

## **Technology Investment Roadmap Submission**

The Port Phillip Emergency Climate Action Network (PECAN) is a network of 14 environment and community groups in the municipality of Port Phillip. Our parent organizations have a collective membership of over 8,000 individuals.

PECAN supports the broad thrust of the Discussion paper but has serious reservations about key aspects. First, the Roadmap does not provide a clear pathway for emissions reductions, and secondly, undue emphasis is placed on the roles of gas and CCS in the transition towards a decarbonized energy system.

The interaction of these two processes means that no deliberate policy will be in place to ensure that Australia can meet its Paris 2050 targets or to follow a pathway consistent with limiting global emissions as closely as possible to 1.5°C of warming – a pathway more achievable for Australia given our abundance of renewable energy resources.

The first question with any roadmap concerns selection of the appropriate destination. We suggest that the destination should provide the following benefits – emissions reductions, expanded manufacturing and employment, increased exports, and cost savings to energy consumers. We believe that the pathway to unlock these benefits is already available.

This pathway has been spelled out by numerous public institutions, think tanks and economists - AEMO, CSIRO, Grattan Institute, Climate Council, Climate Works, Australia Institute, BZE, Ross Garnaut and John Quiggin and all major Australian University Sustainability Centres. While details and timing may vary between their designs they all propose rapid uptake of renewables, supported by pumped hydro, battery storage and DER systems with firming gas playing a decreasing role as penetration of the other firming systems increases. Between now and 2040 this pathway can realistically enable electricity to be based on 100% renewable production, gas for commercial, residential and industrial processes to be phased out, and the transport sector to become electrified or green hydrogen based.

The significance of this pathway is that it is based on currently available or fast developing technologies, which will become cheaper over time, and build on Australia's natural advantages not only of renewables, but also our extensive mineral resources which if strategically utilized can revitalize Australian manufacturing and export capacity.

In contrast, the alternative scenario of business as usual cannot provide the benefits of the renewables-based pathway. First, emissions cannot readily be controlled without reduction targets and policies to achieve them. In the context of post-COVID-19 recovery planning there is already emerging a misplaced reliance on new gas production with its associated problems of emissions generation and large scale infrastructure building. Following this course would create multiple problems – it will increase Australia's emissions, will delay emissions reductions, divert investment away from renewables and lead to dearer energy for consumers, given world parity pricing for gas and the cost of

new infrastructure. If reducing energy prices is a critical objective, the cheapest form of energy now and in the long term will be produced from renewables, even with associated storage capacity.

In the following sections, this submission discusses the technology implications of the Roadmap.

## **Emissions**

Gas is commonly considered to provide about half the emissions of coal, but this assumption doesn't bear close examination.

The most recent figures for Australia's emissions<sup>1</sup> show that while emissions from the electricity and agriculture sectors have declined (the latter due to drought), overall emissions are not reducing sufficiently, due to increased LNG exports and emissions associated with their production.

For the year ended Sept 2019, Australia's emissions fell to 530.8 MT CO<sub>2</sub>e, down by 1.4 Mt CO<sub>2</sub>e on the previous year. Electricity and agriculture sectors fell by a combined 7.7 Mt CO<sub>2</sub>e, but these falls were offset by increased emissions from stationary energy of 2.6 Mt CO<sub>2</sub>e and 3.3Mt CO<sub>2</sub>e from Fugitive emissions from LNG production. It is frequently claimed that these exports are reducing the emissions of the countries receiving the LNG, but investigation shows that they cannot be confirmed and that data is not available to support them. In fact, analysis from the Centre for Climate Economics and Policy at the ANU shows that Australia's energy exports increase global greenhouse emissions, not decrease them<sup>2</sup>.

Global Energy Monitor is a US based research network which tracks fossil fuel development; in a June 2019 report it found that fugitive emissions from proposed increases in LNG use would have as large or larger global heating impact as proposed increases in coal use globally. It further stated that by 2014, methane was responsible for 25% of global warming<sup>3</sup>.

Natural gas is frequently claimed to be an important transitional fuel as it has about half the CO<sub>2</sub> emissions of black coal. However fugitive emissions of methane from LNG are highly problematic; while it is relatively short lived in the atmosphere, over 20 years it has 86 times the warming potential of CO<sub>2</sub><sup>4</sup>.

Apart from methane emissions, increased usage of LNG cannot be supported in terms of global carbon budgets. The concept of its benefits as a transitional fuel is being used in Australia to justify our place now as the world's largest exporter of LNG as well as of coal.

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<sup>1</sup> Australia's National Greenhouse Inventory September 2019, published Feb 2020

<sup>2</sup> F..Jotzo The Conversation, Australia's Energy Exports Increase Global Greenhouse Emissions, Not Decrease Them, June 19,2019

<sup>3</sup> Ted Nace et al, Global Energy Monitor, June 2019

<sup>4</sup> Tim Baxter, The Conversation, February 2,2020

In India, one of the countries expected to become a major user of LNG as it moves away from coal, there is a direct transition to renewables, especially solar. Coal is still being supported but new coal builds are confined to State owned generators financed by State owned banks. The private sector has moved decisively to renewables due to their cost advantages<sup>5</sup>.

The whole justification for LNG cannot be sustained. It is unnecessary, as direct transition to renewables is cheaper and emissions free. Its use for baseload power is indefensible – it replaces one fossil fuel for another, and in many cases will result in only limited emissions reduction. And in Australia's domestic case, its production results in Australia's emissions increasing, as the most recent Greenhouse Inventory showed. Finally, it will not bring energy prices down. The gas case, in PECAN's view, should be limited to the minimum requirement for gas peaking plants until less polluting firming systems can be put in place.

