

Annual report 2015

Chair of Energy Economics

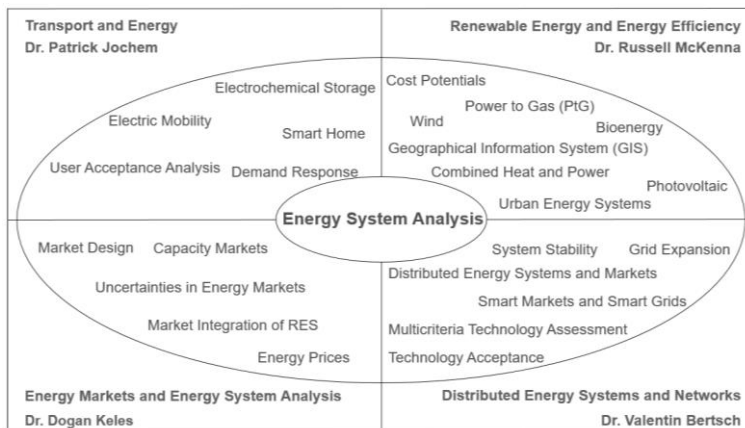


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1. Preface

This report describes the essential work and activities of the Chair of Energy Economics at the Institute for Industrial Production in 2015. Although the four research groups “Transport and Energy”, “Renewable Energy and Energy Efficiency”, “Energy Markets and Energy System Analysis”, and “Distributed Energy Systems and Networks” have different priorities (see figure below), the focus of the chair is to analyze energy systems by considering existing interdependencies among different alternatives. For this reason, the techno-economic characteristics of energy systems are modelled in detail using methods of Operations Research and Informatics.



As in previous years, the chair has been working on numerous projects on a regional, national and international level to provide decision support in the field of energy economics. During 2015, our approximately 25 staff published around 25 peer-reviewed journal articles. My staff and I hope that we can arouse your interest in our research activities by providing you with the present brief report. We hope you enjoy reading and look forward to receiving your comments and suggestions.

Prof. Dr. Wolf Fichtner, Chair of Energy Economics

2. Project Areas

Renewable Energies and Energy Efficiency

- Power-to-Gas concepts with high social acceptance for an efficient and flexible storage and energy infrastructure to integrate renewable energies in Baden-Württemberg
Funding: Ministerium für Umwelt, Klima und Energiewirtschaft Baden-Württemberg (BWPLUS)
Duration: 11.2013-04.2016
- Innovations for a Sustainable Biomass Utilisation in the Upper Rhine Region
Funding: Interreg
Duration: 07.2012-06.2015
- PLAN-EE – a GIS-based Planning Tool for Renewable Energies
Funding: Interreg IV Oberrhein der EU und Mitteln der Wissenschaftsoffensive der Länder Rheinland-Pfalz, Baden-Württemberg und der Region Alsace.
Duration: 07.2012-06.2015
- CIVIS – Cities as drivers of social change
Funding: European Commission
Duration: 10.2013-09.2016
- Wettbewerb “Energieeffiziente Stadt”
Funding: BMBF
Duration: 10.2011-09.2016
- Real Laboratory Karlsruhe East City – Energy Concept (R131 - Part of District Future – Urban Lab)
Funding: MWK BW
Duration: August 2015 - November 2016

Energy Markets

- Perspectives for the long-term development of the electricity markets and the funding of renewable energies considering strong expansion targets
Granted by: BMWi
Duration: 2012-2015

- Insight_E – An Energy think tank informing the European Commission
Granted by: European Commission
Duration: 2014-2017
- E-SAVE – European Market Coupling and its impacts on security supply considering high penetration of renewable energies
Granted by: Stiftung Energieforschung Baden-Württemberg
Duration: 2015-2018
- Impact of different market designs in the CWE market area on electricity prices and on the competitiveness of Swiss hydropower
Granted by: Bundesamt für Energie BFE, Switzerland
Duration: 2015-2018

