UNEP

United Nations Environment Programme

Sustainable
United Nations

132%
increase in
emissions
by 2050*

76%
increase in
emissions
by 2050

A Guide to Greenhouse Gas Emission Reduction in UN Organizations
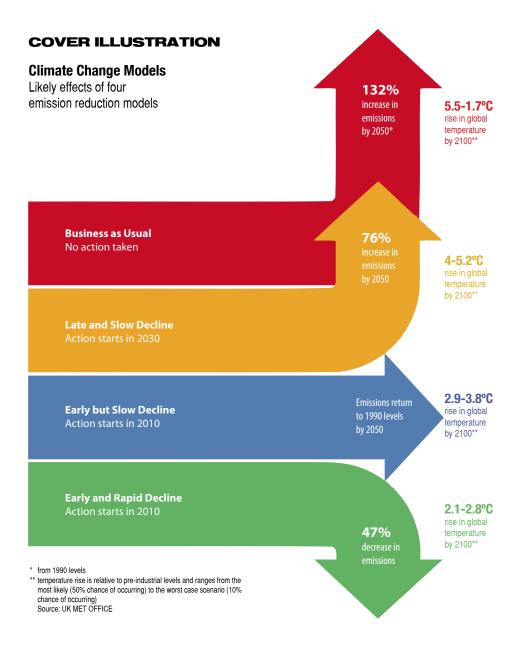
Business as Usual
No action taken

Late and Slow Decline
Action starts in 2030

Early but Slow Decline
Action starts in 2010

Emissions return
to 1990 levels
by 2050

Early and Rapid Decline
Action starts in 2010

47%
decrease in
emissions

COVER ILLUSTRATION

Climate Change Models
Likely effects of four
emission reduction models

132%
increase in
emissions
by 2050*

5.5-1.7ºC
rise in global
temperature
by 2100**

Business as Usual
No action taken

76%
increase in
emissions
by 2050

4-5.2ºC
rise in global
temperature
by 2100**

Late and Slow Decline
Action starts in 2030

Early but Slow Decline
Action starts in 2010

Emissions return
to 1990 levels
by 2050

2.9-3.8ºC
rise in global
temperature
by 2100**

Early and Rapid Decline
Action starts in 2010

2.1-2.8ºC
rise in global
temperature
by 2100**

47%
decrease in
emissions

* from 1990 levels
** temperature rise is relative to pre-industrial levels and ranges from the
  most likely (50% chance of occurring) to the worst case scenario (10%
  chance of occurring)
  Source: UK MET OFFICE

Disclaimer

UNEP
promotes environ-
mentally sound practices
globally. This document is pub-
lished in electronic format only thereby
eliminating the use of paper, ink, and
transport emissions. You are encouraged
print it only when absolutely necessary.
UNEP will print the document on de-
mand on 100% recycled paper.

A Guide to Greenhouse Gas Emission Reduction in UN Organizations

ABOUT THIS GUIDE

This Guide serves to provide an overview of approaches to reducing emissions of greenhouse gases from UN organizations, within the boundaries set in the UN Climate Neutral Strategy. The Guide offers a generic model for how to approach emission reduction, along with key emission reduction options in different areas. For more detailed information about each option, the reader is encouraged to consult the tools and resources that will be made available on the Climate Neutral Website (http://www.unemg.org/climateneutralun/).

The Guide consists of four chapters:
1. A list of generic emission reduction options in different aspects of common UN operations.
2. An introduction to basic concepts and approaches relevant to emission reduction.
3. An extended description of the emission reduction options listed in Chapter I
4. How to get started.

The guide is intended as an introduction and does not attempt to give in-depth implementation instruction for individual emission reduction options, nor to list every possible emission reduction opportunity. Its value is in directing the reader towards areas where such opportunities typically exist.

The Guide will be updated and expanded over time in line with lessons learned from various parts of the UN system. Feedback and comments on how the Guide can be improved are welcome.

Please contact: sustainable.un@unep.org

CONTENTS

INTRODUCTION

Climate change is today recognized as one of the most serious challenges to the global community, potentially affecting almost all aspects of life across the planet. The United Nations is convening and catalyzing international efforts to reduce the causes and effects of global warming. But more than that, the mandate of each and every UN organization is now affected directly or indirectly by global warming. Climate change is no longer seen as only an environmental problem but the effects on health, food production, economic development, infrastructure, and even peace and security are now commonly recognized. More and more members states are asking that each UN organization are considering climate change in their programs of work. For the UN, walking the talk and reducing our own climate footprint is therefore a matter of high priority. This has also been repeatedly emphasized by Secretary General Ban Ki Moon.

UN's Chief Executive Board (CEB) adopted in late 2007 the UN Climate Neutral Strategy, committing all UN organizations to move towards climate neutrality with three specific targets to be achieved by December 2009:

1. All UN organizations have to prepare annual greenhouse gas inventories. The first inventories (for 2008) are to be ready by the end of 2009.
2. All UN organizations have to start reducing their greenhouse gas emissions.
3. All UN organizations have to consider the implications of purchasing offsets to compensate for emissions they cannot avoid.

Even though the Strategy identifies the end of 2009 as a checkpoint for the implementation of the strategy, it is clear that the work on reducing UN's climate footprint cannot be a one-time effort but has to be sustained and integrated into the daily operation practices of all UN organizations.

The first and third objectives of the strategy – to prepare greenhouse gas inventories and to consider implications of offsetting – are not within the scope of this report but are covered by other reports and guidelines developed by UNEP's Sustainable UN facility (SUN) and the Environment Management Group (EMG). This report aims at providing an introduction to how the second objective – greenhouse gas emission reduction – can be pursued in UN.

This guide is specifically addressing reduction of greenhouse gas emissions from sources covered in the UN Climate Neutral Strategy[1]. However, experience suggests that while reviewing the emission reduction options of an organization, ideas for a wider "greening" of the organization are often generated at the same time. Such ideas may relate to issues such as waste generation, consumption of office supplies, or water savings. Interventions in these areas sometimes also have an indirect effect on the energy consumption and greenhouse gas emissions from the organization. For example, if less hot water is consumed, then less energy is used to heat the water. It is recommended that the organization therefore remains open to consider green options that may not immediately seem relevant to the climate neutral strategy.

---

1. The UN Climate Neutral Strategy covers emissions from all activities that are directly within the control of UN's management, for example emissions related to electricity use, heating/cooling of buildings, travel of staff and meeting participants that UN pays the tickets for, use of official vehicles, and leakage of refrigerants from air conditioning. The Strategy does not include emissions related to procurement, commuting of staff, field projects, or waste treatment.

Chapter I

A Quick List of Emission Reduction Opportunities

Chapter I: A Quick Checklist of Emission Reduction Opportunities

This Quick Checklist summarizes generic emission reduction opportunities that are described in more detail in Chapter III. This list can help the reader to get a fast overview of aspects often included in greenhouse gas emission reduction plans, and may serve as a check list for organizations to aid their emission reduction efforts.

Based on the typical greenhouse gas emission profile of UN organizations, which is also similar to many other organizations, the most prominent sources of emissions are travel and buildings. As is explained in

Chapter II, in order to address these it is often necessary to consider interventions in processes and organizational culture to achieve lasting emission reductions. This Quick Checklist therefore presents material under these four headings. For further information about each option please refer to Chapter III. For information about the definitions and methodologies to identify and evaluate what options may be of relevance in the individual case, please refer to Chapter II.

The following opportunities should be considered as means to reduce greenhouse gas emissions:

A. EMISSION REDUCTION FROM TRAVEL

1. **Travel less**
   - ☐ Take a policy decision to reduce travel by XX%
   - ☐ Bundle long-haul missions to increase the length of the missions but reduce the number of trips
   - ☐ Use local staff to reduce the need for long-haul travel
   - ☐ Reduce the number of participants or staff attending the same meeting
   - ☐ Use alternative means of communication such as virtual (Internet based) meetings

2. **Travel in more efficient ways**
   - ☐ When available, go by train instead of air on short-haul sectors
   - ☐ Encourage travel in economy class instead of business class
   - ☐ Give preference to airlines with modern (low emission) aircrafts
   - ☐ Require travel agents to provide information on low greenhouse gas emission travel alternatives to the "business as usual" option
   - ☐ Require travel agents to highlight on tickets and quotations the associated carbon footprint and offset cost.
   - ☐ Require travel agents to give preference to routings and airlines that minimize the number of landings/takeoffs and use more modern aircraft.

3. **Adopt a sustainable travel policy**
   - ☐ Include time bound emission reduction targets and defined responsibilities for implementation.

4. **Implement rigorous screening of travel need and travel modes**
   - ☐ Establish formal checkpoints in travel planning and approval systems.

5. **Raise awareness on why and how to reduce the travel-related carbon footprint**
   - ☐ Conduct awareness raising and training sessions with concerned staff (travelers, approving managers, travel assistants) and travel agents.

6. **Monitor and compare travel patterns**
   - ☐ Track relevant departments' travels to better manage and set targets for emission reduction.

B. EMISSION REDUCTION FROM BUILDINGS

1. **Passive measures**
   □ Improve insulation of the building envelope

   • Reduce heat transfer through windows
     □ Change from single glass windows to double or triple glass windows
     □ Change from clear glass to e-coated glass
     □ Remove "thermal bridges" between the outside and inside
     □ Improve the seals between the inner and outer window frames
     □ Install exterior shading devices outside the windows

   • Enhance natural daylight in the office
     □ Remove non-structural interior walls, replacing them with transparent walls if appropriate
     □ Remodel the office layout to ensure that the more frequently used spaces are adjacent to windows
     □ Install light shelves; horizontal light-reflecting overhangs that are placed above eye-level and have a high-reflectance upper surface
     □ Use bright/light colors for interior decoration (walls, roof, floor and furniture)
     □ Install skylights (roof windows) or light tubes transmitting daylight into the interior of the building
     □ Leave blinds and curtains open in the daytime if compatible with heating/cooling.

