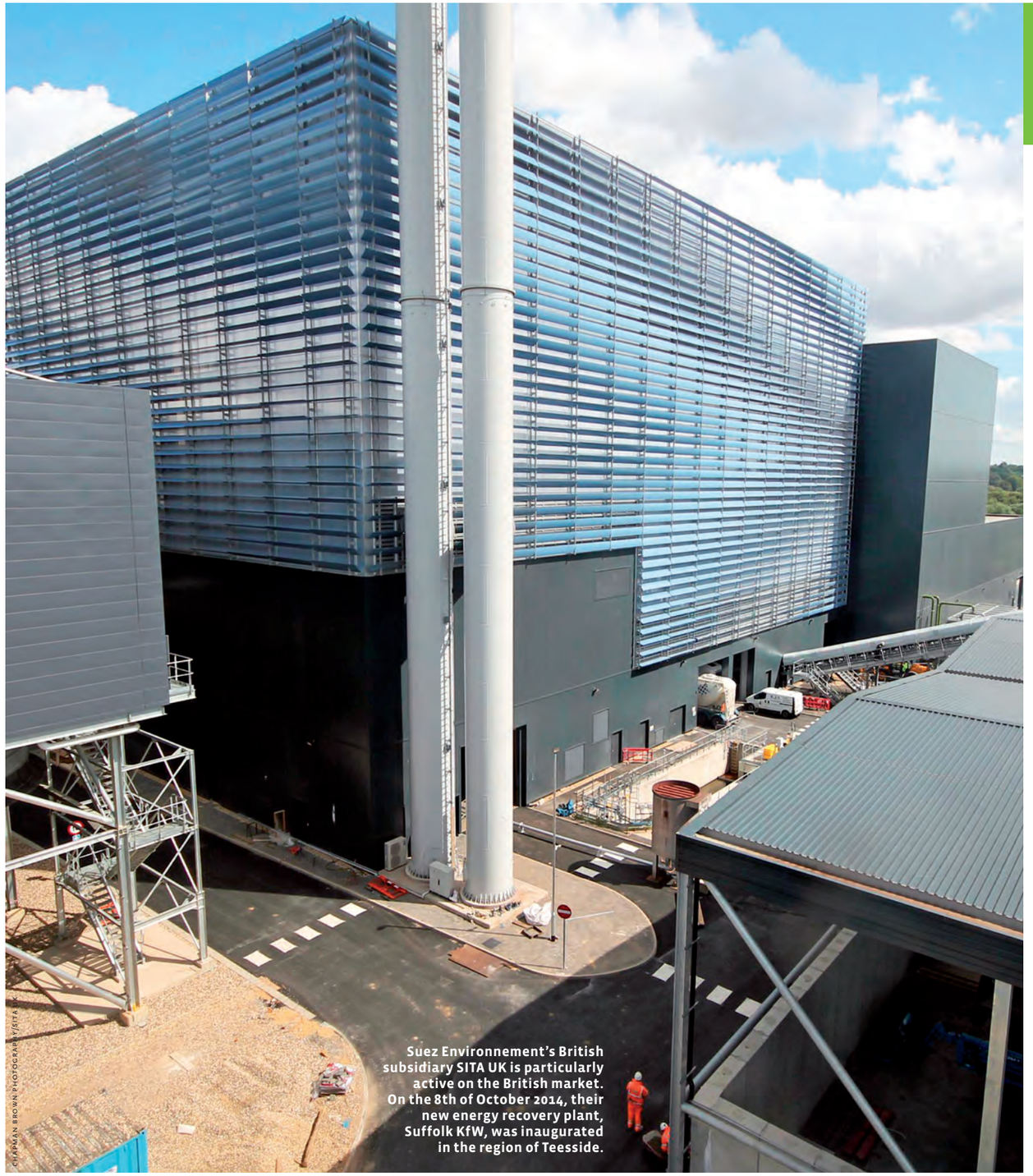


CHAPMAN BROWN PHOTOGRAPHY/SITA UK

Suez Environnement's British subsidiary SITA UK is particularly active on the British market. On the 8th of October 2014, their new energy recovery plant, Suffolk KfW, was inaugurated in the region of Teesside.

+ 0.7 %

The growth of primary energy output from renewable municipal waste in the EU relative to 2013.

