



**Clean Energy
Investor Group**



Clean Energy Investor Principles • August 2021

**Unlocking low-cost capital
for clean energy investment**



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In the spirit of reconciliation Clean Energy Investor Group (CEIG) acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Thank you to CEIG members for providing invaluable input into this report and for their participation in the research that underpins this report.

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About Clean Energy Investor Group

Clean Energy Investor Group (CEIG) is the voice for domestic and global renewable energy developers and investors in Australia.

CEIG was formed in July 2019 by a group of institutional investors in response to the increasing volatility and risks for clean energy investors in the National Electricity Market.

The Group has now established itself as a dedicated investor body to represent, and advocate for, clean energy investors to regulators, policy makers and the broader energy sector.

CEIG's vision is for a strong, investable, National Electricity Market where competitive institutional investment plays a central role in delivering the significant low-cost capital needed to achieve Australia's clean energy transition, at the lowest cost to consumers and taxpayers.

CEIG members are infrastructure and other fund managers and independent power producers. CEIG brings a distinctive "voice of capital" to the decision-making table.

Collectively, CEIG members represent more than 11GW of installed renewable energy capacity across more than 70 power stations and a combined portfolio value of around \$24 billion. CEIG members' project pipeline is estimated to be more than 18GW.

A photograph of two wind turbines in a green field under a blue sky with light clouds. The turbines are white with three blades each. The field is green and rolling, and the sky is a clear blue with some wispy clouds. The image is split vertically, with the left half showing the photograph and the right half being a dark teal color with white text.

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Foreword



The National Electricity Market (NEM) was designed for an era of incremental and steady change and for centralised, thermal coal and gas generation. From governance to transmission and connection and the wholesale market itself, the NEM supports incumbent infrastructure over new clean energy generation and places excessive risk on investors seeking to develop these essential new renewable electricity generation and energy storage assets. The NEM was not designed to enable the complete decarbonisation and transformation of the electricity supply sector. Yet this is the challenge we face today.

Australia is perfectly positioned to capture very significant investment in the clean energy sector. Our solar and wind resources could cleanly generate several times more energy than we currently consume and allow us to export zero-emissions energy or manufactures.

In the lead up to the Glasgow climate conference, Australia can choose to align the NEM transition with the expectations of our international trading partners and global markets to attract the capital needed to decarbonise our electricity sector. With a clear plan for Australia's energy future, the NEM can be made highly investable and the economy will benefit.

Energy Ministers are currently evaluating the Energy Security Board's new design of the NEM and First Ministers will make final decisions later this year. The Clean Energy Investor Group has commissioned modelling and regulatory analysis from Rennie Partners to contribute to this important process.

Our research demonstrates that even the slowest transition scenarios face regulatory barriers that create risk and push up the cost of investing in clean energy projects in Australia compared to other OECD markets.

The NEM requires around \$70 billion of new clean energy investment between now and 2042, as well as significant investment in the transmission network to meet the Step Change scenario in the 2020 Integrated System Plan. Current and committed projects will not be enough to meet Australia's energy needs. An additional 26GW of wind and 22GW of solar is required above the current committed project pipeline.

Most critical of all, our analysis, drawn from the direct experience of our investor members, is that the cost of capital for clean energy projects in Australia is substantially higher than other markets due to significant uncertainty and risk. This risk premium is between 100-250bps, and amounts to close to 10% of the total value of the development pipeline required, or approximately \$7 billion AUD.

The Clean Energy Investor Group has drawn on the wealth of experience of our members to present these recommendations for reform and to drive down the cost of capital for the clean energy transition in Australia. We have organised these under five, high level, CEIG Investor Principles.

Ministers must *align NEM development with global markets* (IP 1) to signal that Australia is a safe place to invest. The Energy National Cabinet Reform Committee can *redesign governance for transformation* (IP 2), so that market bodies have the mandate to support and enable clean energy investment at the scale needed.

This national policy clarity would enable effective climate risk management by investors and market participants. It also provides the framework for the next three Investor Principles. These are about giving federal, state and territory governments and the NEM market bodies the guidance and tools to make reforms that *improve revenue certainty* (IP 3) and *allocate risk effectively* (IP 4). Jurisdictions and regulators could then collaborate to *build investable markets and encourage innovation* (IP 5).

In the pages below we build out this investor vision for the future of the NEM. Adopting these approaches to reform, and listening to the views of the investors who will deliver the low-cost capital required for Australia's clean energy future, will enable a net zero future for the electricity supply sector at a lower cost than can be realised today.

Simon Corbell
Chief Executive Officer
CEIG Ltd

Executive summary

Reforms needed to lower the cost of energy transition

The Clean Energy Investor Group (CEIG) has formulated five Investor Principles to align the NEM with international markets.


The Investor Principles provide an architecture for governments and market bodies to work together. They are offered to governments as they meet to consider the Energy Security Board's proposal to redesign the National Energy Market (NEM). Their implementation would attract investment and reduce the cost of the clean energy transition.

The first Principle is for policymakers to *align NEM development with global markets* (IP 1) which will enable Australia to meet its commitments under the Paris climate Agreement. Governments must then *redesign governance for transformation* (IP 2).

Within this framework, market bodies and state jurisdictions can lower the cost of investment by *improving revenue certainty* (IP 3) and *allocating risk effectively* (IP 4) within a broader objective to *build investable and innovative markets* (IP 5).

Research commissioned by CEIG has identified the risks faced by investors and established that reform would reduce the cost of capital by 100-250 basis points. Modelling has quantified the scale of investment required to align the NEM with international markets and the Paris climate Agreement. Institutional investors have confirmed that the 2020 Integrated System Plan's Step Change scenario is aligned with international markets.

Adopting CEIG's Investor Principles in energy market reform

	IP1: Align NEM development with global markets	Unlock capital pipeline by aligning with global investor expectations	Implement AEMO's ISP Step Change transition scenario to mitigate risk	Provide long-lasting policy certainty
	IP2: Redesign governance for transformation	New Electricity Transition Agreement	Establish an <i>Investors and Innovators Advisory Council</i>	Add an environmental objective to National Electricity Objective Pro-active and pragmatic approaches to market rules
	IP3: Improve revenue certainty	Marginal loss factor reform	Modernise open access regime	Avoid approaches that incorporate locational marginal pricing
	IP4: Allocate risk effectively	Align investor risk with factors that can be priced or managed	Unblock generator connection	Greater transparency and accountability Collaboration for long-term social licence
	IP5: Build investable and innovative markets	Enable effective REZ development	Accelerate investment in transmission network capacity	Reform the regulatory investment test framework Improve contestability frameworks

