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Submission to the NSW Net Zero Commission, 2025 Consultation

Note to the Commission: This submission is provided in good faith to assist the NSW Net Zero Commission in aligning its policies with statutory obligations under the Climate Change Act, EP&A Act, and transparency laws, and to support the development of ecologically and socially just climate policies that deliver genuine emissions reductions.

Executive Summary

This submission critically examines the NSW Government's legislated net zero by 2050 framework, demonstrating that its current application risks functioning as a greenwashing mechanism rather than a credible climate mitigation strategy. By relying heavily on offsets, speculative technological solutions, and partial emissions accounting, the net zero framework permits continued high-emission activities under the illusion of future balancing, while failing to address the fundamental drivers of climate change, biodiversity loss, and ecological degradation.

Importantly, the submission highlights that the NSW Government's current net zero approach may conflict with its legal obligations under the *NSW Climate Change (Net Zero Future) Act 2023*, the *Environmental Planning and Assessment Act 1979 (NSW)*, and the *Government Information (Public Access) Act 2009 (NSW)*. These laws require emissions reductions to occur in a manner consistent with ecological sustainability, transparency, intergenerational equity, and the precautionary principle. Failure to include full lifecycle emissions, to prevent ecological destruction, and to transparently disclose emissions data may expose the NSW Government and related agencies to legal and governance risks while undermining public trust.

Evidence demonstrates that current net zero approaches in NSW frequently exclude full lifecycle emissions associated with the construction, operation, and decommissioning of renewable infrastructure, including embedded carbon in materials, mining impacts, and pollution from persistent substances such as PFAS and microplastics. When assessed holistically, the carbon footprint of large-scale renewable energy projects can approach that of fossil fuel systems, particularly when fossil-fuel-based supply chains and habitat destruction are included. This undermines claims of meaningful decarbonisation while driving land-use change, habitat fragmentation, water impacts, and the erosion of biodiversity across NSW.

Sector-specific analysis reveals further contradictions. In the electricity and energy sector, the focus on electrification and renewables expansion without systemic demand reduction or ecological safeguards has resulted in infrastructure projects that degrade natural carbon sinks while delivering limited net emissions reductions. In transport, the emphasis on electric vehicle transitions overlooks the high emissions and environmental damage associated with battery mineral extraction and manufacturing, while neglecting

investments in public and active transport that would reduce emissions at source.

The industry and waste sectors face rising production costs and risks to employment under poorly designed decarbonisation policies, while current waste management strategies fail to address embedded emissions and pollution effectively. The resources sector, essential to NSW's economy, faces tensions between phasing out fossil fuels and the simultaneous demand for critical minerals for renewable technologies, generating further environmental and social contradictions. In the built environment, retrofitting programs risk imposing financial burdens on vulnerable communities while underreporting the emissions and ecological impacts of construction material supply chains.

The NSW approach to adaptation similarly risks diverting resources from urgent emissions reduction, relying on reactive, infrastructure-heavy measures instead of nature-based solutions that deliver simultaneous mitigation, adaptation, and biodiversity benefits. Without transparent emissions accounting, community-centred decision-making, and an honest appraisal of the material and ecological realities of current net zero strategies, NSW's climate policy risks entrenching systemic environmental harm and social inequity while failing to achieve its stated objectives.

This submission therefore calls for a comprehensive reassessment of the net zero framework. It advocates shifting from offset-heavy and speculative technology reliance to policies that prioritise **absolute emissions reductions at source, compliance with statutory obligations, ecosystem protection and restoration, demand reduction, and social equity**. It further recommends:

• Implementing full lifecycle emissions accounting for all sectors and projects;
• Halting the destruction of natural carbon sinks under the guise of net zero development;
• Investing in nature-based solutions and demand reduction strategies;
• Supporting regional economic diversification and a just transition for affected communities;
• Ensuring transparency and genuine public participation in climate policy development.

By embracing an evidence-based, legally grounded, ecologically honest, and socially just approach to climate mitigation and adaptation, NSW can lead in delivering genuine climate action, preserving ecosystems, and ensuring the wellbeing of its communities while addressing the realities of the climate and ecological crises.

1. Introduction

The *NSW Climate Change (Net Zero Future) Act 2023* and the *Environmental Planning and Assessment Act 1979 (NSW)* require the NSW Government to pursue emissions reductions in a manner consistent with ecological sustainability, intergenerational equity, and the precautionary principle. These statutory obligations require that emissions reduction policies align with environmental protection and social justice, supported by transparent decision-making under the *Government Information (Public Access) Act 2009 (NSW)*.

The NSW Government has committed to legislated emissions reduction targets of 50% by 2030, 70% by 2035, and net zero by 2050. While these targets are positioned as evidence of climate leadership, it is critical that the policies underpinning them are scientifically credible, legally compliant, ecologically responsible, economically viable, and socially just.

At present, the NSW net zero framework relies heavily on the concept of "net zero," which permits the continuation of high-emission activities under the premise that these emissions can be offset through land-based sequestration projects, speculative technological solutions, or future removals. This framework typically measures emissions reductions based only on operational emissions while ignoring or underreporting embedded emissions, lifecycle impacts, land-use change, ecosystem destruction, and pollution created across the lifecycle of energy and infrastructure projects.

