



European Economic and Social Committee

NAT/706
Waste to energy under the Circular Economy

OPINION

European Economic and Social Committee

**Communication from the Commission to the European Parliament, the Council, the European
Economic and Social Committee and the Committee of the Regions**

The role of waste-to-energy in the circular economy

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Rapporteur: **Cillian LOHAN**

Co-rapporteur: **Antonello PEZZINI**

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1. Conclusions and recommendations

- 1.1 The EESC supports the adherence to the waste hierarchy when making decisions on waste management¹, including waste-to-energy options.
- 1.2 There should be a coordinated strategy of spreading the message of the first step on the waste hierarchy, which is the prevention of the production of waste in the first place.
- 1.3 The EESC espouses the principle of sustainability-proofing of EU public money in the light of the Sustainable Development Goals (SDGs)² and that any public funding should be improving the well-being of the citizens of Europe. Public funding should also adhere to the principle of not supporting any activity that causes harm to citizens.
- 1.4 Shortcomings from existing directives on waste treatment must be closed in any future legislation in order to ensure that the transition to a circular economic model is fair, consistent and systemic.
- 1.5 It is important not to create infrastructural barriers to the achievement of higher recycling rates by investments in outdated waste-to-energy processes.
- 1.6 Although separate collection of waste is a priority, especially for Member States with a high dependency on landfill, this must also correspond with an increase in recycling rates in order to have a value in achieving a transition to improved circularity.
- 1.7 Member States with a large number of incinerators at the moment represent an inconsistency with the ambition of higher recycling targets proposed by the Circular Economy Action Plan³. The challenge is to transition these Member States out of incineration dependency and into a diverse range of waste management solutions, through push and pull policy factors including:
 - introducing taxes;
 - phasing out support schemes;
 - a moratorium on new facilities and decommissioning older ones.
- 1.8 The transition to a circular economy has been hindered in the EU by a lack of the right price signals. This is accentuated by continued unjustifiable subsidies for the unsustainable production systems, specifically for the fossil fuel sector⁴. The EESC welcomes the explicitly stated link between access to Cohesion Policy funds and both national waste management plans and the European Circular Economy Action Plan. The link to the European Fund for Strategic Investment could be stronger.

¹ EESC Opinion Circular Economy Package, point 4.3.1, [OJ C 264, 20.7.2016, p. 98–109](#).

² EESC Opinion Sustainable development: a mapping of the EU's internal and external policies, point 4.3.5.5, [OJ C 487, 28.12.2016, p. 41–50](#).

³ Communication of the European Commission, *Closing the loop – An EU action plan for the Circular Economy*, [COM\(2015\) 614 final](#), 2 December 2015.

⁴ David Coady, Ian Parry, Louis Sears, Baoping Shang, *How Large Are Global Energy Subsidies?*, IMF Working Papers, WP/15/105, May 2015.

1.9 Biogas offers opportunities on many fronts at an EU level, in job creation, emission reduction, enhancing fuel security and more. The legislative and policy framework which best supports the optimisation of the associated opportunities should be developed using the best practice examples from around Member States and beyond.

1.9.1 Biodigestion for producing automotive biomethane is in line with the Paris Agreement. A recent assessment by the Commission⁵ shows that biogas production in the EU could at least double and possibly triple from today's levels to 2030.

1.10 Behavioural change and cultural change are required and can be achieved through education at all levels of society.

2. Background

2.1 On 2 December 2015, the Commission adopted an EU Circular Economy Action Plan, offering a transformative agenda with significant new jobs and growth potential and aiming at fostering sustainable consumption and production patterns, in line with EU commitments under the 2030 Agenda for Sustainable Development. This communication focuses on energy recovery from waste and its place in the circular economy. Waste-to-energy is a broad term that covers much more than waste incineration.

2.2 The main aim of this communication is to ensure that the recovery of energy from waste in the EU supports the objectives of the circular economy action plan and is firmly guided by the EU waste hierarchy. The communication also examines how the role of waste-to-energy processes can be optimised to play a part in meeting the objectives set out in the Energy Union Strategy and in the Paris Agreement. At the same time, by highlighting proven energy-efficient technology the approach to waste-to-energy set out here is meant to provide incentives for innovation and help create high-quality permanent jobs.

