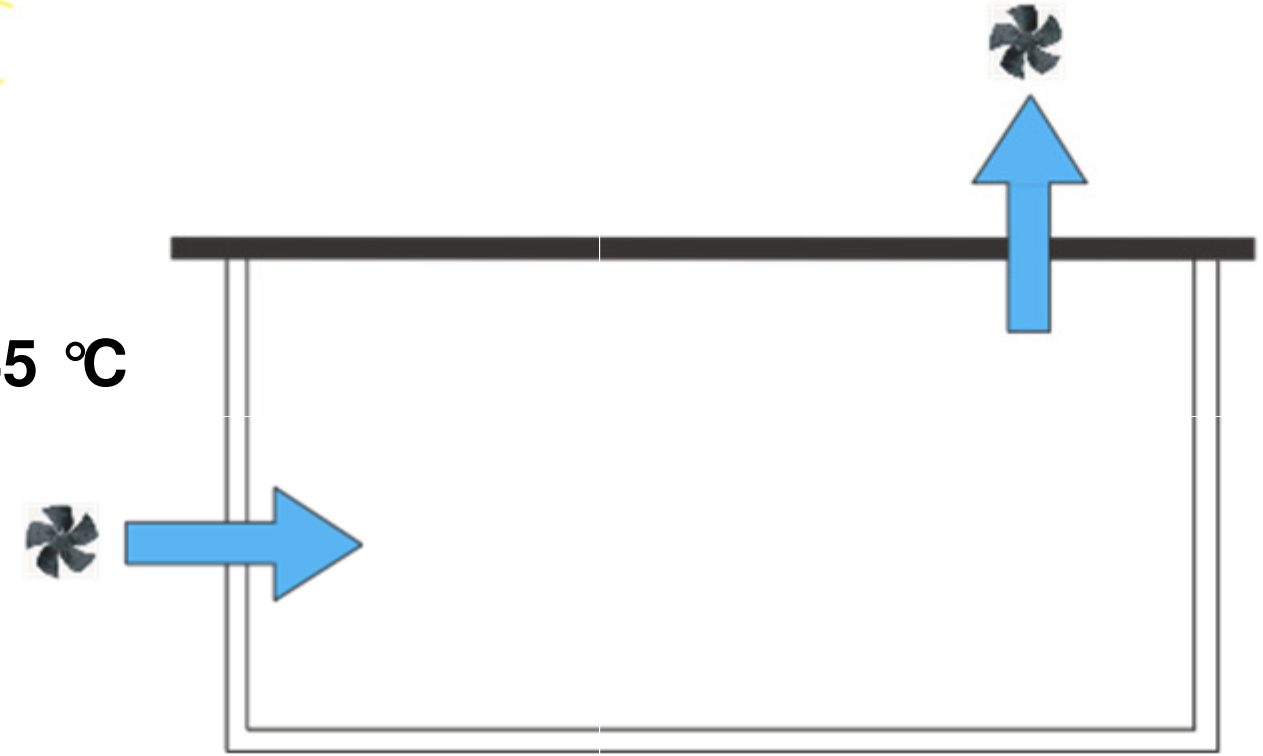

IN COOLING AND
AIR CONDITIONIN
Sales Director
Pertti Saloranta
ENERVENT
powered by

