BIOENERGY AUSTRALIA SUBMISSION

Interim Emissions Reduction Targets for Victoria (2021-2030)

July 2019

The purpose of this submission from Bioenergy Australia is to highlight the role of bioenergy in achieving the emissions reduction targets for Victoria.

About Bioenergy Australia

Bioenergy Australia is the National Industry association, committed to accelerating Australia’s bio economy.

Our mission is to foster the bioenergy sector to generate jobs, secure investment, maximise the value of local resources, minimise waste and environmental impact, and develop and promote national bioenergy expertise into international markets.

Bioenergy Australia’s objectives are to:

Advocate - With our members, we anticipate and develop leading positions on issues of concern to the advancement and growth of bioenergy in Australia.

Campaign - We raise the profile of the industry within the media and broader community to achieve a greater level of understanding about bioenergy and the vital role it must play to achieve carbon neutrality by 2050.

Inform - We publish reports, webinars and articles to help our members keep ahead of industry trends and opportunities. We also manage the Biomass Producer website, an AgriFutures Australia resource showcasing Australian bioenergy projects, expertise, and identifying opportunities for primary producers.

Connect - We facilitate knowledge exchange and networking for members through task-specific meetings, our Annual Conference, and Webinars. We link investors with emerging businesses; researchers with technology developers; government with innovators. We also administer Australia’s participation in IEA Bioenergy. Our Industry groups bring together specialists in specific fields.
The Independent Expert Panel recommends Victoria set greenhouse gas emissions reduction targets of:

32-39% below 2005 levels in 2025 and

45-60% below 2005 levels in 2030.

1: Do you support these targets recommended by the Panel? Why/why not?

Bioenergy Australia supports the targets recommended by the Panel as they are those recommended by the Climate Change Authority for Australia. In 2015, based on scientific evidence, what comparable countries are doing and what is in the best interests of Australia, the Climate Change Authority recommended a 45-65% emissions reduction target for 2030 (below 2005 levels). We also support the escalating target, as it is an important approach to support the transition to a low-carbon economy.

As required by the Climate Change Act 2017, the Independent Expert Panel considered a broad range of issues in reaching its recommended targets including:

Scientific evidence on the significant risks that climate change poses to Victoria;

The actions that Victoria and others (including the Commonwealth government) are already taking to reduce emissions – including the commitment of the international community, through the Paris Agreement, to limit warming to well below 2°C and to pursue efforts to limit the increase to 1.5°C above pre-industrial levels, in order to avoid the worst impacts of climate change;

The implications of Victoria contributing its fair share to limiting global temperature increases in accordance with the Paris goal (emission budgets for Victoria);

The availability of significant emissions reduction opportunities across the Victorian economy; and

The potential economic, social and environmental benefits and costs of Victoria’s transition to a net zero emissions economy.

2: Are these the key issues influencing what the right targets are for Victoria? Are there other issues that should be considered?

Bioenergy Australia believes that the key issues identified by the Victorian Government are crucial in reaching the targets and would like to support the key role of bioenergy in this scenario.

According to the International Energy Agency’s latest market forecast, modern bioenergy will have the biggest growth in renewable resources between 2018 and 2022, underscoring its critical role in building a robust renewable portfolio and ensuring a more secure and sustainable energy system.

In particular, as part of the broad spectrum of environmental and socio-economic benefits, Bioenergy Australia would like to highlight the significant contribution of a potential development of a bio-economy in Victoria:

- Regional employment and economic development

The feedstock used for bioenergy often stems from agricultural activities and can be associated with existing or new manufacturing processes. Development of bioenergy can provide skilled
employment opportunities to these regions and stimulate economic development through the delivery of revenue streams outside of traditional sources.

The Clean Energy Finance Corporation estimates a potential investment opportunity of between $3.5 billion and $5 billion in energy from urban waste, agricultural waste and forest residues. With respect to biofuels, increased use of 10 per cent ethanol-blended petrol (E10) in Australia could create more than 8600 jobs and attract $1.56 billion in investment and generate more than $1.1 billion in additional revenue in regional areas.

- Energy security

Domestic production of biofuels results in less reliance on imported oil and petroleum products, promoting energy security. As an example, the QUT report “Biofuels to bioproducts: a growth industry for Australia” indicates that implementation of a nation-wide mandate for 10 per cent ethanol blending in petrol alone could reduce automotive gasoline imports by about 18 per cent annually, and contribute to enhanced domestic fuel security.

