

## DOCUMENT TITLE: Peer Review: Corporate Environment Management of UN Environment 2014

### SUBTITLE 1: *What is the Peer Review Process?*

The Peer Review Project began in 2012, and was initiated by the United Nation's Environment Management Group. The Project aims to review the environmental sustainability profile and performance of international organizations who are Members of the Group. Peer reviewing refers to one or more of the Group's Members reviewing the environmental performance of fellow Members' facilities and internal operations.

### SUBTITLE 2: *Peer Review Technicalities*

The Process is undertaken by Peer Review Teams comprising technical experts, UN and international organization representatives, and local government authorities, with support and coordination for the Peer Review teams being provided by the EMG Secretariat. The Process relies solely on data and information which are made available by the reviewed UN entities. Achievements, challenges, good practices and lessons learned are then identified and recommendations are proposed which could be useful for the reviewed entity and to the wider UN system.

### SUBTITLE 3: *UN Environment Background*

UN Environment at Nairobi has over 500 staff and the Geneva and Paris offices host between 100 to 200 staff each. UN Environment began its Corporate Environmental Management initiatives with the implementation of its Climate Neutral Strategy, and has been Climate Neutral since 2008. Since this Peer Review, an Environment Management System is in place, with the Environmental Policy having been signed, the EMS manual approved and action plans developed. This will provide a management framework to help monitor, measure and reduce waste generation in all UN Environment offices; and undertake staff sensitization on internal environmental sustainability matters. Additionally, UN Environment has a full time sustainability focal point (Climate Neutral Officer) based in Nairobi; and also hosts the Sustainable UN facility which supports UN entities in their corporate environment management initiatives.

### SUBTITLE 4: *A Peer Review of UN Environment*

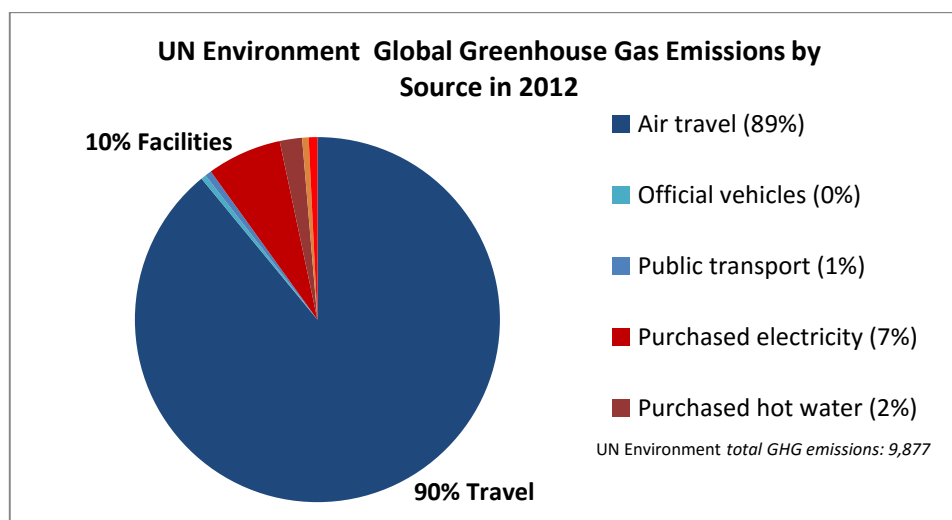
Site visits of the Nairobi and Geneva offices began in late 2013, with reviewers coming from UN Habitat, United Nations Industrial Development Organisation and World Food Programme, with support from the Environment Management Group Secretariat. A detailed analysis was carried out at the Nairobi and Geneva offices, including a wider analysis of UN Environment offices worldwide. UN Environment chose 4 topics to be reviewed against:

1. Greenhouse gas emissions and management related to air travel.
2. Greenhouse gas emissions from facilities.
3. Waste management at facilities.
4. Water management at facilities.

