

## PRES'13 Programme

### Elafos Conference Room (Main Lobby)

#### Sunday, September 29<sup>th</sup>

17:00 Registration (Main Lobby)

19:30 *Welcome Reception (Swimming Pool Area - 11th Floor)*

#### Monday, September 30<sup>th</sup>

08:00 Registration (Main Lobby)

09:00 **Opening Session**

PRES Chair: Prof. Jiří J. Klemeš, Prof. Panos Seferlis

PRES Co-Chair: Prof. Jiří Drahoš, Prof. Ferenc Friedler, Prof. Sauro Pierucci, Prof. Petr Stehlík

Mr. Ioannis Mahairidis, Southern Aegean Region Governor (TBC)

Mr. Stathis Kousournas, Mayor of Rhodes (TBC)

Prof. Eleftherios Iakovou, Chair Department of Mechanical Engineering, A.U.Th.

Prof Jiří Drahoš, Past President of European Federation of Chemical Engineering and President of Academy of Sciences Czech Republic

Prof Panos Seferlis & Prof Jiří J Klemeš: PRES'13 Opening Presentation

09:30 **Plenary Lecture I**

Chair: Prof Jiří J Klemeš, Prof Sauro Pierucci

Process Integration in Sub-Ambient Processes

*Gundersen T.*

10:30 *Coffee Break (Main Lobby)*

#### Session 1.1 Process Integration for Sustainable Development

Chair: Prof Jiří J Klemeš, Prof Sauro Pierucci

11:00 Keynote Lecture

Cogeneration Improvement Based on Steam Cascade Analysis

Sun L., Doyle S., *Smith R.*

11:40 Optimization of Hybrid Renewable Power Generation Flowsheets Using Generic Structural and Temporal Models

Giaouris D., *Papadopoulos A.I.*, Ziogou C., Ipsakis D., Seferlis P., Papadopoulou S., Voutetakis S., Elmasides C.

12:00 A Two-step Solution Strategy for the Synthesis of Pinched and Threshold Heat-integrated Process Water Networks

Ibric N., *Ahmetovic E.*, Kravanja Z.

12:20 Water Allocation Network Synthesis Involving Reliability Analysis

*Du J.*, Chen J., Li J.L., Meng Q.W.

12:40 Development of Innovative Methanol Synthesis Process Based on Self-heat Recuperation

*Kansha Y.*, Ishizuka M., Tsutsumi A.

13:00 *Lunch (Hotel Restaurant – 10<sup>th</sup> floor)*

13:45 *Poster Session – Best Poster Contest (Elafina Conference Room – 10<sup>th</sup> floor)*

## Session 1.2 Process Integration for Sustainable Development

Chair: Prof. Ferenc Friedler, Prof. Jiří Drahoš

- 14:30 Keynote Lecture  
Total Site Heat Integration with Seasonal Energy Availability  
Liew P.Y., Wan Alwi S.R., Klemeš J.J., Varbanov P.S., Manan Z.A.
- 15:10 Refinery Hydrogen Network Management with Key Factor Analysis  
*Deng C., Li W., Feng X.*
- 15:30 The Role of Process Synthesis in the Systematic Design of Energy Efficient Fossil Fuel Power Plants with CO<sub>2</sub> Capture  
Anantharaman R., Jordal K., Berstad D., Gundersen T.
- 15:50 Heat Exchanger Network Synthesis for Batch Processes by Involving Heat Storages  
Du J., Yang P., Li J.L., Liu L.L., Meng Q.W.
- 16:10 **Coffee Break (Main Lobby)**

