A Fairer, Cheaper Electricity System

SEANZ Policy Framework 2026

This report is part of a series by SEANZ examining the key barriers and enablers to decentralised energy solutions. The series provides recommendations to support uptake, reduce consumer costs, strengthen system resilience and economic certainty, and enable consumer interaction with the energy market.

You can read all the reports in the series at www.seanz.org.nz/securing-our-future

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Executive Summary

New Zealand's electricity system is entering a period of profound structural change. Electrification of transport, industry, and heating — driven by emissions budgets under the Climate Change Response Act, the Emissions Reduction Plan (ERP), and security-of-supply objectives — will materially increase electricity demand over the next 25 years. At the same time, consumers, businesses, and government expect electricity to remain **affordable, reliable, and fair.**

MBIE's Energy Outlook, Transpower's *Whakamana i Te Mauri Hiko* system scenarios, and the Commerce Commission's Default Price-Quality Path (DPP4) forecasts all indicate:

Electricity demand could increase by **40–70%** by 2050

Peak demand is likely to grow faster than energy volumes

Network investment requirements could exceed $12–14 billion over the next decade

Under traditional planning approaches, this growth would be met predominantly through **capital-intensive transmission and distribution upgrades,** locking consumers into higher electricity costs for decades.

In addition, dry year risk remains a concern with heavily reliance on gas as a backup fuel. An LNG import facility is the currently favoured solution.

Meeting these challenges using conventional, centralised supply and network expansion alone will be expensive, slow, and socially inequitable. Instead, New Zealand requires a move from a supply-driven, asset-heavy paradigm and towards a **flexibility-led, decentralised, consumer-centric electricity system.**

Executive Summary

Distributed battery storage, solar photovoltaics (PV), grid-scale solar farms, community energy projects, and peer-to-peer (P2P) electricity trading can together deliver:

Lower total system costs

by deferring or avoiding expensive transmission and distribution upgrades and investments in traditional generation infrastructure

Fairer outcomes

by ensuring benefits flow to all electricity users, including renters and low-income households

This paper sets out a strategic policy framework for transforming the electricity system using distributed and grid-scale battery and solar storage as core enablers. It outlines reforms required to unlock system-wide economic and social benefits.

In many areas of required change, New Zealand has lagged other countries. New Zealand's penetration of distributed battery and solar storage is low by global comparison and application of flexibility services as an alternative to traditional investment has failed to gain traction. However, with policy intervention there is opportunity to leapfrog other countries to become a leader in building a fairer, cheaper electricity system.

	LNG Import Terminal	Batteries & Solar
Capital Cost	$1–2 billion	Equivalent solar capacity at ~50% cost
Fuel Source	Imported gas	Free sunlight
Price Impact	Raises wholesale price during use	Reduces wholesale volatility
Jobs	Short-term construction	Distributed national jobs
Lock-in	40–60 years	Modular, scalable
Emissions	Fossil fuel dependent	Zero fuel emissions

1. The Challenge: An Electricity System Under Structural Pressure

1.1 Rapid growth in demand and peak load

New Zealand's electricity system is entering its most significant demand expansion since the original hydro development era. Key drivers include:

- Rapid uptake of electric vehicles
- Electrification of industrial process heat
- Electrification of residential and commercial heating
- Growth in data centres and digital infrastructure

MBIE projections and Transpower system scenarios indicate that total electricity demand could rise by **40–70% by 2050**, while peak demand may grow faster again due to electrification of transport and heating loads.

This creates:

Increasing peak loads on local distribution networks
Higher seasonal variability
Growing congestion at both distribution and transmission levels

1.2 Dry Year Risk with Diminishing Gas Supply

Over the past 6 years domestic gas supply has declined by 45%. New Zealand remains dependent on gas generation during periods of low hydro lake inflows and for limited times during high peak demand periods.

The current government's favoured solution is to invest in an LNG import facility to supplement domestic gas supply.

1. The Challenge: An Electricity System Under Structural Pressure

1.3 The cost of business-as-usual infrastructure planning

Under Commerce Commission DPP4 determinations, electricity distribution businesses are forecast to invest over **$12–14 billion nationally during the next decade.**

At the transmission level, Transpower's major capital programme includes multi-billion-dollar investments in, new grid-exit points, substation expansion and transmission reinforcements

In addition, increasing electricity demand will see on-going investment in new generation capacity and potentially construction of costly fossil fuel infrastructure. The proposed LNG import facility is estimated to cost $1-$2b and locks in higher wholesale prices during periods of gas usage.

These investments are:

- Capital intensive
- Slow to deploy
- Long-lived and irreversible

Once built, consumers are locked into paying for them for 40–60 years, even if cheaper flexibility-based alternatives subsequently become available.

