

**Submission by Shamrock Renewable Fuels Limited to  
The Department of Environment,  
Climate and Communications  
regarding the review of the security of  
energy for Ireland's gas and electricity systems**

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***Background as set out by The Department of Environment, Climate and Communications:***

- *“The International Energy Agency (IEA) defines energy security as ‘the uninterrupted availability of energy sources at an affordable price’.”*
- *“Ireland’s energy system is going through a period of transformational change ... as we transition to a net-zero emissions future”*
- *“We must ensure ... decarbonisation is underpinned by affordability and security”*
- *“As our energy systems evolve and increasing volumes of our energy comes from renewable sources, we must ensure that we maintain security of energy supply.”*
- *“The review is focused on the period to 2030, but in the context of ensuring a sustainable transition up to 2050.”*
- *We are seeking views on policy measures that could be implemented to support Ireland’s security of supply framework.”*

***Note:*** *renewable electricity generation includes wind, hydro, landfill gas, biomass, and biogas*

Review of the Security of Energy  
Supply of Ireland's Electricity and  
Natural Gas Systems Consultation,  
Wholesale Electricity and  
Gas Policy Division, Department of Environment,  
Climate and Communications,  
29-31 Adelaide Rd,  
Dublin 2,  
D02 X285.  
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To whom it concerns,

Shamrock Energy welcomes the opportunity to respond to your consultation on this most important topic of Ireland's security of supply.

Through its four decade old business HDS Energy Limited, Shamrock Energy has been a leading designer, manufacturer and installer of bespoke solutions for large energy and power projects for clients in Ireland, Europe and North Africa. We have developed deep knowledge in the processing and burning of biomass over the past 30 years through the design, manufacture and installation of over 350 energy systems of scale.

Our clients include Fruit of the Loom, Pfizer, Johnson & Johnson, Wyeth Medica, Henkel, Aurivo and Bord na Móna. In Denmark we have designed, constructed and operated six biomass powered district heating schemes totalling 200 MW. In Ireland, we have installed over 200 MW of Biomass CHP Plants and we are a joint owner and operator of the Aurivo 15 MW Biomass CHP plant in County Roscommon.

We have set out in this submission a brief overview of Shamrock Energy's potential operational and financial ability to generate sustainable biomass power at scale and speed in Ireland and we make the following key points:

- 1) Together with its funds partner the Irish Strategic Investment Fund, Shamrock Energy has invested over €50m of its own resources to develop a world class operating facility at Balrath, Kells, Co Meath to produce 80,000 tonnes of wood briquettes and pellets. The product has been launched in the Irish and UK markets in 2022 under the name "WillowWarm".
- 2) Shamrock Energy is capable of delivering a pipeline of developments to contribute at least 200 MW of renewable, dispatchable power generation by 2025. We have a fully permitted site at Balrath, Kells Co. Meath licenced to construct and operate a 20 MW biomass-fuelled electricity generation plant.
- 3) Electricity generated from biomass is dispatchable, secure, reliable and sustainable. It is compatible with a diversified and renewable energy fuel mix. Biomass is a renewable fuel as per the European Renewable Energy Directive.
- 4) Biomass power generation provides an immediate solution to improve security of supply and reduce carbon emissions. Investment in biomass is good for the environment, the Irish agricultural sector and the wider Irish economy. Biomass generation offers additional social and environmental benefits directly, in district heating for example, and indirectly, in agricultural transition, carbon sequestration and supply chain commercial opportunities.
- 5) The Shamrock Energy proposal reduces dependency on imported fossil fuels and actually promotes an indigenous sustainable fuel supply chain and is an ideal transition technology whilst the viability of new net-zero technology is awaited.

- 6) Our Kells plant alone will support clean, sustainable and profitable use of 11,000 hectares of farmland and reduce Ireland’s agricultural emissions by 0.9%.

