

Technologies à faibles émissions de GES pour l'Habitat Durable

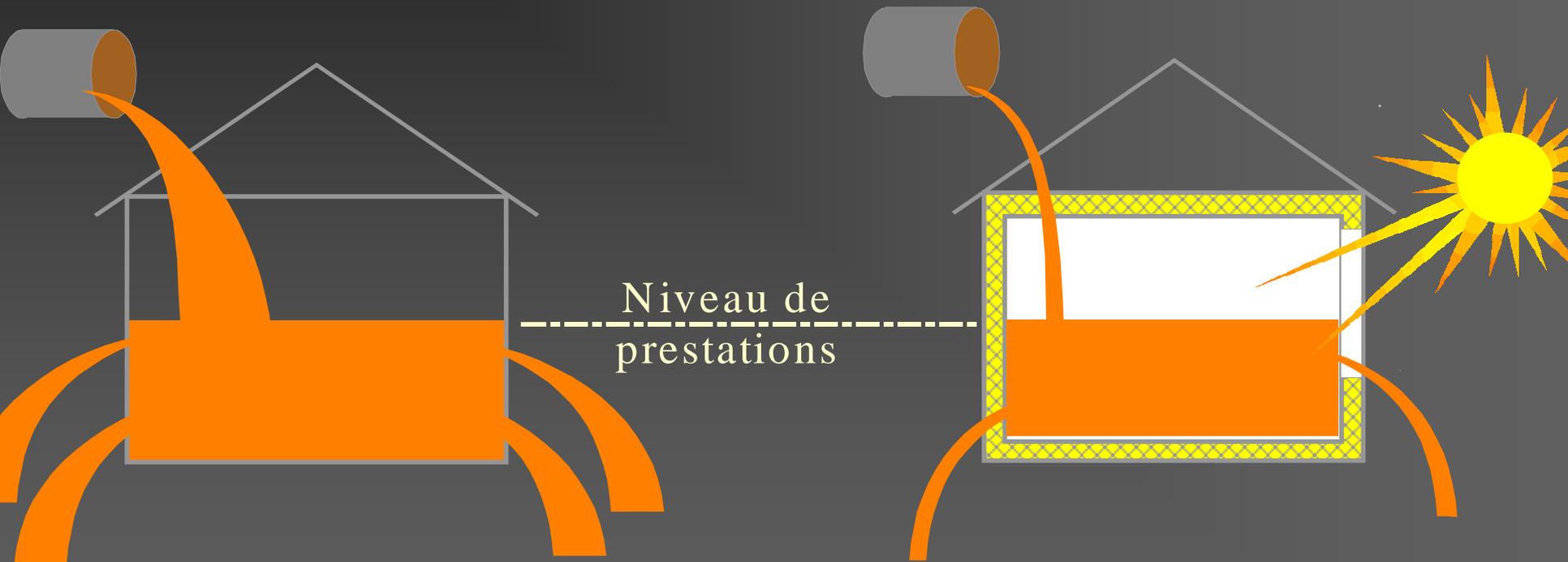
Dr Blaise Mempouo

ARPEDAC

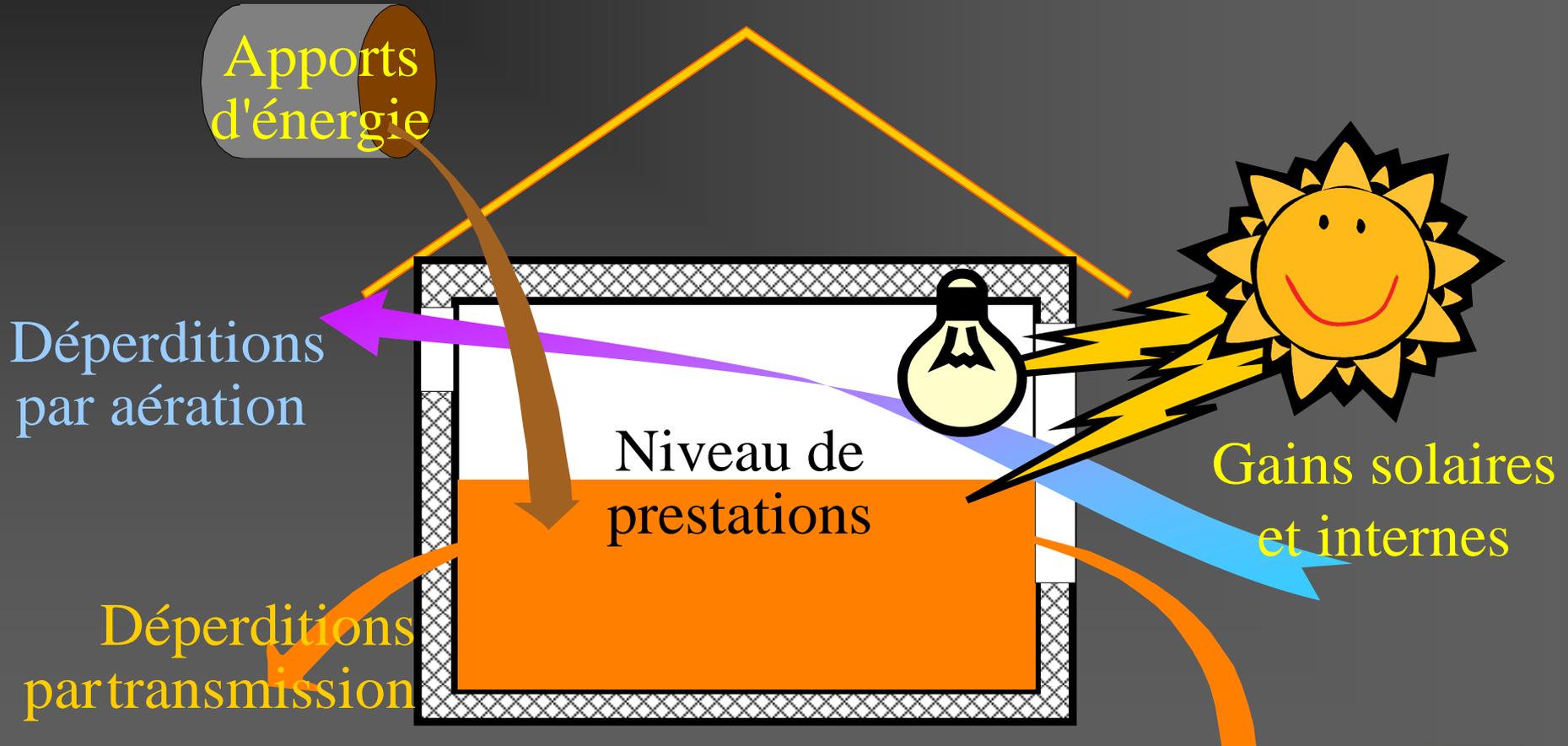
Association pour la Recherche et la
Promotion de l'Énergie Durable en
Afrique Centrale. www.arpedac.org