Clean energy Investor Principles can save consumers up to \$7 billion

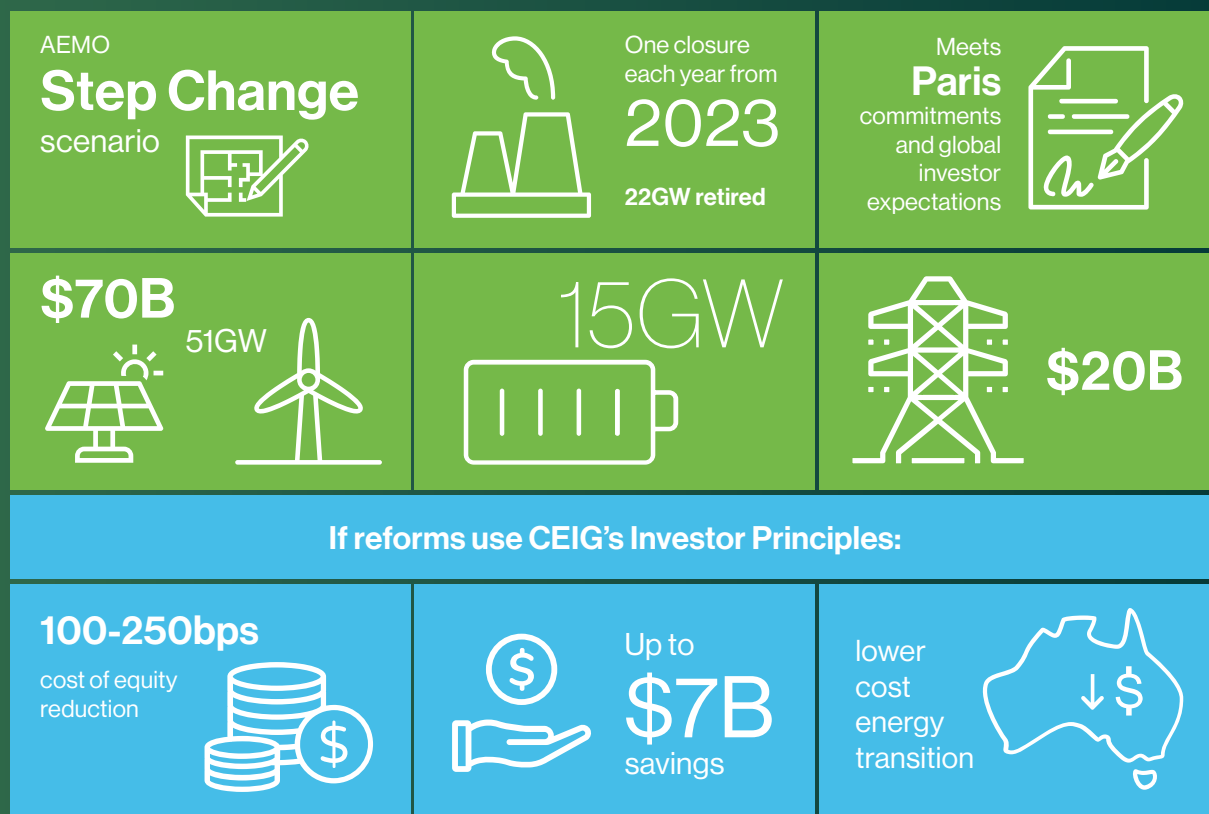
In the right market conditions, the investors in the Clean Energy Investor Group are ready to commit to build the 27GW of wind (\$41 billion) and 24GW of solar (\$29 billion) required by the Step Change scenario. That new generation would be backed up by additional investment in 15GW of storage.

A total of 82GW of wind and solar are currently proposed in the NEM however only 3GW has been committed by investors. This is because clean energy bears excessive risk and revenue uncertainty. That has caused an investment deficit which is predicted to be 20GW over the next 10 years and 48GW by 2042.

Current market conditions create a substantial cost burden for consumers across all scenarios. A survey of investors found that the cost of equity reduction which would be delivered by the Investor Principles would achieve a saving of approximately \$7 billion or close to 10% of the solar and wind investment required.

Modelling commissioned by CEIG also found that if the market was aligned with international developments then the majority of coal generation in the NEM would retire by the late 2030s.

Unlocking low-cost capital for clean energy investment



Unlocking low-cost capital for clean energy investment



In late 2021, Australian governments will decide on the future of the NEM when they consider the Energy Security Board (ESB)'s *Post 2025 Market Design Options* recommendations. This decision will be watched closely by international and local institutional investors.

CEIG endorses many of the ESB's proposals, such as those that would improve system security or streamline the development of Renewable Energy Zones. There are however unsolved issues that place excessive risk on investors such as grid congestion and connection delays. The proposed Congestion Management Model and Physical Retailer Reliability Obligation would also make it harder for investors to commit to new clean energy projects.

Our members participated in a confidential survey which quantified that reform of the NEM could reduce the cost of clean energy investment by \$2.6 – 6.6 billion in present value terms, if the key issues identified in this document were addressed.

The NEM has served Australia well but it is no longer fit-for-purpose. It was designed around a steady-state scenario of slow and incremental technological change. Transformation is the new business-as-usual.

Australia cannot dictate the pace of change in technology or market sentiment. The Biden Administration has announced recently that it will follow the lead of the European Union with carbon border tax adjustments. Geopolitical and investor shifts are accelerating the clean energy transition.

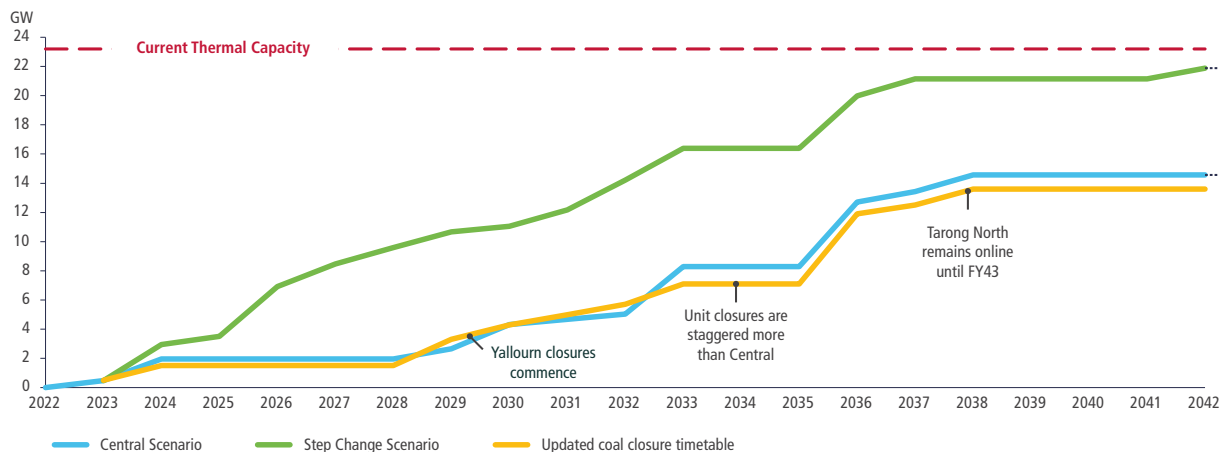
Research commissioned by CEIG has identified the risks holding back investment. We have formulated reforms that would unlock low-cost capital to build the generation, storage and transmission required as Australia transitions to a zero-carbon economy.

If CEIG's Investor Principles are implemented, they will align the development of the NEM with global markets and will make Australia a competitive destination for clean energy infrastructure investment. Governments and market bodies can shape energy markets so they are investable and encourage innovation.

Risk and revenue uncertainty delay the clean energy transformation

Coal retirements accelerate under a Step Change scenario (consistent with the Paris climate Agreement)

Source: AEMO, Rennie Partners



Clean energy investors in Australia face a number of excessive risks that increase the cost of capital and delay investment. These risks are the result of policy uncertainty or poor regulatory design and cannot be mitigated by individual projects. Until these issues are adequately resolved, there will be a large investment deficit in the NEM project pipeline and projects will attract a higher risk premium.