Without reform, this model risks structural increases in electricity costs, worsening energy hardship and deepening energy inequity.

2. From Asset Expansion to System Flexibility and Customer Centricity

New Zealand's electricity system must undergo a **quantum shift in design philosophy:**

From a centralised, asset-heavy supply model — to a decentralised, flexibility-led energy ecosystem.

Rather than continuously expanding physical infrastructure, system planning should prioritise:

- Demand flexibility
- Distributed generation
- Local and grid-scale storage
- Digital orchestration of energy flows

A modern electricity system integrates:

- **Behind-the-meter batteries** at residential and commercial sites
- **Community batteries** embedded within local distribution networks
- **Distributed solar PV** on homes, businesses, farms, schools, and public buildings
- **Distributed solar farms** near load centres
- **Consumers as active market participants,** recognizing their key role in self-generation, optimisation and demand response.

Together, these resources create a layered, adaptive energy ecosystem, reducing reliance on single-point failures and expensive peak-driven infrastructure.

3. Why Batteries and Solar Lower System Costs for All Consumers

3.1 Deferring network infrastructure investment

Peak demand is the dominant driver of network capital expenditure. Batteries and solar directly target peak loads by:

- Shifting consumption away from congested periods
- Reducing maximum demand seen by the grid

Transpower analysis indicates that each **1 GW of peak demand avoided or deferred can reduce future transmission investment by approximately $1.5 billion.**

A recent report by Sapere commissioned by the Electricity Authority in support of the business case for implementing MTR (multi trader relationships), determines a saving from distributed battery storage as follows:

$241 per kW per annum

Avoided — for every 1GW of peak demand reduced.

Source: https://www.ea.govt.nz/documents/9206/Appendix_A_Sapere_Cost_benefit_analysis_for_Multiple_Trading.pdf

3. Why Batteries and Solar Lower System Costs for All Consumers

International experience under the UK's RIIO-ED2 framework and Australia's RIT-D regime consistently shows that **non-wires alternatives deliver 30–70% lower lifetime costs** than conventional infrastructure upgrades.

These avoided costs reduce regulated revenue requirements, benefiting **all consumers through lower long-term network charges.**

This is particularly **critical to low energy users** (such as the elderly, apartment dwellers and low-income households who economise on energy use to save money), who will experience the largest increase in network charges, due to the strong trend by network companies to apply ongoing increases mainly to the unavoidable fixed daily charge.

3.2 Addressing dry year risk

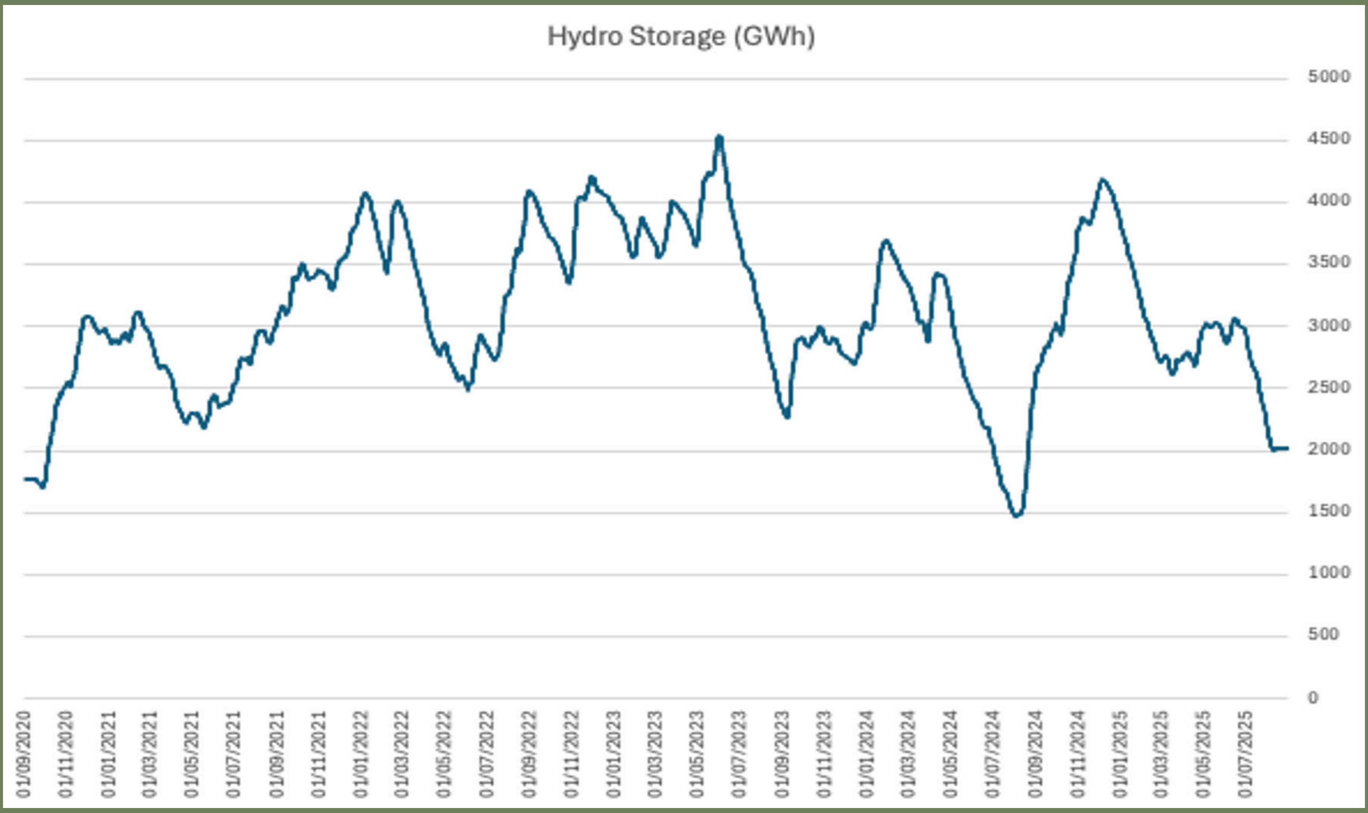
In considering options to address dry year risk, the rooftop solar option has been dismissed, based on " Will not provide substantive additional energy during winter, when we are most likely to experience the dry-year problem"

