Terms of Reference (ToR) for engaging a consultant to develop Multi Sectoral State Energy Plan and 100% RE Roadmap for the State of Goa	Project number 17.2166.1-001.00

Contents

Terms of reference (ToRs) for the procurement of services

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

1. Context

The Indo-German Energy Programme (IGEN Access - II) is a bilateral cooperation project carried out by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Indian Ministry of New and Renewable Energy. IGEN Access - II aims to improve the energy supply in rural areas of selected federal states.

India is envisaged to play a key role in the global energy scenario as India is likely to account for 25% of the rise in global energy demand by 2040 (International Energy Agency). India's energy sector is set for a sea change with recent developmental ambitions of the Government of India. India plans to achieve 450 gigawatts (GW) of renewable energy installations, by 2030, 24X7 Power for all by 2022, 10% reduction of oil and gas import dependence by 2022 (from 2014-15 levels). Provision for ensuring of clean, reliable and affordable energy for all sectors such as transport, cooking, agriculture, industry, MSME etc will certainly make India's energy sector development friendly and secure.

To make energy sector more resilience, demand driven and proactive several policies and market driven initiatives were undertaken to ensure large scale adoption of clean, renewable, efficient, and climate friendly energy technologies across various states.

2. Background to State Energy Plan and 100% RE Roadmap

State being part of the energy system of the entire country it shares all the threats and risks that India is currently facing in its energy sector. It needs to be prepared to protect its own sectoral development through various mitigation and adaptive measures.

The aim of developing State Energy Plan and 100% RE Roadmap is to design an appropriate strategy and to assist the state to take a cleaner and greener trajectory to bring in GHG reduction and climate related benefits, while achieving other development goals.

To deal with such issues and challenges, several advance planning processes have been developed, adopted and mainstreamed at both National and State Governments.

IGEN Access program (processor of IGEN Access-II), assisted State of West Bengal and Assam to develop **State Energy Plan (EP).** EP generated several energy scenarios and computed viable/optimized energy supply mix to meet the projected multi-sectoral energy demand. Besides that, EAP also assisted both Assam and West Bengal to define/develop their long-term energy vision, enabling policy measures, programme priorities as well as associated investment plans,

while recommending necessary short, medium and long-term action plan. The state of Punjab is also being supported for prepared a long-term energy plan and building related capacities within the relevant stakeholders.

State of Goa has shown their interest and willingness to develop/adopt scientific and data-driven approach to develop multi-sectoral state energy plan and specially to develop a detailed roadmap for renewable, clean and energy efficient technologies.

3. The Areas of Activities for IGEN Access-II Programme

IGEN Access-II Programme is geared to specialists and managers at state-run and private energy companies, to providers of financial and other services and to private and public training facilities and networks. Acting through these intermediaries, the module will indirectly reach the rural population who will then benefit from a modern, environment-friendly, high-quality energy supply, irrespective of gender, age, income or ethnicity.

It is expected that implementing the below-mentioned measures will increase the share of RE in rural areas of the partner federal states, and thus boost diversification in the Indian energy matrix (results hypothesis). In the long term, expanding RE will reduce the need to operate conventional power plants and thus increase their capacities. The upshot: fuel savings and reduced emissions of climate-noxious gases. In this way, the project will make another important contribution to a sustainable and above all eco-friendly energy supply in India, thus contributing directly to the achievement of the programme objective.

The module aims to improve rural energy supply in selected Indian federal states. Therefore, one of its key elements centres on strategic advice for decision-makers (e.g. relevant Ministries, State Nodal Agencies and other departments) regarding the initiation of a cross-sector energy planning process for rural areas. Secondly, the module will work on improving overall sector environment by facilitating access to finance, improving capacities and awareness for demand and supply side stakeholders. In addition, development of concepts to explore role of decentralised renewables in special conditions, like disaster prone areas, livelihood generation etc is also planned. All this will lead of more affordable and reliable access of power in rural areas.

The overall module objective of IGEN Access-II programme: The energy supply is improved in rural areas of selected federal states. The achievement of the module objective can be measured using the following indicators:

1. Implementation of one component from the energy plans (e.g. remuneration system for integrated decentralised energy systems, subsidy programme for promoting electric mobility) is funded in 2 federal states respectively.

2. The number of RE systems sold to rural users by module-backed providers has increased.
3. 4 recommendations elaborated by the module for improving the quality of the energy supply under certain specific conditions are implemented.
4. 40% of women-led Village Level Enterprises (VLEs) that disseminate RE confirm that their standard of living has improved by two points on a scale from 1 to 5.

