



# Juba UN House Pilot Project - eco-friendly containers

*Peacekeeping goes green*

*DPKO – UNMIS- SWE'S Pilot Project*

Presented by  
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December 2013



# Summary

1. UNMISS Characterization- EMS
2. General background of SWEs Pilot Project
3. Technical background
4. Monitoring system and Comparative Evaluation
5. Preliminary Results



SUDAN

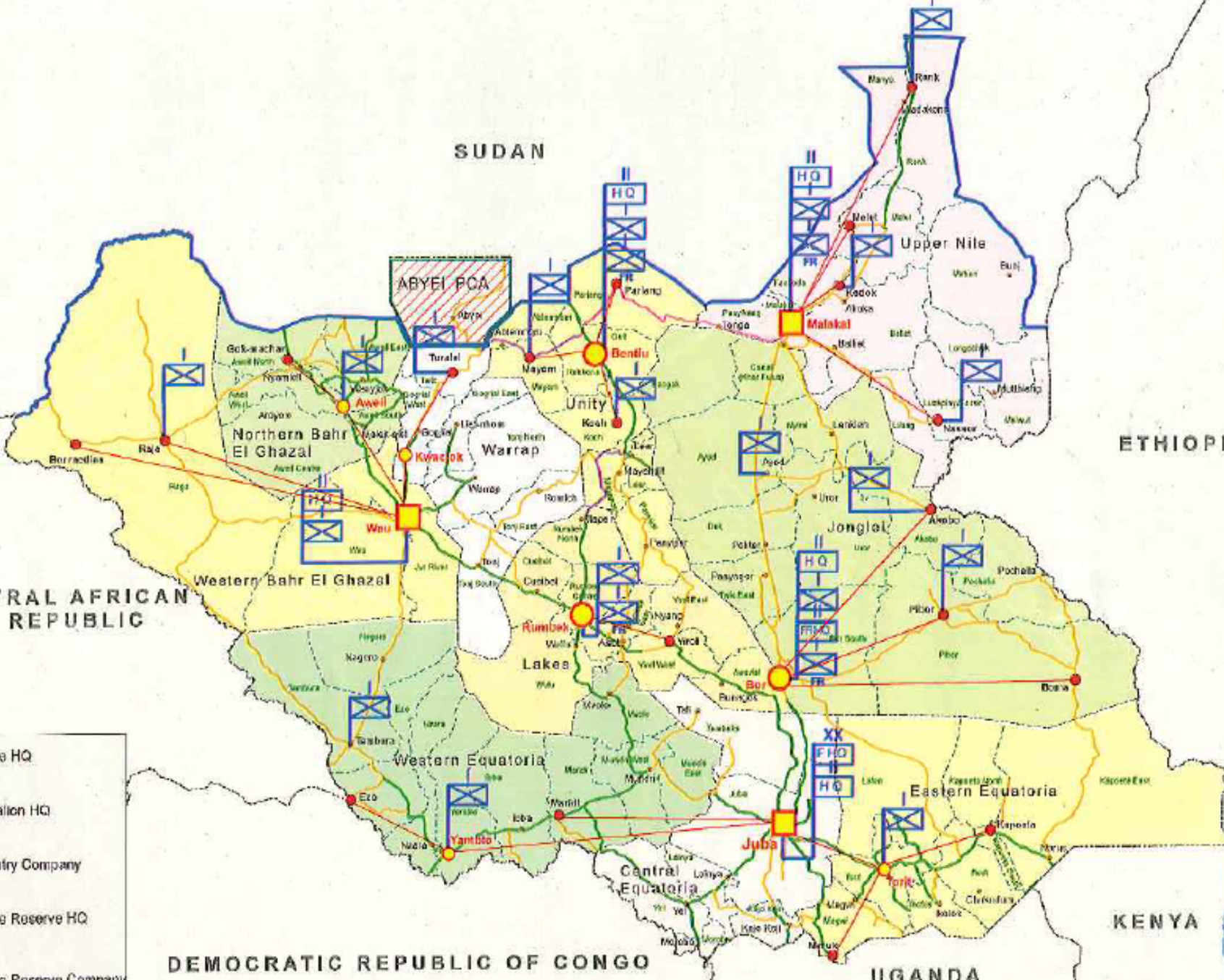
ETHIOPIA

KENYA

DEMOCRATIC REPUBLIC OF CONGO

UGANDA

CENTRAL AFRICAN REPUBLIC







# Mission Characteristics



<i>Number of mission sites within the host country</i>	31	
	State Capital x 10 County Base x 21 (CSB / COB)	
<i>Number of Mission personnel</i>	<i>Military</i>	<i>Civilian</i>
	6931	3388







