



Vacancy Announcement

Energy Audit and Greening of the ONE UN Building in Praia, Cape Verde

FBCVI09D01 – BL 1700

Post Title:	Energy Audit and Green Energy Planning for the ONE UN Headquarters Building in Praia, Cape Verde
Type of Contract:	Individual National Consultant
Duration:	Equivalent of 3 working months
Duty Station:	Praia, Cape Verde
Expected Start date:	as soon as possible

A. Background:

UNIDO in cooperation with The ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE) assists the UN in Praia, Cape Verde, to undertake a comprehensive energy audit of the office UN building (<http://www.un.cv>). Various options to integrate energy efficiency and renewable energy components will be considered. The improvements will reduce the monthly electricity bill of the UN office and will mitigate local pollution and GHG emissions. It will also improve the energy security of the building and reduce the reliance on the back-up diesel generator in the case of grid failure. Moreover, the project will be an important showcase to demonstrate the benefits of renewable energy and energy efficiency to other countries in the ECOWAS region. The project will be included into the “green energy tour plan” for interested visitors and experts.

B. Objectives of this Assignment:

The objectives of the assignment are:

- to conduct a detailed energy audit of the ONE UN Building and gain full understanding of the existing energy performance of the building, its facilities and equipment.
- suggest various options for energy efficiency improvements, energy saving measures and the integration of on- or off-grid renewable energy components to the decision makers.
- design and elaborate the technical specifications including the bill of quantities for the chosen measures.
- Predict the new performance of the building with the recommended changes.
- Develop projections of the energy performance of the building under different options.
- Suggest measures to promote behavioral changes by the inhabitants to improve their energy use efficiency.

C. Scope of Assignment:

Under the direct supervision of UNIDO & ECREEE and the designated focal point from the One UN Office, the consultant will take responsibility for implementing the following activities:

1. Prepare a draft questionnaire for collecting preliminary information such as:



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- Site bio-physical and climatic characteristics
- Building drawings
- Energy tariffs and bills (electricity, fuels)
- Inventory of the major energy consuming facilities and equipments installed, numbers, rated capacities, rated efficiencies, operation patterns, maintenance practices
- Energy distribution diagram (Electricity, chilled water, fuel etc, as applicable)
- Energy Efficiency and Conservation measures undertaken
- Energy metering and building energy management systems available.
- Cost and availability of building materials and green products/technologies in Cape Verde
- Major national energy and construction policies, related to energy efficient buildings
- Traditional architectural styles, materials, technologies and techniques

2. Finalize and share the questionnaire with UNIDO/ECREEE and the One UN in Praia, Cape Verde.

3. Collect data mentioned in the questionnaire, prior to the field study. Any missing data would be further collected during the field study

4. Conduct field study (2-5 days depending on need): visit the site, assess, consult with relevant staff, conduct measurements as appropriate to analyze existing energy performance of the building, facilities and equipments (Note: the consultant should bring relevant instruments to the site), Identify possible improvements in terms of electrical load management, energy efficiency and conservation, use of renewable energy, cleaner fuels. Some of the issues that need to be considered are:

- Electrical load management options, power factor improvements
- Performance analysis and options for major electrical and thermal equipments and systems, e.g, HVAC, motors , pumps, blowers, lighting, boilers, hot water generators, captive power generation, renewable energy systems etc.
- Building envelope thermal performance analysis and improvements in terms of insulation, sun shading, high performance glazing etc.
- Day-lighting options
- Lighting and HVAC control systems
- If needed, conduct building performance simulation including energy and daylight modeling
- Energy monitoring systems

5. Within maximum 4 weeks after the site visit, make a techno-economic feasibility study of the various energy efficiency and renewable energy options identified.

6. Within the fifth week prepare the draft energy audit study and techno-economic feasibility study (including drawings) and finalize the documents within two week of receiving inputs from ECREEE, UNIDO and One UN Headquarter.

7. Prepare the technical specifications and procurement documents including the bill of quantities for the chosen energy efficiency and renewable energy measures and components.

D. Deliverables and time schedule:

The output of this activity will be

1. Comprehensive energy audit report of the building
2. Techno-economic feasibility study including a cost-benefit analyses of the considered renewable energy and energy efficiency measures and components
3. Technical specifications and procurement documents including the bill of quantities



Table 1: Deliverables and Submission Requirements

Action:	Indicative time Schedule
1. Comments on the TORs & finalization of questionnaire & collection of data 2. Field visit and elaboration of the draft audit report and techno-economic feasibility study	Max. 2 w/month
3. Comments and finalization of documents 4. Preparation of the technical specifications and tender documents according to the provided templates	Max. 1 w/month

E. Qualification Requirements:

- Registered individual consultant in one of the fifteen ECOWAS countries
- Postgraduate degree in architecture, civil engineering or in energy, environmental or natural sciences/engineering/technology/management. In case of more experienced candidates in the relevant area, the academic requirements could be reduced
- Minimum five years of relevant working experience in: green Architecture (mainly passive design); building energy performance/daylighting simulations; and energy management in buildings (especially related to HVAC/lighting systems)
- Energy audit certification is an added value
- Ability to organize, analyze and synthesize different types of information in a systematic manner
- Effective management skills, good coordination ability and team working spirit;
- Proficiency in Portuguese
- Working experience with UN Agencies or ECREEE procedures would be an advantage.

F. Application Process:

The selected contractor is not allowed to participate as bidder in the tender process for equipments. **Interested and qualified consultants send their application at latest by 25 October 2011 to tender@ecreee.org. The electronic application contains the following documents:**

- Detailed Personal History Form of consultant (see attached)
- Track record of assignments of similar scope and focus (list of projects and descriptions)
- Scanned copy of highest university certificate and other technical certifications, licenses and quality standards related to the assignment
- Scanned copy of passport



Annex 1: Pictures of the roof of the building:





Annex 2: One UN Headquarter



Appendix 3: Climate Data: Praia, Cape Verde

	Unit	Climate data location	Project location
Latitude	°N	14,9	14,9
Longitude	°E	-23,5	-23,5
Elevation	m	35	35
Heating design temperature	°C	19,2	
Cooling design temperature	°C	30,1	
Earth temperature amplitude	°C	2,7	

Month	Air temperature °C	Relative humidity %	Daily solar radiation - horizontal kWh/m²/d	Atmospheric pressure kPa	Wind speed m/s	Earth temperature °C	Heating degree-days °C-d	Cooling degree-days °C-d
January	22,4	73,6%	5,42	101,1	7,1	23,6	0	384
February	22,2	75,9%	6,17	101,1	6,5	22,7	0	342
March	22,8	76,8%	7,33	101,0	6,0	22,6	0	397
April	23,3	76,7%	7,81	101,0	6,0	22,8	0	399
May	24,1	77,3%	7,47	101,0	6,0	23,1	0	437
June	25,0	77,8%	7,22	101,1	5,2	24,0	0	450
July	25,6	78,6%	6,22	101,0	3,6	25,6	0	484
August	26,4	81,0%	5,75	100,9	3,5	27,0	0	508
September	26,9	82,9%	5,97	100,9	4,0	27,6	0	507
October	26,7	79,5%	5,94	100,9	5,1	27,6	0	518
November	25,5	75,5%	5,17	100,9	5,7	26,7	0	465
December	23,6	74,8%	4,53	101,0	6,5	25,1	0	422
Annual	24,6	77,5%	6,25	101,0	5,4	24,9	0	5.312
Measured at	m				10,0	0,0		

