July 2018

SEAI submission on the Petroleum and Other Minerals Development (Amendment) (Climate Emergency Measures) Bill 2018

Introduction

1. SEAI is Ireland's national energy authority investing in, and delivering, appropriate, effective and sustainable solutions to help Ireland's transition to a clean energy future. We work with Government, homeowners, businesses and communities to achieve this, through expertise, funding, educational programmes, policy advice, research and the development of new technologies. SEAI is part-financed by Ireland's EU Structural Funds Programme co-funded by the Irish Government and the European Union.

2. A central part of SEAI's remit is to contribute to the evidence base for policy making in Ireland. This is supported by statistics and modelling functions based on a range of data sources, including via the collection of data from programmes delivered by SEAI on behalf of DCCAE. This also encompasses a focus on energy supply and use and hence energy-related emissions. We perform this function in the context of our overall relationship and sharing of methodologies with a range of organisations and bodies such as the European Commission, the International Energy Agency and Eurostat.

Fossil Fuel use and emissions in Ireland

3. Energy-related CO_2 emissions (which include transport fuel) account for 61% of total greenhouse gas emissions in Ireland, with the remainder in agriculture (32%), industrial process (6%) and waste (1%) [1]. Total energy demand is delivered by 92% fossil fuels, with the remainder from renewable sources. Of the fossil fuels used, the majority is oil (48%), followed by natural gas (29.4%), coal (9.4%) and peat (5.1%). These fuels are used for transport, heating and electricity generation.

4. Since 2001 Ireland has imported approximately 90% of its total energy requirement. This dropped to 69% in 2016 with the input from the Corrib gas field. Most imports are oil – 72% (for the transport and heating sectors), gas – 17% (for electricity generation, heating and industrial processes) and coal – 11% (for electricity generation at Moneypoint and some home heating).

Projections of energy supply and demand – selected data sources

5. A range of analyses from various sources exist that can inform the debate on this bill as it relates to future energy and emissions scenarios.

6. The **International Energy Agency (IEA)** in its *World Energy Outlook* (WEO) [2] indicate an ongoing, and increasing role for natural gas use globally (as coal and oil use reduce) in their *Sustainable Development Scenario (SDS)* to 2040. According to the IEA, the *SDS* will put the world on course towards meeting the long-term objective of the Paris Agreement. In the scenario, global CO_2 emissions peak before 2020 and decline swiftly driven by a strong programme of energy efficiency and significant scaling of renewable energy sources. Latest IEA analysis indicates that global carbon emissions reached a historical high of 32.5 gigatonnes in 2017, increasing for the first time since 2014. [3]

7. Published future energy scenarios from the **European Union** have not been updated to include the impact of the Paris agreement nor the June 2018 agreements by the Council and Parliament on EU 2030 renewable energy (32%) and energy efficiency targets (32.5%). A recent impact analysis accompanying the *European Union's policy framework for climate and energy in the period from 2020 up to 2030* [4] includes several scenarios to 2050 which are compatible with an 80-95% reduction in greenhouse gas (GHG) emissions by 2050, but not the most recent 2030 targets or Paris agreement. In the most ambitious scenario for renewables (*GHG45EERE35 scenario*) in 2050 (61.7% Renewable Energy Share (RES) by 2050) natural gas accounts for 16.4% of Primary Energy Consumption. In cases with less renewables, natural gas plays an increasing role, as illustrated in a further scenario *(GHG40)* which still delivers 80-95% GHG reduction, natural gas represents 17.9% of Primary Energy Consumption in 2050.

8. Analysis by **University of Manchester** [5] reviews recent research on methane emissions and the relative lifecycle carbon intensity of a range of potential natural gas sources. It finds that *'in order to meet its Paris 2°C commitment the EU needs over 12% p.a. mitigation, starting immediately …'*, and further that *'by 2035 the substantial use of fossil fuels, including natural gas, within the EU's energy system will be incompatible with the temperature commitments enshrined in the Paris Agreement.'*

9. **SEAI** produces Ireland's annual National Energy Projections for energy supply and demand for a range of policy scenarios [6]. These provide the basis for the EPA's National Emissions Projections [7]. SEAI's projections attempt to illustrate the future of energy supply and demand across the different fuels and sectors of the economy over the period to 2030 for a given set of policy assumptions.

10. The most recent national energy projections [8] indicate that by 2030, natural gas may still account for around 33% of total primary energy demand across all energy sectors – an increase on today's level of gas use for primary energy purposes (29.8%). This is despite an assumption of full implementation and the resulting anticipated impacts of renewable energy and energy efficiency policies and measures as outlined in the National Mitigation Plan (NMP) and those more recently announced via the National Development Plan (NDP). It incorporates significant roll out of renewable electricity (55%), renewable transport (25%) and renewable heat (26%) by 2030.