2.3 This Opinion establishes the EESC position on each of the three sections of the Communication, namely:

- positioning waste-to-energy processes in the waste hierarchy and the role of public financial support;
- waste-to-energy processes for treating residual waste: finding the right balance;
- optimising the contribution of waste-to-energy processes to the EU's climate and energy objectives in the circular economy.

It further establishes any additional considerations that warrant inclusion from the perspective of civil society and based on existing positions adopted by the EESC.

2.4 The EESC highlights the need to address the immediate needs of the EU in terms of managing its waste in the context of the existing legislation and in the context of the existing waste

⁵ European Commission, *Optimal use of biogas from waste streams An assessment of the potential of biogas from digestion in the EU beyond 2020*, March 2017.

management infrastructure. While some sub-optimal practices will continue the overall long-term drive is towards a low waste production model, where waste prevention, re-use, remanufacture and recycling dominate the post-use phase of material flows. The challenge is to encourage a speedy and constant just transition towards the long term goals.

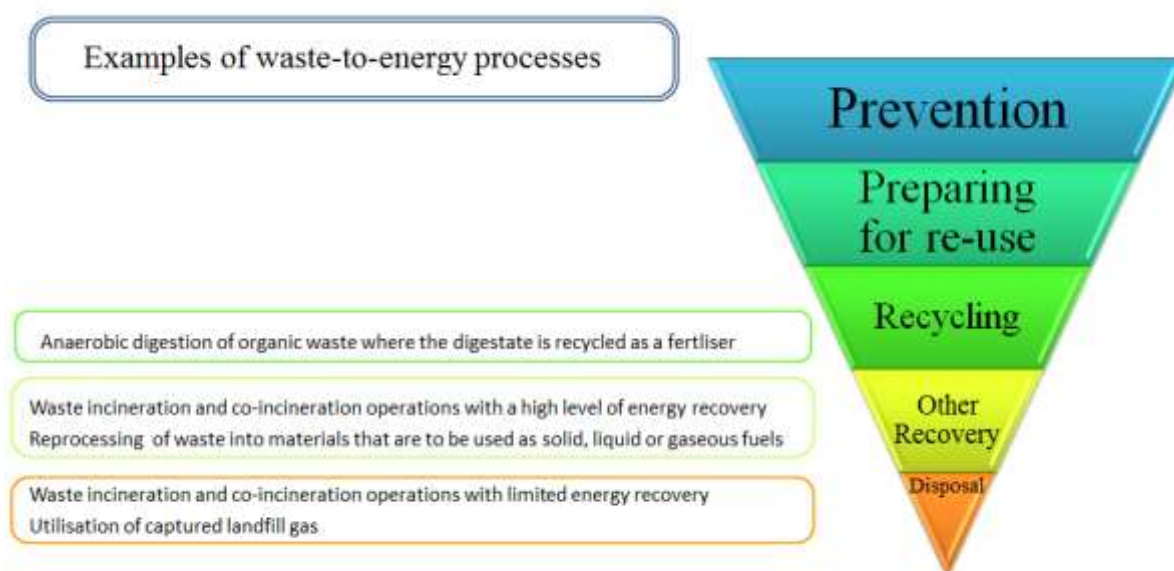
2.5 With an urban waste production average of ca. 480kg/inhabitant across the EU in 2015, the amount landfilled can vary from country to country from 3kg landfilled in the most virtuous one to over 150kg in the least virtuous one.

3. Positioning waste-to-energy in the waste hierarchy and the role of public financial support

3.1 The EESC supports the adherence to the waste hierarchy when making decisions on waste management⁶, including waste-to-energy options.

3.2 It is important to note that waste-to-energy is not always an option that is in line with the circular economy ambitions or principles. For example, incinerating waste materials that could have been prepared for reuse or recycled is not the optimum choice in terms of resource efficiency or best use of raw materials. Equally transporting waste over vast distances at high energy costs in order to achieve comparatively less energy returns through a waste-to-energy process would result in a net energy cost and related climate impact. There are other examples.

3.3 The diagram shows the relationship between the waste-to-energy processes in the Communication and the waste hierarchy.



