

DFID Energy Research Objectives, Approaches and Current Programming

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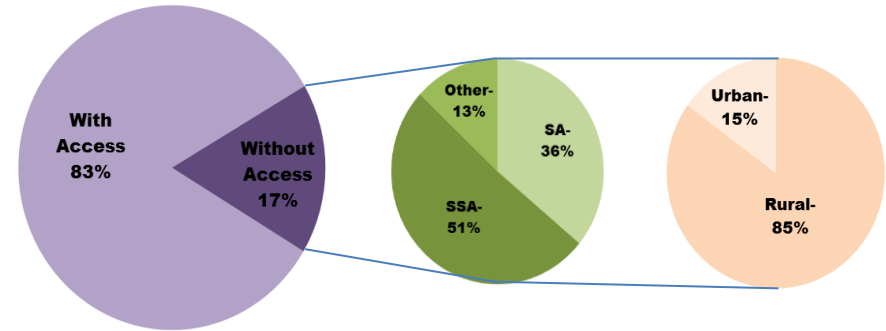
USES Network and Energy for Development Workshop

13^h September 2016

Wellcome Trust, London



- **Over 1 bn lack of access to modern energy services, mostly in SSA and SA; many more are connected but “under-served”**



- **Grid based systems are often insufficient, unreliable and expensive, constrained by poor sector policies, governance and lack of investment. Reliable access is main constraint to growth for most African businesses.**
- **Increasing opportunities for scaling up off-grid clean energy solutions, expanding local grids, and innovation (solar system cost reductions; new business models- PAYGO; increasing energy efficiency) and smarter integration with grid systems.**
- **But barriers remain – technology development; market constraints; scaling up energy businesses – finance, capacity, enabling environment etc.**

Research objectives and incentivising innovation

Sustainable Development Goal for Energy SDG 7

- universal access to affordable, reliable and modern energy services;
- increase substantially the share of renewable energy in the global energy mix;
- double the rate of improvements in energy efficiency;
- enhance international cooperation to facilitate clean energy research and technology;
- expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries.

Cross-cutting considerations



.....and more

- Energy for economic development
- Climate smart development
- Fragile and conflict affected states
- In the UK national interest

Approaches

Technologies and delivery

- Key areas: Renewable energy; energy for productive uses; smart energy networks and system integration; demand side technologies; energy efficiency; bringing frontier technologies into use
- Scaling up use of affordable clean energy services and tackling barriers (eg supporting Energy Africa; humanitarian situations)
- Innovative business models and financing (PAYGO; Crowdfunding)

Strategic Partnerships

- With the Private Sector (eg Shell Foundation; GSMA; Unilever etc)
- With OGD and ODA (inc BEIS and Innovate UK, Mission Innovation, GCRF, Prosperity Fund, and research councils etc)

Delivering Well

- Effective delivery (managing partners, RCs etc)
- Risk management (balancing context, innovation, delivery)
- Tracking direct & indirect results (inc gender and equity)
- Communications

Energy and Innovation Portfolio- current projects

Current projects

Some expected outputs

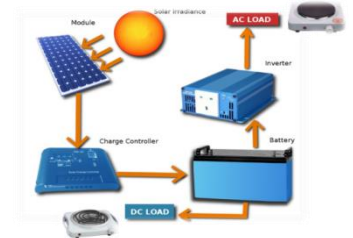
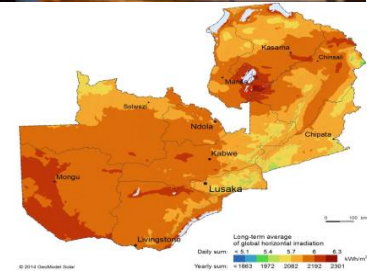
The Challenges

Addressing Barriers to Sustainable Energy Access for All

Sustainable Energy, Access and Gender (SEAG) research on energy and gender, RE resources and impact.
M4D Utilities mobile enabled service provision – half is energy, managed by GSMA (mobile phone trade association)
New Energy Applications and Delivery Models (NEADM) innovation scale up with Shell Fdn.
Green Mini Grids Action Learning and Evaluation
Moving Energy Initiative MEI sustainable energy provision in humanitarian situations,
Crowd Power assesses crowdfunding platforms as a way of securing finance
Transform: Innovation partnership with Unilever

Scaling up the Use of Clean Energy

ESMAP -energy sector policies and best practice guidance
Energy and Economic Growth (EEG) effective larger scale energy infrastructure, political economy
Understanding Sustainable Energy Solutions (USES) partnership with EPSRC, DECC.
Scaling up clean cooking solutions includes cook stove standards, behaviour change, markets etc.
Bio-energy for Sustainable Local Energy Services and Energy Access in Africa



Future Plans

**The Challenge:
Global Goal 7 by 2030**

Addressing
Barriers to
Sustainable
Energy
Access for All

Scaling up
the Use of
Clean Energy

Going Forward

Transforming Energy Access TEA - Major clean energy access R&D programme (£65m):