Decentralised Energy Systems

- Living Lab Walldorf (LiLa Walldorf)
Funding: Ministerium für Umwelt, Klima und Energiewirtschaft Baden-Württemberg
Duration: 2015-2018
- DEMO – Decentralised Energy Systems, Market Integration and Optimisation
Funding: Stiftung Energieforschung Baden-Württemberg
Duration: 2013-2015
- Integrated Development and Evaluation of new Electricity Tariffs
Funding: Karlsruhe Service Research Institute (KSRI)
Duration: 2013-2015
- ESC – Energy Supply Cooperative
Funding: KIC InnoEnergy
Duration: 2012-2015
- ALOMA – Agent-based Load Management Strategies
Funding: EDF
Duration: 2015
- GridControl – Advanced Decentral Grid Control
Funding: BMWi
Duration: 2015-2017

Electric Mobility

- CROME – Cross Border Mobility for Electric Vehicle
Granted by: BMWi
Funding period: 2011-2014
- iZEUS – intelligent Zero Emission Urban System
Granted by: BMWi
Funding period: 2012-2014
- EVREST – Electric Vehicle with Range Extender as a Sustainable Technology
Granted by: ADEME (France), bmvit and FFG (Austria), BMWi
Funding period: 2012-2015
- IILSE – Interoperability of inductive charging systems for electric vehicles
Granted by: BMWi
Funding period: 2015-2017
- Get e-Ready – Business models for electric vehicle fleets
Granted by: BMWi
Funding period: 2013-2015
- RheinMobil – Economic feasibility of French-German cross border mobility with electric vehicles
Granted by: BMWi
Funding period: 2013-2015
- Helmholtz Research School on Energy Scenarios – Construction, Assessment and Impact
Granted by: Helmholtz Association
Funding period: 2011-2017

Grids

- Helmholtz Research Programme “Storage and Cross-linked Infrastructures”
Funding: Helmholtz Association
Duration: 2015-2019
- New Approaches to Integrated Energy Systems and Grid Modelling
Funding: Deutsche Forschungsgemeinschaft (DFG)
Duration: 2014-2016
- Helmholtz Portfolio Initiative “Safety and Security”
Funding: Helmholtz Association
Duration: 2013-2016
- KonStGas
Funding: Federal Ministry for Economic Affairs and Energy
Duration: 2013-2016
- Helmholtz Energy Alliance “Technologies for Future Power Grids”
Funding: Helmholtz Association
Duration: 2013-2015

3. Dissertations and Habilitations

Dr.-Ing. Tobias Heffels, 2015, Kraftwerks- und Speicherbedarf bei hohen Anteilen erneuerbarer Energien, Dissertation.

Dr.-Ing. Lutz Hillemacher, 2014, Lastmanagement mittels dynamischer Strompreissignale bei Haushaltskunden, Dissertation.

Dr.-Ing. Sonja Babrowski, 2014, Bedarf und Verteilung elektrischer Tagesspeicher im zukünftigen deutschen Energiesystem, Dissertation.

Dr. rer. pol. Felix Teufel, 2014, Speicherbedarf und dessen Auswirkungen auf die Energiewirtschaft bei Umsetzung der politischen Ziele zur Energiewende, Dissertation.

4. Awards

- 2015 Russell McKenna, along with colleagues Erik Merkel, Tobias Jäger and Wolf Fichtner, were awarded the prize for the Best Scientific Presentation at the Enerday conference in April in Dresden
- 2015 Marian Hayn: Best Reviewer Award 2015, Energy Research & Social Science
- 2015 Valentin Bertsch: Excellence in Teaching Award, Hector School, the Technology Business School of the KIT

5. Events

Together with the Karlsruhe Service Research Institute (KSRI) a first **Karlsruhe Service Summit (KSS)** Research Workshop was conducted on February 26th. The objective of the workshop was to foster academic and interdisciplinary discourse and networking amongst different generations of researchers from the field of service science. In order to achieve this objective, stimulation of academic scholarship, discussions of ideas as well as dialogue among students and researchers from different countries, disciplines and seniority was intended. The KSS Workshop Proceedings are available [here](#).

On November 9th and 10th, 2015, the Heidelberg Institute for Theoretical Studies (HITS), Heidelberg University and Karlsruhe Institute of Technology (Institute for Industrial Production and Institute of Electric Energy Systems and High-Voltage Technology) organized, for the first time, the **International Symposium on Energy System Optimization (ISESO 2015)** at HITS in Heidelberg.

