Smart Radiator Upgrade (Super Smart with Natural Gas)

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Abstract

Introduction
Each year, natural gas supplier GasTerra organizes a contest for young technical students.

This year, 2 first-year students won the main prize of 50.000€, with a simple idea:
Make a smart upgrade set for existing water radiators for room heating.

In heating upgrades, most attention is paid to the boiler. When upgrading to HR++-boilers (eff of 107%) however, difficulties may occur since the high efficiency boilers are designed for water temperatures around 40°C, while the old radiators are designed for water temperatures higher than 60°C. The resulting mismatch may lead to reduced performance, a larger carbon footprint and increased annual costs.

By engineering a smart, sensor controlled, forced ventilation system for the radiators, first-year Saxion University students Erik Bozelie and Peter Bruins managed to show how about 15-25% of the annual heating costs of an average Dutch household can be saved.

Use of COMSOL Multiphysics®
In their short presentation, they will show how COMSOL Multiphysics® helps to understand turbulent flow and forced ventilation and how it helps the engineer to make the best design decisions. Their simulations have shown the effectiveness of their upgrade and allowed them to implement optimizations that would have been very time-consuming to achieve using more traditional testing methods.

Figures used in the abstract

Figure 1

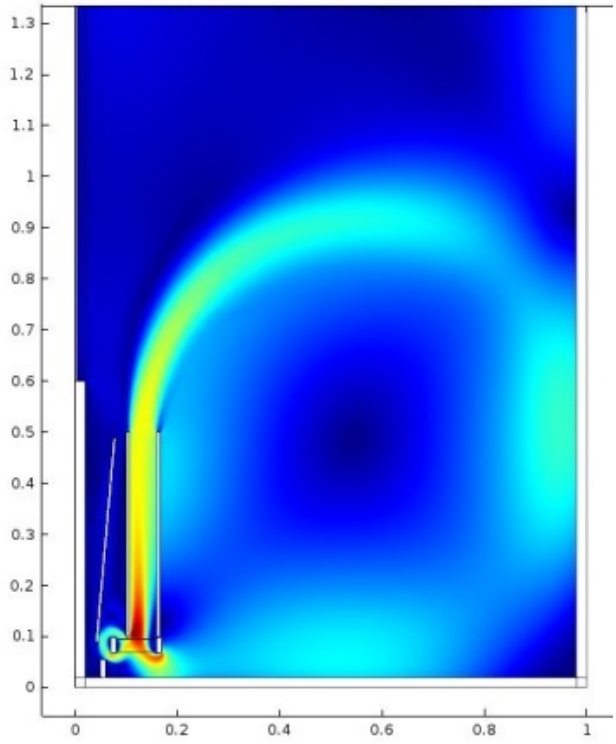

Figure 2

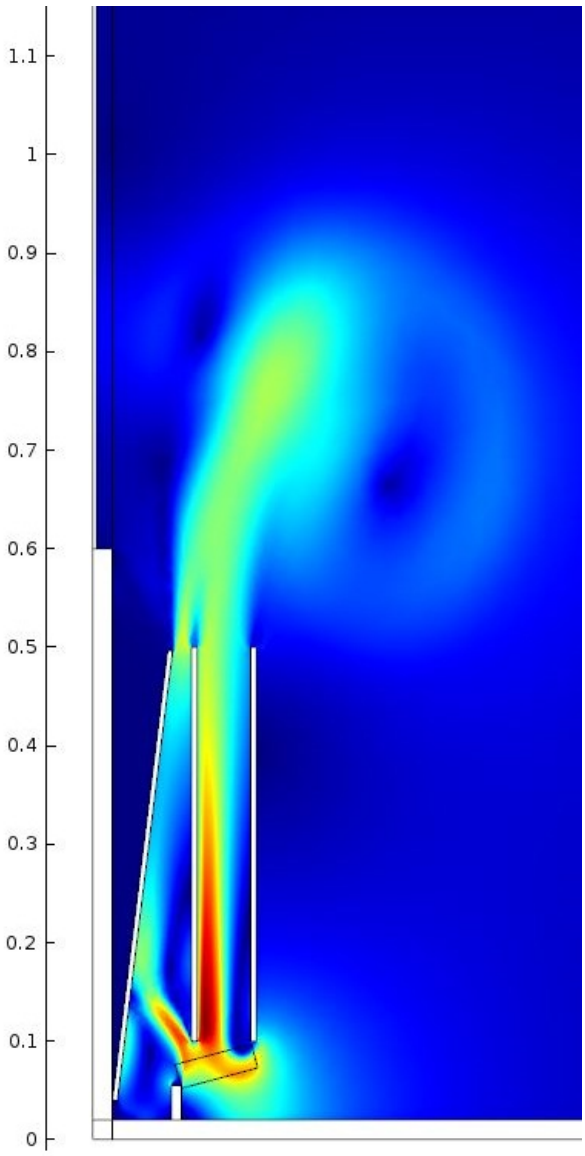

Figure 3