Revolutionizing Access to Clean Energy Services: Accelerating Market Development ,Technology Innovation and Large-Scale Investment

Dr. David J. Jhirad, Dr. Hari Sharan, Mr. Sagun Saxena

GSMA GPM Working Group Meeting
24 March 2010, Cairo



PROJECT TEAM

Confederation of Indian Industry

THE ROCKEFELLER FOUNDATION

D.E.S.I. Power TM

CleanStar

PARTNER

सत्यमेव जयते

Ministry of New and Renewable Energy (MNRE)
Government of India, New Delhi

Global and Indian Energy Challenges: A Strategic Action Agenda

End Energy and Economic Deprivation

- Accelerate access to clean and low-carbon energy services for poverty eradication and economic prosperity

Attract Substantial Capital Investment

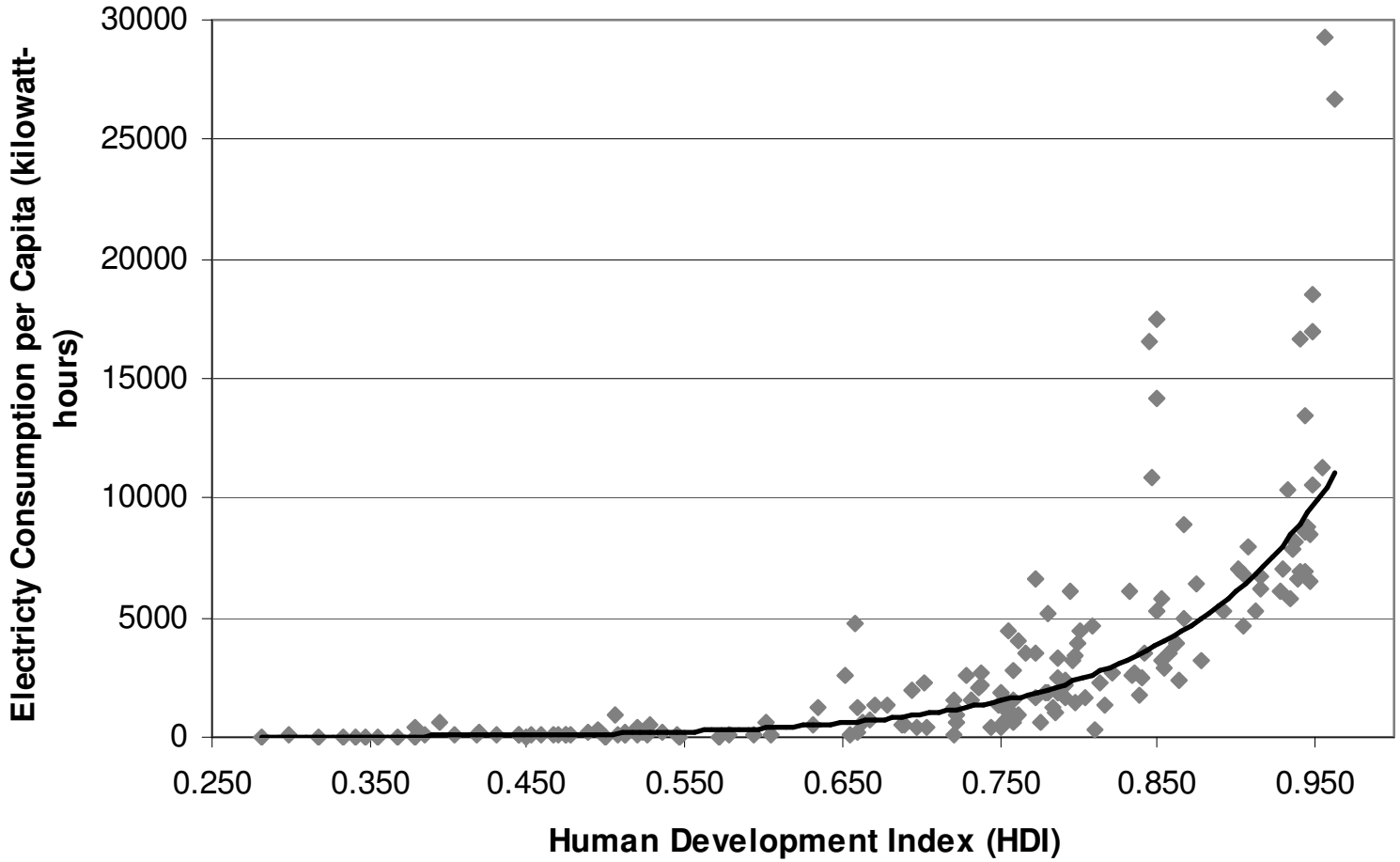
- Create incentives for private and public capital investment over the period 2010-2020 through scaleable business models, technology innovation and market development