Globally, evidence demonstrates that such reliance on offsets and unproven technologies has allowed emissions to continue rising while environmental degradation and biodiversity loss persist (Anderson & Peters, 2016; Hickel & Kallis, 2020). In NSW, the rapid expansion of renewable energy and electrification pathways without comprehensive lifecycle accounting often requires habitat clearing, resource extraction, and large-scale infrastructure development that undermine ecological systems and contradict genuine climate mitigation goals.

Furthermore, current approaches risk exacerbating social inequities by imposing costs on low-income households, regional communities, and workers in emissions-intensive industries without adequate transition planning or meaningful community participation. Without a clear, transparent, and legally compliant pathway to emissions reduction, there is a significant risk that NSW's climate policy will fail to deliver genuine emissions reductions while generating persistent ecological and social harms.

This submission argues that the NSW Net Zero Commission must reassess the net zero target and the policies underpinning it to ensure alignment with statutory obligations and ecological realities. It calls for a transition from offset-heavy, technology-dependent, growth-oriented frameworks towards a strategy grounded in **absolute emissions reductions at the source, ecosystem protection, demand reduction, social equity, and legal compliance**. It is essential that NSW climate policy moves beyond the symbolic language of net zero toward a practical, ecologically coherent, and lawful approach to climate mitigation and adaptation.

This submission will provide a structured critique of the NSW net zero framework, examining the lifecycle impacts of decarbonisation strategies across key sectors, the environmental and social consequences of current approaches, and the limitations of adaptation measures. It will conclude with clear, evidence-based recommendations to guide

NSW towards climate policies that prioritise ecological integrity, community wellbeing, and **compliance with statutory obligations while delivering genuine climate action**.

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2. Critical Analysis of the Net Zero Concept

The NSW Net Zero Commission's commitment to achieving net zero emissions by 2050 is underpinned by assumptions that emissions can be effectively balanced using carbon offsets, land-based removals, and emerging technologies. However, **a detailed examination reveals fundamental shortcomings in the concept as currently applied**, including **systematic undercounting of emissions, over-reliance on unproven technological solutions, and disregard for ecological and social consequences**.

2.1 Misrepresentation in Emissions Accounting

A critical flaw within the current net zero framework is its systematic exclusion of emissions generated during the construction, maintenance, and decommissioning of renewable energy infrastructure and associated transmission systems. By focusing almost exclusively on operational emissions, the NSW net zero pathway risks misrepresenting the true carbon costs of the energy transition, providing a false sense of progress while shifting emissions to other stages in the lifecycle.

During the construction phase, significant greenhouse gas emissions are embedded in the extraction, processing, and transport of materials required for renewable energy projects. The production of steel and cement, both essential for wind turbine foundations and tower structures, is highly energy-intensive, together accounting for approximately 15% of global greenhouse gas emissions due to the continued reliance on coal and high-temperature processing (IEA, 2020; Müller et al., 2020). Aluminium, widely used in solar panel frames and transmission cabling, is similarly emissions-intensive, with production emitting around 16 tonnes of CO_2 per tonne of aluminium produced, in addition to the environmental degradation associated with bauxite mining and alumina refining (Liu et al., 2021).

Wind turbines, for example, require substantial material inputs, with a single 3 MW turbine using approximately 335 tonnes of steel, 1,200 tonnes of concrete, and nearly 5 tonnes of copper, alongside rare earth elements critical for turbine magnets (Guezuraga et al., 2012). Transporting and installing these components involves further emissions due to the use of diesel-powered heavy vehicles, cranes, and ships, while land clearing for wind farms and associated infrastructure releases carbon stored in vegetation and soil, which can take decades or centuries to re-sequester under natural conditions (Keith et al., 2021).

The emissions associated with the decommissioning phase are also largely overlooked in net zero accounting. At the end of their operational lifespan, wind turbine blades, often constructed from complex composites, are difficult to recycle and typically end up in landfill, requiring cutting and transport using fossil fuel-based machinery (Liu & Barlow, 2017). Similarly, solar panels contain hazardous materials such as cadmium and lead, demanding controlled recycling or disposal processes that are energy-intensive (Xu et al., 2018). Battery decommissioning and recycling, necessary for grid-scale storage, involves high-temperature and chemical-intensive methods, contributing further emissions (Harper et al., 2019).

Research indicates that decommissioning and recycling can add up to 10% to the lifetime emissions of wind projects alone (Heath & Mann, 2012).

The exclusion of these emissions from NSW net zero accounting frameworks is problematic. While operational emissions reductions are essential, ignoring the full lifecycle emissions associated with renewable infrastructure construction and decommissioning leads to a significant underestimation of the emissions profile of the state's energy transition. Globally, Scope 3 emissions—those generated upstream and downstream of energy projects—can account for more than 50% of the total emissions associated with renewable energy systems (Hertwich et al., 2015). Current NSW policies focus on Scope 1 and selected Scope 2 emissions while excluding these critical lifecycle emissions, thereby distorting progress reporting and policy evaluation (NSW Climate Change Policy Framework, 2023).

This approach also obscures the geographical shifting of emissions. Many of the emissions associated with the extraction and processing of materials for renewables occur outside NSW, allowing for claims of "clean" energy while environmental and social impacts are outsourced to other regions. Additionally, the push for rapid renewable infrastructure expansion can lead to native vegetation clearing and soil disturbance, undermining biodiversity and the carbon sequestration capacity of ecosystems, which are often excluded from emissions accounting despite their long-term climate significance.