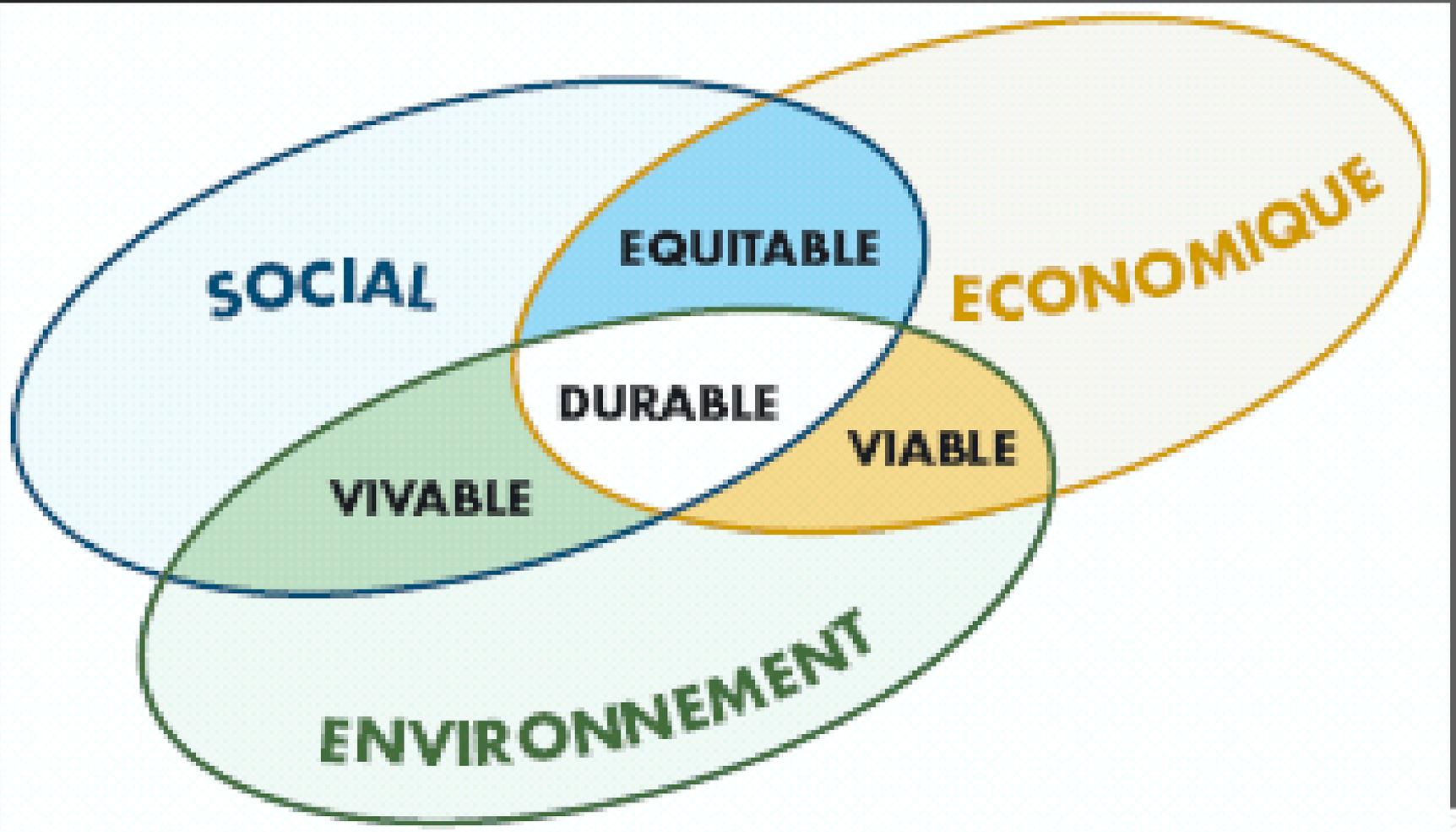
Le bâtiment est un tonneau percé



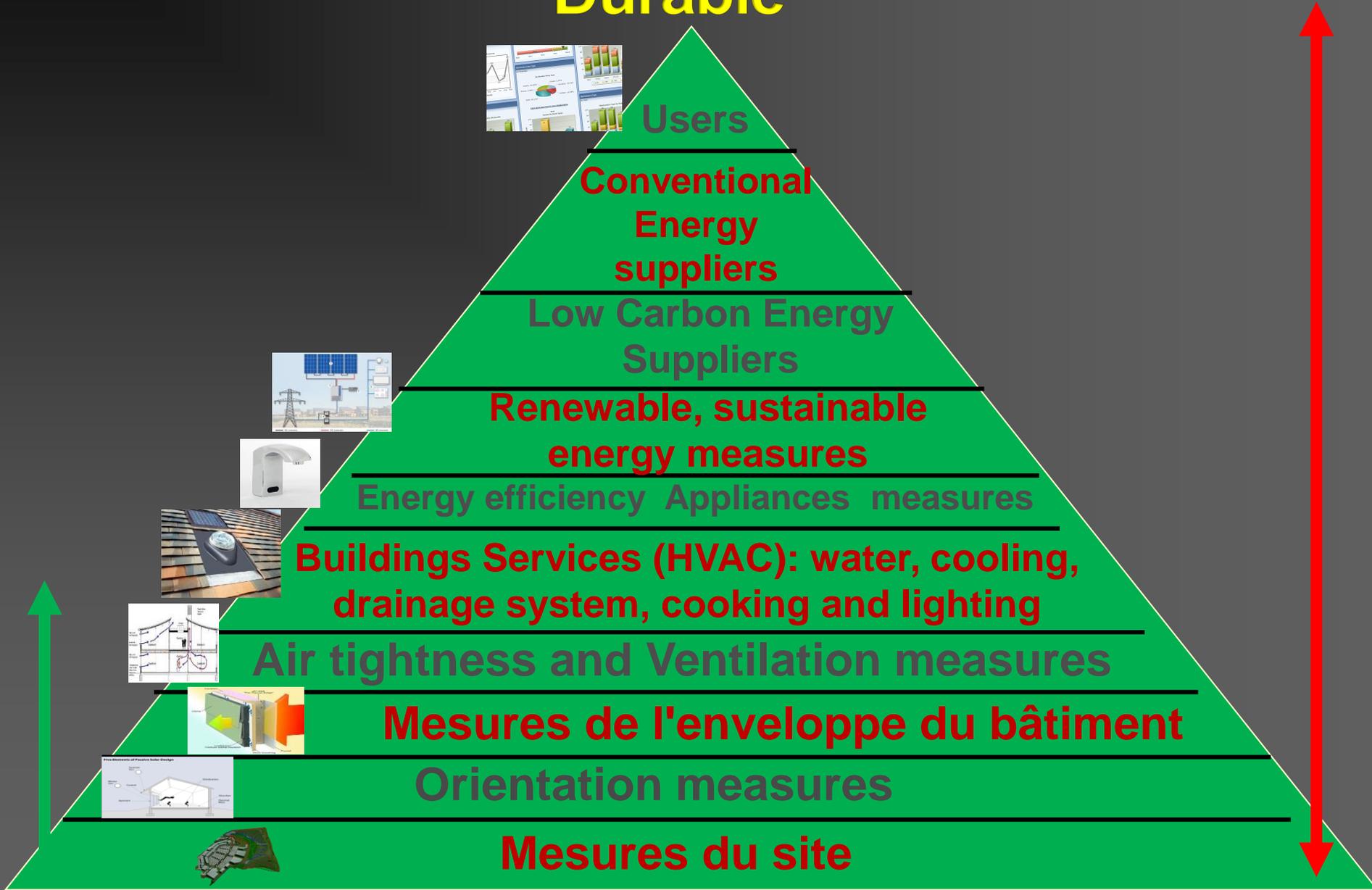
Bilan thermique d'un bâtiment



l'Habitat Durable



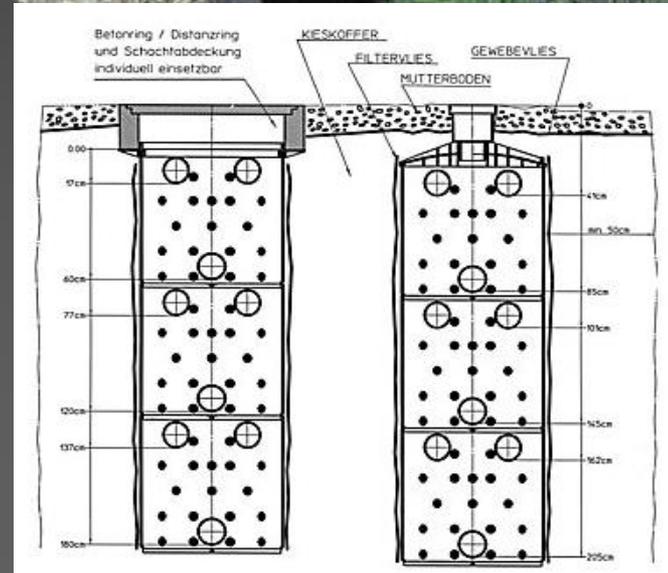
La conception hiérarchisée d'un l'Habitat Durable



MESURES DU SITE

Pour atteindre la haute norme de construction durable

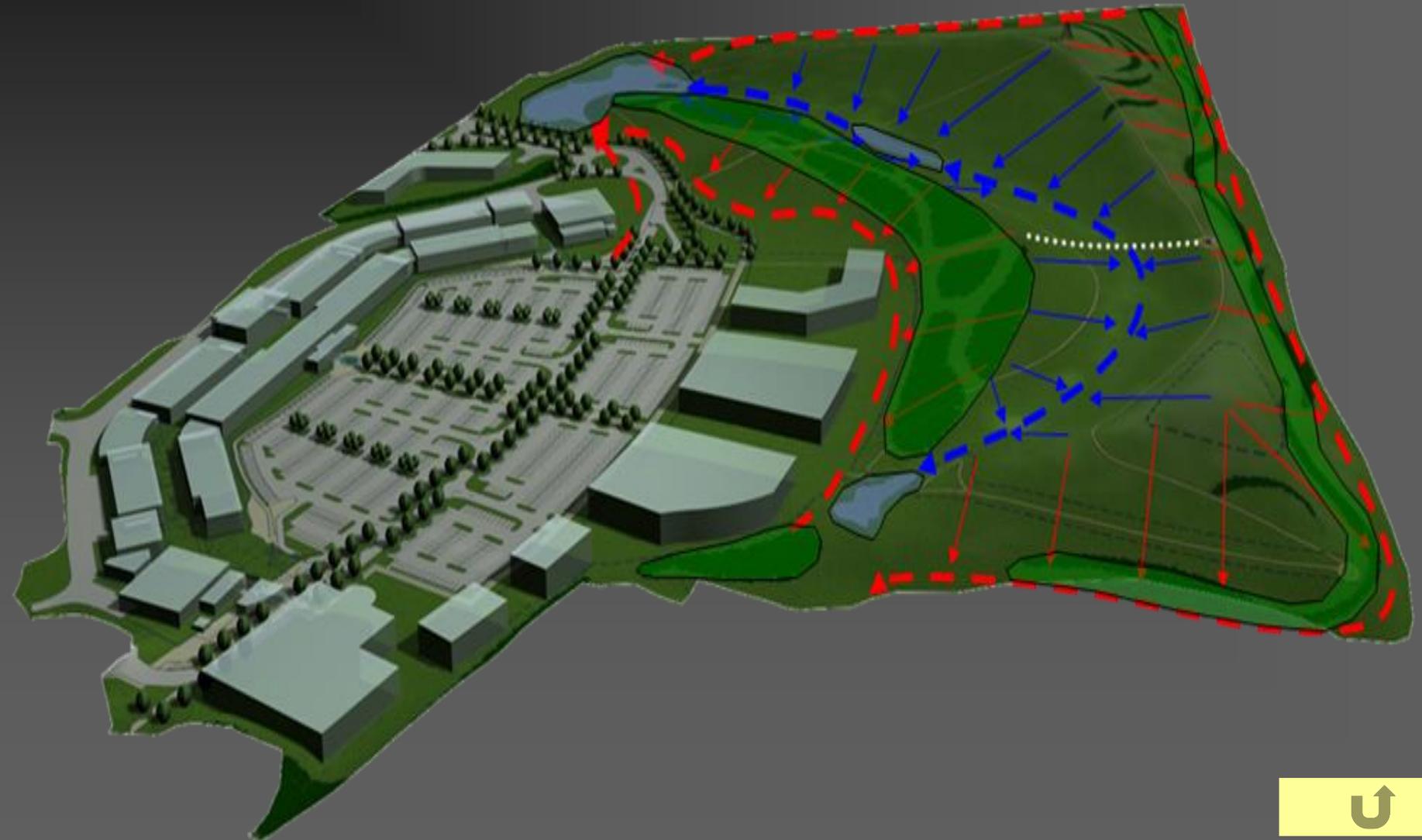
Fournir surface perméable sur le site, les aquifères sont régénérés en aidant à protéger l'approvisionnement en eau pour l'avenir.



MESURES DU SITE

Pour atteindre la haute norme de construction durable

Sustainable Drainage (rainwater collection)