Government Investment in Dry Year Risk Cover: Consideration of an LNG Import Facility February 2026.

This is flawed logic. The value of rooftop solar is to take pressure off hydro storage ahead of winter and again in spring - to allow lake levels to replenish if winter has been dry.

3. Why Batteries and Solar Lower System Costs for All Consumers

Between September 2020 and September 2025 this was New Zealand's hydro storage capacity:

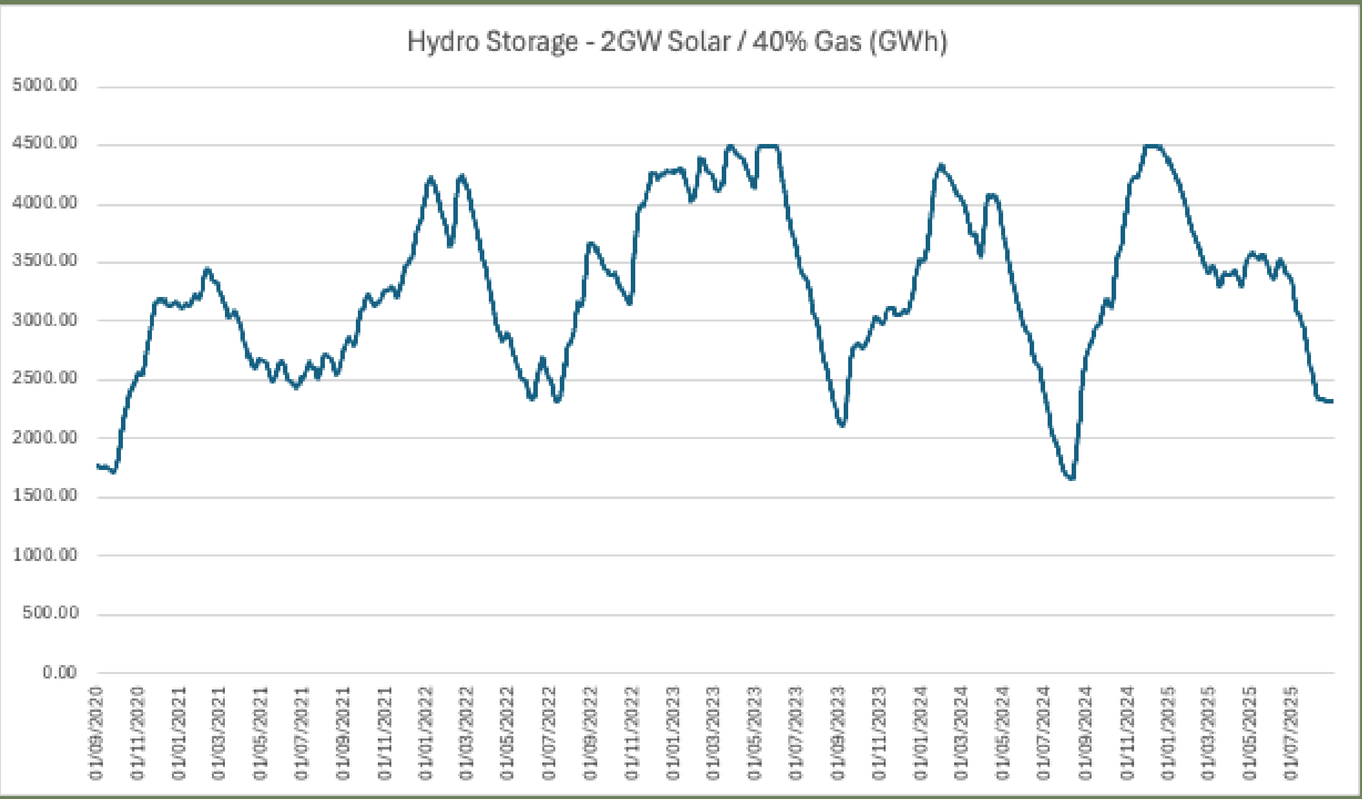


2024 was a particularly dry year with a need to burn fossil fuels to protect hydro lake levels. Electricity prices spiked to $800MWh during this time.

Analysis has been undertaken by SEANZ considering the generation mix each day over that period and then substituting a proportion of gas generation with additional solar.

If gas generation was reduced to 40% of what was used every day (to reflect limited gas supply) and just ***2GW of additional solar added,*** this would have been the hydro lake storage profile.

3. Why Batteries and Solar Lower System Costs for All Consumers



Lake levels would have been maintained above an acceptable level.

Increasing the volume of generation from solar provides a cost-effective option to preserve demand on New Zealand's hydro lakes. The SEANZ report "New Zealand's big switch – unlocking renewable abundance", November 2025, found that deployment of 3GW of solar would have meant that no coal would have been required to meet daily energy demand over the previous 5 years. 8GW of solar would have resulted in no fossil fuel generation at all being required.

3. Why Batteries and Solar Lower System Costs for All Consumers

3.3 Reducing wholesale price volatility and energy costs

Deploying battery storage alongside solar provides capacity to significantly reduce the requirement for thermal peaking.

Installing 350,000 residential batteries would provide the same peaking capacity as New Zealand's current thermal generators.

Solar and storage reduce:

- Dependence on expensive peaking (gas / coal) generation
