

MR 196/2024

CONSULTANCY SERVICES FOR REVIEW OF TEN-YEAR POWER DEVELOPMENT PLAN (PERIOD 2022 -2031)

ENERGY FIJI LIMITED

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REVISION HISTORY & DOCUMENT CONTROL

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1 BACKGROUND

Energy Fiji Limited ("EFL") is a limited liability company that was established in 2018 under the Companies Act (2015).

Energy Fiji Limited is the successor entity to Fiji Electricity Authority, which was established under the Electricity Act Cap 180 with the functions of generating, transmitting, distributing and retailing electricity throughout four of the main islands of Vitilevu, Vanualevu, Ovalau and Tavueni.

It owns over twenty (20) power stations and over thirty (30) substations and switching stations on the islands of Viti Levu, Vanua Levu, Taveuni and Ovalau. EFL owns, operates and maintains a network of 147km of 132kV transmission lines, 565.97km of 33kV sub-transmission lines and over 11,086km of 11kV and 415V distribution lines.

EFL is undertaking investments to upgrade its generation and transmission systems to cater for the future demand and augment the existing network to a secure and reliable transmission network, incorporating an N-1 level of redundancy. This assignment will assist EFL in assessing the adequacy of the ten-year power development plan for the period 2022-2031, and revise it to the planning horizon 2024-2035.

The project scope comprises a review of all current and future planned EFL systems and includes review of demand forecasts versus actual growth, review of load flow studies and network and generation plans. As part of this exercise, the selected service provider/consultant may be required to carry out simulations and calculations to recommend any changes in the plan, and also incorporate planning for the period 2022-2031 in the revised plan. The selected service provider/consultant will also be required to carry out sensitivity analysis on the development plan factoring introduction of new technology, such as but not limited to electric vehicles and various levels of solar PV penetration in the grid.

During evaluation of tender bids, EFL may invite a tenderer or tenderers for discussions, presentations and any necessary clarification before proceeding further.

The deadline to submit tender bids is 1600hrs on 31st July 2024, Fiji Time.

Further information relating to this tender may be acquired from:

Jitendra Reddy Manager Procurement Inventory & Supply Chain 2 Marlow Street, Suva, FIJI.

Phone: +679 3224 320 (L) +679 9992400 (M)

Facsimile: +679 331 6773 Email: tenders@efl.com.fj

2 INSTRUCTIONS FOR TENDERERS

2.1 Eligible Tenderers

This invitation is open to Tenderers who have sound Financial Background, and have previous experience in carrying out similar electrical engineering consultancy works.

Tenderers shall provide such evidence of their continued eligibility satisfactory to EFL as EFL shall reasonably request, using the forms provided in the Schedules.

Tenderers shall not be under a declaration of ineligibility for corrupt or fraudulent practice.

2.2 Eligible Materials, Equipment and Services

The materials, equipment, and services to be supplied under the Contract shall have their origin from reputable companies as specified by EFL and from various countries and all expenditures made under the Contract will be limited to such materials, equipment, and services. Tenderers shall be required to provide evidence of the origin of materials, equipment, and services in their bids.

For purposes of this Contract, "services" means the works and all project-related services including design services.

For purposes of this Contract, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing or substantial or major assembling of components, a commercial recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

The materials, equipment and services to be supplied under the Contract shall not infringe or violate any industrial property or intellectual property rights or claim of any third party.

2.3 One Bid per Tenderer

Each Tenderer shall submit only one bid. A Tenderer who submits or participates in more than one bid will cause all those bids to be rejected.

2.4 Cost of Bidding

The Tenderer shall bear all costs associated with the preparation and submission of its bid and EFL will in no case be responsible or liable for those costs.

2.5 Site Visits

No site visits are required for this project. Bidders requiring a site visit shall coordinate with the Supply Chain office, at their own cost.

2.6 Contents of Bidding Documents

The Tenderer is expected to examine carefully the contents of this Bidding document. Failure to comply with the requirements of bid submission will be at the Tenderer's own risk. Bids which are not substantially responsive to the requirements of the bidding documents will be rejected.

2.7 Clarification of Bidding Documents

A prospective Tenderer requiring any clarification of the bidding documents may notify EFL in writing by email addressed to:

Jitendra Reddy
Manager Procurement Inventory & Supply Chain
2 Marlow Street, Suva, FIJI.
Phone: +679 3224 320

Mobile: +679 9992400 Facsimile: +679 331 6773 Email: tenders@efl.com.fj

EFL will respond to any request for clarification which it receives earlier than five (5) days prior to the deadline for submission of bids.

