional coal-fired power plants.

Gasification technology

Coal and biomass are first converted into synthesis gas. This 'syngas' is 'scrubbed', so the emission of particulate matter, sulphur dioxide (SO₂), nitrogen oxides (NO_x) and metals are kept to a minimum. The cleaned gas is then used to generate energy.

Large-scale CO₂-capture

One of Nuon's ambitions is to use pre-combustion CO₂-capture at Nuon Magnum. Nuon is currently making this innovative technology suitable for large-scale use by means of a trial in the power plant in Buggenum. By gasifying coal and biomass instead of combusting them, and by capturing CO₂, Nuon Magnum will have much lower emissions in comparison with those of a gas-fired power plant.

Flexibility in production

Nuon Magnum can also produce other materials in addition to electricity. For example, if the wind is blowing hard and a lot of wind energy is available, the coal gasification unit at Nuon Magnum can switch to the production of hydrogen. In this way the power plant can respond to the fluctuating availability of wind energy.