We have set out below high level responses to specific matters raised in the CEPA report as follows. Naturally, further discussion may be required to fully understand the background to the CEPA commentary and indeed to qualify and substantiate our response. We remain available to participate in such discussion.

| <b>Ref</b> | <b>CEPA Analysis</b>   | <b>Shamrock Energy Observations</b>   |
|------------|--|---|
| Ob1        | Capex costs of between £2.5m/MW and £3.5m/MW.  | Capex investment for 20 MW export facility estimated at the higher end of the range.  |
| Ob2        | Lower capex for conversion from coal to biomass, e.g. at Moneypoint  | As per Ob1 above, Capex investment is expected to be in the range. New build may be preferable and less risky, avoiding the need to interact with infrastructure which has become non-viable or otherwise sensitive due to age. |
| Ob3        | Assumed conversion efficiency is based on 79% as per Ironbridge coal plant in UK.  | We consider this conversion rate to be overly optimistic. The envisaged conversion of Moneypoint 1 and 2, will therefore prove less efficient and less economic than assumed.   |
| Ob4        | The availability of biomass as fuel for the generator may be limited during the shock period if biomass supply chains are disrupted due to the unavailability of gas supplies.   | Shamrock proposes locally sourced supply chain will have very low or negligible exposure to gas interruption.   |
| Ob5        | The CEPA model does not include system services benefits associated with load following, ramping, and frequency response. Dispatchable plants will be essential for ramping up and down to account for increased variable generation via increased deployment of RES technologies. | The Shamrock facilities will be dispatchable and the technology deployed will be capable of providing the additional services described.  |

In 2012, a report by the SEAI showed that investment in biomass to meet our 2020 targets would make positive returns to the economy, create 3,600 jobs and reinvigorate agricultural and rural economies.

Ireland’s has a strategic opportunity to invest in biomass to reduce its emissions. Recent geopolitical events emphasise the massive negative consequences of our continued over-reliance on imported fossil fuels. Meanwhile our agricultural sector faces economic uncertainty in the face of climate change transition measures.

The Shamrock Energy solution allows us to act now, invest in our economy and secure energy supplies.



**Shamrock Renewable Fuels Limited**

## **1.0 Shamrock Energy**

### *About our biomass fuel*

Shamrock Energy products are carbon neutral and made from a blend of 100% renewable, Irish-grown willow and other biomass.

We have invested approximately €50m to develop and commission our world class biomass briquette and pellet manufacturing plant at Balrath, Kells, Co Meath. This facility will supply 80,000 tonnes per annum of WillowWarm biomass briquettes and pellets throughout Ireland and the United Kingdom.

Working closely with our partners in Teagasc, willow is grown locally including from 2,000 acres of land owned and controlled by Shamrock Energy. Willow is a Short Rotation Coppice (SRC) perennial crop. It has a lifespan of at least 36 years and is typically harvested every two years obviating the need for annual ploughing, reseedling or replanting. Shamrock Energy's deep knowledge of biomass powered energy has enabled it to assemble and organise a sustainable supply chain to underpin its growth.

### *About our biomass generation projects*

Shamrock Energy is developing a power from biomass facility adjacent to the Co Meath manufacturing plant. Once operational the planned facility will provide up to 150,000 MWh of dispatchable, renewable electricity annually to the grid. All relevant consents and permits, including from the Environment Protection Agency (EPA), Commission for Regulation Utility (CRU), ESB Networks and Meath County Council to construct and operate the new CHP plant, are in place. Pending a suitable regulatory and policy environment, this site is ready for construction immediately.

Aside from the Co Meath proposal, a number of other sites are under development by Shamrock Energy. Leveraging existing fuel supply chain, it is conservatively projected that up to 200 MW of dispatchable capacity may be made available by 2025. Investment in land solutions and other developments will yield much greater capacity by 2025 and beyond.

## **2.0 Wider use of biomass in Ireland and universal benefits of biomass**

To date, the principal use of biomass in Ireland has been for electricity generation and industrial heating and CHP, with a lesser albeit significant proportion used for commercial/residential heating. As noted in the CEPA analysis, 265 MW of biomass capacity is already registered in the SEM. Most biomass used in Ireland is sourced from indigenous producers.

