Bioeconomy Action Plan – Public Consultation Submission document

My name is [redacted] and I am a 3rd year Mechanical and Sustainability Engineering student in Dublin City University. This is a mechanical engineering degree at its core, with a focus on sustainability. Some notable modules completed to date that may be relevant to this consultation are Life Cycle Assessment, Pollution & Biosphere, Physics of renewable energy, Thermodynamics and Thermofluid mechanics.

Response to questions:

1. I am satisfied that the pillars outlined in figure 1 of the Bioeconomy action plan represent the structure of the Irish bioeconomy.
2. There are a number of key performance indicators the bioeconomy should be setting out to achieve in order to measure its implementation. Examples could include (but not limited to); Mass of waste material repurposed or recycled, number of people educated on the bioeconomy, number of research projects completed/ongoing, number of bioeconomy related innovations achieved, amount of community initiatives implemented and net reduction in carbon dioxide equivalent emissions. Number of people employed in the bioeconomy, the value of the bioeconomy, mass of biomass used per year and area of land forested or deforested are among other important metrics. (1)
3. The governance pillar should deal with implementation of education programmes in order to raise awareness about the bioeconomy.
4. Research, Development & Innovation pillar should tackle the development of hydrogen vehicles and retrofitting of current combustion vehicles to be electric/hydrogen powered. According to an article in France (2) converting combustion engine buses to electric costs about half the price of buying a brand-new electric bus. There should also be research done into the production of biofuels from food waste/ other organic waste. The water treatment infrastructure should also be developed as it is far behind the European standard.
5. As an undergraduate student I do not yet know enough about the RD&I sector to comment on how best to structure it.
6. The Nature, Climate and Circular Pillar should deal with ensuring that all aspects of the bioeconomy are carried out in ways that will benefit Nature and the climate by promoting a circular economy. In agreement with the description of the pillar, this should look to improve biodiversity. I also agree with the intention to address issues with by-products and end of waste because avoiding wastage will ultimately help avoid producing greenhouse gas emissions as the manufacturing of products from recycled materials has less impact than manufacturing new materials. I agree that renewable energy and the bioeconomy must function harmoniously as renewable energy is another key aspect to reducing greenhouse gas emissions. I think this pillar should have strong links with all the other pillars, since a sustainable bioeconomy relies on a healthy environment.
7. I do not have the required education to respond to this in a meaningful way.
8. I agree that the agriculture, food and marine pillar should focus on actions concerning climate neutral and regenerative farming. Engineering can help make agriculture more efficient in many ways. One way is by using drone technology to detect disease in crops (3). Another could be by using autonomous vehicles (4) which could allow farmers to make use of fine weather windows as these can operate through the night. The John Deere company has several other innovations such as autonomous sprayers, drone sprayers and artificial intelligence that can detect the difference between weeds and crops and spray appropriately (5). The electrification of farms will also reduce their carbon footprint. The appropriate application of sprays to crops can dramatically reduce the impact of excess

fertiliser, pesticides, or other chemicals on the surrounding environment as only the exact amount of chemical required is applied using these innovations.

9. I agree that the Communities Pillar should deal with developing urban bioeconomy initiatives such as making bio-based products from urban biowaste or developing forests in urban areas. This is another crucially important pillar because fostering an environment where principles of a sustainable bioeconomy are a core part of a community is key to get people to act. Psychological studies show that humans are more likely to take action on climate change when they are surrounded by people who are also taking action on climate change (6).
10. I cannot comment on this since I am not currently familiar with policies in place at regional assembly and local authority level.
11. I agree that implementing bioeconomy approaches in industry can improve the autonomy of resource needs. I also agree that replacing fossil-based carbon with captured carbon or biobased alternatives is also important for reducing import dependency, particularly given the current fuel crisis. This pillar should have a strong link with the Research, Development and Innovation pillar, as once a product is fully developed, industry should produce it using the most sustainable methods, such as using biobased materials and minimal energy consumption.
12. I do not have the appropriate qualifications or education to comment on market initiatives.
13. I do not have the appropriate qualifications or education to comment on financing structures or economics.
14. The knowledge and skills pillar should deal with educating people on the bioeconomy and sustainable alternatives. This can be applied to the whole education system, from primary school right the way through to third level. I agree that the education system should be used to increase understanding and awareness for the public. It is my opinion that there are very few areas of expertise that don't relate to or have an impact on the climate or bioeconomy therefore everyone should be educated on this because if someone does not end up working in an area that impacts the climate or bioeconomy, they will consume or use something that does.
15. I think that regional skills and regional enterprise approaches can better support bioeconomy development through supply and demand. Enterprises can create jobs related to the bioeconomy and educators can provide the necessary skills to do so. Developing these skills and employing people with these skills will in turn develop the bioeconomy.
16. Advisory systems are a crucial part of the success of implementing a sustainable bioeconomy. If experts are not properly consulted, the most appropriate methods may not be selected, and the bioeconomy will fail to live up to its potential.
17. I think the current pillars of the bioeconomy cover all the necessary areas therefore I do not see any need for more pillars.
18. Over the next three years the top five priorities for action in the bioeconomy should be:
    - Improving renewable energy infrastructure in Ireland, with the aim of making the grid 100% renewable. This would also include making electric vehicles or hydrogen powered vehicles more accessible and attractive through an increased number of charging outlets or financial incentives.
    - The Implementation of initiatives to improve biodiversity and re-wilding programmes.
    - Education on the bioeconomy. This is key to spreading awareness about the bioeconomy and developing a skilled workforce to tackle the issues associated with the bioeconomy.

- More funding into research and development. This will help drive innovation and allow the bioeconomy to flourish by implementing the newest technologies.
- Implement initiatives to increase regenerative farming, electrify farm vehicles and reduce the use of chemicals which contaminate soil and waterways through the implementation of the technologies mentioned above in part 8.

References:

1. https://knowledge4policy.ec.europa.eu/bioeconomy/monitoring_en
2. https://innovation.engie.com/en/news/news/green-mobility/retrofit-car-sustainable-electrify/18426
3. https://www.youtube.com/watch?v=_93o52q8SZE
4. https://www.caseih.com/northamerica/en-us/pages/campaigns/autonomous-concept-vehicle.aspx
5. https://www.deere.co.uk/en/agriculture/future-of-farming/
6. https://www.bbc.com/future/article/20190304-human-evolution-means-we-can-tackle-climate-change