The symposium attracted an international audience of more than 50 participants as well as international presentations from both, industry and academia. These included three keynote presentations (Professor Claudio Cañizares, Ph.D., University of Waterloo, Canada, Tanja Clees, Ph.D., Fraunhofer SCAI, Germany, and Professor Shmuel S. Oren, Ph.D., University of California at Berkeley, USA) and 18 contributed papers in 7 sessions. The sessions focused on diverse challenges in energy systems, ranging from operational to investment planning problems, from market economics to technical and environmental considerations, from distribution grids to transmission grids and from theoretical considerations to data provision concerns and applied case studies.

Supported by the highly positive feedback of the participants, the organizers announced their plans for the follow-up ISESO in 2017 in the closing session. This year's post-symposium proceedings will be published by Springer in due time. Further

information can be found [here](#). The Chair of Energy Economics wishes to thank all participants and speakers for their contribution to making ISES0 a success.

On November 12th, 2015, the workshop "**Urban Energy System Models**" took place at the Ostendorffhaus in Karlsruhe. The event took place in the context of the Science Year 2015: City of the Future and the project "Wettbewerb Energieeffiziente Stadt", funded by the Federal Ministry of Education and Research.

In 8 talks and three sessions on the topics "consumer acceptance and participation", "geographical information systems (GIS)" and "integrated system analysis", scientific approaches as well as practical applications of urban energy system modeling were presented. Thanks to the heterogeneous attendees from notable institutions, a productive exchange on the current modeling practice as well as new contacts could be established. The agenda as well as the presentation slides are available on the [IIP-website](#).

Session "Electrifying Road Transport" at the World Climate Conference COP21 in Paris during the Transport Day on December 6th. The session was organized on behalf of the World Conference of Transport Research Society (WCTRS). In the context of the 21st session of the Conference of the Parties (COP21), held by the United Nations Framework Convention on Climate Change (UNFCCC), the Transport Day took place. The Transport Day was organized by the Partnership on Sustainable, Low Carbon Transport (SLoCaT), together with the Bridging the Gap (BtG) Initiative and the Michelin Challenge Bibendum. Six break-out sessions were scheduled including "Electrifying Road Transport". This session reviewed the status of electric mobility around the world today and discussed near-term market perspectives and long-term visions for future deployment across all applications. See [agenda](#) of the "Electrifying Road Transport" session. Further information is available [here](#).

6. International Collaboration

Location: University College London (UCL) Energy Institute & Imperial College London (ICL), Department for Electrical and Electronic Engineering

Who: Dr. Russell McKenna

Host: Prof. Neil Strachan (UCL), Prof. Goran Strbac (ICL)

Period: June to September 2015

Short description of stay: During the summer of 2015, Russell McKenna spent around three months working at UCL Energy Institute and the Department of Electrical and Electronic Engineering at Imperial College London in the context of a [WholeSEM](#) Fellowship. The project focused on domestic heat and electricity load profiles, especially the effects that socio-economic and supply-side technological differentiation have on neighborhood electrical load profiles. In particular, the focus was on the impacts of this differentiation on aggregated load profiles and how much these could differ from the standardized profiles often employed today.

Location: Singapore, New Zealand, Hong Kong

Who: Dr. Russell McKenna

Host: Prof. Basil Sharp, Business School, University of Auckland; Dr Janet Stephenson, Centre for Sustainability, University of Otago

Period: March/April 2015

Short description of stay: During March and April 2015, Russell McKenna, along with Michael Zipt from the Chair of Energy Economics at the Technical University of Dresden (TUD), undertook a research trip through New Zealand via Singapore and Hong Kong.

They spent a total of two weeks in New Zealand, beginning at Auckland in the north and finishing in Dunedin in the south. Highlights of the trip included meetings with energy researchers at the University of Auckland Business School, the Electrical Power Engineering Centre in Christchurch (University of Canterbury) and the Centre for Sustainability at the University of Otago (Dunedin). As a result of the trip, the involved institutions are looking to continue collaboration through longer exchanges of students and researchers.

Location: University of Waterloo (Canada), Faculty of Mathematics, ISS4E Laboratory

Who: Dr. Patrick Jochem

Host: Prof. Dr. Srinivasan Keshav

Period: July – September 2015

Short description of stay: Patrick Jochem was invited as a Visiting Professor and he was working together with Prof. Keshav and Prof. Rosenberg in the field of grid defection of private households. The analyses were focused on techno-economic impacts from photovoltaic-battery systems on the electricity demand as well as their profitability in different jurisdictions.

