

# Large-Scale Battery Storage Opportunity in South Africa

## *ESKOM Flagship Battery Energy Storage Systems (BESS) Project*


Presented by: Prince Moyo PrEng

General Manager: Power Delivery Engineering

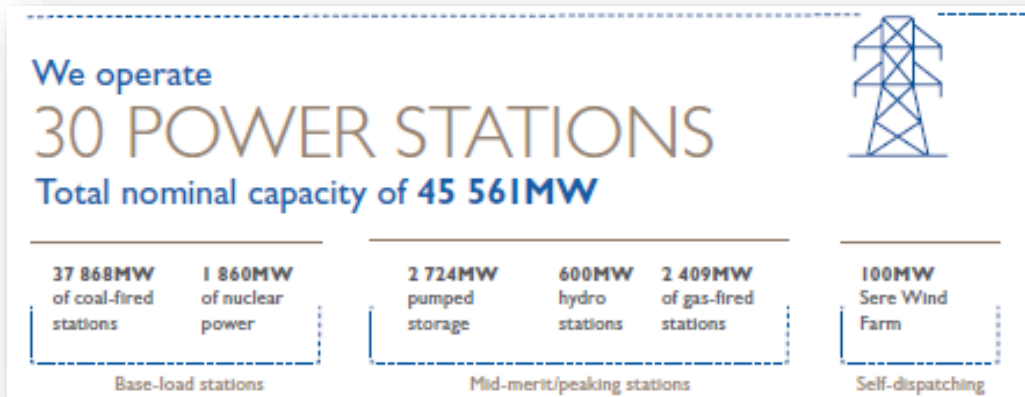
25 September 2019



# Three main objectives

- 
- **① Provide background of the project**
  - **② Discuss requirements**
  - **③ Clarify next steps**

- **100% state-owned electricity utility**, strong government support
- Supplies approximately **90%** of South Africa's electricity
- Connected **215 519 households to the grid** during the 2018 year
- As at 31 March 2019:
  - **6.497 million direct customers** (2018: 6.258 million)
  - 30 operational power stations (including 1 nuclear) with a nominal **generating capacity of 45 561 MW**
  - **17.4GW of new generation** capacity being built, of which 10.7GW already commissioned (Medupi, Kusile, Ingula)
  - Energy sold **~200TWh/annum**
  - Approximately **381 594 km of cables and power lines**
  - **48 628 employees**, inclusive of subsidiaries



# Towards cleaner power with BESS

## In the beginning

- In 2010 Eskom concluded a loan agreement with the World Bank and others for Medupi PS
- Additional project development objectives (PDOs) stipulated
- Implement a 100MW mid-merit Kiwano Concentrated Solar Plant (CSP) ... catalyst to roll out clean energy



## Circumstances changed

- In 2016 Eskom took a decision to investigate alternative solutions to still meet the PDO
- Approval was granted by funders to investigate alternatives
- Engineering continued by Generation engineers



## Now, we start

- In 2017, Eskom proposed the distributed battery storage with solar photovoltaic to be installed as an alternative to CSP
- Battery Energy Storage Systems (BESS) to be implemented in 2 phases achieving a total of 1440 megawatt-hours of energy shifting per day

