SUSCHEM CZ – presentation, recent activities

5. 11. 2024

Martin Šilhan

Chairman

SUSCHEM basic information

SUSCHEM CZ was established in 2005 as a voluntary association according to the CZ law no. 40/1964 (Civil Code) to support sustainable development of chemical industry and respective connected R&D activities with a focus on maintaing the chemical industry competitive while protecting the health and the environment and improving the image of the chemical sector.

SUSCHEM CZ works as a bridge between industry and R&D institutions with a full support to research, development and innovations by all means.

SUSCHEM CZ is an active part of the ETP (European Technology Platform) SusChem

History, Projects of SUSCHEM CZ

- 2005 SUSCHEM CZ established as very first TP in CZ
- 2009 – 2012 the project „SusChem“ realized and finished (project no. 5.1 SPTP01/005)
- 2012 – 2014 the project „SusChem II“ successfully performed and finalized (project no. 5.1 SPTP02/035).
- 2016 – 2019 the project „SusChem III“successfully performed and finalized (project no. CZ.01.1.02/0.0/0.0/15_037/0007178).
- Meanwhile SUSCHEM CZ also participated in international projects as Nanoforce and/or Innochem
- SUSCHEM V application form submitted, expected to start on 7/2025

Structure of SUSCHEM CZ

Executive Committee

Martin Šilhan, Ph.D. (Research Center Řež) - chairman

Jiří Reiss, CSc. (SCHP ČR) - vicechairman

Milan Petrák (VŠCHT – Technopark Kralupy) - vicechairman

Antonín Mlčoch, CSc. (UP Olomouc)

Jakub Šiška (Synthomer a.s.)

Vladimír Špaček, CSc. (SYNPO, a.s.)

Doc. Ing. Jaromír Lederer, CSc. (ORLEN UniCRe, a.s.)

Supervisory Committee

Ivan Souček, Ph.D. (SCHP ČR) - chairman

Jiří Hanika, Prof., Dr.Sc. (ÚCHP AV ČR Praha)

Lenka Pexidrová (MPO)

Martin Veverka (Radka Pardubice)

Members of SUSCHEM CZ

1. Svaz chem. průmyslu ČR
2. Unipetrol výzkumně vzdělávací centrum, a.s.
3. Univerzita Karlova, Přírodovědecká fakulta
4. Synthomer a.s.
5. PRECHEZA a.s.
6. Vysoká škola chemicko-technologická v Praze
7. Ústav chemických procesů AV ČR, v. v. i.
8. Výzkumný ústav organických syntéz a.s.
9. SYNPO, akciová společnost
10. DEZA, a. s.
11. Masarykova univerzita – RECETOX
12. SYNTHOS Kralupy, a.s.
13. Univerzita Pardubice
14. Palackého univerzita - RCPTM
15. RADKA Pardubice s. s r.o.
16. Spolek pro chemickou a hutní výrobu, a.s.
17. DEKONTA, a.s.
18. ALIDEA s.r.o.
19. SYNTHESIA, a.s.
20. VŠB-TUO, Institut environmentálních technologií
21. BASF spol. s r.o.
22. Lučební závody Draslovka a.s. Kolín
23. NAFIGATE Corporation, a.s.
24. UNIPETROL RPA, s.r.o.
25. SPOLANA s.r.o.
26. Středočeské inovační centrum
27. Ecofuel Laboratories s.r.o.
28. Tradecontrol spol. s.r.o.
29. Centrum výzkumu Řež s.r.o.
30. Vysoké učení technické v Brně, fakulta chemická
31. NanoSPACE, s.r.o.
32. EN09, s.r.o.
33. SUAS Group, a.s.
34. ENACO, s.r.o.

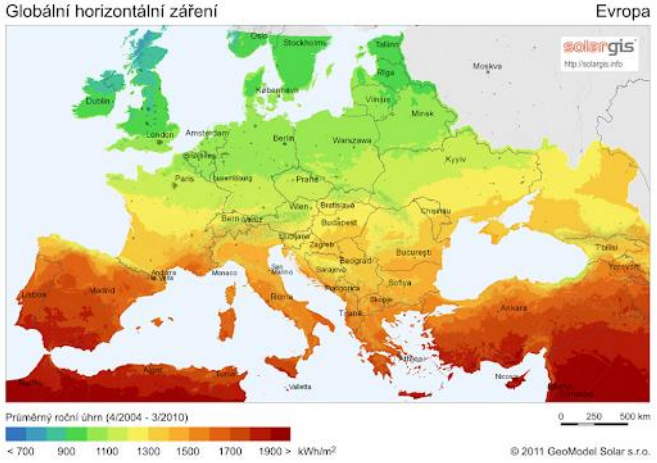
Areas of interest (1/4)

