Submission to the consultation on a national policy statement on the bioeconomy

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UCD Research and Innovation

UCD is wholly supportive of Ireland's desire to be a world leader in the emerging area of the bioeconomy and we welcome the development of a national policy statement.

The bioeconomy encompasses the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, biobased products and bioenergy. A key element of this approach is to extract the highest value possible (cascading) from the residues and not to 'settle' with technically simpler but lower value targets.

A well-functioning bioeconomy can solve the interdependent challenges of food, non-food products, sustainability and climate change. The bioeconomy will provide a bio-based replacement of current fossil-resource paradigms that can maximise output from raw materials, reduce GHGs and substantially break the link between human consumption and environmental damage, while maintaining increasingly high standards of living.

The bioeconomy can simultaneously reduce or eliminate wastes, while using them to produce bio-based materials and chemicals that supplant existing fossil-based products or even to create new products without a fossil based equivalent. The possible global impact of this 'virtuous cycle' is profound.

Even from a purely commercial perspective the opportunity is substantial. The EU market for industrial biotechnology-derived products is expected to grow from €28 billion in 2013 at an annual rate of 7% to reach a market volume of €50 billion in 2030, with strong predicted growths for bio-based chemical building blocks, bio-plastics and bio-ethanol.

Ireland's marine and agriculture production capabilities provide it with a unique opportunity to create a new bioeconomy that creates higher value for traditional sectors (Agriculture, Marine, Forestry), boosts rural redevelopment, while also addressing a European need. The Agri-food industry in Ireland employs over 170,000 people and has an annual turnover of €26 billion and the marine industry employs circa 18,000 people with turnover of approx. €4.5 billion. To sustainably deliver on ambitious growth targets set by industry and nationally (creation of 23,000 direct jobs and added value of 70%) the sector must transform its business models, and the bioeconomy can enable this. This need for transformation has never been greater since Brexit, with job losses already experienced in Agri-food companies.

UCD leads the new BEACON SFI Research Centre for the Bioeconomy, which brings together world leading researchers, industry, and public organisations to jointly develop the knowledge, technology and training needed for the bioeconomy. In addition, UCD leads the Horizon2020 consortium AgroCycle, and plays a significant role in the Glanbia led AgriChemWhey consortium. UCD also played a leading role in Ireland winning EU Model Demonstrator Region status in the bioeconomy, one of only six across the entire EU. UCD is also a member of the Irish Bioeconomy Foundation and is supporting the development of a new pilot scale facility at Lisheen, Co. Tipperary. UCD has also participated in BioÉire to contribute to the shaping of relevant policy.

Crucially, Prof Kevin O'Connor of the UCD School of Biomolecular and Biomedical Science is Chairman of the Scientific Committee for the €3.7bn EU Bio Based Industries PPP, giving Ireland a strong voice in the development of the bioeconomy at European level.

UCD believes that that this is just the beginning for the bioeconomy and that the full range and depth of this opportunity will develop far beyond these initial areas to be a major economic driver for the future Irish economy, both nationally and regionally.

AgroCycle is a €8 million Horizon 2020 research and innovation project addressing the recycling and valorisation of waste from the agri-food sector. Led by the School of Biosystems and Food Engineering at University College Dublin, the consortium of 26 partners comprises partners from 8 EU countries, two partners from mainland China, and one from Hong Kong. The AgroCycle protocol aims to deliver a 10% increase in agricultural waste valorisation by 2020, helping to address the European policy target of reducing food waste by 50% by 2030.

BEACON is a new SFI Research Centre that will be a global leader in frontier research that takes full advantage of the wealth of Ireland's natural resources on land and in the sea for the development of a sustainable circular Irish bioeconomy. The science and technology breakthroughs needed to achieve this high value extraction are a major focus of BEACON, along with the policy and business perspectives needed for broad implementation at scale.

