

LENDERS' PERSPECTIVE ON

SUPPORT TO BATTERY STORAGE IN SOUTH AFRICA



Webinar – Large Scale Battery Storage Opportunity in South Africa

September 25, 2019

| | |
|-------------------|---------------------------------|
| World Bank | African Development Bank |
| Frederic Verdol | Antony Karembu |

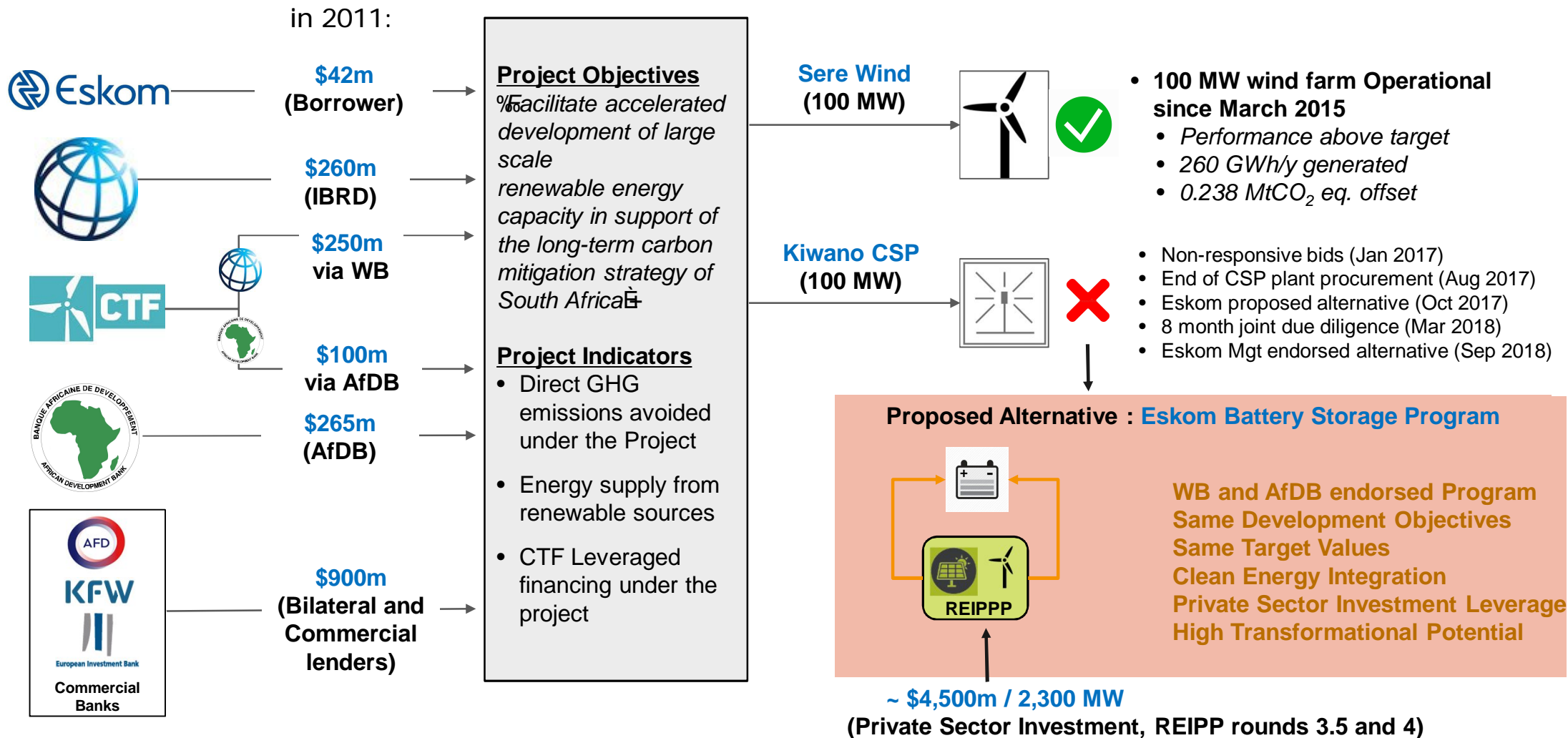


1. ESKOM BATTERY STORAGE PROGRAMME

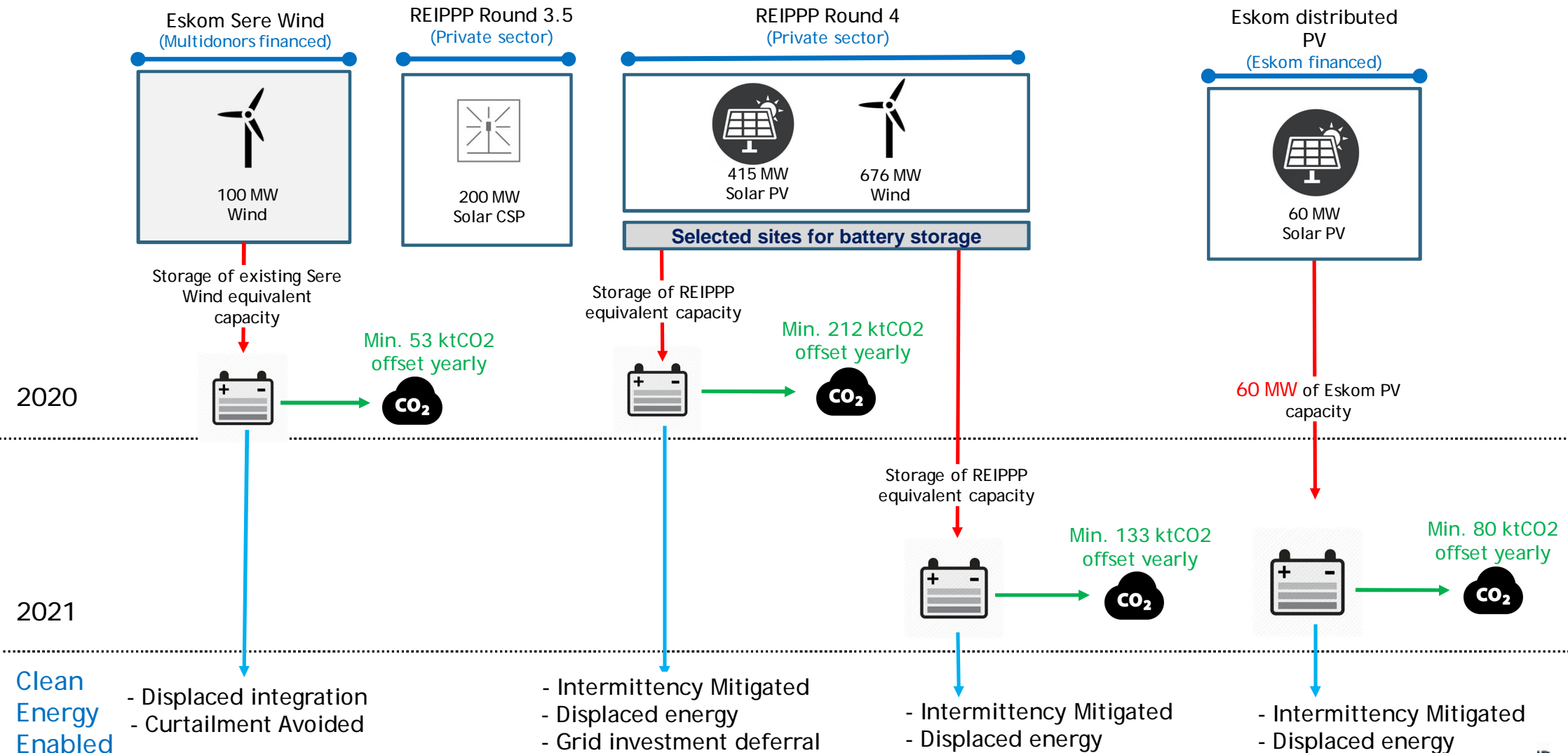


Eskom Renewables Support Project: History Current Status

AfDB and WB are Currently the Confirmed Financiers Supporting Eskom Battery Storage Program