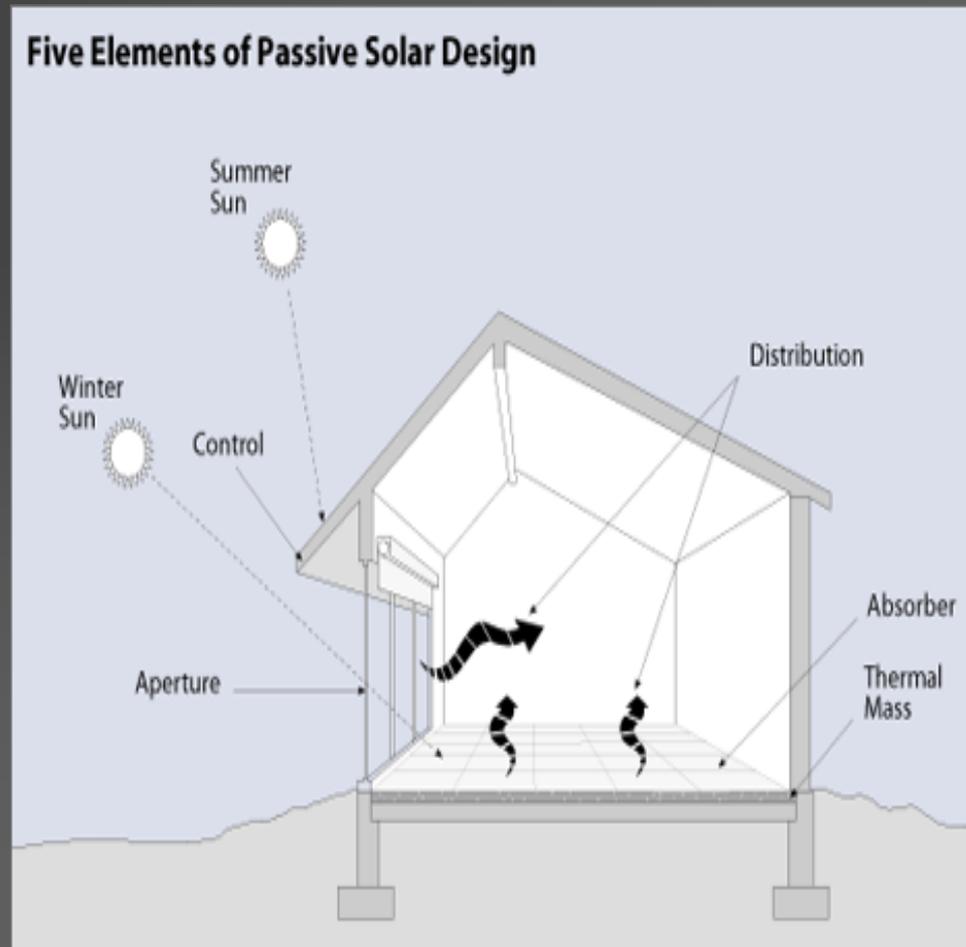


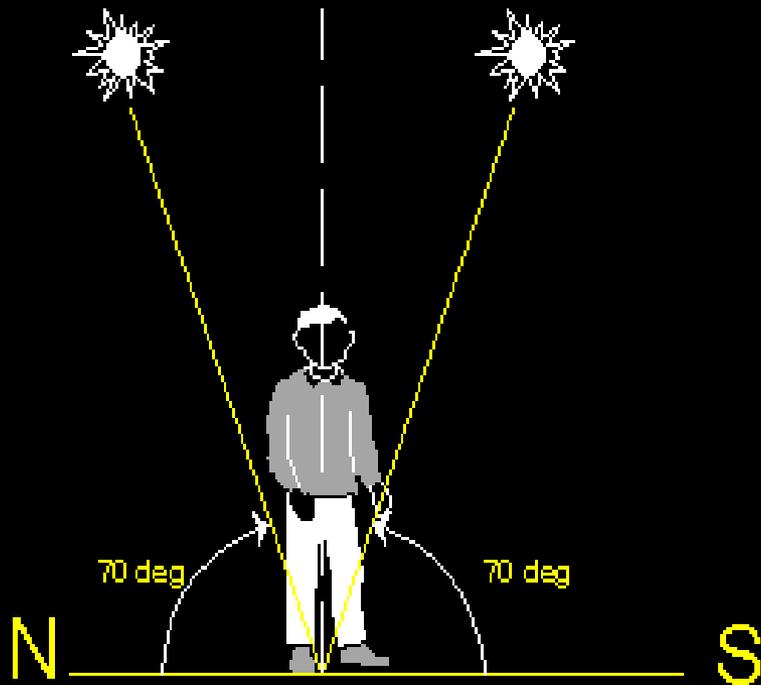
MESURES DE L'ENVELOPPE DU BÂTIMENT

Pour atteindre la haute norme de construction durable

L'objectif est d'optimiser l'utilisation de la lumière naturelle pour obtenir un confort thermique avec un minimum d'énergie conventionnelle..

Une bonne conception du bâtiment utilisé le refroidissement passif





SUN ANGLE



TEMPERATURE

HIGH

36 deg

LOW

20 deg

RELATIVE HUMIDITY

HIGH

75%

LOW

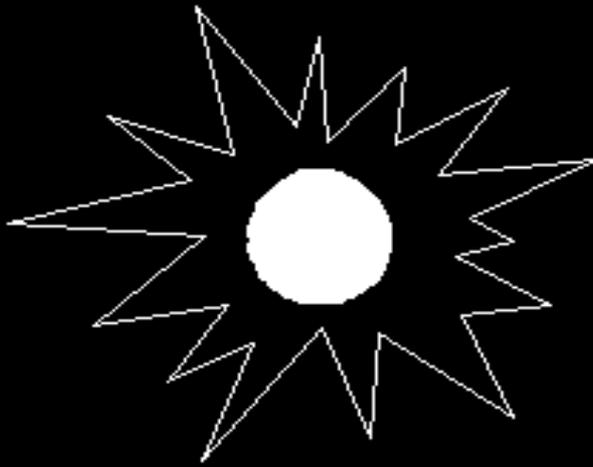
45%

BUILDING ORIENTATION MEASURES

To achieve high Standard of Sustainable Building

NATURAL COOLING

TWO NATURAL ELEMENTS
ARE MANIPULATED FOR
NATURAL COOLING:

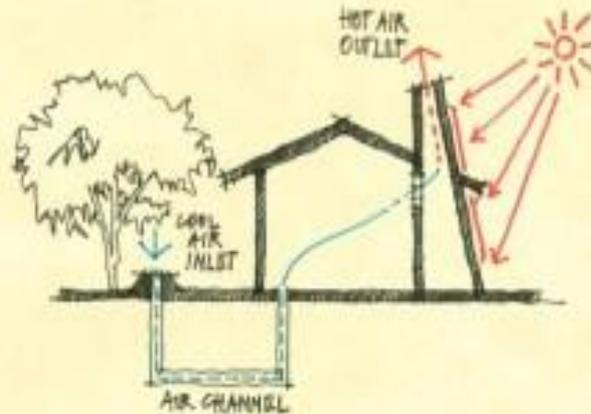
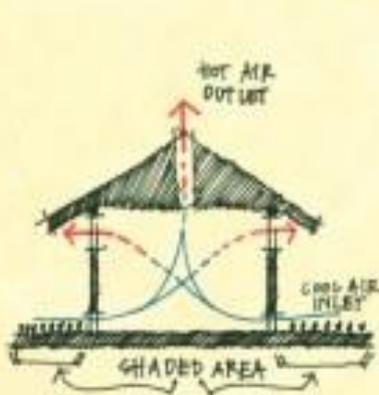
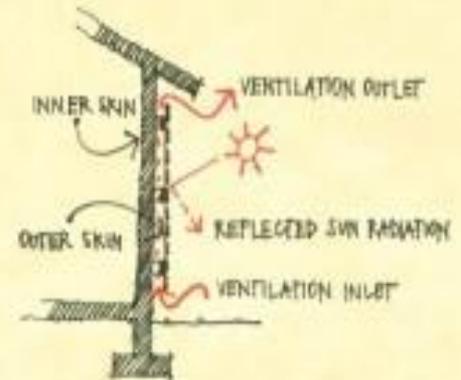
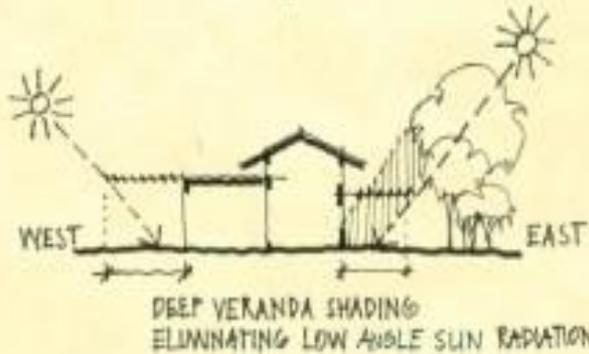
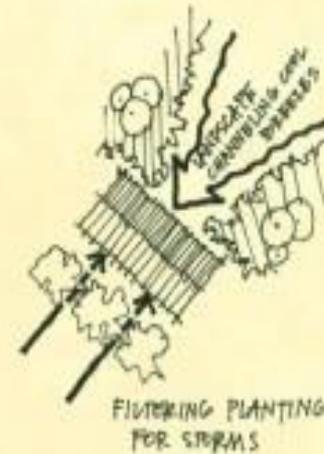
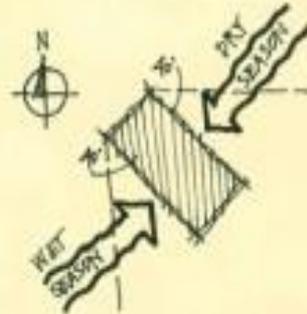
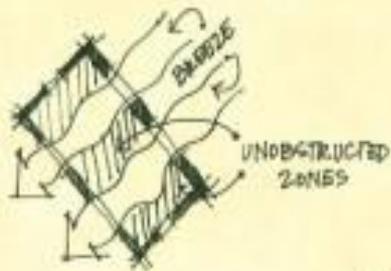


