ABC Engineering Proposal

Solar PV Assessment and Proposal

Prepared for:

ABC Engineering
123 Fake Street, Moss Vale NSW
2577, Australia

Prepared by:

Insert Company
Details Here

ABC proposal for ABC Engineering – 123 Fake Street, Moss Vale NSW 2577, Australia

In an ever-evolving business landscape, unique energy requirements deserve tailored solutions. We take immense pride in crafting bespoke renewable energy solutions that precisely align with your business needs.

As energy costs continue to rise, coupled with the growing emphasis on environmental stewardship, the significance of sustainable alternatives becomes paramount. The integration of a solar energy system stands as a financially astute and ecologically conscious choice, allowing you to reduce both your carbon footprint and energy expenditure.

As an accredited authority in deploying the most esteemed solar solutions across Australia, we'll detail our journey to not only discover the ideal solution tailored to your distinctive needs and aspirations but also to unravel the rationale behind this choice.

Our approach involves an exhaustive analysis encompassing countless system variations. Through our detailed analysis and comparison, we've pinpointed the optimal solution best suited to your requirements.

Throughout the following pages, you will find a comprehensive exposition of the recommended technologies and their corresponding attributes, engineered precisely for 123 Fake Street, Moss Vale NSW 2577, Australia (NMI 4310902904). We delve into the anticipated energy savings, providing insights into system performance that underpin the foundation of our proposal. Financial advantages are broken down in detail, and we explain the intricate mechanisms orchestrating these benefits.

We are deeply appreciative of the encouragement and enthusiasm you've extended to date. Your endorsement fuels our passion, and we eagerly anticipate embarking on this transformative journey towards a renewable energy future with you.

Kind Regards,
Insert Company Name

Project Summary

Reference: #2223895

ABC Engineering
123 Fake Street, Moss Vale NSW 2577, Australia (NMI 4310902904)

Proposed Solution

211.7 kWp / 160.0 kW Solar & 225 kWh / 110.0 kW (2.0 hour) - Sungrow ST225CS-110kW Battery

This proposed solar and battery solution offers the below est. key metrics:

Energy Independence:
64.4%

First Year Earnings:
$73,007

Net Upfront Costs:
-$524,540

Net Present Value:
$564,670

Independent Rate of Return:
14.3%

Simple payback period:
7 years

Your cutting-edge solar and battery configuration will offset a remarkable **170.8** tonnes of CO2 emissions per year – a feat equivalently impactful as **392.9** unburned barrels of oil and growing **2,818.9** tree seedlings for 10 years.

System and Performance

Solar

We've specified this Solar PV system as the leading system size for **123 Fake Street, Moss Vale NSW 2577, Australia** to seamlessly achieve your business objectives.

Based on the system size and location, your Solar PV is expected to generate **285,719 kWh** per year.

Whilst the monthly generation figures fluctuate in line with seasonality, the system generation will offset your site load by an est. **132,871 kWh** per year, while still generating sufficient levels to flow through your battery.

Solar Size

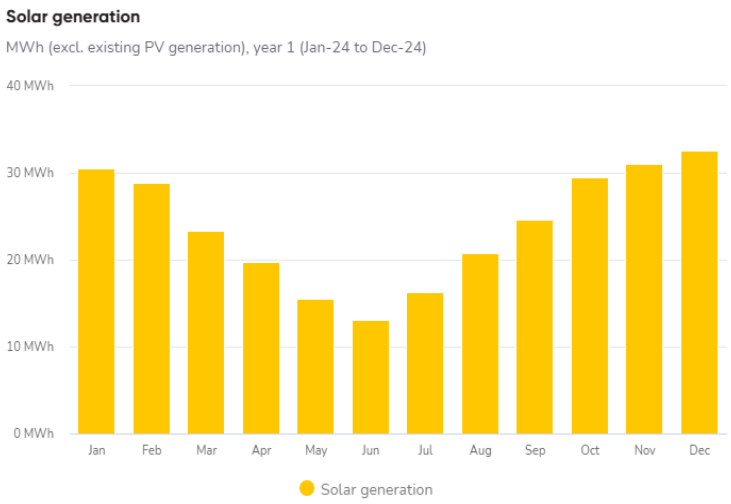
211.7 kWp

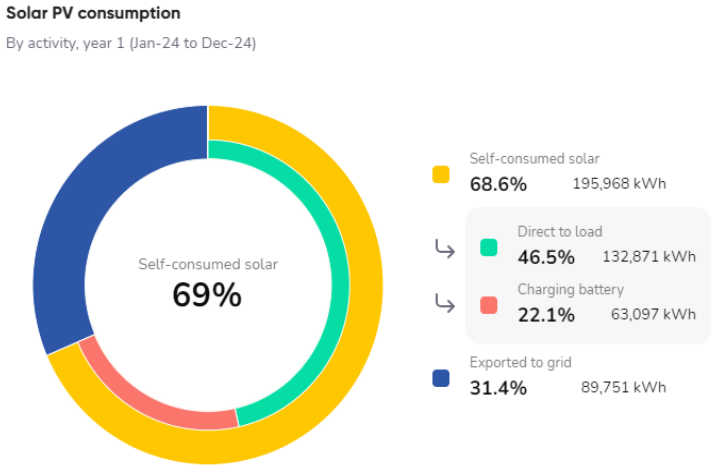
Inverter Size

160.0 kW

Annual Generation

285,719 kWh





System Assumptions: ABC Engineering solar, 0.4% PV Module degradation PA

System and Performance

Battery

By pairing with us for your battery installation, you're not only unlocking the benefits of storing solar generation for your site to consume later, you're also tapping into additional savings opportunities, such as network tariff peak demand reduction.

