CHAPTER 7

Turning Off the Gas Tap: Sustainable Energy Policies, Practices and Prospects in the Netherlands

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Abstract This chapter describes efforts to transition to more sustainable ways of living in the Netherlands. Backhaus captures the status quo of Dutch sustainable energy policies and projects in clarity and brevity, suggesting that prospects to live up to the commitment made in the Paris Agreement are dim. The Perspective project, a major, yet not well-known Dutch research programme in the 1990s discussed as best-practice example, suggests that substantial change is possible. Like most past and current sustainability efforts, the Perspective project focused on individual behaviour change. It qualifies as best-practice example by demonstrating that living well, healthy and sustainably can go hand-in-hand. Marking the Dutch cycling culture as an example, Backhaus proposes that, rather than targeting individuals, future sustainable energy policies and programmes should best address infrastructures, social norms and collectives.

Keywords Dutch energy transition · Natural gas · Sustainable energy · Embodied energy · Energy research

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Introduction

Today, heating, cooking and showering in Dutch households is largely fuelled by gas—not least due to the country's large natural gas reserves. Nevertheless, the Dutch government has committed to an energy system entirely based on renewables by 2050. This commitment entails that newly built homes are no longer required to be connected to the gas network, and gas sourcing companies have been ordered to cap, and within four years, completely stop extraction from a major gas field in the country's north after a series of increasingly severe earthquakes (Rijksoverheid 2018). Yet, while the country sets out to become 'gasless', the share of renewable energy is still very low and implementation is slow.

Developments in the Dutch energy sector have been, and will continue to be, strongly dependent on policies and trends in other countries, especially neighbouring countries in Europe's North-West. While the Netherlands is currently a net importer of energy, this is said to change from 2023 onwards according to the most recent National Energy Outlook (NEO) (Schoots et al. 2017). The 2017 NEO indicates around 5% share of renewables in total domestic energy use, which is projected to increase to 12% in 2020 and 17% in 2023. A steep downward trend of total energy consumption, especially in the built environment, observed between 2005 and 2016, is expected to continue. However, actual energy reduction in the built environment is considered to be much lower than theoretical calculations may suggest (Majcen et al. 2013), and demographic as well as socio-economic trends draw into question positive future projections (Brounen et al. 2012).

Socio-Material Dynamics of Household Energy Use in the Netherlands

With a share of over two-thirds, almost 90% of which is generated from gas, space heating consumes by far the most energy in the Dutch residential sector (Eurostat 2018). Research has shown that compared to households in other countries, Dutch households are less interested in energy-related home renovations including insulation or an upgrade of the heating system due to concerns regarding investment costs, among other reasons. Potentially a coping mechanism, but certainly of relevance in terms of comfort and social conventions, is a comparatively lower average indoor temperature (below 20 °C) at which people in the Netherlands feel comfortable at home (Kammerlander et al. 2014).

Energy use in the Dutch residential sector has decreased in recent years, and this downward trend is believed to continue, not least due to legislation particularly targeting the rental sector (Schoots et al. 2017). Cautionary voices are warning that the actual energy consumption of households in buildings with the most efficient energy labels (A–B) is higher than their theoretical energy consumption, which is used to inform energy policy (Majcen et al. 2013). Other research indicates that an ageing population and increasing wealth are likely to offset the effects of energy policies focusing on the physical and technical aspects of home energy use alone (Brounen et al. 2012). Since evidence suggests that the current and projected energy use of the Dutch dwelling stock and households is higher than assumed, additional energy saving measures are needed to achieve the full reduction potentials and meet energy consumption targets.

Personal mobility also makes up for a great share of energy use. More than 70% of Dutch households own at least one car (CBS 2017) and the total number of private vehicles on Dutch roads continues to rise (CBS 2019). Partially due to public policy, cars on Dutch streets are comparatively smaller and more efficient than in other countries in Europe's North-West. A particularity of the Netherlands is the Dutch 'cycling culture', which is catered to and supported by an extensive network of cycling paths as well as user-friendly bike rental and leasing schemes. In addition, private mobility needs are met by a well-maintained road infrastructure and a rather efficient public transportation system.

