Program • Tuesday, 12th July 2016

Plenary Lecture — 09:00–10:00 | Room 1

09:00–09:30	**Plenary Lecture II** **Renewables – Successful Integration Requires Grids** **J. Homann, Präsident Bundesnetzagentur** (Bonn)	
09:30–10:00	**Plenary Lecture III** **Spiritual impulse from the encyclical 'Laudato si'** **H. H. G. M. Hanke OSB, Bischof von Eichstätt** (Eichstätt)	

Coffee break — 10:00–10:30 | Foyer

Renewable resources — 10:30–12:30 | Room 1

Chair: Dr. H. Hartmann, Technologie- und Förderzentrum (TFZ) (Straubing)
Prof. Dr. J. Karl, Friedrich-Alexander-Universität Erlangen-Nürnberg (Nuremberg)

		Abstr.-No.
10:30–10:50	**Thermochemical conversion of biogenic residues** **Prof. Dr.-Ing. G. Deerberg, Fraunhofer UMSICHT**, E. Stahl (Oberhausen)	164
10:50–11:10	**Industrial CHP with Biomass – Economics and legal framework** **Dipl.-Ing. V. Schäfer, eta Energieberatung GbR** (Pfaffenhofen)	
11:10–11:30	**Micro- and small-scale CHP with solid biofuels – State of the art and further challenges** **Dipl.-Ing. D. Müller, Friedrich-Alexander Universität Erlangen-Nürnberg** (Nuremberg)	
11:30–11:50	**Residential wood combustion – Technical status and upcoming perspectives** **Dipl.-Ing. C. Schmidl, bionergy2020+** (Wieslburg-Land/Austria)	
11:50–12:10	**Power to Gas with Biological Methanation – Praxis and Perspectives** **Dr. M. Reuter, MicrobEnergy GmbH** (Schwandorf)	
12:10–12:30	**Open-top biomass gasification and pyrolysis – cost-efficient small-scale community/industrial-based bioenergy systems** **D. Chiaramonti, University of Florence**, A. M. Rizzo, L. Nibbi, M. Prussi, R. Nistri (Florence/Italy), S. Dasappa (Karnataka/India)	129

Smartgrid II – Grid Operation and Storage Integration — 10:30–12:30 | Room 2

Chair: Dipl.-Ing. K. Ronge, Fraunhofer IIS (Nuremberg)
Prof. Dr. M. Weinhold, CTO Division Energy Management, Siemens AG (Erlangen)

		Abstr.-No.
10:30–10:50	**SWARM – Different strategies and first experiences of providing frequency containment reserve power with distributed battery energy storage systems** **D. Steber, Friedrich-Alexander-Universität Erlangen-Nürnberg**, P. Bazan, R. German (Erlangen)	37
10:50–11:10	**Multi use Battery storage system** **M. Sc. S. Hörlin, Technische Hochschule Nürnberg Georg Simon Ohm** (Nuremberg), A. Dietz (Rückersdorf), N. Graß (Nuremberg), B. Schultes (Bessenbach), S. Rehmet (Nuremberg)	57
11:10–11:30	**Demonstration of Storage Enabled Integration of Smart Buildings in a Smart Grid** **Dr. S. Langemeyer, Siemens AG**, M. Metzger, T. Lehmann, A. Mohsen, M. Kautz, J. Schäfer (Erlangen)	82
11:30–11:50	**Protection of distribution and transmission grids – sustainable energy integration requires innovation** **Dr. C. Fritsch, Siemens AG** (Nuremberg)	214
11:50–12:10	**Deriving an optimal Grid Design for integrating Offshore Wind Energy successfully** **B. Schyska, Universität Oldenburg**, A. Kies, L. v. Bremen (Oldenburg)	216
12:10–12:30	**Investigations with regard to the power quality in an urban low-voltage grid with high PV-share** **G. Seifert, Friedrich-Alexander-Universität Erlangen-Nürnberg** (Nuremberg), A. Köpken, M. Luther, E. Kees (Erlangen)	217

Simulation & Modelling I – Simulation and Optimization of Smart Grids — 10:30–12:30 | Room 3

Chair: Prof. Dr. R. German, Friedrich-Alexander-Universität Erlangen-Nürnberg (Erlangen)
Prof. Dr. A. Martin, Friedrich-Alexander-Universität Erlangen-Nürnberg (Erlangen)

		Abstr.-No.
10:30–10:50	**Mosaik – A Co-Simulation Framework for Smart Grid Scenarios** **L. Fischer, Institut für Informatik Oldenburg (OFFIS)**, S. Lehnhoff, O. Nannen, S. Rohjans (Oldenburg)	94
10:50–11:10	**A model-based approach for assessing the cost of energy independence** **Prof. Dr. Ir. B. Haverkort, University of Twente**, M. Jongerden (Enschede/Netherlands), A. Remke (Münster)	219

