

DeCarbCH Newsletter July 2022



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DeCarbCH Newsletter

July 2022

Dear DeCarbCH Partners,

This is the 6th Newsletter of SWEET DeCarbCH.

The focus is on [Work Package WP05](#), the Combination of renewables, heat transformation and storage for medium and high temperature heating as well as cooling.

We present an exclusive interview with the WP leader, Prof. Stefan Bertsch from [OST-IES](#). In addition, we report on current research projects on high-temperature heat pumps, steam-generating heat pumps, and thermal energy storage (e.g. projects DeCarb-PUI, IntSGHP, HTHP-CH, REVEAL, GIASES). DeCarbCH was also actively present at various conferences.

On June 15, the first [SWEET Conference](#) took place in Bern, which offered an ideal platform for information exchange between research and implementation partners. Prof. Martin Patel presented the DeCarbCH project. On June 22, DeCarb-PUI, IntSGHP, HTHP-CH, and DeCarbCH were presented at the Swiss heat pump conference in Burgdorf. On June 7, Prof. Armin Eberle from ZHAW presented an interesting Lunch Talk on the [Case Study - DeCarb Zurich](#).

Our monthly Lunch Talks are taking a summer break and will come back in September 2022. If you missed the past Lunch Talks, they can still be viewed on our [YouTube channel](#):

- [Pinch Analysis](#)
- [Socio-Economic Challenges](#)
- [Industrial Heat Pumps](#)
- [Thermal Networks](#)
- [Long-term Thermal Energy Storages](#)
- [Temperature Reduction in District Heating](#)
- [Solar Energy for Networks / Industry](#)
- [Perspectives on Thermal Grid Modelling und Uncertainty](#)
- [Negative Emission Technologies](#)
- [Case Study - DeCarb Zurich](#)

Don't forget to follow us on [LinkedIn](#) and [Twitter](#).

We wish you a nice summer break. All the best!

[The DeCarbCH management team](#)

This Newsletter offers the following content:

1. [Interview with Prof. Stefan Bertsch from OST-IES](#)
2. [Research project HTHP-CH: Integration of High-Temperature Heat Pumps in Swiss industrial processes](#)
3. [Research project IntSGHP: INTegration of Steam Generating Heat Pumps in industrial sites \(retrofit\)](#)
4. [Medium and high temperature renewable heat in peak season](#)
5. [Storing Energy from Summer to Winter](#)
6. [Handling of peak loads and enhancing the resilience of local electricity networks](#)
7. [Promoting seasonal storage to cover the winter electricity gap \("Positionspapier"\)](#)
8. [First SWEET Conference on 15 June 2022](#)
9. [SWEET-CROSS final event on January 18, 2023 in Bern](#)
10. [Heat pump conference 2022 in Burgdorf – The latest from the Swiss heat pump research](#)
11. [New Certificates of Advanced Studies \(CAS\) offered by OST](#)
12. [Lunch Talk - Case Study DeCarb Zurich](#)
13. [YouTube Videos of Lunch Talks](#)

Interview with Prof. Stefan Bertsch from OST-IES

Stefan is leading the WP05: Combination of renewables, heat transformation and storage for medium and high temperature heating as well as cooling



WP 05

Question: Could you describe the topic of your WP?

Answer Prof. Stefan Bertsch: Over decades we have been using fossil systems to provide heating for residential and industrial applications and optimized the system integration for these. Current and emerging systems with much lower carbon emissions often require more elaborate integration concepts. While these are successfully in place for residential heat pumps and solar thermal systems, there is a lack of understanding in large-scale or high-temperature applications of renewable systems. Therefore, Work Package 5 (WP05) is developing and showcasing systems solutions for heating at medium and high temperatures as well as for cooling systems. The aim is to propose concepts and guidelines for integrating different kinds of renewable energy sources considering demand profiles, peak load management, simultaneous heating and cooling, control strategies, etc.

Question: How does it relate to DeCarbCH?

S. Bertsch: In order to achieve a quick energy transition, there is a need for easily implementable systems with optimized cost and efficiency while at the same time featuring high reliability. WP05 proposes systems solutions to integrate the technologies employed in WP01. It also presents solutions for industrial sites, which leads to a close collaboration with WP04. In the medium term, we will also be able to help optimize energy system models by providing measurement data from various sites and validated component models. The bottom-up approach of WP05 complements the holistic methods of most other work packages very well and can contribute innovative ideas to the case studies. There are pilot and demonstration projects anticipated to showcase solutions.

