

Empowering the Edge: Decentralized Energy Solutions for Coastal Resilience



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Toward Resilience: Addressing Kerala's Coastal Energy Gaps

- Kerala's 580 km coastline hosts critical infrastructure, bustling ports, and vibrant fishing communities—all highly exposed to the growing risks of cyclones and coastal flooding.
- Disruptions to electricity supply in these regions can severely impact essential services such as hospitals, water systems, and fisheries, threatening both livelihoods and public safety.
- To safeguard these communities and ensure continuity of vital services, there is an urgent need to deploy distributed and resilient energy solutions tailored to coastal vulnerabilities.

Empowering the Edge: Decentralized Energy Solutions for Coastal Resilience

Overview

- Coastal regions face increasing threats from climate change—rising seas, storms, and grid disruptions.
- Traditional centralized energy systems are vulnerable and often slow to recover.
- Decentralized energy solutions offer a path to resilience, autonomy, and sustainability.

Key Concepts

- Microgrids and community solar for localized energy generation.
- Battery energy storage systems to ensure reliability during outages.
- Floating solar and other clean technologies adapted to coastal environments.

Why It Matters

- Enhances energy security for vulnerable coastal communities.
- Supports climate adaptation and disaster preparedness.
- Promotes inclusive and equitable energy access.

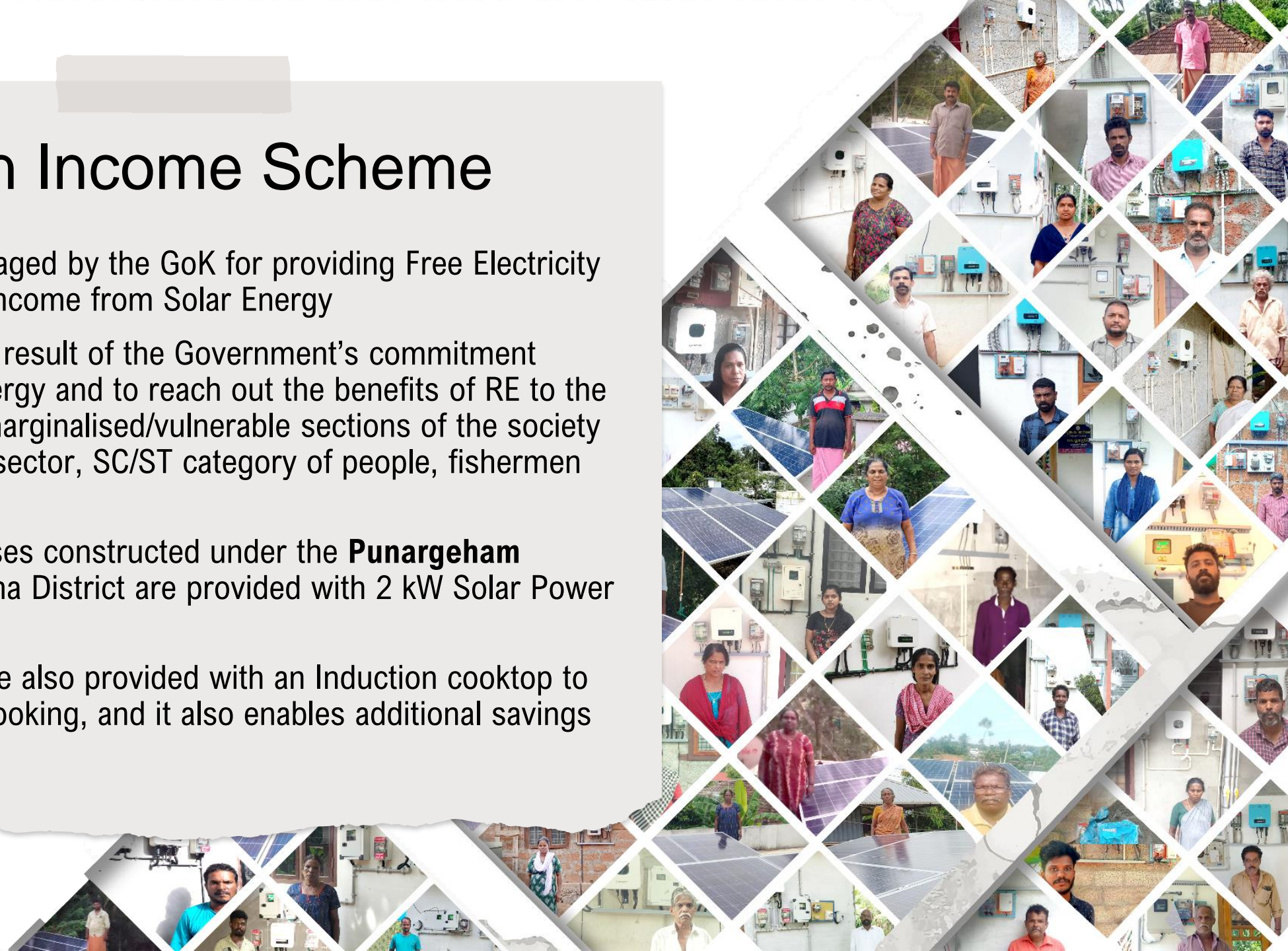
Decentralized Battery Energy Storage Project

