



biosweet

Biomass for Swiss Energy Future
Swiss Competence Center for Energy Research

In cooperation with the CTI



Energy

Swiss Competence Centers for Energy Research



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SCCER BIOSWEET

Biomass for the Swiss energy future





We Connect Researchers and Entrepreneurs

Emission Reduction in Biomass and Biofuel Combustion

The Swiss government envisions substantial changes to the future Swiss energy supply. One of the key elements to realize this change was the creation of research networks between higher education institutions, the Swiss Competence Centers for Energy Research (SCCERs).

The SCCER BIOSWEET is one of eight SCCERs. It is active in the field of bioenergy and focuses on research and implementation of biomass conversion processes with a high level of technological readiness. The potentially most effective ideas along the whole value chain are promoted and the best partners are involved.

The competence center BIOSWEET connects eight Swiss academic institutions and more than thirty partners from public and private sector organizations. It is governed by a board, which is formed by academic partners and representatives from industry. The board works closely with the Managing Office, located at the Paul Scherrer Institute.

Five Research Areas

The SCCER BIOSWEET research activities are structured along market-oriented value chains

- > Biomass to biogas
- > Biogas to biomethane
- > Biomass to advanced heat and power
- > Biomass to liquid fuels
- > Biomass and the energy transition



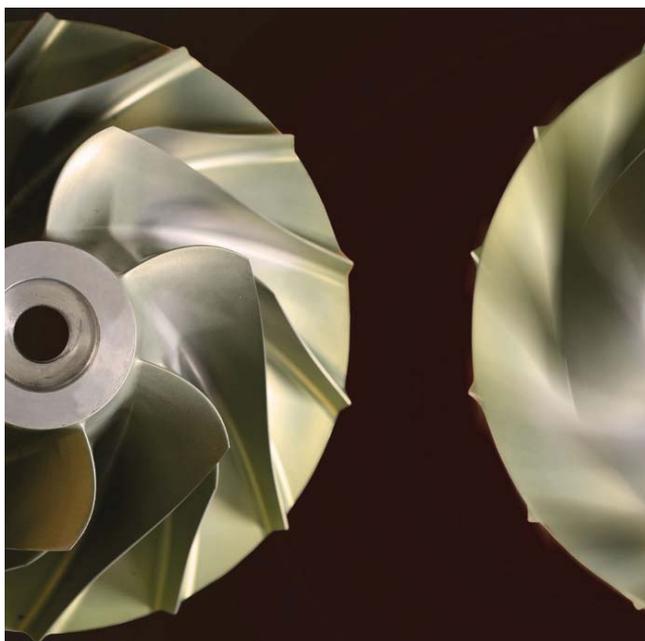
Biomass to Biogas

The biomass to biogas routes which are explored in the SCCER BIOSWEET relate primarily to the use of waste from households, food industry, and agriculture. A strong focus is on how to retrieve the substantial potential of manure. The research topics address optimization of anaerobic digestion and hydrothermal gasification as well as economic process chains for Swiss conditions.

Biogas to Biomethane

This research area focuses on upgrading the biogas from anaerobic digestion and wood gasifiers into grid-quality biomethane. The technology utilizes surplus renewable electricity. The methane yield from the biogas is nearly doubled and the surplus electricity is stored in the gas grid.

**Catalytic methanation pilot reactor
at the Paul Scherrer Institut**



Biomass to Heat & Power

Producing clean and economical heat and power from biomass is a major objective of the SCCER BIOSWEET. The corresponding research area looks at how to further develop and implement dry biomass conversion for advanced heat and power applications.

Pre-treatments such as torrefaction as well as the integration of technologies (e.g. heat exchangers to produce high temperature air) are addressed to increase fuel flexibility, system efficiency and energy yields.

Biomass to Liquid Biofuels

This research addresses microbial and catalytic pathways to convert biomass into liquid fuels as well as solvent- and steam-based pretreatment technologies for biomass. In particular, high-yield and cost-effective processes for the small- to medium-scale production of ligno-cellulosic bioethanol and bio-jet fuels.

The ligno-cellulose derived liquid fuels are primarily based on forestry and agricultural waste and residues, which avoids competition with food production and reduces environmental impacts.

