

i|C|P|S ¹⁹

International Conference on Polygeneration Strategies

PROGRAM

Schönbrunn Palace – Apothecaries' Wing
November 18 – 20 | 2019
Vienna | Austria

CONFERENCE VENUE – SCHÖNBRUNN PALACE – APOTHEKERTRAKT | APOTHECARIES´ WING

Vienna, the capital of Austria, lies in the heart of Europe. It is one of Europe's most fascinating cities with a rich history, countless cultural attractions and excellent infrastructure. In 2019, Vienna was rated the most liveable city for the tenth time.

Schönbrunn Palace is one of Austria's most important cultural assets, and since the 1960s has been one of Vienna's major tourist attractions, drawing millions of visitors each year. The Apothecaries' Wing was the former Cedrat House and the apothecary of the imperial family, this unusual conference venue is today notable for its atmosphere in which intensely focussed discussion and debate can go hand in hand with wellbeing and relaxation. It is located on the east side of the Schönbrunn grounds within a beautiful Orangery and Wine Garden. We welcome you to enjoy the conference in historical atmosphere for modern ideas.



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ADDRESS

Schloss Schönbrunn Meetings & Events

Apothekertrakt (Apothecaries' Wing)

Access via Schönbrunner Schloßstraße

1130 Vienna

Tel: +43-1-811 13 363

meetings@schoenbrunn.at

Public transport lines

Underground route **U4** alighting

at Schönbrunn station, exit Grünbergstraße

Tram routes **10, 60** alighting at Schönbrunn Station

Bus route **10A** alighting at Schönbrunn Station

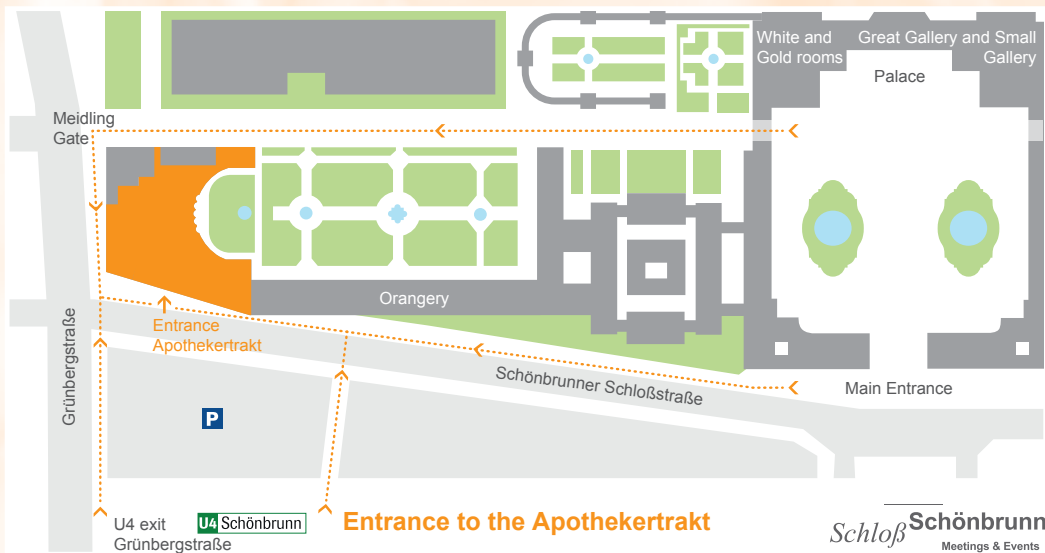
Arriving by car

Parking is extremely limited in the area around Schönbrunn, therefore we advise you to use the public transport.

There is a fee-paying car park located opposite the conference venue.



