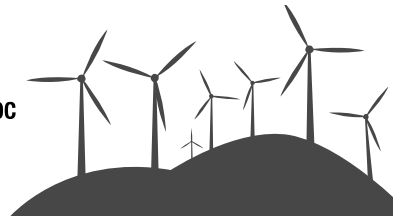
20th Meeting of the CAREC
Energy Sector Coordinating Committee
7-10 September Kuala Lumpur, Malaysia

20-ое заседание Координационного
комитета по энергетическому сектору ЦАРЭС
7-10 сентября 2015 года - Куала-Лумпур, Малайзия



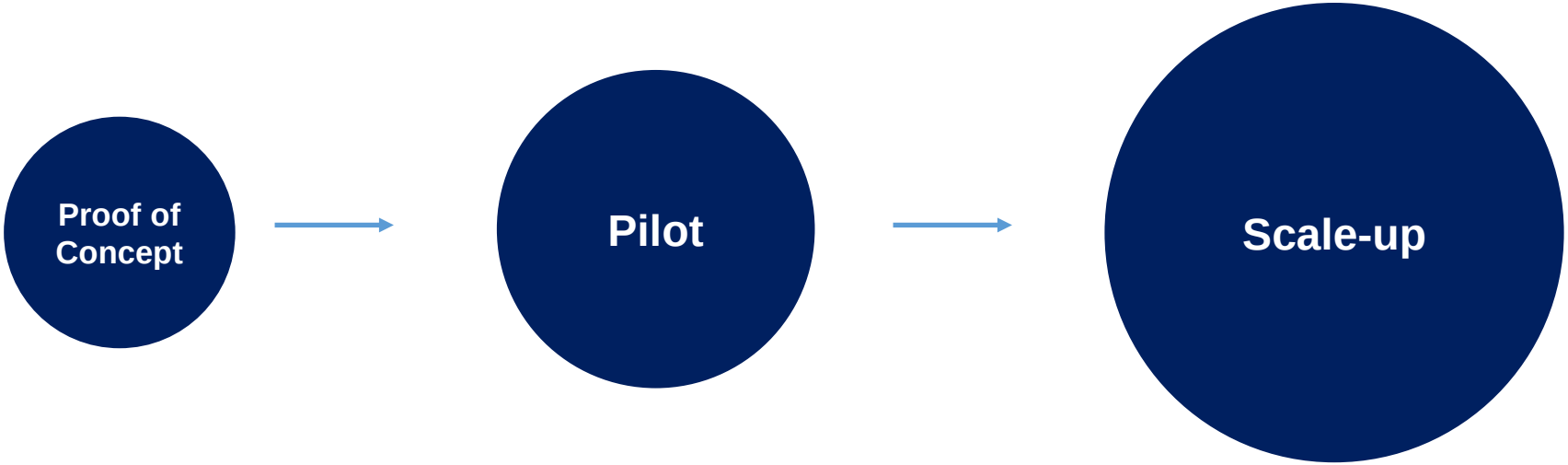
Discussion on Proposed Technical Assistance for a Demonstration of an Off-grid Solar DC Electrification Kit

9 September 2015

Proposed Investment Projects by Each Country
(Based on brainstorming session on 29 July 2015)

Project No.		AFG	AZE	KAZ	KGZ	MON	PAK	TAJ	TKM	UZB
	A. Supply Side									
1	Solar powered micro-grid for remote areas	X			X					
2	Adoption of clean coal technologies in power generation			X			X			
3	Improve efficiency of solar industry / establish new industry								X	
	B. Electric Vehicle and Storage									
4	Battery based on grid storage for reliability improvement of renewable energy					X				X
5	Electric vehicle pilot for government fleet and public transport	X	X	X			X		X	X
	C. Demand Side and Distribution Efficiency									
6	Demand responses through improved hardware, smart meters and tariffs									X
7	LEDs for public lighting and offices	X	X				X			
8	Solar off-grid to reduce demand from diesel	X			X		X			
9	Distribution efficiency and loss reduction				X		X	X		X
10	Improve load dispatch systems and distribution control within SCADA	X			X			X		X