Location: University of Waterloo (Canada), Faculty of Mathematics, ISS4E Laboratory

Who: Johannes Schäuble

Host: Prof. Catherine Rosenberg, Prof. Dr. Srinivasan Keshav

Period: October 2015

Short description of stay: Johannes Schäuble was invited by Prof. Keshav and Prof. Rosenberg to work jointly on different approaches for the commitment of electricity demand side flexibilities by a system operator. Further discussions on the agent based methodology in this field and detailed modelling of storage systems supported the realized research.

Location: University of Bergen (Norway), Faculty of Social Sciences, System Dynamics Research Group

Who: Jonathan Gómez Vilchez

Host: Prof. Dr. Pål Davidsen

Period: April – May 2015

Short description of stay: Jonathan Gómez Vilchez spent six weeks attending, as a guest doctoral student, lectures and labs taught by the System Dynamics (SD) Research Group. During his stay, Jonathan had the opportunity to learn from experienced SD modellers, performed his own SD modelling work and networked with other PhD students who also apply this research method.

Location: Lawrence Berkeley National Laboratory, International Energy Studies Group

Who: Katrin Seddig

Host: Dr. Anand Gopal, Senior Scientist

Period: August - November 2015

Short description of stay: Katrin Seddig was invited as a visiting research scholar and was working together with Dr. Anand Gopal, head of transportation energy area at the Lawrence Berkeley National Laboratory (LBNL). Together they were working on a paper about electric vehicle integration in the California area, especially with a focus on the uncertainties when it comes to demand response provided by electric vehicles. The work included exchange with people from different areas and institutions through LBNL as well as UC Berkeley. Her stay was funded by the DAAD.

Location: Harvard University (Boston, USA), Harvard Kennedy School

Who: Hans Schermeyer

Host: Prof. William W. Hogan

Period: April 2015

Short description of stay: In 2015, Hans Schermeyer was awarded the "Networking Grant" from the Karlsruhe House of Young Scientists (KHYS) and visited Prof. William Hogan for two weeks. The exchange emphasized in the field of locational pricing in power systems and enabled Hans Schermeyer to acquire a deeper understanding of US approaches and research activities on decentralized power systems.

7. Teaching Activities

Lectures at KIT

<u>BSc-Modul „Energiewirtschaft“</u>	
<ul style="list-style-type: none">• Einführung in die Energiewirtschaft (SS, 5.5 ECTS)• Renewable Energy – Resources, Technologies and Economics (WS, 3.5 ECTS)• Energiepolitik (SS, 3.5 ECTS)	
<u>MSc-Modul „Energiewirtschaft und Energiemärkte“</u> <ul style="list-style-type: none">• Basics of Liberalised Energy Markets (WS, 3 ECTS)• Energiehandel und Risikomanagement (SS, 4 ECTS)• Erdgasmärkte (WS, 3 ECTS)• Energiepolitik (SS, 3.5 ECTS)• Planspiel Energiewirtschaft (SS, 3 ECTS)• Quantitative Methods in Energy Economics (WS, 4 ECTS)	<u>MSc-Modul „Energiewirtschaft und Technologie“</u> <ul style="list-style-type: none">• Strategische Aspekte der Energiewirtschaft (WS, 3.5 ECTS)• Technologischer Wandel in der Energiewirtschaft (WS, 3 ECTS)• Wärmewirtschaft (SS, 3 ECTS)• Energy Systems Analysis (WS, 3 ECTS)• Energie und Umwelt (SS, 4.5 ECTS)• Efficient Energy Systems and Electric Mobility (SS, 3.5 ECTS)

Our chair supervises in average about 100 bachelor and master theses per year.

