ACHIEVING ENERGY INDEPENDENCE:

EVERYTHING YOU NEED TO KNOW ABOUT COMMERCIAL STORAGE

SMART
COMMERCIAL
SOLAR

ABOUT THE AUTHORS

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is the Executive General Manager at Smart Commercial Solar. With a long history in solar energy that stretches back more than 13 years, Stenning encourages his team to take the complexity out of the adoption of renewables, supporting each line of business in building the long-term vision for better commercial solar energy and storage in Australia.

KEALY DAY

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INTRODUCTION

Energy is an escalating challenge for Australian organisations, who are being squeezed in several areas. In the short term, the cost of power continues to increase, and there's growing regulatory and social pressure on being seen as a "green" consumer of energy.

In the longer term, power security is another issue. Outages and extreme supply disruption are not a case of "if", but rather "when."

Solar by itself is not enough to be the solution to these challenges. Solar does play a significant role in our energy future, but organisations need to think both defensively and opportunistically about their energy futures. They need to see solar as an essential part of a suite of solutions, strategies and technologies pointing to a single destination: energy independence.

The timelines to do this are pressing, and there is a good cautionary tale out of South Africa. That country's failure to adequately maintain and adapt its power infrastructure has resulted in a blackout every day for over a year now – imagine the costs this would inflict on your typical business.

Close to home, the experience of South Australia has also been illustrative. South Australia has struggled to provide a steady and reliable supply of energy for several years now, much of which has been attributed to a combination of the following causes:

1. ENERGY MIX

South Australia generates a significant amount of its energy from renewable sources, particularly wind and solar. While renewable energy is environmentally friendly, it can be intermittent due to weather conditions (cloud cover, lack of wind), leading to fluctuations in energy supply. This intermittency can strain the grid and lead to power supply instability, which might contribute to blackouts.

2. TRANSMISSION INFRASTRUCTURE

The transmission infrastructure in South Australia might not have been adequately upgraded to accommodate the growing share of renewable energy sources. In some cases, this can lead to congestion in the grid, making it difficult to efficiently distribute the generated power.

3. SUDDEN DEMAND SPIKES

Rapid changes in electricity demand can stress the grid. For instance, during extreme weather (such as heatwaves), air conditioning usage can surge, leading to high demand for electricity. If supply cannot keep up with this sudden increase in demand, it can result in blackouts.

4. LACK OF ENERGY STORAGE

Renewable energy sources like wind and solar are dependent on weather conditions, and energy production might not always match demand. Energy storage technologies, such as large-scale batteries, can help store excess energy during times of high production and release it during periods of high demand. The lack of sufficient energy storage capacity can contribute to supply instability.

In response to these challenges, the South Australian government has been actively promoting and investing in renewable energy and energy storage solutions to address the issue of blackouts and improve energy security. Some of the measures they have taken include:

BATTERY STORAGE

South Australia is home to one of the world's largest battery storage installations, the Hornsdale Power Reserve, which was built by Tesla. This battery helps stabilise the grid by providing rapid injections of power during periods of high demand or supply fluctuations.

RENEWABLE ENERGY TARGETS

The South Australian government has set ambitious renewable energy targets, aiming to achieve a high percentage of its energy from renewable sources by specific deadlines. These targets drive investments in renewable energy infrastructure.

GRID UPGRADES

Investments have been made in upgrading the transmission and distribution infrastructure to better cope with the integration of renewable energy sources into the grid.

DEMAND RESPONSE PROGRAMS

These programs encourage consumers to reduce their energy consumption during peak demand periods, which can help alleviate stress on the grid and reduce the likelihood of blackouts.

DIVERSIFICATION OF ENERGY SOURCES

While continuing to promote renewables, the government might also consider diversifying its energy sources to include more stable and dispatchable sources like natural gas or advanced nuclear technologies, which can provide consistent power when renewables are not producing at their peak.

