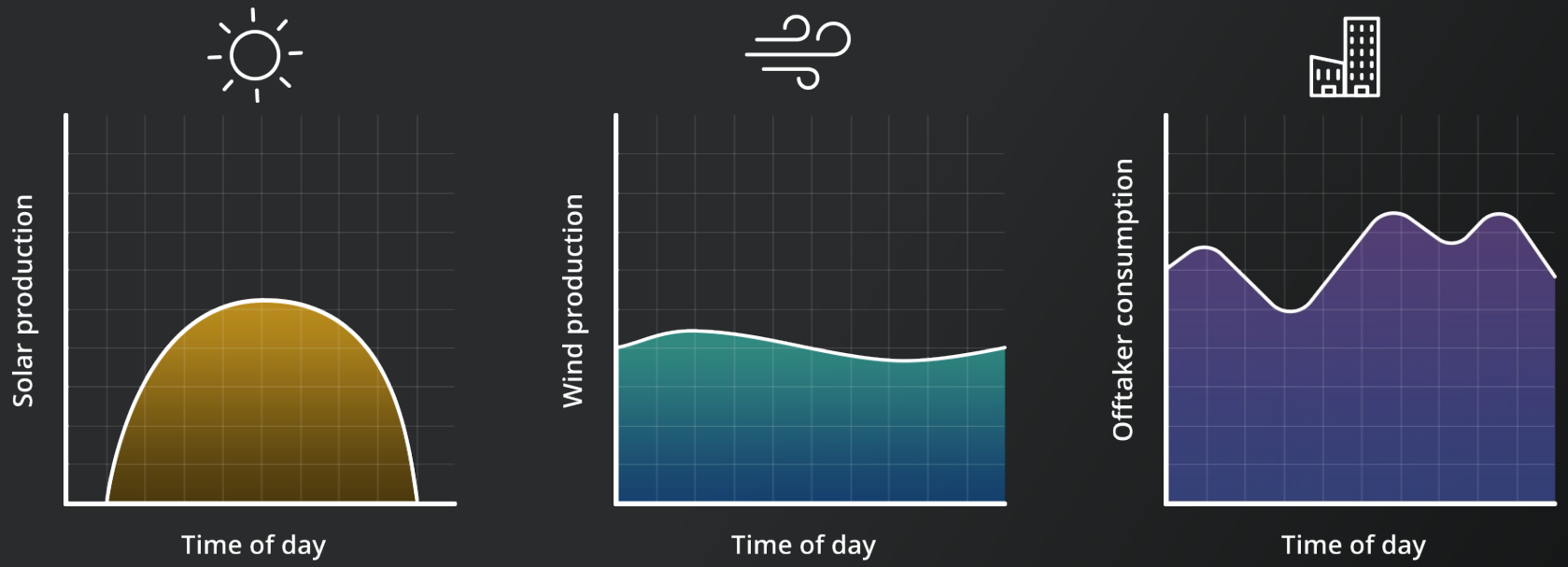
Discovery

Renewable energy strategies for higher education facilities

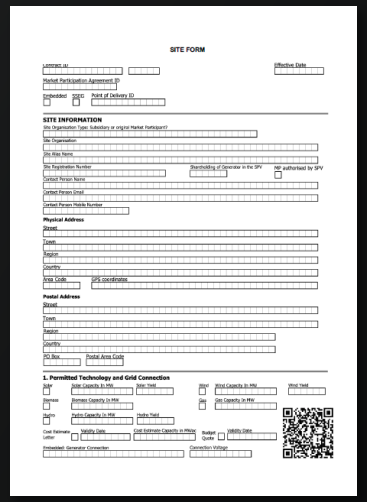
Chloe Dugger: Head of New Business

Payment for renewable energy is unlike utility-supplied electricity

Renewable energy generation almost never matches business consumption



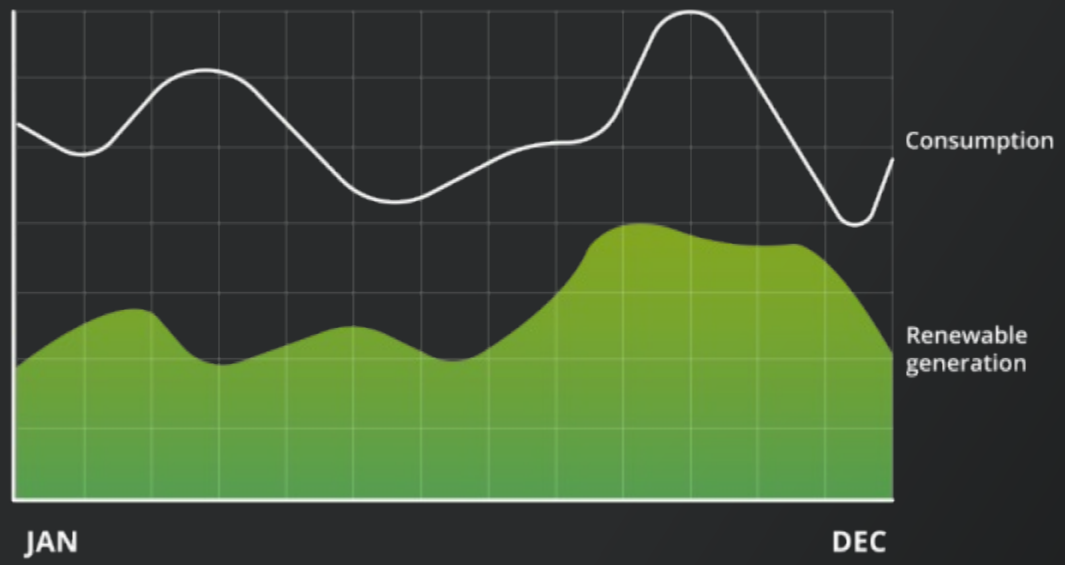
Renewable energy suppliers are not willing to take this mismatch risk



