



## Proposed decision on Treatment of New Renewable Units in the SEM (SEM-21-027)

### INTRODUCTION

Indaver welcomes the opportunity to respond to the *Proposed decision on Treatment of New Renewable Units in the SEM*.

Indaver provides waste treatment services to a significant municipal, commercial and industrial customer base and owns and operates a 17MW hybrid renewable waste-to-energy generator in Duleek, Co. Meath. This facility treats waste that cannot be prevented, reused or recycled and produces partly-renewable electricity. It is fully dispatchable and synchronous.

Indaver also has two additional facilities in the permitting and planning process in Ireland and Northern Ireland. However, proposals regarding the treatment of new renewables (in conjunction with the compensation proposals in SEM-21-026), wholly undermine the business case for the construction of these much needed waste infrastructure facilities.

Indaver's operational and proposed plants will all be Category 1 plant *i.e.* fully dispatchable under EDIL with capability to be controlled up to the registered capacity of the facility. As a result, many of the complications facing new renewable generators (and *de minimis* generation) without priority dispatch are not of relevance and are not addressed in our response.

Indaver agrees with the SEM Committee that Category 1 plant are not subject to curtailment. They are constrained during curtailment events for non-synchronous renewables.

While the Proposed Decision deals primarily with new plant without priority dispatch, we note that there are implications for existing priority dispatch plant. Following an explanation as to why WtE is different to other types of electricity generation from a technical perspective, and why this should be considered at dispatch, it then outlines the need for additional strategic waste infrastructure. We will then discuss the two classes of generator (without and with priority dispatch) in turn.

### **WtE is different to other types of electricity generation – technical considerations**

Unlike other types of electricity generation, the primary purpose of WtE facilities is to treat waste in an environmentally sound manner. Residual waste is combusted at high temperatures in a carefully controlled environment. The heat produced by the combustion process is recovered as steam and used to generate electricity. These facilities are designed to operate at baseload.

A WtE facility must operate with the turbine and generator set in frequency control mode, meaning that the speed of rotation of the turbine blades modulates with the actual steam outflow from the

superheaters. Hence the turbine “follows” the amount of steam produced by the plant and this is because the fuel being burned is not homogeneous. In a conventional power plant, the turbine and generator set will typically operate in power control mode where the electrical output is set and the correct amount of fuel is burned to generate the required amount of power. The fuel is waste but is very variable in calorific value by nature. Mixing of the waste prior to feeding to the furnace helps to homogenise the fuel but is not perfect.

When WtE is instructed to dispatch down, the plant switches from frequency control (all steam goes to the turbine) to power control. Under power control, the maximum power output is limited to a predetermined setpoint as set out in Technical Offer Data. When our facility switches to power control it continues to treat waste at the same rate as before, and the steam required to maintain setpoint goes to the turbine with the balance diverted to the air-cooled condenser (ACC) where the energy in the steam is destroyed.

### **How is WtE treated in other Member States?**

It has proven difficult to find a comparable situation in another European Member State. There are some commonalities in the priority dispatch hierarchy between Ireland and Spain. WtE has a certain flexibility to reduce load, recognising reduced if too quickly, it may trip the boiler. The use of steam bypass is not foreseen as it is considered to be a waste of energy.

### **Need for essential and strategic waste infrastructure**

Whilst beyond the scope of this consultation, the proposed decision will directly impact the provision of much needed waste treatment infrastructure in Northern Ireland and the Republic of Ireland. As you will see in our response below, the public health benefits of waste treatment should be considered in the revision of the priority dispatch hierarchy.

#### **Northern Ireland**

On the basis of analysis and modelling undertaken by Tolvik on behalf of Indaver, additional waste treatment infrastructure will be needed if residual waste generated in Northern Ireland is to be recovered in Northern Ireland. Indaver (NI) Ltd is the lead party within the Becon Consortium and the final bidder in the arc21 project. This consists of a Mechanical Biological Treatment building, a 220,000 tonnes per annum Energy from Waste (EfW) plant and a visitor centre. The analysis concluded that even if the proposed arc21 project is delivered as planned there will still be a residual waste treatment capacity ‘gap’ in Northern Ireland of 124,000 tonnes in 2035. The projections of waste arisings consider projected household changes, anticipated recycling increases and both Brexit and Covid implications.<sup>1</sup>

#### **Ireland**

There is insufficient waste treatment capacity in Ireland and the development of Indaver’s proposed facility in Ringaskiddy is necessary for a number of reasons. Against the backdrop of projected increases in population and economic growth in the Southern region<sup>2</sup>, the development of such strategic waste facilities for the treatment of hazardous and non-

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<sup>1</sup> [appendix-2.1-northern-ireland-residual-waste-market-update.pdf \(becon.co.uk\)](#)

<sup>2</sup> The NPF makes provision for the population of Cork City and County to grow to about 770,000 by 2040.

hazardous wastes would help to address the present spatial imbalance in thermal recovery capacity in the Southern region of Ireland. Currently, a large quantity of residual municipal solid waste (MSW) is being exported for recovery in similar facilities in continental Europe. The development will therefore mitigate the ongoing reliance on the export of waste from the region and is in alignment with the statutory National Planning Framework (NPF) which provides that waste treatment requirements to 2040<sup>3</sup> will require:

- Waste to energy facilities which treat the residual waste that cannot be recycled in a sustainable way delivering benefits such as electricity and heat production; and
- The development of necessary and appropriate hazardous waste management facilities to avoid the need for treatment elsewhere.

