SFS Ireland Submission to the Consultation on developing a Bioeconomy Action Plan for Ireland 2023-2025

SFS Ireland

Piloting a Pathway to Net-Zero

Executive Summary

As stated in the National Policy Statement on Bioeconomy, there is enormous potential yet to be unlocked in Ireland's bioeconomy. One solution to be adequately explored is the production of an aviation biofuel called Sustainable Aviation Fuel (SAF). SAF can be derived from various feedstocks, but of particular interest to producers is green hydrogen, biogas and biogenic carbon dioxide (CO2). SAF has the potential to reduce emissions over its lifecycle by 70% to 80%, compared to its fossil equivalent. A unique opportunity has arisen for Irelands' bioeconomy as aviation industry giants such as Boeing, Avolon, and Orix Aviation are actively engaged in an Irish SAF study. The study is led by SFS Ireland and SkyNRG to determine if commercial scale SAF production is a viable opportunity in Ireland. The project has the RED III framework at its core and is driven by the sustainability principle. The SAF product would be categorised as a high value product, aligning it with the cascading principle and therefore maximising the value obtained from Irelands' biological resources. Biogas from Anaerobic Digesters (AD), will be a key element in SAF manufacture, creating a symbiotic relationship between the SAF and agricultural industry. This relationship would allow for a more stable economy, offset the uncertainties in the agricultural sector created by Brexit, provide employment and regional prosperity, all while helping to decarbonise the aviation and agriculture industry. The National Policy Statement on Bioeconomy made it clear that funding alone will not suffice to *"drive the bioeconomy forward"*. The use of SAF is due to be mandated across the EU from 2025 as per the ReFuel EU document. It is widely accepted by the International Civil Aviation Organisation (ICAO) and the International Air Transport Association (IATA), that SAF production and supply will not reach industry demand for decades to come. This creates a guaranteed market for the product and significantly reduces the risk to the exchequer.

Background

In 2019, the energy requirement of the Irish Aviation industry was 1.2 Mtoe [4], generated via the combustion of 1.16 million tonnes of Jet A1, which produced approx. 3.7 million tonnes of CO2. All of this energy was imported to the state, mainly via Dublin port and the Cork and Shannon area facilitates. Ireland has committed to reduce its transport emissions by 42-50% by 2030 in the newly published Climate Action Plan 2023. However, aviation has no clear role in the decarbonisation of the transport sector according to the latest government plan. The ReFuel EU SAF Mandates start in 2025, where aviation fuel made available to EU airports should contain 2% SAF, increasing to 5% by 2030, 32% by 2040 and 63% by 2050. CAP2023 also mentions the construction of 200 AD facilities, generating 5.7TWh of Biomethane by 2030. The sectors targeted for the use of this biomethane are electricity (1.6TWh), industry (2.1TWh) and residential buildings (0.7TWh) [5]. It is important that the transport sector is included here as a beneficiary and off-taker of biomethane. The long-term demand in the transport sector, especially in aviation, will significantly strengthen the investment case. Irelands' position as a global aviation leader can be consolidated here as the industry transitions to net-zero by 2050. The country has a role to play in the ramp-up of SAF production in the EU and global context.

SAF Rationale

The Airline sector is responsible for 3% of global emissions, in Ireland that's 1.3 Mt of Co2 in 2020 and averaged above 3.0 Mt of Co2eq prior to the Covid pandemic. [6] Alternative aviation fuel options, such as hydrogen and battery technology, continue to develop. However, due to the limitations of battery energy density and a range of issues with Hydrogen, medium and long-haul aircraft will continue to depend on liquid hydrocarbons for the foreseeable future. Ireland's location on the periphery of Western Europe, combined with our close social and economic ties with the United States, ensures the need for medium and long-haul aircraft at Ireland's airports. The Bioeconomy and SAF industry can be a fruitful, symbiotic industry development in Ireland's drive to become net-zero. Combining the Irish aviation and agriculture industry has significant potential for the country's climate conscious future development. SAF manufacturing can be a secure enabler to the development of a Biomethane industry

Answers to questions from the consultation document

Question 1: Are you satisfied the outlined Pillars represent the structure of the Irish bioeconomy?