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SCIENTIFIC COMMITTEE

Univ.-Prof. **Hermann Hofbauer**, *TU Wien*

DI Dr. **Stefan Müller**, *TU Wien*

Univ.-Prof. **Markus Lehner**, *Montanuniversität Leoben*

Univ.-Prof. **Robert Scharler**, *TU Graz*

Univ.-Prof. **Tobias Pröll**, *BOKU*

DI Dr. **Andrés Anca-Couce**, *TU Graz*

DI Dr. **Michael Fuchs**, MBA,
Bundesministerium Nachhaltigkeit und Tourismus

DI Dr. **Matthias Kuba**, *BEST - Bioenergy and Sustainable Technologies*

DI Dr. **Markus Luisser**, *BEST - Bioenergy and Sustainable Technologies*

DI Dr. **Gerhard Schöny**, *TU Wien*

DI Dr. **Gerald Weber**, *BEST - Bioenergy and Sustainable Technologies*

Ass.-Prof. Dr. **Kawnish Kirtania**,
Bangladesh University of Engineering and Technology

Univ.-Prof. **Martin Kaltschmitt**, *Technische Universität Hamburg*

Univ.-Prof. **Jürgen Karl**, *Friedrich-Alexander Universität Erlangen-Nürnberg*

Univ.-Prof. **Reinhard Rauch**, *Karlsruhe Institute of Technology*

Univ.-Prof. **Umberto Arena**,
Università degli Studi della Campania "Luigi Vanvitelli"

Assoc. Prof. **Fabrizio Scala**, *Università degli Studi di Napoli Federico II*

Ir. **Berend Vreugdenhil**, *TNO*

Univ.-Prof. **Joanna Łojewska**, *Uniwersytet Jagielloński W Krakowie*

Univ.-Prof. **Joakim Lundgren**, *Luleå tekniska universitet*

Assoc. Prof. **Martin Seemann**, *Chalmers University of Technology*

Univ.-Prof. **Marcus Öhman**, *Luleå tekniska universitet*

Dr. **Massimiliano Materazzi**, *University College London*

Univ.- Prof. **Kevin J. Whitty**, *The University of Utah*

Junior Committee

DI **Anna Mauerhofer**

DI **Florian Benedikt**

DI **Josef Fuchs**

AIM OF THE CONFERENCE

"Biomass gasification is a key technology for biomass utilization in the future. By conversion of solid biomass into a product gas or syngas all important energy forms currently used in our energy system can be produced: heat, electricity, synthetic biofuels, and chemicals [...] Syngas production, syngas cleaning and syngas utilization are subject of large research programs in several countries worldwide and enormous progress has been achieved in this field in the recent years."

This was the statement 10 years ago and it is valid even more today. The climate targets set in the Paris Agreement need urgent actions and gasification based polygeneration can help to mitigate these problems. Now we are interested in the outcome and the results of the scientific research as well as in the experience gained from industrial implementations. The trend of the last years is characterized by the use of bio-waste, application of different gasification agents (among those also CO₂), advanced gasifier design, optimized gas cleaning and upgrading systems, and a broad variety of synthesis processes. Furthermore, integrated concepts for bio-refineries, bio-based circular economies, combined with carbon capture and utilization (CCU) are as well part of these polygeneration strategies. Therefore, the main aim of the conference is to present the current state-of-the-art of these developments and successes during the last years.

TOPICS

- Gasification
- Gas Cleaning and Gas Upgrading
- Syngas Applications
- Modelling and Simulation
- Industrial Implementations

We have designed a unique social program for networking and relaxation.

MONDAY, November 18th 7 pm – 12 am

Reception by the Mayor and Governor of Vienna and Dinner at the Wine Tavern "Fuhrgassl-Huber"

The Mayor, or on his behalf one official of Vienna's city or county government, will host the conference attendees at a typical Viennese Wine Tavern, a so-called "Heurige", in the suburbs of Vienna on this evening.

Bus transport from the conference venue to the Heuriger "Fuhrgassl-Huber" at 7 pm.

Bus transport from „Fuhrgassl-Huber“ back to the Vienna city center

(Karlsplatz / Opera house – subway lines U1, U2 and U4 as well as near tram stations) between 10:00 pm and 12:00 am.

**Event Address**

"Fuhrgassl Huber"
Neustift am Walde 68
1190 Vienna

TUESDAY, November 19th 6 pm – 9 pm

Come Together Punsch- und Würstelstand – Bring your ICPS-cup!

