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Dear Eliza and Matt

Submission on Climate Change Authority Issues Paper – Targets, Pathways and Progress (Issues Paper)

Thank you for your time earlier last month to discuss the Issues Paper.

UDIA National actively supports Government's efforts to find practical and effective pathways to balance our climate change ambitions and the needs of the Australian community.

In the interests of time and space, we have directly answered many of the question you have posed and provide specific responses to key relevant areas.

Overview of Industry

We understand that your primary responsibility is to find technological pathways for achieving Government's climate change ambitions and emissions reductions.

The Development and Construction industry is keen to find a simple, straightforward approach to meeting climate change ambitions that also safeguards the Australian Government's ability to meet promises to the Australian public on housing, infrastructure, cost of living and economic prosperity.

We see that there are numerous simple ways that Government can effect material change now by simply removing barriers and restrictions that are holding back industry advancement – especially in the Greenfield space. We see the issues as follows:

- The Government has agreed with industry to consider the built environment as a distinct pathway for climate mitigation and adaptation.
- Australia has also committed to Climate Change, net zero emissions by 2050.
- Industry is keen to establish simple, practical and cost-effective pathways to achieve these aims.
- We need to be able to build with energy efficient materials, reduce the sector's carbon footprint and improve overall energy efficiency of new builds.

- Importantly, small to medium sized enterprises make 85% of all house construction and are a significant proportion of the greenfield market.
- Unfortunately, current carbon calculation tools are not suitable for use on greenfield sites where there are hundreds of lots with different builders and purchasers.
- Currently, existing calculation tools work well from a built form perspective, but have not been designed with greenfield developments in mind.
- Given the lag time between innovation, design, planning and final construction, we need to develop that practical pathway now to be able to achieve net zero targets and embed a circular economy.

Industry has several issues that need immediate improvement:

- We need a greenfield/small build/subdivision specific tool that is acceptable to industry.
- Often there is no suitable carbon/energy efficient construction materials in a category, much less ones accepted by (local or state) government planners or engineers.
- Net Zero for buildings will require carbon credits to offset the (newly efficient) embedded carbon builds. It is extremely difficult for individual houses or greenfield developments to achieve energy saving innovations on their own.
- Current planning and building regulations for both developments and dwellings prohibit many green credentialled materials or energy sharing technology from being used.
- Existing building operations account for half of Australia's electricity use and almost a quarter of Australia's greenhouse gas. We need to focus on energy efficiency.
- Existing detached dwellings will need to be renovated or rebuilt in 20 -30 years – home owners and industry need incentives to rebuild/ renovate to overcome the expense or there will be limited impact on energy consumption.

The Issues Paper Questions

1. How should the authority take account of climate science and Australia's international obligations in considering possible emissions reductions targets for 2035?

UDIA National supports the Government ambition to achieve net zero for Australia and our comments throughout this paper are specifically aimed at ensuring we can accelerate towards our objectives with as little transition disruption as possible. Being authentic in this approach means pointing out both the benefits and drawbacks in the current approach and strategy so we can correct quickly and maintain our best trajectory towards success.

This means everyone involved (not just the authority), need to be prepared to quickly recognise necessary change to enhance the benefits and remove the drawbacks. There is no place in this for one sided cheerleaders.

What is very clear is that while there are good reasons to head for net zero emissions, including a cleaner environment for Australian's themselves, as 1% (to 1.3%) of all global emissions, our actions do not materially move the dial for decarbonisation worldwide. **Our influence of the largest emitters is limited, and our greatest advantage is making sure we position ourselves to be a regional, commercial leader in green technology and decarbonisation transition - to help Australia refocus at least part of its GDP on**

future proofed goods and services. This is a realistic goal and a viable opportunity for Australia that provides Australians with a meaningful rationale for accelerating our transition in a balanced way.

The data, research, impacts and progress on climate science is critical to supporting this approach. It must be accurate, verifiable and support our approach. We must be brave enough to recognise inconclusive information/misinformation and quickly alter our approach as needed.

With this in mind, the authority should be mindful of all information in the public domain on climate science and thoroughly question and investigate claims on all issues. We should not accept one view or approach without making our own investigations. We cannot base our approach on flawed data and evidence or ignore facts that are inconvenient as there are very real compromises that will impact Australians in their jobs, lifestyles and communities.

We should be constantly questioning and re-examining key assumptions and conclusions to make sure they still hold including the causes, impact and outcomes underlying climate change. New data is being found all the time and should be used to adjust our approach.

Empirical testing with a sceptical approach are inherent traits of the scientific method. (It is worth reflecting that in collecting the statistics in this paper, there were numerous credible sources with different numbers on several of the metrics listed below – there is no one source of reliable truth in this space and plenty of diverse perspectives).

The authority should also be practical in its approach to the science and impacts. We need to be scrupulously accurate and definitive in the reasoning we apply to addressing climate change as it significantly impacts motivations, reasoning and action taken. Mistakes in any of these areas will undermine momentum towards climate action.

A look at the common metrics is quite revealing.

Australia is ranked as the 14th highest emitter of carbon dioxide (with China, US, India, Russia and Japan as the five highest emitters). Australia is 11th largest emitter per capita globally but the largest emitter per capita in the OECD (which includes industrialised countries with smaller populations than ours – as well as extremely high emitters with massive populations). Importantly according to the CSIRO, Australia is only 1% of all global emissions.

