Energy, Environment and Climate Change

Investigation into the Transition to Renewable Energy

Youth Parliament 2022

the

Committee Investigating Energy, Environment, Climate Change

Investigation into the Transition to Renewable Energy

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Terms of reference

That the Legislative Council Committee on Energy, Environment & Climate Change inquire into and refer to:

1. Greenhouse gas emissions in the state of NSW;

2. The state of the transition to renewable energy in the state of NSW;

3. Skills migration initiatives for workers employed in the fossil fuel industry in the state of NSW;

4. Consultation of Aboriginal and Torres Strait Islander groups when establishing energy projects in the state of NSW;

5. Initiatives to current technologies efficient, including innovation in agriculture; and

6. Public outreach initiatives around renewable energy, including through government departments and institutions in the state of NSW.

Chairperson's foreword

The climate crisis poses an existential threat to humanity. In order to address this issue, large-scale mitigation by 2030 is required, providing reductions in the effects of this crisis such as rising sea levels, premature death and crop losses. New South Wales (NSW) has a responsibility as global citizens to address this crisis in accordance with our advantageous position as a strong and stable economy and a developed society. This would also ensure the future of New South Wales for generations to come, maintaining social, environmental and economic opportunities. The key aspect of addressing climate change is mitigation by reducing greenhouse gas emissions, which requires the broad implementation of renewable energy generation to phase out fossil fuel-based production.

I am pleased to present The Committee Investigating Energy, Environment and Climate Change report into The Transition to Renewable Energy in New South Wales to the 2022 Youth Legislative Council for consideration. The report has investigated a broad range of topics, including areas such as public outreach, particularly Aboriginal consultation on environmental approval, as well as the use of innovation and existing technologies.

Furthermore, the report discusses the current skills migration programs and economic opportunities that comprise the transition to renewable energy, including through case studies examining the experiences of such transitions internationally and in other states of Australia.

Throughout the report, the Committee has noted several key gaps in the plan and implementation of this transition. In particular, the lack of skills migration initiatives for fossil fuel workers, shoring up economic losses from the transition, is concerning to the Committee, as is the poorly designed consultation system with Aboriginal language groups in local areas when establishing new energy projects. We also wish to see efficiency programs for existing technologies and when developing new innovation.
We have proposed a breadth of solutions designed to expedite the transition to renewable energy and ensure a 'just transition' as per the 2021 report from the Legislative Assembly Committee on Environment and Planning. As part of this, this Committee recommends measures including subsidised TAFE, ambitious renewable energy targets and large-scale battery installation within renewable energy zones.

This Committee would like to thank those organisations and individuals who have provided useful resources for compiling this report, including Members of the NSW Parliament, the NSW Government and other non-governmental organisations. I would also like to express my sincere gratitude to all members of this Committee for their dedication to research and their invaluable solutions to address the transition to renewable energy.
I commend this report to the House and to the floor.
The Honourable Joshua Shaw, Youth MLC Youth Minister for Energy, Environment & Climate Change

Introduction

The climate crisis is a large existential threat to humanity that we have ignored for far too long. In the state of NSW this issue needs to be addressed through strategies such as large-scale mitigation by 2030. Through this the committee believes that there must be effective steps taken to mitigate the effects of this crisis such as rising sea levels, premature death and crop losses.

The state of New South Wales (NSW) has a need to address this crisis in the global stage in order to maintain the wellbeing of people and in accordance with the strong and stable economy we provide in the country of Australia. Through this the committee believes that the future of NSW would be able to maintain social, environmental and economic aspects for the welfare of citizens now and in decades to come. The key aspect of this action on climate change is mitigation by reducing greenhouse gas emissions, through the broad implementation of renewable energy generation to phase out fossil fuel-based production. The report has used research and provided solutions to a broad range of topics, including public outreach, particularly around Aboriginal consultation on environmental approval, use of innovation and existing technologies and current skills migration programs and economic opportunities. Overall, through the mitigation of climate change, NSW can harness significant economic and social opportunity. The recommendations put forward in this report include research from multiple sources such as case studies, past legislation and scientific information to ensure the best possible solutions to tackling this crisis.

Background

The importance of climate action and the role of renewable energy

The importance of climate action

Climate action is crucial in order to take action against climate change and to address environmental issues threatening the future of the planet. Climate change has begun to result in severe environmental issues that affect people's daily lives (especially marginalised and/or vulnerable populations) due to severe weather, recurring natural disasters, etc which directly affect the liveability, wellbeing and economy of communities globally. According to the Swiss Re Institute, one of the estimated largest impacts of climate change results in the loss of up to 18% of GDP of the worldwide economy by 2050 if global temperatures rise by 3.2°C.

An aspect of climate action suggested by the Climate & Clean Air Coalition includes the large scale mitigation by 2030 which provides benefits such as:

- Reduced rising of sea level by 20% by 2030
- 2.4 million premature deaths avoided annually from air pollution
- 52 million tonnes of crop losses prevented from major staples

Other benefits of climate action entail:

Health benefits

Reduction of harmful climate pollutants like tropospheric ozone (O3) and black carbon will reduce death from air pollution - a substantial environmental threat that drives climate change on a macro level and kills approximately 7 million people a year.[1] World Health Organisation (WHO)[2] estimates that between 2030 and 2050, climate change will cause hundreds of thousands of additional deaths each year from malnutrition, malaria, diarrhoea and heat stress alone. Public Health and wellbeing will also be challenged as a warming planet and constant environmental emergencies will result in a lack of basic needs such as clean air, drinking water, sufficient food, etc. vulnerable groups such as women and children experience the impact of climate change more harshly as more than 60% of all premature

[1] *Climate & Clean Air Coalition* |. n.d. "Why we need to act now | Climate & Clean Air Coalition." Accessed June 15, 2022. https://www.ccacoalition.org/en/content/why-we-need-act-now.

