



Sustainability in the Dutch Power Sector

Fact Sheet Series

Nuon

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Nuon

1 Introduction

This series of fact sheets is designed to investigate the Dutch power sector and raise public awareness about the sustainability of power companies operating in the Netherlands. The series consists of ten company fact sheets and four thematic fact sheets, for a total of 14. The ten company fact sheets focus on ten of the Netherlands' leading power companies: DELTA, Electrabel, Eneco, E.ON, Essent, Greenchoice, Nuon, Oxxio, RWE, and Windunie. For each company, the fact sheet will contain information on four measures of sustainability: the company's current fuel mix for installed electricity generation capacity in Europe, current fuel mix of electricity supplied in the Netherlands, investments in new generating capacity in Europe, and initiatives to encourage consumers to become more sustainable in their energy use by conserving energy and reducing overall use (demand-side initiatives) in the Netherlands. The thematic fact sheets focus on these same four areas and compare the ten companies' performance in each area. Information for the fact sheets has been gathered from news articles and databases; company sources such as websites, annual reports and CSR reports; and personal interviews with the companies. All of the companies were given and used the opportunity to review a draft of their fact sheet, provide comments, and correct any factual errors. Funding for the fact sheets was provided by Greenpeace. All fact sheets in this series are available on the SOMO website at www.somo.nl.

2 Basic company information

Nuon is a non-listed public limited liability company incorporated in 1998 with its registered office in Amsterdam. The company is active throughout the electricity chain, with operations in the field of generation, trade, distribution and supply. In addition to being one of the largest energy distributors in the Netherlands, the company has interests in energy generation and supply projects in Germany and Belgium, and has trading activities with, among others, the UK and Scandinavia. Nuon provides electricity, natural gas, cooling and heat to over three million customers in the Netherlands, Belgium and Germany. The company also markets and trades wholesale energy, and it offers energy-related services, such as equipment installation. Nuon's major shareholders include the municipality of Amsterdam, and the provinces Gelderland, Noord-Holland and Friesland.

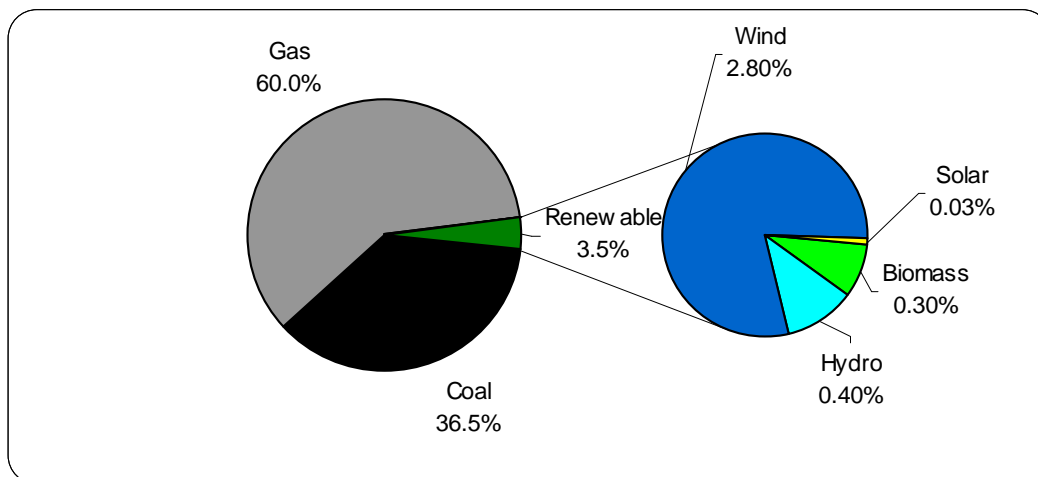
3 Installed capacity for electricity generation in Europe

While Nuon has several international operations, all its generation capacity is located in the Netherlands. Figure 1 shows the fuel mix of Nuon's generation capacity. Nuon makes the distinction between three different types of gaseous sources from which it produces electricity: 19.2% comes from blast furnace gases, generated at the Corus steel factory site, 25.1% from natural gas fired in combined heat and power plants, and the remaining 15.7% comes from natural gas fired in regular natural gas plants.¹

In total, Nuon has a generation capacity of 4,108 MW. One-third of the wind capacity comes from the large offshore wind farm near Egmond aan Zee. The company also owns four small-scale hydroelectric plants, one in Maurik and one in Alphen with a capacity of 10 MW and 14 MW,

respectively, and two smaller plants at Hagestein and Roermond.² The biomass capacity is accounted for by the biomass plant Lelystad and the co-generation of biomass and coal in the Willem-Alexander plant in Buggenum.³