The overarching risks for investors are policy and regulatory uncertainty that makes it difficult to plan new projects and the potential for delays in delivering a fit-for-purpose transmission network that can accommodate the clean energy generation fleet needed to develop the NEM in a manner consistent with the Paris climate Agreement.

Even after reaching financial close on a project, investors may still face problems such as the prospect of congestion outside a Renewable Energy Zone (REZ) or slow connection and commissioning processes. These delays push up cost. Finally, once projects are operational, they may be penalised with volatile changes to their marginal loss factors or curtailment that reduce revenue.

Marginal Loss Factors create revenue uncertainty

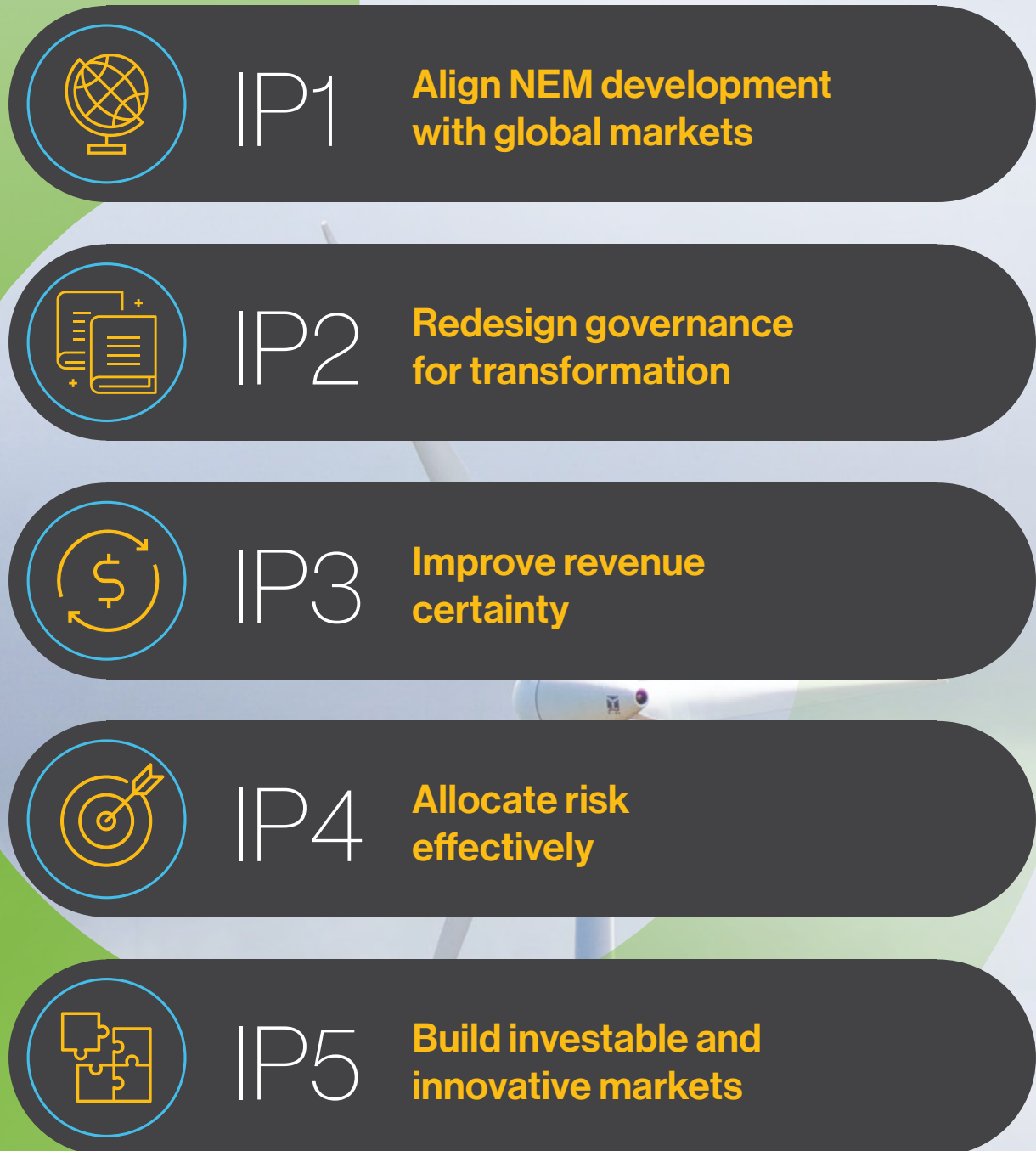
When energy travels a long distance through the electricity network, some is lost as heat. Each year, the Australian Energy Market Operator (AEMO) estimates the amount of energy lost for each generator and applies a Marginal Loss Factor (MLF) to every unit of electricity they produce.

For generators far from consumers with an MLF less than 1, this means receiving less revenue compared to the volume they produce. MLFs can also change substantially from one year to the next – for example from the planning or commissioning of new generators, or changes in demand – which makes revenue very volatile and unpredictable. This revenue uncertainty threatens the viability of existing projects and makes future projects less investable.

MLFs were put in place at a time when the NEM was only undergoing incremental change; they are not fit-for-purpose for the rapid NEM generational transition that we need to achieve.

CEIG's five Investor Principles

Five Investor Principles to unlock low-cost capital for clean energy investment



Institutional investors represent the largest pools of global capital and are ready to deliver the gigawatts of generation, storage and transmission required to secure Australia's energy future. Where equity investors lead, debt finance and technology will follow.

CEIG is optimistic that Australia can attract strong international investment in clean energy. Our five Investor Principles offer a coherent framework for governments and regulators to create investable markets.

The federal and state governments have shared policy responsibility for the NEM. They can deliver the first two Investor Principles through the Energy National Cabinet Reform Committee.

Align NEM development with global markets (IP 1) Government needs to agree to a transition plan for the NEM that is consistent with Australia's commitments under the Paris climate Agreement, in line with global investor expectations and global capital flows. This requires that governments choose and implement an Integrated System Plan (ISP) scenario to mitigate risks. This would provide a strong signal to the market.

Redesign governance for transformation (IP 2) means shaping how governments and market bodies work together. Rule-making and standard-setting in the NEM should be coordinated to improve efficiency, increase stability and deliver investable markets for clean energy technologies.

We have a number of specific proposals and together they constitute a framework for a new intergovernmental agreement in the NEM. The existing Australian Energy Market Agreement should be rewritten as an Australian Electricity Transition Agreement. This will align the three market bodies with Australia's international climate commitments and give confidence to investors.

The last three Investor Principles operationalise the first two policy principles by providing criteria for regulatory decisions. These decisions include changes to the National Electricity Rules by the Australian Energy Market Commission (AEMC), the making of guidelines by the Australian Energy Regulator (AER) and the updating of operational standards and procedures by AEMO.

As jurisdictions become more active planning interconnectors, Renewable Energy Zones and making markets to support reliability, they are increasingly acting like regulators. This means that state and territory government can also help implement the last three CEIG Investor Principles.

Principle 3 *Improve revenue certainty* (IP 3) is critical to lowering the cost of capital and underpins an investable clean energy market. Unlike thermal generators whose costs are more evenly spread over the life of a plant, the costs of renewable energy generators are concentrated in the upfront capital investment cost. To improve the bankability of a project and lower the cost of capital, clean energy projects need to demonstrate they can generate predictable and stable revenue streams.