[2] WHO. n.d. "Climate change." WHO | World Health Organization. Accessed June 17, 2022. https://www.who.int/health-topics/climate-change.

deaths from household air pollution in 2012[1] were among women and children, predominantly in South Asian middle class and lower class families.

Food security benefits

Food security is compromised due to the frequent and unpredictable environment. Air pollutants such as the tropospheric ozone and methane cause around 110 million tonnes (4-15% of global crop production depending on region) [3]in annual losses of major staple crops: wheat, rice, maize and soybeans. This is mainly due to severe weather conditions, heat stress, droughts and floods. Climate action can help to reduce the risks to food security and improve the agricultural industry and agrarian environments.

Environmental benefits

Climate action will result in extensive environmental sustainability development which will be an exceptional benefit for the future of the world economy and advancement. Rising sea levels, global warming, extreme weather conditions, and air and water quality will be improved. These environmental benefits can be achieved through the transition to renewable energy. The United Nations[4] suggests investing in sustainable solutions such as closing fossil fuel subsidiaries.

The role of renewable energy

Renewable energy serves a vital role in the mitigation of climate change. It reduces carbon emissions and other pollutants in the air, resulting in cleaner air, energy and the environment. Dominating renewable energies include solar, wind and hydro along with sustainable bioenergy which would ensure the advancement of innovation and technology in addition to preventing the causes of climate change. The International Renewable Agency (IRENA) strives to supply ⅕ of the world's electricity with renewable by 2050[5] which would result in efficient and sustainable power generation.

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[3] CCA Coalition. n.d. "Short-lived climate pollutants and food security | Climate & Clean Air Coalition." Climate & Clean Air Coalition |. Accessed June 18, 2022. https://www.ccacoalition.org/en/content/short-lived-climate-pollutants-and-food-security.

[4] UN. n.d. "Renewable energy – powering a safer future | United Nations." the United Nations. Accessed June 17, 2022. https://www.un.org/en/climatechange/raising-ambition/renewable-energy.

[5] ARENA. n.d. "Global Renewables Outlook: Energy transformation 2050." IRENA. Accessed June 20, 2022. https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020.

Current legislation and renewable energy projects in NSW

New South Wales (NSW) is one of the leading states towards the addition of renewable energy in the electricity market[6]. Due to generations of rooftop solar panels and large scale solar and wind farms, the amount of solar and wind energy more than doubled in 2015-2020. As renewable energy grows, the ability to store renewable-generated electricity for later consumption becomes increasingly important.

NSW electricity has a strategy in the NSW government's plan for more reliable, affordable and sustainable electricity that supports and grows with the future and the economy.[7] The strategy plans to reduce the use of powered generators as they are outdated, too costly and emit harmful gases. This is to be accomplished by conveying Australia's first coordinated renewable energy zone in the central west Orana region. Thus, conserving energy via energy security safeguard. Significant due to demands being at peak, setting a target to support the state's energy resilience and by simplifying energy business in NSW.

The availability of energy is a key economic and political concern.[8] Consumer costs, as well as the sector's intersection with climate change action and emissions reduction, frequently propel it to national prominence. Government and industry have made ensuring energy security in the power, gas, and liquid fuel sectors a top concern. Increased renewable energy generation reduces glasshouse gas emissions for the industry. However, this poses issues for the management of Australia's primary electrical grid. Hydrogen is currently being researched as a transportation fuel, but it can also be utilised to store renewable energy. The Coalition and Labour agree that a national hydrogen industry should be developed. It has the potential to become a large export business, and the COAG Energy Council is working on a National Hydrogen Strategy.

Australian coal mining industry, skills migration programs

The market size of the mining industry in Australia during 2019-2020 was at $202 billion, being Australia's largest industry at 10.4%. In NSW, its market size was $14.9 billion. The industry directly employs 40,000 workers, with thousands of others working for it indirectly. It

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[6] "Energy Consumption | NSW State of the Environment." n.d. NSW State of the Environment. Accessed June 25, 2022. https://www.soe.epa.nsw.gov.au/all-themes/human-settlement/energy-consumption.

[7] ARENA. n.d. "Global Renewables Outlook: Energy transformation 2050." IRENA. Accessed June 20, 2022. https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020.

[8] "Energy challenges – Parliament of Australia." n.d. Parliament of Australia. Accessed June 25, 2022. https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook46p/EnergyChallenges.

currently has a median annual salary of $123,844. As such, the mining industry for things such as coal is large. Specifically, however, in the coal mining industry, 21,000 people are employed in NSW coal mines (38 total operating), with many of these mines shutting down before 2030. While the large loss of jobs will prove a heavy burden on NSW, the state does not currently have an official 'skills migration program' to ensure these workers can assist in the development of the renewable energy industry[9].

Consultation of Aboriginal and Torres Strait Islander groups when establishing energy projects in NSW

Overview

Ever since climate change started to alter the weather patterns, Aboriginal people and Torres Strait Islanders have been hit hardest by the damaging alterations. Whether it be the proposing and opening of energy products destroying the land or the impacts of climate disasters it has been rapidly increasing over the past decade. It is vital that First Nations communities have the final say on all energy projects, renewable or not.

Aboriginal and Torres Strait Islander peoples have been heavily impacted by alterations of weather patterns and the overall climate - stemming from the effects of climate change. The artificial destruction of ecosystems for the extraction and exploitation of non-renewable energy resources over the last few decades have been detrimental to areas that have significant cultural importance to indigenous custodians, causing undesirable strain between first nations peoples and government institutions. It is imperative that all communities of Indigenous backgrounds have the opportunity to cooperate with the government and extraction companies on issues pertaining to their land, as guaranteed by provisions outlined in the Native Title Act 1993 (Cth).

What has the NSW Government done?

