2025 consultation

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Net Zero Commission
NSW

11 July 2025,

Re: Net Zero Commission 2025 Consultation

Powering Australia welcomes the opportunity to contribute to the Net Zero Commission 2025 Consultation.

Powering Australia is a federally funded Industry Growth Centre with a mission to grow Australia's clean-tech manufacturing industries and deliver better business outcomes for First Nations in the energy transition.

We believe there are opportunities to leverage NSW's energy transition to build domestic manufacturing capabilities, strengthen supply chain resilience, and accelerate decarbonisation while achieving net zero by 2050. The consultation presents significant potential to position NSW as a leader in clean technology deployment and manufacturing, creating economic opportunities that support both climate objectives and regional prosperity.

Our key takeaways:

- **First Nations partnership as strategic enabler:** First Nations knowledge, capabilities, and land access (controlling 43% of required clean energy infrastructure) should be leveraged through meaningful partnerships, equity participation, and co-designed solutions that deliver better business outcomes while accelerating NSW's transition.
- **Manufacturing sovereignty for climate resilience:** NSW's energy transition provides foundation to expand Australia's clean technology manufacturing capabilities—from transmission components to heat pumps, transport infrastructure, and carbon management systems—creating a more resilient and self-sufficient response to current and emerging climate challenges.
- **Coordinated procurement and supply chain intervention:** Strategic procurement across sectors, supported by targeted investments, can deliver substantial savings while reducing equipment delivery times, eliminating international supply chain vulnerabilities, and building local manufacturing capability to accelerate decarbonisation.

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- **Integrated transport decarbonisation:** Enhancing freight network efficiency through modal shift to rail, combined with Low Carbon Liquid Fuels (LCLFs) for hard-to-electrify sectors and domestic Transport Innovation Precinct development, delivers highest impact while maintaining operational efficiency and building sovereign capability.
- **Technology-enabled land sector transparency:** Addressing land sector emissions uncertainties through co-designed monitoring technologies integrating traditional ecological indicators with precision agriculture, while leveraging bio-economy opportunities in regional economic transition areas.
- **Industrial decarbonisation through coordinated policy:** Energy-intensive manufacturing facilities require coordinated push and pull mechanisms—from common user testing infrastructure and green public procurement to carbon border adjustments—accelerating adoption while maintaining competitiveness.
- **Consumer-led built environment transformation:** Distributed Energy Resources coordination, combined with workforce development and strategic gas network transition management, enables consumer-driven electrification while addressing equity concerns and building local manufacturing capabilities.

Yours sincerely,

Miriam Cuellar

Node Leader NSW – Transmission and Distribution

Powering Australia

Q 1: What actions can the commission take to engage across the community to help drive the shifts needed for the net zero transition and for effective climate change mitigation and adaptation?

It is essential to maintain public support to fund the energy transition. Appropriately framing the choices can help drive the shifts required to achieve the net zero transition.

The public are exposed to certain costs today that will avoid uncertain adaptation costs and economic losses in the future. The way people experience loss-aversion has the potential to impact public support.

The commission could maintain support for the energy transition by communicating opportunities and benefits that offset near term costs (e.g. industrialisation opportunities, personal benefits of rooftop solar, air quality, health), and by undertaking and presenting research that creates greater certainty about the adaption costs, options, economic losses and downside risks from climate change.

Q 3: How should the commission best engage with First Nations people to learn about cultural knowledge and practices to support adaptation, and what information and evidence should it draw on to inform its understanding of these practices?

Consultation fatigue is a barrier identified in previous government processes. Where possible, the Commission should leverage insights from existing consultations, such as the First Nations Clean Energy Strategy to avoid duplicating consultation efforts.

Where the Commission undertakes direct consultation, it should implement systematic feedback mechanisms to demonstrate the consultation's direct impact on policy development to build trust and engagement.

Q 4: What additional mechanisms, support, or incentives can meaningfully empower and enhance First Nations people's involvement in climate mitigation, adaptation and environmental stewardship?

Powering Australia's ambition is that First Nations are identified and capture their own opportunities, rather than only responding to proposals from others.

We recommend that energy authorities develop a First Nations Statement of Opportunity to proactively make communities aware of opportunities. This would enhance community agency and align with self-determination principles.

Our research has revealed First Nations opportunities that extend well beyond land use.

Potential opportunities include:

- **Land and sea-linked ventures:** including green ammonia, green iron, critical mineral refining, renewable generation through partnerships, and biogenic low-carbon liquid fuels
- **Broader clean-tech opportunities:** manufacturing, recycling, and wind infrastructure production
- **Supporting services**: Encompassing project development, construction, environmental services, operations management, and research and development.

These categories have different entry mechanisms. Further detail will be made available in our First Nations Sector Competitiveness Plans, planned for release in the next few months.

Q5: What additional information and evidence should the commission consider when assessing progress towards NSW's targets for reducing net greenhouse gas emissions?