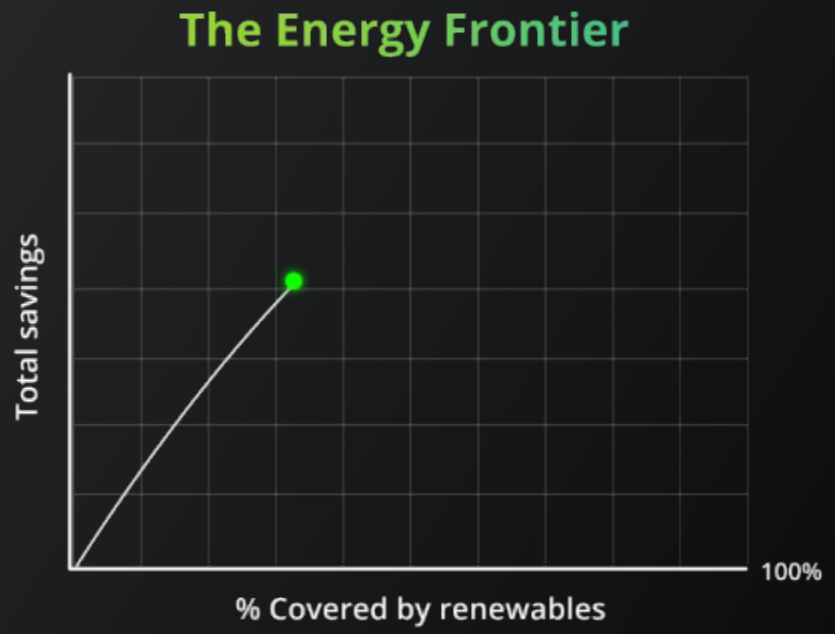
Take-or-pay commitments

How industry is solving for the needs of companies

Share-of-plant approach



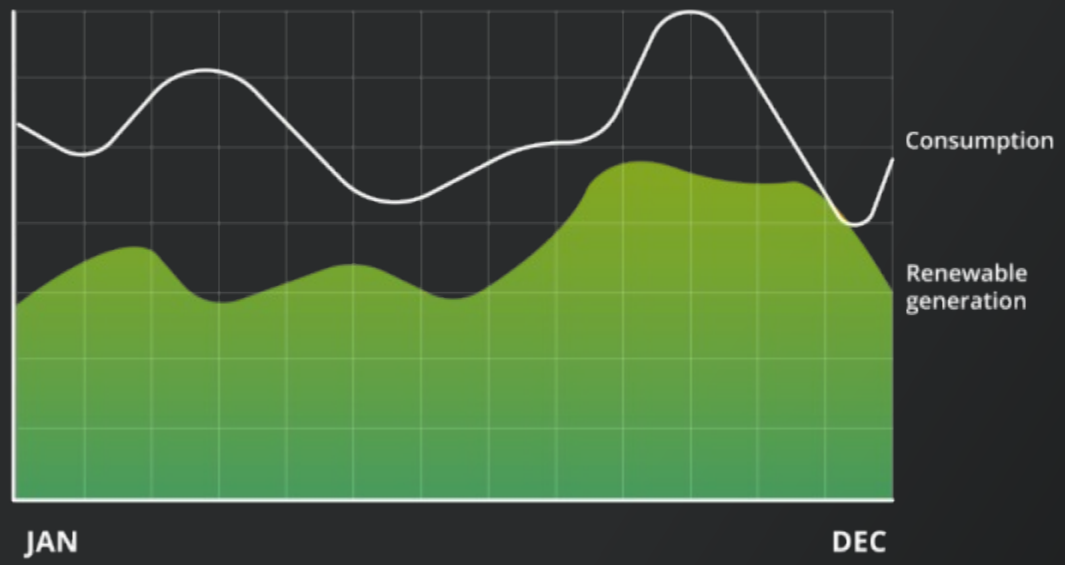
Low coverage with minimal risk of wasted supply.



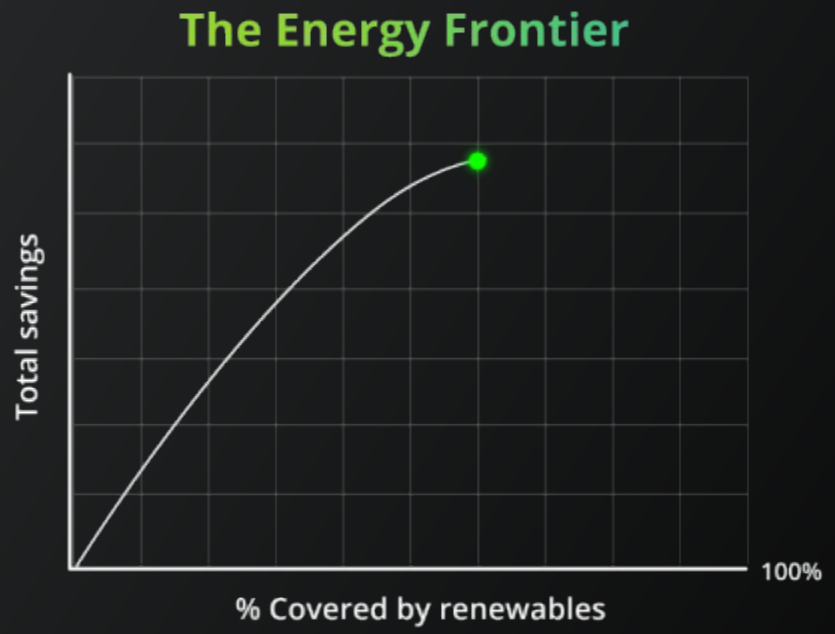
Low coverage but at cheap prices.