## Session 1.3 Process Integration for Sustainable Development

Chair: Prof. Kazuo Matsuda, Prof. Xiao Feng

- 16:40 Keynote Lecture  
Optimisation of Pumped-hydro Storage System for Hybrid Power System Using Power Pinch Analysis  
Mohammad Rozali N.E., Wan Alwi S.R., Manan Z.A., Klemeš J.J., Hassan M.Y.
- 17:20 Heat Transfer Area Targeting for Heat Recovery on Total Site  
Boldyryev S., Varbanov P.S., Nemet A., Kapustenko P., Klemeš J.J.
- 17:40 Enlarging the Product Portfolio of a Kraft Pulp Mill via Hemicellulose and Lignin Separation – Process Integration Studies in a Case Mill  
Lundberg V., Bood J., Nilsson L., Mahmoudkhani M., Axelsson E., Berntsson T.
- 18:00 Multi-objective Regional Total Site Integration  
*Čuček L., Varbanov P.S., Klemeš J.J., Kravanja Z.*
- 18:20 Heat Integration Across Plants Considering Distance Factor  
*Wang Y., Wang W., Feng X.*

**Tuesday, October 1<sup>st</sup>**

### Session 1.4: Sustainable Biofuel Production

Chair: Prof. Eugeny Kenig, Dr Elvis Ahmetovic

8:30 Keynote Lecture

Integration of Biohydrogen Production with Heat and Power Generation from Biomass Residues

Wukovits W., Drljo A., Hilby E., *Friedl A.*

9:10 Optimal Design of Solar Assisted Hydrothermal Gasification for Microalgae to Synthetic Natural Gas Conversion

*Mian A.*, Ensinas A.AV., Ambrosetti G., Marechal F.

9:30 Glycerin Revalorization Using Anaerobic Digestion of Organic Waste

Rafecas Rahuet A., Plesu V., *Bonet Ruiz J.*, Bonet Ruiz A., Llorens Llacuna J.

9:50 Bioethanol from Brewer's Spent Grains: Acid Pretreatment Optimization

*Caetano N.S.*, Moura R.F., Meireles S., Mendes A.M., Mata T.M.

10:10 Sustainable Production of Bioparaffins

*Hancsok J.*, Eller Z., Polczmann G., Varga Z.

10:30 **Coffee Break (Main Lobby)**

11:00 **Plenary Lecture II**

Chair: Prof. Truls Gundersen, Dr Hon Loong Lam

Synthesis of Water Networks with Water Loss and Gain via an Extended Pinch Analysis Technique

*Feng X.*, Deng C.

### Session 1.5: Sustainable Biofuel Production

Chair: Prof. Anton Friedl, Dr Tibor Chován

12:00 Process Simulation Tools for the Assessment of Biorefinery Processes Intensification by Ultrasounds Technology

*Garcia A.*, Gonzalez Alriols M., Wukovits W., Friedl A., Labidi J.

12:20 Energy Integration of the Gas-cooled/water-cooled Fixed-bed Reactor Network for Methanol Synthesis

*Manenti F.*, Leon Garzon A.R., Bozzano G.

12:40 Evaluation of Sorghum Biorefinery Concepts for Energy and Bioethanol Production

*Weinwurm F.*, Drljo A., Theuretzbacher F., Bauer A., Friedl A.

13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**

13:45 **Poster Session – Best Poster Contest (Elafina Conference Room – 10<sup>th</sup> floor)**

### Session 1.6: Industrial Application & Optimisation Design

Chair: Prof. Neven Duić, Prof. Truls Gundersen

14:30 Keynote Lecture

Life Span Production Plant Optimisation Under Varying Economic Conditions

Nemet A., Klemeš J.J., *Kravanja Z.*

15:10 Development of Modified Plug-flow Furnace Model for Identification of Burner Thermal Behaviour

*Jegla Z.*

15:30 Dynamic Multi-objective Synthesis of Companies' Supply-networks  
*Kiraly A., Pahor B., Čuček L., Kravanja Z.*

15:50 Process Intensification Alternatives in the DME Production  
*Kiss A., Suszwalak D., Ignat R.*

16:10 **Coffee Break (Main Lobby)**

## Session 1.7: Industrial Application & Optimisation Design

Chair: Prof. Chakib Bouallou, Prof. Nataša Markovska

16:40 Keynote Lecture

A Derivative Approach to Minimising Total Cost in Heat Exchanger Networks Through Optimal Area Allocation

*Walmsley T.G., Walmsley M.R.W., Morrison A.S., Atkins M.J., Neale J.R.*

17:20 Generalized Framework for the Optimal Design of Solvent-based Post-combustion CO<sub>2</sub> Capture Flowsheets