Under the NSW large scale solar energy guideline, it states that 'Avoid the loss of Aboriginal cultural heritage. If losses cannot be avoided, impacts must be minimised.' and further goes on to state that for any land modification it MUST go through the local Aboriginal council to

[9] Sustainability of energy supply and resources in New South Wales. 2021. "Legislative Assembly of New South Wales - Committee on Environment and Planning." Parliament of NSW. https://www.parliament.nsw.gov.au/ladocs/inquiries/2542/Report%20-%20sustainability%20of%20energy%20supply%20and%20resources%20in%20NSW.pdf;
Khmelev, Daniel. 2021. "NSW Must Avoid 'Poorly Planned' Coal Closures: Committee." The Epoch Times. https://www.theepochtimes.com/nsw-must-avoid-poorly-planned-coal-closures-committee_3950609.html?welcomeuser=1.

approve for any modification on council owned land. However, in the mining application guideline Indigenous consent is not mentioned once.

Technology and innovation in the future

The committee considers that climate change is a problem, in the state of NSW various energy efficient and renewable options are being explored. Technology and Innovations are used in many fields, what our committee wants to know is how do we reduce energy consumption using them. In NSW, farmers produce more than $15 billion worth of produce, but how much energy are they using for spraying, harvesting and many more. Agriculture used 104.4 petajoules out of 1468.8 petajoules in total. The government needs to think of alternatives. The committee believes that energy, environment and climate change bodies should engage with technological companies in NSW that are researching and developing beneficial technology for the benefit of the state. The public and communities will be eased into further recommendations and development of action on technological innovations in NSW. Technological innovations which are less likely to harm the state are being researched. In sectors such as agriculture, mining, infrastructure construction, household usage, defense and public transport. Innovation such as real time data monitoring of energy consumption is already in use.

Technological innovations include:

- Agricultural drone (Agricultural drones are aerial spraying systems designed for aerial spraying in farming lands).
- Solar farms (Solar farms are a relatively effective and unobtrusive way of generating electricity).
- Led light efficiency(Led is an energy efficient lighting and reduces energy usage by 75%).
- Public electric transport
- Real time data technology of energy
- Clothes dryer (Oak Ridge National Laboratory and General Electric are developing a new type of clothes dryer that uses a heat pump cycle to generate hot air needed for drying).
- Dynamic Operating Envelopes

The transition to renewable energy in South Australia

In the early 2000s, South Australia set a target of renewable energy composing 26% of renewable energy generation by 2020. However, this was overachieved, with renewables comprising 60% of the state's energy needs throughout 2020. Currently, South Australia's energy is provided by:

- 13% rooftop solar
- 4% large scale solar
- 42% wind
- 42% gas generation

The South Australian Government has now introduced new targets of 100% renewable energy by 2030 and 500% renewable energy by 2050, however, this 100% target is on track to be reached by 2025. In fact, in October of 2020, South Australia experienced an hour in which solar alone supplied 100% of all energy demand. This clear ambition has led to significant investment in renewables in South Australia and created a variety of jobs to support the local economy[10].

One of the keys to the beginning of a successful transition to renewables in South Australia has been the implementation of Variable Renewable Energy and Distributed Energy Resources Integration[11], which means that systems, such as small-scale solar, were established to supply energy to businesses or households. This was assisted by the effective use of federal subsidies and market driven approaches. In particular, South Australia made use of the Commonwealth Government's Renewable Energy Certification Scheme and Renewable Energy Target as part of the Kyoto Protocol, ensuring that their state was the most attractive in Australia for renewable investment driven by these schemes. This was further aided by the Commonwealth Mandatory Renewable Energy Target[12], which forced large consumers of electricity to supply a certain proportion of their power from renewables. By making South Australia an attractive investment option as part of these programs, the state reaped benefits not experienced by New South Wales. South Australia also instituted Renewable Energy Supply Contracts in which the State Government bought certain amounts of energy from renewable sources, as well as providing solar feed-in tariffs to pay household and business consumers who supplied solar into the market, which incentivised rooftop solar uptake.

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[10] Bowyer, Johanna, and Gabrielle Kuiper. 2021. "A Grid Dominated by Wind and Solar is Possible." Institute for Energy Economics and Financial Analysis. https://ieefa.org/wp-content/uploads/2021/05/A-Grid-Dominated-by-Wind-and-Solar-Is-Possible_June-2021.pdf

[11] Australian Renewable Energy Agency (ARENA). n.d. "Distributed energy resources." Australian Renewable Energy Agency. Accessed June 25, 2022. https://arena.gov.au/renewable-energy/distributed-energy-resources/.

[12] St John, Dr Alexander. 2014. "The Renewable Energy Target: a quick guide." Parliament of Australia. Report. https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1314/QG/RenewableEnergy.

South Australia has also maintained a stable grid through the implementation of four batteries, including the world's largest, the Hornsdale Power Reserve, which recovered its capital costs in just over two years of operation. Grid stability has also been maintained through recently introduced regulations around small-scale solar installations, particularly for the 40.3% of households with rooftop solar, encouraged through solar feed-in payments[13]. These regulations enable operators to remotely disconnect small-scale solar systems from the grid, maintaining a safe supply. Some organisations, such as the Institute for Energy Economics and Financial Analysis, have criticised this, however, instead favouring Dynamic Operating Envelopes[14], which limit what customers can import from and/or export to the grid on a five-minute basis, instead of a permanent basis set for conservative worst case scenarios. This enables full utilisation of renewable capacity in times of peak generation.

South Australia has also managed to transition entirely away from coal-fired power, dismissing the traditional myth that a coal baseload is necessary to maintain a stable grid. The last coal-fired generator in South Australia closed in 2016 and was not subsidised by the State Government, enabling market conditions to dictate its shutdown.

In fact, renewables have pushed down wholesale electricity prices, including becoming negative at some periods of the day (fig 1), ensuring renewables are more attractive and profitable to the market and benefiting consumers.