PROPOSED DEMONSTRATION OF AN OFF-GRID SOLAR DC KIT TO SUPPORT IMMEDIATE ELECTRICITY ACCESS



Sept 2015 – March 2016

Proof of Concept of an off-grid kit

April 2016 – Nov 2016

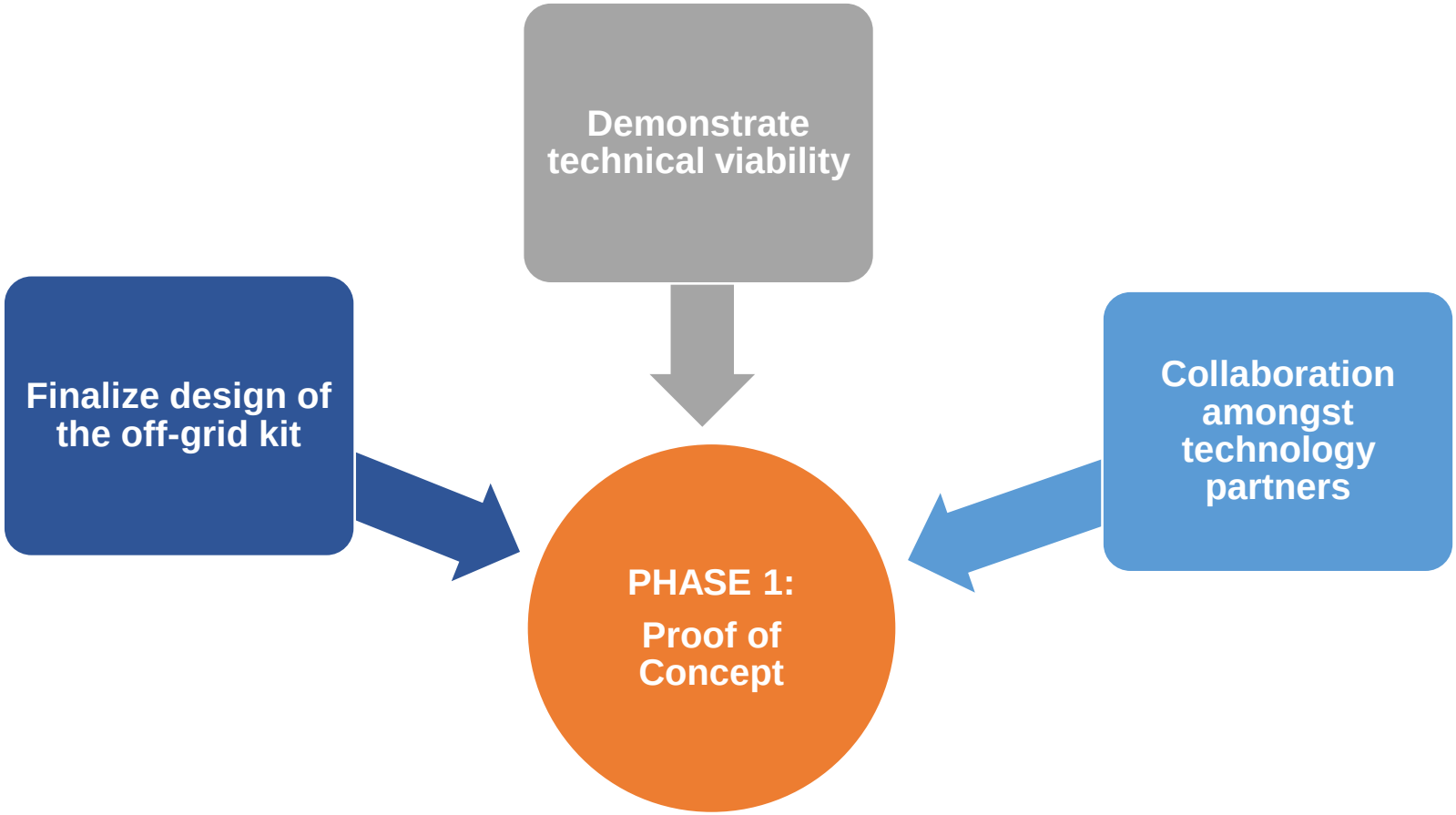
Multi-country demonstration with estimated 1,500-2,000 off-grid kits in participating CAREC and Southeast Asian countries