*Damartzis T., Papadopoulos A.I., Seferlis P.*

17:40 Integration of Solar Heating Into Heat Recovery Loops Using Constant and Variable Temperature Storage

*Walmsley M.R.W., Walmsley T.G., Atkins M.J., Neale J.R.*

18:00 A New Batch Extractive Distillation Operational Policy for Methanol Recovery

*Hegely L., Lang P., Kovacs G.*

18:20 A New Solar Reactor Aperture Mechanism Coupled with Heat Exchanger

*Menon A. K., Farid A., Ozalp N.*

20:00 **Conference Gala Dinner (Swimming Pool Area – 11<sup>th</sup> Floor)**

Wednesday, October 2<sup>nd</sup>

## Session 1.8: Clean Technologies - Low Emissions Technologies

Chair: Dr Jiří Hájek, Prof. Vatcheslav Kafarov

- 8:30 Keynote Lecture  
Waste to Energy for Small Cities: Economics Versus Carbon Footprint  
Ng W.P.Q., *Varbanov P.S.*, Klemeš J.J., Hegyhati M., Bertok B., Heckl I., Lam H.L.
- 9:10 Flue Gas Cleaning by High Energy Electron Beam – Enhancement Effects Due to Water Droplets Generation  
*Gogulancea V.*, Lavric V.
- 9:30 CO<sub>2</sub> Emission Reduction in the Cement Industry  
Mikulcic H., *Vujanovic M.*, Markovska N., Filkoski R., Ban M., Duic N.
- 9:50 Permeable Adsorbing Barrier for Groundwater Protection from Single-compounds and Multicomponent Contamination by Chlorinated Organic Compounds  
Bortone I., Di Nardo A., Di Natale M., *Erto A.*, Musmarra D.
- 10:10 Techno-economic Assessment of Polymeric, Ceramic and Metallic Membranes Integration in an Advanced Igcc Process for H<sub>2</sub> Production and CO<sub>2</sub> Capture  
Koutsonikolas D., *Kaldis S.P.*, Pantoleonatos G.T., Zaspalis V.T., Sakellariopoulos G.P.

10:30 **Coffee Break (Main Lobby)**

11:00 **Plenary Lecture III**

Chair: Prof. Panos Seferlis, Dr. Petar Varbanov

Optimization-based Process Synthesis for Sustainable Power Generation  
Dowling A. W., *Biegler L.T.*

## Session 1.9: Waste Minimisation, Processing and Management

Chair: Dr Zdeněk Jegla, Dr Hon Loong Lam

Keynote Lecture

- 12:00 The Logistic Model for Decision Making in Waste Management  
Somplak R., Prochazka V., *Pavlas M.*, Popela P.
- 12:20 Nimo/hbeta as Catalysts with Dual Functions Beneficial to Waste Tyre Pyrolysis  
Piyawongpinyo Y., *Jitkarnka S.*
- 12:40 Optimal Swro Network Synthesis and Design Assessment with Water Quality Insights  
Alnouri S., *Linke P.*

13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**

14:00 **Conference Closing: Prof. Panos Seferlis,**

## PRES'13 Programme

Clio Conference Room (3<sup>rd</sup> Floor)

Monday, September 30<sup>th</sup>

### Session 2.1 Energy Saving Technology

Chair: Prof. Panos Seferlis, Prof. Petr Stehlík

- 11:00 Keynote Lecture  
Low Heat Power Generation System  
*Matsuda K.*
- 11:40 Exploring the Near-optimal Solution Space for the Synthesis of Distributed Energy Supply Systems  
*Voll P., Hennen M., Klaffke C., Lampe M., Bardow A.*
- 12:00 Active Magnetic Regenerative Heat Circulator for Energy Saving in Thermal Process  
*Kotani Y., Kansha Y., Tsutsumi A.*
- 12:20 Theoretical Potential to Convert Excess Heat Into Electricity in the Finnish Industry  
*Jarvinen T., Holmberg H., Ahtila P.*
- 12:40 Total Site Integration for Coke Oven Plant  
*Ulyev L., Kapustenko P., Vasilyev M., Boldryev S.*
- 13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**
- 13:45 **Poster Session – Best Poster Contest (Elafina Conference Room – 10<sup>th</sup> floor)**

