

Brookfarm case study: Clean energy strategy for growth



Brookfarm is building on its position as a sustainability leader by developing a clean energy strategy that ensures clean energy initiatives are implemented as the business continues to grow.

Participating in the clean energy strategy program helped us turn our clean energy ideas into a structured plan. As we grow our business, the strategy will ensure that we 'design in' the best opportunities.

William Brook, General Manager, Brookfarm

Summary

Brookfarm is one of Australia's leading producers of gourmet macadamia products. Already a sustainability leader, Brookfarm wanted a clean energy strategy to ensure its rapid growth remains sustainable.

This case study highlights the value of taking a strategic approach to clean energy initiatives, using a clean energy strategy to guide business decisions, as well as the value of setting ambitious targets.

Brookfarm is now working towards an energy productivity target and an ambitious target of operating with 100% renewable energy by 2025.

About Brookfarm

Having started on a small scale in 2000, Brookfarm is now one of Australia's leading producers of gourmet macadamia products.

Originally a dairy farm in Byron Bay, Brookfarm was transformed by planting 4,000 macadamia trees and 30 hectares of regenerated subtropical rainforest.

In 2015 Brookfarm was awarded the Premier's Green Globe Award for Environmental Excellence. The award recognised Brookfarm's solar installation, water saving initiatives and the planting of over 30,000 trees.

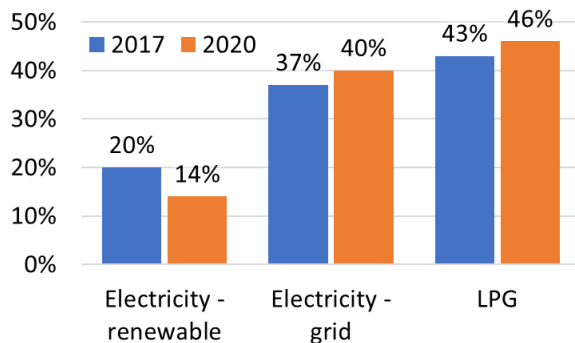


Figure 1: Composition of Brookfarm's energy use by energy source: 2017 and 2020 (forecast).

Current energy situation

Most of Brookfarm's current energy consumption is electricity (57%), with the remainder being LPG (43%). Due to the specialised baking processes required, there are limited renewable energy alternatives for LPG, so Brookfarm focused on electricity.

In 2015, Brookfarm installed a 98 kilowatt rooftop solar PV system on their production facility that currently supplies 20% of their energy needs. With increased demand for its products, Brookfarm forecasts doubling current production volumes in two years and plans to develop a new production facility.

Unless clean energy options are implemented during this process, this increase in energy demand will be met by grid electricity (see Figure 1), reducing the contribution of renewable energy to the energy mix.

What is a clean energy strategy?

The NSW Government is actively encouraging businesses to develop clean energy strategies for achieving 100% renewable energy and emissions reduction.

A strategy includes an individually crafted mix of measures for reaching a clean energy target. Measures might include energy reduction, energy efficiency, on-site solar or other renewable energy, off-site procurement of renewable energy or purchase of carbon emission offsets.

Fast facts: Brookfarm's energy situation and clean energy strategy



Energy consumption

- Currently 940 gigajoules of LPG per annum and 187,000 kilowatt-hours of electricity



Energy cost

- Estimated at \$75,000 per annum



Clean energy target

- 100% renewable energy by 2025
- Halve energy consumption per kilo of muesli by 2020 from a baseline of 44 megajoules per kilogram



Possible measures

- Equipment upgrades
- Heat recovery system for ovens
- Expansion of solar PV

Setting a target

While Brookfarm owners and staff raised initiatives for clean energy, these weren't developed in a systematic manner and didn't always align with business priorities. Given how fast Brookfarm expects to grow, they needed a strategic approach.

Brookfarm's clean energy strategy identified a suite of clean energy opportunities to improve their current operations and ensure that clean energy opportunities are 'designed in' to its future production facility.

By carefully assessing their current situation and exploring the full range of clean energy measures available, Brookfarm gained the confidence to set ambitious new targets.

Brookfarm's strategy has two targets:

- a productivity-based target to halve energy use per kilogram of muesli produced by 2020
- a renewable energy target of 100% by 2025.

Targets would be reached in three stages:

1. optimise energy footprint
2. generate renewable energy
3. buy renewable energy.

The first stage reduces energy use in all facilities; the second stage implements on-site and off-site renewable energy generation; and the third stage purchases GreenPower, renewable gas alternatives and optimises energy supply contracts to facilitate this procurement.

Measures to reach the target

Measures for stage 1 *optimise energy footprint* focused on the existing production facility:

- replace batch ovens with continuous ovens to improve energy efficiency
- implement heat recovery and reuse to reduce LPG consumption
- upgrade packaging machines to more energy-efficient machines
- upgrade lighting to LED lighting to reduce energy consumption
- utilise ice banks to support the muesli cooling tunnel
- upgrade the compressed air system to improve energy efficiency.

For stage 1, the new production facility will have energy efficient design specifications. Measures for stage 2 *generate renewable energy* were:

- explore the feasibility of a solar PV system (220 kilowatts)
- consider a battery storage system of 100 kilowatt-hours for the existing 98 kilowatt solar PV to capture excess solar energy
- assess the feasibility of pyrolysis and anaerobic digestion to generate biogas (offsetting LPG usage).

The third stage has no immediate next steps so Brookfarm will assess measures later.

Brookfarm's key clean energy strategy takeaways

The need for a systematic approach: Management and staff are often motivated to generate ideas on how clean energy initiatives can be advanced in their business. Use a structured and systematic strategy to ensure that all potential opportunities are captured, assessed and integrated into the planning process for both existing and new facilities.

Targets assist with new developments: New developments present unique opportunities to integrate clean energy initiatives. A clean energy target and structured strategy can provide a focus for discussions and lead to improved design specifications for new facilities and equipment. This prevents overlooking valuable clean energy initiatives.

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