Strengthen Energy, Water and Food Security

- Build social, economic and ecosystem resilience

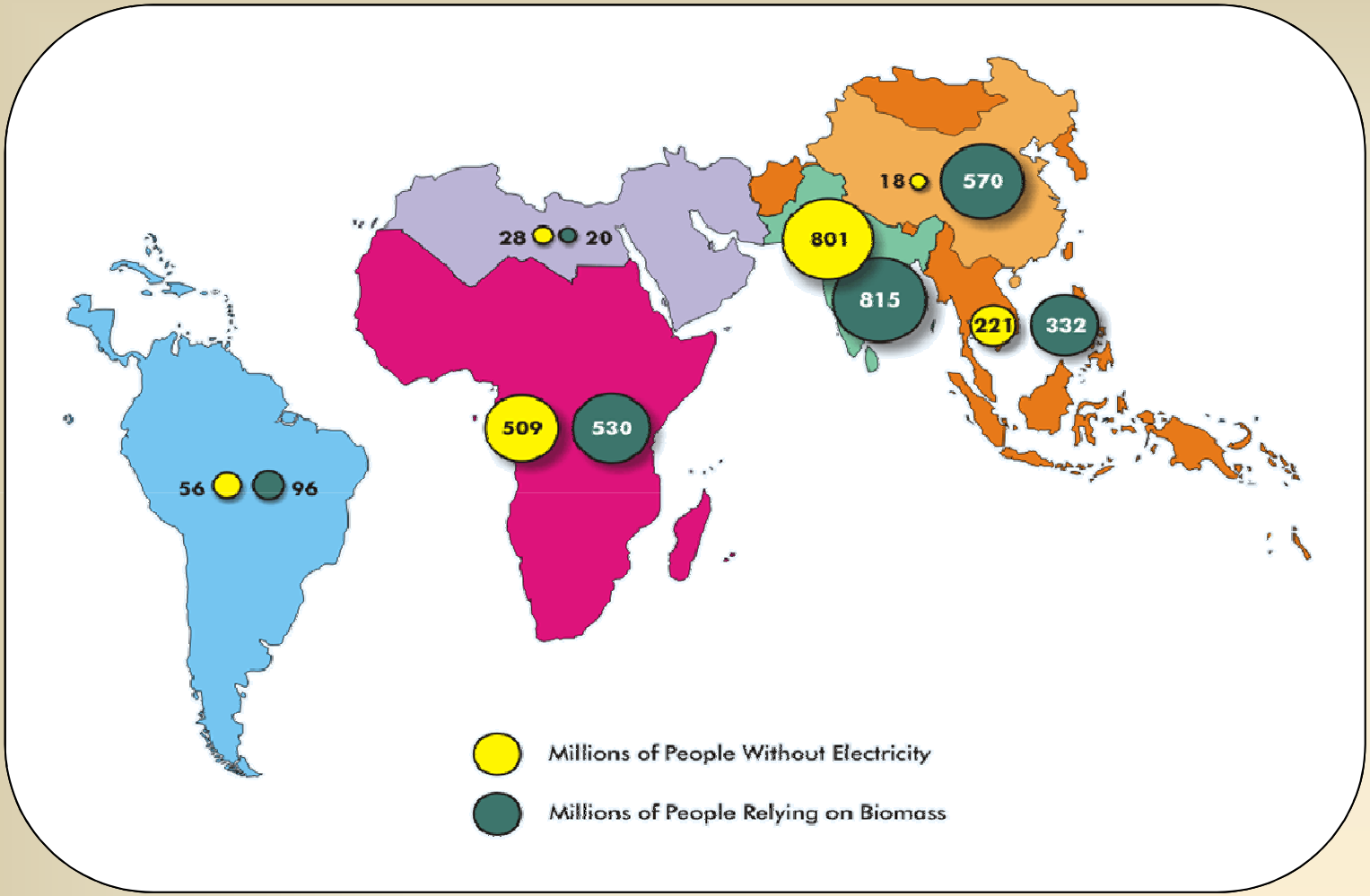
Energizing Development

The provision of energy services is a vital precursor to economic development



Source: UNDP, Human Development Index

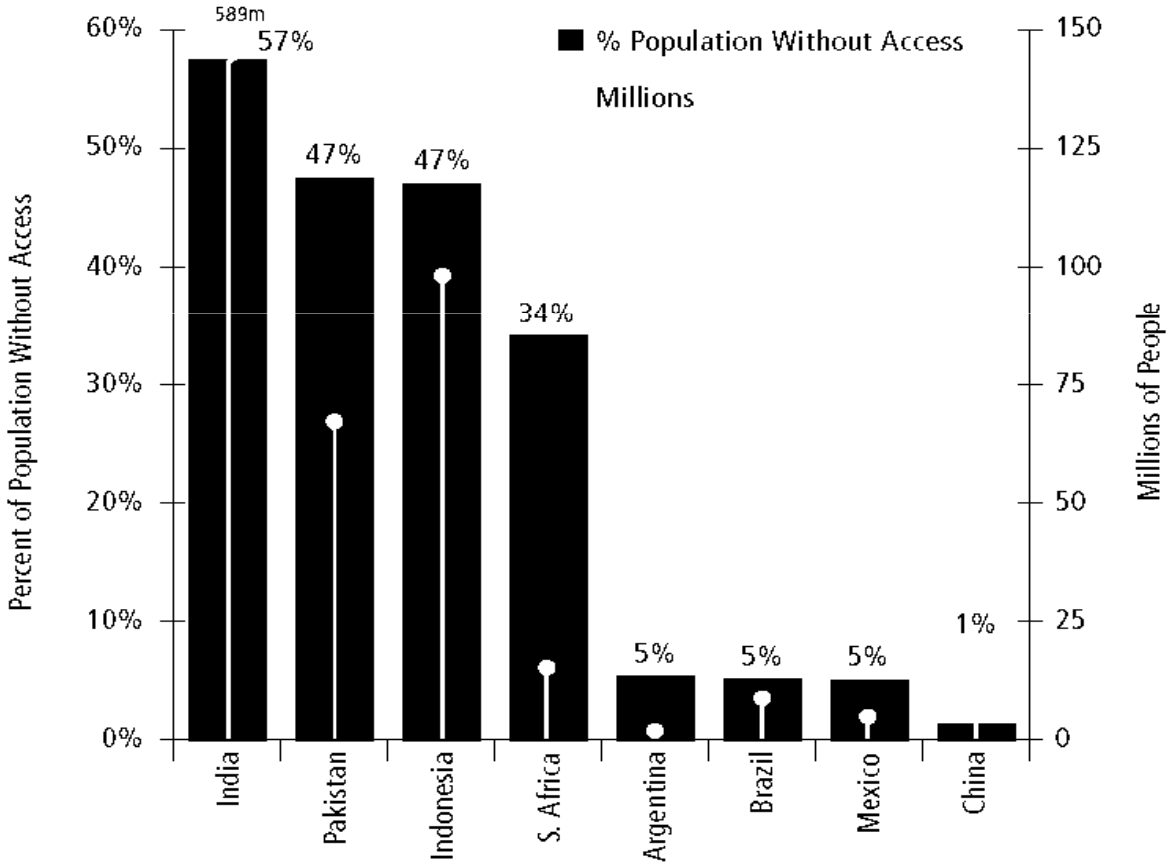
Map of Global Energy Poverty



1.6 billion people have no access to electricity
80% of them in South Asia and sub-Saharan Africa

The Development Challenge

Population without access to electricity, selected countries



Source: IEA (2002)

Leveraging Large-Scale Energy Solutions: New Industries and Infrastructure

1 **Strategic Imperative**

- Launch an Initiative to provide universal access to clean fuels and electricity
- Implement multi-faceted innovation in financing, technology, markets and policy