RENEWABLE MUNICIPAL WASTE BAROMETER

A study carried out by EurObserv'ER.

Preliminary estimates compiled by EurObserv'ER suggest that the production of primary renewable energy recovered by household refuse incineration plants in the countries of the European Union, only increased by 0.7% in 2013 to achieve 8.7 million toe. On the bright side of things, heat sales to networks surged, which reflected better use of the primary energy.

8.7 Mtoe

Of primary energy produced from the combustion of renewable municipal waste in the European Union in 2013.

18.7 TWh

Electricity output from renewable municipal waste in the European Union in 2013.

RENEWABLE MUNICIPAL WASTE BAROMETER – **EUROBSERV'ER** – NOVEMBER 2014

The Flamoval complex operated by Veolia in Arques (Pas-de-Calais France), processes 92 500 tons of urban waste per year.

EurObserv'ER reckons that the energy recovered from renewable municipal waste incineration that takes into account the organic part (cartons, kitchen waste, etc.) increased slightly in 2013 (by 0.7% over 2012), giving output of about 8.7 Mtoe **(table 1)**. Heat sales to district heating networks stepped up conspicuously in 2013, as synergy between the incineration plants and the heating networks improved. Heat output increased 7.8% over 2012 to reach 2.4 Mtoe **(table 3)**, while electricity output remained stable at 18.7 TWh **(table 2)**. This development demonstrates the increased energy efficiency of the incineration plants that is stimulated by European legislation, primarily through the transposition of the framework directive on waste (2008/98/EC) that encourages operators to optimize the energy efficiency of their plants, primarily by looking for new outlets for heat production. The Directive stipulates that the incinerators can only be classed as waste-to-energy recovery units if they meet minimum yield criteria, which in the case of plant constructed since 31 December 2008 must be at least equal to 65%. The energy efficiency of those constructed prior to 2008 must be at least 60%. If these criteria are not met, the waste incineration process will not be recognized as treatment eligible for waste ranking as imposed by the directive.

HUGE DISPARITIES IN EUROPE

Waste-to-energy recovery in the European Union is a patchwork panorama because of the political divergences on treatment methods and also delayed integration of the new Member States. At the start of the 2000s, the landfill directive of 26 April 1999 (1999/31/EC) really set the ball rolling for the construction of incineration plant totally dedicated to recovering electricity. The directive set a target for reducing the dumping of biodegradable municipal waste: a 75% reduction by 16 July 2006 (compared to the reference year, 1995), then to 50% by 16 July 2009 and 35% by 16 July 2016. A number of countries, such as Germany, the Netherlands, Belgium, Sweden, Austria and Denmark went even further by banning municipal waste dumping altogether. Landfill dumping is now marginal (1-3%) in these countries, which has enabled them to develop their recycling and waste-to-energy recovery concurrently. Other countries further to the South of Europe (Spain, Italy, Portugal, Greece) and also the UK have dragged their feet and still have fairly high municipal waste dumping rates (about 50-60%). Lastly, successive and recent enlargements to include Eastern European countries in 2004 (the EU of 25) and 2007 (the EU of 27) mean that their waste recovery sectors are underdeveloped with landfill dumping rates rising to excess of 90% (65-99%). Their funding requirements are high, and even though they receive aid from the European Union, they will have to make major efforts to meet their obligations.

TOWARDS A CIRCULAR ECONOMY WITHOUT WASTE

The European Commission plans for a waste management watershed. On 2 July 2014 it presented two documents, a communiqué entitled: "Towards a circular economy: a zero waste programme for Europe" and a proposal for a directive amending the directives on waste, packaging and packaging waste, the landfill of waste, end-of-life vehicles, batteries and accumulators and waste batteries and accumulators, and electrical waste and electronic equipment. This directive proposal proposes to adopt a different approach to waste management, namely to make the transition from a linear economic model that terminates at the product end of life to mass production of waste with a more circular economic model founded on re-use, repair and recycling, where waste would be used as a resource and return to the economic circuit to create new products and wealth. According to the European Commission this new approach should create about 580 000 new jobs at the same time boosting Europe's competitiveness and reducing demand for rare and costly resources. The key aims of this proposal coupled with greenhouse gas emission reduction and environmental conservation targets, are to raise the municipal waste recycling rate to 70% and the packaging waste recycling rate to 80% by 2030, but also to ban landfills of any kind of recyclable waste from 2025 onwards and all municipal waste by 2030. These issues will now be up for debate in the European Parliament and European Council, which could pave the way for the adoption of a common text by 2016. While this draft directive sets ambitious proposals, the Commission has set relatively generous deadlines for achieving them by building in allowance for the context in a number of Member States. According to the CEWEP, the Confederation of European Waste-to-Energy Plants, these measures would release the full potential of waste and provide new outlets for affordable bio-waste energy recovery, bearing in mind that energy recovery is only ranked fourth in the waste treatment hierarchy behind prevention, re-use and recycling

