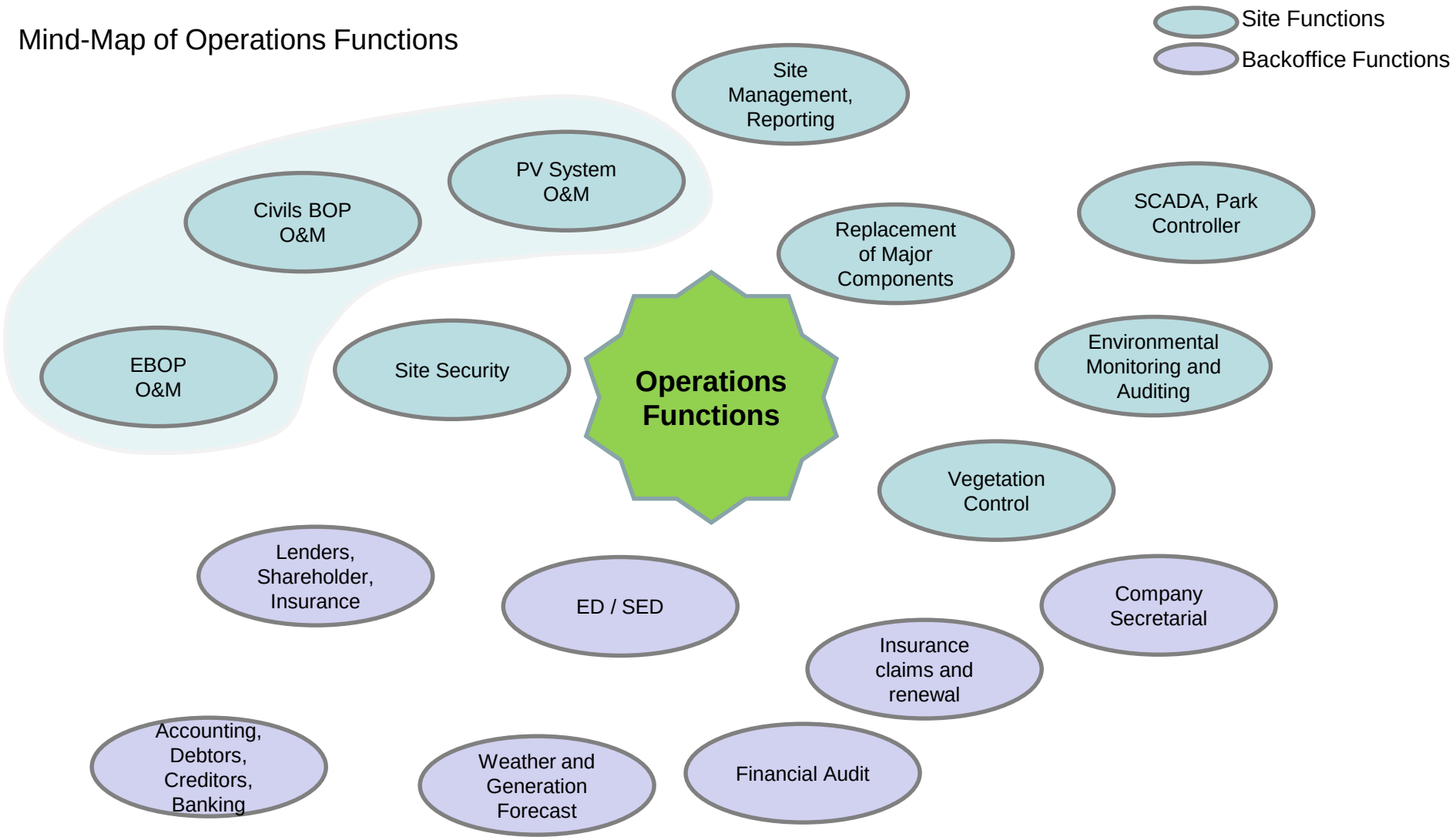
Agenda

- Asset Management: How do you slice the cake
- O&M contract options
- Performance measures for O&M contracts

A lifetime of performance – maximising your asset

Mind-Map of Operations Functions



This scope can be split up between 2 and 16 contractors with various degrees of inhouse services

A lifetime of performance – maximising your asset

The correct O&M concept is critical to maximise asset value.

Different O&M contract concepts have very different risk and return profiles.

OEM/EPC = O&M

+ Knows the power plant
+ Access to component supplier
+ Preferred option by lenders
- Lack of transparency
- Often expensive

Independent O&M

+ Potential cost advantage
+ Increased control of project owner
- Unknown ability to service and replace specific components

Fully wrapped

O&M contract to include component replacement, security, CBOP, EBOP, etc

+ Little involvement of project owner required
+ Preferred option by lenders
- Impossible for owner to win financially

Unbundled

SPV to assume risks for component replacement and multiple contractors

+ Cost advantage
+/- Greater involvement of the project owner requires experience but gives control

A lifetime of performance – maximising your asset

How to measure the performance of your O&M contractor

Technical Availability (TA): Ratio of time the power plant is available to total time

- Does not show how efficient the power plant operates
- Often misrepresented by exclusion of events (e.g. grid, weather, owners)
- Can not and should not be 100%

Performance Ratio (PR): Ratio of measured output to maximum output based on the name-plate rating

- Good to compare days in the same period but ineffective as an absolute measure
- Influenced by TA and Equipment Effectiveness (EE). At 100% TA, the PR will equal the EE
- Often misrepresented by exclusion of events
- PR is subject to degradation, which can be different to the forecasted degradation

Energy Output: P50/P90 comparison

- Influenced mostly by weather and by PR and TA
- Forecast can be inaccurate

Soft measures: Quality of Reporting, H&S, Housekeeping, Invoicing

- Measured an important part of the deliverables
- Difficult to measure objectively