#### **Air Travel-Related Greenhouse Gas Emissions And Management**

### SUBTITLE 1: *Status in 2014*

Air travel accounts for almost 90% of UN Environment's greenhouse gas emissions. Whilst maintaining compliance with the UN Secretariat Administrative Instruction on air travel, UN Environment engages in around 8,000 to 11,000 air trips per year. Half of these are undertaken by meeting participants funded by Un Environment. An overview is provided below, highlighting the percentage of Un Environment global greenhouse gas emissions by source. Also below is a selection of the many recommendations put forward in the final UN Environment Peer Review Report.



The following information has been selected from the achievements, challenges and recommendations provided in the UN Environment Peer Review Report. For the complete list, please visit the final Report.

## **SUBTITLE 2: *Achievements in 2014***

1. A reduction in air travel emissions:  
UN Environment's greenhouse gas emissions from air travel peaked in 2010. However, since then they have been decreasing, with a 16% decrease per capita between 2011 and 2012. Moreover, in 2012 there was a 17% decrease in the number of flights per capita, an 8% decrease in km travelled per capita and a 16% decrease in greenhouse gas emissions per capita.
2. A Carbon tax: Since 2008, UN Environment has been charging its various divisions with a carbon tax relating to air travel and facilities-related greenhouse gas emissions. This tax is collected in a Climate Neutral Fund, and is used to purchase carbon offsets, fund emission reduction and other environmental management activities, and to finance staff involved.
3. A reduction and avoidance in travel demand: UN Environment travel rules specify that other options to avoid air travel should be considered before approving travel; e-communication is also encouraged. Furthermore, missions in nearby areas are bundled together to reduce travel-related emissions and where possible, the use of trains in place of planes and economy class air travel is encouraged.

## **SUBTITLE 3: *Challenges in 2014***

1. Planning, implementation and monitoring:  
There is no strategy/policy and little live monitoring of air travel-related greenhouse gas emissions, aside from general intention by staff and guidance, including that provided in the Climate Neutral Strategy. In addition, the UN Greenhouse Gas Inventory exercise which provides some air travel monitoring faces challenges, as this is undertaken annually thus feedback regarding divisions on performance is infrequent.
2. ICT Infrastructure:  
UN Environment in Nairobi reported that there were serious issues with the ICT infrastructure, which affects the ability to displace air travel by using other means of communication. However, at present there seem to be limited options to reduce flights through an e-communication route. The United Nations Office at Nairobi serves as the ICT service provider for UN Environment, Nairobi; hence it is central for a solution to this issue.
3. Change in travel rules:  
The previous rule of the most direct or economical route for missions has now shifted entirely to the most economical, since August 2013. As a result, many trips might have much longer routes or more connecting flights, leading to more emissions.

## **SUBTITLE 4: *Recommendations in 2014***

1. Implementing a system focussing on emission reduction measures and monitoring:  
Air travel emissions being the largest of the emission sources for UN Environment, should be more comprehensively monitored to facilitate reductions.
2. Air travel emission versus programmatic performance and staff productivity:  
Reducing air travel benefits may come at the expense of programme delivery or staff productivity. A more holistic strategy to correlate air travel emissions with performance and staff productivity is necessary.
3. Monitoring of avoided emissions:  
UN Environment should develop a methodology and system to record and monitor avoided emissions; for example, when a videoconference is carried out. This will encourage good performers and will also give a better idea of progress of UN Environment's climate neutrality.

## **Focussing on the Nairobi Office**

### **Greenhouse Gas Emissions From Facilities**

## **SUBTITLE 1: *Status in 2014***

UN Environment consumes approximately 720,035 kWh of electricity per year for office operations, including lighting, computers, share of data centre and UPS energy use, while the photovoltaic panels can generate an average of 730,000 kWh per year. Much of the potential design benefits of the Nairobi office can be accrued through proper usage, operations and maintenance. However, many building users are not aware of their share in ensuring cross ventilation and energy savings whilst using the building. Furthermore, since maintenance and operations are not the responsibility of UN Environment, there is limited power to enforce all necessary measures to reduce greenhouse gas emissions.

