

INFORMATION NOTE

Waste management policy in the Netherlands

1. Introduction

1.1 The Netherlands' waste management system is highly regarded around the world. In 2011, recycling and composting¹ of municipal solid waste ("MSW") together accounted for 61% of waste treated in the country, while incineration accounted for 38% of the remaining waste. Only 1% of MSW was deposited in landfill. A well-defined national waste management policy with quantitative targets, coupled with comprehensive waste processing infrastructure, has placed the Netherlands among the frontrunners in recycling and thermal waste treatment in Europe.

1.2 In view of the successful waste management system of the Netherlands with high recycling rates, energy efficient waste incineration plants and minimal landfill disposal, a Statement of Intent on waste management collaboration between Hong Kong and the Netherlands was signed on 6 May 2013. Under the Statement of Intent, both places will co-operate on waste issues through the interaction of government, industry, education and research institutions. They also agree to boost collaboration in the exchange of scientific studies and technological developments, and to share expertise and strategies to maximize resource recovery and minimize waste disposal.

1.3 This information note provides an overview of waste management policy in the Netherlands, with special reference to waste incineration treatment technology in terms of its development, energy recovery process, monitoring and enforcement measures, and the extent of public acceptance of the technology in the country.

¹ Composting means the biological treatment of biodegradable matter resulting in a recoverable product.

2. Regulatory framework for waste management policy

Responsible authorities

2.1 In the Netherlands, the Ministry of Infrastructure and the Environment is the government agency in charge of the overall environmental policies in the country. The Ministry develops national policy and strategies on the environment in a national context, as well as ensuring the implementation of the European Union ("EU") legislation in national regulations. Rijkswaterstaat is an executive arm of the Ministry responsible for advising the Ministry on the development and evaluation of national and EU waste policies and regulations, as well as providing support to the Ministry with policy implementation.

2.2 On the local level, the provincial governments are responsible for translating the national policy into the regional framework, granting environmental permits, inspecting waste treatment facilities (including incineration and landfilling) and stipulating limits for noise and emissions. Meanwhile, the municipal governments are in charge of implementing the national policy and strategy on environmental management, and enforcing environmental regulations such as separation, collection, treatment, recycling and disposal of waste from households, and commercial and industrial activities in their municipalities.

Relevant regulations

2.3 The waste management policy is primarily governed by the *Environment Management Act*, which stipulates an integrated approach to environmental management in the Netherlands and provides the legal framework by defining the roles of the national, provincial and municipal governments. The Act covers matters such as waste collection, disposal of hazardous waste, air quality, noise nuisance, and environmental permits for industrial and commercial activity, as well as setting out various environmental management strategies including environmental planning, environmental impact assessment, and environmental permit and reporting.

2.4 The Netherlands is also governed by the *Industrial Emissions Directive* issued by the EU which commits its member states to control and reduce the impact of industrial emissions on the environment. The Directive is transposed into Dutch national legislation by the *Environmental Activities Decree*, *Environmental Law Decree* and *General Provisions Environmental Law*. Specifically, the *Environmental Activities Decree* sets out the provisions on plant operation and pollution control criteria by specifying emission limit values of various air pollutants and contaminants, whereas the *Environmental Law Decree* and *General Provisions Environmental Law* specify the application requirements, qualifying conditions and assessment of the environmental permit, and the enforcement policy to be adopted by the relevant authorities.

3. Waste treatment in the Netherlands

3.1 In the past decades, the ever increasing level of material consumption and the significant lack of physical space together with environmental deterioration of the land in the Netherlands have forced the Dutch government to take measures early to reduce the landfilling of waste. The Dutch waste management policy is influenced mainly by the so-called Lansnik's Ladder², which was incorporated into Dutch legislation in 1994 and has been introduced in the EU *Waste Framework Directive* as the waste hierarchy. The basic principles of waste hierarchy follow the lines of avoidance of waste as much as possible, recovery of valuable raw materials from waste, generation of energy by incinerating the residual waste and only then landfilling what is left over in an environmentally sound way.

