VOLTA CHEM

Electrification of the Chemical Industry

Industrial Hybrid Energy Systems

Unlocking Industrial Demand Response

Objective

- Unlocking the Demand Response (DR) potential in industry to support the growth of variable renewable electricity;
- Maximise the techno-economic feasibility of flexible hybrid (gas-electric) heating systems in an industrial setting.

Motivation

- The demand for high temperature heat in industrial processes contributes for 25% of our national primary energy demand and 95% is provided by fossil resources.
- Hybrid (gas-electric) industrial heating systems offer a large potential to provide for the growing demand for flexibility in the electricity system.

Project scope

- Identify electrification options at the end-users and assess their flex-potential;
- Development of a FlexValue tool that analyses the value of the flexibility in current and future energy markets;
- Design, build and test of a flexible hybrid heating system at an industrial site.

Partners

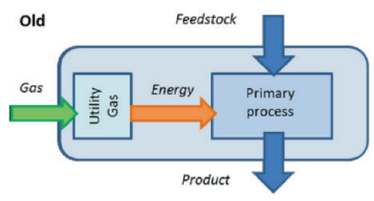
TNO innovation for life · Sime Darby UNIMILLS Innovative partner. Vital to Food. · E.J. BOS · ECN · Huikeshoven Industriële elektrowarmte Huikeshoven b.v. · SCHOLT ENERGY SERVICES · croonwolter&dros | TBI · sympower · alliander · eRisk Group Energy & Finance · MVO · EMMTEC services

Applicability

- Targeted market sectors are food, paper, chemical, and general heating utilities;
- New business opportunities for equipment manufacturers and technology providers.

Results

- A calculation tool for flexibility that optimises the value of DR and gives support to investment decisions;
- A pilot project in industry that serves as example for other potential applications;
- Testing and optimisation of a flexible hybrid utility in representative industrial conditions;
- Validated business case for flexibility and electrification of industrial heating processes.



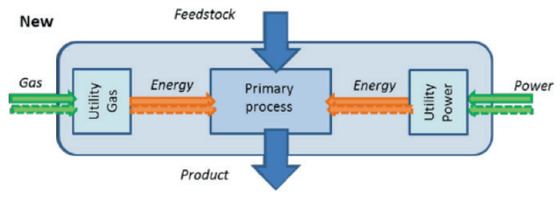


Figure. Depiction of transition from solely fuel powered utilities to hybrid utilities, intermittently producing heat from fuels and from (renewable) power.

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