Invited Submission to Department of An Taoiseach
on developing Ireland's Bioeconomy

(15th Sept 2017)

Response to Discussion Document to inform a policy for smart, sustainable and inclusive growth

NUI Galway welcomes the opportunity to provide a submission in relation to the Discussion Document on the Bioeconomy (the part of the economy that uses renewable resources from land and sea). NUI Galway welcomes that the National Mitigation Plan, Action Plan for Jobs and Action Plan for Rural Development all contain commitments to the strategic development of Ireland's bioeconomy. NUI Galway has extensive education, research and impact pathway activities in relation to the bioeconomy, spanning multiple disciplines and research units. In particular, both the Ryan Institute and the Whitaker Institute within NUI Galway have significant research activities underway on advancing Ireland's bioeconomy on land and sea. The following submission provides inputs from both of these NUI Galway research institutes, that can be used to inform a National Policy Statement to drive developments in the area.

Ryan Institute: www.ryaninstitute.ie

Ryan Institute comments and recommendations in relation to the Discussion Document and the development of a Natiional Policy Statement on the bioeconomy.

1) Does the broad definition outlined adequately encompass the opportunities presented by the bioeconomy?

a) The bioeconomy definition outlined in the Discussion Document draws from the EU Bioeconomy Strategy 2012 – Innovating for Sustainable Growth: A Bioeconomy for Europe. The bioeconomy intrinsically covers a broad spectrum of the economy. It is advisable to retain as wide a definition as possible for the scope of the bioeconomy so as not to implicitly exclude or inadvertently impede any areas of it in a public administration context.
b) Specifically for the bioeconomy in Ireland, it is critical to recognise from the outset that Ireland has particular natural resource advantages in terms of its marine territory and also its pasture and forestry-growing conditions. Ireland ranks very highly amongst European Union member states for these natural environmental advantages.
c) In terms of Ireland's international obligations and its commitments to climate action, the development of a bioeconomy strategy should seize opportunities to support the state's transition to a low-carbon economy, as enacted in our climate legislation and in stated policy positions on for example energy, transport, agriculture, food, forestry and the marine.

2) How can a high-level policy statement on the bioeconomy assist in progressing the development of the priority value chains identified?

a) A high-level policy statement on the bioeconomy will be a significant aid to coherence in governance and policy implementation across all sectors.

b) A high-level policy statement on the bioeconomy puts a name/title and a definition on this area for a cross-section of public policy officials in government departments, state agencies, regional agencies and local authorities. The policy statement will assist in the necessary awareness-building and knowledge-building required across various sectors of public administration to enable the type of joined-up decision-making and policy implementation required to allow for the strategic development of the bioeconomy.
c) A high level policy statement on the bioeconomy will assist the development of prioritised high-value chains identified at a more micro level. It will provide a reference point for public officials involved in policy delivery that impacts on the development of those value chains.
d) A high level policy statement offers another tool to address the integration of responses to its climate action and de-carbonisation challenges.

3) What lessons can Ireland take from the European approach, including to the Circular Economy?

a) Ireland can take lessons from other European Union member states in terms of prioritising resource recovery from residues, by-products and resources currently considered wastes, as a prelude to looking at extraction of first-generation resources for use in the bioeconomy.
b) Another lesson from the European approach is the need for piloting and demonstrating technological developments in an Irish setting. Whilst there have been supports and initiatives for smaller-scale lab-based research, innovation requires piloting and demonstration phases to enable up-scaling of the technology to de-risk it for investors prior to deployment and commercialisation. The BioÉire project has been greatly informed by the know-how and knowledge base built up through the NUI Galway Ryan Institute's hosting of the Irish Technology Centre for Biorefining and Bioenergy (TCBB) and its participation in the award-nominated, EU Interreg-funded BioBase N.W.E. project, which enabled direct introductions for Irish companies and state agencies to pilot facilities in other EU member states.
c) Lessons from Europe indicate that support for the development of bioeconomy industries will be required to be put in place over a 10 to 15 year time-frame, with tariff supports tapering off towards the end of that life-cycle as a market becomes established and bedded down.
d) Particularly in the context of the UK exit from the EU ("Brexit"), it is important to be cognisant that the existence of a tariff or market support mechanism in one jurisdiction on the island could have the effect of acting as a pull factor for materials out of one jurisdiction into the other.