Dec 2016

Estimated 50,000 off-grid kits in Afghanistan and/or Pakistan, or other interested DMCs

The proposed demonstration will support the faster adoption of the technology, directly bringing the benefits to the poor at an earlier rate

PROPOSED PHASE 1 PROOF OF CONCEPT WILL FINALIZE THE DESIGN OF AN OFF-GRID SOLAR DC KIT AND DEMONSTRATE THE KIT'S TECHNICAL VIABILITY



PHASE 1

PROPOSED ACTIVITIES TO BE COMPLETED IN PHASE 1 PROOF OF CONCEPT

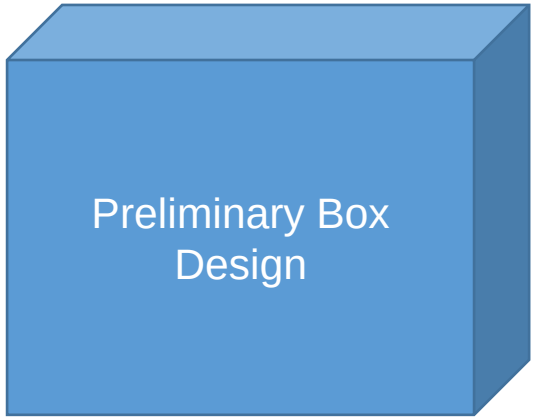
- ✓ Finalized prototype design and drawings
- ✓ Concept demonstration
- ✓ Simplified business model
- ✓ Competitions: Box packaging design competition & Naming competition
- ✓ Technical papers by technology experts
- ✓ Introduce project through social media: Facebook, LinkedIn
- ✓ Design Phase 2 Pilot implementation

PROTOTYPE OF OFF-GRID DC KIT

KIT Components

250 watt solar panel	$150
2 kWh Lithium-ion battery	$700
10 LED light bulbs with cables	$100
1 DC LED 19” TV	$200
1 DC refrigerator	$200
2 DC fans	$50
Contingency	$100

Total: $1,500



PHASE 1

OFF-GRID SOLAR KIT WITH DC APPLIANCES

Solar PV Module

DC Power Controller System

DC loads

PHASE 1

OFF-GRID SOLAR KIT WITH DC APPLIANCES OF MYSHELTER FOUNDATION, INC.