Transport, especially the aviation sector, should play an active role as beneficiary within the Irish bioeconomy. The term "industry & enterprise" is less clear to that extend, and from the CAP2023 publication it seems that the transport sector is not included in the term "industry". It would be prudent to add a separate pillar for the transport sector, given its role within the bioeconomy, rather than referring to it under one of the existing pillars.

Question 2: Are there specific key performance indicators and/or targets the bioeconomy should be setting out to achieve to measure its implementation?

With the consumer of the biogas in mind, it would be beneficial to set specific certification KPIs for biomethane to ensure biogas meets the required standards for onwards processing.

Targets on production levels should be included, monitored, and reported quarterly. For example, the CAP 2023 calls for 20 AD plants by 2025 and 200 by 2030. Will biogas production levels vary between plants? This data is of great importance to projects like ours, examining the opportunities for onwards processing through feasibility and planning studies.

Question 3: What other key issues should the Governance Pillar deal with*?*

Regulatory coherence across all sectors and departments is essential to ensure compliance. A cross-departmental working group or stakeholder forum could assure all issues are addressed and considered. With a multitude of interested stakeholders from various industries and government departments, a dedicated working group or forum could be used to provide a platform to learn about ongoing projects, developments that may be close to commercial scale, funding opportunities, etc. This would foster new relationships and maximise the potential of the bioeconomy.

As the bioeconomy is a relatively new undertaking it may be susceptible to fraud and non-ethical activities despite the best intentions of the action plan. Mechanisms should be agreed on, whereby companies or individuals engaging in such activities will be held to account.

Question 4: What key issues should the Research, Development & Innovation Pillar deal with?

Clear and fast funding channels**.** Time is of the essence. Ireland has the benefit of starting a "clean sheet" in terms of developing a bioeconomy. Early integration of all sectors along the biogas supply chain will ensure coherence and compliance throughout the product life cycle. There are a lot of R&D projects and partnerships in existence, but difficulty in accessing funding often slows down progress.

Question 5: How could the RD&I bioeconomy approach be best structured to support the enhancement, application and scaling-up of biological knowledge and bioeconomy solutions?

A Tiered approach across the entire system could be a possibility:

1. Feasibility
2. Government Policy
3. Investment
4. Commercialisation

SFS Ireland and our partners are close to finishing the pre-feasibility phase for the production of SAF in Ireland using Irish biological resources. Without this first crucial step, a risk assessment for investors is impossible. Once the potential of a successful project is confirmed on basic criteria such as feedstock availability, sustainability, suitable locations, market dynamics, etc, clear government policy confirming an appetite to take on risk alongside potential investors is key. With acceptable risk shared by government and the private sector, new bioeconomy operations can be developed into long term commercial operations.

Bioeconomy solutions that are in line with the cascading principle should be prioritised. The National Policy Statement on Bioeconomy lists several high value use cases in a variety of sectors for Irelands' bioeconomy. SFS Ireland strongly believe SAF belongs to that group. Giving priority to high value products, manufactured in partnership with the bioeconomy industry will maximise the value of the biological resources available and help map the future potential of the industry.

Question 6: What key issues should the Nature, Climate & Circular Pillar deal with?

Integrating the Renewable energy and circular economy. There are different pathways of producing SAF from biogas, one of which would be via Power to Liquid (PtL). The production of SAF from biogas via PtL brings together biogas from the AD industry and green hydrogen. The latter is produced by running water through an electrolyser to separate the hydrogen and oxygen. As sustainability and a clear target of net zero are at the heart of our project, the hydrogen must be produced from renewable sources of electricity, such as wind or solar. There will be several instances during the bioeconomy evolution where the renewable energy industry will be involved. Planning ahead and carefully selecting suitable sites for large scale commercial projects that have advantageous access to renewable energy farms will minimise the effect to nature, biodiversity, and ecosystems.

