



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

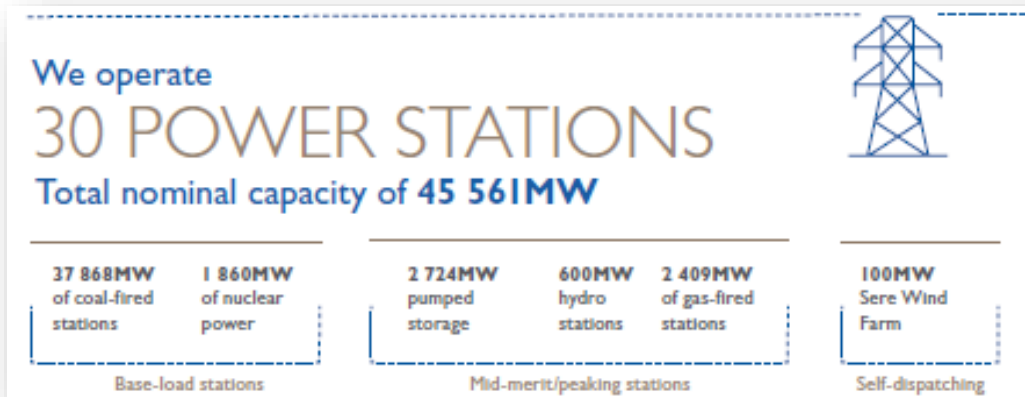


1 Provide background of the project

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



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

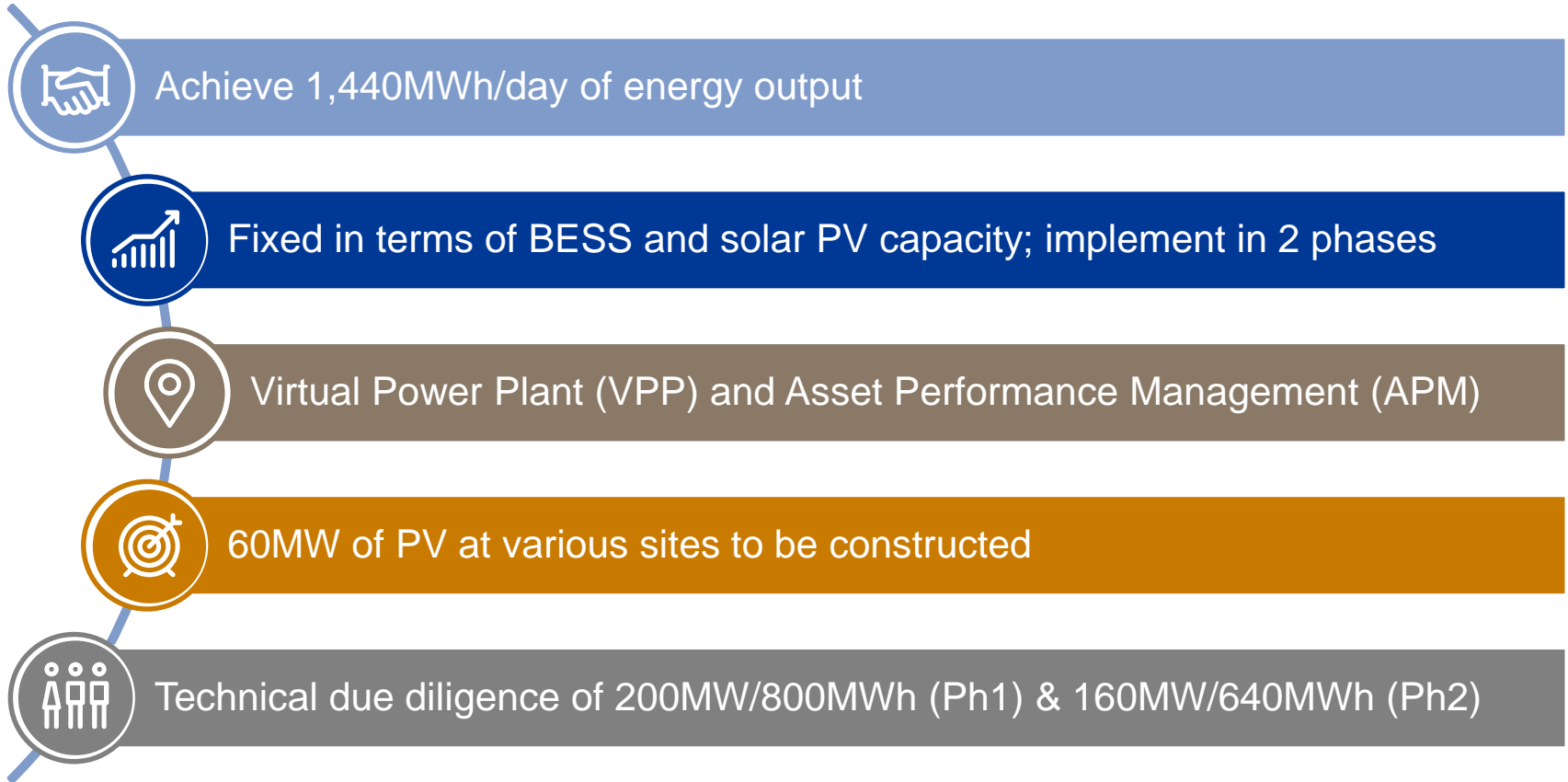
- In 2017, Eskom proposed the distributed battery storage with solar photovoltaic to be installed as an alternative to CSP
- Battery Energy Storage Systems (BESS) to be implemented in 2 phases achieving a total of 1440 megawatt-hours of energy shifting per day