# *Environmental Policy and Guidelines for UNMIS*

❖ Environmental Policy and Guidelines for UNMIS, has been approved by DMS on 23-02-2009 and were formulated based on the DPKO policy and guidelines highlighting environmental **objectives, responsibilities, standards of conduct for personnel, components of environmental objectives, monitoring of environmental actions and resources.**



# *Environmental Responsibility Specific Issues*

## *Specific Issues*

- Waste management ( Solid, liquid and hazardous waste)
- Hazardous substances management
- Natural resources management
- Pollution (air, noise, water, soil)
- Energy Conservation
- Cultural/historical resources management







# UNMISS Waste Management





# Environmental Guidelines on Waste Management




United Nations Mission in Sudan  
Engineering Section  
Environmental Engineering

Detailed Mission Guidelines

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*Environmental Guidelines on  
Waste Management*

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Approved by:   
Approval date: 04 March 2009  
Contact: Environmental Engineering  
Review date:

## Purpose

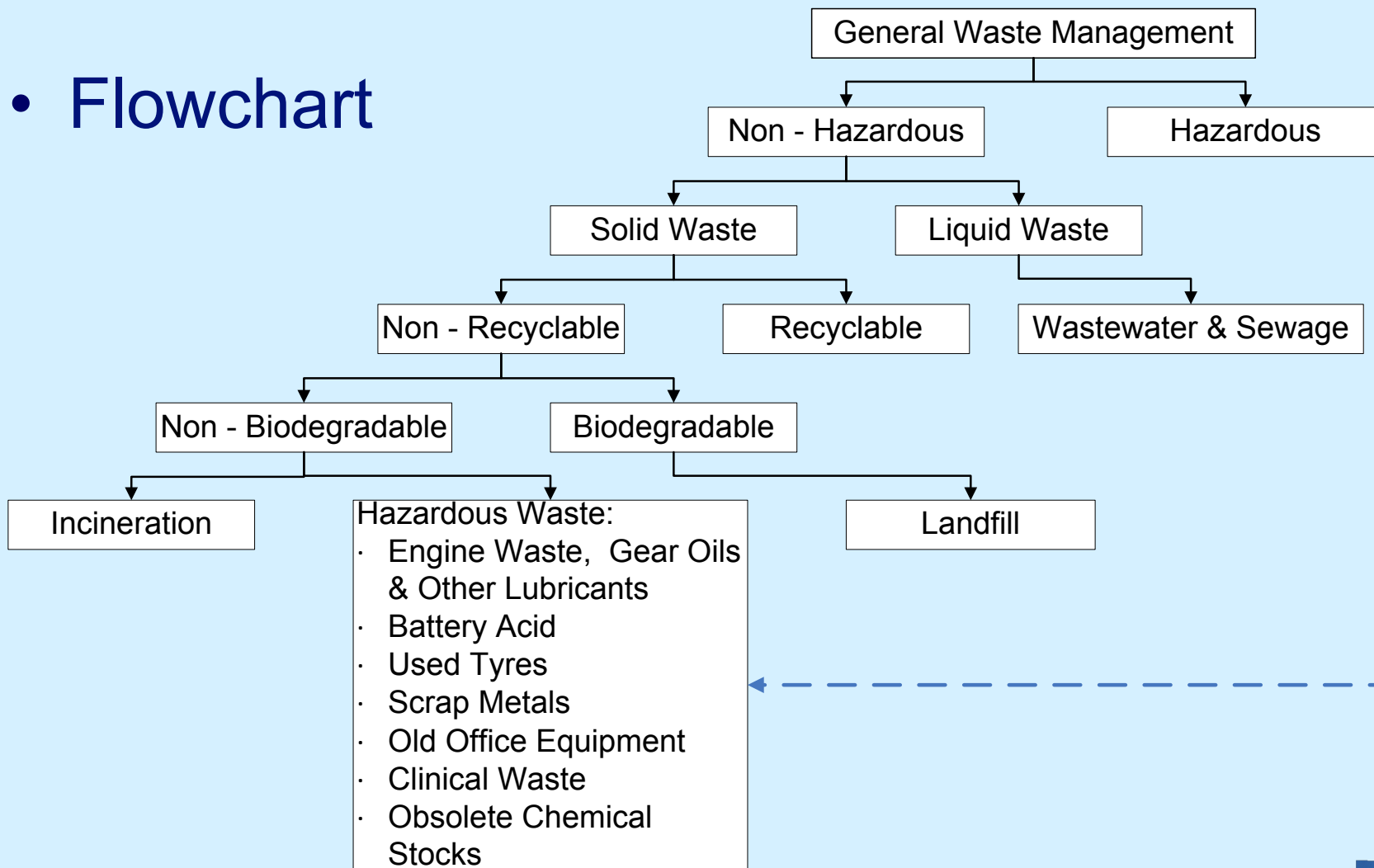
To establish the Waste Management System and provide guidance for the United Nations Mission in Sudan (UNMIS) on environmental matters and its implementation in the Mission area for the complete **waste management system for solids, liquids and hazardous waste**. This includes generation and source reduction, segregation, collection, treatment and waste disposal







