Woodfuels

Biomass Rediscovered

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In the immediate aftermath of the first oil crisis in 1973 there were efforts at the national level and across the EU to increase the use of indigenous sources of energy, including biomass. However, as the 1970s progressed, the security of supply argument faded in the face of abundant and generally low-cost supplies of imported oil and gas. Oil use expanded rapidly across residential, commercial and industry heating, while the gas networks, in line with the national policies of the time, extended from the cities to many of the larger towns to cater for an ever expanding heating and general energy demand (Figure 1).

And today after two decades and more of national and EU policy measures, and a half century after the first oil crisis in 1973, the difficulties of moving away from the stranglehold of fossil fuels in Ireland's energy supply and use remain. A lot of fossil gas in moved each day through the GNI network. These uncomfortable facts are starkly illustrated in the SEAI's annual energy statistics which shows that in 2024 (the latest year for which data are available), almost 85% of Ireland's primary energy supply was fossil-fuel-based (Figure 2).

In recent years transport has been the largest user of energy, followed by heat and then electricity (Figure 3). Over the decade ended 2024, heat energy use declined by 1%, while both electricity (27%) and transport (8%) increased, leading to an overall increase of 8% over the period, to a total final energy consumption of 517 PJ in 2024.

HEATING HOMES AND THE FIXATION ON ELECTRIFICATION

While heat demand has shown a small decline over the past decade, it grew by close to 5% in 2024 compared with 2023. The largest increase was in the residential sector, which grew by 6% over the same period. Heat demand remains highly fossil-based: in 2024, only 8.5% was satisfied using renewable energy, and that figure was lower again in the residential sector at 6.3%. Of the renewables, biomass provided the largest share at 42%, while heat pumps accounted for 28% and biodiesel 7.0%. As per usual the SEAI language in the latest *Energy in Ireland* report seems to champion a decreasing share of biomass in heating compared to the growth of the big brother of electrified heating, when of course, and as the name suggests, all renewables make valuable contributions to reducing greenhouse gas emissions.

Electrified heating/retrofitting is one of the principal decarbonisation policies set out in rolling Climate Action Plans. It is being kind to say that the associated targets of more than 500,000 deep retrofits and

Figure 1. *The current gas pipeline with connections and interconnectors to Scotland. Source https://www.gasnetworks.ie/about/what-we-do/pipeline-map. The current network extends to over 14,000 km.*

400,000 heat pump installations in existing homes by 2030 will not be met. And that is not good news for policy makers or for the electricity industry/lobby. But a more fundamental issue is will the foreseen energy use reductions and consequent greenhouse gas emission savings happen. That depends on several factors, such the level of decarbonisation of the electricity grid, the actual as opposed to theoretical performance of the retrofits to improve energy efficiency, and what is referred to as the rebound effect.

The rebound effect has a long history in energy economics, dating back to the 19th century and arguments about the impact of improvements in the efficiency of steam engines on coal consumption. Ways to calculate the effect are many, but fundamentally it can be defined as the difference between the expected energy saving and the actual one after all the consumer/producer behavioural effects have been accounted for. Or for those who prefer it more quantitatively: rebound effect (RE) = expected savings-actual savings / expected savings.

Suffice to say that are any number of ways that rebound effects can occur. A simple illustration of the concept is shown in Figure 4.

Recent reports and literature such as the ESRI *Review of residential heat decarbonisation in Ireland's emissions from heating*[1] and before that the COFORD report *Forest-based biomass and modern bioenergy Moving to net zero*[2] have drawn attention to possible rebound effects following retrofitting whereby a household might heat their home to a higher temperature because the energy now costs less to use.

While the increase in residential heating in 2024 may be partly explained by it being a colder year than 2023 and some impact of fuel prices. it remains concerning as, according to gov.ie, by of the end of 2024, the government had invested €1.2 billion in energy upgrades across 186,000 homes.