As noted above, this means inherently (on these numbers), Australia will not impact climate change in any material way irrespective of action taken. That does not mean we should do nothing, because it also tells us there are other countries that are far more efficient at reducing emissions within the OECD nations.

In the same way that you clean you room for yourself, there is logic and reason for Australia to reduce carbon emissions to make our own country cleaner and more efficient - irrespective of the outside impact on the world. Equally, as a wealthy nation there is a need to lead by example if we insist on global reduction in carbon emissions.

The issue with "Green at all costs" and cost reductions in Green Technology

What is also true is that we should not adopt a "green at all costs" approach, not only because it creates an unsuccessful outcome for Australia but also because it can lead to inherently perverse outcomes.

For example, using ABS figures for Australia's 2022 carbon emissions and GDP (463.9 million tonnes and $690,960 million), every dollar earned in Australia contributes .7kg of carbon dioxide or around 1 tonne of carbon dioxide for every $1,400. Every green choice has a carbon impact from cost/price let alone manufacture and use. This means there is a point at which a green alternative may more greatly impact emissions than an existing alternative (cost to purchase vs cost to use).

This is a useful measure since, unless you look to deplete savings, any dollars used must be replaced, and in effect money spent is future demand for more dollars to replace the spend.

Importantly, this is the carbon impact based on our activity now, and in future the expectation is this will reduce over time, but the extent to which we can reduce carbon emissions is a factor how efficiently we can transition our high carbon activities which contribute to our Gross Domestic Product.

A basic calculation using desktop research on Electric vehicles are a good study of this interaction (NB: these are public desktop research numbers for illustration purposes):

- In short, if you take into account the carbon cost opportunity of money spent on (say a Tesla 3 vs a midrange Mazda 3), as well as the greater efficiency of the EV, **both cars have the same global emissions profile up to 24 years of operations** – well past the standard life of a car.
- This practically suggests that you could achieve as much **now, by limiting used car life to 15-18 years** (to avoid materially disadvantaging low income Australian's who rely on older used cars).
- If you look at the manufacture carbon emissions of an EV and a petrol car, **both cars have the same global emissions profile up to circa 14.5 years of operation.**
- **Neither analysis suggests we don't pursue EV cars, as the carbon profile will reduce with greater efficiencies in energy production, but it does show that green innovation must become cheaper quickly or we go backwards very materially.** It also is cautionary on removing existing tech.
- The calculations for these conclusions are below:

  Carbon by Manufacture and Operation:

  - EVs are up to **80% more carbon intensive in manufacture** than equivalent petrol vehicles – eg: a Tesla 3 80kWh battery creates up to 16 tonnes of carbon dioxide emissions according to the MIT climate portal. NB: this varies on country of manufacture and can be considerably lower but given they are made in the US and China (as two of the largest emitters), it is reasonable to assume it is at the higher end of the scale.
  - **Carbon emissions from EV use result from charging the battery but are less than petrol cars (region and power source dependent)** – a smaller carbon amounts in places like Norway with high renewable energy sources but significantly higher for countries like Australia using coal fired stations – in coal heavy West Virginia EV's were less operationally efficient than hybrids but more efficient than petrol alone and we can plausibly assume similar in Australia.
  - Australia's Green Vehicle Council estimates **average emissions for a petrol vehicle to be about 1.773 tonnes per year.** Without a specific EV emissions number we have estimated a similar *ratio* as the US (Petrol car 5.19 tonnes vs EV 1.97 tonnes – much higher numbers than Australia but presumably similar ratio) – that is 37% of petrol emissions or **EV emissions of 673 kg per**

year. This means an Australian EV saves 1.1 tonnes of carbon dioxide emissions a year over a petrol car.

- In manufacture, **building a medium sized petrol car emits 5.6 tonnes of carbon** and (bar the battery), we can assume a similar emission for an EV. The Tesla 3 there is a manufacturing emissions profile of 5.6 + 16 (up to) tonnes = **21.6 tonnes of carbon.**
- **The *Global* carbon footprint of both cars will be identical** (for manufacture bar, funding footprint and maintenance cost), **if they were driven for 14.5 years**. (Petrol car: 1.773x14.5 + 5.6 = 31.31 tonnes of carbon dioxide emissions vs EV car: .673x14.5 + 21.6 = 31.35 tonnes of carbon dioxide emissions).

Carbon by Purchase (carbon opportunity cost of each dollar), and Operation:

- A Tesla 3 with 80kWh battery is $72,000 ($71,900 less on road costs) and a roughly equivalent type of petrol car would be a Mazda 3 G25 (2.5L) circa $35,000 ($34,670 less on road costs) - $37,000/1400 price difference for EV technology (in a broad sense) or **26.4 tonnes of carbon dioxide**.
- Ignoring manufacturing (which is more carbon intensive for EVs in any event), and maintenance costs (which are less than a petrol car), a Tesla EV costs 26.4 tonnes of carbon dioxide more than the Mazda from generation of the funds to purchase it ($37,000/1,400 difference). **At an emissions savings of 1.1 tonnes per year, it will take 24 years to save enough carbon dioxide to offset the difference in the EV's own purchase price.**
- Put another way, the purchase of the **Mazda 3 petrol vehicle** would be **$35,000 or 25 tonnes of carbon dioxide** and create **1.773 tonnes of carbon dioxide per year in use**. The **Telsa 3** will cost **$72,000 or 51.4 tonnes of carbon dioxide and 673 kg of carbon per year in use**. You would need to drive the petrol car **14.9 years to equal the carbon cost of purchasing the EV vehicle**.
- **Worse still, the carbon footprint of both cars will be identical** (bar manufacture and maintenance cost), **if they were driven for 24 years**. (Petrol car: 1.773x24 + 25= 67.552 tonnes of carbon dioxide emissions vs EV car: .673x24 + 51.4=67.552 tonnes of carbon dioxide emissions).
- In Australia, the **average car is scrapped after 18.2 years**, so there absolutely no carbon saving from driving the EV for the average life of the car (on our current energy structure).
- **Equally, even if technology costs drop to the same as the Mazda, (25 tonnes of carbon emissions), the Ev would still need to be driven 22 years to save the equivalent carbon emissions, but it will be more efficient in use than the equivalent petrol car.**