### Session 2.2 Energy Saving Technology

Chair: Prof. Martin Picon Nuñez, Dr Lidjia Čuček

- 14:30 Keynote Lecture  
A Mathematical Programming Approach to the Optimal Long-term National Energy Planning  
*Koltsaklis N.E., Dagoumas A.S., Kopanos G.M., Pistikopoulos E.N., Georgiadis M.C.*
- 15:10 Effect of Different Gas Turbine on Integrated Gasification Poly-generation Plant with Methanol and Power Generation  
*Chen P.C., Chiu H.M., Chyou Y.P.*
- 15:30 Cost-effective Design of Energy Efficient Four-product Dividing Wall Columns  
*Dejanovic I., Halvorsen I., Skogestad S., Jansen H., Olujic Z.*
- 15:50 Energy Intensive Process in Professional Laundry Care: Up-to-date Approach  
*Máša V., Bobak P., Stehlík P., Kuba P.*
- 16:10 **Coffee Break (Main Lobby)**

### Session 2.3: Operational Research, Supply Chain Management

Chair: Prof. Nasrin Ozalp, Dr Monika Bakošová

- 16:40 Keynote Lecture  
Biomass Demand-resources Value Targeting  
*Lam H.L., Lim C.H.*

- 17:20 Optimizing the Operation of a District Heating System  
*Olofsson D., Bellqvist D., Karlsson J., Johansson M.*
- 17:40 A Location-routing Approach to Optimal Sludge Management  
*Solisio C., Dovi V.*
- 18:00 Note on the Development of Sustainable Supply Chain Strategy  
*Deutsch N., Dravavolgyi T., Rideg A.*
- 18:20 Intensifying Air Separation Units  
*Manenti F., Rossi F., Croce G., Grottoli M.G., Altavilla M.*

**Tuesday, October 1<sup>st</sup>**

## Session 2.4: CO<sub>2</sub> Minimisation and Mitigation

Chair: Prof. Sharifah Rafidah Wan Alwi, Prof. Simon Harvey

8:30 Keynote Lecture

A Decision Support Framework for Capturing the Impact of Energy Savings and Pollution Legislation on Supply Chain Network Design

Mallidis I., Vlachos D., *Iakovou E.*

9:10 Kinetics Study and Simulation of CO<sub>2</sub> Absorption Into Mixed Aqueous Solutions of Methyldiethanolamine and Diethanolamine

Toro-Molina C., *Bouallou C.*

9:30 A Methodological Framework for Supply Chain Carbon Footprint Management

Aivazidou E., Iakovou E., *Vlachos D.*, Keramydas C.

9:50 Energy Performance of CO<sub>2</sub> Capture Processes: Interaction Between Process Design and Solvent

*Neveux T.*, Le Moullec Y., Corriou J.P., Favre E.

10:10 Hydrodynamic-analogy-based Modelling of CO<sub>2</sub> Capture by Aqueous Monoethanolamine

*Yazgi M.*, Kenig E.

10:30 **Coffee Break (Main Lobby)**

11:00 **Plenary Lecture II (Elafos Conference Room)**

## Session 2.5: CO<sub>2</sub> Minimisation and Mitigation

Chair: Prof. Lorenz Biegler, Prof. Cheng-Liang Chen

12:00 Greek Lignite-fired Power Plants with CO<sub>2</sub> Capture for the Electricity Generation Sector

Kakaras E., Koumanakos A., *Doukelis A.*

12:20 Integrated Low-temperature CO<sub>2</sub> Capture from IGCC Power Plant by Partial Condensation and Separation of Syngas

*Berstad D.*, Anantharaman R., Neke P.

12:40 Assessment of Carbon Capture Options for Super-critical Coal-based Power Plants

*Cormos C.C.*, Cormos A.M., Agachi P.S.

