ELECTRIFY SOUTHLAND

Powering Forwards:

A Life Cycle Cost and Resilience Analysis of Backup Power Solutions for Southland Farms in a New Era of Energy System Disruptions

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Version History:

Version 1.0 - November 2025: Initial Draft for Stakeholder Comment:

Version 2.0 - December 2025: Audit-corrected. Incorporates physics-based PV generation methodology, panel and battery degradation, maintenance costs, and Southland-specific capacity factors. Accompanied by an interactive calculator spreadsheet for farm-specific analysis.

Version 3.0 - February 2026: For Waimumu Field Days - No EECA grants conservative baseline. 6% electricity inflation default (below recent actuals of 11-12%). All scenarios modelled with physics-based PV generation, Southland-specific capacity factors, and full lifecycle costs including degradation, maintenance, and component replacement.

Where to find this information online:

This report is available at
https://poweringforwards.electrifysouthland.nz

A calculator to get an indication for you is available at
https://farmcalc.electrifysouthland.nz

Get a quote for a personalised assessment by contacting
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Executive Summary

This report answers a single question that every Southland farmer should be asking after the October 2025 storms: **over the next 20 years, what is the smartest way to protect my farm from power failure - and what will it cost me?**

The answer is clear, but it is not simple. It depends on your electricity consumption, whether you already own a generator, and how you choose to finance the investment. This report models many realistic combinations so you can find your scenario.

The headline finding: **a dairy farm that invests in a 50 kW solar PV + 75 kWh battery system today, financed through ASB's 0% Smart Solar Loan, will accumulate approximately $220,000 in net financial benefit over 20 years** - while simultaneously eliminating its exposure to grid outages, generator failure, diesel supply disruption (geopolitical events, AF8, etc), and uncapped electricity price escalation. Even in the most pessimistic scenario we model (a farmer who already owns a generator, pays market interest rates, and sees only modest electricity inflation), the solar system still generates positive cumulative returns over 20 years.

Critically, **this analysis assumes no government grants.** The EECA Solar on Farms demonstration fund is closed and no future general subsidy rounds have been announced. Every number in this report stands on its own commercial merits. If grants become available in future, they represent pure upside.

The financial case is strong, but the risk case may be even stronger.

Over a 20-year period, there is a 93% probability that a diesel generator will fail to start at least once when you need it. Each failure event on a dairy farm can cost $5,000-$15,000 in spoiled milk and lost production. The solar + battery system has no fuel dependency, no single mechanical point of failure, and provides power every day - not just during emergencies. It is the difference between an insurance policy that might not pay out and a productive asset that works for you 365 days a year.

The choice is not between solar and diesel. It is between a depreciating cost and a compounding asset.

Moreover, solar + battery is the gateway to a much larger savings opportunity. This report models only the electricity bill offset - but as Rewiring Aotearoa's research into farm electrification demonstrates, once cheap solar generation is available on-farm, the economics of replacing diesel-powered machinery with electric equivalents become compelling.

New Zealand's agricultural sector spends approximately $700 million on diesel annually. Forest Lodge Orchard in Central Otago, which has fully electrified its operations - including electric frost-fighting fans, an electric tractor, and electric utility vehicles - saves approximately $40,000 per year in combined energy costs, with electric machines running at roughly 20% of the operational cost of their diesel equivalents.

As CEO Mike Casey puts it, "It's so significantly cheaper than a litre of diesel that it would just make absolutely no sense to buy another diesel machine once you are taking advantage of your rooftop solar." For a Southland dairy farm, the $220,000 in solar savings modelled in this report could be the floor, not the ceiling - each diesel machine replaced with an electric equivalent powered by your own generation multiplies the return on your original solar investment.

If you want to hear more about the Rewiring Aotearoa take on the solar on farms value proposition and hear from more farm solar experts, there’s a free event later in the month (Thurs 26th in Invercargill) that is worth attending: (Solar) Powering Southland (facebook event link) or if you have questions regarding the event, contact Demi - demi.lawrence@greatsouth.nz. RSVP here: https://forms.office.com/r/xP0a1Y55Zr

Section 1: The New Imperative for Energy Resilience in Southland Agriculture

1.1 The Southland Storms: A Systemic Stress Test

The severe wind storm that struck Southland in October 2025 was more than a weather event; it was a systemic stress test that revealed an acute vulnerability in the region's infrastructure. Over 25,000 PowerNet customers across Southland and South Otago lost electricity. For many in remote rural areas, power was out for up to a week. This was not a localised fault but a catastrophic failure of the network's backbone, with high winds downing poles and lines across vast areas.