## **SUBTITLE 2: *Achievements in 2014***

Greenhouse gas emissions from the Nairobi office are estimated to be relatively low due to the following:

1. Passive Design Features:

The north-south building orientation ensures maximum natural light gain and an open design allowing natural ventilation. Motion and luminosity sensors to switch off and adjust lights, laptop computers, light wells and an open office plan also contribute to lowering energy consumption.

2. Solar Photovoltaics power and solar water heaters:

Help to reduce the building's fossil fuel dependency.

3. Indigenous species in the atrium:

These help with evaporative cooling and ventilation within the building.

## **SUBTITLE 3: *Challenges in 2014***

1. Slightly excessive and uneven heating flaws within the building:

- a. There is inadequate external sun shading in some areas of the building.
- b. The glazed roof lights designed to increase daylight, happen also to increase heat.
- c. A staggered layout means the building is slightly off from the ideal north-south direction leading to sun exposure.

2. Measures to mitigate design flaws:

- a. Due to rising building temperatures, occupants use their own measures which increases energy consumption.
- b. Blinds are often drawn to block sunlight which subsequently leads to artificial lighting requirements and prevents air flow needed to cool down the building's temperatures.
- c. Maintenance and upkeep of green features does not take place.

3. Energy consumption data is not easily available and electricity consumption is relatively high:

This is partly due to the lack of a sub-metering system to have disaggregated data from the rest of the compound and measure NOF's energy consumption; and the hosting of the compound's data centre in NOF's basement, which was not initially planned for that purpose. The data centre consumes as much as the office facilities in NOF.

## **SUBTITLE 4: *Recommendations in 2014***

1. Monitoring/tracking energy performance:

Monthly fuel consumption and electricity generation from diesel generators should be monitored; presently, only consumption of diesel is monitored which is not useful for performance analysis.

2. Avoiding direct solar gains:

Better technologies should be investigated, to capture sunlight and spread it inside the building in an efficient manner while avoiding the heat from the sun. Thermal comfort in the building is affected by heat entering through the rooftop. Consequently, work spaces like the fully-glazed cubicles on each floor are affected; moveable slats designed to admit air, along with fans are recommended for these cubicles.

3. Maintenance of the solar photovoltaic system:

The solar photovoltaic panels should be properly cleaned since a layer of dust is visible on all the panels, which reduces output from the panels and incurs a 2% loss in performance. Per year, this equates to 15,000 kWh of solar electricity. It was also observed that better maintenance of the system is required. Unsafe practices, such as leaving exposed wires on the roof should also be avoided.