2 **Lessons from 50 Years of Rural Electrification**

- Providing access to electricity services is necessary but not sufficient
- Require parallel investment in infrastructure for economic value creation, "anchor tenants" who can pay for services, and effective institutional delivery mechanisms

Leveraging Large-Scale Energy Solutions: New Industries and Infrastructure

3 **Anchor loads**

- Burgeoning infrastructure of cell phone towers in South Asia and Sub-Saharan Africa
- "Greening the towers", providing excess power to villages, and using "smart grid" technology, are just initial steps toward goal

4 **New incentive frameworks**

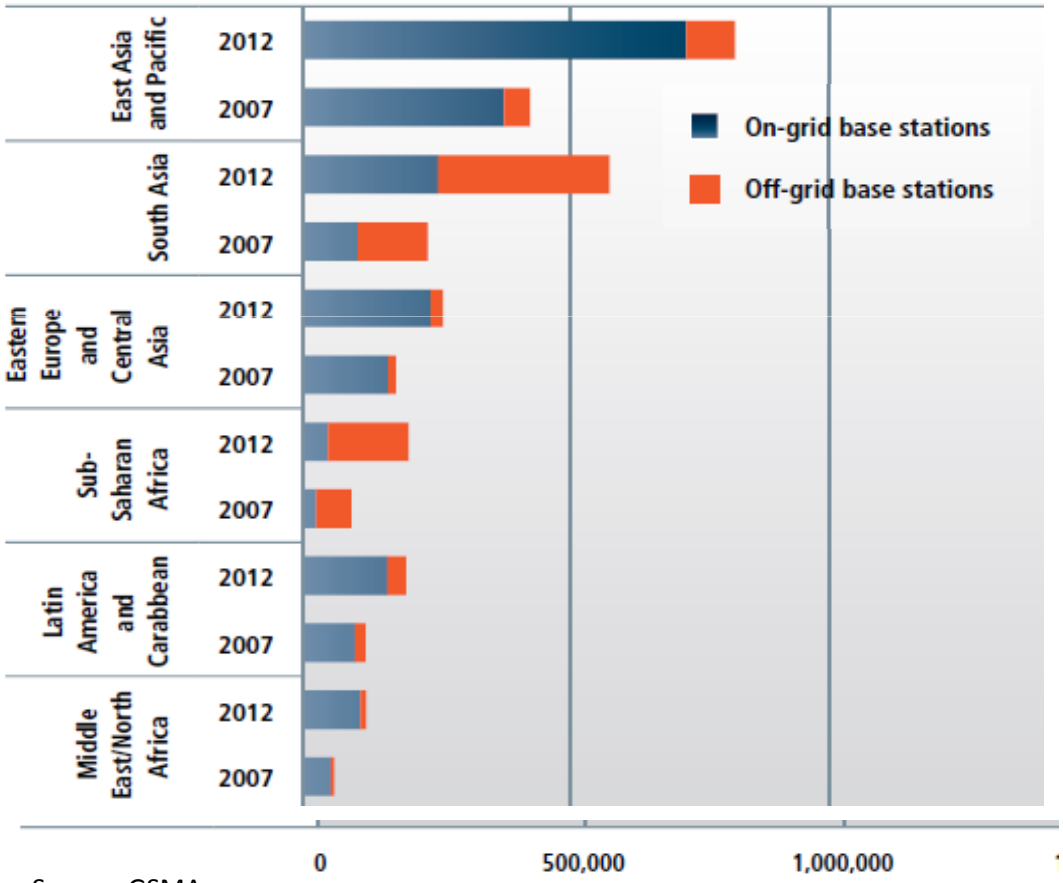
- Provide incentives for government-wide involvement, private investment in energy and power utilities or service companies (ESCO's), and market demand for clean, low-carbon energy services

