

More NSW businesses with rooftop solar would be a ‘win win’ for power bills and the clean energy transition

Australia’s transition to clean energy is crucial for meeting climate goals, enhancing energy security, supply reliability, and reducing costs.

Customer-owned energy resources (CER), especially rooftop solar photovoltaic (PV) and batteries, already play a significant role in our energy mix and have huge potential to further accelerate the transition. Rooftop solar generated 11.2¹ per cent of our energy in 2023, and 11.6 per cent of 2024 year-to-date in NSW² making it the second-largest contributor of renewable energy generation last year and again in 2024.

More effectively harnessing CER as a source of power would accelerate our energy transition, provide consumers with immediate reductions in their energy bills and bring benefits to the wider community. This is true for residential installations, as well as for businesses.

New South Wales is leading the nation in CER installations. In light of the recent extension of Eraring in response to a forecast reliability gap, this discussion paper aims to highlight the role of Commercial and Industrial (C&I) CER as another key contributor to addressing this gap and facilitating the energy transition.

Compared to residential installations, C&I CER is larger in scale, and more easily managed and integrated into the power system. Despite this, solar PV systems are disproportionately installed on household rooftops across Australia. This is a missed opportunity for businesses and for the power system.

As part of our previous work in identifying and supporting the dismantling of barriers to CER, Nexa Advisory has outlined several policy areas that the NSW Government can develop to incentivise C&I companies to invest in solar panels and batteries. This paper further details the barriers and opportunities for this development.

This would unleash a significant untapped resource for the clean energy transition and leverage existing grid infrastructure, reducing costs for NSW businesses. Critically, it also provides insurance, providing affordable and reliable electricity for businesses. From a system planning perspective, enabling this resource helps to bridge the reliability gap recently identified by the Australian Energy Market Operator (AEMO), increasing the certainty in and reliability required to close coal-fired power stations in a timely manner without risk to power reliability or prices.

¹ Clean Energy Council, [Rooftop solar and storage report H2 2023](#), p.4, 16 April 2024

² [OpenNEM](#)

CER in NSW

The status quo

As shown in Figure 1, NSW has led deployment of solar PV at all scales in Australia since 2018. The state accounts for 27 per cent of all systems installed in Australia since 2001.

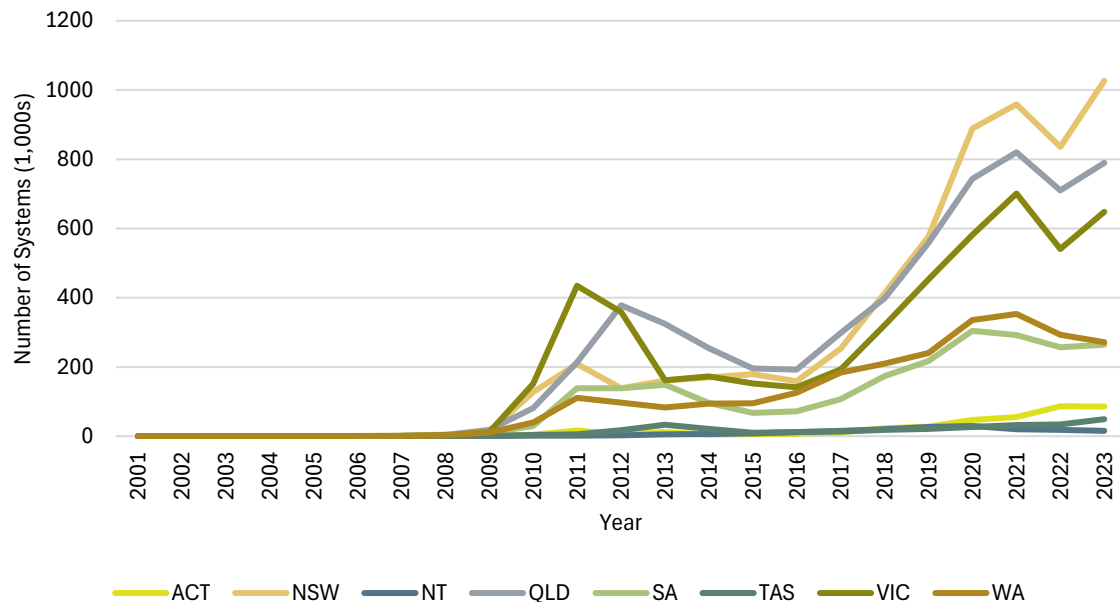


Figure 1: Number of Solar installations by state (CER and Sunwiz data)

However, both the total and growth in installation numbers in NSW are dominated by residential systems. Of the installed capacity, 77 per cent of systems are less than 15 kW - which has been typical for the residential sector. We are now seeing growth in 15-30 kW systems, which highlights the increasing size of residential arrays³.

Shown in Figure 2, the size and scale of residential rooftop solar PV in NSW currently accounts approximately a third of residential electricity consumption. This compares to a much smaller amount of only 5 per cent of self-generation for C&I consumers.