Eskom Battery Storage Program Synopsis



Eskom Commitment and Preparedness for its Battery Storage Program

Eskom Demonstrated Commitment to the Project

- Eskom Group Capital executives endorsed battery storage program as a strategic capital expenditure
- Eskom Board IFC endorsed battery storage program, releasing budget for preparation
- Early on, Eskom has obtained PPPFA exemption related to battery storage, to use WB Procurement Guidelines, that AfDB will also apply for this project.
- Eskom and Government signed REIPPPs power purchase agreements linked to battery storage (April 4, 2018)
- Eskom recruited a Technical Advisor expert in energy storage systems for the project detailed engineering

Power Sector and Government Commitment to the Project

- Eskom Corporate Plan endorses battery storage as technology of choice for the utility
- 6 UHYfmignghYa g'VcbbYWjcb'ghUbXUfXg'UXXYX'jb'Gci h'5 ZjWUg' grid code
- Regulatory / Environmental frameworks Zcf'9g_ca'Ug'VUHYfmignhcfU'Y'UggYhg'hc'dUj'Y'h'Y'k'UmZcf'Z'fh'Yf'dfc'YWg'
- 5a Vjh'ci g'hUf'Yhg'Zcf'VUHYfmihYW'bc'c[mibck'jb'Gci h'5 ZjWUg'XfUZi'Y'YWf'Yh'mi masterplan

Technical experience and readiness

- Eskom has a long expertise in operating optimally pumped-hydro storage, to displace power from baseload to peak demand
- Eskom Research Center running a battery storage testing facility since 2016, conducted experiments on solid and flow batteries.

2. HIGHER LEVEL OBJECTIVES



Beyond The Eskom Program, a Transformational Potential

Demonstration effect of battery technology as THE tool for countries in Energy Transition

Utility perspective

- : fca `U`If UX]hcbU`DY`Ywf]V]mdfcXi Vwf`hc`U modern energy manager
- With incoming 2,330 MW of Wind and Solar IPPs by 2021, good timing hc`UWe i]fY`hc`c`g`UbX`g_]`g`Zf`G5d`YbYf[m transition to a cleaner mix
- Lessons from large-scale battery program useful to better integrate future decentralized / rooftop solar capacity
- More flexibility and more dispatchable clean energy thanks to the batteries, allowing to decommission old coal plants

South Africa perspective

- In a period of economy recovery, reliability of electricity supply is critical to attract private investment (industry, manufacturing)
- Scale up of battery technology in power sector to complement rapid expansion of variable renewable energy
- Integration and industrialisation in the battery storage value chain (mining, manufacturing, operation) feasible in South Africa

Africa region and Global perspective

- Over 5,000MW electrochemical batteries in operation worldwide, But NO battery connected to the grid in all Africa
- Demonstration effect in South Africa will enable variable renewable energy to expand faster in Africa, and in low income countries.
- Largest WB and AfDB operation on battery storage, mostly funded by CTF, this flagship project could serve as reference for many others.