A credible pathway to emissions reduction for NSW must involve transparent, cradle-to-grave emissions accounting for all energy and infrastructure projects. Including the construction, maintenance, and decommissioning phases within emissions assessments would enable an accurate reflection of the true climate impacts of the transition and prevent the misrepresentation of progress toward net zero. Without this comprehensive approach, claims of emissions reductions risk being overstated, while ecological and social costs continue to accrue under the guise of sustainability.

Case Study – Transmission Infrastructure
The Western Victoria Transmission Network Project illustrates emissions, and biodiversity impacts not captured in net zero claims. Significant clearing of remnant native vegetation and soil disturbance contributes to both biodiversity loss and the release of stored soil carbon (Keith et al., 2021), yet these emissions are not subtracted from net zero claims.

Offsets and Land Use
Offsets frequently rely on afforestation or carbon farming, ignoring the instability of these sinks under fire, drought, and clearing (Matthews et al., 2022). In NSW, bushfires have reversed decades of carbon sequestration in forests within days, illustrating the temporal fragility of such offsets (Boer et al., 2020).

Legal Risks of Incomplete Accounting
By failing to include full lifecycle emissions in project-level and statewide accounting under the Net Zero framework, the NSW Government may breach its obligations under Section 5 of the *Environmental Planning and Assessment Act 1979 (NSW)*, which requires that the principles of ecologically sustainable development be considered in decision-making, including the need to consider the full environmental impacts of projects across their lifecycles. This omission may render policy implementation susceptible to judicial review on grounds of failing to consider mandatory relevant considerations in administrative decision-making.

2.2 Reliance on Unproven Technological Solutions

A further limitation within the current net zero framework is its heavy reliance on future technological solutions for large-scale greenhouse gas removal, including carbon capture and storage (CCS), direct air capture (DAC), and bioenergy with carbon capture and storage (BECCS). While these technologies are frequently positioned as essential components of net zero pathways, there is currently limited empirical evidence demonstrating their feasibility at the scale, speed, and reliability required to offset continued emissions within the necessary timeframe (Lawrence et al., 2018; IPCC, 2022).

Carbon Capture and Storage (CCS) involves capturing CO_2 emissions at the point of generation and storing them in geological formations. While technically proven in small-scale demonstrations, large-scale deployment has been hindered by high costs, technical complexity, and concerns over long-term storage stability and leakage (Herzog, 2017). For instance, the Boundary Dam CCS project in Canada has consistently failed to meet its capture targets while experiencing high operational costs, casting doubt on its scalability as a reliable climate mitigation strategy (IEEFA, 2018).

Direct Air Capture (DAC) technologies aim to remove CO_2 directly from the atmosphere. However, DAC is energy-intensive, requiring between 6–10 gigajoules of energy per tonne of CO_2 captured, and is expensive, with current costs estimated between USD $100–$600 per tonne of CO_2 removed, depending on the process and scale (Realmonte et al., 2019). If powered by fossil fuel-based energy, DAC systems risk emitting more CO_2 than they capture, undermining their mitigation potential (Fuhrman et al., 2021).

Bioenergy with Carbon Capture and Storage (BECCS) involves growing biomass, using it for energy, and capturing and storing the resulting emissions. However, large-scale BECCS requires significant land, water, and nutrient resources, potentially competing with food production, impacting biodiversity, and resulting in net emissions if supply chains are poorly managed (Smith et al., 2016). Additionally, BECCS can exacerbate social conflicts over land use, particularly in regions where agricultural land is scarce (Fajardy & Mac Dowell, 2017).

The reliance on these technologies creates a **moral hazard**, providing justification for the continued operation and expansion of high-emission industries under the assumption that future removals will balance current emissions (Anderson & Peters, 2016). This approach risks delaying immediate and meaningful emissions reductions, while diverting resources away from proven measures such as demand reduction, efficiency improvements, and ecosystem restoration (Fuss et al., 2014).

Furthermore, the scalability of these technologies to remove the gigatonnes of CO_2 necessary to align with net zero targets remains unproven, with significant challenges related to infrastructure, energy inputs, cost, public acceptance, and governance structures (Lawrence et al., 2018; Minx et al., 2018). Without robust evidence of viability, the heavy inclusion of CCS, DAC, and BECCS within NSW's net zero plans undermines the credibility of the state's climate strategy and risks embedding a false sense of security regarding emissions reductions.

A credible climate policy for NSW must therefore prioritise emissions reductions at the source and invest in demand-side measures, while treating emerging carbon removal technologies with appropriate caution, ensuring that their potential role is supplementary rather than central in climate planning.

2.3 Economic and Ecological Consequences

The pursuit of net zero pathways without rigorous analysis of feasibility and system impacts risks generating unintended economic and ecological consequences that may undermine NSW's environmental, social, and economic resilience.

From an economic perspective, the rapid phase-out of fossil fuels without secure, reliable, and affordable alternatives can threaten energy system stability and increase electricity costs, impacting industry competitiveness and household energy security (Finkel, 2020; Garnaut, 2019). As renewable generation expands, variability in supply due to weather conditions necessitates additional investments in storage and grid management, which remain technologically and financially challenging (IEA, 2021). NSW's reliance on imports of renewable energy technologies and critical minerals further exposes the state to international supply chain disruptions and price volatility (Hund et al., 2020).