On our 2nd day of the conference, we would like to invite you to enjoy Viennese specialties at our "Punsch- und Würstelstand". Come together and try hot winter punch and sausages outside the conference venue at Schloss Schönbrunn.

All revenue will benefit the initiative OroVerde to help the indigenous people of Sarayaku to protect their environment and the rainforest of Ecuador against illegal deforestation and land grabbing. With your donation we support the indigenous activists to measure and to mark the territory of Sarayaku and to monitor its borders and hunting-free zones.

**Event Address**

Orangerie Garden
Schönbrunn Palace,
1130 Wien

Room I – Maria Theresia			
INTRO	08:00	Registration	Organization Committee
	09:00	Initial Welcome	Müller, Stefan TU Wien
	09:20	Keynote Speech	Vogel, Theresia Klima- und Energiefonds
	09:40	Keynote Speech	Fuchs, Michael Federal Ministry Republic of Austria Sustainability and Tourism
	10:00	Coffee Break	

SCIENCE MEETS INDUSTRY

We are glad to present for the first time of the ICPS our new series of lectures “Science Meets Industry”. Industrial partners will give some insights into their practical experience and their development achievements to the scientific renewable energy community. An exchange between researchers and early adopters is very important to us, because this offers the opportunity to formulate the relevant questions, define the real challenges and to work together on solutions. To facilitate this exchange between researchers and practitioners, we scheduled the presentations of this series within the thematically fitting session - you’ll find them marked orange in our program.

VISUALIZATION OF INDUSTRIAL PLANTS

Please visit our stand in the conference courtyard, where we take a further step in engineering and visualizing and plants using virtual reality or 3D-print. We offer the opportunity to try our virtual reality glasses by virtually visiting a 3D-scanned industrial plant. Open within coffee breaks and during the poster session.

Room I – Maria Theresia			
GASIFICATION – FEEDSTOCK AND AGENTS	10:30	Steam Gasification of Sewage Sludge for Synthesis Processes	Schmid, Johannes Christian SMS group Process Technologies GmbH
	11:00	Structure Analysis with Relevance for Complex Materials – an Outlook to X-Ray Absorption Spectroscopy on Phosphorus	Skoglund, Nils Umeå University
	11:30	Spectroscopic In Situ Methods for the Evaluation of the Active Centers on Ash-Layered Bed Materials from Gasification in a Fluidized Bed Reactor	Łojewska, Joanna Jagiellonian University
	12:00	Influence of Fuel Ash and Bed Material on the Water-Gas-Shift Equilibrium in DFB Biomass Steam Gasification	Fürsatz, Katharina BEST Bioenergy and Sustainable Technologies GmbH
	12:30	Lunch	
	13:15	Poster Session	
	14:00	Development of a New Method for Investigation of the Ash Behavior in the Fluidized Bed Conversion Processes	Priscak, Juraj BEST Bioenergy and Sustainable Technologies GmbH
	14:30	Catalytic Effect of Potassium in Thermochemical Gasification of Biogenic Resources in a Floating Fixed Bed Gasifier	Hofmann, Angela MCI
	15:00	Industrial Application of Large Scale Waste Gasification and Future Applications	Bolhar- Nordenkampf, Markus Valmet
	15:30	Coffee Break	
GASIFICATION – ADVANCED REACTOR SYSTEMS	16:00	Experimental Test in a Lab-scale Fluidized Bed Reactor to Investigate Agglomeration Behavior under Real Conditions	Diem, Sebastian TU Wien
	16:30	Evaluation of Sorption Enhanced Reforming in Combination with Oxyfuel-Combustion for the Sequestration of CO₂	Hammerschmid, Martin TU Wien
	17:00	Syngas Production for DME Synthesis from Sorption Enhanced Gasification of Biomass: A Pilot Plant-Based Case Study	Hafner, Selina University of Stuttgart
	17:30	Equilibrium-Loss Free Synthesis-Gas Production from Methane by Catalytic CVD-Carbon Reduction or Oxidation	Petters, Stefan Carbotopia Syndicate
	18:30	Departure with Busses to “Heurigen”	
	19:00	Reception by the Mayor of the City of Vienna at Heurigen Restaurant “Fuhrgassl-Huber” – 19., Neustift am Walde 69	

