

Realization of a low carbon society through game changing technologies

R&D Project Title : Development and Demonstration of Biomass Gasification with Chemical Heat Recuperation

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Summary :

This project aims at Proof-Of-Concept of biomass gasification to syngas (H_2/CO) with chemical energy loss of $<5\%$, as a core process of biomass-to-chemicals in the future. The gasification has a particular feature of integrating miscellaneous biomass into the syngas, but also technical problems such as low syngas yield and tar emission. Our R&D team develops a novel reactor system that spatially reconfigures endothermic/exothermic reactions, enabling extremely efficient thermal-to-chemical energy recuperation, and low-temperature complete gasification by applying potassium as an excellent pyrolysis catalyst, phase-transferring gasification/reforming catalyst and also a 'recyclable' catalyst. The R&D will prove the above minimized energy loss in thermally-stand-alone modes and tar emission below $5 \text{ mg}/\text{Nm}^3$ dry syngas. The R&D team also challenges to maximized utilization of external CO_2 that will realize an extremely carbon negative process.