Ecologically, the infrastructure required for renewable energy generation and transmission frequently results in habitat fragmentation, biodiversity loss, and soil and water degradation. Clearing native vegetation for transmission corridors, access roads, and project footprints releases stored carbon and reduces ecosystem resilience, while also impacting threatened species (IPBES, 2019; Keith et al., 2021). Additionally, the mining and processing of minerals necessary for batteries and solar panels are associated with pollution, water contamination, and significant land degradation, often occurring in regions with high ecological and social vulnerability (Vidal, 2022; Nuss & Eckelman, 2014).

Further, the renewable energy sector can generate persistent pollutants, including microplastics from turbine blade degradation and per- and polyfluoroalkyl substances (PFAS) used in component manufacturing, which contaminate soils, groundwater, and marine ecosystems (Bergmann et al., 2019; Sunderland et al., 2019). These pollutants are resistant to environmental breakdown, bioaccumulate in food chains, and pose long-term risks to ecological and human health.

Socially, net zero policies that prioritise large-scale infrastructure transitions without attention to equity risk exacerbating inequality, particularly in rural and regional communities reliant on extractive industries for employment (Healy & Barry, 2017). Rising energy costs and regressive policy mechanisms can disproportionately impact low-income households, increase the risk of energy poverty while undermining public support for climate policy (Newell & Mulvaney, 2013).

These economic and ecological concerns underscore the need for NSW to adopt a climate strategy that prioritises system-wide analysis, demand reduction, and ecological protection, ensuring that the transition towards lower emissions does not generate new environmental crises or exacerbate social inequalities.

The analysis demonstrates that the current net zero framework in NSW:

- **Excludes full lifecycle emissions, misrepresenting progress**.
- **Relies on technological solutions that are currently infeasible at scale**.

- **Creates ecological, economic, and social harms while risking energy insecurity**.

A meaningful climate strategy requires **transparent, accurate carbon accounting, prioritisation of demand reduction, protection of ecosystems, and a shift away from assumptions of endless growth under a "net zero" label.**

Transparency and Accountability Obligations
The NSW Government has obligations under the *Government Information (Public Access) Act 2009 (NSW)* to ensure transparency in decision-making and to provide accurate public reporting on emissions data and environmental impacts associated with climate policies. The current lack of lifecycle emissions disclosure within the Net Zero framework may conflict with these transparency obligations, undermining community trust and informed participation in climate policy development.

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3. Sector-Specific Concerns

A comprehensive evaluation of NSW's net zero framework requires examining how proposed emissions reduction and adaptation measures impact key sectors of the economy and environment. Each sector carries unique emissions profiles, ecological footprints, and social implications that are often oversimplified within net zero planning. By unpacking these sector-specific concerns, it becomes clear that **current approaches risk substituting complex ecological and social realities with linear technological solutions that do not adequately address the scale or urgency of the climate and ecological crises**.

The following sections critically analyse the electricity and energy, transport, industry and waste, resources, and built environment sectors. This analysis highlights the **limitations, contradictions, and hidden costs embedded in the current net zero strategy**, reinforcing the need for a shift toward policies prioritising genuine emissions reductions, ecological integrity, and social equity.

3.1. Electricity and Energy

The electricity and energy sector is central to NSW's net zero planning, with decarbonisation strategies primarily focused on transitioning from fossil fuels to wind, solar, and battery storage. However, this approach often fails to account for the **full environmental, social, and lifecycle carbon costs associated with renewable energy expansion** while risking energy insecurity and ecological damage.

Lifecycle Emissions and True Carbon Accounting

While operational emissions from renewables are low, the **manufacturing, transport, installation, maintenance, and decommissioning of renewable infrastructure are carbon-intensive processes**. The production of solar panels requires high-temperature processing of silica and aluminium, both of which are emissions-heavy industries globally reliant on fossil fuels (Liu et al., 2021). Wind turbines require large quantities of steel, concrete, copper, and rare earth elements, which collectively contribute significant greenhouse gas emissions (Guezuraga et al., 2012).

Lifecycle assessments conducted in Europe have demonstrated that **when full upstream and downstream emissions are included, the carbon footprint of renewables can approach that of fossil fuels, particularly in contexts reliant on coal-heavy industrial supply chains (Gibon et al., 2017).** In Australia, where manufacturing of key components is often outsourced to regions with limited emissions controls, this embedded carbon is effectively exported but remains part of the true global carbon cost of the NSW transition.

Moreover, **the decommissioning phase is rarely addressed** in NSW policy frameworks. Turbine blades made from fluoropolymer composites contribute to microplastic pollution, while solar panels contain heavy metals and PFAS-related compounds that can leach into the environment during disposal, creating irreversible contamination of soils and water (Sunderland et al., 2019). These environmental impacts are long-term, persistent, and incompatible with claims of “clean” energy.

Resource Extraction, Water, and Habitat Impacts

Renewable energy technologies require extensive mineral extraction, including lithium, cobalt, nickel, and rare earth elements. Mining these materials has **severe impacts on water resources, biodiversity, and local communities**, particularly in regions with weak regulatory frameworks (Vidal, 2022). Water usage in mining and refining processes can exacerbate water scarcity, while chemical contamination affects aquatic ecosystems and downstream agricultural productivity (Hund et al., 2020).

Land clearing for large-scale solar and wind farms, along with the associated transmission infrastructure, results in **habitat fragmentation, soil carbon losses, and disruption of hydrological cycles** (Keith et al., 2021). The construction of access roads and substations in previously undisturbed areas leads to biodiversity loss and reduces ecosystem resilience against climate change impacts, undermining the very goals of climate adaptation.

