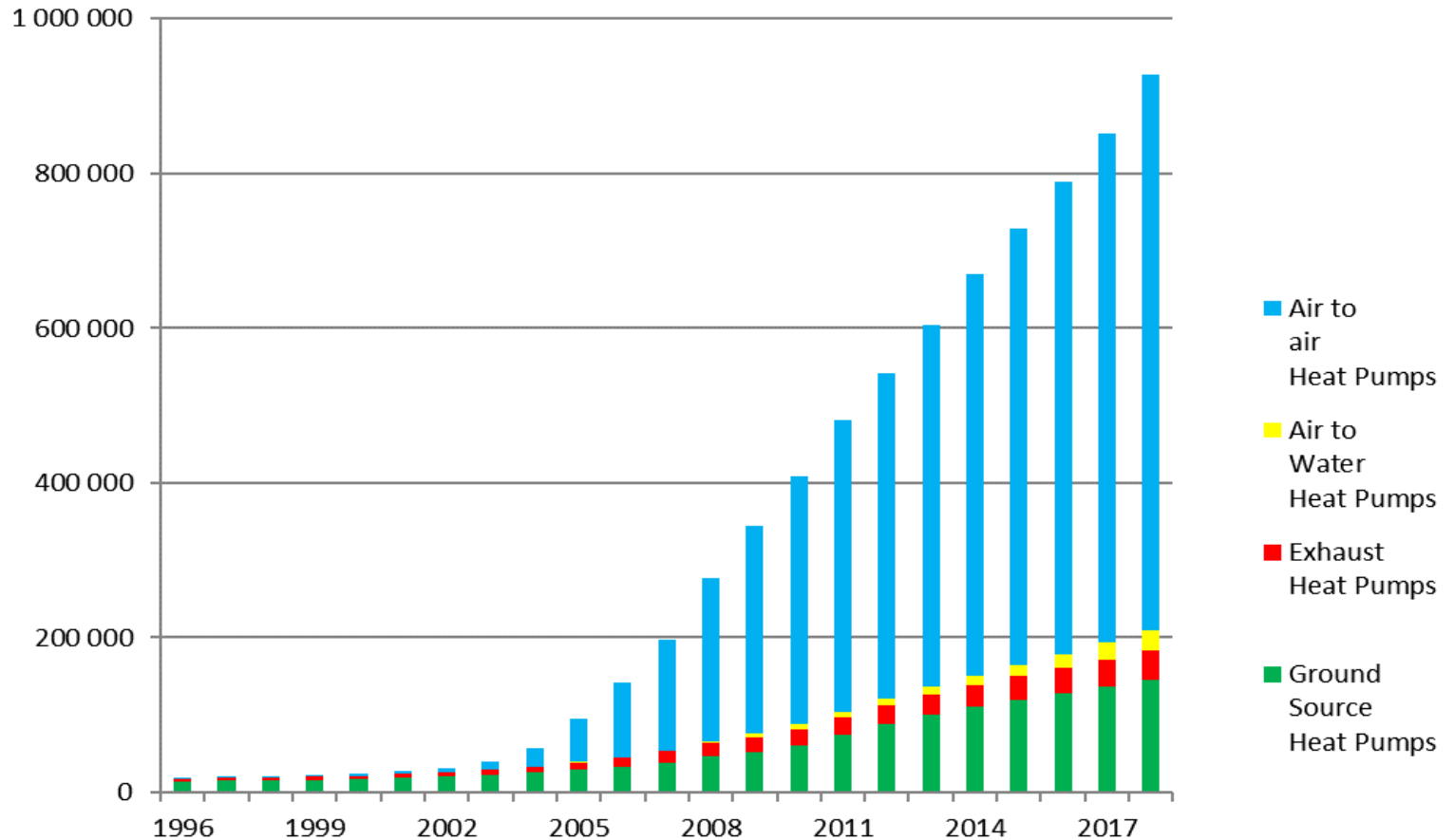


WHY ARE THERE 700 000 AIR TO AIR HEAT PUMPS IN OPERATION EVERYDAY IN FINLAND?



- First of all we call air conditioners Air to Air heat pumps in Finland.

700.000 Air to Air Heat Pumps in Finland



- Air to Air heat pumps are used as additional heat source in several one family houses. Usually there is a, so called, main heating system in every house like oil burner, Ground source heat pump, district heating, direct electricity heating etc. In many summer cottages Air to Air heat pump can be only heat source for heating.
- They are usually used in houses where there is direct electricity heating (electrically heated radiators) and in houses where main heat energy source is oil. We also have houses with 3000 l water tank, that is heated by electricity heating and heat is distributed by radiators as terminal units.