Energy Policy in the Netherlands

Dutch national policy for the built environment focuses on energy efficiency, offering subsidies for heat pumps, and biomass, wood pellet or solar thermal heating systems to private homeowners, and since 2017 also to municipalities, provinces and public bodies. The 'energy efficiency you do now' (energie besparen doe je nu) programme provides cheap loans for energy efficiency renovations (e.g. insulation) to private homeowners and associations of apartment owners. Further, national government supports industry efforts with respect to electric heat pumps, district heating (geothermal and residual/waste heat) and the electrification of transport, including personal mobility. Furthermore, national energy policy requires utilities to support home energy savings, which often takes the form of energy saving tips, information on renovations and available subsidies, as well as smart meter-supported real-time data on home energy use. The overall goal for the national roll-out of smart meters is offering a

smart meter to every Dutch household by 2020 and achieving at least 80% coverage. By the end of 2017, a total coverage of 16% had been achieved (author's calculation based on: CBS 2018; RVO 2018: 19).

Agreements have been made with municipalities and housing corporations that all rental apartments owned by housing corporations need to have an energy label of B or better, and all privately owned apartments need to have an energy label of C or better by 2020. Subsidies are available for apartment owners who either offer social housing or who plan rather ambitious energy efficiency renovations. An agreement with the construction, installation and energy sector states that every year, 300,000 existing flats are to be made energy efficient. For example, the block-for-block (blok voor blok) programme, running since 2012, comprises 14 projects targeting at least 33,500 flats that are, ideally, renovated cost efficiently, i.e. on block-level. In addition, the five biggest cities of the Netherlands together with the 32 middle to large-sized towns have developed a Smart City Strategy and six Dutch cities and industry partners are experimenting with 'smart city' concepts and technologies to achieve reductions in CO_2 emissions.

In recent times, interest has risen in supporting communities that are keen to take collective action by studying their business case (e.g. RVO) or by looking into the possibilities of an energy service company (ESCO) model for energy cooperatives (e.g. nmf Limburg). The Dutch cooperative sector is undergoing remarkable developments, currently fuelling 85,000 (1%) of Dutch households. Although there are no longer subsides for solar PV, energy cooperatives can profit from tax exemption schemes. In 2017, 100 new solar cooperatives have been established, leading to an increase of 53% compared to 2016 and a total solar capacity of 37 MW. Sixty-three of the new cooperatives benefit from the 'Postcode rose regulation' (Postcoderoosregeling), a national tax exemption scheme. This development will likely continue, with more than 200 projects planned for 2018. Although cooperative wind energy remained stable at 118 MW in 2017, a near doubling of capacity is expected for the period of 2018–2019 due to planned projects that emerged from close collaboration between several cooperatives, governments and commercial companies. Onshore wind energy is also increasingly cooperative-based, partly due to municipal requirements (HIER local energy monitor).

Trends in National Household Energy Campaigns in the Netherlands

Sustainable Energy Consumption Initiatives (SECIs) in the Netherlands reflect Dutch energy policy in various ways (Table 7.1). The clear number one issue addressed is the energy efficiency of buildings and of appliances. The slow roll-out and uptake of energy efficiency measures, as well as renewable energy, has been recognised, and governmental actors at different levels have become better aligned by offering complementary support and services. While national energy policy for the built environment mainly addresses building envelopes, energy sources, (smart) systems and appliances, Dutch municipalities, and hence many SECIs, seek to facilitate and support uptake by collaborating with commercial actors, neighbourhood initiatives, cooperatives, etc. In addition, municipalities and environmental organisations try reaching individual households with more direct, tailored and accessible information about energy efficiency, available subsidies and other support schemes. For example, several SECIs consist of central information points, or energy coaches, who provide tailored advice. Another frequently found type of SECI provides energy efficiency equipment such as energy-efficient light bulbs, low-flow showerheads and draught-excluding tape to households for free; thus, aiming to inform about energy efficiency and providing an 'energy starter kit'.

Table 7.1 47 exemplary SECIs in the Netherlands according to their problem framing (Jensen et al. 2017)

Problem framing	*No. of initiatives*
Changes in complex interactions	2
Changes in everyday life situations	8
Changes in individuals' behaviour	29
Changes in technology	8

The good practice example below highlights the already high level of awareness of energy issues in the Dutch populace and indicates that—building on general awareness and willingness to change—personal, tailored advice paired with efficient technologies can help achieve significant consumption reduction of more than 40% in energy use.