- Exposure to dry-year hydrological risk
- Price spikes during supply scarcity (largely driven by high use of fossil fuels during these periods)

The recent Sapere report referenced above determines a saving in peak thermal cost per kW of battery storage deployed.

$118 per kW per annum

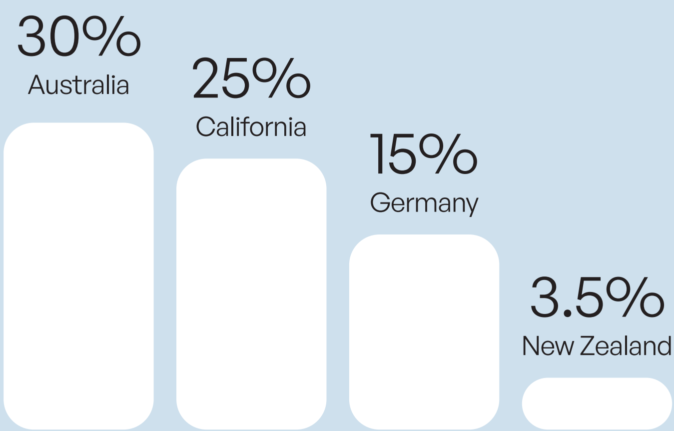
Offset thermal Peaking

4. Policy to Achieve a Fairer, Cheaper Electricity System

Uptake of distributed battery and solar storage has significant potential to provide a fairer and cheaper electricity system by cost effectively improving the utilization of existing infrastructure, reducing the requirement for costly imported fossil fuels and offsetting growing electricity demand.

Without stimulus the volume of uptake required battery and solar storage may be too slow to avoid infrastructure investment. **Penetration of rooftop solar in New Zealand has only reached 3.5%** which lags well behind most other countries.

New Zealand is Behind Comparable Markets in Rooftop Solar Uptake



There are opportunities for Government to incentivize battery and solar uptake through rebates which are significantly less than the value they deliver to New Zealand's electricity system. In addition, these incentives will support accelerated growth of the solar / battery industry, thereby increasing the size of the economy.

These incentives should not be termed or viewed as a subsidy which have been historically applied to make uneconomic options economic.

To avoid criticism of the incentives benefiting the wealthy (who can afford the residual cost of investment), **low-cost, long-term financing** mechanisms are also needed to allow all homeowners to participate.

In addition, without deliberate policy intervention distributed energy **risks creating a two-tier system:**

- Asset owners benefit from batteries and solar
- Non-owners face rising electricity charges

Policy to support options for renters and other groups unable to benefit from their own battery / solar system needs to be provided.