Powering Australia has developed a suite of Sector Competitiveness Plans that outline the opportunity for Australia and NSW to develop clean-tech manufacturing industries and deliver better business outcomes for First Nations in the transition.

These reports will be released over the course of this year and we welcome the opportunity to brief the commission on their findings.

Q 6: The speed of deployment of electricity generation and infrastructure is a key risk to emissions reduction targets. What more could be done to fast-track deployment?

Four interlinked strategies could be used to fast-track deployment: Accelerate transmission infrastructure; improve community economic participation; pre-assess REZ; and accelerate DER deployment.

Accelerate transmission infrastructure: International experience demonstrates how coordinated transmission planning can accelerate renewable deployment. As one example, Texas's Competitive Renewable Energy Zones program generated $1.7 billion in annual savings from a $7 billion transmission investment while reducing wind curtailment from 17% to 1.2%[1]. The program's "build-first" approach—where transmission infrastructure preceded generation development—eliminated bottlenecks that typically constrain renewable deployment[2].

NSW's $2.1 billion Transmission Acceleration Facility investment demonstrates genuine commitment to addressing infrastructure constraints[3]. Building on this foundation, the state could explore how renewable projects can be better synchronised with transmission planning, leveraging approaches now being implemented across Australian REZ programs.

Community engagement and economic participation: Meaningful economic participation can align stakeholders and accelerate project acceptance. Approval processes should be coupled with strengthened benefit-sharing mechanisms, building on the Budget's $128 million Central-West Orana community program.

REZ approval coordination: The substantial REZ investment creates opportunities for streamlined assessment processes within designated zones. REZs could incorporate pre-assessed environmental baselines and coordinated state-federal reviews, reducing cumulative assessment timeframes while maintaining environmental standards.

Distributed Energy Resources: There is substantial headroom for faster deployment of distributed energy resources. Faster deployment of DER may avoid network constraints and investment and also align individual incentives to electrify homes and personal transport. Policies and legislation that unlocks DER for apartment and rental accommodation could unlock a second phase of deployment beyond freehold homeowners.

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[1] https://cleanenergygrid.org/texas-national-model-bringing-clean-energy-grid/

[2] https://txses.org/texas-transmission-troubles-and-crez-ii/

[3] https://www.budget.nsw.gov.au/sites/default/files/2025-06/NSW-Budget-2025-26_Overview-Glossy.pdf

Q 7: Are the measures now in place sufficient to ensure community engagement and benefit sharing from the build out of infrastructure for the energy transition?

Benefit Sharing

NSW's benefit sharing guideline could be sharpened to deliver more direct benefits to those impacted by renewable infrastructure. Renewable projects have a large initial impact during construction, with a long tail from loss of amenity and other economic impacts. Matching the timeframe of the benefit to the impact should be a core principle of benefit sharing.

Directly impacted parties should be compensated over-time, proportional to the impact experienced over that timeframe. While this scope is explicitly not considered benefit sharing in the guideline, some level of guidance ensuring the sustainability of deals struck for directly impacted parties is essential.

Neighbourhood-benefits should not be front loaded into shared community facilities nor discounts to energy costs, but into more direct, material and time-relevant experienced benefits, such as employment opportunities or industry. It would be a missed opportunity to not shape benefits towards activities that build broader economic benefits for the community.

Deals struck with communities often become "expiring bargains" – benefiting the parties involved at the time, but not benefiting those impacted in the long run. Communities are not static, and benefits are accrued differently by the community as it evolves over time. It is essential to maintain benefits over-time, to reinforce the mutual benefit of the infrastructure which is long lived in the community.

The same principles can be applied at the local-community and council managed scale.

International Approaches

Opportunities exist to enhance effectiveness by adopting international approaches.

Community ownership models: Research from comparable federal systems demonstrates that community ownership combined with procedural justice achieves significantly higher acceptance rates than financial compensation alone. British Columbia requires 25-51% Indigenous ownership in renewable projects, supported by Canada Infrastructure Bank financing covering up to 90% of community equity positions[4,5]. Minnesota's community solar program demonstrates effective implementation, with 34,000+ participating families generating $1.67 billion in projected statewide benefits[6].

Scottish research of 320 residents near wind projects found that shared ownership projects incorporating meaningful community engagement and financial benefits achieved the highest acceptance levels, while purely financial compensation without procedural involvement often appears as "buying off" communities[7]. Early engagement during project siting, co-design processes for community benefits, and continued relationship maintenance throughout operations prove significantly more effective than late-stage consultation[8].