NEWS FROM AROUND THE COUNTRIES

Heat recovery makes new ground in the Netherlands

The Netherlands, which produces 51 toe of renewable energy per thousand inhabitants, is one of the most active EU players pursuing energy recovery from household waste by incineration. Statistics Netherlands claims that primary energy output reached 855.3 ktoe in 2013, which is relatively stable (0.7% more) compared to its 2012 output. Along with Germany, the Netherlands actually imports waste. So in 2012 (2013 figures unavailable), about 14% of the waste treated in the country's waste-to-energy plants was imported, and most of that (roughly 700 000 tonnes) came from the UK. The explanation for this import policy is that its ultra-modern incineration plants that were purpose-designed for energy recovery, were over-dimensioned, which has prompted the country to implement waste importing and source it from the UK, which currently does not have enough treatment capacity. The main trend observed is a ↘

240 million tonnes of household waste in Europe

Eurostat claims that more than 80.7 million tonnes of the 240 million tonnes of household waste treated in 2012 (the latest available figures), were still being dumped instead of being reused, recycled or recovered as energy. The figures for waste recycling are 65.9 million tonnes, 35.7 million tonnes for composting and methanization and 58 million tonnes for incineration including 47.8 million tonnes (82.4%) in waste-to-energy plants. For 19 countries of the European Union dumping is still the main municipal waste treatment method and in 15 countries, more than half of the waste tonnage goes into landfills. Some of them have dumping rates close to or in excess of 90% (Romania, Bulgaria, Malta, Latvia and Lithuania). Every European citizen produces an average of 503 kilograms of municipal waste per annum, with individual state differences within the range of 300-700 kilograms.

Table n° 1

Primary energy production from renewable municipal waste in the European Union in 2012 and 2013 (in ktoe)*

Country	2 012	2 013*
Germany	2 595.6	2 728.9
France	1 261.7	1 246.0
Netherlands	849.7	855.3
Italy	806.8	827.6
Sweden	769.5	753.9
United Kingdom	691.0	683.7
Denmark	492.5	482.7
Belgium	333.1	299.8
Finland	193.0	193.5
Spain	175.7	147.3
Austria	143.7	129.9
Portugal	86,0	96.7
Czech Republic	83.7	82.9
Ireland	44.4	48.7
Hungary	45.0	40.7
Poland	32.5	32.5
Bulgaria	20.8	21.0
Slovakia	18.6	19.4
Luxembourg	17.1	17.0
Lithuania	0.0	11.0
Slovenia	7.5	7.4
Malta	0.7	1.0
EU (28 countries)	8 668.7	8 727.0

* Estimate. Source: EurObserv'ER 2014.

significant increase in heat production that Statistics Netherlands puts down to the commissioning of new connections that deliver both to industry (in the form of steam) and district heating networks (hot water production). Thus heat sales increased by 18.3% between 2012 and 2013 to 215.8 ktoe, having already increased by 15.6% between 2001 and 2012. This development hit renewable electricity output, which dropped by 4.6% between 2012 and 2013.

Two-digit growth for heat sales in Germany

Renewable energy output growth through waste-to-energy recovery remained steady in Germany. Preliminary AGEE-Stat estimates suggest that primary energy output exceeded 2.7 Mtoe, which represents a 5.1% year-on-year increase. Heat sales to networks were the main beneficiary of this growth, which rose to two-digits (10.7%) in 2013 over the previous year. This translates into output of 705.6 ktoe, while electricity production also increased by 6.2% (i.e. 5.3 TWh) over the same period. The effects of the new German waste management and recycling law (Kreislaufwirtschaftsgesetz – KrWG) could be responsible. The law stipulates that energy recovery must be maintained at a threshold of at least 11 000 kJ/kg (0.262 toe per tonne of waste), allowing a potentially lower level if a better option for environmental protection is found.