4. Objective of the Developing State Energy Plan and RE Roadmap for Goa

The proposed assignment aimed to:

a. To develop an Energy Vision for Goa in sync with its Vision 2035; SAPCC as well as other economic and environmental plans and policies
b. To develop a RE roadmap along with detailed sectoral energy action plan to achieve its Energy Vision
c. To boost capacities of concern government officers to adopt and mainstream advance planning process

5. Break-up of Tasks to be Performed

IGEN Access-II intends to co-ordinate with all key state departments / agencies / institutions and its national counterparts (as / if required) to understand the current energy eco-system; policies / trends and also to envisage strategic plans / policies / strategies / opportunities / challenges which are necessary to incorporate while developing multi-sectoral;, long-term state energy plan as well as RE roadmap.

On behalf of IGEN Access-II and Government of Goa, the selected consulting firm should complete the following work packages (WP)

Work Package-I: Developing State and Sectoral Energy Vision

This preparatory phase is aimed to engage and sensitize all key stakeholders (departments / agencies) towards the objective, process and benefit of state energy plan. In this process stakeholders process should understand their roles and responsibility so as to ensure their active participation and ownership.

The consulting firm should pro-actively interact with the representatives of Government Departments to understand their requirements, challenges and expectations and should translate

that into EP development activities. The consulting firm should provide necessary guidance to stakeholders, so that it can take necessary measures or alternative route to address those issues. The consulting firm should come out with a list of departments who will be the primary participant and beneficiary of the EP process. Considering the energy eco-system energy, Tourism, environment, agriculture, industry, MSME, urban development, municipalities and transport departments should be enlisted as a key stakeholder.

Through departmental dialog process, the consulting firm is expected to build necessary capacities of stakeholders by making them understand the present energy status of the (respective) sector(s), future energy demand to meet its development goals/ pathways. The stakeholders should also be assisted to articulate and/or define specific sectoral energy vision / goals and pathways, which should reflect in the overall state energy vision and state energy plan. The sectoral and state energy vision should be measurable and achievable in a time bound manner and must be endorsed by the appropriate authority at the highest level of the state of Goa.

The consulting firm is expected to develop a detailed communication/reporting, monitoring & evaluation process.

As a preparatory phase, the consulting firm is expected to assess and to review the existing knowledge and skill gaps of stakeholders. Accordingly, the firm should develop a detailed training calendar as well as capacity assessment protocol. The said training and capacity building process should therefore go parallelly across all work-packages to ensure seamless participation, acceptance and ownership of entire process and methodology by the members. The firm should also maintain a detailed database of participation, knowledge exchange and training sessions / inputs wise performance. The consulting firm should ensure that each member is capable enough to communicate with their respective department/sector to secure data input / verification and necessary decision making.

This WP should ensure the deliverables **(D1) in the form of a publishable report** containing (at least) the following

- Approved state energy vision
- Approved (by respective department/sector) sectoral energy vision(s)
- Agreed EA goals, communication, monitoring and evaluation process
- Visioning workshop proceeding(s)
- Stakeholder wise role and responsibility
- A detailed training calendar and training assessment protocol

Work Package-II: Preparing State Energy Database

The main purpose of this work package is to develop an appropriate state energy database which can contain all major sectoral energy data and information historically as well as with future trend. The database should be built in such a way so that it can work as standalone system and can be updated in a regular manner. The database should also contain cost information which can help to build the cost optimization model in the later stage. The main activities of this WP are as follows:

- Developing the password protected (by respective data provider) multi-sectoral energy database framework
- Data collection and (collective / sectoral) validation.
- Developing the historic trend of the energy systems related indicators (resources, primary energy, secondary energy, capacity, use of energy etc.)
- Converting the energy data into energy model readable information and generating the parametric values essentially required for building energy systems model.

In the process of developing the State energy database, utmost importance should be given to the data conversion (assumption, process and formula); data validation and acceptance of the all data / data-sets (i.e. primary/secondary/assumed and processed) by the respective State department/agencies. The consultants are urged to conduct thorough consultation and meetings with the relevant key stakeholders to validate the data and information collected and inserted in the database.