4) Given the cross-sector nature of the bioeconomy, how can a national policy best support development?

a) This is very much connected with question no. 3 as posed in the Discussion Document: the existence of an overarching policy statement in and of itself gives a policy identity and a recognition to the bioeconomy – to an extent it gives an identity to it in an Irish setting. It gives an over-arching focal point from which public and civil servants can navigate.
b) A national policy document could support bioeconomy market development with a clearer recognition of the importance of pilot-scale facilities. A national bioeconomy policy statement should include a recognition of the need to enable scale-up from laboratory scale to demonstration scale (from eg 1litre or 1 kg scale in the lab to larger 100l to 1000l scale). Access to demonstration scale facilities will be required to demonstrate and de-risk technology to encourage investment on the pathway to eventual deployment. Solely state-owned facilities are not necessarily the policy response to this need – there are lessons from Europe pointing towards more of a role for public-private partnerships that facilitate the state and industry, together with the higher-education institutes to collaborate in relevant industry-settings. Currently, some NUI Galway Ryan Institute and other Irish university-

based research groups are engaging with tcbb RESOURCE and industry partners to carry out the type of testing and demonstration that requires an outlet or test-bed in an industrial setting. This includes participation in the EU Interreg N.W.E.-supported BioBase4SME project with tcbb RESOURCE, focused on providing anaerobic digestion and pyrolysis test-bed facilities for the bioeconomy in Ireland.

5) Can we identify a common set of principles, including in particular the application of the cascading principle, which will assist in the development of both the bioeconomy and circular economy?

a) A critical point is to tailor policy, technologies and supports to Ireland's unique conditions and bio-resources. While the cascading principle is well-established in the research literature, but the commercial reality for a country such as Ireland is availability of the quantity of biological materials for feedstock required for Irish enterprises to compete with larger regions and multinational companies. Ireland has an existing economic focus on forestry, marine and agri-food production. It would be prudent to focus on near-term valorisation of the existing, albeit currently fragmented supply of raw material from marine discards and forestry and agri-food-based residues and by-products.
b) In the case of forestry, there is an argument for placing more importance on the conversion of wood into higher-value added materials, including building products or conversion to other higher-value added products, rather than a focus as a renewable biomass fuel for heat and power generation. In this regard, the expertise of the Ryan Institute in low-carbon footprint building materials, biorefining and timber engineering can be interfaced with the production forestry sector.
c) The bioeconomy presents an opportunity for integration with climate action obligations and arguably the focus for a large exporter of food, beverages and wood such as Ireland should be on the role of the bioeconomy in the reduction and mitigation of GHG emissions in farming, transport and industry. The Ryan Institute's capabilities in life-cycle analysis can be used for rational development of circular economy business models and low-resource footprint products supported by robust evidence.

6) How can a national policy statement support local and regional co-operation around the use of renewable biological resources?

a) A national policy statement could offer an opportunity to inform the development plans produced by local authorities. For example, a national policy document could give guidance to local authorities and local authority planners in relation to decisions with implications for the development of the bioeconomy. Consistency in planning decisions across various local authorities will become critical to the market development of the bioeconomy. A national policy statement can assist by building awareness amongst local authority and regional agency officials and planners of the role of the bioeconomy and the implications of their decisions around the use of renewable biologicial resources. It can also offer stakeholders a reference point to which they can point when making proposals or applications to local authorities.
b) Irish Water has published a National Wastewater Sludge Management Plan (2016), which suggests maximising the operational efficiency of satellite sludge de-watering and regional sludge hubs -as a potential option for consolidating otherwise fragmented supply chains of sludge for resource recovery. It also states that the use of existing anaerobic digestion infrastructure should be maximised to increase resource recovery. A national bioeconomy policy statement could benefit from reflecting a similar approach generally within local authority areas and regions to facilitate the consolidation of feedstock supplies.

7) How can waste policy, including an examination of the definition of waste, best support developments in the bio and wider circular economy?

a) There are external regulatory and policy drivers to continue the move away from landfill and there are opportunities for the bioeconomy within this challenge.
b) Definitions that enable a waste to be classified as a residue or by-product can assist the development of the bioeconomy.
c) 8) How can we stimulate demand for bioeconomy products? What is in it for the consumer?
d) Before we focused on stimulating demand, we should focus on supporting the provision of appropriate pilot-scale facilities to scale-up and de-risk technological innovations and to encourage private investment in deployment and ultimately in commercialisation.
e) Green public procurement offers an opportunity to stimulate demand for bioeconomy products, with the Green Tenders policy statement already in place since 2012 and the EPA having published guidance to public bodies on green procurement in 2014.
f) Pricing of bio-based products could be a deterrent to consumers opting for the bio-based version of a product -for example bio-based detergents and cleaning agents currently on the supermarket shelf in Ireland. Obligations on producers to supply a particular portion of bio-based products on to the market, at a similar price to the equivalent fossil-fuel derived products could be a means to stimulate more demand for the bio-based products. It may encourage the consumer to make the switch to the bio-based equivalent.
g) Behavioural change is a key challenge of which some government departments and state agencies are becoming more aware. Some are taking steps to focus on behavioural change as something to integrate into their own areas of service delivery. The European Union bioeconomy strategy of 2012 recognises that a more involved dialogue with the consumer will be required to develop the bioeconomy. Arguably, to stimulate consumer demand for bio-based products, we are ultimately talking about engaging with the consumer on tangible quality of life fundamentals such as clean air, clean water and affordable energy.

