

Mozambique - Temane Transmission Project (TTP)

Terms of Reference:

Specialist preliminary heavy haul route investigation for the transport of transformers to substations to be located at Vilanculos, Chibuto and Matalane

Revision (B) 17th December 2018

1. Introduction

Electricidade de Moçambique E.P. (“EDM”), in partnership with Sasol New Energy Holdings Ltd (“Sasol”) and Globeleq Africa Limited (“Globeleq”), is developing a 400-MW Independent Power Producer (“IPP”) project at Temane in the Inhambane Province of Mozambique known as Central Termica de Temane (“CTT”) or the Temane IPP. The plant will use natural gas from the nearby PSA gas fields at Pande and Temane, to be developed and operated by Sasol Petroleum Mozambique Lda.

The Temane IPP will be connected to the electricity grid in the Maputo area in southern Mozambique through a 560-km, 400-kV transmission line including 3 new substations, known as the Temane Transmission Project (“TTP”). The TTP is the first phase of the larger interconnection between Maputo and the Tete Province, known as Sociedade Nacional de Transporte de Energia (“STE”).

The TTP will be implemented as a publicly financed project, which will connect the Temane IPP plant and any other future plant and loads along the TTP corridor to the transmission network.

The services of an external specialist service provider are required to support EDM in identifying optimal routes for the transportation of transformers and reactors from the most suitable port of entry to selected new substation sites for the TTP project.

2. Objectives

The primary objectives of the investigation are to;

- a) Establish the location of the nearest port of entry and offloading for the transformers in both 3 – phase and single-phase configuration.
- b) establish the optimal road route with respect to length, structural integrity and regulatory approval for the transportation of both 3 phase and single-phase transformer configurations described in these terms of reference.
- c) Determine the extent of any modifications required to the proposed route(s)

3. Information provided for the route study

Transformers and reactors are to be delivered to three (3) substations located at Vilanculos, Chibuto and Matalane. A map indicating the primary roads and locations of the substations is included as Annexure 1. The GPS coordinates of the substation locations are as follows;

Vilanculos Substation

Plant area	416m x 315m
Coordinate	S21° 57' 21.5" E35° 06' 05.7"

Chibuto substation

Plant area	460m x 310m
Coordinate	S24° 38' 08.1" E33° 31' 28.7"

Matalane substation

Plant area	282m x 222m
Coordinate	S25°40'42.32" E32°37'56.39"

4. Transformer data

The following transformer weights and sizes are the weights for the heaviest element of the transformer to be transported and do not represent the total transformer weight.

4.1. Option 1. - 3 phase transformers

The following 3 phase transformers are to be delivered to the applicable substations;

3 Phase Transformers	Vilanculos SS	Chibuto SS	Matalane SS
Transformers	400/110/33kV (1)	400/275kV (1)	400/66/33kV (1)
Transformer MVA	150	150	400
Transformer wt (heaviest transportable weight without oil) (tonnes)	140	150	250
Transformer dimesions (width x height x length) (mm)	4100 x 4600 x 7800	4400 x 4700 x 7900	4000 x 4700 x 8500
Access to substation	New 2km road from N1	New road from N208	New road from N1

4.2. Option 2 - Single phase transformers

Single Phase Transformers	Vilanculos SS	Chibuto SS	Matalane SS
Transformers	400/110/33kV (1)	400/275kV (1)	400/66/33kV (1)
Transformer MVA	150	150	400
Transformer wt (heaviest transportable weight without oil) (tonnes)	60	65	115
Transformer dimesions (width x height x length) (mm)	3000 x 4500 x 4000	3000 x 4500 x 4100	3500 x 4600 x 4900
Access to substation	New 2km road from N1	New road from N208	New road from N1

4.3. Scope of work

The scope of work shall be:

- Review of Mozambique road regulations and load limitations applicable to the transformer units to be transported
- Review and summary of Mozambique transport permitting procedures and processes for abnormal loads described in these terms of reference
- Identify of the port of loading of the transformers (both three phase and single-phase options) based on available lifting capacities and road access
- Identification of road route options and determination of the preferred route (for both of the three phase and single-phase options).
- Identification of any structural issues along the route(s) including bridge and culvert structural integrity and indicative loading and dimensional constraints
- Assess the route (supported by photographic evidence) for physical obstructions including excessive gradients, bridges, culverts, transmission lines, rail crossings or any other obstacles.
- Definition of specifications and requirements for reinforcement, modification, removal, widening, straightening or any other modification
- Risk assess the route for operational and environmental concerns
- Budgetary assessment (based on Detailed Bill of Quantities) of any modification required to be made to the recommended route and indicative time frame to carry out the modifications

4.4. Relevant Experience

Bidders should have completed a minimum of 3 route surveys for consignment weight up to 100 MT each for transformer transportation

4.5. Deliverables, Payment and Timeline

The study should be completed within 8 weeks of contract award

Payment of 100% of the survey price shall be made within 30 days of submission of the Consultants final report and accompanying invoice.

The Consultant shall provide the following deliverables within the stated time frames;

Deliverable	Content	Schedule
Inception report	<ul style="list-style-type: none">• The survey objectives and routes to be surveyed• The survey approach• The survey methodology and tasks• Work programme• Staff organisation• Key staff and responsibilities	2 weeks from commencement date
Draft final report	<ul style="list-style-type: none">• Road regulations and permitting• Port of entry lifting facilities• Identification of trailer type	No later than 7 weeks from the commencement date

	for transport <ul style="list-style-type: none"> • Recommended routes and options (if any) • Obstructions and route infrastructure modifications (if any) supported by photographs • Environmental risk assessment for route • Cost estimate and schedule for any modifications with a BOQ 	
Final report	Amended final draft	No later than 8 weeks from commencement date

4.6. Estimated Level of Effort

The Client's estimate of the expected level of effort required to complete the assignment is 55 person-days for all key staff in total.

4.7. Key Staff

Project Manager

The Project Manager should have a minimum 10 years experience in the planning and management of heavy load/wide load machinery transportation in the Southern Africa region. The Project Manager should present evidence as having managed and coordinated successfully at least 2 (two) heavy haul projects of a similar nature.

Structural Engineer (bridges)

The Structural/Civil Engineer should be a professional engineer, MSc or BSc, with at least 10 years relevant experience covering steel structure design, design of steel bridges and, foundations, and other structural works related to roads and bridges.

Civil engineer (roads)

The Civil Engineer should be a professional engineer, MSc or BSc, with at least 10 years relevant experience covering roads and culverts, and other civil works related to roads and culverts.

If suitably qualified and experienced, the role of civil and structural engineer may be combined

Annex 1. Project Map