Since 2008, significant growth in use of biomass for power generation is attributable to co-firing of biomass with peat and the coming into operation of two new waste-to-energy facilities.

Bord na Móna's 118 MW power station at Edenderry, County Offaly, currently produces just under half of its output from biomass with a plan to operate solely on biomass fuel from 2024, subject to planning approval. The operator says that the fuel will be derived from a broad range of lower grade and residual forest products. Latest figures state that 80% of the biomass used to co-fire the plant is supplied by Irish producers.

The agricultural and food development authority, has extensively researched and reported on why we need biomass in Ireland. Attention is drawn to the extensive research carried out to date by the Agriculture and Food Development Authority, Teagasc, particularly the 2012 report appended to this submission, and the Irish Bioenergy Association (IrBEA) in which the emphatically compelling case for Irish energy crops is made.

As a renewable fuel which can be produced and supplied by local businesses, biomass generation allows us to displace the import cost and carbon emissions of fossil fuel-based generation.

We set out below the critical benefits of biomass in the context of power generation:

### *Power Generation*

As the CEPA report points out, diversification from gas-fired plant allows for a reduction of the requirement for secondary fuel at gas fired power stations during a shock scenario. Biomass power stations, being thermal power plants, are well suited to replacing or diversifying largely gas-based power production.

Biomass plants are fully dispatchable and with greater control and certainty regarding fuel stocks are as or more reliable than their gas-fuelled equivalents. Generation from biomass is an ideal transition technology whilst we await the viability of other net-zero technology currently in development.

### *Displacement of high carbon emission activities*

Biomass reduces our carbon emissions by displacing higher emissions from fossil fuel power generation and certain agricultural activities. Willow chip fuel emits over 90% less carbon than natural gas. It is ten times less carbon intensive than the average unit of power from the national grid. Annually, 200 MW of biomass generation would produce 950,000 less tonnes of emissions compared to gas generation. This is heavily complemented by 803,000 tCO<sub>2</sub>eq of agricultural emissions displaced through land use for crop growth.

### *Carbon sequestration*

Renewable biomass fuel crops provide more energy than they require for production. As stated above, 803,000 tCO<sub>2</sub>eq is displaced by indigenous crop growth. The crops themselves, provided even further benefit through the process of carbon sequestration whereby the crop structure and root system stores carbon absorbed by the atmosphere. The sequestration provided by the fuel crop to supply 200 MW of biomass generation amounts to more than 300,000 tCO<sub>2</sub>eq.

### *Combined carbon savings*

The combined annual benefit of displaced emissions and carbon sequestration provided by growing fuel crops and generating 200 MW of electricity from biomass is over 2 million tonnes of carbon dioxide equivalent. This represents a saving of 3.4% on Ireland's 2020 emissions and 9% of emissions in the agricultural sector.

Shamrock Energy plans to promote highly localised growth and supply of fuels to its facilities. This reduces carbon contribution from transport. Teagasc calculates that supply within 5 km could offer savings of around 19.5 kgCO<sub>2</sub> per load journey compared to within a 30 km radius.

### *District Heating*

The Climate Action Plan 2021 includes a range of actions (nos. 180-186) to help deliver on a key metric of supplying up to 2.7 TWh of district heating by 2030. According to data provided in the Teagasc report (2012), only approximately 30,000 hectares, or less than 1% of Ireland's agricultural land mass would deliver biomass crops to meet the district heating target.

## **3.0 Just transition**

As we have seen in the midlands, there is a great need to provide sustainable transition from long established agricultural and industrial activities. Biomass offers much by way of economic and knowledge incentive to drive a new market sector with the clear potential to become another success story for Irish renewables.

Producing biomass crop is estimated to generate a profit of €700 per hectare per annum for the farmer. This presents a highly competitive opportunity for farmers being higher than the average farm income of €600 (Department of Agriculture, Food and the Marine, 2021) and almost 2.5 times higher than for cattle

rearing farms. An average 43 ha. farm would stand to generate €80,800 over 20 years of growing biomass crops.