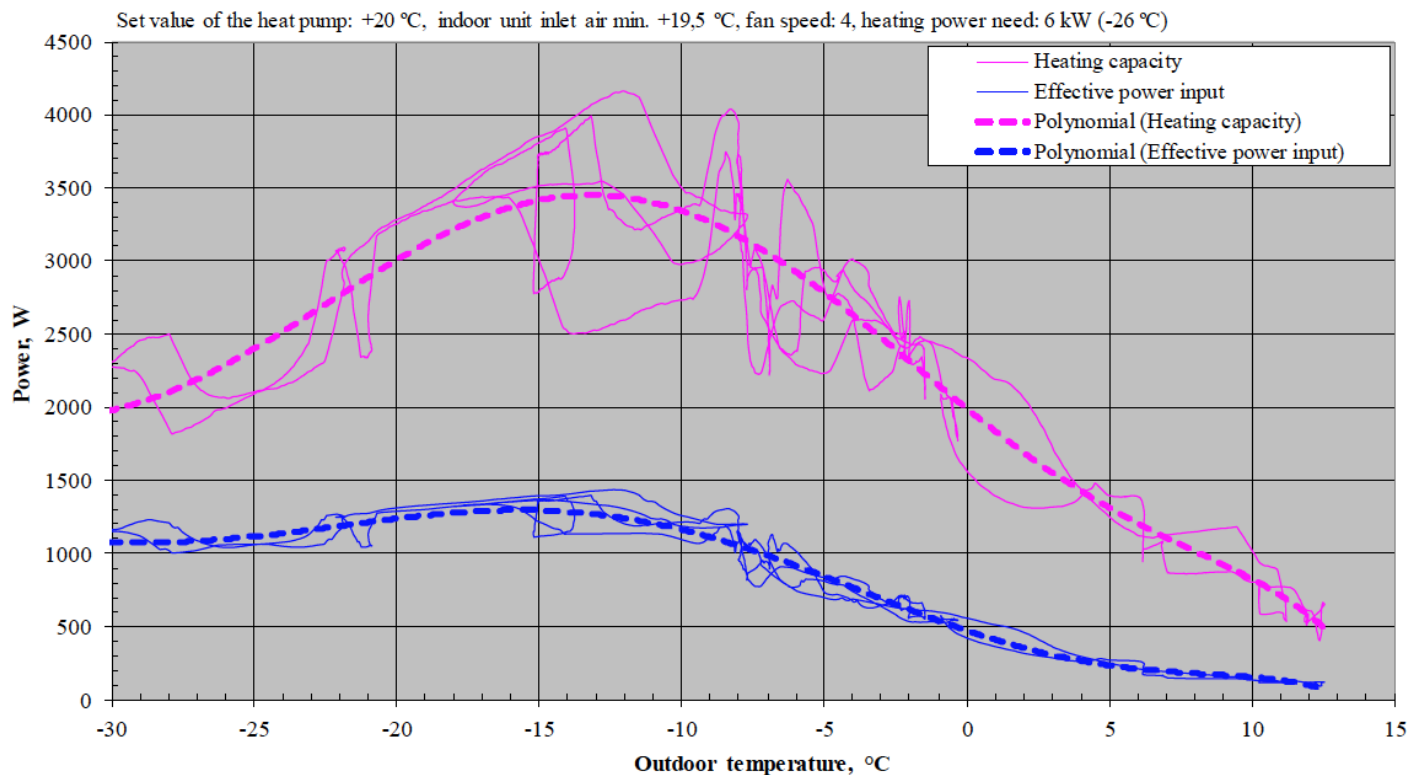
- Potential for Air to Air heat pumps
 - 500 000 direct electricity heated houses.
 - 500 000 summer cottages
 - 100 000 one family houses with electrically heated water circulation system
 - 180 000 one family houses heated with oil burners.
- Cooling mode is used only a few days or weeks per year. There are summers when there is no need at all for cooling. Cooling is not the main reason for purchasing Air to Air heat pumps.
- How does Air to Air heat pump save energy and house owners money in Finland? How do they operate when it is – 25 C or even – 30 C ambient temperature? Do they give any COP after – 10 C? How much heat out put can you get from air to air heat pumps when it is really cold outside?
- The following test report shows you how good the new Air to Air heat pumps are even in cold climate.

Air-to-air heat pump: Mitsubishi MSZ-LN25VGW + MUZ-LN25VGHZ

OPERATION TEST

Moving hourly average of heating capacity and power input as a function of outdoor temperature.