- Expanded partnership with Shell Foundation (TIME)
- Open calls with Innovate UK Energy Catalyst
- Clean Energy Innovation Partnerships (incl. crowdfunding)
- Skills and capacity building

Scaling up existing successful programmes:

M4D GSMA strategic partnership for mobile enabled applications and digital inclusion

Moving Energy Initiative MEI for pilot testing phase of humanitarian sustainable energy provision

Innovative funding trialling crowdfunding platforms for peer to peer solar);also impact investing study (inc in TEA)

Clean Cooking with Global Alliance for CC

ESMAP further support on policy, best practice and knowledge , including RE mapping

New Pipeline Programmes:

Low Energy, Inclusive Appliances LEIA

Frontier Technologies

Potential Mission Innovation support with BEIS

Where we want to be



Platform for Household and Community Level Development

Energy Africa will provide a platform for even bigger impacts and movements up the energy and development ladder; TEA will support with innovation and business models



Basic Energy Systems
 (Households)
 0.1kW-2kW, \$5-\$200



Energy Products and Sustainable Fuels
 (Productive use)
 >3kW, \$500-\$10,000



Off-grid Energy Services
 (Low income households,
 rural industry, community services)
 >25Kw, >\$50,000



Source: Shell Foundation

Transforming Energy Access for households and improved livelihoods (TEA)

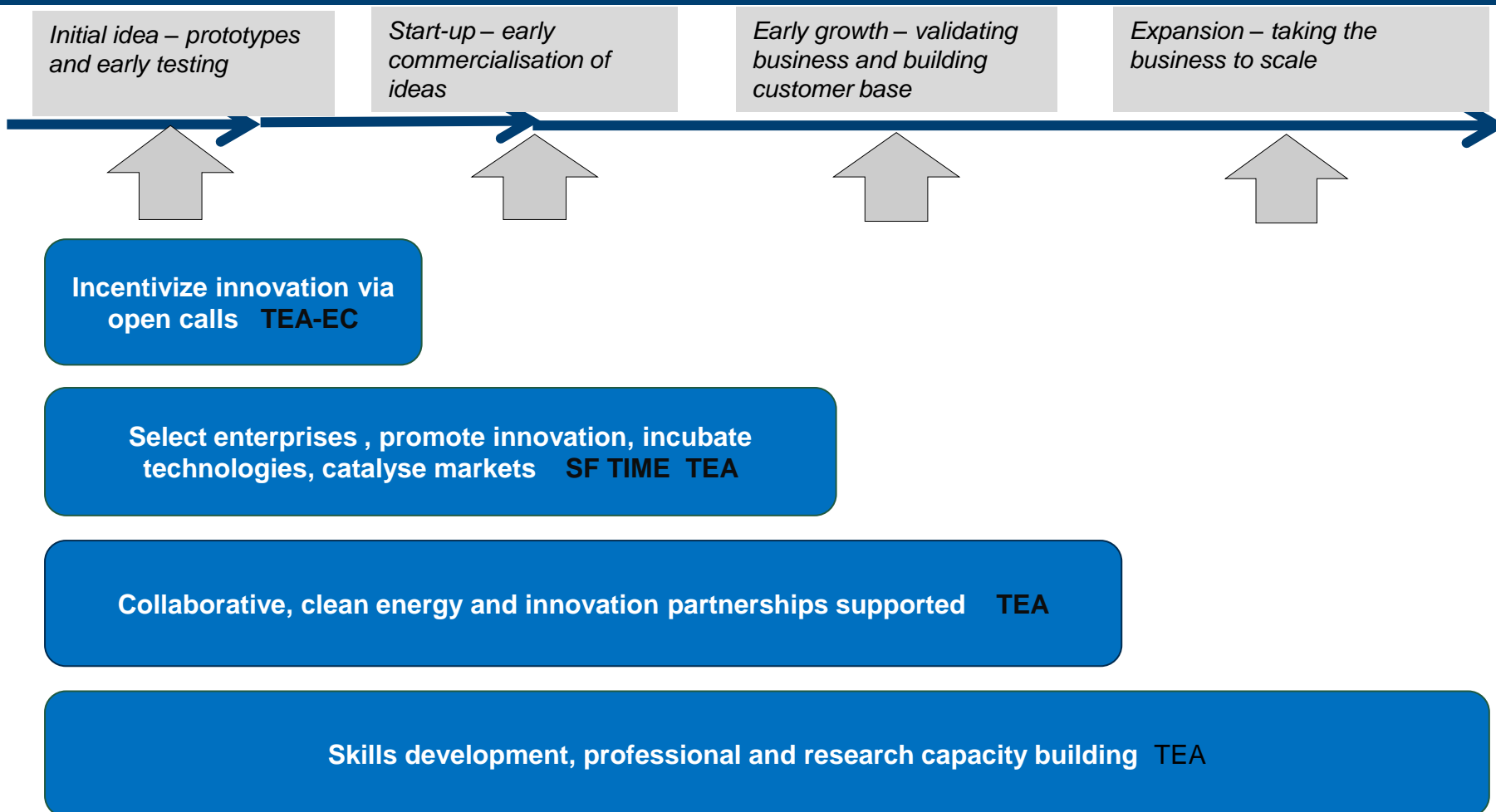
Project Purpose: To support early stage testing and scale up of innovative technologies and business models that will accelerate access to affordable, clean energy based services to poor households and enterprises.