As the experience in South Australia has made clear, the benefits of taking a holistic approach to energy independence are significant, and this is something that both business and government has started to action. For example, the retail chain, Officeworks, has been a trailblazer in sustainability. Recently, it was able to deliver a 100% renewables-powered outlet, in Warana through the combination of a large solar array, supported by a properly configured battery, and sourcing of renewable energy from their retailer. Not only was the Warana outlet able to reduce power consumption from the grid by 62%, going from 340,000 kWh per year to 130,000 kWh per year, but the outlet is now a truly climate-resilient site that is well prepared for any future disruption to energy supply.

Australia needs to ensure that the experience of South Australia isn't replicated and the transition to a better energy environment is smooth. The time to follow trailblazers like Officeworks in achieving energy resilience is now.

THE STATE OF RENEWABLE ENERGY IN AUSTRALIA:

35.9%

Australia's electricity generation from renewables in 2023. (1)

3-4 YEARS

The average "payback period" for commercial solar installation. (3)

2GWH

The amount of large-scale battery storage under construction at the end of 2022. (2)

83%

The amount of energy expected to be generated by renewables by 2030 (4)

WHAT IS COMMERCIAL SOLAR BATTERY STORAGE?

The key to energy resilience is having properly configured battery storage on-site. The battery or batteries in the commercial environment must be programmed to only charge when electricity is cheapest, either when there is excess solar or during off-peak rates. Likewise, the system must be configured to only discharge the battery during peak times or at specific thresholds, to avoid spikes in consumption. By having this control, a business can achieve multipliers in the savings generated.

Essentially, batteries are the solution to the reality that solar energy generation is “dumb”: it generates when the sun is shining and isn’t able to do much more than that. A battery, meanwhile, is smart - it can listen, learn and function to suit the purpose.

A good example of what this looks like is Fraser’s Property, who partnered with Smart Commercial Solar for a complete energy resilience solution. This included electrical infrastructure design, metering strategy, essential services power and, critically, integrating all of that with a solar/battery/bio-generator solution.

The result was a system with multiple power generation sources which allows Fraser’s Property to operate in the NEM and participate in wholesale, demand response, and FCAS markets, and gain access to hybrid control of all generation/energy sources to optimise the financial outcomes.

The commercial storage solution was central to the success of this project.

Did you know?

Battery storage systems can be configured to provide back up power during grid outages or emergencies. It is particularly important in industries that depend on uninterrupted power supply.

FRASER'S PROPERTY KEY PROJECT STATS:

Integration of Multiple Power Generation Sources

Setting up the system to operate in the NEM and participate in wholesale, demand response and FCAS markets

Hybrid control of all generation/energy sources to optimise financial outcomes

THE ROLE OF BATTERIES IN COMMERCIAL ENERGY SYSTEMS

Many assume that a commercial battery's role is quite simple – to store and provide energy. However, within that function, a battery delivers a host of meaningful benefits, including:

1

PEAK SHAVING

Peak shaving involves reducing electricity consumption during peak demand periods when utility rates are typically higher. By discharging stored energy during these peak hours, businesses can lower their electricity costs and optimise their energy usage.

2

LOAD SHIFTING

Load shifting refers to the practice of redistributing energy consumption from high-demand periods to low-demand periods. Battery storage systems allow businesses to store excess energy during off-peak hours and use it during peak hours, effectively reducing electricity expenses and supporting grid stability.

3

MICROGRID

Commercial battery storage plays a crucial role in microgrid applications. Microgrids are localised energy systems that can operate independently from the main grid. By combining solar power with battery storage, businesses can create self-sustaining microgrids that provide reliable electricity, particularly in remote areas or during natural disasters.

4

INTEGRATION WITH RENEWABLE ENERGY SOURCES

Battery storage enables the seamless integration of renewable energy sources into the commercial sector. By storing excess solar energy, businesses can optimise their energy generation, reduce reliance on fossil fuels, and achieve a greener and more sustainable energy mix.

Officeworks' Chief Financial Officer Brendan Hargreaves was keen to work out what a future climate-resilient store would look like.

