

Electrifying the Manufacturing State

Blessed with unparalleled access to sun and wind, Victoria can build a clean, efficient manufacturing sector fit for the 21st century.

A science-based, state-wide emissions reduction target for the next decade will kick start the revolution.



The renewable energy opportunity for Victorian manufacturing

The next industrial revolution is coming as the world swiftly moves to a zero carbon economy. New energy sources have long been essential to economic growth. Today, the new source of energy is cheap wind and solar.

Businesses and manufacturers all over the world are racing to replace fossil fuels with renewables. With our unparalleled resources in solar and wind, Victoria is in the ideal position to capitalise on this moment in history.

Beyond Zero Emissions' award winning *Electrifying Industry* plan shows that by switching to renewable electricity it is possible to double manufacturing efficiency, harnessing the power of the sector to drive productivity growth, innovation, exports and create high-quality Victorian jobs.

The Victorian Government can help capitalise on this zero-carbon opportunity with an ambitious industrial strategy with two aims:

- to expand Victorian manufacturing, capitalising on our renewable resources
- to decarbonise industry, eventually to zero or near zero emissions.

Setting a state-wide, science-based emission target for the next decade is the first step to a thriving Victorian manufacturing sector in a global, renewable economy.

Victorian manufacturing at-a-glance

Victoria is proudly the manufacturing state. Victoria is home to over 13,000 manufacturing firms employing over 280,000 people, and in 2015-16 represented 7.5% (\$25.9B) of Victoria's Gross Added Value.¹

The Victorian Government's *Advanced Manufacturing Policy* highlights that Victorian manufacturing strengths include a highly skilled workforce, engineering and design expertise, well developed freight and logistics, an enabling regulatory regime and renewable energy targets that provide manufacturers with certainty and opportunity.

¹ Advancing Victorian Manufacturing, Fact Sheet, Victorian Government, 2017

The global shift to low-carbon industry

A powerful coalition of governments, investors and businesses is propelling us towards a zero carbon economy, motivated by economics and the imperative to limit dangerous climate change. Almost \$39 trillion dollars (almost half the world's GDP) is generated in places where governments have set, or are proposing to set, a net zero emissions target.²

For smart governments and manufacturers, it represents an opportunity to produce goods more efficiently and demonstrate long-term vision and credibility.

Government and international action

Every country in the world is currently signed up to the 2015 Paris climate agreement, with many governments further ramping up their climate policy. Most large economies now have ambitious renewable energy targets, and more and more countries also impose costs on carbon - China now runs the world's largest emissions trading scheme.

Trading blocs such as the European Union are already discussing carbon tariffs as a way of penalising countries without credible carbon policies.

Investor action

Investors increasingly view high-carbon strategies as risky, and this concern has led them to divert billions of dollars away from companies that mine or exploit fossil fuels.

The Investor Agenda, a group of 631 investors representing over \$37 trillion dollars in assets, has called on governments to phase out thermal coal power worldwide, put a price on carbon, end subsidies for fossil fuels, and strengthen nationally-determined contributions.³ Another initiative, Climate Action 100+ has persuaded many of the world's largest emitters, including BHP and Rio Tinto, to commit to strategies that align with the Paris Agreement.

Investor action is an opportunity for Victorian manufacturers. Last year, a survey by the Investor Group on Climate Change found that "Climate-aligned investment is continuing to accelerate. Investors are actively looking for opportunities to support climate solutions..."⁴

2 Half the world's economy now eyeing net zero transition, analysis shows, BusinessGreen, 18 February 2020, via <https://www.businessgreen.com/news/4010947/half-world-economy-eyeing-net-zero-transition-analysis>
3 Press release, The Investor Agenda, 9 December 2019, via http://theinvestoragenda.org/wp-content/uploads/2019/12/December-9-2019_PressRelease_Global-Investor-Statement-to-Governments-on-Climate-Change.pdf
4 Press release, Investor Group on Climate Change, 20 August 2019, via https://docs.google.com/document/d/1aEs2tQYDj7f6eiURW4cC06yvPem_3x-pMDkEx9S3kxHI/edit
5 Meet the companies already setting their emissions reduction targets in line

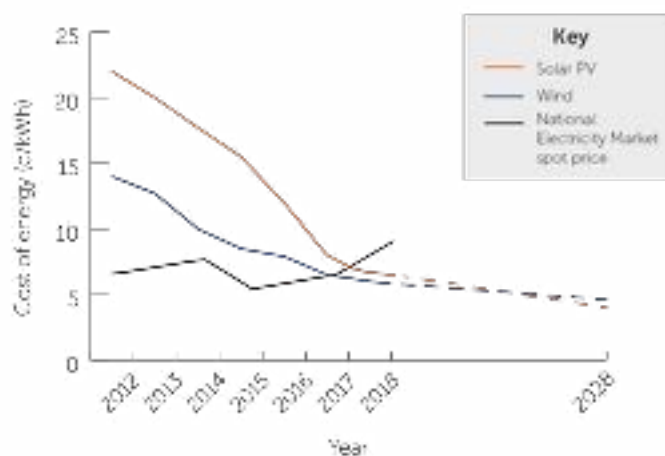
Businesses are leading

Shrewd companies are turning climate risk into an opportunity. More than 805 global businesses are taking science-based climate action.⁵ Success will necessitate major changes to manufacturing processes, and an almost total rejection of fossil fuels. Australian companies leading the way include Woolworths, Yarra Valley Water and South East Water. Other global groups operating in Australia include Mars, Ikea and Chobani.

