HYBRID HEAT PUMPS IN SOUTHERN EUROPE:

INTEGRATING ENERGY SOURCES FOR HOME COMFORT

6 December 2017

AGENDA

- Home comfort in Southern Europe – today and tomorrow
- One appliance covers all thermal comfort needs
- Investments: hybrids are convenient
- A great tool for energy management

Heating and Cooling in Southern Europe – today

The situation:

~70% of heaters already installed in buildings in Southern EU: old and inefficient;

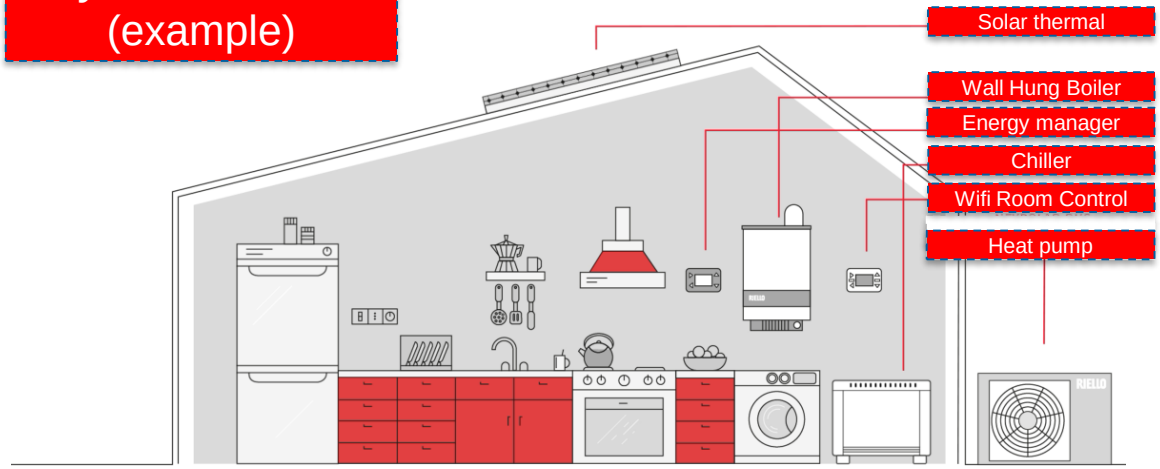
- Need to modernise with efficient / renewable systems;
- Often cooling needed.

Some constraints:

- Old / ancient existing building stock → transformation is complex;
- Connections of homes to electricity grid do not support high peaks → difficult to install electric-only heat pumps.

Home comfort in Southern Europe – with hybrid systems

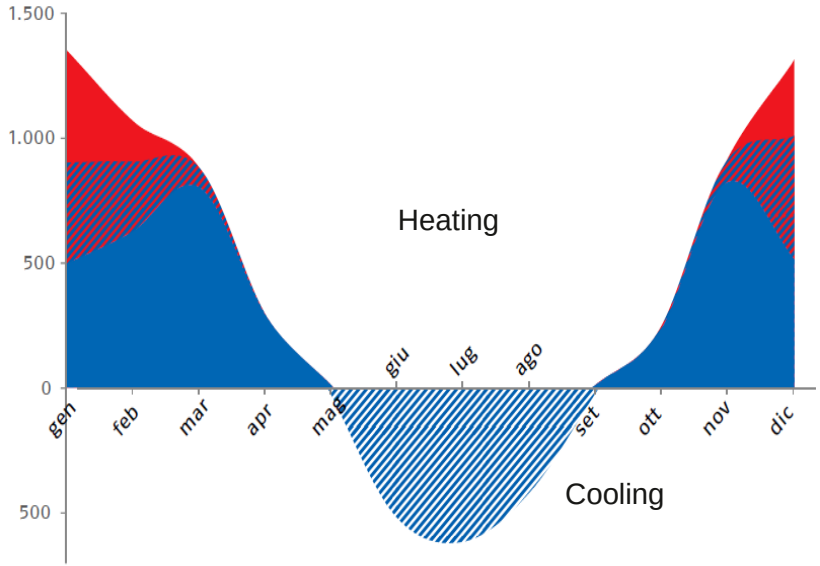
Hybrid solution (example)



A solution for modernisation

- Very efficient system using renewables;
- One appliance for both heating and cooling;
- Fit for use in existing building: available space, higher heating needs than new buildings;
- Small size Heat Pump perfect for existing electricity connections.