13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**

13:45 **Poster Session – Best Poster Contest (Elafina Conference Room – 10<sup>th</sup> floor)**

## Session 2.6: Thermal Treatment of Waste Including Waste to Energy

Chair: Prof. David Kukulka, Prof. Thore Bertsson

14:30 Keynote Lecture

Simulation software for mass and energy balance of process and energy systems

*Skydanek L.*

15:10 Combining Multi-parametric Programming and Nmpc for the Efficient Operation of a Pem Fuel Cell

*Ziogou C.*, Georgiadis M.C., Pistikopoulos E.N., Papadopoulou S., Voutetakis S.



- 15:30 Co-Pyrolysis of Biomass and Plastics Waste: a Modelling Approach  
*Oyedun A.O., Gebreegziabher T., Hui C.W.*
- 15:50 Solar Energy and Biowaste Conversion Into H<sub>2</sub> on CuO<sub>x</sub>/TiO<sub>2</sub> Nanocomposites  
*Ampelli C., Passalacqua R., Genovese C., Perathoner S., Centi G., Montini T., Gombac V., Fornasiero P.*
- 16:10 **Coffee Break (Main Lobby)**
- Session 2.7: Heat Exchangers as Equipment and Integrated Items**
- Chair: Prof. Michael R.W. Walmsley, Prof. Petro Kapustenko
- 16:40 Keynote Lecture  
Evaluation of a 1eht Enhanced Heat Transfer Tube Bundle for Processes Involving Boiling  
*Kukulka D., Smith R.*
- 17:20 Thermal Analysis of Unconventional Process Condenser Using Conventional Software  
*Paciska T., Jegla Z., Kilkovsky B., Reppich M., Turek V.*
- 17:40 Dynamic Data Reconciliation in a Hot-oil Heat Exchanger for Validating Energy Consumption  
*Singhmaneeskulchai P., Siemanond K.*
- 18:00 The Modified Analogy of Heat and Momentum Transfers for Turbulent Flows in Channels of Plate Heat Exchangers  
*Arsenyeva O., Tovazhnyanskii L.L., Kapustenko P., Demirskyy O.*
- 18:20 CFD Investigation of Heat Transfer and Flow Patterns in Tube Side Laminar Flow and the Potential for Enhancement  
*Osley W.G., Droegemueller P., Ellerby P.*
- 18:40 Numerical Analysis of Plain Fin-and-oval-tube Heat Exchanger with Different Inlet Angles  
*Chu W., Yu P., Ma T., Zeng M., Wang Q.-W.*
- 20:00 **Conference Gala Dinner (Swimming Pool – 11<sup>th</sup> Floor)**

Wednesday, October 2<sup>nd</sup>

## Session 2.8: Integration of Renewables, Biomass and Energy

Chair: Prof. Manan Zainuddin, Prof. Peter Lang

- 8:30 Keynote Lecture  
A Process Integration Technique for Targeting and Design of Power Networks  
*Chen C.L., Lai C.T., Lee J.Y.*
- 9:10 Renewable Energy Balancing with Thermal Grid Support  
*Zwaenepoel B., Vansteenbrugge J., Vandoorn T., Van Eetvelde G., Vandeveldel L.*
- 9:30 Process Integration of Lignocellulosic Biomass Pre-treatment in the Thermo-chemical Production of F-t Fuels. Centralised Versus Decentralised Scenarios  
*Peduzzi E., Boissonnet G., Haarlemmer G., Setier P.A., Marechal F.*
- 9:50 Influence of Different Pretreatment Methods on Biomass Gasification and Production of Ft Crude Integrated with a Pulp and Paper Mill  
*Isaksson J., Asblad A., Berntsson T.*
- 10:10 Techno-economic Energy Model for Low Carbon Business Parks  
*Timmerman J., Deckmyn C., Vandeveldel L., Van Eetvelde G.*