THE SUN



THE WIND

BUILDING ORIENTATION MEASURES

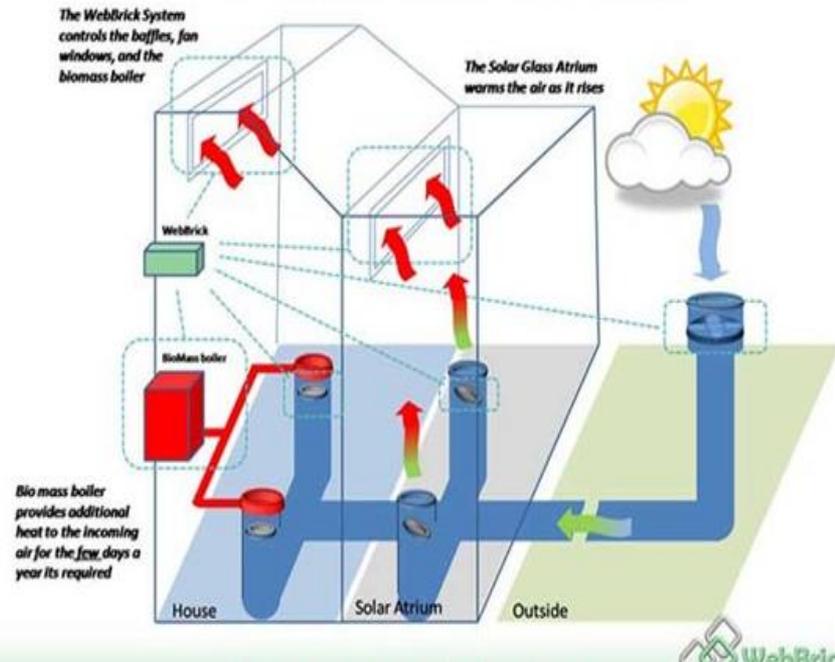


BUILDING ORIENTATION MEASURES

To achieve high Standard of Sustainable Building



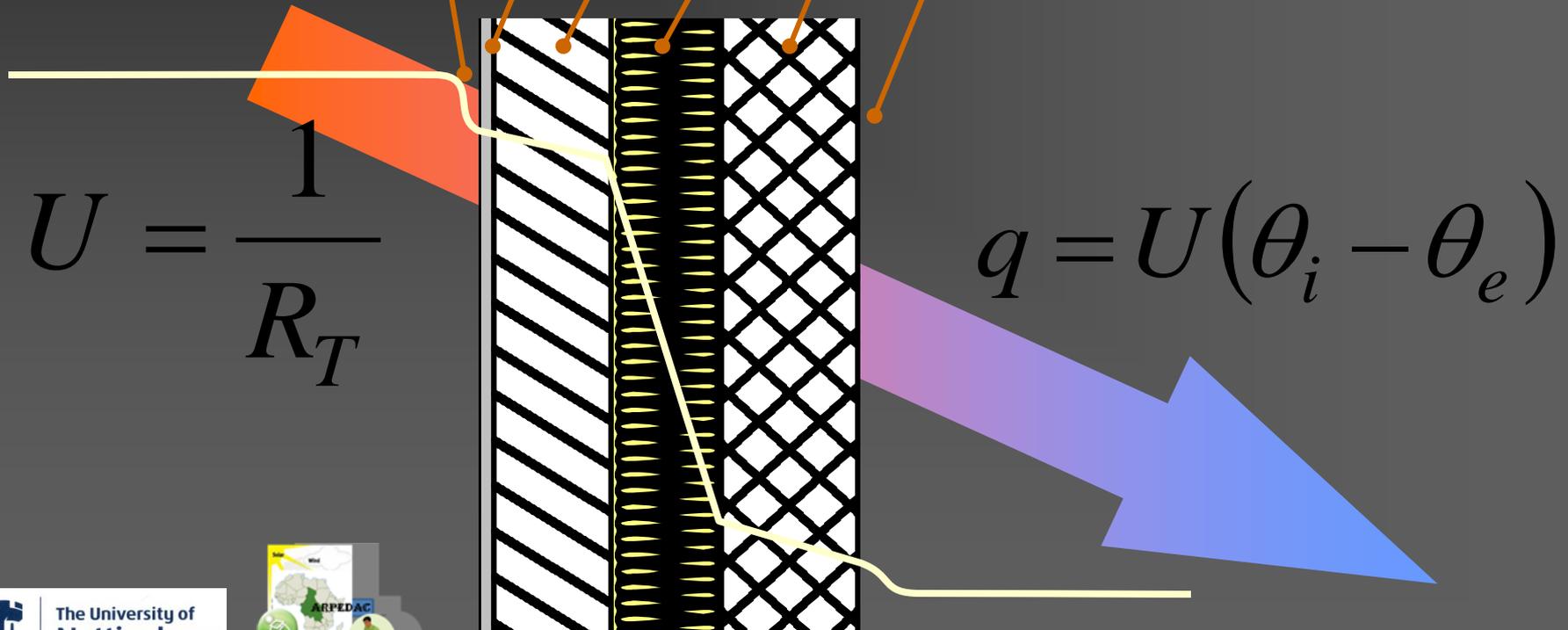
Intelligent Temperature Control



BUILDING ENVELOPS MEASURES

Reduce the U-values of envelopes, design spaces using no toxic materials.

$$R_T = R_{si} + R_1 + R_2 + R_3 + R_4 + R_{se}$$

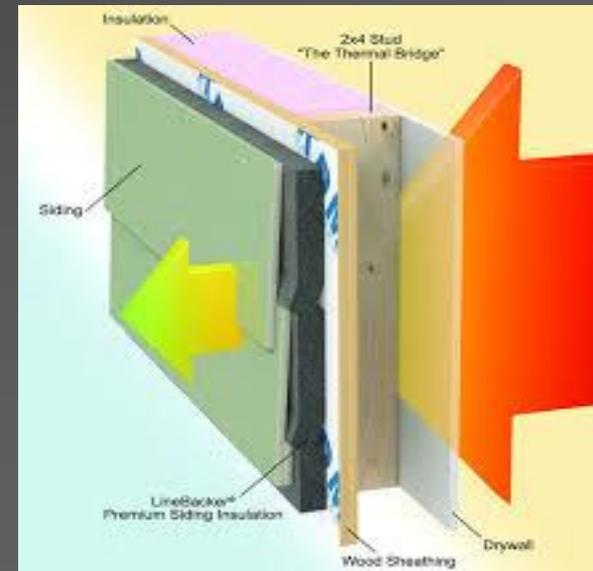
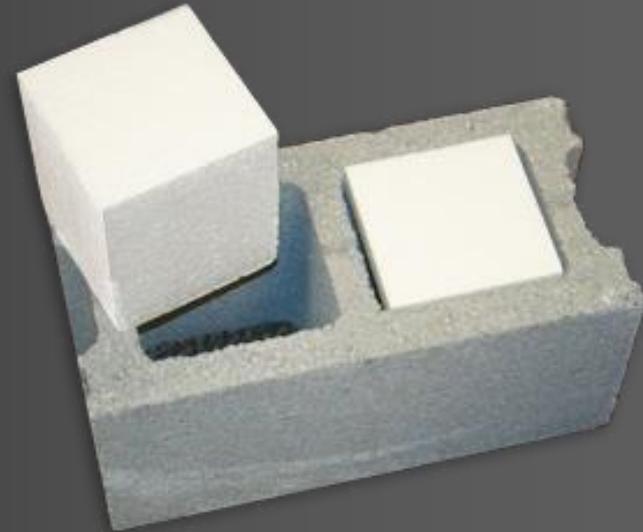


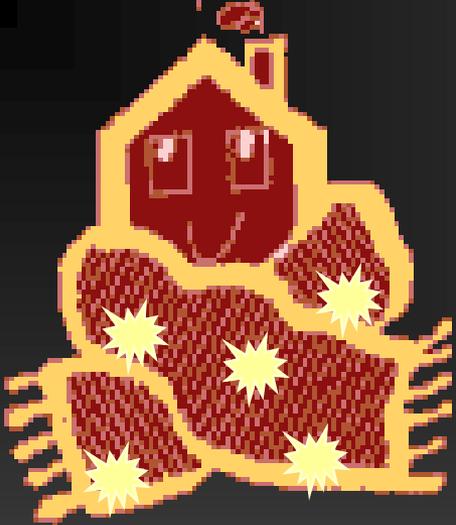
$$U = \frac{1}{R_T}$$

$$q = U(\theta_i - \theta_e)$$

BUILDING ENVELOPS MEASURES

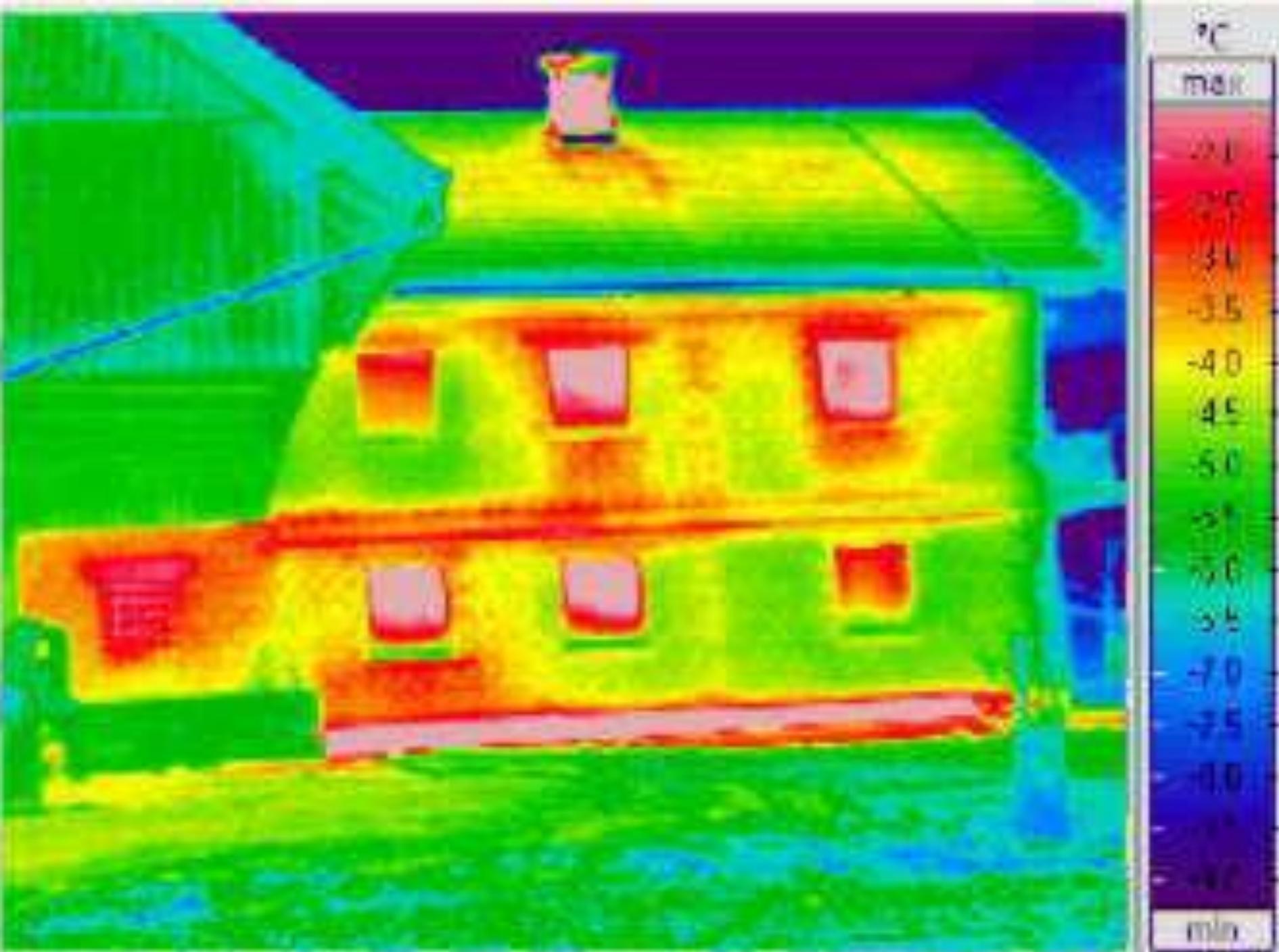
Building Insulation and energy conservation



