GREEN BUILDING
BUILDING IN BUILDING
The benefits of double facades:

- Excellent heat insulation when applying windows
- Optimal use of solar energy
- Natural ventilation in all weather conditions
- Very good sound insulation, even with windows open
- Easy integration of sun protection, functional elements, etc.
- Integration of various opening elements
PRINCIPLE DOUBLE FACADE

INTEGRATED SUNSHADING

SINGLE GLAZED

DOUBLE GLAZED (LOW U-VALUE)

ROOM

SUNSHADING CAN BE THERMOCHROME OR PHOTO-OPTIC

-> ACTIVE USAGE OF SUN ENERGY
COST FOR UNNATURAL LIGHT CAN BE SAVED UP TO 70 PERCENT
HEAT/ SOLAR GAIN

A. REDUCTION OF HEAT TRANSMISSION
B. PREHEATING OF FRESH AIR
C. LESS RADIATION OF UNNATURAL LIGHTS

40-60 PERCENT OF HEATING COSTS CAN BE SAVED
HEAT LOSS

WINTER: TEMPERATURE OF BUFFER AIR IS CLOSE TO INTERIOR TEMP
- > HIGHER COMFORT
VENTILATION (OPTIONS)

SPOW VENTILATION WITH OUTSIDE AIR

NATURAL INPUT
MECHANICAL OUTPUT

MECHANICAL INPUT
NATURAL OUTPUT

DOUBLE LAYER: OPTION TO VENTILATE NATURAL

SPOW VENTILATION WITH INSIDE AIR
VENTILATION (OPTIONS)

SEPARATE SYSTEM
EASIER TO PREDICT THE INSIDE COMFORT

OR

INTEGRATED SYSTEM
BETTER CONTROL FOR NEED OF PEOPLE INSIDE

CAVITIES IN SECOND LAYER CAN REGULATE NATURAL AIR FLOW
A. FLOOR HEATING

Floor heating = up to 100W/m²

Passive building heating requirement = 40-60W/m²

Water heated by:

Geothermal heat pump

Dry screed floor heating


**Geothermal Heat Pump**

- **Usage of the warmth of the earth to heat/cool water**
  (the earth has a constant temperature)
- Cooling and heating

**Ground Source Heat Pump**

- **Heating Mode**
  
  ![Diagram](image)

  - Circulation
  - Heat exchange and use
  - Heat absorption
  - Recirculation

- **Cooling Mode**

  ![Diagram](image)

  - Circulation
  - Heat exchange and absorption
  - Heat discharge
  - Recirculation

- **Needs electricity to work (small amount)**
- Can go up to 480 kW
- **High COP efficiency (4-5)**
- **Passive cooling** (not a lot of energy is used)
  The compressor does not have to be on, cold ground temperature is pumped up
COOLING

A. PASSIVE
   NIGHT COOLING
   STACK EFFECT

B. AIR COOLING
   GEOPUMP
   AIRFLOW
WATER
ELECTRICITY

SUN ENERGY CAN BE USED TO GAIN ELECTRICITY

- Parts of the shading on the roof or in the facade can be photocells to collect the energy and make it into electricity
SHADING ON ROOF
SHADING FACADE
FACADE

SOUTH - WEST FACADE
SOUTH - EAST FACADE
NORTH - EAST FACADE
NORTH - EAST FACADE