SPONGE Microgrids

PV Diesel Battery Optimization

Problem

Every Hybrid PV project has one goal:
Reduce Generator Runtime

Generators are: Expensive, Noisy, Polluters.

Solution

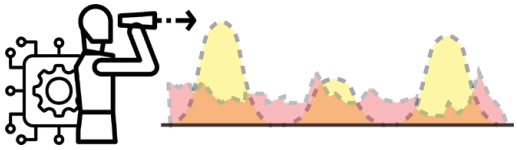
Hybrid PV Optimization
Smart Storage to Reduce Diesel

Run your generator less **without buying**

✅ new solar panels ✅ extra batteries ✅ a fancy "eco-generator"

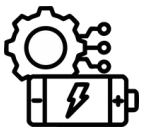
How it Works:

Forecast

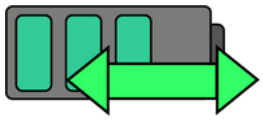


Sponge EMC uses intelligent generation and consumption forecasts...

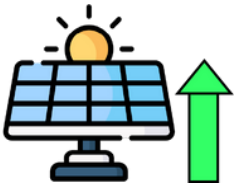
Control



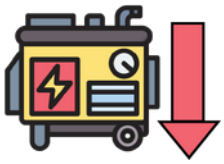
...to control microgrid behavior.



Sponge makes more efficient use of batteries...



To boost solar yields by **up to 40%...**



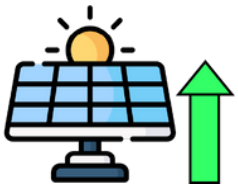
and reduce diesel consumption by **up to 20%.**

On this page we are going to prove that

Your Hybrid PV System is Inefficient.

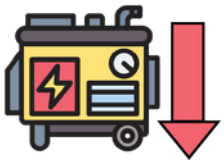
Once we identify inefficiencies, we can optimize against them

The Basics: Solar vs. Generators vs. Batteries

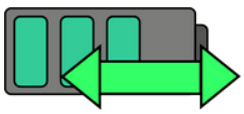


Solar is the most efficient part of your system. Beyond solar's install cost, every kWh produced by solar is **free**.

Generators are the least efficient part of your system. After you buy a generator, every kWh of energy is **expensive** - based on the cost of diesel.



- **Generators** are most efficient when running at **75–100% capacity**.
  - For example, if you have a **125 kW generator**, it's typically set to run consistently produce **100 kW of energy.**
- Running a generator at low loads (like 25%) is inefficient—it can cost **50% more per kWh**, and it can damage the generator.
- To avoid this, generators are often set to run at their efficient level, with any **extra energy used to charge batteries**.



Battery energy efficiency **is variable**.

- **The cost of battery power depends on how it was charged:**
  - Solar = Free (Zero Marginal Cost)
  - Generator = Expensive (based on diesel cost)