EVROPSKÁ UNIE
Evropský fond pro regionální rozvoj
OP Podnikání a inovace pro konkurenceschopnost
MINISTERSTVO PRŮMYSLU A OBCHODU
SUSCHEM CZ
Aktualizovaná Cestovní mapa průmyslové modernizace a zavádění pokročilých technologií v chemickém průmyslu ČR

„Sustainable chemistry“ - very broad term, not as focused as CTP Plastics. For instance, out last „Roadmap“ deals with:

1. Decarbonisation - up to 2050, not very favourable natural conditions (PV, WE, geothermal – see below). Predictions up to 2050 show a high degree of inaccuracy. Lack of available information (company strategy documents reach up to 2030, seldom further).

2. Chemicals strategy for sustainability - first step towards the “zero pollution” ambition - key commitment of the European Green Deal



Areas of interest (2/4)

3. Refinery-petrochemical complex - many challenges, as decarbonisation, use of bio-raw materials, e-fuels …

4. Circular economy - technologies, business models, CAPEX …

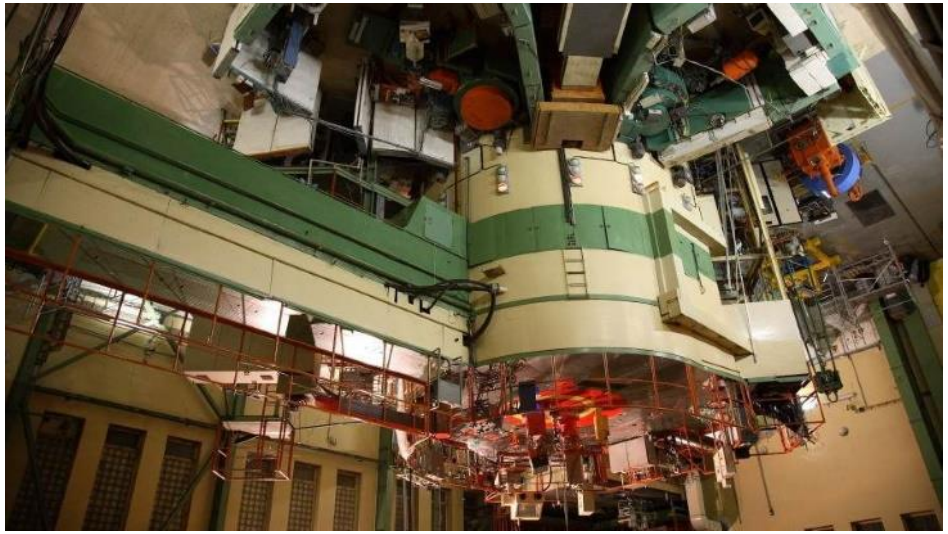
5. Advanced materials - more durable, extreme conditions, lower environmental impact …

Areas of interest (3/4)

6. Nuclear energetics - recent energy crisis (Ukraine), surge in elektricity prices. Nuclear reactor can provide steady electricity, heat (steam, even high-temperature for some reactor types)

- „generation III+“ - „downscaled“ PWR/VVER reactor concept, all „almost-ready“ prototypes. *In my opinion, they will not be commisioned because of CAPEX.*
- „generation IV“ – yes, but not sooner than 2040 (?)