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[4] https://news.gov.bc.ca/releases/2024ECS0072-001678

[5] https://cib-bic.ca/en/indigenous-equity-initiative/

[6] https://pv-magazine-usa.com/2025/03/25/minnesota-legislation-aims-to-sunset-community-solar-program/

[7] https://www.tandfonline.com/doi/full/10.1080/13549839.2024.2360716

[8] https://www.wri.org/insights/clean-energy-community-benefits-agreements

Implementation within existing frameworks: The Government's REZ access scheme framework could accommodate community ownership criteria, building on the Strategic Benefit Payments Scheme that provides $200,000 per kilometre of transmission lines to landowners over 20 years[9]. Manufacturing Centres of Excellence provide platforms for communities to develop clean technology capabilities, enabling participation in supply chains rather than solely hosting infrastructure.

This approach would leverage NSW's substantial infrastructure investments while addressing community engagement challenges identified in recent planning processes.

Q 8: Are First Nations communities adequately engaged and included in sharing the benefits of the transition? What more could be done, and by whom?

First Nations could play a much greater economic role in the energy transition.

Our research investigates three categories of opportunities including: direct participation in renewable and related projects; manufacturing and related opportunities; and construction and maintenance services.

Achieving greater participation requires a concerted effort from Government, infrastructure companies and the communities themselves.

Government:
First Nations businesses face structural challenges. Generations of exclusion from mainstream economic systems has impacted the development of governance and technical capabilities required to secure finance for capital-intensive investments.

There is scope for further investment in governance and finance capability, exploration of financial guarantees, and perhaps innovation in governance structures themselves. Asking a community organisation to function equivalent to a corporate is impractical, and the options around First Nations governance deserves further research and innovation. Getting these foundations right is essential for securing large scale investments.

Second, there is scope to better inform community organisations that opportunities exist, prior to project inception. In this, we have recommended that AEMO prepare a “First Nations Statement of Opportunities” which helps individuals and organisations become aware of and decide on renewable opportunities.

Infrastructure Companies:
Further to our comments on benefits in Q7, project developers must move to a more proactive stance in delivering benefits to stakeholders. Many developers have established international supply chains that they are reluctant to change. We need systems that encourage developers to zero-base their supply chain arrangements to enable greater local economic participation, rather than short lived investments in community infrastructure, as per the benefits guidelines.

This could be implemented through Australian Industry Participation Plans (AIPP). AIPP require proponents to demonstrate free and fair opportunities for Australian companies to participate in large projects. The performance standard should be increased to require proponents to demonstrate a comprehensive strategy to enable Australian companies to participate in large projects.

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[9] https://www.energyco.nsw.gov.au/living-in-a-renewable-energy-zone/information-for-landowners/strategic-benefit-payment-scheme

Communities:
Communities must also position themselves to develop and capture opportunities. There are emerging examples of best practices across First Nations' Australia.

One example is the Yindjibarndi people, who have developed comprehensive strategies to develop their regional economy and participate in the energy transition. Their investment in contemplating and choosing participation options, in capability building and in projects themselves is an exemplar for First Nations involvement.

Another example is the work of Pilbara Solar who are working with First Nations communities to assess the development potential of their lands. Some of this work is supported by the WA State Government, and a similar approach could be adopted by NSW.

Q 9: What are likely to prove the most effective approaches to accelerate rapid decarbonisation across freight and passenger transport?

Personal Transport
Accelerating the electrification of the bus network will bring forward emissions reductions and facilitate domestic manufacturing.

Freight
Improving freight network efficiency at the same time as supporting the decarbonisation of the network will deliver the highest impact.

Rail is 16 times more carbon efficient per ton-kilometer than road transport. Maximising the utilisation of rail, developing strategic intermodal terminals should be a first priority.

Second, supporting the uptake of decarbonisation technologies, i.e. battery electric, hydrogen, low carbon liquid fuels, will enable industry to choose the appropriate transition pathway.

The heavy freight sector is particularly hard to decarbonise, partially because of low margins and invested capital. In addition, axle weight limits constrain the feasibility of the available battery technology options.

Decarbonising the sector through a Low Carbon Liquid Fuels (LCLFs) strategy could deliver an immediate 30-50% emission reduction which can be further improved to 70-90% through the adoption of eFuels[10].

LCLF's act as "drop-in" fuels[11], leveraging existing supply chains and infrastructure as well as building sovereign energy resilience for liquid fuels. CSIRO projects that a LCLF industry could contribute between AUD $6 billion to $12 billion annually in direct economic benefits[12], making this approach both environmentally and economically viable.

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[10] https://www.tfa.com.au/industry-note-june-2024-the-role-of-hydrogen-and-low-carbon-liquid-fuels-in-the-decarbonisation-of-transport/#:~:text=They%20offer%20an%20immediate%2030%2D50%25%20fuel%20use,further%20improved%20by%20another%2070%2D90%25%20with%20LCLF.&text=Subject%20to%20the%20rate%20of%20investment%20and,fuels%20in%202050%20(50%2D90%25%20of%202021%20demand).
[11] https://www.mitsubishicorp.com/jp/en/news/release/2025/20250117001.html?utm
[12] https://minister.infrastructure.gov.au/c-king/media-release/low-carbon-liquid-fuels-future-made-australia#:~:text=CSIRO%20projects%20that%20a%20LCLF%20industry%20could,at%20a%20time%20of%20increasing%20international%20uncertainty.