"We chose Warana to be the first store to get a lithium battery because, first of all, it's located in the Sunshine State, so it's the perfect place to put it. But it's also a perfect example of working in close partnership with our landlord, who has been a key contributor to this initiative"

- Brendan Hargreaves, Officeworks Chief Financial Officer

WHY ARE BUSINESSES TURNING TO COMMERCIAL STORAGE?

With both the Officeworks Warana and Fraser's Property Industrial sites, the goal of commercial solar storage was not just to save on power costs. That's certainly a benefit that helps to justify the initial cost of the solution with key stakeholders – especially with the increasing cost of electricity meaning that it's possible to leverage renewables and commercial storage to offset as much as 80% of consumption.

However, the longer-term goal, to deliver energy resilience, is an even more compelling and important one. The transition from coal-based power to a power grid that is supported by renewables is a complex one, and it will come with disruption. For businesses that are totally energy reliant, this is concerning. While that transition takes place, organisations will need to take responsibility for their own resilience.

Additionally, for socially conscious organisations, there are multiple benefits to commercial storage solutions. The obvious one is that the more energy consumption can be moved to solar panels on the business' roof, the greater the carbon offset.

However, in addition to that, as the network of commercial batteries connected to the grid increases, more capacity will be stored and available to the grid when needed. Businesses with these systems will essentially operate as stabilizing agents, building greater resilience into the grid for all people that need energy, while also providing revenue back to the organisation for doing so.

Ultimately, businesses with solar generation and commercial storage solutions will reduce the volatility in the market. This will in turn reduce wholesale prices of energy, meaning that small businesses and families have lower bills, and businesses will be more competitive with lower overheads. Additionally, as adoption of these systems increases, the continued volume and scale will also act to bring the price of renewables down too, making it even more affordable for even more businesses, and allowing organisations that are already using these systems to scale further.

“The typical Queensland store consumes around 340,000 kWhKwH per year. At Officeworks Warana, we consume about 130,000 KwH per year. It’s a reduction of about 70 per cent from your typical Queensland store.”

- Patrick Heagney, Officeworks Carbon and Energy Manager.

SIZING THE RIGHT BATTERY

To understand just how significant the impact of a properly configured battery system can be, first consider that typically, a solar system can meet 30-40% of current needs. Using batteries, we can sensibly reach another 30-40%. This can be achieved through a hybrid system comprising rooftop solar panels and a basic battery setup. To further enhance your sustainability efforts, you can supplement this setup with solar car shades to generate more on-site renewables.

It is even possible that battery storage, in combination with ample space for solar panels, can meet 100% of a company's energy needs. And it should be noted that whilst it has been historically difficult to reach these levels on a purely financial basis, we've reached a tipping point in the renewable energy sector where the rising costs of grid power and decreasing battery costs make off-grid systems more attainable than ever before. Instead of solely focusing on energy storage during non-sun hours, businesses can leverage batteries to capitalise on high-priced market events, network emergency contributions or avoid demand charges by using the battery for peak demand reduction.

Being able to achieve that means working with the right partner that can advise on the right battery size for your organisation.

THE FIRST STEP

Determining your organisations' energy consumption patterns and needs, particularly if you've already had solar installed. If you find that you have excess solar energy generated during the day that goes unused, a battery storage system can capture and store this energy for use during periods of higher demand or when solar production is limited, such as during cloudy days or at night.

NEXT

Evaluate how important a continuous power supply is for your business. If your operations heavily rely on uninterrupted power, such as in healthcare facilities, data centres, or manufacturing plants, configuring your site with batteries that can act as an Uninterruptible Power Supply.

FINANCING COMMERCIAL BATTERIES

One of the most common prohibitors that prevent organisations from investing in battery energy storage systems is the up-front costs, which can be significant (though they are dropping). With any form of Capex spending being heavily scrutinised, organisations are looking to find other ways to finance these projects.

Smart Commercial Solar is now delivering 50% of systems under a Power Purchase Agreement (PPA). Under a PPA, the solar energy provider installs and maintains the solar panels on the business premises with no upfront capital expense.