The event fundamentally shifted the perception of risk for the agricultural community. Power outages ceased to be a manageable inconvenience and became the trigger for a cascade of secondary failures. The declaration of a state of emergency in Southland and Clutha highlighted the severity. Towns like Tuatapere and Ohai lost drinking water as treatment plants failed. Eighty-six cell towers went offline, isolating already stressed rural communities.

For farmers, this demonstrated in the starkest terms that **grid dependency is a critical business liability**. The failure of the grid was not an isolated event but a systemic collapse that took with it the support structures upon which modern farming operates.

1.2 The Fragility of the Status Quo

In the immediate aftermath, the default solution - the diesel generator - was put to the test and found wanting. Reports from the region described a "scramble to hire generators," with the Southland Mayor noting a "shortage of generators around the traps." This exposed the first flaw in the traditional backup model: in a widespread crisis, the assumption that supplementary equipment will be readily available is dangerously optimistic.

More fundamentally, the crisis revealed that the diesel generator is not an independent solution but is itself reliant on the very infrastructure that had failed. Its operation depends entirely on consistent diesel supply. With widespread power outages, fuel stations were unable to operate their pumps, and road closures hampered logistics. A generator with an empty tank is no more useful than a connection to a dead grid.

These storm-related outages were a minor drill, not the main event. A major rupture of the Alpine Fault (AF8) won't close roads for a few days - it will sever transport and energy lifelines for months, making widespread diesel resupply a physical impossibility. On top of this, New Zealand has 100% import dependency for diesel. Our entire national backup system is vulnerable to any geopolitical event that disrupts a handful of fragile shipping lanes. Relying on continuous, affordable diesel supply for long-term security is not a resilience strategy.

Case study: As Southland farmer Blair Drysdale wrote on social media about the solar system installed just ten days before the storm, "our 21kW PV array and 51kWh battery and inverter *faced up to the challenge with ease allowing us to have everything operating as normal in the house and for the key parts of the yard that we needed running." And they were also able to help others: "This meant we were able to offer our tenants in our other house, neighbours and friends hot showers if they wanted one, because small generators that a lot of people did have can only do so much."*

1.3 The Economic Rationale

The imperative to reassess on-farm energy resilience is not driven by risk alone, but by a powerful convergence of economic pressures. In the December 2025 quarter, New Zealand electricity prices rose 12.2% year-on-year - the highest annual increase since the late 1980s. This followed an 11.3% rise in the September quarter. The Commerce Commission's new five-year line charge cycle, which began in April 2025, brought significant increases that are now flowing through to retail bills. Feb 9th 2026, the government announced a levy on electricity prices to pay for an LNG imports terminal… Electricity price inflation is not moderating; it is accelerating.

Meanwhile, the "tough call to dump milk" became a painful reality for many dairy farmers during the storms - a direct and quantifiable financial blow exceeding $21,000 per three-day outage for a typical operation. The confluence of rising daily energy costs and massive financial risk from energy failure creates a compelling economic case for re-evaluating the farm's entire energy strategy.

Section 2: Assumptions, Context, and Why This Analysis Is Conservative

2.1 System Sizing: Physics-Based, Not Marketing-Based

Every number in this report is derived from first principles. The PV system is sized to deliver a specific energy target for Southland conditions, not from a supplier's catalogue.

Dairy farm system (50 kW PV + 75 kWh BESS):

The target is to offset 65% of a dairy farm's 87,500 kWh annual consumption (based on a $28,000 annual bill at $0.32/kWh). Southland's solar capacity factor is 13% - lower than the national average of 15% due to higher latitude and shorter winter days. The required PV size is:

> 87,500 kWh × 0.65 ÷ (0.13 × 8,760 hours) = **49.9 kW → 50 kW**

Annual generation: 50 kW × 0.13 × 8,760 = **56,940 kWh/year**

The battery is sized at 1.5× the PV capacity (75 kWh) for dairy resilience - enough for overnight loads plus one milking cycle during grid outage.