- Green Backup Power: Replaces diesel genset; Enables grid-interactive energy storage, ensuring uninterrupted power
- Smart Load Management: Enhances building energy efficiency by shaving peak demand.
- 2 Nos of Disaster Relief Camps from each District provided with Hybrid Systems to ensure uninterrupted power – To be extended to all buildings assigned as relief centers.



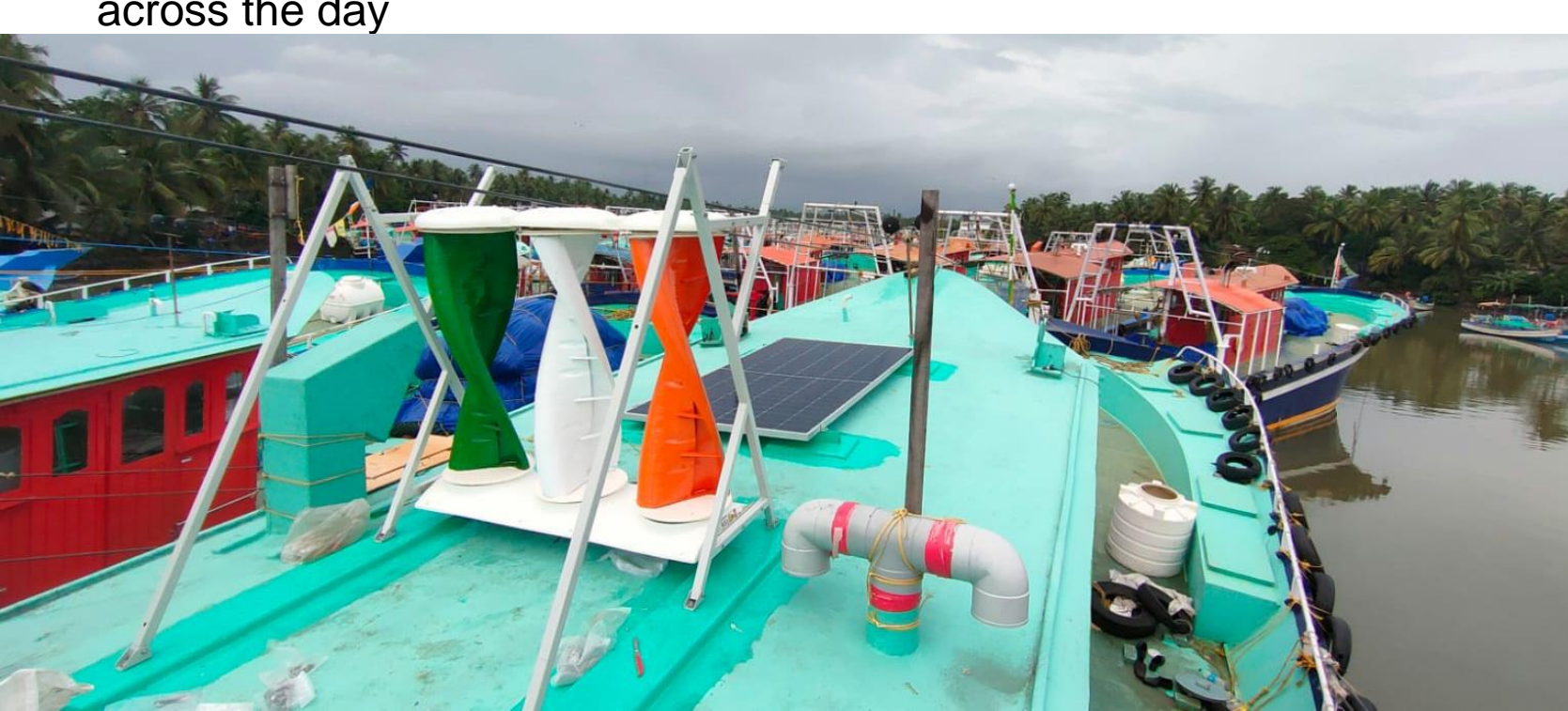
Green Income Scheme

- The Scheme envisaged by the GoK for providing Free Electricity and an additional income from Solar Energy
- The scheme is the result of the Government's commitment towards Green Energy and to reach out the benefits of RE to the Underprivileged/ marginalised/vulnerable sections of the society including the BPL sector, SC/ST category of people, fishermen society etc.
- A total of 142 houses constructed under the **Punargeham project** in Alappuzha District are provided with 2 kW Solar Power Plant free of cost.
- The households are also provided with an Induction cooktop to promote electric cooking, and it also enables additional savings in terms of LPG.



Solar Wind Hybrid System for Fishing Boats

- Done a pilot implementation of Solar-wind hybrid power plants for powering stand by loads during fishing at the sea
- Dedicated lines drawn and equipment up to 1 kVA can be connected and operated continuously for a period of 6 hrs
- Battery can be recharged from Solar during daytime and from wind across the day





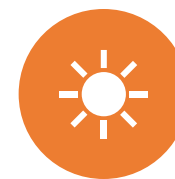
Solar Cold Storage – Marine Sector



CAPABLE FOR
SHORT-TERM
STORAGE OF FISH



- 2 DEGREE TO 2
DEGREE CELSIUS



10 MT CAPACITY,
15KWP SOLAR



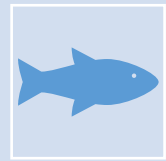
PUTHIYAPPA
HARBOUR,
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Solar Dryers