How industry is solving for the needs of companies

Share-of-plant approach



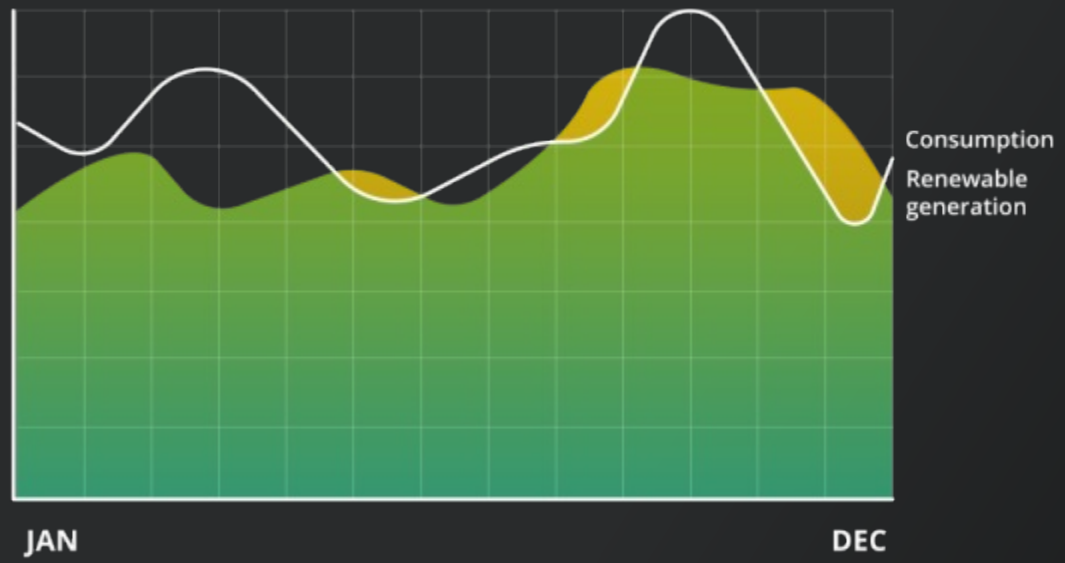
Maximum supply while ensuring no wastage.



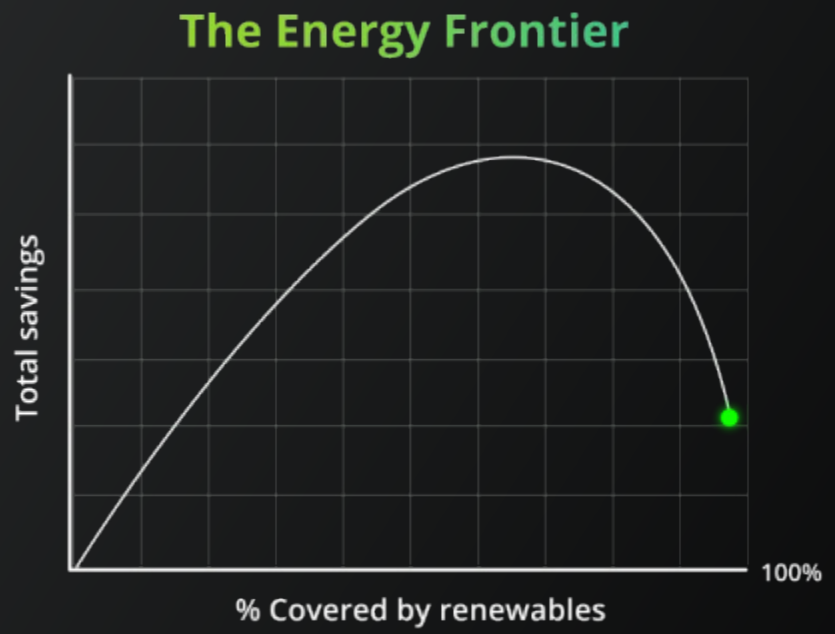
Greater coverage but total savings reach their peak.

How industry is solving for the needs of companies

Share-of-plant approach



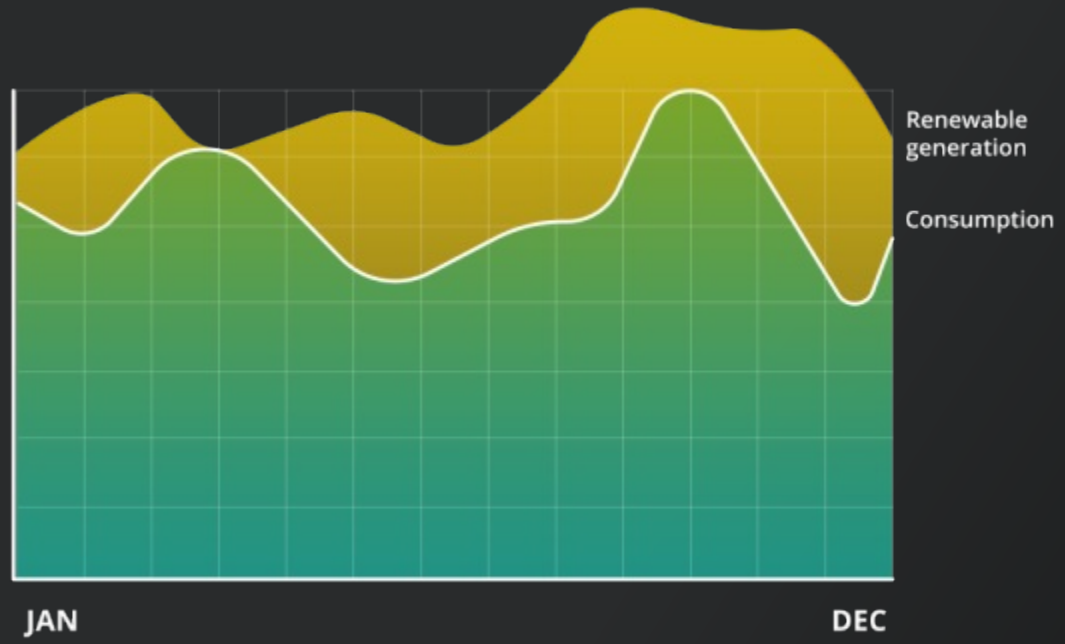
A share of supply is wasted to achieve high coverage levels.