4. Policy to Achieve a Fairer, Cheaper Electricity System

4.1 Incentivising battery and rooftop solar storage as a national infrastructure investment

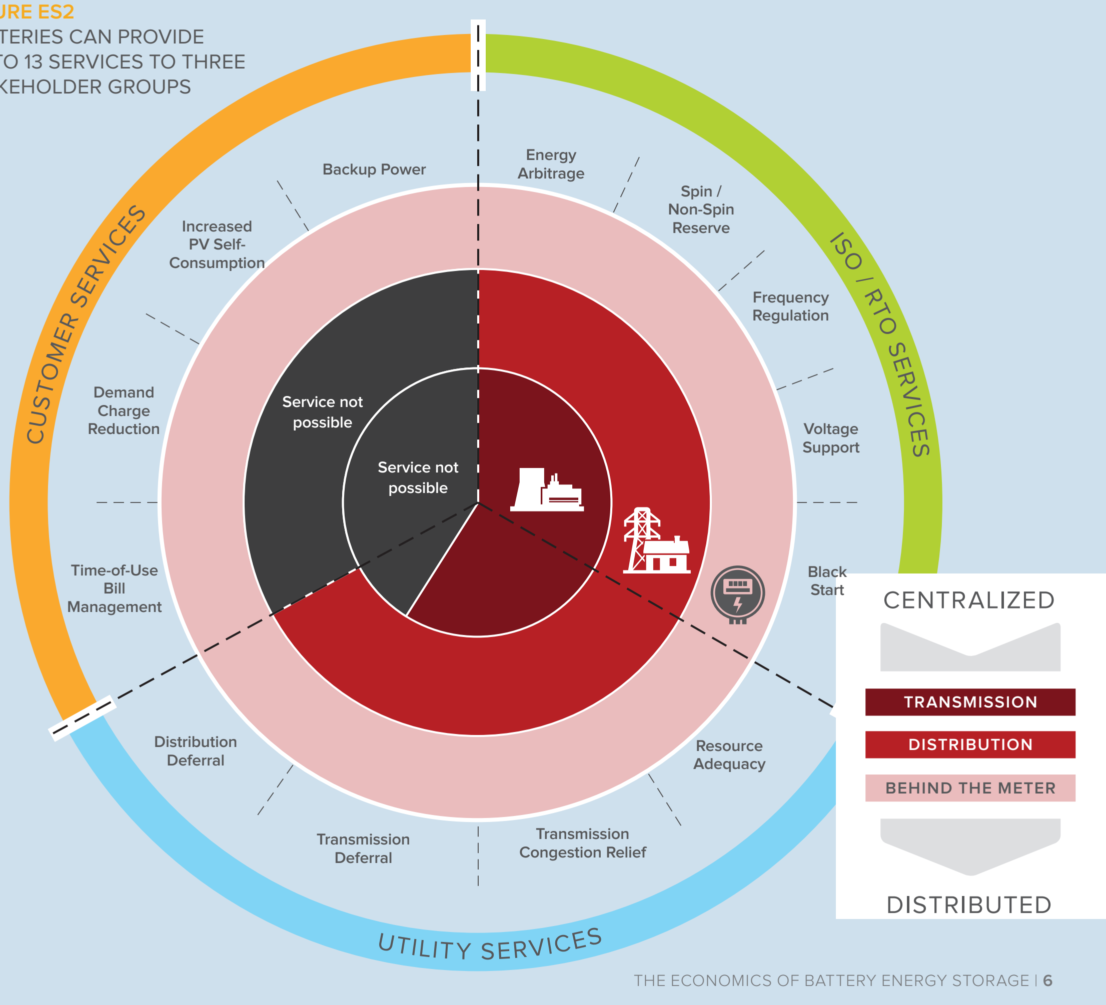
Solar PV provides electricity at a price significantly lower than the average grid electricity cost (at around 12c/kWh versus current average variable grid electricity cost of 25c/kWh) and therefore is a logical investment for building owners with the ability to fund the initial investment.

Despite this, uptake rates remain low.

Battery storage, however, has not yet reached a price point that provides a reasonable return on investment to a customer. On a total value stack basis, batteries make sense, but many of the value streams are not readily accessible to individual customers.