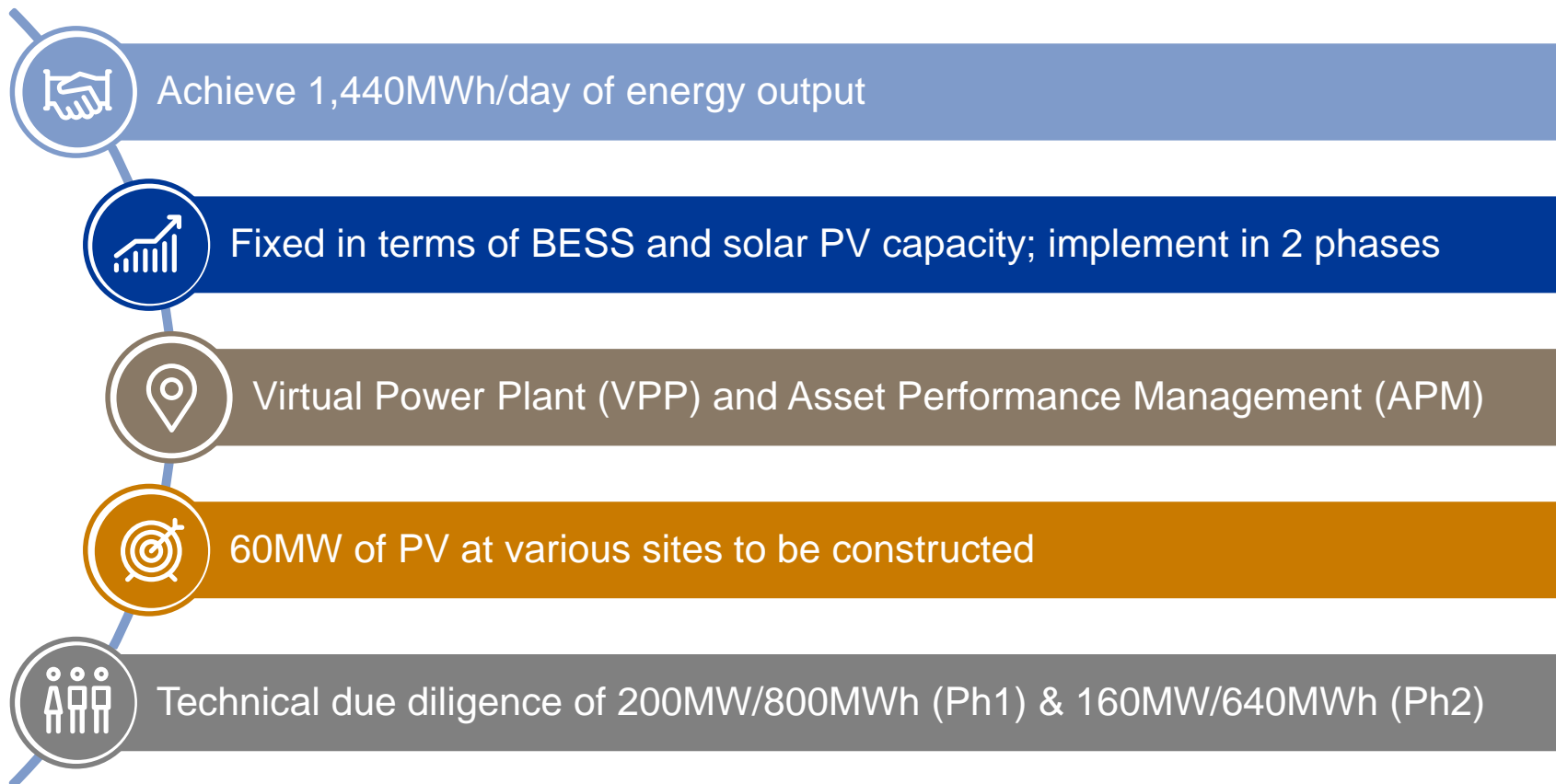


# Agenda



- **Scope**
- Timeline
- Process to follow
- Considerations
- Next steps

# BESS solution scope



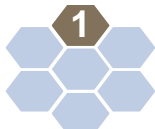






# Six components identified

## BESS Scope

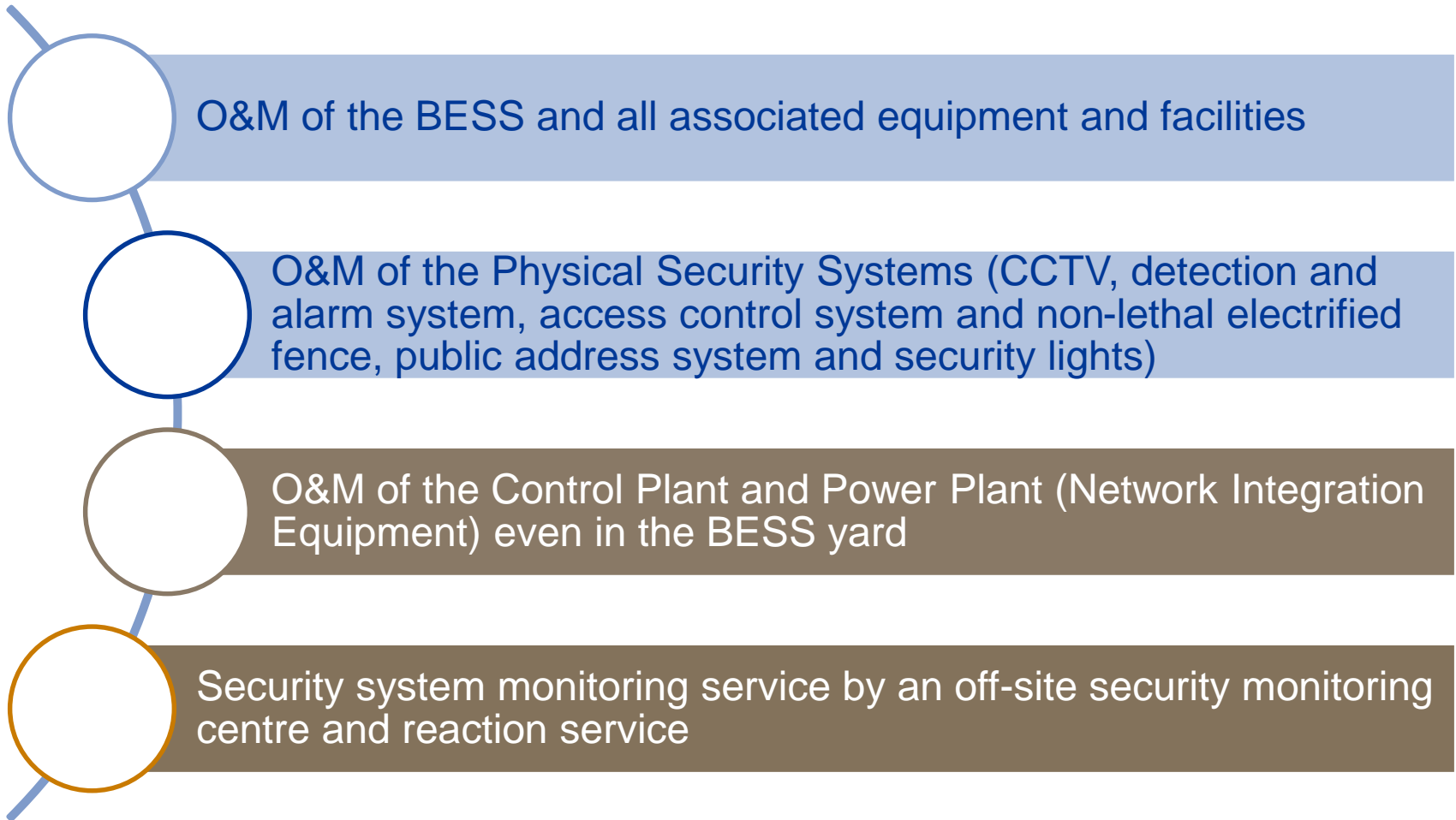


## Description

-  Technology agnostic
-  Focusing on functional and technical requirements for BESS to meet the use case and integrate with Eskom control and monitoring infrastructure.
-  BESS equipment can be configured to meet Eskom use case; work with VPP
-  Test certificates, compliance with industry best practices, including safety
