

Rewiring Aotearoa submission on Maximising benefits of local generation

About Rewiring Aotearoa

Rewiring Aotearoa is an independent non-partisan non-profit, funded by New Zealand philanthropy. It is a registered charity working on energy, climate, and electrification research, advocacy, and supporting communities through the energy transition. The team consists of New Zealand energy, policy, and community outreach experts who have demonstrated experience both locally and internationally. We're always fighting for the New Zealanders who use the energy system, and our goal is to help build a low cost, low emissions, high resilience electrified economy for Aotearoa NZ.

Key points

We strongly support the Electricity Authority's aim of removing unnecessary barriers to more efficient investment in distributed generation and maximise the benefits it brings for all New Zealanders.

It is great to see the progress the EA is making in its Networks connection workstreams which will translate in real benefits for consumers.

We agree with the Electricity Authorities description of benefits from distributed generation and support the proposals set out in this consultation although propose some additional measures and modifications.

Proposal A1: Part 6 sets a default 10kW export limit (static export limit)

Q1. What are your views on the proposal to set a default 10kW export limit for Part 1A applications?

We strongly support the Authority's proposal to set a default 10kW export limit for Part 1A applications.

Currently the typical 5kW export restrictions imposed by networks on new small distributed generation connections are often arbitrary and do not reflect real constraints on the network - limiting small scale solar exports unnecessarily.

There are significant benefits for allowing greater exports from customer solar and battery systems - both to the customer investing and for all customers due to these investments lower electricity costs.

We think that a default 10kW export limit will be more efficient and provide long-term benefits to DG owners (e.g. owners of residential solar and batteries), electricity consumers, and New Zealand in general. These benefits include, for example:

- positive returns for DG owners, encouraging more efficient DG uptake
- reduced and/or deferred investment in network upgrades (eg, by using DG to meet peak electricity demand), saving consumers money
- improved security of supply, through greater investment in generation
- increased energy supply when there is a dry year and/or low wind, leading to lower wholesale electricity prices and reduced power bills for consumers
- reduced greenhouse gas emissions.

Q2. What are your views on the Code clarifying that a distributor cannot limit the nameplate capacity of a Part 1A application, unless the capacity exceeds 10kW?

We agree that the Code should clarify that distributors cannot limit the name plate capacity of a Part 1A application.

However in our view it would be better for the Part 1A application to apply to connections which would meet export limits of up to 10kW but have no limit on name plate capacity.

We hear from households through our community engagement that are designing smaller capacity rooftop solar installations than would be optimal for their needs, just to keep the installed capacity under 10kW to access the Part 1A connection pathway. This is despite the maximum export through the inverter from their system being under 10kW.

It is only the exported power that would influence network reliability and voltage limits so the streamlined connection process should be based on the export limits not installed distributed generation capacity.

This would provide a streamline pathway for new DG customers and increase benefits to customers who export up to 10kW without impacting the operation and reliability of networks. For example if a customer wanted to connect a solar and battery system under Part 1A applications which has nameplate generation

capacity above 10kW they could, as long as the solar & battery system was configured so it would not export more than the imposed 10kW export limit. This would maximise benefits to customers by allowing customers a streamlined pathway to install solar and battery systems optimised for their needs (e.g. potentially greater than 10kW system) sized to power their onsite energy needs and be stored in batteries for later use. Only excess generation up to 10kW could be exported.

Q3. There are requirements for distributors in Proposal A1. Which of these do you support, or not support, and why?

We support the requirement for distributors in Proposal A1 to implement a default 10kW export limit for Part 1A applications.

However the 10kW default export limit should not necessarily create an upper limit if distribution networks analysis shows a higher default limit is possible without compromising network operations. Bespoke export limits for Part 1A should not only have scope to be lower than 10kW but also higher. As we note above a limit on nameplate capacity for connections for DG connected under the Part 1A process is not required.

We support the requirement in Proposal A1 to require distributors to take the following steps to set a lower default export limit for certain parts of the network:

- a) undertake a network assessment to determine in what areas, if any, a lower export limit will apply, using the industry-developed export limits assessment methodology (ELAM), that the Code will require all distributors to adopt
- b) publish the network assessment, and a copy of the ELAM (or a link to it), on the distributor's website
- c) publish a signed statement by its CEO that export limits have been determined in accordance with Code requirements and the ELAM
- d) for applicants, include easily accessible lists or maps of areas on a network where lower than 10kW export limits apply
- e) repeat the network assessment where there has been a material change on the network (eg, changes to low voltage conductors (lines/cables) or transformers, or high voltage network changes) – the distributor can also reassess earlier if they choose.