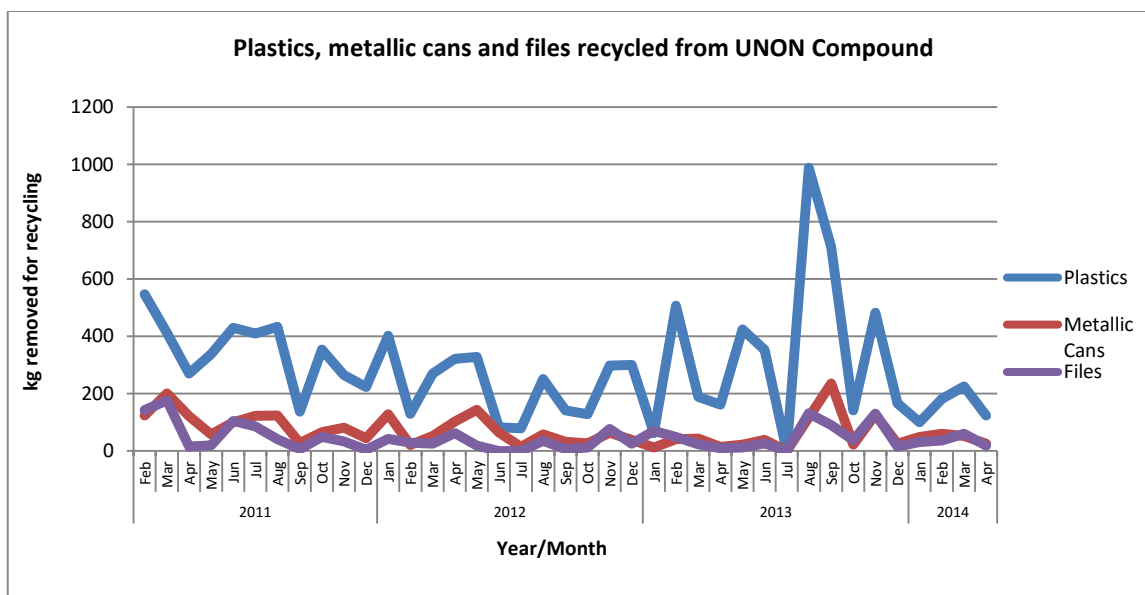
## **Waste Management At Facilities**

### **SUBTITLE 1: *Status in 2014***

UN Environment does not have a specific waste management policy globally nor at the Nairobi office, although certain waste management practices exist to some extent. The major waste streams identified are "typical" of office-generated waste. In 2013:

- 63,684 kg of recyclable waste was removed from the United Nations of Nairobi (UNON) site: 91% of this was mixed paper or cardboard.
- When combined with mixed waste which is sent to landfill (575,625 kg in 2013), the average staff member at UNON generates 183 kg of waste per year.

The graph below highlights the total captured recycling in kg, for the three "typical" waste streams.



## **SUBTITLE 2: Achievements in 2014**

1. Step by Step Environmental Volunteer Group:  
Although waste is not separated at source in the UN Environment Nairobi offices, staff have contributed through the Step by Step environmental volunteer group to establish the Near Zero Waste Station where recyclable content is sorted from mixed waste collected throughout the United Nations Office at Nairobi compound.
2. A reduction in the volume of printed materials:  
The volume of printed materials produced for the UN Environment annual meetings in Nairobi has been reduced significantly since the 1998 decision to provide parliamentary documents electronically rather than printing them by default.

## **SUBTITLE 3: Challenges in 2014**

1. Determining waste management practices:  
The primary challenge for UN Environment Nairobi is its limited input in determining waste management practices, including sustainable procurement, because these activities are managed by United Nations Office at Nairobi. However, this can also be seen as an opportunity to become more involved in the Nairobi Office's decision making in these areas of work.
2. Obtaining accurate baseline data:  
In all UN Environment locations, obtaining accurate baseline data on the amount of waste generated by UN Environment alone when they occupy shared premises is challenging. While it is important to have accurate baseline information for larger offices to track progress in waste reduction efforts, smaller offices will need to weigh up the costs and benefits of doing so, versus relying solely on the building waste contractor.
3. Staff engagement and awareness:  
Establishing and maintaining staff engagement and awareness around the importance of waste management can be time-consuming, often relying on strong commitment from management and keen individuals.

## **SUBTITLE 4: Recommendations in 2014**

1. Waste assessment:  
Waste data for UN Environment offices alone is not currently available (it is part of the shared compound waste). A thorough waste audit of the UN Environment Nairobi offices would help to establish baseline figures from which to measure impact.
2. Prevention and minimisation:  
There is a need to focus on waste prevention and minimisation. This is particularly important given the limited scope which UN Environment has, to change current waste management practices mandated to UNON; moreover, given the lack of formal waste management systems.
3. Use of ICT:  
Continue to encourage a more electronic way of working throughout UN Environment to reduce paper use.

## Water Management At Facilities

### **SUBTITLE 1: *Status in 2014***

Water is provided by the city of Nairobi and by boreholes at the UN Compound. Rainwater is also harvested for irrigation, fountains and ponds. Water tanks are used on the compound since the water supply is not steady. The water is pumped from the tanks at the ground level to the overhead water storage. A gravity feeding system delivers this water to the buildings. Most of the compound's wastewater is treated by an oxygenation wetland, but the Nairobi office building has its own facility to treat and purify water for irrigation purposes. However, no water consumption data are available.

