

Case 3

CUT DIESEL COSTS AND INCREASE EFFICIENCY



OFF-GRID BESS SOLUTIONS FOR DIESEL DISPLACEMENT



Many off-grid sites, remote industrial operations, and facilities in regions with unreliable power rely heavily on diesel generators to meet their energy needs. While diesel generators are reliable, they come with high fuel costs, frequent maintenance,

and a significant carbon footprint. BESS like MC-I can seamlessly integrate with diesel generators and renewable energy sources to reduce fuel consumption, extend operating hours, and lower environmental impact.

THE PROBLEM

Diesel generators are commonly used to power off-grid operations, but they are expensive to run, require constant fuel supply, and produce harmful emissions. The reliance on diesel can limit 24-hour operations and significantly increase operational costs, especially in remote areas where fuel supply chains are fragile.

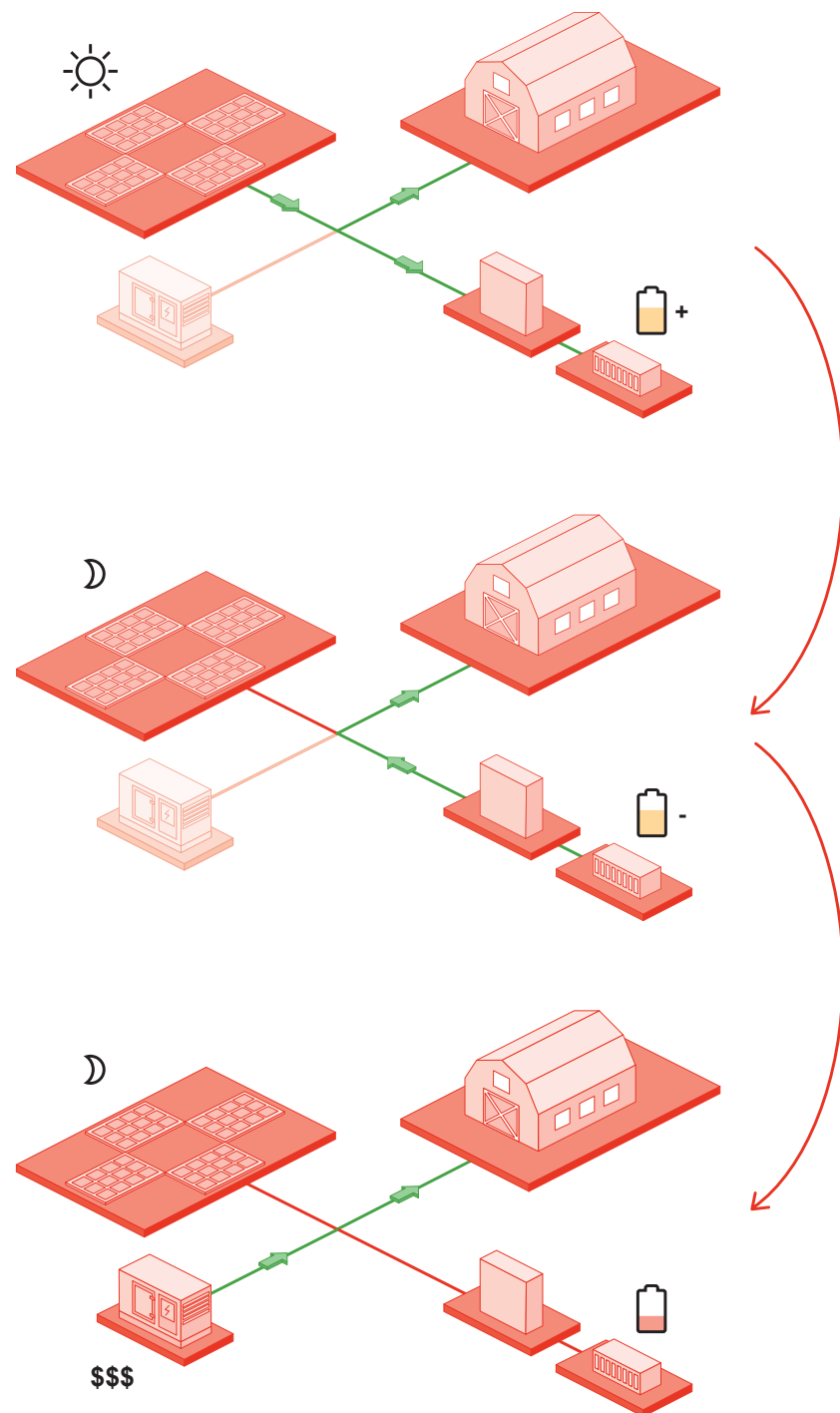
Example: A mining facility in a remote location runs diesel generators 24/7 to maintain operations. Fuel costs are extremely high, and constant generator use leads to expensive maintenance and repairs. Additionally, transporting fuel to the site adds logistical challenges and increases costs.