In addition to point (a) we strongly urge the Electricity Authority to commission an independent expert review of the industry-developed ELAM with the scope of the review to be undertaken from the customer perspective to ensure it is sufficiently designed to avoid unnecessary export limits being implemented, and provides

transparent, fair outcomes for customers. Code amendments should be drafted in a way that requires this and requires EDBs to give effect to the recommendations of this review.

In addition to the requirement (e) to repeat the network assessment where there has been a material change on the network, we think that bespoke export limits that apply under the Part 1A connection process should be reviewed every two years. The review should explain to the Electricity Authority what innovative steps have been taken to:

- provide more dynamic management of exports that could reduce the need for lower bespoke export limit,
- demonstrate what new information have been considered and why, including assessment of smart meter data or similar granular information about low voltage networks constraints, and
- options to encourage more local demand at mid summer days- to utilise solar exports at times when they are likely to be the highest (to help reduce potential network congestion associated with solar exports).

The Authority notes in point 5.28 that it expects distributors to evolve their approach to export limits, so consumer benefit is maximised. For example, this could include distributors allowing higher limits with pre-conditions (eg, requiring smart inverter control). This additional two yearly proposed review is needed to ensure EDBs are actively exploring innovative, smart solutions that can benefit customers and lower network investment. For example dynamic operating envelope and smart inverter control could be paired to maximise network utilisation and distributed generation exports - with low levels of curtailment, in a way that minimises or avoids network investment as small scale solar uptake increases. The Electricity Authority should actively monitor and ensure that EDBs are undertaking improvements to network management that can avoid unnecessarily keeping lower bespoke export limits in place long term.

Q4. What are your views on the proposal for industry to develop an export limits assessment methodology?

Please see response to Q3.

In summary, we support this proposal for industry to develop an export limits assessment methodology - however to mitigate risk of unnecessary export limit restrictions resulting from the use of the ELAM, we strongly suggest that the Electricity Authority commission an independent expert review of the ELAM with the scope of the review to be undertaken from the customer perspective to ensure it is sufficiently designed to avoid unnecessary export limits being

implemented, and provides transparent, fair outcomes for customers. Code amendments should be drafted in a way that requires this and requires EDBs to give effect to the recommendations of this review.

In addition to the requirement to repeat the network assessment where there has been a material change on the network, we think that bespoke export limits that apply under the Part 1A connection process should be reviewed every two years. The review should explain to the Electricity Authority what innovative steps have been taken to:

- provide more dynamic management of exports that could reduce the need for lower bespoke export limit,
- demonstrate what new information have been considered and why, including assessment of smart meter data or similar granular information about low voltage networks constraints, and
- options to encourage more local demand at mid summer days- to utilise solar exports at times when they are likely to be the highest

This would provide a way for the Electricity Authority to actively monitor and ensure that EDBs are undertaking improvements to network management that can avoid unnecessarily keeping lower export limits in place long term.

In addition we think that bespoke export limits for Part 1A should not only have scope to be lower than 10kW but also higher. This would allow scope to provide greater consumer benefit (through increased DG exports) if the distributor's analysis demonstrates this is feasible with its existing network.

Q5. What would you do differently in Proposal A1, if anything?

Please see our response to Q3.

Q6. What concerns, if any, do you have about requiring the 2024, rather than 2016, version of the inverter installation standard for Part 1A applications?

We do not have any concerns.

Proposal A2: Part 6 sets default inverter response settings
(dynamic export limits)

Q7. Do you support amending the New Zealand volt-watt and volt-var settings to match the Australian values - why or why not – what do you think are the implications?

Yes we support amending the New Zealand volt-watt and volt-var settings to match the Australian values. This would mean the inverter settings are consistent with the new 230 V +/- 10% settings supporting more efficient exports from distributed generation whilst meeting the new safety requirements.

This would increase benefits (as described above) to electricity consumers through increased safe and efficient DG exports, without compromising voltage stability.

The Australian settings have been in place for some years without issue and it makes sense to move to these settings in New Zealand. As the Authority notes, New Zealand distributors already refer to the Clean Energy Council list of approved inverters for their networks, the list used by Australian distributors. Further, Australia and New Zealand share a common product market, so household appliances should not be unduly affected by adopting the Australian volt response settings.

