

ENERGY STORAGE ACADEMY

PROCUREMENT PRACTICES WITH BATTERY PROJECTS

THE CASE OF **SOUTH AFRICA**

Pretoria

April 06, 2021

Frederic Verdol

Senior Energy Specialist

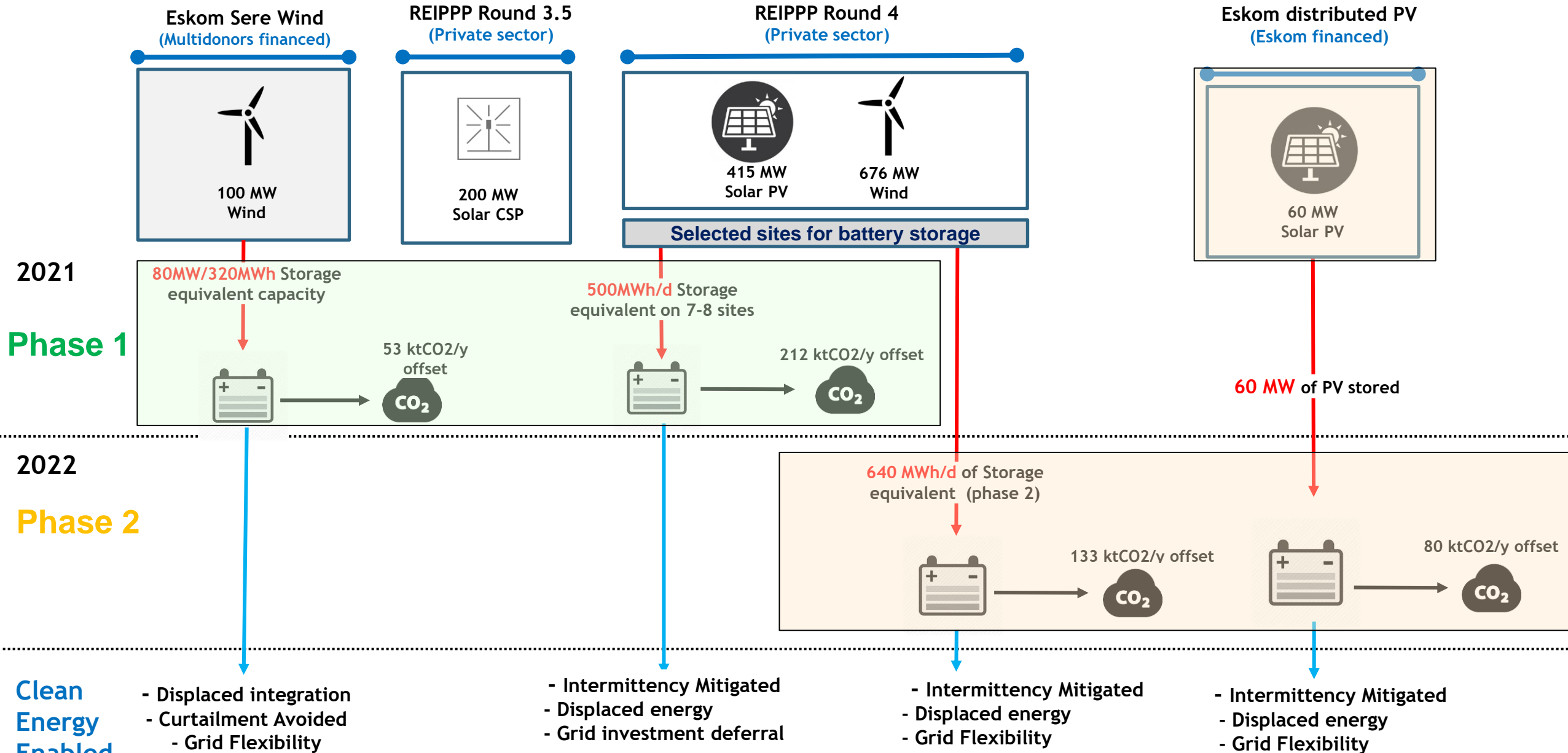


OUTLINE

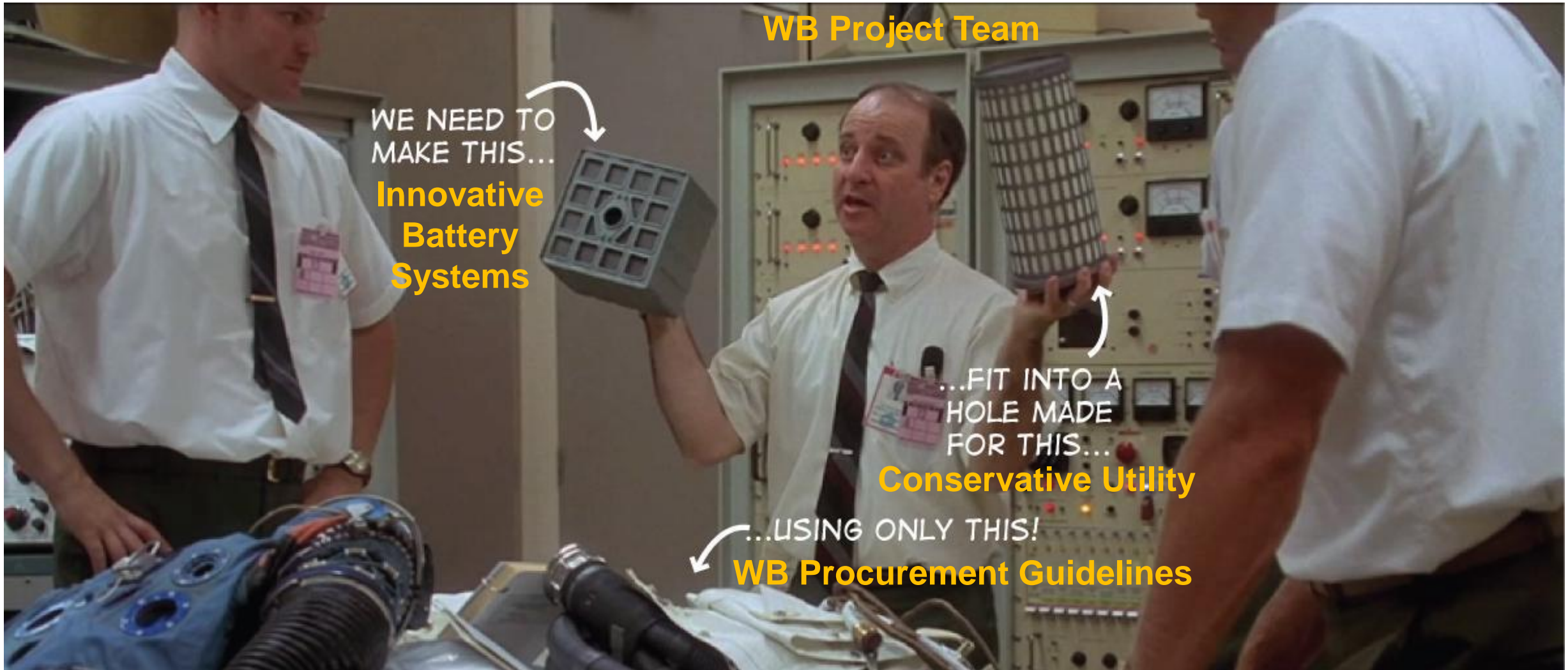
1. Eskom Battery Storage Program
2. Procurement Process
3. Enabling the Scale-up Effect
4. Replicable Take-Away



1- Eskom Battery Storage Program – a Synopsis



2- The Procurement Challenge(s)



...And in a constrained timeline!

Eskom Battery Procurement's Specific Technical Challenges

- **A Multi-site Battery Program with several storage needs to serve, not co-located with clean energy:** screening methodology developed for longlist, modelling with battery expert for shortlist.
- **Utility's First Battery Storage Infrastructure:** Ownership issue (Tx or Dx?); Storage culture issue; Resulting an extended list of technical criteria and too many different teams involved.
- **Technology Neutral Approach in a pilot/demonstration project :** Best fit for the storage needs, but requires more work to assess all possible impacts (Environment, Safety, O&M, Training).
- **Phased and Sequential Procurement Strategy:** procure packages sequentially, to learn and improve from one to the other.
- **Empowerment of Disadvantaged Groups:** for the first time in a WB Project, inclusion of specific requirements in tender documents, on skills development and employment of SA disadvantaged groups.