Room II: SOPHIE				
SYNGAS APPLICATIONS – PRODUCTION OF BIOFUEL	10:30	Aviation Biofuels: an Economic and Environmental Assessment with an Outlook on Cost Reduction Potentials	Neuling, Ulf	Hamburg University of Technology
	11:00	Continuous Hydrodeoxygenation of Liquid Phase Pyrolysis Oil with Biogenous Hydrogen Enriched Synthesis Gas for Fuel Production	Treusch, Klara	BDI-BioEnergy International GmbH
	11:30	Dual Fluidized Bed Biomass Gasification: Temperature Variation Using Pure CO₂ as Gasification Agent	Mauerhofer, Anna Magdalena	TU Wien
	12:00	Biofuels: Science Made Industry	Münzer, Ewald-Marco	Münzer Bioindustrie GmbH
	12:30	Lunch		
SYNGAS APPLICATIONS – ELECTRICITY AND HEAT	13:15	Poster Session		
	14:00	Investigation of SOFC Operation with Steam Gasifier Product Gases as a Basis for Enhancing its Performance	Pongratz, Gernot	Technical University of Graz
	14:30	Demonstrative Installation for Cogeneration of Heat and Power from Biomass Gasification Process	Iluk, Tomasz	Institute for Chemical Processing of Coal
	15:00	Biomass Gasification: Research and Realization	Aichernig, Christian	Aichernig Engineering GmbH
	15:30	Coffee Break		
MODELLING AND SIMULATION	16:00	Thermochemical Equilibrium Study of Ash Transformation during Combustion and Gasification of Sewage Sludge Mixtures with Agricultural Residues with Focus on the Phosphorus Speciation	Hannl, Thomas Karl	Luleå Tekniska Universitet
	16:30	Molecular Dynamics Simulations in the CaO-K₂O-SiO₂ System to Study Viscosity of Molten Woody Biomass Ash Slags	Ma, Charlie	Umeå University
	17:00	1 MW Scale-up of the Advanced Fuel Flexible Dual Fluidized Bed Steam Gasification Process by Process Simulation	Benedikt, Florian	TU Wien
	17:30	State of the Art Process Engineering	Walcher, Constantin	Verto Engineering GmbH
	18:30	Departure with Busses to “Heurigen”		
	19:00	Reception by the Mayor of the City of Vienna at Heurigen Restaurant “Fuhrgassl-Huber” – 19., Neustift am Walde 69		

Room III: MAXIMILIAN			
HEAT-TO-FUEL WORKSHOP	12:30	Lunch	
	13:15	Poster Session	
	14:00	Initial Welcome and Keynote for Heat-to-Fuel Workshop	Zweiler, Richard GET
	14:10	Aqueous Phase Reforming of Fischer-Tropsch Water Fraction	Pipitone, Giuseppe / Giulia Zoppi Politecnico di Torino
	14:30	Modeling, Design and Assessment of a Milli Structured Reactor for Fischer Tropsch Reaction	Geffraye, Geneviève Cea Liten
	15:00	Parameter Variation Using Cobalt Based Catalyst and Slurry Bubble Column Reactor for Fischer-Tropsch Synthesis	Weber, Gerald BEST Bioenergy and Sustainable Technologies GmbH
	15:30	Coffee Break	
	16:00	Influence of Preassure and CO ₂ in Fluidized Bed Gasification of Waste Biomass	Szul, Mateusz Instytut Chemicznej Przeróbki Węgla
	16:30	Heat-to-Fuel Workshop - Closed Session	Partners and user group members of the Heat-to- Fuel project Heat-to-Fuel
	18:30	Departure with Busses to "Heurigen"	
	19:00	Reception by the Mayor of the City of Vienna at Heurigen Restaurant "Fuhrgassl-Huber" – 19., Neustift am Walde 69	