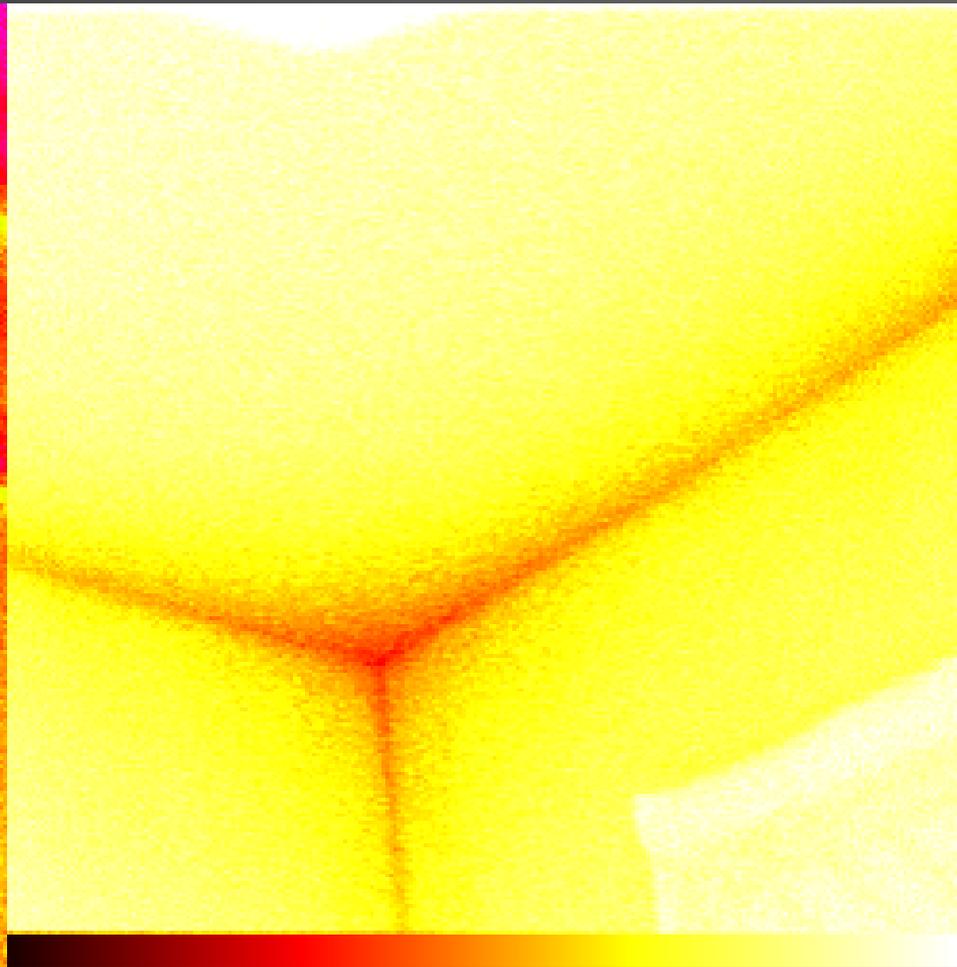
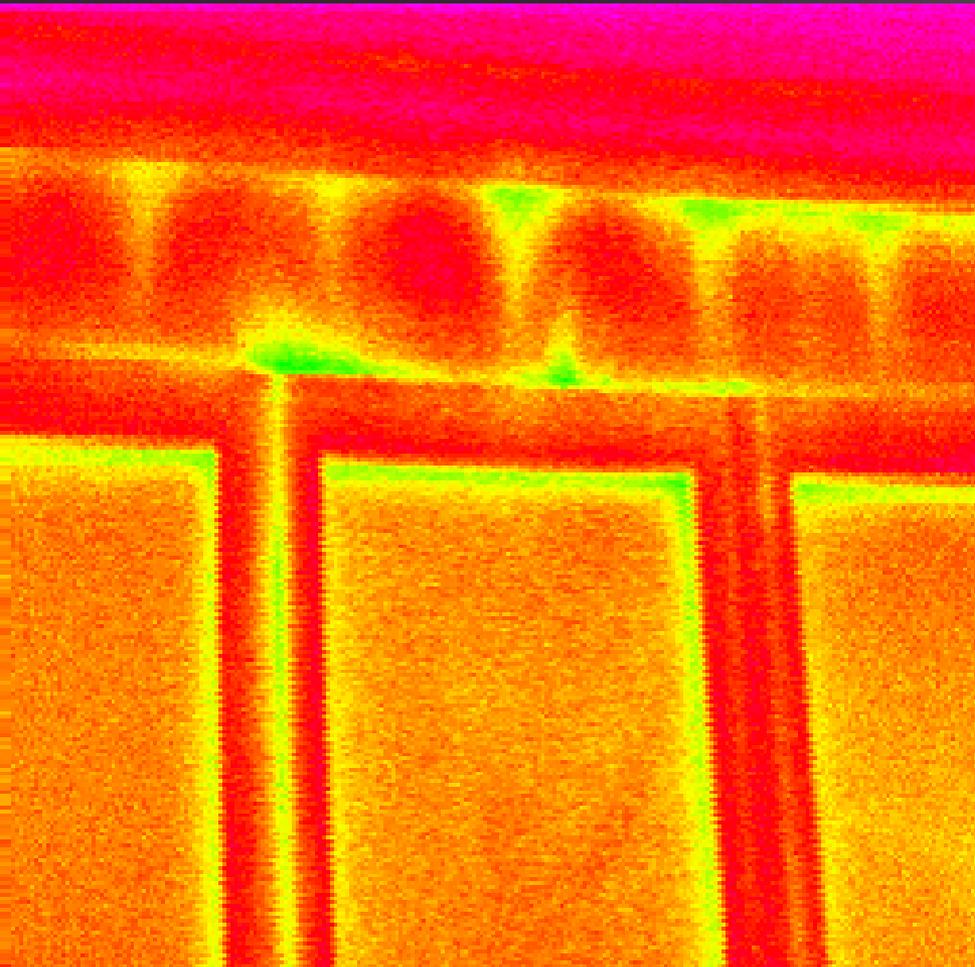


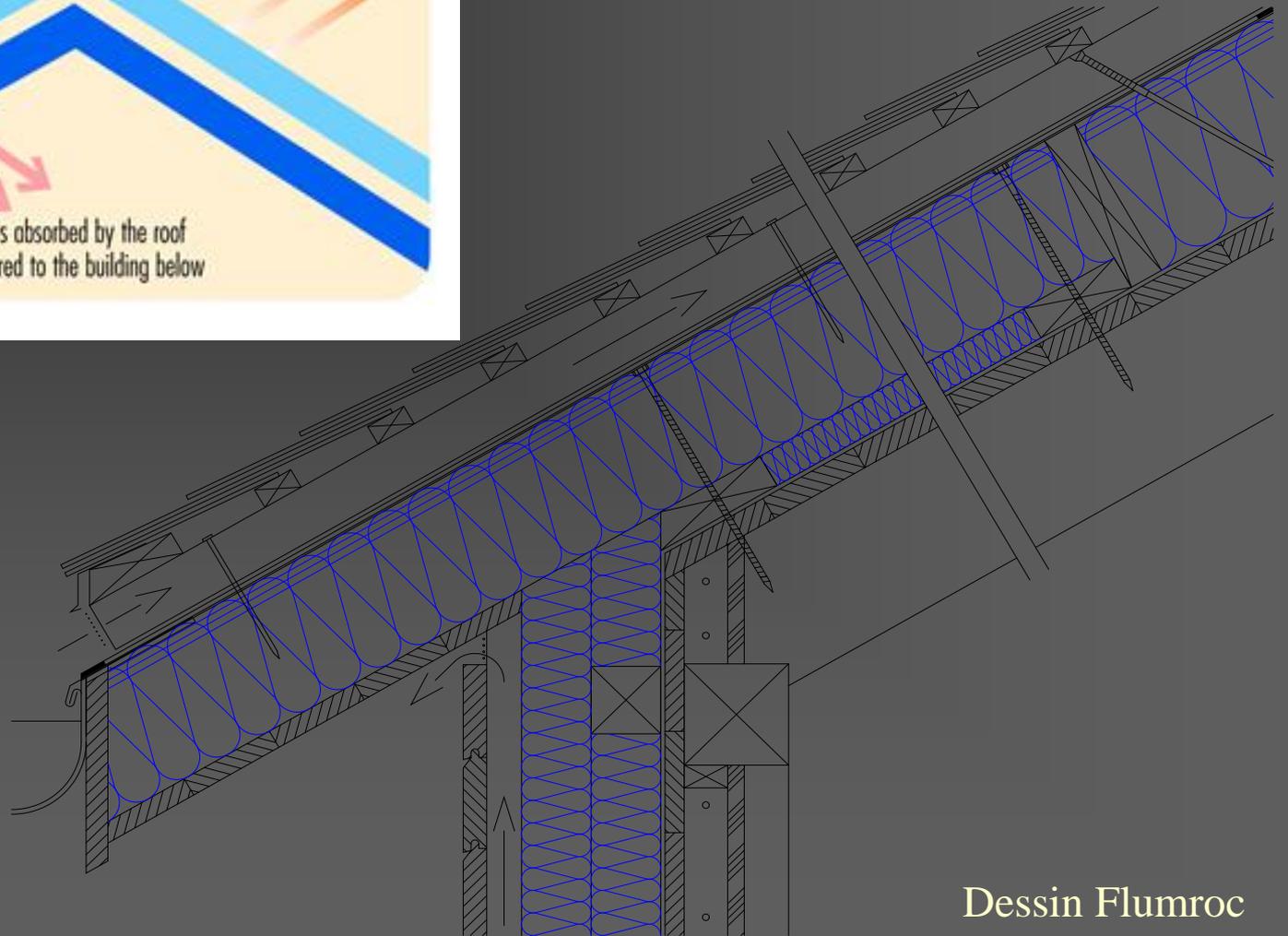
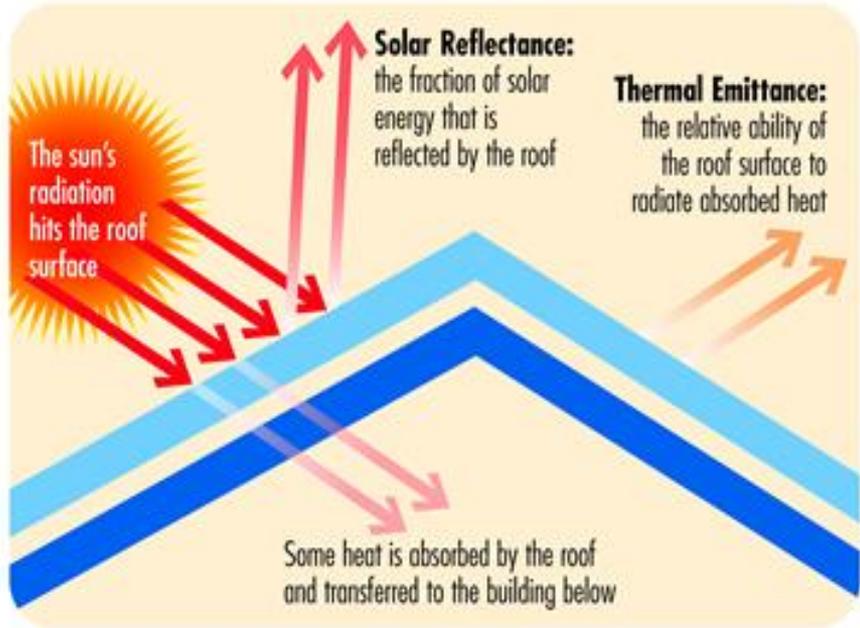
Pont thermique

- Discontinuité dans l'isolation thermique de l'enveloppe du bâtiment
- Ponts thermiques géométriques
 - angles, coins
- Ponts thermiques matériels
 - balcons, fixations, cadres si isolation extérieure
 - dalles, murs intérieurs si isolation intérieure