We also agree with the Authority that:

- Optimised volt response settings enable inverters to respond more effectively to local voltage fluctuations. This reduces unnecessary curtailment of DG output and increases the amount of energy available for self-consumption or export.
- Applicants wanting to connect DG would see immediate benefit from the updated volt response settings.

We support the Authority's proposal to update Part 6 of the Code, so it references: (a) the Australian volt-watt and volt-var settings in the inverter performance standard (as detailed in Figures 10, 11 and 12 below) (b) the Australian inverter settings for sustained operation at high voltage (c) the latest version of the inverter performance standard (AS/NZS 4777.2:2020 incorporating Amendment No.1 and 2).

We have not responded to questions Q8, Q9, Q10.

B. Proposal to improve setting larger scale export limits (Part 2 bespoke export limits)

Q11. What are your views on the proposal that where distributors set bespoke export limits for Part 2 applications, they must do so using the industry developed assessment methodology?

We support the proposal for distributors to set bespoke export limits for Part 2 application using an industry developed assessment methodology.

It is important that the proposed assessment method that distributors use is transparent, fair and use is monitored by the Electricity Authority to ensure it is not used to unnecessarily limit distributed generation. A third party expert review on behalf of consumers of the bespoke export limits assessment method (BELAM) for Part 2 applications should be undertaken to ensure the industry developed assessment method is robust and unbiased. Code amendments should be drafted in a way that requires this and requires EDBs to give effect to the recommendations of this review.

Getting this right will be really important for many small businesses, community groups, farms and households who want to install more than 10kW of solar so that unnecessary limits are not placed on the scale of their solar and battery installations. This group of customers installing mid size solar are typically not resourced to engage in the connection process with distributors in the same way that the large utility scale distributed solar and battery firms are. We think it's important that the proposed assessment method that distributors use is transparent, fair and use is monitored by the Electricity Authority to ensure it is not used to unnecessarily limit distributed generation. A third party expert review on behalf of consumers should be undertaken to ensure the industry developed assessment method is robust and unbiased.

Q12. What are your views on the several requirements that must be adhered to regarding the distributors' documentation (see paragraph 5.96) relating to setting export limits under Part 2?

We agree with these requirements, however there should be a process where any deviation from the BELAM can be rejected by the Electricity Authority and the analysis be required to be repeated using the BELAM. Having greater oversight will be important and any reason to deviate from the BELAM requires technical scrutiny by a technical expert commissioned or employed by the Electricity Authority.

Q13. Do you agree it is fair and appropriate that where distributors set export limits for Part 2 applications, applicants can dispute the limit? If so, what sort of process should that entail?

Applicants should be enabled to dispute the limit if they think it is not efficient. This should be especially relevant where deviations from the BELAM methodology are used and smaller customers will especially benefit from support to reassess whether export limits are fair and appropriate.

Q14. What would you do differently in Proposal B, if anything?

As noted above, we proposed the following additions to the proposal:

- A third party expert review on behalf of consumers of the Bespoke Export limits assessment method (BELAM) for Part 2 applications should be undertaken to ensure the industry developed assessment method is robust and unbiased. Code amendments should be drafted in a way that requires this and requires EDBs to give effect to the recommendations of this review.
- There should be a process where any deviation from the BELAM can be rejected by the Electricity Authority and the analysis be required to be repeated using the BELAM.
- Applicants should be supported to dispute the limits through a well defined process if the EDB has deviated from the BELAM.

Proposal C: All low voltage DG applications must comply with the inverter performance standard

Q15. What are your thoughts on requiring the inverter performance standard (AS/NZS 4777.2:2020 incorporating Amendments 1 and 2) for low voltage DG applications in New Zealand?

We support the proposal to require the AS/NZS 4777.2.2020 performance standards.

6. Transitional arrangements

Q16. Do you consider the transitional arrangements workable regarding requirements and timeframes? If not, what arrangements would you prefer?

We support the Authority and agree it is important to implement these proposals quickly to deliver consumer benefits. We think that the 4 month transitional timing is fair and reasonable and can ensure effective, efficient and safe implementation. We have seen how some EDBs have already raised the default export limit and we think for many EDBs an even shorter timeline is possible.

7. Regulatory statement for the proposed amendments

Q17. What are your views on the objective of the proposed amendments?