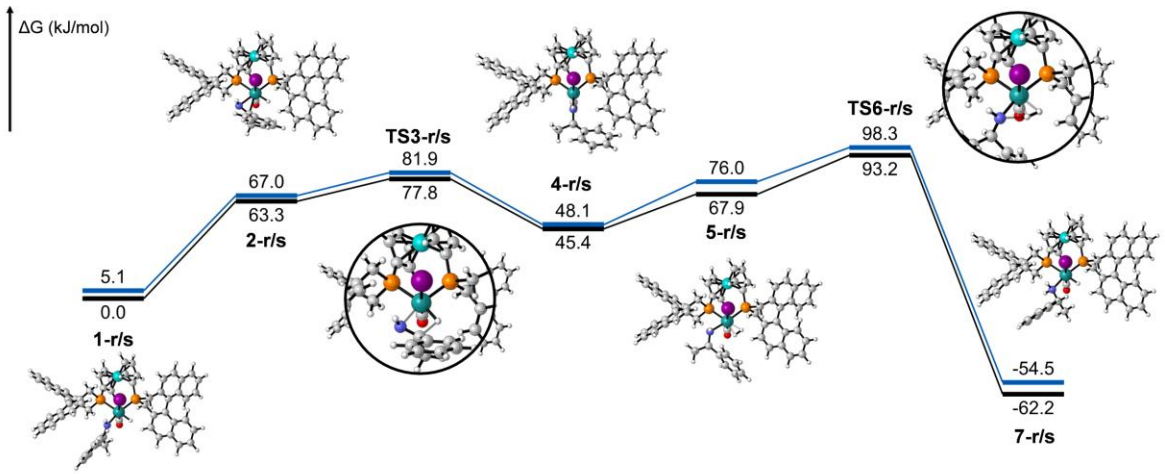
Possible synergy with hydrogen production and „peak shaving“ of nuclear reactor (electrolysis, steam electrolysis).

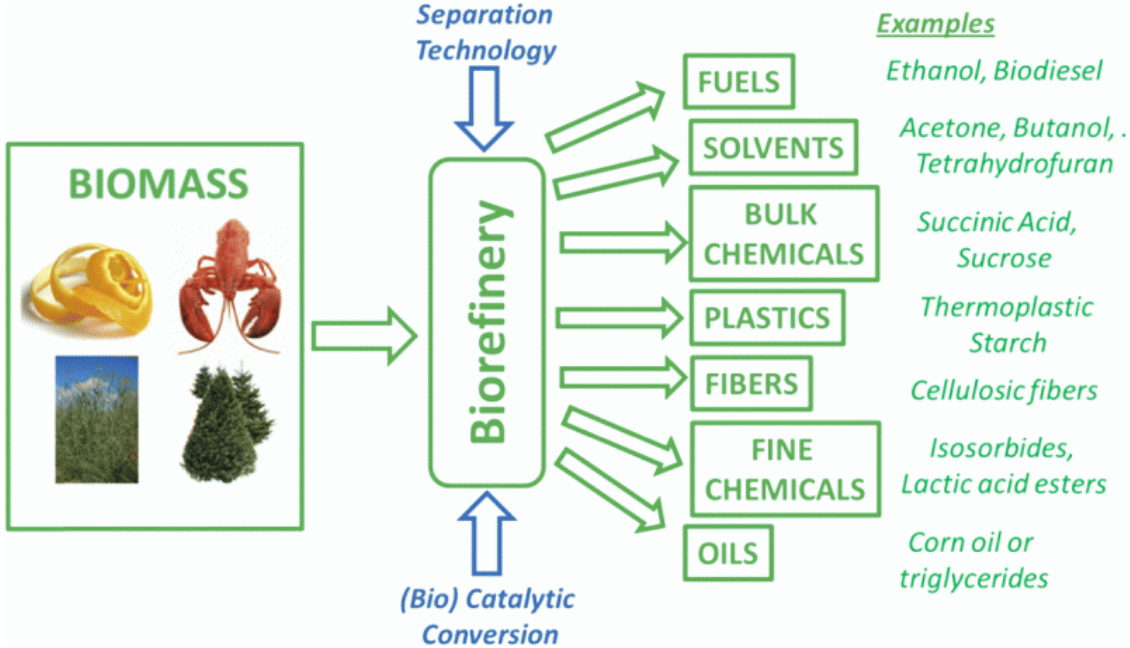


Areas of interest (4/4)

7. Chemistry 4.0 – application of AI in chemical industry, use of quantum-chemical modelling methods (prediction of molecular properties, reduction of experimental labour)

8. Industrial biotechnology – biorefinery concept, advanced biomass processing. Use of living organisms (alga) for chemicals production