What this shows very clearly is four things:

1) The raw cost of green technology does matter and at current energy profiles, many green innovations may not be a practical advantage over existing technology.
2) Unless we move to an almost completely renewable grid (which is difficult to cost effectively do in the short term given the base load requirements needed), the real carbon cost of funds for a given efficient technology may not offset.
3) Bringing down the cost of green technology alone does not solve the problem for net zero emissions. We need innovations to be both energy efficient and inexpensive (in an efficient energy grid) to really see gains.

4) We need to be more practical and discerning about green technology when comparing existing technology.

In reality, little is currently done to measure the carbon cost of generating funds nor applying it to green (or other technology), so the cost and true impact is hidden.

Similarly, no-one has yet meaningfully addressed the existential issue for Australia, given our exports and GDP relies heavily on carbon intensive raw materials like coal, gas and other minerals which are then consumed in another country.

The logic of net zero emissions and being a regional example, has a fundamental problem of principle. At the extreme, we are exporting the very things we are choosing to eliminate ourselves – it would put us at war with our own prosperity to do otherwise in the short term, but we will need to quickly build productivity in other areas as the world adopts more green technology.

We have simply ignored this conflict of principles in other areas such as being nuclear free while selling Uranium, so it does not have to be a great issue, but we do need to make a conscious choice to draw the line somewhere.

This of course does not address the further problems of countries in Asia, the West and Central Asia who actively ignore decarbonisation in favour of industrial productivity and economic growth. Our actions are unlikely to impact their approach and will very likely put us at a competitive disadvantage unless we are very strategic about how we transition to ensure Australia remains cost efficient, productive and prosperous.

2. How should the authority weight the goals of ambition and achievability in considering possible emissions reductions targets for 2035?

As noted above, we have chosen a path and although we must constantly interrogate the continued soundness of our strategy as data develops, we must be inherently practical about what we can achieve and how.

It is not enough to move to net zero, we must be able to do it in a way that does not sacrifice the productivity and economic stability of the Nation.

The authority's objectives should be to set targets that balance and ensure:

1) Australia meets international obligations or revises those obligations in line with existing data relevant to Australia.
2) Existing Government policies across industries are not undermined by changes eg: housing affordability and accelerating supply.
3) The cost and impact on business, industry and the economy does not cause material or lasting detriment to productivity, GDP, trade and viability of Australian businesses.
4) Any impact on Australian citizens does not exacerbate cost of living, energy, employment and housing pressures.
5) A cost benefit analysis is done on the positive and negative impacts of a given target.

It is absolutely critical to not only obtain data and monitor each of these factors, it is important to maintain a close working relationship with industry and business groups as well as community action groups so that there is an early warning on any issues arising from the policies taken.

3. How can Australia further support other countries to decarbonise and develop sustainably?

Australia is relatively late to green innovation in comparison to other European nations. As one of the larger economies in Asia Pacific, many will look at what we do to inform them on wat they can or should do themselves.

Critically, we need to get the balance right to achieve climate change ambitions without significantly undermining our economic progress/cost of living, worsening housing affordability or sacrificing food and energy security.

If we achieve the climate change goals but (for example), undermine our productivity and GDP, energy availability, housing affordability or cost of living, it will be seen as a fail overall by other nations.

Poor process, painful transition or bad social/economic/community outcomes will encourage other, less prosperous nations to abandon any process towards net zero.

Our primary support at first instance is to get it right. Where we succeed, we can share and advise other nations. If we do not, we will set back the region.

4. What technologies are important for each sector's pathway to net zero and why?

See below

5. How can governments use mandates, rules, and standards to accelerate Australia's decarbonisation? Is more planning by governments needed? If so, how should this be coordinated and how can this be done while making the transition inclusive, adaptive, and innovative?

There are numerous ways in which we need to accelerate decarbonisation and may of them are not expensive and elaborate solutions, but simply getting out of the way of industry to find a pathway forward (once the objective is set).

Critically, much of the current regulation as well as actions of Governments in all spheres, contribute to limit, hold back or even prohibit green innovation. This is often nothing to do with a lack of motivation or conflicting principles, but more to do with the collision of two practical realities – cost and complexity.

For example, LGS's are concerned about inheriting innovations (e.g. materials innovation, reuse of recycled materials and materials with recycled content, low carbon concrete), in civil and landscape construction even-though (many of) the products and materials have approved product specifications (e.g IPWEA standards) and EPA's.