Case Study: The Perspective Project (Project Perspektief)

The Perspective project tested the possibility of living a low-energy lifestyle with a high level of well-being in a system of economic growth. The research project was carried out in the Netherlands from 1995 until 1998, financed by the then Ministry of Housing, Spatial Planning and the Environment (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieu; VROM). Supported by a research institute and two universities, the consultancy practitioner CEA implemented the project, involving private households. The initial 20 households were hand-picked and committed to aiming to reduce their energy use as much as possible over a period of two years. They were informed about the energy intensity of products and services, and coached and monitored throughout the entire run-time of the project towards achieving and maintaining a low-energy lifestyle (Project Team Perspective 1999).

In the Dutch context, the Perspective project is unique in terms of its focus, funding, duration and ambitions. National government was confronted with a constant increase of energy use, including by households. Research demonstrated that demand would continuously grow unless addressed. Therefore, the idea emerged to test whether energy use can be reduced and kept low, even if income increases, while well-being remains stable or improves. The Perspective project benefited from a general awareness of environmental and energy issues beyond the research and policy sphere. However, an exploration of what a reduction of indirect energy use means in practice was unprecedented (Schmidt 2017). A variety of households were selected for participation, and it appears that financial gains were as much a motivation to participate as possible environmental gains (Project Team Perspective 1999).

Methods for Intervention

The methods of intervention addressing direct energy use were the provision of energy-efficient appliances, monitoring, information and coaching. At a kick-off event, participating households were informed about basic principles to reduce indirect energy use (e.g. quality rather than quantity, services rather than products). Second, people were given information on energy consumption and monitoring in print form. Most importantly, households received monthly coaching services. Advice focused on helping with the monitoring of home energy consumption, with thinking about saving strategies, with the planning of monetary spending, and with additional information on the energy intensity of products and services. A second event bringing together all participating households was organised about half-way through the project to thank and motivate everyone, exchange tips and experiences, and to commit people to the next period of maintaining reduced consumption levels. A final event was held to celebrate the successful completion of the entire undertaking.

Another method of intervention was the provision of 20% additional household income simulating economic growth. Households were obliged to follow a number of rules with respect to spending their increased income to ensure that their spending patterns would be following similar principles as before: no unusual donations or 'silly' expenditures; no more savings than prior to the project; and no big loans and investments. Any purchase costing more than 500 Dutch guilders (approx. €225) had to be discussed with the coach who then gave advice based on potential energy impact.

Framing the Energy Challenge

The project focused on households who already lived in energy-efficient homes and who were willing to commit to a two-year, longitudinal study on saving embodied (indirect) and direct energy use. As the main goal was achieving maximum energy savings with the help of (or despite) a 20% increase in household income, energy and energy savings were framed as something positive for all household members, in terms of health or time efficiency, as well as for the environment. The project created several changes in everyday life situations regarding information,

support and finances, to evaluate the possibility of maintaining a low-carbon lifestyle in a scenario of economic growth and increased personal wealth.

Outcomes and Outputs

The goal of the Perspective project was a 40% reduction in energy use compared to similar households in less efficient homes. An average of 43% of reduction was accomplished, about half resulting from reductions in direct, and half from indirect energy use. Miniscule monitoring was done through meter readings as well as the careful registering of all products bought, and services used. The registering of product purchases was made somewhat easier by means of a self-learning system with barcode reader, which required the manual entering of data only the first time an item from the supermarket was scanned. All subsequent scans were then automatically registered. Some products had to be weighed in the monitoring process. In addition, interviews were conducted to gain insights into people's emotions and experiences, for example with respect to comfort and well-being and the value they attach to different consumption categories. Personal coaches took note of dilemmas people faced, such as the desire of wanting to go to a faraway place for vacation and, due to their commitment to the project, the requirement to take a low-energy holiday instead.

Overall, households reached the target by reducing their direct and indirect energy use and—simulating potential effects of economic growth on households—increasing their level of spending and well-being. They achieved a reduction in energy use in all categories measured: transport, food, living, hygiene, clothing and leisure. Monetary spending increased in the categories of food and living and decreased in the categories of direct energy use and leisure (Project Team Perspective 1999).