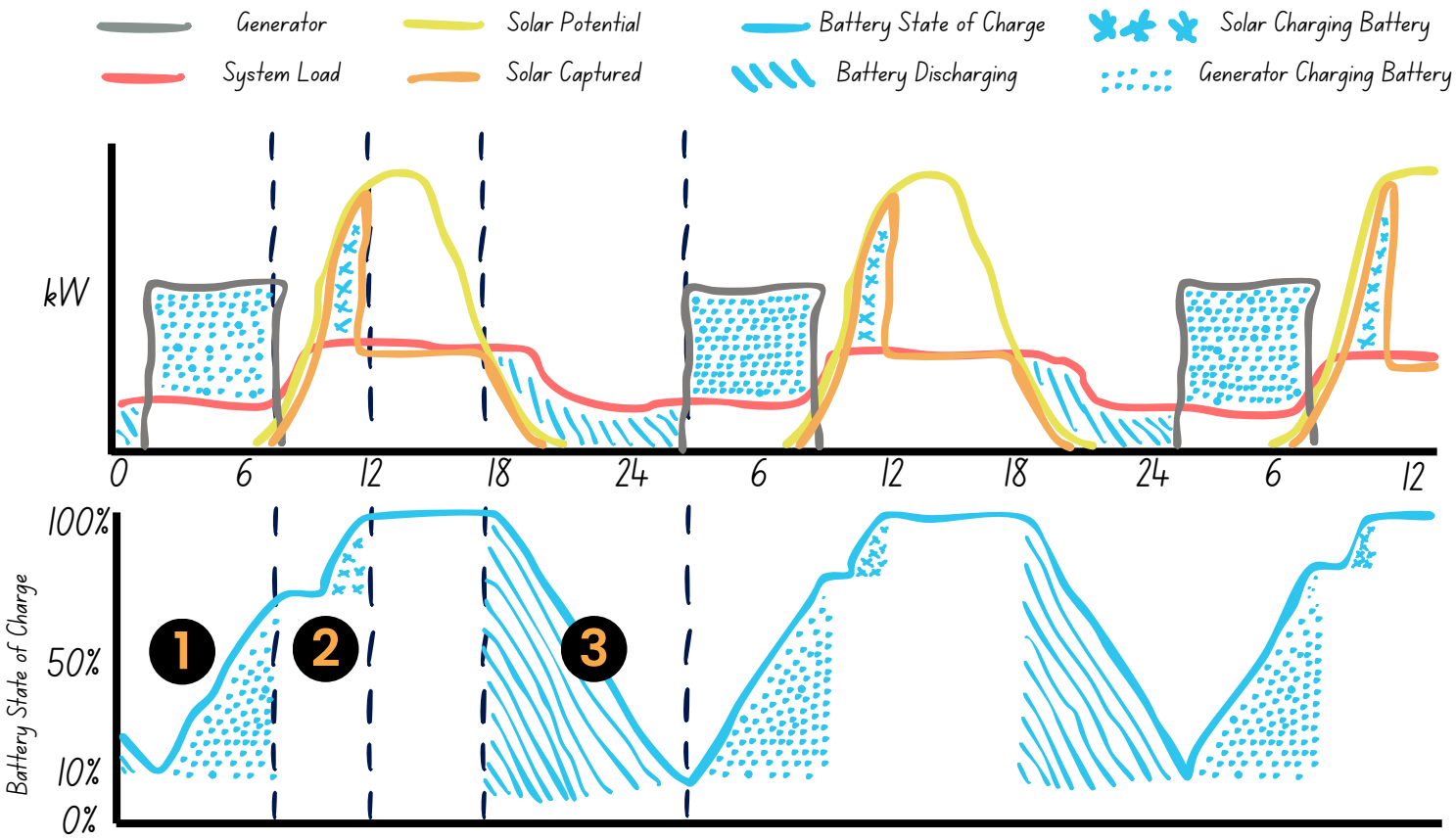
Optimization Challenge

Maximize solar charging of batteries and minimize generator charging.

solved by: Hybrid PV Optimization — Smart Storage to Reduce Diesel

Can we minimize charging the battery with the generator?