The EPA has also referred to Nationally important infrastructure projects as including Critical Service Infrastructure (Wastewater, Water and Waste)<sup>4</sup>.

Secondly, it will assist in meeting the challenging waste legislative targets contained in the Circular Economy Package (CEP).

A number of significant challenges relating to the sustainable management of waste have been highlighted by the Environmental Protection Agency (EPA) in the publication 'Ireland's Environment 2020 – An Assessment'<sup>5</sup>.

- The publication states that in 2018 over one-third of municipal waste was exported for treatment, 729,000 tonnes for recycling and 287,000 tonnes for energy recovery abroad. These figures clearly underline that the link between economic growth, consumption levels and waste generation has not been broken.
- It further states that Ireland has some significant waste infrastructure deficits 'as evidenced by its high dependence on export markets for treating municipal and hazardous wastes'. As such, this situation clearly poses a risk to the state in the event of export markets closing at short notice.
- The EPA Report also highlights that Ireland has not moved significantly towards self-sufficiency with regard to domestic hazardous waste treatment. The objective of striving for self-sufficiency in the management of hazardous waste and minimising hazardous waste export is underlined as a key policy priority in Ireland's National Hazardous Waste Management Plan 2014 - 2020.

In a similar vein, the National Waste Plan for a Circular Economy<sup>6</sup> also highlights in clear terms that Ireland is reliant on exports of municipal, construction and demolition (C&D), packaging

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<sup>3</sup> Project-Ireland-2040-NPF.pdf at page 149

<sup>4</sup> <http://npf.ie/wp-content/uploads/2017/09/0580-EPA.compressed.pdf>

<sup>5</sup> Environmental Protection Agency, Ireland's Environment 2020 – An Assessment: [Environmental Indicators: Environmental Protection Agency, Ireland \(epa.ie\)](#)

<sup>6</sup> A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2021-2025, Section Supporting Indigenous Treatment Capacity at page 47: [Waste Action Plan for a Circular Economy](#)

and other wastes in order to manage the waste produced, estimated at 9.5 million tonnes in 2020, and goes on to warn that:

*‘This leaves the State potentially exposed if there are external shocks to the export market beyond our control. It also means that we are exporting materials, energy and jobs that could be harnessed here’.*

### **New Generation without Priority Dispatch**

According to the proposed decision, future renewables that connect to the system, such as WtE, will be non-priority dispatch, and therefore will be dispatched down first in order to address constraints.

The SEM Committee’s Proposed Decision may be summarised as follows:

- **Generators must compete for an energy position in ex ante markets:** *“The SEM Committee proposes that no specific changes are required to accommodate dispatchable units without priority dispatch, subject to testing and impact assessment being carried out for such units (Category 1) by the TSOs.”*
- **Generators are dispatched on a commercial merit order for energy balancing:** *“New units without priority dispatch which are dispatched away from their ex-ante market positions for energy balancing reasons should be considered in dispatch on an economic basis like any other instance of balancing energy.”*
- **Generators are dispatched on a commercial merit order for constraints:** *“The RAs propose that constraints will be applied to all non-priority dispatch units based on a market based merit order, based on the bids and offers of such units, accounting for operational constraints and system security.”*

Waste processing facilities must maintain a certain level of efficiency in order to be classified as an “R1 recovery facility” *i.e.* that it is classified as a recovery operation rather than a disposal operation pursuant to the Waste Framework Directive (WFD). The distinction between 'recovery' and 'disposal' has become progressively more relevant, both commercially and economically within Ireland’s and Europe’s evolving waste policy. The Waste Framework Directive specifies that WtE can be classified as R1 only where their energy efficiency is equal to or above 0.65. WtE facilities are designed with this threshold in mind and reports this information on an annual basis to ensure it still meets the recovery threshold in line with licence requirements. Therefore, instructions to dispatch down to minimum generation (or indeed dispatch down to off) can impact the amount of waste treated, or the amount of electricity produced and ultimately Ireland’s ability to meet EU mandated waste targets.

The EU Electricity Regulation within the Clean Energy Package has removed priority dispatch from any new WtE facility. Indaver is concerned that the removal of priority dispatch is deeply problematic within the context of maintaining R1 certification on an electrical system with high penetration of non-synchronous renewables installed in excess of average demand. The downwards dispatch and redispatch (in the case of redispatch whether market-based or non-market based for constraints) is going to make achieving R1 efficiency difficult without wider policy supports from the CRU or SEM Committee. Even if curtailment is eliminated, there is no guarantee that WtE plant will be able to outcompete legacy priority dispatch renewables and HE CHP, and other renewables and conventional generation which may be able to accept deeper negative pricing in order to continue running to meet the available demand. Furthermore, besides from the risk to the R1 status, unlike other forms of

renewable generation, WtE produces more CO<sup>2</sup> per MW when instructed to minimum generation levels. This is because less electricity is being derived for export per tonne of waste treated.