Sheep & beef farm system (10 kW PV + 20 kWh BESS):

A smaller system targeting approximately 46% of a lower electricity bill ($8,000-$18,000 range). Primarily a resilience investment protecting stock water supply.

2.2 What We Assume - And What We Don't

This analysis is deliberately conservative. Here is what it includes and excludes.

Table 1: Key Assumptions

Parameter	Value	Why This Is Conservative
Electricity price inflation	**6% p.a.**	Long-term NZ average is ~3%, but recent actuals are 11-12%. We use 6% as a moderate forward projection.
Discount rate	6%	Standard for long-term agricultural investments.
Diesel price inflation	3% p.a.	Conservative; diesel is subject to global supply shocks.
Southland capacity factor	13%	Below NZ national average of 15%.
Self-consumption	75%	Remaining 25% exported at $0.12/kWh - well below grid price.
Panel degradation	0.5%/year	Output declines from 100% to 90.5% over 20 years.
Battery degradation	0.3%/year savings impact	Resets at Year 15 replacement.
Maintenance	1% of gross CAPEX/year	Covers cleaning, monitoring, minor repairs.
Year 15 replacement	Inverter ($13,500) + battery ($33,750) = $47,250	Full replacement at mid-life.
Residual value (Year 20)	$31,500	Inverter + battery have 10 of 15 years life remaining.
EECA grants	**$0**	**Demonstration fund is closed. No future rounds announced.**

What we exclude (all of which would improve the case):

Potential future EECA grants or co-investment programmes. Revenue from grid services or demand response. Carbon credit value. Insurance premium reductions. Productivity gains from uninterrupted operations. Land value uplift from energy infrastructure.

2.3 Why 6% Electricity Inflation Is Not Aggressive

This is the assumption that drives the financial model, so it deserves scrutiny. The evidence supports it:

The long-term NZ average (2006-2022) was approximately 3% per year, taking prices from 18.87 c/kWh to 30.22 c/kWh. However, this period included a Commerce Commission line charge cycle that held network costs flat or declining in real terms. That cycle ended in April 2025.

The new cycle has delivered immediate, significant line charge increases. In the year to December 2025, electricity prices rose 12.2% - the highest since the late 1980s. Fixed charges rose 21% year-on-year, while variable rates rose 12%.

Structural drivers of future price growth include: electrification of transport and industry increasing demand on constrained networks; aging transmission infrastructure requiring reinvestment; climate-driven hydro variability; and the cost of building new generation capacity.

Our 6% default sits between the long-term average (3%) and recent actuals (11-12%). The sensitivity analysis in Section 4 shows outcomes across the full range from 2% to 12%, so readers can apply their own judgment.

Section 3: Your 20-Year Financial Journey

This section presents the core financial comparison between diesel and solar + battery for a Southland dairy farm. Rather than a single headline number, we show the full financial trajectory - because the value of this investment compounds over time.

3.1 The Diesel Baseline

A 40 kVA diesel generator with automatic transfer switch costs $20,000 upfront. Over 20 years, running 84 hours annually (72 hours outage + 12 hours testing) at 8 L/hr and $1.87/L diesel:

Diesel 20-Year NPV: -$49,590

This is a pure cost centre. Every dollar spent on diesel fuel, maintenance, and the generator itself is money that generates no return. By Year 20, the cumulative cost exceeds $74,000.

3.2 The Solar + Battery Investment

Gross system cost: $157,500 (50 kW PV at $1,800/kW + 75 kWh battery at $900/kWh)

The farmer's actual outlay depends on three factors: whether they would have bought a diesel generator anyway (and can avoid that cost), whether they own a generator they can sell, and how they finance the investment. The table below shows every realistic combination.