We've specified this battery combined with our advanced value stack as the leading option to compliment your solar installation and maximise savings and revenue opportunities.

Battery Size

225 kWh

Battery Power

110.0 kW

Technology

Sungrow ST225CS-110kW

Battery Value Stacks

A battery "value stack" is the combination of multiple battery services which create value.

Simple battery value stack

A battery which extracts value exclusively from "behind-the-meter" services - typically "out-of-the-box" use cases.

Modelled value stack:

Demand charge reduction

+

Time-of-Use Tariff Arbitrage

+

Increased solar self-consumption

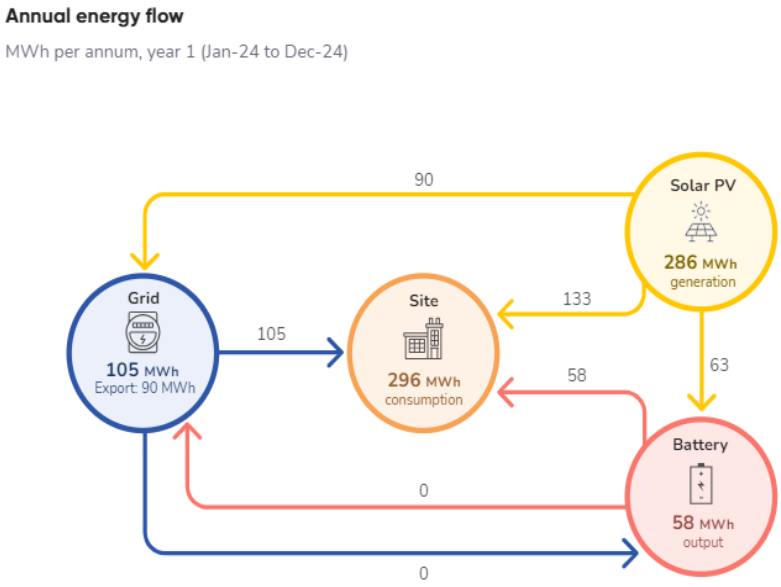
Consumption and Energy Flows

Energy Flow

From your solar and battery solution, in the first year we estimate:

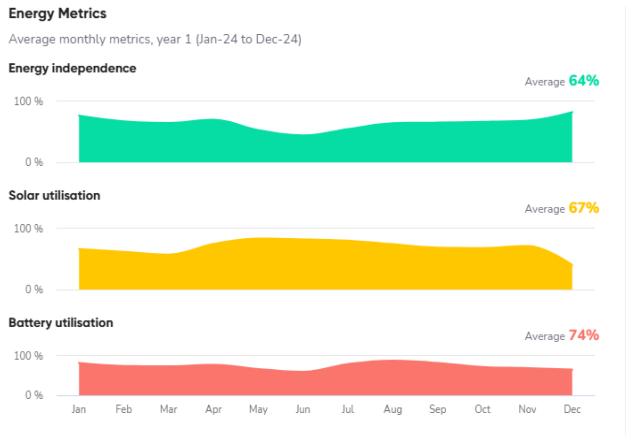
- **63,097 kWh** to flow from solar to battery
- **58,091 kWh** to flow from battery to load
- **89,751 kWh** to flow from solar to the grid
- **0 kWh** to flow from battery to the grid
- **0 kWh** to flow from the grid to the battery

This leaves only **105,414 kWh** of energy consumed by the site from the grid.



Key Metrics

By proceeding with the proposed solution, you're on track to achieve **64.4%** energy independence in your first year, **with 66.8%** solar utilisation and **74.2%** battery utilisation.

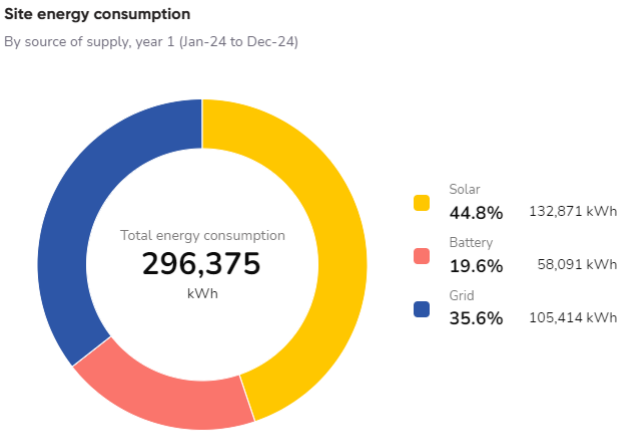


Consumption and Energy Flows

Site Energy Consumption

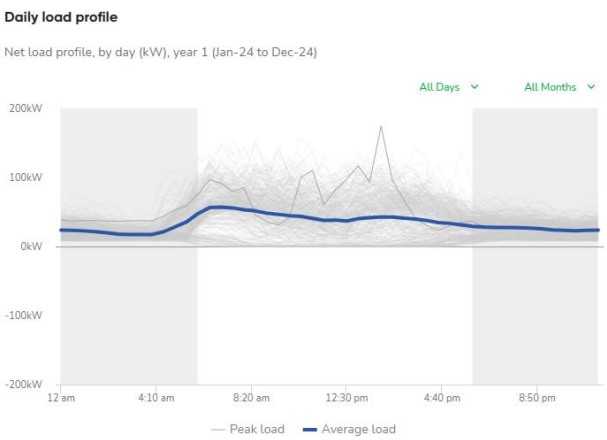
Currently your site is consuming **295,161 kWh** per year, with 100% of this coming from the grid. With our proposed solution, your site energy consumption breakdown will be the following:

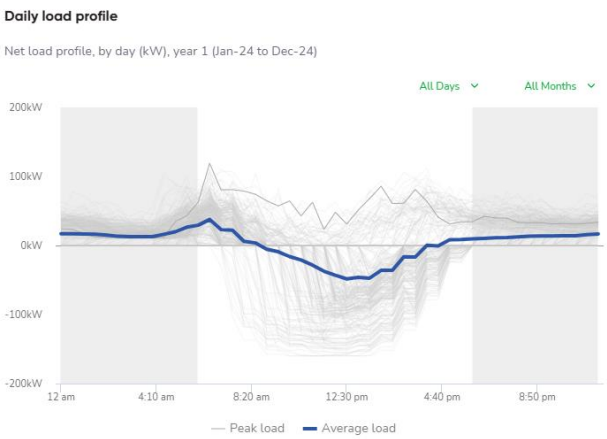
Consumption from solar	132,871 kWh	44.8%
Consumption from battery	58,091 kWh	19.6%
Consumption from grid	105,414 kWh	35.6%



Solar and battery not only help reduce energy consumption, but they also aid in demand reduction, providing significant savings on network tariff demand charges.

Below is a view of your site's daily demand profile before (left) and after (right) installation:

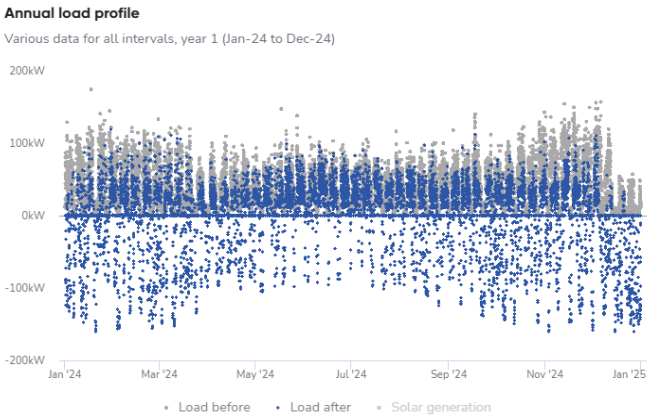




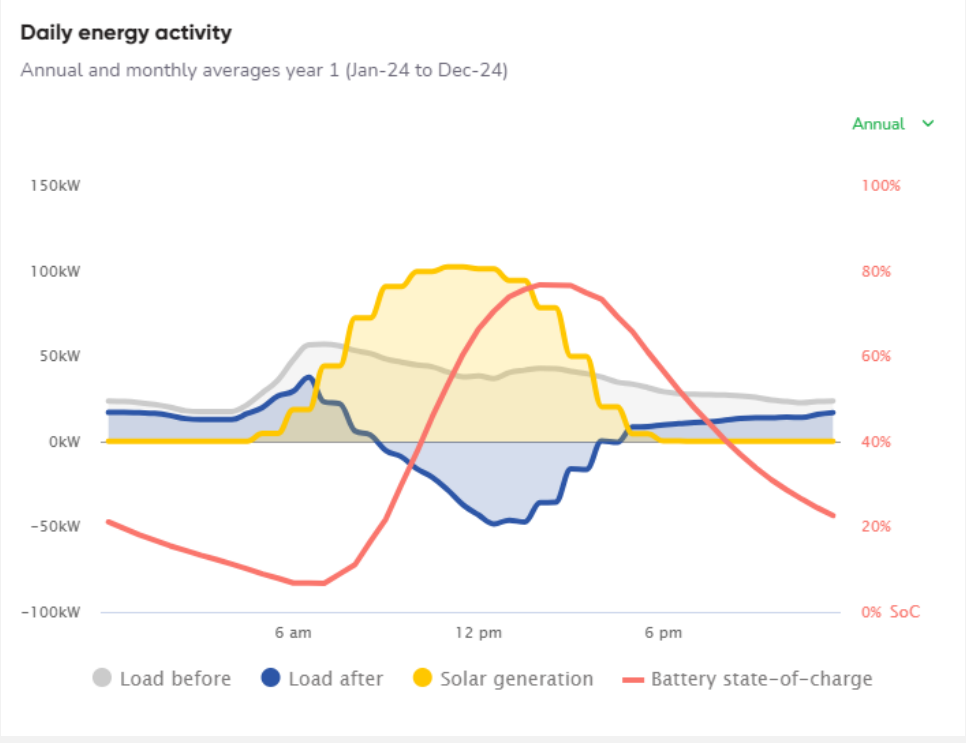
Consumption and Energy Flows

Site Energy Consumption

Following the daily load profile view on the previous page, this is the view of your site's demand profile before and after installation on an interval-by-interval basis over the course of a year.



How your solar & battery work together



We can see the impact the solar and battery system will have on your average daily load clearly – at 6am, the solar kicks in reduces the site consumption to below 0.

This also enables the battery to charge throughout the day.

As the sun goes down, we can see the battery kick in to further offset the site consumption as the solar generation drops off for the day.

Financial Benefits and Cashflow

Based on the current annual electricity spend, the proposed solution offers significant savings and earnings potential over the project lifetime.

Invoice Comparison

Below is a comparison of your current annual energy spend vs expected first year spend after the project is commissioned, and a breakdown of the savings on a line-item basis.

Bill calculations All prices in nominal terms.