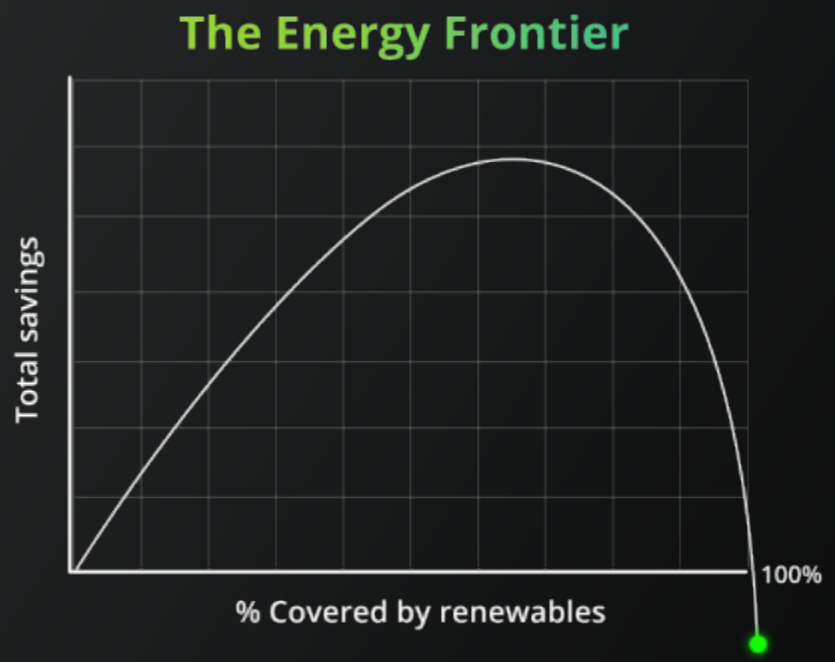
Higher coverage but total savings fall due to wasted supply.

How industry is solving for the needs of companies

Share-of-plant approach



Significant excess must be generated to ensure 100% coverage.



Full coverage but savings disappear.

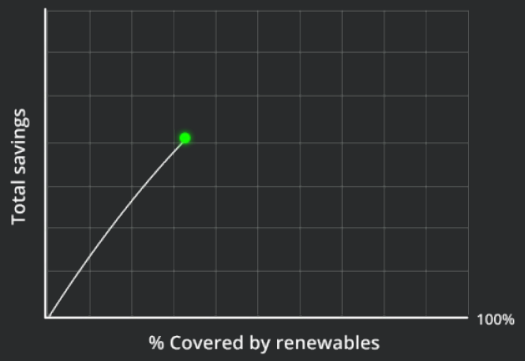
Industry first whitepaper

- The embedded solar model
- The wheeled solar model
- The wheeled wind model
- The trader/ aggregator model
- The product model

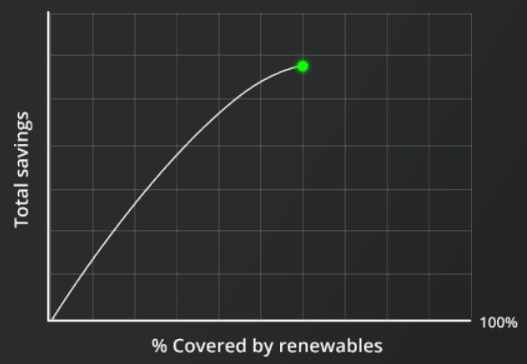
- Financial services
- Food retailer
- Fitness
- Hospitality & entertainment
- Shopping centre
- Mining
- Agriculture