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

BESS solution scope

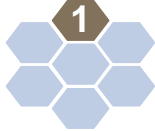





Six components identified

BESS Scope

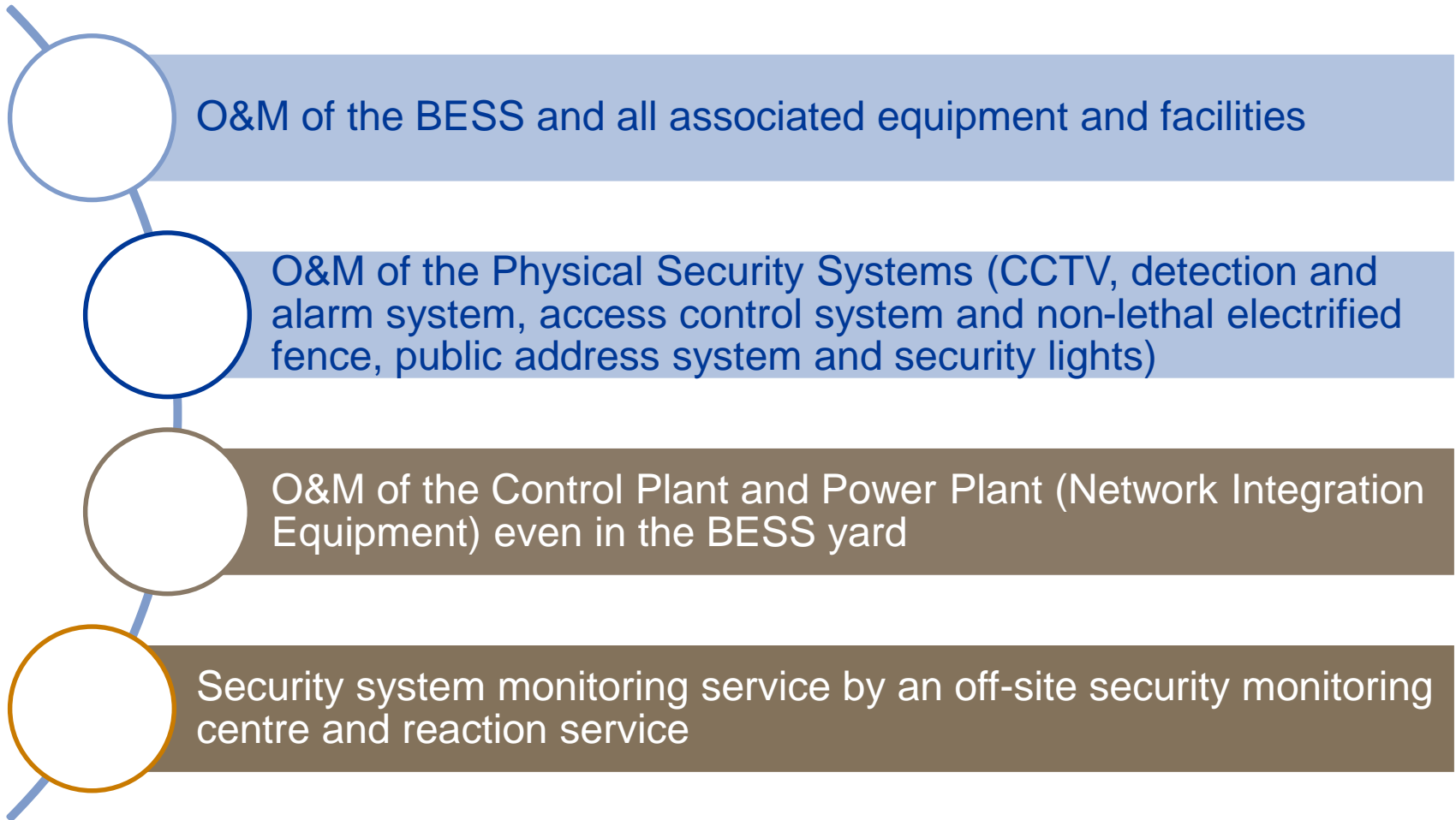


Description

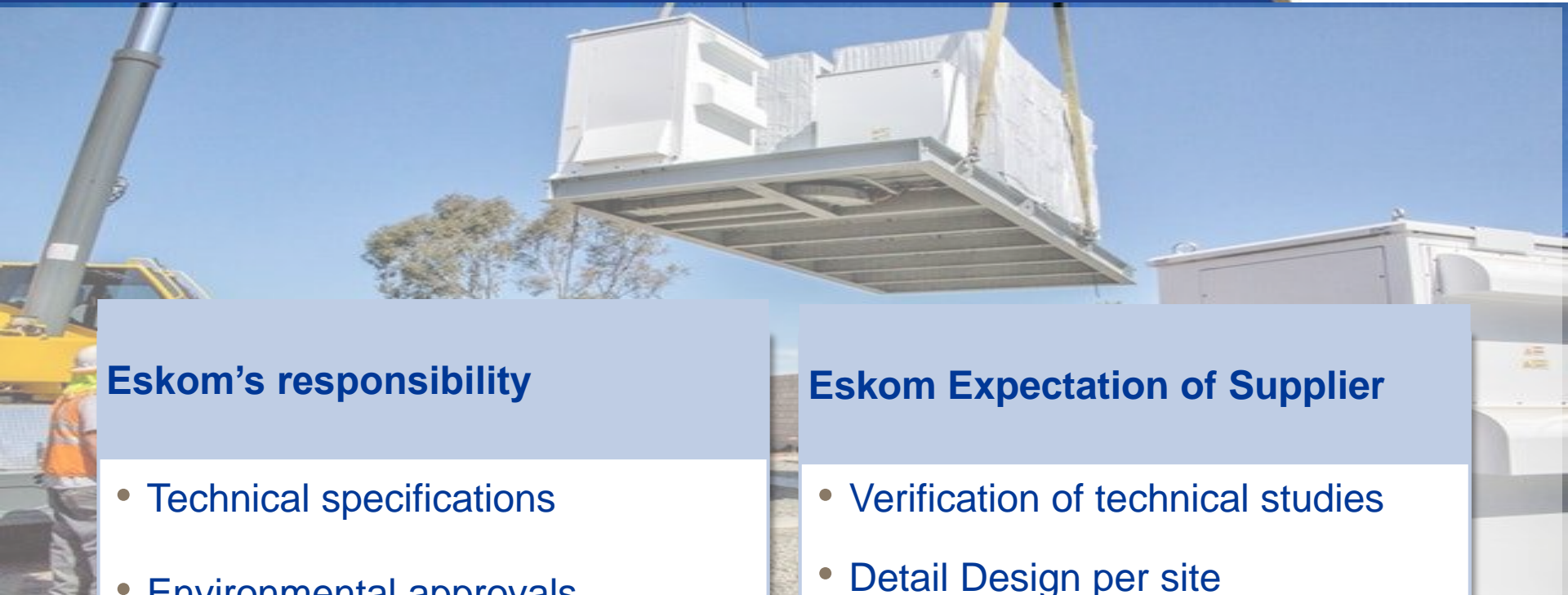
-  Technology agnostic
-  Focusing on functional and technical requirements for BESS to meet the use case and integrate with Eskom control and monitoring infrastructure.
-  BESS equipment can be configured to meet Eskom use case; work with VPP
-  Test certificates, compliance with industry best practices, 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