Rocky Mountain Institute: THE ECONOMICS OF BATTERY ENERGY STORAGE HOW MULTI-USE, CUSTOMER-SITED BATTERIES DELIVER THE MOST SERVICES AND VALUE TO CUSTOMERS AND THE GRID. October 2015

FIGURE ES2
BATTERIES CAN PROVIDE UP TO 13 SERVICES TO THREE STAKEHOLDER GROUPS



THE ECONOMICS OF BATTERY ENERGY STORAGE | 6

4. Policy to Achieve a Fairer, Cheaper Electricity System

An incentive for customers to install rooftop solar

The financials of a suitable incentive are as follows:

- $2.1b (midpoint of $90-180m pa cost range discounted at 7% over 15 years) to construct an LNG import terminal
- To provide 2GW of solar capacity would allow $1000 per kW for an equivalent cost
- An incentive of $500 per kW would deliver a dry year solution at 50% lower cost than the LNG option
- This has additional value in lowering wholesale costs compared to LNG
- An average residential rooftop system is currently 7.5kW and commercial around 100kW. An install volume of 160,000 residential and 8,000 commercial, would be needed.
- For an average residential install the incentive would be $3750. (similar level to Australia)
- Total install cost pre incentive would be around $15,000 (incl GST)
- The additional GST collected on the total installed system cost and tax on installer income would likely see the scheme being close to fiscally neutral. (e.g. GST on a $15,000 system would be $1956 and installer margin would be $5000 @ 33% tax would be $1667 =$3623 total)

Two Ways to Spend $2 Billion

Fiscally near-neutral when GST and installer tax revenue included.

LNG Import Facility

Locks in higher wholesale prices exposes NZ to global gas markets Commits consumers for 40–60 years

2GW of Solar
*Up to Half the Capital Cost

Reduces dry-year fossil fuel dependence
Lowers wholesale price volatility
No exposure to global fuel prices
Scalable, domestic generation

4. Policy to Achieve a Fairer, Cheaper Electricity System

An incentive for customers to install battery storage

The financials of a suitable incentive are as follows:

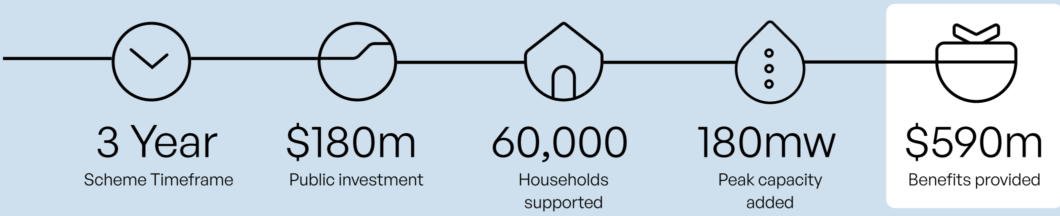
- The value determined by Sapere of battery storage in reducing infrastructure investment and reducing thermal peaking costs is $359 per kW:
- A typical residential battery currently comprises a 5kW inverter and 10kWh battery. Based on a 3-hour peak demand period the system can offset demand by 3kW.
- This has a value in avoided infrastructure investment and thermal peaking costs of $1077 per annum. Over a 15-year battery life at a 7% discount rate this provides a present value of $9809.
- A battery incentive for a 10kWh battery of $3000 would support more customers installing solar with battery storage and deliver benefits of over 300%.
- The additional GST collected on th e total installed system cost and tax on installer income would likely see the scheme be close to fiscally neutral. (e.g GST on an $11,000 system would be $1,434 and installer margin would be $4,500 @ 33% tax would be $1,500 = $2,934 total.)
- From a customer point of view a 10kWh battery system's cost would reduce from $11,000 to $7,000, significantly improving the financial proposition for customers.
- It is suggested that it should be mandatory for an incentivised battery to be enrolled in a VPP or aggregated flexibility service for the incentive to be granted to maximise peak demand export for all New Zealand households and businesses to benefit (by maximizing potential without curtailment). The consumer then also benefits from an additional revenue stream for the grid services provided.

4. Policy to Achieve a Fairer, Cheaper Electricity System

Currently residential batteries are being installed at a rate of around 7000 systems per annum (60% of new solar installs).

An incentive of $3000 for a 10kWh system is at a similar level to the Australian rebate scheme which has seen a massive, rapid increase in the volume of batteries being deployed - 155,000 in the first 6 months (albeit with some flaws in the scheme which are now being addressed).

A 3-year scheme targeting 60,000 battery installs would cost $180m and provide benefits of $590m. It would add 180MW of peak demand response capacity increasing supply security and reduce the need for fossil fuel generation. (New Zealand's current fossil fuel peaking capacity is around 1200MW)



If each battery was accompanied by a 7kW solar PV array (the current average system size), this would add 420MW of generation capacity - more than doubling the currently installed volume.

With expected falling battery prices, an ongoing incentive would not be required. This policy would give impetus to lift the currently flat growth path and provide the foundation to further accelerate from.

4. Policy to Achieve a Fairer, Cheaper Electricity System

4.2 Addressing affordability

Even with incentives, the capital cost of hardware will remain out of reach for many homeowners. While bank low interest 3–5-year loans are helpful, the outgoings during this period to repay the loan exceed the savings.

Longer term loans where **repayments are lower than the savings from day one** would enable more homeowners to install systems.

