UN Compound Beijing Peer Review Executive Summary

The key findings and recommendations of the Peer Review conducted by the United Nations Environment Management Group on the corporate environmental management of the UN Compound in Beijing are presented here. The purpose of this summary is to share the lessons learned in the Peer Review process and to highlight possible areas of focus and collaboration among UN and related agencies in corporate environmental management.

For more detailed information on the report please contact the EMG Secretariat at emg@un.org

The Peer Review Process

The Peer Review is undertaken by a team comprising technical experts, representatives of UN entities, international organizations and local government authorities, with support and coordination provided by the EMG Secretariat. The Peer Review Team analyses data and information shared by the reviewed agency and gathered during site visit of the reviewed facility(ies). Achievements, challenges, good practices and lessons learned in approaches to corporate environmental management are then identified and compiled in the Peer Review Report, along with proposed recommendations. These recommendations focus on how the environmental performance of the reviewed entity could be improved, ensuring greater resource efficiency, and economic and social sustainability.

A peer review of the UNHCR Office in Kakuma

The peer-review of UNHCR was conducted with a visit to the premises on the 23-27th October 2017. The site visits allowed the peer review team to visit the facilities of the UN Compound, UNIFCEF, UN Women, and WHO in Beijing.

The Executive Summary shares the findings in terms of the status, achievements, challenges, and recommendations. The full version of the report presents the same topics more comprehensively.

In the spirit of the Peer Review, the recommendations are non-binding and subject to validation by the Peer Review Body. The good practices, lessons learnt, and the recommendations are expected to help the UN Compound Beijing in its efforts to improve its environmental performance. It is advisable that the UN Compound conducts a more detailed analysis of the recommendations to confirm the expected environmental and economic benefits and their technical and organisational feasibility.

UN Compound Beijing: Facilities

Energy

Successes

Energy use during after-office hours was well-managed within the compound, using an average of 97% less energy than is used during the day.

Challenges

In the UN Compound, energy consumption peaks during January and July, the hottest and coldest months of the year, due to the increase in use of heating in the Winter and the increased use of cooling in Summer.

Recommendations

It is recommended to install a power and energy monitoring system within the compound, to monitor the real-time production, storage, and usage of electricity. Ideally, this monitoring system will produce automatic reports of the energy usage.

Although the phantom load is relatively low, at 9Kw during unoccupied hours, there are likely to be multiple low-hanging fruit to reduce the phantom load consumption. It is recommended that these easy-fixes are targeted to reduce the energy consumption by up to 50%.

PV

Successes

A 30kW photovoltaic is installed on the roof of the compound, which has been operational for several years.

Lighting

Successes

Both daylight and motion sensors were used to control lighting attached to the entrance door, which ensures lighting is only used when necessary.

Throughout the majority of the UN Compound, the lighting level was seen to be within the recommended standards for optimal productivity and energy efficiency.

Challenges

Throughout the UN Compound, many inefficient lights were used, including incandescent light bulbs and compact fluorescent downlights.

Lighting is also not circuited to harness daylight, with many offices being unable to turn lights next to the window off without also turning the lights furthest from the window off.

Recommendations

Conducting a complete retrofit of the lighting system, including recircuiting lights and replacing bulbs with energy efficient LED alternatives, within the facility would increase the energy efficiency of lighting within the Compound. Additionally, it is recommended to install motion sensors in bathrooms and little used corridors and common areas to ensure lighting is not used unnecessarily.

It is recommended to introduce task lights in working areas, to ensure that entire offices are not lit up unnecessarily.

Heating and Air-Conditioning

Challenges

The air-conditioner system which operates in the data-centre runs continuously, but is found to be the second least efficient category air conditioning system.

Throughout the compound, the majority of split-unit refrigerant pipes were found to be poorly insulated near the inlet and outlet valves of the compressors.

Recommendations

It is recommended to utilise an inverter-based multi-split air-conditioning unit, as this is more likely to operate at part load – and thus at its highest efficiency – most of the time.

It is recommended that the UN Compound installs its own heating system, in order to reduce financial costs and the associated greenhouse gas emissions compared to the centralised district heating network which operates using coal.

It is also recommended to install a heat-pump in combination with the thermal storage system, as this produces a large volume of heat for a lower energy consumption. There is an estimated maximum payback time of 10 years for this recommendation. This system could also be utilised for cooling in the summer, if the air conditioning system was replaced with water-based fan-coil units.

It is recommended that outdoor compressors are kept free from obstructions, to allow the units to be operating efficiently.

It is recommended that the most efficient split-unit air conditioner is installed in the data-centre, to reduce energy consumption. The air-conditioner system which operates in the data-centre runs continuously, but is found to be the second least efficient category air conditioning system.

It is recommended that the exposed pipes are insulated to prevent unnecessary energy losses. The pipe holes in walls should also be properly sealed to prevent air leakages into the building.

It is recommended to install thermostats on all radiators within the compound, to provide better opportunities for temperature control, and thus reduced energy consumption, within the buildings. This does not provide any financial gain due to the centralised heating system, but will reduce energy consumption overall.

Electrical Devices

Successes

The UN Compound had at least 3 electric car charging stations throughout the compound.

Refrigerators found within the compound were mostly rated as having levels of high efficiency.

The majority of printers within the Compound are shared, which reduces energy consumption.

Challenges

There are several personal printers within the Compound, and it is recommended that unless they are used for highly confidential documents, their use should be limited.

Within the Compound there is a relatively high use of desktop computers, with 60 out of 120 staff members using desktops as opposed to laptops. Desktop computers use 70% more energy than laptops, so this increases energy consumption significantly.

The data centre was recorded to be operating in a room temperature of 18 degrees Celsius, which is too cool for the datacentre to be operating at maximum efficiency.

Recommendations

Any inefficient refrigerators should be replaced with the lowest cost, highest efficiency labelled refrigerator, when the UN Compound is purchasing a refrigerator.

It is recommended to switch desktop computers to laptop computers when they reach the end of their life-span.

It is recommended that the data centre room temperature is maintained at 25 degrees Celsius to prevent the occurrence of server and storage failure rates.

Office Environment

Successes

Throughout the compound there were well-managed greeneries, both indoor and outdoor. Indoor greeneries have been found to increase occupant productivity, as well as improving internal air quality.

Across the compound, some doors are double-sealed, and windows also being double-glazed and sealed well. The measured CO2 data indicates that the building is air-tight, with CO2 levels lower than the limit of 1100ppm for most offices.

Challenges

The compound does not have a mechanical fresh-air supply system, with any infiltration resulting from leakages of outdoor air into the building. This can increase energy consumption.

Some densely-populated rooms, including a meeting room, were found to have CO2 levels above 2000ppm.

Many of the offices were found to have an uncomfortable room temperature, of between 21 and 30 degrees Celsius.

Recommendations

It is recommended that in densely-populated rooms, fresh air supply fans which operate based on a CO2 sensor, to ensure that air quality in these rooms is appropriate.

It is recommended to install a reversible ceiling fan in office spaces, to ensure that the air is circulated thoroughly to provide comfortable conditions in both Winter and Summer.

It is recommended to set the room temperature set-point as closer to the outdoor condition, to reduce energy consumption and also to ensure the room temperature is more comfortable.

Training and Awareness

Recommendations

It is recommended that technical training and information sharing on energy efficiency and sustainability are conducted regularly. These programmes should be designed to inform staff of how to also apply this knowledge into their homes.