Before

Year 1	Quantity	Unit	Tariff*	Unit	MLF	DLF	Charges
Retail							$28,457
AEMO FRC Operations	366	days	2.164	c/day			$8
Metering Charge	366	days	4.085	$/day			$1,495
Value Added Service Charge	366	days	1.366	$/day			$500
Peak	84,146	kWh	9.05	c/kWh	1.01	1.069	$8,219
Shoulder	107,812	kWh	9.05	c/kWh	1.01	1.069	$10,531
Off Peak	104,416	kWh	6.836	c/kWh	1.01	1.069	$7,704
Network							$39,946
Fixed charge	366	days	78.00	c/day			$285
High Season	38 x 12	kVA x mth	15.93	$/kVA/mth			$7,219
Low Season	62 x 12	kW x mth	7.85	$/kW/mth			$5,828
Peak	40,360	kWh	10.313	c/kWh			$4,163
Solar Soak	59,260	kWh	3.644	c/kWh			$2,159
Off Peak	196,755	kWh	10.313	c/kWh			$20,292
Other Usage Charges							$35,738
AEMO Participant Charge	296,375	kWh	0.039	c/kWh		1.069	$125
AEMO Ancillary Charge	296,375	kWh	0.045	c/kWh		1.069	$142
PRC Charge	296,375	kWh	0.061	c/kWh		1.069	$193

Bill calculations All prices in nominal terms.

Savings

Year 1	Quantity	Unit	Tariff*	Unit	MLF	DLF	Charges
Retail							$40,627
Usage Components							$23,027
Volume Components							$17,600
Network							$18,684
Volume Components							$15,951
Demand Components							$2,733
Other Income							$13,696
LGCs							$13,696
Total excl. GST							**$73,007**

Bill calculations All prices in nominal terms.

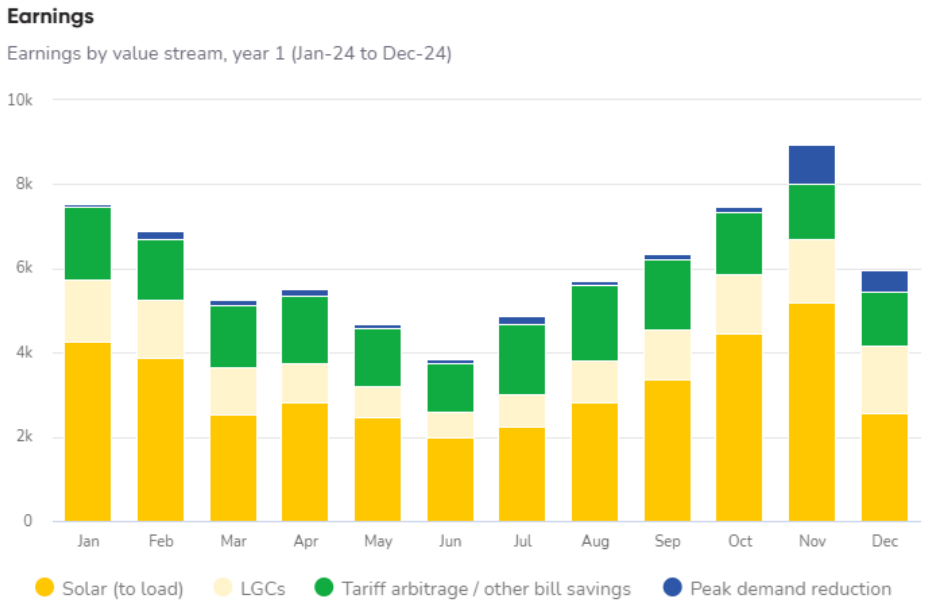
After

Year 1	Quantity	Unit	Tariff*	Unit	MLF	DLF	Charges
Retail							$10,857
AEMO FRC Operations	366	days	2.164	c/day			$8
Metering Charge	366	days	4.085	$/day			$1,495
Value Added Service Charge	366	days	1.366	$/day			$500
Peak	20,817	kWh	9.05	c/kWh	1.01	1.069	$2,033
Shoulder	24,221	kWh	9.05	c/kWh	1.01	1.069	$2,366
Off Peak	60,376	kWh	6.836	c/kWh	1.01	1.069	$4,455
Export tariff	-89,751	kWh	-0.00	c/kWh	1.01	1.069	$0
Network							$21,263
Fixed charge	366	days	78.00	c/day			$285
High Season	28 x 12	kVA x mth	15.93	$/kVA/mth			$5,382
Low Season	52 x 12	kW x mth	7.85	$/kW/mth			$4,932
Peak	14,992	kWh	10.313	c/kWh			$1,546
Solar Soak	3,132	kWh	3.644	c/kWh			$114
Off Peak	87,290	kWh	10.313	c/kWh			$9,003
Other Usage Charges							$12,711
AEMO Participant Charge	105,414	kWh	0.039	c/kWh		1.069	$44
AEMO Ancillary Charge	105,414	kWh	0.045	c/kWh		1.069	$50
PRC Charge	105,414	kWh	0.061	c/kWh		1.069	$69
ESC Charge	105,414	kWh	3.934	c/kWh		1.069	$4,434
SREC Charge	105,414	kWh	4.00	c/kWh		1.069	$4,508
LREC Charge	105,414	kWh	3.20	c/kWh		1.069	$3,606
Other Income							-$13,696
LGCs							-$13,696
Total excl. GST							**$31,134**