5 **Construct high reliability & low-cost service models**

- Identify business models and pilot projects with potential for massive and rapid expansion

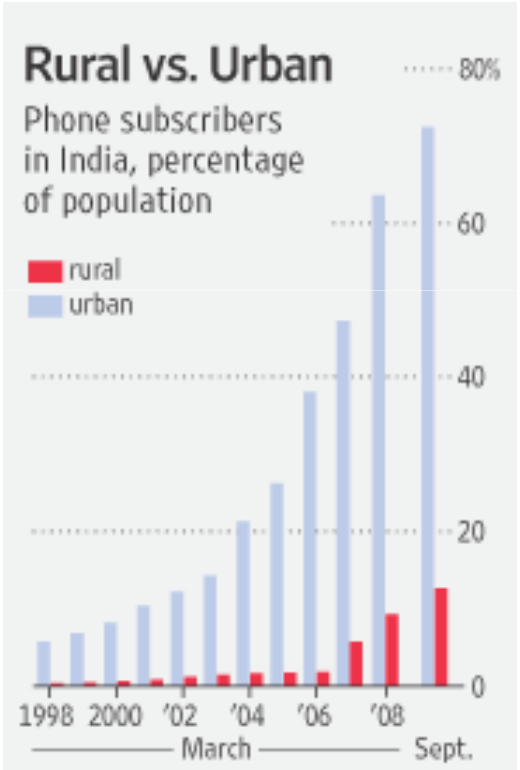
The Mobile Phone Industry is Expanding Rapidly in Rural Areas