11. The rise is gas demand over the period 2020 to 2030 is primarily driven by its growing contribution to electricity generation. Gas must make up the supply gap left behind as more carbon intensive peat and coal cease to be used for electricity generation (at least by 2030), in this relatively short timeframe (from an infrastructure development perspective). This supply gap cannot be entirely closed by additional renewable energy sources in that timeframe. With the higher levels of variable renewable electricity anticipated by 2030, gas generation provides important system balancing services over the modelled time horizon. Additional sophistication of control on the grid, interconnection to other jurisdictions will help to address this gap, but are required even to meet the level of ambition being considered here.

12. **SEAI analysis** suggests a near-term increase in gas consumption for end-users in the residential and industry sectors (to the early 2020s), after which demand begins to fall to just below today's levels by 2030. This declining trend will be driven by uptake of heat pumps, biomass boilers and other low carbon heating technologies plus the impact of energy efficiency measures. Gas demand in the services sector is projected to fall considerably by 2030 due to these technologies and energy efficiency improvements.

13. Long-term energy system analysis undertaken by **University College Cork (UCC)** [9] indicates that gas could continue to play a role in the Irish energy system over the period to 2050, in the power generation and buildings sector. The long-term modelling exercise indicates that gas for electricity generation must be combined with carbon capture and storage (CCS) to remain part of the energy mix in the longer term

and to remain consistent with Paris commitments. The study finds that *'immediate increased decarbonization ambition over the next 3–5 years is critical to achieve the Paris Agreement goals, acknowledging the current 80–95% reduction target is not consistent with temperature goals of 'well below' 2°C and pursuing 1.5°C.'*

14. In summary, this very limited literature review highlights the need for a significant programme of fossil fuel reduction, starting now, to reduce emissions resulting from servicing heat demand and generation of electricity. Whilst the studies differ in their findings, it is clear that there is an ongoing role for natural gas, but only with the associated programme of decarbonisation across the economy.

15. It is evident that most of the gas demand growth in Ireland over the long-term will be for electricity generation – to replace more carbon intensive coal and peat and to support an electricity system with very high levels of renewable generation. In the medium to long-term the system must be further decarbonised by a combination of replacement of natural gas with renewable sources of gas and CCS technologies.

16. The longer the delay of annual total (net) emissions reductions (in the order of 10% per annum) the more challenging and costly future decarbonisations become. Modelling scenarios will need to be updated to ensure they are based on achieved levels of decarbonisation in each accounting period, and in the event of delayed mitigation will indicate a shrinking time horizon for fossil fuel use, and the need for costlier solutions such as negative emissions technologies (e.g. bioenergy CCS) in the future.

Transition to a low carbon energy system

17. In the context of the transition to a low carbon society, significant and immediate action is needed to honour Ireland's agreement with the Paris Agreement. In that context, a number of 'no regrets' policy actions can be identified. These are informed by existing policies and measures in place in Ireland, the modelling results highlighted above and on outcomes of analysis on future heat infrastructure options undertaken for the National Infrastructure Commission (UK) **Element Energy (UK).** [10]

18. In additional to continuation and enhancement of existing polices, such as measures outlined in Ireland's National Development, new initiatives will be required to meet Paris goals. For example:
    - An enhance programme of deep and wide-reaching energy efficiency improvement across Ireland's building stock
    - Actions to enable low cost (sustainable) biomethane injection into the gas grid
    - Expanded roll out of renewable electricity, including offshore wind, and grid support services such as storage
    - Delivery of district heating networks where viable - for example utilising waste heat from the Poolbeg waste to energy facility in Dublin
    - Accelerated delivery of electric vehicles and increases to biofuel blends in transport
    - Establishment of long-term carbon pricing signals to drive investment across all sectors of the economy, combined with polices to support the less well-off that could be disproportionately impacted by resultant price increases

    We would note that many of the recent changes to ongoing government climate and energy policy have begun to address the above opportunities.

Recommendation

19. Acknowledging:
    - The current and future role of gas as both a heat source and enabler of high penetrations of renewable electricity in the immediate term
    - The need to mitigate security of supply risk associated with relying on imported gas and oil in the long-term to support necessary energy services
    - The need to decrease Ireland's exposure to international price variations and increases in imported energy sources over time
    - Ireland's commitment to the Paris Agreement and associated greenhouse gas emission budgets
    - The need for accelerated sustainable energy technologies and practices immediately
    - The range of existing analyses and the inherent uncertainty in scenario modelling

    SEAI recommends further analysis and debate on the Bill. This should seek to ensure that sufficient flexibility is established so as not to eliminate the possibility of utilising local non-renewable energy resources where such use may be deemed the best option for the State and in full recognition of climate commitments and security of energy supply considerations for Ireland in the long term.