Three stages of renewable energy procurement

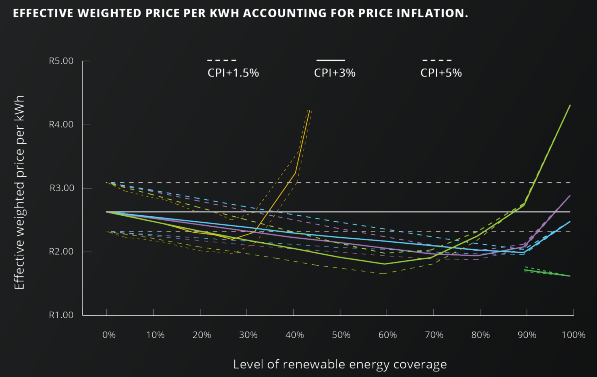
Stage 1: Point of wasted generation

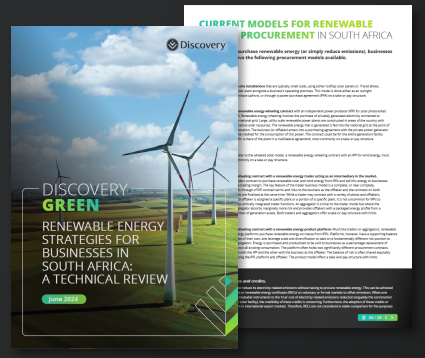


Stage 2: Point when gains turn to losses



Stage 3: Robustness to generation and consumption variability





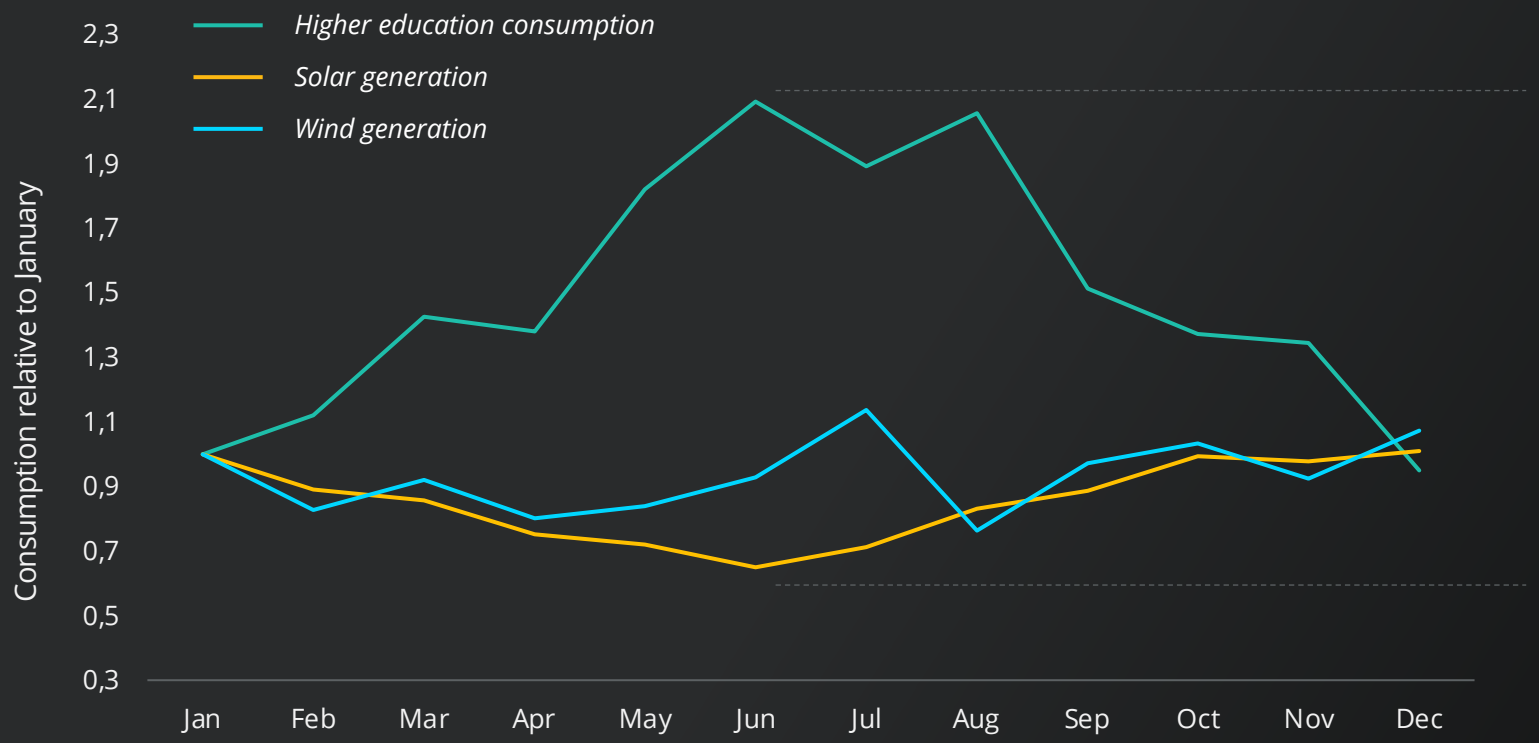
7 out of 8

Industries save the most from the product model

Typical higher education consumption profile

Winter peaks with downtime during summer

Electricity consumption relative to the month of January

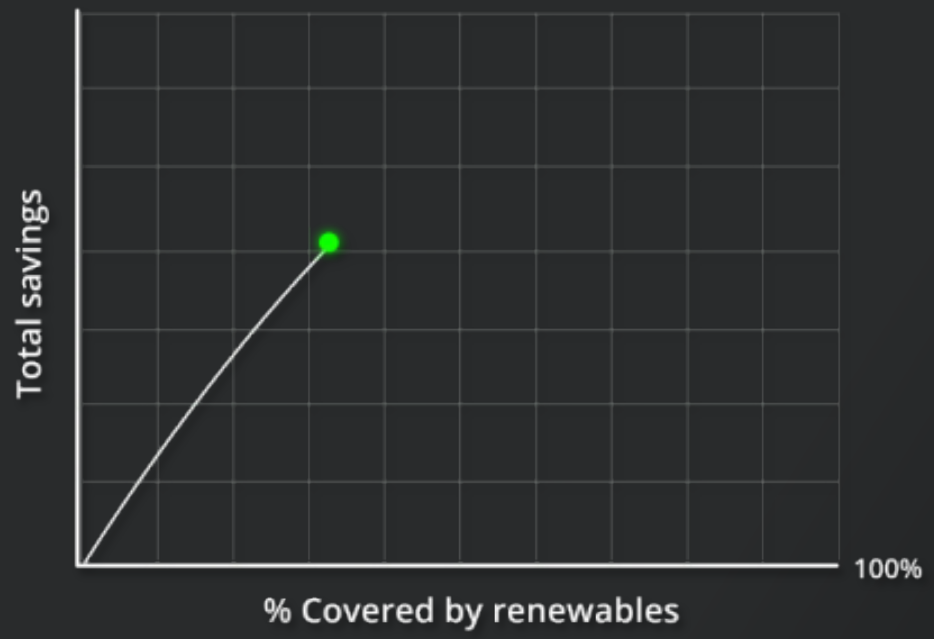


*Winter consumption gets to **2x** summer consumption*

*Solar generation during winter falls to **0.6x** summer consumption*

What percentage of electricity consumption can be replaced by each strategy