3.4 The waste hierarchy itself is not enough to determine the suitability or otherwise of waste-to-energy processes. The EESC espouses the principle of sustainability-proofing of EU public money in the light of the SDGs, and that any public funding should be improving the well-being

⁶ EESC Opinion Circular Economy Package, point 4.3.1, [OJ C 264, 20.7.2016, p. 98–109](#).

of the citizens of Europe. Public funding should also adhere to the principle of not supporting any activity that causes harm to citizens.

- 3.5 It is important that the weaknesses of the Waste Framework Directive do not leak through to Circular Economy initiatives, for example, the possibility of a Member State being excluded from separate collection obligations due to a technical or financial inability to implement it. The focus should be on using public funding to overcome technical difficulties, or using economic policy instruments to remove the financial constraints to implementing the best practice option. For materials with toxic substances there are justifiable grounds for disposal or energy recovery as preferable to reuse or recycling.
- 3.6 This Communication is a strong development from the Circular Economy Action Plan, and it sets out a high ambition for improved efficiency in waste-to-energy processes and increased focus on the waste hierarchy as determining the circularity of different processes. However the legislation on which this Communication is built, specifically the Waste Framework Directive, has historic weaknesses that will continue to cause difficulties and weaken the Communication if not addressed. It is necessary to review the classification of waste, perhaps based on opportunities offered by new technologies in waste-to-energy plants (e.g. a damaged tomato is not put on the market whereas an unsold tomato is a waste), possibly including also sludge out of urban sewage for biodigestion processes. The ambition to address these issues in the Circular Economy Action Plan must be reflected in necessary legislative amendments at all relevant levels.
- 3.7 The positioning of waste-to-energy processes on the waste hierarchy can be misleading due to the constraints of how the processes are treated by legislation. Positioning is defined according to definitions which are set out in legislation rather than scientific analysis of the actual impact of such waste-to-energy processes.
- 3.8 There are also technical aspects of the calculation methodology associated with definitions and thresholds in the Waste Framework Directive. These are the calculation methods that determine the positioning of the different waste-to-energy processes on the waste hierarchy. These detailed calculations should be re-examined by the Commission in order to ensure that they now are robust in the context of the Circular Economy in particular, but also the Sustainable Development Goals, the Energy Union and the Paris Agreement.
- 3.9 The separate collection obligations that are part of European waste legislation⁷ are a critical aspect of achieving improved waste management.
- 3.10 Technological advances will continue to offer better opportunities for maximising efficiency in products and energy flows, leading to innovative solutions for more efficient processes.
- 3.11 Ecodesign of goods and services, extended in scope to be all-inclusive, as part of a pan European system, will result in a reduction to a minimum of waste as a circular economy is

⁷ Directive 2008/98/EC, in particular articles 11 (paper, metal, plastics, glass and construction and demolition waste) and 22 (biowaste) - [OJ L 312, 22.11.2008, p. 3-30](#).

achieved. The ecodesign element of this is essential to provide clean repairable, reuseable, recyclable, modular products and will ultimately lead to the elimination of waste as we currently understand it.

3.12 The above points will mean increasingly less mixed waste availability as a feed source for incinerators, and therefore at a national level subsidies for these should be phased out and no new investments in this area considered, except when it comes to modernising existing infrastructure and making it more resource- and energy-efficient.

4. **Waste-to-energy processes for treating residual waste – finding the right balance**

4.1 It is important not to create infrastructural barriers to the achievement of higher recycling rates by investments in outdated and energy-inefficient waste-to-energy processes.

4.2 In 2013, 2.5Mt of mostly refuse-derived fuel (RDF) was shipped between Member States for the purpose of energy recovery⁸.

4.3 Waste-to-energy assessments have to be cognisant of this transport element as once included in the measurement of the emissions associated with different waste management approaches, the transport aspect can determine the actual impact of the process in terms of emissions.

4.4 There is a geographical split in Europe in terms of distribution of incinerators. Germany, the Netherlands, Denmark, Sweden and Italy have most of the functioning active incinerators in Europe. In general, many Member States continue to have an over-reliance on landfill. This needs to change to meet the new challenges and targets set out in the waste legislation associated with the Circular Economy Action Plan.