This is often due to LGA's being unfamiliar with new products and innovations, lack of experience through prior product applications and/or lack of knowledge through project case studies, and hence the risk (real or perceived) of liability should the product not perform or even fail, or possible environmental impacts (e.g., leaching, dust, odour).

This is especially the case with more capital-intensive construction such a roads and pavements, parking areas, retaining walls. Use of such materials by private sector developers have in the past required a significant bond (or similar insurances) to cover an extended period beyond standard defects.

It can also be a question of budgets (or lack there of) and concerns with maintenance and performance of new concepts. A lack of certainty can kill a concept dead just as easily as resistance to change.

Resolving these issues can be achieved through a more coordinated approach led by state Govts. and coordinated through the National Cabinet to achieve consistent verifiable standards and regulations in the use of materials innovation, reuse of recycled materials and materials with recycled content.

For example, programs such as the VicRoads (ecologiQ - Victoria's Big Build) and the Waste Authority WA / Main Roads WA 'Roads to Reuse' program (Roads to Reuse | Waste Authority WA) are useful in developing pathways for reuse of recycled materials, however there is no clear mechanism or pathway for the standards to be applied at a local Government level. Often the issue is that the standards applied to high and heavy use applications (such as highway and freeway road, bridge and interchange construction) are sometime not directly applicable to local government and residential subdivision development requirements – e.g., for local low traffic needs)

However both these programs can be referenced to provide a useful structure whereby a nationally coordinated program is rolled-out that include developing partnerships with the private sector – materials manufactures, developers, and state local Governments partner in the application of materials innovation, with a clear mechanism to address product verification, and to underwrite concerns of liability and financial costs.

Below are potential solves for some of the more direct problems that exist in this space.

The Federal, State, Territory and Local Government in close collaboration with industry, need to fast track building and planning rules that provide options to promote rather than prohibit (but not require), the use of carbon efficient/green credentialled materials, build products and development innovations so that housing builds and precincts can hit net zero.

- This approach would include Federal Government coordinating agreement with states and Territories to:

  1) Resolve and Remove Federal, State and Council restrictions/prohibitions on green construction materials for developments including ensuring the use of up to date engineering standards and balancing green credentials vs maintenance of materials. Often for example, Councils, prioritise asset management over sustainable or recyclable advantages.

  2) State government policy reform to allow net zero innovations at a suburb scale to be implemented such as:

     a. Energy and battery technology to scale up green efficiencies - Energy sharing technology between houses (such as micro grids, embedded networks and community battery storage).

     b. Water innovations such as storm water to potable water concepts; advanced desalination, water reuse and recycling systems; grey water and black water treatment and reuse concepts.

     c. Construction innovations such as permeable surfaces in streets to capture rainwater and utilise in place for irrigation of street trees.

  3) Land subdivisions/DA's should allow and incentivise houses to share innovations that promote carbon neutral or carbon credits without the need for body corporates:

     a. Energy sharing technology including batteries as well as electric output.

     b. Green tree zones for sharing any carbon credits across a development.

     c. Neighbourhood 'Circular Economy Hubs' which encourage the sharing, re-use, recycling and avoidance of products going to landfill. These Hubs also encourage community and social development and reduce transport dependency though co-ownership and sharing unneeded materials.

  4) Model planning schemes to incentivise, passive solar, natural ventilation, shading etc in sub-divisional design and area plans.

- Net Zero for buildings will require carbon credits to offset the (newly efficient) embedded carbon builds. It is extremely difficult for individual houses or greenfield developments to achieve energy saving innovations on their own due to expense, complexity and scale needed for some systems/innovations.
- Current planning and building regulations for both developments and dwellings prohibit many green credentialled materials from being used in developments.
- Education on sustainable material usage, its benefits and incorporation is necessary at all levels of Government. Local Government in particular often have rules and guidelines that prioritise asset management over sustainable or recyclable advantages, leading to prohibition of otherwise useful materials from developments.

- Many regions prohibit rather than incentivise energy sharing technology and carbon credits.

The Federal, State and Territory Governments must establish incentives to encourage developers, builders and purchasers of dwellings to invest in a broad spread of high performance green technology that may only benefit downstream users or long term. This could include low interest loans or grants for green/sustainable infrastructure.

- This would include products such as every solar panel upgrade, energy reduction initiative, thermal insulation. They all benefit the User not the Developer unless the Developer can charge a premium to offset these required services.
- Technologies and materials that are recycled, recyclable or high efficiency often are not chosen because of cost and the benefits do not appear in the short term or are an advantage to other (non-paying) users – eg: recyclable products do not advantage average home owners looking for a forever home or that are unlikely to renovate - energy efficient insulation and technology that is carbon neutral may not be economically feasible for housing affordability and ignored in favour of more cost efficient materials.
- Forcing sustainable credentialed products on developers and purchasers where end users are not prepared to pay for the innovation (eg: involving high early expense with long payback periods), make product more expensive with no added advantage – this acts directly against increasing dwelling supply and housing affordability.
- We need to incentivise Developers to go further so tenants benefit from sustainability/circular economy initiatives, to enable Australia to meet its net zero targets and stop prioritising virgin materials over recycles/reused materials.
- Further, incentivising the adoption of industry-led green credentials such as EnviroDevelopment and Green Star Communities, will push green outcomes towards a pragmatic place for the end-user (with specific reference to benefit for the end-user).