Stage 1: Point of wasted generation



The embedded solar model

13%

The wheeled solar model

31%

The wheeled wind model

51%

The trader/ aggregator model

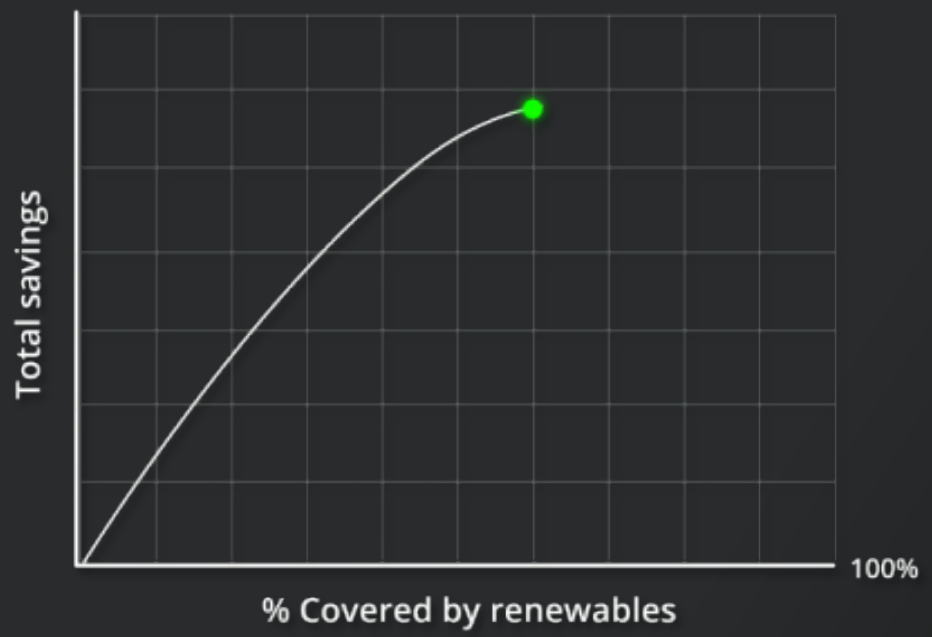
39%

The product model

90%

Which strategy is optimal and how much can be saved

Stage 2: Point when gains turn to losses

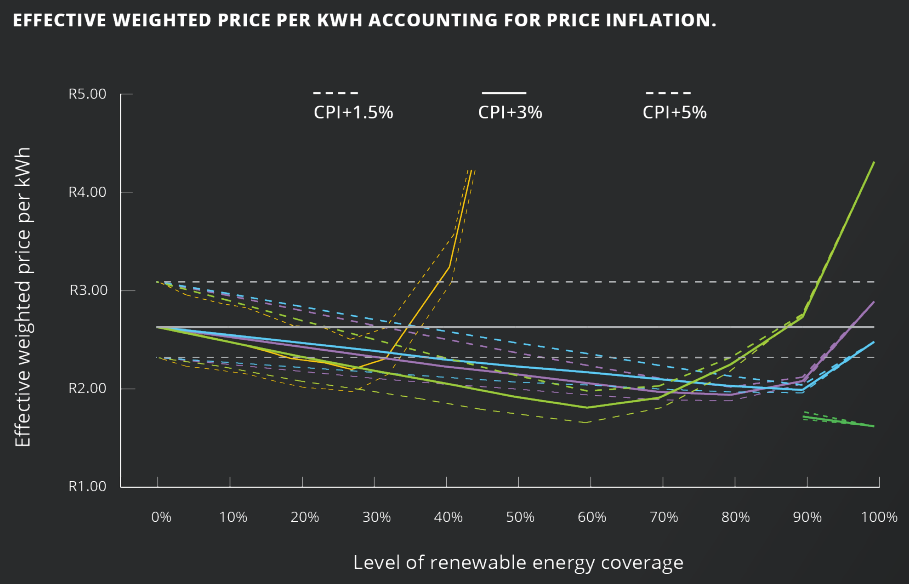


	Optimal level of coverage	Level of savings *(15-year term)*
The embedded solar model	25%	10%
The wheeled solar model	60%	28%
The wheeled wind model	90%	24%
The trader/ aggregator model	75%	27%
The product model	90%	32%

Utility price is the WEPS active energy charge (excluding losses) and including Eskom's Affordability Subsidy Charge; assuming WEPS increase of 20% in 2025 and CPI + 2% thereafter