2.8 Amendment of Bidding Document

At any time prior to the deadline for submission of bids, EFL may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderer, modify the bidding documents by issuing addenda.

2.9 Language of Bid

The bid, and all correspondence and documents related to the bid, exchanged between the Tenderer and the EFL shall be written in the English language.

2.10 Bid Prices

Unless specified otherwise, Tenderers shall quote for the entire facilities on a "single responsibility" basis such that the total bid price covers all the Supplier's obligations mentioned in or to be reasonably inferred from the bidding documents in respect of the design, manufacture, including procurement and subcontracting (if any), testing and delivery.

Tenderers shall give a breakdown of the prices in the manner and detail called for in the Schedules of this bidding document, or any issued addenda.

Bid prices shall be inclusive of all relevant taxes, including with-holding tax, for off-shore service providers. Tenderers are required to familiarize themselves with Fijian taxation laws.

2.11 Bid Currencies

Prices shall be quoted in a single currency only.

2.12 Bid Validity

Bids shall remain valid for a period of **90 days** from the date of Deadline for Submission of Bids specified in Sub-Clause 2.15.

2.13 Format and Signing of Bids

The Tenderer shall submit their bids using the EFL's electronic tender hosting website, https://www.tenderlink.com/efl. EFL will not be accepting any hard-copy submissions for this tender.

The bid shall contain no alterations, omissions or additions, except those to comply with instructions issued by EFL, or as necessary to correct errors made by the Tenderer, in which case such corrections shall be initialed by the person or persons signing the bid.

2.14 Sealing and Marking of Bids

The Tenderer(s) shall clearly mark the technical and financial proposals that make up the bid. The bid shall:

a) be addressed to EFL at the following address:

Tender Secretary

Attention: Jitendra Reddy

Manager Procurement Inventory & Supply Chain

2 Marlow Street, Suva, FIJI. Phone: +679 3224 320 Mobile: +679 9992400 Faccimile: +679 331 6773

Facsimile: +679 331 6773 Email: tenders@efl.com.fj

And

b) bear the following identification:

- Bid for: CONSULTANCY SERVICES FOR REVIEW OF TEN-YEAR POWER DEVELOPMENT PLAN (PERIOD 2022-2031)
- Bid Tender Number: MR 196 /2024

DO NOT OPEN BEFORE: 1600hrs on 31/07/2024

2.15 Deadline for Submission of Bids

Bids must be received by EFL at the address specified above no later than 1600 hours (Fiji Time) Wednesday 31st July, 2024.

EFL may, at its discretion, extend the deadline for submission of bids by issuing an addendum, in which case all rights and obligations of EFL and the Tenderers previously subject to the original deadline will thereafter be subject to the deadlines extended.

2.16 Late Bids

Any bid received by EFL after the deadline for submission of bids prescribed above will be rejected and returned unopened to the Tenderer.

2.17 Modification and Withdrawal of Bids

The Tenderer may modify or withdraw its bid after bid submission, provided that written notice of the modification or withdrawal is received by EFL prior to the deadline for submission of bids.

No bid may be modified by the Tenderer after the deadline for submission of bids.

2.18 Rejection of One or All Bids

EFL reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the grounds for the rejection.

2.19 Process to be Confidential

Information relating to the examination, clarification, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to Tenderers or any other persons not officially concerned with such process.

Any effort by a Tenderer to influence EFL's processing of bids or award decisions may result in the rejection of the Tenderer's bid.

Lowest bid will not necessarily be accepted as successful bid.

2.20 Clarification of Bids

To assist in the examination, evaluation and comparison of bids, EFL may, at its discretion, ask any Tenderer for clarification of its bid. The request for clarification and the response shall be in writing or by fax, but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by EFL in the evaluation of the bids.

2.21 Compliance with Specifications

The tender shall be based on the equipment and work specified and shall be in accordance with the Technical Specification. It should be noted that unless departures from specifications are detailed in Schedules of the Technical Specification, the tender would be taken as conforming to the Specification in its entirety. The Tenderer shall tender for the whole of the Works included in the Specification.