Achieving this:

1. *Phase-In Strategy Based on Sector Readiness*
    - Regulatory Reform: Develop consistent national road network access approvals for zero emission vehicles. Mass limits and concessions penalise operators who adopt clean tech solutions, delaying broader industry uptake.
    - Short-Term LCLF: Leverage Federal Government funding through ARENA and global partnership opportunities to enable SAF and marine fuels as aviation and shipping decarbonise.
    - Short-to-Medium Term LCLF: Prioritise LCLFs in heavy transport and rail where zero-emission technologies remain cost-prohibitive or untested at scale.
    - Parallel Electrification: Continue electrifying light vehicles and urban fleets where infrastructure and supply chains can adapt more rapidly.

2. *Accelerate Local LCLF Industry Development*
    - Develop a NSW Low Carbon Fuels Strategy aligned with federal decarbonisation targets and industry needs[13] prioritising SAF and renewable diesel development.
    - Support co-location of feedstock production, refining facilities, and end-users to reduce logistics costs.
    - Prioritise LCLF investment and incentives by accelerating implementation of "Building a thriving renewable fuel industry in NSW".
        - Expand on the NSW Renewable Fuel Scheme to use suite supply-side incentives (e.g. tax credits, production grants, concessional finance) to attract early investment.
        - Launch a Demonstration Grant Program for renewable diesel and SAF in heavy transport and aviation hubs (e.g., Sydney Airport, Port Botany).

3. *Infrastructure and Grid Integration*
    - Coordinate planning approvals and investment in the road and rail sectors for shared charging facilities, depot upgrades and LCLF refuelling infrastructure.

Australia must also foster local innovation and rebuild its domestic heavy vehicle automotive manufacturing capability, to support the needs of the hard to abate heavy vehicle and off-road sectors. Powering Australia, in collaboration with the heavy vehicle industry and global automotive technology partners is facilitating the establishment of a shared, **national Transport Innovation Precinct in Victoria** that will support:

- Access to global-standard R&D and testing infrastructure
- Battery, hydrogen, and component testing
- Advanced manufacturing equipment and shared spaces
- EV charging and hydrogen refuelling infrastructure
- Heavy vehicle servicing, training, and modelling tools

Q10: What specific actions or policies could increase uptake of emissions reduction strategies in agriculture, both in the short and long term?

- Consider seeking Federal Government support to shift the diesel fuel rebate, valued at $1.3b in 2024-25 into a low-emissions stock feed subsidy to the same value.
- Provide support to pastoralists to implement the beef cattle herd management method.
- Investigate ways that direct ammonia can be used for crops.

[13] https://www.energy.nsw.gov.au/nsw-plans-and-progress/regulation-and-policy/public-consultations/building-thriving-renewable-fuel#developing-a-new-renewable-fuel-strategy-for-nsw

Q 11: Given the uncertainties in land-sector net emissions, how should NSW incorporate this sector into the state's climate policy and emissions profile?

The forthcoming Emissions Reduction Roadmap for NSW Land and Primary Industries could build on existing strengths across two key areas[14]:

Enhanced agricultural efficiency and technology integration: Technology adoption programs could build on the Government's $41.2 million investment in modernising primary industries research and development.

International experience demonstrates significant potential for emissions reduction while improving farm profitability. Canada's 4R Nutrient Stewardship program achieved 15-25% reductions in nitrous oxide emissions with profit increases of $9-87 per acre, while Australia's More Profit from Nitrogen program delivered approximately $200 per hectare annual savings for cherry growers and 36% environmental cost reductions for sugarcane producers[15,16,17].

These programs succeed by combining voluntary, industry-led frameworks with targeted government R&D investment, creating trusted advisor networks that translate complex science into practical farm-specific advice. California's dual approach combines research through its Fertilizer Research and Education Program with regulatory frameworks mandating nutrient management reporting, generating comprehensive farm-level data[18].

Such approaches could complement NSW's Innovation Blueprint while generating granular farm-level data needed to significantly improve regional greenhouse gas inventory accuracy[19]. Precision agriculture technologies present opportunities for incentivising data-sharing frameworks that revolutionise agricultural emissions accounting, moving from broad estimates to verified, near-real-time assessments.

Regional economic transition and bio-economy development: Integrating land sector opportunities with broader regional economic transition strategy presents significant potential for coal-producing regions. The $27.3 million Future Jobs and Investment Authority, combined with Manufacturing Centres of Excellence in the Illawarra and Hunter/Newcastle, creates foundation for developing regional bio-economy infrastructure processing agricultural feedstocks into low-carbon liquid fuels.