## **Manufacturing and Employment**

Australia's manufacturing capacity has been hollowed out in the last decade, and the Covid-19 crisis has driven home our dependence on imports of both high-tech manufactured products like ventilators, and lower tech items like face masks and testing kits. And those gaps are just in the health sector.

Australia has abundant renewable resources – not just wind and solar, but geothermal, wave action and biomass. We also have plentiful mineral resources – iron ore, copper, rare earths like lithium, manganese, cobalt, bauxite and many others. Yet to date we have not joined these resource riches together. Australia could become a manufacturing powerhouse if we strategically managed the potentials we have available.

A report prepared by Ernst Young for WWF<sup>6</sup> showed that a renewables led recovery program would generate nearly three times as many jobs as similar expenditure on fossil fuel programs, and reduce emissions at the same time. The proposal, involving fast tracking wind and solar projects already approved, increasing grid capacity, and backing new industries in battery manufacturing, electric buses, green hydrogen and in manufacturing, could create 100,000 new jobs. The report showed that if just 10% of the funds proposed by Commonwealth and State government recovery programs was diverted into this renewables proposal, 160,000 jobs could be generated.

A similar proposal from BZE<sup>7</sup> points out that the shift to a clean energy grid is inevitable, and that strategic opportunities lie in acceleration of this process rather than slowing it down. It proposes building 90GW of renewable capacity and 20GW of battery storage over the next five years, estimating that this would produce 124,000 construction and 22,000 ongoing jobs; currently there are proposals for 133GW in development with 23% of this approved. It further suggests that these projects be

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<sup>5</sup> Clyde Russell, Coal-fired power losing unfair fight in India, AFR, 21/2/2020

<sup>6</sup> WWF, Securing Australia's Future: Renewable Recovery from Covid 19, May 2020

<sup>7</sup> Beyond Zero Emissions Briefing Paper: Rapid Shift to Renewables, May 2020

located in specified Renewable Energy Zones based on Gladstone, Whyalla, and the Hunter and Latrobe Valleys. These proposals make good sense as coal mining and generating jobs in the Valleys and Gladstone will reduce over time. ABS Labour Force figures show about 46,000 people employed in the coal mining sector, divided equally between thermal and metallurgical coal, so approx. 25,000 workers are currently employed in thermal coal mining where closures are expected to come earlier<sup>8</sup>.

A further study prepared by the Centre for Future Work shows that if the Manufacturing sector moved from fossil fuels to energy sourced from renewables there would be savings of \$1.6bn each year, about 23% of the sector's current power bill<sup>9</sup>.

At present Australia's mineral resources are extracted and exported, with value adding limited to aluminium which is precariously placed due to increased energy costs in recent years. There are many opportunities for refining and smelting these raw materials using cheap renewable energy, and building new manufacturing around lithium batteries, green hydrogen, green steel and electric vehicles for public transport – buses, trams and light rail. In a sign of further improvements to come ANU researchers this week claimed a new world efficiency record for a solar panel which directly splits water to produce hydrogen<sup>10</sup>.

## Exports

Australia is at a crossroads in the development of its post-COVID recovery planning. The National COVID Coordinating Commission is recommending that billions of dollars should be spent on building gas pipelines across Australia, while scientists and a clear majority of Australians want a cleaner future with fewer emissions.

The manufacturing proposals outlined above form the basis for a significantly increased export capacity, which will become of greater importance as our current export markets shift to renewable energy and green production. Apart from finished manufactures, opportunities lie in exports of green hydrogen, green steel and green energy.

There are several proposals currently in development of hydrogen exports. The Asian Renewable Energy Hub in the Pilbara is a major project of 15GW aimed at the export of green hydrogen and ammonia. Infinite Blue Energy (IBE) is planning Australia's largest Hydrogen project at Dongara in WA, and is separately planning to transition large fossil fuel users in NSW to green hydrogen. ARENA has funded a suite of hydrogen projects, and Siemens is backing a 5GW plant at Murchison in WA.

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<sup>8</sup> ABS, Labour Force Detailed, Quarterly: <https://www.abs.gov.au/AUSSTATS/abs@.nsf/MF/6291.0.55.003>

<sup>9</sup> Centre for Future Work, Renewable Energy Could Power Australian Manufacturing Renaissance, May 8, 2020

<sup>10</sup> Renew Economy, Australian Researchers Claim New Record for Direct Solar to Hydrogen Solar cells, June 17 2020

Last month the Grattan Institute released a study exploring opportunities for green steel exports<sup>11</sup>. It sees Australia capturing 6.5% of the global green steel market worth about \$65bn, with production mainly in Queensland, and providing tens of thousands of jobs, comparable to the number in coal-mining regions.

And direct export of energy is also on the list, with the \$20bn Sun Cable project sending power to Singapore from the world's biggest solar farm and battery storage facility via a high voltage DC sub-sea cable. Other projects are also at planning stage including an Energy Transition Hub proposal for export to Indonesia.

## CONCLUSION

A gas-led recovery would create additional emissions, additional costs for consumers, and additional delays in the inevitable transition to renewables, together with fewer jobs and export opportunities. No wonder the Institute for Energy Economics and Financial Analysis has described these proposals as “unbelievably silly”<sup>12</sup>.

The CSIRO/AEMO pathway will enable Australia to meet its Paris targets, create more jobs, renew manufacturing, create more exports, and achieve a more prosperous Australia.

Port Phillip Emergency Climate Action Network

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<sup>11</sup> Grattan Institute, Start with Steel, May 11th 2020

<sup>12</sup> IEEFA Labels Unbelievably Silly Proposals For Gas Led Recovery, EcoNews, May21, 2020