One would imagine that such a level of investment in residential energy efficiency would have had a greater impact on reducing energy use for heating. The ESRI report generated much media coverage and negative

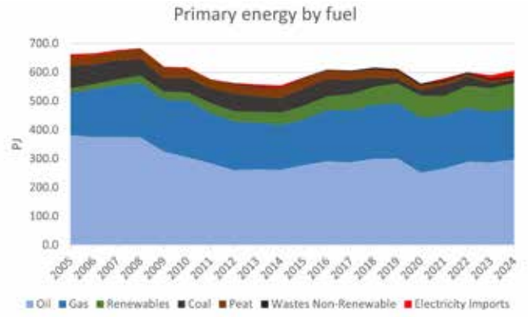


Figure 2. *Primary energy by fuel 2005-2024 in Ireland, showing a reduction in overall energy use, a steady if modest increase in the level of renewable fuels used, but also a rise in gas and oil use in 2024. (Based on data provided at https://www.seai.ie/data-and-insights/seai-statistics/energy-use-overview).*

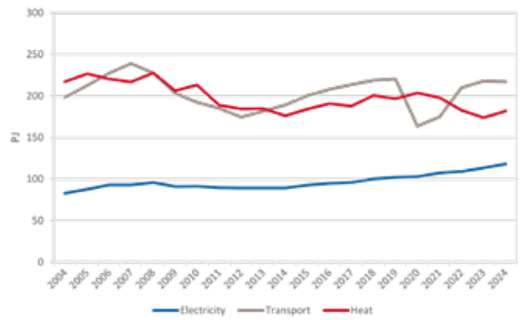


Figure 3: *Annual final energy consumption in electricity, transport and heat modes over the two decades 2005-2024 in Ireland. Transport is currently the largest user followed closely by heat, with electricity about 64 PJ less but on a growing annual trajectory.*

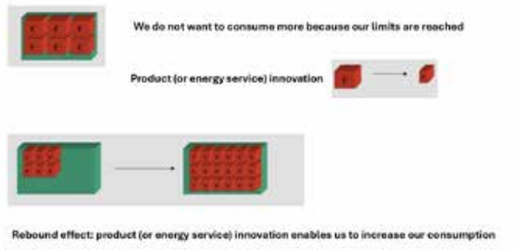


Figure 4: *The rebound effect – based on an image in Growth and Rebound by Francois Schneider (www.decroissance.org/francois/recherche/schneider_lyon_english.pdf)*

comment about the cost of retrofitting and the return to the householder on the investment. The SEAI scheme was however stoutly defended by SEAI, with one of the principals saying to the effect: we have to stop burning things. That assertion was ill judged and failed to recognise that biomass remains the largest source of renewable heat. Unfortunately, biomass is not electricity.

Given the level of investment of state and homeowners in retrofitting a heads-in-the-sand and finger-pointing approach is not the way to go. Far

1. https://doi.org/10.26504/QEC2026SPR_SA_Lynch
2. https://www.coford.ie/media/coford/content/publications/Forest-based%20biomass%20and%20modern%20bioenergy%20Moving%20to%20net%20zero%20A%20COFORD%20paper%20231224.pdf

more investment in analytics and research on actual energy performance of retrofits and on behavioural aspects of heat use is necessary to see if the taxpayer and homeowners are getting value for money.

Other issues that merit a more analytic approach in the policy sphere are the cost of deep retrofitting and its lack of accessibility to those on lower incomes, the need to more actively promote basic but game-changing attic and wall insulation as opposed to the bells and whistles and vastly expensive deep-retrofit option, to make space for renewable and cost-effective modern biomass heating, and to end the blinkered approach that allows for only electrical heating.