Further, electricity and heat produced from bioenergy can often be dispatchable and ramped up and down to support variable renewable energy.

- Enhanced resilience of agriculture

Growing energy crops, especially perennial species strategically integrated into existing agricultural production systems (such as buffers to prevent runoff to streams), can provide income diversification to landholders, enhance agro-biodiversity and reduce environmental impacts of agriculture.

- Utilisation of waste streams

Bioenergy is typically produced from the utilisation of waste materials such as agricultural and animal residues as well as municipal waste. This delivers economic benefit to resources that would generally be considered as end-of-life products, and can contribute towards a reduction in landfill.

The use of waste streams to generate bioenergy rather than disposal to landfill moves away from the linear economy, and promotes a circular economy approach to using the available resources for their highest order use, in accordance with the waste hierarchy.

The potential utilization of a broad range of waste streams provides the opportunity to create new industries. For instance, technologies are constantly under development to optimise the conversion of waste into biofuels. Some examples are the Australian technology developer Licelia, Mercurius Australia teamed up with Southern Oil Refining, and Global Ecofuels Solutions (GEFS) in conjunction with Rural Australia.

In addition, new employment opportunities arise from growing and harvesting biomass, transport, handling, and through procurement, construction, operation and maintenance of bioenergy plants.

Bioenergy Australia invites the Victoria’s Government to focus on waste to energy opportunities and to develop a no-waste policy.

Victoria has choices about the emissions reduction pathway, or trajectory, to follow to reach net zero emissions by 2050. Different trajectories imply different costs and benefits over time. The
Panel’s advice includes indicative trajectories to 2050 associated with its recommended targets (Chapter 5 of the Panel’s report).

3: Do you agree with the Panel’s indicative trajectories to 2050? Why/why not?

Bioenergy Australia agrees with the emissions budget, target and trajectories, which are well-justified, based on sound science, and consistent with the Paris Agreement, as well as being plausible for Victoria.

Note also that the Intergovernmental Panel on Climate Change (IPCC) has identified that forests managed for timber production and bioenergy, achieve greater greenhouse benefits than forests managed for conservation alone, also demonstrated for NSW by Ximenes et al (2012)¹.

4: Are there other key greenhouse gas emissions reduction opportunities beyond those the Panel identified? (Chapter 6 of the Panel’s report).

Bioenergy Australia acknowledges that bioenergy with carbon capture and storage (BECCS) has been mentioned as an option for removing carbon dioxide from the atmosphere and we would like to point out that bioenergy (with or without CCS) is actually recognised internationally as a key contributor to climate change mitigation. The IPCC has estimated substantial global mitigation potential for bioenergy in its series of assessment reports and special reports. Its most recent report, the Special report on meeting a 1.5 degree target (SR1.5) identified bioenergy (with or without CCS) as a major contributor in all scenarios that meet the Paris Agreement target of “well below 2 degrees”. According to the report, “bioenergy use is substantial in 1.5°C pathways […] due to its multiple roles in decarbonizing energy use”.

As illustrated in Fig. 6.7 of the report, there are significant greenhouse gas emissions reduction opportunities in different sectors including electricity, LULUCF, industry, agriculture, buildings and transport.

Figure 6.7 Illustrative estimates of emissions reduction opportunities across the Victorian economy to 2030.


As highlighted in the Bioenergy State of the Nation report, prepared by KPMG for Bioenergy Australia, we would like the Victorian Government to consider the role of Australia’s future potential bioeconomy in decarbonising the sectors identified in the report.

- Transport

Biofuels derived from biomass and other waste sources can be used in the transport sector as a replacement for conventional fuels, with the opportunity to deliver not only a significant reduction in GHG emissions, but also a range of economic and social benefits.

In 2017, biofuels made up 3 per cent of the transport fuel demand worldwide, with 70 per cent of this usage coming from the US (47 per cent) and Brazil (23 per cent). This equates to 140 billion litres globally, which is expected to grow in the future as more sustainable fuel sources are sought by the market.

While the biofuels industry has not experienced the same growth in Australia, production is expected to increase due to mandates for ethanol-blended petrol in both New South Wales and Queensland and a growth in the global demand for biofuels specifically for the aviation and marine sector.