8. Publications

Peer-reviewed Journals

- Ruppert, M.; Hayn, M.; Bertsch, V.; Fichtner, W. (2016): Impact of residential electricity tariffs with variable energy prices on low voltage grids with photovoltaic generation, *International Journal of Electrical Power & Energy Systems* (accepted)
- Ringler, P.; Keles, D.; Fichtner, W. (2016): Agent-based modelling and simulation of smart electricity grids and markets – A literature review, *Renewable & Sustainable Energy Reviews*, (accepted)
- McKenna, R.; Bertsch, V.; Jochem, P.; Genoese, M.; Fichtner, W. (2016): Infrastrukturelle und nachfrageseitige Herausforderungen für die Energiewirtschaft: eine Aufgabe für die Energiesystemanalyse, *Betriebswirtschaftliche Forschung und Praxis* (accepted)
- Paraschiv, F.; Hadzi-Mishev, R.; Keles, D. (2016): Extreme Value Theory for Heavy-Tails in Electricity Prices, *Journal of Energy Markets*, (accepted)
- Jochem, P.; Brendel, C.; Reuter, M.; Fichtner, W.; Nickel, S. (2016): Optimizing the allocation of fast charging infrastructure for electric vehicles along the German Autobahn, *Journal of Business Economics*, (online)
- Keles, D.; Scelle, J.; Paraschiv, F.; Fichtner, W. (2016): Extended forecast methods for day-ahead electricity spot prices applying artificial neural networks (ANN), *Applied Energy*, 162, 218-230
- McKenna, R.; Ostmann, v. d. Leye, P.; Fichtner, W. (2016): Key challenges and prospects for large wind turbines, *Renewable and Sustainable Energy Reviews*, 53, 1212-1221
- Jochem, P.; Doll, C.; Fichtner, W.: (2016): External Costs of Electric Vehicles, *Transportation Research Part D: Transport and Environment*, 42, 60-76
- Bertsch, V.; Fichtner, W. (2016): A participatory multi-criteria approach for power generation and transmission planning, *Annals of Operations Research*, DOI 10.1007/s10479-015-1791-y (available online)

- McKenna, R.; Herbes, C.; Fichtner, W. (2015): Energieautarkie: Vorschlag einer Arbeitsdefinition als Grundlage für die Bewertung konkreter Projekte und Szenarien, *Zeitschrift für Energiewirtschaft*, 39, 4, DOI 10.1007/s12398-015-0164-1
- Jochem, P.; Schönfelder, M.; Fichtner, W. (2015): An efficient two-stage algorithm for decentralized scheduling of micro-CHP units, *European Journal of Operational Research*, 245, 862-874
- Merkel, E.; McKenna, R.; Fichtner, W. (2015): Optimisation of the capacity and the dispatch of decentralised micro-CHP systems: A case study for the UK, *Applied Energy*, 140, 120-134
- Schermeyer, H.; Bertsch, V.; Fichtner, W. (2015): Review and extension of suitability assessment indicators of weather model output for analyzing decentralized energy systems, *Atmosphere*, 6, 1871-1888
- Creutzig, F.; Jochem, P.; Edelenbosch, O.Y.; Mattauch, L.; Vuuren D.P.v.; McCollum, D.; Minx, J. (2015): Transport – a roadblock to climate change mitigation?, *Science (Policy Forum)*, 350 (6263), 911-912
- Kieckhäfer, K.; Feld, V.; Jochem, P.; Wachter, K.; Spengler, T.S.; Walther, G.; Fichtner, W. (2015): Prospects for regulating the CO₂ Emissions from Passenger Cars within the European Union after 2023, *Zeitschrift für Umweltpolitik & Umweltrecht*, 38(4), 425-450
- Jochem, P.; Babrowski, S.; Fichtner, W. (2015): Assessing CO₂ Emissions of Electric Vehicles in Germany in 2030, *Transportation Research A: Policy and Practice* 78, 68-83
- Babrowski S.; Jochem, P.; Fichtner, W. (2015): Electricity Storage Systems in the Future German Energy Sector: An Optimization of the German Electricity Generation System until 2040 Considering Grid Restriction, *Computers & Operations Research*, 66, 228-240
- Emanuel, G.; Naumann, M.; Jochem, P.; Fichtner, W. (2015): Prädiktive Kraftstoffeinsatzoptimierung von Hybridfahrzeugen durch Metaheuristiken, *Internationales Verkehrswesen*, 67(1), 74-77

McKenna, R.; Hollnaicher, S.; Oostman V. D. Leye, P.; Fichtner, W. (2015): Cost-potentials for large onshore wind turbines in Europe, *Energy*, 83, 217-229

Other Journals

Bublitz, J.; Keles, D.; Zimmermann, F.; Genoese, M.; Fichtner, W. (2015): Bewertung der Klimainstrumente für den deutschen Strommarkt, *ew - Magazin für die Energiewirtschaft*, Heft 8/2015

Conference Proceedings

Keles, D.; Bublitz, A.; Fichtner, W. (2015): Bewertung unterschiedlicher Design-Optionen für den deutschen Elektrizitätsmarkt und deren Auswirkungen auf die Versorgungssicherheit, *Tagung Optimierung in der Energiewirtschaft 2015*, VDI Berichte 2266, VDI Wissensforum GmbH, Düsseldorf.