Areas of interest – country-specific

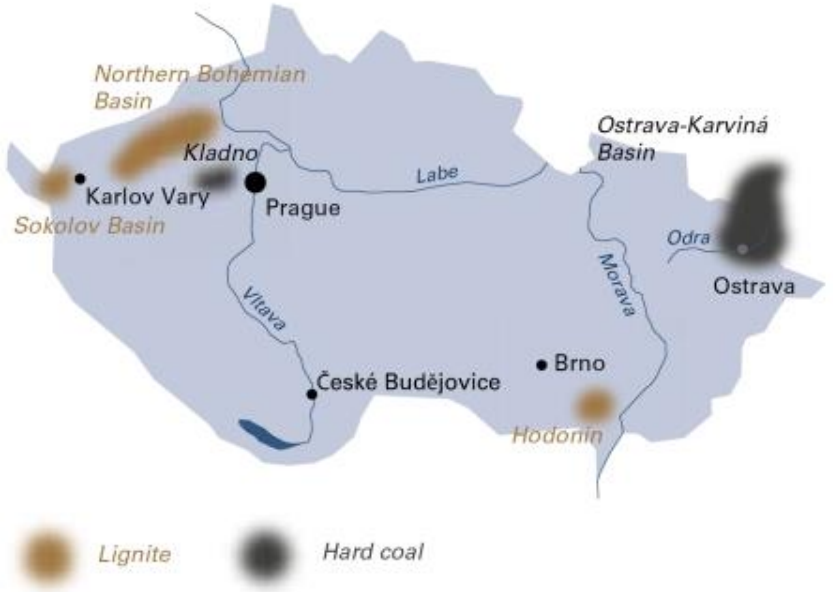
Example: lithium, gigafactory

- Europe's biggest lithium deposit is located in CR (3–5% of the world's total Li reserves), Cínovec near German border.
- Recent pre-feasibility study showed that 2.25 million tons of ore could be extracted in Cinovec every year, which would allow for the production of just under 30,000 tons of lithium hydroxide (enough almost one million lithium-ion car batteries a year).
- The Czech Republic would ideally like to produce the batteries, too, and is planning a gigafactory for that very purpose.

ICT Prague, Cirktech centre, focused on Li ore processing

Recent activities (1/3)

Technology foresight of the Karlovy Vary region (finished 4/2023) – *based on Technology foresight of the Ústí region (10/2018) – both regions are "coal regions" with signicificant share of coal-based energetics and heavy industry, both regions are expected to change significantly in next years.*



Recent activities (2/3)

Chemical Informatics: Use of data analytics and AI to optimize chemical processes and discover new compounds) with focus on Molecular properties modelling, based on quantum chemistry methods.

- „AI part“ and quantum chemical part
- (finished 9/2024)

Green methanol – production possibilities of green methanol

- unconventional sources and technology pathways to produce „green“ methanol, which is keystone of many valuable chemical substances
- (to be finished in 1/2025)

Recent activities (3/3)

Networking project proposal - focused on digital and Green transformation of chemical industry

- Approx 200 k EUR, 7/2024-11/2027, *de minimis*
- focused on digital transformation, green transformation, SUSCHEM EU cooperation and EU research programme - transfer
- creation of strategic documents and update of existing strategic documents (SRA, IAP, TF, Roadmap)

IRISS project www.iriss-ssbd.eu), see following IVL presentations

Thank you for your attention!

www.suschem.cz

Main Targets of SUSCHEM CZ

- International cooperation, mainly within the ETP SusChem
- Preparation and update of strategic documents, as SRA, IAP, Technology Foresight, Roadmap in the chemical industry
- Vision for sustainable development of chemistry and chemical industry
- Support to R&D&I and to scientific and technological development including public sharing of results by seminars, conferences, publications and knowledge transfers.
- Bridging industry and R&D in chemistry and chemical industry by initiating and performing new scientific and technological research, also driving both industry and R&D to a proper commercial use of obtained solutions
- Promotion of innovation activities and scientific and technological development in chemistry and chemical industry
- Initiating and supporting projects for sustainable development of chemical industry and looking for proper financing, including consultancy for possible applicants
- Supporting international cooperation in chemistry and chemical industry

Technology platform in Czech Republic

- TPs are voluntary associated subjects from R&D institutions, universities, industry and services (both large companies and SMEs). Bridging the R&D activities with industry with a full feedback for both sides should lead to a better knowledge of needs and innovations
- The main goal of TPs is creation and preparation of visions and strategic documents (SRA, IAP, TF, AP, Roadmaps) for respective economical sector and development to enhance the sector´s competitivness. They are also active in necessary advocacy approaches
- The CZ TPs are supported by EU funds via CZ Ministry of Industry&Trade (OP TAK), permanent, institutional support is missing
- TP focused on plastics, biofuels, CCS, hydrogen, pharmaceutics, energy – close cooperation with SUSCHEM CZ