Road

In Australia the vast majority of petrol cars can use ethanol blended fuel — in the same way that virtually all trucks and cars can take biodiesel blended fuel. According to the QUT report “Biofuels to bioproducts: a growth industry for Australia”, biofuels use at up to 10% in petrol and diesel in Australia can reduce GHG emissions by 8.9 million tonnes CO2 eq. per year, with subsequent health benefits driven in part by the reduction in the use of carcinogenic materials such as alkanes, toluene and benzene.

Aviation

As part of the global decarbonisation process, the international aviation industry has committed to reducing its greenhouse gas emissions. Unlike the land transport sector, airlines have limited options to materially reduce emissions other than through the use of aviation biofuels, therefore bio-based aviation fuels can significantly contribute to a significant decrease in global CO2 emissions. Worldwide in 2015, 781 million tonnes of CO2 was produced from flights. Biofuels can decrease the carbon footprint of jet fuel by 80 per cent, based on full life cycle assessment. An overall reduction in CO2 emissions of 5 per cent can be expected if biofuel replaces 6 per cent of jet fuel by 2020.

Maritime

The maritime industry is facing a similar transformation. LSF2020 refers to the new ‘Low Sulphur Fuel’ regulations, which will come into effect on 1 January 2020. These regulations are the biggest of a series of steps by the International Maritime Organisation to reduce marine pollution (MARPOL) in response to the threat of climate change. The LSF2020 emission regulations mean ships will have to significantly reduce emissions on the high seas as well as in coastal areas, which is a significant opportunity for the biofuels sector.

- Gas

While there has been strong investment in recent years in transitioning the electricity supply from fossils fuels to renewable electricity generation, there has been slower progress in transitioning
other sources of energy consumption, such as gas used for thermal processes, to lower emissions or renewable sources.

Biogas is a proven technology, which is widely adopted internationally. The biogas market in Europe has experienced a strong growth. Between 2009 and 2015, the number of installations almost tripled (~6,200 in 2009 to 17,400 plants in 2015). Germany, the United Kingdom (UK) and France are among the leaders in terms of European biogas production, with respectively around 100 TWh (~360 PJ), 23 TWh (82.8 PJ) and 5.5 TWh (19.8 PJ).

The recently launched report "Biogas opportunities for Australia", prepared by ENEA consulting for Bioenergy Australia, examined the potential for the use of biogas energy in Australia and found that biogas represented a multi-billion dollar investment opportunity for Australia, with the potential to offset natural gas use in transport and could be used for heat and/or electricity generation and injection into the existing gas network.

According to the Deloitte report "Decarbonising Australia’s gas distribution networks", biogas is currently the cheapest option for decarbonisation of energy provided by gas networks. Enough biogas potential exists to meet all residential and commercial gas demand on the East Coast. The cheapest form of biogas feedstock (urban waste, livestock residue and food waste), is currently sufficient to meet around 14% of energy used from gas.

In a study conducted by ENEA Consulting and Quantis in 2015, the replacement of natural gas by biomethane in France resulted in the reduction of GHG emissions by 54 gCO2e for each MJ that was produced, injected into the gas grid and consumed. This amount translates to more than 85 per cent emissions reduction from the consumption of natural gas, which has the emission factor of approximately 63.1 gCO2e per MJ (LHV) in France.

- Electricity

Bioenergy is a dispatchable source of electricity generation that can be used to support reliability and security of the grid. The Australian Energy Market Operator (AEMO) has noted that maintaining energy security in the National Electricity Market will require significant new dispatchable capacity as coal-fired power stations retire.

Bioenergy can play a significant role in the energy transition by providing flexible and dispatchable generation capacity to support and complement variable wind and solar. Bioenergy technologies that can be used for electricity generation include biomass combustion, co-firing, gasification and anaerobic digestion.

- Industry

Since significant industrial emissions are generated from direct combustion of gas for heating purposes, there is huge potential for bioenergy in Australia to supply industry and communities with renewable energy that supports the community and the economy whilst reducing greenhouse gas emissions. In fact, the generation of thermal energy (heat) from biomass is a simple and effective way of extracting energy from a solid biomass material, and thermal energy represents a compelling case for the utilisation of bioenergy in Australian manufacturing.

Heat generated from bioenergy can also be used to deliver the thermal energy required in places like food processing facilities, abattoirs and dairy producers (all of whom need steam and hot water for their manufacturing); commercial glasshouses, hospitals and aquatic centres (for space and water
heating); and industrial manufacturers such as plywood and MDF manufacturers, and cement producers (who require steam and hot air).