Energy Security and Grid Stability

The rapid replacement of fossil fuels with variable renewable energy sources introduces challenges for **grid reliability and stability**. Solar and wind are inherently intermittent, requiring backup capacity and significant storage solutions to ensure supply during periods of low generation (IEA, 2021). Current battery technologies, while advancing, rely on materials with high embodied energy and carry recycling and disposal challenges, further adding to the lifecycle emissions of renewable energy systems (Harper et al., 2019).

Moreover, the push for electrification of sectors such as transport and heating without parallel demand reduction measures will place additional strain on the grid, risking blackouts and price volatility, disproportionately affecting low-income households and small businesses (Garnaut, 2019).

Social and Economic Implications

Renewable energy developments often occur in rural and regional areas, where community concerns over land use, landscape changes, and biodiversity impacts are frequently sidelined (Healy & Barry, 2017). Without meaningful community engagement and benefit-sharing frameworks, the rollout of large-scale renewables can exacerbate social tensions while delivering limited local economic benefits, particularly when profits are concentrated among developers and offshore investors.

A credible decarbonisation strategy for the NSW electricity and energy sector requires:

- **Full lifecycle emissions accounting for all renewable energy projects**;
- Integration of **demand reduction and energy efficiency** as primary strategies;
- Protection of **high-conservation-value lands** from infrastructure encroachment;
- Investment in **community-scale renewables with local ownership** to enhance resilience and social license;
- Rigorous end-of-life planning for renewable technologies to prevent persistent pollution.

Without addressing these critical factors, NSW risks pursuing an energy transition that **delivers minimal true carbon reductions while creating long-term ecological and social harms.**

3.2. Transport

The transport sector is one of the largest and fastest-growing sources of greenhouse gas emissions in NSW, with private vehicles, freight, and aviation contributing significantly to the state's emissions profile. Decarbonisation strategies under the net zero framework have prioritised the electrification of transport, including the widespread adoption of electric vehicles (EVs) and investment in charging infrastructure. However, **a critical examination reveals that this approach carries substantial hidden emissions, ecological impacts, and social equity challenges that undermine the claimed environmental benefits**.

Full Lifecycle Emissions of Electric Vehicles

While EVs are often promoted as "zero emissions," this claim typically refers only to tailpipe emissions, ignoring the **significant emissions generated during manufacturing, battery production, and disposal**. The production of EVs, particularly the extraction and processing of lithium, cobalt, nickel, and graphite for batteries, is highly energy-intensive and heavily reliant on fossil fuels, especially in countries with coal-based electricity grids (Harper et al., 2019; Hund et al., 2020).

Lifecycle studies have demonstrated that **the carbon footprint of EVs can be comparable to, or only marginally lower than, efficient internal combustion engine vehicles when full upstream emissions are included**, especially in regions where the grid supplying charging infrastructure is still significantly powered by fossil fuels (Ellingsen et al., 2016; Liu et al., 2021). In NSW, despite increasing renewable penetration, the grid remains partially reliant on gas and coal, meaning that charging EVs indirectly contributes to continued fossil fuel demand.

Mining, Pollution, and Habitat Destruction

The materials required for EV batteries and motors, including lithium, cobalt, and rare earth elements, are sourced through mining operations that cause **significant land degradation, water contamination, and biodiversity loss** (Vidal, 2022). Mining operations for cobalt and nickel, often located in ecologically sensitive areas, use large volumes of water and chemicals that can contaminate groundwater and surface water systems, with impacts extending downstream to agricultural lands and communities (Hund et al., 2020).

Additionally, the global supply chains for these critical minerals frequently involve human rights violations, unsafe working conditions, and child labour, raising ethical concerns about the social sustainability of EV expansion (Amnesty International, 2019). These issues are often overlooked in NSW's net zero planning, which focuses on vehicle electrification without addressing the upstream impacts of mineral sourcing.

PFAS, Microplastics, and End-of-Life Pollution

EVs and charging infrastructure contribute to **persistent pollutants** entering the environment. Battery casings and wiring often contain PFAS-related compounds, while brake and tyre wear release microplastics into waterways and soils, impacting aquatic ecosystems and food chains (Sunderland et al., 2019). End-of-life management for EV batteries presents additional challenges, as recycling processes are energy-intensive and risk the release of toxic substances if not managed correctly (Harper et al., 2019).

Current NSW frameworks lack comprehensive end-of-life planning for EV infrastructure, leading to risks of landfill accumulation and long-term pollution.

Road Expansion, Habitat Loss, and Water Impacts

The electrification of transport is often paired with road infrastructure expansion, requiring land clearing for new roads, bypasses, and charging stations. This contributes to **habitat fragmentation, loss of remnant native vegetation, and soil carbon release**, undermining biodiversity and climate resilience (Keith et al., 2021). Road surfaces also alter local hydrology, increasing runoff and reducing groundwater recharge, further exacerbating water stress in sensitive catchments (Foley et al., 2005).

Equity and Urban Planning

The prioritisation of EVs under net zero frameworks tends to benefit wealthier households able to afford new vehicles while neglecting systemic transport reforms such as **public transport expansion, active transport infrastructure, and urban design that reduces the need for long car commutes** (Healy & Barry, 2017). Without addressing the demand side, electrification risks entrenching car dependency, increasing traffic congestion, and continuing urban sprawl, leading to additional emissions from vehicle manufacture, road construction, and maintenance.

