

GOOD PRACTICES IN SME

Modernizing a ventilation system



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How can a gravitational ventilation system be modernized?

The modernization of a gravitational (natural) ventilation system could include:

- Installing ventilators and diffusers regulated by pressure differences or humidity,
- Using hybrid ventilation.
- Using mechanical supply and exhaust ventilation with heat recovery.

An advantage of using a hybrid ventilation system is the wide range of control over the air flow. Due to this control we can limit air flow when the rooms are not in use. This lowers the energy losses of air heating. Hybrid ventilation allows for the improvement of room ventilation efficiency, particularly in the summer and transition periods when naturally occurring convection does not provide enough air flow to ensure adequate conditions. A disadvantage of this system is its energy consumption for ventilator motors and no opportunities for heat recovery.

Using mechanical supply-exhaust ventilation with heat recovery involves higher investment costs and the necessity of committing building space for ventilation ducts and the central ventilation unit. However, using heat recovery will not only improve the performance of the system, but will also decrease the amount energy consumed to heat the air, therefore decreasing the energy consumption of the entire system.



Pic. 1 budujemydom: diagram illustrating gravitational ventilation

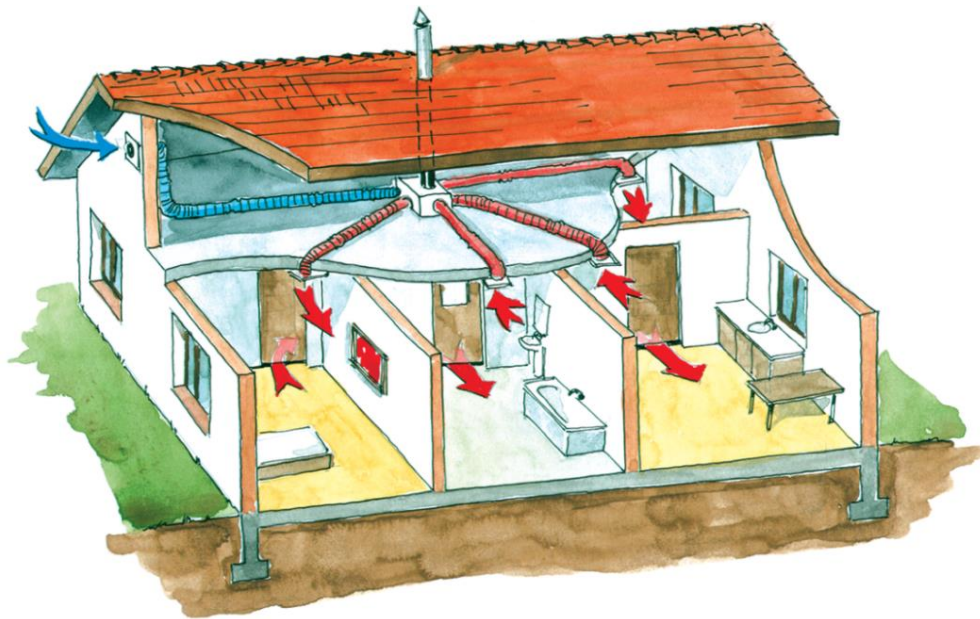
How to modernize mechanical ventilation systems?

Modernizing mechanical ventilation systems can involve using supply and exhaust ventilation with heat recovery. Heat recovery takes place in a heat exchanger called the recuperator. The purchase of a recuperator is associated with high investment costs of the modernization; however, it allows for decreasing the heating energy demand by about 50-80%. In the case of electrically heated buildings, the energy savings for this investment will be considerable, making the investment's return relatively quick.

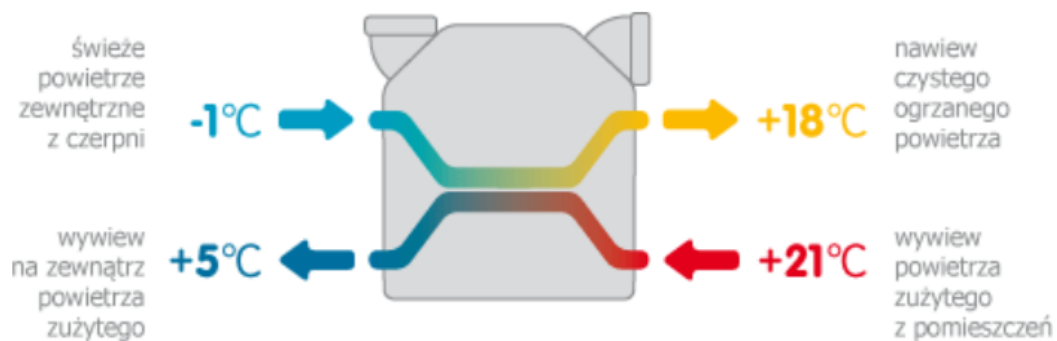
Decreasing energy consumption in mechanical ventilation systems can also be achieved by:

- using variable airflow systems allowing for adjusting the intensity of the ventilation to the demand and the changing heat load,
- selecting optimal air flow speed in the ducts,
- purchasing an installation with relatively low flow resistance,
- replacing overpowered ventilators,
- investing in high performance ventilators,
- using advanced automation ensuring variable load of the ventilation and AC and correct cooperation with other installations.

Source: KAPE



Pic. 2 budujemydom: mechanical ventilation diagram



Pic. 3 comfortis: recuperation diagram

Top left to bottom right: Fresh outside air from the intake, clean heated air ventilator, used air outside exhaust, used air room intake.