

Project or team name: A new life for waste heat

Team members and University:

Prokop Pučejdl, CTU in Prague, faculty of mechanical engineering

Edoardo Tasini, CTU in Prague, faculty of mechanical engineering

(Danila Lisitskii, CTU in Prague, faculty of of nuclear sciences and physical engineering)

Project category: Energy

Potential for impact

In Europe there are over 20 000 gas pressure reduction stations.

The project is about optimizing power production in these stations, where electricity is produced by using pressure differential in an expansion turbine, which is being operated in combination with a cogeneration unit to assure the necessary preheating of the gas, and to produce additional volumes of electricity. A lot of heat that is produced from the cogeneration unit gets wasted, especially during summer, when the gas flow is very low. Our solution to this problem is to add another expansion unit (Organic Rankine Cycle), in order to use as much waste heat as possible to produce even more energy. We believe this would contribute to a more sustainable future, since we would be able to produce electricity from heat that would otherwise be wasted.

Novelty

The Organic Rankine Cycle is already being studied and tested, but it is yet to be applied on a large scale.

Feasibility

We provide precise thermodynamical, economical and ecological calculations on one particular pressure reduction station. Same approach can be applied to every station throughout Europe to assure maximal power production.

Inclusivity (industry, potential users, multiple disciplines engaged)

Every gas distribution company can apply the solution on their pipeline grid. For example GasNet in Czech republic.