OUR SOLUTION

By integrating BESS with existing diesel generator systems and renewable energy sources (such as solar or wind), businesses can reduce diesel consumption, lower fuel costs, and improve overall energy efficiency. The BESS stores excess renewable energy or grid power (when available) and supplies it during periods of high demand, reducing the need to run diesel generators continuously.

OPERATION OF THE BATTERY ENERGY STORAGE SYSTEM (BESS)

Schematics



Step 1 DAYTIME: SOLAR AND BATTERY POWER

- **Solar power:** During the day, when the sun is shining, the solar panels generate electricity (represented by the green arrows). This solar energy powers the off-grid site directly and charges the BESS (the battery starts filling up, indicated by the yellow color).
- **BESS charging:** The BESS charges using the excess solar energy, storing power for later use (at night or when solar is unavailable).
- **Diesel generator off:** Since solar power is sufficient, the diesel generator is not needed, and it remains off (marked by the red „off“ symbol on the generator). This helps save on fuel costs.

Step 2 EVENING/NIGHT: BATTERY POWERING THE SITE

- **Battery Discharging:** As the sun sets and solar power is no longer available, the BESS takes over. It supplies stored energy to the off-grid site (indicated by the green arrows).
- **Battery Powered:** The site is powered by the BESS until the battery runs low. The diesel generator is still off at this stage, keeping fuel costs down.

Step 3 LOW BATTERY: DIESEL GENERATOR ENGAGES

- **Battery running low:** When the BESS's charge is nearly depleted (indicated by the red color in the battery), the system prepares to switch to the diesel generator to maintain power to the site.
- **Diesel generator on:** The diesel generator kicks in, providing power to the off-grid site and ensuring operations continue without interruption. The generator operates at its optimal power level, charging the battery from the excess that the loads don't need. It will continue running until the battery is full or even better, with a smart controller (EMS) the system will forecast the optimal maximum charge to allow the battery to power the site until the solar system is generating enough power again.

Cut fuel costs and reduce your reliance on diesel generators with our innovative BESS solutions. Learn how we can help you transition to a cleaner, more cost-effective energy model. Contact us and request more information or a personalized consultation

GET IN CONTACT

KEY BENEFITS



LOWER DIESEL CONSUMPTION

Significantly reduce fuel usage by integrating BESS with diesel generators.



COST SAVINGS

Decrease operational costs associated with fuel purchases and generator maintenance.



EXTENDED OPERATIONAL HOURS

Maintain 24/7 operations with a hybrid system that combines BESS, renewables, and diesel power.