Solar PV Panels

Box

Battery Pack

PHASE 1

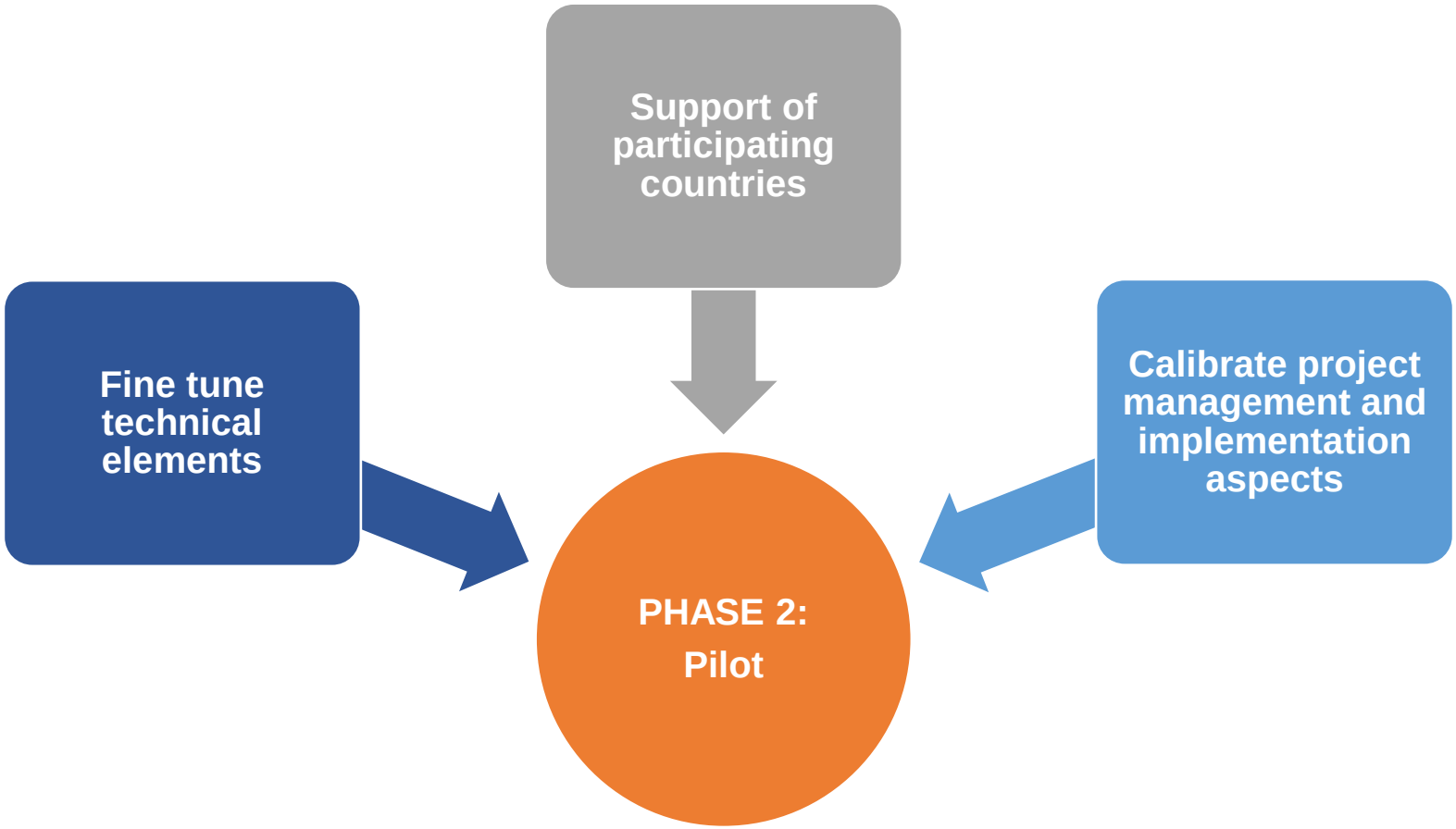
OFF-GRID SOLAR KIT WITH DC APPLIANCES OF MYSHELTER FOUNDATION, INC.

Appliance Charging Station

DC Electric Fan

DC Television

PROPOSED PHASE 2 PILOT WILL BE A MULTI-COUNTRY VIABILITY DEMONSTRATION INVOLVING ~1,500-2,000 OFF-GRID KITS IN PARTICIPATING CAREC AND S.E. ASIAN COUNTRIES