Ringler, P.; Keles, D.; Fichtner, W. (2015): Flexibilisierung der Stromnachfrage und deren Auswirkung in zukünftigen Elektrizitätssystemen - Eine Untersuchung mithilfe einer agentenbasierten Simulation von Strommärkten, *Tagung Optimierung in der Energiewirtschaft 2015*, VDI Berichte 2266, VDI Wissensforum GmbH, Düsseldorf.

Mainzer, K.; McKenna, R.; Fichtner, W. (2015): Rolling Horizon Planning Methods in Long-Term Energy System Analysis MILP Models, *CORS/INFORMS International Meeting*, Montreal, June 17th 2015.

Rodenhausen, M.; McKenna, R. (2015): Creation of Incentives for Capacity Checks to Support the Development of Adjacent Wind Farms, *Paper presented at the DEWEK Conference*, 19th-20th May, Bremen.

Weiß, J.; McKenna, R. (2015): Analytical and Experimental Analysis of the Wake Effects on Turbines in Wind Farms to Optimize the Overall Energy Production, *Paper presented at the DEWEK Conference*, 19th-20th May, Bremen.

- McKenna, R.; Merkel, E.; Jäger, T.; Fichtner, W. (2015): Is there an optimum scale for energy autarky? Presentation at the WholeSEM Annual Conference 6-7 July 2015, Cambridge, UK.
- McKenna, R.; Merkel, E.; Jäger, T.; Fichtner, W. (2015): Is there an optimum scale for energy autarky? Presentation at the Enerday conference, 17th April 2015, Dresden, Germany.
- Heffels, T.; McKenna, R.; Fichtner, W., (2015): German electricity generation and storage system development under electricity grid restrictions, CORS/INFORMS International Conference, Montreal, Canada.
- Jochem, P. (2015): Integrating Electric Vehicles into the Energy System, UNFCCC Conference of the Parties (COP21), Paris.
- Jochem, P. (2015): Profitability of Photovoltaic-Battery Systems for Private Households, University of Waterloo, Canada.
- Layer, P.; Feurer, S.; Jochem, P. (2016): Pricing for the Energiewende, Annual Meeting, American Marketing Association, Las Vegas, USA.
- Brendel, C.; Jochem, P.; Reuter, M.; Fichtner, W.; Nickel, S. (2015): Optimizing the allocation of fast charging infrastructure for electric vehicles along the German Autobahn, Conference "Sustainability and Decision Making", February 25-26, Aachen.
- Bublitz, A.; Renz, L.; Keles, D.; Genoese, M.; Fichtner, W. (2015): An assessment of the newly proposed strategic reserve in Germany, International Conference on European Energy Markets 2015 in Lisbon, IEEE Xplore.
- Görlitz, R.; Bertsch, V.; Caton, S.; Feldmann, N.; Jochem, P.; Maleshkova, M.; Reuter-Oppermann, M. (Eds.) (2015): Advances in Service Research – Proceedings of the First Karlsruhe Service Summit Research Workshop, KIT Scientific Publishing, Karlsruhe, Germany.