Mobile Phase Base Stations by Region



Source: GSMA

Rural Growth



Source: TRAI

In the Field…


Poles but no wires…


… wires but no power

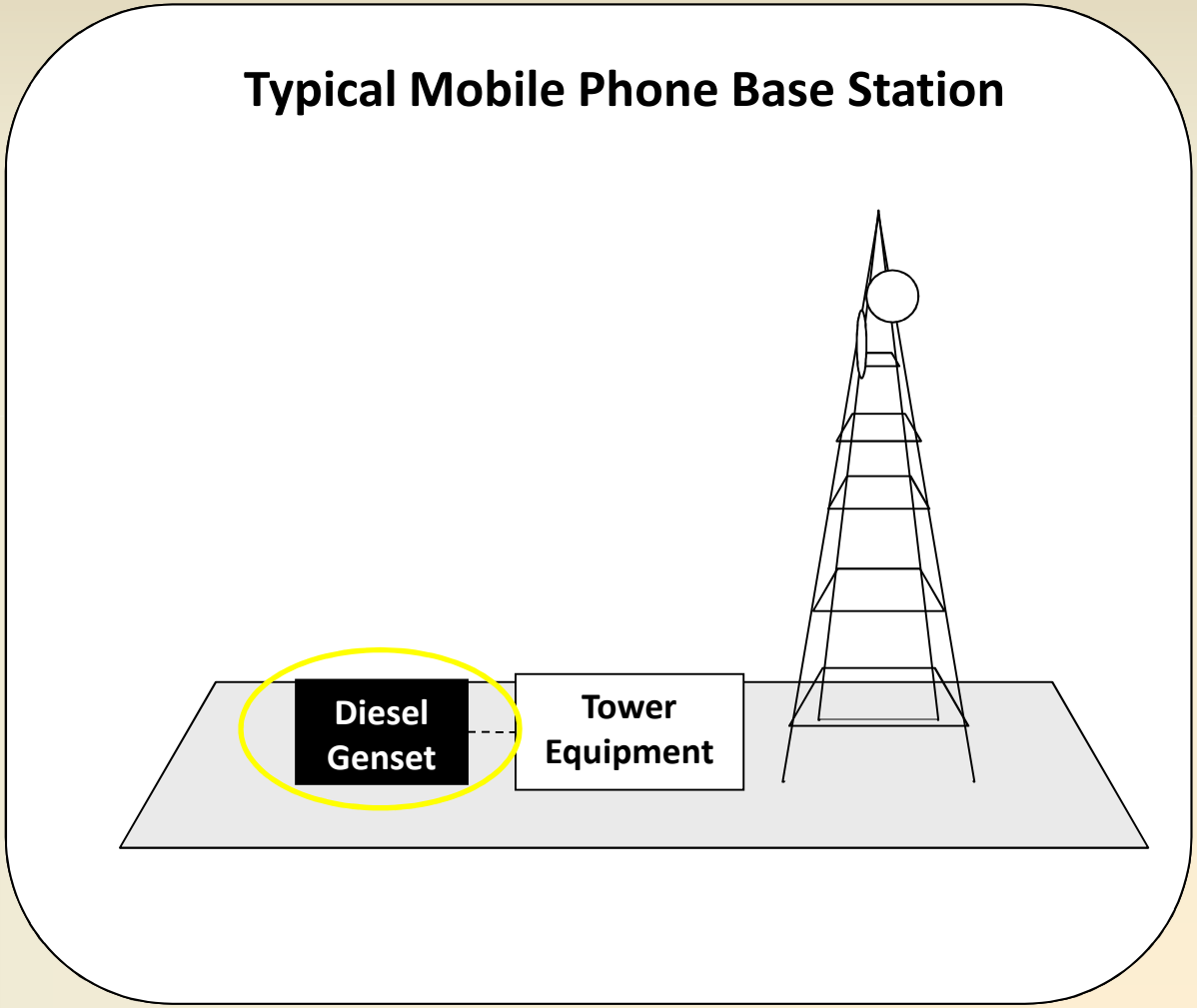

Towers keep rising…



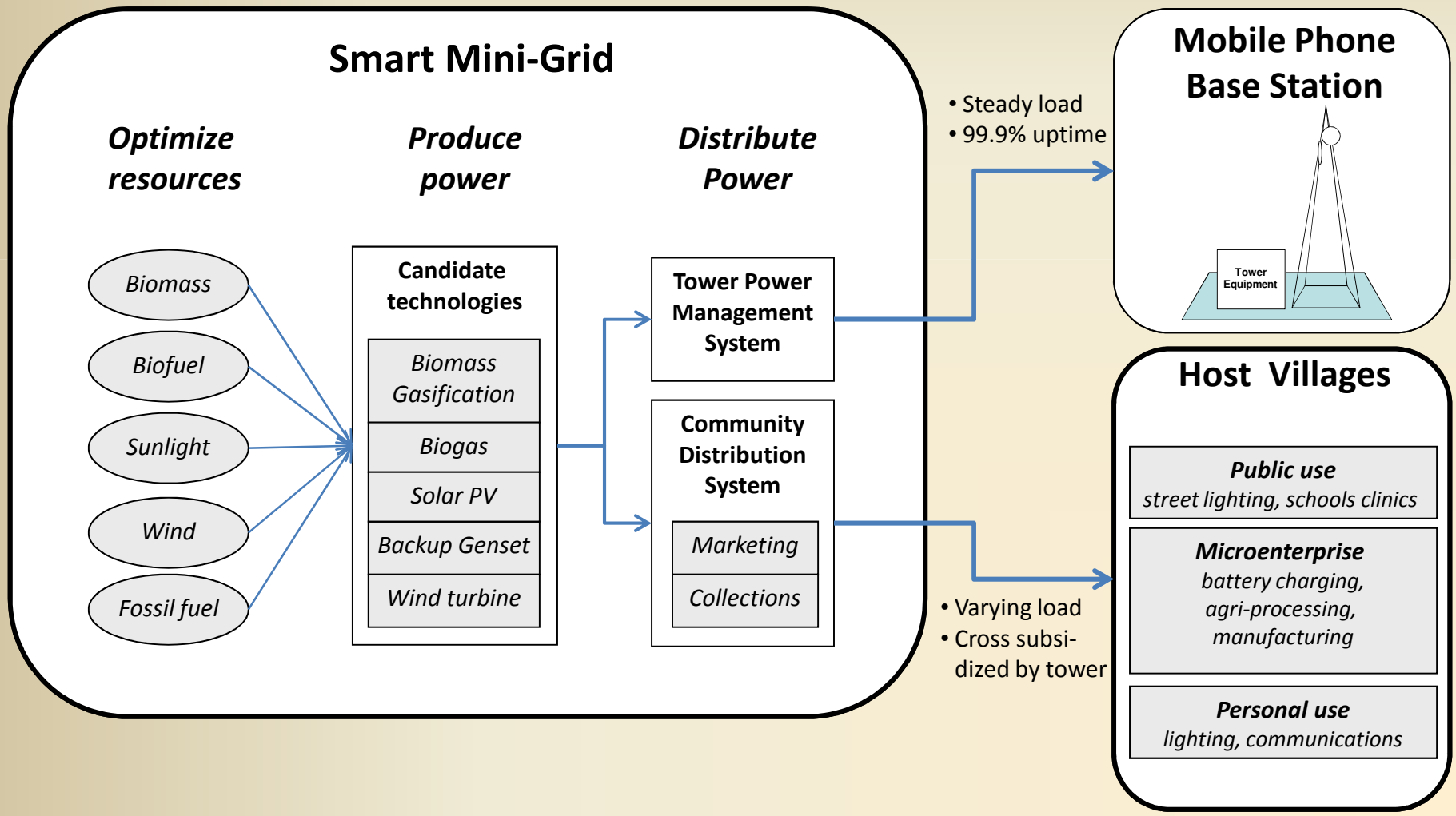
… rates keep falling