Courtyard: November 18 th and 19 th 01:15 pm – 02:00 pm			
POSTER SESSION	Biogas to SNG Demonstration Plant		Salbrechter, Katrin Montanuniversität Leoben
	Modeling Steam Gasification of Biomass with Mathcad 15 via Two Reaction Stages		Wojnicka, Barbara AGH UST
	Concept of the Ideal 16MW _{th} Biomass Gasification System to Feed a Synthetic Natural Gas Production Process		Walcher, Constantin Verto Engineering GmbH
	Optimization of Industrial Bio-SNG Production from Low-Grade Fuels		Veress, Marton TU Wien
	Hot Metal Production with Reduced Fossil Carbon Usage		Fuchs, Josef TU Wien
	Investigation of the Upgrading of Fischer-Tropsch Waxes through Hydroprocessing		Neuner, Philipp Karlsruhe Institute of Technology
	CarbonRecycling™ by DFB Technology		Dichand, Michael Güssing Renewable Energy GmbH

Room I – Maria Theresia

GAS CLEANING AND GAS UPGRADING	09:00	Secondary Tar Conversion in a Char Bed with a Real Producer Gas Reducing Char Deactivation	Anca-Couce, Andrés	TU Graz
	09:20	Decomposition of Tars in Dual Fluidized Bed Gasification – Mechanisms of Formation and Decomposition in Long-Term Operation	Umeki, Kentaro	Luleå University of Technology
	09:40	Developing an Adsorption-Based Gas Cleaning System for a Dual Fluidized Bed Gasification Process	Loipersböck, Jürgen	BEST Bioenergy and Sustainable Technologies GmbH
SYNGAS APPLICATIONS – SNG	10:00	Coffee Break		
	10:30	From Wood to Biogas - a Small-Scale Demonstration	Rasmussen, Niels Bjarne	Danish Gas Technology Centre
	11:00	Experimental Performance of a Trickle-Bed Reactor for Biological Methanation	Weidlich, Tobias	FAU Erlangen-Nürnberg
	11:30	Dynamic Methanation of By-Product Gases from Integrated Steelworks	Wolf-Zöllner, Philipp	Montanuniversität Leoben
	12:00	Research & Development to Secure Future Options	Hannes, Jens	RWE Power AG
	12:30	Lunch		
INDUSTRIAL IMPLEMENTATIONS INDUSTRIAL DEMONSTRATION	13:15	Poster Session		
	14:00	Dynamic Methanation of By-Product Gases from the Steel Industry in the Scope of the Project i³upgrade	Hauser, Alexander	FAU Erlangen-Nürnberg
	14:30	Evaluating the Efficiency of Power-to-X Technologies by adapting the VDI-Guideline 4663	Kerpen, Lukas	HAW Hamburg
	15:00	Polygeneration: A Metallurgical Plant builder's Perspective	Weissenbaeck, Herbert	SMS group Process Technologies GmbH
	15:30	Coffee Break		
	16:00	Thermodynamic Investigation of SNG Production Based on Dual Fluidized Bed Gasification of Biogenic Residues	Bartik, Alexander	TU Wien
	16:30	Current Developments in DFB Gasification of Biogenic Residues: Experiences from Lab to Industrial Scale	Matthias, Kuba Florian, Benedikt	BEST Bioenergy and Sustainable Technologies GmbH / TU Wien
	17:00	The Unique Decarb Demo Scale Research Site of Wien Energie	Krobath, Philipp	Wien Energie
	17:30	SUMMARY, OUTLOOK, POSTER AWARD	Stefan, Müller	TU Wien
	18:00	Come Together "Punsch und Würstelstand" at the Conference Venue (Orangerie Garden)		