This WP should ensure the following **deliverables (D2)** containing (at least) the following

- **D 2.1** A state energy database along with a report containing
    - Detailed source of data and testimony
    - Method of data collection, processing, validation and validation testimony
    - Sector wise data-gaps, proxy data and recommended gap-mitigation measures
    - Agreement of base year and related testimony
    - List of secondary / standard data; research papers, reference documents

- **D 2.2.** Web-hosting password protected multi-sectoral state energy database and information along with a report on it. Webhosting can be done in designated Government website or in cloud-based server (temporary)

Work Package-III: Baseline Assessment

The main purpose of this work package would be to assess the existing situation of the State in terms of its energy supply, demand and consumption pattern along with its energy resource availability. This step outlines the critical data sets that will lay the foundation for the state energy

plan. Analysis of this information will allow to consider options within realistic parameters and set benchmarks for measuring progress. The main activities under this work package are as follows:

- What other energy-related plans and policies state need to be incorporated by the state energy plan? This also includes review of the relevant sections defined in SDGs and SAPCCs of the state of Goa.
- What is the current profile of the state's energy resources, demand and supply and institutional capacity?
- Mapping of inter departmental linkages in terms of energy flow and generating energy flow diagram at base year.

Considering licencing cost and recurring maintenance cost related issues, it is advisable to use **free, authentic and time-tested standard energy modelling platform** and all associated / supporting software and tools. However, preference will be given to **MESSAGEix platform** (considering synchronizing possibility of state energy database with that of IESS 2047, which were developed/used by NITI Aayog).

In case the consultant is keen to use anything other than MESSAGEix, they need to provide technical comparison to justify the added advantage. The consultant needs also to list down details of energy modelling and associated software / tool / platform they would like to use.

This WP should ensure the following **deliverables (D3) in the form of a report** containing (at least) the following

- Base year State Energy Balance sheet with demand sector disaggregated to major energy consumers of the state like tourism, agriculture, industry, MSME, transport, residential and commercial buildings, agriculture, mining, urban development etc
- Detailed note on Reference Energy System (RES) of the state to map 05 level of energy conversion (i.e. at resource, primary, secondary, final and useful level) with appropriate diagram
- Detailed note on Energy System Model, calibration and optimization framework etc
- Comparison of key baseline results with that of national / international best practice, supported by reference document(s)., so as to help the state to set an indicative target.

Work package IV: Developing Long Term Energy Scenario including 100% RE Scenario

The main activities of this work package are related to development of an energy cost optimization model which will help the state to identify an optimal energy supply mix under various boundary

conditions and thereafter generating various policy scenarios. During the course of study if any substantive changes to existing policies or introduction of new policies are made by the government of Goa and if these are considered to have a substantive bearing on the modelling results then these changes should be reflected in the baseline assumptions. The consultant is also expected to propose a detailed approach for the following sub-activities

(A) Capacity Building on Baseline and Long-term Scenario Building: This task is to ensure that the concerned stakeholders should get adequate exposure and training to understand the modelling assumptions, approaches and the overall process. Moreover, all key stakeholders should realise the need/benefit of inter-sectoral planning approach to accept/adopt the same. It is envisaged that enhanced capacity should also be measured through the complementary nature of inputs suggested by appropriate sectors, to develop/implement longer term sustainable development plans. All major components of Work Package IV should be developed through detailed consultation with key stakeholders.

(B) Baseline Projection: Baseline projection is the key for all future policy analysis. Therefore, utmost importance should be given to build the long-term baseline of the State. The consultant should spend adequate amount of time to build the baseline with intense communication with the State officials from the major stakeholders. Clear definition and sub-steps of the baseline analysis should be articulated at the beginning of this exercise. All existing and upcoming government policies which might have bearing on the future energy scenario of the State should ideally be included in the baseline. The consultant should incorporate (as much as possible) target setting and reporting parameters, used by state departments/agencies, on day-to-day basis, while analysing baseline report. However, the consultant should be responsible to fix the boundary of the baseline which is approved by the Government

(C) Scenario Building: Scenario building exercise should be started only after the baseline is confirmed, validated and communicated back to concerned authorities. The main objectives of the scenario building exercise would be to simulate the State objectives of developing the Energy Plan at broad level as well as at the sectoral level. Therefore, developing scenario would require second level of consultation key stakeholder / beneficiary departments.

(D) Developing 100% RE Scenario

To develop RE Scenario, the consultant is expected to carry out a time series analysis through a power system as well as load flow modelling process. The consulting firm should also incorporate necessary cost optimization models, to develop a (close to) practical scenario.

The consulting firm should consider all possible / likely grid connected and off-grid RE (and clean technology) intervention / application, which otherwise might create additional demand on grid supply (e.g. cooking, pumping energy demand for irrigation, thermal energy demand at household /SME sector etc).

During the course of the modelling / analysis, if Government of Goa change any policy / assumption / trend, which can have a substantive bearing on the modelling results then those changes should be incorporated in the modelling process.