As one of the main objectives in the policy sphere is reduction in greenhouse gas emissions, data should be provided to the public domain on an annual basis by SEAI or another state body on the costs per tonne of carbon dioxide abated based on currently deployed policies, including retrofitting. Given that emissions from oil and gas use in residential heating increased from 4.27 to 4.40 million tonnes of carbon dioxide over the period 2014-2024 also speaks to the need for research and analytics related to current and future greenhouse gas abatement policy interventions, such as biomass and bioenergy in general.

But in recent months the policy focus has shifted from climate change, as the Middle East conflict impacts on global oil and gas supplies, with associated sharp rises in fuel costs. Security of supply and energy costs are once again centre stage, with a recurring theme that all modes of indigenous energy supply, and not just wind and solar, must be fully considered.

THE CHANGING POLICY FOCUS TO ENERGY SUPPLY AND COSTS

The 8th European Political Community Summit, held in Yerevan, Armenia in May, featured energy security and costs as one of the strategic topics. It came of course against the background of the latest energy crisis. In a panel discussion, Commission President von der Leyen spoke about energy security and the EU:

"And it is this overdependency on the volatility of the global prices of energy that is painfully hurting our competitiveness. But we have assets. That's also important. We have assets in the European Union. These are the energies that grow at home. It is the renewable energies from wind and sun to hydropower to geothermal, but also to biomass, you name it, and it is nuclear. And we have to build our energy reliance much stronger, much more reliable on these homegrown, cheaper and predictable energy sources that we do have."

A strong statement about the importance of biomass for energy security, and for good reason as bioenergy (principally biomass) remains the largest source of renewable energy in the EU 27, making up 11% of the Union's final energy consumption in 2024 (Figure 5).

Other statements and information such as the recently issued Factsheet *Tackling a fossil fuel energy crisis by accelerating the shift to clean, homegrown energy*[3] speak mainly to the cost implications of the current crisis. It points out that in the first 50 days of the [Iran] conflict, the EU spent an additional €24 billion on fossil fuel imports. The response measures in the document echo the earlier statements from the Commission as in … "The EU needs to boost domestic production of homegrown clean energy - such as renewables, nuclear and sustainable biofuels." These aspirations need to be reflected in the upcoming revisions to the Renewable Energy Directive, the Regulation on land use, land-use change and forestry and related policies.

In that regard, the current burden of over-regulation that impacts on biomass mobilisation and use needs to be critically examined. Linking BECCS-generated greenhouse savings to Emissions Trading Scheme (ETS) compliance also needs to be progressed in a way that will provide certainty for project investors.

NATIONAL DEVELOPMENTS

Minister of State Timmy Dooley addressing the Irish Bioenergy Association (IrBEA) National Bioenergy Conference in May spoke in a comparable way to the EU Commission as he highlighted the growing role of solid biomass and biochar in ensuring Ireland's energy security and resilience.