### • Flowchart





# Modalities of Solid Waste collection and Disposal

## Environmental Guidelines on Waste Management F.3

### 1. Local contractor collects waste;

- UNMIS HQ (Government) and Juba / No TCC's)
- Mission Wide Camp Support Management (SOW and Procurement process for North and South Regions)

### 2. Government Authorized garbage collection points. United Nations Owned Equipment (UNOE) or Contingent Owned Equipment (COE) is utilized to collect waste;

- Log Base, Ed Damazin and Rumbek
- TS's x 4

### 3. Local Arrangement. Waste is disposed off locally.

- Pilot Project
- SHQ x 4
- TS's x 14





# Hazardous Waste







# *Water supply water source management*







# WATSAN





# Modular Wastewater Treatment Systems

(System contract No. PD/CO132/07)



Module 2:  
Lift Station



- Module 1:  
Septic System  
(2 versions)



- Module 3:  
Wastewater  
Treatment Plant





# Environmental Guidelines on Waste Management

## Waste water management – Chapter G



### CONSTR OF SEPTIC TANKS AT CAMBODIAN CAMP







# Waste water management – New Oxidation Pond, Abyei S HQ

Before (2006) and After (May 2010)



**Uncontrolled swage discharge**



**Swage pipeline system**

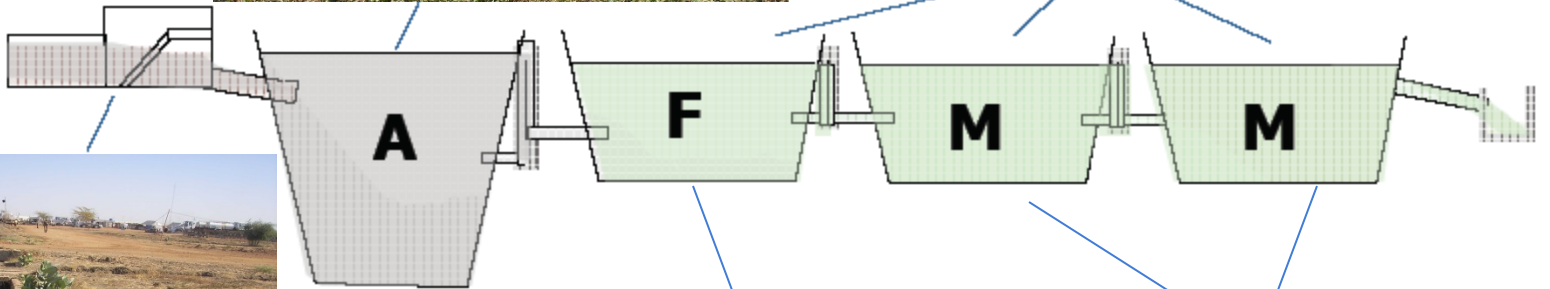


**New fenced Oxidation Pond**





# Waste Water Treatment Oxidation Ponds





# *Green facilities for Generator Sites & Fuel Stations, Preventing pollution from POL*



- **Concrete flooring**
- **Drainage channels and retention dyke**
- **Oil separators**
- **Containment basins and protection measures for workshops at TS level.**







# *UN House Generator station*





UNMISS



Swedish Defence  
Research Agency (FOI)



UNDFS / LSD

## *“Peacekeeping Goes Green”*



**Juba UN House Pilot Project - eco-friendly containers**





## General background of the project

1. Collaboration on “*Environmental and Health Issues in Peacekeeping Operations*”, 1<sup>st</sup> Field environmental visit to UNMISS (Oct, 2006).
2. UN initiative “*Peacekeeping Goes Green*” (2008-UNHQ-007191, 20 March 2008), joint visit to UNMIS (June 27-July 7, 2008) -Terms of Reference and technical SOW-