The UK wants to make up for lost time

In the next two to three years, the UK should make up for part of its waste energy recovery shortfall. According to Ecoprog, a German consulting firm specializing in environmental markets, about 20 waste-to-energy incineration plants should be commissioned by 2017 offering 4.6 million tonnes of treatment capacity per annum. This compares to the country's current treatment capacity of 3.28 million tonnes by its 24 incineration plants. These somewhat late decisions need to be put into perspective with British legislation dating back to 1996 that increased the landfill dumping tax annually. The tax levied on "active" waste (the bulk of municipal waste) increased from £ 72 (€ 91) per tonne to £ 80 (€ 101) on 1 April 2013. To avoid paying this tax local authorities and companies prefer export their waste to the Netherlands, Germany and Sweden, which have surplus treatment capacities. In 2012, Wales and England exported about 900 000 tonnes of waste. According to the DECC (Department of Energy & Climate Change) primary energy output from renewable waste declined slightly in 2013 (1.1% year-on-year) to 683.7 ktoe, pending the construction of new plants.

Table n° 2

Gross electricity production from renewable municipal waste in the European Union in 2012 and 2013 (in GWh)*

	2012			2013*		
Country	Electricity only plants	CHP plant	Total	Electricity only plants	CHP plant	Total
Germany	3 118.0	1 832.0	4 950.0	3 268.0	1 987.0	5 255.0
Italy	1 201.5	961.6	2 163.2	1 230.0	977.0	2 207.0
France	1 283.4	943.5	2 226.9	1 243.7	914.3	2 158.0
Netherlands	0.0	2 235.0	2 235.0	0.0	2 133.0	2 133.0
United Kingdom	1 474.1	559.4	2 033.5	1 169.4	817.9	1 987.3
Sweden	0.0	1 662.0	1 662.0	0.0	1 700.0	1 700.0
Denmark	0.0	892.0	892.0	0.0	858.0	858.0
Belgium	537.9	167.2	705.1	484.4	150.6	635.0
Spain	715.0	0.0	715.0	0.0	595.0	595.0
Finland	63.5	270.4	333.8	66.5	283.5	350.0
Portugal	245.0	0.0	245.0	0.0	286.0	286.0
Austria	149.0	91.0	240.0	160.0	47.0	207.0
Hungary	30.0	81.0	111.0	0.0	115.0	115.0
Czech Republic	0.0	87.0	87.0	0.0	84.0	84.0
Ireland	61.2	0.0	61.2	0.0	70,0	70.0
Luxembourg	36.0	0.0	36.0	0.0	36.0	36.0
Slovakia	0.0	27.0	27.0	0.0	29.0	29.0
Lithuania	0.0	0.0	0.0	0.0	19.0	19.0
Malta	0.0	9.0	9.0	0.0	9.0	9.0
Slovenia	0.0	6,1	6.1	0.0	7.4	7.4
Bulgaria	0.0	0.0	0.0	0.0	0.0	0.0
EU (28 countries)	8 914.6	9 824.1	18 738.8	7 622.1	11 118.6	18 740.7

** Estimate.* ***Source: EurObserv'ER 2014.***

THE UK AND POLAND DRIVE THE MARKET

A recent Ecoprog study, "Waste to Energy 2014-2015", reveals that the number of new incineration plant projects has hardly increased over the past few months and it is not expecting any change in the next two to three years. Ecoprog has counted 25 installations in the two most active European Union countries –the UK and Poland –that should come on stream before 2017, as well as the odd new facility elsewhere in the EU. According to the consultancy, future demand in Europe will not only depend on the construction of new plants but also on the expansion of the renovation market as incineration plants retrofit to meet the new standards. It also claims that the reduction in municipal waste output planned in the European legal texts will lead to closure of a number of sites, particularly in Germany that already suffers from considerable waste treatment overcapacity.

Ecoprog adds that European waste legislation over the longer term will result in increasing the demand for waste treatment by incineration because many countries, including those of Eastern Europe, have yet to transpose the European landfill and framework waste directives by 2020. As the European Commission plans to ban landfills altogether in the longer term the demand will increase still further.

