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Victorian Bioenergy Network Submission to the Productivity Commission Inquiry on Opportunities in the Circular Economy


Introduction

The Victorian Bioenergy Network (VBN) appreciates this opportunity to contribute to the Productivity Commission's inquiry into Australia's opportunities in the circular economy. As a leading advocate for bioenergy development here in Victoria, VBN underscores the importance of bioenergy as a versatile and sustainable resource, crucial for enhancing Australia's materials productivity and efficiency. This contribution is particularly vital in the context of economic growth, energy security, reduction of sovereign risk and environmental sustainability.

Bioenergy's Role in the Circular Economy

Bioenergy's Role in the Circular Economy Bioenergy is fundamental to the circular economy, transforming organic waste materials into valuable energy sources. This process reduces waste and emissions while supporting energy security. Our network is involved in several initiatives where bioenergy systems convert agricultural, food and other organic wastes into biogas, heat, and biofuels, embodying the circular economy's principles by maximizing material utility and minimizing environmental impact.

Recognition of Bioenergy in Promoting a Circular Economy Bioenergy is increasingly acknowledged as a crucial pathway to achieving a circular economy. By transforming organic waste into valuable energy resources, bioenergy initiatives exemplify the essence of circular principles—extending the lifecycle of resources, reducing waste, and minimizing environmental impact. Projects such as the innovative utilization of agricultural byproducts at Katunga showcase how bioenergy not only supports sustainable agricultural practices but also contributes to a more robust circular economy by reducing dependency on non-renewable resources and enhancing overall resource efficiency. This alignment of bioenergy with circular economy objectives positions



it as a sustainable, strategic solution capable of driving significant economic and environmental benefits across Australia.


Case Studies and Success Metrics


1. **Australian Consolidated Milk's Biogas Initiative:** At the ACM facility in Victoria, cheese whey waste is converted into biogas, which powers dairy processing operations. This initiative reduces waste, energy costs, and greenhouse gas emissions.
2. **Yarra Valley Water's Re-Waste Facility:** This project takes food waste from Melbourne Markets and other food manufacturers, which would otherwise go to landfill, and converts it into energy. This energy offsets the intensive energy demands of wastewater operations. Given the success of the first plant a second plant is currently under construction at Lilydale where the digestate produced is investigated for soil regeneration applications, adding another layer of material reuse and avoiding the need for synthetic fertilisers.
3. **Shepparton Bioenergy Forum Initiatives:** At the forum, projects were discussed that integrate bioenergy solutions in local manufacturing sectors, demonstrating how bioenergy can reduce industrial waste and provide renewable energy solutions.
4. **Biomethane Developments in Australia:** While still in early commercial stages, several key projects are pioneering biomethane production both in the operational and planning stage:
 - a. **Malabar Biomethane Injection Plant:** Operated by Jemena Gas Networks in NSW, this plant converts methane from sewage into biomethane, injected into the gas network, significantly reducing carbon emissions.
 - b. **Anaerobic Digestion Facilities in Victoria:** Facilities in Wollert (since 2017) and the upcoming one in Lilydale process pre-consumer food waste into biogas and potential future biomethane for the gas grid, with digestates used as organic soil improvers.

The Ararat Bioenergy project is a transformational bioenergy and Circular Economy project, to be developed and centred in a new industrial park in Ararat, Western Victoria. This is currently in the planning stages. In a region known all over the world for its cereal cropping, this project is designed to maximise the effective use of low-grade or excess straw and crop stubble, and potentially other organic waste streams, transforming them into renewable gas, electricity, heat and other valuable co-products such as renewable fertiliser, hydrogen and/or biomethanol

Advancing Circular Economy with Biomethane

Prioritizing biomethane development is a significant opportunity for Australia's circular economy. Biomethane is a comprehensive solution that diverts waste, converts it into a crucial energy source,





and produces valuable by-products like digestate, which supports feedstock growth and recirculates residuals back into the system.

Environmental Opportunities of Biomethane:

- **Closed-loop System:** Biomethane converts organic waste into renewable energy, captures emissions, and produces digestate that enriches soil health.
- **Emission Reductions:** Replacing natural gas with biomethane can reduce emissions by 8-31%, with further benefits from using digestate instead of mineral fertilizers.
- **Agricultural Benefits:** Converting manure into biomethane prevents methane emissions from decomposition.
- **Resource Savings:** Using one tonne of digestate can save significant amounts of oil, water, and CO₂ emissions.
- **Scalability:** Biomethane has the potential to supply 23% of the pipeline gas market by 2030 as a renewable, carbon-neutral alternative to natural gas.

