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Impact of EU Legislative Developments on the Waste-to-Energy Sector

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Looking at the evolution of the municipal waste management in the EU during the last two decades, one can come to several observations. Firstly, we can see a steady decline in landfilling. Secondly, there was a substantial growth in recycling and composting rates, followed by an increase of waste incineration capacity. With regard to municipal waste generation, although the amount of waste per capita decreased during last fifteen years, it is still rather high (c. 475 kg/capita) and prone to fluctuations [7]. For some, these developments are not satisfactory, as they place the EU still rather far away from a real circular economy.

In this context, the last years alone have been an intensive period for the EU institutions, Member States and other stakeholders trying to envisage a transition to a more resource efficient and less waste generating society. This push will of course also impact Waste-to-Energy sector. From the review of the EU waste legislation, through the European Commission's Communication on Waste-to-Energy, to the work on the review of Waste Treatment and Waste Incineration BREFs, all these legislative proposals raise many questions with regard to *raison d'être* of Waste-to-Energy sector. Will it be still feasible to run Waste-to-Energy plants? Will it be allowed to build new plants? Is the sector part of the circular economy at all?

In this article we are going to consider these and other issues that might impact the Waste-to-Energy sector in the coming years. We have divided them into three sections representing a full legal landscape: policy, technical regulations and financing.

1. Policy

1.1. Circular economy package

The review of the European waste laws has been a classic example of EU lengthy legislative procedures. The first proposals of the so-called Circular Economy Package were published and then withdrawn in 2014, and current drafts were issued in December 2015. However, hopefully the works on the Package are finally coming to an end. During the drafting of this article, the outcome of the negotiations between the EU institutions (so-called *trilogues*) were not known yet. We will therefore focus on general considerations regarding the likely impact that the new legislation can have on Waste-to-Energy.

For the Waste-to-Energy sector, the draft Waste Framework Directive [9] and the Landfill Directive [8] are the key pieces of legislation. Although the acts rarely refer directly to waste incineration or energy recovery, the topic has been present during the legislative works at the European Parliament and the Council of the EU.

For example, in 2016 while discussing the proposals at the Parliament's Committees some Members of the European Parliament proposed to add caps on incineration to the draft Directives proposed by the European Commission. The final version of the European Parliament's amendments to the proposals did not keep such extreme measures, but still included provisions directly targeting Waste-to-Energy. For instance, the amendment 5. to the Landfill Directive called for ensuring that minimising landfilling does not lead to a shift towards incineration, while the amendment 11. suggested considering an introduction of incineration limits in the future. Although these amendments concerned recitals that form the non-binding part of a legislative act, they show clearly the European Parliament's attitude towards Waste-to-Energy.

On the other side, the position of the Council of the EU, composed of the EU Member States, did not foresee such provisions. It is therefore probable that the final outcome of the negotiations between the Parliament and the Council will keep the *status quo* with regard to Waste-to-Energy.

One of the more concrete issues that are under discussion during the trilogues is the definition of recycling and which activities can be included in its scope. In the Commission's proposal for the Waste Framework Directive the art. 11a(5) introduced a possibility to count metals recovered in conjunction with incineration towards the recycling targets. The Parliament tabled an amendment allowing counting metals also from co-incineration. In turn, the Council went back to the original version concerning metals, but it also added an amendment that would allow minerals recovered in co-incineration plants (but not incineration plants) to be counted towards recycling targets. Such provision could lead to an increased demand for waste from cement kilns plants – and to be specific, pre-treated Refuse Derived Fuel. It could have an impact

on the quality of remaining waste that will be not only unsuitable for recycling, but also more difficult for Waste-to-Energy plants: with lower calorific value and more pollutants. Taking into account a fluctuating nature of cement production due to the link with economic activities, co-incineration of waste in cement kiln plants should not be prioritised as a management option for residual waste. There is also no reason why not to count minerals from the incineration bottom ash (IBA) towards recycling as well, as it constitutes a useful construction material.

As far as other provisions are concerned, the proposal of the European Parliament to increase the recycling target, from 65 percent to 70 percent in 2030, could raise questions whether there will be enough supply for existing Waste-to-Energy capacity, not to mention new capacities. It is though important to note that the targets concern only municipal solid waste, and does not take into account commercial and industrial waste that can compose up to 50 percent of Waste-to-Energy plant's feedstock. However, currently there is no reporting obligation for this type of waste, so it is difficult to assess these waste flows at the EU level. For Waste-to-Energy sector, the inclusion of these data would clarify how much capacity is realistically needed in the EU.