4.5 Member States with high reliance on landfill and low or no incineration should firstly focus on separate collection. Separate collection at source is critical for the supply of good quality high value waste to the recycling and this needs to be encouraged.

4.6 However, there are many examples at Member State level of separate collection rates being high, but corresponding recycling rates are not proportionate. This apparent contradiction needs focussed policy tools to be addressed.

4.7 This Communication encourages national governments to focus funding support and strategies in directions other than incinerators by examining payback time, availability of feedstock, and capacity in neighbouring states.

4.8 Utilising a neighbouring incinerator may represent the best option in some cases, but before doing so, a full life cycle analysis should be carried out including, critically, the associated costs of transport, both economic and environmental.

⁸ European Topic Centre on Waste and Materials in a Green Economy (ETC/WMGE), *Assessment of waste incineration capacity and waste shipments in Europe*, January 2017.

- 4.9 Apart from some very specific circumstances and given technological advances, it is unlikely that choosing to incinerate could represent the most resource efficient or best practice solution to addressing waste management challenges.
- 4.10 Member States with a large number of incinerators at the moment represent an inconsistency with the ambition of higher recycling targets. The challenge is to transition these Member States out of incineration through push and pull policy factors including:
- introducing taxes;
 - phasing out support schemes;
 - a moratorium on new facilities and decommissioning older ones.
- 4.11 The EESC highlights that choosing to impose a general tax on incineration without providing affordable accessible alternatives for the end user will simply result in higher costs for the civilian. The use of taxes as an economic instrument needs to be focussed and clever.
- 4.12 There needs to be an efficient procedure in each Member State for the application for and allocation of permits to carry out waste management activities.

5. Optimising the contribution of waste-to-energy processes to meeting the EU's climate and energy objectives in the circular economy

- 5.1 The EESC agrees that only by respecting the waste hierarchy can waste-to-energy maximise the circular economy's contribution to decarbonisation, in line with the Energy Union Strategy and the Paris Agreement. Biodigestion for producing automotive biomethane is in line with the Paris Agreement. Vehicles powered with biomethane can provide an effective means to help decarbonise transport in Europe.
- 5.2 To optimise the contribution of waste-to-energy processes to the EU's climate and energy objectives within the circular economy, there is a need to ensure that the most efficient techniques and technologies are used when waste-to-energy processes are required. This is consistent with the Commission's proposed changes to the Renewable Energy Directive; however, these criteria should be encouraged for all new plant, irrespective of size, including smaller plant of less than 20 MW.
- 5.3 Taxation on waste collection has an ever growing impact on families' and businesses' resources; it should therefore be used in a forward-looking way and keeping in mind the protection of the environment.
- 5.4 The public and the private sector should have the possibility to collaborate on long-term projects with a view to making a culture of circularity more concrete. Corporate Social Responsibility can also play an important role in the transition to more sustainable waste management options.
- 5.5 The transition to a Circular Economy has been hindered in the EU by a lack of the right price signals. This is accentuated by continued unjustifiable subsidies for the unsustainable

production systems, specifically for the fossil fuel sector⁹. The EESC welcomes the explicitly stated link between access to Cohesion Policy funds and both national and regional waste management plans and the European Circular Economy Action Plan.

5.6 The link to funding from the European Fund for Strategic Investment could be stronger to ensure that these investments prioritise opportunities that promote the objectives for the Circular Economy Action Plan. Some forms of incentive could be explored with a view to creating an appropriate chain downstream of facilities, such as distribution of fuel and/or secondary raw materials, or creating further products for potential use.

6. Other opportunities

6.1 Biomethane

6.1.1 The options to produce biogas through anaerobic digestion is mentioned in the Communication. This is an opportunity for different Member States and should be expanded upon. A recent assessment by the Commission¹⁰ shows that biogas production in the EU could at least double and possibly triple by the year 2030 from current levels.

6.1.2 Biogas is a functioning working model in many Member States, notably Italy and Germany. As working examples these countries can also offer valuable lessons learned from the practicalities of implementation.

6.1.3 Currently, the cost of biomethane is higher than the cost of fossil methane. However, the use of biomethane is justified by the indirect costs incurred by mutagenic and carcinogenic agents – e.g. NOx and oil smokes produced by fossil fuels¹¹.