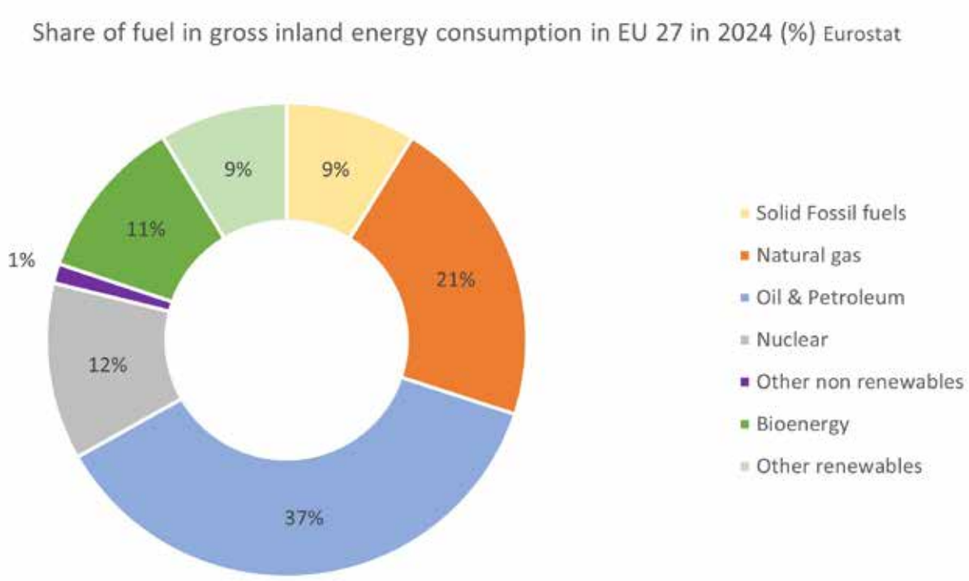


Figure 5. *Gross inland energy consumption in the EU in 224 by fuel source. Total energy consumption was 53,663 PJ, of which 10,662 PJ was from renewables, with fossil fuels continuing to dominate supply, with a combined total of 35,844 PJ, or 67% of consumption.*

3. https://ec.europa.eu/commission/presscorner/api/files/attachment/882427/Factsheet%20-%20AccelerateEU.pdf

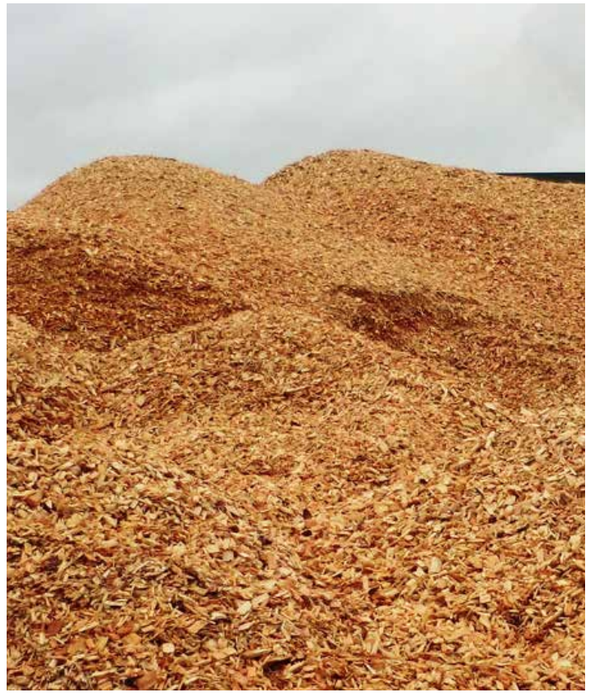
To make this happen the proposed changes to the Support Scheme for Renewable Heat (SSRH) need to be implemented.

These include:

- extension of the SSRH to the ETS sector
- removal of the SSRH scheme 1 MW cap
- increases in SSRH operational tariffs and adjustment of the heat cap.

If implemented and vigorously promoted the changes will open up more opportunities at scale for biomass, given the potential to gradually expand harvest of wood energy assortments by over one million green tonnes per annum over the coming decade as outlined in the COFORD modern bioenergy report. Such a development will make a significant contribution to decarbonising heat, thereby reducing greenhouse gas emissions, and contributing to energy security and affordability. In that regard the Climate Action Plan needs to provide a far stronger policy signal about the role of biomass in decarbonising the economy.

CONCLUSIONS

National 2030 greenhouse gas emission targets are not going to achieved due to an over-emphasis on retrofitting and electrification, and shortfalls in other sectors such as transport and agriculture. Measures such as the SSRH have not been promoted with sufficient vigour and determination in order to realise their decarbonisation potential, which could provide additional annual greenhouse gas savings of over 400,000 tonnes of greenhouse gas emissions by the middle of the coming decade.

A changing policy landscape to address security of energy supply and costs matches perfectly to expansion of the use of sustainable biomass resources and indeed to bioenergy in general. However, these tailwinds need to be supported by stated policies and not overshadowed by a blinkered 'electrify everything' approach.