

D-Lab Development

2009.10.14

Ideas Generator Dinner Tonight
Yunus Challenge Tomorrow
Poverty alleviation challenge

D-Lab Energy

That picture that people show a lot...
a picture of the world at night

A lot of the areas we are going to, have very little light
India has done a lot of rural electrification
Maybe not on household level
Illustrates the need for household electrification systems

Two Types of Electrification

Urban - lots happens through theft
Cats claws in Brazil
Welders on side of road in Haiti
"People finding a way to make it happen"

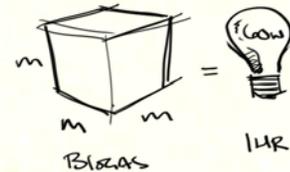
Rural
large chunk of people connected in last 2 decades
Lots of people too far from grid
Centralized energy doesn't work for them
Decentralized is more affordable and effective



Alternative Energy/Fuels

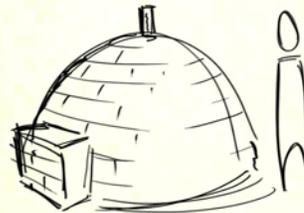
Biogas

Methane from human or animal waste
More efficient fermentation with
these than plant
Provides fuel for cooking and lighting.



Household Superdome Digester

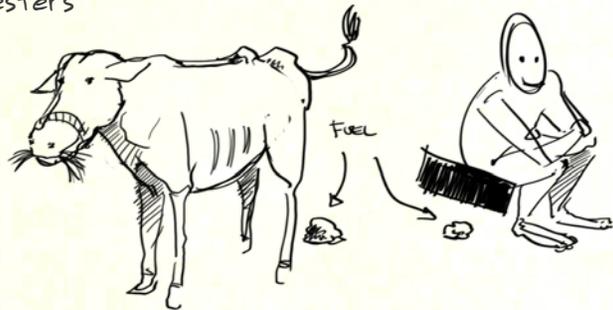
Has to be close the home
Almost always on site
Lots of municipal garbage sites will have
digesters and produce methane



Biogas digester in Honduras

Leak resistant bag, filled with waste
Often cattle provide fuel source
Gas is regulated by the digester
Manual process
Can be managed

Talking about dealing with cultural barriers of using human waste in digesters



Floating Drum Digestors
Moves up and down.

India + China have mature biogas digestion technologies

CONSTRUCTION CHALLENGES

Cost / Material / Environment

Digging in the ground to get warmer temps in cold areas

Transportation and storage of gas

Income Generation

Cost of digester recovered through food selling

BIODIESEL

Highest energy content compared to other fuels

From vegetable oils

To use in engines, have to reduce viscosity through transesterification

EFFICIENT STOVES

Traditional cooking stoves are 10% efficient
Heat emanates in all directions,
not just towards pot
Fuel efficient stoves require special equipment
Behavioral change and acceptance
Similar to solar cooker

People like to use wood stoves
They like the way it cooks
They are familiar with it



There is not silver bullet technology, rather a portfolio of technologies, because different things will be effective in different environments.

HOMER / small scale energy system modeling program



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