Besides the above mention approach and scope of modelling, the consulting firm is also expected to propose suitable methodology for data validation and other technical/policy assumption. 100 % RE scenario building exercise should be started only after the assumptions and methodologies are approved.

The entire modelling process should incorporate the following (indicative and not exhaustive) steps

i. Develop the hourly load curves for the target year
ii. Estimate the hourly RE generation potential (based on the available and/or estimated data, approved by Govt of India/Goa) for the various variable generation sources in Goa (particularly wind and solar)
iii. Conduct a detailed estimation of RE generation potential (using various RE technologies such as biomass, hydro, solar, wind, waste to energy etc.). **The consultant is expected to mention the resource assessment methodology they would like to adopt.**
iv. Run a despatch model to identify the sector wise shortfall / excess energy situation, which will be met through other RE sources
v. Any remaining shortfall will have to be addressed through import of RE based electricity from outside Goa
vi. Develop sector wise potential of various RE technologies to meet all types of energy demand

The consultant **should not exclude** on the following issues while developing the state energy model

- Demand sector disaggregation should be aligned to sectoral policy assessments
- Inter-state and/or international energy/commodity trade and trade potentials
- Energy supply and demand balance and grid stability for RE integration
- Resource potential particularly about solar, wind, biomass, waste and hydro
- Resource availability and production projections for coal, gas and petroleum products
- Modernization of the Electrical Power System; energy sector reforms / targets /mandate
- Energy Efficiency requirements / potentials for industrial, buildings as well as electrical transmission/distribution systems as well as at user's end

- Inclusion of disruptive technologies and business models in all priority sectors such as Tourism, Transportation, agriculture, industry/MSME, cooking and storage

The entire modelling process should focus on the following outcomes

- **Economic Outcome**: Financial implication on distribution sector to consider 100% RE
- **Energy Mix Outcome**: Developing scenarios for increasing integration of RE (generated from within the state or purchased from other state/nation), including potential technologies which are in the demonstration stages but may have potential with the state of Goa
- **Assets management**: Technical transformation of power plants
- **Environment:** Positive contribution to reduction in CO2 emission (with 100% RE), replacement (improvement of PLF) coal power plant or phase out of the inefficient coal power plants.
- **Low Carbon Growth:** Integration of inter and intra state low-carbon clean energy generation while achieving 100% RE scenario
- **Meeting other development indicators:** Impact on other social and environmental standards/indicators as highlighted in Goa's SDG Vision document.

This WP should ensure the following **deliverables (D4)**

D4.1: Handing over an **energy database and modelling software** linked and web-based modelling platform along with detailed operation guide, which will allow Government of Goa to develop different other optimized energy scenarios, if/as required.
D4.2: A **detailed report** on various energy scenarios containing

- The major outcomes of Baseline Scenario Assessment
- Assumptions and outcomes of different other scenarios created
- Outcome of 100% RE scenario along with detailed assumptions/preconditions
- Sectoral roadmaps to fulfil 100% RE scenario targets
- Description of web-based modelling platform and scenario developer
- Testimony of consultation and inter-sectoral communication

D4.3: A **report on the modelling training** /capacity building activities
D4.4: At-lease **2 case study** to show synergic inputs provided by complementing-departments/sector using scenario outcome, to develop action plan or to set common target

Work Package V: Developing the Decision Support Tool

The consultant should develop a dynamic and modelling software linked, menu-driven, web-based energy planning decision support tool (DST) which can capture the results of different scenario simulations against pre-selected indicators. The focus of this WP should be to create a web-platform for policy makers to carry out scientific system planning process without going through complex and multi-parameter calculation. DST is therefore, required to capture the fundamental information like baseline scenario, gap between baseline effort and required effort, pathways to follow to achieve the required target and additional effort required to meet the development gap.

The decision-making indicators should be selected in consultation with key decision makers. It is highly desirable that a user interface of the model is prepared such that by changing the variables and running the simulations, different results can be visualized by the user, such that not just technical experts, but a broader audience can use the tool especially policy makers. A user guide in this regard needs to be prepared. Adequate capacity building measure need to be taken in order to enable PMU members handling the DST in the future independently.