To answer that, let's look at the **status quo.**



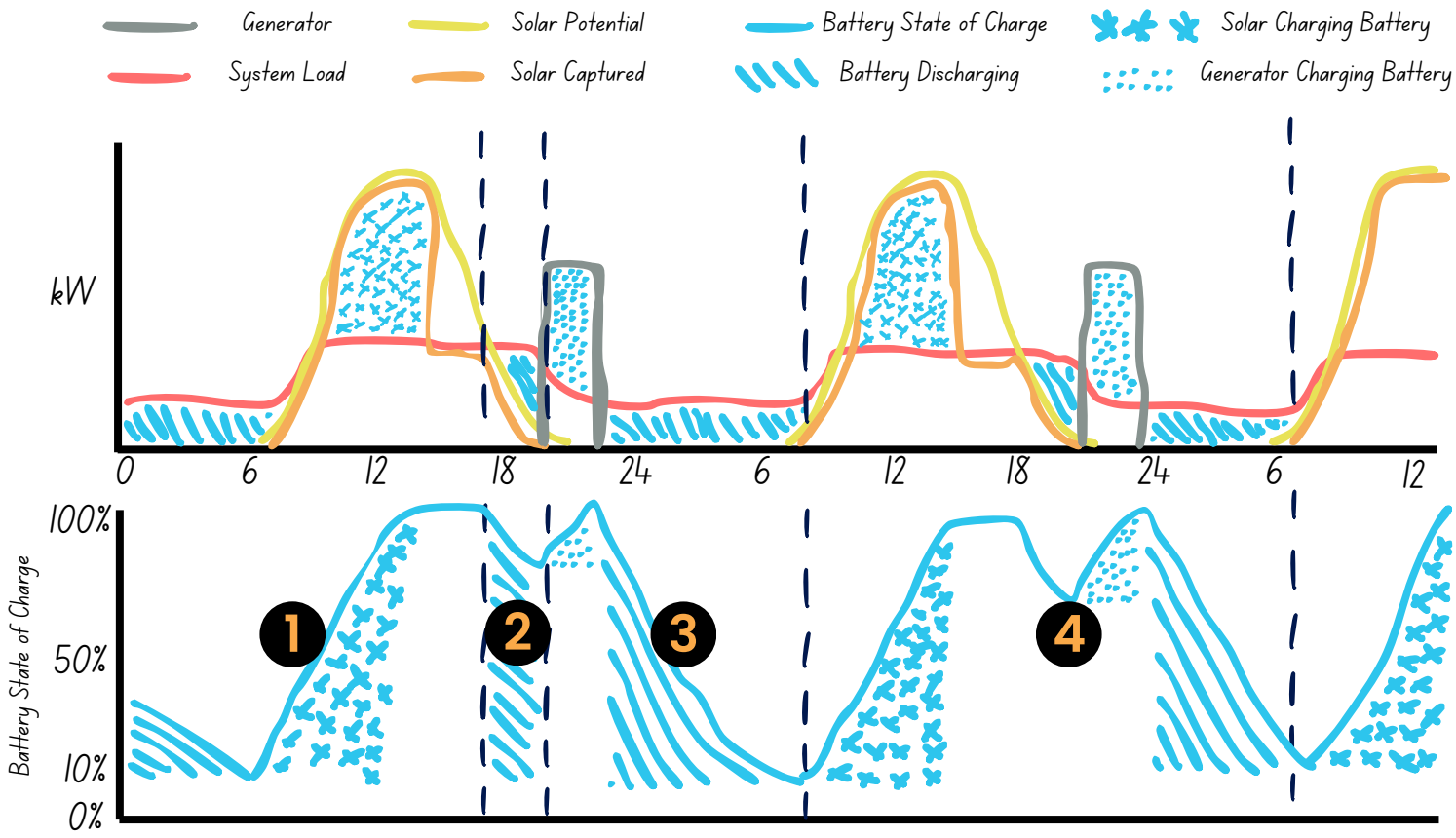
1	2	3
• Overnight, your **battery runs out**. • In the **early morning**, the **generator turns on** to power the load and charge the battery. • This is typically the **lowest demand** time of day, so there's **extra generator power**, which ends up charging the battery.	• When the **battery is charged by the generator**, it fills up **before the sun rises.** • That means when **solar power becomes available**, there's **less room** in the battery to store it. • Since batteries are usually **smaller than your solar capacity,** some of that free solar energy is wasted.	• In the **evening**, when solar is gone, the battery discharges to meet demand. • But some of that energy came from the **expensive generator**, not free solar. • So now you're **paying more** for electricity than you should be.

Bottom Line:

Charging the battery with the generator early in the day wastes solar potential and makes your evening power more expensive.

How SPONGE reduces your diesel costs.

Optimize battery use to reduce diesel **by up to 20%.**



1	2	3	4
Evaluate Forecasts **Sponge checks tomorrow's solar forecast** and your **expected energy usage.**	**Let the Battery Run** As the **sun sets**, your **battery** is full from the day's solar	**Smart Generator Timing** Later in the evening, **Sponge runs the generator** briefly. Just enough to **top up the battery** so it can make it through the night.	**Maximize Solar in the Morning** In the morning, the **battery has room** to capture solar energy. That night, you'll be **using cheap solar energy,** not expensive diesel.