   • Optimize natural ventilation, cooling and heating
     □ Establish ventilation corridors inside the building
     □ Enhance natural ventilation with solar chimneys
     □ Use night time natural cooling in hot climates and day time natural heat accumulation in cold climates
     □ Use under-roof ventilation and green roofs to decrease heat accumulation in hot climates
     □ Benefit from adjacent vegetation to direct or shield the building from prevailing wind flows and direct sunlight
     □ Use heat generated by office equipment to reduce the heating need in cold climates

2. **Active measures**
     □ Switch to energy supply from renewable energy sources or purchase Renewable Energy Certificates
     □ Produce on-site energy from renewable energy sources
     □ Support heating/cooling with earth-energy cooling/heating systems
     □ Reduce heating/cooling needs through heat recovery from the ventilation air
   • Improve the performance of the Heating, Ventilation and Air Conditioning (HVAC) system by conducting a limited assessment or full retro-commissioning of the system. This may result in one or several of the following recommendations:
     □ Complete replacement with a more efficient system
     □ Upgrade or replace parts of the existing equipment
     □ Improve control of the HVAC system (increase the monitoring points, fine tune control parameters, upgrade standard operating procedures etc)
     □ Seal leaks in ducts, clean fans and filters
     □ Improve training of operators
     □ Establish monitoring and feedback systems

- Optimize the efficiency of lighting. Measures include:
  - ☐ Provide the right level of lighting for the activities carried out
  - ☐ Only use high efficiency lamps, such as fluorescent lamps
  - ☐ Change from magnetic to electronic ballast in lamps
  - ☐ Regularly clean lamps/bulbs
  - ☐ Ensure that lights can be turned on individually for each room or work place
  - ☐ Install movement sensors in less frequently used spaces
  - ☐ Install timed central switches

- Reduce energy use by office equipment:
  - ☐ Purchase energy efficient equipment
  - ☐ Activate energy saving features on the equipment
  - ☐ Ensure that equipment is turned off when the work day is over
  - ☐ Completely unplug electric equipment when possible, e.g. at night and on weekends
  - ☐ Replace individual equipment with common high-efficiency equipment:
  - ☐ Move from individual printers to Local Area Network (LAN) connected high-efficiency common printers/copying machines/scanners
  - ☐ Replace physical servers with virtual servers

3. **Building management measures**
   - ☐ Commissioning all new systems and upgrades of existing systems
   - ☐ Retro-commission existing systems
   - ☐ Define, monitor and report on the key parameters of the energy systems (e.g. energy use, air speed, temperatures)
   - ☐ As part of the above, set the indoor temperature so that it meets comfort levels without wasting energy on over heating or over cooling.
   - ☐ Use automated building management systems.
   - ☐ Provide training for key staff on proper operation and management of the building energy systems.
   - ☐ Encourage energy saving behaviour among the building users.

C. EMISSION REDUCTION THROUGH PROCESSES

- ☐ Provide training on sustainable procurement to enable procurement of climate friendly goods and services
- ☐ Pursue increased use of on-line administrative tools and paperless administration
- ☐ Consistently reflect cost savings associated with emission reduction measures, such as energy savings and avoided offset costs
- Adopt and implement a policy to conduct all meetings as green meetings, e.g.:
  - ☐ Reduce the overall number of international meetings and overall number of participants. Use means of e-communication instead of physical meetings when possible.
  - ☐ Select venues to minimize the need for long-haul travel and local environmental impact.
  - ☐ Provide catering services that meet criteria for safe production and fair trade.
  - ☐ Avoid the use of disposable plates, cups and bottles.
  - ☐ Favour hotels that meet environmental criteria.
  - ☐ Organize local transportation using less polluting modes of transport.

D. EMISSION REDUCTION THROUGH ORGANIZATIONAL CULTURE

- ☐ Adopt an overall policy guiding and supporting the effort of the organization to reduce greenhouse gas emissions.
- ☐ Establish an Environmental Management System to support practical implementation of the policy.
- ☐ Assign a senior manager/director as champion for the climate neutral effort

- • Institute formal check points in key planning and management processes, including:
    - ☐ Compulsory training for all staff.
    - ☐ Require that project documents, memoranda of understanding and other forms of formal agreements, describe how the greenhouse gas emissions from related activities will be minimized.
    - ☐ Include goals to support greenhouse gas emission reduction in staff work plans, such as the Performance Appraisal System (PAS).

- • Encourage staff support for a green and climate friendly organization through innovative incentives, such as:
    - ☐ Increase the awareness through information campaigns, matched by incentives for staff to turn the message of the campaign into practical action, e.g. on recycling, local transport, use of double sided printing, use of recyclable cups etc.
    - • Provide an office setup that encourages sustainable and carbon-lean office practices, e.g.:
        - ☐ Use common printers, scanners and copying machines
        - ☐ Provide highly visible recycling stations
        - ☐ Organize work spaces so that they benefit from natural lighting
        - ☐ Use plants in the office as a way of improving the indoor environmental quality, both physically and mentally

- ☐ Develop and share with all staff monthly or quarterly key performance indicators (travel, paper use, waste generation, etc) for each department/division within the organization.
- ☐ Highlight and recognize emission reduction initiatives by individual staff or departments
- ☐ Consider using the UN Flex policy to allow distance work, thereby reducing the need for commuting and improving work-life balance
- ☐ Invite colleagues to provide suggestions on how to further improve the organizational culture to support sustainable and climate friendly behaviour

Chapter II

Basic Concepts and
Approaches

Chapter II: Basic Concepts and Approaches

A. UNDERSTANDING THE BASICS

The term "Greenhouse gases" (GHG) is used as a common name for several different gases which all contribute to the Greenhouse effect, better known as Climate Change.

UN's Climate Neutral Strategy is based on the methodology for emission calculation known as the "*Greenhouse Gas Protocol*", which was developed by the World Resources Institute and the World Business Council for Sustainable Development. This is a methodology now widely used by companies and organizations in both the public and private sectors. The Greenhouse Gas Protocol uses the definition of the Kyoto Protocol on what Greenhouse Gases to consider. These are: Carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), ozone (O3), hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF6). The greenhouse gases most commonly emitted by UN organizations are carbon dioxide from burning of fossil fuels, emissions associated with electricity production off site, hydrofluorocarbons as leakage from refrigeration and air conditioning aggregates, and sometimes methane from on-site waste treatment.

Different gases have different levels of impact in terms of their greenhouse effect. This is expressed as their Global Warming Potential – GWP. Carbon dioxide (CO2) has a GWP of 1, while Methane (CH4) has a GWP of 23, and Hydrofluorocarbons 23 (HFC23), formerly used as a refrigerant in air conditioning aggregates, has a GWP of 12.000. This means that the emission of 1 kg of HFC23 has the same impact on the climate as the emission of 12.000 kg of carbon dioxide. Because of the different levels of impact of different gases, emission of greenhouse gases are expressed as "Carbon dioxide equivalent" (CO2 eqv). The emission of one tonne of CO2 is expressed as one tonne CO2 eqv. The emission of one tonne of HFC23 is expressed as 12.000 tonnes CO2 eqv. It is therefore important to keep in mind that even small volumes of emissions of some greenhouse gases, such as HFC, can have a big impact on the carbon footprint of the organization.
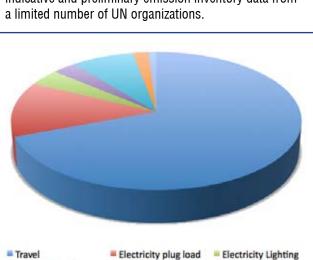
B. IDENTIFYING EMISSION SOURCES

The Greenhouse Gas Protocol, which is used by UN for calculating its greenhouse gas emissions, pre-defines the emission sources to be considered. In the context of the UN Climate Neutral strategy the following boundaries have been set for emissions to be included:

- On-site fuel consumption
- Purchased electricity
- Purchased heating/cooling (e.g. steam)
- Release/leakage of other chemicals causing GHG emissions, e.g. refrigerants
- Fuel used for vehicles (owned or rented)
- Official travel of staff and other persons for whom the organization pay the ticket.

Sources not covered by the UN Climate Neutral Strategy include emissions from waste treatment, emissions from staff commuting, emissions from field projects, and emissions embedded in products and services (i.e. associated with the production of these products/services) procured by the organization.

The preparation of the GHG emission inventory, also mandated for each UN organization by the

Figure 1: Typical distribution of greenhouse gas emission sources in UN organizations. Based on indicative and preliminary emission inventory data from a limited number of UN organizations.

Legend: Travel, Electricity plug load, Electricity Lighting, Electricity others, Heating/Cooling, Refrigerants, Others

UN Climate Neutral Strategy, is not covered by this Guide, but obviously the GHG inventory is an important first step to identify options for emission reduction. The GHG inventory will look differently in different organizations depending on the focus of activities, size of organization, location and age of offices etc. In general terms however, it is likely that the largest greenhouse gas emission source will be air travel, followed by electricity generation and use, followed by non-electric heating/cooling, followed by other sources.

Identifying the sources of emissions is however not sufficient to allow identification of emission reduction measures. It is also necessary to understand why the emissions are created so as to allow identification of means to reduce the emissions. An example of why it is important to understand what is causing emissions is provided in Box 1.

The second step in preparing your greenhouse gas emission reduction strategy is therefore to conduct an assessment of the underlying causes for greenhouse gas emissions. This can be done within specific areas, e.g. travel, electricity use, or heating/cooling. In most organizations however, it makes sense to make a wider review of the overall organizational approach to emission reduction and sustainability performance.

- Are there for example any policies established supporting emission reduction, or sustainability initiatives?
- How is this reflected in practical action, staff training, or budgeting?
- Are there any green groups active in the organization?
- Are investments made to upgrade facilities?
- Are offices set up to optimize resource conservation?

- Are staff encouraged to include sustainability considerations in their daily work?

Together with the GHG inventory, this wider review is, in most cases, very helpful to indicate in what areas it makes sense to start looking for emission reduction opportunities.

SUN has developed an "Initial Assessment Questionnaire" to assist organizations to undertake this organization-wide review. This can be downloaded from the following web address:

http://www.unemg.org/climateneutralun/BecomingClimateNeutral/EmissionsReduction/ToolsTemplates/InitialScreening/tabid/553/Default.aspx

C. A STRATEGY FOR EMISSION REDUCTIONS

The GHG Inventory and assessment of underlying causes will provide a good ground for developing the emission reduction plan.

An emission reduction plan may either focus on emission reduction within a specific area (e.g. travel or facility management) or the whole office or organization. In most cases emission reductions are achieved through a combination of one-time interventions, e.g. upgrading a heating system, and on-going processes, such as managing the heating system. It therefore makes sense to establish emission reduction plans that are set up as integrated parts of the daily management of the organization. In most cases this would translate to an environmental management system (EMS), with an initial focus on greenhouse gas emissions. EMS are further described under "organizational culture" below.

Box 1: Sources and causes
Why it is important to understand what is causing GHG emissions?

The climate neutral focal point in UN Office X had just finalized the GHG inventory for the organization. Her quest was now to figure out how to reduce the emissions. One of the major causes for the emissions according to the GHG inventory was the use of electricity in the office. Electricity was used for a number of different purposes, including lighting, ventilation, powering of office equipment, cooling of servers, and heating of the building. The climate neutral focal point did not have a breakdown between the different categories of electricity use, but according to the facility manager the electric heating system was a major energy consumer.