Room II – SOPHIE

MODELLING AND SIMULATION	09:00	Kinetic Modeling of Industrial Plastic Pyrolysis	Lechleitner, Andreas	Montanuniversität Leoben
	09:20	Investigating Tar Formation at Low Pressures in Wood Gasification Systems, Applying a Novel Thermo-chemical Simulation Model	Boiger, Gernot	ZHAW Zurich University of Applied Sciences
	09:40	A Novel CPFD Simulation of a Dual Fluidized Bed Cold Flow Model	Lunzer, Andreas	Verto Engineering GmbH
	10:00	Coffee Break		
INDUSTRIAL IMPLEMENTATIONS – CCU, GREENING THE GAS	10:30	Dual Fluidized Bed Based Technologies for Carbon Dioxide Reduction Applied to Hot Metal Production	Fuchs, Josef	TU Wien
	11:00	Evaluation of Two Sorbents for the Sorption-Enhanced Methanation in a Dual Fluidized Bed System	Scala, Fabrizio	University of Napoli Federico II
	11:30	Technoeconomic Study of Cost Driving Factors of a Gas Greening System for Steel Making Based on Power-to-Gas and Biomass Gasification	Rosenfeld, Daniel	JKU Linz
	12:00	Pathways for Decarbonizing CO₂-intensive Industries	Rechberger, Katharina	K1-MET GmbH
	12:30	Lunch		
INDUSTRIAL IMPLEMENTATIONS – INTEGRATED CONCEPTS	13:15	Poster Session		
	14:00	Hybridization of Biomass Steam Gasification in a Dual Fluidized Bed Reactor with Concentrated Solar Energy	Gómez-Barea, Alberto	ETSI. Universidad de Sevilla
	14:30	Techno-economic Analysis of Liquid Fuels, Hydrogen and Methanol Production via Hybrid Dual Fluidized Bed Solar Gasification	Saw, Woei Lean	The University of Adelaide
	15:00	Integrated Concept for Municipal Solid Waste Valorization: Pre-pilot Experience	Kirtania, Kawnish	Bangladesh University of Engineering and Technology
	15:30	Coffee Break		
INDUSTRIAL IMPLEMENTATIONS – OPERATIONAL EXPERIENCE	16:00	Laser-based Deposit Diagnostic in Biomass-Fired Power Plants	Graube-Kühne, Franziska	TU Dresden
	16:30	A Review Study of Chinese Domestic Gasification Technologies	Pang, Yin	FAU Erlangen-Nürnberg
	17:00	Power, Heat & Biochar: Trigeneration Technology Developed by SynCraft	Huber, Marcel	SynCraft Engineering GmbH
	17:30	SUMMARY, OUTLOOK, POSTER AWARD etc.	Stefan, Müller	TU Wien
	18:00	Come Together “Punsch und Würstelstand” at the Conference Venue (Orangerie Garden)		

Excursion to research institutions and demonstration plants in Vienna 09:00 am - 02:30 pm / 04:00 pm

This excursion leads you to research institutions and demonstration plants in Vienna. Your journey starts in Vienna city center at TU Wien, where you can visit the technical lab with research facilities aiming at the conference targets. Highly qualified scientists personally conduct the guided tour and you can experience the latest research facilities up close. Afterwards, we will take you to Wien Energie where you can see incineration of sewage sludge, municipal waste and hazardous waste. The tour will lead you to the research location for the development project "Waste2Value Development Project" (demonstration of gasification and synthesis) where you can join the concept presentation.

*Presented by TU Wien
& BEST - Bioenergy and Sustainable Technologies
& Wien Energie*

TIMETABLE**HALF DAY EXCURSION:**

- 09:00 am – 10:15 am TU Wien
- 11:00 am – 12:00 pm Wien Energie - Factory tour
Haidequerstrasse 6, Simmeringer Haide, 1110 Vienna
- 12:30 pm – 02:00 pm Lunch at Concordia Schlössl
Simmeringer Hauptstrasse 283, 1110 Vienna
- 02:30 pm Arrival at Vienna Airport

TIMETABLE**FULL DAY EXCURSION:**

- 09:00 am – 10:15 am TU Wien
- 11:00 am – 12:00 pm Wien Energie - Factory tour
Haidequerstrasse 6, Simmeringer Haide, 1110 Vienna
- 12:30 pm – 02:00 pm Lunch at Concordia Schlössl
Simmeringer Hauptstrasse 283, 1110 Vienna
- 02:10 pm – 03:10 pm Wien Energie / BEST - "Waste2Value"
- 03:30 pm Arrival at Vienna Airport
- 04:00 pm Arrival at Vienna City Center,
Karlsplatz / Opera house