Turning to incineration plant operators, they fall into five major categories **(table 4)**– the major French companies like Veolia Environnement and GDF Suez, partly held by public funds, the Spanish companies that are mainly subsidiaries of the major construction groups, the major private companies in Germany held by the Rethman-Remondis and Alba Groups, companies held by private investment funds such as the Dutch AVR Gansewinkel and Biffa and lastly municipal companies, such as the Dutch company, Delta. Most of the waste in Europe's countries is local authority-managed. There are also private companies that have national operations only. If we look at the main developments of the major companies working across Europe, we spotlight the demerger agreement between Dalkia, the energy

Table n° 3

Gross heat production from renewable municipal waste in the European Union in 2012 and in 2013 (in ktoe) in the transformation sector***

	2012			2013*		
Country	Heat only	CHP	Total	Heat only	CHP	Total
Germany	270.1	367.4	637.5	274.0	431.5	705.6
Sweden	48.6	460.7	509.2	54.0	512.5	566.5
Denmark	30.1	283.8	313.8	29.4	277.1	306.5
France	62.5	193.3	255.8	62.5	193.3	255.8
Netherlands	0.0	182.5	182.5	0.0	215.8	215.8
Italy	0.0	71.0	71.0	0.0	83.3	83.3
Finland	10.3	72.2	82.5	10.4	72.5	82.9
Austria	13.9	35.3	49.2	14.4	29.4	43.8
Czech Republic	0.0	35.9	35.9	0.0	35.5	35.5
United kingdom	23.7	0.0	23.7	30.6	0.0	30.6
Belgium	3.3	15.5	18.8	3.0	13.9	16.9
Hungaria	0.0	7.4	7.4	0.0	7.4	7.4
Lithuania	0.0	0.0	0.0	0.0	5.5	5.5
Slovenia	0.0	1.9	1.9	0.0	2.5	2.5
Slovakia	1.1	0.0	1.1	0.0	1.1	1,1
Malta	0.6	0.0	0.6	1.0	0.0	1.0
EU (28 countries)	464.3	1 726.7	2 190.9	479.3	1 881.5	2 360.8

** Estimation. ** Heat sold to district heating networks..* ***Source: EurObserv'ER 2014.***

RENEWABLE MUNICIPAL WASTE BAROMETER – **EUROBSERV'ER** – NOVEMBER 2014

View of the grab and pit inside the Waste-to-Energy Center of Tiru group (EDF) in Villefranche-sur-Saône (Rhône).

/ JEAN-ROMAIN PAC/TIRU

services enterprise that was formerly a Veolia Environnement subsidiary, and EDF. Under the agreement's terms, all the business in France has been transferred to EDF while all the international business has reverted to Veolia. The demerger agreement also provides for Veolia to transfer 550 million euros to EDF to compensate the difference in value between the holdings.

In another development, the German electrical utility E.ON has finalized the partial sale of its E.ON Energy from Waste AG (EEW) subsidiary to EQT, a Swedish investment fund by making over 51% of the shares. EEW has about 18% of the