Yes we agree with the objective of the proposed amendments.

Q18. Do you agree the benefits of the proposed amendments outweigh their costs? If not, why not?

Yes - we agree the benefits of the proposed amendments will significantly outweigh costs.

This article by Rewiring Aotearoa outlines how customers can play a key role in lowering energy costs for themselves and all electricity consumers:

<https://www.rewiring.nz/news/how-customers-can-reduce-electricity-prices>

Q19. What are your views on the Authority's estimate of costs of lost benefits from a 5kW export limit?

In addition to lost benefits from the 5kW export limit, there are significant lost benefits to households from the current 10kW capacity limit that applies to access the Part 1A connection pathway. The capacity limit of 10kW for the Part 1A connection pathway can incentivise customers to undersize rooftop solar investments. Households benefit the most from investment in solar by maximising their own use and avoiding the variable cost of electricity. As the cost of solar panels continues to fall the value proposition to households from investing in large panel sizes and avoiding more variable costs is increasing. However the capacity limit on who can access Part 1A will limit installed capacity and benefits to customers.

These benefits could be provided to customers by applying our proposal that Part 1A applications apply to connections which would meet export limits of up to 10kW but are not limited by name plate capacity.

Q20. Are there costs or benefits to any parties (eg, distributors, DG owners, consumers, other industry stakeholders) not identified that need to be considered?

Additional benefits:

The Authority should also consider the wider benefits from measures that enable customers to invest in rooftop solar, that provides lower cost electricity which support electrification and associated affordability benefits especially for households struggling with electricity bills including:

- Household energy production/storage and electrification offer large private and public benefits

- Households can save thousands a year from day one, especially benefitting those struggling with rising energy bills
- The public benefits from home energy generation and storage, and electrification, are diverse and substantial
 - Household solar and electrification can help address energy hardship
 - Electricity production from rooftop solar can be significant and delivered quickly
 - Household batteries and solar lower the need for grid infrastructure investment
 - Household solar and batteries provide household and community energy resilience
 - Household solar can help in a dry year
 - They also reduce emissions and NZ's financial liability
 - Solar and electrification can support NZ communities, and NZ, with diminishing gas supplies
 - Solar and electrification support keeping inflation under control

Please refer to Appendix 1 for more details.

Innovation will be key to avoid or offset network costs:

It is important for the Electricity Authority to carefully scrutinise and test potential costs to support efficient export limits.

In the recent trial Aurora undertook, they were able to use smart meter data to test the potential to move to a default 10kW export limit. With low levels of solar on the system, shifting from a network configured to allow customers to export at a default 5kW to a system that allows the current small number of rooftop solar customers to export at 10kW may require no physical upgrades in the near term.

In point 5.35 the Authority notes “Distribution networks have been built, over many years, to maintain voltage levels at 230V $\pm 6\%$. Reconfiguring these for 230V $\pm 10\%$ will not always be straightforward. In some instances, a distributor may need to impose lower export limits until they can upgrade physical assets (eg, transformers, lines) to accommodate the higher voltage range. However, with limited visibility of their networks, they may not always know this until issues occur.”

Lack of visibility should not be used as an excuse for setting conservative and inefficient low default export limits or for undertaking costly upgrades to physical assets that are not needed in the short term. It is instead an issue that both the Electricity Authority and the sector should be proactively working towards a solution for.

The Electricity Authority should help to address barriers to network visibility by ensuring access to appropriate smart meter data is fairly priced and easily accessible to distributors so they can assess, monitor and provide for efficient customer exports whilst minimising network investments.

There are opportunities to avoid investment in networks associated with increased exports. For example dynamic operating envelope and smart inverter control could be paired to maximise network utilisation and distributed generation exports - with low levels of curtailment, in a way that minimises or avoids network investment as small scale solar uptake increases.

Q21. Do you agree the proposed Code amendments are preferable to the other options? If you disagree, please explain your preferred option in terms consistent with the Authority's main statutory objective in section 15 of the Electricity Industry Act 2010

We agree the proposed Code amendments are needed. However we propose some additional measures be added that will help better achieve the objective of the Authorities proposed changes, improving outcomes for customers.

In particular, the 10kW default export limit should not necessarily create an upper limit if distribution networks analysis shows a higher default limit is possible without compromising network operations. Bespoke export limits for Part 1A should not only have scope to be lower than 10kW but also higher.