CONVENTIONAL VENTILATION

OUTSIDE
TEMPERATURE +45 ℃

OUTGOING AIR
TEMPERATURE +24 ℃

NCOMMING AIR
EMPERATURE +45 ℃



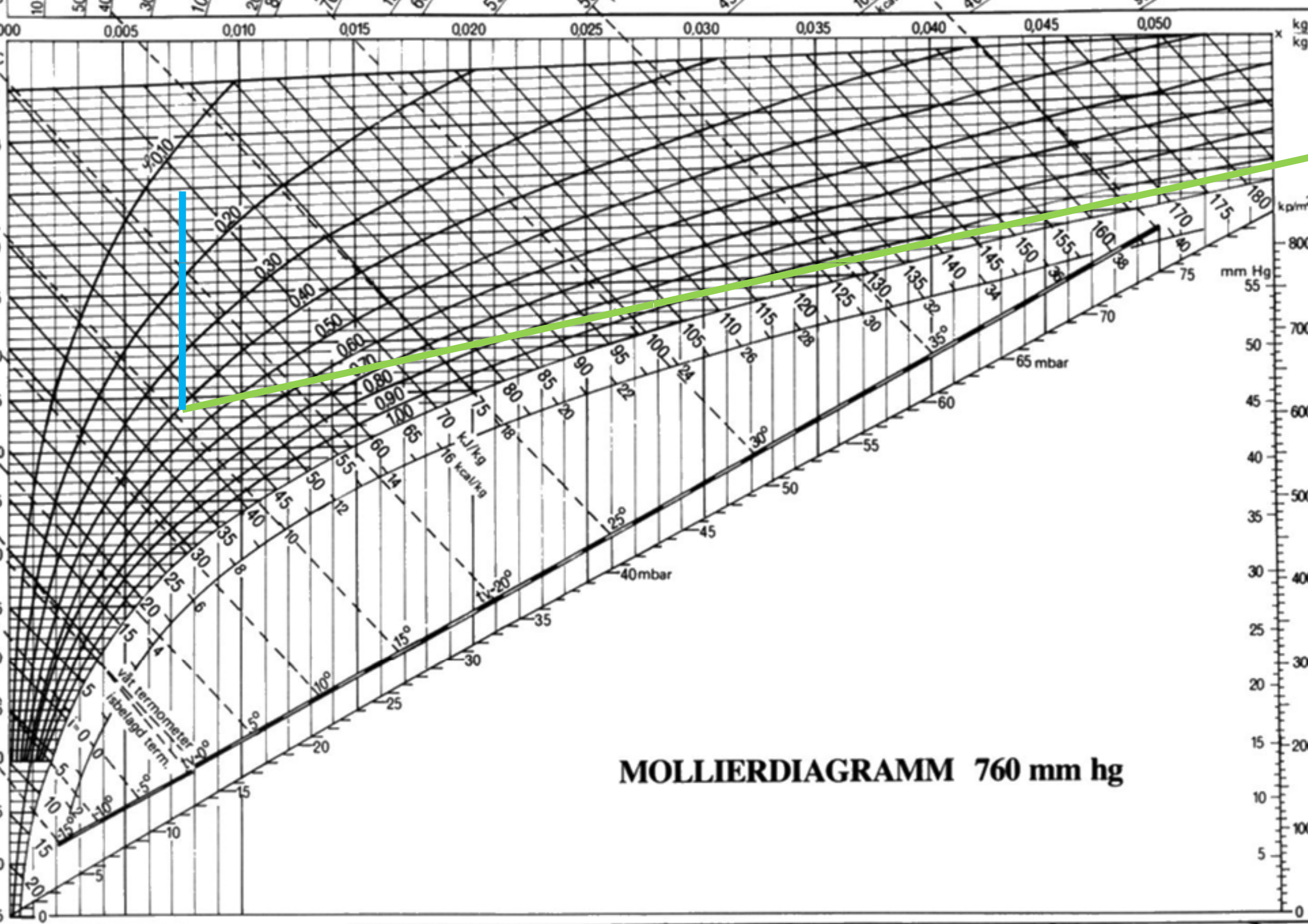
ENERGY CONSUMPTION IN CONDENSATION PRIOR TO COOLING

is vital to distinguish the difference between the cooling energy needed fo
ensory cooling and the total energy needed for cooling including the
ondensation.

he cooling energy needed for sensory cooling can be calculated by
eduction of temperature outside and the desired temperature inside (the
ue line on the next page).

he total cooling energy needed includes also the latent energy needed for
ondensation of excess humidity. This means the difference in enthalpy, tha
needed to dry the air from outside (the green line on the next page).

ithout condensation of the excess humidity that the warm air outside
ontains it is not possible at all to cool the air. Dry air contains much less
nergy than humid air as energy is accumulated in mass and humid air
eighs much more than dry air.

