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Solar supported biomass heating networks in Austria

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Biomass supplied heating networks are as well as single biomass stoves widely spread in Austria, especially in areas with plenty of wood and in rural areas. 587 decentral biomass heating network systems were in operation at the end of the year 2000. These networks should at least cover the domestic hot water demand during the summer months. Facilities, such as for example schools, are therefore not to be considered for such systems. Presently, the energy demand fall to 5% of the installed power in the summer time. If just a biomass boiler is applied, the low power output could only be reached through regulation with an stop and go operation and this would highly reduce the boiler efficiency and increase the emissions. Therefore, a small oil or gas boiler is often installed in addition to the system and is run during the summer months. This, of course, contradict the attempt to cover the energy demand with renewable energy sources.



Figure 1: The solar supported biomass heating network in Lienz, East Tyrol, (630 m² gross collector area) was taken in operation in 2002 (source: S.O.L.I.D.).

If the output power from the oil or gas boiler cover 30-40% of the power demand of the net (which often is the case) and two biomass boilers contribute with a boiler split of 1:2, then the biomass boiler can be taken in operation in during summer without an stop and go operation, when operated with part load.

A boiler power split is often problematic due to economical reasons and the boiler must also be run with extreme partial power or be run with the means of a power regulation storage tank during the summer period.

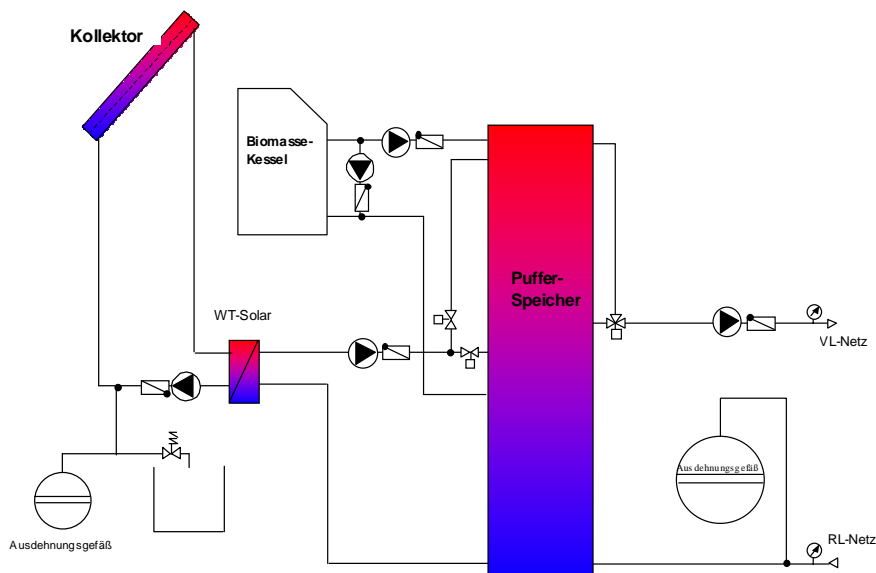


Figure 2: An example of a typical hydraulic concept of a solar supported biomass heating network.

Solar supported biomass heating networks originated from the dilemma of covering the heat demand during summer for systems with only a biomass boiler. There are presently 14 solar supported biomass heating networks with a total of 1250 m² collector in operation in Austria. The solar thermal systems are planned in such way that almost a 100% solar coverage is reached during the summer months. An auxiliary fossil driven fuel heating system, which is often available on site, is only needed during a few days when the solar heat does not bring sufficient heat energy. This alternative gives the possibility to practically cover the entire primary energy demand with renewable energy sources.