10:30 **Coffee Break (Main Lobby)**

11:00 **Plenary Lecture III (Elafos Conference Room)**

## Session 2.9: Integration of Renewables, Biomass and Energy

Chair: Dr Alexandra Bonet-Ruiz, Prof Janos Abonyi

- 12:00 Study of Different Bio-processing Pathways in a Lignocellulosic Biorefinery by Process Simulation  
*Garcia A., Egues I., Sanchez C., Barta Z., Labidi J.*
- 12:20 Thermo-economic Optimization of Integrated 1st and 2nd Generation Sugarcane Ethanol Plant  
*Ensinas A.V., Codina V., Marechal F., Albarelli J., Silva M.A.*
- 12:40 Modelling the Fluid Phase Behaviour of Multifunctional Alkanolamines and Carbon Dioxide  
*Chremos A., Forte E., Papaioannou V., Galindo A., Jackson G., Adjiman C.*
- 13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**
- 14:00 **Conference Closing**

## PRES'13 Programme

### Ourania Conference Room (4<sup>th</sup> Floor)

Monday, September 30<sup>th</sup>

#### Session 3.1 Batch, Dynamic, Flexible and Sustainable Plant Operation

Chair: Dr Petar Varbanov, Prof. Zdravko Kravanja

11:00 Keynote Lecture

Robust Constrained Model Predictive Control of Heat Exchanger Network

*Bakošová M., Oravec J.*

11:40 Operational Flexibility in Pulp Mill Steam Production at Off-design Heat Loads

*Svensson E., Berntsson T.*

12:00 Comparison of Conventional and Middle Vessel Batch Reactive Distillation Column: Application of Hydrolysis of Methyl Lactate to Lactic Acid

*Edreder E.A., Mujtaba I.M., Emtir M.*

12:20 Historical Process Data Based Energy Monitoring - Model Based Time-series Segmentation to Determine Target Values

*Abonyi J., Kulcsar T., Balaton M., Nagy L.*

12:40 Optimization of Pid Controller Parameters in the Case of Batch Styrene Suspension Polymerization

*Palau G.R., Lavric V.*

13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**

13:45 **Poster Session – Best Poster Contest (Elafina Conference Room – 10<sup>th</sup> floor)**

#### Session 3.2 Compact Multifuel-Energy to Hydrogen Converter (COMETHY)

Chair: Dr Paris Voutetakis, Dr Martin Gough

14:30 Development of a Solar-powered, Fuel-flexible Compact Steam Reformer: the Comethy Project

*Giaconia A., Turchetti L., Monteleone G., Morico B., Iaquaniello G., Shabtai K., Sheintuch M., Boettge D., Adler J., Palma V., Voutetakis S., Lemonidou A.A., Annesini M.C., den Exter M., Balzer H.*

14:50 Time-on-stream Stability of New Catalysts for Low-temperature Steam Reforming of Biogas

*Turchetti L., Monteleone G., Giaconia A., Sau S., Palma V., Castaldo F., Lemonidou A.A., Angeli S.D.*

15:10 Low Temperature Methane Steam Reforming: Catalytic Activity and Coke Deposition Study

*Angeli S.D., Monteleone G., Giaconia A., Lemonidou A.A.*

15:30 Steam Reforming Of Ethanol To H<sub>2</sub> Over Bimetallic Catalysts: Crucial Roles Of CeO<sub>2</sub>, Steam-To-Carbon Ratio And Space Velocity

*Palma V., Castaldo F., Ciambelli P., Iaquaniello G.*

15:50 Modeling and Simulation of a Membrane Reactor for the Low Temperature Methane Steam Reforming