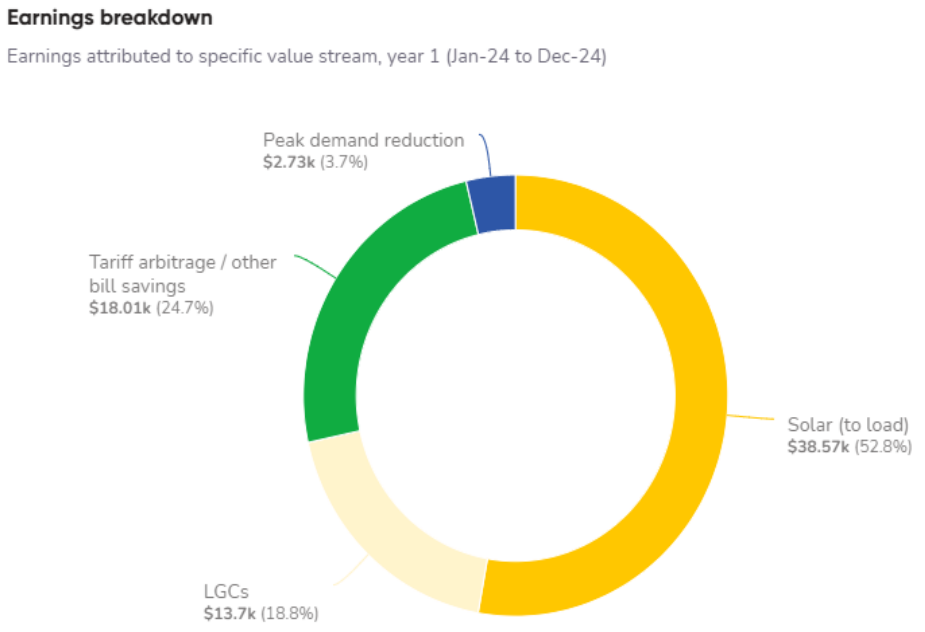
Financial Benefits and Cashflow

Solution Earning

The proposed solution offers a potential first year earnings of **$73,007.** Below is how this is expected to flow in on month-by-month basis throughout the first year:



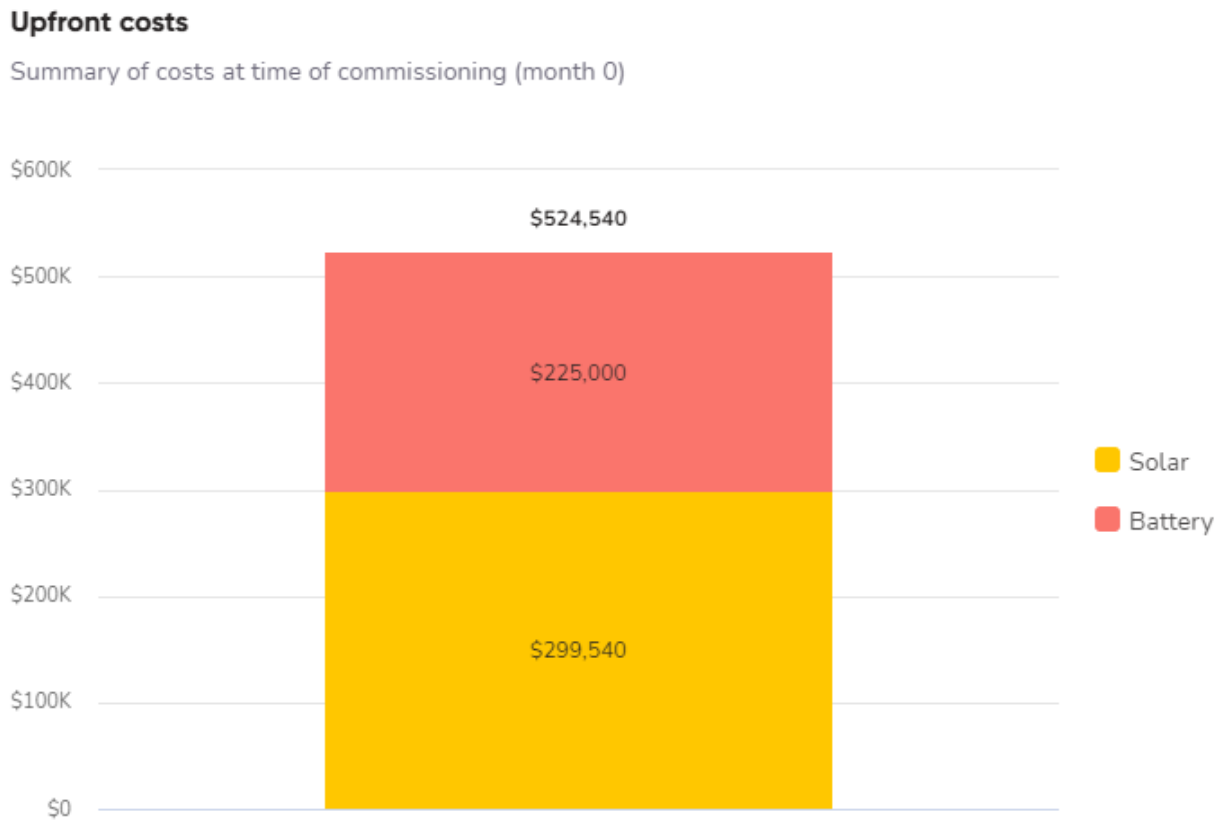
$0	$2,733	$38,573	$0	$18,005	$0	$13,696	$0
Wholesale arbitrage	Peak demand	Solar to load	Solar exports	Tariff arb. & other bill savings	Outage Reduction	LGCs	FCAS