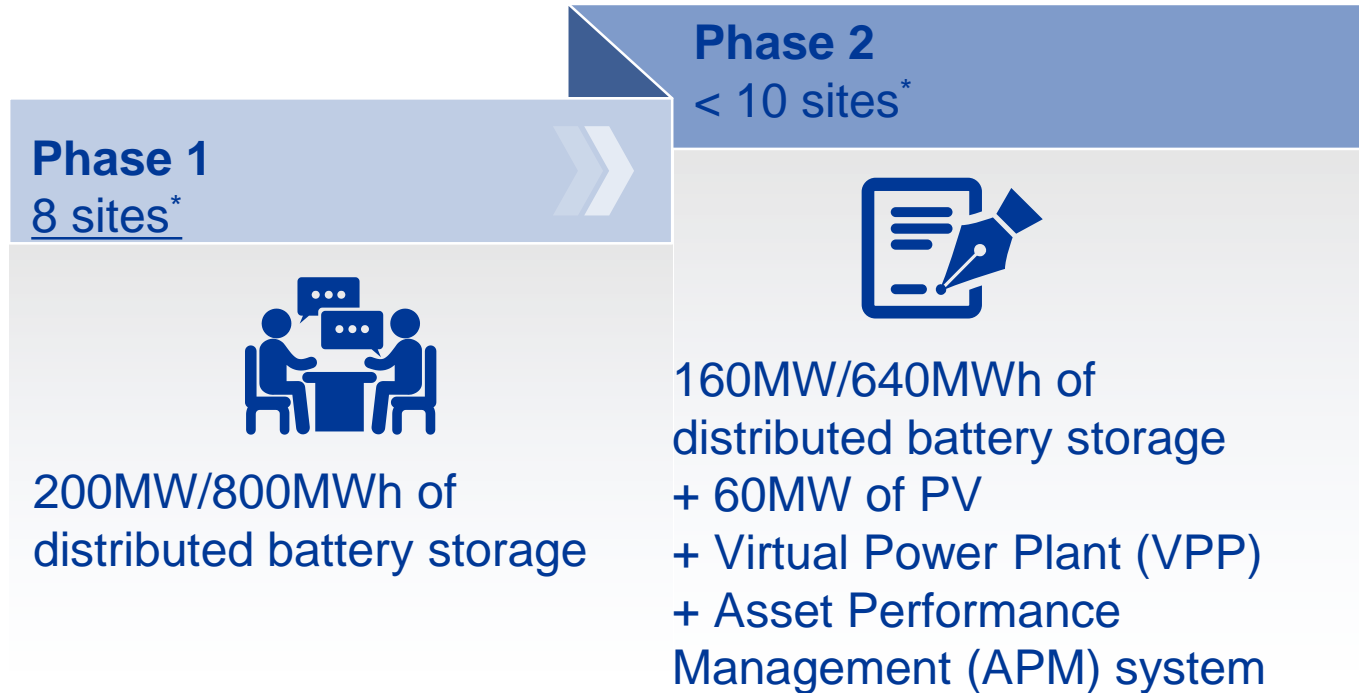
- Verification of technical studies
- Detail Design per site
- Execution – full DSI/ EPC
- Hazardous Material management – Construction, Operation (spares) and Disposal at end of life
- Product & Functional guarantees



