

Electricity System Restoration (ESR) Competitive Procurement Event Appendix 7 - Feasibility Assessment Process

Background

Electricity System Restoration (ESR) project development for Electricity System Operator (ESO) takes the form of a phased, two stage feasibility process. You have successfully completed ITT part 1 which is the **Stage 1 Feasibility (F1)** which requires a potential ESR Service Provider to assess the capability of the main generating units or equipment to provide the ESR Service, together with some preliminary work to consider possible solutions. Stage 1 is designed to allow the project to terminate at an early stage should the main plant be deemed inappropriate for provision of a ESR Service.

We are now moving on to the full design stage which is where the ESO will instruct the tenderer to proceed to scoping an ITT part 2, **Stage 2 Feasibility (F2)**. The aim of **F2** is to provide a comprehensive and robust technical and commercial evaluation of the proposed service within your chosen tender category to enable progression to a contractual negotiation or tender. Important to highlight that the scope of works for the **F2** must be reviewed and agreed between ESO and the potential ESR Service Provider before any work should start on the **F2** itself.

The outcome of **F1** and **F2** are dedicated reports (F1 Report, F2 Report). Each report should provide sufficient confidence in the capability of the Service Provider to support a decision to continue with the feasibility process.

Prerequisite

Prior to commencement of an F2 Study and associated F2 Report, a scope of works for delivering the report (including costs and programme) must be delivered and approved by ESO. Please do not begin any works until a signed Feasibility Study letter has been received.

Note: Where data for the network studies is required from secondary stations, the potential ESR Provider will make the request for suitable data (e.g., Sub synchronous Torsion Interaction – shaft data) via the ESO. Any costs in retrieving the data set need to be scoped as part of the F2 Study sanction process and be included within the scope.

Study and Report

The objectives of **F2** are to:

1. Confirm technical capability, detail, and how will the ESR Service be delivered.
2. Provide an Implementation Strategy.
3. Develop network modelling to ensure the ESR Service will not cause any impact or damage to third party plant or equipment, where the service is provided in an alternative operating mode.
4. Provide a commercial offer for the ESR Service.

Further information can be found on each of these sections below.

1. Confirm capability and detail how will the ESR Service be delivered



It is anticipated that the Original Equipment Manufacturer (OEM) will be consulted at this stage to provide assurance of any stated capability, with appropriate engineering analysis being evidenced. Confirmation of capability should be to a sufficient level to agree a contract for delivery of a ESR Service.

As a guide, the **F2 Report** should include but not be limited to the following content and can be different for the specifics of each individual project:

- a. Confirmation of Capability** (above that explored under the F1 Study and backed up with physical or simulated evidence):
 - i. ESR capability, operation, and control of the equipment/Plant, confirmed by the OEM.
 - ii. Start-up Power Requirements / profile with any peak requirements.
 - iii. Typical Time to Connect and start-up sequence in ESR mode (if variable, e.g., warmth state, detail accordingly).
 - iv. Block loading profile, and requirements to achieve the Minimum Stable Operating Level. Any variation in Block Loading capability due to equipment status, output level or energy/fuel supplies.
 - v. Identification of any timing constraints in the start-up or Block Loading process, specific hold points, maximum durations at low load levels, critical load points.
 - vi. Resilience of Supply (ESR Service and ESR Auxiliary Unit(s)).
 - vii. Reactive capability at various loading points, including initial energisation (c0MW).
 - viii. Ability to meet availability requirement – assessed over typical maintenance cycle and merit order where appropriate.
 - ix. Any differences between modules/ poles/ or units.
 - x. OEM reference list for similar main plant/equipment undertaking ESR provision.
- b. ESR Auxiliary Unit(s) Capability**
 - i. Capability to start without external supplies and provide sufficient power output to enable the delivery of the contracted ESR Service.
 - ii. Governor investigations as necessary.
 - iii. Start-up times, reliability, and availability.
 - iv. Fuel supplies and durations.
 - v. Auxiliary Single Line Diagram.
- c. ESR Operation**
 - i. Conceptual design, control philosophy, supporting study work and any physical testing requirements to confirm capability. This should consider the capability of neighbouring sites likely to undertake Power System Synchronisation of Power Islands.
 - ii. Control room and Plant staffing summary and review to achieve the 24h availability of the service.
 - iii. Systems' resilience review noting Telecommunication and systems' resilience to a blackout event, and their physical location.
- d. ESR Equipment Schedules – Existing and new**
 - i. Existing to include assessment of fitness for purpose and any modifications required.
 - ii. New to include general specifications and scope.
 - iii. Civil installations required.
 - iv. Balance of Plant General Arrangements.

ESO

v. Single Line Diagrams.

Typically includes Auxiliary generation and starting equipment, electrical interconnections, fuel system, Main and Aux control systems, protection – energizing and synchronizing systems.

2. Provide an Implementation Strategy

- Build/Install programme plan, including the steps and timelines for the following:
 - Consents
 - Purchasing
 - Commissioning
 - Outage requirements
- Consents – please explain what will be required, and how the provider will ensure that at the time of F2 report submission, the provider will confident that any necessary consents or permits will be in place to achieve the delivery timeline
- Operation and Maintenance Strategy
- Risks

3. Any network modelling to ensure the ESR service will not cause any impact or damage to third party plant or equipment, where the service is provided in an alternative operating mode

If applicable.

4. Provide a commercial offer for the ESR Service

Recovery of capital costs will be agreed on an open book basis. Full and detailed breakdowns of all costs should be provided here, and ESO reserves the right to employ consultants to evaluate the designs and cost structures as part of the tender.

- Project Development
- Main Equipment
- Construction
- Monthly Availability Fee
- Service Readiness strategy (Commercially viable runs, preparedness capability, etc.)