Current Situation:
Most Base Stations Have Dedicated Power Supply

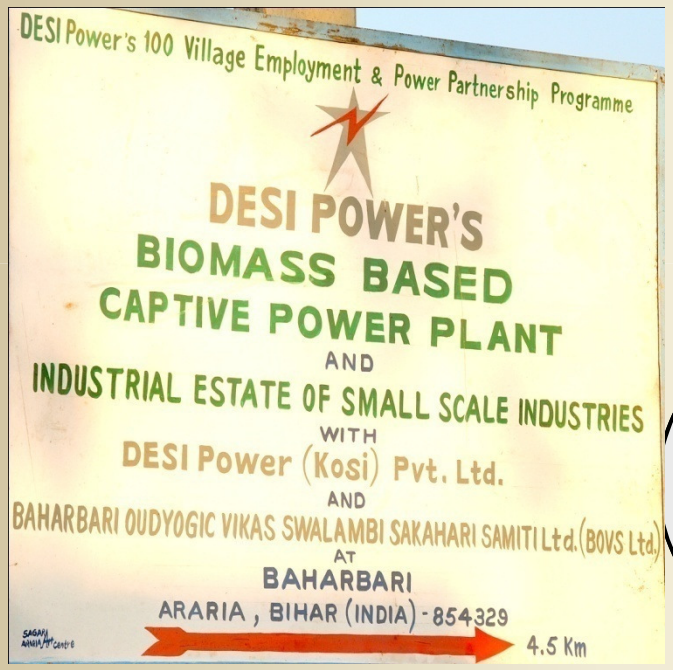
- Powered by diesel generator set
- This is a costly and polluting solution
- Local communities remain without clean energy services for economic and social development