11:10–11:30	**Coupled Simulation Model of the German Energy System and Houses with Photovoltaics and Batteries Providing Control Power** **P. Bazan, Friedrich-Alexander-Universität Erlangen-Nürnberg**, M. Pruckner, D. Steber, R. German (Erlangen)	222
11:30–11:50	**Estimating the Infrastructure Needs of a Global Renewable Energy Grid** **A. Kies, ForWind - Zentrum für Windenergieforschung** (Oldenburg)	225
11:50–12:10	**Mixed-Integer Linear Programming for the Day-Ahead Operation of Smart Grids** **G. Orlinskaya, Friedrich-Alexander-Universität Erlangen-Nürnberg**, M. Schmidt (Erlangen)	140
12:10–12:30	**Optimal Price Zones for the German Electricity Market** **M. Schmidt, Friedrich-Alexander-Universität Erlangen-Nürnberg**, F. Liers (Erlangen), V. Grimm, G. Zöttl (Nuremberg)	162

Buildings — 10:30–12:30 | Room 4

Chair Dipl.-Kfm, Dipl.-Phys. C. Wetzel, CalCon Deutschland AG (Munich)

		Abstr.-No.
10:30–10:50	**Building control in a district heat network** **M. Kivikas, NODA** (Nuremberg)	
10:50–11:10	**Modelling and prediction of buildings energy consumption using Machine Learning techniques** **G. Kontes, Fraunhofer IBP**, D. Rovas (Nuremberg)	79
11:10–11:30	**Clustering buildings according to their energy saving potential** **M. Sc. V. Peyramale, CalCon Ingeniuergesellschaft mbH** (Munich)	26
11:30–11:50	**Supply of cooling energy for a research building directly powered by photovoltaics** **A. Derakhshan, ZAE Bayern** (Erlangen), S. Hörlin (Nuremberg), H. Medl, C. J. Brabec, T. Kunz, C. Camus (Erlangen)	72
11:50–12:10	**Monitoring Smart Energy Systems using Multi-timescale Nexting** **J. Feldmaier, Technische Universität München**, D. Meyer, H. Shen, K. Diepold (Munich)	151
12:10–12:30	**Energy efficiency program (EEP) at Siemens – Siemens manufactory Regensburg** **P. Bradley, Siemens AG** (Nuremberg)	148

Storage III – Thermal, Chemical and Electrochemical Storage — 10:30–12:30 | Room 5

Chair Prof. Dr.-Ing. W. Arlt, Friedrich-Alexander-Universität Erlangen-Nürnberg (Erlangen)
Prof. Dr.-Ing. H. Bolt, Forschungszentrum Jülich GmbH (Jülich)

		Abstr.-No.
10:30–10:50	**Energy Storage – Technologies and Applications** **Dr. A. Hauer, ZAE Bayern** (Garching)	43
10:50–11:10	**Thermodynamic constraints of energy storage technologies** **Dr. K. Müller, Friedrich-Alexander-Universität Erlangen-Nürnberg**, W. Arlt (Erlangen)	36
11:10–11:30	**Catalytic cascades for the conversion of CO2 into chemical energy carriers by regenerative electricity** **Dr. F. Steffler, Fraunhofer IGB**, L.-I. Csepei, T. Gärtner, V. Sieber (Straubing)	203
11:30–11:50	**A novel concept for solar-aided thermochemical energy storage and transportation based on CaO-looping – the NESTOR project** **Dr. G. Karagiannakis, Centre for Research & Technology Hellas (CERTH)** (Thermi-Thessaloniki/Greece), K. Sakellariou (Thessaloniki/Greece), N. Tsongidis (Thermi-Thessaloniki/Greece), D. Baciu, G. Charalambopoulou, T. Steriotis, A. Stubos (Athens/Greece), J. Obermeier, K. Müller, W. Arlt (Erlangen), A. G. Konstandopoulos (Thermi-Thessaloniki/Greece)	170
11:50–12:10	**Operational Experiences with Advanced Vanadium Redox Flow Batteries in the Megawatt Range** **Dr. A. Luczak, Vanadis Power GmbH** (Nuremberg)	27
12:10–12:30	**Formic acid as a hydrogen carrier – A Pd/C_3N_4 heterogeneous catalyst for reversible chemical hydrogen storage** **S. W. Nam, Korea Institute of Science & Technology** (Seoul/South Korea)	161

Lunch break & Campfire — 12:30–02:00 | Foyer

Integration III – Thermal Energy — 02:00–04:00 | Room 1

Chair Prof. Dr. A. Dietz, Technische Hochschule Nürnberg Georg Simon Ohm (Nuremberg)
T. Vogel, FS Frankensolar Projektmanagement GmbH (Nuremberg)