Manufacturers are saving money with renewable energy

Renewable energy costs are plummeting, and leading companies are taking advantage of this new era by building their own renewable installations, or purchasing contracts for renewable power supply.

Companies are benefiting from renewable energy power purchase agreements (PPA), with typical cost savings of 20-50%.⁶ The market for renewable PPAs is set to boom, which will drive costs down even further and aid the expansion of renewable energy in Australia.



Victoria leading the way

Victoria is a national leader in transitioning to renewable energy. Legislating the 50% renewable energy target by 2030 sends a strong policy signal to investors and industry that Victoria is 'serious about its renewable energy transition.'⁷ Recent announced changes to the *National Electricity (Victoria) Act 2005* will also play a role, with the Government noting the amendments "... will unlock renewable projects and improve the reliability of Victoria's energy supply."⁸

with climate science, accessed 25 February 2020, via <https://sciencebasedtargets.org/companies-taking-action/>
6 Electrifying Industry, Beyond Zero emissions, 2018
7 Victoria's renewable energy targets, accessed 25 February 2020, via <https://www.energy.vic.gov.au/renewable-energy/victorias-renewable-energy-targets>
8 Victoria Acts to Secure a More Reliable Energy System, Victorian Government, 18 February 2020, <https://www.premier.vic.gov.au/victoria-acts-to-secure-a-more-reliable-energy-system/>

The big switch

Electricity is a remarkably versatile form of energy that can be used to power any industrial heat process, from cooking a can of baked beans to melting 100 tonnes of iron.

But electricity isn't just another source of energy. It allows us to make things in a smarter way. Electrical heating is more efficient, faster, precise, modular and scalable, and is available everywhere.






Australian manufacturing is inefficient, consuming more energy per dollar of output than any other developed country. Switching to renewable energy would double the efficiency of many industrial processes.

Electrifying Food and Fibre

Victoria is Australia's biggest food and fibre exporter. In 2018-19, Victoria's food and fibre exports were valued at \$14.2 billion.⁹ Food manufacturing uses low grade heat, and is ideally suited to industrial heat pumps.

Swapping old gas boilers for industrial heat pumps can boost the competitiveness of this vital sector. A remarkable energy efficiency of 300-700% means a heat pump can pay for itself in less than two years, delivering big savings for Victorian food and fibre manufacturers.

Our zero emissions pathway in *Electrifying Industry* uses five types of electrical heating technologies, as well as hydrogen:

TECHNOLOGY	TEMPERATURE	WORKS BY...	CAN MAKE...
 Industrial heat pumps	up to 160°C	using electricity to extract thermal energy from one place and transferring it to another	chemicals, food and drink, pulp, paper and wood
 Electromagnetic heating	up to 2,000°C	using the electromagnetic spectrum to deliver heat. Eg, infrared, induction and microwaves	food and drink, pulp, paper and wood, fabricated metal and machinery, ceramics and chemicals
 Electrical resistance	up to 1,800°C	passing an electrical current through a resistive heating element like a metal bar	cement, glass and ceramics, iron and steel chemicals
 Electric arc heating	up to 5,000°C	using electricity to melt metal (electric arc) passing a powerful electric current through certain gases like argon (plasma arc)	iron and steel, cement and ceramics
 Renewable hydrogen	n/a	passing an electrical current through water (an indirect route to electrification)	chemicals (like ammonia) and steel

⁹ Food and Fibre, DJPR, <https://djpr.vic.gov.au/priority-industries-sectors/food-and-fibre> accessed 18 February 2020



Making it happen

The Victorian State Government can attract investment in zero carbon manufacturing by:
Setting *targets to keep warming under 1.5 degrees* to send a strong signal that Victoria is a climate leader that welcomes clean, renewable industries.

Developing an *industrial strategy that stimulates growth in Victorian low carbon manufacturing* and rapidly reduces industrial emissions to zero.

Setting *sustainable procurement standards and targets* to support emissions targets with the considerable spending power of the Government.

Investing in research and commercialisation through financial incentives, with the aim of establishing Victoria as a global leader.

To read the full report, visit: <https://bze.org.au/research/manufacturing-industrial-processes/electrifying-industry/>

Beyond Zero Emissions is a climate change think tank, showing through independent research and innovative solutions how Australia can reach beyond zero emissions.

www.bze.org.au