3. The Seminar on “*Sustainable Approaches in Conflict and Disaster Areas*” (Nairobi, 10 March 2009).
4. “The 3rd Sustainable Approaches in Conflict & Disaster areas workshop” in Umeå, Stockholm and Kristinehamn (August 25-28th 2009).
5. The “4th Sustainable workshop, Technical evaluation” (7-11 December 2009, Umeå Sweden)
6. The UN Controller’s authorization (Refer to Authorization letter of 12 January 2011).
7. 27 October 2011 UNMISS was delighted to confirm the Reception and Technical Inspection of the Green Containers- Pilot Project – donated by the Government of the Kingdom of Sweden.
8. Monitoring plan for SWE’s donated equipment which will allow computing energy and water saving base on the comparative evaluation of green container in front of UNMIS’ s standard prefab units.( Nov 2012-Nov 2013)



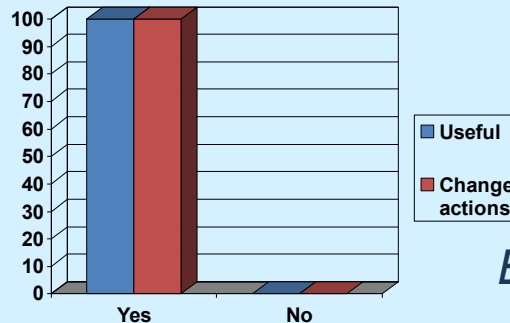


# Environmental Awareness (2008)

Outcome 200 visit

Training  
Module 2

Waste  
Analysis



## PROPOSAL

- Training modules
- Train the trainers
- Knowledge transfer
- Awareness campaign
- Environmental Guidebook for UNMISS
- Workshop

*Evaluation snapshot*

18 participants  
4 sectors  
Logistic Officers  
Rank WO to LtCol





Project	Swe support	UNMIS Juba	UNMIS HQ
<b>1. Pilot Sustainable infrastructure and utilities</b>	Sustainable house (cost benefit) Energy supply (solar,wind) Water supply (rainwater) Waste management Green procurement	Function Constructing mtrl DATA input + comparative analysis Human resources	-Adm support -Logistic support
<b>2.Waste disposal</b>	Compost / biogas "On situ" soil remediation	Construction as planned	As above
<b>3. EIA for new UNMIS HQ Juba</b>	Support Scoping- Risk assessm. / 3D Models / Tools / Training	Ownership, Scoping, EIA, Training + DATA input	As above + DATA +Analysis
<b>4. Env. Awaren.</b>	Awareness campaign Env training Modules Knowledge transfer	Ownership Train the trainers	-Adm



# Technical description

*Development and production of two (pre-fab) pilot green houses; Office unit, Ablution Unit.*

sustainable technological solutions applied regarding:

- a. Low to Zero emission, energy production with solar panels,
- b. sustainable buildings construction; rainwater harvesting,
- c. composting system and office equipment;
- d. low energy computers, printer, LED lightning, etc





# Juba UN House – UNMISS HQ

Field Visit to UNMIS (June 27-July 7 2008)





# Juba UN House – UNMISS HQ







# *Reception and Technical Inspection of the Green Containers - Pilot Project – 27 OCT 2011*





# *“Peacekeeping goes green, pilot project”, Site development*







United Nations Mission in Sudan (UNMIS)



# UNMISS Photo Release

United Nations Mission in South Sudan  
Working for the people of South Sudan

02 December 2011

## USG Susana Malcorra inaugurates environment pilot project in UN House

As part of the ongoing collaboration between the United Nations Department of Peacekeeping Operation and the government of Sweden on "Environmental and Health Issues in Peacekeeping Operations, UNMISS was chosen as a pilot mission for development of models and tools for handling various environmental and health issues and the later initiative for the camp greening projects.

The United Nations Under Secretary General (USG), Susana Malcorra, Head of the Department of Field Support for Peacekeeping missions, inaugurated today at UN House, Juba, the pilot project on Environmental and Health issues in Peacekeeping Operations.

Pointing out the importance of a clean environment, USG Malcorra said: "the environment is absolutely unpolluted when we arrive and we must keep it unpolluted when we leave so that we leave behind something that does not hurt the earth with our presence"

The environment pilot project is a sustainable prototype for office and ablution. The site is at present supplied with water, power and connected to the main sewage system.

USG Malcorra was accompanied by Ms. Birgitta Liljedahl and Mr Daniel Vesterlund from Sweden; Mr Nicolas Von Ruben and Fernando Gryzbowski from UNMISS.



Compiled by Media Relations Unit, Public Information Office, UNMISS – Juba  
[www.unmiss.un.org](http://www.unmiss.un.org)





# Ops – CAM MP Unit





- **Water Treatment Plant.** Complete water purification system, mounted in steel frames for production of drinking water from polluted fresh water source, 1.5 m<sup>3</sup>/h capacity. Compact system in five steps, with high purification based on particle filtration- Sludge filter, Activated Carbon and UV filters- , contaminants adsorption and bacteria removal without any chemicals.





# Sustainable Waste Management and GHG reduction

## *Landscaping and greening Juba Regional HQ Before and After*

### **Composting System**

- The unit may be installed outdoors or indoors and draws under 1 kWh of electricity per day at 230 V. All types of food waste may be disposed of including meat and fish, and the unit produces roughly 10 kg of rich soil compost for every 100 kg of food waste. The T40 model will accept up to 100 kg of food waste per week.





# *Landscaping and gardening*





# Environmentally Sustainable Technology:



## Water Conservation

- ✓ Solar water heater (300L)
- ✓ Dry toilets
- ✓ Urinary
- ✓ Washbasin
- ✓ Shower (head and mixer)
- ✓ Shower cabinet
- ✓ Coin/pollet
- ✓ Water Treatment Plant
- ✓ Rainwater harvesting



**Chemical dry toilet, separating urine and fecals.  
The urine will be collected in a septic tank or be lead into the Camp Juba sewage sy**





UNMIS

# Environmentally Sustainable Technology:

## Renewable energy and power conservation system



- 1) Photovoltaic System (solar cells).
- 2) Extra insulation and shading for reduction of AC needs.
- 3) Solar Water Heater.
- 4) LED Illumination and Office equipment Computers.
- 5) Shading roof (velvet and flat models).
- 6) Semi centralized AC System.
- 7) Wind turbine vents.



# PRE-FAB MODULES (FLAT PAC)



<b><u>INSULATION:</u></b>	
- floor:	thickness = 100 mm PU foam = 0.54 W/m <sup>2</sup> K
- roof:	thickness = 100 mm PU foam = 0.37 W/m <sup>2</sup> K
- external wall:	thickness = 1100 mm PU foam = 0.375 W/m <sup>2</sup> K
- sanitary window:	thickness = 4/16/4 mm U= 2.10 W/m <sup>2</sup> K
	<b>uPVC-windows with insulated, obscured glazing</b>