This is complemented by the need to *Allocate risk effectively* (IP 4). Policy makers should avoid placing excessive risks on investors to avoid higher risk premiums that are ultimately paid for by consumers. Instead, they should allocate risks to the party best able to control, manage or price those risks. Finally, market bodies and jurisdictions can work together to *Build investable markets and encourage innovation* (IP 5) that better leverage private sector capacity and capability.



Adopting an investor-principle based reform approach

Modelling AEMO's Step Change scenario is about effective risk management

As governments and investors across the globe step up their decarbonisation efforts, Australia will be under increasing pressure to lower its emissions more rapidly, particularly in the energy sector.

CEIG has commissioned modelling from Rennie Partners to quantify the volume and cost of investment required to transition the energy system. CEIG has chosen to model AEMO's 2020 ISP Step Change scenario – the only ISP scenario that is consistent with the Paris climate Agreement's target of maintaining warming under 2 degrees.

Planning for the Step Change scenario reflects effective risk management principles and planning for an energy transition scenario that is aligned with global investor expectations and international trading partner action.

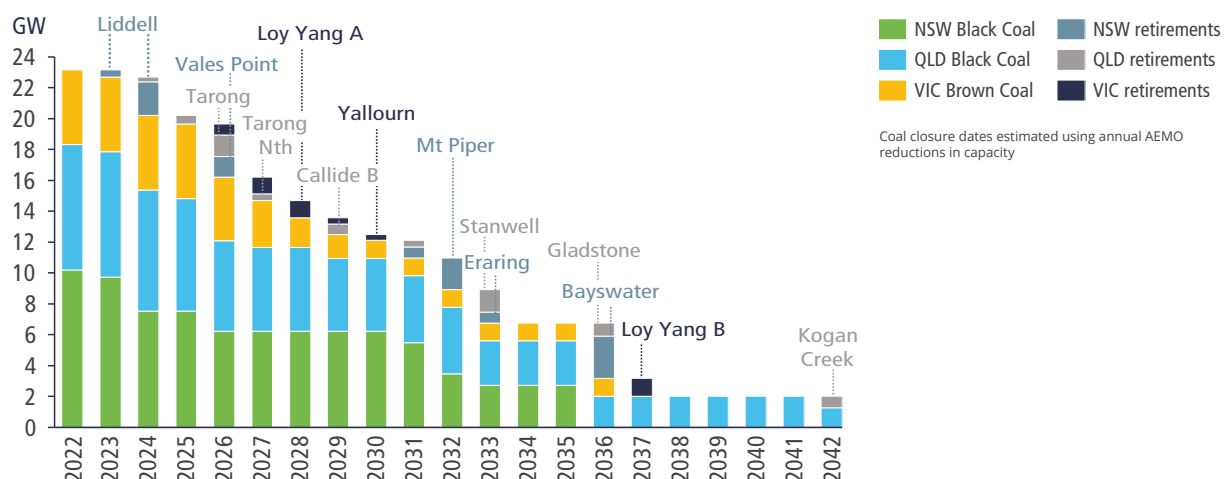
The pace of coal retirement is accelerated under a scenario consistent with the Paris climate Agreement

Under an ISP scenario that is consistent with Australia's commitments under the Paris climate Agreement, the majority of the NEM's coal capacity closes before the late 2030s, with only 2GW of coal capacity left by 2042.

The retirement of more than 20GW of coal capacity by 2038 happens at an accelerated pace compared to current assumptions. This pace is equivalent to around 1 plant (or multiple units) closing each year, starting in 2023 with Liddell power station. In effect, multiple coal plants retire 6 to 7 years earlier than their technical end of life.

Retired and remaining coal capacity, FY22 – FY42 (Step Change)

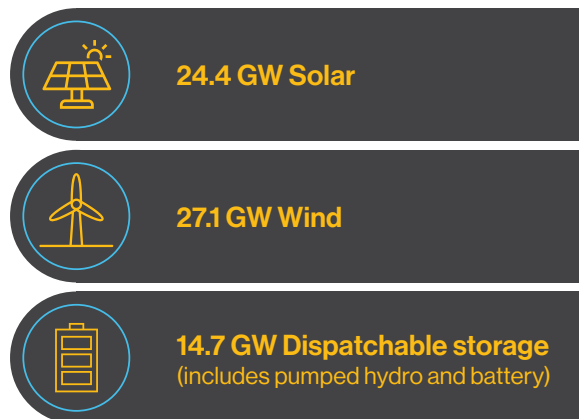
Source: AEMO, Rennie Partners



An additional 51GW of wind and solar and 15GW of storage by 2042

By 2042, an additional 51GW of new generation capacity is required to transform the energy system, split between 27GW of wind and 24GW of solar, as well as an extra 15GW of dispatchable storage. By the early 2030s alone, the amount of wind and solar generation capacity currently in the grid needs to double. This is a faster pace than is currently envisaged.

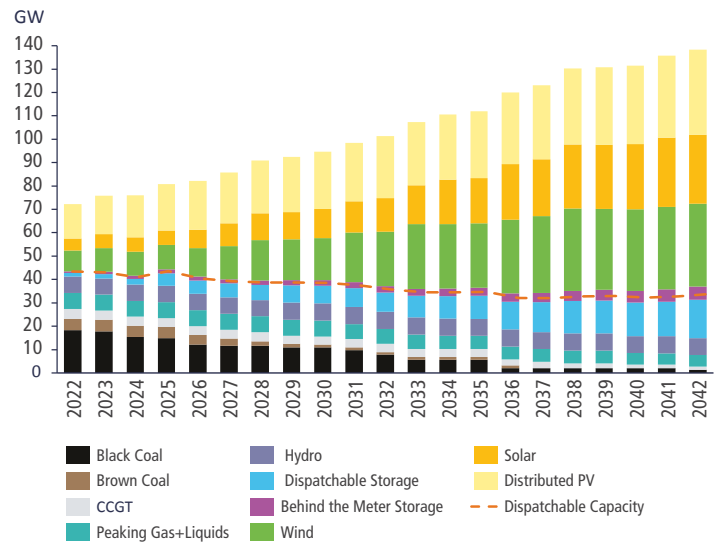
Most of the new wind, solar and storage needs to be operational well before 2040 to replace coal generation as it progressively retires. Significant transmission network upgrades will also be required to enable this new capacity, support the development of renewable energy zones and maintain a reliable electricity grid.