Figure 8 Negative daytime prices in South Australia

South Australian average underlying electricity price[12] by time of day – Q1 2021 and Q1 2020

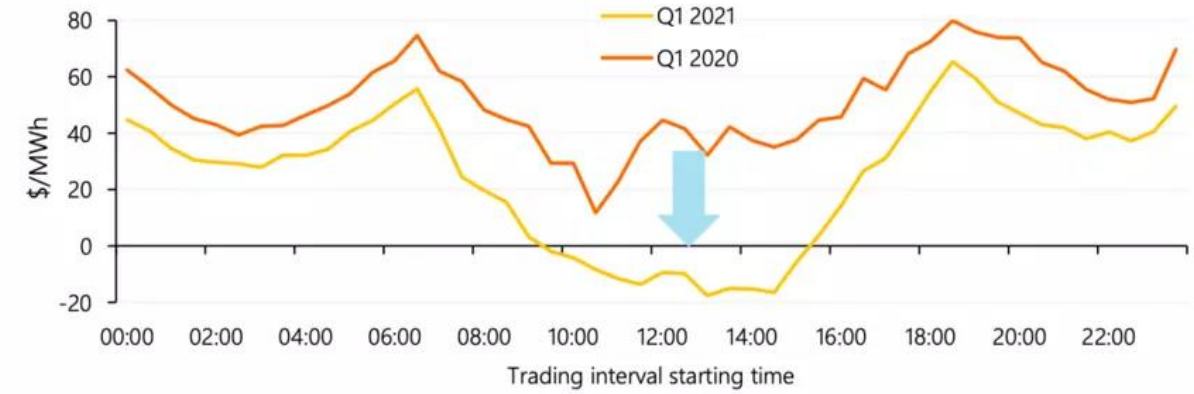

Fig. 1.1, negative daytime prices in South Australia

Now, renewable energy is currently the cheapest form of power generation in the broader Australian market, making it an increasingly attractive option for consumers and corporations alike.

[13] South Australian Government. n.d. "Solar feed-in payments." Government of South Australia. Accessed June 25, 2022. https://www.sa.gov.au/topics/energy-and-environment/energy-bills/solar-feed-in-payments.

[14] Australian Renewable Energy Ageny (ARENA). n.d. "Dynamic Operating Envelopes Workstream." Australian Renewable Energy Agency. Accessed June 25, 2022. https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/dynamic-operating-envelopes-workstream/.

Public outreach

In the implementation of various different socioeconomic legislative changes to societal life by the NSW Government, numerous methods were utilised to convey alterations of government policy. From the COVID-19 pandemic to the recent floods in regional NSW, policy was altered to accommodate for the circumstances presented at hand - often at times utilising the means of communications (including social media and the internet) to reiterate government messaging. In the case of the implementation of the Crimes Legislation Amendment (Sexual Consent Reforms) Act 2021 (NSW) to the Crimes Act 1900 (NSW), an advertising campaign was conducted by the NSW Government to communicate policy reform. Although it is ongoing, the predominant method of communication to convey the legislative changes is through social media, on platforms such as YouTube and TikTok. These means of government communication are regulated by legislation such as the Government Advertising Act 2011, whereby its advertising has to be in an impartial manner.

For the improvement of the NSW Government's approach to aspects regarding public relations - especially regarding the implementation of environmental legislation for the transition to renewable resources, the government can consult studies conducted by institutions on its approach to advertising as part of self-evaluation. According to the Audit Office of NSW, the government has decreased its media expenditure in the 2019-20 Financial Year. To implement government messaging on legislative reforms on the transition to renewable resources, expenditure must be increased to accommodate for an increase of public messaging[15].

[15] NSW Government,"*All of Government Communications Framework*" https://www.nsw.gov.au/nsw-government-communications; NSW Government. 2022. (accessed 25/06/2022);
NSW Government, "Make No Doubt" https://www.makenodoubt.dcj.nsw.gov.au/,NSW Government. 2022 (accessed 25/06/2022);
Audit Office of New South Wales, "*Government advertising 2018-19 and 2019-20*", https://www.audit.nsw.gov.au/our-work/reports/government-advertising-2018-19-and-2019-20; Audit Office of NSW. 2020. (accessed 25/06/2022)