		Abstr.-No.
02:00–02:20	**A Techno-economic Analysis for the Integration of Metal Hydride Compressors in Real Power Systems** A. Stubos, E. Zoulias, **E. Stamatakis, National Center for Scientific Research Demokritos**, I. Tzagkaroulaki (Athens/Greece)	106

02:20–02:40	**Energy savings via use of free cooling and cold energy storage** **P. Puls, Fraunhofer IISB**, R. Öchsner, S. Linhardt (Erlangen)	64
02:40–03:00	**Smart Heat Grids for Thermal Energy Solutions** **M. Kivikas, NODA (Nuremberg)**, C. Johansson (Karlshamn/Sweden)	160
03:00–03:20	**Q-Regenerator – basic principle of a novel ultra-high temperature heat converter and storage system** **Prof. Dr. F. Opferkuch, Technische Hochschule Nürnberg Georg Simon Ohm (Nuremberg)**, P. Greil (Erlangen), A. Dietz (Nuremberg), A. Bonet (Erlangen), M. Weigand, M. Weclas (Nuremberg)	207
03:20–03:40	**Enhanced adsorber systems based on thermally conductive polymers for heat transformation applications** **M. Sc. M. Hinze, Friedrich-Alexander Universität Erlangen-Nürnberg**, W. Schwieger, F. Ranft, D. Drummer (Erlangen)	62
03:40–04:00	**Optimised Electricity Production by Biogas Plants** **K. Bär, Institut für neue Energie-Systeme**, G. Häring, M. Hüneke, M. Sonnleitner, W. Zörner (Ingolstadt)	167

Wind — 02:00–04:00 | Room 2

Chair: R. Bartl, Bayern Innovativ (Nuremberg); Dr. J. Hauch, ZAE Bayern (Erlangen)

		Abstr.-No.
02:00 - 02:20	**tba** **C. Manseder, Vestas Wind Systems** (Schweinfurt)	
02:20 - 02:40	**Innovative bearing solutions for wind turbines** **A. Qualen, Schaeffler Technologies AG & Co. KG** (Schweinfurt)	
02:40 - 03:00	**Greater, taller, tougher - The rapid development of wind turbines and the resulting challenges for mechanical drive-trains** **W. Losert, eolotec GmbH** (Nuremberg)	
03:00 - 03:20	**Numerical and Experimental Investigations of the Aeroacoustics of a Straight bladed and a Helical Darrieus Wind Turbine** **J. Weber, Friedrich-Alexander Universität Erlangen-Nürnberg,** S. Becker, C. Regensburger, F. Greipel (Erlangen), M. Kaltenbacher (Vienna/Austria)	95
03:20 - 03:40	**Operational experience of a Darrieus H-rotor wind turbine using a sensor-less control concept** **Prof. Dr.-Ing. G. Kießling, Technische Hochschule Nürnberg Georg Simon Ohm**, M. Rieger (Nuremberg)	149

Modelling of Markets — 02:00–04:00 | Room 3

Chair: Prof. Dr. V. Grimm, Friedrich-Alexander Universität Erlangen-Nürnberg (Nuremberg); Prof. Dr. C. Kemfert, DIW Berlin (Berlin)

		Abstr.-No.
02:00–02:40	**The Impact of Market Design on Transmission and Generation Investment in Electricity Markets** **C. Sölch, Friedrich-Alexander-Universität Erlangen-Nürnberg**, V. Grimm, G. Zöttl, B. Rückel (Nuremberg)	86
02:40–03:00	**Investment Incentives for Flexible Demand Options under Different Market Designs** **M. Ambrosius, Friedrich-Alexander-Universität Erlangen-Nürnberg**, V. Grimm, C. Sölch, G. Zöttl (Nuremberg)	92
03:00–03:20	**Optimization Techniques for the Analysis of the Entry-Exit-System in Gas Transportation Networks** **L. Schewe, Friedrich-Alexander-Universität Erlangen-Nürnberg**, C. Hayn, M. Schmidt (Erlangen)	168
03:20–03:40	**An Electricity Market to Integrate Fast Growing Renewable Energies** **K. Imolauer, Rödl & Partner**, B. Hufnagel (Nuremberg)	111
03:40–04:00	**Determinants of technology acceptance. Results of the representative survey on knowledge and attitudes tour what's the German energy turnaround ("Energiewende")** **Dr. R. Zeh, Friedrich-Alexander-Universität Erlangen-Nürnberg**, S. Merkle, F. Pfaffenberger (Nuremberg)	146

Cities — 02:00–04:00 | Room 4

Chair: Dr. M. Fraas, Wirtschaftsreferent, Stadt Nürnberg (Nuremberg); Prof. Dr.-Ing. W. Lang, Technische Universität München (Munich)