3.3 Choose Your Scenario

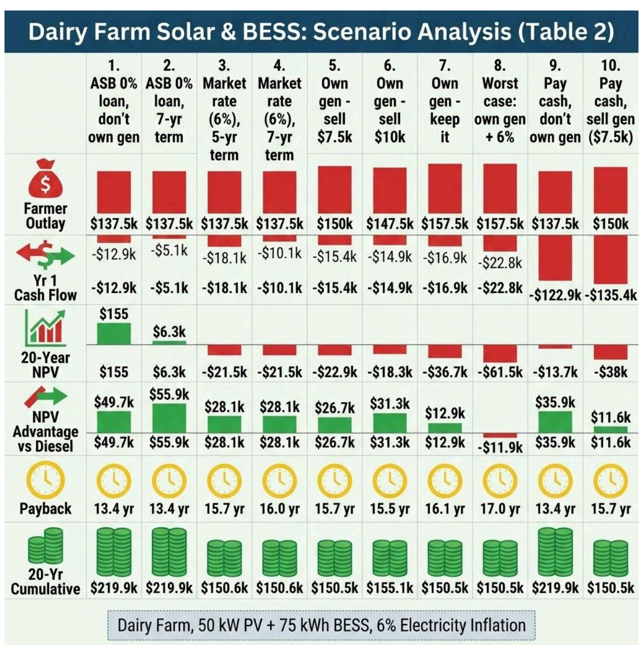

Table 2: Scenario Summary - Dairy Farm, 50 kW PV + 75 kWh BESS, 6% Electricity Inflation

Scenario	Farmer Outlay	Yr 1 Cash Flow	20-Year NPV	NPV Advantage vs Diesel	Paybac k	20-Yr Cumulative
1. ASB 0% loan, don't own a generator	$137,500	-$12,948	$155	**$49,745**	13.4 yr	**$219,943**
2. ASB 0% loan, 7-year term	$137,500	-$5,091	$6,341	$55,931	13.4 yr	$219,943
3. Market rate (6%), 5-year term	$137,500	-$18,090	-$21,505	$28,085	15.7 yr	$150,578
4. Market rate (6%), 7-year term	$137,500	-$10,079	-$21,505	$28,085	16.0 yr	$150,578
5. Own generator - sell for $7,500	$150,000	-$15,448	-$22,876	$26,714	15.7 yr	$150,494
6. Own generator - sell for $10,000	$147,500	-$14,948	-$18,270	$31,320	15.5 yr	$155,100
7. Own generator - keep it	$157,500	-$16,948	-$36,695	$12,895	16.1 yr	$150,494
8. Worst case: own gen + 6% rate	**$157,500**	**-$22,838**	**-$61,505**	**-$11,915**	**17.0 yr**	**$150,494**
9. Pay cash, don't own a generator	$137,500	-$122,948	-$13,722	$35,868	13.4 yr	$219,943
10. Pay cash, sell gen ($7,500)	$150,000	-$135,448	-$38,015	$11,575	15.7 yr	$150,494

All scenarios: No EECA grants. 75% self-consumption. 6% electricity inflation. 6% discount rate.

Includes 0.5%/yr panel degradation, 1% CAPEX annual maintenance, Year 15 inverter + battery replacement ($47,250), and Year 20 residual value ($31,500). Diesel baseline: $20,000 CAPEX, NPV -$49,590.

How to read this table:

"Farmer Outlay" is what you actually need to fund - either by cash or loan. Scenarios 1-4 don't own a generator, so the $20,000 you *would have spent* on a diesel generator is subtracted from the solar cost (you're redirecting that spend). Scenarios 5-8 already own a generator, so no avoided cost applies - but selling it recovers some capital.

"NPV Advantage vs Diesel" is the key comparison metric. A positive number means solar wins in present-value terms. In 9 of 10 scenarios, solar beats diesel. Only the worst case (Scenario 8) shows a modest $12k NPV disadvantage - and even that scenario generates $150,000 in cumulative cash returns over 20 years.

"20-Year Cumulative" is the undiscounted total of all cash flows. This is the real money in your pocket (or avoided from your pocket) over 20 years.

3.4 The Financial Journey: Scenario 1 in Detail

For the recommended default scenario (ASB 0% loan, don't own a generator), here is the year-by-year cumulative position - the "green line" that shows how the investment builds wealth over time.