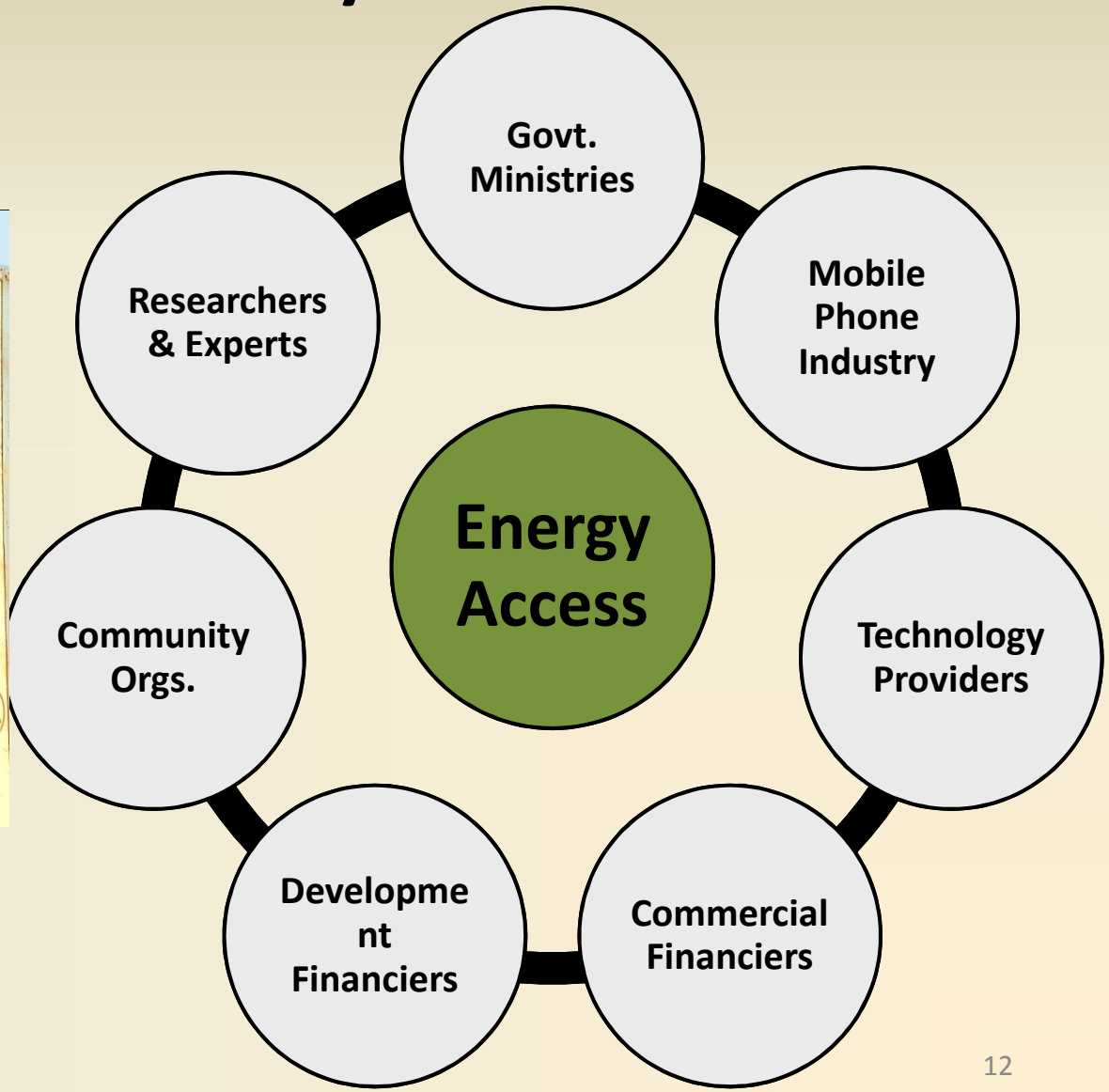


Future Vision:
Base Stations are "Anchor Customers" for Commercial Mini-utility Supplying Host Villages



Realising this Vision Requires Orchestration of Many Stakeholders





Transformative Economic, Social & Environmental Benefits Can be Achieved at the Scale Needed

Enhanced reliability and expanded access to energy services

- Revolutionize access to energy services for several hundred million people over the next two decades
- Improve health and safety in rural areas

Market development & job creation

- Enable new enterprises and market development through access to reliable power and parallel investments in micro-infrastructure
- Create employment through producing, processing and supplying biofuels and other energy resources

Reduced CO2 and black carbon emissions

- Reduce dependence on fossil fuel

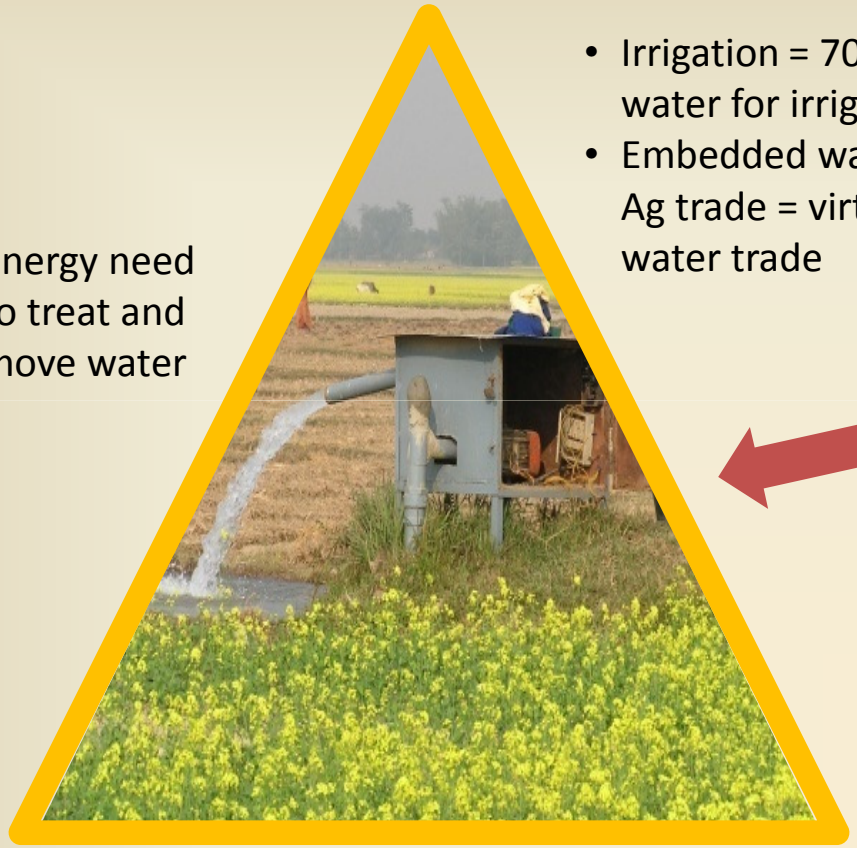
Levers for Sustainable Rural Development

Growth
Development
Security

Water

- Irrigation = 70% of water for irrigation
- Embedded water: Ag trade = virtual water trade

- Energy need to treat and move water



Population

Consumption

Climate change

Energy

- Bio-fuels: food vs. fuel
- Fertilizers need energy, emit GHG
- Soil carbon sequestration