2.22 Signature of Tenderer

A tender submitted by a Partnership shall be signed by one of the members of the Partnership and shall be accompanied by a certified authorization of all the partners authorizing the individual partner to sign on behalf of the Partnership. A tender submitted by a Corporation to the Contract and shall be

accompanied by a certified resolution of the Board of Directors authorizing the individual to sign on behalf of the Corporation.

2.23 Insurance

The Tenderer is to confirm that they have in effect the insurance policies below and provide copies of valid certificates with the bid:

- 1. Professional Indemnity
- 2. Public and Products Liability Insurance

Tenderers who are registered locally are required to provide copies of the following:

- Fiji Revenue and Customs Services tax compliance certificate
- Fiji National Provide Fund compliance certificate
- Fiji National University Levy compliance certificate

3 GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract shall be FIDIC Client/Consultant Model Services Agreement – Fifth Edition 2017 (White Book).

4 ADDITIONAL CLAUSES TO GENERAL CONDITIONS OF CONTRACT

EFL will provide during the contract stage.

5 SCOPE OF WORK

The appointed service provider/consultant is required to carry out a review of the tender year power development plan (period 2022 – 2031), which was prepared by Power Research and Development Consultants Pvt Limited of Bangalore, India. The power development plan consists of the demand forecast, generation plan and network development plan. EFL aims to align the ten-year development plan based on changes in growth pattern and impact of emerging technologies.

The successful bidder will sign a contract with EFL including NDA for information that is provided by EFL to the bidder.

The key activities to be undertaken shall be as follows:

- Review the 10-year demand forecast for the ten-year planning period from 2024, for the five EFL-operated power systems (EFL will provide actual demand data for the years 2022 to 2024).
 Sensitivity analysis will be required for a range of load factors and for impact of emerging technologies on the demand forecast, and subsequently on the network and generation development plans.
- 2. Review and comment on generation and network development plans, including carrying out any simulations for verification and support of claims. These may include sizing of potential battery energy storage systems. The consultant will be further required to provide scope of work with appropriate solutions along with the ratio of installation of Renewable Energy sources.
- 3. Review and comment on the master plan and projects identified in the master plan, and provide an updated list of master plan with associated costs. The consultant will further provide the duration of each project including commencement and completion dates with solid reasons to strengthen the power system as part of the master plan.
- 4. Carry out power system modelling for all options provided to ensure each power system is stable with the additional recommendations. The successful bidder will also be required to submit the models created in an acceptable format to EFL's System Analysis Tool (MiPower)
- 5. Submit draft and final review reports for the demand forecast, generation planning and network planning and master plan.
- 6. Present the findings of the review to the Executive Management group after submission of draft report, and finalize the report and submit after receipt of comments.

7. Provide capacity building and knowledge transfer to EFL staff. The training should include demand forecasting, generation planning and network planning.

The selected consultant will be required to spend some time in Fiji with the EFL team, as part of data gathering, verification and capacity building.

The consultant will report to the General Manager System Planning and Control.

6 OVERVIEW OF EFL'S POWER SYSTEMS

6.1 Viti Levu Interconnected System

The Viti Levu Interconnected System (VLIS) is by far the largest system of the four power systems operated by EFL. The VLIS consists of four hydro power stations and nine thermal power stations, which are linked via 132 kV or 33 kV transmission systems, or 11kV interconnectors.

The installed generation capacity on Viti Levu is approximately 294.73MW, comprising 137.1MW hydropower, 147.91MW of thermal capacity and 9.72MW wind energy. The recorded peak demand on the VLIS is 196.24 MW to date.

The Wailoa, Nadarivatu and Wainikasou hydro power stations are located in the centre of the island. 132 kV steel tower transmission lines connect Wailoa and Nadarivatu power stations to the 132 kV backbone transmission network, which spans from Cunningham to Vuda, with 132kV switching stations in Wailoa and Nadarivatu.

The Wainikasou hydro power station is connected to the Wailoa switching station via a 33 kV transmission line and a 132kV/33 kV step-up transformer at Wailoa. The Nagado Power station is connected to the 33 kV sub-transmission network in the Western region of VLIS.

132/33 kV substations are situated at Vuda in Western Region and at Cunningham in Western Region. These are connected to strategically located 33/11 kV zone substations via 33 kV sub-transmission lines or underground cables.