Financial Benefits and Cashflow

Upfront Costs

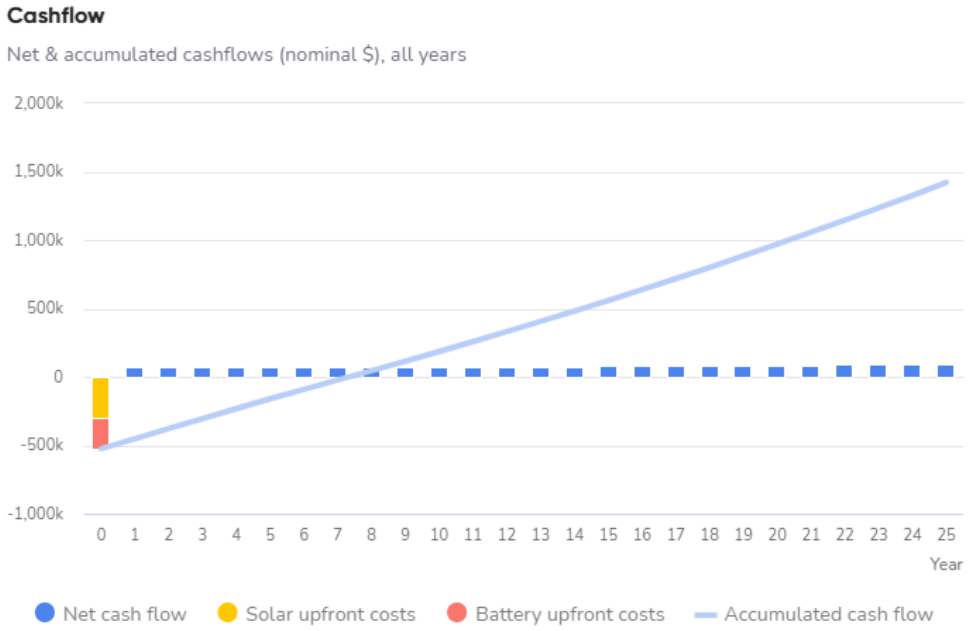
The upfront costs for the proposed solution come to **-$524,540,** ex GST, providing a simple payback period of **7** years.



Financial Benefits and Cashflow

Cashflow

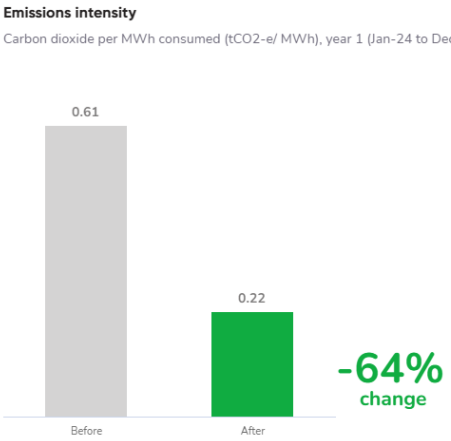
With an outright purchase option, you could expect to see the below cashflow over the first year and the **25** year project lifetime.



Environmental Impacts

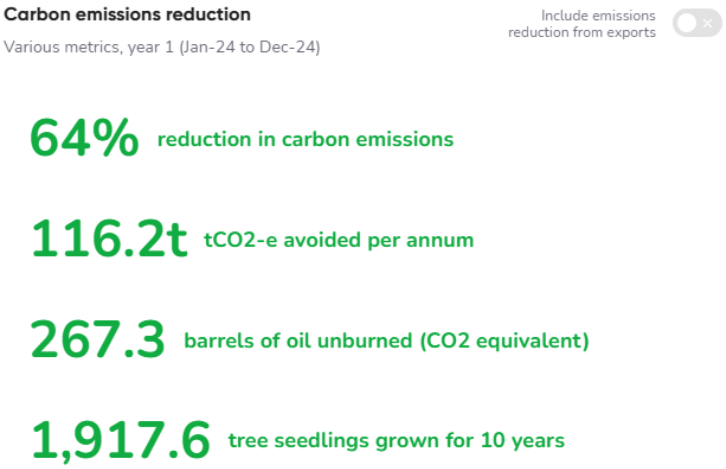
Emissions Intensity

Currently, we estimate **0.6** tCO2-e/MWh are consumed at **ABC Engineering** each year. With our proposed solution, this is expected to reduce to **0.2** tCO2-e/MWh per year.



Emissions Reduction

This high-level overview demonstrates the impact the proposed solution will have on carbon emissions reduction including emissions reduction from grid exports.



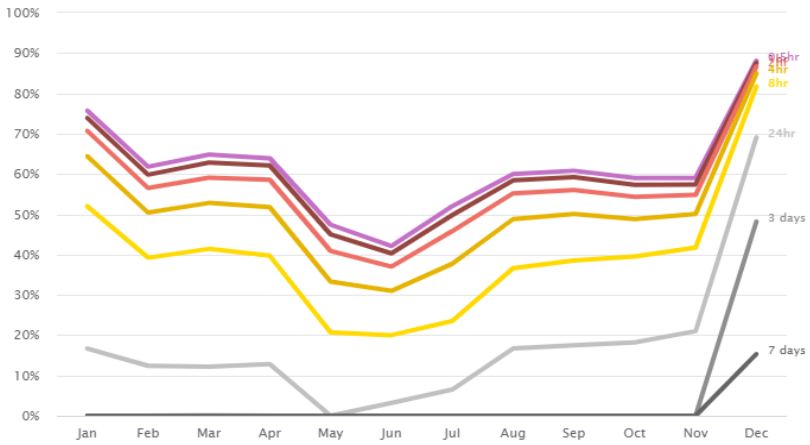
	Including grid exports	Excluding grid exports
Reduction in carbon emissions	94.7%	64.4%
Tonnes of CO2 avoided per year	170.8	116.2
Barrels of unburned oil	392.9	267.3
Tree seedlings grown	2,818.9	1,917.6

