



Further reading:

- The Sustainable Development Goals
- The Sustainable Development Goals National Implementation Plan 2018-2020
- Measuring Ireland’s Progress: The Sustainable Progress Index 2021
- Ireland country profile - SDGs and the environment

For enquires contact:

Prof. Piet Lens
Established Professor
NUI Galway
piet.lens@nuigalway.ie

Dr. Qidong Yin
Postdoctoral Researcher
NUI Galway
qidong.yin@nuigalway.ie

The content and views included in this policy brief are based on independent, peer-reviewed research and solely belongs to the authors and do not reflect the position of the Institute or the University.

Acknowledgments: This policy brief was prepared through the SFI Research Professorship Scheme awarded to Prof. P. Lens at NUI Galway.



Improving Renewable Energy Recovery in Ireland through Adoption of Anaerobic Digestion

Background

With advancement of modern society, the demand for clean energy and management of wastes is rapidly increasing. To achieve a sustainable future for all countries and people, the United Nations (UN) have designed and have implemented the 2030 Agenda for 17 Sustainable Development Goals (SDGs) based on 169 targets and over 230 indicators. In 2018, the Irish government published the “Sustainable Development Goals National Implementation Plan 2018-2020” to take a whole-of-government approach for the implementation of SDGs.

In February 2021, the Social Justice of Ireland published its Sustainable Progress Index 2021. It evaluated Ireland’s performance on the 17 SDGs in the context of its peers in the European Union 15 (EU15) countries. Ireland is a leader and scored well in some areas such as the SDGs relating to Quality Education (SDG 4) (2/15) and Peace and Justice (SDG 16) (4/15). However, Ireland ranks at the bottom of the list for several environment SDGs in the latest EU progress index, i.e., Clean Water and Sanitation (SDG 6) (12/15); Affordable and Clean Energy (SDG 7) (14/15); Responsible, Consumption and Production (SDG 12) (14/15); and Climate Action (SDG 13) (13/15). This indicates that in Ireland, much work is still needed to improve its existing conditions. In particular, Ireland’s share of renewable energy is one of the lowest among the EU15 countries, falling well below the EU15 average. According to the data from Eurostat, Ireland's share of renewable energy was 21% below the EU15's average in 2004, and has remained well below the EU15 average since then (Fig. 1). Ireland was 10.8% below the EU15's average in 2019.

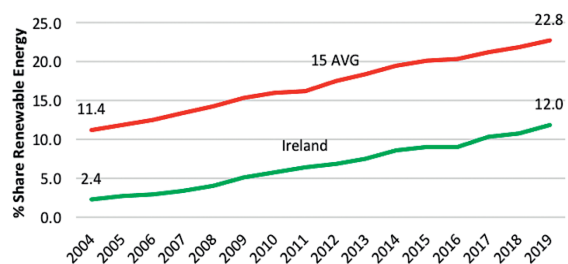


Figure 1. Share of renewable energy, Ireland and EU15 average (Source: Eurostat, 2020; Clark et al., 2020)

Anaerobic digestion

To address the present challenge, anaerobic digestion (AD) could serve as a sustainable environmental solution in fulfilling simultaneous clean energy generation and waste management. Furthermore, Ireland’s extensive agricultural and food industry is a large source of greenhouse gas (GHG) emissions and the application of AD can also contribute to the reduction of GHG emissions (SDG 13).

Despite the benefits of AD, Ireland has been slow in adopting the technology, and is only ranking 20th in AD deployment among the EU28 countries (Štambaský, 2016). Moreover, many AD facilities in Ireland are used for wastewater treatment, while fewer AD plants are employed for treating organic wastes from the agricultural and food sectors, e.g. animal manure and food waste. To date, most animal manure is still applied directly to land after storage and only 43% of Irish households (comprising mainly food waste) have access to a brown bin for composting. Proper management of organic wastes from the agricultural and food sectors as well as the wider adoption of AD technology are urgently needed for achieving Ireland's environment SDGs.

Recommendations

Three key aspects are recommended for improving renewable energy generation, mitigating GHG, and enhancing waste pollution control in Ireland, as described below (Figure 2):

Waste management

- Focus more attention and resources into developing metrics so that citizens are better informed about environmental challenges and are interested in green technology and energy recovery.
- **Optimize the collection and management of organic wastes** from agricultural and food sectors to ensure more biodegradable wastes are properly applied for energy recovery.

AD adoption

- Understand the motivations and characteristics of the potential adopters of the AD technology.
- **Adjust the AD deployment strategy** to focus more on agricultural waste treatment. Increase the amount of AD facilities, particularly decentralised AD infrastructure treating agricultural and food wastes in Ireland.
- **Invest in research and development for advanced AD technology**, e.g. the co-digestion (mixing food waste and manure) scenario may perform better in environmental impacts than mono-digestion.

Renewable energy utilization

- **Explore more scenarios for the use of renewable energy** and increase the economic value of renewable energy, e.g. evaluate the use of renewable energy in public transport systems.
- **Support the transition to renewable energy** by upgrading the national grid and investing in the relevant infrastructure.

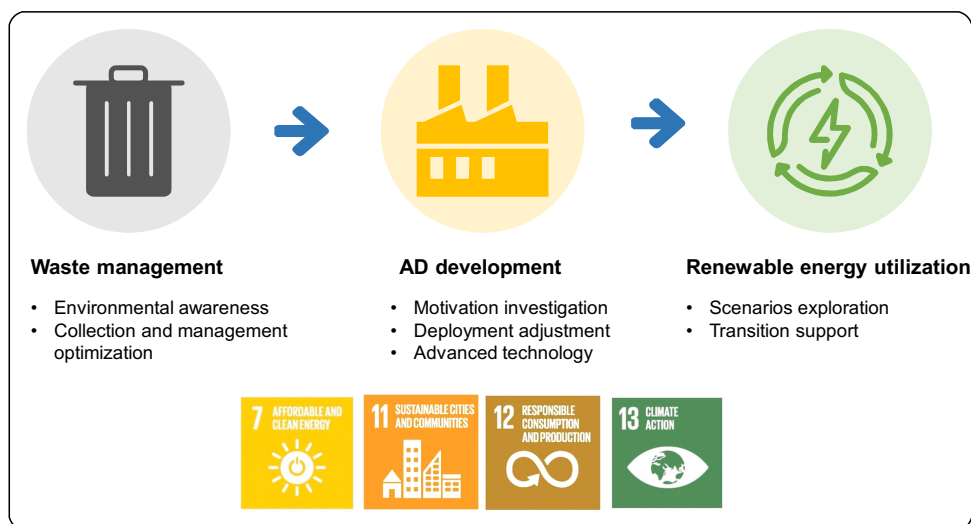


Figure 2. – Key aspects for improving renewable energy recovery in Ireland

The reference links of data and image used can be found below:

1. Eurostat (2020). Sustainable Development in the European Union: Monitoring Report on Progress towards the SDGs in an EU context, 2020 edition, Luxembourg: Publications Office of the European Union.
2. Clark, C. M., Kavanagh, C., Lenihan, N. (2020). Measuring progress: The sustainable progress index 2020. Social Justice Ireland: Dublin, Ireland.
3. <https://www.epa.ie/nationalwastestatistics/composting/>
4. <https://www.epa.ie/irelandsenvironment/waste/>
5. <https://www.socialjustice.ie/content/taxonomy/tags/sustainable-progress-index>
6. Štambaský, J. (2016). The potential size of the anaerobic digestion industry in Ireland by the year 2030. Cré-Composting & Anaerobic Digestion Association of Ireland.