The 33 kV network is configured as a closed ring system feeding a total of eleven substations around the Central region, and two substations fed off in a radial configuration. The Cunningham Road, Old Kinoya, New Kinoya, Suva, Knolly Street, Vatuwaqa, Sawani, Nausori, Komo Park, Rokobili and Hibiscus Park stations are configured as a closed ring main system while single radial circuits run from Hibiscus Park to Wailekutu, Wailekutu to Deuba, and from Sawani to Gusuisavu Substation. Majority of these 33kV circuits are of underground cable construction. Korovou Power Station is interconnected via an 11kV radial line, to Sawani 33/11kV substation.

The Western Region 33 kV sub-transmission network is configured as radial links to seventeen (17) 33/11 kV zone substations and 33kV switching stations, including the one at Vuda itself.

There are 33 kV circuits that run from Vuda to Pineapple Corner, Vuda to Naikabula in Lautoka, and Vuda to Rarawai in Ba, and a 33 kV overhead line extending from Rarawai to Tavua 33/11 kV substation. This line further extends to Volivoli Substation. The Rakiraki Power Station is connected to Volivoli Substation via an 11kV link.

There are four 33kV circuits that extend from Vuda to Waqadra, of which two 33 kV circuits run direct from Vuda to Waqadra whilst one is via Sabeto Switching Station (connected to Nagado Power Station via a single 33 kV circuit), and the other through Voivoi Substation. The Nadi Power Station is connected to Waqadra Substation via dual 11kV interconnectors.

A single 33kV circuit feeds Momi Substation from Waqadra Substation via Nawai 33kV Switching Station.

A single 33 kV circuit emanates from Waqadra to Qeleloa, which further extends to Nabou Switching Station, and then to Sigatoka 33 kV Substation. The Nabou Green Energy Limited power plant is connected to the Nabou 33kV switching station. The Maro 33 kV substation is a tee-off to Nabou - Sigatoka 33 kV overhead line, and supplies power to Natadola 33/11 kV substation via a single 33 kV underground circuit.

The Sigatoka 33 kV Substation feeds Nacocolevu and Korolevu 33 kV substations via a single 33 kV overhead line. A single 33 kV underground cable links Butoni Wind Farm to Nacocolevu Substation. Majority of the 33 kV overhead lines in the Western Region are of wooden-pole type construction.

Power distribution is by means of more than 11,000km of 11kV and 415/240V lines

Independent Power Producers (IPPs) are also connected to the EFL electricity grid. At present, two IPPs are connected directly to the 11kV distribution network and one on the 33kV sub-transmission network.

6.2 Other Systems

There are four other power systems operated by EFL, apart from the VLIS, which are namely:

- Labasa,
- Savusavu,
- Ovalau and
- Taveuni.

The Labasa power system consists of a thermal power station at Cawaira, which is connected to the 11kV distribution network in Labasa, and connects to the Seaqaqa and Dreketi substations via a 33kV sub-transmission line. A single 33kV, 70km, Chafer-conductor overhead line runs from Cawaira Power Station to the Dreketi 33kV/11kV substation. The Seaqaqa 33kV/11kV substation is connected to the Cawaira – Dreketi 33kV sub-transmission line at a tee-off at approximately 35km from Cawaira.

The Savusavu power system contains a thermal power station in Savusavu and a Wainiqeu run-of-river hydro-electric scheme connected to the 11kV distribution network.

The Savusavu and Labasa power systems are two independent grids on the island of Vanua Levu.

The Ovalau power system consists of diesel generators installed at Levuka power station connected to the 11kV distribution network, which traverses the entire island along the coast.

The Taveuni power system consists of 2x1MW generators installed at Waiyevo thermal power station, 2x 375kW hydro-electric machines at Somosomo power station, a 1MW solar plant at Mua (with BESS), and 11kV overhead distribution lines forming the network.

7 DELIVERABLES

Within one week of commencement, the Consultant shall submit to EFL a detailed work program outlining time inputs, field visits and the methodology, in MS Project format.

An inception report shall be submitted with the detailed work program.

A draft final report shall be submitted to EFL within 3 months of commencement of services. The final report incorporating EFL comments shall be submitted within 2 weeks of receiving EFL comments.

Weekly progress reports shall be submitted every Monday from the date of commencement.

The Consultant will provide, upon request from EFL, presentation of activities, findings and recommendations to the EFL executive management group at the proposed date below.