Year	Cumulative Position	What's Happening
0	-$137,500	Investment made.
1	-$150,448	Loan repayments exceed savings (temporarily).
3	-$173,925	Deepest point of the "investment valley."
5	**-$193,887**	**Loan paid off.** Savings now flow freely.
6	-$174,932	Recovery begins - $18,955 net cash flow.
10	-$88,322	Halfway to breakeven.
13	**-$10,366**	**Approaching breakeven.**
14	**$18,451**	**In profit. Every year from here adds to wealth.**
15	$1,557	Inverter + battery replacement (-$47,250). Temporary dip.
16	$35,156	Recovery - now with fresh components.
20	**$219,943**	**Final position (includes $31,500 residual asset value).**

The pattern is clear: five years of investment, then accelerating returns for fifteen years. The system doesn't just pay for itself - it builds $220,000 in value. At 6% electricity inflation, your Year 20 avoided electricity cost alone is worth over $39,000 - nearly triple the Year 1 figure.

3.5 Monetise Your Existing Equipment

If you already own a working diesel generator and switch to solar + battery, your generator becomes surplus equipment. Rather than letting it depreciate in a shed, consider selling it to recover capital for your solar investment.

A well-maintained 40 kVA generator typically sells for 30-60% of its replacement cost, depending on age and condition. At current replacement prices of $15,000-$25,000, this means $4,500-$15,000 in recovered capital. The table above models sale proceeds of $7,500 and $10,000.

Even a modest $7,500 recovery from selling your generator reduces your effective solar investment and cuts the payback period. This is not a grant or subsidy - it is straightforward equipment liquidation that any farm business should consider when upgrading infrastructure.

Section 4: Stress-Testing the Assumptions

The financial case should not depend on any single assumption holding perfectly true. This section shows what happens when the most important variable - electricity price inflation - varies across a wide range.

4.1 What If Electricity Prices Change?

Table 3: Inflation Sensitivity - Scenario 1 (ASB 0% Loan, No Generator Owned)

Electricity Inflation	PV+BESS NPV	NPV Advantage vs Diesel	Payback	20-Year Cumulative
2% (pessimistic)	-$88,718	-$39,129	19.6 yr	$21,082
4% (conservative)	-$49,430	$160	17.1 yr	$107,732
6% (default)	**$155**	**$49,745**	**13.4 yr**	**$219,943**
8% (moderate)	$63,007	$112,597	12.0 yr	$365,610
10% (high)	$142,962	$192,552	11.0 yr	$555,028
12% (crisis)	$244,971	$294,560	10.1 yr	$801,604

Table 4: Inflation Sensitivity - Scenario 8 (Worst Case: Own Generator, 6% Market Rate Loan)

Electricity Inflation	PV+BESS NPV	NPV Advantage vs Diesel	Payback	20-Year Cumulative
2% (pessimistic)	-$150,378	-$100,789	>20 yr	-$48,367
4% (conservative)	-$111,090	-$61,500	19.4 yr	$38,282
6% (default)	**-$61,505**	**-$11,915**	**17.0 yr**	**$150,494**
8% (moderate)	$1,347	$50,937	13.9 yr	$296,160
10% (high)	$81,302	$130,892	12.6 yr	$485,578
12% (crisis)	$183,311	$232,900	11.5 yr	$732,154

How to interpret this:

For the recommended scenario (Scenario 1), solar beats diesel in NPV terms at any electricity inflation above 4%. Since New Zealand has not experienced sustained electricity inflation below 4% in the modern era, and current rates are 11-12%, the 6% default is moderate. At 8% - which is closer to recent trends - the NPV advantage exceeds $112,000.

Even in the absolute worst case (Scenario 8 at 4% inflation), the cumulative 20-year cash position is still positive ($38,282). This means that **in every scenario where electricity inflation is 4% or above, the solar system generates positive cumulative returns over 20 years regardless of financing or generator ownership.**

The only scenario where a farmer genuinely loses money is Scenario 8 at 2% inflation - a combination of worst-case financing, no avoided diesel cost, AND electricity inflation well below any historical precedent. This is the "everything goes wrong" scenario, and even then, the loss is modest.