(almost) Live from the UN Climate Summit . 24 September 2019

Battery Storage seen as the best way to fast track transition to Clean Energy Globally

Support to Renewable Energy and Battery Storage in Low and Middle Income Countries

- Climate Finance : 9 Multilateral Development Banks commit to raise **\$175bn** annually by 2025
- UK Commits **\$250m** to support battery storage in Africa
- Release of the WEF & Global Battery Alliance insight **report on Battery Value Chain Scale up by 2030** :



South Africa (SA) President Statement at UN Climate Summit

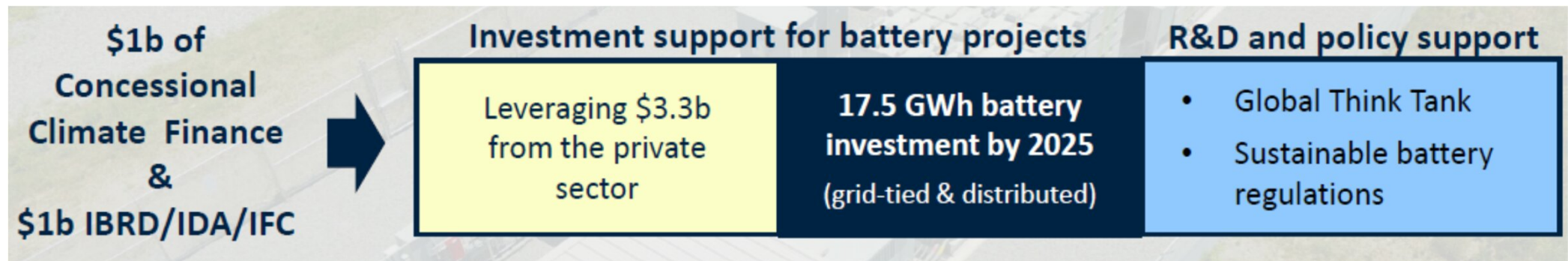
- G500 YYYWfJWfma UghYfd'Ub'f**2030 IRP** k J''VY'gccb'ZbU]nYXÎ žk]H 'HJf[Yhg'cb'VUhyf mWUdUW]mł
- A **\$11bn climate finance facility** í]g'VY]b['XYj YcdYXÎ žhc'gi ddcfhG500'1 ghYbYf[młfUbg]h]cb
- 7 U''Zcf'j]bj Ygha Ybh]b'a]bYfUg'YI hfUW]cbžUbX'Zcf'í U'Uf[Y'gł UfY'cZH Y'value chain']b'G5 "