Source: AEMO, Rennie Partners

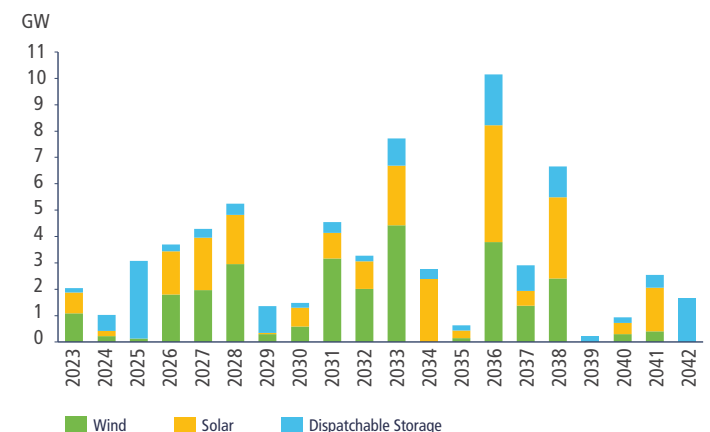
NEM generation capacity, FY22 – FY42

Source: AEMO, Rennie Partners



NEM additional wind, solar and dispatchable storage, FY22 – FY42

Source: AEMO, Rennie Partners

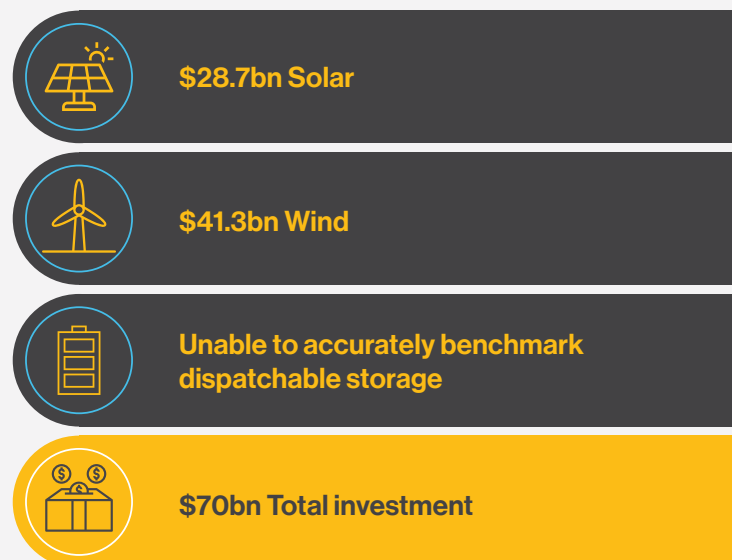


Investors need to deliver \$70 billion of clean energy to transform the NEM

Investment in new variable renewable energy worth a total of \$70 billion (present value term) is required in the NEM and is split between \$41 billion for wind generation and \$29 billion for solar.

Modelling suggests that NSW and QLD will each benefit from investment in wind and solar capacity of around \$25 billion, while investment in Victoria can be expected to reach \$11 billion over the next 20 years. The remaining \$9 billion of investment is spread across Tasmania, South Australia, and the Australian Capital Territory.

The NEM jurisdictions will also benefit from investment in storage capacity and upgrades to the transmission network.



Source: AEMO, Rennie Partners. Note: Present value \$.

There are not enough committed wind and solar projects, with a 20GW investment deficit in the next 10 years and a 48GW deficit to 2042

Only around 3GW of wind and solar projects are classified as ‘committed’ by AEMO.

This very small number of committed projects reflects the continuing uncertainty that investors face in the Australian energy market and is aligned to the current low levels of investor confidence. Overall, the 3GW of committed projects represents less than 10% of the volume of projects required to replace the coal fleet over the next 20 years.

This creates a 20GW deficit in the volume of investment required by 2032, and an even larger 48GW investment deficit by 2042 compared to the 51GW of additional capacity required.

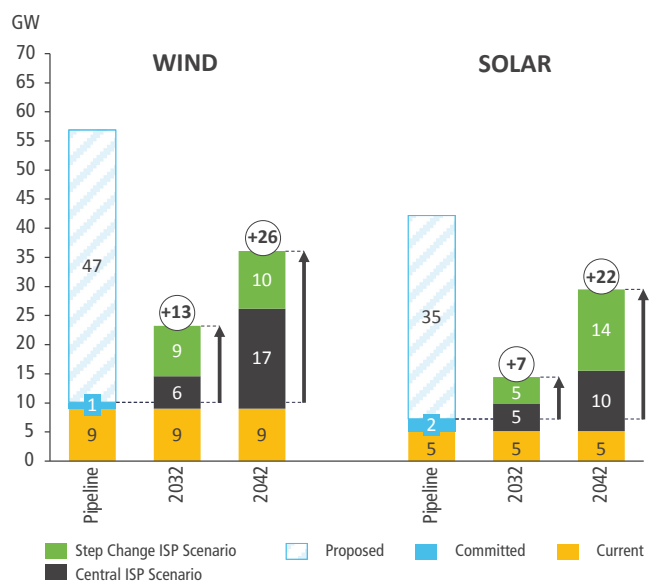
If investment can be unlocked, the pipeline of proposed projects can deliver enough capacity

Provided investment can be unlocked, there are enough proposed projects to ensure that Australia’s main grid remains reliable. Although there are very few committed projects as of 2021, there is a substantial 82GW pipeline of proposed projects across wind (47GW) and solar (35GW).

To unlock this significant potential investment, market bodies and governments have the opportunity to implement market reforms and design policies consistent with CEIG’s five Investor Principles, unlocking a lower cost of capital and a cheaper clean energy transition.

Project pipeline and NEM additional generation, FY22 – FY42

Source: AEMO, Rennie Partners



Applying CEIG’s Investor Principles to reform the NEM can significantly reduce the cost of the transition

As outlined in this document, current policy and regulatory settings in the NEM place excessive risks on investors. This increases the cost of capital for investors as they factor in a risk premium that reflects the higher-risk setting in the Australian market. Those higher capital costs directly flow through to the cost of new clean energy assets and are ultimately paid for by consumers.

In July 2021, Rennie Partners conducted a survey of CEIG members to quantify the impact on the cost of capital of market bodies and governments implementing reforms that are based on CEIG’s Investor Principles.

Rennie Partners’ findings suggest that significant savings can be made from implementing investor-principle based reforms:

- the cost of wind and solar investment could be reduced by up to \$6.6 billion, or 9.4% of the total \$70 billion investment value;
- the range of capital cost reduction can be expected to be between \$2.6 billion and \$6.6 billion based on potential cost of equity reductions of 100 to 250bps.

If nothing is done to lower the cost of capital, this has the potential to translate into the energy transition being more costly in Australia than it should be, unnecessarily burdening consumers with higher costs. It also risks investors’ focus shifting to other markets or other asset classes if it is unresolved.

The investment deficit will be even greater to reach a greater electrification scenario

Modelling commissioned by CEIG uses AEMO's 2020 ISP Step Change scenario. While this scenario envisages a high uptake of clean energy, it does not account for the significant contribution that the clean energy sector could make to further decarbonise other elements of the Australian economy.

Australia can leverage its abundant, low-cost wind and solar resources to electrify and decarbonise transport and industrial processes in the economy, particularly in those sectors where reducing emissions is more difficult. It can also allow Australia to develop a globally competitive hydrogen industry, domestically and for exports.

While the opportunities are great for Australia, the amount of clean energy investment required to satisfy this growing demand for electricity will create an even larger investment deficit. CEIG looks forward to the AEMO's modelling of the 2022 ISP scenarios, particularly the Step Change and Hydrogen Superpower scenarios, to further assess the investment opportunity.

Methodology

Rennie Partners has used AEMO's 2020 ISP databooks and has applied cost benchmarks for wind, solar and transmission projects to quantify the total amount of investment required under the Step Change scenario.

Rennie Partners also conducted a survey of CEIG members to quantify the potential reductions in the cost of capital that could be achieved if investor-principle based reforms were implemented. For this work, Rennie Partners has sourced its weighted average cost of capital assumption from work conducted by NAB for the NSW Government in November 2020 in the [NSW Electricity Infrastructure Roadmap – Weighted Average Cost of Capital Report](#).

Finally, the quantification of the project pipeline uses data published by AEMO on the status of renewable energy projects.