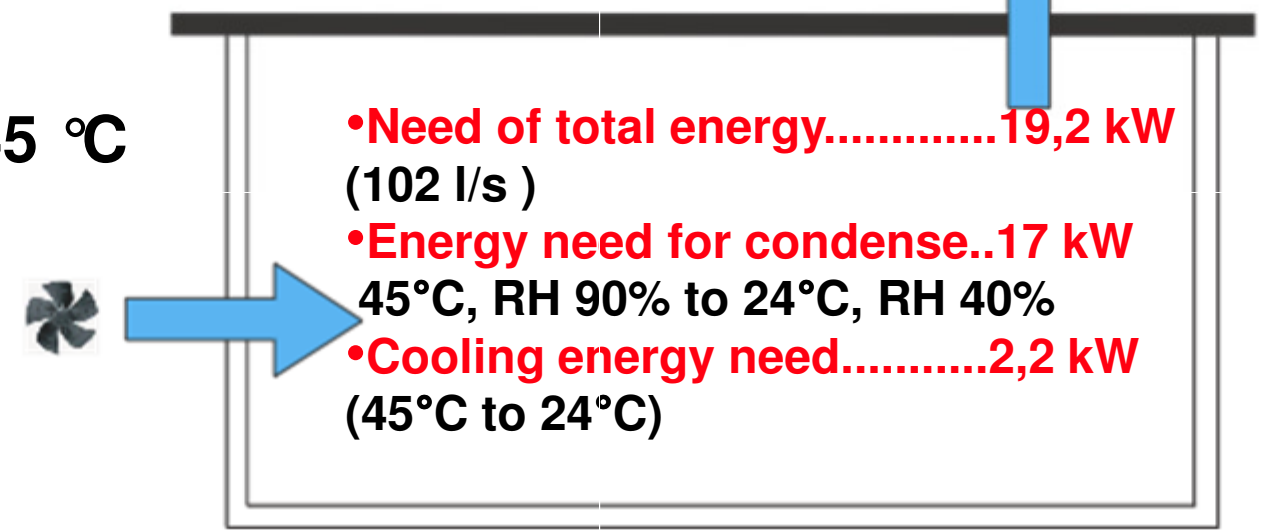

MOLLIERDIAGRAMM 760 mm hg
våt termometer
isbelagd term.
kJ/kg
kcal/kg
mm Hg
65 mbar
40mbar
kp/m²

CONVENTIONAL VENTILATION IN A 350 m² VILLA

OUTSIDE
TEMPERATURE +45 °C

OUTGOING AIR
TEMPERATURE +21

NCOMMING AIR
EMPERATURE +45 °C



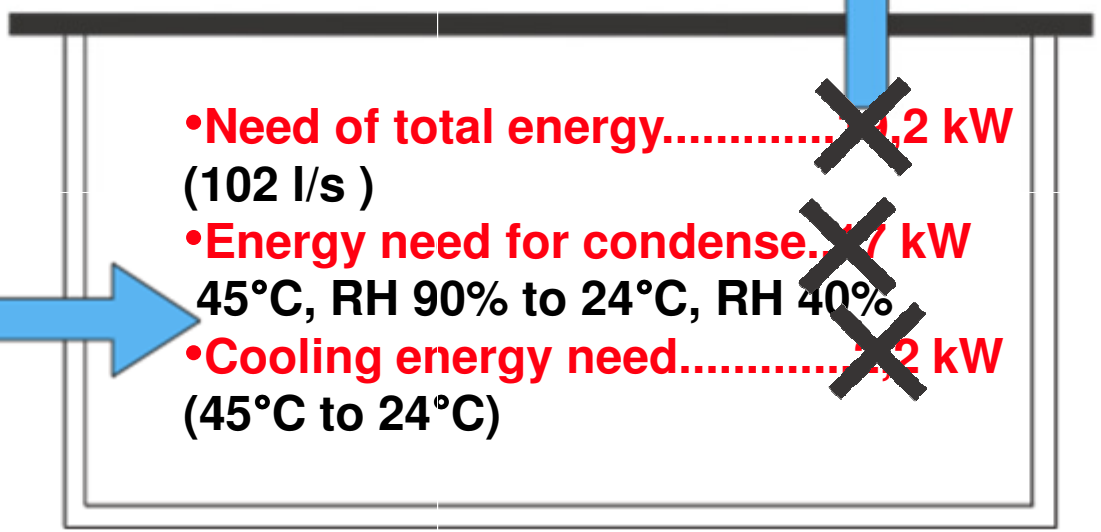
! Biggest amount of cooling energy goes to condensation of excess humic