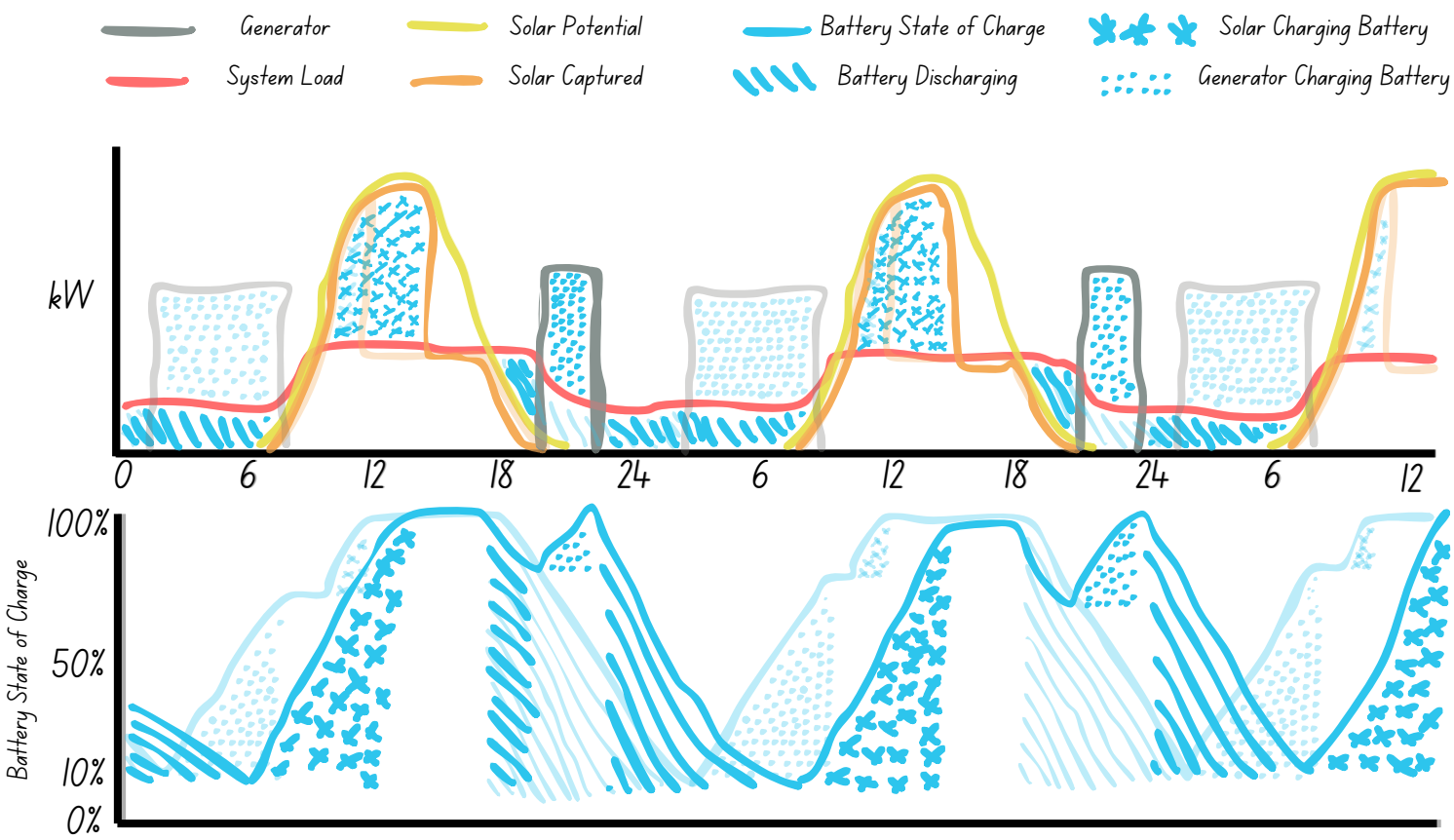
What if Solar Tomorrow Is Low? ⛅

If solar production is expected to be less than your energy needs, Sponge can't save fuel—the generator has to run either way.

BUT: Sponge can still help by shifting generator use to the evening, so your team (or family) isn't disturbed in the early morning.

Let's summarize how SPONGE reduces your diesel costs.

On this page, we compare **Standard Controls vs Sponge Optimization.**



Sponge PV Diesel Optimization Summary

- Sponge reduces generator run time by up **20% per annum** compared to standard controls.
- It does this by forecasting your demand to run your generator **just long enough** to get you comfortably through the night.
- In the morning, your battery is primed to be charged by free solar energy, instead of expensive generator energy.
- **Continuous adaptation** to changing forecasts and consumption behaviours means your system is always optimized to **save you money.**

PRICING

Up to

20%

Reduction in Diesel Usage

Up to

4 Yr

Reduction in Payback Period

Sponge Optimization Pricing Formula:

Sponge EMC	+	Commissioning Fee	+	5 Yr Subscription
 Pro or Pro+		Based on Project Size (kW AC)		For Projects >30kW AC*

5 Year Subscription Price

= 1 Year Optimization Savings

Option 1: Pay Hardware + Commissioning Fee and Try Sponge Optimization Free for 1 year.