Eskom Procurement Strategy and Process

A Longer Preparation for a Better Understanding of Market Dynamics, Interest and Expectations

- **Eskom (and Government) Knowledge Enhancement on Battery Technologies:** Since 2017, Eskom Research is piloting 4 different battery technologies; Eskom created a core technical team to enhance skills (via technical workshops and conferences) and share knowledge internally.
- **Eskom (and Government) Knowledge Enhancement on Battery Markets:** Eskom and Government undertook experience exchanges to utilities' battery systems (lifetime and O&M function of the use), regulators (grid code) and manufacturers (supply chain and logistics).
- **Market Knowledge on What Eskom Wants:** Eskom showcased the project in at least 4 international conferences in 2018-2019, conducted a 'roadshow' webinar on 25 September 2019 (300 participants).

At the Difference of BAU Infrastructure Investment, Eskom Team had a more coordinated and proactive approach with other Government officials (NERSA, DEA, DOE, DPE), sharing technical knowledge to advance project together.



Eskom at UET Battery Manufacture (Shanghai, March 2018)



DPE / Eskom / DEA visit to IID Utility's 30MW Li-ion battery (San Diego, June 2019)



Eskom / WB visit to Tesla factory (Nevada, April 2018)

3- South Africa Battery Development: it is already happening!

Paving the Way for Battery Storage Scale-up while Implementing a Demonstration Project

2018-2019: Technical Design and Procurement Preparation

- Incoming 2,330 MW of Wind and Solar IPPs by 2022, scale up of rooftop Solar and need to decommission old coal plants drove Eskom decision to acquire **flexibility tools for grid stability** and re-skilling critical mass of staff.
- April 2018, Eskom has obtained PPPFA exemption related to battery storage, to **use WB Procurement Guidelines**.
- May 2018: Eskom recruited a Technical Advisor expert in energy storage systems for the project detailed engineering
- October 2019: SA releases the IRP 2030, **first masterplan with explicit battery storage targets (3000MW by 2030)**.

2019-2020: Administrative Approvals and First Procurement

- S1-2020: **Environmental approval** for all the battery sites under phase 1.
- Multi-stakeholders technical working group on **SA Battery grid code** (Regulator released final draft for consultation)
- August 2020: first tender under Eskom Battery Program: large market participation, but technical requirements too stringent for an EPC.
- S2-2020: industrials announce construction of **battery manufactures** in SA.

2020-2021: Feedback from Market and Procurement Scale-up

- October 2020: SA confirms **public procurement of 513MW Battery Storage IPPs**, by mid-2021.
- February 2021: Result of SA public procurement for 2000MW emergency generation shows **PV+Storage as least cost dispatchable option in SA**, before Gas.
- March 2021: **Eskom launches procurement for 827MWh BESS**, for 7 battery storage sites, with relaxed technical criteria.

4- Main Take Aways from South Africa Battery Project (so far...)

1. Invest in a reputable battery expert for the technical design
2. Involve early on all the Public entities contributing to the Project
3. Implement the Project with the Scale-up enablement in mind
4. Prioritize Project sustainability over impact

Multi-site, stand-alone or collocated battery: start from the long-term energy storage need(s), then the optimal location(s), then the technical requirements.