For the avoidance of doubt, R1 certification *cannot* be managed through financial compensation. In that regard, it is different to other renewable generators that find themselves without priority dispatch, which can become dispatch-indifferent as long as they are financially compensated. While treating constraints as market-based (and therefore grandfathering priority dispatch plants' right to deliver energy during redispatch events) is nominally worse than if those constraints were considered non-market based (and therefore shared amongst new and priority dispatch renewables alike), it is the loss of priority dispatch which is the over-riding issue for which a solution must be found.

Indaver has a number of potential solutions to this issue:

1. This could be achieved by exempting WtE (and other classes of generation) from mandatory participation in the Balancing Market as Balancing Service Providers. The generators would remain Balance Responsible for any deviation of delivery from *ex-ante* trades. The WtE generators should be allowed to deviate their physical notifications from their *ex-ante* traded position as necessary to maintain their R1 certification.

We note that the Regulation only requires that Balancing Market participation for redispatch be open to all classes of generation. It need not be mandatory for all generation. We also note that the requirement that the *ex-ante* markets remain the exclusive route of dispatch is a SEM Committee decision – another element which is not required by the Regulation.

These tools provide focussed routes for the SEM Committee to allow for certain generators to meet wider policy objectives and to be allowed to be dispatched outside of a standard commercial merit order. Note that the generator would not be designated as a priority dispatch generator, and would be subject to TSO dispatch for safety or last-resource security issues.

2. In line with our response to SEM-20-028, priority dispatch hierarchy (to be consulted on) should recognise the threat to public health with sustained disruption of the processing of waste, and the essential service of waste recovery required under European and national legislation. This would require the constraints to be classified as non-market based, and a sub-hierarchy proposed for non-market based downwards redispatch under Article 13(6)(a);
  - Indaver suggests that the SEM Committee could classify most constraints as non-market based through application of Article 13(3)(c). That said, this, in light of our response below in relation to priority dispatch plant, is not our preferred approach unless there is a guaranteed change to the priority dispatch hierarchy. See below.
3. Ultimately, no WtE facility is technically designed to compete within a market merit order while maintaining its R1 efficiency. Such future generators could request Grid Code derogations limiting its technical flexibility (high minimum stable generation, long minimum on times). This would limit the flexibility of the plant to the TSO beyond scheduling the electrical output of the facility to zero (which would not be a favoured approach from Indaver).

Overall, there is some further justification in part for such an approach under Article 13(5) of the Regulation, which requires “*take appropriate grid-related and market-related operational measures in order to minimise the downward redispatching of electricity produced from renewable energy sources or from high-efficiency cogeneration*”.

## Existing facilities with Priority Dispatch

Indaver's comments in relation to the primacy of WtE within the merit order – along with the relevant potential solutions proposed above (1) and (3) – are also applicable to WtE with priority dispatch.

Priority dispatch plant should have priority over non-priority dispatch plant for all forms of downwards redispatch. Correspondingly, this is aligned with the SEM Committee proposals for constraint as market based, but deviates from the SEM Committee proposals for curtailment. On the basis that the WtE facilities are not curtailed, however, Indaver is agnostic on the SEM Committee's conclusions regarding curtailment regardless of whether it is aligned with our starting principled position as long as the existing priority dispatch hierarchy is not used as a mechanism to constrain priority dispatch WtE in advance of curtailment of non-priority dispatch renewables.

While Indaver understands that the priority dispatch hierarchy is to be consulted on shortly, the choice to classify curtailment as non-market based for non-synchronous generation is only acceptable if all wind (priority dispatch and non-priority dispatch) is dispatched down in advance of priority dispatch WtE facilities. Implicitly, the existing priority dispatch hierarchy cannot be maintained if curtailment is to be considered non-market based, as this would lead to priority dispatch plant being dispatched down in advance of new non-priority dispatch renewables.

The principles of Article 13(1) are clear – redispatch actions should be market based where possible. There is adequate competition for most constraints on the all-island network, and as a result non-priority dispatch generators should be allowed to compete on a market basis, i.e. as per energy balancing without the application of bidding principles.

If the SEM Committee believes there is insufficient competition for such constraints, in principle the market-based bids and offers could be regulated to achieve an appropriate market outcome. In the context of renewable generators, that would be at the level of their individual market support (or balancing energy price arising from energy actions, if more commercially favourable). This would require a change to the bidding principles in the market.

It is noted that, in line with our response to SEM-21-026, where dispatched down on a non-market basis, we should also receive compensation at the level of financial support, as per the SEM Committee's own position in SEM-21-026, the level of support for non-market based redispatch should not be lower than the compensation for market-based dispatch.

Outside of the above analysis reliant on non-market based redispatch being compensated at least the same level as market-based redispatch, the SEM Committee's interpretation of the "value" of priority dispatch has no merit as a reason for not paying compensation at the level of financial support as per the arguments in our response to SEM-21-026.