3.2 To reduce the reliance on landfill disposal, the Dutch government issued a waste decree in 1995 which introduced a landfill ban for 35 waste categories including all combustible and biodegradable waste. It also introduced a landfill tax in the same year in an effort to reduce waste generation by making landfill disposal more expensive while at the same time promoting recycling, composting and incineration as more attractive waste management options.

² The Lansnik's Ladder is a waste hierarchy model named after a Dutch parliament member who proposed it.

3.3 When the landfill tax was first introduced, there was a single tax rate for all waste. In 2000, two different levels of taxes were introduced. Combustible MSW was charged with a high tax, while waste that was assumed to be non-combustible with no other favourable recovery was charged with a low tax. In 2002, there was a steep increase of the tax level which kept increasing marginally in the ensuing years. In 2010, the landfill tax surged from €65 (HK\$670) per tonne in the early 2000s to €107.5 (HK\$1,107) per tonne, the highest rate in Europe. Amid high landfill tax, more MSW has been diverted from landfilling to either recycling³ or incineration. In 2012, the landfill tax was repealed as the low level of landfilling had rendered its existence as an administrative burden without inducing further benefits.⁴

3.4 Apart from the landfill ban and landfill tax, the Netherlands has also implemented a series of measures to prevent waste generation and promote recycling and material recovery. These include imposing strict waste treatment standards, setting up waste charging scheme whereby households pay in proportion to the quantity of waste generated, and introducing producers responsibilities for the management of their products at the end-of-life stage.⁵ In addition, the Dutch government has set out a well-defined national plan for waste management in the country.

National Waste Management Plan

3.5 In 2002, the *Environmental Management Act* was amended to stipulate the Ministry of Infrastructure and the Environment to draw up a National Waste Management Plan ("NWMP") every six years, taking into account the waste hierarchy model and the national environmental policy plan. The first NWMP came into force at the beginning of 2003 and was reviewed in 2009, resulting in the second National Waste Management Plan. The second NWMP covers the period 2009 to 2015, with a view to 2021.

³ With increasing use of recycling for waste management in recent years, the Netherlands achieved the 50% recycling target stipulated by the *Waste Framework Directive* by 2009, 11 years ahead of the deadline. Indeed, the Waste Management Council was closed down in 2006 because all its targets were met and waste was no longer an important issue in the country. The Council was established in 1990 to help govern waste management policies among the different tiers of government.

⁴ According to the email reply from Rijkswaterstaat dated 20 December 2013, the Dutch government plans to re-introduce landfill tax in October 2014 with the objective to shift the taxation burden to the consumption of environmental resources, thereby reducing waste generation.

⁵ Producers are responsible for setting up a collecting and recycling system for the following products: waste electrical and electronic equipment, end-of-life vehicles, tires, batteries and packing waste. The expenses so incurred are often passed on to consumers.

3.6 The first NWMP set out the framework for future waste management in the Netherlands and introduced the control of waste policies under a national perspective. It banned direct disposal of mixed municipal waste to landfills and called for the increase of waste utilization from 81% in 2000 to 86% in 2012 by recycling and applying non-recyclable waste substances for useful purposes such as fuel.

3.7 The second NWMP introduces various initiatives to enhance the waste management policy, such as setting up quantitative targets of increasing the recycling of household waste to 60% and total waste to 85% by 2015, as well as reducing waste generation and the environmental impact of waste by optimizing recovery and re-use.

4. Development of thermal waste incineration

4.1 Thermal waste incineration has a long tradition in the Netherlands with one of the earlier waste incineration plants entering into service in the capital city of Amsterdam as early as in 1919. With the advance in technology over the past decades, waste incineration plants are gradually equipped with waste to energy conversion and emission reduction capabilities. In contrast, pyrolysis and gasification have a very limited application in MSW management in the Netherlands as both technologies are applicable only to well-defined homogeneous waste streams and not suitable for the treatment of MSW.⁶

4.2 In the Netherlands, the introduction of landfill ban and landfill tax in 1995 resulted in increased use of incineration for waste treatment. However, incineration capacities were insufficient at that time and waste collectors had to choose between exporting waste to neighbouring countries or accepting the increasingly high landfill cost of disposing waste in the Netherlands. This was particularly the case in 2002 when the surge in landfill tax per tonne made landfilling an expensive option for waste disposal. A lot of combustible waste was subsequently shipped to Germany for landfilling, but the practice ended in 2005 when Germany imposed a landfill ban.