Renewable Fuels


At Katunga, The Katunga Fresh Project in Victoria exemplifies innovative circular economy principles by integrating advanced pyrolysis and Fischer-Tropsch technologies to transform biomass into renewable fuels, electricity, and high-quality CO₂ for greenhouse use. This sustainable model not only powers local tomato and potential new greenhouse operations for crops like strawberries or peppers but also exemplifies efficient resource utilization by converting agricultural waste into valuable energy outputs. Such practices underscore Katunga Fresh's commitment to enhancing agricultural efficiency, sustainability, and self-sufficiency, aligning with broader environmental and economic goals within the Australian market.

Biodiesel Production at Barnawartha: A Model for Circular Economy and Regional Development

Overview

Just Biodiesel's Barnawartha facility demonstrates the potential of biofuel production to enhance regional bioeconomies through sustainable practices. This plant is set to produce up to 50 million liters of biodiesel annually, using tallow and recycled vegetable oil. The production includes biodiesel blends B5, B20, and B100, which are significant green alternatives to conventional diesel.

The Barnawartha plant is pivotal for the local economy, promising to re-employ local workers and potentially create a substantial number of jobs. As a circular economy initiative, the plant not only recycles waste but also contributes to reducing carbon emissions and dependence on fossil fuels. This aligns with regional development goals by fostering economic growth and sustainability.





Strategic Importance

The plant which is operating well below capacity due to lack of supporting policy is strategically important as it demonstrates how localized biofuel production can serve as a cornerstone for regional bioeconomy strategies, enhancing resource efficiency and providing economic benefits to the community.

These case studies illustrate that bioenergy can deliver significant economic and environmental benefits, including energy and waste disposal cost reductions, decreased reliance on fossil fuels, and lower emissions.

Financial Challenges in the Transition to Cleaner Energy

Recent data from the Victorian Chamber of Commerce and Industry indicates significant financial hurdles in transitioning to cleaner energy:

74% of businesses are not financially planning for a transition to cleaner energy sources, likely due to existing financial pressures.

81% cite cost as the main barrier to switching from gas to electricity, highlighting the need for affordable and scalable alternatives like bioenergy.


These statistics underscore the need for supportive measures that can alleviate financial burdens and encourage investment in sustainable energy solutions.

Opportunities for Enhancing Materials Productivity

Bioenergy offers substantial opportunities to enhance materials productivity across various sectors:

Agriculture: Utilizing crop residues and livestock waste for bioenergy production can transform agricultural waste into valuable resources, reducing environmental impact and generating economic returns.

Manufacturing: Industrial waste streams, such as those from the food processing sector, have significant potential for bioenergy projects that improve material efficiency and reduce carbon footprints.





Barriers and Recommendations

Bioenergy faces several barriers, including regulatory challenges and financial constraints. To overcome these barriers, VBN recommends:

- Enhanced policy support: Specific policies that support bioenergy, including subsidies, grants, and favorable regulations, can facilitate broader adoption.
- A clear recognition of the role of bioenergy as a central pathway for circular economy transition in key government initiatives including sufficient funding from agencies to projects and to industry bodies to support the development of the key sector.
- Increased awareness and education: Promoting the benefits of bioenergy among stakeholders and the public can drive interest and support for these technologies.

Conclusion

In conclusion it should be noted that the role of bioenergy in the circular economy has previously been discussed in the Turning Circle Report - <https://www.ieabioenergy.com/wp-content/uploads/2022/06/Turning-Circle-report.pdf>. First wider recognition along with investing in bioenergy is crucial for advancing Australia's circular economy goals, improving material efficiency and energy security, reducing environmental impact and sovereign risk, and creating significant economic opportunities. VBN is committed to collaborating with the Productivity Commission and other stakeholders to realize these benefits. We believe that with the right support, bioenergy can play a pivotal role in transitioning Australia to a more secure, sustainable and economically vibrant circular future.

Best regards,

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Executive Officer

Victorian Bioenergy Network