Research indicates domestic SAF industry could deliver approximately $13 billion annually in new value, including direct employment of over 2,000 jobs in refineries, construction and upstream logistics in regional Australia, plus over 10,000 downstream aviation sector jobs[20].

This development could leverage the record $2.8 billion TAFE investment to develop agricultural carbon management and bio-economy skills, ensuring regional communities participate meaningfully in emerging opportunities. Building on international experience with programs like the US Conservation Reserve Program providing stable income streams for

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[14] https://www.decarbhub.au/our_projects/nsw-emissions-reduction-roadmap/

[15] https://fertilizercanada.ca/wp-content/uploads/2017/01/fc_aggp-summary-report2016_vf-digital.pdf

[16] https://www.crdc.com.au/sites/default/files/CRD21004-004%20Cherry%20Case%20Study_Mk10.pdf

[17] https://www.crdc.com.au/sites/default/files/CRD21004-008%20Sugar%202%20Case%20Study%20MK3.pdf

[18] https://www.waterboards.ca.gov/centralcoast/water_issues/programs/ilp/docs/r3-ar-technical-report.pdf

[19] https://www.usda.gov/oce/entity-scale-ghg-methods/executive-summary

[20] https://www.csiro.au/-/media/Missions/TNZ/Opportunities-and-priorities-for-a-Low-Carbon-Liquid-Fuel-Industry.pdf

participating landowners while generating substantial public benefits[21], NSW could develop coordinated transition frameworks supporting agricultural enterprise diversification in the Hunter, Illawarra, Central West and Northwest regions. Rather than conventional land retirement approaches, this could focus on collaborative economic development maintaining the agricultural sector's essential food production role while creating alternative revenue streams through carbon farming, renewable energy hosting, and bio-economy participation.

Q 13: What policies or programs at a sectoral level could complement the Safeguard Mechanism to support the accelerated decarbonisation of heavy industry in NSW?

It is difficult to bear technology risk in capital intensive heavy-industries. The combination of capital intensity in fixed plant, together with typically low margins, requires conservative financial decisions and creates a slow moving investment environment.

Many decarbonisation technologies in this sector are not mature. The relative abatement costs and risk of many technologies is often higher than the cost and risk to offset. The ability to offset enables economic efficiency, but drives low rates of deployment of new technologies. This impacts the rate of cost declines of those technologies – keeping abatement costs high.

Decarbonised new plant and modifications compete against the status quo. Declining baselines in the Safeguard Mechanism encourage businesses to choose offsets first and defer investment in new plant.

A final factor is that Australian heavy industry is export intensive and trade exposed. Australia has no mechanisms that equalise the cost burden from decarbonisation. Imposing high costs on domestic producers impacts their relative competitiveness.

Accelerating decarbonisation of heavy industry needs a comprehensive approach.

- Incentives to retire old capital and make new investment.
- Facilities and demonstrator projects that de-risk technologies at full relevant scale.
- Mechanisms to diffuse technologies across industries, and lower deployment costs.
- Targeted procurement to underpin new industry.
- Carbon border adjustments.

Investment Incentives:

Noting the Federal government controls most fiscal levers, there is scope for the Commonwealth to consider accelerated depreciation, production credits, or accelerate investments from established funds such as the NRF, CEFC or ARENA.

Our preference is for incentives that have low net cost to the State. Industry also needs investment certainty – opportunistic, time bound and competitive grant programs are poor matches to heavy industry, due to the way major projects evolve from concept through to FID. Below, we recommend four options.

The State could offer fixed capital investment incentives that net to its expected GST revenue. The State would accrue a multiple of GST revenue from the project's indirect economic activity.

Time bound payroll tax concessions during the construction phase could improve project economics. Labour costs often comprise 20-40% of total project cost, and a 5.45% payroll tax

[21] https://ers.usda.gov/sites/default/files/_laserfiche/publications/40581/50873_aer626.pdf

concession would reduce project costs by 1-2%. The net benefit for NSW would accrue over the operating life of the project.

The State Government could use its own procurement to incentivise investment. By specifying production methods in procurement contracts, the state can achieve the desired decarbonisation objective.

Finally, the State could consider operating a bond program to finance private investments. In China, local government financing vehicles commonly finance private projects. Similarly, in the US, Government entities arrange debt on behalf of private projects in revenue bonds. In revenue bonds the municipality act as an arranger and the bondholder assumes the revenue risk in the underlying assets.

Targeted industry support and technology derisking:

It is costly to pilot technologies for heavy industry. As one recent example, BHP, Bluescope and Rio Tinto announced a $300 million Neosmelt pilot facility.

At this scale, it is not practical to support individual companies to independently prove technologies, nor to fragment these efforts across multiple states.

A national approach is warranted.

Powering Australia is developing a concept for an Industrial Test Facility, intended to house and reuse infrastructure for relevant scale prototyping of industrial processes. This type of relevant or full-scale testing is common in heavy industries. The NSW Government could consider assisting NSW businesses use this facility, which is intended to lower the costs and risks of innovation and accelerate time to market.

