ENERGY STORAGE IS KEY TO ACCOMPLISHING 1.5°C AND SDG7 GOALS

• Wind and solar are constrained by variability.

• Energy storage increases system flexibility helping to:
  1. improve energy access through minigrids;
  2. reduce GHG emissions displacing fossil-fuels with renewables.

• Battery storage is modular and universally deployable.

• However, market still nascent: 19GWh stationary vs. 400GWh for EVs.
CONCESSIONAL FINANCE CAN SPEED UP THE TRANSITION

• Concessional finance can bridge financial viability gap.

• $1 billion Energy Storage Program will mobilize:
  - initial $500 million through the CIFs, including DFIs;
  - other sources of concessional climate finance;
  - additional $3 billion from DFIs and private financing.

• Program will catalyze a market of 200-400 GWh.

• Expected outcomes: increased access, reduced cost and emissions.
• Support structured as a CIF Dedicated Private Sector Program (DPSP).

• DPSP program requires projects to meet the following criteria:
  a. potential for GHG emissions savings;
  b. cost effectiveness;
  c. demonstration potential at scale;
  d. development impact;
  e. implementation potential;
  f. additional cost and risk premium.

• Also required to include detailed analyses on:
  ✓ how projects facilitate private sector investment
  ✓ how projects meet minimum concessionality and blended finance principles
AVAILABILITY EXPECTED IN FEB-MAR 2020 TO ALL CIF COUNTRIES
1. Support adoption of **policies and regulations**

2. Diversifying to more **environmentally sustainable technologies**

3. Support to **firm power auctions (PV/wind + storage)**

4. Finance **large-scale demonstration projects**

5. Support **mini-grids and distributed applications**

6. Finance **standalone batteries** as grid asset

(over 4GWh in WB’s current pipeline)
Program will increase storage knowledge through cooperation

Energy Storage Partnership

WORLD BANK GROUP
Department for Business, Energy & Industrial Strategy
CSIR
THE FARADAY INSTITUTION
GLOBAL BATTERY ALLIANCE
IDB
IEA
IESA
UKRI
IRESEN
KIAT
Korea Battery Industry Association
Loughborough University
LCEDN
Masen
National Physical Laboratory
National Research Council Canada
Conseil national de recherches Canada
PROTERMO SOLAR
SAESA
SECI
SUN FOR EVER
ZAE BAYERN
Global public goods approach to energy storage:

- **Building capacity** in developing countries.
- Understanding of **emerging markets**.
- Opportunities to **inform investments** and policy dialogue.
- Access to **country** and **project-specific information**.
- Opportunities for new technologies to **gain visibility**.
- Opportunities for **multilateral cooperation** and responsible innovation.
BATTERY STORAGE INVESTMENT PLAN (BSIP)

Focused on batteries

Different battery technologies

ENERGY STORAGE PARTNERSHIP (ESP)

Technology neutral

Mechanical
Electrical
Chemical
Thermal
Electro-chemical

Provide lessons learned from WBG projects

Inform on best practices (policy, procurement, enabling infra.)

Develop sustainable battery solutions for developing countries
ESP WORKING GROUPS

1. Power systems: safety, valuation and warranties
2. Test bed for knowledge dissemination and capacity building
3. Testing protocols and validation of performance
4. Flexible sector coupling
5. Decentralized energy storage solutions
6. Enabling policies and procurement frameworks
7. Recycling systems and standards
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BACK-UP SLIDES
✓ Partnership between World Bank and 18 partners
✓ to help reduce poverty through sustainable energy solutions.

PROVIDING TECHNICAL ASSISTANCE AND CUTTING-EDGE KNOWLEDGE

Inform Development Financing
Inform Policy and Strategy and Increase Client Capacity
Deepen Knowledge and Generate Innovative Solutions
800 million people still lacking access to electricity

6x renewable energy capacity increase by 2030

Goal 7:
Ensure access to affordable, reliable, sustainable and modern energy for all.

Targets by 2030

7.1 Ensure universal access to affordable, reliable and modern energy services

7.2 Increase substantially the share of renewable energy in the global energy mix

7.A Enhance international cooperation to facilitate access to clean energy research and technology.
ADDITIONAL CHALLENGES FACED BY SIDS COUNTRIES

1. Strong reliance on **imported fuel supply**
2. Lack of **regional connectivity**
3. Limited RE deployment potential due to lack of **flexibility**
4. Price premium associated with projects due to **remoteness of locations**
5. High exposure to **adverse weather events**
6. Importance of **planning for resilience**
7. Limited options for supplying **firm power**
OPTIONS IN DEVELOPING COUNTRIES FOR SUPPLYING FIRM POWER ARE VERY LIMITED
World Bank plans battery revolution in developing nations

Institution looks to mobilise $5bn to generate increase in battery storage capacity

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(over 4GWh in WB’s current pipeline)
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6. Enabling policies and procurement frameworks
7. Recycling systems and standards
Tasks

- Produce a common guide for safe operation of energy storage systems
- Develop cost-benefit valuation methods and a catalogue of applications
- Identify warranties that are suited for applications in developing countries

Progress:

- Drafting the outline for a best practice document on safe operation of BESS in developing countries based on literature review, reports from CIGRE and World Bank’s presentations
- Collecting key documents/guidelines on cost benefit valuation
- Produced a draft presentation with key aspects of energy storage warranties for developing countries
Tasks

- Host an energy storage testbed in challenging climatic conditions
- Contribute to research, monitoring and building capacity in developing countries

Progress

- Continue exchanges between the Partners around viable testbed models for the conditions / locations of each Partner
- Continue engagement with donors and prospective partners to raise resources for advancing testbed concept development
Tasks

- Investigate discrepancies between specifications of energy storage systems and actual performance in developing countries

Progress

- Assessing 5-6 pilot PV + BESS mini-grids sites in Nigeria (NREL and Faraday Institution)
- Collecting key documents such as reports from BERA and NREL
Tasks
• Expand Annex 35 on flexible sector coupling to developing countries

Progress
• Defining a deliverable based on internal discussions with the group
Task

• Develop new models for the role of storage in mini-grids that will be available in open course
• Study on what type of battery is needed for different types of mini-grids depending on the number of people

Progress

• Drafting outline of the study
• Secured funds and preparing desk review for mini-grids study
Tasks

• Produce a paper identifying policies and regulations to enable energy storage
• Produce a paper on best practices on service purchase agreements (PSPAs) for energy storage

Progress

• Drafting paper on energy storage policies and regulations: engage whole team, circulate outline for feedback, invite suggestions for case studies and inputs, and develop draft report with inputs
• Drafting a literature review paper about existing solar plus storage PPA’s (IFC)
Tasks

• Identify most relevant technology attributes for environmental sustainability
• Take stock of current recycling practices
• Identify successful models for recycling systems

Progress

• Preparing structure of the future report, methodology, and distribution of work
• Collecting data and conduct literature review, including reports form WG members
• Gathering insights through dialogue with different stakeholders, including the private sector