The Federal, State and Territory Governments in close collaboration with industry, must prioritise and incentivise options for reduction of energy consumption to make new and existing buildings operationally efficient, deliver sustainable and carbon efficiencies that are multiples higher than reducing embedded carbon. This should provide greater scope for efficiency without regulating any specific product type or innovation to be incorporated.

- This would include:

1) Working with developers and builders to identify the greatest efficiency for a given spend in a reasonable timeframe – especially new vs renovation vs rebuild. This includes impacts of embodied carbon and carbon abatements possible through adaptive re-use and any financial incentives to do so (carbon credits etc)
2) Incentives focusing on providing more options for efficient new and retrofit projects as well as considering incentives to encourage full replacement of existing builds with highly efficient new builds to significantly reduce energy consumption.
3) Incentivising passive design – good design principles rather than added tech, will have the greatest impact on a reduction in energy in Australia. Passive design considerations vary from climate to climate so there is no one-size-fits-all scenario.

4) Insulation, double glazing, sustainable materials.
5) Replacing gas with electricity.
6) EV charging.
7) Heat pumps.
8) Geothermal technology.
9) PV Solar Installations.
10) Solar hot water.
11) All electrical devices to be Demand Enabled Response Capable (DRED).
12) Green walls and other green infrastructure.
13) Passive solar orientation.

- Current data indicates that a house over a 40 year lifecycle on average embodies between 16 - 26 tonnes of Co2 (upon build), and releases 10.97 tonnes of Co2 per year. This means lifetime emissions are a far greater impact by a factor of x30.
- Reducing embedded carbon in new builds will do nothing to reduce the existing inefficient buildings.
- Retrofitting efficient technologies into existing dwellings is the most practical way to improve existing buildings, but it is expensive and has limited efficiency improvements over knockdown rebuilds. Knock down rebuild however (on current calculations), create the largest carbon footprint through removal of the existing non-recylable materials/build and replacing a full build.
- Existing greenfield dwelling will need to be renovated or rebuilt in 20 -30 years. Without incentives to rebuild/renovate in order to overcome the expense, there will be limited impact on energy consumption.

The Federal Government should:

1) not adopt any targets or restrictions on industry businesses that fail to demonstrate net zero contribution until there are sufficient alternative products in the market to avoid further jeopardising housing affordability.
2) incentivise the acceleration of green credentialled products for development.

- One of biggest problem with net zero in the property industry is that current products in the Greenfield market are designed to give the best build for an affordable price but were never designed for carbon neutral.
- Government should not adopt targets and restrictions that will impact upfront cost of housing delivery. This ultimately, adversely affects housing supply, project viability and affordability.
- The affordability for operations and maintenance of housing by a purchaser, has broader benefits to the community but until technology becomes less expensive, innovation will be held back without Government incentives.

- Any move to net zero must take into account policy objectives such as supply of housing, affordable/social housing targets and the construction cost increases on development. Adding net zero requirements at this stage without adequate time for builders and developers to pivot and without an influx of accessible and affordable net zero products on the market in Australia, will only exacerbate the affordability crisis already being experienced by the Australian market.
- Unless there are alternative materials in the market that can allow a builder/developer to achieve net zero, it is unfair and counterproductive to penalise the market.
- Government will need to incentivise creation of "green materials" as penalties or restrictions will have the adverse impact of forcing up prices for houses and restricting stock in a crisis or pushing developers out of business.
- Equally, Government needs to adopt a staged approach to introducing technology to the industry especially where innovation is costly to ensure it does not impact viability of project and businesses. This would involve providing targets to larger more financially strong organisations and allow for adoption in a number of years by smaller organisations once the teething issues are worked out.

6. How can governments stimulate private finance needed for the net zero transition – are there innovative instruments that could be deployed or new business models that governments could support? Is there a bigger role for governments to play in coordinating the investment needed to transition the economy?

The Clean Energy Finance Corporation (CEFC) has begun piloting a model where a discount on financing costs is offered in return for sustainability and Net Zero outcomes. The model stimulates private finance because there are other investors in the projects who gain experience with the sustainability aspects. Leading to a normalisation of better carbon and environmental performance more widely. This model already has several successful examples in multiple states. Expanding the role of CEFC in Net Zero property has direct results in terms of the subject properties but also shows leadership in the finance sector. Banks are proactively looking to develop and expand green finance products and will benefit from the CEFC demonstrating approaches and benchmarks. Seeking to expand the CEFC involvement in this space will be beneficial.

There are case studies and other information on the CEFC website here: Property - Clean Energy Finance Corporation - Clean Energy Finance Corporation (cefc.com.au)

Energy Upgrade Agreements (EUAs) are a well-established model that allows building owners to cost recover from tenants for building upgrades in proportion to the benefit of that upgrade to the tenant. Government at all levels has a place in providing the measurement and assurance infrastructure to enable this process to work fairly for all parties. The NABERS system could be adapted to provide a framework. Schemes have been trialled in Melbourne and Sydney and could benefit from additional support.

7. How can governments better support markets, including carbon markets, to deliver emissions reduction outcomes?

The Clean Energy Regulator (CER) administers the Australian Carbon Credit Unit (ACCU) scheme nationally. ACCUs are created where a tonne of carbon dioxide equivalent is removed from the atmosphere and sequestered, or when a tonne of carbon dioxide equivalent emission is avoided.