The current transport decarbonisation strategy under NSW's net zero plan overlooks:

- The **shocking true emissions of EV supply chains and battery production**;
- Persistent pollution from PFAS and microplastics;
- Irreversible ecological impacts from mining, road expansion, and habitat loss;
- Social inequities and missed opportunities for genuine system change.

A credible path forward would prioritise **demand reduction, public transport investment, active transport infrastructure, and circular economy approaches for transport systems** before defaulting to large-scale electrification as a singular solution.

3.3. Agriculture and Land Use and 'Green Energy' Impacts

The NSW net zero pathway has placed significant reliance on land-based offsets and the expansion of wind and solar infrastructure across rural and regional landscapes. However, these strategies often fail to account for the **true, full carbon costs and ecological impacts** associated with land-use changes for renewable energy and carbon offset projects.

While renewable energy projects are presented as low-carbon solutions, **a full carbon accounting reveals a different reality**. Manufacturing, transporting, and constructing wind turbines and solar panels require substantial inputs of steel, concrete, aluminium, rare earth elements, and plastics, all of which are emissions-intensive (Guezuraga et al., 2012). When including the entire lifecycle, studies have shown that the carbon footprint of renewables can approach that of fossil fuels, particularly where materials are sourced from high-emission supply chains and where fossil fuels continue to underpin manufacturing (Vidal, 2022; Liu et al., 2021).

Further, **renewable energy infrastructure often displaces existing carbon sinks**. Clearing remnant native vegetation and agricultural land for wind farms, solar arrays, and transmission corridors releases stored carbon from soils and biomass (Keith et al., 2021). This land-use change is rarely included in project-level emissions accounting, despite its substantial contribution to atmospheric greenhouse gases.

PFAS and microplastics associated with "green energy" present further concerns. Turbine blades constructed with fluoropolymers degrade into microplastics over time, entering soils and water systems, while solar panels and associated cabling use PFAS-based components that can leach into the environment during manufacturing, operation, and decommissioning (Sunderland et al., 2019). PFAS compounds are persistent, bioaccumulative, and toxic to wildlife and humans, with contamination risks that are effectively irreversible within ecological timescales.

Moreover, large-scale land use changes for renewables and offsets alter local climates by changing albedo, water vapour flux, and soil moisture dynamics, impacting regional rainfall patterns, groundwater systems, and microclimates (Foley et al., 2005). These impacts can exacerbate drought conditions, reduce agricultural productivity, and undermine ecosystem resilience, contradicting the stated objectives of climate adaptation and emissions mitigation.

The current framing of "net zero" obscures these realities by using **incomplete carbon accounting** that excludes lifecycle emissions, ecosystem destruction, and pollution externalities. Countries such as Germany, where more rigorous accounting practices are implemented, have demonstrated that the effective carbon savings from renewables can be significantly lower than reported under narrow operational metrics, especially when embedded emissions are included (Gibon et al., 2017).

A credible climate policy for NSW must acknowledge these realities. It should prioritise the **protection of existing carbon sinks, soil health, water systems, and biodiversity** over land-intensive offset and renewable infrastructure expansion. Regenerative agriculture and integrated landscape management that enhance carbon sequestration while maintaining ecological function offer a pathway to genuine emissions reductions without the irreversible ecological harms associated with large-scale "green energy" sprawl.

3.4 Industry and Waste

Decarbonisation policies within NSW's net zero framework aim to transition industrial sectors towards lower emissions. However, **this approach risks significant impacts on industrial productivity, employment, and regional economic stability if poorly managed**.

Industries such as manufacturing, mining, cement, steel, and chemicals are emissions-intensive but foundational to NSW's economy and regional employment. Decarbonisation initiatives, including emissions caps, fuel switching, and offset requirements, can **increase production costs, reduce competitiveness, and result in carbon leakage**, where production shifts to jurisdictions with less stringent policies, undermining global emissions reductions (IEA, 2021). Without careful policy design, these pressures can lead to **factory closures, job losses, and economic decline in regional communities**, disproportionately affecting low-income households and increasing inequality (Healy & Barry, 2017).

Electrification of industrial processes and the use of hydrogen are proposed solutions, but these face challenges of high capital costs, technological readiness, and the availability of low-emissions electricity at scale (Garnaut, 2019). Heavy industries risk exposure to volatile electricity prices if renewable integration is not matched with system reliability investments, threatening operational continuity.

Regarding **waste management**, current net zero pathways often focus on landfill gas capture and recycling initiatives. However, these strategies frequently underperform due to contamination, poor waste separation rates, and the high emissions embedded in recycling processes themselves, especially where energy inputs are fossil-fuel based (Zaman & Lehmann, 2011). Furthermore, the proliferation of **single-use plastics in renewable technologies and battery casings adds new waste streams**, with PFAS and microplastics leaching into ecosystems during disposal (Sunderland et al., 2019). Without upstream waste reduction and circular economy measures, waste management strategies remain ineffective in delivering significant emissions reductions while creating persistent pollution.

3.5 Resources

The resources sector, including mining for coal, gas, critical minerals, and metals, is a critical pillar of the NSW economy, providing significant export revenue, employment, and regional development. Restricting resource development under net zero targets poses **complex economic consequences** that require clear, evidence-based policy deliberation.