Analysis Insights

Battery Metrics

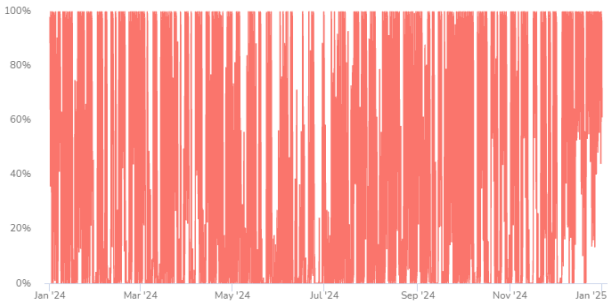
Backup power duration

% of time the load can be fully serviced, for a given time, should an outage occur, year 1 (Jan-24 to Dec-24)



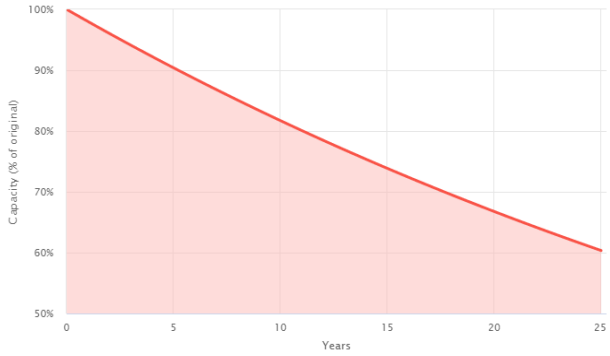
Battery State of Charge

% of total storage capacity, year 1 (Jan-24 to Dec-24)



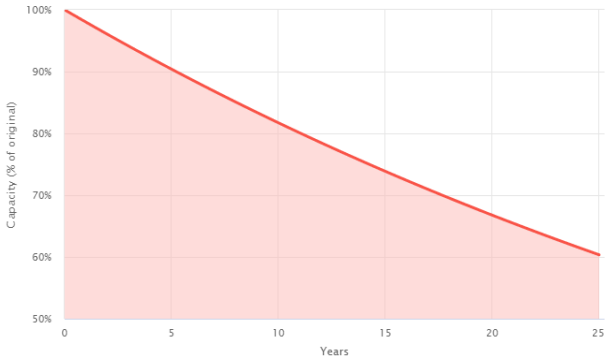
Battery capacity

Includes degradation and replacement over project life



Battery capacity

Includes degradation and replacement over project life



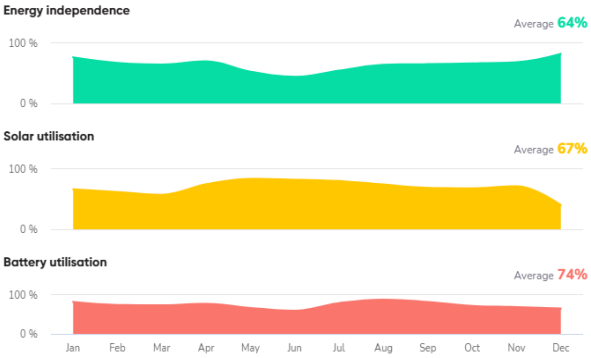
Analysis Insights

First Year vs Lifetime

Below is breakdown of our analysis results, comparing the project first year figures to the project lifetime figures.

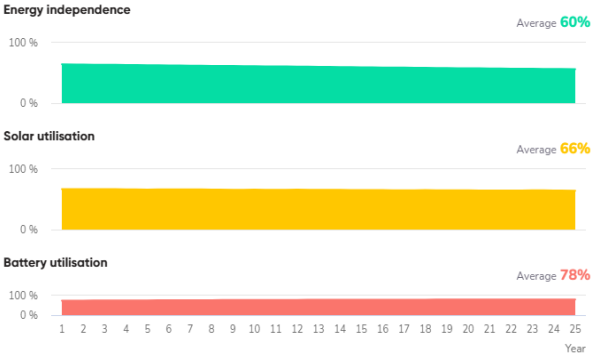
Energy Metrics

Average monthly metrics, year 1 (Jan-24 to Dec-24)



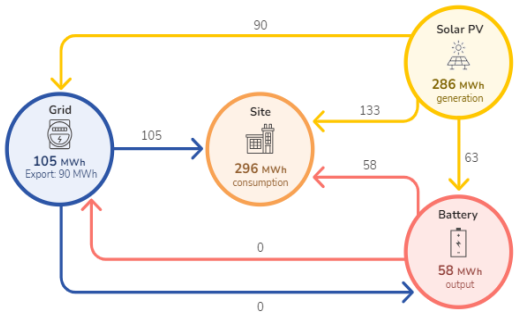
Energy Metrics

All years



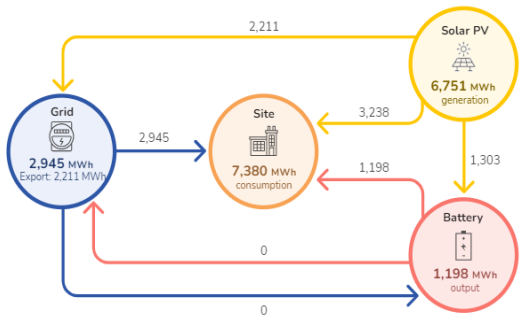
Annual energy flow

MWh per annum, year 1 (Jan-24 to Dec-24)