9) What is the most appropriate mechanism to co-ordinate development and monitor progress?

a) The Ryan Institute proposes that there should be a two-part mechanism used to co-ordinate development and progress:

(i) Within the system of government and public administration, a Department of An Taoiseach-chaired working group reporting to a Cabinet Committee with representation from Dept. of Communications, Climate Action and Energy (DCCAE), Dept. of Agriculture, Food and the Marine (DAFM), the Dept. of Rural & Community Development, the Dept. of Public Expenditure (DPER) and the Dept. of Finance, Dept. of Jobs, Innovation & Enterprise (DJEI) and DFAT (Dept. of Foreign Affairs and Trade).

(ii) For direct broad and sectoral engagement with key stakeholders, the inter-departmental working group should run a broader sub-committee on a quarterly basis, or as required. This broad sub-committee should include in particular industry, higher-education research institutes, third sector (social enterprise having a role as loss leaders) and national representative organisations. Within that forum, the NUI Galway Ryan Institute recommends that there would be provision for enabling direct engagement and outreach to citizen and stakeholder groups to share information and enable behavioural change.

10) Are there any other issues to be addressed through a national policy statement?

a) A recognition that the bioeconomy is intrinsically a cross-cutting, cross-sectoral policy issue comprising within it many sub-sets.
b) A recognition that the development of the bioeconomy will require a broad range of awareness-building and dialogue across various sectors of society and that a process of behavioural change will be required -regarding how the citizen and the consumer in particular view sustainability issues and could be encouraged to see waste as an economic building-block.
c) Importance of land-use change planning in relation to biomass supply chains for a sustainable bioeconomy.
d) Specific genetic tailoring of biomass feedstocks should be pursued to generate process engineering efficiencies that can deliver competitive edge for Irish enterprises.
e) The national bioeconomy roadmap should be an integral component of decarbonisation pathways for Ireland.
f) Both the forest-based bioeconomy and the marine-based bioeconomy are currently underappreciated and have major potential.
g) To develop disruptive new products and fuels, there should be a strong focus on fostering biotechnological and chemical conversions of biomass to high value products, chemicals and precursors. This is missing from the current policy (which is largely based on extraction rather than conversion approaches).
h) The document should recognise the importance of land-use change planning in relation to biomass supply chains for a sustainable bioeconomy.

Whitaker Institute: www.whitakerinstitute.ie

Whitaker Institute / SEMRU comments and recommendations in relation to the Discussion Document and the development of a Natiional Policy Statement on the bioeconomy.

The current definition of the bioeconomy focuses on the use of a wide range of renewable biological resources and innovative and novel technologies to produce value added products in a sustainable manner. This involves a highly complex policy framework across a broad range of policy areas, including the marine. With the launch of Harnessing Our Ocean Wealth (HOOW) – an Integrated Marine Plan (IMP) for Ireland (July, 2012), the government stated its vision and goals to enable Ireland's marine potential. The strategy included a number of sectoral targets, some of which relate directly to specific bioeconomy marine resources including food (sea fisheries, aquaculture and seafood processing) and non-food resources (marine-based chemicals and pharmaceuticals, novel marine bioproducts and marine ICT).

In order to monitor progress towards these targets, the most appropriate mechanism involves the economic, social and environmental measurement of the performance of Ireland's marine based bioeconomy. From an economic perspective, the Bioeconomy Input Output model (BIO) developed by SEMRU and Teagasc in 2015 (Grealis and O'Donoghue, 2015) offers a macroeconomic framework to analyse the linkages between marine based bioeconomy sectors and the wider economy. The model suggests that because marine based bioeconomy sectors derive much of their inputs from national sources, including labour, any expansion of these sectors is likely to have a large impact on the regional and local economy, contributing to development in rural coastal areas. In line with the objectives set out in the Action Plan for Rural Development, there is a need to strengthen coordination at the regional and local levels to ensure that the development of the marine based bioeconomy takes place in a socially sustainable manner. Furthermore, to contribute to the environmental measurement of Ireland's marine based bioeconomy, it would be desirable to incorporate ecosystem services values to economic models such as BIO to assess the structural interdependencies between these values and the economy.

More than any other industry the bioeconomy sectors rely on functioning ecosystems that are increasingly coming under pressure from human activities and climate change effects. Further research is needed in order to understand the linkages between these underlying ecosystems and the services that they deliver that ensure the sustainability of the renewable biological resources that form the basis for our bioeconomy. It could also be argues that our tourism sector is highly dependent on the maintenance of our natural capital stock and, as such, has strong linkages, if not partly within, the bioeconomy. This is particularly the case for marine recreation and angling pursuits where the economic values are linked to a healthy natural environment and in the case of angling to a sustainable and high quality stock of coarse, sea and game fish.