



SPIRE-04-2016

IMPROOF

Full Title: Integrated model guided process optimization of steam cracking furnaces

Aim:

The objective of the project **IMPROOF** is to drastically improve the energy efficiency of steam cracking furnaces by at least 20%, in a cost effective way, while simultaneously reducing emissions of greenhouse gasses and NO_x per ton ethylene produced by at least 25%.

Concept:

One important way to reduce the energy input in steam cracking furnaces is to reduce coke formation on the reactor wall. The use of either advanced coil materials, combined with 3D reactor designs, improved process control, and more uniform heat transfer will increase run lengths, reducing simultaneously CO₂ emissions and the lifetime of the furnaces. Biogas and bio-oil will be used as alternative fuels because they are considered renewable, and hence, decrease net CO₂ production. Application of high emissivity coatings on the external surface of the radiant coils will further substantially improve the energy consumption. Less firing is required to reach the same process temperatures in the radiant coils. This will reduce fuel gas consumption and CO₂ emissions by 10 to 15%. IMPROOF will demonstrate the advantage of combining all these technological innovations with an anticipated increase of the time on stream with a factor 3.

Start date:

01/09/2016

End date:

31/08/2020