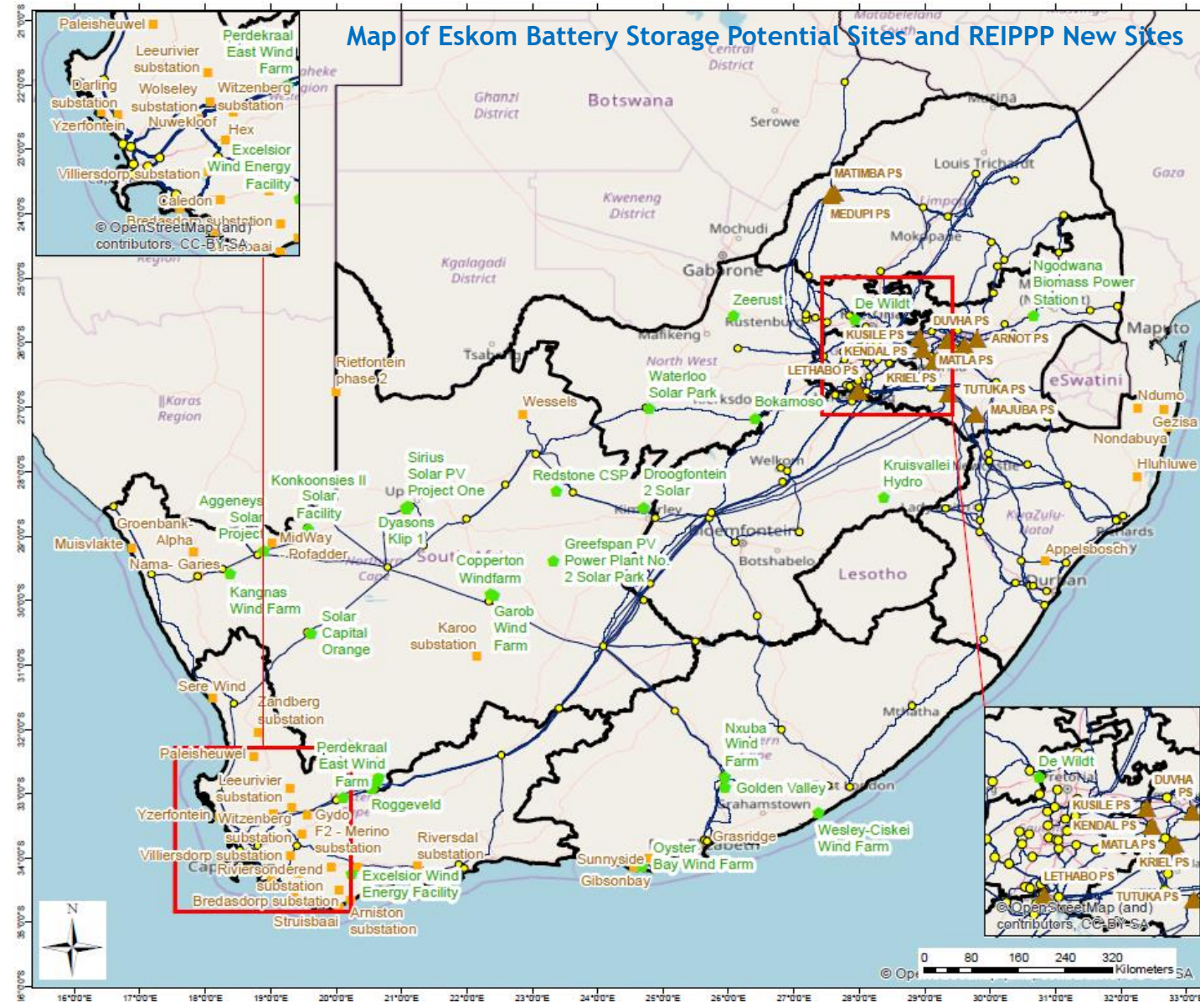
Ngiyabonga!

(Thank You!)



Annex: Methodology for Sites Selection and Due Diligence

Map of Eskom Battery Storage Potential Sites and REIPPP New Sites



Chronological Due Diligence Process

- 2016: Eskom Research tests battery systems
- 2017: System Operator and Planning simulate overall benefit of storage
- First Concept of Eskom Battery Program
- Concept submitted to Lenders for funding (in lieu of Kiwano CSP)
- 2018: WB and AfDB approve concept, start joint due diligence
- Eskom hires DNV, Battery Expert Firm
- Sites Longlisting, site prioritization criteria
- 2 phases program, to mitigate risk
- 2019: Eskom hires EIA consultants
- Eskom drafted battery grid codes
- Eskom requests operation licensing
- Eskom requests PFMA Approval

Legend

- ▲ Eskom Coal Power Stations
- Independent Power Producers
- Eskom Substations
- Battery Storage Sites
- Eskom Transmission Power Lines
- ▭ Provinces
- ▭ SADC Countries

Annex: A Technical Assistance Sub-Component has been designed to ensure project proper implementation, monitoring and scale-up

Main Activities under the Technical Assistance Component

- **Additional implementation support** to the supervision of final design, procurement, installation and operation of battery storage infrastructure financed under the Project .
- **Strengthening of Eskom technical capability** on battery technology, operation and maintenance.
- Help preparing the **enabling environment** for further private investment in energy storage (along with VRE).
- Promote the **other tools and solutions** contributing to accelerate clean energy development.

Rationale for Adding a Technical Assistance Component

- **External support and expertise** to ensure fast implementation, while Eskom strengthens its capacity.
- **Critical need for parallel supervision** of several battery systems, implemented on the national territory.
- **Monitoring batteries performance** using measurement tools and analytical services (M&E, Demonstration effect).
- Need to engage with key public authorities (Regulator, REIPP, Academia), for **sustainability and scalability**.

Alternative Financing Sources

- Potential technical assistance through **other Trust Funds**, but limited amounts (KGGTF, ESMAP).
- Integration of extra support on Borrower's side (Owner's Engineer), but would not mitigate technical risk on Borrower's side.