Box 1: Sources and causes - continued
Why it is important to understand what is causing GHG emissions?

...

At this stage she had a choice between two courses of action:
1. Focus on the electric heating system and work with the facility manager to have the system upgraded.
2. Try to confirm that the electric heating system is really a major electricity consumer as compared to other electricity use, and if so, try to understand why the electric heating system is consuming large amounts of electricity.

In this case, the climate neutral focal point decided – wisely - to go for option 2. She first confirmed that the electricity consumption was large compared to other similar systems and buildings. She then made a list of potential reasons for why the heating system was consuming excessive amounts of electricity, and indicated a potential remedy for each cause.

Cause for high electricity use	Remedial action
Indoor temperature set too high	Reduce indoor temperature and inform staff
Heating is on, also when the office is empty	Reduce heating during off-hours
Poor insulation of walls	Add wall insulation
High heat loss through windows	Install high performance windows
Staff leave doors and windows open for ventilation, causing higher demand for heating	Improve ventilation system and inform staff
Heating system outdated	Replace/upgrade heating system
Heating system not properly maintained	Provide training and operation manuals for concerned staff.
Heating system lacks proper control system	Install/upgrade building management system
Heating system was never properly installed	Conduct retro-commissioning of the heating system
The whole office is heated even though only parts are normally in use	Establish zoned heating control so that only office space in use is heated
Large heat loss in exhaust air from ventilation	Install a heat exchanger between outgoing and incoming ventilation air.
Electricity consumption is in fact normal but the electricity is purchased from coal fired plants, causing high emissions	Consider purchasing "green electricity" from renewable energy sources.

With this list in hand, the climate neutral focal point reviewed each potential cause and thereby identified the best options for reducing electricity consumption for heating and associated greenhouse gas emissions. Her review resulted in a list of three priority actions:

1. Reduce indoor temperature
2. Replace windows
3. Provide training to the staff responsible for controlling the system.

The result would have been much different – and more expensive – if she had just thought that the apparent source (the heating system) was also the cause for excessive electricity and associated emissions.

The analysis she undertook to identify which ones of these options should be pursued, also provided her with the facts and figures she needed to prepare a convincing emission reduction plan for the approval of senior management.

It is also possible to just focus on specific actions to reduce emissions within limited areas. For this kind of emission reduction plans it is useful to provide the following information so as to get senior management support for its implementation:

1. Current carbon footprint from the targeted area (e.g. travel)
2. Explanation of technical requirements for the intervention
3. Explanation of administrative requirements
4. Estimated emission reduction through the proposed interventions.
5. Estimated cost for the interventions
6. Estimated savings from the intervention (e.g. through reduced energy use, reduced travel costs, and reduced offset costs).
7. Responsibility for implementation
8. Implementation schedule

An example of an emission reduction plan for a specific area is provided in Box 2.

Box 2: Example of an issue specific emission reduction plan

The climate neutral focal point in UN office Y in a field duty station is working on compiling a comprehensive emission reduction plan for the organization, framed as an environmental management system. Due to a public debate about the pollution from 4-wheel drives, the director decides that the emissions from the twenty 4-wheel drives that the office is using for local transport has to be addressed as a matter of urgency and requests that the climate neutral focal point put together a proposal within a few weeks for how this can be done. The climate neutral focal point carefully reviews the situation, using the approach presented in Box 1: Identify why the cars are used, when they are used, how they are used and what alternatives there are to using the cars. He compiles a list of options as follows:

Option	Cost/savings	Technical requirements	Admin requirements
Sell 4-wheel drive automobiles and buy hybrid cars	Second hand value of 4-wheel drives is low and hybrid are expensive at local market. Pay-back period from fuel savings is still long.	Poor access to service of hybrid cars.	Security in smaller cars?
Sell 4-wheel drive automobiles and lease hybrid cars	Saving from selling 4-wheel drives + lower fuel consumption of hybrids. Lease costs moderate = overall cost saving	Poor access to service of hybrid cars. Lease company does not guarantee service = high risk.	Secure lease agreement and clarify if insurance is valid when transport is not in owned car.
Sell 4-wheel drive automobiles and buy smaller cars with less fuel consumption	Saving from selling 4-wheel drives + lower fuel consumption of smaller cars = overall cost saving	None	Security in smaller cars?
Upgrade engines for better fuel efficiency	Moderate costs for upgrading engines + lower fuel costs = moderate pay-back period	Find qualified garage to perform upgrade	None
Only use 4-wheel drive automobiles for essential travel, and lease smaller cars for other transport	Most 4-wheel drives can be sold and replaced by smaller number of smaller cars with lower fuel costs = immediate savings	None	Issue instructions for when 4-wheel drives can be used.
Improve maintenance of cars and train drivers in fuel efficient driving	Minor cost for training of drivers and more frequent maintenance. Savings from reduced fuel use.	Secure supply for improved maintenance	None *... continued on P. 14*

Box 2: Example of an issue specific emission reduction plan - continued

...

Based on the considerations in this list the climate neutral focal point could then put together the following emission reduction proposal for his director:

Current carbon footprint from the targeted area (transport in 4-wheel drives)
In total the 20 4-wheel drives are used on average110 days per year each. The total distance covered by all 4-wheel drives is 112.000 km with an estimated total GHG emission of 50 tons CO_2 eqv.

Explanation of technical requirements for the intervention
After reviewing several options to reduce the emission we propose the following actions:
1. Only use 4-wheel drives when essential. Most travel is undertaken on good roads where 4-wheel drives are not required. Our estimate is that we only need five 4-wheel drives, and can manage the remaining travel requirements with ten fuel efficient smaller cars. Due to the problems with maintenance in this location we do not recommend hybrid cars.
2. Upgrade the engines for the five remaining 4-wheel cars.
3. Provide training to all drivers on maintenance and fuel efficient driving

Explanation of administrative requirements
1. Establish guidelines for when 4-wheel drives can be used (e.g. for security)
2. Implement selling and purchasing of cars.

Estimated emission reduction through the proposed interventions.
Assuming that we will maintain the same level of travel, but will mostly travel in better maintained, more fuel efficient 4-wheel drives and smaller cars, we estimate that we can reduce fuel consumption and associated greenhouse gas emissions by 50%.

Estimated cost for the interventions
•   Costs for purchasing ten smaller cars, for upgrading the remaining 4-wheel drives, and for providing training and improved maintenance for all cars is calculated at US$ 2.5 million.

Estimated savings from the intervention
•   Earnings from selling 15 4-wheel cars is estimated at US$ 3 million.
•   Fuel costs are estimated to be reduced by 50%.
•   Overall this action will result in an immediate cost saving of US$ 500.000 and an annual fuel cost saving of approximately US$ 20.000 at today's fuel prices.

Responsibility for implementation
The head of general services would be in charge for implementing these actions

Implementation schedule
Upon your decision we estimate that all actions can be implemented within 6 months.

With this well prepared emission reduction proposal, also saving money for the organization, the director had no problems in approving its implementation.

Chapter III

Description of Emission Reduction Options

Chapter III: Description of Emission Reduction Options

Whether your greenhouse gas emission reduction plans targets the whole office/ organization, or has a more limited focus, your main challenge is to identify exactly what options there are for reducing emissions. In this section we will provide an overview of some of the common options. Details are provided in sources referred to in the text.

Broadly, emission reduction can be pursued in the following areas:

A. **Travel**: Reduced travel and more efficient travel supported by a proper travel policy.
B. **Buildings**, Active and passive measures as well as improved building management measures.
C. **Processes**: Procurement, administration, budgeting, and meetings
D. **Organizational Culture**: policies, environmental management systems, formal checkpoints and innovative incentives.

A. EMISSION REDUCTION FROM TRAVEL

Emissions from travel, in particular air travel, constitute the major part of the greenhouse gas emissions in most UN organizations, and are therefore a priority area to address.

In this context we include official missions of staff, entitlement travel (home leave etc), and travel of meeting participants and consultants for whom the organization is paying the fare. The typical travel profile in UN is one where the vast majority of missions and other travel are undertaken by air. The general policy in UN is that travel should be undertaken in the most direct and economic mode. In most organizations there is also a rule stating that staff traveling for more than nine hours are entitled to business class, although there are variations in how this is applied.

Emission reduction from travel can be achieved in two ways:

1. Reduce travel
2. Travel more efficiently

1. Reduce Travel

Travel is an essential requirement for much of the work of the United Nations. This however does not mean that every single trip is justified. Within UN there are examples of different ways of reducing travel:

a. Make a top-down decision to reduce travel by XX%. This has been done by many organizations – not for environmental reasons - but for cost saving reasons. In some cases the implementation of the decision has been given to the heads of divisions, who have had to meet the travel reduction goal as part of the goals stated in their personal appraisal system (PAS) plan. This is on one hand an easy way of reducing emissions, but may on the other hand result in that essential travel is cut, which will harm the performance of the organization. A careful analysis of current travel patterns to identify who goes where and why, so as to better understand the potential to reduce travel within different parts of the organization is recommended before any top-down decisions are taken.

b. Optimize travel planning so as to reduce the travel required for each mission. This can be done by:

 • Bundling missions so as to cover several meetings or objectives in one single ticket, in particular for long-haul travel. This may

Figure 2. In most UN organizations, air travel generates the vast majority of greenhouse gas emissions

require that the staff remains on mission for a longer period of time to cover the time in between meetings, incurring additional DSA, but this is often more than compensated by not having to issue two or several tickets for the same destination.

- Using staff in local offices. In many cases it is possible to use local or regional offices to cover meetings and objectives, instead of having staff traveling long distances from the headquarters.
- Reduce the number of participants to meetings. Some organizations have adopted policies for limiting the number of staff to any given meeting, while others send a large number of staff to the same meeting, some of whom have only limited functions to perform in the meeting, which could be covered by other staff.
- Instead of traveling, use alternative means of communication. Many meetings can be conducted via Information and Communication Technologies (ICT) such as telephone, e-mail, video conferencing, virtual meeting rooms, or personalized (PC to PC) video links. Some of these technologies have developed rapidly in the past few years and the costs and problems associated with e.g. video conferencing have decreased significantly. However, UN organizations and offices do not always equip their staff with a level of ICT sufficient to provide a realistic alternative to travel. SUN is in the process of developing a recommendation for minimum ICT access in UN organizations, with the intention to release this in 2009. In addition, the Secretary General issued in early 2009 a bulletin providing general guidelines on green ICT (www.iseek.un.org)

2. Travel more efficiently

The carbon footprint of any travel depends not only on the distance traveled, but also on the form of transport used. Train usually has a much smaller carbon footprint than travel by car. Travel by car usually has a smaller carbon footprint than travel by air. Air travel in economy class has a smaller carbon footprint than travel in business class, and business class has a smaller carbon footprint than travel in first class. The lower the class, the smaller share of the aircraft and associated emissions

does the ticket represent. Normally a business seat accounts for twice the emissions of an economy seat and a first class seat three times the emissions of an economy seat. Travel by modern aircraft has normally a smaller footprint than older aircraft. And each landing and take-off increases the carbon footprint of any aircraft.

