

SOLAR PV WITH BATTERY ENERGY STORAGE SYSTEM (BESS)



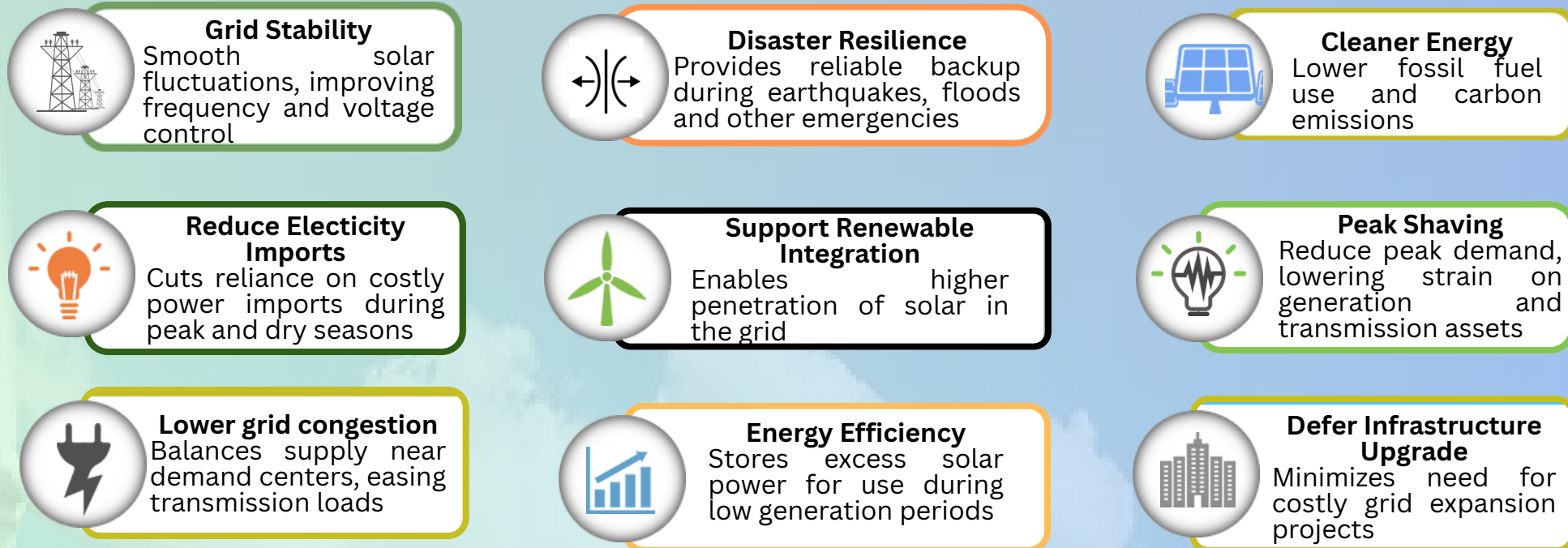
Powering a Greener
Tomorrow—Day and Night.

Solar PV System with BESS

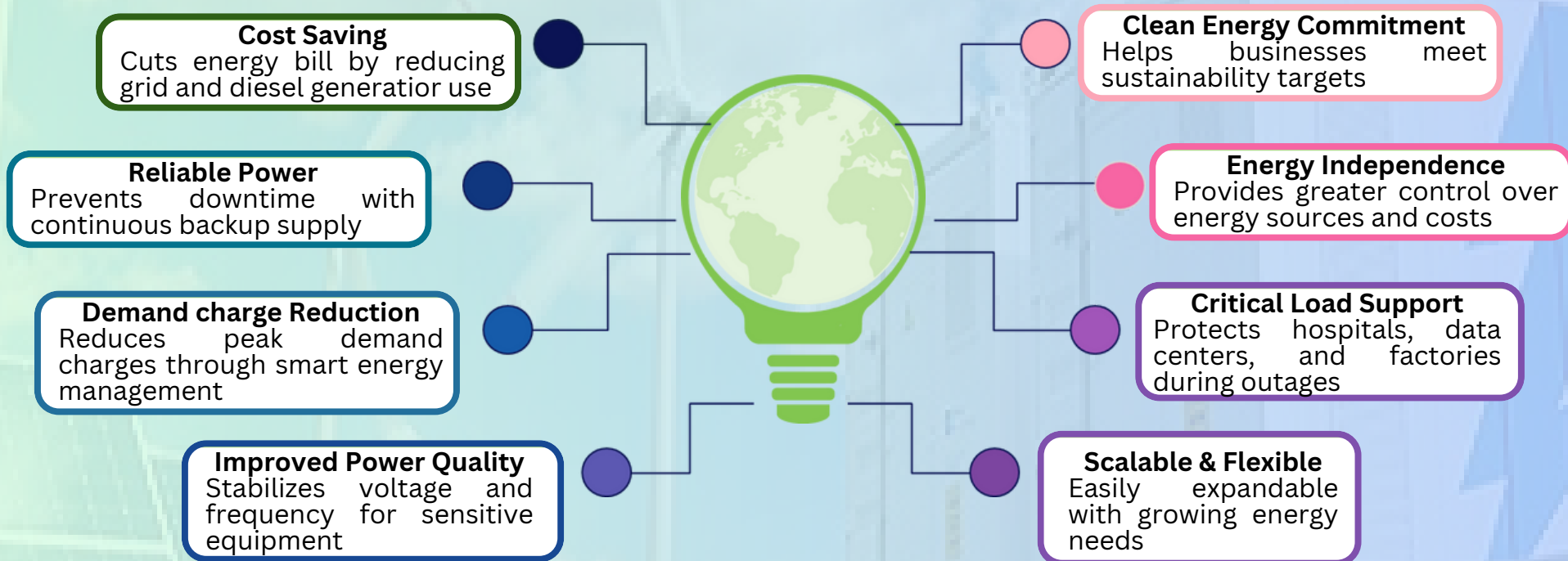
A Solar PV system with BESS (Battery Energy Storage System) combines solar photovoltaic (PV) panels that generate electricity from sunlight with a battery system to store excess energy for later use. This allows for greater energy independence, grid stability, and the ability to utilize solar power even when the sun isn't shining.