³ PV Magazine, [Australian consumers say bigger is better for rooftop solar](#), 25 January 2024

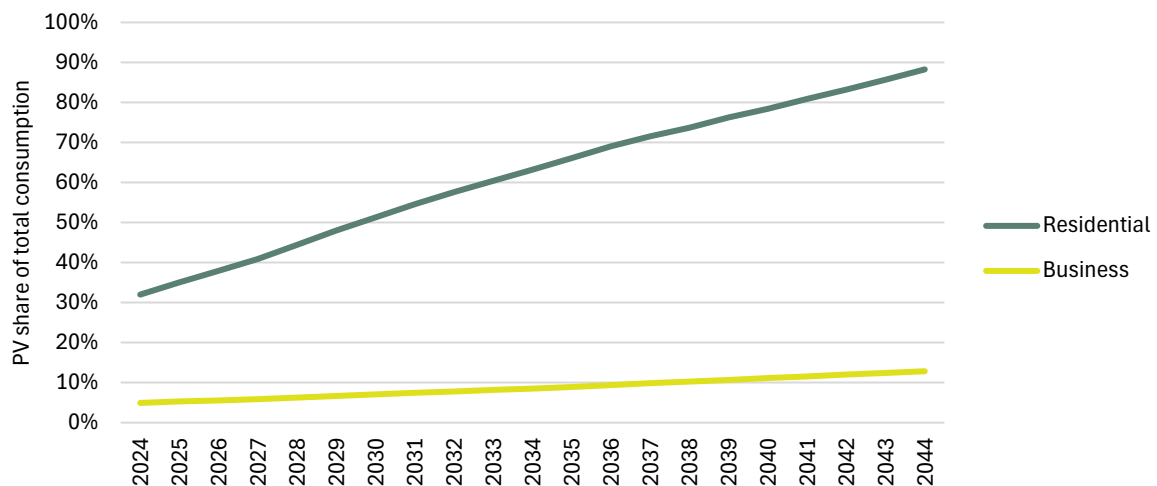


Figure 2: Share of total NEM-wide electricity consumption, by sector, met with sectoral rooftop solar PV (AEMO 2023 ESOO Central Scenario, Nexa analysis)

Clearly, C&I consumers are not investing in rooftop PV in the same way as households, despite the benefits to their bottom line. This trend is expected to continue; AEMO projects that in 20 years, nearly 90 per cent of residential electricity consumption but only 13 per cent of C&I electricity consumption will be met by rooftop solar PV.

The potential

Nationally, there is an estimated potential for up to 28 GW of C&I rooftop solar PV. With NSW representing 28 per cent of all solar installations over 15 kW, this suggests there is a potential for over 7 GW of C&I rooftop solar PV in NSW⁴.

The potential for battery installations for C&I customers is equally untapped. AEMO’s Integrated System Plan (ISP) projects a total build of 11.6 GW of distributed batteries in NSW alone over the next 20 years⁵.

A significant share of these could be installed at C&I facilities such as warehouses, which have roof-space that could generate power in excess of their actual need. This makes them ideal locations for the deployment of batteries - turning warehouses into small and nimble dispatchable power plants. This opportunity has already been recognised in the property industry, with early movers such as Dexu planning to deploy more than \$25 million of batteries in its new warehouses⁶.

Together, unlocking C&I CER through rooftop solar and batteries benefits business consumers through demand-side management, allowing shifting consumption profiles to reducing peak demand charges and resulting in cost savings on energy bills. These measures also improve energy resilience, providing electricity backup for business operations.

⁴ Ibid, 28 % taken from analysis of data used in this report.

⁵ AEMO, Draft 2024 Integrated System Plan, December 2023

⁶ AFR, “Batteries to power up warehouse pipeline as big as 40 MCGs”, 29 April 2024

Benefits of C&I CER

Reducing bills

Rooftop solar PV and batteries can directly and significantly reduce a consumer's energy bills⁷ and provide greater control of energy costs. This is especially the case for C&I customers who are likely to have specific contracts with networks and retailers that have a time-of-use component⁸. Adding batteries will add yet more value.

According to Dexus, installing a 200-kilowatt-hour (kWh) battery in the base build of a new 20,000 sqm warehouse will cut energy costs by \$92,000 a year⁹. Unsurprisingly, nine out of ten prospective warehouse tenants now show interest in warehouses with embedded energy solutions¹⁰ that will reduce their cost base. The 50 per cent year-on-year decline in solar module and battery export prices out of China in 2024 makes the commercial case even more compelling, but we need a business education program to raise awareness.

Increasing Flexibility

Integrating CER into the power system includes 'orchestration' measures to deliver system and/or market benefits, via direct control or incentivising consumers through retail and/or network tariffs^{11,12}. Much of the focus of the work in this area so far has focused on residential consumers. However, working with larger-scale C&I consumers is less complex and costly^{13,14}. With proper engagement by dedicated energy professionals, significant capacity could be efficiently accessed and made flexible.

Reducing network impacts and service augmentation

Utilising solar and Battery Energy Storage System (BESS) to reduce and shift load peaks reduces the need to invest in C&I connection infrastructure and the distribution networks. The reduced network investment benefits all consumers by reducing network tariffs.