3. ENERGY STORAGE PARTNERSHIP



World Bank Group Global Program For Accelerating Battery Storage Deployment

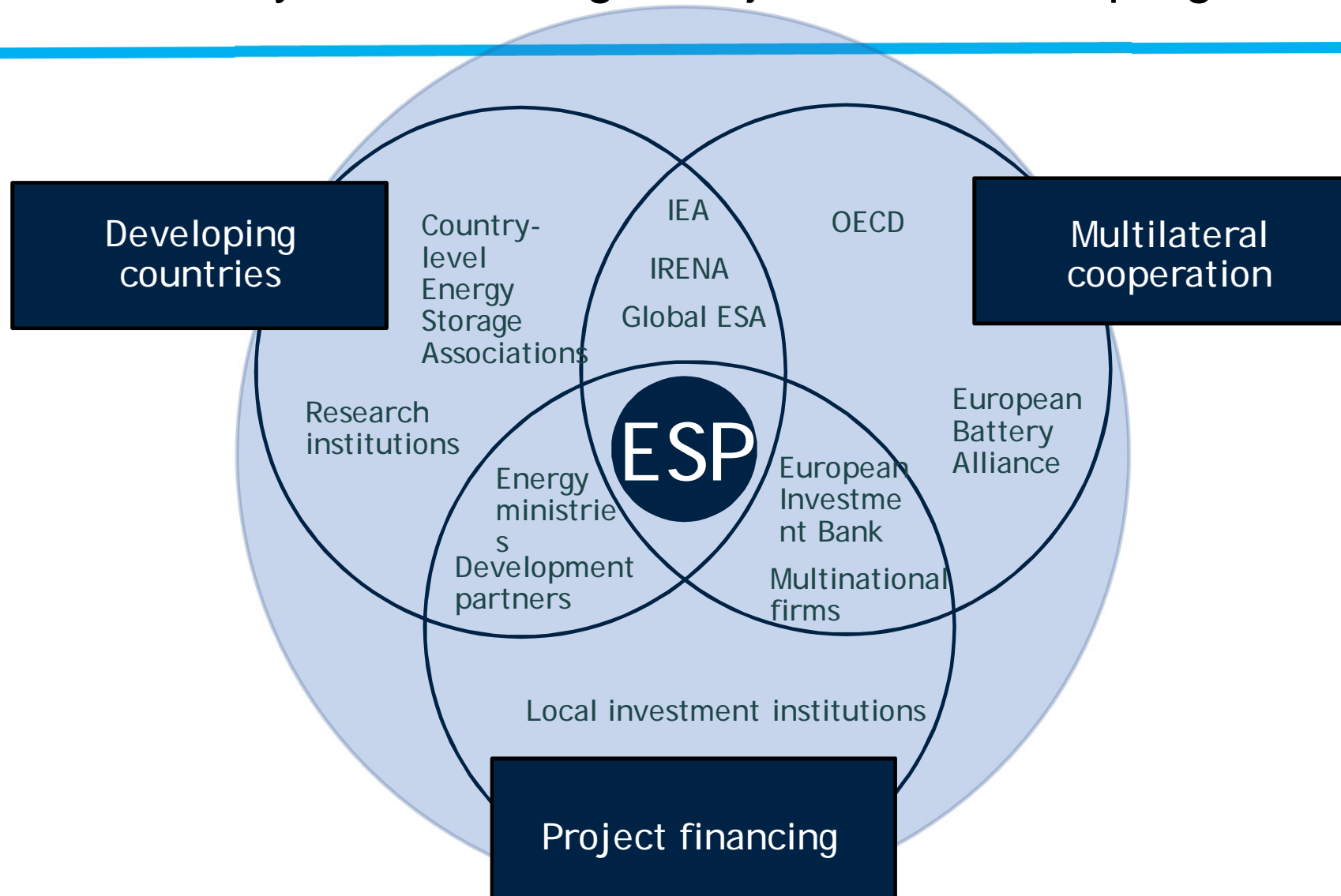
- Battery Storage is key to accomplishing **2°C** and **SDG7**, but battery market is nascent.
- WBG is already an important player in the battery market: **0.75GWh** out of 5GWh deployed in developing countries
- WBG has a strong experience in **demonstrating and scaling-up emerging technologies** (CSP, Geothermal, Mini-grids, Off-grid Solar)
- Since September 2018, WBG plans to **mobilize concessional climate finance** and **leverage commercial capital** to accelerate deployment of sustainable battery systems.



The Energy Storage Partnership (ESP), a Global Think Tank to Support Market Development

- Launched in May 2019, the ESP will foster international cooperation on:
 - Technology Research Development & Demonstration, Applications;
 - System Integration and Planning Tools;
 - Enabling Infrastructure (communication technologies, EMS); and
 - Policies, Regulation and Procurement for energy Storage.
- ESP will complement WBG's \$1 billion battery storage investment programme, and help raising \$1 billion in concessional finance.
- ESP intends to be a technology neutral platform to connect stakeholders, share experiences, and bring new technological and regulatory solutions and business models to developing countries.
- ESP Objectives:
 - Contribute to expand global market – and accelerate cost reduction for energy storage;
 - Help developing countries to have a leadership role in technology improvements;
 - Enable Renewable energy development in developing countries.

ESP As a Catalyzer of Storage Projects in Developing Countries



29 Confirmed ESP Partners

New International Partnership Established to Increase the Use of Energy Storage in Developing Countries



中国化学与物理电源行业协会储能应用分会
Energy Storage Applications Branch of China Industrial Association of Power Sources



Energy Storage Association



National Research Council Canada

Conseil national de recherches Canada



Ngiyabonga! (Thank You!)