Section 5: Benefits Beyond the Financial Model

The NPV analysis captures the direct financial flows, but several important benefits sit outside the spreadsheet. These are real, quantifiable risk reductions that a prudent business should factor into its decision.

5.1 Generator Failure Risk: The Hidden Gamble

Industry data indicates a 12.5% failure-to-start probability for diesel generators that sit idle for extended periods between outage events. This means:

Over 20 years, the probability of experiencing **at least one** failure-to-start event is **93.1%**. The expected number of failures is 2.5. At a cost of $5,000-$15,000 per failure event (spoiled milk, lost production, emergency hire costs), the expected loss over 20 years is approximately **$25,000**.

This cost is not included in the diesel NPV calculation. If it were, the diesel NPV would worsen by $10,000-$15,000 in present-value terms, making the solar advantage even larger across all scenarios.

A solar + battery system has no single mechanical point of failure equivalent to a generator's failure-to-start risk. The battery and inverter operate daily, so faults are detected and addressed immediately rather than discovered during an emergency.

5.2 Energy Price Hedge: Locking In Your Costs

A solar system effectively locks in the cost of a significant portion of your electricity at today's prices. The only ongoing cost is maintenance (1% of CAPEX per year, growing at 2.5% CPI). The energy itself is free.

Over 20 years at 6% electricity inflation, the grid cost of the energy your system self-consumes (42,705 kWh/year) would total approximately **$533,000**. Your solar maintenance cost for the same period is approximately **$41,000**. The hedge value - the avoided exposure to grid price escalation - is approximately **$492,000**.

This is the energy equivalent of fixing your mortgage rate for 20 years while others ride the variable market. It does not appear directly in the NPV (which captures the savings), but it represents a fundamental reduction in business risk.

5.3 Fuel Supply Independence

A solar + battery system requires no external inputs to generate electricity. No diesel deliveries, no fuel storage compliance, no degraded fuel testing, no supply chain vulnerability. In a regional emergency - whether storm, earthquake, or geopolitical disruption - your energy supply is autonomous.

For Alpine Fault (AF8) preparedness, this is not a theoretical advantage. Transport routes to Southland could be severed for weeks or months. A solar system with battery storage continues operating throughout.

5.4 Environmental and Regulatory Position

The dairy system avoids approximately **1,801 kg of CO_2 per year** from eliminated diesel combustion, plus displaces approximately **1,851 kg/year** of marginal grid emissions through exported solar generation. Over 20 years, total avoided emissions are approximately **73 tonnes of CO_2**.

As emissions reporting requirements and climate-related financial disclosures extend to the agricultural sector, demonstrable on-farm decarbonisation becomes a tangible business asset. Solar + battery provides documented, measurable emissions reductions without relying on offset markets.

5.5 Summary: The Full Value Stack

Benefit	Quantified Value (20 years)	In Financial Model?
Net cumulative cash savings (Scenario 1)	$219,943	Yes
Avoided generator failure losses	~$25,000 expected	No
Energy price hedge value	~$492,000 gross avoided exposure	Partially (captured as savings)
Diesel supply independence	Unquantified but material for AF8	No
CO_2 avoided	73 tonnes	No
Farm resilience during outages	Continuous operation vs. time-limited	No

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Section 6: Farm-Type Context

6.1 Dairy Farms: High Consumption = Higher Returns

Typical Southland dairy electricity bills: **$22,000-$45,000/year** (the DairyNZ benchmark for 2025/26 is $28,000 for an owner-operated farm). Operations are 24/7 year-round: milking plant, vat refrigeration, water pumps, effluent systems.

This high baseline consumption is precisely what makes solar + battery so effective. A 50 kW system generates ~57,000 kWh/year - offsetting 65% of consumption and delivering $15,374 in Year 1 savings that grow at the rate of avoided electricity inflation. The investment scales with your bill: larger operations with higher consumption see proportionally greater returns.

For dairy, the resilience case is also strongest. The financial consequences of a three-day outage (dumped milk, disrupted cooling chains) can exceed $21,000 in direct costs. A single serious outage can wipe out an entire year's worth of diesel generator operating costs - assuming the generator starts at all.