Refroidissement intérieur

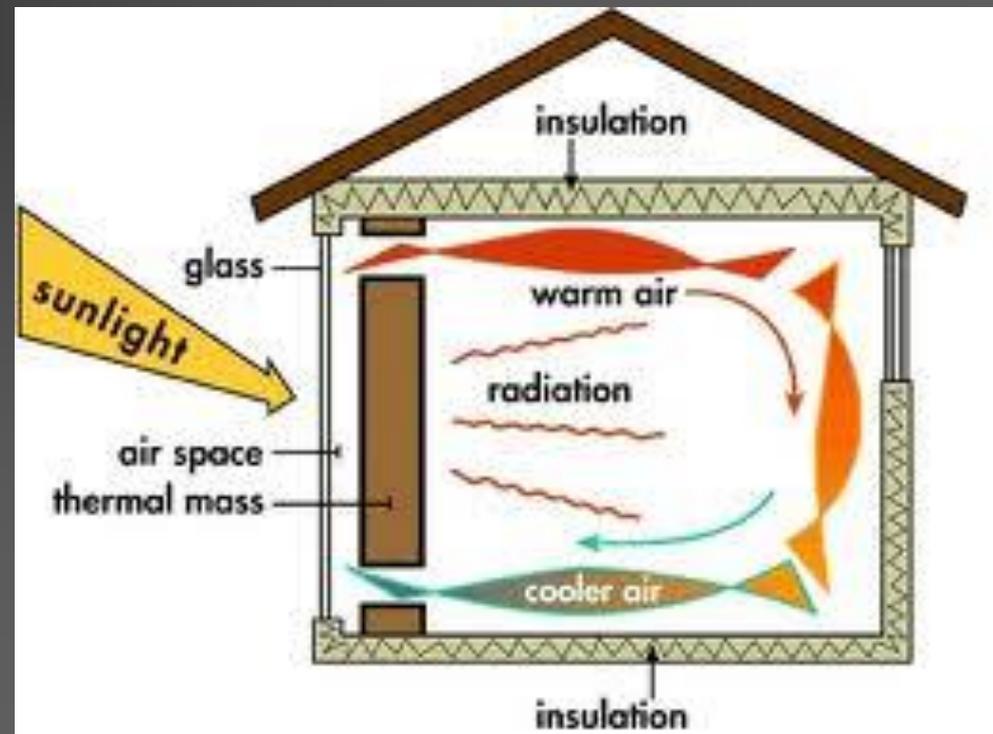
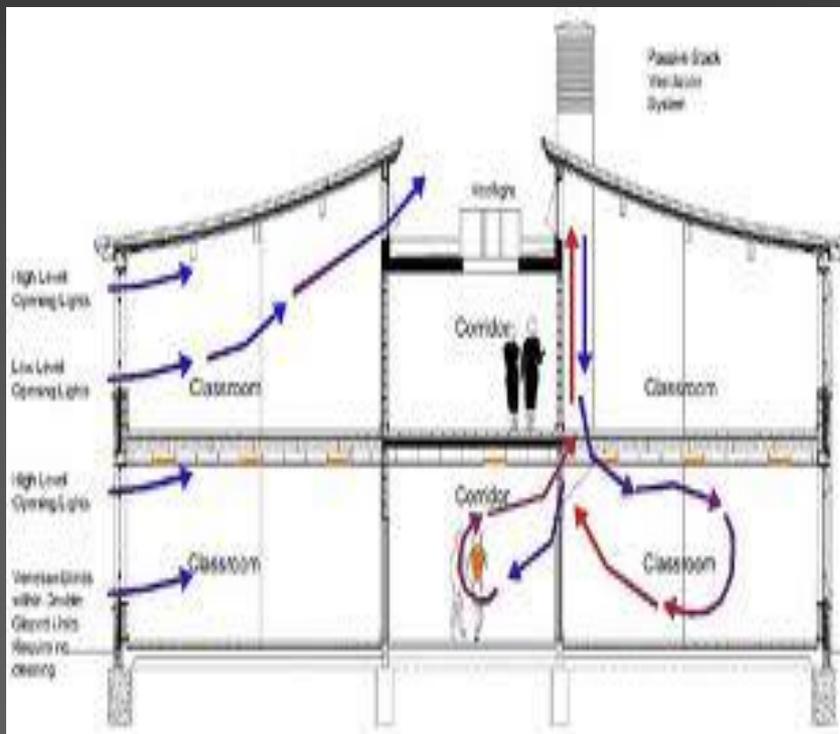




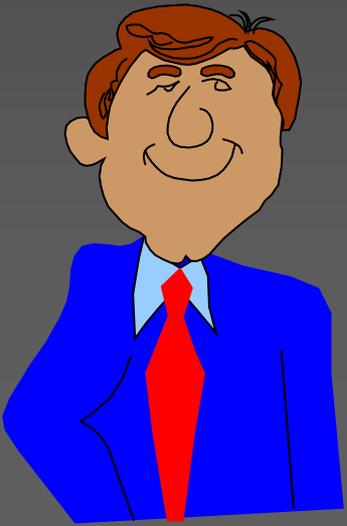
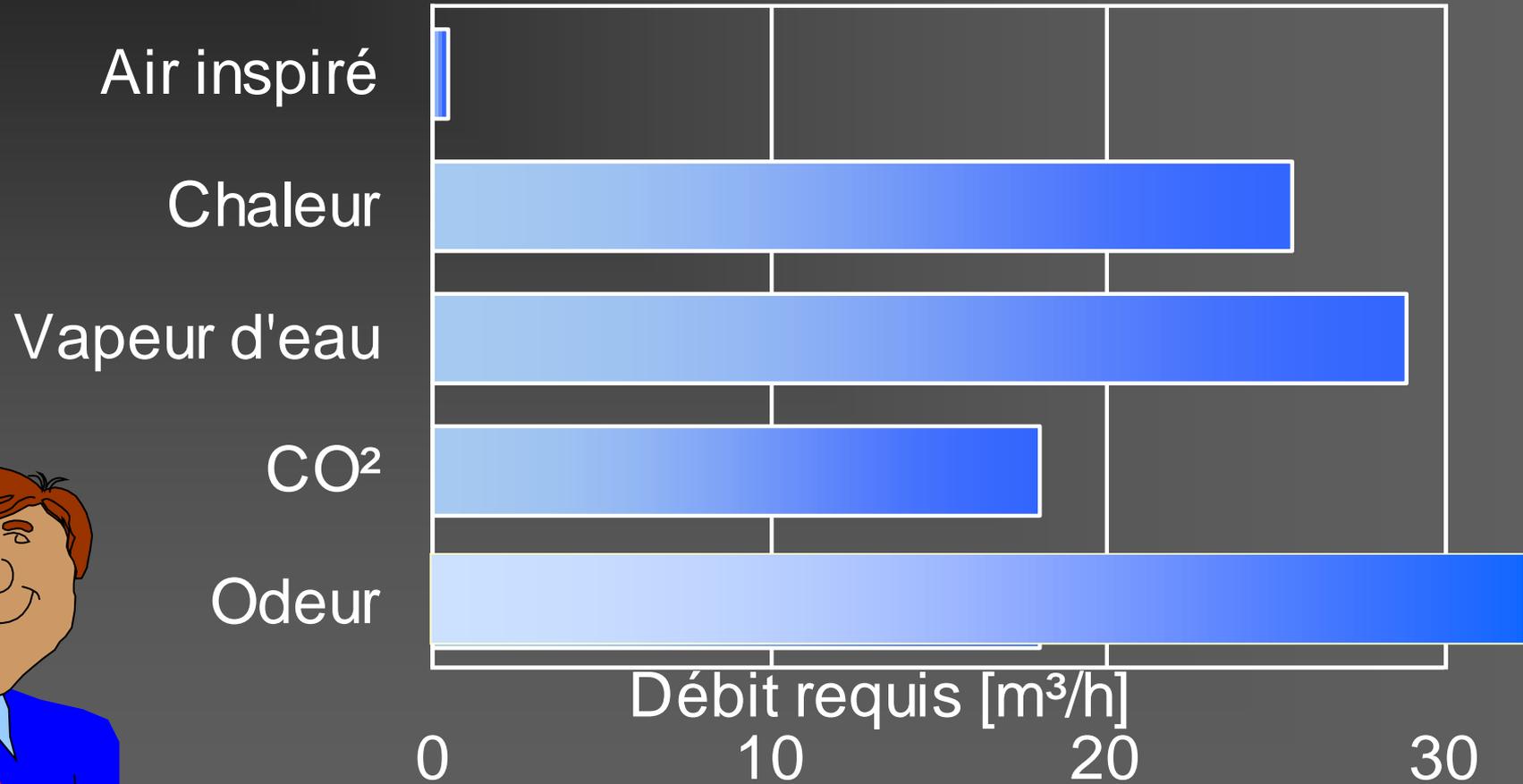
Dessin Flumroc

AIR TIGHTNESS AND VENTILATION MEASURES

- Increase air tightness between building envelopes, with additional thermal & acoustic insulation, and find more efficient ways of supplying fresh air and extract use air/moisture from the buildings,
- Utilize natural ventilation/cooling