This WP should ensure the following **deliverables (D5)**

D 5.1: The developed DST along with the software components
D 5.2: A detailed users' manual on the developed DST
D 5.3: A report on capacity building measures taken for training PMU members

Work Package VI: Developing State Energy Action Plan

This work package will ensure delivery of energy plan and energy action plans. To ensure adoption of energy action plan (EAP) by the respective state departments/agencies a wider consultation is upmost necessary. The consultant is also expected to propose a detailed approach for the following sub-activities

(A) **Generation of time step wise; sector and sub sector wise goals/strategies.** In consultation with respective stakeholder(s), the consultant is also expected to develop priority setting protocol so that the respective department/agencies can take appropriate decision based on state's development need; likely impact of action; resource availability and local eco-systems. Wherever applicable, the proposed activities should be linked with respective result(s), obtained from least cost modelling analysis, for easier reference and logic building.

(B) Developing recommended action to meet each goal

The consultant should recommend programmatic actions to meet defined goals. Recommendations should include detailed action plans and milestones for implementation. Each recommended action should outline the following (indicative) parameters

- Nature of action (i.e. regulatory / policy, institutional, financial, technical, implementation etc)
- Time horizontal (i.e. short, medium, long term)
- Lead and partner department / agencies
- Quantify financial requirement / gap

Recommended programmatic actions should focus on emerging technologies, need for changing the existing regulations, evolving consumer behaviour, possible environmental hazards, sectoral challenges/opportunities and unpredictable nature of supply/demand as well as other market driven issues such as pricing. An analysis of the emissions impacts of the options to meet future energy needs will strengthen the energy planning process.

This WP should ensure the following **deliverables (D6)** as a **detailed State Energy Action** Plan containing the followings (indicative and not limited list):

- **Executive Summary**
- **Background of the project**
- **Detailed Approach, Methodology** of formulating the state Energy Action Plan State Energy database (overall description of preparation process; structure; state energy balance Sheet; reference energy system of the state; energy system model & its description / importance etc.)
- **Baseline Assessment** (it gives detailed / analytical assessment of State Energy database on current and sectoral status of Primary Energy Supply conditions; details of electricity generations (generator wise, fuel wise, sector wise consumption pattern etc); Final energy usage pattern (fuel wise, sector wise consumption pattern); GHG emissions profile of the State (sector wise, fuel wise, time horizon wise pattern) etc
- **Future energy scenarios** of the State (this is the core section and it helps State to see its future energy scenarios based on various set of assumptions and energy modelling software. Besides Business-As-Usual scenario, other scenarios such as 100% RE Scenario, Balanced growth scenario, SDG scenario, Energy Security Scenario, Energy Efficiency scenario etc, climate friendly scenario etc can also be developed based on State's need)
- **State Energy Vision & Action Plan** (based on comparison of various energy scenarios and their respective outcome/impact develop)
    - Structure of Strategic Energy Plan
    - Mapping of State Energy Visions

  - Sectoral energy vision and Strategic Action Plans
- **Detail State Energy Action Plans** for
  - Energy Supply Sectors (scale / year / fuel / source / usage wise)
  - Energy Demand Sectors (include at least Tourism, Transport, Industries, MSME, Buildings, Agriculture & Fisheries, Cooking etc)
- **Way Forward** (based on multi-sectoral discussion and priority setting)
  - Structure of multi-sectoral institutional mechanisms to be ensure sustained adoption/use of the modelling-based planning process
  - Data-gaps and periodic updation (of state energy database)
  - Implementation plan (as suggested by multi-sector core team)
  - Introduction of DST
- Glossary
- Acknowledgements
- Appendices
- References and resources

Finalize and Adopt the Action Plan: The consultant is expected to submit the plan to the appropriate authority at the highest level of the state for approval through the proposed (by Anchor department of Govt of Goa) through the appropriate channel. The consultant will further respond to any final questions; rectify the mistake (if any) and defend the plan if/as needed / requested by any stakeholders directly and/or through IGEN Access-II programme of GIZ.

Work Package VII: Wind Resource Assessment

The state of Goa has a blessed with good wind resource, which can be tapped for energy generation. The consultant is required to undertake secondary assessment for exploring the wind resource potential through desk-based research and data available with agencies like NIWE and others who have conducted such assessments in the past. The consultant will also be required to validate these assessments by carrying out stakeholder discussions and feedback.

This WP should ensure the following **deliverables (D7)**

- A brief report to bring out results related to this Work Package will be required.

NOTE: The Bidder in their technical proposal should explain the approach and methodology, adopted to perform the key activities explained above.

Along with the details above on all the Work Packages, the organization is also required to address the following aspects within their technical proposal.

I. Overall Approach in undertaking this assignment including specifically the approach adopted towards identifying and including new development opportunity and challenges for the State.
II. Specific activities to be provided/undertaken by State Govt or by any specific department/agency as a precondition or project enabler.
III. What are the perceived risks in the implementation of the above assignment? And their respective mitigation strategy.