PROSPECTIVE ACTIVITIES FOR PHASE 2 PILOT

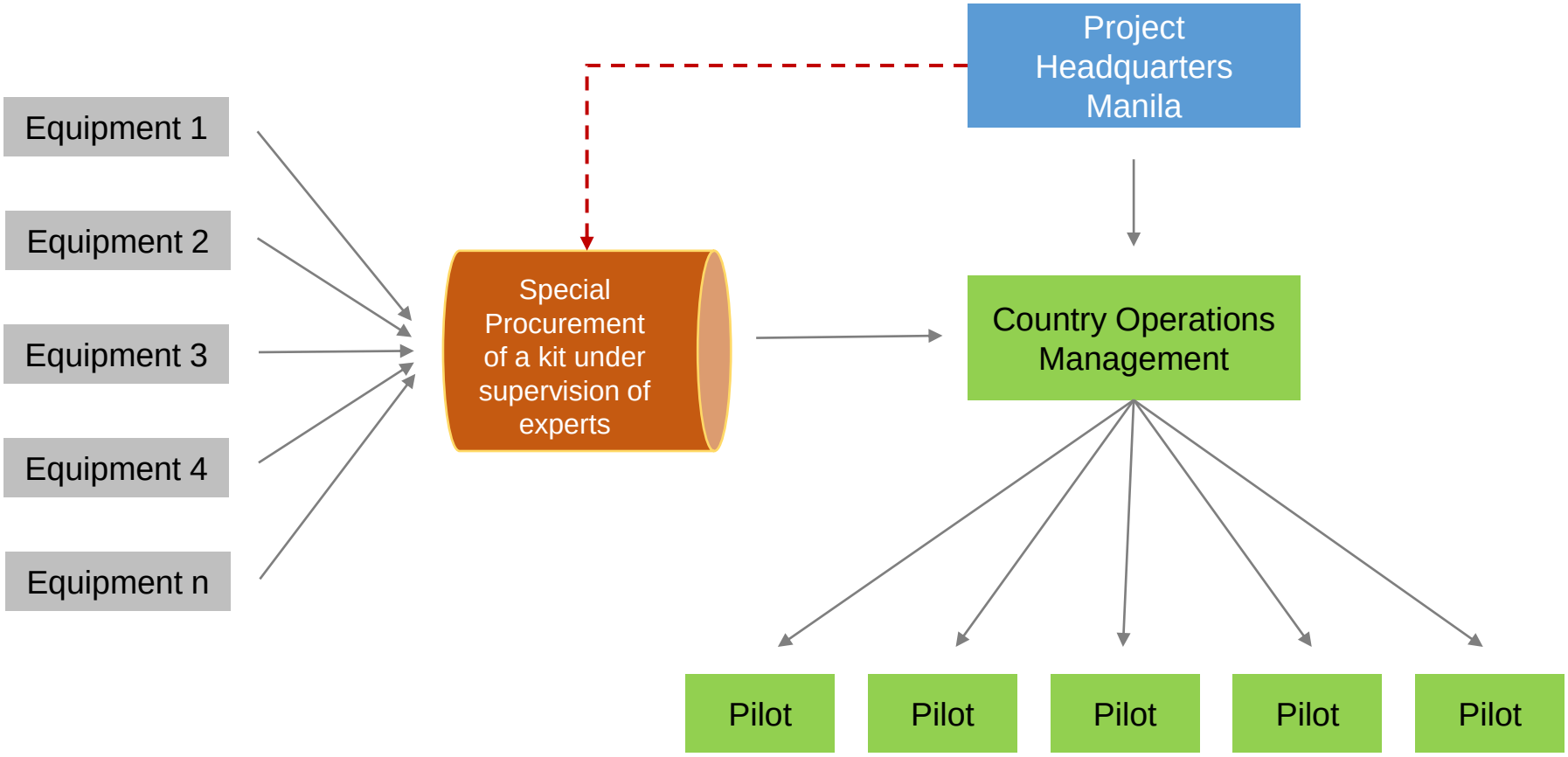
Technical

- ✓ Establish acceptable warranty levels
- ✓ Detail technical specifications of the kit components
- ✓ Develop key components

Project Design

- ✓ Develop cash flow models and test financial viability
- ✓ Develop plans and identify policy needs for local industry development
- ✓ Identify and build capacity of key stakeholders
- ✓ Develop branding and communication strategy
- ✓ Develop training material and workshop training plan
- ✓ Test social acceptability of off-grid kit
- ✓ Develop scale-up plans for Phase 3