-  Compliance with the RPP Grid Code as well as draft BESF Grid Code for interconnection to the grid.
-  Training of applicable stakeholders e.g. First Responders, Operating and Maintenance

# Operating and maintenance scope

 In scope     Out of scope





# Clearly defined roles



## Eskom's responsibility

- Technical specifications
- Environmental approvals
- Site selection
- Land acquisition
- NERSA Licensing

## Eskom Expectation of Supplier

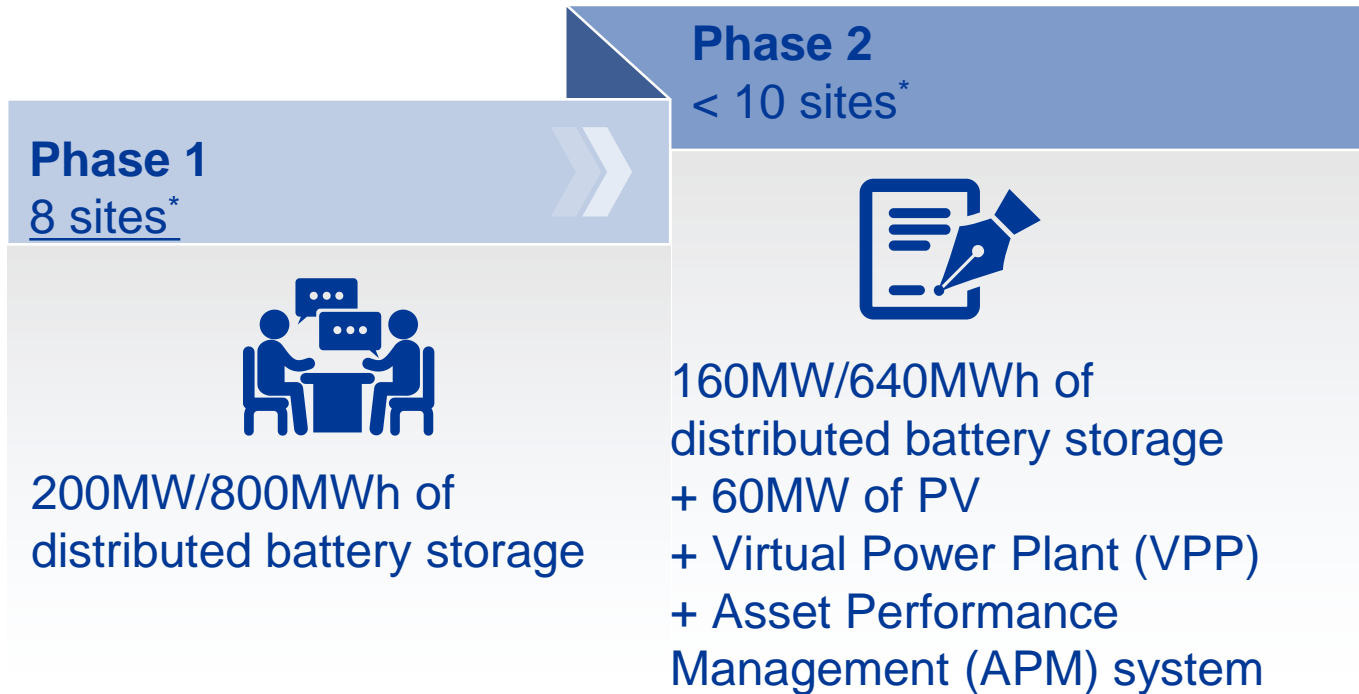
- Verification of technical studies
- Detail Design per site
- Execution – full DSI/ EPC
- Hazardous Material management – Construction, Operation (spares) and Disposal at end of life
- Product & Functional guarantees