Currently there is no mechanism that allows ACCUs to be created on the basis of actions on embodied carbon in buildings. If actions were rewarded through the creation of ACCUs, significant reductions could be unlocked and a complete change of thinking around embodied carbon emissions reductions, particularly in the construction of buildings, could be sparked. A mechanism for the creation of ACCUs on the basis of 'upfront' embodied carbon reductions against a benchmark, or a reference building, based on exceeding an established trajectory to Net Zero 2050, would be beneficial.

NABERS is developing an embodied carbon tool. Enabling consistent measurement and reporting will normalise consideration of embodied carbon and provide a level of data to inform reductions. Mandatory disclosure of embodied carbon, supported by a government endorsed, low-cost measurement and reporting process will be beneficial.

8. What further actions can be taken by governments (e.g., through public funding), the private sector and households to accelerate emissions reductions, including in relation to the deployment of technologies and access to new opportunities in the transition to net zero? What barriers stand in the way and how could they be overcome?

Decarbonising the grid more quickly is one of the strongest actions that could be taken – the flow on effects impact everything. The key missing piece seems to be the uptake of distributed energy storage. There is a huge opportunity to leverage private capital through moderate incentives and other policies that will see large benefits to the electrical infrastructure. Bi-directional charging of electric vehicles appears to offer a large part of the solution to renewable-energy-based electricity grids – government policy could be designed to bring this feature on more quickly.

9. How should governments decide upon the appropriate allocation of resources towards reducing emissions, removing carbon from the atmosphere, and adapting to climate change impacts?

The balance of carbon mitigation and co-benefits should always be part of the policy framework. Carbon offsetting projects that lead to genuine re-vegetation have dramatically more impact on climate resilience that the removal of atmospheric carbon alone.

Scalability is important. Schemes and policies that induce change throughout a sector will generally have larger, more lasting impact than individual projects or facilities. Leveraging private capital can be a powerful accompanying tool. For example, incentivising electrification and renewable energy systems in the residential building sector appears to have economy changing potential over time.

Reduction is less valuable than a trajectory to zero. Fuel switching may offer short term reductions, but the government should not underwrite changes that lock the economy into a carbon emissions profile that is still unacceptably high. Change to zero carbon methods rather than targeting reductions. Reductions should be supported if they have <2year implementation and do not involve major infrastructural works.

10. How can governments, businesses and people, including First Nations people, help ensure the benefits and burdens of the net zero transition are equitably shared?

A price on carbon is the most equitable scheme that has been identified to date. A cap-and-trade approach as has been adopted in the Safeguard Mechanism will work at the economy scale. There is a need for a safety net, as always, for disproportionate impacts and for the disadvantaged, but the generality is that those with less resources are typically lower emitters.

11. How can governments better ensure First Nations people are empowered to play a leading role in the development and implementation of climate change policies and actions, including as they relate to the ongoing curation of the Indigenous estate?

As discussed above, seeking to maximise the co-benefits of actions is crucial. Social benefits from carbon farming and other responses can be significant if correctly designed. Carbon farming on Aboriginal land can have additional layers of financial, training and land management benefits. In a similar way, remote area renewable energy plants can provide a unique mix of economic and training benefits for local people in their local area.

12. How can Australian governments support the wellbeing of workers, communities and regions as the nation decarbonises, including in relation to cost of living, workforce and industry transition and access to low emissions technologies and services?

Please see answer to question 2 – it is absolutely imperative that the Australian Government (like the authority) adopt similar objectives to those outlined in question 2.

If there is an objective to balance and consider each of; wellbeing of workers, communities and regions as the nation decarbonises, cost of living, workforce and industry transition and housing, there will be an inherent need to obtain data and monitor each of these factors.

It is also important to maintain a close working relationship with industry and business groups as well as community action groups so that there is an early warning on any issues arising from the policies taken.

It will require close stakeholder engagement that is meaningful rather than a one way “information or education session” – Government needs workshops and consultation on a regular basis to keep the initiative on track.

13. How can governments help Australians prepare for and respond to the impacts of climate change?

See 12 above.

14. What else should the authority be considering in its advice to government?

As noted in numerous answers, every stage of your approach on climate change needs to be done in lockstep consultation with impacted parties. You should consider establishing a Climate Change

Transition Council that is tasked with engagement with stakeholders, monitoring progress across industries, communities and given oversight on influencing outcomes (rather than simply feeding back information).

The approach will need to be a constant stream of communication and feedback on what is working, what is not.

Below are further comments we want to make on specific areas raised by you.

Electricity and Energy

Energy sector plays a massive role in decarbonising developments, as well as the nation in general. AS mentioned previously, the carbon efficiency of the electricity sector has the most material impact across the country from homes, businesses and industries to the electrification of transport.

The illustrative example raised earlier in relation to the comparable of EV and petrol car carbon footprints is emblematic of the critical importance of efficiency of the energy grid. There significant activity in the transport sector with EVs and EV Charging equipment. There are various grants, rebates and discounts (stamp duty and FBT exemptions) for EVs all over Australia. Support of the EV Transport industry is strong however as noted, the key is to change the actual power generation to support the transport transition.

If you were to take into account the embedded carbon cost of funds to purchase items, you start to see that the real carbon cost of green innovation like EVs over traditional technology is significantly more complex. Increased cost has a carbon footprint all its own and reveals the hidden cost benefit of change.