Potential Benefits

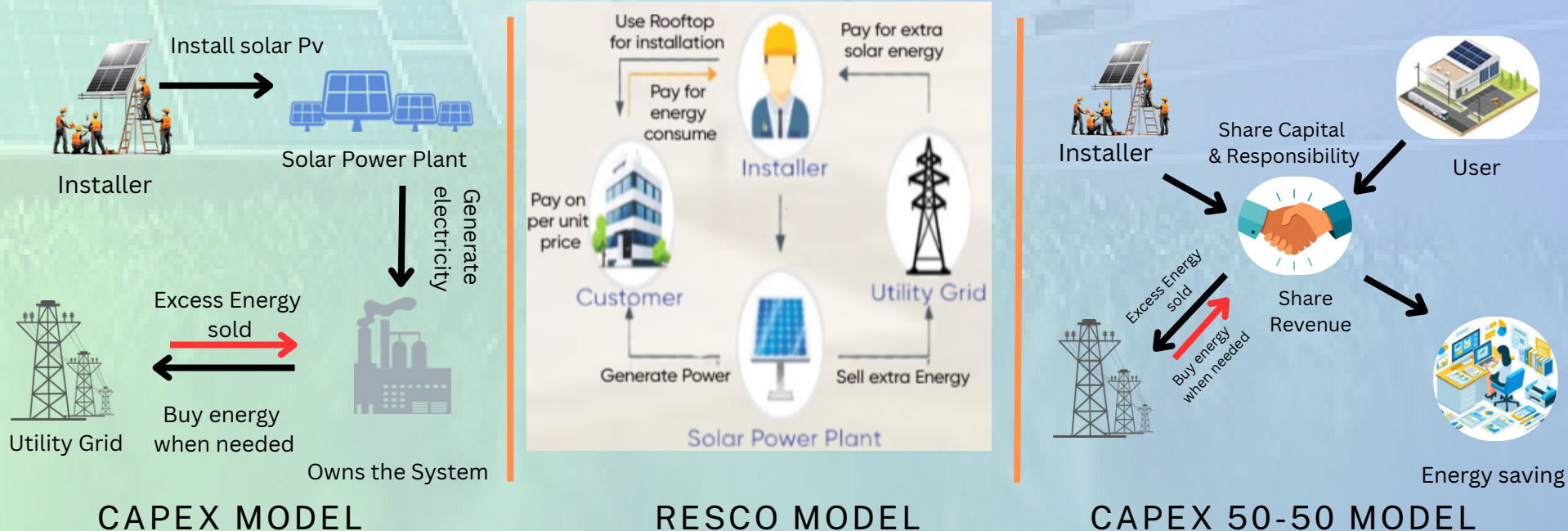
For Nation



For Commercial and Industrial



Business Model



Revenue Generation



Reduce electricity import during dry season and peak hours, stored energy and export it during peak hour



Reduces grid electricity use, demand charge, diesel generator dependence, cutting overall expenses



Generate Carbon credits, which can be sold in international markets for additional income.

Best Practices and Case Studies

Ningxia Solar + 220 MW / 880 MWh BESS project , China



The Ningxia Solar + 220 MW / 880 MWh BESS project in the Ningxia region of China is operated by CHN Energy. The project combines large-scale solar PV with battery storage operating in both grid-following and grid-forming modes. This allows it to not only store and shift solar energy to peak demand hours but also to provide voltage regulation, frequency control, and inertia support, key functions for maintaining grid stability. By reducing solar curtailment and enhancing grid resilience in China's Northwest region, it serves as a model for integrating high levels of renewable energy into the grid.
Source: [CHN Energy](#)

Holcim's Portland Cement factory in Florence



Total Energies is installing a 33-MW solar/ 38.5 MWh energy storage at Holcim's Portland cement factory in Florence, Colorado, and is expected to begin operating in 2025. This project is expected to cover around 40% of the energy demand at the plant. The BESS is reducing the cement plant's draw of power from the grid during peak demand periods, and helps to manage its costs of electricity through peak shaving, as electricity cost is high during peak hours. Holcim is targeting the powering of all its US operations with renewable energy by 2050.
Source: [Energystorage](#)

Challenges

Lack of Comprehensive Energy Storage Framework and mechanism for owning and operating storage projects connected to national grid

Absence of safety standard, procedures and end of life management of energy storage technologies

Lack of a dedicated grant and affordable financing scheme

Way Forward

1

Formulate a national framework that defines ownership models, grid integration mechanisms, and grid codes

2

Enforce standards for solar equipment and Battery System to improve reliability and system lifespan.

3

Mobilize concessional finance, grants, or blended capital through partnerships with multilateral donors

4

Facilitate partnerships between utilities, private developers, and financial institutions to share risks and benefits

5

Provide affordable financing incentives to reduce the cost burden for industries.

6

Formulate Safety standards and lifecycle management for BESS projects

