Integration of LT Geothermal Resources with Other Power Generation Technologies to Improve System Performance

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Project Description

The low-temperature (<150°C) geothermal resource base for the United States is estimated to be >500 GW, but is under-utilized largely due to the current limitations on geothermal power plant technology. One potential way to better utilize the large low-temperature resource would be to use the warm fluid to augment energy inputs into other types of power plants (e.g., waste-to-energy and biomass). This project will conduct a techno-economic analysis that compares augmented versus non-augmented power plants.

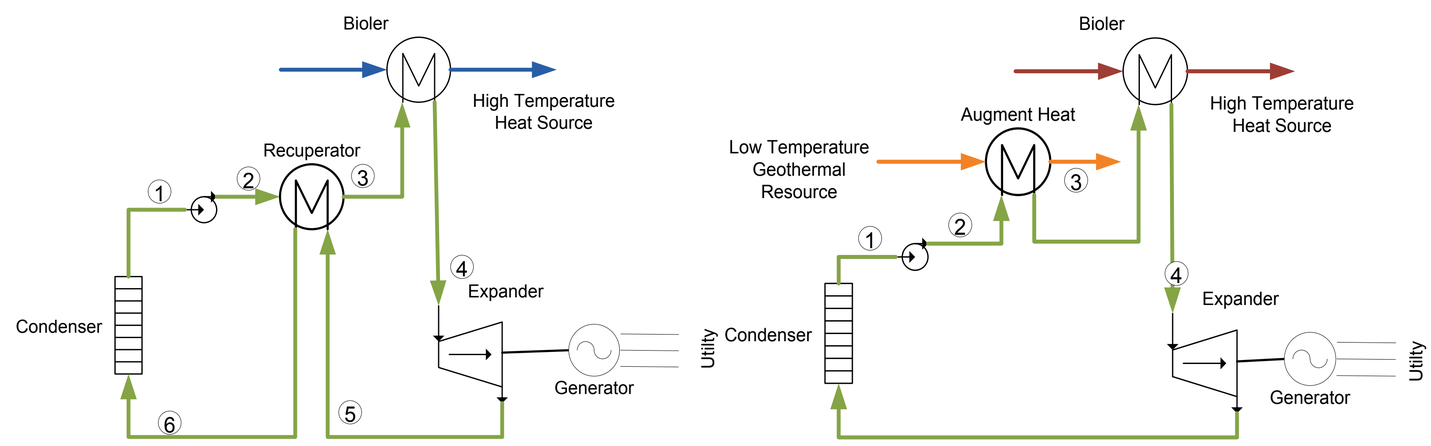

Figure 1. Common and augmented waste heat cycles.

Expected Outcomes and Applications

1. Identification of promising novel applications for low-temperature geothermal resources
2. Insight into the impact that low-temperature geothermal could have on other energy resources
3. Better utilization of the large low-temperature resource base
4. Reduction in feedstock needed in waste-to-energy and biomass plants for similar power output
5. Improvement in analysis methods for combined-resource plants

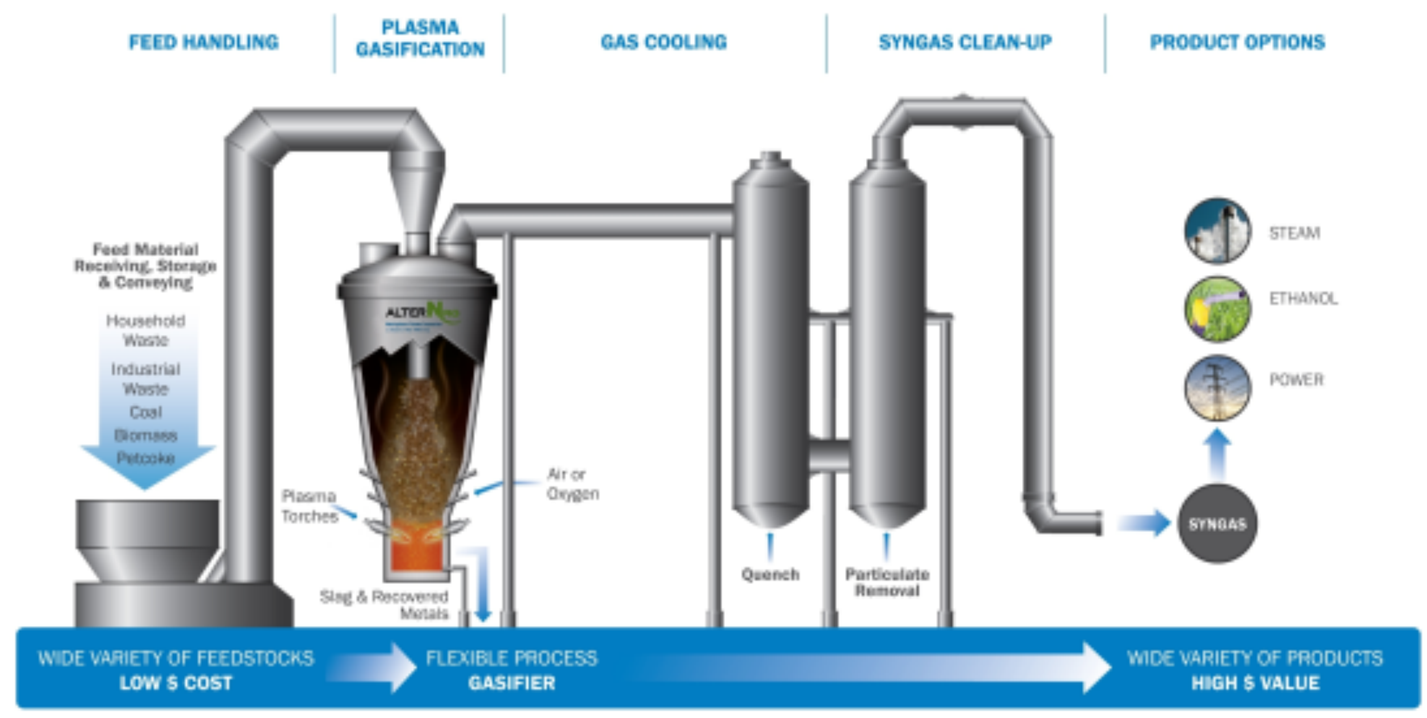

Figure 2. Biomass gasification process diagram.

Accomplishments and Current Status

1. Identification of two (possibly three) power generation technologies meriting further research
   - Biomass gasification (Figure 2)
   - Natural gas compression
   - Anaerobic digester gas plants
2. Developed initial plans for collection and analysis of data

Next Steps

1. Collection of data associated with low-temperature resources
2. Development of engineering models for the two primary systems under consideration
3. Financial analysis

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