BEACON will combine cutting edge research with entrepreneurship, industrial expertise, and policy, to bring about a paradigm shift to a sustainable (circular) bioeconomy. This programme will be a force for positive change for major sectors within Ireland that can be translated to other sectors nationally (e.g. Forestry and Pharma) and internationally.

A major challenge for bioeconomy research is the effective integration of diverse disciplines to develop cohesive sustainable solutions. BEACON will integrate a spectrum of disciplines to address major challenges for the bioeconomy identified by industry and policy makers. These key challenges are: Selective Separation, Conversion, and Sustainability, and will be complemented with applications in partnership with Ireland's Marine and Agri-food industries. The specific focus of the programme is Agri-food residues, Marine biomass, and bio-based chemical and polymers. Targeting residues from existing bioeconomy processes differentiates BEACON from other bioeconomy centres which are focused on virgin biomass.

Direct feedback from BEACON's industry partners confirms that Ireland's bioeconomy can be a platform for the development of new bio-based products for a wide range of companies, with greatly varying scales and sectors. The full potential of the programme could be transformational for Ireland's economy and society, with impact on a global scale.

To fully achieve the potential of the bioeconomy in Ireland, the central partners of BEACON, both industry and academic, recognise the need to develop a complete pathway to market for new discoveries, technologies and products. BEACON is proposed as a fundamental building block of a national infrastructure spanning basic research, which connects to pilot scale, and demonstration/market implementation (e.g. EU Model Demonstrator Region (MDR) and BBI Flagship projects).

It is essential that any national policy supports this connected view of having a coordinated national capability to develop the bioeconomy from new fundamental research, through to pilot scale facilities, and on to fully implementable products, processes and services.

Responses to specific consultation questions

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

We agree with the broad definition, but suggest that the potential of 'residues' is specifically named in any policy definition of resources for the bioeconomy. Bio-based residues are now widely recognized as being integral to the bioeconomy and circular economy. In particular, the residues of the AgriFood and Marine sectors in Ireland present a significant source of bio-based chemicals and materials for the bioeconomy.

We also broadly agree with the list of potential bioeconomy outputs, but recommend specifically noting bioactives and proteins in the list of expected bioeconomy outputs. Bioactives and proteins are recognized internationally as a critical offering from the bioeconomy where there is no equivalent from fossil economy or where the fossil economy will not be able to compete due the higher costs of production from fossil resources, or the inability for a fossil equivalent to be marketed as natural.

The policy should also consider that economic value will come not only from the high value outputs of the Irish bioeconomy, but also from new Irish bioeconomy technologies and companies that can operate globally to implement the bioeconomy in other regions. This is a new area where Ireland can be a world leader.

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

The bioeconomy cuts across many traditional boundaries in policy, industry, research and innovation. A high-level policy statement can act as a focal point and call to action for the multitude of organisations and groups needed to develop the bioeconomy generally, and the priority value chains specifically.

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

The European approach shows the need to connect and coordinate the relevant but disparate policy organisations. It also sets up diverse investment and financing vehicles to provide different types of funding to suit different types of activity. It also highlights that the circular economy approach is a significant enabler for the sustainability of the bioeconomy.

More specifically, BEACON has been strongly informed by Strategic Research Agenda of the Biobased Industries Consortium. This leverages the latest thinking across Europe and harmonises our efforts to maximise Ireland's ability to benefit from and contribute to Europe-wide initiatives.

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

An all of government approach led by the Taoiseach's office with the support of all departments is important and should be reflected in the policy statement. We recommend the Italian approach to developing a national policy as a comparator to examine.

The national policy should support structures and investments that are inherently cross-cutting by nature, thereby preventing needless fragmentation or duplication of effort and investment. A policy statement that includes participative governance will strongly aid bioeconomy development across sectors. The creation of new value chains will require participation across sectors; technological developments can occur within a sector but market penetration and resource supply will require new partnerships across sectors creating new business relationships.