Question: What are the main objectives?

S. Bertsch: There are several closely interrelated objectives. One is to give an easily accessible overview of different solutions for heating and cooling. Based on these technologies, systems solutions will be developed and optimized from a technical and socio-economic standpoint. Concepts for digitalization will be used to optimize control and determine the optimal integration levels. This will lead to the acceleration of market penetration of new and emerging concepts. Storage solutions, especially for longer terms, are also considered to reduce the effects of the winter gap in the energy supply. The main objective of WP05 is to help planners, manufacturers, and customers better understand and accept heating and cooling systems with low carbon emissions, which will lead to an increased pace of the energy transition.

Question: What are the main research questions and outcomes?

S. Bertsch: The main questions are on a systems-level: What technologies are best combined to reach medium and high temperatures/powers? How can carbon-free process heat and steam be created, stored, and distributed in an optimal way? How can issues such as temporal or spatial discrepancies be overcome? How can the integration of renewable system solutions be accelerated? The answers will be given in the form of guidelines and

showcases wherever feasible. For easy applicability, a tool will be developed to choose optimal solutions based on location, supply options, temperature, and power requirements supporting planners and consultants.

Question: Could you provide some examples to illustrate the specialty of your WP?

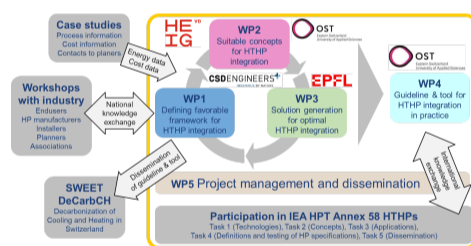
S. Bertsch: At the moment, several industrial partners are planning to decarbonize their processes using heat recovery and integrating a high share of renewable energy. While suppliers for technologies such as industrial and high-temperature heat pumps are on the market, there is big uncertainty with respect to dimensioning, integration, and control. Industrial customers are very hesitant to introduce new technologies into their processes, which have not been proven in the field for many years. Questions mostly concern the optimal design, initial operating costs, and reliability. Operators want to see successful installations before implementation in their own company. Therefore, the uptake of new technologies is very slow. By developing guidelines, demonstration, and monitoring of real systems this hurdle will be tackled for several emerging technologies.

Question: A final word for our readers?

S. Bertsch: The best time to work on the energy transition is now. There are many affordable technologies already available.

[read more](#)

NEWS from WP05: Combination of renewables, heat transformation and storage for medium and high temperature heating as well as cooling



HTHP-CH: Integration of High-Temperature Heat Pumps in Swiss Industrial Processes

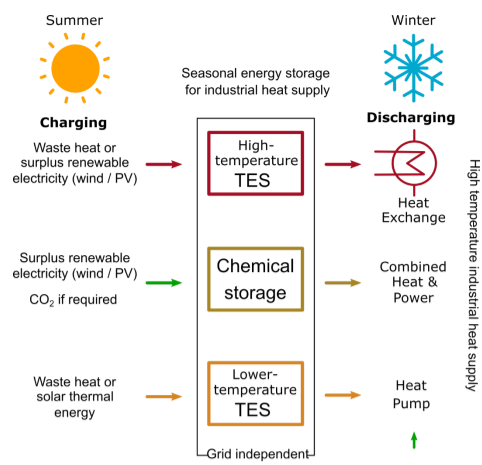
HTHP-CH develops a guide and an assessment tool for integrating HTHPs in practice based on case studies for the Swiss industry. The project is a collaboration with OST-IES, EPFL-IPESSE, HEIG-VD/IGT, and CSD Engineers.

[read more](#)

IntSGHP: INTEgration of Steam Generating Heat Pumps (SGHP) in industrial sites (retrofit)

OST IES investigates specific case studies and system integrations. Dr. Frédéric Bless presented IntSGHP at the WP Tagung 2022 in Burgdorf.

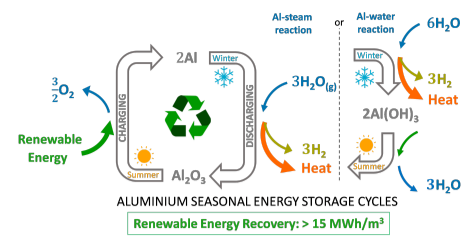
[read more](#)



Medium and high temperature renewable heat in peak season

To decarbonize the heat supply within the industry sector not only in summer but also in winter, long-term energy storage options are needed. Therefore, Thermal Energy Storage (TES) and sector coupling Power-to-X-to-Heat technologies using "renewable fuels" are considered the most relevant technologies.