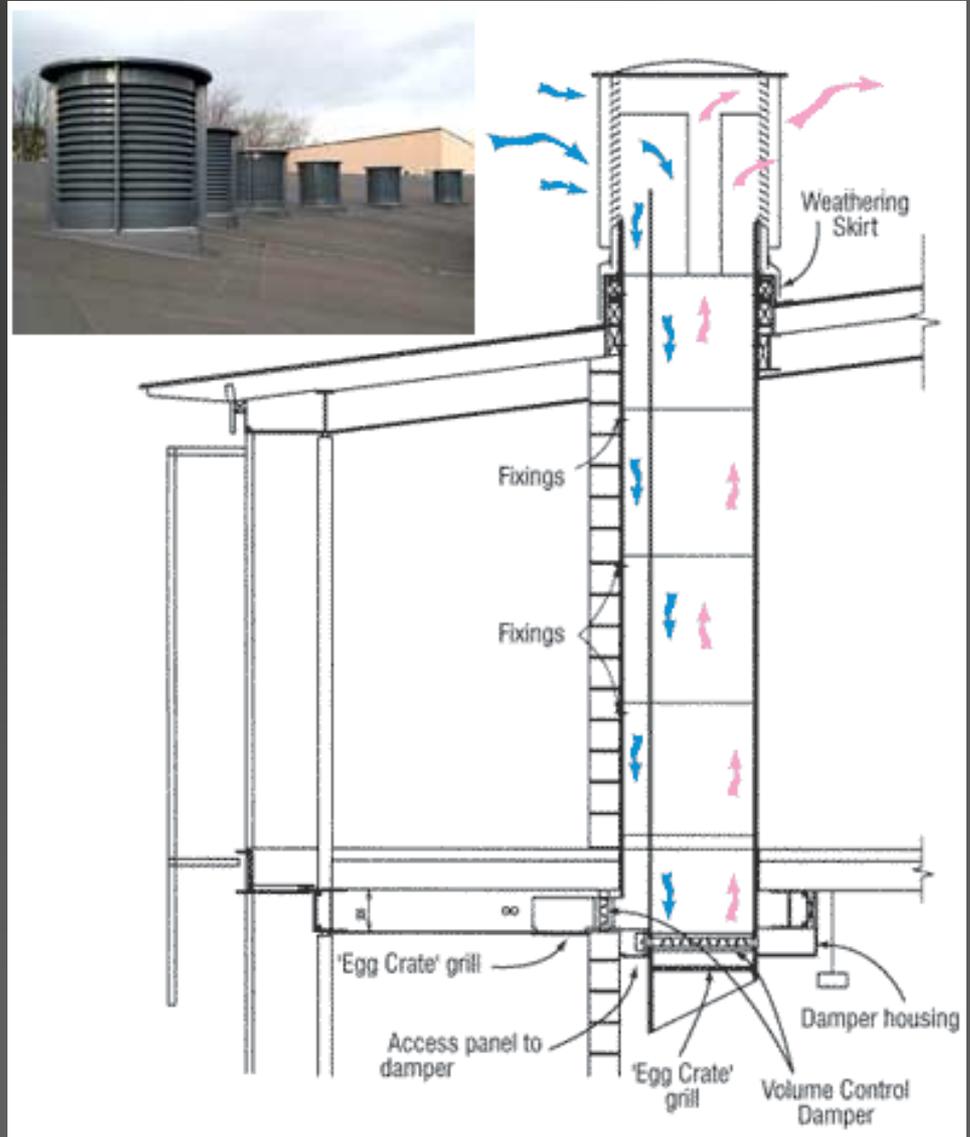


Débit d'air pour une personne



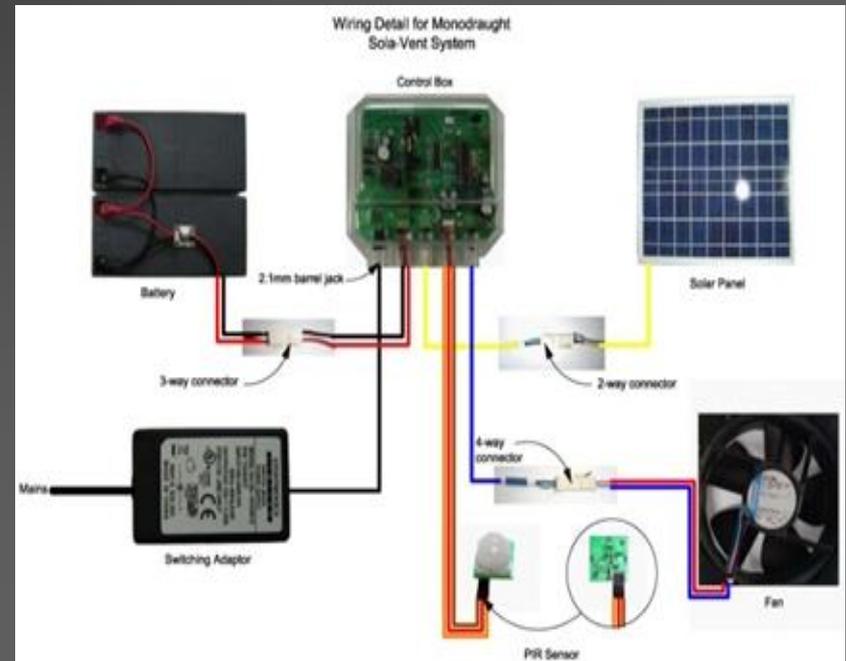
VENTILATION MEASURES

Windcatcher



BUILDING SERVICES MEASURES

- *High-efficient lighting, water, heating and cooling systems, controllers to minimize standby losses*
- *Use high efficiency water equipment and minimize standby losses from lighting by monitoring building occupancy*
- *skylight for natural day lighting*
- *Rain water harvesting*
- *Use of low energy technologies to improve HVAC efficiency*

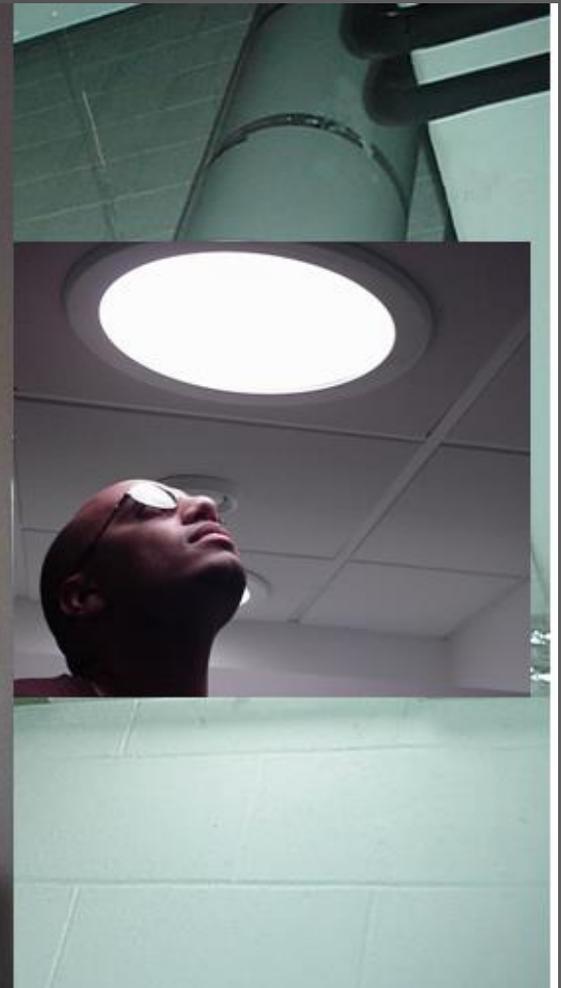


BUILDING SERVICES MEASURES

Day lighting-*Solar Tubes*

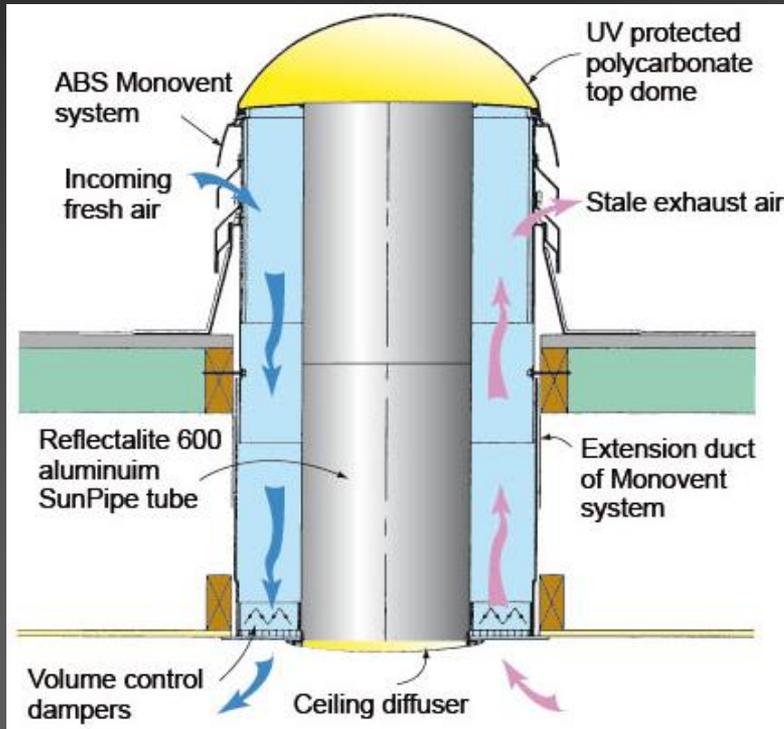


Daylighting



BUILDING SERVICES MEASURES

Integrated lighting and ventilation device



Two compact-fluorescent downlighters

Rainwater harvesting



Top-Tank® Garden Pack

Scope of Supply:

- ① Down-pipe rainharvesting Filter



- ② Top-Tank(s)
- ③ Interconnection Pipe (if two tanks)
- ④ Suction Pipe
- ⑤ Portable Garden Jet-Pump 700