While phasing out thermal coal aligns with global emissions reduction goals, the abrupt restriction of resource extraction risks **economic dislocation in mining-dependent communities**, reductions in state revenue, and social disruption (IEA, 2021). Transition plans must include alternative employment pathways, retraining programs, and investments in economic diversification to prevent hardship in regional areas (Garnaut, 2019).

Simultaneously, the net zero transition paradoxically depends on **expanded mining for critical minerals** required for renewable energy technologies, including lithium, cobalt, nickel, and rare earth elements (Hund et al., 2020). Mining these materials involves **high carbon emissions, land clearing, water consumption, and pollution**, contradicting the sustainability claims of renewable energy expansion (Vidal, 2022). For instance, mining for battery minerals often occurs in sensitive ecosystems and water-scarce regions, exacerbating biodiversity loss and water stress (Nuss & Eckelman, 2014).

Thus, there is an inherent contradiction in promoting resource extraction for renewables while pursuing net zero, with the material intensity of the clean energy transition demanding systemic demand reduction and technological innovations to minimise extraction impacts.

3.6 Built Environment

Retrofitting the existing building stock to meet energy efficiency standards is presented as a core pathway to reducing emissions in NSW's built environment sector. However, **this strategy faces challenges of cost, technical feasibility, and social equity impacts**.

Retrofitting requires significant capital investment for insulation, glazing, electrification of heating and cooling, and energy-efficient appliances (IEA, 2021). Many older buildings, particularly in regional areas, face structural limitations that make deep retrofitting technically challenging or cost-prohibitive. The financial burden often falls on homeowners and landlords, leading to **housing affordability pressures, rental increases, and potential gentrification** (Miller et al., 2022).

Furthermore, the embodied emissions associated with producing and transporting retrofit materials, including insulation, steel, glass, and HVAC systems, are often excluded from emissions accounting. Without lifecycle emissions considerations, retrofit programs risk **delivering lower net emissions reductions than reported** (Gibon et al., 2017).

In the construction industry, transitioning to low-emissions materials and practices is essential but faces barriers related to supply chain readiness, skills shortages, and cost competitiveness (Liu et al., 2021). Policies must therefore focus on **demand reduction through urban design**, prioritising compact, low-energy urban forms and reducing car dependency rather than relying solely on technological retrofits.

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4. Adaptation Strategies

Adaptation measures are an essential component of climate policy, enabling communities and ecosystems to cope with the impacts of climate change. However, within NSW's current net zero planning, **the focus on adaptation is at risk of diverting attention and resources away from addressing the immediate drivers of environmental decline and emissions, undermining broader sustainability outcomes**.

Many adaptation initiatives, such as coastal defences, flood mitigation infrastructure, and bushfire response systems, are necessary to protect communities. However, if implemented in isolation, they risk addressing only the **symptoms of climate change without tackling the causes, such as habitat destruction, unsustainable land use, and high-consumption economic structures** (IPCC, 2022). For example, constructing seawalls without simultaneously reducing emissions contributing to sea-level rise creates a cycle of reactive spending, while deferring urgent mitigation actions required to address the underlying crisis.

Furthermore, there is a risk that **adaptation strategies prioritise hard infrastructure responses over nature-based solutions** that can provide both mitigation and adaptation benefits. Wetland restoration, reforestation, and regenerative agriculture can enhance resilience to floods, droughts, and heatwaves while sequestering carbon, improving biodiversity, and strengthening ecological integrity (Seddon et al., 2020). Current NSW strategies often underfund these systemic solutions in favour of technology-heavy interventions with high ongoing maintenance costs.

The allocation of resources toward adaptation must also be considered in the context of competing public needs. NSW faces pressures on health, housing, education, and social services. Adaptation projects that are **capital-intensive and focused on protecting high-value assets may divert funds from services critical to community resilience, particularly for vulnerable populations** (Barnett et al., 2015). Moreover, without equity-centred planning, adaptation spending risks reinforcing existing inequalities, as affluent regions secure protection while lower-income communities face escalating climate risks.

In addition, the emphasis on adaptation may inadvertently provide a political pathway for delaying meaningful emissions reductions, under the narrative that society can continue high-emission practices while managing impacts through adaptation spending. This **risks entrenching fossil fuel dependency, ongoing land clearing, and resource exploitation**, while fragile ecosystems continue to degrade (Hickel & Kallis, 2020).

A credible climate strategy for NSW must ensure that adaptation planning is **integrated with immediate, systemic emissions reduction measures, biodiversity protection, and social equity objectives**. Nature-based adaptation should be prioritised, delivering co-benefits for carbon sequestration and ecosystem restoration while enhancing resilience. Transparent cost-benefit analyses and community engagement processes are essential to ensure that adaptation measures do not divert funds from pressing social needs and that adaptation investments are made where they can deliver the highest ecological, social, and economic returns.

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5. Recommendations

It is imperative that the NSW Net Zero Commission critically reassess its commitment to a "net zero by 2050" framework, which, under its current application, functions primarily as a **greenwashing narrative** rather than a credible climate mitigation pathway. The concept of net zero, as currently promoted, enables continued high-emission activities under the illusion that future offsetting or technological fixes will balance these emissions, a position that is not supported by empirical evidence or material realities (Anderson & Peters, 2016; Hickel & Kallis, 2020).