A limit on nameplate capacity for connections for DG connected under the Part 1A process is not required. It would be better for the Part 1A application to apply not only to connection of distributed generation with capacity of up to 10kW, but also to connections which would meet export limits of up to 10kW but could have name plate capacity over 10kW

See question 2 and 3 for all of the proposed additions and why we think these would improve outcomes for customers and align with the objective of this workstream.

Appendix 1 - The public benefits from home energy generation and storage, and electrification, are diverse and substantial

Household solar and electrification can help address energy hardship

Solar in particular can immediately help reduce energy hardship and alleviate cost of living stress. Energy hardship costs the health system tens of millions per year on physical health issues such as asthma, and also increases the risk of severe mental distress.¹ Energy hardship has further wider economic impacts that are difficult to assess

Central government is currently spending nearly \$550 million a year directly supporting households to afford their energy bills.

Electricity production from rooftop solar can be significant and delivered quickly. A lot of a little is a lot. If 10% of homes - around 200,000 - had solar and battery storage exporting to the grid, this would equal the peak response of the Huntly power station.

This can be done. Australia is currently installing 1,000 household batteries a day,² and nearly 40% of homes have solar. Even at our currently low installation of residential batteries, by 2030 there would be 280MW of residential batteries, the ninth largest power station in NZ. Household, farm and business solar and batteries therefore can have a positive impact not just on the individuals saving money from creating and storing electricity, but on the system overall through increased supply and reduction in peak (lowering network costs, discussed below).

As the energy transition requires significantly more electricity, with the Government's Electrify NZ including the goal of doubling the supply of renewable energy, it is clear households and farms can play a significant role. These individual solar and battery systems can also be deployed significantly quicker than large-scale generation alternatives.

Household batteries and solar lower the need for grid infrastructure investment. Growing demand for electricity puts further strain on transmission and distribution lines and some local networks, which are already nearing capacity, especially during peak times. Transpower and electricity distribution companies (EDBs) continue to actively plan and obtain permission to fund line upgrades. The

¹ <https://www.phcc.org.nz/briefing/energy-poverty-lowest-income-households-pay-more-aotearoa>

²

<https://www.theguardian.com/environment/2025/jul/23/australias-surge-in-household-battery-installations-is-off-the-charts-as-government-subsidy-program-powers-up> Note this is driven in part by new subsidies.

largest likely rises in consumer bills over the coming decades are expected to come from upgrades to NZ's distribution infrastructure. Boston Consulting Group estimates these costs to be \$65 billion over 25 years.³

However, household batteries and solar offer an alternative that can in many instances deliver the same outcome at much lower cost to NZ.

When a battery is installed, it lowers the peak of the household or business using it. This effectively enables more electricity to run on the same network assets and more households to be served by them. The addition of battery storage can therefore delay or prevent the need for expensive grid upgrades and enable us to get more out of our existing assets.

Household solar enables more energy generation into the energy system. This reduces the need for additional generation to be built and grid infrastructure to deliver that energy over long distances, therefore lowering future system costs. Because solar and battery adoption happens household by household, the real question is timing: will enough homes add solar and storage before network companies commit to building costly new grid assets?

If the adoption can be encouraged to happen earlier, it could save billions in energy infrastructure investment. A more flexible electricity system, including many more household batteries, could save New Zealand up to \$10 billion by 2050 and keep power bills lower by as much as 50%.⁴ These savings are for every household on the network, in addition to the specific savings for households that install solar/batteries.

Work in Queenstown examining how to meet future energy demand and increase resilience has compared the opportunities for solar and batteries to delay or displace the need for a second transmission line, which could cost an estimated \$720 per annum per household. Rewiring's analysis suggests such a deferral could save the community tens of millions of dollars.

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<https://web-assets.bcg.com/b3/79/19665b7f40c8ba52d5b372cf7e6c/the-future-is-electric-full-report-october-2022.pdf>

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<https://www.eeca.govt.nz/about/news-and-corporate/news/eeca-and-counties-energy-scale-demand-flexibility-with-karaka-harbourside-dso-pilot/#:~:text=%E2%80%9CA%20more%20flexible%20electricity%20system.as%20much%20as%2050%25.%E2%80%9D>

A recent report⁵ showed that if 6,000 Queenstown homes (around a third of existing homes) installed 5 kW of solar and 25 kWh of battery storage, it would be enough to meet peak winter demand even for extended periods of cloudiness. It would also defer the need for a new line by 2-4 years, and that deferral of 3-7 years is possible with solar, batteries and demand flexibility in a high demand growth scenario and more than 7 years in a non-high growth scenario.