		Abstr.-No.
02:00–02:20	**Economic Development and the Greening of Cities** **Dr. M. Fraas,** Wirtschaftsreferent, Stadt Nürnberg (Nuremberg)	
02:20–02:40	**European Metropolitan Region Nuremberg – a model for regional cooperation in energy and climate policies on local and regional level** **Dr. P. Pluschke, Stadt Nürnberg** (Nuremberg)	229
02:40–03:00	**Centre for Urban Ecology and Climate Adaptation – Mitigation and Green Urban Infrastructure** **J. Brasche, Technische Universität München**, T. Zölch, J. Maderspacher, R. Schelle, G. Hausladen, W. Lang, S. Pauleit (Munich)	176

03:00–03:20	**Sustainability-Indicators for local heat supply systems based on renewable energy** **Prof. Dr. D. Hehenberger-Risse, Technologiezentrum Energie HAW Landshut** (Ruhstorf)	25
03:20–03:40	**Energy use plan** **T. Wagner, Technische Universität München** (Munich)	
03:40–04:00	**EU-fundraising in the field of city and energy-related topics** **T. Ammerl, BAYFOR**, A. Reiter, A. Blume, M. Kratschke, C. Schuback (Munich)	212

Solar — 02:00–04:00 | Room 5

Chair	Prof. Dr. C. Brabec, ZAE Bayern (Erlangen) Dr. F. Karg, AVANCIS GmbH (Munich)	
		Abstr.-No.
02:00–02:40	**Flexible, semitransparent, colorful – Architectural integration of OPV** **Dr. R. Pätzold, BELECTRIC OPV GmbH** (Nuremberg)	
02:40–03:00	**BIPV applications for CIGS Modules** **Dr. F. Karg, AVANCIS GmbH** (Munich)	
03:00–03:20	**New Challenges and Requirements for BIPV Modules beyond Power Generation** **C. Camus, ZAE Bayern**, R. Auer (Erlangen), A. Baumann, H.-P. Ebert (Würzburg), H.-J. Egelhaaf (Nuremberg), U. Hoyer, T. Kunz (Erlangen), H. Weinläder, S. Weismann (Würzburg), C. J. Brabec (Erlangen)	182
03:20–03:40	**Controlling the morphology of solution processed hybrid organic-inorganic halide perovskites** **Prof. S. Choulis, Cyprus University of Technology**, I. Burgués-Ceballos, A. Savva (Limassol/Cyprus)	215
03:40–04:00	**Towards Fully Autonomous Inspection of Photovoltaic Power Plants Using Unmanned Aerial Vehicles** **Prof. Dr. F. Gallwitz, Energie Campus Nürnberg (EnCN)**, S. Dotenco (Nuremberg), M. Dalsass (Hof)	108

Regional Leaders Summit – “Renewables Go Global” — 02:00–04:00 | Room 6

Chair	Dipl.-Ing. M. Dillig, Friedrich-Alexander-Universität Nürnberg-Erlangen (Nuremberg) Dr. S. Goers, Johannes Kepler University of Linz (Linz/Austria)
02:00–02:15	**Welcome Addresses – The regional Leaders Energy Network** **Prof. Dr.-Ing. W. Arlt, Friedrich-Alexander-Universität Erlangen-Nürnberg** (Erlangen), **Dr. F. Gauzy, BayFOR** (Munich)
02:15–02:30	**Renewable Energy Development in Georgia** **N. N.** (Atlanta, Georgia/USA)
02:30–02:45	**Conversion of natural oil and fats to fuels and fine chemicals** **X. Li, Chinese Academy of Sciences** (Quingdao/China)
02:45–03:00	**Value from Waste – Tapping Energy from Waste Paper Sludge from a South African Perspective** **Dr. E. van Rensburg, Stellenbosch University** (Stellenbosch/South Africa)
03:00–03:15	**Biorefineries – The European Perspective** **Dr. H. Steinmüller, Johannes Kepler University of Linz** (Linz/Austria)
03:15–03:30	**Liquid biofuels through gasification of residual feedstock – From lab to full industrial scale** **Prof. J.-M. Lavoie, Université de Sherbrooke** (Quebec/Canada)
03:30–03:45	**Energy planning in Brazil – Roles for energy efficiency and renewable energies** **Prof. G. Jannuzzi, Universidade Estadual de Campinas (UNICAMP)** (São Paulo/Brazil)
03:45–04:00	**Energiewende goes Global – The Renewable Energies Alliance** **Prof. Dr. J. Karl, Friedrich-Alexander-Universität Erlangen-Nürnberg** (Nuremberg)

Final remarks — 04:00–04:30 | Room 1

Coffee break & Campfire — 04:30–05:30 | Foyer