While carbon cost of funding is not currently being considered, it very profoundly brings home the fact that the energy infrastructure of the economy is a fundamental carbon driver. If we are really looking to make meaningful headway on reducing carbon emissions, we have to take all aspects into account including the (carbon) opportunity cost of choosing one efficient product over another less efficient product. Otherwise, we can very possibly be going backwards.

Equally important is the fact that energy costs in and of themselves increase not only due to technology but also due to the way the technology is implemented. For example (although dirty), coal has been traditionally cheap to run as a base load of energy since it keeps producing energy at a constant rate (which is either used or not). As we transition to more renewables, the base load needed varies with conditions and when/if renewable generation is on line. Unfortunately this also means the base load needs to vary on a more regular basis leading to inefficiencies and greater cost to operate those otherwise cheap sources.

In effect, as we transition to renewables, we have increasing technological cost and operational cost as efficiencies of base load generators are lost. This means either maintaining a constant load and risking brown outs or greater energy bills with consequential cost of living and cost of business increases. The increases act as a feedback loop with increased business costs of themselves further increasing cost of living.

We agree with the other Barriers/Enablers you identified – each of those issues are being faced by the states such as WA right now.

The issue of needing larger-scale transmission and network upgrades to facilitate large-scale solar is a good point. It is uncertain if large-scale systems will have a long-term place in the system. The distributed opportunity of generation/storage at the household level is key.. Any power that is transmitted over long

distances results in losses thus Utilities need to take advantage of solutions that couple generation at the load, which is what the land development sector and built form can aid in. Technologies at the home (also commercial sites) will dictate what will need to be incorporated in to the greater network in the longer term. There will still be large-scale systems for heavy industry and for segments of the residential space below economic means to fully transition. The incentives to push this are included in previous submissions, but what we need to incorporate at the distributed level in addition to the innovations that should be incorporated are:-

1. Energy Management Systems to optimise energy consumption at home, with cloud-based connectivity to allow Utility or Third-party aggregator access.
2. Vehicle-to-Grid functionality (Standards) to better utilise mobile energy storage for network needs.
3. Smart metering with real-time data capture to monitor actual instantaneous distributed energy consumption and renewable generation.

For large scale systems, the government needs to assist with:

1. Re-zoning land and providing access to Utilities for renewable energy zones (already happening).
2. Prepare and document the energy models of the future to determine the level of network upgrades required (already happening).
3. Provide funding to Utilities, and incentives to private enterprises to build these networks to allow for the connection of green projects (in planning/being developed).
4. Assist educational institutions/training centres to increase the level of labour available to complete the transition. Which would include increasing skilled migration (already happening).
5. Secure key equipment to allow the transition to occur. Globally there are shortages of key parts of electrical equipment (substations/HV Switchgear). Support to local industry to manufacture equipment (which is starting to be considered).
6. Support Local industry to manufacture batteries and other renewable equipment (which is starting to happen).
7. Labour resources are the key issue across the board, the amount of engineers/technicians/electricians/finance people/administrators etc required to fully decarbonise is staggering. We need vast numbers of people to support this transition.

Built Environment

The journey towards Net Zero particularly for the construction and built form industries is not without obstacles. These industries are heavily reliant on supply chains which are not yet decarbonised such as energy, transportation and manufacturing, are facing increased costs for products which are considered net zero and are facing barriers to innovation through policy and regulatory bodies. The transition to Net Zero will no doubt entail short-term economic and social impacts which will place further pressure on the affordability of homes and cost of living for everyday Australians.

We generally agree with the observations within the Issues Paper regarding the challenges regarding to the built environment and the net zero transition. As identified within the report, buildings account for a significant portion of Australia's energy consumption and greenhouse gas emissions. This highlights the need for sustainable yet commercially viable urban development and building design.

Many 'green' practices are already being adopted by the industry such as energy-efficient development, passive design principles and renewable energy integration and consideration of the public realm and green infrastructure.

Achieving Net Zero has been demonstrated internationally and locally with new buildings and retrofit of existing buildings. It is feasible and achievable to do so for a number of reasons including typically one

developer in charge of the development, a clear and traceable supply chain, shared infrastructure, centralised systems and economies of scale. In particular, the ability to install solar panels, batteries and a centralised and efficient energy solution alongside a sustainable water and waste solutions within a singular building with a management structure in place. Recent local examples include:

- Sydney's Quay Quarter Tower which demonstrated a saving of approximately 12,000 tonnes of embodied carbon through its adaptive and reuse construction strategy.
- The Circle House project located in the Danish city of Aarhus, led by 3XN Architects, is a blueprint for circular construction in Denmark, with 90 per cent of its building material able to be demounted and reused (or resold) without loss of value.
- The Believe in Better Building project, by Arup Associates, is the tallest timber building in the United Kingdom. The structure locks in 1,242 tonnes of CO_2, even after discounting the 200 tonnes of emissions associated with manufacturing and transporting the timber from Austria. This is equivalent to 12 years of regulated operational carbon or 6 years of total operational carbon.
- Domestically, we are seeing industry lead by example in this area too—
- Stockland has accelerated its commitment to Net Zero Carbon to 2028, while Mirvac's Planet Positive Plan will see its operations achieve Net Positive in scope 3 emissions by 2030.

We generally agree with the barriers and enablers identified within the Issues Paper particularly in relation to high upfront costs; commercial viability, availability and maintenance of key technologies and the challenges of retrofitting existing buildings. These barriers and enablers are appropriate considerations for medium to high density residential developments and commercial buildings.