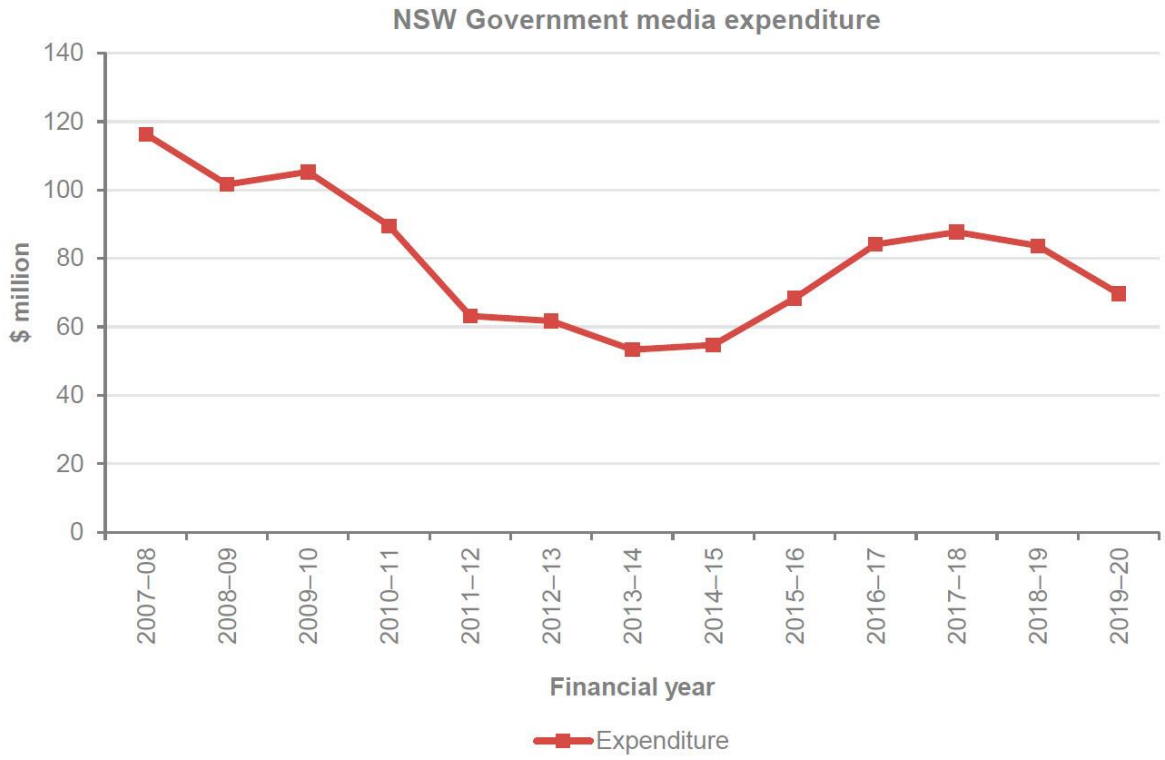

Fig. 1.2, NSW government media expenditure, 2007-2020

Recommendations

Further implementation of climate change education into the NSW curriculum

Due to climate change being an increasing global crisis, a further implementation should be integrated within the NSW education systems to educate the younger generations who will live through this issue, about its severity and the significance of its immediate mitigation. Australia doesn't have substantial climate change education put in place for any states including NSW, whereas countries like Italy, Vietnam and Mauritius have advanced to incorporating sustainable development and climate change into their curriculums[16].

Ways to implement more climate change education into the curriculum include:

- Encouraging schools and education institutes to work more with organisations like Sustainable Schools NSW (an initiative by the Australian Association for Environmental Education) which aims to connect teachers and environmental educators with relevant resources and a like-minded community to help spread the important message of climate action to future generations.

- Implement the Climate Change Education for Sustainable Development (CCESD) program made by UNESCO organisation to increase climate literacy in the future generations.

- Explicit mention of climate change in primary (years 1-6) curriculum apart from sustainability and endangered species topics.

First Nations' Treaty and Local Aboriginal Land Council veto powers

A treaty with First Nations People must be implemented by the New South Wales Government to establish a formal recognition of the important contribution of Aboriginal and Torres Strait Islander people to the state. This would further enshrine the voice of such people, particularly local language groups, in legislation, recognising the important role they play in approving and considering environmental approval projects. As part of this, it is essential that NSW adopt a system allowing Local Land Councils, as the voices of local

[16] UN and UNESCO. n.d. "Shaping the Future we want: UN." Sustainable Development - UN Decade of Education for Sustainable Development. Accessed 6 20, 2022. https://sustainabledevelopment.un.org/content/documents/1682Shaping%20the%20future%20we%20want.pdf.

language groups, to have the power of veto over Environment Approvals over both new Renewable Energy and Fossil Fuel projects in their jurisdiction. This would demonstrate greater recognition and empowerment of Aboriginal and Torres Strait Islander people in NSW and create a recognition of the importance of Local Language Groups, respecting Dreaming, land and identity. This addresses an often overlooked aspect of the 'just transition' to renewable energy in NSW.

Education and public awareness campaigns for the general public

Educating the public about climate change, and the importance of climate action, as well as renewable and non-renewable energy, are vital as education is a critical agent for addressing the issue of climate change and ensuring awareness and understanding when establishing a clear transition to renewable energy. Due to the termination of non-renewable energy which is a huge step in climate action, it impacts the entire population as it's a major change that impacts their daily lives because of the normalised and common non-renewable sources such as coal, oil gas, etc. Hence, public participation in a campaign for the education and awareness of climate change is effective as it encourages people to support the transition and make informed decisions. In addition, it unites the public for more sustainable development in the future.

The campaign strives to inform and gather all residents of NSW regardless of demographic features to create united opinions about the severity of climate change and the importance of the transition to renewable energy through:

- Recommendation 1 (Further Implementation of Climate Change Education into the NSW Curriculum) - conducting workshops and/or information sessions as part of campaign
- Conducting workshops and/or information sessions as part of campaign in possible workplaces.
- Advertisements in public spaces (eg: cinema theatres)
- Social media campaign through paid advertisements or exposure and/or creating an account that provides relevant information with regular updates.
- Organising public or charity events that attract public attention.
- Sponsoring other events or campaigns to attract public attention.

Electric vehicles

Electric vehicles are an important step into transitioning to renewable energy, as they are able to completely replace petrol and diesel vehicles, which both come from the generation of fossil fuels. From September 2019-2020, it was found that the transport sector emitted 102 million tonnes (Mt) of carbon dioxide equivalent ($MtCO_2$-e)[17], and this same year, transport accounted for 20% of New South Wales' (NSW) emissions.[18] Constrastingly, research shows that electric vehicles emit, on average, 29-41% less emissions than a typical fossil-fuelled car for every kilometre driven. In NSW, this is predicted to have a 17-39% reduction in emissions if electric vehicles are populated throughout the state.[19] Electric vehicles made up only 0.1% of light vehicles on NSW roads as of March 2021[20], and the uptake of these vehicles needs to be supported by cutting tax on the vehicles and increasing charging stations in NSW. NSW is currently set to tax electric vehicles up to 2.5 cents per kilometre[21], which decreases incentive to own the vehicle, when rather incentives and subsidies should be offered to increase desire, in turn helping to reduce emissions. As well as this, charging stations make owning the vehicles more appealing, as currently one of the main deterrents to purchasing a vehicle is the lack of charging places available, and with more in place, a heavy increase in these vehicles could be seen, helping reduce emissions in NSW.

