

DISCOVERY **GREEN**

SUMMARY

Renewable energy strategies for businesses
in South Africa: A technical review



SOUTH AFRICAN BUSINESSES NEED A NEW MODEL FOR RENEWABLE ENERGY. **HERE'S WHY**

Understanding the context

As businesses make the rapid shift to renewable energy, a data-driven assessment of existing approaches is critical to ensure an effective and scalable approach and avoid future risk.

Given rising electricity costs, frequent power outages, upcoming carbon taxes and global penalties for high carbon emissions, it's no surprise that local businesses are moving quickly to adopt renewable energy. Since South Africa boasts excellent renewable energy resources, businesses that can secure renewable energy reliably have much to gain, especially over time.

Discovery Green's research evaluated the **long-term efficiency** of procurement models currently in the market. Our analysis showed that **only one** of the four procurement methods for securing renewable energy is **dependably effective and scalable**.

Understanding the problem

What makes renewable energy procurement different?

- 01 | It's take-or-pay, not pay-as-you-use:** Unlike utility-supplied electricity, which businesses pay for as they use, renewable energy requires payment at the point of generation. This means businesses must commit to buying an unknown amount of energy each month, whether or not they use it.
- 02 | Variability in generation and consumption costs businesses:** Renewable energy output and business energy use can vary greatly. For example, solar output from a single plant can change by over 14% month-to-month, and wind by over 33%. Business energy use can also drop significantly, as seen during the COVID-19 pandemic, when it fell by up to 40%. This means the amount of energy power plants produce and the amount that businesses actually use are often mismatched by a significant degree. This variability can lead to wasted energy costs, reducing a business's financial savings.

Businesses face a trade-off when choosing renewable energy options.

- **The cost of low renewable energy coverage:** Low coverage options – like on-site solar solutions that only generate power in the day – are relatively affordable in the short term, and offer a minimal risk of wasted energy costs. However, exposure to future utility price increases remains high as businesses must buy electricity not covered by their renewable solution from their utility. The cost of covering their remaining energy needs with renewable sources in the future is also high, as off-peak energy is expensive to generate, and is likely to increase drastically in price as daytime solar energy gets cheaper. As a result, this option makes it harder for businesses to scale up their coverage of renewable energy.
- **The risk of high renewable energy coverage:** Procuring larger amounts of renewable energy to replace a greater portion of existing electricity consumption increases a businesses' financial savings, but also increases the risk of incurring wasted energy costs. However, businesses enjoy greater protection from future utility price hikes. Quoted prices are higher here because more expensive wind energy is necessary to meet off-peak demand. This option also removes the hurdle for businesses to scale their coverage in the future. The short-term benefits are smaller than the low coverage option, but a high coverage creates significantly more savings over the long-term.



Coverage:

The percentage of a business's energy needs met by renewable sources.



There are three time-of-use energy periods:

- **Peak** – mornings and evenings
- **Standard** – daytime
- **Off-peak** – nighttime and weekends

There's a need to consider total costs

Most businesses choose a low-coverage option, despite its higher future costs, potential carbon penalties and barriers to scale. However, businesses need to consider not just the quoted price, but the all-in price of electricity – in the present and over the long term.

Understanding a solution

How can businesses maximise their financial savings?

To maximise savings and avoid wasted energy costs, businesses should aim for the highest renewable energy coverage at the lowest cost. This involves considering both the **current and future financial benefits** of its procurement model.

How do the market's current models fare?

Our analysis explored the long-term efficiency of the four procurement models currently in the market:



Embedded solar

These are on-site solar installations, usually small scale, like rooftop solar panels. They are either purchased outright or through power purchase agreements.

While affordable, this model has the lowest coverage level due to the inability to store energy for off-peak consumption.



Wheeled solar and/or wind

Wheeling is the process of delivering energy through the national grid. Here, businesses buy energy from large scale solar or wind plants connected to the national grid.

This model also has relatively low coverage, but wheeled wind can help businesses with off-peak consumption.



Trader through aggregation

Intermediaries buy renewable energy from power plants and sell it to businesses, often on a take-or-pay basis. These traders are mere middlemen because businesses effectively contract directly with the generator (the renewable energy plant) itself.

This model passes most of the risk onto the buyer, as it requires businesses to pay for a minimum amount of energy, used or not.



Trader through platform

Platforms buy renewable energy in bulk and package it like a product. They then sell it to businesses based on their consumption patterns, not on how the renewable energy plants perform. Energy is sold as a percentage replacement of each business's unique energy needs.

This model shares risks more equitably by spreading it across different generation sources and businesses from different industries.

What did the research find?

Discovery Green's analysis revealed the following valuable insights:

- 01 | The embedded solar model usually has the lowest quoted price, but it results in the lowest financial savings for most industries,** due to its low coverage and vulnerability to future utility price hikes. Businesses typically achieve only 8% to 39% coverage before wasting energy, compared to 41% to 73% with the wheeled solar and/or wind model.
- 02 | Before considering variability in generation and consumption, the wheeled solar model saves businesses with standard-heavy consumption profiles the most money. However, since most businesses consume the most energy in off-peak hours, the platform model almost always offers the highest savings, even before variability risks are considered.** Savings range from 5% to 39% for the wheeled solar model, compared to 33% to 34% for platforms.
- 03 | The platform model provides the highest financial savings for almost all industries, after considering variability.** By diversifying both generation and consumption, it achieves high coverage levels and protects businesses from wasted energy costs. The financial impact of the wheeled solar model ranges from a cost of 5% to a saving of 37%, while the platform model consistently offers savings between 33% and 34%.

Q | Why not just use cheap solar, and supplement with wind energy for off-peak demand?