Some governments provide low interest finance to customers directly. The largest such scheme is the German KfW program which supports low interest financing of renewable energy projects (from homeowners through to large commercial projects). Customers apply through their bank who manage the application process with KfW.

There have also been historic schemes in New Zealand, currently being revisited, for Local Councils to provide loans for residential solar, repaid over an extended period through a special rates levy (which remains with the property through ownership changes).

An alternative option is to mandate monopoly network companies to provide 10–15-year loans for customers to add battery and solar storage. Recovery would be through a special lines charge, so again, it would remain with the property through ownership changes. There is arguably closer alignment in the business activity of network companies than Councils in providing finance.

If it is assumed network companies would earn their current average 6% WACC. A 7.5kW solar system with 10kWh battery would cost a customer $19,250 post incentives.

Financed over 15 years this would have an annual repayment of $1,982.

Based on solar generation alone, assuming 75% self-consumption (due to the battery), an import saving of 25c/kWh and export revenue of 12c/kWh would provide an energy cost saving of $2,202 in year 1 – a saving of $220pa.

In addition there will be savings on TOU energy and network rates and potential revenue from VPP services .

4. Policy to Achieve a Fairer, Cheaper Electricity System

4.3 Making solar available to all

Approximately **35% of New Zealand households rent.** For these customers and others unable to purchase their own battery and solar systems new regulatory models are required.

4.3a Peer to Peer Sharing

A peer-to-peer (P2P) community solar scheme enables households, businesses, and other electricity users to share, trade, or allocate locally generated solar electricity with one another, rather than relying solely on export to the wholesale market or a single retailer.

Allowing owners of generating and storage assets to directly sell their output to other customers would provide opportunity for any customer to benefit from the evolution of the electricity system.

Power owned and controlled by communities themselves is a key component of the energy transition. More than half of wind in Denmark and half of solar in Germany is customer owned

Participants would not need to become licensed electricity retailers. Instead, a defined regulatory category—such as "energy sharing," "collective self-consumption," or "renewable energy community"—would be created in NZ law or regulation to permit **intra-community allocation of electricity over the public grid.**

All participants would remain connected customers of a licensed retailer, but bill "credits" would reflect their share of local solar generation. (These credits would typically be valued above wholesale export prices, but below full retail tariffs)

Alternatively (and even preferably) an automated process would be implemented to reconcile the import and export volumes between parties in each half hour trading block and the volumes shared removed from the retailer billing volume.

Network use-of-system charges would continue to apply but could be structured to recognise that energy is being consumed locally within the same feeder or substation zone, reducing long-distance flows across Transpower's grid and lowering losses. Over time, this could align with a "locational" approach to pricing and incentives consistent with Commerce Commission price-quality frameworks and emerging flexibility objectives.

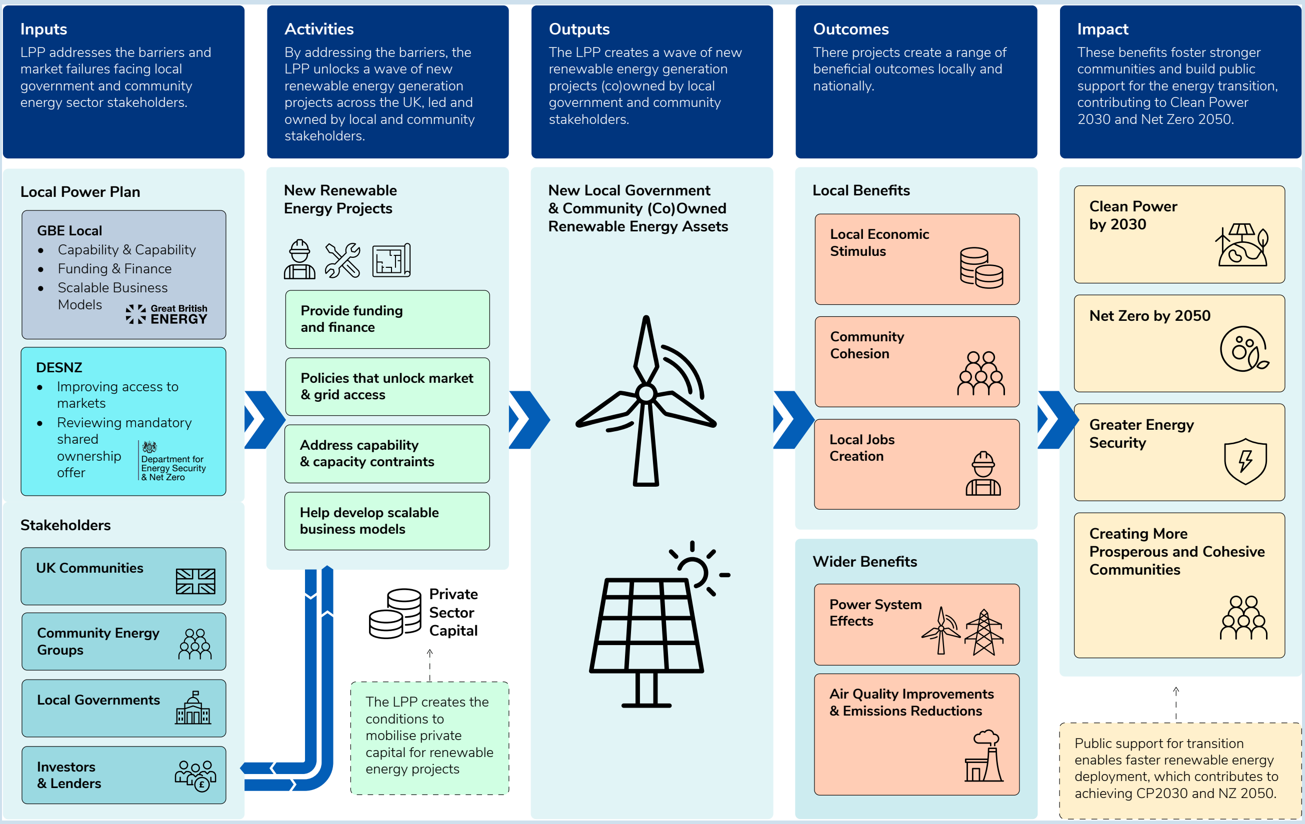
4. Policy to Achieve a Fairer, Cheaper Electricity System

