

## SECRETARIAT

# EXPANDING THE REIMBURSEMENT COVERAGE FOR LARGER COE RENEWABLE ENERGY SYSTEMS

## Secretariat Issue Paper # 17

### 1. ISSUE PAPER THEME: Major Equipment

### 2. SUMMARY / BACKGROUND / PREVIOUS HISTORY

In 2023, simplified reimbursement rates for solar PV hybrid systems were adopted in the COE Manual, providing T/PCC clarity on the reimbursement rates they would receive if they deployed renewable energy systems in the field.

The simplified reimbursement rates were adopted for solar PV systems with a nominal capacity ranging between 24 and 150 kilowatt-peak (kWp), used in low penetration configuration working alongside the COE generators, with all the solar PV output being utilised for instantaneous consumption (e.g. no storage of energy). In this configuration, the maximum achievable share of electricity produced by the solar PV is approximately 20%. Given that most COE generators deployed in the field are of a capacity equal to or less than 350 KVA, this leads to a maximum solar PV capacity of approximately 150 kWp. Solar PV hybrid systems with a nominal capacity greater than 151 kWp and systems including energy storage remained under special case modalities, with a reimbursement rate to be determined on a case-by-case basis.

Since the promulgation of the COE Manual 2023, 12 COE renewable energy projects have been completed or are at an advanced planning stage, demonstrating the strong interest shown by T/PCCs and partner Member States to integrate renewable energy systems into COE electricity generation scheme. More COE renewable energy projects have been pledged by Member States in the context of the 2025 Peacekeeping Ministerial.

One of the COE projects completed to date and three of the projects at the late planning stage involve the installation of solar PV systems with a nominal capacity exceeding the 151 kWp threshold and with the inclusion of energy storage to achieve a higher renewable energy share.

### 3. DETAILED PROPOSAL

It is proposed to expand the reimbursement rate coverage in the COE Manual (Chapter 8, Annex A) to include pre-determined reimbursement modalities for renewable energy systems with a capacity greater than 151 kWp, which general include an energy storage component, categorized as medium-to-high penetration hybrid systems, capable of achieving renewable energy penetrations in the order of 50-80%.

As the ratio between solar PV capacity and energy storage can vary greatly in medium-to-high penetration systems, depending on the site-specific operating conditions and the required renewable energy share it is proposed to adopt a flexible reimbursement approach.

This involves the addition in Chapter 8, Annex A of the COE Manual of separate unit rates for the solar PV system component (1500 US\$ per kWp of nominal peak capacity) and for the energy storage system component (330 US\$ per kWh of nominal capacity) based on a generic market fair value (GMFV) estimated using existing system contracts in use by the UN as reference. It is proposed to apply the same GMFV unit rate for energy storage system when such a system is added to an existing COE solar PV hybrid system, as detailed in a new footnote.

It is also proposed to add a line pertaining to portable deployable renewable energy system for use as primary electricity source in temporary operating settings, while using special case modalities as the GMFV may be highly dependent upon the transportation means (e.g. self-propelled vehicle, containerized solution for transportation on flatbed truck, etc.).

Lastly, it is proposed to add a bullet point to chapter 3, annex A, paragraph 12 to clarify that existing COE generators may become redundant, oversized or no longer needed as the primary power source when a hybrid renewable energy system is implemented in a contingent camp.

## 4. FINANCIAL IMPLICATIONS

As the deployment of COE renewable energy systems remains optional, there are no predetermined financial implications at the organizational level. However, similar to the amendments made for the COE Manual 2023, the proposed reimbursement rates for systems with a nominal capacity greater than 151 kwp and for energy storage systems will allow to provide an acceptable payback period for T/PCC and a neutral or positive business case for the UN, considering the projected fuel savings from COE electricity production.

## 5. PROPOSED 2026 COE MANUAL TEXT

Chapter 3, annex A, include bold text and add a new bullet.