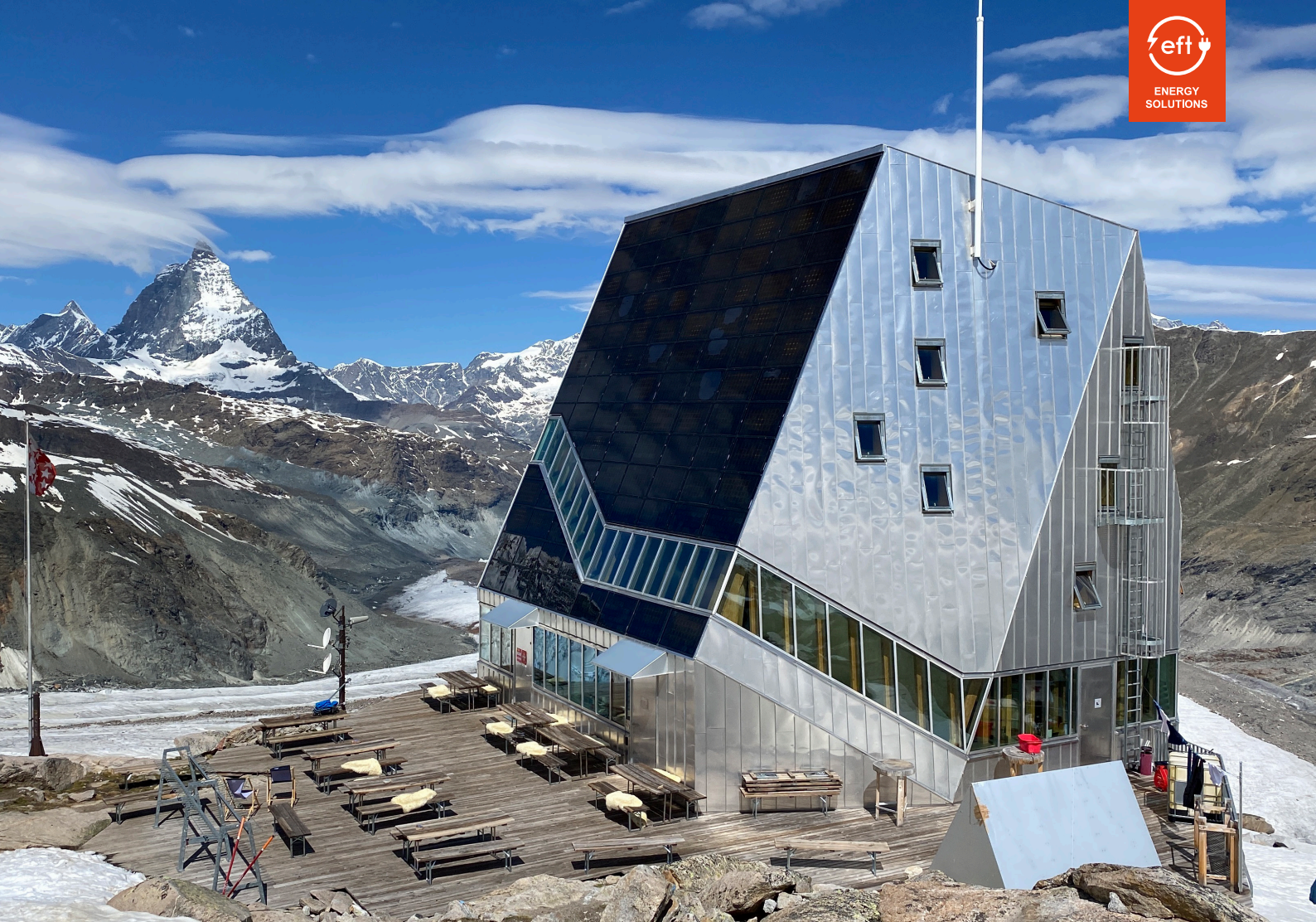
ENVIRONMENTAL SUSTAINABILITY

Cut down on carbon emissions and other pollutants by reducing diesel use and integrating renewable energy.

REAL WORLD EXAMPLE: MOUNTAIN HUT IN SWISS ALPS

The “Bergkristall” (Mountain Crystal), a mountain hut situated at an altitude of 2,883 meters in the Monte Rosa Massif of the Valais Alps, has been largely energy self-sufficient since 2010. Along with thermal solar collectors, a photovoltaic system integrated in the hut’s southern facade ensures a high degree of energy self-sufficiency and a reliable energy supply. However, in 2020, performance data showed that the lead acid batteries on site were reaching the end of their life, making the generator run a big percentage of the time. Due to the space and access limitations (The batteries had to be airlifted to and

fro) it was decide to replace them by 215kwh of the latest generation BYD lithium batteries. The new battery solution has pushed the hut’s energy self-sufficiency to even greater heights by lightening the load on the generator used in bad weather. In addition, the new batteries offer more usable capacity. The completed project considerably boosts the Monte Rosa Hut’s secure, energy-efficient and sustainable energy supply at any time of day and in any weather condition.



THE RESULTS

Almost complete elimination of diesel use

Much reduced running hours of the generator translated into huge maintenance savings compounded by the remote location