Question 8: What key issues should the Agriculture, Food & the Marine Pillar deal with?

Achieving specified grades of biogas for onwards processing as per the anticipated consumer market. Provide support in particular to those sectors that are in line with the cascading and sustainability principles and have the least effect on land use, land use change and forestry.

Question 11: What key issues should the Industry & Enterprise Pillar deal with?

The issue of renewable energy should be front and centre for this pillar. Providing government supports for new operations that are determined to use sustainable, renewable sources of energy should be a priority. Our project not only plans to use sustainable energy as much as possible, but the final product will have a significant effect on the emissions of the transport industry in Ireland. Job creation and the building of a more stable economy in the light of recent geopolitical events should also be taken into account. Therefore, as per answer to question 1, if the transport sector is not a pillar in its own right, or part of a Renewable Energy pillar (as per answer to question 17) it should be clearly made a part of this pillar.

Question 12: What lead market initiatives could support entrepreneurship, development, innovation and the commercialisation of bio-based products, processes, information, and services?

Developing an Irish SAF industry as part of the bioeconomy model will secure future demand for biogas, biogenic CO2 and possibly other by-products such as digestate. As previously mentioned, demand for SAF will outstrip supply for decades and European mandates for its use are set to begin in just 2 years. When the ReFuel EU proposals from the European Commission are written into European Law, they will put in motion a plan to ramp up SAF use in European airports from 2% in 2025 to 63% in 2050. This could see between 1500 and 2000 new SAF refineries coming online to have a chance of fulfilling that requirement. Only a handful of countries currently produce SAF and Ireland has an opportunity to join them while also developing a bioeconomy. Developing the entire supply chain from the beginning ensures coherence and compliance throughout processing.

Financial support and risk sharing from government is required to attract the necessary private investment from suitable, reputable companies.

Question 14: What key issues should the Knowledge & Skills Pillar deal with?

Opportunities including not only the biomethane sector, but also the downstream processing, such as SAF technology development. In an effort to educate, upskill and provide job opportunities, we should examine successful projects abroad. Lessons can be learned, and knowledge and skills required from countries already enjoying a growing bioeconomy. One of our partners, SkyNRG, has extensive international experience and has already aided the development of a SAF plant in the Netherlands. Creating policies and providing support to the commercial entities can bring the required knowledge and skills with it from abroad.

Question 17: Are there any further Pillars/Issues which this Action Plan should address?

Transport should have a visible role to play within this Action Plan. The addition of a "Renewable Energy" Pillar might be a way of addressing this issue. Alternatively, the re-naming of the "Industry & Enterprise" Pillar to facilitate the transport sector could also be helpful.

Consider a finance pillar to detail opportunities available for start-ups and entrepreneurs to reduce investment risks involved. This pillar could go further than the funding mentioned in the Research, Development, and Innovation Pillar. Detail finance options, subsidies, tax allowances, grants etc. to attract investment, and allow for projects to be scaled up to commercial levels.

Question 18: Indicate what the top five priorities for action in the bioeconomy over the next three years should be?

- **Educate** the agricultural sector and government departments about opportunities.
- **Streamline planning and investment** opportunities to accelerate AD development.
- **Biogas specification targets** to ensure onwards processing is in line with potential off-take markets.
- **Stakeholder engagement** across the bio-economy supply chain to ensure a coherent approach. (SFS Ireland is the first aviation member of IrBEA and has engaged in numerous renewable energy and bioeconomy events in 2022 to communicate the aviation industry's need for a functioning, well-coordinated AD sector within Ireland)
- **Access to financial support** for R&D and pilot project development in order to create a bioeconomy that is part of Ireland's circular economy development and supports cross-sector and down-stream involvement.

We remain available to discuss any of the above at your convenience,
Yours sincerely,

[redacted]