However, achieving Net Zero emissions in greenfield development in Australia poses a range of challenges from the complexities of construction to Australia's essential services landscape and existing policy frameworks and the myriad of housing solutions available to individual land purchasers.

There are practical constraints related to infrastructure and utilities in greenfield developments. Establishing energy-efficient systems, such as renewable energy generation, smart grids, and water and waste recycling facilities, requires significant upfront investment and coordination among various stakeholders. Current policy considerations typically don't support sharing of utilities unless a management structure is in place, such as a body corporate system. Furthermore, integrating sustainable transportation options, such as public transit, cycling infrastructure, and pedestrian-friendly design, necessitates long-term planning and collaboration with local authorities and transport agencies.

The regulatory landscape also presents obstacles to achieving net zero in greenfield development. While there is growing recognition of the importance of sustainability in urban planning, regulatory frameworks often lag behind in incentivising or mandating sustainable practices. Developers may face bureaucratic hurdles, inconsistent regulations, and a lack of clear guidelines on energy efficiency standards, renewable energy requirements, and emissions reduction targets.

Financial considerations further complicate the transition to Net Zero in greenfield development. While sustainable building practices and technologies offer long-term cost savings through reduced energy consumption and operational expenses, the upfront costs can be prohibitive for purchasers, particularly in a market where the purchaser is making a housing decision for the next 5-10 years rather than in the context of a 30 year+ lifecycle decision.

In addition, the ability for a Developer of a greenfield development to control the embodied carbon of individual residential homes when the Developer is not constructing the home, is a challenge. Typically, in a greenfield context, the Developer is responsible for the construction of the public realm (roads and parks/open space) and the creation of an individual allotment. The purchaser who purchases the individual allotment then can choose any builder they wish who will then have a wide range of house

designs to select from. Due to the myriad of choices available, the ability for Developers to track and assess embodied carbon emissions associated with construction materials and building processes for individual residential houses present a significant obstacle to achieving Net Zero in greenfield context.

We would recommend including explicit considerations within the Issues Paper regarding the specific barriers and enablers relating to greenfield development to ensure a comprehensive summary of the built environment context in Australia is captured.

Further to the above, the Issues Paper should also include reference to materials such as concrete, steel, and other commonly used materials and their high carbon footprints. These materials are fundamental to the built environment (medium to high density residential, commercial and greenfield development). Reducing embodied carbon requires sourcing sustainable materials, optimising construction methods, and minimizing waste throughout the construction lifecycle. However, limited availability of eco-friendly alternatives, lack of industry standards, and cost considerations pose challenges to achieving meaningful reductions in embodied carbon emissions.

Circular Economy

Embedding circular economy principles and practices represents a substantial means of reducing carbon emissions through the application of embedded carbon in the building industry. It is estimated globally[1] and nationally that the contribution of the building sector to reduce carbon emissions is significantly higher as a percentage of carbon contribution from the built environment sector than that suggested in the diagram on p.19 of the Issues Paper.

Industry and particularly the built environment has a powerful role to play through embedding circularity and circular practices if the correct incentives, benefits, regulation and access to circular solutions are designed well with industry and clearly communicated more widely over a reasonable timeline to allow the industry to adapt.

Many of the circular economy practices required are *evolutionary* not *revolutionary* but are still yet to be realised at scale, even if the knowledge and expertise exist to drive this change forward. Most circular economy practices are going unrealised due to the lack of incentives and direction as described above.

While the 2024 Issues Paper clearly outlines a desire to embed circular practices, it does not really demonstrate how this will happen. It needs linkages from ambition to action, which is where circular economy desperately needs to transition towards, if the Federal Government's scale of change is to be realistically achieved. There is unlikely to be any real progress in circular economy implementation at scale until these critical areas are addressed in a meaningful way.

The CCA 2024 Issues Paper also misses a key strategic opportunity to link CCA's overall objectives with the vast amount of research and recommendations regarding the circular economy by the Federal Government's '*Circular Economy Ministerial Advisory Group' (CEMAG)*[2].

CEMAG is a Federal Government Advisory body tasked with developing a roadmap forward for the Government to adopt to meet its ambition for a circular economy by 2030. The recent and highly

[1] https://www.unep.org/resources/report/building-materials-and-climate-constructing-new-future#:~:text=The%20buildings%20and%20construction%20sector,staggering%2037%25%20of%20global%20emissions.

[2] *https://www.dcceew.gov.au/environment/protection/circular-economy/ministerial-advisory-group*

publicised release of its 'Interim Report'[3] has already motivated the Federal Government to instantly adopt some key recommendations, including a mandatory sustainable procurement policy which comes into effect 1 July 2024.

In addition, the UDIA has recently drafted a background paper on the Circular Economy and Net Zero which details the potential for UDIA members to adopt these practices and points towards the required regulatory and funding mechanisms required to encourage circular economy practices amongst its members. It is highly recommended that the link to the CEMAG and the UDIA's Position Paper be considered as part of any circular economy objectives.

Please do not hesitate to contact the UDIA National Head of Policy and Government Relations - Andrew Mihno on 0406 454 549 to discuss this further.

Col Dutton
UDIA National President

[3] https://www.dcceew.gov.au/sites/default/files/documents/circular-economy-ministerial-advisory-group-interim-report.pdf