*Kyriakides A.S., Ipsakis D., Voutetakis S., Papadopoulou S., Seferlis P.*

16:10 **Coffee Break (Main Lobby)**

## Session 3.3 Industrial & Experimental Studies

Chair: Prof Jalel Labidi; Reserve: Prof. Yasuki Kansha

- 16:40 Keynote Lecture  
Thermo-hydraulic Design of Solar Collector Networks for Industrial Applications  
*Picon-Nunez M., Martinez-Rodriguez G., Fuentes-Silva A.L.*
- 17:20 Research About the Method of Synthetizing N,n-dimethyl-1,3-propanediamine Continuously  
*Meng Q.W., Deng C., Li Y., Du J.*
- 17:40 Kinetic Study of the Methyl Acetate and Isobutanol Transesterification Catalysed by the Dissociation of Sodium Hydrogensulfate in Alcohol Media  
*Vega Rodriguez A., Plesu V., Calvet Tarragona A., Bonet Ruiz J., Bonet Ruiz A., Llorens Llacuna J.*
- 18:00 Energy Consumption Versus Antioxidant Activity of Pressurized Fluid Extracts from *Pfaffia Glomerata* Roots  
*Santos D., Vardanega R., Albarelli J., Ensinas A.V., Marechal F., Meireles M.A.*
- 18:20 Power Grid Simulation Model for Long Term Operation Planning  
*Zabojnik J., Dvorak M.*
- 18:40 Online Monitoring of TOC Contaminations in Clean-in-place Processes for Optimized Process Control, Increased Process Efficiency and Quality  
*Siegmann-Hegerfeld T., Genner A., Brandstetter M., Miltner M., Lendl B., Harasek M.*

**Tuesday, October 1<sup>st</sup>**

### Session 3.4: New Horizons in Energy

Chair: Prof. Michael Georgiadis, Dr Martin Pavlas

- 8:30 Opportunities for Heat Integration of Biomass-based Fischer-Tropsch Crude Production at Scandinavian Kraftliner Mill Sites  
*Ljungstedt H., Pettersson K., Harvey S.*
- 8:50 Heat Transfer Intensified Techniques for Retrofitting Heat Exchanger Networks in Practical Implementation  
*Pan M., Bulatov I., Smith R.*
- 9:10 Implementation of Heat Integration for Efficient Process Design of Direct Adipic Acid Synthesis in Flow  
*Vural Gursel I., Wang Q., Noel T., Hessel V.*
- 9:30 Energy Efficiency Improvement Through Technology Optimisation and Low Grade Heat-Recovery Industrial Application  
*Semkov K., Mooney E., Connolly M., Adley C.*
- 9:50 Process Modification Potentials for Total Site Heat Integration  
*Chew K.H., Wan Alwi S.R., Klemeš J.J., Manan Z.A.*
- 10:10 An MILP Model for Distributed Energy System Optimization  
*Haikarainen C., Pettersson F., Saxen H.*

10:30 **Coffee Break (Main Lobby)**

11:00 **Plenary Lecture II (Elafos Conference Room)**

### Session 3.5: New Horizons in Heat

Chair: Dr Costas Theodoropoulos, Dr Jordi Bonet Ruiz

- 12:00 New Retrofit Approach for Optimization and Modification for A Crude Oil Distillation System  
*Kamel D., Gadalla M., Ashour F., Nour Aldin H.*
- 12:20 Investigation of Alternative Reducing Agent Injection into the Raceway of Blast Furnaces Using CFD  
*Maier C., Jordan C., Harasek M., Feilmayr C., Thaler C.*
- 12:40 CFD Modelling of Hydrodynamics and Heat Transfer in Channels of a PHE  
*Stogiannis I.A., Paras S.V. Arsenyeva O.P., Kapustenko P.O.*

13:00 **Lunch (Hotel Restaurant – 10<sup>th</sup> floor)**

13:45 **Poster Session – Best Poster Contest (Elafina Conference Room – 10<sup>th</sup> floor)**

### Session 3.6: New Horizons in Modelling Techniques

Chair: Dr C Maier, Dr Flavio Manenti

- 14:30 Keynote Lecture  
A Methodology for Creating Sequential Multi-period Base-case Scenarios for Large Data Sets  
*Bungener S., Van Eetvelde G., Marechal F.*
- 15:10 The Use of Reduced Models in the Optimization of Energy Integrated Processes  
*Smith R., Ochoa-Estopier L.M., Jobson M.*

- 15:30 Double Substrate Limitation Model for the Experimental Scale-up of Succinic Acid Production from Biorefinery Glycerol  
*Rigaki A., Webb C., Theodoropoulos C.*
- 15:50 Investigation of Heat Exchanger Network Flexibility of Distillation Unit for Processing Different Types of Crude Oil  
*Varga Z., Danics N.*
- 16:10 **Coffee Break (Main Lobby)**