

Smart Radiator Upgrade (Super Smart with Natural Gas)

Erik Bozelie & Peter Bruins.

Saxion | Academie Creatieve Technologie, Van Galenstraat 19 | 7511JL Enschede

Introduction: Improving the Home boiler is easy, for less than 1000€ the old boiler is replaced for the modern High Efficiency (107%) HR++ boiler.

However to achieve that efficiency, the return temp of the water circuit must be lower than 30°C. The older radiators in the rooms however are calculated on 80°C. By reducing the temperature the heating capacity will not be sufficient anymore, replacing the radiators is costly and invasive in the household.

So the logic conclusion:

→ Upgrade the existing Radiators

1. Increase the heat capacity at 30/50°C
2. Make the control smarter
3. Increase the comfort

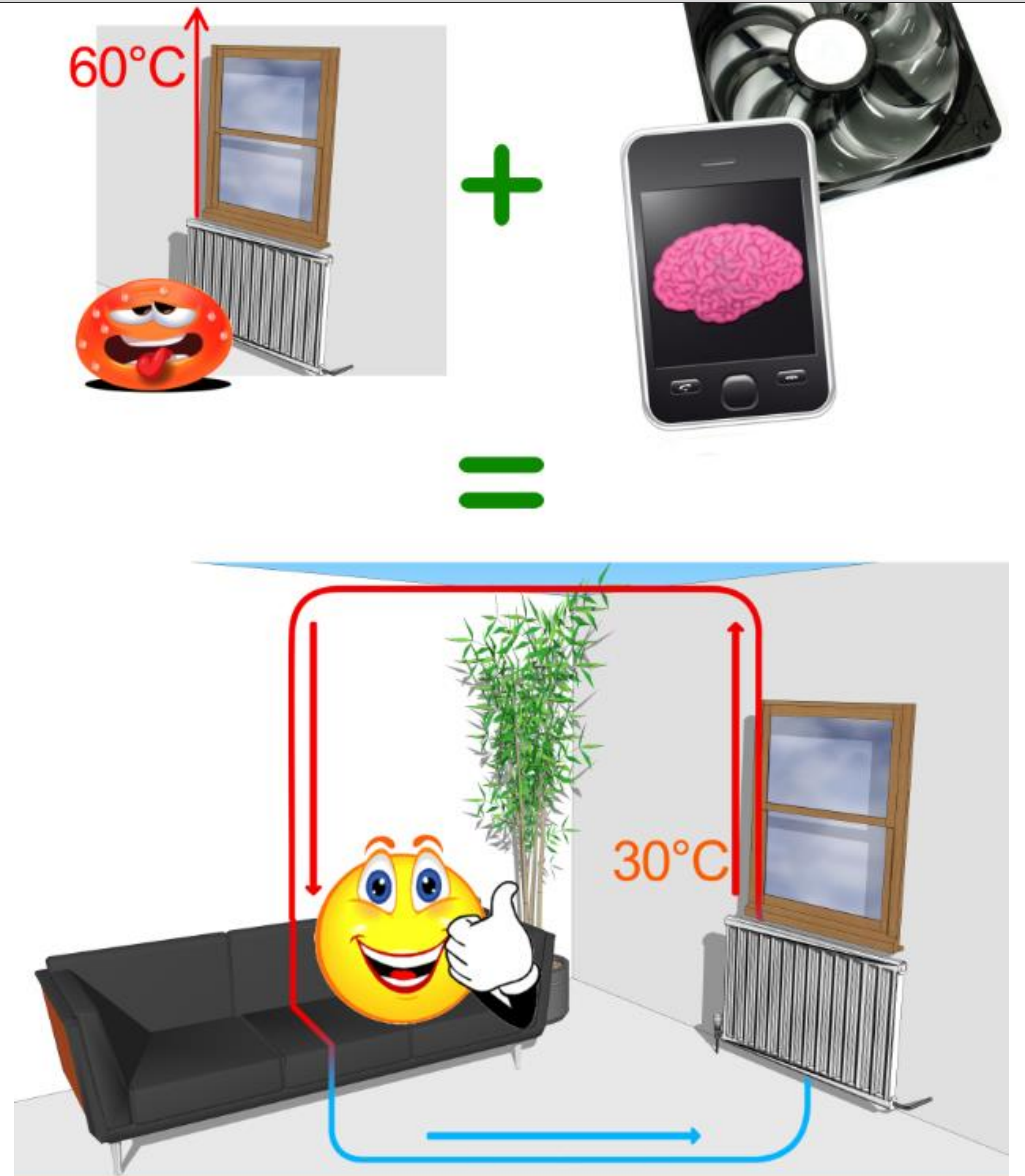


Understanding turbulent flow:

Easy to build models, will give us students in the project the opportunity to understand the complex behavior of **air**, **heat** and **velocity**.

Learning by playing around with simulation variations, is giving an accelerated development for the project. Result data has an educational value.

Instead of dealing with a large number of equations and formulas, knowledge can be gained, without years of experience.



Conclusions:

1. Computer simulations are time intensive.
2. Understanding turbulent flow is needed to make an excellent product.
3. With thanks to COMSOL Netherlands for their support
4. **The research and project realization is supported by GasTerra by 50k€=\$67.000**

Time=32.6 Slice: Temperature (degC)