- Holistic approach with four themes:

- Stimulating technology innovation
- Accelerating enterprise-led innovation in technologies and business models
- Supporting collaborative clean energy partnerships
- Developing local skills and expertise

(plus potentially Bioenergy Phase 2 and clean energy research uptake reporting)

Addressing Barriers for Development of Decentralised Sustainable Energy Businesses



- **Energy Catalyst:**

- Round 3: Question on developing country relevance posed to applicants; 1/3 positively identified; confirms demand and relevance of many proposals; 20 projects identified for DFID co-funding alongside Innovate UK and EPSRC funding (15 early; 3 mid and 2 late stage; key considerations for DFID are potential for impact; priority and timeliness. Round 4 closes this week (Innovate UK; DFID and EPSRC funding totals £19m); Round 5 opens 5 Dec (£8m DFID and EPSRC funding at present).

- **Shell Foundation TIME**

- Investment committee has endorsed proposals for DFID-SF support for 13 existing energy business with potential for scale up, and for 3 relatively new businesses.

- **Other TEA components**

- Procurement of the TEA Research Programme Delivery Consortium is on-going. The RPDC will conduct scoping studies for the Clean Energy Partnerships and Skills and Expertise components in Phase 1. Phase 2 will include calls and competitions. A limited number of fast-track initiatives under TEA Phase 1 are being considered; these include establishment of a Peer-2-Peer Solar Africa funding platform, and a possible study into impact investing in the energy sector (under the Partnerships component), and a skills development partnership initiative (under the Skills and Capacity Building component).

Pipeline energy R, D and D thinking

- **Frontier Technologies:** Support range of frontier technologies as well as make existing data/technologies more open and useable; demand-led internal challenge fund followed by matchmaking processes connecting the skills of innovators in key technology sectors to the needs and opportunities in DFID programmes and countries.
- **Big data:** Pilot studies to explore new technologies, such as big data and new satellite imaging, that offer unparalleled opportunities to fill the gaps
- **Low Energy Inclusive Appliances:** Support a programme that will accelerate availability, affordability, efficiency and performance of appliances which are critical to improving the value proposition and expanding markets for household solar and mini-grid systems, as well as enabling the most efficient use of available grid power in weak grid situations.
- Expanding collaboration with OGD on UK Energy Innovation Fund and Mission Innovation and other initiatives relevant to clean energy R, D and D.



Department for
Business, Energy
& Industrial Strategy

OFFICIAL

MISSION INNOVATION

Accelerating the Clean Energy Revolution

www.mission-innovation.net

*Fostering greater multilateral collaboration to
make clean energy widely affordable*





MISSION INNOVATION

Accelerating the Clean Energy Revolution

Membership

-  Australia
-  Brazil
-  Canada
-  Chile
-  China
-  Denmark
-  European Union
-  France
-  Germany
-  India
-  Indonesia
-  Italy
-  Japan
-  Mexico
-  Norway
-  Republic of Korea
-  Saudi Arabia
-  Sweden
-  United Arab Emirates
-  United Kingdom
-  United States

- Mission Innovation is a high-profile initiative seeking to strengthen international clean energy Research, Development & Demonstration.
- It was launched by heads of state/government on the first day of COP21, in Paris, in November 2015. It involves 21 members so far, with others likely to join.
- In a separate but loosely linked initiative, 29 high net worth investors led by Bill Gates formed the Breakthrough Energy Coalition (‘the Coalition’) and pledged to invest more ‘patient capital’ in early energy research and development. The Coalition expects to work with Mission Innovation Governments and with influential private sector partners to explore ways of working more effectively together, encouraging investment, and improving the flows of innovative ideas through to commercialisation.
- The Steering Committee for the initiative is chaired by the US, with the UK, India and Indonesia as vice-chairs.



MISSION INNOVATION

Accelerating the Clean Energy Revolution

There are two parts to Mission Innovation:

a. Doubling Governmental Investment in Clean Energy Innovation

- The 21 members have pledged to double public funding for relevant clean energy research, development and demonstration.
- Members' combined doubling total will be \$30 billion per year by 2021.
- The UK's commitment is to double relevant Research Development & Demonstration investment to in excess of £400 million in 2020/21.

b. Fostering increased transparency and strengthening collaboration

- Central to Mission Innovation is information sharing by and among members, which promotes transparency and integrity, allows for broad stakeholder engagement, gives rise to opportunities for collaboration, and can inspire and inform investment decisions by the private sector.

Mission Innovation progress to date

- Since the launch, the focus has been on achieving: a shared understanding of objectives; securing the doubling of financial commitments; initial sharing of members' national energy innovation programmes and priorities; and sharing examples of good practice in collaboration and delivery. See the [website](#) for more information.