Fully-subsidised retraining and skills migration

New South Wales (NSW) currently has no skill migration programs in place to ensure a 'just transition' for fossil fuel employees and their families, who rely on such incomes. As such, to increase public support for the transition to renewables and ensure a 'just transition', fully subsidised retraining and skill migration opportunities must be funded by the NSW Government. This should include fully subsidised TAFE for workers in such industries, as well as fully subsidised private education opportunities. Skill migration seminars, to educate fossil fuel workers about these programs and assist them in involving themselves must also be launched through fossil fuel workplaces. This is an essential part of harnessing the

[17] Laird, Philip. 2020. "2020: Transport is letting Australia down in the race to cut emissions - University of Wollongong – UOW." UOW. https://www.uow.edu.au/media/2020/transport-is-letting-australia-down-in-the-race-to-cut-emissions.php.

[18] NSW Government. n.d. "NSW greenhouse gas emissions | AdaptNSW." AdaptNSW. Accessed June 1, 2022. https://www.climatechange.environment.nsw.gov.au/nsw-emissions.

[19] Smit, Robin, and Hussein Dia. 2022. "How climate-friendly is an electric car? It all comes down to where you live." The Conversation. https://theconversation.com/how-climate-friendly-is-an-electric-car-it-all-comes-down-to-where-you-live-179003.

[20] NSW State of Environment. n.d. "Transport | NSW State of the Environment." NSW State of the Environment. Accessed June 1, 2022. https://www.soe.epa.nsw.gov.au/all-themes/human-settlement/transport.

[21] Australian College of Road Safety. 2021. "Electric Vehicles in Australia: What approach is your state taking?" Australasian College of Road Safety. https://acrs.org.au/newsroom/electric-vehicles-in-australia-what-approach-is-your-state-taking/.

economic opportunity of a transition to renewable energy and maintaining a stable economy and a fair society[22]. It also reduces stress and anxiety for fossil fuel workers currently, with many mines in NSW facing closures before 2030.

Climate emergency declaration and renewable energy targets

The example of South Australia has paved the way for Australian states aiming to become renewable energy powerhouses[23] with the state now expected to achieve 100% renewable energy by 2030 and an incredible 500% renewable energy by 2050 [24]. Whilst a remarkable achievement in its own right, this example provides significant lessons for New South Wales (NSW). New South Wales must first and foremost recognise the seriousness of the threat of climate change by declaring a 'climate emergency', and henceforth adopt targets of 100% renewable energy by 2030, as well as 400% renewable energy by 2040. Such ambitious targets provide pathways for ambitious market investment and signal the strong commitment of the NSW Government to a market-driven transition to effectively respond to the threat posed by this broader global challenge.

Hydropower

Hydropower is a natural energy source and can save 5.7 gigatonnes of emissions in the time we have until 2050 of just greenhouse gases. This is a necessity for the state of NSW as it can create large generation of energy efficiently. In NSW climate change is a large problem, so natural resources have to be used to reduce carbon emission problems and the reliability of coal and other gases which are affecting the environmental health of the state. The current projections of electricity generation are falling due to improper technology usage from a number of 4.5 to approximately 3.9 and the government should overcome this. NSW has large projects such as the one in the Snowy Mountains which uses reservoirs of water and turbines to generate electricity and is distributed to the grids. Smaller river systems are also there for smaller usage of energy generation in more rural areas or for particular reasons such as farming. In NSW the energy, environmental and climate change committee would like to use the advantage of steep mountains and easy rain runoff to harness water into new storage facilities. We would also like to use sewage treatment plants and water plants for small and efficient hydro energy generation in the city area to reduce the

[22] McCarthy, Patrick. 2021. "Transitioning communities dependent on coal mining in NSW." Parliament of NSW. https://www.parliament.nsw.gov.au/researchpapers/Documents/Transitioning%20Communities%20Dependent%20on%20Coal%20Mining%20in%20NSW.pdf.

[23] Flemming, Sean. 2021. "What South Australia can teach us about renewable energy." The World Economic Forum. https://www.weforum.org/agenda/2021/06/renewable-energy-south-australia-climate-change/.

[24] Flemming, Sean. 2021. "What South Australia can teach us about renewable energy." The World Economic Forum. https://www.weforum.org/agenda/2021/06/renewable-energy-south-australia-climate-change/.

transportation problems and increase efficiency of everyone in the state in hydro power on a smaller level[25].

Fossil fuel divestment

In order to stay below the catastrophic 2°C degrees global warming, the state of New South Wales (NSW) must divest from all fossil fuel industries. This will ensure that we have less bonds and connections to the industry. It is undeniable that fossil fuels are the ultimate cause of climate change, and by continuing the investment into them, NSW is setting its citizens up for failure. Since the start of the Paris agreement five years ago, NSW has approved 23 fossil fuel projects expected to release at least 3 billion tonnes of greenhouse gas which is six times what the whole of Australia emits in a year.[26] In 2018, NSW emitted the second largest amount of emissions in Australia, far behind the current target to reach net zero emissions by 2050.[27] Over the last few years, NSW has pledged over $100 million to “coal innovation”, which is certainly not reducing emissions and making sure that fossil fuel companies can still thrive.[28] With the rate of global warming increasing every year, it is vital that NSW stops funding these companies in order to make a full transition to renewable energy.

Small-scale solar subsidies

As of the current date the state of NSW has a program called “empowering homes program” which aims to add 300,000 solar panels across the state in the next decade. Currently it is offered in 204 postcodes or 24 of NSW’s towns. Although the state of NSW has an affordable solar rebate program and the empowering homes program, it just still isn't enough. The state must roll out a solar plan that is available to everyone, including renters. It must be free if not cheap as this will allow low income people to be able to install and afford solar panels. With compassion and commitment we can help people struggling with the energy prices to lower these prices whilst also combatting the climate crisis. For all citizens renting or buying solar panels should be a necessity not an amenity. We ask that the state of NSW provides all home renters/owners to have free solar panels and batteries installed in

[25] "Hydro Energy". 2022. *Energy NSW*. https://www.energy.nsw.gov.au/renewables/renewable-generation/hydro-energy.