PHASE 2: OPTIONS FOR PROJECT MANAGEMENT

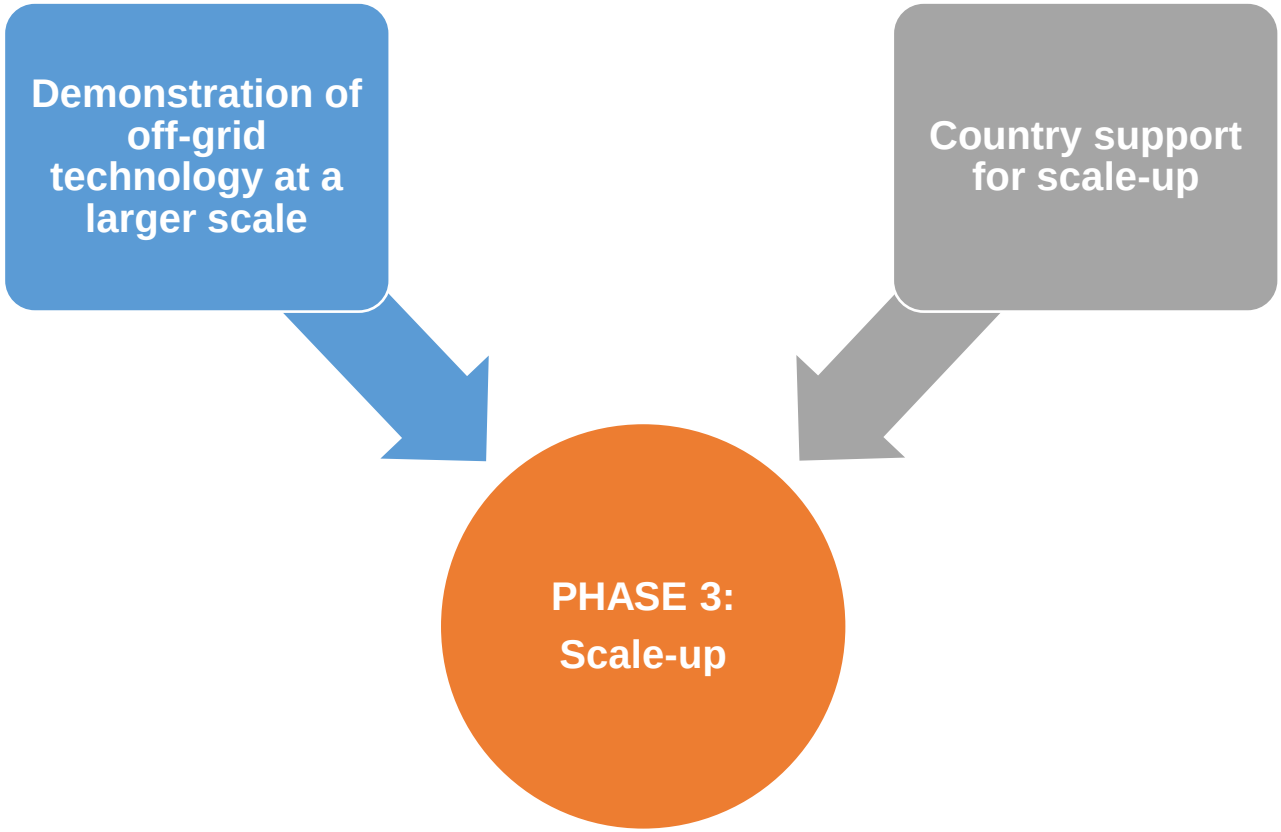


ESTIMATED COST PLAN FOR PHASE 2 PILOT

Project Investment Plan
($ million)

Item	Total
A. **Base Cost**	
a. DC Home Kit	2.00
b. Consulting Services	0.05
c. Technical Experts	0.15
d. Workshop	0.20
e. Communication	0.05
Subtotal (A)	**2.45**
B. **Contingency**	0.05
Subtotal (B)	**0.05**
Total	**2.50**

PROPOSED PHASE 3 WILL SCALE UP THE PILOT AND WILL INVOLVE DISTRIBUTION OF ESTIMATED 50,000 KITS IN AFGHANISTAN OR PAKISTAN OR OTHER INTERESTED DMC COUNTRIES



PROSPECTIVE RESULTS AND FINDINGS FROM THE PROPOSED PROJECT WILL BE SHARED AND MADE OPEN SOURCE THROUGHOUT THE PROJECT LIFE