1 Year of Sponge Savings = Price of 5 Year Optimization Subscription. (How it Works)

Option 2: Use **Sponge Estimation Form** to give us info we need to simulate 1 year of savings.

1 year of Simulated Savings = Price of 5 Year Optimization Subscription

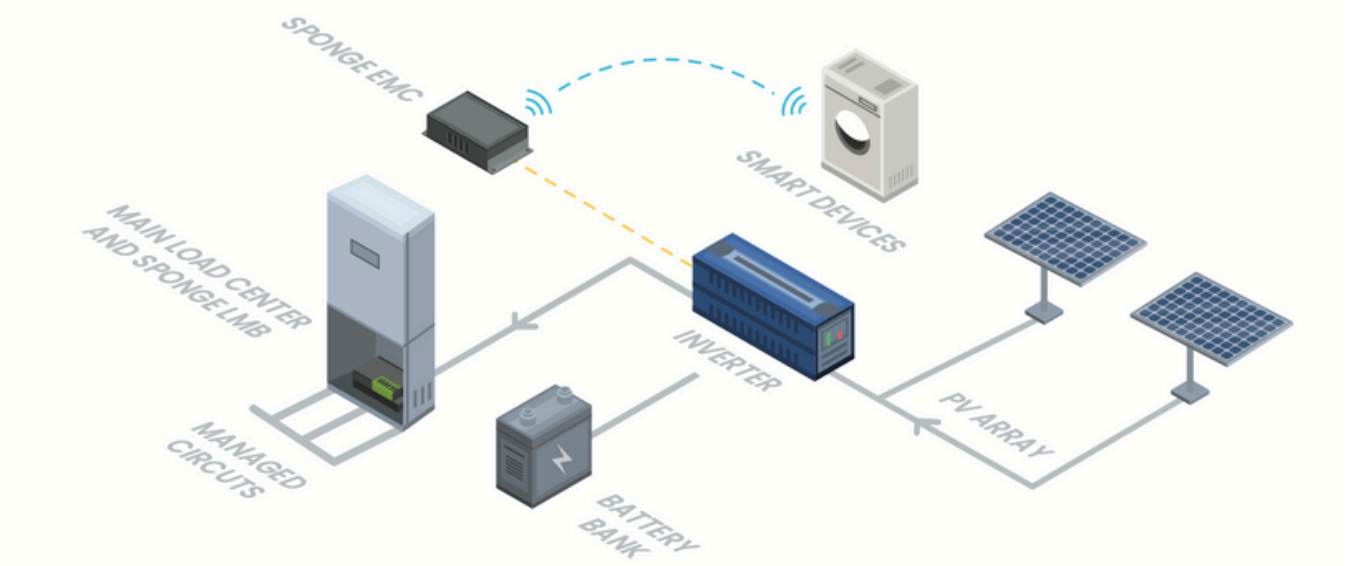
You can expect your Optimization quote in 5 business days or less.

*Sponge Optimization subscription is free for projects <30 kW AC

HOW IT WORKS

Sponge Offering

The Sponge solution includes the delivery and commissioning of our Energy Management Controller, which operates our proprietary control algorithms. But it doesn't stop there. Our team has full remote access to every system we deploy, enabling over-the-air updates, remote monitoring, system maintenance and most importantly, quality assurance.



Control Philosophy

At Sponge, we respect that system reliability is paramount. Thats why our control approach is simple and nonintrusive. Our controls operate completely outside the loop of mission critical system operations and simply make adjustments to targeted set points as required in order to instigate the performance we want to see. After the control action, defaults settings are restored. This means that there is no incremental complexity or reliability risk introduced, just added value and improved performance.

Order Information

01. Reach out to your installer to confirm your decision to procure the Sponge Optimization Package.

02. The Sponge Optimization Package will be added to you existing payment schema.

03. The Sponge EMC will be installed by your solar installer with commissioning support from Sponge Microgrids.

Looking for a quote?
For projects <30kW AC, reach out directly to your installer for hardware pricing.

For Projects >30kW AC, Please use the SPONGE ESTIMATION FORM to submit information required to generate your subscription quote.
The SPONGE ESTIMATION FORM is also available on our website: Sponge.to

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SPONGE Microgrids

Monitor | Control | Optimize