The Commission's proposal for a new Waste Framework Directive did not tackle this issue, but the European Parliament partly addressed it in its amendment to the art. 11(4)(a) of the Waste Framework Directive. It included a provision that *the Commission shall examine the possibility of setting preparing for re-use and recycling targets that apply to commercial waste, non-hazardous industrial waste and other waste streams to be met by 2025 and 2030. To that end, by 31 December 2018, the Commission shall draw up a report, accompanied by a legislative proposal, if appropriate, which shall be sent to the European Parliament and the Council.* A similar amendment was introduced to the draft of the Landfill Directive. Lack of reporting obligation seems though to render the amendment difficult to implement in practice.

Nevertheless, one should keep in mind that again the Council of the EU has a more down-to-Earth approach with regard to the targets, therefore the final numbers will probably be lower than the ones proposed by the European Parliament. It applies also to landfilling targets, as the European Commission and the Council of the EU have been leaning towards granting Member States, in particular from Central and Eastern Europe, a longer period of time for reducing their landfill rate. Such an extension could be an impediment to investments into new integrated waste treatments facilities, including Waste-to-Energy, in these parts of the EU.

Finally, we should mention the European Parliament's amendment introducing a list of measures aimed at fostering transition to the Circular Economy. One of them is an incineration tax. Member States have of course an exclusive competence with regard to taxation, so implementation of such a tax would depend on the country's discretion. The experience shows that taxing incineration does not necessarily lead to increased recycling rates [1], but it could be simply an attractive source of income for a national budget.

[1] Sweden introduced taxation of incineration of household waste in 2006, but repealed it in 2010. It was observed that the tax did not have any significant effect on improving recycling rates [16]

1.2. Waste-to-Energy communication

The beginning of the year 2017 was marked with the publication of a document closely linked to the Circular Economy Package and entirely dedicated to the Waste-to-Energy sector, as its name clearly indicates: *The Communication on the Role of the Waste-to-Energy in the circular economy* [2]. Although not binding, it should be considered as a manifestation of the European Commission's political views regarding the sector. This relatively short document (10 pages) surprisingly focuses on anaerobic digestion as the key Waste-to-Energy technology, despite the fact that this technology treats only biodegradable fraction of waste. This was even more surprising to us, as the initial communication should have been released with the *Clean Energy for all Europeans* package in November 2016 and would have focussed on the added value Waste-to-Energy could bring from an energy perspective.

Regarding the thermal energy recovery from waste, the Communication is, to say the least, rather sceptical. It suggest that the countries where Waste-to-Energy sector is well developed should envisage incineration taxes or even a moratorium on new plants. For the EU Member States with low or non-existent waste incineration capacity, the Commission again focuses on promoting anaerobic digestion. But it also acknowledges that Waste-to-Energy can still constitute part of an integrated waste management plan.

The Commission's position is motivated with a statement that the amount of available feedstock for Waste-to-Energy processes is expected to fall. However, this assumption is not confirmed by the study *Towards a better exploitation of the technical potential of waste-to-energy [15]* that was supposed to underpin the Communication. The study, prepared by the EU Joint Research Centre (JRC), reviews various Waste-to-Energy *pathways* (i.a. waste incineration plants, co-incineration in cement kiln plants and anaerobic digestion) and presents its current use and possible future developments.

The authors also assess potential evolution of feedstock available for Waste-to-Energy processes. They conclude with an opinion that *(…) despite the existing potential for waste prevention and reduced generation of these streams [household and similar waste] through better and more widespread source-separated collection, energy recovery is likely to increase to support the necessary massive diversion from landfill. Moreover, higher recycling rates for other waste types may lead to a further increase in the generation of sorting residues, unless the quality of the materials collected separately at source improves.[15, p. 9]*

Scenario	Energy recovered – Average PJ	Improvement Potential PJ	Energy Recovered – Optimised PJ
WI power	110	71	181
WI heat	275	65	340
Cement plants	176	12	188
AD electricity	70	-38	32
AD heat	33	0	33
AD fuel	12	86	98
Total	**676**	**173**	**872**

Table 1:

Summary of Waste-to-Energy technical potential

Source: JRC's study

The second conclusion of the study is that it is possible to increase the efficiency of Waste-to-Energy, and waste incineration is the technology with the highest technological potential.