- Scope
- **Timeline**
- Process to follow
- Considerations
- Next steps

# Phase 1 completion target

The delivery of the value will depend on the following:



## Deliverables



Phase 1 to be completed **31 Dec 2020**

Phase 2 to be completed 31 Dec 2021

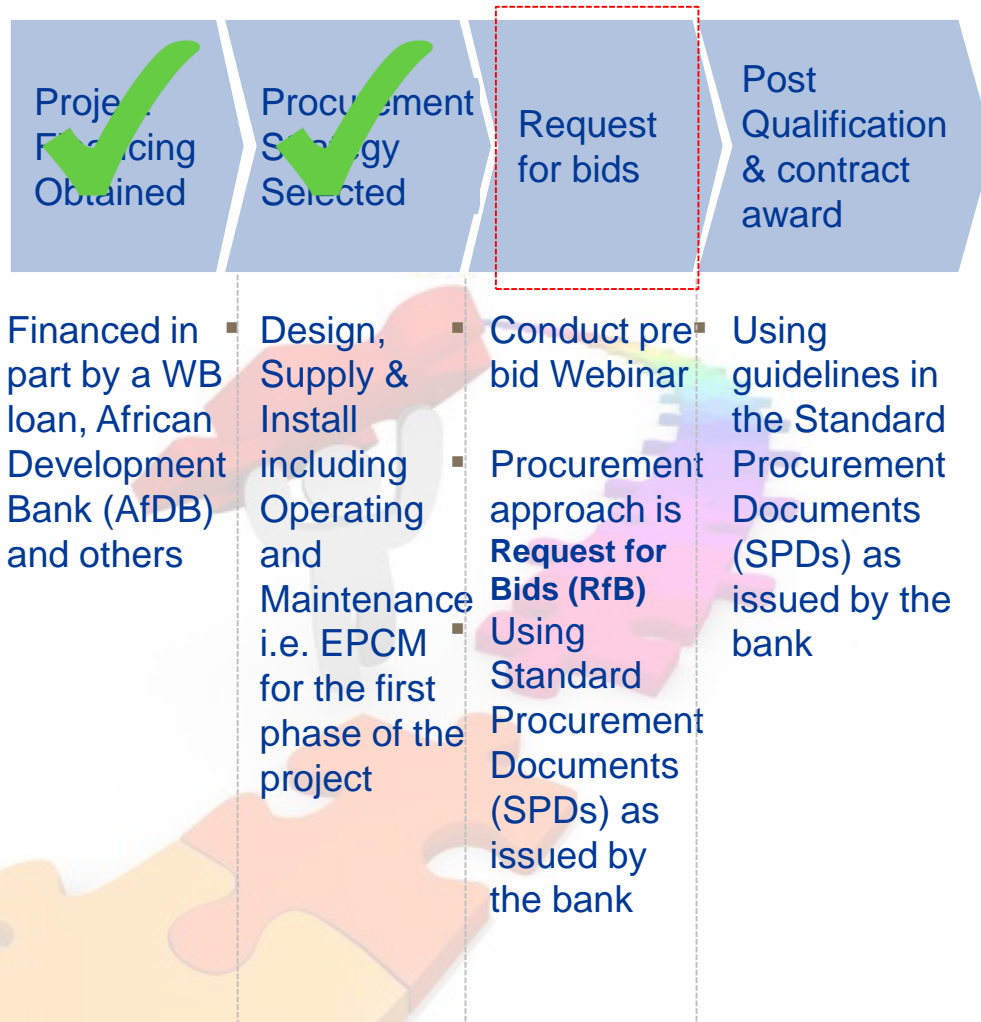
# Agenda



- Scope
- Timeline
- **Process to follow**
- Considerations
- Next steps

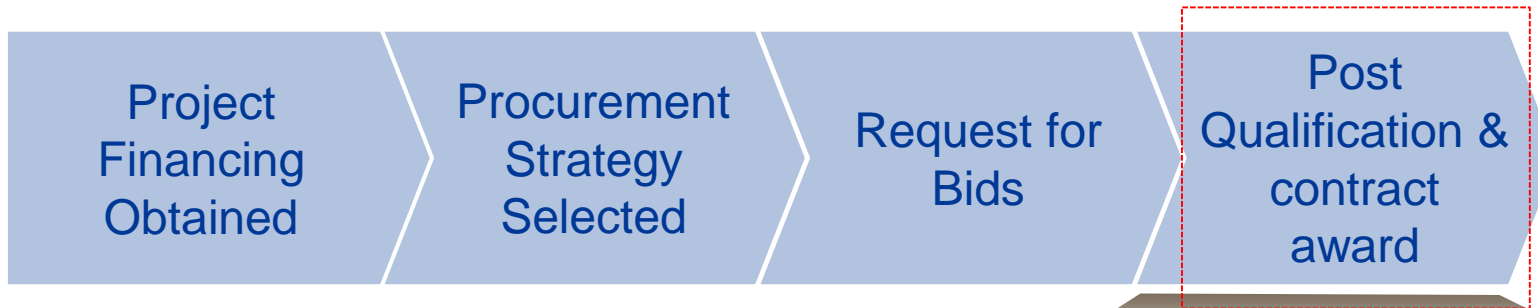
# Procurement method

## Process flow of the procurement process



## Insights

- Four packages for Phase 1; staggered
- Approach for Phase 2 being defined
- Post qualification assessment:
  - past experience & installations, appropriate skills, track record, capacity and capability
  - information of subcontractors
- Regulation 24 of the Construction Industry Development Board (CIDB) applicable
- Localisation targets for phase 1:
  - Minimum 20% local content (local to site and South Africa) to be achieved for each package
  - Subcontracting to local suppliers, M&O
  - Designated material (as prescribed by the South African Department of Trade and Industry) - [http://www.thedti.gov.za/industrial\\_development/ip.jsp](http://www.thedti.gov.za/industrial_development/ip.jsp)
  - Skills development (as prescribed by the skill development regulation )



## Evaluation of bids

1

### **Substantial responsiveness**

- Preliminary examination
  - Eligibility, Completeness, Verification and Bid Security
- Commercial Evaluation
  - Qualifying Pass/Fail criteria, contract conditions