12. The provision of equipment that generates electricity from renewable energy to replace any or all of the fuel generators is **strongly encouraged to reduce the contingent reliance on diesel fuel for electricity generation and improve its energy autonomy in case of crisis or prolonged disruption of the diesel fuel supply chain**. Such provision will either be assessed on a wet lease reimbursement rate or as a special case, depending on the type of system, as detailed in chapter 8, annex A.<sup>12</sup>

New bullet added after the first two bullets under paragraph 12.

- **When a COE renewable energy system is deployed in the field, existing COE generators may become oversized or redundant as primary power sources. Such COE generators shall be repatriated at UN expense or disposed.**

Chapter 8, annex A, add the bold text and remove text in bold with a strikethrough.

## Annex A

### Reimbursement rates for major equipment under a wet lease or dry lease arrangement

(United States dollars)

| Category of equipment                                                                                                                   | Type of equipment                                                                                                                                                                                                     | Generic fair market value      | Estimated useful life in years | Maintenance rate | Monthly dry lease rate | Monthly wet lease rate | No-fault incident factor (percentage) | Monthly non-United Nations POL | Painting rate | Repainting rate |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------|------------------|------------------------|------------------------|---------------------------------------|--------------------------------|---------------|-----------------|
| <b>Electrical equipment</b>                                                                                                             |                                                                                                                                                                                                                       |                                |                                |                  |                        |                        |                                       |                                |               |                 |
| Renewable energy – solar photovoltaic system integrated with diesel generator(s) in a hybrid low-penetration configuration <sup>q</sup> | 24-36 kWp nominal capacity (integrated in a hybrid system with a 101-150 kVA total capacity) <sup>q</sup>                                                                                                             | 49 740                         | 7                              | 90               | 600                    | 690                    | 0.2                                   |                                |               |                 |
|                                                                                                                                         | 37-48 kWp nominal capacity (integrated in a hybrid system with a 151-200 kVA total capacity) <sup>q</sup>                                                                                                             | 70 434                         | 7                              | 128              | 850                    | 978                    | 0.2                                   |                                |               |                 |
|                                                                                                                                         | 49-80 kWp nominal capacity (integrated in a hybrid system with a 201-300 kVA total capacity) <sup>q</sup>                                                                                                             | 106 860                        | 7                              | 193              | 1 290                  | 1 483                  | 0.2                                   |                                |               |                 |
|                                                                                                                                         | 81-120 kWp nominal capacity (integrated in a hybrid system with a 331-500 kVA total capacity) <sup>q</sup>                                                                                                            | 166 500                        | 7                              | 301              | 2 010                  | 2 311                  | 0.2                                   |                                |               |                 |
|                                                                                                                                         | 121-150 kWp nominal capacity (integrated in a hybrid system with a 500-625 kVA total capacity) <sup>q</sup>                                                                                                           | 224 505                        | 7                              | 406              | 2 710                  | 3 116                  | 0.2                                   |                                |               |                 |
|                                                                                                                                         | <del>Greater than 151 kWp nominal capacity (integrated in a hybrid system with a greater than 626 kVA total capacity)<sup>q</sup></del>                                                                               | <del>Special case</del>        |                                |                  |                        |                        |                                       |                                |               |                 |
| Renewable energy system components – medium and high penetration system <sup>r</sup>                                                    | Solar PV system component (unit rate per kWp nominal capacity for the solar PV system) <sup>x</sup>                                                                                                                   | 1500 US\$ per kWp <sup>y</sup> | 7                              | 3 US\$ per kWp   | 18 US\$ per kWp        | 21 US\$ per kWp        | 0.2                                   |                                |               |                 |
|                                                                                                                                         | Energy storage system component <sup>u</sup> (unit rate per kWh capacity for the storage system) – as part of a new COE medium-to-high penetration system or as an addition to an existing COE low penetration system | 330 US\$ per kWh <sup>z</sup>  | 7                              | 1 US\$ per kWh   | 4 US\$ per kWh         | 5 US\$ per kWh         | 0.2                                   |                                |               |                 |