CONVENTIONAL VENTILATION IN A 350 m² VILLA

OUTSIDE
TEMPERATURE +45 °C

OUTGOING AIR
TEMPERATURE +2

NCOMING AIR
EMPERATURE +4 °C



ERGY RECOVERY VENTILATION IN A 350 m² VILL

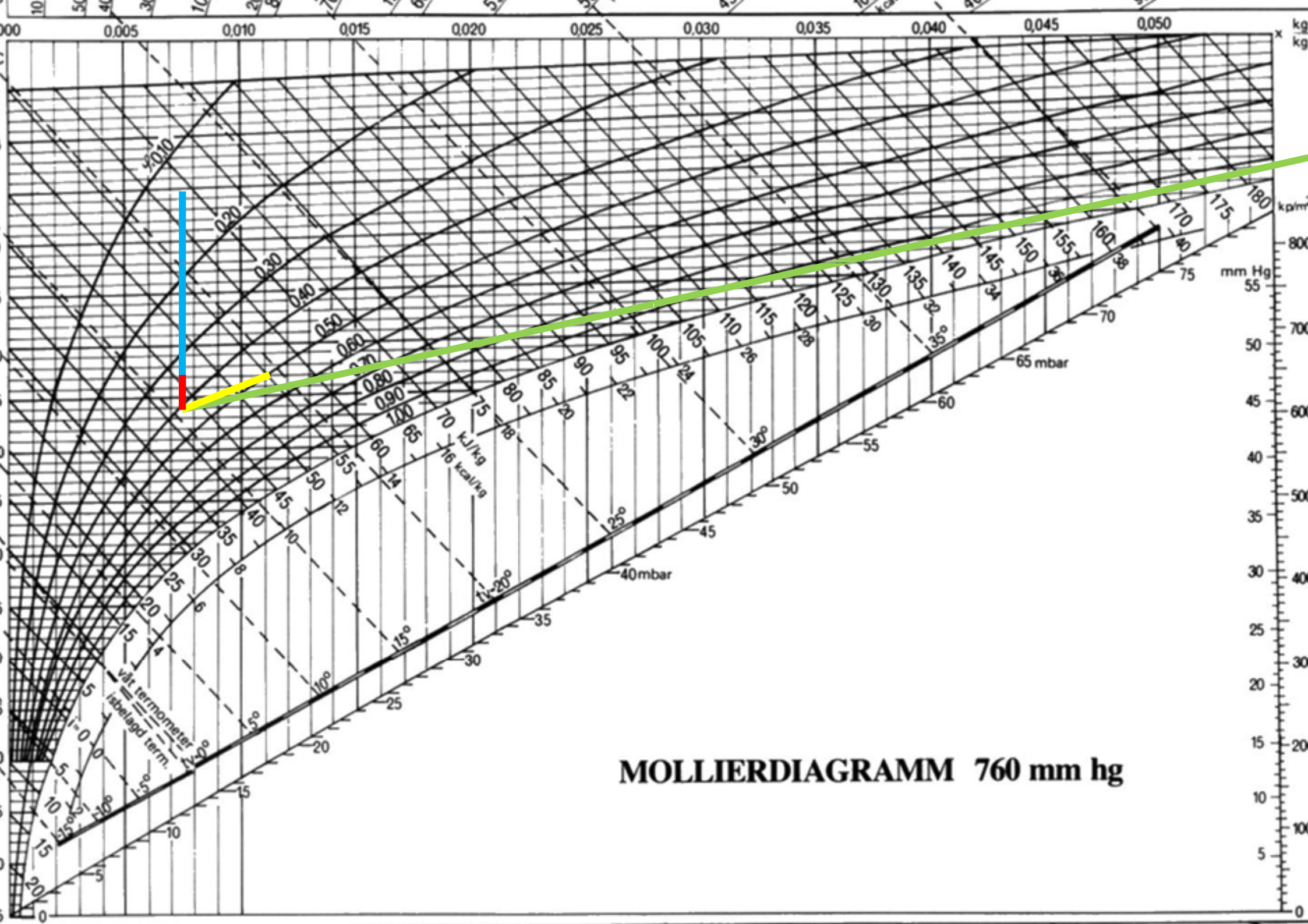