- Technical Evaluation including Safety, Health and Environmental
  - All Mandatory requirements are met on a Pass/Fail criteria

2

### **Evaluation of cost**

- Price, Total Cost of Ownership – capital, operating, O&M, disposal costs

3

### **Most Advantageous Bid/ Post Qualification**

# Agenda



- Scope
- Timeline
- Process to follow
- **Considerations**
- Next steps



# Special considerations

## Groups

### 1 Environmental considerations

## Considerations

- 500m3 hazardous substances limit
- Management of hazardous materials, spares, disposal of failed units, recycling, value of electrolyte/ active material

### 2 Space and time

- Limited to available space per site
- Time constraints as per deliverables

### 3 Augmentation

- Augmentation allowed for in the bid

### 4 Product guarantees vs Performance guarantees

- Normal product guarantees
- Performance guarantee 20yrs/ life of plant
- Consideration of penalties for breaching performance guarantees

# Agenda



- Scope
- Timeline
- Process to follow
- Considerations
- **Next steps**

# Next steps

## For Eskom

- Request for Bids (RfB) to be issued to market subject to governance approval
- Contract award to successful bidder for the first site

## For potential bidders

- Note special conditions; World Bank procurement approach
- Submit questions, comments, suggestions and feedback via the webinar platform provided
- Look out for bid notifications on the relevant sites – Eskom, CIDB, WBG, AfDB, etc
- Respond to bids in full

**THANK YOU**