- **Agriculture**

Agricultural crop residues constitute a large biomass resource from managed lands. They can provide an additional source of revenue for agricultural producers, and may be a low cost, sustainable feedstock for the production of bioenergy, biochar and bio-products.

As outlined in the IEA Bioenergy report “Mobilising sustainable bioenergy supply chains: Opportunities for agriculture”, biogas can fit into a platform of technologies and agricultural practices that, when applied in synergy, are able to store additional carbon, increase soil fertility and the net primary production at the farm, mitigate emissions from the farming sector, increase the organic matter of the soil and contribute to the fight against climate change at the local level while improving food security.

Pyrolysis to produce bioenergy and biochar offers an alternative negative emissions solution that also contributes to soil productivity.

- **Buildings**

Although some gas use could potentially be decarbonised by substituting electricity from renewable generation sources, shifting energy consumption currently met by gas to electricity would be costly and require a large investment in electricity networks and renewable generation. For example, in Victoria switching from gas to electricity would result in a doubling or tripling of peak electricity demand in winter.

On the contrary, as previously mentioned, biogas currently represents the cheapest option for decarbonisation of energy provided by gas networks.

**5a: Across the Victorian economy, which activities do you think the Victorian government should prioritise in reducing Victoria’s greenhouse gas emissions? Your response can be for the whole Victorian economy and/or for individual sectors.**

A combination of a carbon price and targeted actions should be prioritised in reducing Victoria’s greenhouse gas emissions.

A carbon price will increase the incentive for business to invest in emissions reduction, however, additional action will be required to overcome other barriers that do not respond to a carbon price. These include market structure and supply, information gaps, decision processes, capital constraints and investment priorities. Overcoming these barriers will most effectively be achieved through targeted action. The barriers to emissions reduction vary by specific opportunity and subsector and so a portfolio of tailored measures is needed for the different opportunities.

In addition, business-led solutions are critical to address the emissions reduction challenge. In some cases, the complexity or difficulty of a barrier will make business-led solutions less feasible or less efficient, and thereby necessitate further government action to create market conditions where full capture of emissions reduction is possible. But in many cases, businesses have the ability now to achieve more cost-effective emissions reductions.

Bioenergy Australia believes that Victoria’s Government should prioritise specific sectors in reducing GHG emissions. These include:
- Transport sector

We invite the Victoria’s Government to consider making a commitment to a future biofuels and bioproducts industry, similarly to the Advance Queensland Biofutures 10-Year Roadmap and Action Plan. As part of this commitment, we suggest the introduction of a biofuel mandate, similar to the ones currently operating in NSW and QLD.

- Energy from Waste (EfW)

Studies have shown that the increased deployment of EfW compared to landfill can reduce greenhouse gas emissions. Therefore, we invite the Victoria’s Government to strengthen the EfW strategy as part of the transition to a circular economy.

Bioenergy Australia encourages the Victoria’s Government to incentivise the efficient use of solid biomass resources (e.g. forestry residues, green waste) in electricity and heat applications such as in biomass boilers for industrial heat, displacing diesel, as well as the use of waste materials for the production of liquid transport fuels.

- Decarbonisation of the gas network

As previously mentioned, biogas represents a reliable and cheap option for decarbonisation of energy provided by gas networks. Several recommendations have emerged from the report “Biogas opportunities for Australia” for Australian Governments and industry stakeholders to consider, aiming to advance Australia’s biogas sector. These are:

1. Setting renewable gas target(s)
2. Launching industry stakeholder consultation for policy design
3. Introducing waste management strategies to support feedstock quality and quantity
4. Encouraging plant operators, especially landfill operators, to maximise biogas use
5. Exploring opportunities for the transport sector
6. Providing regulatory clarity for the digestate
7. Simplifying approval processes
8. Informing the community about biogas and its benefits
9. Exploring future work to quantify the industry’s economic potential

5b: What policies or programs are needed to drive these emissions reductions?

Three broad types of action taken now will help Victoria achieve maximum emissions reduction at lowest net cost to the economy. The type of action depends on the risk of “lock-in” of emissions and the ease of emissions reductions:

- Remove barriers for those opportunities for which a positive return is already available for business

- Introduce a price for carbon and remove further non-price barriers to capture opportunities for which technology and economics are well understood, but not currently profitable to undertake

- Undertake longer term actions to improve the economics and certainty of high potential emissions reduction opportunities that are currently difficult to implement

Delaying action will mean some low-cost opportunities are lost. Many emissions reduction opportunities, like avoiding the installation of inefficient equipment that has a 20–30 year life, exist
only for a finite period. Without prompt action the reduction potential will disappear, and any remedial measure to later “make up” the deficit will cost more.