In return, the business agrees to purchase the generated solar energy at a predetermined rate over a specified period, typically ranging from 10 to 25 years. This allows businesses to access clean and renewable solar energy without the upfront costs of installing the system themselves, making commercial solar more accessible and attractive.

Did you know?

If you have seen a significant increase in your energy rates and already have solar, now is a good time to get a battery feasibility study to understand the latest numbers.

Batteries have a role to play in these solutions, too. By integrating battery storage into the equation, it offers the following advantages for businesses:

INCREASED ENERGY RELIABILITY

Battery storage ensures a continuous and reliable energy supply, even during periods of low solar generation. Stored energy acts as a backup power source, providing businesses with energy resilience and minimising disruptions to operations.

OPTIMISED COST SAVINGS

By utilising stored energy during peak demand periods, businesses can reduce or eliminate costly demand charges. Battery storage allows businesses to maximise their solar energy utilisation, further optimising cost savings and increasing the financial returns of their PPA investments.

ENHANCED ENERGY INDEPENDENCE

Battery storage empowers businesses to become more energy independent by reducing their reliance on grid electricity. By storing more solar energy, businesses can decrease their dependence on fossil fuel-based grid energy and contribute to a greener, more sustainable future.

For those organisations with an existing solar PPA, note that it is possible to incorporate battery storage into your ongoing agreement.

For organisations who own their solar system outright and are interested in adding a battery without impacting Capex, there are also specialty funders who offer payment solutions for solar system upgrades, including adding a battery.

SO, ARE SOLAR BATTERIES RIGHT FOR YOU?

For those who have already installed solar and seen the benefits, battery storage is the next logical step. It may not stack up for all businesses, however as an organisation we're seeing battery uptake increase as energy rates continue to drive uncertainty in the long-term view of Australia's energy market. Battery storage insulates a business from price volatility in one of its largest cost inputs and provides energy independence - something that is becoming critical.

If you have seen a significant increase in your energy rates and already have solar, now is a good time to get a battery feasibility study to understand the latest numbers.

Our team can provide a comprehensive battery analysis that details the costs, savings and environmental benefits of installing a battery.

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GET STARTED WITH A FEASIBILITY STATEMENT

To start achieving energy independence in your business, reach out for a free feasibility study today.

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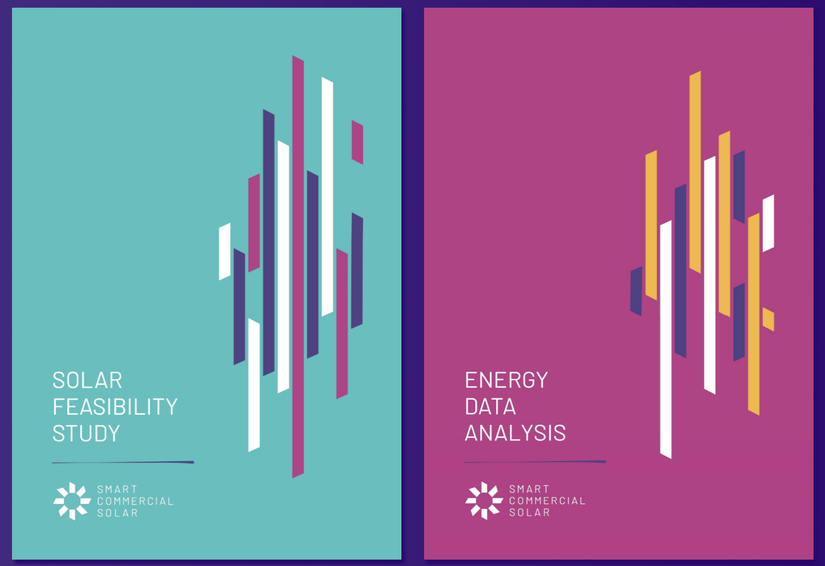

THANK YOU FOR YOUR TIME AND ENERGY