- 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**

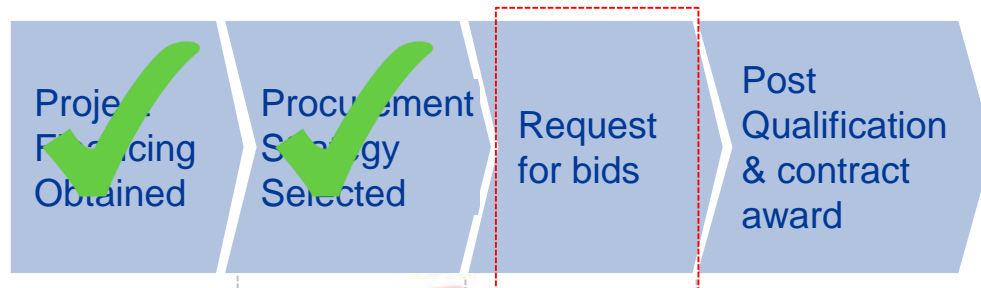
Phase 2 to be completed 31 Dec 2021



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

Procurement method

Process flow of the procurement process



Financed in part by a WB loan, African Development Bank (AfDB) and others

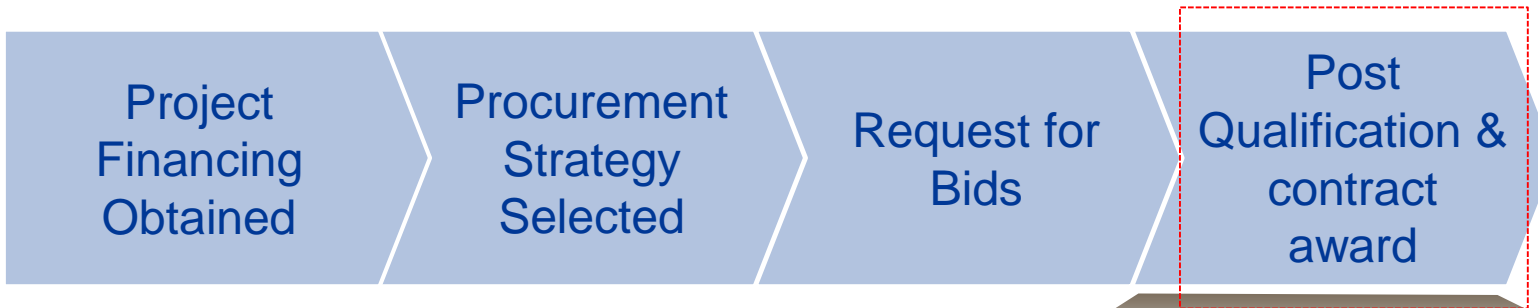
Design, Supply & Install including Operating and Maintenance i.e. EPCM for the first phase of the project

Conduct pre bid Webinar
 Procurement approach is **Request for Bids (RfB)**
 Using Standard Procurement Documents (SPDs) as issued by the bank

Using guidelines in the Standard Procurement Documents (SPDs) as issued by the bank

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
 - 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



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

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**

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