There are therefore good reasons to consider options for guiding travelers towards more efficient modes of travel. Of course, staff should not be punished for undertaking travel which is essential for the organization. Instead, travel efficiency policies should be coupled with positive incentives.

The following policies have been applied in various parts of the UN system:

- Short-haul travel, e.g. travel less than 500 km, should always be undertaken by train if available. This applies in particular in Europe and North America. Travel by train is normally undertaken in first class, which can be seen as a positive incentive for train travel.
- When entitled to business class travel, staff are offered the option to go by economy class instead, but with a full day for rest upon arrival at the destination as a positive incentive. The provision for time for rest is a standard clause in UN travel policies but is often interpreted and applied in a very restrictive manner. The extra day of DSA is always more than compensated for by the savings in ticket costs.
- In some organizations a generic ban on business class travel has been implemented. In these cases this has been applied to all staff including the Executive Director. Restrictions that apply only to staff below certain levels are a recipe for resentment and circumvention.
- Travel agencies are instructed to give preference to routings and airlines minimizing the number of landings/takeoffs, and using more modern aircrafts.

The above examples of policies would normally require that the organization formally adopt a revised travel policy where the guidelines for how to travel are clearly defined, so as to avoid conflicts with managers or travel staff managing travel requests as per UN's standard travel policy.

3. Other Travel-related Issues to Consider

Sustainable Travel Policy

Emission reduction plans for travel will benefit from being presented as a coherent revised travel policy or policy for sustainable travel. Such a policy would normally include five elements:

1. A policy statement on the ambition of the organization to reduce the environmental impact from travel, in particular associated greenhouse gas emissions.
2. Decisions on reduced travel and/or more efficient travel, including elements as outlined above.
3. Mechanisms for implementation of decisions. This may refer directly to the travel planning and approval process, as exemplified below, or to associated areas, e.g. upgrade of ICT to provide improved alternatives to travel.
4. Designation of responsible persons, budget and deadlines.
5. Mechanism for monitoring and reporting (see below).

Mechanisms for implementation

A decision to travel less or to travel more efficiently will in the end be managed through whatever travel planning and approval system is in place. Travel planning and approval is in no way a coherent process within UN. However, there are a number of measures which are often not implemented, but which would contribute to fewer and better planned missions:

- Require the travel agent to provide and highlight information about the carbon footprint and offset costs for each ticket quoted.
- Require that the travel agent always include, among quotations given, low carbon alternatives as well as business-as-usual alternatives, e.g. travel in economy class instead of business, or travel by train instead of by air.
- Ensure that travel plans in offices are circulated to all staff at least one month ahead of the start of missions so as to allow staff to identify opportunities for coordination.
- Require that the travel request explains why the objective of the mission cannot be conducted through ICT or by local staff.
- Conduct awareness raising and training of staff to ensure that everybody understand the importance of travel from a climate change

perspective, understand how the travel carbon footprint can be reduced, and also know what alternatives there are, and what incentives there are to use the alternatives.

- Train managers, travel assistants and fund management staff to recognize the reasons why incentives such as an extra R&R day for long-haul travel in economy class, or bundling of meetings resulting in missions having a longer duration, are beneficial for the organization.

Monitoring

Monitoring is an essential part of any sustainable travel policy. The objective is both to be able to track and report on how travel patterns evolve as a result of the travel policy, and to identify additional opportunities to reduce emissions from travel. A travel monitoring system can be easily maintained by registering for each ticket a few simple data:

- Name of traveler
- Destination
- Mode of travel
- Purpose of travel
- Climate footprint of the travel

The associated greenhouse gas emissions will in any case be registered in the annual greenhouse gas inventory, but these data will also provide an indication of who are the most frequent travelers, what are the most common purposes of travel, and to what extent are alternative (low carbon) travel modes used.

Frequent Flyer Miles

Most airlines are today offering their passengers some form of rewards for choosing to fly with their airline. These are most often provided in the form of "Frequent Flyer Miles", which can be converted into air travel class upgrades, free hotel nights, free air trips etc. Considering the vast volume of travel undertaken in UN many staff accumulate considerable amounts of Frequent Flyer Miles. Concerns have been raised about this for the following reasons:

- It can be considered an undue benefit that staff are personally rewarded for travel undertaken on the expense of the UN. In some countries the frequent flyer miles awarded in connection with official travel by government officials are awarded the government, not the officials.
- In many cases staff are likely to convert their

frequent flyer miles to free air tickets, for personal travel that they would – or would not – have undertaken had they not had the miles. On the other hand staff may just as well use the miles to upgrade themselves to a higher class of travel or to save money by using the miles to get free hotel nights or other forms of benefits.

- It could be argued that staff may tend to favour certain airlines or certain routings when travelling so as to allow them to accumulate frequent flyer miles on their airline of preference, i.e. not travel the most direct route as is required by UN travel rules.

The first concern is first and foremost an economic issue about who should "own" the frequent flyer miles, and is not of direct relevance to the climate footprint of the organization.

The second concern, about how the miles are used, are again without impact on UN's climate footprint since travel would either be undertaken by the staff privately (i.e. outside the boundaries of the UN climate neutral strategy), or be used to upgrade the class of travel, something that is however not reflected in UN's footprint (only the class of travel purchased is reflected). It can be argued that in any case the frequent flyer air miles are contributing to a real increase in greenhouse gas emissions from travel, regardless of whether this is reflected in UN's greenhouse gas inventories or not. While this may be true, depending in how the staff actually use their frequent flyer miles, it is also difficult to monitor or manage. In neither case is the official climate footprint of the organization affected.

The third concern, about staff favoring certain routings or airlines, would mean that UN's requirements that staff have to travel the shortest and most economic routing are not effectively enforced. This would be a problem that goes far beyond the use of frequent flyer miles and would not be solved by trying to regulate the use of frequent flyer miles.

Even if the issue about frequent flyer miles often surfaces, and may indeed be an issue in relation to how the organization is using its resources, it is difficult to justify interventions from a climate neutral perspective.

However, there are examples of offices in UN where staff have been encouraged to use their Frequent Flyer Miles for purposes benefiting the organization. Some airlines e.g. offers to convert Frequent Flyer Miles into funds for humanitarian assistance (education, health or poverty eradication) as well as for projects aimed at reducing greenhouse gas emissions. The idea to encourage staff to use the Frequent Flyer Miles to purchase offsets to compensate their travel goes well with an overall approach to sustainable travel in UN. In summary, strictly spekaing from a climate neutral perspective frequent flyer miles do not add to the climate footprint of the organization, but may be used voluntarily by staff to offset their travel climate footprint, which is strongly recommended.

SUN is preparing a more comprehensive sustainable travel guide to be released in 2009. This will include specific examples of travel policies, example of standard requirements for travel agents, case studies and a step-by-step implementation model for a sustainable travel system in UN organizations.

B. EMISSION REDUCTION FROM BUILDINGS

Since much of UN's activities take place in offices, large shares of the greenhouse gas emissions from the organization also relate to activities in the office. As mentioned above the most common sources for emissions include electricity use, heating/cooling of buildings and leakage of HFC from refrigeration equipment. **However, the underlying causes for emissions are often more complex and diverse, typically including both physical features of the buildings and equipment used, as well as processes, management and organizational culture.** Under the heading "Buildings" we will review some of the issues directly related to the buildings, while management, processes and organizational aspects are addressed in the following sections.

Most UN organizations do not own the buildings where their offices are hosted, but rent them, which in some cases limit the type of changes the organization can do to the building. However, even in rented offices there are usually many opportunities to improve the building performance, and reduce greenhouse gas emissions, within the restrictions set by the building owner.

Emission reduction opportunities in buildings can broadly be classified as:

1. **Passive measures**, typically focused on reducing the need for energy consumption (e.g. reduce the need for artificial lighting)
2. **Active measures**, typically focused on improving the efficiency of whatever functions energy is used for (e.g. improve the efficiency of artificial lighting)
3. **Building management measures**, including integrated management systems, monitoring and training.

1. Passive measures

Passive measures serve to reduce the need for energy consumption in a building, e.g. by reducing the heat

Figure 3: Typical distribution of energy use in 10 storey Western European office building (Source UNEP SBCI 2008)
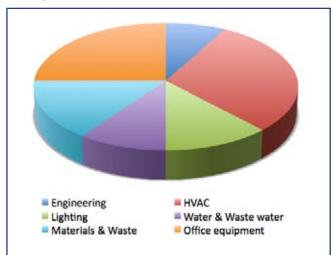

Figure 4: Improved insulation is often a cost effective measure to reduce the energy use in buildings.

loss to the outside in a cold climate, or by increasing the level of natural light penetration into the building. Passive measures do not require energy to function (hence the name "passive measures"). The following areas are worthwhile to consider:

Improve insulation of the building envelope

The building envelope consists of the walls, roof and floor of the building. The main purpose of the envelope is to protect the inside from outside conditions, including wind, rain, sunshine and shifting air and ground temperatures. In order to do this, the building envelope usually consists of several layers of different building materials, including structural elements, water proof layers and heat insulating layers. In particular the heat insulating layers are important for regulating the heat transfer through the envelope, and can, if correctly designed, reduce the heat transfer significantly.

Insulation is surprisingly often inadequate in buildings, in particular in roofs, but also in walls and floors. In hot climates insulation is more often an exception than a rule, in spite of insulation being as important for containing cold inside an air conditioned building as for containing heat in a heated building. A rough indication of whether the insulation is adequate can be gained by simply feeling with your hand the temperature of the surface of the wall, roof or floor, on a day with hot or cold outside temperatures. If the surface feels much warmer or colder than the indoor air, then it is worthwhile to take a closer look at the insulation. The SUN Guide for Climate Friendly Buildings and Offices (due in July 2009) contains practical advice on how to assess opportunities for improved insulation in buildings.