6.2 Sheep & Beef Farms: Resilience-Led Investment

Typical Southland sheep & beef electricity bills: **$8,000-$18,000/year**. Demand is more seasonal, with peaks around shearing, lambing, and irrigation.

The financial returns from a smaller system (10 kW PV + 20 kWh BESS, gross cost $36,000) are more modest in absolute terms but still compelling:

Metric	Sheep & Beef
System	10 kW PV + 20 kWh BESS
Gross CAPEX	$36,000
Avoided diesel generator	-$8,000
Farmer outlay	$28,000
Year 1 savings	$3,075
PV+BESS 20-Year NPV	-$2,006
Diesel 20-Year NPV	-$20,460
NPV Advantage	**$18,454**
20-Year Cumulative	$41,060

For sheep and beef, the primary driver is not bill reduction but **stock water security**. Prolonged outages that disable water pumps create an immediate animal welfare crisis. A solar + battery system that keeps pumps running during a multi-day grid failure is not a luxury - it is essential business continuity infrastructure.

A phased approach works well for sheep and beef: start with a system sized to protect critical water supply and gradually expand as the operation's energy needs grow or as electrification of farm equipment (EVs, electric fencing, monitoring systems) increases consumption.

Section 7: Next Steps

For All Farmers

Step 1: Know your numbers. Use the Electrify Southland "Powering Forwards" calculator (farmcalc.electrifysouthland.nz) to model your specific farm. Enter your annual electricity bill, select your financing option, and see your personalised 20-year financial journey.

Step 2: Check ASB eligibility. The ASB Smart Solar Loan (0% interest for 5 years on up to $150,000) is currently available until 30 June 2026. This is the single most impactful financing mechanism for solar on farms. Contact your ASB Rural Manager or enquire through asb.co.nz.

Step 3: Get competitive quotes. Obtain at least three quotes from SEANZ-listed installers (eligible for the 0% loan) familiar with farm-scale systems. Ensure quotes include battery system with islanding and black start capability (not just solar-only).

Step 4: Plan for the full lifecycle. Budget for annual maintenance (1% of system cost) and Year 15 inverter + battery replacement ($47,250 for the dairy-scale system - current prices, also expected to fall on recent trends). These costs are factored into this report's analysis.

If You Already Own a Generator

Assess its current resale value and factor that into your solar investment calculation. A working generator in good condition can recover $4,500-$15,000 depending on size and age. Don't let a sunk cost in existing equipment prevent you from making a better long-term investment.

For Lenders and Policymakers

This analysis demonstrates that concessional lending (0% interest) is the single most powerful mechanism for accelerating solar adoption on farms. The difference between 0% and 6% interest is approximately 2-3 years on the payback period and $20,000-$40,000 in NPV advantage. Co-investment grants, if reintroduced, would further accelerate adoption - but the commercial case stands without them.

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Appendix B: How the Calculator Works

The accompanying spreadsheet allows farmers to enter their own parameters and see personalised results. Key inputs include:

Your electricity bill (annual $). This determines the value of self-consumed solar generation and scales the financial returns proportionally.

Financing choice. Pay cash, ASB 0% loan (5 year), or market rate loan (user-specified rate and term). The calculator shows annual cash flows under each option.

Generator ownership. Toggle whether you currently own a generator (no avoided cost) or would need to buy one (solar investment offsets this spend).

Electricity inflation. Default 6%, adjustable. The calculator shows how your returns change across the range.

All degradation, maintenance, and replacement costs are built into the model. The calculator's outputs match this report's methodology exactly.

Electrify Southland is a not-for-profit initiative advocating for accelerated electrification and energy resilience in Southland, New Zealand.

This report was prepared by Nathan Surendran, Professional Engineer, Director of Schema Consulting Ltd.

The analysis uses publicly available market data and standard engineering methodologies. Individual farm results will vary based on specific energy profiles, site conditions, and equipment selection. To book a more in depth assessment with higher confidence attached, book a discovery call with Nathan here:
https://cal.com/nathan-surendran-ygbbhl/on-farm-solar-15-min-discovery-cpnversation

This report does not constitute financial advice.