6.1.4 Above all, the possibly higher cost of biomethane is in line with the goals enshrined in the Paris Agreement on reducing the emissions of greenhouse gas out of traditional fuels¹².

6.1.5 It is critical that feedstocks used in anaerobic digestion have low or no indirect land use change (ILUC) impacts and do not negatively impact food production. Biogas facilities are best located in close proximity to a supply of feedstock (agricultural waste primarily) and as a waste management and energy needs solution. Constructing anaerobic digesters and thereby creating demand for a new supply of feedstock, either waste or crops, must be avoided.

6.1.6 The location of the biogas facility is critical. There needs to be an identified efficient use of the energy produced so that efficiently produced energy is not in turn wasted. It is also essential to note that anaerobic digestors are not a wholesale solution for all agricultural regions in the EU,

⁹ David Coady, Ian Parry, Louis Sears, Baoping Shang, *How Large Are Global Energy Subsidies?*, IMF Working Papers, WP/15/105, May 2015.

¹⁰ European Commission, *Optimal use of biogas from waste streams An assessment of the potential of biogas from digestion in the EU beyond 2020*, March 2017.

¹¹ [COM/2017/011 final - 2017/04 \(COD\)](#).

¹² "L'opera loda l'artefice", Machiavelli said.

and their promotion should be limited to where there is a readymade feedstock that is currently problematic waste.

- 6.1.7 However development of a well planned biogas production and use infrastructure can be a very efficient way of dealing with farm waste, dealing with potentially environmentally damaging substances and facilitating safe disposal. It can also address heating and transport fuel requirements for communities.
- 6.1.8 Anaerobic digestion can help address public health issues, provide fertiliser for land, represent emission reduction and be a practical example of circularity.
- 6.1.9 Anaerobic digestion can be most effective when the circular economy principles are applied, specifically the concept of small loops, where the feedstock for the digester is sourced locally, and the energy output is used locally (with an exception where fuel is used in trucks as gas). Investments must support the objective of reducing waste travelling to as close as possible to zero kilometres.
- 6.1.10 The employment and economic boosts associated with the development of an integrated biogas element to a national or regional energy mix should be analysed and highlighted. Options to facilitate and speed-up administrative procedures authorising the construction of biowaste digester projects should also be considered.
- 6.1.11 Policy and economic support for projects that meet all the criteria will drive innovation and can be one of the many tools that help the transition to a low carbon economy.
- 6.1.12 The review of mandate M/475 by the CEN should be expanded so that biomethane from sources not currently authorised, such as landfill gas, sewage treatment plant gas, from sludge and from unsorted urban and other waste, can be injected into natural gas networks. Biomethane of this kind is already readily available.
- 6.1.13 The European Fund for Strategic Investments is crucial to the introduction of anaerobic digestion processes for projects that are not yet financially viable.
- 6.1.14 Incentives, of the type traditionally used for the fossil fuel industry, should be encouraged for the use of vehicles powered by biogas. These incentives should benefit the end user offering affordable and accessible alternative transport options to the consumer.

6.2 Cultural change and education

- 6.2.1 There is a need to recognise the challenge faced by cultural differences. Behavioural changes in terms of both separating waste at source should be addressed as a need for cultural change. Many tools can be employed, not the least of which is nudge thinking¹³, to achieve this.

¹³ EESC Opinion Applying Nudge Thinking to EU Policy-Making, [OJ C 75, 10.3.2017, p. 28–32](#).

6.2.2 There should be a coordinated strategy of spreading the message of the first step on the waste hierarchy, which is the prevention of the production of waste in the first place.

6.2.3 Behavioural change can also be achieved by developing programmes on these topics at school level. This should apply to all levels of school, from kindergarten and primary schools through to universities and workplace training to educate and inform children and citizens as a long term approach.

6.2.4 Universities and public bodies can help create legitimacy for new technologies and practices and as such can function as models of best practice and regional ambassadors for waste-to-energy processes¹⁴.

Brussels, 5 July 2017

Georges Dassis

The president of the European Economic and Social Committee

¹⁴ Examples exist across a range of Member States, one of which is situated at University College Cork in Ireland which has its own small-scale anaerobic digesters that function for research.