In addition to enabling regulatory changes, Government support to Community Energy development is important to create momentum. This support would include resourcing to build capability within communities and funding to seed early exemplar projects.

A recent example is the GBE Local Energy Plan in the UK (Feb 2026).

https://www.gov.uk/government/publications/local-power-plan

This diagram shows, step by step, how the Local Power Plan delivers real benefits for communities:



8 | Local Power Plan

The GBE Local Energy Plan has set a target of 1000 community projects by 2030, with a financial backing of £1b.

An equivalent New Zealand program could target 100 projects with a budget of $200m.

4. Policy to Achieve a Fairer, Cheaper Electricity System

4.3b Balcony Solar and Balcony Energy Storage

Balcony solar has provided options to apartment dwellers in Germany and is now expanding in popularity to other countries. While a relatively small system – generating around 1000kWh per annum in NZ conditions, this could provide around 20% of a typical apartment's electricity usage. The benefit however may be broader, through generating awareness of distributed solar electricity.

Currently electrical regulations in Australia / New Zealand prevent balcony solar and energy storage being installed. The **safety "compromises"** associated with changing the regulations are the same as those considered in other restrictions where regulations have been amended on the basis that the risks are acceptable.

For manufacturers to create products within the New Zealand market, Australia would also need to change regulations to allow their use (the NZ volume would be insufficient).

The key features of balcony solar in Germany are:

- Typically a plug-in PV system has a capacity of 400 to 800W (1.8A to 3.5A).
- Consists of 2 to 4 PV panels with a small inverter and an AC electric lead with a standard 3 pin plug which is plugged directly into a standard household power socket. No special wiring required.
- Power is fed into the household circuits. Any surplus power is exported without compensation. This avoids additional registration, certified metering and yields little benefit to anyone.
- In Germany, payback is estimated to be less than 5 years for a typically 800W system. It is expected that in New Zealand the payback would be less because of the additional sunlight hours compared to Germany (averaging 14% higher in NZ)
- Policy changes introduced in 2024, took the output limit from 600 to 800W. Bigger systems with up to 2000 Wp are allowed, provided inverter output stays within the 800W threshold.
- Plug in battery systems with a maximum output of 800W are also permitted
- Policy change simplified the installation and registration process.
- Self-installation is permitted; landlords cannot deny tenants installation.
- Registration is mandatory but is a short, free of charge online form which is quick and accessible.
- In Germany 0% GST is applied, reducing upfront costs.

Summary of Steps New Zealand Needs to Take for Balcony Solar

Regulations need to change for balcony PV and storage equipment approval and acceptance.

Regulatory choke points include changes to AS/NZS 3000, AS/NZS 4777.1, AS/NZS 4777.2 and maybe AS/NZS 5033

Remove the need for DG Approval and mandate network notification to be easy, free of charge, online with an immediate turnaround.

Metering process needs to be streamlined.

Change tenancy law's so that landlords cannot reasonably refuse installation and cannot set up preventative covenants. (Sometimes with older apartments, balconies are mechanically unsuitable for the additional load)

To incentivise uptake apply the solar subsidy as above of $500 per kW ($200 to $400 per system)

Incentivise plug in battery storage as above. A typical 800W battery output would have an $800 incentive

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