It is therefore not clear to us why the Communication and the JRC study seem to have contradicting messages.

1.3. Clean energy package

The second big piece of legislation that is currently under discussion at the European Parliament and the Council of the EU is the *Clean Energy for All Europeans* package, called in short Clean Energy Package.

The package, published in November 2016, contains several legislative proposals, out of which the the revised Renewable Energy Directive (RED II) is of the biggest interest for the Waste-to-Energy industry [10].The draft concerns Waste-to-Energy sector only in few places, but it can influence plant's way of operating.

The European Commission's proposal for RED II keeps the definition of biomass from the current Directive generally unchanged (art. 2(c)). It includes *the biodegradable fraction of waste, including industrial and municipal waste of biological origin*, which means that part of energy generated in Waste-to-Energy plants can be labelled as renewable. It is relevant for several reasons. Firstly, it means that such energy would qualify for financial support schemes for electricity. However, the set-up of support schemes for renewables depends on Member States, and the ongoing trend is to limit state aid for renewables.

Together with the definition of biomass there arises the question of sustainability criteria. The European Commission recognised in the draft RED II Directive that there are no sustainability issues when using the biodegradable fraction of waste. After all, in contrast to raw biomass, which is used only once as an energy source, municipal waste of biogenic origin served as a product before being transformed into energy. It is therefore an implementation of the *cascading use of biomass* approach.

Another interesting provision in the RED II for the Waste-to-Energy sector concerns mainstreaming renewable energy in the heating and cooling sector (art. 23). Assuming that energy from biodegradable fraction of waste is considered renewable, then Waste-to-Energy can play a useful role in fulfilling the envisaged target of increasing renewable heating and cooling of 1 percent every year. What is interesting, there is one reference to Waste-to-Energy and heating in the explanatory memorandum (page 15): *Furthermore, district heating systems represent an important infrastructural technology to facilitate increased total conversion efficiencies of waste-to-energy plants.*

The proposals are currently discussed by the Committees at the European Parliament. As in the case of the Circular Economy Package, some MEPs show a rather negative attitude towards Waste-to-Energy. Among proposed amendments to the RED II Directive, there are a few that target financial support for energy recovered from the municipal waste of biogenic origin. For instance, amendment 416 to the draft opinion of the

Environment Committee states that: *By way of derogation from paragraph 1, Member States shall ensure that no financial support is provided for the extraction of energy from incineration of municipal waste nor for co-incineration in cement kilns by 2021.*

However, at this stage of the legislative process it is difficult to make any more concrete forecasts as the texts might still substantially change before being adopted.

1.4. Plastics strategy

The Commission is also currently drafting two Communications related to plastics: the EU Strategy on Plastics [14] and the Analysis of the interface between chemicals, products and waste legislation and identification of policy option [13], to be published in the fourth quarter of 2017. As they are non-legislative initiatives, they will not create any binding obligations. Nevertheless, they aims is to address i.a. the issue of plastics recyclability and plastics waste and propose future measures.

As Waste-to-Energy treats plastics that are unsuitable for recycling due to presence of substances of concern or insufficient quality, it should be highlighted that energy recovery supports quality recycling.

2. Technical regulations

Year 2017 was marked by a release of the draft 1 of the Waste Incineration (WI) Best Available Techniques (BAT) Reference Document (WI BREF) prepared by the European Integrated Pollution Prevention and Control Bureau (EIPPCB). The review was triggered in accordance with the Industrial Emission Directive (IED) [3] that is an overarching piece of legislation regulating environmental performance of various industry sectors.

According to the IED, each sectorial BREF has to be reviewed every eight years. As the first WI BREF was published in 2006 [12], the review process started already in June 2014. It included collecting of a great deal of operational data and technical knowledge provided by the operators and members of the Technical Working Group (TWG, composed of representatives of the Member States. industry and NGOs).

The draft 1, issued in May 2017 [1], keeps the structure of the WI BREF from 2006. On the other hand, there is an important change to the legal status of Chapter 5 of the BREF – BAT Conclusions. In the new BREF, BAT Conclusions will be binding, contrary to their current status, where they are only a set of guidelines. As they establish the emissions levels associated with BATs (so-called BAT-AELs), it means that permit authorities and plant operators will be obliged to respect these values.

