

International Workshop *From waste to energy: technology, the environment and the implications under EU law*

October 22, 2015, at the **FACULTÉ LIBRE DE DROIT, Université Catholique de Lille**

Municipal solid waste may have ‘...the opportunity to become a precious source and fuel for the urban sustainable energy mix of tomorrow’.¹ In the first years of this decade, the increase in venture capital and private equity business investment in the Waste to Energy sector (WtE) has been estimated to have increased by 186 % to a total of 1 billion US\$. The WtE market as a whole is expected to reach close to 30 billion US\$ by 2015, with major expansions in China and India as well as in the EU.²

Waste-to-energy plants, unlike other energy producing operations have two purposes. Such plants generate energy and they manage waste, notably municipal solid waste (MSW) on which we will focus during this Workshop; they produce useful materials in the process. Energy production and solid waste management are both complicated processes which share that they have a substantial environmental impact. Usually the costs and benefits of WtE production are compared either to the costs and benefits of energy production or to those of other forms of waste management, like landfill disposal. In view of the fact that these two sides of this production process are inter-woven, a more comprehensive analysis taking into account broader social and environmental costs and benefits than is so far common seems appropriate and needed. A more complete costs-benefit analysis will eventually involve the comprehensive results of several crucial aspects of WtE, including the availability of adequate quantities of municipal waste of sufficient quality. Although as such this is not a good thing, the lack of available MSW in the near future is unlikely. Rather on the contrary,³ although regional availability will differ. The quality of MSW, notably its inconsistency, may be an issue but one that will not specifically be addressed during the Workshop.

The technical possibilities of converting (solid) waste into energy set the basis for what might be achieved with WtE. One of the core technological questions to be addressed is: What is the most suitable process to valorise certain waste streams as energy. Although the currently best known and most often used WtE technology for MSW processing is incineration in a combined heat and power (CHP) plant, whether this is also the ‘best’ WtE process is for various reasons doubtful. Apart from the answers to the question of commercialization, other thermo-chemical technologies, like gasification or plasma technologies may eventually prove to be superior processes. It has been argued that plasma gasification/vitrification is perhaps the most promising candidate for such combined energy and materials valorisation⁴. It is expected that further improvements in this technology will enhance in particular the commercial viability of WtE. Generally speaking the inconsistency of the composition of

¹ World Energy Council, World Energy Resources-2013 Survey, London 2013, Ch.7b.2

² *Id.*, 7b.5&6.

³ On the contrary, one may say. According to a 2012 World Bank study, the amount of municipal solid waste generated is expected to grow faster than urbanization rates in the coming decades, reaching 2.2 billion tons/year by 2025 and 4.2 billion by 2050 (*What a Waste: A Global Review of Solid Waste Management*, World Bank, 2012).

⁴ See, A. Bosmans, I. Vanderreydt, D. Geysen & L. Helsen, ‘The crucial role of Waste-to-Energy technologies in enhanced landfill mining: a technology review’, in: *Journal of Cleaner Production* xxx (2012), p. 1-14.

MSW, the complexity of the design of the treatment facilities, and the air-polluting emissions still represent researchable issues for all WtE technologies and will be among the matters referred to today.

What does *commercial viability* mean in the broader context of the competition with other energy carriers and in terms of the total benefits and costs (including environmental costs) of WtE in a ‘circular economy’? In order to address this issue, the view of major international financial and economic organisations and platforms, like the World Bank, the World Energy Council, UNEP, the European Environmental Agency and other EU institutions must be examined, as well as academic opinion. The actual investment policies of institutions like the World Bank, and some countries pioneering in this type of energy including their views regarding further financing of WtE are revealing. A problem in any estimation of WtE development in terms of costs and (eventual) output and benefits however is the location of projects which will strongly determine the costs and the composition of the available MSW.

Landfill gas production probably represents the worst waste management option of all the WtE technologies. But all other options also have environmental consequences. Incineration, e.g., has more negative consequences in terms of climate change and acidification than thermal gasification. In any choice of WtE technology the various levels of environmental impact increasingly are taken into account, although legal requirements like the requirements of environmental impact assessments may differ substantially per location. In particular the so-called Life Cycle Analysis (LCA) approach plays an important role, but seems to lead more and more to the conclusion that the environmental implications differ so substantially on the basis of the particular project, its technology and its location that only a case-by-case evaluation will lead to acceptable insights.

The WtE choice made has also important legal consequences which in part are still to be elaborated into EU legal instruments, both in terms of Energy Law and in view of Environmental Law. These legal processes can be said to be still in quite an initial phase. In the 2008 ‘Framework’ Waste Directive, for example, WtE processes are only explicitly referred to in the margin of the directive, in its Annexes II A and B. In its 2011 Guidelines on the R1 Energy efficiency formula of the Annex, the Commission tries to provide further clarification on the meaning of this crucial formula. The Commission argues that where recycling of waste is not the preferable option from an environmental point of view, technically not feasible or economically not viable, energy should be generated from it. Meeting or exceeding the energy thresholds of the R1 formula make municipal waste incinerators classify as energy recovery facilities. This classification is a first, and crucial, legal step in the context of a much wider effort to replace existing landfills with WtE facilities. But this legal process is still in an initial phase and in need of further elaboration and adaptation in view of the technological developments in this dynamic field. During the latter half of the Workshop the current state of the law will be introduced including an inventory of legal issues to be addressed in the near future.

The Workshop will be in English; following all introductions will be a (brief) opportunity for first questions and comments. The morning will be concluded by a general Round Table discussion with all the speakers.

PROGRAM

8.45-9.00 Coffee

9- 9.30 Welcome and introductory words

- Dr Ioannis Panoussis, Doyen du Faculté libre de droit, Univ. Cath. de Lille
- Prof. Harry Post, Visiting Professor at the Law Faculty

Chair: Dr Aurelien Raccah, Vice-Dean for International Development of the Faculté libre de droit, Univ. Cath. de Lille

9.35-9.55 Waste Management, WtE and the Environment: introductory remarks

- Prof. Harry Post (Faculté Libre de droit, Univ. Cath. de Lille)
- Comments

9.55-10.35 WtE: A choice between technologies in terms of technology

- Prof. Lieve Helsen, (KU Leuven, Dept of Mechanical Engineering)
- Comments

10.35-11.15 WtE in practice: the AEB solutions

- Dipl.-Ing. Matthias Wieseler, Plant Technology Team Leader at the AEB (the Amsterdam Municipal Energy Company)

- Comments

11.15 Break for refreshments

Chair: Harry Post

11.35-12.15 EU Energy law and WtE

- Prof. Kim Talus (Univ. of Eastern Finland, Fac. of Law)
- Comments

12.15-12.55 EU Environmental law and WtE -

- Dr Thomas de Romph (KU Leuven, Fac. of Law)
- Comments

12.55-13.30 Round table with all speakers

13.30 End