OUTSIDE
TEMPERATURE +45 °C

OUTGOING AIR
TEMPERATURE
+40,4 °C
RELATIVE HUMIDITY 9

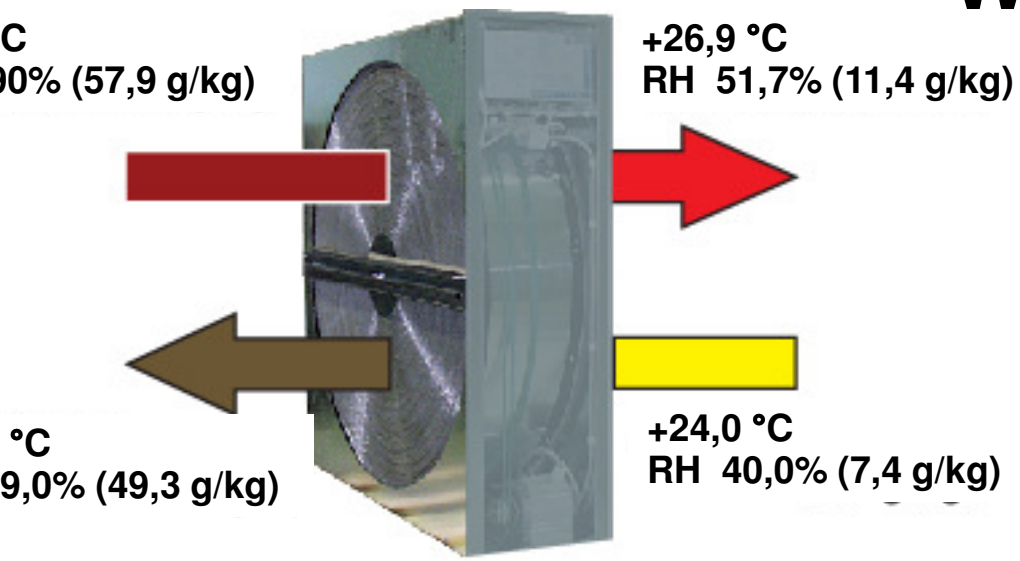
OMING AIR
ER ROTOR
IPERATURE +26,9 °C
LATIVE HUMIDITY 51,7%