Technology diffusion: NSW should support open collaboration across heavy industry. Public funding should be contingent on shared learning and precompetitive collaboration.

Green public procurement and embodied carbon standards: NSW should leverage its role as major infrastructure purchaser to stimulate demand for low-emissions materials. Gradually incorporating green steel, aluminium, and cement in public construction projects and introducing embodied carbon standards in tenders creates reliable early markets for clean industrial products, rewarding domestic producers investing in decarbonisation while providing long-term project pipeline certainty. Sweden's support for green steel projects demonstrates how industrial policy can establish leadership in iron and steel decarbonisation[22].

Carbon border adjustments and production incentives: The Safeguard Mechanism can unintentionally penalise local manufacturers while allowing high-carbon imports to avoid scrutiny.

NSW should advocate for national carbon border adjustments (CBAM) or adopt complementary state-level measures ensuring imported goods reflect true carbon emission costs[23]. Production credits or contracts for difference (CFD) aligned with federal programs could support first movers, closing cost gaps and enabling globally competitive low-emissions manufacturing.

[22] https://rooseveltinstitute.org/publications/leading-with-industrial-policy/?utm

[23] https://www.energycouncil.com.au/analysis/the-risk-of-carbon-border-adjustment-mechanisms/?utm

Q 14: What measures could accelerate industrial heat electrification in NSW, where technology is viable?

While technologies for electrifying low and medium temperature industrial heat are commercially available and cost-effective, uptake remains slow due to operational risk concerns. Many light industrial businesses operate on tight margins requiring continuous production. Even where payback periods prove attractive, companies hesitate to adopt new technologies amid uncertainty about performance in existing systems, viewing bottom-line risk as too significant.

Risk mitigation and demonstration: Establish common user demonstration facilities co-designed with but not owned by universities, enabling businesses to trial electrification technologies under realistic conditions before full deployment. ARENA's Powering the Regions Fund Industrial Transformation Stream can support this approach. NSW should leverage current opportunities while addressing industry awareness gaps regarding available support programs.

Early-stage development support: Introduce pre-FEED (front-end engineering and design) funding to close major gaps in early-stage project development. This would support thorough due diligence, feasibility studies, and integration assessments essential for investment confidence, similar to the U.S. Department of Energy's Energy and Emissions-Intensive Industries funding approach[24]. Expand grant support for engineering design and system modelling, enabling businesses to evaluate how technologies would operate within their infrastructure while avoiding unanticipated performance risks.

Knowledge sharing and collaboration: Create centralised knowledge-sharing platform showcasing real-world case studies, implementation outcomes, and lessons learned to reduce uncertainty and accelerate peer learning. Foster collaboration between SMEs and research/R&D ecosystems, increasing exposure to innovation networks, technology providers, and practical demonstration opportunities.

Performance and market support: Trial temporary performance risk guarantees providing early adopters protection against underperformance during transition phases. Coordinate grid planning and pricing signals with electrification priorities ensuring energy access supports technology uptake. The EU's transparency approach to addressing electrification barriers while enabling affordable electricity prices provides relevant precedent[25].

These complementary measures would transform viable technologies into widespread adoption, supporting NSW's decarbonisation goals across the light industrial sector.

Q 19: What additional measures could accelerate electrification and increase energy efficiency of new and existing buildings?

Energy Efficiency Measures: Many efficiency measures have a negative abatement cost and could assist existing residential and business owners manage ongoing cost pressures. Well established methods, such as building insulation, door and window sealing, double glazed windows and thermal films, heat pumps and hot water energy storage are generally recognised as value positive steps.

The UK has implemented boiler upgrade schemes. The Victorian government is launching a home insulation scheme in 2026. The CEFC operate a $1b Household Energy Upgrades

[24] https://www.energy.gov/fecm/funding-notice-energy-and-emissions-intensive-industries-eeii?utm

[25] https://www.e3g.org/wp-content/uploads/E3B-Briefing-How-EU-market-design-can-make-power-clean-and-affordable.pdf?utm_source

Fund, which is available through select lending institutions. NSW could consider similar schemes, perhaps preferencing equipment manufactured in Australia.

Technology coordination and education: CER coordination could provide revenues back to households, which in turn would accelerate adoption and electrification. NSW could provide materials to educate NSW consumers on the benefits of Virtual Power Plants (VPP), Vehicle-to-Grid (V2G), and smart metering technologies.

Supply chain and manufacturing intervention: Heat pump adoption faces implementation barriers despite policy support. NSW requires 4 times current installer capacity to meet 2030 electrification targets[26], while equipment supply chains experience 6-18 month delays and 40-50% price increases since COVID-19.

Building a local supply chain could eliminate international shipping delays while building export capabilities for specialized Australian conditions equipment. If NSW considered a heat pump scheme, tailoring it so that it preferences local made equipment could build our industry and avoid these supply constraints.