Insulation is generally a cheap material but can be expensive to install in existing buildings since it usually requires that parts of the existing walls, roof or floor are removed. However, in connection with major renovations, it is always worthwhile to consider improving the insulation.
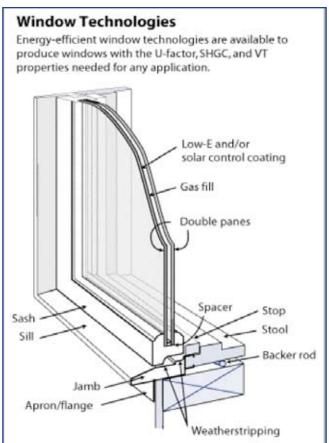
Reduce heat transfer through windows

Windows are often the weakest part of the building envelope in terms of high heat transfer. Heat transfer is taking place both through the light transmitted through the glass, through direct heat transfer (conduction) through the glass and window frame, and through air leakage through gaps between the window and frame (convection).

The window performance can normally be improved in several ways:

- Change from single glass windows to double or triple glass windows, with insulating inert gases in between the window panes. This is usually a very effective measure.
- Change from clear glass to e-coated glass, to reduce transmission of heat radiation.
- Remove "thermal bridges" between the outside and inside by changing the window frame material from metal, a "good" conductor of heat and cold, to less heat conductive materials such as PVC or wooden frames.
- Improve the seals between the inner and outer window frames to eliminate any gaps and air leakage.
- Install exterior shading devices outside the window to reduce the direct sun exposure and associated heating of the inside.

Note that colored or tinted glass, while reducing direct visible light, is often less effective in terms of reducing heat transfer through the glass. Instead,

Figure 5: Options to reduce heat transfer through windows (illustration courtesy of US DoE).

specially treated glass (often referred to as e-coated glass) can be used for this purpose.

Interior shading, curtains and louvers, can be used to reduce direct sunlight but does not reduce heat transfer. Only double/triple glass windows combine high light penetration with low heat transfer.

Enhance natural daylight in the office
Lighting may be a major cause of electricity use in a building. The need for artificial lighting can be reduced by maximizing the daylight penetration into the office. This may include:

- Remove non-structural interior walls, possibly replacing them with transparent walls.
- Remodel the office layout to ensure that the more frequently used spaces are adjacent to windows.
- Install light shelves reflecting the daylight into the building. This horizontal light-reflecting overhang is placed above eye-level and has a high-reflectance upper surface. This surface is then used to reflect daylight onto the ceiling and deeper into a space.
- Use bright or light colors for interior decoration (walls, roof, floor and furniture)
- Avoid direct exposure to daylight as it is usually more comfortable to work in indirect light, and direct light may cause the building users to close the blinds and turn on a lamp.
- Install skylights (roof windows) or light tubes (also known as "light wells") transmitting daylight into the interior of the building through tubes fitted with mirrors for fibre optics.

Figure 6a: Light shelves installed in an office.

Natural cooling and heating

Depending on the location, design and form of the building there may be opportunities for optimizing natural ventilation, thereby reducing the need for artificial ventilation.

- Establish ventilation corridors inside the building, providing an open pathway for air to move between windows or ventilation openings at opposite sides of the building. Many times it only takes to open a door or to reconfigure some interior partitions to establish such ventilation corridors.
- Natural ventilation can be enhanced in hotter climates by the use of solar chimneys, exposed to direct sunlight, thereby creating a forced movement of air upwards. This upward airflow, if connected to the interior air volume of the building, can provide forced (solar powered) natural ventilation throughout the building.
- In hot climates with a difference between day and night temperatures, the building can be cooled down during the night through natural ventilation, thereby reducing the need for daytime artificial cooling.
- In cold climates, sun radiation can be accumulated as heat in water tanks or heat absorbing structures during the day when exposed to the sun, and then be used as heat sources through radiation towards the interior during the night.
- Roofs are directly exposed to the sun and may transmit large amounts of heat into the building. In addition to insulating the roof (refer above) under-roof ventilation and green roofs can decrease the heat load on the interior considerably.
- Surrounding vegetation can be used to increase heating or cooling of buildings as well as to enhance natural ventilation. Trees planted adjacent to buildings provide shading in the summer time and (in temperate climates) let through sunlight in winter time when the leaves have fallen off the trees. Depending on where they are placed, they may also shield the building from the cooling effect of wind in cold climates and may direct predominant winds towards certain areas to enhance natural ventilation of the building.
- The heat generated by office equipment, refrigerators and other machines is sometimes sufficient to keep the temperature indoors at comfortable levels. This can be taken advantage of by placing major heat generating equipment at central locations in the building. Since hot air travels upwards, heat sources can often be further enhanced if placed in the lower parts of the building, especially if there are open passageways between the floors.
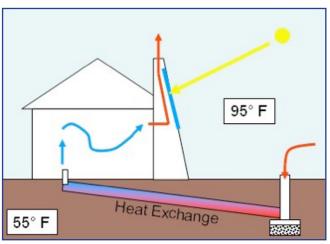
Figure 6b: Principle design and example of the use of light tubes.

Figure 7: Design principle for solar chimneys

2. Active measures

Active measures refer to systems consuming energy for their operation. This includes heating, cooling, ventilation, lighting, but also office equipment and energy supply. Reducing greenhouse gas emissions in these areas typically includes three types of interventions:

a. Switch to more efficient systems,
b. Improve management and maintenance of the systems,
c. Optimize the configuration of the systems.

Figure 8: Under roof ventilation. Air between outer and inner roofs is heated and raised towards vents at the top of the roof where it exists the roof, while fresh cooler air is sucked into the roof space through vents at the lower parts of the roof.
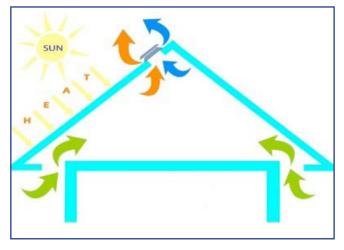

Figure 9: Green roofs can reduce heat gain and heat loss, reduce water runoff and provide a literally green image of the building: Fukuoka International Hall, Japan.
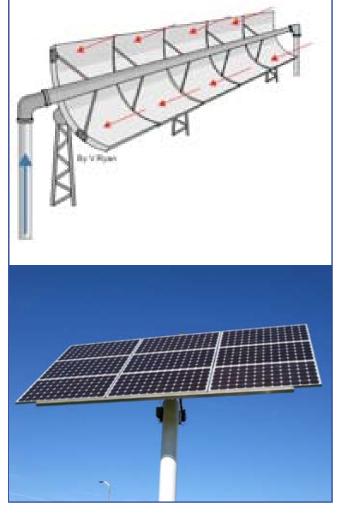

The following areas are worthwhile considering.

Green energy

Energy supply is providing the Number One opportunity to drastically reduce the carbon footprint of energy consumption in the building. If energy can be sourced from renewable sources (hydro, wind, solar) or nuclear power, the carbon footprint will be close to zero, regardless of how much energy is used in the building. In locations where it is possible to purchase green power (also referred to as green electricity, green certificates etc) this is often the easiest and most effective way of reducing the carbon footprint. The cost for green power is often slightly higher than for the normal energy supply (also referred to as brown electricity or brown power) but is often resulting in a net saving if the organization is purchasing offsets to compensate for greenhouse gas emissions. An emission reduction strategy entirely based on green power will drastically reduce

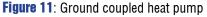**Figure 10**: PV cells and solar water heater design.

the greenhouse emissions but will not capture the cost savings from reduced energy consumption associated with most other strategies.
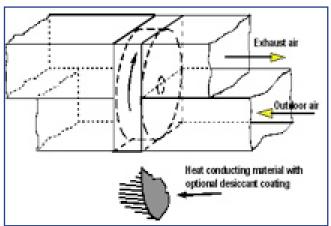
On-site renewable energy

An alternative to purchasing green power from the outside is to install on-site renewable energy production on-site. This includes photovoltaic cells (PV cells), solar heaters, wind turbines (building integrated or free standing) and biomass fueled boilers/heaters. The conditions and costs for installing on-site renewable power supply vary from location to location. In most cases it is very difficult to ensure full energy supply only through PV cells or wind turbines, but in almost all cases these technologies can be used to produce supplementary energy, thereby reducing the need for external power supply. These technologies are also often used as visible and easily recognizable representations of organizations' ambitions to "go green". PV cells and wind turbines produce electricity, while solar heaters produce hot water through direct uptake of solar radiation. Solar heaters have a higher degree of efficiency and can in many cases provide the entire need for hot water to a building. The hot water can also be used for heating the building.

Ground/Water as heating/ cooling source

A ground/water coupled heat pump uses the earth or ground water or both as sources of heat in the winter, and as the "sink" for heat removed from the home in the summer. For this reason, ground-source heat pump systems have come to be known as earth-energy systems. Heat is removed from the earth or water body through a liquid, such as ground water or an antifreeze solution, upgraded by the heat pump, and transferred to indoor air. During summer

months, the process is reversed: heat is extracted from indoor air and transferred to the earth through the ground water or antifreeze solution.
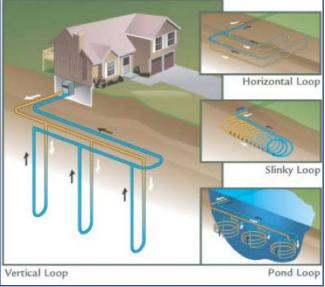
Heat recovery in ventilation air

Heat exchangers are devices that transfer heat from one medium to another. The radiator is a common example of a heat exchanger. In the case of buildings where the inside temperature is different from the outside, significant energy losses occur when heated or chilled indoor air is vented outside. This loss of energy can be reduced by transferring the heat in the outgoing air to the incoming air. There is a wide range of heat exchangers available for this purpose, including plate heat exchangers and heat wheels.

Heating, Ventilation and Air Conditioning (HVAC) systems

The three functions of heating, ventilating, and air-conditioning are closely interrelated. All seek to provide thermal comfort, acceptable indoor air quality, and reasonable installation, operation, and maintenance costs. HVAC systems can provide ventilation, reduce air infiltration, and maintain pressure relationships between spaces. In modern buildings the design, installation, and control systems of these functions are integrated into one or more HVAC systems.

There are different types of standard heating systems. Central heating is often used in cold climates to heat private houses and public buildings. Such a system contains a boiler, furnace, or heat pump

Figure 12: Principle for heat exchanger

Figure 11: Ground coupled heat pump

to heat water, steam, or air, all in a central location such as a furnace room in a home or a mechanical room in a large building. The system also contains either ductwork, for forced air systems, or piping to distribute a heated fluid and radiators to transfer this heat to the air.

In boiler fed or radiant heating systems, all but the simplest systems have a pump to circulate the water and ensure an equal supply of heat to all the radiators. The heated water can also be fed through another (secondary) heat exchanger inside a storage cylinder to provide hot running water.