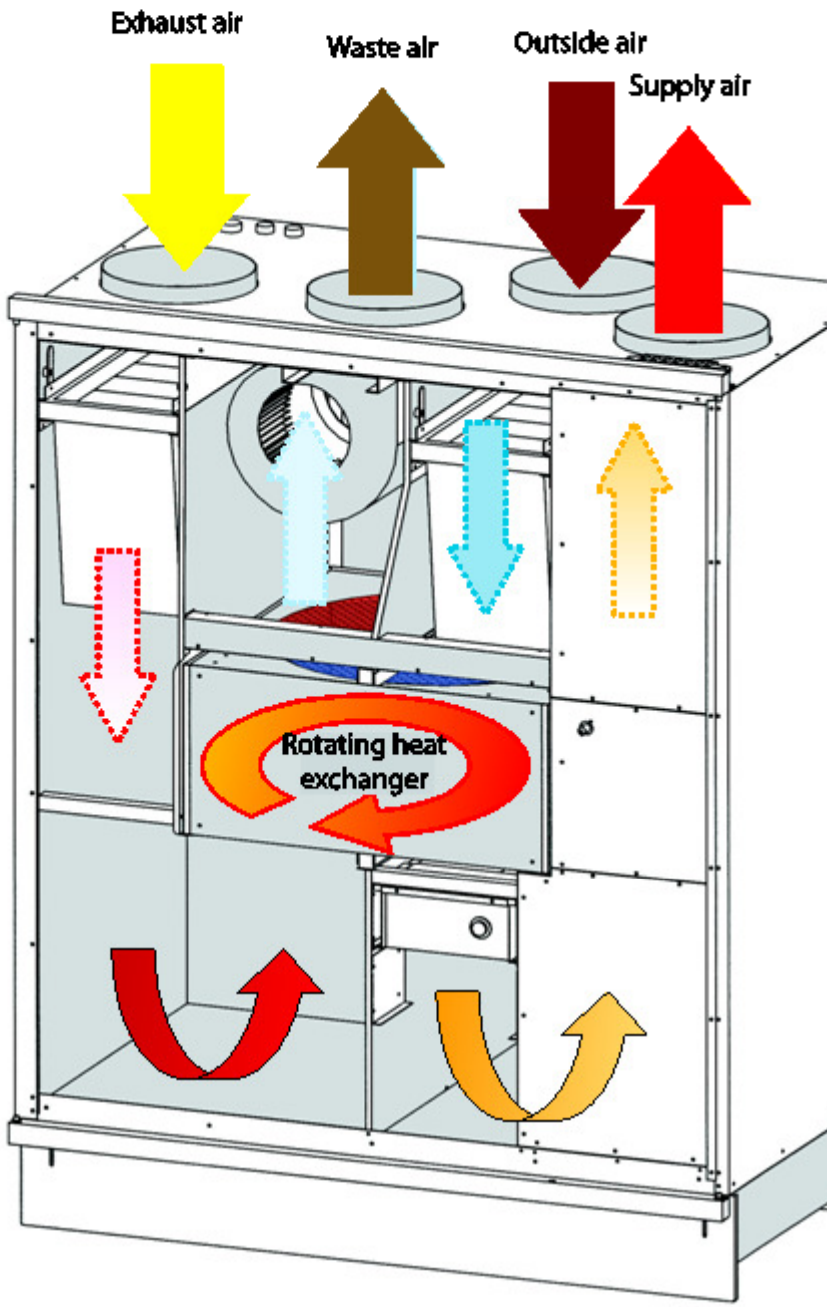
New air in +26,9 °C(RH 51,7%) / out +40,4 °C(RH 99%)

- Total energy need.....1,6 kW
- Cooling need.....0,4 kW
- Need of condense energy....1,2 kW


MOLLIERDIAGRAMM 760 mm hg
0,005
0,010
0,015
0,020
0,025
0,030
0,035
0,040
0,045
0,050
kg/kg
kp/m²
mm Hg
65 mbar
40mbar
kJ/kg
kcal/kg
våt termometer
isbelagd term.

RECOVERY OF COOLNESS WITH HEAT EXCHANGER WHEEL





e outside air (dark red) is pushed through the wheel.
e humidity and excess heat in the air are transferred
ne wheel, after which the dry and cooler fresh supply
light red) is blown into the house.
the wheel rotates the excess humidity and heat
tained in wheel will enter the exhaust section where
stale exhaust air (yellow) from the will take up the
t and the humidity from the wheel.
s will heat up the waste air (brown) and load it with
nidity from the wheel prior to being pushed out from
building.