Which strategy is optimal and how much can be saved

Stage 3: Robustness to generation and consumption variability



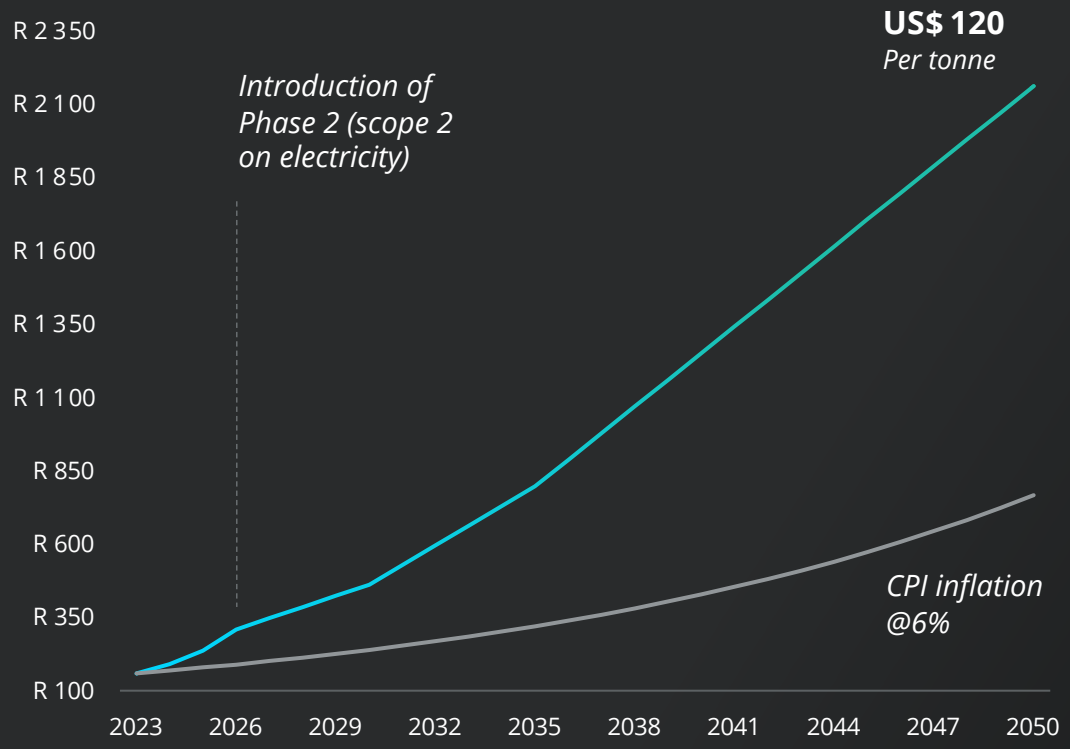
	Optimal level of coverage	Level of savings *(15-year term)*	Savings after volatility
The embedded solar model	25%	10%	8%
The wheeled solar model	60%	28%	27%
The wheeled wind model	90%	24%	18%
The trader/ aggregator model	75%	27%	24%
The product model	90%	32%	33%

Utility price is the WEPS active energy charge (excluding losses) and including Eskom's Affordability Subsidy Charge; assuming WEPS increase of 20% in 2025 and CPI + 2% thereafter

South African businesses are expected to pay Carbon tax on electricity consumption from 1 Jan 2026

Carbon tax rate increasing

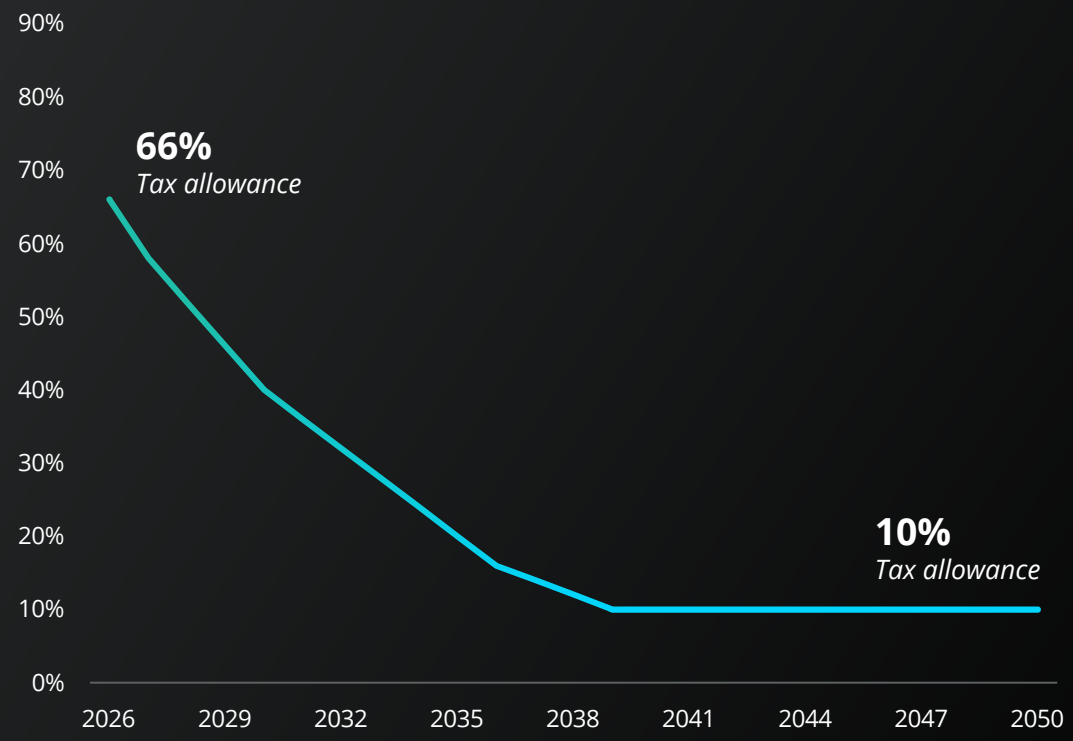
SA Carbon Tax rate, published to 2030
ZAR per tonne CO2e