### **SUBTITLE 2: *Achievements in 2014***

1. On-site treatment:

Currently, wastewater is entirely treated on site and used for irrigation purposes or released into a wetland. A new state-of-the-art sewage processing plant was built for the UN Environment Nairobi Office. It is located on the north of the building and purifies the water by aeration. The water emerges clean and goes by gravity to the lagoon/wetland on the northern limit of the compound.

2. Rainwater harvesting:

Harvesting rainwater reduces the need for public water for irrigation. All rainwater is harvested from the roof of the Nairobi Office and goes to the pond and fountain at the western entrance. From there it goes by gravity to the four fountains of the other Nairobi Office buildings. When the last fountain on the east side is full, the water goes through a pipe and is fed by gravity to the lagoon/wetland on the northern limit of the compound. It is then used for irrigation and landscaping purposes in the internal and external garden areas.

3. Easy and low maintenance:

Water distribution has been designed to require an easy and low maintenance, so little time and money is spent on ensuring maintenance.

4. Replacing plastic bottled-water with glass-bottled water:

Since this Peer Review was undertaken, the Nairobi Office has rectified the wide-spread use of plastic bottles for drinking water, and have now replaced these with glass bottles. As the public water potability is not ensured at all time, bottled water is required.

### **SUBTITLE 3: *Challenges in 2014***

1. Lack of data:

Water consumption data is not available due to a lack of metering or other issues around the Nairobi Office.

2. Rainwater and treated wastewater management:

Rainwater and treated wastewater are sometimes not sufficient to ensure irrigation demand. The need for irrigation should be minimised in order to avoid using municipal water for irrigation.

### **SUBTITLE 4: *Recommendations in 2014***

1. Water metering:

Water metering is required, and should be linked to a Building Management System. With this link, it will be possible to detect leaks.

2. Wastewater treatment:

Wastewater treatment is efficient but requires electricity. The wetland treatment may not be so efficient and requires a large space. Alternative systems like plant-soil wastewater filters should be considered.

3. Priorities for water shortage:

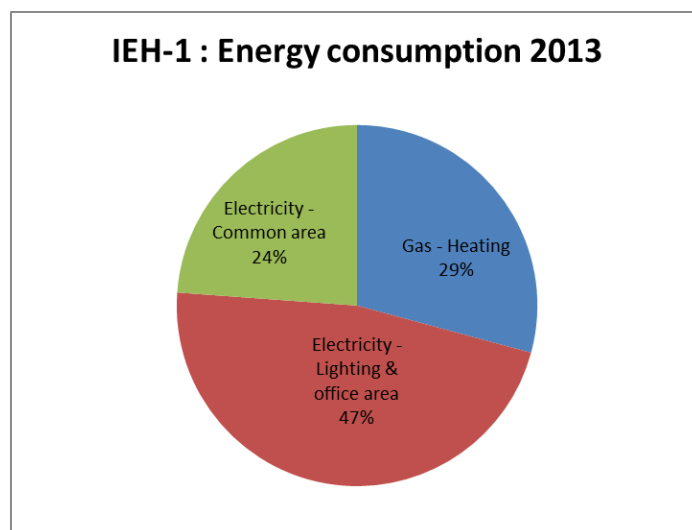
Priorities should be identified for irrigated areas in order to switch off some irrigation systems in case of a recycled water shortage.

## **Focussing on the Geneva Office**

### **Greenhouse Gas Emissions From Facilities**

#### **SUBTITLE 1: *Status in 2014***

The main forms of energy used in the building are electricity for cooling and domestic hot water. Hot water used for space heating is purchased from the neighbouring building, where natural gas is used to produce it. Also, solar photovoltaic panels on the building's rooftop contribute partially to meet the electricity demand of the building. Below is an overview which breaks down energy consumption in 2013 at the International Environment House 1 in Geneva.