Further information is available from Rennie Partners' *Investor Principles – Supporting Report* – available for download at www.ceig.org.au

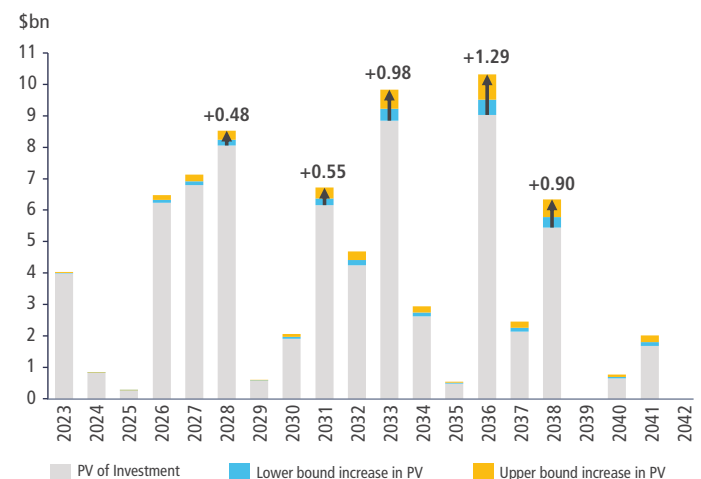
The Australian market is risky and attracts a higher cost premium

A survey of CEIG members suggested that the cost of capital is higher in Australia compared to other OECD countries such as the UK, US and Europe.

Since the cost of debt has gone down over recent years while the cost of equity has remained stable, Rennie Partners' survey findings suggest that the equity risk premium required by investors has grown over time.

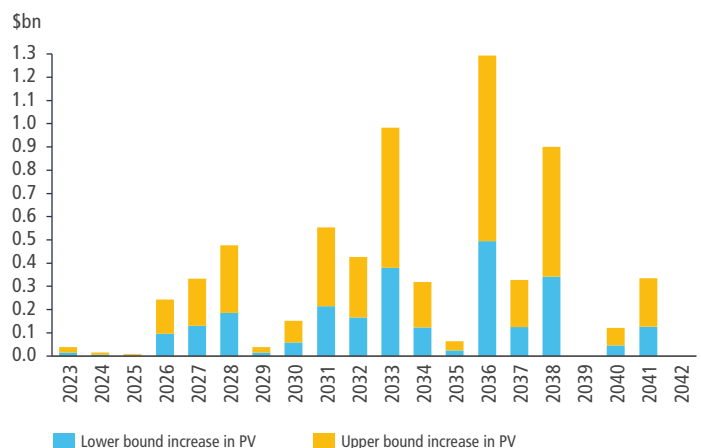
Present value of investment and cost of equity reductions, FY22 – FY42

Source: CEIG, AEMO, Rennie Partners



Present value of 100-250 bps reduction in cost of equity, FY22 – FY42

Source: CEIG, AEMO, Rennie Partners





CEIG Investor Principle 1

Align NEM development with global markets

Unlock capital pipeline by aligning with global investor expectations

Global investors, central banks and governments are increasingly responding to the risks posed by climate change. This influences decisions made by Australian and international investors and the relative attractiveness of the Australian electricity market to new investment.

The foundational CEIG Investor Principle *Align NEM development with global markets* is that in order to attract capital, Australian governments must align the transition of the NEM with the expectations of global markets and our international trading partners. This recognises that global investor sentiment is already shifting to net zero and seeking to mitigate climate risk. Investment in a national market which fails to plan for the shift to net zero consistent with international agreements will be seen as riskier and more uncertain than those that plan for an orderly transition, and invest in the necessary market reforms and physical infrastructure to make it a reality.

In November 2021, the Conference of the Parties 26 (COP26) climate conference in Glasgow will provide more clarity about the international policy context. In the lead up to the COP26 climate conference, Australian Energy Ministers should meet to take stock and adopt a transition plan that accords with global investor sentiment. In practical terms, this will require selecting from one of the diverse pathways in the ISP.

Governments must implement AEMO's ISP Step Change transition scenario to mitigate risk

The first action we identify under this Investor Principle is that governments should choose and implement an ISP scenario which is consistent with Australia's commitments under the Paris climate Agreement. The research commissioned by CEIG has identified AEMO's 2020 ISP Step Change scenario as the only current ISP scenario which aligns with those commitments. Collectively, CEIG investors consider Step Change a conservative but prudent scenario to adopt in planning for the NEM transition, and setting out a pipeline for investment which investors can plan for.

If governments can reach agreement to endorse an ISP scenario, they can then move confidently to decide on the ESB's *Post 2025 Market Design* reform proposals which will give investors and consumers the clarity they need to make financial decisions.

Providing long-lasting policy certainty

Institutional investors need this alignment with international market expectations to be established and maintained over the long-term so that they can then work to meet the capital needs of the NEM over the 2020s and 2030s.

Australia's clean energy resources are attractive to investors but systemic risks in the market are constraining investment. Providing for regulatory stability is a critical step towards improving investor confidence in the NEM.

After the COP26 climate conference, Australia will be in position to align the reform agenda in the NEM with international markets. Investor Principles 2 to 4 provide a framework for an investable NEM over the long-term.

CEIG Investor Principle 2

Redesign governance for transformation

The governance of the NEM needs to be redesigned to support the transformation underway in the electricity sector. The ambition of state-led REZ programs and the level of investment required to decarbonise the grid mean that the rules of the market, and how it is governed, have to keep up with the most fundamental change to the electricity generation sector for a century.

The architecture of the NEM was built for an era when the issues requiring management were the privatisation of state-owned utilities, the formation of a national wholesale electricity market and the need for greater competition. In contrast, the challenge of the 2020s and beyond is primarily to facilitate the transition to zero-carbon, reliable and affordable electricity in the NEM.

A new accord for NEM governance

The primary governance reform that is required is a new intergovernmental *Australian Electricity Transition Agreement (ETA)*. Similar to the current *Australian Energy Market Agreement (AEMA)*, an ETA would continue to be a framework to coordinate energy policy between the Commonwealth and jurisdictions governments. However, the ETA would be written to enable the fast, large-scale transformation of the energy system rather than the smaller incremental changes that the AEMA was designed to accommodate.

A new intergovernmental Australian Electricity Transition Agreement

An ETA would deliver long-term certainty to all market participants on the objectives and timeframes for the development of the NEM. The ETA would be the new foundational document of the NEM, outlining the long-term goals for the future development of the market and specific roles of governments and market bodies. In particular it would formalise and recognise the increased, and ongoing, roles of state jurisdictions in the future development of the NEM, such as facilitating the development of REZs and participation in the market through auctions or other long-term purchasing arrangements. It could also explicitly rule out any subsidies or regulatory subsidies to thermal generation. This would send a signal to investors that there is no risk of anti-competitive proposals such as the proposed physical retailer reliability obligation.

The ETA would preserve the current institutional framework by reforming the existing ESB into an *Electricity Transition and Security Board*. The Board would have the same advisory and regulatory alignment functions but would be more clearly aligned with investment and technology trends. This would reflect the new normal in the NEM: technological transformation and security of supply are not competing objectives. Instead, they must be integrated and planned for.

To support the Board with this new mission, Ministers would appoint a technology innovator as one of its independent members. The ETA could be negotiated by Energy Ministers and endorsed by First Ministers following the endorsement of the ESB's *Post 2025 Market Design* reforms and would also take into account the international agreements negotiated in Glasgow at the COP26 climate conference.