With regard to the content of the draft 1 WI BREF, certain proposed BAT-AELs are stricter than the current ones, whereas others are kept at the same value, or in one case, when the pollutant (CO) was identified as a non-key environmental issue – the higher end was raised. However, generally the emission levels in proposed in the draft are lower than the emission limit values (ELVs, maximum allowable limits that cannot

be exceeded) set in the IED. Apart from the question of their feasibility, one should also consider the ambiguous relation between the BATAELs and the ELVs. For the moment, there is an ambiguity stemming from the fact that according to the IED, the ELVs concern so-called Normal Operating Conditions. However, the IED makes an exception for waste incineration and refers to Effective Operating Time as the basis for compliance. The latter is a larger category, as it also includes Other Than Normal Operating Conditions. As the draft does not clarify which category the BAT-AELs refer to, it might be confusing for the permit writing authorities.

The values are described in the tables here after:

Table 2: Emissions to air

Parameter	WI BREF 2006		WI BREF D1 2017		
Emissions to air mg/Nm³ unless stated	BAT-AEL		BAT-AEL		Averaging period
	Daily average	Half-hourly average	New plant	Existing plant	
Dust	1 – 5	1 – 20	2 – 5 (1)		Daily average
Cd+Tl	0.005 – 0.05		0.01 – 0.02		Average over the sampling period
Sb+As+Pb+Cr+Co+ Cu+Mn+Ni+V	0.005 – 0.5		0.05 – 0.3		
HF	< 1	< 2	< 1	< 1	Daily average or average over sampling period
HCl	1 – 8	1 – 50	2 – 6 (2)	2 – 8 (2)	Daily average
SO_2	1 – 40	1 – 150	10 – 30	10 – 40	
NO_x	40 – 100 (SCR) 120 – 180 (SNCR)	40 – 300 (SCR) 30 – 350 (SNCR)	50 – 120 (3)	50 – 150 (3) (4)	
CO	5 – 30	5 – 100	10 – 50	10 – 50	
NH_3	< 10	1 – 10	3 – 10 (3)	3 – 10 (3) (5)	
TVOC	1 – 10	1 – 20	3 – 10	3 – 10	
PCCD/F (ng I-TEQ / Nm³)	0.01 – 0.1 ng/m³ (non-continuous sample)		< 0.01 – 0.04 (6)	< 0.01 – 0.06 (6)	Average over the sampling period or long-term sampling average
PCCD/F + dioxin-like PCBs PCBs (ng WHO-TEQ/Nm³)	No BAT-AEL for PCBs		<0.01 – 0.06 (6)	<0.01 – 0.08 (6)	
Hg	0.001 – 0.02	0.001 – 0.03	5 – 20 (µg/Nm³) (7)	5 – 25 (µg/Nm³) (7)	Daily average, long-term daily average, or average over the sampling method

(1) 2 – 7 for existing plants where a bag filter is not applicable
(2) The lower end of the BAT-AEL range can be achieved when using a wet scrubber; the higher end may be associated with the use of dry sorbent injection
(3) The lower end of the BAT-AEL range can be achieved when using SCR
(4) The higher end of the BAT-AEL range is 180 mg/Nm³ where SCR is not applicable
(5) For existing plants fitted with SNCR without wet abatement techniques, the higher end of the BAT-AEL range is 15 mg/Nm³
(6) Either the BAT-AEL for PCDD/F or the BAT-AEL for PCCD/F + dioxin-like PCBs applies
(7) The lower end of BAT-AEL ranges can be achieved when using fixed-bed adsorption or a wet scrubber enhanced with the use of oxidants; the higher end of the BAT-AEL ranges can be achieved when using dry sorbent injection

Parameter mg/Nm³	WI BREF 2006	WI BREF D1 2017	Averaging period
Dust	No BAT-AEL	2 – 5	Average over the sampling period

Table 3:

Emissions to air from the treatment of slags and bottom ashes

Table 4: Emissions to water

Parameter mg/l unless started	BAT-AEL	WI BREF 2006 Averaging period	WI BREF D1 2017 BAT-AEL (daily average)
TSS	10 – 30 (95 %) 10 – 45 (100 %)	spot daily or 24 hours flow proportional sample	10 – 30
TOC	No BAT-AEL		15 – 40
As	0.01 – 0.15	Monthly measurements of a flow proportional representative sample of the discharge over a period of 24 hours with one measurement per year exceeding the values given, or no more than 5 % where more than 20 samples are assessed per year	0.01 – 0.05
Cd	0.01 – 0.05		0.005 – 0.03
Cr	0.01 – 0.5		0.02 – 0.08
Cu	0.01 – 0.5		0.03 – 0.15
Hg	0.001 – 0.03		0.001 – 0.01
Ni	0.01 – 0.5		0.03 – 0.15
Pb	0.01 – 0.1		0.02 – 0.08
Tl	0.01 – 0.05		0.005 – 0.03
Zn	0.01 – 1.0		0.01 – 0.5
Sb	0.005 – 0.85		No BAT-AEL
Co	0.005 – 0.05		No BAT-AEL
Mn	0.02 – 0.2		No BAT-AEL
V	0.03 – 0.5		No BAT-AEL
Sn	0.02 – 0.5		No BAT-AEL
NH_4-N	No BAT-AEL		10 – 30
SO_4^{2-}	No BAT-AEL		400 – 1,000
PCDD/F	0.01 – 0.1 (ng TEQ/l)	average of 6 monthly measurements of a flow proportional representative sample of the 0.01 – 0.1 discharge over a period of 24 hours	(ng I-TEQ/l)
Chemical oxygen demand	50 – 250	spot daily, or 24 hour flow proportional sample	No BAT-AEL
pH	pH 6.5 – pH 11	continuous measurement	No BAT-AEL

Source: WI BREF 2006 and WI BREF Draft 1 2017

Additionally, there is a risk that the proposed values cannot be measured with the certainty required by the IED. The industry has been proposing to clarify the issue of measurement certainty within the Reference Report on Monitoring (so-called ROM) [6]. However, it is only a partial solution to the problem because the ROM acts only as an additional guidelines on monitoring standards. Permitting authorities, while setting ELVs for a given plant, will base their decisions mostly on the WI BREF and the IED.

Hence, it is important to ensure that the WI BREF is feasible to implement and offers legal certainty for plant operators. In order to improve the situation, the TWG Members advocate improving the transparency of the process. The method of deriving BAT-AELs for the WI BREF draft 1 was not clear to us nor did it seem explained in a clear manner to the TWG Members. The values should be plotted in relation to each other, in order to avoid *Frankenstein plants*, which would need to have the lowest emissions, but also the lowest reagent and energy consumption. Moreover, as it was mentioned above, the permitting authorities will most probably use only BAT Conclusions to draft permits, since this is the sole chapter of BREFs translated into all EU languages. It is therefore primordial to take up the TWG Members comments aiming at adding definitions and clarifying the BAT Conclusions so that they can be used as a stand-alone document.

The review will now move to the assessment of the submitted comments by the EIPPCB. Later, we can expect further exchange of suggestions and remarks within the process, with the Final TWG Meeting sometime in 2018. After the Final Meeting, the final draft will have to be presented at the formal meetings in Brussels: so-called the Art. 13 Forum and the Art. 75 Committee. The first one has only an advisory role, but the latter, composed of the Member States, votes on the adoption of the BREF. If the document is adopted, then the European Commission publishes it as an implementing decision. Since we can expect this publication in 2019, all operating permits will have to be reviewed by competent authorities by 2023, so within four years. New BAT-AELs might mean that refurbishments would be needed. The next chapter of this paper will therefore describe available public funding options for the Waste-to-Energy.

3. Financing

3.1. European structural and investment funds

As this paper focuses on the EU legislation, in this section we will only concentrate on financing options available through the EU funds. It is nevertheless a substantial amount of money, as for example in the programming period for 2007 to 2013 105 billion EUR was dedicated to climate and environment, out of which 6,2 billion was spent on waste management projects (including Waste-to-Energy).

In the current programming period for 2014 to 2020, Waste-to-Energy projects can be financed with a couple of funding sources that together make up the so-called European Structural and Investment Funds. They are managed by the Member States themselves, but the European Commission supervises the execution of Partnerships Agreement that describe how a given fund should be used.

The first fund is the Cohesion Fund. It is available for the countries whose gross National Income per capita is lower than 90 percent of the EU average. For the programming period 2014 to 2020, these are the following Member States: Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. The fund focuses on transport and environment, and one of the priorities is waste management.

The second fund, the European Regional Development Fund (ERDF) is available for regions from all Member States, but the more developed a given region is, the more focus should be given to the Fund's priorities when allocating money. Waste management is also one of the priorities of the ERDF.