6: Are there any emissions reduction opportunities identified by the Panel that you would not support Victorian government action on? Why not?

As previously mentioned, decarbonising the energy currently supplied through gas distribution networks by switching to renewable electricity might not be the best solution as it would require a very large increase in electricity generation, transmission and distribution, with customers also incurring costs to make the switch. Decarbonising the gas network would be a preferable response, as has been done in Germany, France, Denmark and other nations.

Victoria’s transition to a net zero emissions economy presents a range of potential economic, social and environmental costs and benefits, ranging from impacts on industries and jobs to impacts on health, biodiversity and natural resources.

7: In addition to those identified by the Independent Expert Panel (see Chapter 7 of the Panel’s report), are there other key benefits of reducing greenhouse gas emissions?

As part of the environmental benefits, Bioenergy Australia would like to highlight that reducing greenhouse gas emissions would significantly limit the incidence of extreme weather conditions in Australia. Climate change, worsened by the burning of coal, oil and gas, is already intensifying extreme weather events in Australia and around the world. Australians are facing increasingly frequent and severe extreme weather, including droughts, bushfires, heatwaves and supercharged storms, testing the limits of our coping capacity. Therefore, Australians need to work collectively with the international community under the Paris Climate Agreement, in order limit the impacts of extreme weather on our livelihoods, safety and health.

As discussed in the report, reducing GHG emissions will also provide additional growth opportunities for businesses. In particular, as the world moves towards a low carbon economy, demand for carbon-efficient products and services will steadily increase, providing significant opportunities for businesses that supply these, such as engineering and construction companies and equipment and product manufacturers and installers.

8: Of all the benefits of reducing emissions, which are the most important and why?

As mentioned in question 7, climate change will have severe impacts on people and environment, in all sectors, but especially in agriculture, which already suffers from managing under variable climate. Therefore, a lower level of pollution and more stable weather conditions are certainly key drivers in achieving the emissions reduction targets. However, socioeconomic impacts, such as new jobs and growing industries, represent a massive opportunity for Australia’s economy.

9: From your experience, are there any barriers to reducing Victoria’s greenhouse gas emissions that the Independent Expert Panel didn’t identify? (See Chapter 6 of the Panel’s report)
Bioenergy Australia believes that the main barriers to reducing Victoria’s greenhouse gas emissions are price of GHG emissions, market structure and supply, information gaps and decision making, and capital constraints and investment priorities.

10: Of all the barriers, which are the most important to address and why?

Economic and market access barriers are probably the biggest challenges preventing the reduction of greenhouse gas emissions in many sectors.

11: How can the key barriers you identified in Question 10 be overcome?

As discussed in the report, policy action is required to overcome the existing economic barriers. In particular, there is a strong need to develop a consistent, coherent and ambitious long-term policy.

As an example, the introduction of some form of carbon price would strongly assist in overcoming the barrier that decision makers currently overlook the long run costs imposed by activities that produce emissions—or the benefits of reducing them.

For a carbon price mechanism to be effective, especially for longer term investment decisions, policy certainty is important. If investors are unsure of policy outcomes, the risk of acting or investing based on the price signal increases, thus reducing policy traction.

12: In addition to those identified by the Independent Expert Panel (see Chapter 7 of the Panel’s report), are there other impacts of reducing greenhouse gas emissions?

No.

13: Of all the impacts, which are the most important to address and why?

As discussed in the report, reducing GHG emissions will have a significantly positive economic and environmental impact. On the contrary, unaddressed climate change is projected to significantly impact Victoria’s infrastructure, water security, agricultural production, biodiversity, alpine and coastal areas, Aboriginal heritage, and the health of all Victorians.

14: How can these impacts be addressed?

An effective emissions reduction requires action to address the range of barriers that currently block effective action. This includes the introduction of a carbon price to ensure decision makers increasingly take account of the long run costs imposed by GHG emissions, and seek out innovative ways to reduce carbon pollution. Targeted action and policy development are also required to address non-price barriers.

15: Do you have other comments about action on climate change in Victoria?

No.
Thank you for the opportunity to provide this submission.

Yours sincerely

[Signature]

Shahana McKenzie, CEO Bioenergy Australia