A climate change expert on the Board of each market body

The market bodies are statutory rule makers, operators and regulators. To support work programs consistent with Australia's commitments under the Paris climate Agreement, and recognising that timely decarbonisation of the NEM is an overarching public policy objective, the ETA would agree that at least one climate expert be appointed to the governing bodies of each of the AEMC, AEMO and AER.

Establishment of an *Investors and Innovators Advisory Council*

The ETA could also establish an *Investors and Innovators Advisory Council* made up of investment and technology innovation expertise. The Council would support Ministers and the market bodies by sharing independent, expert perspectives on the cutting-edge regulatory, technological and financial innovations occurring in the energy sector globally. Such an advisory body would ensure the market bodies remained constantly engaged with the latest investment and technological developments and would help inform decisions made by Ministers and market bodies on the design of key policy and regulatory reforms.

Adding an environmental objective to the National Electricity Objective (NEO)

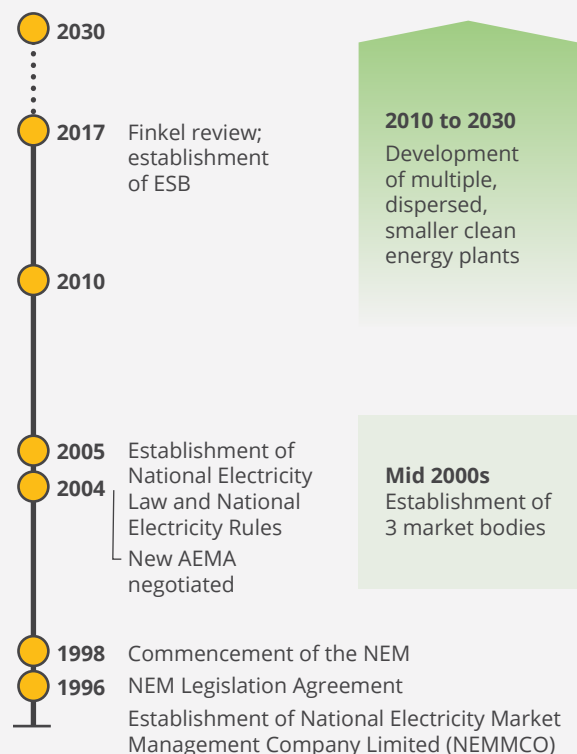
Consistency with the Paris climate Agreement and the integration of transformation and security must cascade down through the work programs of the three market bodies. This will require an environmental objective to be added to the NEO to recognise the need to reduce carbon emissions in the pursuit of efficient investment in, and operation, of electricity services.

The market bodies would then make the appropriate consequential revisions to the assessment criteria they use to inform policy and regulatory, including investment test, decisions.

A proactive and pragmatic approaches to market rules

In a time of rapid change market bodies should pursue pragmatic market designs that build on past successes, domestically and internationally, rather than the application of theoretical models which do not align with market practicalities.

From privatisation to clean energy transformation



They should recognise the benefits of proactive problem solving and apply forms of centralised planning where it is appropriate and needed. This recognises that governments will sometimes need to lead the development of new markets that are required as technology changes. For example, the AEMC should be commended for its recent proposal to proactively and centrally procure system strength.

Finally, market bodies should support innovation within and between jurisdictions to drive the decarbonisation of the electricity grid, including through formalised knowledge sharing of lessons learnt between NEM jurisdictions.

Increased transparency and accountability

In a system undergoing fast transformation, it is important for market bodies to be transparent and collaborative to provide market participants with better visibility around what's expected. A good example of a problem area is the currently opaque and complex grid connection process, which is now subject to the work of AEMO's Connection Reform Initiative.

CEIG Investor Principle 3

Improve revenue certainty

The third CEIG Investor Principle is to *improve revenue certainty* for clean energy investors. Achieving a reasonable level of revenue certainty is critical for committing to a final investment decision and securing finance. It is a key factor in lowering the cost of capital and is a major foundation of an investable clean energy market.

Unlike thermal generators whose costs are more evenly spread over the life of a plant, the costs of renewable energy generators are concentrated in the upfront capital investment. To improve bankability and lower the cost of capital, projects need to demonstrate they can generate predictable and stable revenue over the life of the project.

Clean energy investors currently face many barriers that create uncertainty about the predictability of future revenues. Market bodies should adopt revenue certainty as one of the key criteria used in rule-making. As state jurisdictions exert increasing influence over the creation and regulation of their own new clean energy markets, they should also be cognisant of the need to design policies and regulations that deliver sufficient revenue certainty to limit any unnecessary risk premiums.

CEIG believes that there is little value in designing price signals that aspire to theoretical purity but fail to provide certainty around revenue. Instead, it would be more constructive to pursue pragmatic market designs that build on past successes and allow for more predictable revenues.

Marginal loss factor reform

The application of Marginal Loss Factors (MLF) – the current loss factor methodology applied in the NEM – creates revenue uncertainty for clean energy generators. Investors build solar and wind projects on the basis of expected future revenue but can then be faced with unpredictable and potentially large variations in their MLF once those projects are operational.

The unpredictability of MLF variations and the range of change that can occur year on year can create revenue volatility that investors cannot ultimately control, manage or price effectively. This increases the cost of equity for new projects and is a strong disincentive to investment. Marginal loss factors should be reformed to put in place a more stable and fair regulatory environment.

Modernise the open access regime

CEIG supports the development of REZs as they provide an effective way to prioritise and coordinate where generation investment should occur and provide a strong signal to investors, particularly when combined with effective REZ access regimes. However, without commensurate investment in the transmission network, the expected benefits of REZ policies and the technical integrity of the network could be at risk because of the potential for congestion to occur in the transmission or distribution network between the REZ and the relevant regional reference node. This issue is further complicated where REZ networks are substantially ‘meshed’ with the broader distribution or transmission networks.

Governments and market bodies must work together to modernise the open access regime currently in place in the NEM. To accommodate the scale of clean energy investment required in the NEM, access to the grid will need to be more closely facilitated. Greater visibility of projects seeking to connect outside of REZs and mechanisms to balance opportunities to connect in the broader NEM with the certainty provided in REZs will need to be implemented.

Avoid approaches that incorporate locational marginal pricing

Locational marginal prices (LMPs) are an inadequate signal to inform investment location decisions and the principles behind the earlier AEMC's proposals under the *Coordination of Generation and Transmission Investment* have been widely rejected by investors and the industry more broadly as infeasible and likely to create additional risks in an already uncertain investment environment.

CEIG is concerned that the ESB continued to pursue the use of LMPs as part of its congestion management proposals as outlined in its *Post 2025 Market Design Options* paper and suggests that the market bodies must avoid approaches that incorporate locational marginal pricing.

Integrate NEM development with economic stimulus policies

Successfully aligning the NEM with international markets and building appropriate governance and rule-making principles will drive investment into regional areas. This should be integrated with state and economic development and benefit sharing policies to maximise opportunities for those regional areas to build and maintain social licence for the transformation of the energy sector.

Locational marginal prices fail to provide a suitable investment signal

Locational Marginal Prices (LMPs) do not provide an appropriate locational signal and provide too much uncertainty for future investment. An LMP provides a signal for where to locate in that specific five-minute interval. The pattern of historical LMPs is not sufficient to provide a robust long-term locational signal as it does not incorporate sufficient high quality long-term future information and does not allow for effective predictions of future LMPs.