| Category of equipment                   | Type of equipment                                                                                                                                                        | Generic fair market value | Estimated useful life in years | Maintenance rate | Monthly dry lease rate | Monthly wet lease rate | No-fault incident factor (percentage) | Monthly non-United Nations POL | Painting rate | Repainting rate |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------|------------------|------------------------|------------------------|---------------------------------------|--------------------------------|---------------|-----------------|
| Other types of renewable energy systems | <del>Renewable energy storage systems "</del>                                                                                                                            | <del>Special case</del>   |                                |                  |                        |                        |                                       |                                |               |                 |
|                                         | <del>Medium and high penetration hybrid systems power penetration (photovoltaic peak power kW to generator 100 per cent load rating kW) of greater than 35 percent</del> | <del>Special case</del>   |                                |                  |                        |                        |                                       |                                |               |                 |
|                                         | <del>Autonomous photovoltaic and battery systems, with or without backup or peak demand generators</del>                                                                 | <del>Special case</del>   |                                |                  |                        |                        |                                       |                                |               |                 |
|                                         | Portable and deployable renewable energy system for use as primary electricity source in temporary operating settings                                                    | Special case              |                                |                  |                        |                        |                                       |                                |               |                 |
|                                         | Solar photovoltaic area and street lighting units, equipped with LEDs, batteries and sensors-timers                                                                      | Special case              |                                |                  |                        |                        |                                       |                                |               |                 |
|                                         | Other renewable energy systems <b>not based on solar photovoltaic technology"</b>                                                                                        | Special case              |                                |                  |                        |                        |                                       |                                |               |                 |

Chapter 8, annex A, add the bold text, remove text in bold with a strikethrough and revise the order of the footnotes.

(Footnotes to annex A)

<sup>q</sup> Solar photovoltaic system integrated with diesel generator(s) where the solar photovoltaic system can provide between 25 and 35 per cent of the generator 100 per cent load rating as expressed in kW ( $kW = KVA \times 0,8$ ). The dry and wet lease rates listed pertain to the reimbursement of the solar PV system only. **The Ggenerators(s) is (are) to be reimbursed based on the applicable rates for the *generators, stationary and mobile*, and *generators ISO 8528 prime power standards and role generator*, categories as listed in at ~~chap~~ **Chapter 8**, annex A.**

<sup>w</sup> **The total reimbursement for a medium to high penetration would be calculated by adding the wet lease rates for each of three components of the system, based on the rates shown in annex A, namely wet lease for the diesel generators, the wet lease for the solar PV system component and the wet lease for the energy storage system (when applicable).**

<sup>x</sup> **The wet lease rate is to be calculated by multiplying the generic fair market value unit rate (1500 US\$ per kWp) by the nominal peak capacity of the solar PV system component as expressed in kWp based on the system scoping and engineering design**

<sup>y</sup> **Inclusive of all components (e.g. solar PV panels, inverters, controllers, cabling, mounting structure, etc.), delivery to the site of installation, and system construction, installation and commissioning**

<sup>n</sup> **Renewable energy storage systems are to be used in conjunction with a solar PV system in low, ~~or~~ medium- or high penetration hybrid configuration. The wet lease rate is to be calculated by multiplying the generic fair market value unit rate (330 US\$ per kWp) by the nominal capacity of the energy storage system component as expressed in kWh based on the system scoping and engineering design.**

<sup>z</sup> **Inclusive of all components (e.g. batteries, battery management system, cabling, mounting structure, etc.), delivery to the site of installation, and system construction, installation and commissioning.**

<sup>v</sup> ~~Renewable energy storage systems are to be used in conjunction with a solar photovoltaic system in low or medium penetration hybrid configurations.~~ **Other renewable energy systems not based on solar photovoltaic technology can include solar thin film technology, wind energy and other types of energy produced using renewable energy sources, not based on fossil fuel.**