### **SUBTITLE 2: Achievements in 2014**

1. Temperature settings:  
The International Environment House 1 is very efficient in terms of energy consumption, with conservative indoor temperature settings.
2. Heating and cooling:  
Energy consumption for heating/cooling and electricity used by the Heating, Ventilation and Air Conditioning system is about 33 kWh/m<sup>2</sup>.year which is lower than the Swiss Environmental rating for renovated buildings – Minergie – at 38 kWh/m<sup>2</sup>.year.
3. Lighting:  
The building, through its daylight sensor system, tries to optimise daylight availability to the extent possible.

### **SUBTITLE 3: Challenges in 2014**

The monitoring results identified a few areas of concern:

1. Level of humidity:  
Relative humidity levels have been consistently reported to be below the comfort threshold. Measured values are below the recommended range (30 to 60%) in a majority of cases.
2. Level of CO<sub>2</sub>:  
Elevated CO<sub>2</sub> concentrations have been measured, suggesting inadequate ventilation. Indoor Air Quality survey carried out in 2013-2014 highlighted that daily CO<sub>2</sub> levels in some offices exceeded 1000 ppm.
3. Level of microbiological contamination:  
High microbiological contamination of surfaces was found.

### **SUBTITLE 4: Recommendations in 2014**

1. Energy recovery:  
Energy from the exhaust of the Heating, Ventilation and Air Conditioning system is currently not being recovered. A study could consider the feasibility of installing energy recovery heat exchangers to save a considerable amount of energy.
2. Automatic temperature sensors:  
Occupants have the option to open windows, but there are no contact sensors on windows for turning off the cooling system when opened. Hence, staff should be reminded of how the system works so as to reduce cooling demand.
3. Motion and CO<sub>2</sub> sensors for lighting:  
Motion sensors used in some toilets should be replicated throughout the building. Monitoring CO<sub>2</sub> levels can also allow the facility managers to react to the need for greater fresh air intake.

## Waste Management At Facilities

### **SUBTITLE 1: *Status in 2014***

UN Environment itself does not have a specific waste management policy in Geneva, although standard waste management practices exist. Paper and printed materials are the major solid waste constituents; during 2013, recycled waste paper per staff member removed from UN Environment Geneva amounted to around 150 kg per staff.

### **SUBTITLE 2: *Achievements in 2014***

1. Waste food sorting and collection:

The sorting and collection of food waste from the kitchen and cafeteria is well organised and controlled by the City of Geneva. Local organic food products are encouraged. Moreover, staff members are encouraged to use their own cups rather than disposables. Unused food is collected and redistributed through local charity associations.

2. Office waste sorting:

Sorting of office waste is carried out in the basement of International Environment House 1, which is well organised and clean with clear labelling.

## Water Management At Facilities

### **SUBTITLE 1: *Status in 2014***

Water is provided by Services Industriels de Genève (who also provide electricity) to International Environment House 1 premises. There is no provision for ground water extraction. Magnetic water softeners are used only for the kitchen and the cooling tower, whilst rainwater is discharged into the public sewage system.

### **SUBTITLE 2: *Achievements in 2014***

1. Water efficiency:

Aerators were installed on faucets in 2008; however, no sensors have been installed due to probable cost and maintenance issues. Water fountains are no longer used because the tap water is potable.

### **SUBTITLE 3: *Challenges in 2014***

1. Fairly high per capita water consumption:

The per capita water consumption is around 11.5 m<sup>3</sup>/person/year, which is quite high compared, for example, to the UK Government targets of 7.7 m<sup>3</sup>/person/year.

### **SUBTITLE 4: *Recommendations in 2014***

1. Water balance and audit:

A water balance and audit should be undertaken to identify the actual reasons for the excessive water consumption. Connecting water meters to the Building Management System would give instant information about water consumption. Hence, an alarm can be set if any water is consumed at night resulting from a leak.