⁶ Based on the email reply from Rijkswaterstaat dated 20 December 2013.

4.3 In response to the German landfill ban, the Netherlands made considerable investment to increase its waste incineration capacity in the mid-2000s. In January 2007, the Dutch government further opened its borders for the incineration of waste (both household and commercial/industrial) from abroad with the objective to stimulate the expansion of further incineration capacity in the Netherlands. Coupled with the successful implementation of national waste management plans which resulted in declining availability of waste, the Dutch waste incineration plants have been left with a net overcapacity since 2010. As such, waste companies have been importing waste from other countries, such as the United Kingdom and Italy, to make full use of the excess incineration capacity.

4.4 In the Netherlands, only grate incineration technology has been adopted for incineration of MSW due to its reliability and robustness in accommodating variations in composition and calorific value⁷ of MSW. Moreover, factors such as simplicity of operation, low personnel requirement and ease of training of personnel have made the technology attractive to be adopted in new incineration plants.⁸

4.5 As at 2012, there were 12 waste incineration plants which process MSW in the Netherlands with a total incineration capacity of 7.605 million tonnes. All of them have energy recovery status which allows the plant to import combustible waste for incineration. The total amount of waste incinerated (both domestic and from abroad⁹) in 2012 was 7.48 million tonnes, of which a net overcapacity of close to 2%. In view of the current overcapacity problem and expected lesser amount of domestic waste in the coming years¹⁰, there should be no expansion of the Netherlands' capacity for waste incineration until 1 January 2020.¹¹

⁷ Calorific value is the amount of heat produced by the complete combustion of a fuel.

⁸ Based on the email reply from Rijkswaterstaat dated 20 December 2013.

⁹ The amount of waste from abroad incinerated stood at 1.035 million tonnes, representing about 14% of the total amount of waste incinerated during 2012.

¹⁰ According to a Rabobank report, Dutch combustible waste amounted to 6.445 million tonnes in 2012 and is projected to decrease to 5.5 million tonnes by 2015. See Dutch Waste Management Association (2012).

¹¹ See Recycling Portal (2009).

Energy recovery

4.6 Energy recovery is an important source of income for waste incineration plants in the Netherlands. Under the *Environmental Activities Decree*, any heat generated from waste incineration is to be recovered as much as technically and economically feasible. All waste incinerators in the Netherlands produce energy in the form of electricity and/or heat, and the energy produced could recover about 50% of the total cost of incineration plant operation.¹² Of the electricity produced by waste incineration plants, 82% is exported off site while the remaining 18% is used onsite. Meanwhile, the heat produced is used for industrial processing, district heating and greenhouse heating. In 2012, 4 014 GWh of electricity was produced and 14.1 PJ of heat delivered by waste incineration plants.

4.7 The city of Amsterdam provides a showcase example of effective use of energy produced by waste incineration plants. Afval Energie Bedrijf ("AEB") is a waste and energy company owned by the city government. AEB has two waste incineration plants with a combined incineration capacity being the highest in the Netherlands. Every year, AEB processes more than 1.4 million tonnes of domestic and industrial waste, representing 20% to 25% of the total annual quantity of combustible waste in the Netherlands. During the combustion process, AEB generates 1 000 GWh of electricity which is sufficient to meet the electricity demand of 285 000 households, i.e. 75% of all households in Amsterdam.

4.8 Moreover, about 50 000 Amsterdam households have been using district heating, of which 25% comes from heat produced by waste incineration. The provision of heating from waste means that the city is less dependent on primary fuels such as natural gas. It is expected that more households (in the range of 100 000s) will be connected to district heating in the coming years, thus helping the city of Amsterdam to meet its climate target of reducing carbon dioxide emissions by 40%.