Conclusion

The catalogue of exemplary SECIs presented in this chapter did not aim to be representative of all sustainable energy initiatives in the Netherlands, yet a heavy focus on technological solutions and individual

behaviour change can be seen in the figures shown in Table 7.1. Initiatives focusing on changing collective conventions for significant reductions in energy use (as tested by the ENERGISE project) are still rare, yet crucial to meet national renewable energy and energy efficiency targets. An important finding of the presented best practice project Perspective, and many other projects, is that living healthy and well is possible with a smaller footprint. A potential improvement in the design and approach of the Perspective research project, that successfully provided individual coaching services to participating households, could have involved more interaction between participants to share ideas and experiences, and to tackle social conventions collectively.

To achieve the country's contribution to meeting targets of the Paris Agreement, current positive trends in the Netherlands need to be maintained and their pace and reach needs to increase. The 100% goal for renewable energy by 2050 appears steep, and seems to require the more forceful pursuance of currently still nascent cooperative models. Similarly, the downward trend of energy use in the built environment needs to continue, accelerate and potentially be enjoyed with caution as the discrepancy between potential and actual reduction is unknown. In terms of renewable energy, recognising that incumbent actors are reacting slowly at best, policy actors and supporting agencies have recently started to develop better support measures for local, community-based renewable energy initiatives. In terms of energy efficiency, policy and other national actors seem to have hardly taken note of the role and relevance of collective conventions that might require more collective models of engagement. Hopefully, in the future, the importance of challenging unsustainable social norms that are enabled by and entrenched in existing and even in emerging infrastructures is recognised. Such recognition could result in more sustainable policies, initiatives and infrastructure investments.

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References

Brounen, D., Kok, N., & Quigley, J. M. (2012). Residential energy use and conservation: Economics and demographics. *European Economic Review, 56*(5). https://doi.org/10.1016/j.euroecorev.2012.02.007.

CBS—Centraal Bureau voor de Statistiek. (2017). *Huishoudens in bezit van auto of motor; huishoudkenmerken, 2010–2015*. Available at https://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=81845ned.

CBS—Centraal Bureau voor de Statistiek. (2018). *Huishoudens; samenstelling, grootte, regio, 1 januari*. Available at https://statline.cbs.nl/statweb/publication/?vw=t&dm=slnl&pa=71486ned&d1=0-2,23-26&d2=0&d3=0,5-16&d4=(l-1)-l&hd=090402-0910&hdr=t,g3&stb=g1,g2.

CBS—Centraal Bureau voor de Statistiek. (2019). *Personenauto's; voertuigkenmerken, regio's, 1 januari*. Available at https://opendata.cbs.nl/statline/#/CBS/nl/dataset/71405ned/table?dl=9FAA.

Eurostat. (2018). *Energy consumption in households*. Available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_consumption_in_households.

HIER opgewekt, *Local Energy Monitor*. Available at https://www.hieropgewekt.nl/local-energy-monitor.

Jensen et al. (2017). *Comprehensive open access dataset of Sustainable Energy Consumption Initiatives (SECIs)*. ENERGISE—European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable No. 2.3.

Kammerlander, M. et al. (2014). *Individual behavioural barriers to resource-efficiency*. POLFREE—Policy options for a resource-efficient economy. Grant Agreement No. 308371, Deliverable 1.6

Majcen, D., Itard, L. C. M., & Visscher, H. (2013). Theoretical vs. actual energy consumption of labelled dwellings in the Netherlands: Discrepancies and policy implications. *Energy Policy, 54*. https://doi.org/10.1016/j.enpol.2012.11.008.

Project Team Perspective. (1999). *Minder energiegebruik door een andere leefstijl?* Project Perspectief, December 1995–Juni 1998. Eindrapportage. VROM.

Rijksoverheid. (2018). *Kabinet: einde aan gaswinning in Groningen; Nieuwsbericht* 29 March 2018. Available at https://www.rijksoverheid.nl/actueel/nieuws/2018/03/29/kabinet-einde-aan-gaswinning-in-groningen.

RVO—Rijksdienst voor Ondernemend Nederland. (2018). *Marktbarometer Aanbieding Slimme Meters. Voortgangsrapportage 2017*. Available at https://www.rijksoverheid.nl/documenten/rapporten/2018/06/19/voortgangsrapportage-marktbarometer-aanbieding-slimme-meters-2017.

Schmidt, T., Project leader of the project Perspektief, personal communication on 27 June 2017, 8.45–9.30 am.

Schoots, K., Hekkenberg, M., & Hammingh, P. (2017). *National energy outlook—Summary*. Available at https://www.ecn.nl/nl/energieverkenning/.