C&I loads coincide with peak solar

Unlike homes where peaks loads are outside peak solar times, a significant proportion of C&I consumers use their energy during the day. As such, the reductions in energy costs will often be significantly higher than in the domestic setting.

Barriers to C&I CER

There are many barriers which must be addressed to accelerate the uptake of CER in the C&I sector. Many of these barriers reflect structural misalignment and the lack of incentives to enable businesses to benefit from these investments. These include:

⁷ Nexa Advisory, [Putting the Power in People's Hands](#), Oct 2023

⁸ Australian Treasury, [Consultation on Consumer Data Right \(CDR\) rules amendments submission](#), Sept 2021

⁹ AFR, [Batteries to power up warehouse pipeline as big as 40 MCGs](#), 29 April 2024

¹⁰ Ibid

¹¹ Powercor, Transmission Licence [webinar](#), 16 May 2024

¹² AEMC, [Unlocking CER benefits through flexible trading](#), August 2023

¹³ New Energy Ventures, [Opportunities for Batteries & VPPs in the Australian C&I segment White Paper](#), 2020

¹⁴ Energy Storage World Forum, [5 Reasons Why C&I Virtual Power Plants are better than residential ones](#), accessed 29 May 2024

- **Tenancy** - businesses that are tenants depend on landlords to install or give approval to deploy CER. This limits these businesses, including because benefit sharing with the landlord erodes the business case for CER.
- **Physical limitations** - the structural integrity of some commercial buildings may preclude deploying rooftop solar PV.
- **Missing retail arrangements** - some retailer contracts prevent C&I customers from deploying CER.
- **Outdated tariff design** - network tariffs and connection requirements may limit the benefits of CER.
- **Missing market for services** - lack of innovative retail offerings and incentives for C&I to provide flexibility services, resulting in the failure to realise the full benefits of CER.
- **High capital cost** - upfront capital costs are a barrier to investment, especially in the current economic climate.
- **Low awareness of benefits** - some businesses are unaware of potential bill savings.
- **Technical connection requirements** - connecting large-scale CER systems with grid export capability often requires bespoke technical analysis and design that increases connection risks and timelines.
- **Lacking emissions reduction reporting/mandate** - many businesses are not actively engaged in Environmental, Social and Governance reporting and understand the potential impacts of carbon emissions on their business.

Unlocking C&I CER

NSW is Australia's leading CER state. Unlocking the full potential of C&I CER to maximise benefits is the next area for development in the sector.

Given the pending exit of remaining coal-fired power stations – including Eraring – NSW would benefit from the rapid deployment of a well-designed policy program to accelerate private investment in CER. This would ensure replacement capacity can be delivered ahead of coal closures. A comprehensive policy approach should also leverage the existing grid and explore the deployment of Virtual Power Plant (VPP) schemes where possible. Creating a strong financial incentive to overcome deployment barriers is critical to unlocking this opportunity.

We encourage the NSW Government to consider the following recommendations under its current NSW Consumer Energy Roadmap:

1. Establishing a scheme similar to Small-scale Technology Certificates (STCs) for systems beyond 100 kW, or leveraging the Peak Demand Reduction Scheme (PDRS) to enable businesses to capture the benefits of installing CER more easily.
2. Battery systems and participation in VPP offering for C&I consumers can be a key contributor to reliability – including through demand-side response¹⁵ - and should therefore be considered under future Capacity Investment Scheme (CIS) or Long-term Energy Service Agreement (LTESA) auctions, and could be incentivised to do so through a simplified application process.
3. C&I consumer network tariffs must be reviewed to unlock value, with a focus on C&I participation and flexible load.

¹⁵ Nexa Advisory, [Accelerating Commercial & Industrial Demand Side Participation in NSW](#), Feb 2024



About Nexa Advisory

Nexa is a full-service advisory firm. We work with public and private clients including renewable energy developers, investors and climate impact philanthropists to help accelerate efforts towards a clean energy transition. We've been shaping the energy industry for over 20 years. With a proven track record across policy creation, advocacy, political risk assessment and project delivery, we're holistic in our approach and deliver solutions with commercial intent.

The Nexa Advisory team is a collaboration of passionate energy specialists, all committed to the successful transformation of Australia's energy markets. The team is focused on helping clients grasp the unpredicted opportunities the energy transformation will bring. The decentralisation of energy promises, for the first time, to enable a truly democratised ecosystem with people and communities at the centre. We believe in an energy industry where people are at the centre of every recommendation we make. This belief guides our approach to the challenges we solve, and the outcomes we create.

Disclaimer:

Nexa Advisory disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the material including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

Nexa Advisory further does not warrant or accept any liability in relation to the quality, operability or accuracy of the material.

Whilst the material is considered to be true and correct at the date of publication, changes in circumstances after the time of publication may impact upon the accuracy of the material. The material may change without notice and Nexa Advisory is not in any way liable for the accuracy of any information printed and stored by a user.

Nexa Advisory takes no responsibility for the accuracy, currency, reliability and correctness of any information included in the material provided by third parties nor for the accuracy, currency, reliability and correctness of links or references to information sources (including Internet sites) outside of Nexa Advisory.