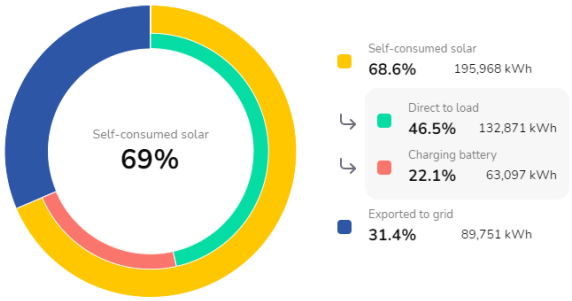
Annual energy flow

MWh over project lifetime, all years



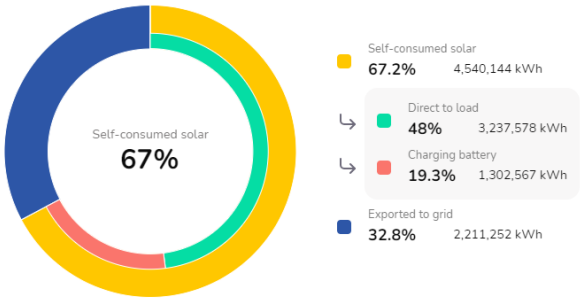
Solar PV consumption

By activity, year 1 (Jan-24 to Dec-24)



Solar PV consumption

By activity, all years



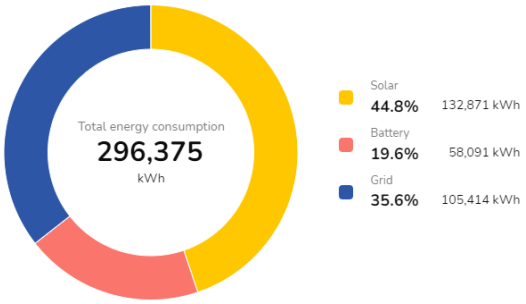
Analysis Insights

First Year vs Lifetime

Below is breakdown of our analysis results, comparing the project first year figures to the project lifetime figures.

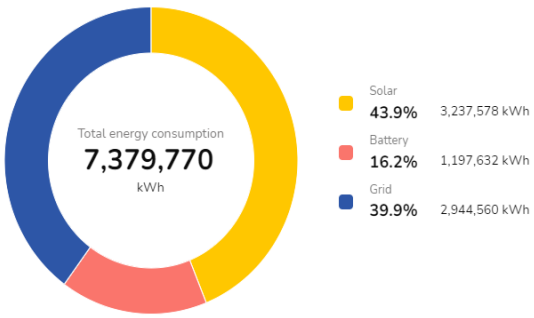
Site energy consumption

By source of supply, year 1 (Jan-24 to Dec-24)



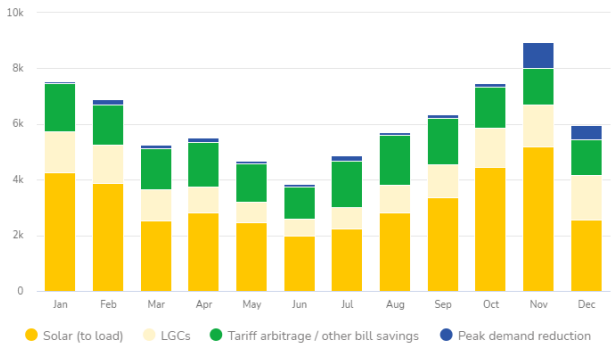
Site energy consumption

By source of supply, all years



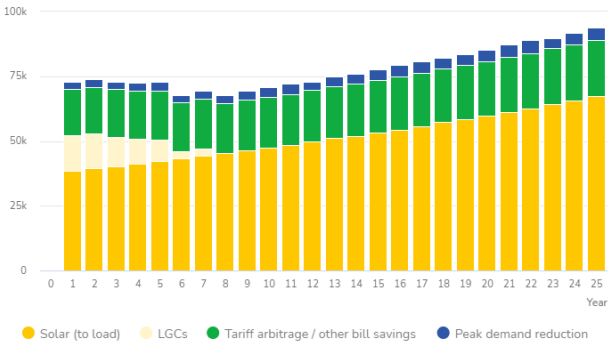
Earnings

Earnings by value stream, year 1 (Jan-24 to Dec-24)



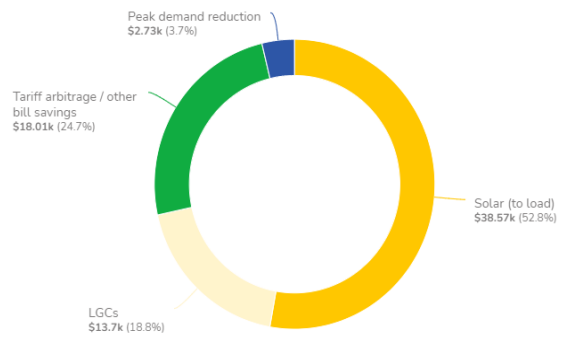
Earnings

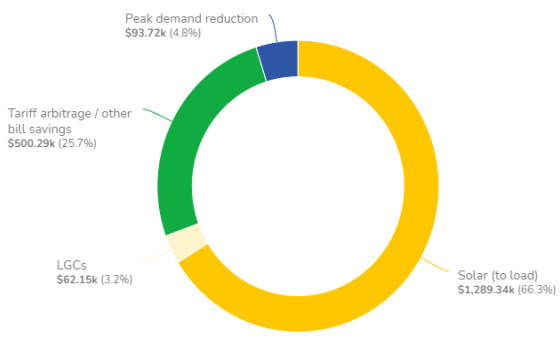
Earnings by value stream, all years



Earnings breakdown

Earnings attributed to specific value stream, year 1 (Jan-24 to Dec-24)



Earnings breakdown

Earnings attributed to specific value stream, all years