¹² Based on the email reply from Rijkswaterstaat dated 20 December 2013.

Monitoring and enforcement measures

Environmental permit

4.9 In the Netherlands, an environmental permit from the provincial government is required for the installation of waste incineration plants. The environmental permit must provide emission limit values for polluting substances together with inspections and maintenance details. Various stakeholders including green groups and local residents are invited to participate in the permit application process to provide their views.

Self-monitoring system

4.10 The Dutch environmental legislation prescribes self-monitoring measures on the emission of pollutants from waste incineration plants. Specifically, a waste incineration plant is required to install an automatic system to prevent waste feeding into the plant when the emissions exceed the limit values. Plant operators are also obliged to comply with the emission sampling and measuring standards set out under the legislation.

4.11 In another effort to ensure accurate measurement of pollutant emission, the operator is required to calibrate and perform periodic checks on the proper functioning of the measurement system, as well as conducting annual monitoring and parallel measurement of the measurement system by accredited professionals.

Environmental inspection and reporting

4.12 The provincial government is in charge of conducting environmental inspection of waste incineration plant. Plant operators are required to submit an environmental report to the provincial government on an annual basis describing the impact of their activities on the environment. They are also required to submit a report to the European Pollutant Release and Transfer Register, which is an Europe-wide register that provides environmental data such as amounts of pollutant releases to air, water and land as well as off-site transfers of waste from industrial facilities in the European Union member states.¹³

¹³ The European Pollutant Release and Transfer Register is a publicly accessible electronic database with the objective to enhance public access to information and participation in environmental decision-making.

Public acceptance of waste incineration

4.13 Waste incineration is widely accepted in the Netherlands as the incineration process not only produces relatively inexpensive heat and electricity compared with fossil fuel alternatives, but it is also viewed by the public as a better means compared with landfill disposal.¹⁴ However, there have been isolated instances where the public opposed to the construction of waste incineration plants. For instance, the REC Harlingen waste incineration plant has been commissioned since 2011. When the Friesland provincial government decided to grant an environmental permit to the plant in 2008, the public had raised concerns about the adverse effect on human health and the environment. In fact, the REC Harlingen construction was so controversial that the provincial government ordered the court to conduct an investigation in December 2012 to evaluate the permit granting process so as to provide insight for future projects.

4.14 The court found that the environmental aspects of the plant did not sufficiently address spatial planning and nature conservation. More importantly, the provincial government was reluctant to provide detailed information on the permit granting process, thus failing to win public trust. As such, the court recommended that, amongst others, full consideration of interests of all parties, coherence and transparency in the official authorization process, and a more active and open dialogue between the community and business sector might have gained public support for the waste incineration plant.

Prepared by Diana WONG
26 February 2014
Tel: 2871 2125

Information notes are compiled for Members and Committees of the Legislative Council. They are not legal or other professional advice and shall not be relied on as such. Information notes are subject to copyright owned by The Legislative Council Commission (The Commission). The Commission permits accurate reproduction of information notes for non-commercial use in a manner not adversely affecting the Legislative Council, provided that acknowledgement is made stating the Research Office of the Legislative Council Secretariat as the source and one copy of the reproduction is sent to the Legislative Council Library.

¹⁴ Based on the telephone reply from Rijkswaterstaat on 18 December 2013.