In addition to this, the national policy statement must be precisely defined enough to provide principles to guide investment and prioritisation, but not be so rigid as to impede any existing initiatives or constrain future innovation.

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?

Cascading: focus should be prioritised on the highest value outputs
Circular: resource efficiency, re-use, and sustainability are key to long term success of the bioeconomy
Innovation: support and investment is needed from basic research through to pilot scale and demonstration facilities.
Diversification: the full breadth of bioeconomy inputs and outputs should be explored
Job creation and human capital development: growth in the bioeconomy will enable job creation, but this must be matched by investments in people to fill those jobs: from PhDs to CPD and reskilling programmes
Rural development: national policy should, as far as possible, ensure that bioeconomy investments are incentivised to areas where biomass is sustainably exploited which is predominantly rural Ireland.

How can a national policy statement support local and regional cooperation around the use of renewable biological resources?

A national bioeconomy policy that promotes and supports innovation in the regions is critical. The bioeconomy presents opportunities for economic growth, with benefits to both the consumer and the environment – but it also presents an opportunity for rural development. The national policy should specifically explore mechanisms to make balanced regional development a natural outcome of public and private investments in Ireland's bioeconomy.

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

Wastes and residues present a significant feedstock for the bioeconomy, and is a particular focus of research at UCD.

The national policy should recognise the importance of sustainability (Social, economic and environmental) and circularity to the bioeconomy. The policy should therefore not promote the generation of waste but rather should support the use of unavoidable waste. A re-examination of the definition and what constitutes waste is needed. Such an exercise can also promote earlier intervention in the management of a resource to avoid it becoming a waste. A policy statement that clearly guides the development of resource usage, resource efficiency and avoids categorising residues as wastes can help to develop the bioeconomy and circular economy.

How can we stimulate market demand for bioeconomy products? What is in it for the consumer?

Ireland can stimulate the bioeconomy through support for the production of high value products that contribute to better human and animal nutrition health, resource efficiency, environmentally friendly processes and products (reduced greenhouse gases, water savings, biodegradable products, nontoxic products).

A policy that supports innovation such as the production of high value products that target growing markets, and products that are of benefit to human and animal health means Ireland will be supporting a bioeconomy that is addressing market demand. For products that come from the bioeconomy that are important for a sustainable society but of lower value where fossil based equivalents may have an economic advantage public procurement could stimulate the market uptake of bioeconomy based products (biobased products). Government is itself the largest consumer in the state, and can therefore drive the bioeconomy through public procurement. A national policy can set out this ambition, and indicate a priority for sustainable bio-based products.

Incentive schemes could be examined, and could be based on models already present in various green energy and home improvement initiatives.

There are various specific consumer benefits. For example, there are some health and nutrition products that can only come from nature and for which there is no fossil equivalent or no viable fossil equivalent. Therefore, the bioeconomy will add to consumer choice and new business opportunities. Environmentally conscious consumers will benefit from having products and materials that are sustainable, and all will benefit from reduced environmental damage. Into the future we expect ever greater policy interventions to make fossil based products less attractive, e.g. through taxation on fossil products, or reliefs on bio-based alternatives – the net effect would be providing consumers with affordable sustainable substitutes for fossil products and new products not yet imagined.

What is the most appropriate mechanism to coordinate development and monitor progress?

UCD recognises that there will be coordinating groups at various sectors and levels. However, a cross cutting forum spanning government, agencies, industry, NGOs, RPOs and other stakeholders could act as an excellent coordination and monitoring vehicle. The BEACON SFI centre has allocated platform and operations resources to stakeholder engagement that could strongly contribute to such a multi-stakeholder forum.

Clarifications

Page 3 Section 2 “Benefits of the bioeconomy” bullet point number 4 states “reducing our dependency on natural resources and imports” is an error. It should refer to “fossil based resources” and not natural resources.

Page 5. Should use the term “Bio-based chemicals” and not “biochemical”. They have different meanings.