Figure 1: Fuel mix of Nuon's generation capacity, 2007

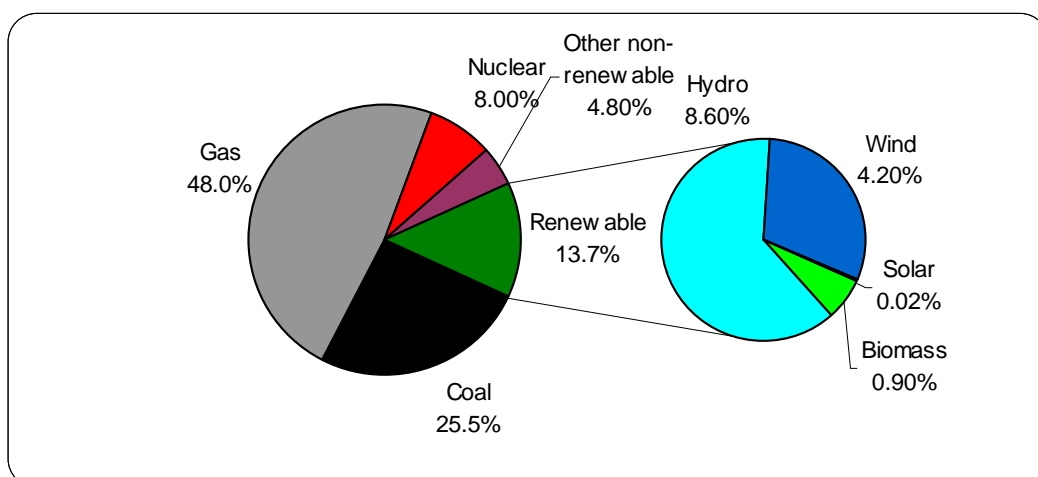


Based on: Nuon Annual Report 2007

4 Electricity supplied in the Netherlands

Figure 2 shows the fuel mix of electricity supplied by Nuon in the Netherlands. As the figure reveals, Nuon's supply mix is more sustainable than the mix for the electricity it generates itself. No information was found regarding the type of hydro power (large scale or small scale) that is supplied. Only for one renewable product the electricity is guaranteed from small-scale hydro, in addition to wind and solar energy.⁴

Figure 2: Fuel mix of supplied energy by Nuon Retail and Business, 2007



Based on: Nuon Stroometiket 2007

Table 1 presents the CO₂ emissions and radioactive waste production resulting from the generation of the electricity that Nuon supplies in the Netherlands.

Table 1: Emissions and waste resulting from Nuon's electricity supply, 2007

Indicator	Amount
CO ₂ (g/kWh)	431.8 ⁵
Radioactive waste (µg/kWh)	240

Based on: Nuon Stroometiket 2007

5 Announced investments in new generation capacity in Europe

In July 2006, the construction plans for Nuon Magnum were announced. In September 2007, Nuon decided to invest in Nuon Magnum in two streams, starting with the natural gas stream and postponing the decision on the coal/gas/CCS stream with two years. Within the next two years, Nuon will decide whether it will continue with the coal gasification and biomass turbines, possibly with CO₂ capture facilities.

The company is also in the process of developing a wind farm near Antwerp, Belgium. Two wind turbines are already in operation, while an additional 38 are planned (total capacity of 90 MW).⁶ Additionally, Nuon is entering a joint-venture with Electrawinds and C-Power Holdco to develop the biggest wind farm off the Belgian coast.⁷

Table 2: Nuon's announced investments in new production capacity

Project name	Location	Fuel Type	Date in operation	Amount (€)	Output Capacity (MW)	Project status
Nuon Magnum ⁸	Eemshaven (NL)	Natural gas	2011	1.5 billion	1,300	Under construction
Wind farm Antwerpen	Antwerpen (BE)	Wind	2007 - unknown	100 million	78 ⁹	Various stages

Based on: Nuon Annual Report 2007

Table 3 shows all announced investments that are not yet underway. The construction of the CCGT in Frankfurt am Main is expected to start in 2008¹⁰, while permission has just been granted for the construction of the CCGT plant near Charleroi, Belgium.¹¹

Table 3: Nuon's announced plans for investment in new capacity

Project name	Location	Fuel Type	Date in operation	Amount (€)	Output Capacity (MW)	Project status
Gas plant Frankfurt	Frankfurt am Main (DE)	Natural gas (CCGT)	2010	N/A	450	Planning phase
Gas plant Charleroi	Charleroi (BE)	Natural gas (CCGT)	N/A	N/A	450	Permission granted
Hemweg ¹²	Amsterdam (NL)	Natural gas	N/A	N/A	500	Planning phase
Gas plant Diemen ¹³	Diemen (NL)	Natural gas	N/A	N/A	500	Planning phase
Nuon Magnum	Eemshaven (NL)	Coal and biomass	N/A	N/A	N/A	Planning phase