One appliance covers all thermal comfort needs



Use profile of a hybrid heat pump in Verona, Italy – example:

- Heating with heat pump only
- Heating with boiler only
- Heating with boiler and heat pump
- Cooling with heat pump

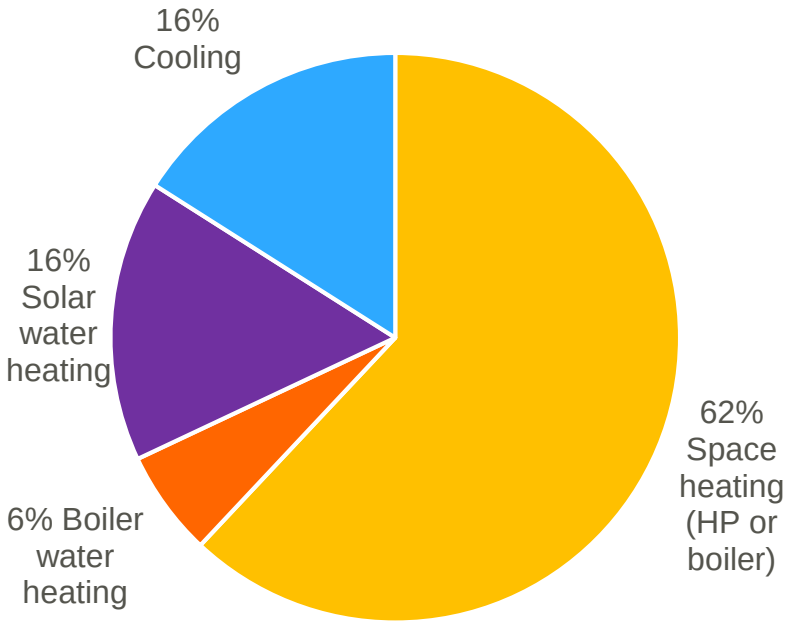
- Cooling: between a sixth and a quarter of all thermal comfort needs in Southern EU (e.g.: Italy);
- Growing cooling needs in many EU countries;
- Hybrid heat pumps can do both heating and cooling;
- Advantages: one appliance, one installation, one maintenance service.

Investments: hybrids are convenient

- Investment costs are major barrier to integrate renewable heating in buildings;
- Cost of combining two technologies is mitigated;
- Smaller (= less expensive) heat pump than in standalone systems;
- Fit for use within existing heating systems / old buildings – performance increases as the building gets more insulated;
- Lower energy bills for consumers;
- Incentives in most successful markets;
- Only one appliance for heating and cooling.

A great tool for energy management

Example: energy use of a hybrid in a new building in Verona, Italy



- Hybrids allow people to use electricity or gas as energy sources;
- People determine the setting, when the appliance switches from electricity to gas;
- With dynamic prices, this can be done automatically:
  - When PV and wind are most abundant, hybrids will run on electricity (and even store energy with hot water storage);
  - When electricity is scarce/ in very cold days, hybrids switch automatically to the gas grid;
- These technologies are ready!

Both heat pumps and hybrid heat pumps can provide demand response

- Heat Pumps can provide demand response services thanks to:
  - Hot water storage cylinders;
  - Thermal storage of the building.

- Hybrid Heat Pumps may use storage. But can also suspend electricity demand and use the boiler.

- Choice of heater? Depends on various factors, including building type and people preferences.

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