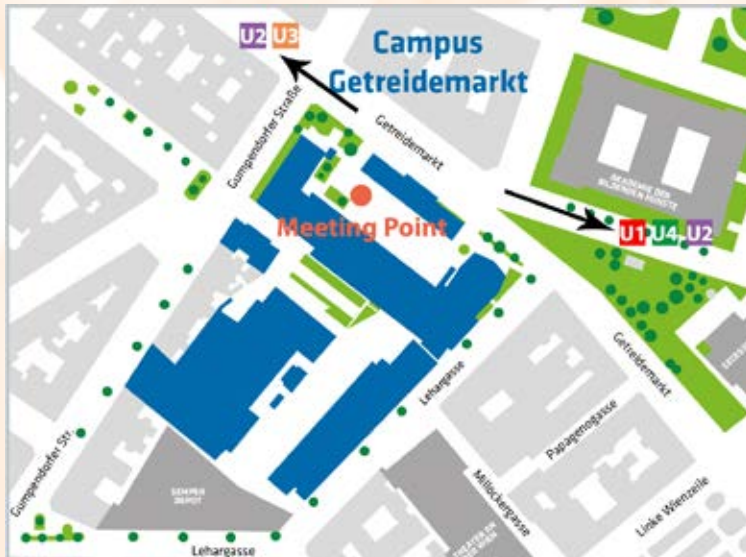


TU Wien



Wien Energie

Excursion to research institutions and demonstration plants in Vienna 09:00 am - 02:30 pm / 04:00 pm



Meeting Point:

Institute of Chemical, Environmental and Bioscience Engineering

Getreidemarkt 9/166,
1060 Vienna

Excursion to voestalpine | Austria's largest steel based technology company 08:30 am - 04:30 pm

Your journey of discovery will take you to the realms of steel production, steel processing and steel products. After you visit the exhibition in the voestalpine Stahlwelt, you are in for an exciting plant tour. Our multimedia buses will transport you deep inside the plant grounds covering 5.2 square kilometers, directly to the production facilities, where you will get a behind-the-scenes look at the steel-making process.

Presented by voestalpine

**TIMETABLE**

08:30 am – 11:00 am Transport to voestalpine
11:00 am – 01:00 pm voestalpine exhibition and plant grounds
01:00 pm – 02:00 pm Lunch at restaurant Caseli
voestalpine-Straße 3b, 4020 Linz
04:00 pm Arrival at Vienna Airport
04:30 pm Arrival at Vienna City Center
Karlsplatz / Opera house

For both tours:

Please note that the local traffic can potentially delay the arrival of the bus at the airport / in Vienna.

You'll need sturdy shoes and stain-resistant clothing. Some facilities are accessible only by steep stairs and may not be suitable for people who are afraid of heights or with limited mobility.

Excursion to voestalpine | Austria's largest steel based technology company 08:30 am - 04:30 pm



Meeting Point:
Karlsplatz 1
1010 Vienna

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REGISTRATION & FEES

Regular:	€ 590,--
Students:	€ 450,--

The fee includes the participation in all lectures and presentations, coffee breaks, and lunch on both conference days (18. – 19. 11. 2019) as well as a conference package (digital proceedings, program, etc.) and access to the internal area of the ICPS19 webpage. In this area you will have access to the electronic versions of the presentations and other material after the event.

Social program and technical excursions are additional events and are not included in the registration fee. Please note that the registration deadline is November 13th 2019. Registration after this deadline is only possible at the conference desk on November 18th.

CONTACT

Verein zur Förderung zukunftsfähiger Energietechnik auf Basis der Polygenerationsstrategie aus Biomasse

Getreidemarkt 9/166
A-1060, Vienna

contact@icps-conference.org

ADDITIONAL INFORMATION

Conference number: +43 664 1228000

WiFi access: please ask at the conference desk

www.icps-conference.org

Access to internal area of the conference webpage:
InsideICPS19

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