Based on: Nuon Annual Report 2007

Nuon is also investing in expanding existing gas storage in Epe and Zuidwending, and in a carbon capture and storage (CCS) demo project in Buggenum, all in the Netherlands. Additionally, Nuon purchased all shares of Burlington Resources Nederland Petroleum. Through this new subsidiary, Nuon acquired a stake in 35 gas fields in the Dutch North Sea.¹⁴

6 Demand-side initiatives

Nuon offers the following demand-side products and services:

- Development of innovative solar foil, Helianthos.
- Insulation products and advice to improve the energy efficiency of households.
- Customers can purchase high efficiency boilers, which require less energy to heat water.
- Boiler service contracts, to ensure proper maintenance and repair of boilers.
- Energy shops, offering products such as low energy light bulbs and water saving shower heads, which can be financed through the consumer's energy bill. Nuon also offers an online shop with the same products.
- Energy reduction advice services.
- Energy label development.

¹ Nuon Annual Report 2007, p.35.

² Idem., p.47.

³ Nuon website, Centrales "Willem-Alexander centrale te Buggenum, no date, <http://www.nuon.com/nl/over-nuon/kernactiviteiten/opwekken-energie/centrales/buggenum.jsp> (25-07-08).

⁴ Nuon website, Maatschappelijk ondernemen, klanten, "Groene producten voor klanten", no date, <http://www.nuon.com/nl/verslaggeving2007/maatschappelijk-ondernemen/klanten/groene-producten-voor-klanten.jsp> (25-07-08).

⁵ The CO₂ emissions have decreased by 12% in comparison with 2006. 6% of this decrease can be ascribed to a more renewable fuel mix. The other 6% is accounted by the different method of calculating the CO₂ emissions of Nuon's blast furnace gas plant. For more info see, <http://www.nuon.com/nl/verslaggeving2007/maatschappelijk-ondernemen/klanten/groene-producten-voor-klanten.jsp>.

⁶ Nuon Belgium website, Duurzame Projecten, "De Antwerpse Haven", no date, http://www.nuon.be/nl/nuon/duurz_haven.html (28-07-08).

⁷ "Joint Venture for largest offshore wind farm in Belgium", Nuon, 31 July 2008, <http://www.nuon.com/press/press-releases/20080731/index.jsp> (19-08-08).

⁸ In July 2007, Nuon announced the suspension of the planned coal and biomass turbines at the Magnum plant. Nuon's plans currently are that the Magnum plant will consist of 3 gas turbines with a total generation capacity of 1,300 MW. After the first building phase, these gas turbines will be fuelled with natural gas. In the second phase an additional gasification plant will be built, in which coal and biomass can be gasified to form a so-called syn-gas. This syn-gas can be co-fired on the gas turbines (together with natural gas). Thus, when Magnum actually becomes multi-fuel (after phase 2), the existing gas turbines will not change and the total capacity will remain 1,300 MW; Nuon says that it is not possible to say which part of the capacity is used for which fuel (G. Beijen, Nuon, e-mail 03-09-2008). Thus, since the construction of the natural gas turbines is proceeding and the plans for coal and biomass are so vague, for the calculations in these fact sheets the entire 1,300 MW is considered to be natural gas.

⁹ Expansion from 12MW existing capacity to 90MW after construction has finished.

¹⁰ „Erweiterung der Produktionskapazität verstärkt Position auf deutschem Markt - Nuon schreibt Bau des Gaskraftwerks in“, Nuon press release, 28 January 2008, <http://nuon.de/publish/frameset.php?seite=%2E%2E%2Fpublish%2Fgeschaefsbereiche%2F%5Fbersicht%5Fgeschaefsbereiche%2Ehtml> (25-07-08).

¹¹ "Nuon plant stroomcentrale in Seneffe", De Tijd, 11 July 2008,

http://www.tijd.be/nieuws/ondernemingen_energie/Nuon_plant_stroomcentrale_in_Seneffe.7863844-432.art (25-07-08).

¹² "Nuon wil twee gascentrales bouwen", De Volkskrant, 19 April 2008; "Opeens regent het nieuwe energiecentrales", Nederlands Dagblad, 17 April 2008.

¹³ Idem.

¹⁴ "Nuon stapt groot in gasvelden", Dagblad de Pers, 12 Juni 2008.