Forced air systems send heated air through ductwork. During warm weather the same ductwork can be used for air conditioning. The forced air can also be filtered or put through air cleaners.

Heating can also be provided from electric, or resistance heating using a filament that becomes hot when electricity passes through it. This type of heat can be found in electric baseboard heaters, portable electric heaters, and as backup or supplemental heating for heat pump system.
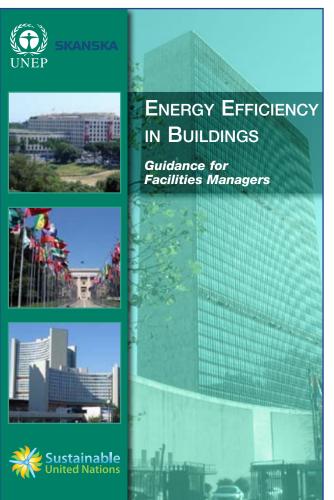
Ventilating is the process of "changing" or replacing air in any space to control temperature or remove moisture, odors, smoke, heat, dust and airborne bacteria. Ventilation includes both the exchange of air to the outside as well as circulation of air within the building. It is one of the most important factors for maintaining acceptable indoor air quality in buildings.

Air conditioning and refrigeration are provided through the removal of heat. The definition of cold is the absence of heat and all air conditioning systems work on this basic principle. Heat can be removed through the process of radiation, convection, and conduction using mediums such as water, air, ice, and chemicals referred to as refrigerants. In order to remove heat from something, you simply need to provide a medium that is colder -- this is how all air conditioning and refrigeration systems work. There is a large number of specific technologies which can be applied to remove heat, each one of which may be more or less suitable depending on local conditions.

HVAC systems are often major energy consumers in a building and due to their complexity and rapid technology development in this area for the last decades often represent major opportunities for energy savings. In addition to several of the passive measures presented above, savings in HVAC systems may be achieved by:

- Complete replacement with a more efficient system
- Upgrading or replacing parts of the existing equipment
- Improved control of the HVAC system (increase the monitoring points, fine tune control parameters, upgrade standard operating procedures etc)
- Seal leaks in ducts and clean fans and filters
- Improved training of operators
- Establishing a monitoring and feed-back system and compare to benchmarks as a means to assess the efficiency of the system and identify need for further improvement.

Figure 13: The Energy Efficiency in Buildings Guide provides more detailed information on the top ten energy saving measures in buildings (SUN May 2009).

Since HVAC systems are often large complex systems it is helpful to have external experts to carry out an assessment ("retro- commissioning") of opportunities for improvement. Even in relatively new buildings, experience suggests that retro-commissioning frequently results in energy savings in the range of 20-30%.

Lighting
Lighting is sometimes responsible for large shares of electricity use in an office and there are several ways of reducing the energy used for lighting. The first option is of course to consider increased use of natural daylight, as described above. Once the passive measures to enhance daylight penetration into the office are implemented, you are ready to consider reducing the energy use for artificial lighting.

Measures to reduce energy consumption for lighting include:

- Provide the right level of lighting for the activities carried out: Map the lighting need and remove lamps providing lighting above what is needed. Avoid decorative lighting.
- Only use high efficiency lamps such as compact fluorescent lamps.
- Electric current in lamps normally has to be adjusted to avoid overloading and burning the lamp. This adjustment is done with a device called ballast. Electric ballasts are considerably more energy efficient than the older magnetic ballasts. Changing from magnetic to electric ballast can be an easy and cheap way to reduce electricity consumption in lamps.
- Regularly clean lamps

Figure 14: SUN's manual for efficient lighting.

- Ensure that lights can be turned on individually for each room or work place. You should not have to turn on the lights for an entire floor if you only use one room on that floor.
- Install movement sensors in less frequently used spaces, e.g. in rest rooms, so as to automatically turn off the lights when the room is empty.
- Install timed central master switches so as to ensure that lights are turned off at a certain time (the staff needing the lights can then individually turn the lights in their own room on again).

Find more information about efficient lighting at: www.unep.fr/scp/sun/publications

Office Equipment
Most offices have a large number of computers, printers and copying machines that are typically responsible for a large or even major share of electricity consumption. The energy consumption of office equipment can be reduced by:

A) Improving the efficiency of each machine:
- Purchase energy efficient equipment (refer to the SUN product fact sheet on sustainable procurement of IT equipment www.unep.fr/scp/sun/). Computers, screens, copying machines and printers have all gone through a revolution in terms of energy efficiency in the past decades.
- Activate energy saving features on the equipment (automatic screen savers, stand-by mode) and other indirect measures such as default double-sided printing on printers.
- Ensure that equipment is turned off (not only put in stand-by mode) when the work day is over.

B) Replacing individual machines with common high-efficiency equipment:
- Move from individual printers to high efficiency Local Area Network (LAN) common printers/copiers/scanners. In addition to reducing energy use and investment costs, studies show that common printers/copiers contribute to an improved indoor environment and reduce printing volumes.
- Replace servers with virtual servers, i.e. reduce the number of actual servers required to host a certain number of functions/ applications, or outsource the entire server

function to external data centers. This can be an important measure as traditional server rooms, mostly because of the need for cooling, typically account for approximately 15% of electricity consumption in an office-based organization.

C) Completely unplug electric equipment when possible:

- Electric equipment consume electricity even when in stand-by mode, and sometimes even when turned off but still plugged in. This type of idle electricity consumption can have a significant impact on the total consumption and can be reduced if the equipment is unplugged when not in use, e.g. at night and on weekends. This can be done easily by using power strips with multiple plugs and a switch.

3. Building management measures

Passive and active emission reduction measures in buildings mostly address physical features of different components of buildings. A building is like a machine, requiring maintenance and on-going management to perform as intended. Building management measures are therefore as important for the performance of the building as are active and passive measures. The main opportunities for reducing greenhouse gases through building management measures are described as follows.

Commissioning of new systems or upgrading of equipment

Commissioning refers to independent (from the supplier) verification that new systems and equipment are correctly installed and perform as to specification. The verification normally follows established test protocols and is performed by an independent expert. Commissioning is an established and proven method for achieving cost cuts and sizeable efficiency improvements

Retro-commissioning of existing systems

Retro-commissioning refers to an independent testing of existing HVAC systems to ensure that their performance remains optimized. Due to wear and tear or individual upgrades that are not optimized for the entire system, even well maintained systems require retro-commissioning every now and then in order to remain in top running order. If your building is equipped with a system that has not been retro-

commissioned for the past 10 years, the chances are good that a retro-commissioning will result in energy and cost savings.

Monitoring and reporting

Monitoring and reporting on key parameters of a building's energy systems (e.g. energy use, air speed, temperatures) should constitute a very basic requirement for ensuring good system operation. Unfortunately, in many cases there is no monitoring and therefore no way of getting an early indication of system malfunctions. A documented procedure for monitoring and reporting of a few key parameters, and plotting these against benchmarks, is highly recommended as a measure to ensure energy efficiency. A very basic, but also very important aspect of monitoring and control is to ensure that indoor conditions throughout the building meet specifications. Complaints from the building users on too hot or too cold rooms are often a sign that the building is over heated or over cooled. In both cases this indicates inappropriate functioning or control of the system. As a rule of thumb, a one degree over heating or over cooling typically causes an additional 5% of energy use and associated costs.

Automated building management systems

In larger and more modern buildings the monitoring and reporting can be managed through automated building management systems. These are computerized systems automatically measuring and recording a number of key parameters both in the energy systems and in individual offices, automatically adjusting the system to provide optimum temperature, air circulation, etc.

Training

Even the best systems are bound to break down sooner or later if the staff managing the systems do not fully understand how to operate and maintain them. It is important to ensure that key staff are properly trained in how to operate the system. This refers especially to active measures; energy supply, heating, cooling, ventilation and lighting.

Behaviour of building users

The behaviour of the users of the building also has a very large impact on the energy use in a building. They may or may not chose or understand how to make use of energy saving features in the building. They may or may not care about the carbon footprint of the building. Improving the behaviour of

the people in the building is however more related to organizational culture and is therefore presented under that heading.

C. EMISSION REDUCTION THROUGH PROCESSES

The ability of an organization to move towards carbon neutrality requires that basic processes are directed towards supporting this effort. This is particularly true if the carbon neutral effort is to be maintained over a longer period of time and not simply done as a one-off activity. Key processes are:

1. **Sustainable Procurement**, through which almost all products and services in UN are acquired.
2. **Administration**, which is essential for the work of UN, but which can be set up to function in more or less efficient ways with more or less impact on the energy and resource use of the organization.
3. **Budgeting**, which may or may not support funds being directed towards investments in greenhouse gas emission reduction.
4. **Meetings**, although not always a formal process, are one of the most common activities in UN. Meetings are important both for the carbon footprint and for the public image of the organization.

1. Sustainable procurement

Procurement is the process we use in the UN to acquire goods and services. Procurement is a highly formalized process following strict rules primarily to ensure transparency, fairness and best value for money for the organization. Procurement may be managed by an individual office but is more often managed by a common procurement function in the main UN body at the duty station.

Being able to purchase more sustainable goods with a lower carbon footprint (e.g. recycled paper, energy efficient equipment or fuel efficient transport) is very important for an organization that is trying to reduce its carbon footprint and/or improve its overall sustainability. Unfortunately the procurement process is many times seen as an obstacle rather than a help in purchasing environmentally friendly goods and services. The underlying problem is that neither req-

uisitioners nor procurers are trained in how to apply the procurement rules so as to support procurement of goods and services with a low carbon footprint. However, SUN is now, in cooperation with several UN organizations, developing practical guidance and tools to build capacity among UN requisitioners and procurers in this area. Specific "cut & paste" product criteria tailored for different product groups and different regions are being developed, as are training packages. As mentioned above, an effort to revise the overall UN procurement policies to better support sustainable and climate friendly procurement is also in progress (www.unep.fr/scp/sun).

Emission reduction plans of organizations should therefore also give attention to the need to provide staff in procurement with adequate training and access to sustainable procurement tools as a means to support the overall carbon neutral effort of the organization.