Another recent report⁶ found that even if less than 7% of new household builds around 2033 had a 7 kW solar system and 10 kWh battery, this would be enough to provide energy security for a 24-hour period during peak winter demand, and 80% of new builds around 2050 would be enough to provide 8 hours of such energy security. Adding solar and batteries to existing housing stock, as is already happening in Queenstown, reinforces that significant delay or even displacement of investment in lines and grid infrastructure may be possible (and economically beneficial for the households that install, alongside benefits for all households).

Household solar and batteries provide household and community energy resilience

Following events like Cyclone Gabrielle⁷ households with solar power and batteries were able to continue to operate as usual and also provide vital services to their communities – like cooling, cooking, charging and communication.⁸ As noted in the draft DPMC and MfE Long-Term Insights Briefing⁹, we can expect events of this severity more often.

This resilience provides critical services in times of crisis. This enables food to be kept chilled/frozen and cooked, communication and, importantly, reduces the demand on emergency and medical services to support households that are medically dependent on electricity (such as for home dialysis and breathing support). This is important, as nearly 10% of all residential connections are registered as medically dependent on electricity.

If homes own electric vehicles, it will allow them to travel for extended periods of time while the network is out, and provide a crucial transport lifeline if fuel deliveries are cut off. For example, an Alpine Fault 8 event in Queenstown could cut the town off from petrol/diesel supply by road for several weeks or months. In these situations, electric vehicles could recharge from household / local solar

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<https://static1.squarespace.com/static/6823b5c571f3675c9ee74139/t/68ba1c0953c6f135176c88f4/1757027337811/250901+Frankton+final+report+and+results-r10+final.pdf>

⁶ Note this was not a full technical report exploring full historical records of cloudy days and has limits.

⁷ <https://www.seanz.org.nz/resilience-in-wake-of-gabrielle>

⁸ Solar alone, with the right technical specifications, offers benefits during daylight hours while batteries extend these benefits.

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generation and provide vital transport and access to households and communities.

We have also recently seen the benefits for rural resilience, with some farms that have solar and storage in Southland able to continue milking and keeping keeping that milk during the October weather event.¹⁰ Such farmers were also able to offer their neighbours hot showers and fresh food.

Household solar can help in a dry year

In addition to playing a significant role in generally meeting future demand, household and farm solar can make a meaningful difference with NZ's dry year hydro challenge. In a dry year, there is an estimated 11% bonus in solar production in the important late summer and early autumn period when it isn't raining. This equates to 225GWh of extra production in a dry year if a 9kW system was installed on 50% of homes in NZ. This 225GWh is 5% of New Zealand's total hydro storage capacity.

If it had been there in 2024, it would have been an extra 18 days of storage, based on the trajectory of national storage in July/August. Five percent or 18 days may not sound like much, but when storage bottomed out in 2024, all else being equal this would have more than halved the wholesale price at the worst time of the crisis, lessening the crippling impact on many industries of such wholesale price spikes.¹¹

Solar and electrification also reduce emissions and NZ's financial liability

Emissions from energy decisions made by households account for approximately 15% of New Zealand's total emissions, or around 31% when excluding those emissions embedded in exports.¹² NZ is on track to face a \$3–\$24 billion cost from having to buy international carbon credits to meet our 2030 Paris targets. Over 25% of Aotearoa NZ's gross carbon emissions come from small fossil fuel machines, which can be replaced by existing technology today. If all homes electrified all their fossil fuel machines by 2040, around 10 million tonnes of emissions would be saved annually (105 million tonnes saved cumulatively between 2024 and 2040).

¹⁰ <https://www.farmersweekly.co.nz/technology/solar-kept-milk-flowing-in-southland-blackout/>

¹¹ See <https://www.rewiring.nz/watt-now/why-solar-makes-sense> for more and to explore different scenarios.