8 PROGRAM

The anticipated program for the work is shown below.

| Milestone | Target Deadline |
|---------------------------------------|--|
| Close of Tender | 31st July 2024 |
| Award of Tender | No later than 23 rd August 2024 |
| Issue of Contract and Purchase Order | No later than 6 th September 2024 |
| Commencement of Study | No later than 28th September 2024 |
| End of Study | No later than 22 nd November 2024 |
| Submission of Draft Report | No later than 6th December 2024 |
| Submission of Final Report | No later than 30th December 2024 |
| Complete capacity building & training | No later than 31st January 2025 |

9 SUPERVISION AND REPORTING

The project will fall under General Manager System Planning & Control.

10 EXPERTISE AND QUALIFICATION

The following is required:

- The Consultant, or its team members, must have as minimum a degree in electrical engineering/science, or equivalent standard of education.
- The Consultant, or its team members, shall have at least 15 years working experience in power system networks planning
- Good management and co-ordination skills, and experience on technical project implementation.
- Proven experience in design and planning of power systems
- Experience and skills in training and transfer of knowledge.
- Excellent interpersonal and communication skills in English is required to train / coach staff and give occasional presentations during the assignment

11 PAYMENT SCHEDULES AND TERMS

The payment will be based on the milestones defined below. **EFL will not be making any advance payment for this work**. The prices quoted shall be inclusive of With-holding Tax in Fiji (for off-shore service providers), or provisional tax, for local service providers.

| Milestone Activity | Percentage Payment | |
|---|--------------------|--|
| Draft Report Submission and Acceptance by EFL | 80% | |
| Final Report Submission and Acceptance by EFL | 20% | |

12 INPUTS AND FACILITIES PROVIDED BY EFL

The successful bidder shall provide its own accommodation in Fiji for any trips to Fiji. EFL can provide transportation for maximum two persons for any visits to Fiji.

EFL will also provide:

- a copy of power development plan for the period 2022-2031
- all relevant single line diagrams of existing transmission, swub-transmission and distribution networks in pdf formats
- relevant single line diagrams of committed network reinforcements and augmentations in PDF format
- Typical daily generaion schedule; and
- Existing database of power system data. Consultant will be required to review the data for correctness prior to using in the review study
- Generation Forecast Plan leading up to 2035
- Generation, sales and demand data for the years 2022, 2023 and 2024
- any other data required by the Consultant for the study, in its tender submission and as agreed by EFL; and
- Office space for maximum of two persons, (excluding workstations, printing facilities and internet connectivity) at Navutu depot.

TENDER CHECKLIST

The Bidders must ensure that the details and documentation mention below must be submitted as part of their tender Bid

| Ten | der Number | |
|-----|---|-------------------|
| Ten | der Name | |
| 1. | Full Company / Business Name: | |
| | (Attach copy of Registration Certificate) | |
| 2. | Director/Owner(s): | |
| 3. | Postal Address: | |
| 4. | Phone Contact: | |
| 5. | Fax Number: | |
| 6. | Email address: | |
| 7. | Office Location: | |
| 8. | TIN Number:(Attach copy of the VAT/TIN Registration Certificate - Local Bidders Only (Man | datory) |
| 9. | FNPF Employer Registration Number: (For Local Bidders only) (Ma | ndatory) |
| 10. | Provide a copy of Valid FNPF Compliance Certificate (Mandatory- Local Bi | dders only) |
| 11. | Provide a copy of Valid FRCS (Tax) Compliance Certificate (Mandatory Lo | cal Bidders only) |
| 12. | Provide a copy of Valid FNU Compliance Certificate (Mandatory Local Bidd | lers only) |
| 13. | Contact Person: | |
| | I declare that all the above information is correct. Name: Position: Sign: Date: | |

Tender submission

Bidders are requested to upload electronic copies via Tender Link by registering their interest at: https://www.tenderlink.com/efl

EFL will not accept any hard copy submission to be dropped in the tender box at EFL Head Office in Suva.

This tender closes at 4.00pm (1600hrs) on Wednesday 31st July, 2024.

For further information or clarification please contact our Supply Chain Office on phone (+679) 3224360 or (+679) 9992400 or email us on tenders@efl.com.fj

The bidders must ensure that their bid is inclusive of all Taxes payable under Fiji Income Tax Act.

The lowest bid will not necessarily be accepted as the successful bid.

The Tender Bids particularly the "Price" must be typed and not hand written.

Any request for the extension of the closing date must be addressed to EFL in writing three (3) working days prior to the tender closing date.

Tender Submission via email or fax will not be accepted.