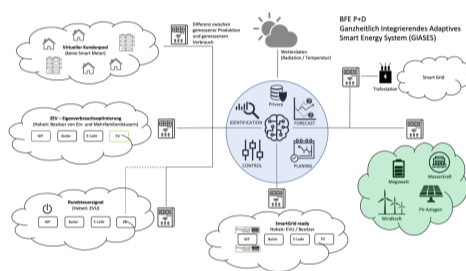
[read more](#)



Storing Energy from Summer to Winter

The SPF Institute for Solar Technology of OST will be research leader of the EU Horizon Europe project REVEAL – Revolutionary Energy Storage Cycle based on sustainable carbon free Aluminium. The ambitious goal is to transfer renewable energy from summer to winter at an affordable cost.

[read more](#)



Handling of peak loads and enhancing the resilience of local electricity networks

The P+D project GIASES (Ganzheitlich Integrierendes Adaptives Smart Energy System zur Glättung von Lastspitzen) explores, together with the iHomeLab, to what extent such measures can contribute to handling future peak loads in the electricity network.

[read more](#)



Promoting seasonal storage to cover the winter electricity gap ("Positionspapier")

The AEE Suisse Organization 'Forum Energiespeicher Schweiz (FESS)' and others published a paper ("Positionspapier"). The SRF TAGESSCHAU and the Luzerner Zeitung picked up the topic of seasonal storage and published interviews.

[read more](#)

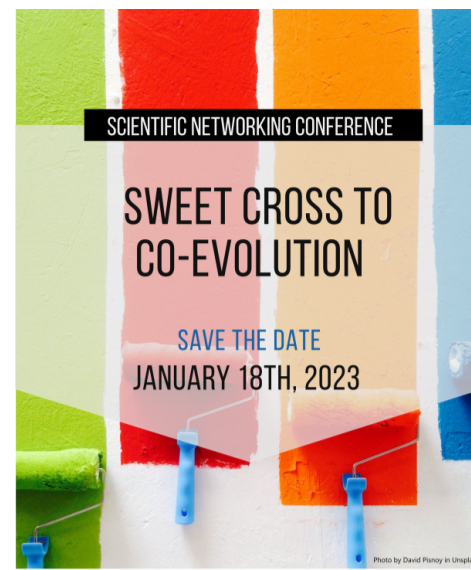
FURTHER NEWS



**First SWEET Conference
on 15 June 2022**

The conference offered an important platform for information exchange between research and implementation. Prof. Martin Patel presented DeCarbCH.

[read more](#)

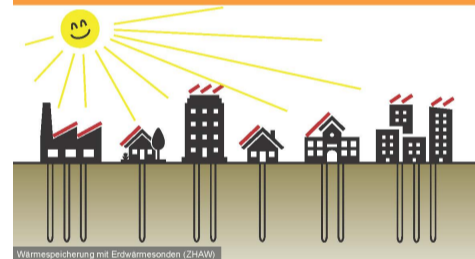


Location: University of Bern
Registration opens in September 2022
Cost: Free (limited to 100 participants)
Contact: www.sweet-cross.ch

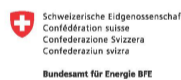
**SWEET-CROSS
(CooRdination of Scenarios
and Data in SWEET) final
event on January 18, 2023
in Bern**

Please save the date.

[read more](#)



28. Tagung des Forschungsprogramms
Wärmepumpen und Kältetechnik
des Bundesamts für Energie BFE



**Heat pump conference 2022
in Burgdorf – The latest
from the Swiss heat pump
research**

*The projects DeCarb-PUI,
IntSGHP, HTHP-CH, and
DeCarbCH were presented.*

[read more](#)



**New Certificates of
Advanced Studies (CAS)
offered by OST in the field
of DeCarbCH**

*OST offers new Certificates of
Advanced Studies (CAS) in 2022,
2023 and 2024 related to the topics
of DeCarbCH. Each CAS can be
completed as advanced education or
as part of the Master of Advanced
Studies (MAS) in Energy Systems or
the Master of Engineering (M.Eng)
in Energy Systems and Energy
Economics.*

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Watch our previous Lunch Talks on our YouTube Channel

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are available on [YouTube](#) and the presentation slides on our [DeCarbCH Website](#).

[All the News on the Website](#)

[EVENTS](#)

- Lunch Talks -

[We will come back in September](#)

Any question can be sent to info@sweet-decarb.ch



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