In the current programming period, the emphasis is put on ensuring correct implementation of the EU regional policy. It is done i.a. though applying horizontal or sector-specific *ex-ante* conditionalities (art. 19 of the Regulation (EU) No 1303/2013). For waste management sector it means adopting strategic documents, such as waste management and prevention plans, and implementation reports [4]. The aim of this exercise is to ensure and foster the implementation of the circular economy principles: the application of waste hierarchy, prioritising prevention, re-use, recycling and recovery.

Such an approach means that potential Waste-to-Energy projects need to prove their compatibility with a national waste management plan. The example of the Czech Partnership Agreement shows that this condition is treated seriously by the European Commission. In the *Observations on the Partnership Agreement with Czech Republic* [11] the Commission stated outright that Czech Republic's wish to invest in new Waste-to-Energy capacity in not justified as long as there is no comprehensive legal framework ensuring that waste targets will be complied with [11, p. 9].

The Waste-to-Energy Communication follows this approach and underlines that *extra incineration capacity would only be granted in limited and well justified cases, where there is no risk of overcapacity and the objectives of the waste hierarchy are fully respected [17].*

3.2. European fund for strategic investment

In addition to the ESIF funds, the EU also offers financing solutions through the European Fund for Strategic Investment (with confusingly similar abbreviation – EFSI). Contrary to ESIF that could be described as grants, EFSI was designed to provide guarantee for projects with a higher risk profile. The Fund is operated by the European Investment Bank (EIB) in Luxemburg. In order to be approved, projects also need to comply with the objectives of the EFSI. Environment and secure energy supplies are one of them.

Modernisation of the Waste-to-Energy plant in Warsaw, Poland, is one example of a project supported with EFSI resources. The EIB agreed to finance maximum fifty percent of project costs (approximate total cost: EUR 248 million) in a form of loan with a payback time of twenty years [5].

4. Conclusions

Although the final shape of new laws is not known at the moment of writing this text, it is visible that the trend to a more circular economy will continue, meaning that the role of Waste-to-Energy will have to change. Connection to district heating network (in places with demand for heat), recovery of metals and bottom ash, production of salt and calcium brine, etc. – there are many solutions that can be implemented in Waste-to-Energy plants which increase their contribution to the circular economy. Of course, the choice of solutions depends on a specific situation of a plant (e.g. location, technology used, size).

Nevertheless, even if some Western European countries have less need for new Waste-to-Energy capacity, they will still need to replace some aging plants. At the same time, Central and Eastern European countries still have a high landfilling rate and as it was stated in the cited study by the JRC, new capacity will be needed to accommodate the diversion from landfills. We can therefore expect that in the future Waste-to-Energy investments will still happen, but in a more targeted way, ensuring that the integrated waste management approach is maintained.

5. Sources

[1] Best Available Techniques (BAT) Reference Document on Waste Incineration, Draft 1 (May 2017)

[2] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on The role of waste-to-energy in the circular economy (COM(2017) 34 final)

[3] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), 2010

[4] Guidance on Ex ante Conditionalities for the European Structural and Investment Funds. Part II, European Commission, February 2014

[5] http://cor.europa.eu/en/events/Documents/ECON/Conference-investment-plan-29062017/2017.06.29%20-%20STRUZIK%20PL.pdf, 2016/2017

[6] JRC Reference Report on Monitoring of Emissions to Air and Water from IED installations, Revised Final Draft

[7] Municipal waste statistics, Eurostat

[8] Proposal for a Directive of the European Parliament and of the Council amending Directive 1999/31/EC on the landfill of waste (2015/0274(COD))

[9] Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste (2015/0275(COD))

[10] Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast) (COM(2016) 767 final/2)

[11] Ref. Ares(2014)2054836 - 23/06/2014

[12] Reference Document on the Best Available Techniques for Waste Incineration, August 2006

[13] Roadmap on Analysis of the interface between chemicals, products and waste legislation and identification of policy options, 27th January 2017

[14] Roadmap on Strategy on Plastics in a Circular Economy, 26 January 2017

[15] Saveyn, H.; Eder, P.; Ramsay, M.; Thonier, G.; Warren, K.; Hestin, M.: Towards a better exploitation of the technical potential of waste-to-energy. EUR 28230 EN. 2016

[16] Skatt I retur SOU 2009:12, Betänkande av ASKA-utredningen, Governmental inquiry, ISBN 978-91-38-23147-0, 2009

[17] The Communication on the Role of the Waste-to-Energy in the circular economy, p. 5

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