# CLIMATE SOLVER 2012 AWARDEE

## Energy Access: Smart Microgrid

### Developed by: Gram Power (India) Pvt. Ltd.

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## Innovation

IEA estimates that the number of people without electricity is close to 1.4 billion. This implies that every fifth household on our planet does not have access to electricity. Given that fossil fuels are a limited resource, it is necessary and wise to develop opportunities to provide people with electricity through renewable resources, such as solar, wind and biomass.

The smart microgrid system developed by Gram Power has been providing flexible, modular and reliable power from renewable sources of energy to people using prepaid recharge energy credits through a local village entrepreneur, similar to buying pre-paid credits for cell phones.


The electricity storage system

The recharging equipment for energy credits.

Gram Power installs distribution lines from the generation station to every home along with a proprietary smart prepaid meter that detects and eliminates energy theft, monitors power consumption of consumers and optimizes the supply and demand of power. Once a microgrid has been installed, a local entrepreneur is recruited and trained for operating the plant, its management and for the sale of power. Gram Power sells energy credits at a wholesale price to the entrepreneur, who in turn earns a commission by selling these credits to the consumers.

## Benefits

Smart microgrid is an innovative solution that has the ability to tap renewable energy resources thereby reducing GHG emissions and enhancing the quality of life of people. Gram Power's smart microgrid also has the ability to be scaled up from as few as fifty homes to several thousand households. If this innovation penetrates the remote areas of the world it has the ability to reach out to 48 million people by 2022.

## About the Company

Gram Power's vision is to provide affordable, flexible, and sustainable power to improve the quality of life of the 1.4 billion world poor living without reliable electricity. Gram Power's Smart Microgrid, in 2011, was selected by NASA as among the top 10 cleantech innovations from around the world.

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## Energy Access: Paribesh Chula

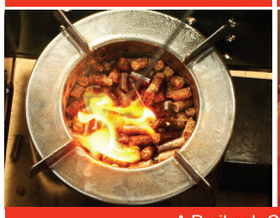
### Developed by: Enfragy Solutions India Pvt. Ltd.

## Innovation

The International Energy Agency (IEA) estimates that there are 2.75 billion people worldwide who depend on traditional fuels for cooking. The traditional cooking devices along with the use of traditional fuels cause health hazards and at the same time pose a stress on the ecosystem. The efficiencies of these systems are also low. Efficient cook-stoves address the problem by enhancing reducing the emissions. In cases where these are supported by a supply chain of bio-waste pellets, it also enhances the overall sustainability.

A Paribesh Chulha

Pellets made from bio-waste, mainly crop residue



A Paribesh Chulha in use

Paribesh Chula or '**PARI**' is one such environment friendly stove designed to be carbon neutral and much more energy efficient. It is based on waste to energy concept. PARI uses solid bio-pellet which is a carbon-neutral fuel, made from agricultural waste like bagasse, groundnut husk, rice/wheat straw or cotton stalks. These wastes are highly compressed and made into pellets which the stove burns efficiently using an innovative gasification process.

PARI has a chamber for burning pellets and a mini-fan, powered by rechargeable batteries and controlled by a regulator. The mini-fan blows sufficient air to enable uniform ignition. The technology through this innovative process increases combustion efficiency.

A supply chain model for PARI is being developed to support the local manufacturing of bio pellets, to ensure faster market penetration and also reduce costs. The model gives impetus to developing local level entrepreneurship by recruiting villagers to help in its effective distribution and sale.

## Benefits

Paribesh Chula through its waste-to-energy model of sourcing agriculture waste for the bio-pellets and high efficiency combustion has an added benefit because it also reduces greenhouse gas (GHG) emissions. Assuming that this innovative solution will be able to reach out to the larger market in the developing world, about 25 million people could benefit from this solution by the year 2022.

## About the Company

Enfragy is committed to designing and delivering green energy solutions that make a lasting impact on the lives of people who do not have access to clean and sustainable energy.