References

1. *Afval Energie Bedrijf*. (2014) Available from: <http://www.aebamsterdam.com/> [Accessed February 2014].
2. CE Delft. (2008) *Future Dutch Waste Policy: Priorities and Leverage Points*. Available from: http://www.cedelft.eu/publicatie/future_dutch_waste_policy%3A_priorities_and_leverage_points/816?PHPSESSID=8c061c8380e46fb49dd6f553235e401c [Accessed February 2014].
3. Dutch Recycling. (2013) *The Case for Export of Residual Waste*. Available from: <http://www.dutchrecycling.com/news/130718%20The%20Case%20for%20Export%20of%20Residual%20Waste.doc/> [Accessed February 2014].
4. Dutch Waste Management Association. (2011) *Netherlands Imports More Waste*. Available from: http://www.wastematters.eu/uploads/media/DWMA_wasteforum_Netherlands_imports_more_waste_sept_2011.pdf [Accessed February 2014].
5. Dutch Waste Management Association. (2012) *Recycling Benefits from Combustible Waste Imports*. Available from: http://www.wastematters.eu/uploads/media/DWMA_Recycling_benefits_from_combustible_waste_imports_November_2012.pdf [Accessed February 2014].
6. Eionet. (2008) *Complete Country Profile for Netherlands*. Available from: <http://iris.eionet.europa.eu/gbr/member-states-summary-information/netherlands/> [Accessed February 2014].
7. Eionet. (2012) *Factsheet for Netherlands*. Available from: http://scp.eionet.europa.eu/facts/factsheets_waste/2009_edition/factsheet?country=NL [Accessed February 2014].
8. European Commission. (2014) *Environment: Waste*. Available from: <http://ec.europa.eu/environment/waste/> [Accessed February 2014].
9. European Environment Agency. (2013a) *Managing Municipal Solid Waste - A Review of Achievements in 32 European Countries*. Available from: http://www.eea.europa.eu/publications/managing-municipal-solid-waste/at_download/file [Accessed February 2014].

-
10. European Environment Agency. (2013b) *Municipal Waste Management in the Netherlands*. Available from: <http://www.eea.europa.eu/publications/managing-municipal-solid-waste/netherlands-municipal-waste-management> [Accessed February 2014].
 11. Government of the Netherlands. (2012) *Main Points on Simplifying Environmental Planning Legislation in The Netherlands*. Available from: <http://www.government.nl/documents-and-publications/reports/2012/06/28/main-points-on-simplifying-environmental-planning-legislation-in-the-netherlands.html> [Accessed February 2014].
 12. Government of the Netherlands. (2014) *Environmental Management Act*. Available from: <http://www.government.nl/issues/environment/roles-and-responsibilities-of-central-government/environmental-management-act> [Accessed February 2014].
 13. GovHK. (2013) *Press Releases: Hong Kong and the Netherlands Sign Agreement on Waste Management Collaboration (with Photos)*. Available from: <http://www.info.gov.hk/gia/general/201305/06/P201305060381.htm> [Accessed February 2014].
 14. LAP. (2003) *Landelijk afvalbeheerplan 2002-2012*. Available from: [http://www.lap2.nl/downloads.asp?c=./sn_documents/downloads/99%20LAP-archief/03%20LAP1_OrigineleVersie\(2003\)](http://www.lap2.nl/downloads.asp?c=./sn_documents/downloads/99%20LAP-archief/03%20LAP1_OrigineleVersie(2003)) [Accessed February 2014].
 15. LAP. (2010) *Landelijk afvalbeheerplan 2009-2021*. Available from: [http://www.lap2.nl/sn_documents/downloads/01%20Beleidskader/versie%202010-02%20\(1e%20wijziging\)/beleidskader-00-compleet_2010-02-16.pdf](http://www.lap2.nl/sn_documents/downloads/01%20Beleidskader/versie%202010-02%20(1e%20wijziging)/beleidskader-00-compleet_2010-02-16.pdf) [Accessed February 2014].
 16. Ministry of Infrastructure and the Environment. (2014) *Rijkswaterstaat Environment*. Available from: <http://rwsenvironment.eu/subjects/waste-circular/> [Accessed February 2014].
 17. Recycling Portal. (2009) *Netherlands: No Expansion of Waste Incineration Capacity Until 2020*. Available from: <http://www.recyclingportal.eu/artikel/23332.shtml> [Accessed February 2014].
 18. Rijksoverheid. (undated) *Omgevingsvergunning*. Available from: <http://www.rijksoverheid.nl/onderwerpen/omgevingsvergunning> [Accessed February 2014].
-