Toyesi's 30+ year Australian heat pump manufacturing demonstrates existing capability that could be scaled[27]. Victoria's higher rebates ($1,400 vs $1,000) for Australian-manufactured equipment proves market creation potential[28].

Targeted deployment and workforce development: The Cheaper Home Batteries Program, complementary to Small-scale Technology Certificates, provides means to upgrade buildings[29,30]. NSW could target high energy consuming and strata buildings to provide information on leveraging these programs. This should connect to adequate workforce for building upgrades and equipment installation. TAFE NSW partnership could deliver 2,000+ additional qualified installers annually through accelerated pathways, addressing the critical capacity gap constraining electrification progress.

Q 20: How could social equity be better addressed in the transition to an electrified built environment?

Gas network stranding creates severe equity impacts requiring proactive intervention to protect vulnerable households from prohibitive cost increases while supporting workforce transition.

Addressing network stranding impacts: Gas network stranding threatens remaining customers with projected bill increases of 2 times by 2040 and 5 times by 2055[31]. The NSW Jemena network's $2.3 billion regulatory asset base creates stranded asset risk borne by households least able to electrify[32]. Vulnerable household protection requires intervention before network costs become prohibitive. Strategic decommissioning planning could reduce

[26] https://www.iea.org/reports/the-future-of-heat-pumps/executive-summary
[27] https://toyesi.com.au/
[28] https://www.a2ep.org.au/heatpumps
[29] https://www.dcceew.gov.au/energy/programs/cheaper-home-batteries
[30] https://cer.gov.au/schemes/renewable-energy-target/small-scale-renewable-energy-scheme/small-scale-technology-certificates
[31] https://energyconsumersaustralia.com.au/news/gas-distribution-network-rule-changes-what-you-need-know
[32] https://energyconsumersaustralia.com.au/our-work/research/report-turning-down-gas-reducing-consumer-risk

regulatory asset base by $500 million by 2055, while targeted electrification support prevents inequitable cost allocation[33].

Workforce transition opportunities: Skills transferability analysis identifies high-transferability roles requiring minimal retraining including gas fitting professionals, electrical engineers, and grid connection specialists. Rapid retraining programs provide $21.72 billion economic benefit versus $1.07 billion costs over five years, supporting just transition principles[34].

Implementation framework: Establish NSW Just Transition Office coordinating gas network decommissioning with vulnerable household support, workforce transition programs, and strategic manufacturing development in electrification equipment. Leverage current funding schemes to prioritise transition for vulnerable households and buildings.

Consumer education and empowerment: Growing uptake of rooftop solar, home batteries, and electric vehicles creates opportunities for consumers to understand significant impacts on home energy costs and how building electrification can benefit them. Educational programs should provide consumers with supporting resources to incentivise building and household electrification, demonstrating how distributed energy resources can reduce energy costs while supporting grid stability.

This coordinated approach addresses equity concerns while creating economic opportunities through workforce development and manufacturing capability building in electrification equipment.

Q 22: What should be included in a monitoring framework for NSW in the context of the transition to net zero, including any specific metrics and indicators?

A monitoring framework should be designed to ensure sustained public support.

It should surface a simple set of metrics to give the public confidence that (1) we are on track; (2) the measures are cost effective; and that (3) the public benefits.

On Track
The NSW Government should forecast a trajectory to net zero report its progress against this forecast. Detailed metrics should be split by sector. The forecast can be re-cut every five years to ensure the mid-term goals are relevant.

Cost Effective
Weighted average abatement cost should be reported, at an aggregate level and split by sector. This cost can then be compared against the long-term (i.e. 10 year) forecast of ACCU prices to ensure the measures achieve relative value for money.

Public Benefit
The energy transition should deliver jobs and growth for NSW and its First Nations people. Relevant employment should be monitored at aggregate and sector level, with a separate First Nations measure. This could be facilitated by changes to ANZSIC codes to better segment

[33] https://reneweconomy.com.au/gas-network-death-spiral-pressure-mounts-to-protect-consumers-from-cost-of-stranded-assets/
[34] https://www.iea.org/news/programmes-to-prepare-workers-for-clean-energy-transitions-can-build-on-lessons-from-existing-schemes-new-iea-report-says

clean-tech industries and employment. The ANZSIC codes were last updated in 2006, prior to the growth of Australia's clean-tech industries.

Subsidiary Metrics:

A suite of subsidiary metrics could help monitor system performance.