This approach seems logical for achieving high coverage, but it ends up being more expensive than a pure wind energy model. After meeting 45% of their energy needs with solar, businesses are left with an awkward off-peak heavy consumption profile, and face 1.8 times the cost to cover the remaining 55% with renewable sources. As a result, savings are lower compared to the platform model.

Q | Could time-of-use utility pricing change so much that it nullifies savings from the wheeled solar model?

Yes, this has already happened in developed markets like Australia, where daytime electricity prices can be negative. In such cases, even businesses with heavy daytime consumption could end up paying up to 8% more than they would with the platform model. The platform model offers the highest financial savings for almost all industries, even before considering variability in generation and consumption.

A case for renewable energy platforms

Our analysis shows that **renewable energy platforms are the most efficient and reliable solution** for most businesses. Here are five ways this model reduces risk and offers significant cost savings.

Renewable energy platforms



Increase renewable energy coverage

Platforms combine solar and wind energy to meet unique business needs, reducing wastage and costs. This approach is more flexible and effective than relying on a single energy source or traditional aggregators.

Platforms can cover 90% or more of a business's electricity needs with renewable energy, without the risk of wasted energy costs.



Stabilise consumption profiles

Platforms create a portfolio of businesses from various industries, forming an ecosystem that can handle demand volatility and reduce wasted energy.

Analysis shows that while one business might experience wasted energy at 49% coverage, a portfolio of five businesses from different industries can increase this to 78%.



Reduce the risk of wasted generation

Renewable energy from a single plant can fluctuate by up to 72% within a billing period.

Platforms pool energy from multiple sources with different generation profiles, creating a stable and diverse energy portfolio. This reduces the impact of generation fluctuations and ensures a more reliable supply.



Simplify procurement

Platforms eliminate the risks of generation and consumption variability, making securing renewable energy as straightforward as signing a mobile phone contract.

This simplicity helps businesses understand the product better and encourages competition among suppliers.



Are cost-effective and low-risk


Businesses using renewable energy platforms can save between 33% and 34% on generation costs over time, without the risk of wasted energy.

This encourages scalability, regardless of the business's consumption profile.



Strategic decision-making: A comparison of renewable energy procurement models

Deciding factors	Embedded solar	Wheeled solar	Wheeled wind	Trader through aggregation	Trader through platform
Coverage before energy wastage	8% – 39%	41% – 64%	49% – 73%	54% – 73%	90%
Quoted energy price	X	(1 – 1.4) X	(1.3 – 1.6) X	(1.1 – 1.7) X	(1.3 – 1.7) X
Total financial savings	<17%	-5% – 37%	3% – 21%	14% – 26%	33% – 34%
Protection from variable generation	Low Energy must be consumed as it is generated and cannot be banked monthly. Reduced risk of wasted generation because of its low coverage level. Relies on the performance of a single site.	Low Relies on the performance of a single site. Energy can be banked monthly.	Very low Wind generation is significantly more variable. Relies on the performance of a single site. Energy can be banked monthly.	Low to medium The full risk of generation variability is passed to the business. Multiple sites can potentially smooth variability. Energy can be banked monthly.	High Multiple sites smooth variability. The remaining variability is diversified away through the platform. Energy can be banked monthly.
Protection from variable consumption (like maintenance, strikes etc.)	Low Has a low coverage level. Contracts may have take-or-pay commitments. Energy cannot be banked monthly.	Low Contracts have take-or-pay commitments. Energy can be banked monthly.	Low Contracts have take-or-pay commitments. Energy can be banked monthly.	Low Contracts have take-or-pay commitments. Energy can be banked monthly.	Very high Excess energy is shared across the platform ecosystem to avoid take-or-pay commitments. Diversification creates a stable consumption portfolio. Energy can be banked monthly.
Simple procurement process	Fairly simple Readily understood with a competitive market. Requires site inspection and legal and technical due diligence. Requires on-site construction, which can be disruptive. Some projects can be completed within a few months.	Very difficult Requires extensive legal and technical due diligence to evaluate proposals. Contract terms vary widely across suppliers. Can take over 4 years from the start of negotiation to energy delivery.	Very difficult Also requires extensive legal and technical due diligence to evaluate proposals. Contract terms vary widely across suppliers. Can take over 5 years from the start of negotiation to energy delivery.	Fairly difficult The aggregator does due diligence on the site, but some legal and technical due diligence is still needed from the buyer. Can take over 5 years from the start of negotiation to energy delivery, depending on the generation technology.	Simple Simplified and standardised contract with less risk transferred to the buyer. The contract is more like a mobile phone contract. Contracts can be finalised within a month.
Ability to increase coverage in the future	Low Leaves businesses with a consumption profile skewed towards off-peak hours. Low coverage reduces the skewness of the remaining consumption profile. Physically limited by available roof space.	Very low Also leaves businesses with an off-peak consumption profile. Very costly for suppliers to meet this demand, often making it too expensive to procure more renewable energy.	High Wind provides a 24-hour generation profile. The remaining consumption profile of the business remains largely unchanged. However, the risk of wasted energy increases significantly.	Very low to high This depends on the nature of a business's agreement with the aggregator and the generation technology used.	Very high High coverage eliminates the need for future scaling. The remaining consumption profile of the business remains largely preserved due to a 24-hour renewable energy supply.



Contact us: support.discoverygreen@discovery.co.za

Discovery | +27 11529 2888 | www.discoverygreen.co.za

Copyright 2023 Discovery Ltd is the licensed controlling company of the designated Discovery Insurance Group.
Registration number: 1999/007789/06.

Companies in the Group are licensed insurers and authorised financial services providers.

Discovery Green Registration number: 2023/647514/07

Terms, conditions and limits apply.