- Hayn, M.; Bertsch, V.; Fichtner, W. (2015): A concept for service level indicators in residential electricity tariffs with variable capacity prices, in: Görlitz, R.; Bertsch, V.; Caton, S.; Feldmann, N.; Jochem, P.; Maleshkova, M.; Reuter-Oppermann, M. (Eds.) *Advances in Service Research – Proceedings of the First Karlsruhe Service Summit Research Workshop*, pp. 1-10, KIT Scientific Publishing, Karlsruhe, Germany.
- Hayn, M.; Schneider, R.; Bertsch, V.; Fichtner, W. (2015): Wert der Versorgungssicherheit und Akzeptanz von Stromtarifen mit variablen Leistungspreisen, *Proceedings 9. Internationale Energiewirtschaftstagung, 2015, Vienna, Austria*.
- Schermeyer, H.; Schwarz, H.; Bertsch, V.; Fichtner, W. (2015): Stochastic simulation of photovoltaic electricity feed-in considering spatial correlation, in: Weber, C.; Derksen, C. (Eds.) *Proceedings of the 2015 SmartER Europe Conference*, pp. 12-16.
- Ruppert, M.; Bertsch, V.; Fichtner, W. (2015): Optimal Load Shedding in Distributed Networks with Sigmoid Cost Functions, in: *2015 International Symposium on Smart Electric Distribution Systems and Technologies (EDST)*, pp. 159-164, IEEE Xplore.
- Meyer-Hübner, N.; Suriyah, M.; Leibfried, T.; Slednev, V.; Bertsch, V.; Fichtner, W.; Gerstner, P.; Schick, M.; Heuveline, V. (2015): Time constrained optimal power flow calculations on the German power grid, in: *ETG Congress 2015, IEEE Xplore (forthcoming)*.
- Bertsch, V.; Fichtner, W.; Hall, M.; Schumacher, T.; Weinhardt, C. (2015): Service Requirements for Consumer Engagement in the German Energy Retail Market, in: Zhao, X.; Zhang, J.; Han, H.J. (Eds.) *Proceedings of 2015 Quality in Service (QUIS 14)*.
- Raskob, W.; Bertsch, V.; Ruppert, M.; Strittmatter, M.; Happe, L.; Broadnax, B.; Wandler, S.; Deines, E. (2015): Security of electricity supply in 2030, *Critical Infrastructure Protection & Resilience Europe*, The Hague, Netherlands.

Book Chapters

- Stryja, C.; Fromm, H.; Ried, S.; Jochem, P.; Fichtner, W. (2015): On the Necessity and Nature of E-Mobility Services – Towards a Service Description Framework, in: Nóvoa, H.; Dragoicea, M. (Eds.), Exploring Services Science, Lecture Notes in Business Information Processing Series, Vol. 201, pp. 109-122, Springer.
- Babrowski, S.; Jochem, P.; Fichtner, W. (2015): Elektrofahrzeuge und das städtische Energiesystem, Schriftenreihe des Wettbewerbs "Energieeffiziente Stadt", Buch 4: Stadt und Mobilität, LIT-Verlag, Berlin, pp. 137-146.
- Babrowski, S.; Ensslen, A.; Jochem, P.; Fichtner, W. (2015): Akzeptanz von Elektrofahrzeugen im Urbanen Raum, Schriftenreihe des Wettbewerbs "Energieeffiziente Stadt", Buch 4: Stadt und Mobilität, LIT-Verlag, Berlin, pp. 147-156.
- Ried, S.; Reuter, M.; Jochem, P.; Fichtner, W. (2015): Dispatch of a wind farm with a battery storage, Proceedings of OR, Springer.
- Slednev, V.; Bertsch, V.; Fichtner, W. (2016): A multi-objective time segmentation approach for power generation and transmission models, in: Ljubic, I.; Pflug, G.; Tragler, G.; Doerner, K. (Eds.) Operations Research Proceedings 2015, Springer.

IIP Working Papers

- Schwarz, H.; Bertsch, V.; Fichtner, W. (2015): Two-stage stochastic, large-scale optimization of a decentralized energy system – a residential quarter as case study, Working Paper Series in Production and Energy, No. 10 | October 2015.
- Mainzer, K.; McKenna, R.; Fichtner, W. (2015): Charakterisierung der verwendeten Modellansätze im Wettbewerb Energieeffiziente Stadt, Working Paper Series in Production and Energy, No. 9 | September 2015.

- Ensslen, A.; Peatz, A.; Brabowski, S.; Jochem, P.; Fichtner, W. (2015): On the road to an electric mobility mass market – How can early adopters be characterized?, Working Paper Series in Production and Energy, No. 8 | May 2015.
- Jäger, T.; McKenna, R.; Fichtner, W. (2015): Onshore wind energy in Baden-Württemberg: a bottom-up economic assessment of the socio-technical potential, Working Paper Series in Production and Energy, No. 7 | April 2015.
- McKenna, R.; Herbes, C.; Fichtner, W. (2015): Energieautarkie: Definitionen, Für- bzw. Gegenargumente, und entstehende Forschungsbedarfe, Working Paper Series in Production and Energy, No. 6 | March 2015.