

Cuveglio

Kindergarten

The kindergarten is endowed with plant of winter heating and summer conditioning with control of the temperature and damp environment. Particularly, the select adopted progettualities have had the objective to guarantee a comfort elevated environment and to exploit renewable energies (solar and geothermal) with systems to tall energetic efficiency.

The necessary condition for the sustainable use of renewable energetic sources has been the realization of a lower part wrap energetic requirement with parameters of isolation you increase in comparison to the least expectations from the normative in force, an optimization of the surfaces dispersing (factor of form) and the exploitation of the solar contributions during the winter season.

DESCRIPTION OF THE FITTINGS:

The plant of climatization is synthetically composed from:

- Central of production of the warm fluids and you cool with pumps of geothermal heat;
- Geothermal plant with low enthalpy;
- Plant of panels heating radiant for the winter heating and the summer climatization to system of dehumidification;
- Plant of treatment air summer and winter with unity at high efficiency;
- Thermal solar plant of production sanitary warm water;
- Photovoltaic plant 28,98 kWps type "grid connected", that is connected to the Electric Net of distribution of next realization.

For the production of the heat two pumps of geothermal heat (PdC) is used connected to seven vertical probes of depth equal to around 90 ms each: one with reversing operation of thermal power equal to 20.8 Kw for the heating, the air conditioning of the environments (I install to radiant panels to floor) and for the production of sanitary warm water, the second in version warm solo of thermal potentiality equal to 15.2Kw, to service of the feeding of the batteries of post heating of the unity of treatment air positioned in coverage. The choice to use two PdCs is born both from the demand to contemporarily have warm and cold fluids during the summer period and is for optimizing the outputs of the pump of service heat of the plant to radiant panels during the winter phase.

Both the PdCs are endowed with partial recovery of the job of compression, which will be used for producing sanitary warm water during the operation in regime of heating / air- conditioning in combining to the thermal solar plant.

For the exchange of the air environment is used an unity of treatment air autonomous silver ware in coverage able to guarantee the exchange of air during the winter and summer period and, during this

last period, the control of the damp relative environment and the integration of power frigorifera to the radiant panels.

Unity of treatment is working in pump of heat with treatment external air of renovation and expulsion exhausted inside air with recovery of Static and Dynamic heat to tall efficiency.

The unity is on purpose studied for places to high variability of overcrowding and it effects a continuous parzializzazione of the quantity of external air making it adherent to the real demands of the climatized local. This allows to guarantee a correct contribution of frigories to the environment and the same time a correct contribution of external air and a substantial energetic saving.

Energetic analysis:

The described fittings have been realized on the principle of the maximum efficiency both in terms of production of thermal energy using fittings with vertical geothermal that of environmental impact trying to limit the use of energies fossils: in practice locally the building in object is to impact zero.

To such intention some meaningful data of saving of issues of gas bring him it shuts in comparison to the use of systems of gas generation methane.

Plant of heating and production sanitary warm water

Total saving of issues (geothermal + solar thermal): **8.934 Kg CO2/for one year**

Photovoltaic plant

Respect of annual total energy produced by the plant amounts to: **35 580.90 kWh.**

Emissions saving: **19.570 Kg CO2**

We believe that the system realized building-plant both a good example of application of the criterions of sustainable development in the constructions, particularly both for the aspects of energetic optimization and of integration, of the renewable energies in the buildings.