

NANOSTIR

Optimisation of solid biofuel operated **Stirling** CHCP units by means of **nanotechnological** coatings

NANOSTIR: The combination of solid biofuel boiler, small power range Stirling engine and absorption cooling machine

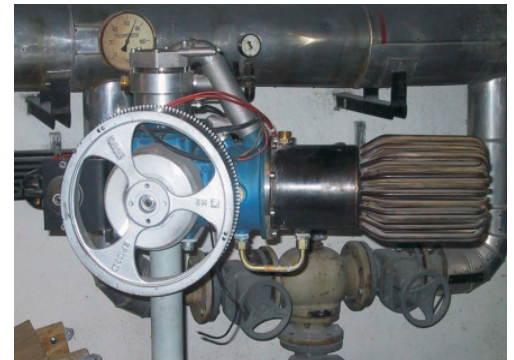
NANOSTIR represents a completely new and highly innovative, alternative and sustainable polygeneration energy system to provide power, heat and cooling energy for the future using renewable energy sources.

First step:

The basis idea of **NANOSTIR** is the optimisation of a small scaled solid biofuels utilising Stirling engine (generating approx. 1 kW electrical energy) by means of nanotechnological coating material.

Second step:

The optimised CHP unit will be combined with an absorption cooling machine (generating about 10-15 kW cooling energy) to form a CHCP unit.



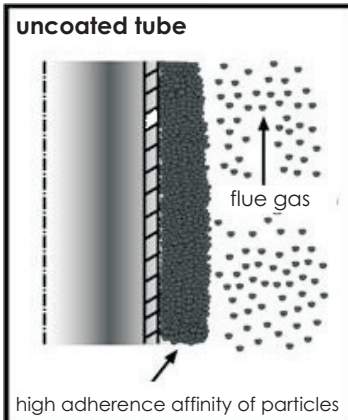
Quelle: LFS Tulln
used Stirling engine

Associated issues concerning Stirling engines, operated with solid biofuels such as wood logs, chips or pellets, are:

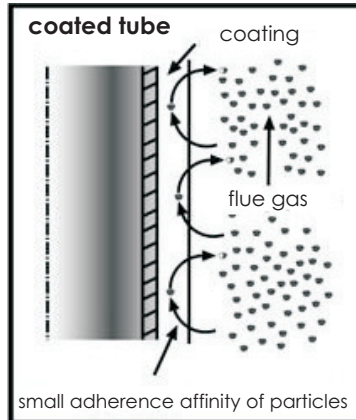
- significant problems with soiling and slagging of the primary heat exchanger
- high maintenance efforts
- an almost immediate to a significant decrease in the efficiency

Approach:

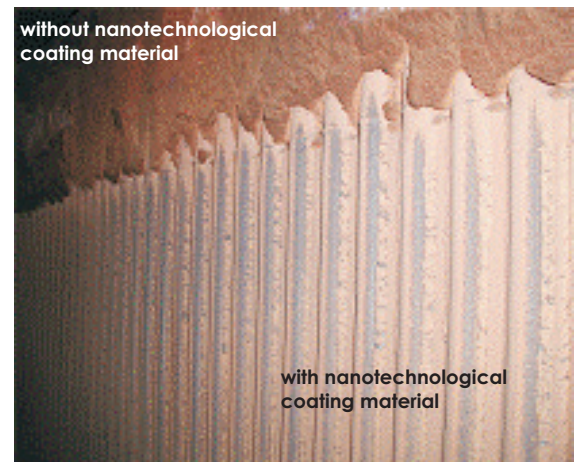
By means of nanotechnological coating, these problems can be reduced extensive, illustrated in the following pictures:



Quelle: www.itn-nanovation.com
without nanotechnological coating material



Quelle: www.itn-nanovation.com
with nanotechnological coating material



Quelle: www.itn-nanovation.com

Objectives:

- a broader applicability and demand on Stirling CHCP units
- by extending the applicability potential, more SME's as well as owners of appropriate buildings will become interested
- profits for the users** are a higher energy efficiency of more than 90% and a higher independency from fossil energy sources

Partners:



Kubbier