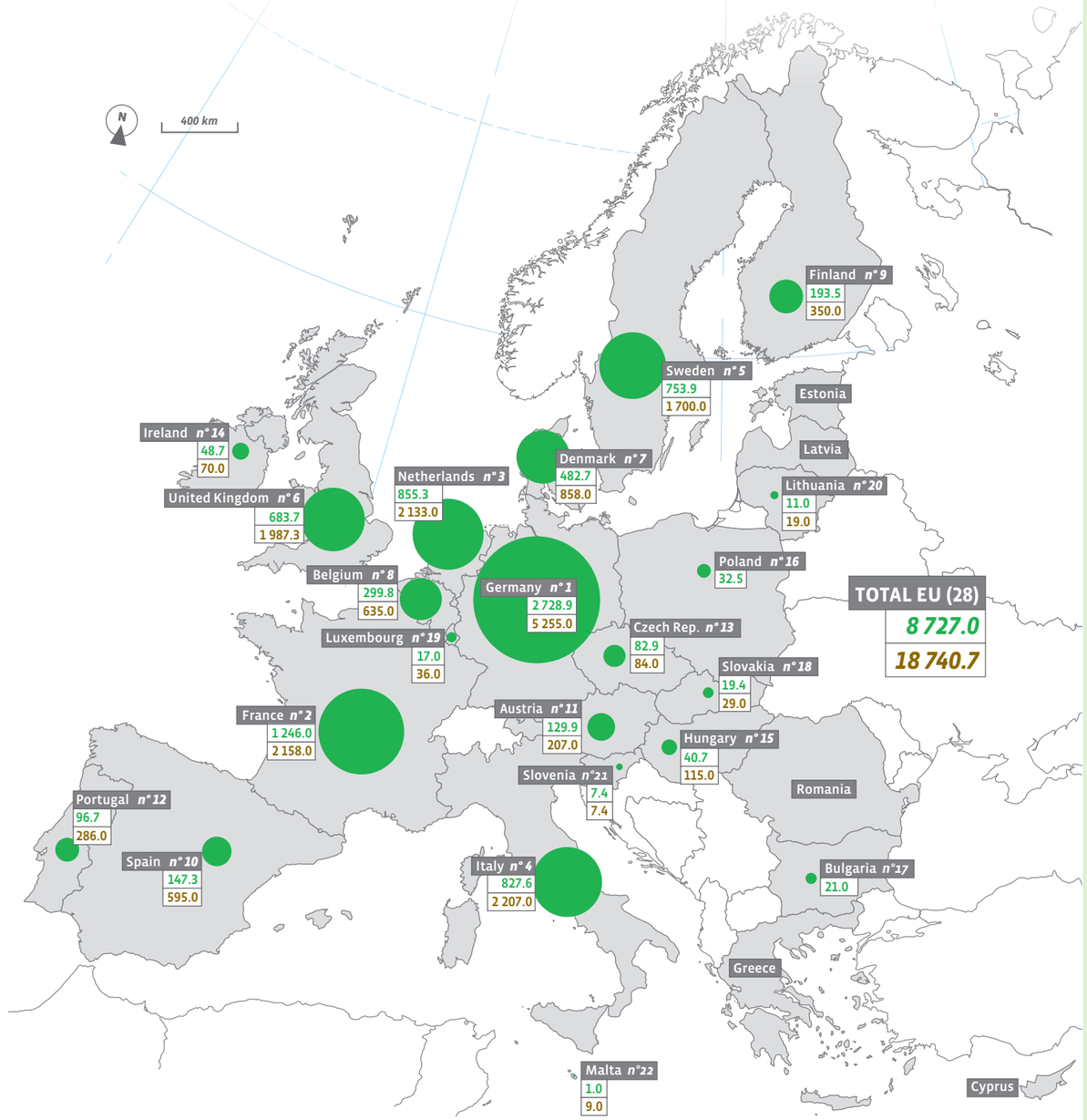
Table n° 4

Representative firms of the incineration sector in Europe in 2014

Entreprises	Country	Tons of waste incinerated	Number of waste to energy plants	Energy production in 2013 (GWh)
EEW Energy from Waste	Germany	4 731 000	14	4 634 (electricity and heat)
Remondis	Germany	4 552 000	19	n.a.
SITA (Suez environnement)	France	4 500 000	36	1 500 of electricity and 1 650 of heat
Veolia(1)	France	n.a.	58	n.a.
Tiru (EDF)	France	3 300 000	21	2 540 (electricity and heat)
Urbaser	Spain	1 906 000	8	1 144 electricity
Gruppo Hera	Italy	1 410 000	10	1 054 electricity
AEB Amsterdam	Netherlands	1 400 000	2	1 000 electricity

(1) In France, Veolia operates 61 incineration plants, out of which 58 are waste to energy plants (including treatment of hazardous waste).
Source: EurObserv'ER 2014

Primary energy production and gross electricity production from renewable municipal waste in the European Union in 2013 (in ktoe)*



Key

8,959 *Primary energy production from renewable municipal waste combustion in the European Union in 2013* (in ktoe).*

8,959 *Gross electricity production from renewable municipal waste in the European Union in 2013* (in GWh).*

** Estimate.* ***Source: EurObserv'ER 2014.***

VINCENT RUSTUEL/ANGELS'SEA STUDIO

Ecostu'Air is one of the last generation Waste-to-Energy incineration plants. It processes the waste coming from 136 towns of Seine-Maritime (76), which represents 142 000 tons of waste per year.