6. Timeline and Reporting

The expected duration of the project to be around **270 human-resource days** and is required to be completed by December 2021. GIZ may also require the organisation to prepare short reports / concept notes / discussion papers / minutes of meeting from time to time.

A likely estimation of work package wise allocation of human resource (in person days) is as given below.

	Scope of Work (including necessary training and Capacity Building inputs)	**Allocation of Human Resource (in person days)**
I	Developing state and sectoral energy Vision	30
II	Preparing State energy database	45
III	Baseline Assessment	30
IV	Developing long term energy scenarios, including 100% RE scenaio	75
V	Developing the Decision Support Tool	45
VI	Development of the Draft Energy Action Plan	25
VII	Wind resource assessment	20
Total Human Resource (in Person Days)#		**270**

Total person days excludes travel days/time. GIZ assumes approx. 20 train/air travel to/from Goa for 3 experts (i.e. approx. 60 round trips with same numbers of over-night stay) besides approx. 90 numbers of local travel, during the assignment period.

The bidder is expected to further detail out expert wise (or team member wise), work package wise person days, in their proposal. Bidder can do a minor change in work-package wise human resource allocation, if as they feel appropriate, without changing the total person days. Bidder should propose detailed human resource allocation strategy, based on their experience and core

expertise, for effective and quality communication particularly with GIZ and with Government officers.

During this period, the consultant is expected to report on a fortnightly basis regarding the progress on the assignment. The consultant is also expected to develop a **Project Monitoring Sheet (PMS)** for regular tracking of progress made on the assignment. The format of PMS will be shared with the consultant. GIZ may also require the consultant to prepare short reports/concept notes/discussion papers from time to time.

Monitoring and Evaluation: A detailed monitoring mechanism needs to be developed to demonstrate how the bidder will achieve the desired impact sustainably. The suggestive monitoring mechanism needs to be shared at the proposal stage, along with milestones (including number of end users) to be reached with time schedule and key deliverables. The proposal also needs to clearly detail out how sustainability of the intervention will be ensured after the project period.

Knowledge Dissemination Plan: The bidder needs to propose a detailed knowledge dissemination plan. This will entail wider knowledge sharing within the sector to encourage replication and scalability. Besides regular, individual, department level meetings GIZ assumes 5 major idea/knowledge sharing (one-day) workshops, each involving around 25 participants.
The selected Bidder will develop necessary factsheet(s) on project, process, and products (interim and final). The parameters and template will be developed in consultation with GIZ.

7. General Deliverables for the Project Management

The firm of consultants is expected to provide the following deliverables

- Updates (conference call or one to one meeting) on a fortnightly basis on project progress. Since GIZ is supporting the Government of Goa in the development of energy plan and action plan, therefore, it is expected of the consultant to also update and attend meetings called by Any key department and Agency of Govt of Goa during the period of assignment
- Inception report within the first two weeks of the project
- Project monitoring sheet (template to be provided by IGEN-ACCESS) within the first two weeks of the project
- Please refer to the respective description of the specific deliverables under each of the work packages mentioned before in the terms of reference
- All reports and documents as defined in the terms above
- Reference documents (preferably in soft version) and links which were used to develop State Energy Action Plan as well as to implement certain specific action plan

Program Steering and Reporting

- The firm of consultant will report to a Technical Expert (to be nominated) from the GIZ - IGEN-Access programme. The firm of consultant is to designate a team lead
- The firm of consultant will be required to closely work with the established PMU and attend meetings called by Government of Goa apart from regular update meetings with GIZ
- During the period of assignment, the consultant is expected to report on a fortnightly basis regarding the progress on the assignment. The consultant is expected to develop a Project Monitoring Sheet (PMS) for regular tracking of progress made on the assignment. The format of PMS will be shared with the consultant. GIZ may also require the consultant to prepare short reports/concept notes/discussion papers from time to time.

8. Program Steering and Reporting

- The organisation will report to a Technical Expert (to be nominated) from IGEN Access-II programme of GIZ India.
- The organization is to designate a team lead, who should take all key technical as well as financial decisions on behalf of firm and should act as a point of contact for all communication.
- During the period of assignment, the organisation is expected to report on a fortnightly basis regarding the progress on the assignment. The organisation is expected to develop a Project Monitoring Sheet (PMS) for regular tracking of progress made on the assignment. The format of PMS will be shared with the organisation.