The continued expansion of renewable infrastructure without full lifecycle accounting, alongside reliance on speculative technologies such as large-scale carbon capture and direct air capture, has allowed emissions to continue rising globally, even in jurisdictions claiming net zero progress (Lawrence et al., 2018; IPCC, 2022). The NSW framework must therefore be **replaced with realistic, evidence-based policies focused on absolute emissions reduction at source** rather than offsets and accounting tricks.

Strengthening Legal and Governance Integrity
The Net Zero Commission should ensure that all emissions reduction policies and projects are developed and assessed in compliance with the *NSW Climate Change Act, the EP&A Act*, and biodiversity conservation legislation, ensuring that the principles of ecological sustainability, intergenerational equity, and the precautionary principle are consistently applied. Embedding these legislative duties in the framework will reduce the risk of legal challenge, increase community confidence, and ensure that NSW climate policy is both effective and lawful.

5.1 Reassess the Net Zero Target with Transparent Carbon Accounting

NSW should:

- Abandon reliance on net zero claims that fail to include **full lifecycle, embedded, and decommissioning emissions** across all sectors, including renewables, electrification, and offset projects (Gibon et al., 2017).
- Establish transparent carbon accounting frameworks, tracking upstream and downstream emissions, ecosystem destruction impacts, and pollution footprints, to provide honest reporting to the public.
- Reject the offset-heavy approach and instead prioritise the **protection of existing carbon sinks, prevention of habitat destruction, and reduction in overall energy and resource demand**.

5.2 Prioritise Absolute Emissions Reduction and Ecological Protection

NSW climate policy should:

- Shift the focus from perpetual growth to **demand reduction through efficiency, sufficiency, and systemic change**.
- Prioritise **nature-based solutions** that protect and restore forests, wetlands, and soils as primary climate actions, delivering biodiversity, water, and climate benefits without the ecological damage of large-scale technological infrastructure (Seddon et al., 2020).
- Reject strategies that increase persistent pollutants such as PFAS and microplastics under the banner of "green energy" while destroying habitats in the process.
- Phase out subsidies and fast-tracking for projects that destroy carbon sinks or biodiversity under the false promise of carbon neutrality.

5.3 Integrate Economic and Social Equity into Climate Policy

Climate policy cannot ignore the economic and social fabric of NSW:

- Transition plans must ensure **regional economic diversification and retraining opportunities**, protecting communities dependent on emissions-intensive industries from economic collapse during transitions (Healy & Barry, 2017).
- Policies must protect housing affordability during building retrofits and energy transitions, ensuring costs do not fall on the most vulnerable.
- Investment in **public transport, active transport infrastructure, and compact urban design** should be prioritised over large-scale EV transitions, reducing emissions while supporting social wellbeing.

5.4 Ensure Transparency and Public Engagement

A core reason net zero frameworks fail communities is their **top-down, opaque approach**. NSW must:

- Commit to **genuine, ongoing public engagement**, ensuring local communities have decision-making power over climate-related projects impacting their lands and livelihoods.
- Provide transparent, publicly accessible reporting on all emissions accounting, ecological impacts, and economic trade-offs of climate policies.
- Engage independent, multidisciplinary scientific reviews of climate strategies to ensure accountability and honesty in climate action planning.

NSW has an opportunity to become a leader in genuine climate action by rejecting the false security of net zero and instead pursuing a strategy of **real emissions reductions, ecological protection, and socially just transitions**. The time for greenwashing under the net zero label has ended; effective, evidence-based, transparent, and ecologically honest policies must replace it.

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6. Conclusion

This submission has critically examined the NSW Government's net zero by 2050 framework, demonstrating that its current reliance on offsets, partial emissions accounting, speculative technological solutions, and large-scale renewable expansion **fails to deliver genuine emissions reductions while generating significant ecological and social harms**. By ignoring full lifecycle emissions, the destruction of carbon sinks, pollution from PFAS and microplastics, and the material intensity of "green" technologies, the net zero narrative risks functioning as a **greenwashing exercise**, allowing continued high-emissions activity under a false promise of future balancing.

NSW's climate strategy must move beyond the symbolic language of net zero to adopt a **pragmatic, evidence-based approach that prioritises absolute emissions reductions at the source, protects and restores ecosystems, and ensures a fair and just transition for communities**. This includes shifting focus from perpetual economic growth to demand reduction, energy efficiency, and nature-based solutions that deliver true mitigation and adaptation outcomes.

Urgent, transparent, and honest action is required to address the climate crisis without exacerbating biodiversity loss, water stress, pollution, and social inequality. The NSW Net Zero Commission has an opportunity to lead by rejecting ineffective accounting practices and embracing climate policies that reflect ecological limits, material realities, and social justice.

By prioritising **real emissions reductions, ecological integrity, and social equity**, NSW can transform its climate response into one that delivers meaningful environmental, social, and economic outcomes, ensuring a resilient future for all communities and ecosystems across the state.

Legal Imperative for Honest Climate Policy
Moving beyond symbolic Net Zero claims towards a framework grounded in accurate lifecycle emissions accounting, ecological protection, and community-led decision-making is not only an environmental necessity but a legal imperative under NSW law. By aligning climate policy with statutory obligations under the *EP&A Act, Climate Change Act*, and transparency laws, the NSW Government can ensure that its climate strategy withstands legal scrutiny while genuinely contributing to emissions reductions and ecological resilience.

“We request a formal written response from the Commission outlining how these concerns and recommendations will be addressed in the Net Zero framework review.”

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