German waste incineration market with 19 incineration plants (13 of which belong to the company), with combined treatment capacity of 4.5 million tonnes and energy recovery standing at about 1 700 GWh of electricity and 2 400 GWh of heat. In 2013, EEW generated 514 million euros' worth of sales and employed 1 300 people.

Looking at new completions, Suez Environnement's British subsidiary SITA UK is particularly active on the British market. On 8 October 2014, it inaugurated its new energy recovery plant, on Teesside. The contract between the consortium led by SITA UK and the South Tyne and Wear Waste Management partnership, covers the treatment of 190 000 tonnes of residual household waste per annum from the local authorities of Gateshead, South Tyneside and Sunderland. The plant will be equipped to treat 256 000 tonnes and produce electricity for about 30 000 households. SITA UK has many public-private partnerships (PPPs) in the UK, on both the operating and development fronts. In January 2014, SITA UK announced it was signing a PPP contract with its partners Sembcorp Utilities UK and Itochu Corporation. The consortium, SITA Sembcorp UK, is responsible for the funding, construction and operation of a new 49-MW plant designed to treat more than 430 000 tonnes of household waste per annum, that should produce sufficient energy to supply the equivalent of 63 000 households with electricity. In November 2013, it announced that through a consortium led with Scottish Widows Investment Partnership and Itochu Corporation, it would be designing, constructing and operating the SERC (Severnside Energy Recovery Centre) waste-to-energy plant to process 96% of West London's waste at the rate of 300 000 tonnes per annum. The 34-MW facility is set to produce enough electricity to supply the equivalent of 50 000 households. It could also supply local businesses with hot water and thus further improve its environmental performance. Suez Environnement also has a foothold in the Polish market through its SITA Polska subsidiary. At the end of December 2012, the city of Poznań signed a PPP with Zielona Energia, a common subsidiary of SITA Polska and Marguerite Waste Polska (a subsidiary of the Marguerite private investment fund). The consortium will be responsible for designing, funding and operating a waste-to-energy plant with a design capacity to treat 210 000 tonnes of waste by 2016. The plant will operate in cogeneration and have 15 MW of electrical capacity and 34 MW of thermal capacity that will supply Poznań's heating network.

ACCELERATION PLANNED FROM 2017 ONWARDS

For the time being, primary energy output from waste-to-energy recovery is enjoying restrained growth. Nonetheless, pressure from Europe is gradually trickling through and sparking off investment decisions, primarily in Eastern Europe most of which is facing a blank canvas. It stands to reason that if these countries are to fall in line, they will have to start investing in waste-to-energy recovery in the second half of this decade and appreciably more from 2017 onwards. This should give the sector new impetus over the medium term. Looking at prospects, CEWEP estimates that the energy contribution of waste to the renewable energy directive targets could realistically reach 67 TWh by 2020 distributed respectively between 25 TWh of electricity and 42 TWh (3.6 Mtoe) of heat. The 2020 potential is assessed at 98 TWh split between 37 TWh of electricity and 61 TWh (5.3 Mtoe) of heat. The Confederation points out that the total contribution of municipal waste, renewable and otherwise, would double those figures, namely 134 TWh by 2020, for a potential of 196 TWh.

EurObserv'ER estimates that this target would require a 1.2-Mtoe increase in final energy consumption (heat and electricity) by 2020, i.e. a mean annual increase of 3.4% up to that time line. The projection is in keeping with the sector's momentum and its current growth prospects. □

Sources: Statistics Austria, Ministry of Industry and Trade (Czech Republic), SOeS (France), AGEE-Stat (Germany), Ministry of Economic Development (Italy), Statistics Lithuania, STATEC (Luxemburg), Statistics Netherlands, The Institute for Renewable Energy (Poland), DGGE (Portugal), Energy Center Bratislava (Slovakia), IDAE (Spain), DECC (United Kingdom), Observ'ER, AIE.

The next barometer will cover solid biomass

Download

EurObserv'ER is posting an interactive database of the barometer indicators on the www.energies-renouvelables.org (French-language) and www.eurobserv-er.org (English-language) sites. Click the "Interactive EurObserv'ER Database" banner to download the barometer data in Excel format.

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