References

[1] Energy in Ireland (SEAI, 2017) https://www.seai.ie/resources/publications/Energy-in-Ireland-1990-2016-Full-report.pdf

[2] World Energy Outlook (IEA, 2017) https://www.iea.org/weo2017/

[3] Global energy demand grew by 2.1% in 2017, and carbon emissions rose for the first time since 2014 (IEA, March 2018) https://www.iea.org/newsroom/news/2018/march/global-energy-demand-grew-by-21-in-2017-and-carbon-emissions-rose-for-the-firs.html

[4] Impact Analysis accompanying *A policy framework for climate and energy in the period from 2020 up to 2030* [SWD(2014) 15 final] (European Commission, 2014) https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0015&from=EN

[5] Natural Gas and Climate Change (University of Manchester, Anderson and Broderick, 2017) https://www.research.manchester.ac.uk/portal/en/publications/natural-gas-and-climate-change(c82adf1f-17fd-4842-abeb-f16c4ab83605).html

[6] SEAI National Energy Projections (SEAI, 2017) https://www.seai.ie/resources/publications/Irelands_Energy_Projections.pdf NB: The data in this report has been updated and appears in the EPA publication on Emissions Projections below. A more detailed projections report from SEAI is upcoming (expected August 2018)

[7] EPA National Emissions Projections (May 2018) http://www.epa.ie/climate/emissionsinventoriesandprojections/nationalemissionsprojections/

[8] SEAI National Energy Projections (expected publication August 2018)

[9] Zero carbon energy system pathways for Ireland consistent with the Paris Agreement (University College Cork, Glynn, et/ al., 2018) https://www.tandfonline.com/doi/full/10.1080/14693062.2018.1464893

[10] Cost analysis of future heat infrastructure options - Report for National Infrastructure Commission (UK) (Element Energy Limited, 2018) https://www.nic.org.uk/wp-content/uploads/Element-Energy-and-E4techCost-analysis-of-future-heat-infrastructure-Final.pdf

Attachments

Figure 1 – Indigenous energy by fuel

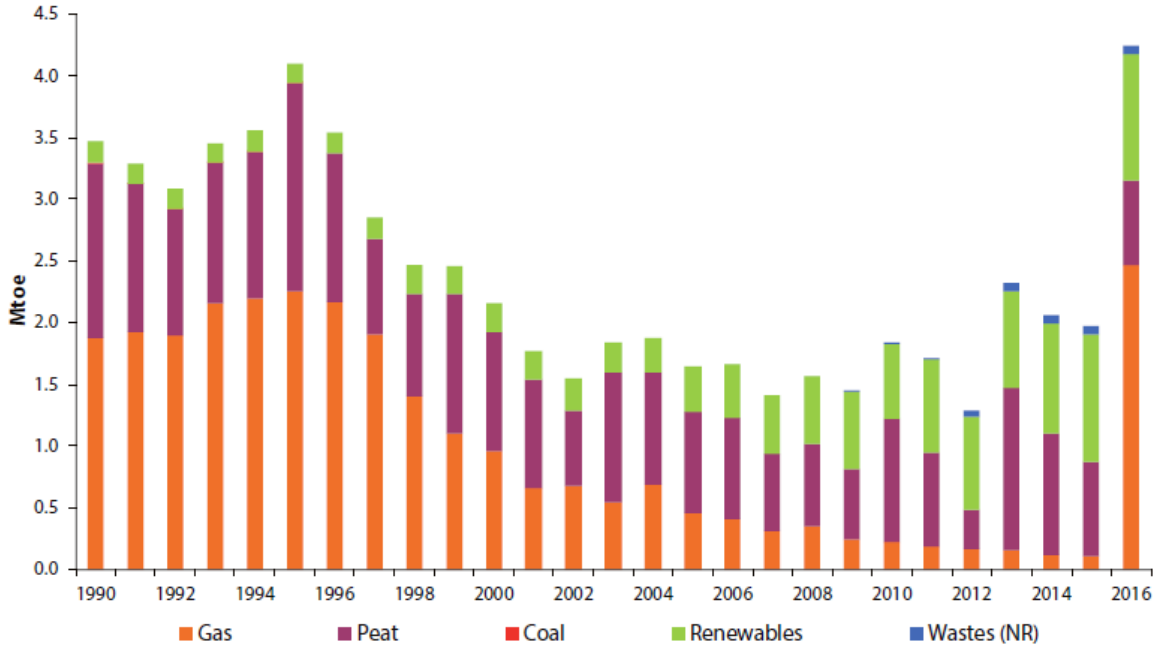

Figure 2 – Imported energy by fuel