Hybrid model solar dryers having LPG, biomass or electricity as alternate back up heating source for continuous hygienic drying of fish even under unfavorable weather conditions.

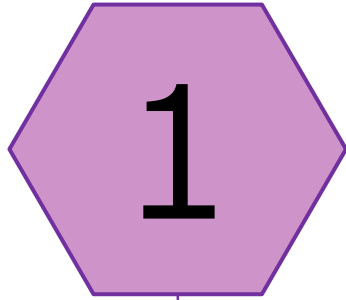


The capacity varies from 6 to 110 m² of tray spreading area for drying of various quantities of fish varying from 10 kg to 500 kg.

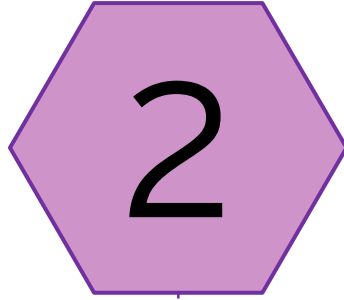
Policy and Financing Enablers

- Kerala's ₹3,000+ crore proposal to ADB via NABARD: Solarize 1 lakh homes – **Special mandate to consider all houses/ flats constructed for fisherman community under Punargeham.**
- Need for flexible finance, resilience grants, and policy mandates to mainstream energy resilience in coastal planning.
- Propose a National Toolkit for resilient coastal energy systems, backed by peer learning and pilot projects.
- Nominated Disaster Relief Centres to be fully powered by Standalone Power sources to ensure uninterrupted power during natural calamities

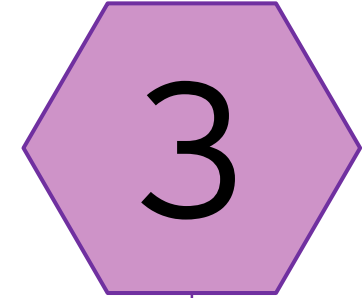
Community & Livelihoods Focus



Fisheries cold
chains and
processing



Water supply and
health care
during disasters



Economic resilience for
coastal communities,
especially salt farmers and
fisherfolk

Processing and Storage Infrastructure :

- **Processors:** 112 units
- **Cold Stores:** 150 units
- **Public/Co-operative Ice/Cold Units:** 19 units
- Largest clusters are located in Kochi, Kollam, Alappuzha, and Kozhikode.



Partnerships and Call to Action

- Initiate a Coastal Energy Resilience Alliance bringing together Indian states, the Asian Development Bank (ADB), and global partners—with Kerala positioned as the lead innovation hub driving sustainable energy solutions
- ANERT pledges to pilot innovative coastal energy solutions, systematically document outcomes, and actively share scalable models for broader adoption

THANK YOU