Food

Conflict
Failed States
Humanitarian Assistance

Example:
Baharbari Biomass Plant, Bihar



















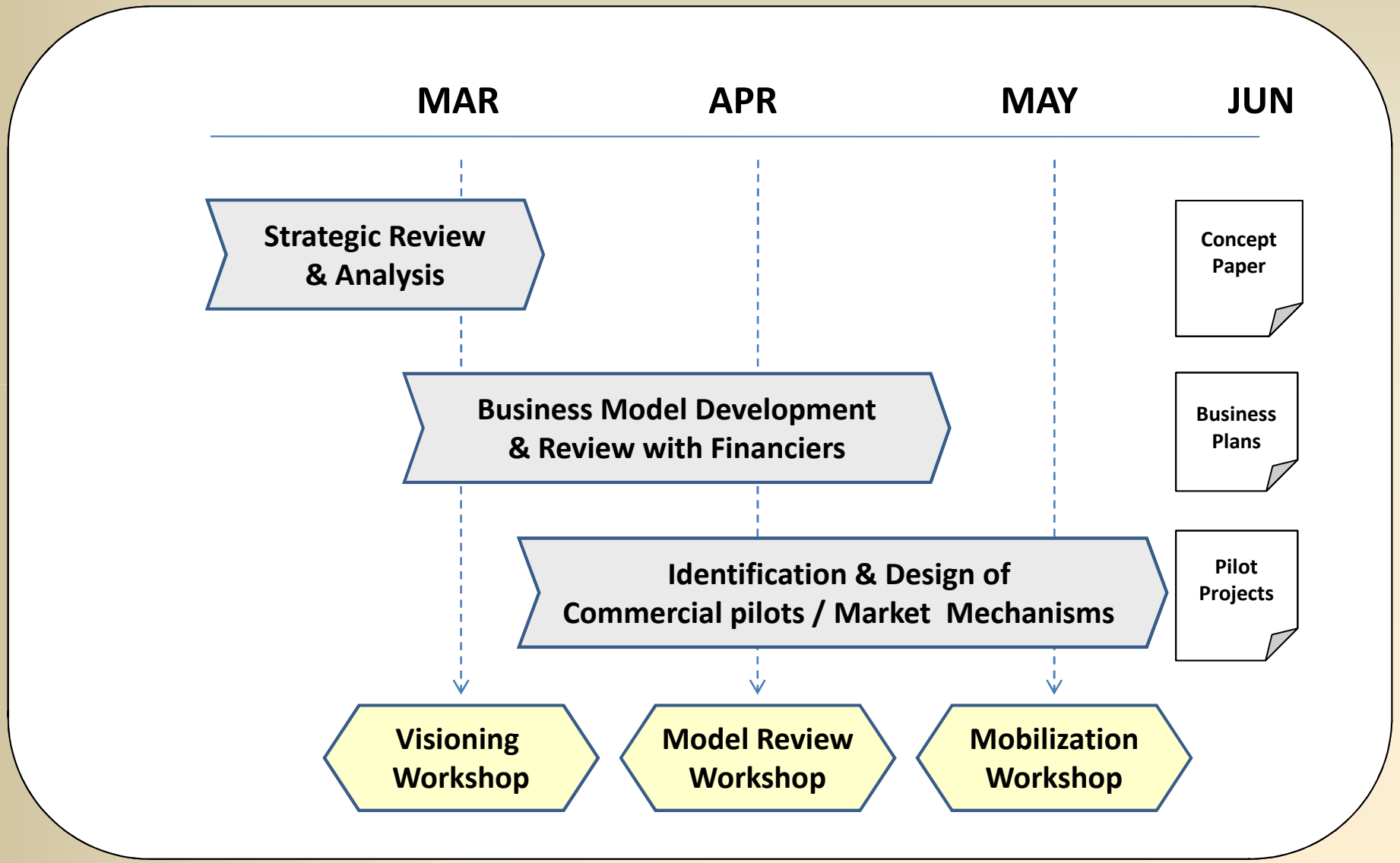

DESI POWER







Project Timeline



Contact Information

Dr. David J. Jhirad: Davidjhirad@post.harvard.edu, 202-364-4133, 202-663-5813

- *Professor and Director, Energy, Resources and Environment Center, Johns Hopkins University, School of Advanced International Studies(July 1)*
- *Special Advisor - Climate & Energy and former Vice-President Rockefeller Foundation. Former Vice-President, Science, WRI, Visiting Professor Georgetown U. Author or co-author of 3 books and over 100 publications on international energy and power policy, technology innovation, development and climate change*
- *Assistant Secretary of Energy in Clinton-Gore Administration: Led US energy relationships with all major countries and institutions, Vice- Chairman, IEA Governing Board, and US Energy Representative, APEC*
- *Ph. D. Harvard University, Applied Physics, Bowdoin Prize ,B.A., M.A. Cambridge University*

***Dr. Hari Sharan:* hari.sharan@bluewin.ch, +41 52 335 3500**

- President, Dasag Energy Engineering Ltd., Seuzach,CH**,** and Chairman, DESI Power, Decentralised Energy Systems (India), Bangalore
- Areas of specialization: Energy and power policy and technology; Renewable Energy Technologies: biomass ,solar thermal, PV; power station management; sustainable development, especially of villages; climate change, Joint Implementation and CDMPh.D. University of
- Ph.D. Manchester Institute of Science and Technology, (UMIST), UK. Awarded the PATUK Prize, B.Sc. (Eng.) (Honours) Mechanical Engineering, Bihar

  Institute of Technology, India.

Mr. Sagun Saxena: sagun@cleanstar.in, +44 77929 73407

- *Founder of CleanStar, an award-winning Indian enterprise established in 2005 with a focus on developing sustainable bioenergy projects and end-use technologies that benefit remote rural communities*
- *In charge of international partnership development (Brazil, Mozambique, Haiti), business model innovation, and sustainability assurance*

  B.S. Chemical Engineering (Berkeley) & M.B.A. (Oxford)