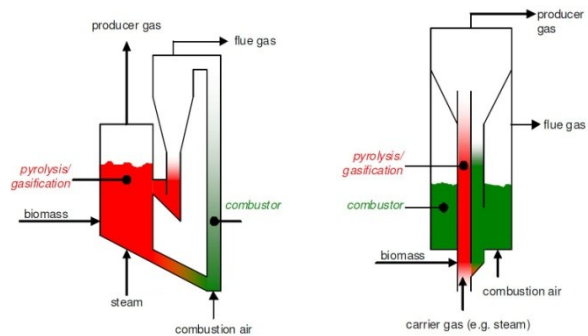


consumption is ~2%. Additional benefit for the OLGA concept, in which oil is cleaned and recycled, is that no limitations are set to the initial tar load in the raw product gas.

Optimization of the gasification process Due to the consumption of oil in conventional biodiesel/RME scrubbing it is crucial to lower the initial tar load of the producer gas. This can be done by promoting tar reforming in the gasification reactor. This can be achieved by using carefully selected catalytically active bed materials such as olivine. Also steam might be applied to promote the steam reforming and gasification reactions.

To illustrate the consequences of reducing initial tar loads in a gasifier, the FICFB indirect gasifier is compared with the MILENA indirect gasifier. In the FICFB gasifier Austrian olivine as well as steam is used in order to reduce the initial tar load. Typically, this amounts to 25% steam related to the mass flow of wood on top of the steam already available from the moisture in the wood.

The MILENA gasifier only needs about 5% to maintain fluidization at the bottom of the gasification zone. Tar content in gas from MILENA is not considered to be of relevance, since OLGA has proven to remove tars from high concentrations to very low concentrations. As such, MILENA generates tar loads up to 60 gr/m³, whereas FICFB is aiming for approximately one tenth of that.



The FICFB gasification zone requires relatively high amounts of heat to supply energy for the endothermic reforming reactions as well as the heating of the relatively large amount of steam. The result is that the energy of the tar-free product gas that is available for further treatment is 78% for the MILENA-OLGA concept and 72% for the FICFB with conventional RME scrubber.

Start-up and off-set conditions Besides the direct economic and indirect efficiency advantage, the OLGA system brings benefits to operations as well. As high tar loads are acceptable, initial start-up issues and off-set conditions (e.g. the bed material not being catalytically active) are not causing any issues in an OLGA based system, whereas in a conventional biodiesel/RME based system (and the need for low tar content) initial start-up and off-set conditions can lead to serious fouling issues.

Features	Benefits
Recycle of heavy and light tars without oil being consumed	No tar waste streams all energy recovered, resulting in lower operating costs
Oil recovery system in 1 st loop, with heavy tar and solids separation	No expensive dust filter required
Oil stripping system in 2 nd loop, with light tar separation	Minimization of oil losses
High tar removal efficiency and very low tar dew point in comparison to conventional biodiesel/RME scrubbing	Product gas suitable for gas engines, gas turbines and catalytic upgrading
Compatible with most industrial gasifiers	Free in gasifier selection
Upgrading of conventional biodiesel/RME scrubbers to OLGA tar removal possible	Reduction of oil consumption and allowing for optimization of the gasification process

²A. van der Drift, R.W.R. Zwart, B.J. Vreugdenhil, L.P.J. Bleijendaal, "Comparing the options to produce SNG from biomass", Presented at the 18th European Biomass Conference and Exhibition, 3-7 May 2010, Lyon, France