Moving hourly average of heating capacity and power input including defrost periods

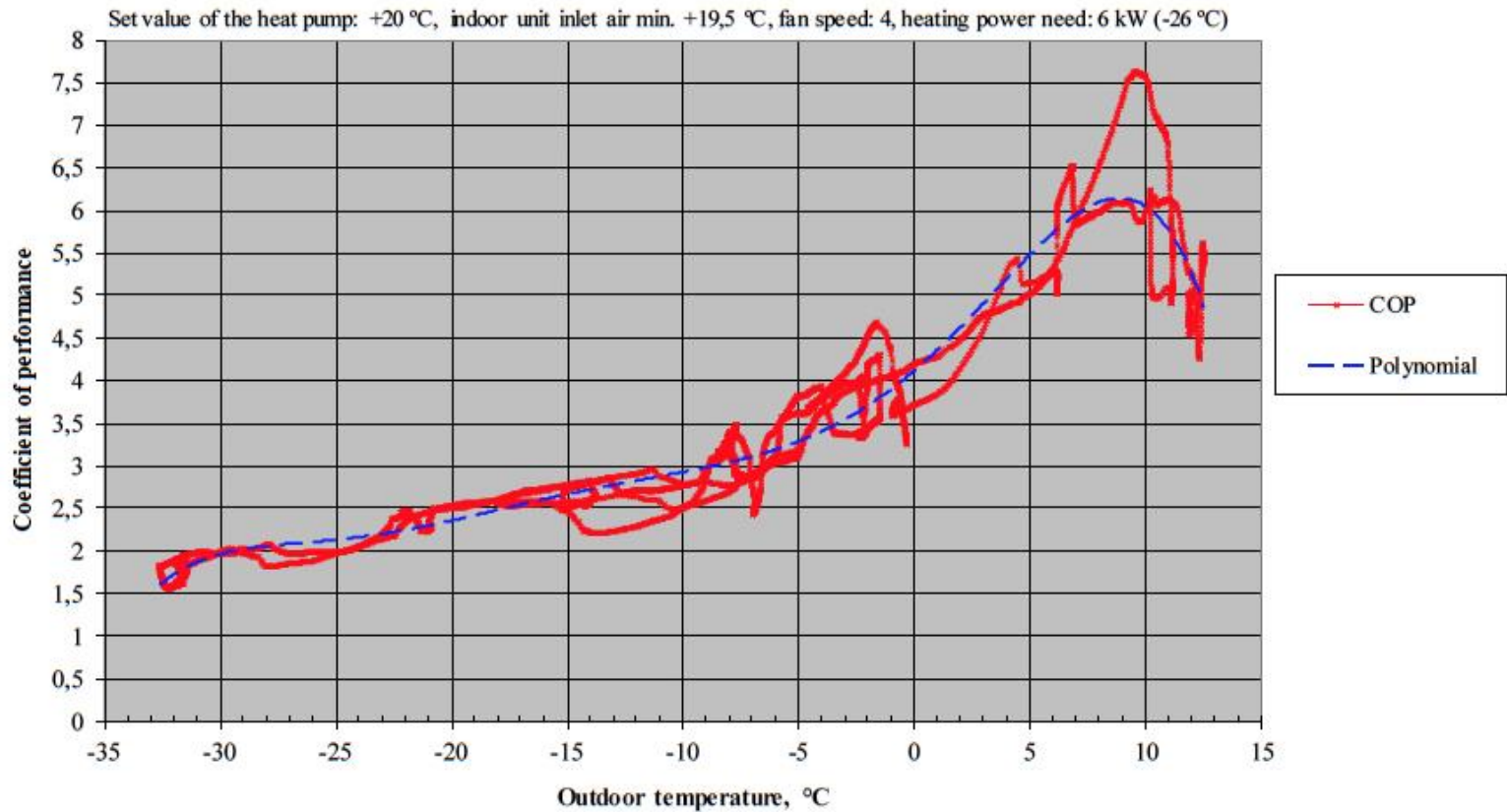


Air-to-air heat pump: Mitsubishi MSZ-LN25VGW + MUZ-LN25VGHZ

OPERATION TEST

Moving hourly coefficient of performance, including defrost periods
(dash line is a degree 6 polynomial graph).

Moving hourly coefficient of performance including the defrost periods



- Market for Air to Air heat pumps is expanding. Many house owners purchase additional units for their houses and often also a new unit to summer cottage. The same simple technology is nowadays used also in bigger capacities when heating larger open spaces like for example factory halls, ware house premises, parking halls etc. Climate change is expected to increase ambient temperature in the future and because houses here are built to keep heat indoors apartments over heat very easily – this is also creating new demand.

- Air to Air heat pumps are technically simple and their COP and heat efficiency is getting better all the time, so it is not a surprise, that the sales is on an increasing trend among all other heat pump solutions. Investment is also far lower comparing to other heat pump solutions.
- It is calculated, that the mounted 700 000 air to air heat pumps have reduced approx.. 3 tWh/a in Finnish electricity consumption.

- One good Air to Air heat pump can easily save 4000 kWh per year in heat consumption. Many customers don't want to invest 8 000 – 18 000 € for Air to Water or Ground source heat pump. You can get an Air to Air heat pump (installed keys in your hand) for 1500 – 2400 €. Good quality Air to Air heat pumps can operate 10 – 15 years.

SCANOFFICE GROUP video