VENTILATION

tal energy.....,2 kW

gy ne r co se..17 kW

ng energ .....2,2 kW

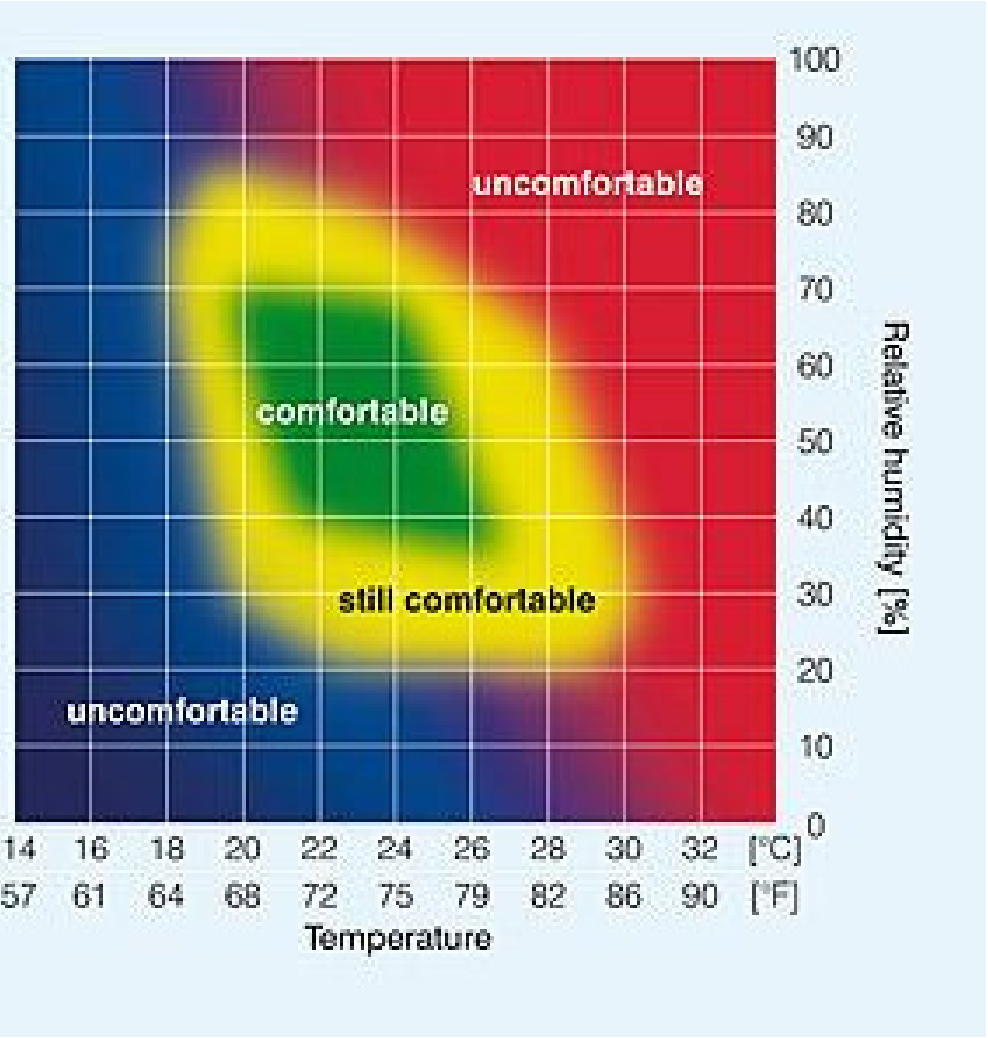
CONVENTI AL
ENSIVE WAY

VENTILATION

- Total energy need.....1
- New cooling need.....
- New need of condense energy..