1300 Litre Package (1 Tank)

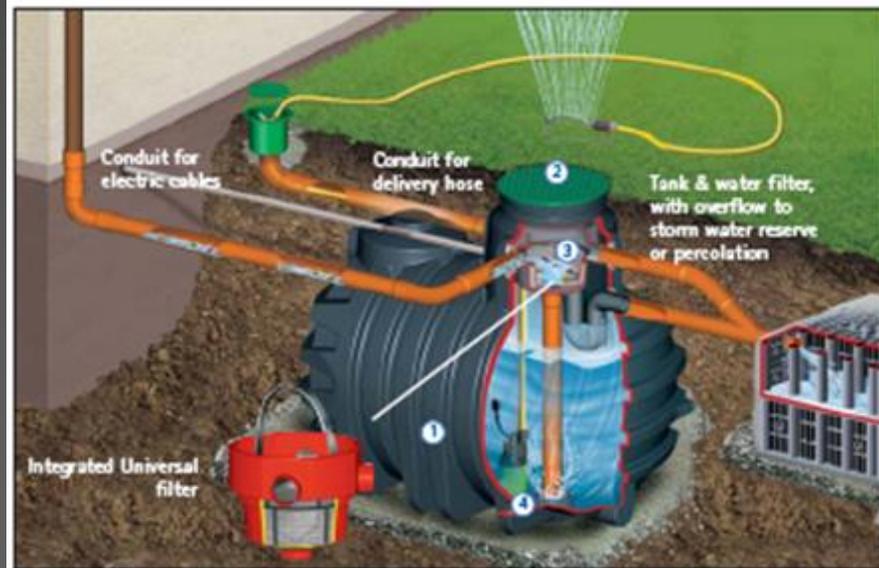
Order. No. 324013

2600 Litre Package (2 Tanks)

Order. No. 324010

3900 Litre Package (3 Tanks)

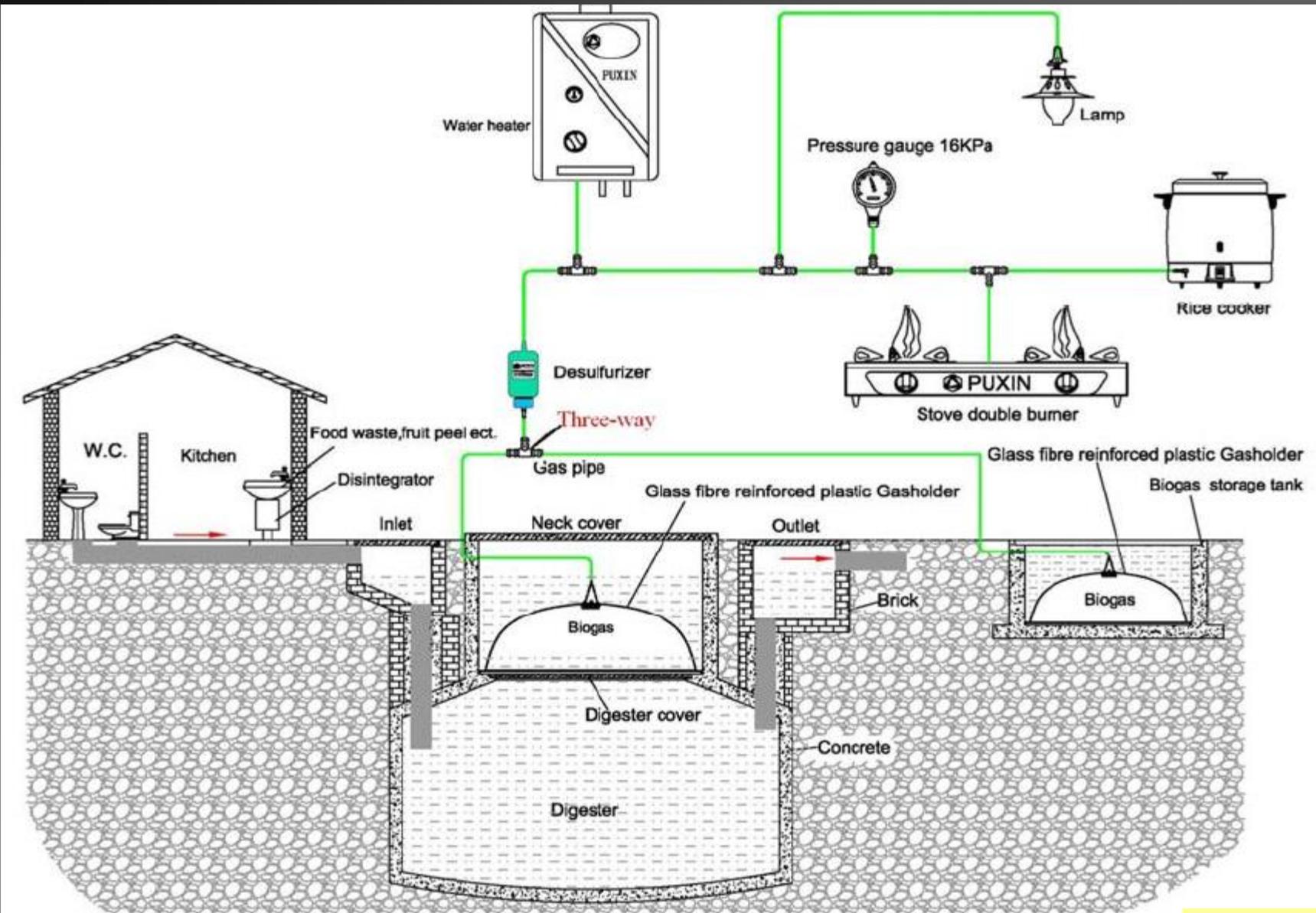
Order. No. 324011



Black/Grey Water Recycling



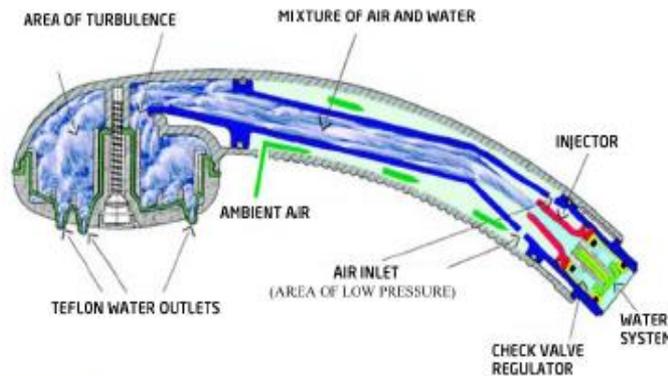
Black/Grey Water Recycling – Biogas



Energy efficiency equipment and Appliances measures



Venturi Shower head



VENTURI injector

Constant outflow nonreturn valve (outflow to be chosen)



White shower head



Chrome-plated shower head



Touch less automatic faucet

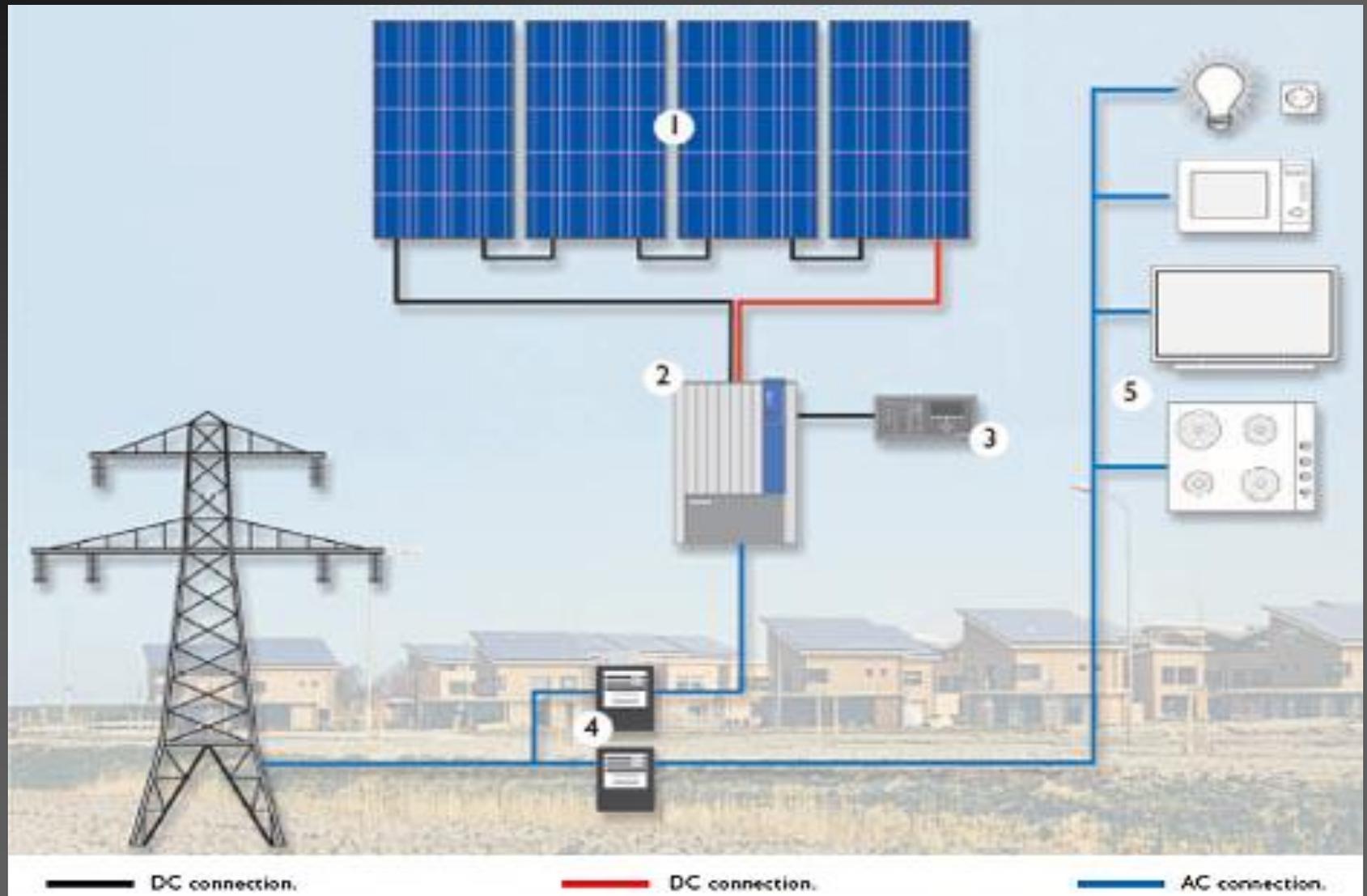


Motion sensor

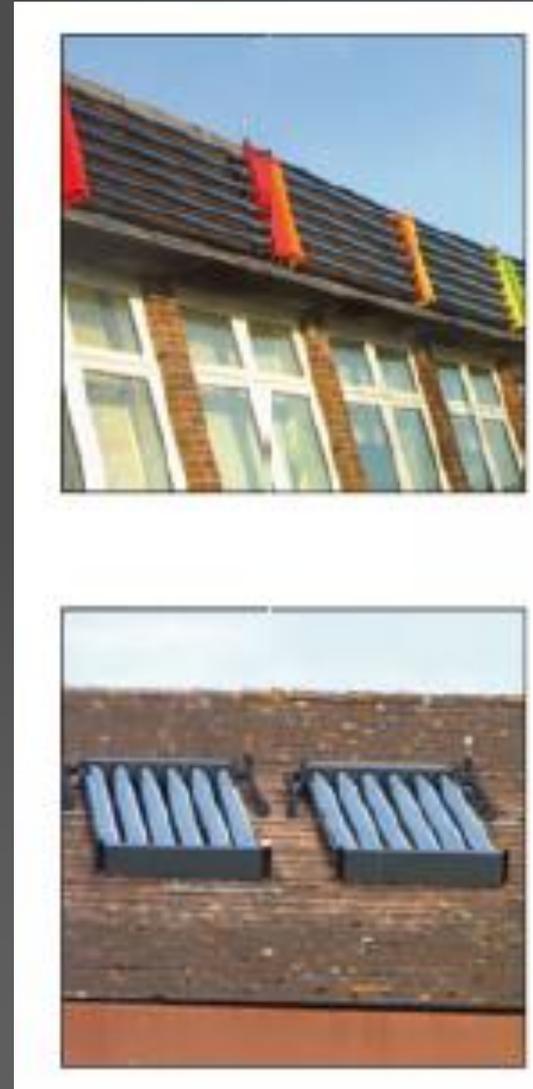
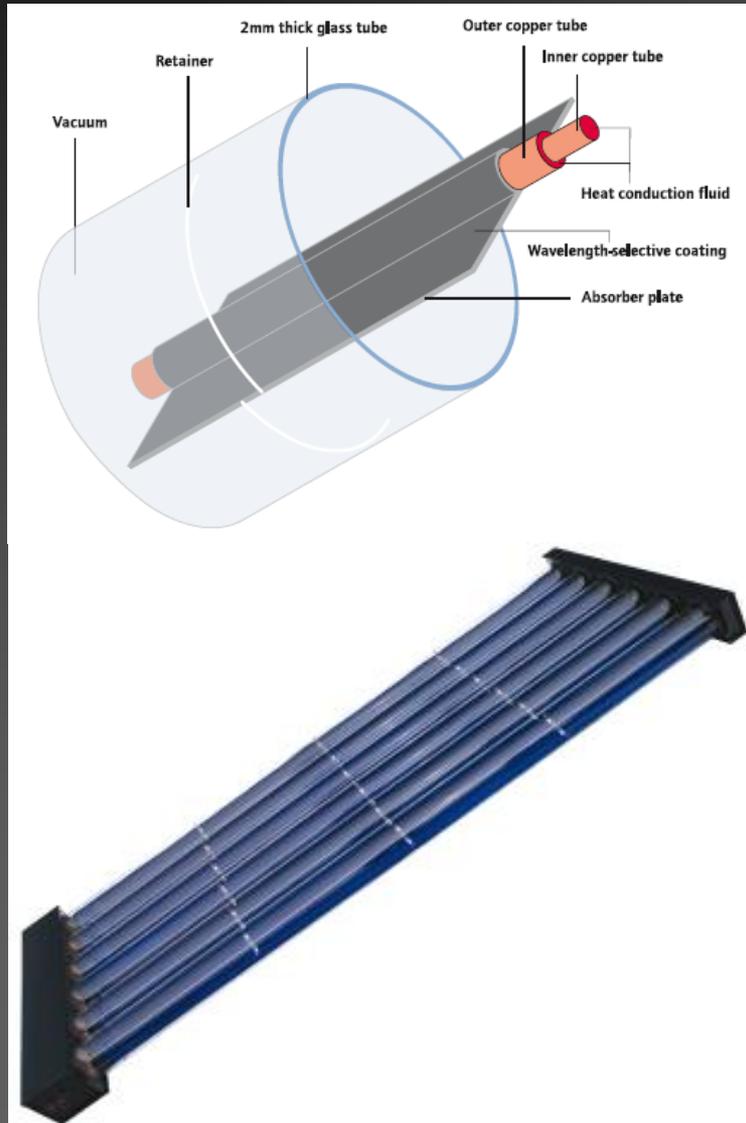
Energy efficiency equipment and Appliances measures



A domestic PV-grid connected systems



Advanced evacuated tube solar collector



USERS MEASURES

- Building operator and occupant training on energy efficiency building operation can reduce energy consumption

Monitoring and Targeting / Energy Management System (eZdash)



THANK YOU FOR
YOUR ATTENTION

Blaise.mempouo@arpedac.org