9. Eligibility of the firms

The consulting firm **must fulfil the following criteria**

- Average annual turnover of the last 03 financial year should be at least 120,000 euro per annum
- At least 10 number of employees as at 31 Dec of previous year
- The technical assessment is only based on reference projects with a minimum commissioning value of at least 15,000 euros
- Provide evidence of at least 5 reference projects / assignments in the technical long term, strategic and multi-sectoral energy planning
- At least 3 reference projects adopted /rolled out at national /state level in last 3 years

Criteria
At least 5 reference projects / assignments of strategic Energy Planning at least 2 similar projects in Asia
Experience in developing EP/EAP/DST at state and/or national level.
Training/capacity building experience for Government officials particularly on new energy planning and associated tools
Energy Modelling experience at national/ state level, which is adopted/used for designing policy / program /schemes
Core team of Energy Modeller and Energy System Planner
Regional experience (in Goa)
Experience of development projects (ODA financed)

- **Further Requirement:** Considering energy eco-system and development need of Goa, the consulting firm may include some additional planning dimension or value-added activity or deliverables, which can ensure the adoption / mainstreaming /sustainability of EAP process, within the given human resource boundary. The firm should include strategy, process and outcome for the same.

10. Personnel Concept

The organisation is expected to provide a pool of expert to accomplish the overall assignment. Based on the proposed methodology, approaches and knowledge/skill sets of experts, the consulting firm is expected to provide likely human resource engagement plan (in person-days) for the following experts for undertaking the assignment.

I. Team Leader (Refer 2.1 in Technical Assessment Grid)

- **Task**
  - Overall responsibility for the advisory packages of the contractor (leading the team, provide guidance, responsible for the quality of the deliverables and deadlines).
  - Coordinating and ensuring communication with GIZ, all concerned Government Officers and other key stakeholders, decision makers
  - Quality assurance, personnel management, planning and steering assignments and supporting other experts and input providers

- **Qualifications of the team leader**

Parameter	*Reference	Details
Qualification	2.1.1	At last Master of Engineering or Energy Economics or Energy Planning
General professional experience	2.1.3	minimum 8 years of professional experience on integrated planning, policy development
Specific professional experience	2.1.4	minimum of 5 years of management experience of developing multi sectoral strategic plans at national / state level
Leadership / management experience	2.1.5	• Regional experience of working at Asian region, India as well as at state level • Experience of developing India's energy scenarios and dynamics of global power eco-system • In-depth understanding and experience of blending macro-economics with micro/sectoral plan • Flexible and able to multitask; can work within an ambiguous, fast-moving environment, while also driving toward clarity and solutions; demonstrated resourcefulness in setting priorities
Regional Experience	2.1.6	4 years of management/leadership experience as project team leader/ advisor/manager
Development co-operation experience	2.1.7	Experience of managing ODA financed project and quality protocol of international development agencies (preferably with GIZ)

II. Expert 1 (Refer 2.2 in Technical Assessment Grid)

- **Task**
  - **Expert 1** (co-leader) should take charge of energy modelling and macro/micro-economics, communication with key stakeholders, mentoring internal team and key Government officers/ decision-makers
  - As a senior expert, Expert 1 should take care of quality of energy planning and strategic decision making on quality assurance and coordinating with other subject exerts and decision makers

- **Qualifications of Expert**

Parameter	*Reference	Details
Qualification	2.2.1	Degree in Engineering or Energy Economics or Energy Planning and Post- graduate in energy related topics
General professional experience	2.2.3	minimum 5 years of professional experience on energy planning, modelling and strategic planning
Specific professional experience	2.2.4	minimum of 3 years of experience of developing strategic energy and carrying out sectoral assessment specially on developing • National/state renewable / clean energy technologies and roadmap for state / national • Assisting state to develop/implement med to long term operation plans
Regional Experience	2.2.6	Working experience in western Indian states (especially with Goa) Experience with renewable / power / environment department of Goa will preferred

Expert 2 (Refer 2.3 in Technical Assessment Grid)

- **Task**
  - Expert 2 should act as an **expert on energy policy / plan and should** coordinate with concern experts of key Government officers and GIZ
  - Expert 2 should understand how international, national and state national and state policies and should be in a position to communicate these with state authorities to ensure maximum possible strategic inputs from them

- **Qualifications of Expert 2**

Parameter	*Reference	Details
Qualification	2.3.1	Degree in engineering or Energy, Economics or Energy Planning
Language	2.3.2	Well versed with English, Hindi for effective communication with Government officers. Working knowledge of Konkani is an added advantage

Specific professional experience	2.3.4	minimum 7 years of experience on energy policies and plans; Experience of developing energy related plan / policies at national / state level
Regional Experience	2.3.6	Working experience in North Indian states especially with Goa. Project experience with renewable / power / environmental policies of Goa will preferred