[26] Morton, Adam. 2022. “NSW fossil fuel projects approved since Paris agreement set to release 3bn tonnes of emissions.” The Guardian, February 4, 2022. https://www.theguardian.com/australia-news/2022/feb/05/nsw-fossil-fuel-projects-approved-since-paris-agreement-set-to-release-3bn-tonnes-of-emissions.

[27] Department of Industry, Sciences, Energy and Resources. 2020. “State and Territory Greenhouse Gas Inventories 2018.” Department of Industry, Science, Energy and Resources. https://www.industry.gov.au/sites/default/files/2020-05/nga-state-and-territory-greenhouse-gas-inventories-2018.pdf.

[28] Australia Institute. 2021. “Australian fossil fuel subsidies hit $10.3 billion in 2020-21.” The Australia Institute. https://australiainstitute.org.au/post/australian-fossil-fuel-subsidies-hit-10-3-billion-in-2020-21/.

the next decade, this will slash statewide emissions and is a fundamental key to making NSW Australia's renewable super power.

Implementation of large-scale batteries

In order to transfer between fossil fuels to renewable energy, we would need the installation of large scale batteries in renewable energy zones across NSW by 2027. Currently the state of NSW has plans to have the largest solar battery in the southern hemisphere, the project has commenced and will finish in 2027. This has come after Origin Energy has called for the Eraring coal fired power station to close in 2025. This is one of NSW's strongest actions when it comes to climate change. But like always we can do better, in order to combat this crisis and restore energy prices back to reasonable to cheap prices we must install enough large scale solar batteries to store solar power for enough homes across the nation.

Tax deductions for significant investors in renewables

In order for NSW to be a lead in climate action, enticing the public is a must. We need to have bipartisanship with the NSW population and have their trust in the process of transitioning from fossil fuels to renewables. A pull factor would be tax deductions for significant investors into the renewable sector. Companies won't invest in dying industries like fossil fuels and will need to invest their money into something else. So we plan to implement a tax deduction on investments on fossil fuels of 10 percent. This will draw in the investing market and even further help kick off the renewable industry here in the state of New South Wales. For instance, if a significant investor/company invests $1 billion into the renewable energy sector they are able to deduct $100 million off that investment. Without an incentive it would be punishing to see such a profitable and sustainable industry not take off especially in the times of the climate crisis.

Final recommendations

First Nations Treaty With the NSW Government

Recommendation 2, stating that a First Nations Treaty with the NSW Government and power of veto for local language groups represented by Local Land Councils must be implemented due to the importance of First Nations voices when making decisions on stolen land. A treaty with the First Nations people of NSW would ensure that their voices are listened to when all decisions are made within the government, as almost every decision made affects Indigenous peoples. This is because the First Nations people of Australia are disproportionately affected by most of the issues surrounding our government, particularly climate change. Many First Nations peoples living on islands and in remote areas are at particular risk of being affected by natural disasters as a result of climate change.[29] When the environment is being destroyed, it is ultimately First Nations land that is being destroyed and thus why it is vital to consult with the traditional owners of the land. Further, the veto power for local language groups means that any decisions made by the government which are deemed not in the best interest of the First Nations peoples, can be vetoed by them so that the government as a whole can come to a decision that supports First Nations peoples. This veto power means that any decision concerning the climate would have to be taken into consideration by First Nations peoples, ultimately ensuring that any of these important decisions made are collectively supported by the first owners of the land, and will not jeopardise their sacred environment.

Subsidised Skill Migration

Recommendation five (5), stating that 'fully subsidised TAFE and private provider retraining opportunities for fossil fuel workers be provided, as well as compulsory skill migration seminars' must be implemented to ensure a just transition for fossil fuel workers. This also ensures the NSW Government retains the social licence to transition efficiently from fossil fuels to renewable energy, and maintains a stable economy and low unemployment by developing support pathways for those employed in the fossil fuel industry. By subsidising skill migration to this significant extent, NSW can address the enormous gap left in planning for this transition with the absence of a dedicated 'skill migration program' by developing migration pathways and a sense of security for tens of thousands of fossil fuel workers. Henceforth, the NSW Government is able to effectively transition to renewable energy in

[29] Climate Council. 2021. "First Nations Climate Justice." Emergency Leaders for Climate Action. https://emergencyleadersforclimateaction.org.au/wp-content/uploads/2021/07/First-Nations-Climate-Justice-panel-Climate-Council.pdf.

order to address the inevitable threat of climate change, while maintaining just outcomes in society[30].

Remove Fossil Fuel Investments per market conditions

Eliminating fossil fuel investments (Recommendation 7) which has been further elaborated on, to be shut down per market conditions effective immediately. This is crucial to accomplish the transition to renewable energy as it directly impacts the effect of other recommendations such as achieving the target of 100% renewable energy by 2030. Fossil fuel investments largely contribute to NSW market and consumerism due to it being a multi-trillion dollar industry that centres all citizens and national economy. In Australia, Fossil fuel subsidies cost $11.6 billion in 2021-22 across all federal, state and territory governments, equivalent to $22,139 per minute[31] - which accounts for NSW's fossil fuel investments. This marks a $1.3 billion (12%) increase on the 2020-21 total of $10.3 billion.[7] Most investments are from energy and fossil fuel companies such as Oil Search, Beach Energy, Whitehaven Coal, Cooper Energy, etc and other corporations such as Australia's big four banks (Westpac, Commonwealth, NAB and ANZ) which have loaned almost $19 billion to new coal and gas projects in Australia.[32] The removal of fossil fuel investments can be implemented by:

- Promoting the DivestInvest Australia Project[33] in NSW - a project of The Australia Institute's Climate & Energy Program that provides research, advises and guides institutions and individuals through the process of divesting from fossil fuels.

- Signing petitions and campaigning in communities which encourages local councils in the state to vote removing fossil fuel investments - councils like Marrickville[34] (already fossil fuel free) could influence others.