Figure 14: Sustainable Procurement manual for the UN (UNEP SUN 2008)

2. Administration

Administrative processes in the UN can be seen from two perspectives. They are essential parts of the UN's operation, without which the UN could not function at all. On the other hand, they are also often seen as a major barrier to efficiency of the organization. For this reason a number of more or less continuous efforts are underway in different UN bodies to revise and improve different aspects of their administrative processes. From a climate neutral perspective, reform of administrative processes is important but also a very tall order. However, there are three specific areas where climate neutral focal points may be able to bring about positive change:

- Provide input to the reform process of UN's administrative systems. This refers to the substance of different rules.
- Provide input to the structure and function of the UN's new Enterprise Resource Planning (ERP) system, which is to replace IMIS and other admin systems within 2-3 years. This is not referring to the substance but to the format of the on-line information management of administrative information.
- Eliminate paper use associated with administrative processes in your office/organization. This has a direct impact on energy use, paper and toner use and waste generation – in some cases also a sizeable reduction of greenhouse gas emissions. Paperless administration can be supported by different versions of electronic administrative tools (e.g. on-line correspondence tracking, on-line travel planning, on-line preparation of contracts, or on-line HR requests), but is first and foremost a matter of attitudes of staff and management. With basic software (Acrobat PDF writer and e-mail) it is possible to eliminate almost all paper printing and also improve tracking and speed in processing of administrative requests. However, this is only possible if concerned staff and management are willing to adopt paperless routines. Since there are often cost savings associated with paperless administration, the proposal for going paperless can be underpinned with a simple cost-benefit analysis.

3. Budgeting

Most interventions to reduce greenhouse gas emissions require some kind of capital investment. Considering that cost efficiency is one of the performance indicators for the UN, it is important to ensure that proposals to reduce greenhouse gas emissions are presented along with appropriate financial analyses. There are a number of different ways for calculating costs (direct cost, net present value, cost-benefit analysis etc), but regardless of the model used a few basic principles should always be adhered to when it comes to greenhouse gas emission reduction investments:

- Most (but not all) greenhouse gas emission reduction efforts are associated with cost savings. The most common types of cost savings are reduced energy use and reduced travel costs. The reduced costs should always be presented as savings to offset investment costs.
- The UN climate neutral strategy requests all UN organizations to consider the implications for purchasing offsets for greenhouse gas emissions which can not be avoided. Although there is not (yet) a decision for all UN organizations to purchase offsets it can be argued that it is likely that such a decision will be adopted sooner or later. In such a case, the value of avoided (reduced) greenhouse gas emissions associated with the investment should also be presented as savings to offset the investment costs. The price for offset costs is the same as the price for purchasing emission offsets from Clean Development Mechanism (CDM) projects, also known as Certified Emission Reduction (CER) units. The current price for CER can be found at www.pointcarbon.com.
- Although difficult to express in financial terms, it is worthwhile to highlight other benefits associated with investments in emission reduction measures, such as improved productivity, improved indoor environment, improved work-life balance, reduced waste generation and improved safety/risk for accidents.

Most budget planning in UN follows a two-year cycle. This means that long-term savings resulting in a pay-back period of more than two years may not easily be reflected in the standard format for budget proposals. It is important in these cases to highlight wherever possible (e.g. in a cover note or in a foot note) the long term savings and benefits of the proposal.

4. Meetings

The United Nations organizations are responsible for a very large number of meetings each year - ranging from small meetings with less than 10 people to large events with several thousand participants. These meetings may be organized within UN's own premises or in other venues. In either case, the meetings all come with an environmental cost including a carbon footprint. The main contributor to the footprint of a meeting is typically travel of meeting participants, but also production of meeting documents, catering, accommodation, local transport, and waste generation contribute. Some of these activities/impacts are not covered by the Greenhouse Gas Protocol, but because of the high profile of many UN meetings, it is always a good idea to make them as green as possible and to minimize their environmental footprint. Several large UN meetings have already been organized as "green and climate neutral" meetings, and more and more organizations find this a good way of communicating their climate neutral ambitions.

For more information on how to make a meeting green please refer to the *Green Meeting Guide 2009* (http://www.unep.fr/scp/sun/publications)

D. EMISSION REDUCTION THROUGH ORGANIZATIONAL CULTURE

Anyone with experience from trying to improve a company or an organization knows that changing a piece of equipment is usually easier than changing the behaviour of the person who is using the equipment. This is also relevant for greenhouse gas emission reduction in organizations. While improved buildings, reduced travel, and revised processes will all contribute to emission reductions, it is in the end the attitudes and behaviour of people in the organization which decides to what extent the changes will have any lasting impact. Intelligent policies will not have any impact if management is not committed to implement the policies. Energy saving equipment will not have any impact if staff are not making use of the energy saving features. And arrangements to allow staff to reduce travel or travel in more efficient ways will have only a minor impact if the travellers don't understand and support this effort. These factors, affecting the understanding and commitment of staff to support a

reduced carbon footprint of the organization, are here referred to as "organizational culture"

Organizational culture refers both to the formal signals and incentives that the organization provides to encourage more "carbon lean" behaviour, and to informal, often staff initiated, actions to make the organization more green and efficient. In the context of green house gas emission reduction, the following factors need to be considered:

1. A policy to provide overall guidance and support for activities aiming at reducing greenhouse gas emissions (and other negative impact).
2. An environmental management system to support practical implementation of the policy.
3. Formal check points to translate the commitment into visible action, including formal requirements in staff training, project documents, and the Personal Appraisal System.
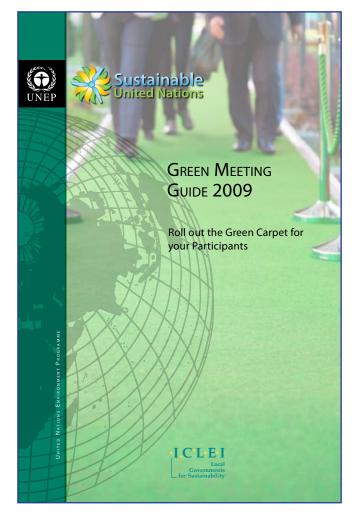4. Innovative incentives such as distance work

Figure 15: Green Meeting Guide (SUN, June 2009)

and set-up of the work space reflecting the "message" of the organization. This also includes various forms of staff recognition and formal-informal communication and awareness raising campaigns.

1. Policy support

Policies are overarching guiding documents outlining the principles and values according to which different aspects of an organization functions. While it is true that policies in some instances are quite ignored and have very little impact on how an organization functions, it is equally true that a supporting policy is often an absolute requirement in order to change the ways business is normally conducted. There are a number of areas where the UN has adopted common policies for all UN organizations to adhere to, including travel, ICT and procurement. Some of these policies are now under review to better support carbon neutrality and sustainability goals. However, each individual UN organization also has its own policies, and it is at this level that a stated policy on climate neutrality and sustainability can be very useful. A carbon neutral policy does not need to be a lengthy or complicated document, but can be short and concise. The basic elements include an outline of the purpose and goals of the organization in relation to climate change, measurable time bound targets for the achievement of these goals, and an indication on how these targets should be achieved.

2. Environmental Management Systems

Greenhouse gas emission reduction can be done as one-off efforts, but to ensure long-lasting impact it is strongly recommended that climate change management be integrated as a continuous activity in the organization. The best way to do this is to organize related activities within an environmental management system (EMS). EMS provides standardized comprehensive tools for planning, implementing, reporting and improving environmental management in an organization. Environmental management systems can be more or less ambitious, covering wider or more limited aspects of the organization's operations, e.g. all environmental aspects, or only greenhouse gas emissions. An EMS may be externally certified (ISO 14.001 is the most common certification system) or internally managed without formal certification.

There are several benefits associated with adopting a limited EMS approach including:

- A systematic approach for reducing the emissions of the organization
- Clear assignment of responsibilities and deadlines for different tasks
- A planned system for monitoring and reporting progress
- A sound basis for budgeting of related emission reduction investments – and savings
- A good basis for building a more comprehensive environmental management system, also including aspects beyond greenhouse gas emissions, such as water use, waste management materials and coherence with national legislation.
- Improved control of operations
- Reduced risk of accidents and adverse impact of the organization on the environment.
- Contributing to improved public relations and reputation among stakeholders.

More information about environmental management systems can be found at : http://www.unep.fr/scp/business/emp.

3. Formal check points

Most UN organizations plan their work and operations through formal processes, guided by management decisions and implemented through administrative systems. For most staff the planning and implementation procedures are concretized through a number of formal steps by which future actions are developed or decided. This includes staff training, preparation of project documents, issuance of different kinds of contracts and agreements (LoA, MoU etc), and Performance Appraisal Systems (PAS). Inclusion in these steps of formal check points where the importance of minimizing greenhouse gas emissions from particular activities (e.g. contracted activities or personal performance) is a powerful way of increasing common awareness of these issues within the organization. For example:

- Ensure that the induction training of new staff includes a module on the climate neutral effort of the organization and how it should be translated into daily action. The same module could be included as a compulsory element for all existing staff as well, in the same manner as training on field security or harassment is compulsory today.
- Require that all project documents and all formal agreements (LoA, MoU etc) include a paragraph describing how the greenhouse gas emissions

- associated with the activity will be minimized.
- Include in the PAS for each staff member how he/she will promote reduced greenhouse gas emissions from his/her area of responsibility, and link it to verifiable indicators so as to make the performance contribute to the overall PAS rating of the staff member.

4. Innovative incentives

Innovative incentives refer to more creative ways of using various aspects of our daily work environment to encourage more carbon lean and green behaviour.

At its most basic (but still very important) stage, this typically takes the form of posters or signs in the office reminding the staff about basic sustainability behaviour. "Turn off the light", "use the recycling bin", "print double sided", "take public transport" are some of the common messages on these posters and signs. Such information campaigns are important but are most effective when they are supported by practical means to take action, e.g. by providing recycling bins, by providing discounted tickets on local public transport, or by setting all printers on double sided printing as the default option.

Having a person at the top level in the organization to act as champion for the whole effort is also a good way to ensure visibility and to engage the attention and support from directors and other staff.

The set-up of the work space/office is another important area where the commitment of the or- ganization to reduce climate change impact can be reflected. Physical building features have been discussed above, but in addition the entire interior space planning and set up can be designed so as to reflect a culture of sustainability. This includes:

- Use common printers, scanners and copying machines. Having a few common "printer islands" in an office is much more energy efficient than having individual equipment in each room. It also allows the organization to have higher quality equipment at a lower total cost (less machines to purchase and service), and also improves the indoor working environment.
- Provide highly visible recycling stations with ac- companying instructions about what type of waste to throw in each waste bin.

- Organize work spaces so that they benefit from natural lighting as much as possible. This can be done both in open office landscapes and in offices with individual rooms.
- Having plants in the office is a proven way of improving the indoor environmental quality, both physically and mentally. Some offices have organized "in-office gardening competitions" or provided "adopt a plant" schemes to encourage staff to take personal care of their plants.

An old saying is "A little bit of competition is always helpful". This can also be used within an office with several departments or units, where public displays of monthly or quarterly statistics on the paper use, energy use, number of rooms where the light have been left on etc, allows each department to compare themselves against other departments in the office.