Open Source

Phase 1 Proof of Concept

- ✓ Prototype design and drawings
- ✓ Simplified business model
- ✓ Concept demonstration
- ✓ Box packaging design competition
- ✓ Technical papers by technology experts

Phase 2 Multi-Country Pilot

- ✓ Full technical specifications and drawings
- ✓ Government reports by participating countries
- ✓ Off-grid community
- ✓ Workshops in all participating countries
- ✓ Training materials – apps, videos, manuals, YouTube vides
- ✓ Social media

Phase 3 Scale-up

- ✓ ADB Publications
- ✓ International off-grid seminar
- ✓ International off-grid community
- ✓ Government reports by participating country

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(Based on brainstorming session on 29 July 2015)

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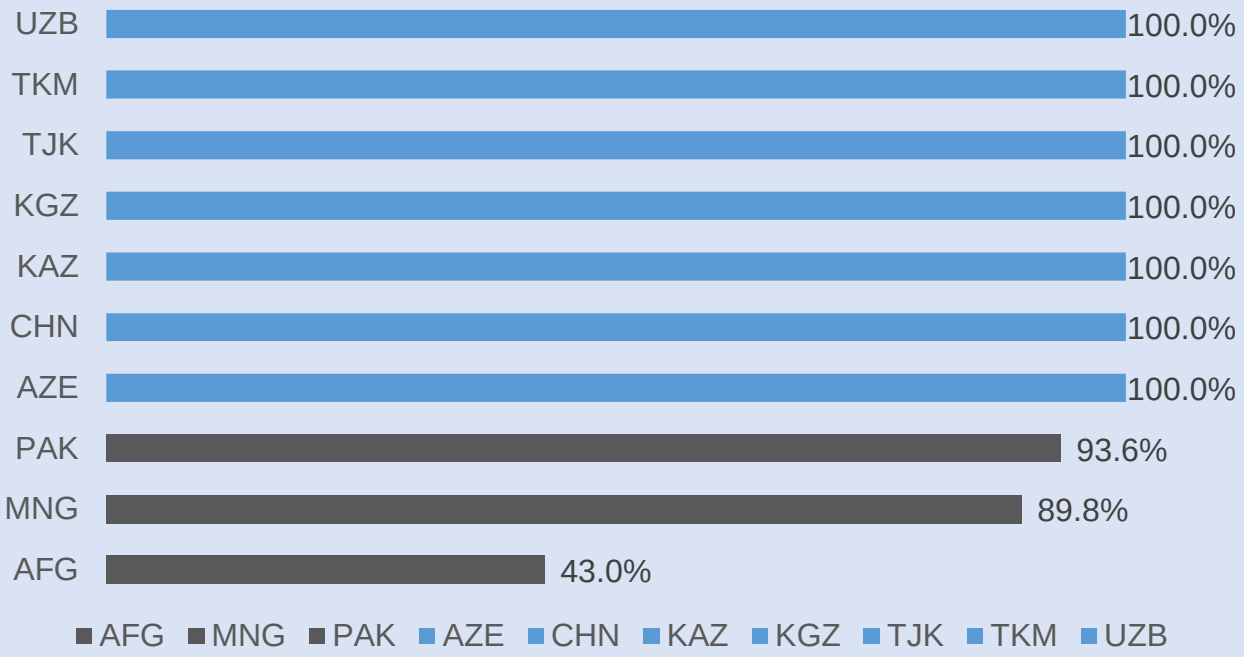
8	Solar off-grid to reduce demand from diesel	X			X		X			
9	Distribution efficiency and loss reduction				X		X	X		X
10	Improve load dispatch systems and distribution control within SCADA	X			X			X		X

SUPPORTING SLIDE:

ACCESS TO ELECTRICITY IN AFGHANISTAN, PAKISTAN AND MONGOLIA CAN BE IMPROVED

Electrification Rates, 2012
(in %)



SOURCE: World Development Indicators, World Bank