Source: National Treasury

Tax allowances phasing out

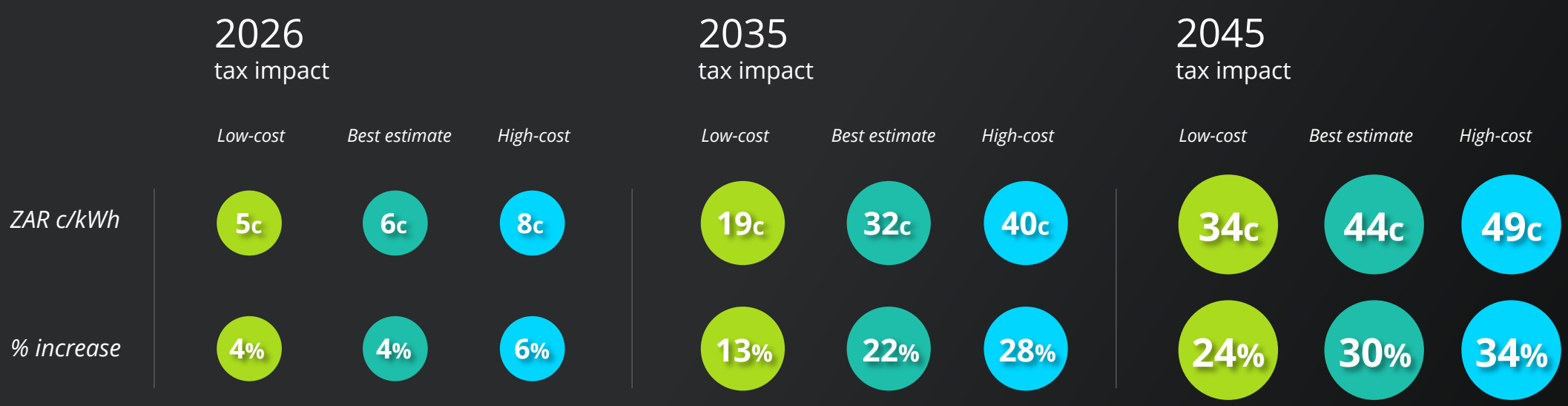
Expected tax allowance, best-estimate
Percentage of tax rate



Sum of fuel combustion allowance and trade exposure allowance

Increase in electricity prices due to SA Carbon tax

Shown in today's terms



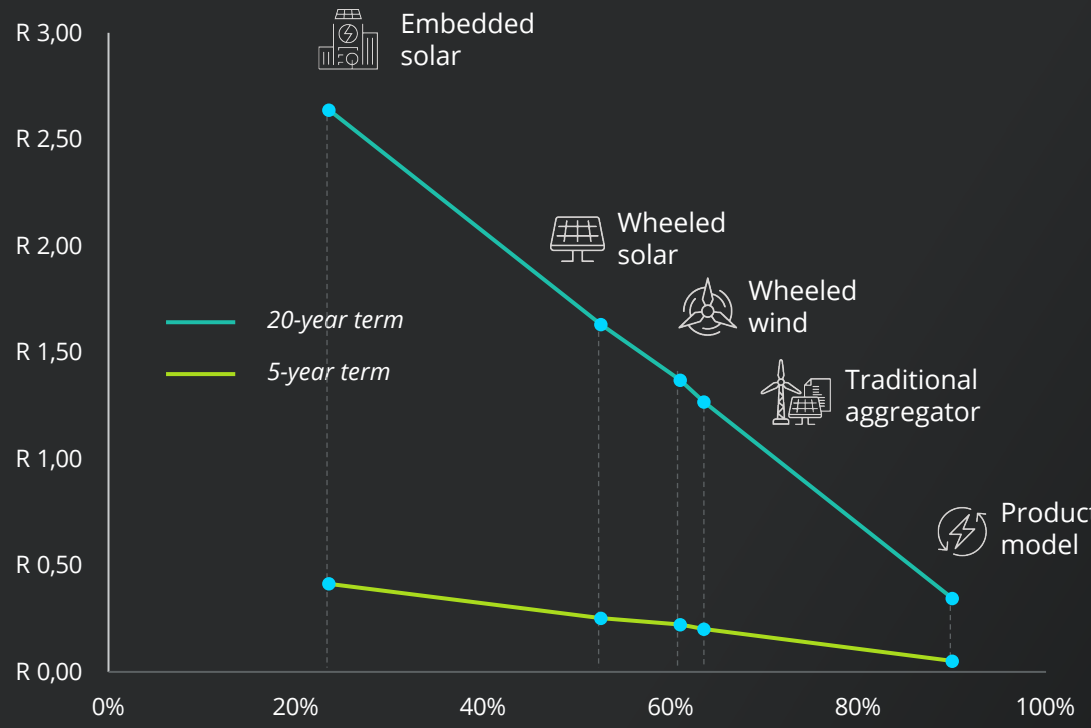
- *Best estimate scenario* — *Linear phasing out of basic allowance to 2039; trade exposure allowance remains*
- *Low-cost scenario* — *Linear phasing out of basic allowance to 10% in 2050; trade exposure allowance remains*
- *High-cost scenario* — *Linear phasing out of basic allowance and trade exposure allowance to 2030*

How to compare prices for renewable energy

New pricing consideration

Before carbon tax: **Price of utility vs price of renewables** ▶ Now: **Price of utility vs price of renewables vs coverage**

Impact of carbon taxes and inflation on quoted renewable energy price today
ZAR per kWh



	Quoted 2024 price		Impact on 5-year contract	Impact on 20-year contract
Embedded solar	R0.77	+	**R0.41**	**R2.64**
Wheeled solar	R0.90	+	**R0.25**	**R1.63**
Wheeled wind	R1.11	+	**R0.22**	**R1.37**
Traditional aggregator	R1.06	+	**R0.20**	**R1.27**
Product model	R1.20	+	**R0.05**	**R0.35**

Assuming WEPS increase of 20% in 2025 and CPI + 2% thereafter

Four key takeaways from the technical review

1. **Businesses must be careful of short-term gains** vs long term robust strategies that enable maximum savings coverage and protection.

2. **Renewable energy is unique**, businesses need to recognise the risk of wasted generation they may create depending on the strategy they pursue.

3. **Platforms followed by wheeled solar offer the greatest financial benefit** but the former provides greater protection against volatility and scenarios such as excess national solar production.

4. **The arrival of SA Carbon taxes on electricity consumption** means that the biggest driving factor informing renewable energy strategies should be the **amount** of renewable energy coverage, not necessarily price.

Discovery

Discovery Limited