NB! TOTAL ANNUAL
ENERGY SAVING
168192 kWh !

COMFORTABLE INDOOR CONDITIONS ARE COMBINATION OF TEMPERATURE AND HUMIDITY



The diagram on left shows the area of temperature and relative humidity witch people would clasify as comfortable and uncomfortable.

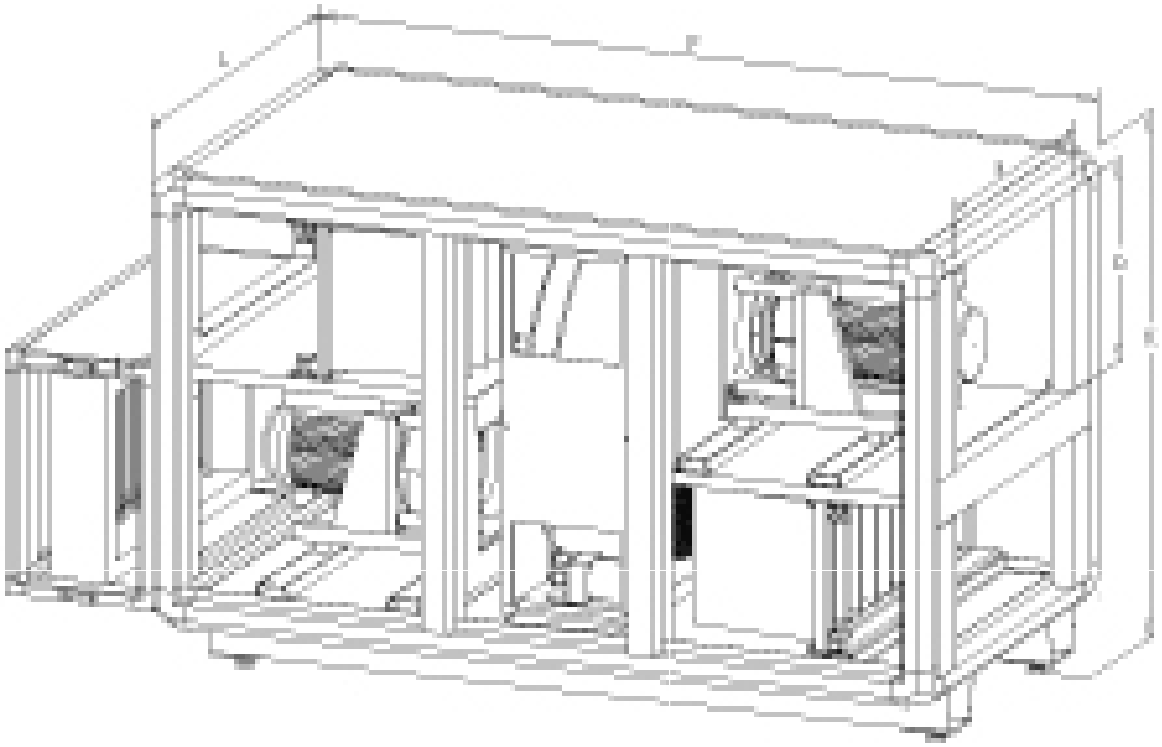
As it is shown, the higher the relative humidity the lower the indoor temperature must be.

ntilation systems in different sizes for individual appartments
residential Green Homes or rooms in Green Hotels

Up to 220 m2

Up to 800 m2

ntilation systems in different sizes for residential Green
omes or rooms in Green Hotels up to 7000 m2



VENTILATION SYSTEM CHARACTERISTICS

- Steering/ dimensioning parameters for system and flow rates
- Integrating ventilation to cooling
- Duct network
- Cooling with re-circulated air

cts about Enervent

- **Energy recovery ventilation since 1983**
- **President's innovation award in 2008**
- **Company of the year 2008 of greater Helsinki Region**


شكرا
Thank you
powered by