III. Expert 3 (Refer 2.4 in Technical Assessment Grid)

- **Task**
  - Expert 3 should act as an **expert of renewable energy, energy efficiency and climate change** and should coordinate with concern experts of key Government officers and GIZ
  - Expert 3 should understand how international, national and state policies can be integrated in local conditions for sustainable adoption of renewable / clean / efficient technologies in a strategic manner

- **Qualifications of Expert 3**

Parameter	*Reference	Details
Qualification	2.4.1	Degree in engineering or Science. Post-graduate on energy management and climate policies will be preferred
Specific professional experience	2.4.4	• Minimum 5 years of experience on renewable energy and climate change related policies/plans/analysis • Experience of assisting central / state Govt in developing energy related plans / policies
Regional Experience	2.4.6	Working experience in North Indian states especially with Goa Project experience with renewable environmental policies of Goa will preferred

IV. Expert 4 (Refer 2.5 in Technical Assessment Grid)

- **Task**

- Expert 4 should act as a **local co-ordinator cum renewable energy expert**
- Expert 4 should have exposure and experience of working and following up higher level Government officers and should be capable enough to communicate effectively with govt officers and GIZ
- Expert 4 should have in-depth understanding of renewable energy technologies, energy efficient technologies and should be capable enough to contextualize then in the local context

- **Qualifications of Expert 4**

Parameter	*Reference	Details
Qualification	2.5.1	Post-graduate on Science or energy management
Specific professional experience	2.5.4	• Minimum 5 years of liaising experience with central and state govt (especially with Goa Govt). • Experience on renewable energy and climate change related projects will be preferred

Pool of short-term technical experts: Beside the above key technical experts, bidder must share detailed role, responsibility and degree of involvement (in person-days) of pool of short-term technical experts, along with their detailed resume. Bidder may keep aside **not more that that 10% person days** for pool of expert(s) and appropriate budget for the same. **However, these resumes won't be considered for technical bid assessment.**

11. Quality Assurance and Other Bidding Requirements

To ensure the quality of the outputs the organisation must meet the following requirements:

- GIZ honours intellectual copyrights and strictly prohibits any copyright violations and plagiarism
- GIZ will not be providing any fund to be used to create assets on ground. The bidder must keep this checked while preparing the technical as well as financial proposals.
- Reports or documents pertaining to the project and prepared by the organisation need to be thoroughly verified prior to submission. Sub-quality deliverables would not be accepted
- It is expected that all documents will undergo a final proofread by the team leader
- The organisation ensures that GIZ staff is briefed continuously on the progress of the project and informed immediately on any changes whatsoever (e.g. delays, availability of information etc.)

- All meetings will be documented by the organisation. The minutes of meetings need to be approved by the staff of GIZ
- The organisation is not allowed to replace project staff without prior approval by the staff of GIZ
- All the steps of the scope shall be coherent and complimentary in nature and they should not be considered as individual isolated steps
- GIZ encourages to share the results achieved from the assignment including relevant data with the larger audience for better sectoral learnings.
- The bidder organisation can refer to the parameters mentioned in the Technical assessment grid (attached in the Tender document) to prepare the technical proposal.

12. Structure of the Proposal

- The proposal should contain a very brief company profile followed by a detailed approach and methodology to execute the project. The proposal should also contain the project timeline highlighting milestones and deliverables. Please elaborate the roles and responsibilities of the different team members in the proposal

- The entire proposal including approach and methodology proposed, CVs etc., needs to be in English. Each CVs need to be in uniform format with a maximum of three pages; The length of technical proposal should not exceed 35 pages including CVs

- The template for financial quotes has been attached with the tender documents. The potential bidders are advised to follow the attached budget template

- The bidder is expected to keep separate detailed budgetary provision for train/flights, other (local/national) travel costs, per diems and accommodation costs for their team

- Consideration of local resources should be clearly outlined in the proposal. Local resources could be used for coordination purposes and local logistics.

13. Further Requirements

- All reports, slides, presentations and other media and information material need to be submitted to GIZ in soft copy
- Timelines shall be strictly adhered and delays in any of the deliverable shall be reported and aligned with GIZ in advance

- The bidder may be required to make technical presentation to GIZ before final selection at GIZ office. In case it is required, the bidder will be informed in advance

Note

- In order to select a suitable organisation, GIZ may invite shortlisted organisations to present their methodology and approach to a committee which will help GIZ in making final selection.
- GIZ reserves the right to cancel or modify this tender. Notice will be provided accordingly.