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[30] McCarthy, Patrick. 2021. "Transitioning communities dependent on coal mining in NSW." Parliament of NSW. https://www.parliament.nsw.gov.au/researchpapers/Documents/Transitioning%20Communities%20Dependent%20on%20Coal%20Mining%20in%20NSW.pdf.

[31] Australian Institute. 2022. "Australian fossil fuel subsidies surge to $11.6 billion in 2021-22." The Australia Institute. https://australiainstitute.org.au/post/australian-fossil-fuel-subsidies-surge-to-11-6-billion-in-2021-22/.

[32] Zhou, Naaman. 2017. "Big Australian banks invest $7bn more in fossil fuels than renewables, says report." The Guardian, March 5, 2017. https://www.theguardian.com/australia-news/2017/mar/06/big-australian-banks-invest-7bn-more-in-fossil-fuels-than-renewables-says-report.

[33] Australian Institute. n.d. "DivestInvest." The Australia Institute. Accessed June 20, 2022. https://australiainstitute.org.au/initiative/divestinvest/.

[34] Vorrath, Sophie. n.d. "NSW council votes to dump fossil fuel investments." Renew Economy. Accessed June 20, 2022. https://reneweconomy.com.au/nsw-council-votes-dump-fossil-fuel-investments-82022/.

- Making changes to investment portfolios of companies, institutions and councils and setting a goal (eg: ensuring that over $15 million of its investment portfolio is fossil fuel free, with the view to increasing this amount).

- Encouraging politicians and people of authority to understand the long term benefits of removing investments.

Climate Emergency Declaration and Renewable Energy Targets

South Australia is a leading example of how we need to take action on climate change, with the state expected to reach 100% renewable energy by 2025 and 400% renewables by 2050. This is a clear and concise statement that the state of NSW is behind on acting on climate change. The first step to achieving these ambitious goals is acknowledging the crisis itself by declaring a ‘climate emergency’. This affirms that the NSW parliament admits that climate change is human induced and that the current measures taken aren't enough to terminate the effects that climate change will cause. In addition, it also guarantees that the government will take action in alignment with science to take the necessary steps to halt the rapid changing of the climate and ensure that we do not pass 1.5 degrees. Furthermore, NSW has the potential to pave the way for a more secure economy and climate and additionally, to be a green energy leader among not only NSW but our nation as a whole.

3% Tax Deduction for Significant Investors

Significant investors in Renewable Energy Infrastructure must have a 3% tax deduction; this is in order to invest a significant amount into the renewable energy production which are located in renewable energy zones. This is such a significant part in combating the climate change crisis. Having a partnership with the population of NSW is crucial in order to gain trust to transition to renewable energy. However, we cannot have this without investment into renewable energy which isn't a dying industry like fossil fuels. In addition, through this the investor is able to profit while allowing the ‘just transition to renewable energy’, simultaneously reducing and combatting the effects of the climate change crisis.

Dissenting statements

Revised Removal of Fossil Fuel Investments per Market Conditions

Eliminating fossil fuel investments is a goal of the opposition party, although the government is setting overestimated targets of 100% renewable energy by 2030, we would like to recommend an alternative 100% renewable energy by 2050 plan in order to accommodate major energy investment groups with change. The public have to also be considered as a change in energy for the state of NSW means large investments and subsidies for future energies. The government has made decent recommendations but have overestimated support from industries, labour unions, export dealers and overall fossil fuel companies such as Origin, BHP, Beach and Cooper. The transition of investments should not affect other industries so it is recommended by the opposition to ease investment banks such as Commonwealth bank, Westpac, ANZ and NAB. This will be done through transfer of energy deals in a manner which can not affect their industry.

The Main goals of the opposition in the transition of investments

- Subsidising the large investors through government to achieve the removal of fossil fuel investments over 30 years to achieve set targets and maintain economic wellness.

- Increasing competition between companies by introducing new companies that have innovative ideas such as Genesis energy, and introducing industry caps and goals to make sure that there is development of renewable energy

- Encouraging politicians and developing committees to strategise a effective removal of investments

Revised Climate Energy Targets and Renewable Energy Targets

Denmark is a leading example on climate change. It is ranked 4th in the world and NSW has the potential to input renewable energies. The opposition's goals of 100% renewable energy by 2050 is an unrealistic act on climate change in which the most efficient output happens. NSW needs to admit its flaws in energy and declare a climate emergency that can cause greater change in people. Advertisements and other announcements can achieve this. High levels of research have already been done to choose the right action plan based on weather and other factors. Industries consist of 37 percent of emissions and we would also like to

propose that competitive goals are placed among energy companies to monitor the reductions. The government is looking at not crossing 1.5 degrees, alternatively we would like to keep it below 1 degree to face futuristic challenges. We believe that NSW is just a start and can really bring forth change in climate change among the people.

Education and Public Awareness Campaigns for the General Public

Educating the public about climate change, and the importance of climate action, as well as renewable and non-renewable energy, are vital as education is a critical agent for addressing the issue of climate change and ensuring awareness and understanding when establishing a clear transition to renewable energy. Due to the termination of non-renewable energy which is a huge step in climate action, it impacts the entire population as it's a major change that impacts their daily lives because of the normalised and common non-renewable sources such as coal, oil gas, etc. Hence, public participation in a campaign for the education and awareness of climate change is effective as it encourages people to support the transition and make informed decisions. In addition, it unites the public for more sustainable development in the future.

The campaign strives to inform and gather all residents of NSW regardless of demographic features to create united opinions about the severity of climate change and the importance of the transition to renewable energy through:

- Recommendation 1 (Further Implementation of Climate Change Education into the NSW Curriculum) - conducting workshops and/or information sessions as part of campaign
- Conducting workshops and/or information sessions as part of a campaign in possible workplaces.
- Advertisements in public spaces (eg: cinema theatres)
- Social media campaign through paid advertisements or exposure and/or creating an account that provides relevant information with regular updates.
- Organising public or charity events that attract public attention.
- Sponsoring other events or campaigns to attract public attention.