¹² EECA and Rewiring Aotearoa, based on 2021 emissions data, https://www.eeca.govt.nz/assets/Uploads/Electric-Homes-Technical-Report_March-2024.pdf

The more homes that install solar, the greater still the emissions savings. With the recent deal to add an extra 600,000 tonnes of coal to the stockpile at Huntly Power Station, the total will reach 1.1 million tonnes, or about 110 days of running all units at Huntly.¹³ Avoiding burning those 1.1 million tonnes of coal can avoid 2.75 million tonnes of emissions. While another dry year will mean that is not possible, every household with solar means we are burning less coal, with the average home with solar's 23kWh production for in winter the equivalent of 13 kg of coal, or around a tonne of coal every 77 days per home with solar.

The International Energy Agency recently found that one large container ship full of solar panels “can provide the means to generate as much electricity as... the coal on over 100 large ships”. With around 200,000 tonnes of coal on a large coal ship, if five similar sized ships were used to deliver solar panels instead of the coal for the stockpile, it would deliver many, many decades more electricity.¹⁴

Household solar and electrification create local jobs

Installation of solar and electrification of our households requires skilled professionals. While certain parts of installations are limited to electricians, there are also opportunities for roofers and general builders to take on significant amounts of solar installations. Additionally, every million dollars spent in New Zealand on electrification rather than overseas on coal could create around eight jobs, with that extra 600,000 tonnes of coal imported equating to around 1,000 jobs for one year if the money had been spent domestically.¹⁵

Solar and electrification can support NZ communities, and NZ, with diminishing gas supplies

As the supply of gas continues to diminish, gas prices will increase and push even more households into energy hardship. The upfront cost of switching from gas to

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<https://www.rnz.co.nz/news/business/568921/gentailers-agree-to-stockpile-coal-at-huntly-power-station>

¹⁴ This is illustrative, and we recognise that: the ships coming to NZ are different sizes to the International Energy Agency study; a coal ship cannot simply carry solar panels; no container ship is solely delivering solar panels. <https://www.iea.org/reports/energy-technology-perspectives-2024>

¹⁵ Job creation numbers are estimated using the figure of 8.15 jobs (6.01 direct and 2.14 indirect) per \$1 million of spending on electrification (including labour, appliance/equipment purchase, and one EV per household). Job creation figures have been created using [Insight Economic's employment multipliers](#), derived from the [StatsNZ national accounts input-output tables](#). As electrification activities and household spending do not map perfectly to the sector classes used for employment multipliers, a “best fit” approach was taken, and expected spending and reduced spending spread across all relevant sectors. This is also informed by the methodology in [Rewiring Aotearoa's Electric Homes report](#). Assumes base cost of US\$125/tonne of coal, and NZD to USD of 1.7 to reach around NZ\$130 million. Adding import/transport overheads could bring this closer to NZ\$160 million.

electricity will be a barrier to some households, risking them being locked in to ever-increasing gas prices. Finance can support households to switch off gas when they consider the time is right.

An abundance of solar, alongside different management of our hydro assets, can additionally reduce the need to burn gas for firming of our electricity supply, and free up gas for industries that do not yet have viable economic alternatives.

Recent modelling from the New Zealand Green Building Council found “replacing gas and inefficient electric heaters with heat pumps could save up to 48 Petajoules of gas annually - nearly 40% of current production - and deliver net electricity savings of up to 4,000 GWh per year, enough to power over half a million homes. It’d also save New Zealand households up to \$1.5 billion a year on energy bills.”¹⁶ While these savings figures are based on the conversion of more than just residential heating and may overstate the percentage of current gas production that could be freed up, they point generally towards what is possible.

Solar and electrification support keeping inflation under control and improves balance of trade

Significant take-up of rooftop solar and batteries is likely to be both anti-inflationary, and bring incredible price stability to households. Operational household energy costs for the expected 30-year life of solar panels will not only be significantly lower, but also entirely stable as with solar, households will be locking in the price of that energy for 30-plus years.

While there could be some short-term minor inflation driven by labour bottlenecks and rollout logistics, the solar installation industry can be expected to quickly scale and increase efficiencies, as was seen in Australia. As some of the required labour (roofers and builders in particular) is currently facing relatively weak demand, this may not eventuate.

In addition, increasing uptake of solar, and electrification of machines, reduces our reliance on imported liquid fuels, and improves our balance of trade. This allows cashflow to be retained in New Zealand, and has flow on effects like a stronger NZ Dollar which can help households with inflationary pressures by making imports cheaper.

16

<https://nzgbc.org.nz/news-and-media/new-report-heat-pumps-could-cut-household-energy-bills-by-1.5bn-per-year-help-protect-thousands-of-kiwi-jobs>