

An Overview of European Federation of Chemical Engineering's (EFCE) Technical Activities 2019-20

The main technical activities in the European Federation of Chemical Engineering takes place in its **20 Working Parties and 4 cross-cutting Sections** covering the breadth of Chemical Engineering <https://efce.info/Scientific+groups.html>. Members are drawn from both academia and industry across Europe with some members invited from beyond Europe. This short note provides an overview of their activities within the last year.

Our Working Parties and Sections are working on a broad range of topics of importance to the Process Industries across the full range of processes involving particulates and fluids. Many groups consider aspects of climate change (particularly the Energy Section) and environmental protection.

The EFCE sponsored the biennial **European Conference of Chemical Engineering (ECCE12)** held in 2019 in Florence. During the conference there were three focused workshops sponsored by Working Groups on: Electrochemistry and Electrocatalysis, Energy and Chemical Engineering, and Crystallization Fundamentals and Industrial Processes. Sessions within ECCE were also held on Environment and Safety, Multiphase Systems, and Membrane Engineering.

Working Groups and Sections organise focused conferences involving researchers and practitioners from around the world. The Working Parties addressing aspects of Particle Technology (**Agglomeration, Comminution and Classification, Crystallization, Mechanics of Particulate Solids, Characterization of Particulate Solids**) came together for the PARTEC2019 conference held in Nuremburg. The annual European ESCAPE Conference on **Computer Aided Process Engineering** was held in Eindhoven in June 2019 and online in 2020. In Eindhoven there was a session led by the **Quality by Design** Working Party. In November 2019 in Paris the **Multiphase Fluid Flow** Working Party held a workshop on "Recent Advances in Bubble Columns". The **Drying** Working Party organised 'Eurodrying' in 2019 in Turin. The **Loss Prevention and Safety Promotion** Working Party held the 16th International Symposium on Loss Prevention and Safety Promotion in the Process Industries in Delft 2019. In October 2020 a workshop was held on "Future Directions in **Product Design and Engineering**". The biennial international CHISA Chemical Engineering conference organised by the **Czech Society of Chemical Engineering**, the International Symposium on Chemical Reaction Engineering (to be held in India), the International Symposium on Industrial Crystallization, the [European Symposium on Electrochemical Engineering](#), and the 31st European Symposium on Applied Thermodynamics (ESAT) have all been postponed to 2021. CHISA will be held virtually from 15-18 March 2021. The Distillation and Adsorption Conference organised by **Fluid Separations** held every four years will take place in Toulouse in 2022.

On-line events have proved very popular in 2020. In November 2020 a series of spotlight talks in eleven webinars were organised by the following groups: **Energy, Chemical Reaction Engineering, Education, Energy, Loss Prevention and Safety Promotion, Mechanics of Particulate Solids, Mixing, Multiphase Fluid Flow, Process Intensification, Quality by Design, Static Electricity in Industry, Thermodynamics and Transport Properties**. Each session addressed key topics in the area and the series

enabled attendees to sample topics in areas that they find interesting but may not otherwise have had the opportunity to attend to encourage cross fertilisation between specialist areas. It allowed EFCE groups to highlight and host global debates and discussions on topics of key social interest. On top of this series the Quality by Design and Crystallization Working Parties held webinars in September and October of 2020.

A series entitled **European Forum on New Technologies** was launched two years ago. In 2019 an event entitled '**Digitalization** in Chemical Engineering' was held exploring the effect of digitalization development: from materials design, through plant design and into plant operations and management discussing developments and research needs. In 2020 the third such event was held over two half days on '*Chemical Engineering in the **Plant of the Future***'.

The development of **early career researchers** is a particular priority for the EFCE. Events for early career researchers continue to be a significant and growing element of the activities. In the last year such events were held by the following groups: **Chemical Reaction Engineering, Computer Aided Process Engineering, Polymer Reaction Engineering, Energy and Food Engineering**. A Horizon 2020 Training Network funded by the European Commission on "Training in Upscaling Particle Systems" - Advancing Industry across Length-scales (TUSAIL)" prepared by members of the Working Party on Mechanics of Particulate Solids has been funded. The **Product Design and Engineering** Working Party maintains a very strong link with the Collaborative Research Centre 'Design of Particulate Products' at the University of Nuernberg-Erlangen

The **Education** Working Party is finalising its EFCE Bologna recommendations for Chemical Engineering Education in the three cycle Bologna degree system. They have also been having discussions with the AESPA (European Alliance of Subject Specific Professional Accreditation and Quality Assurance) about the promotion of professional accreditation, to complement national accreditations. A special Webinar sponsored by the CHISA conference, De Gruyter and EFCE was held in November of 2020 on 'Teaching Electrochemical Engineering Storage to Engineers'.

Further information about the activities of EFCE and its Working Groups and Sections can be found at <https://efce.info/>. The highlight of 2021 will be the ECCE13&ECAB6 European Conference on Chemical Engineering jointly with the European Conference on Applied Biotechnology. It will be held either in Berlin or online in September on the theme '**Engineering the Future**'. We look forward to seeing you there.

EFCE Working Parties: Agglomeration, Characterisation of Particulate Systems, Chemical Reaction Engineering, Comminution and Classification, Computer Aided Process Engineering, Crystallization, Drying, Education, Electrochemical Engineering, Fluid Separations, High Pressure Technology, Loss Prevention and Safety Promotion, Mechanics of Particulate Solids, Mixing, Multiphase Fluid Flow, Polymer Reaction Engineering, Process Intensification, Quality by Design, Static Electricity in Industry, Thermodynamics and Transport Properties.

EFCE Sections: Energy, Food, Membrane Engineering, Product Design and Engineering.