The UN Flex policy (ST/SGB/2003/4) allows different forms of flexible working arrangements, including work from home up to two days a week. Distance work (working from any location outside the office) can have several benefits:

- Reduced need for commuting, reducing costs and carbon footprint of individual staff (this can be included as a goal in the PAS for the individual staff member).
- Reduced need for office space (and costs for the organization), if flexible office space arrange- ments are applied, e.g. if five staff share four

Figure 16: Example of poster for staff awareness (UNEP). More posters are available from www.unep.fr/scp/sun/culture.htm

work spaces and combine this with one day of distance work each per week.

- Improved work-life balance and improved productivity, as time spent on commuting can be more productively spent.

Distance work is also closely related to sustainable travel policies as it allows staff to work from a distance. Several meetings in the same place can thereby be covered in one trip, as the staff can work (and be recognized for doing so) in between meetings at the destination, rather than having to travel back to the office between the meetings.

It should be noted that not all categories of staff and not all UN locations are suitable for participation in distance work schemes and that decisions need to be underpinned by studies of attitudes and behaviour of concerned staff. It also requires a minimum level of mobile working equipment and set-up (laptop computers, distance access to e-mail and common files).

Figure 17: Example of in-house information display of monthly performance of different departments in ESCAP.

Different forms of formal recognition for green initiatives or the rewarding of champions of greenhouse gas emission reduction can also send a message that this is an important part of the organizational culture. Different organizations have established different forms of such schemes, where individuals or departments are rewarded for particularly good achievements. Examples of rewards used in UN for this kind of recognitions include cash rewards to be used for improving the performance of his/her part of the organization in any way he/she prefers, as well as entitlements to participate in external courses/ trainings, to have donations to charities made by the organization but in the winners name (e.g for tree planting), or to participate in specific meetings or missions with the head of the organization etc. In almost all cases the winner of the price is well announced and also awarded a plaque or diploma at a formal ceremony.

Innovative incentives can come in many forms and often build on a team culture with common values. UN offices are typically a melting pot of people with various cultures and backgrounds. While this can be a problem for building teams in some cases, it is also an excellent source of generating new ideas for strengthening the team. It is always a good idea to take advantage of the ideas from colleagues on how to make the office green and climate friendly. This can be done through a formal survey, through a brain storming session, or just by a discussion board on the local intranet.

Chapter IV

How to Get Started

Chapter IV: How to Get Started

Responsibility for implementing the UN Climate Neutral Strategy rests formally with the head of each UN organization. Each organization has also assigned a person (normally at headquarters) responsible for coordinating the activities related to the climate neutral strategy. This person – the "Climate Neutral Focal Point" - will need the support of other staff in the organization, both in other functional areas (facilities management, ICT support, travel etc), and in other duty stations.

The Climate Neutral Focal Points constitute the Issue Management Group (IMG) on Climate Change, coordinated and supported by SUN and EMG. It is clear that much or the work to reduce UN's greenhouse gas emissions will be pursued through these focal points, while SUN/EMG are working on improving common rules and regulations for the entire UN system. However, actual implementation of activities will in most cases have to take place at the local level; in the regional or country level offices around the world. Indeed there are already today many examples of local initiatives to green the office at the local level. Regardless of whether activities to green the office at the local level have already started or not, there are a number of steps that can be followed to come off to a good start (or good continuation). Some of these are summarized in the section below.

1. **Identify and activate interested colleagues**
   Many UN staff are already practicing "green habits" at home but do not have time or incentives to also do this at work. If you start talking about what could be done in your office, it is likely that these colleagues will want to help.

2. **Tell a story**
   There is always a story to tell – the question is how to tell it. As was mentioned in the beginning of this report climate change touches on a multitude of issues, and should not be seen merely as a green issue. This can also be translated to the local context where the drivers for pursuing greener and climate leaner organizations may relate to environmental considerations, as much as to economic considerations, staff health, efficiency of the organization, and the credibility of the organization. The key to

finding support and enthusiasm for climate neutral and greening activities is sometimes found in the way these are presented – not as environmental issues, but just as issues of economy, efficiency, staff health etc.

3. **Make an initial screening of what areas are of most importance**
   Preparing a greenhouse gas inventory is always useful, but so is to talk with staff about what issues are they personally concerned. This may be the amount of paper used, the habit to turn off (or not) lights in the evening, or the over cooling/over heating of the office. This guide has proposed a methodology (in Chapter II) for how the initial screening may be conducted. A common approach is to call a meeting with interested colleagues to discuss what issues may be of concern. The Quick list (chapter I) can here be helpful to provide inspiration on what issues to consider.

4. **Prepare a plan**
   Based on the initial screening in step 3, develop more detailed information on what can be done, what are the expected benefits, what are the costs and what are the requirements to implement each option. It is usually recommended to single out only a few low hanging fruits (easy and/or cheap options) for a start to demonstrate that it can be done and to not overload whoever will end up with responsibility to implement the plan.

5. **Get senior level support**
   The plan should then be presented for senior management for their review and approval, and allocation of resources if needed/possible. Ideally the plan should make use of *SMART* objectives. SMART stands for:

   - *Specific* – Objectives should specify what they want to achieve.
   - *Measurable* – You should be able to measure whether you are meeting the objectives or not.
   - *Achievable* - Are the objectives you set, achievable and attainable?
   - *Realistic* – Can you realistically achieve the objectives with the resources you have?
   - *Time Constrained* – When do you want to achieve the set objectives?

By using SMART objectives and further identify/propose WHO will be held accountable for meeting each objective and with WHAT funds, the plan easily translates into action on the ground. Again, when presenting the plan to the senior management it is good to present this not only as an environmental issue, but as an opportunity to (for example) reduce costs, improve efficiency and increase staff satisfaction.

6. **Monitor and share result – celebrate successes**

    It is important that your work and progress is visible and recognized, so as to generate support to continue with other activities in the plan. Making the progress an item of pride for the whole office, including senior management is also a good way to ensure continued support. Also share your progress and lessons learned with other staff in other offices/organizations. Today more and more green initiatives are underway in UN, and the importance of sharing experiences so as to inspire others to follow, should not be under estimated. The UN Climate Neutral web site (www.unemg.org/climateneutralun) also has a space where UN offices can share their experiences with each other. Inspire your colleagues!

7. **Know where to find support**

    The implementation of UN's climate neutral strategy is unique in that it is going on simul-

taneously in all UN organizations around the world. There are many ways of finding more information and support:

*   Talk with your organization's designated Climate Neutral Focal point. He/she should be able to provide advice and guidance on the progress of the climate neutral strategy. If you are the designated focal point, then talk with focal points in other organizations to find answer to your questions.

*   Go to the UN climate neutral web site (www.unemg.org/climateneutralun). There you will find the reports tools and guidelines mentioned in this report: You will information on sustainable travel, on sustainable procurement, on sustainable facilities management and so on. There will also be posted the official inventories and fact sheets from each UN organization, as well as case studies and links to resources outside UN.

*   Contact SUN and EMG to receive direct advice on specific issues. Currently EMG is operating a help desk on how to prepare greenhouse gas inventories and SUN is providing assessment support and is also having a helpdesk on sustainable travel. Additional support on specific issues will also be responded to as far as is possible.

A final word...

As this guide reflects, there are multiple opportunities to reduce the climate footprint of UN organizations. Not all measures presented in this guide are relevant in all situations, but in all situations, at least some of the measures presented should be relevant. When pursuing emission reductions, it is important to do this in a practical and realistic way. Even if ambitious goals are set, and the effort to reach these goals may be time consuming, the journey towards these goals start with a first step. It is our hope that this guide inspires you - the reader - to take that first step.

About Sustainable United Nations (SUN)

Sustainable United Nations (SUN), is a UNEP initiative that provides support to UN and other organisations to reduce their greenhouse gas emissions and improve their sustainability overall.

SUN was established in response to the call from UN Secretary General Ban Ki-Moon at the World Environment Day 2007 (5 June), to all UN agencies, funds and programmes to reduce their carbon footprints and "go green". This call was echoed in October 2007 in a decision of the UN Chief Executives Board (CEB/2007/2, annex II) to adopt the UN Climate Neutral Strategy, which commits all UN organisations to move towards climate neutrality. SUN is in this context working with the UN Environment Management Group – the UN body coordinating common environmental work within UN – to provide guidance, and develop tools and models for emission reduction within organisations.

SUN is using a "whole-organisation" approach in identification of sources and causes for emissions and opportunities for reduced emissions and improved sustainability. In this way opportunities for improvements are typically found within one of the three major focus areas for SUN:

a. Physical assets: building, equipment, vehicles…
b. Management processes: procurement, travel, management systems…
c. Organisational Culture: day-to-day office behaviour and "corporate" culture, green meetings…

SUN operates in synergy with existing initiatives and networks such as the Sustainable Buildings and Construction Initiative, the High Level Committee on Management Procurement Network, the UN Global compact, or the Marrakech Task Force on Sustainable Public Procurement and many others.

For more information, see
www.unep.fr/scp/sun

About the UNEP Division of Technology, Industry and Economics

The UNEP Division of Technology, Industry and Economics (DTIE) helps governments, local authorities and decision-makers in business and industry to develop and implement policies and practices focusing on sustainable development.

The Division works to promote:

> sustainable consumption and production,

> the efficient use of renewable energy,

> adequate management of chemicals,

> the integration of environmental costs in development policies.

The Office of the Director, located in Paris, coordinates activities through:

> **The International Environmental Technology Centre** - IETC (Osaka, Shiga), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.

> **Sustainable Consumption and Production** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.

> **Chemicals** (Geneva), which catalyzes global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.

> **Energy** (Paris), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.

> **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.

> **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies.

UNEP DTIE activities focus on raising awareness, improving the transfer of knowledge and information, fostering technological cooperation and partnerships, and implementing international conventions and agreements.

For more information,
see **www.unep.fr**

Climate change is one of the most serious challenges to the wellbeing of our society and planet.

The United Nations has decided that the organization has to walk the talk and move towards becoming a climate neutral organization. In order to support the various parts of the UN family to reduce their climate footprint, the Sustainable United Nations facility in UNEP is providing tools and advisory services on various aspects of this effort.

This guide summarizes the overall approach to emission reductions in UN, and range of options that can typically contribute to a reduced climate footprint. The guide presents a list of measures in the areas of travel, buildings design and management, processes and organizational culture. It also provides advice on strategies to support implementation of these measures.

The guide focuses on the situation in UN, but is also a useful reference for other organizations.

DTI/1217/PA