Where farmers have higher on-farm heating requirements, access to their own biomass fuels will offset conventional fuel needs and greatly reduce costs with savings amounting to multiples of the profits from production for third party end use.

#### ***4.0 Wider social and economic benefits***

Currently only one organisation is offering to buy biomass crops in Ireland. Promoting biomass will invigorate the sector benefitting direct and indirect suppliers. From crop growers to plant and machinery suppliers, new revenue opportunities will be presented. When SEAI investigated a proposed €1.5 billion investment in biomass to meet 12% of our 2020 renewable heat targets, results showed that it would immediately return to the economy 55% of the investment along with €430 million per year in operating expenditure.

Analysis of the employment effects showed that the investment would create 3,600 jobs full time equivalent jobs across the biomass facilities, suppliers and the wider economy.

Given the nature of biofuel production, the investment and benefits will accrue mainly in the rural economy. Communities will benefit from increased business activity, spending and opportunities for those seeking employment locally.

Nationally our energy imports are approximately six times our exports. Use of indigenous biomass fuels reduces exposure to fluctuating international energy markets and improves our balance of supply.

Greater deployment of biomass on a national basis will drive the need for expertise in crop growing, harvesting, ecological and agricultural consultancy.

##### *Other benefits in summary*

- Biomass energy crops can improve water quality and prevent flooding.
- Biomass energy crops can significantly increase biodiversity on farms.
- Small to medium scale biomass energy plants provide an accessible means of compliance with sustainable planning guidelines.

##### ***Key Figures:***

|              |   |
|--------------|---|
| 540 hectares | Land used to grow fuel to generate 1 megawatt (MW) of electricity   |
| 200 MW       | Our target generation portfolio, creating new business opportunities for carbon intensive farmland          |
| 1,080        | Number of 100 ha. farms that would benefit from a clean sustainable and profitable business into the future |
| 2,000,000    | tonnes of CO2 equivalent emissions saved  |
| 9%           | Reduction in agricultural emissions   |
| 3.4%         | Reduction in national emissions   |

## 5.0 What more can be done?

Given the nascent state of the biomass industry in Ireland, appropriate regulatory support is required to ensure that the great number of benefits, as outlined in this document and otherwise, are realised. The International Energy Agency (IEA) defines energy security as ‘the uninterrupted availability of energy sources at an affordable price’. Biomass will provide this security as long as it is supported to the same or equivalent extent as other renewable (and indeed non-renewable) generators.

A simple overview of the constituent costs and potential revenue streams is provided in the Appendix. Shamrock Energy welcomes questions and debate on the detail behind the content of our submission. In particular, we invite discussion on the regulatory support which would provide for fair incentives whilst ensuring minimum environmental, financial or other risks to society.

## APPENDIX

– High level description of costs and potential revenues for biomass power generation.

| Biomass constituent costs   | Potential revenues   |
|---|--|
| <ul style="list-style-type: none"><li>• <b>Fuel productions costs</b><ul style="list-style-type: none"><li>○ <i>Crop establishment</i></li><li>○ <i>Harvesting</i></li><li>○ <i>Processing</i></li><li>○ <i>Producer storage</i></li></ul></li><li>• <b>Transport and handling costs</b><ul style="list-style-type: none"><li>○ <i>Loading</i></li><li>○ <i>Haulage to generation facility</i></li><li>○ <i>Unloading</i></li><li>○ <i>User storage</i></li></ul></li><li>• <b>Power generation costs</b><ul style="list-style-type: none"><li>○ <i>Devex</i></li><li>○ <i>Capex</i></li><li>○ <i>Opex</i></li><li>○ <i>Other</i></li></ul></li></ul> | <ul style="list-style-type: none"><li>• <b>Capacity Remuneration Mechanism (CRM), subject to auction</b></li><li>• <b>Ex ante and balancing market trading</b></li><li>• <b>DS3 Programme</b></li><li>• <b>Funded support schemes, e.g. RESS</b></li></ul> |