Industrial Capacity:

- Deployment rates by sector
  - Generation - GW and GWh per annum for grid and behind the meter
  - Networks – Connection (MW per annum) and deployment (MWkm per annum)
  - Transport – Vehicles (gCO2 per ton-km) and ZEV sales
  - Carbon – Nature Based - ACCU per annum, CCS-CCUS CO2 stored/utilised.
  - Heavy Industry – CO2 revenue intensity, investment levels split by subsector.
- NSW and Australian market share of relevant industries.
- Local content ratios in renewable energy projects and heavy vehicle manufacturing
- Training throughput in clean-tech relevant qualifications

First Nations participation indicators:

- First Nations capital deployment;
- Economic complexity indicators; (e.g. Harvard complexity index for FN industry)

Community engagement and equity metrics:

- Acceptance rates for renewable infrastructure
- Household participation measures (e.g. rooftop solar rates, battery deployment rates)

Coordinated delivery indicators:

- Project completion times across Renewable Energy Zones and transmission
- Clean technology exports demonstrating domestic manufacturing capability;
- Supply chain risk assessment for critical components and materials.

Q 23: The adaptation objective is for NSW to be more resilient to a changing climate. The Act allows for regulations to further define the adaptation objective. What does a more resilient NSW look like to you?

A more resilient NSW would be characterised by strengthened domestic capabilities in clean technology manufacturing and renewable energy infrastructure, reducing vulnerabilities to supply chain disruptions while supporting the state's climate objectives.

Infrastructure resilience through local manufacturing: Locally manufactured renewable energy components including solar panels, wind turbines, and battery systems would reduce dependence on international supply chains during global disruptions. Distributed energy storage and generation capabilities could maintain power supply during extreme weather events, supported by community-scale energy systems with local manufacturing capabilities for maintenance and rapid component replacement.

Economic diversification and capability building: Processing facilities for critical minerals required in clean technology manufacturing, coupled with circular economy infrastructure enabling local recycling and remanufacturing of clean energy components, would strengthen supply chain resilience. Diversified regional economies with clean technology manufacturing would provide employment opportunities outside major metropolitan areas, building on initiatives like the Future Jobs and Investment Authority and Manufacturing Centres of Excellence.

Adaptive capacity and emergency response: Research and development facilities capable of developing and commercialising climate-relevant technologies, supported by skills development programs ensuring workforce capabilities match evolving industrial needs. Rapid deployment capabilities for emergency power and infrastructure during climate-related disasters, enabled by smart grid technologies manufactured locally for responsive energy management during varying climate conditions.

Regulatory frameworks and government support can accelerate sovereign clean technology manufacturing capability development, positioning NSW as both climate resilient and economically competitive in the global clean energy transition while achieving net zero by 2050 and minimising climate vulnerability beyond that target.

A vision for whole-of-Australia collaboration: While these capabilities would significantly strengthen NSW's climate resilience, Powering Australia believes even greater impact could be achieved through enhanced national coordination. NSW has the opportunity to lead by example in fostering collaboration across states and territories, demonstrating how communities—including First Nations, regional areas, and metropolitan centres—can work together to achieve Australia's long-term global economic competitiveness and energy security. By building on existing partnerships and creating new collaborative frameworks, NSW could catalyse a whole-of-Australia approach that amplifies the benefits of the clean energy transition, enabling optimal national response to climate challenges while maximising opportunities for innovation, economic development, and shared prosperity across all Australian communities.

Q 24: What additional information and evidence should the commission consider when assessing progress towards the adaptation objective?

Assessing progress towards the adaptation objective should focus on achieving self-sustainability in climate resilience capabilities, building on themes established throughout this consultation response.

Self-sustainability framework requirements: Coordination between government, industry, and research institutions; investment in both physical infrastructure and human capabilities; regulatory frameworks supporting domestic manufacturing while maintaining competitive markets; integration with national initiatives including the National Reconstruction Fund's clean energy priorities, ARENA, Future Made in Australia, and Rewiring the Nation.

Manufacturing and supply chain resilience indicators: Proportion of renewable energy infrastructure manufactured within NSW, including transmission and distribution components, heat pumps, and battery systems addressed in previous responses. Government procurement response to policy changes fostering local production, building on green procurement principles outlined for heavy industry and community infrastructure projects.

Emergency response and recovery metrics: Response times for infrastructure repair and replacement during climate events, incorporating critical infrastructure for First Nations communities as emphasised in consultation responses around meaningful participation and partnership. Data monitoring power outages and restoration rates, tracking improvements in restoration timeframes through distributed energy systems and local manufacturing support capabilities.

Economic and technological independence measures: Economic diversification metrics in regional areas, particularly in coal-dependent regions addressed through Future Jobs and Investment Authority initiatives and Manufacturing Centres of Excellence development. Reduction in critical technology import dependencies across clean energy components,

transport infrastructure, and carbon management technologies discussed throughout consultation responses.

Integrated capability assessment: Skills development program effectiveness in building workforce capabilities for climate resilience, common user facility utilisation for technology development and testing, and circular economy infrastructure development enabling local recycling and remanufacturing capabilities. These metrics connect adaptation progress with broader transition objectives while supporting whole-of-Australia collaborative approaches advocated throughout this submission.