Biomass & the Energy Transition

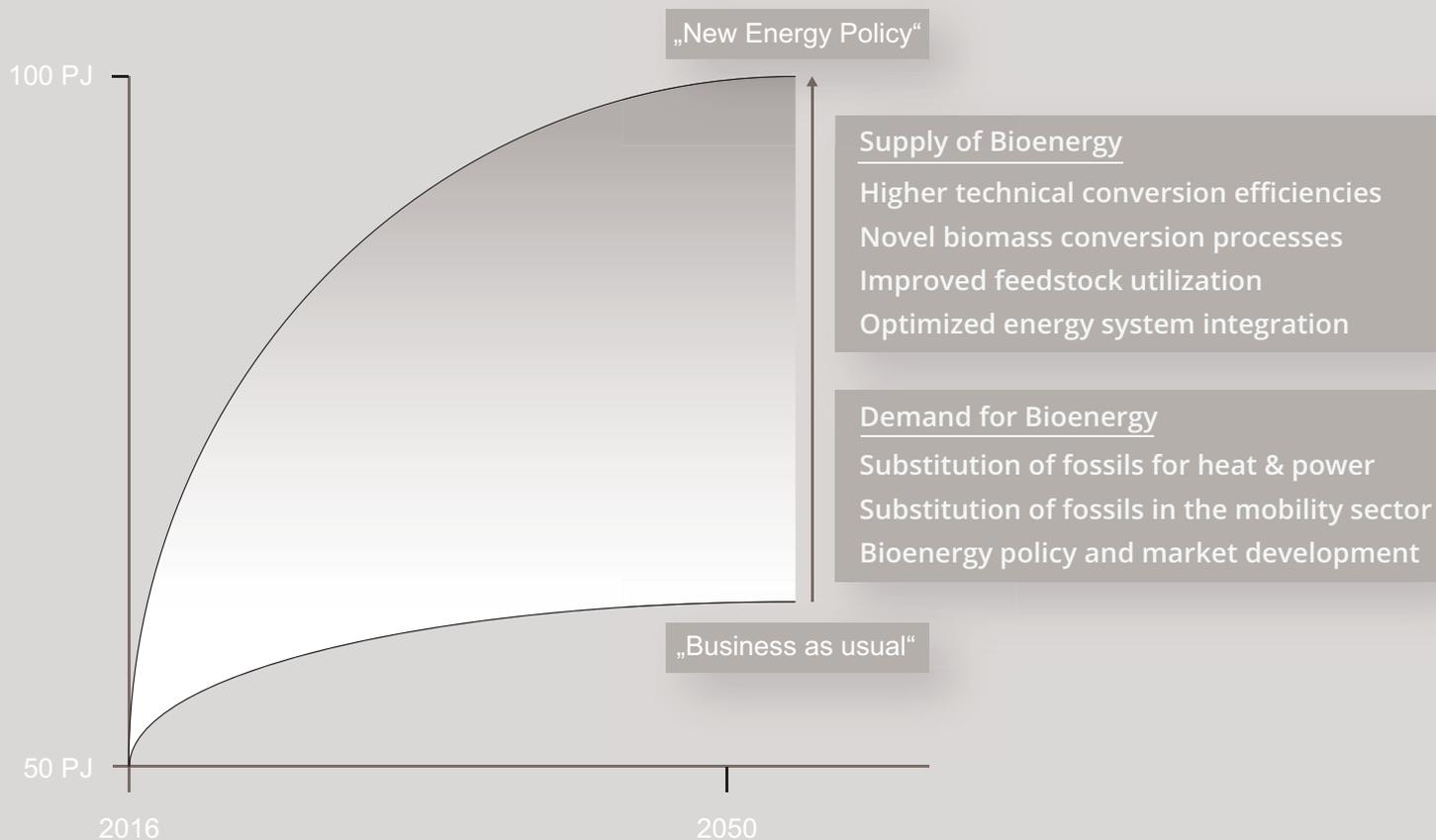
The SCCER BIOSWEET partners are looking at the role of biomass for the energy transition. Databases, models and tools for an optimal and sustainable collection, storage and conversion of biomass in Switzerland are being developed and promoted. These complementary and interdisciplinary competencies are essential for the implementation of the Federal energy strategy 2050.



Double Switzerland's Energy Consumption from Biomass

The SCCER BIOSWEET develops biomass valorization technologies to make the Swiss energy turnaround happen. For 2050, the Federal Energy Strategy foresees a bioenergy share of ten percent of the final energy consumption – 100 Petajoule. To meet this ambitious goal the current energy consumption from biomass needs to be doubled. The SCCER BIOSWEET's research and development activities are designed accordingly.

On the one hand, the technological goal is to exploit biomass resources to the highest sustainable extent. This is pursued by pushing the efficiency limits of existing technologies, by creating novel biomass conversion processes, by improving the feedstock utilization and by designing better integrated energy systems. On the other hand, the SCCER BIOSWEET provides expertise to support energy policy and market development and it reaches out to promote biomass based energy carriers for mobility and heat and power applications.



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