LMPs do not contribute meaningfully to projections of future revenue. Rather, LMPs create difficulties in forecasting revenue and therefore generate uncertainty that increases the cost of capital and long-term price for consumers.



CEIG Investor Principle 4

Allocate risk effectively

Investors seeking to develop new clean energy assets face a number of excessive risks that ultimately increase the cost of capital and dampen investment. As these risks are often the result of legacy NEM features, poor regulatory design or policy uncertainty, they are out of the direct control of investors and cannot be mitigated by individual project owners.

Our fourth Investor Principle – *allocate risk effectively* – aims to guide market bodies and governments to design policies that avoid placing an unnecessary risk premium on the cost of capital.

Align investor risk with factors that can be priced or managed

To lower the cost of capital, investors should not be exposed to excessive risks to revenue. Whenever they design policies or regulations, market bodies and governments should aim to allocate risks to the party best able to influence and control those risks. Generally, investors will accept to take risks that they can control, manage or price effectively.

Whenever investors cannot control a risk, they are prepared to take steps up-front to de-risk and pay a price commensurate with the risk mitigation benefits received. For example, to mitigate congestion risk, investors have expressed support for REZ access regimes where generators pay a fee in return for the provision of more firm access to the transmission network.

The importance of durable policy and regulatory frameworks over time is paramount as investors need to assess, quantify and mitigate risks as accurately as possible prior to making final investment decisions on their projects.

Unblock generator connection

Network connection risks create uncertainty that is extremely difficult for investors to quantify and is the source of a material risk premium on their cost of capital.

Market bodies should focus on reforming the connection and commissioning process to account for the changing nature of the electricity

generation fleet in the NEM. The development of standards for connection applications and decisions could help accelerate the pace of approvals and reduce project risk. There is also a need for better defined information and modelling requirements and for greater transparency and accountability from the market bodies and the transmission network service providers.

CEIG welcomes the introduction of AEMO's Connection Reform Initiative to progress work on these complex issues and the collaborative approach that it fosters with industry.

Greater transparency and accountability

CEIG acknowledges the continuing efforts from the market bodies to provide more granular and more regular information and to engage deeply with industry more broadly. Nevertheless, the requirement for greater transparency and accountability should also be applied more broadly than the connection and commissioning process.

Market participants should have formal opportunities to interrogate the market bodies' decisions and it may also be useful to consider new or improved dispute and review mechanisms in the National Electricity Rules. For example, it would have been beneficial for market participants to better understand and have the ability to question AEMO's decisions and actions in the Western Murray Zone in Victoria and New South Wales. These new or improved dispute and review mechanisms could include a broader dispute resolution process, independent review panels or quick referral processes to standing panels.

Collaboration for long-term social licence

CEIG recognises the importance of obtaining and maintaining social licence for clean energy projects with local communities. Investors are prepared to lead the way by conducting best-practice community engagement and by sharing the benefits of their projects with local communities. Investors look forward to collaborating with industry, governments and regulators to ensure the clean energy sector maintains its long-term social licence.

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Living Room lights

2 lights



CEIG Investor Principle 5

Build investable and innovative markets

NEM market design needs to be fit-for-purpose to enable the large-scale transformation of the energy system that will occur over the next 10-20 years. The establishment of effective markets and appropriate procurement and funding frameworks is essential to deliver all the assets and services that will support the energy transition.

Our fifth CEIG Investor Principle sets out how to enable this generational investment through the definition of markets that investors can confidently invest in.

Enable effective REZ development

Considering the level of investment required in the NEM, the development of a framework that facilitates investment at scale and at pace is critical to a successful energy transition.

The creation of REZs as a concept, followed by the introduction of regular ISPs, actionable ISP Rules and the ESB's REZ Framework have been welcome developments in the definition of investable REZ markets in the NEM.

The state-led REZ programs are significant in scale and will provide strong signals to investors for where to locate their projects. Provided the key features of those REZ programs – REZ access regimes, pricing, auctions and offtake contracts – are designed taking into account our Investor Principles, they will enable least-cost clean energy investment at the scale required.

CEIG welcomes state-based approaches to REZ design. However, CEIG also encourages state governments and market bodies to coordinate REZ development and foster policy consistency across the NEM. This will provide greater predictability around the pipeline of projects and could avoid potential bottlenecks from multiple competing REZ markets.

Accelerate investment in transmission network capacity

Investment in transmission infrastructure is a critical requirement for the success of the energy transition and needs to be delivered in time for new clean generation capacity to be operational ahead of coal plant closures.

If the delivery of transmission infrastructure is slow or delayed, projects will struggle to connect to the grid and the NEM could see repeats of the issues seen in the Western Murray Zone. Without sufficient transmission investment, there is also a strong risk of congestion increasing in the NEM which may dampen investor confidence further.

The development of new transmission infrastructure can be considered a public good that will facilitate the rapid decarbonisation of the Australian economy. To facilitate that investment, CEIG supports the costs of transmission infrastructure being shared between its beneficiaries:

- investors and generators who benefit from greater and more firm access to consumers;
- consumers who benefit from a clean and reliable energy system;
- the growing category of market participants who are both energy consumers and producers (such as hydrogen producers) who will benefit from greater access to generators, consumers and export markets; and
- governments as they achieve broader social, regional and economic policy outcomes through the transformation of the energy system.



Reform the regulatory investment test framework

The process to approve transmission infrastructure investment needs to be modernised to be more timely, improve contestability and factor in the broader suite of benefits that accrue with those investments, including environmental and social factors. The mechanics of the Regulatory Investment Test for Transmission need to be simplified and allow for faster project delivery.

They also need to allow for innovative non-network solutions to be more appropriately considered than they currently are.

Improve contestability frameworks

The transmission network needs to be transformed to enable the transition of the energy supply system. Greater contestability of transmission frameworks can enable lower costs for consumers and promote a quicker and more efficient build out of transmission to ensure a more orderly transition ahead of coal closures.

Over the last 20 years, the transmission companies have largely focused on maintaining a large existing electricity grid, not on building complex infrastructure projects. They may also lack incentives for efficient scoping and procurement since the regulatory framework guarantees their return based on the size of their regulated asset base.

In contrast, private investors have greater capacity and capability to deliver the large scale of transmission investment required:

- investors have deep experience in delivering large infrastructure projects;
- they are used to managing complex risks;
- they have gained valuable experience gained in other sectors and/or other countries; and
- they can leverage larger pools of capital at lower cost for the ultimate benefits of consumers.

The market bodies should leverage private investors' expertise by enabling greater contestability in the delivery and funding of transmission investment. CEIG looks forward to engaging with the AEMC on its *Transmission Planning and Investment Review*. States also need to further consider how natural monopolies (privatised and state-owned) can be incentivised to deliver more timely delivery of projects, achieve cheaper cost of capital outcomes and bring new market participants into the sector.

The provision of system services requires new procurement methods and innovation

As the grid accommodates an increasing proportion of inverter-based devices, system services will need to be procured differently. The ESB has made useful proposals in its *Post 2025 Market Design Options* paper with a combination of new markets and more efficient procurement methods for system services. Those proposals offer effective ways to coordinate the central procurement of sufficient system services while increased competition will deliver lower costs. CEIG encourages market bodies to continue considering the use of inverter-based devices to deliver system services in the NEM.







**Clean Energy
Investor Group**

📍 50 Camberwell Road, Hawthorn East VIC 3123

✉ secretariat@ceig.org.au