

## Dr. Daniel Huppmann

---

International Institute of Applied Systems Analysis (IIASA)  
Schlossplatz 1, 2361 Laxenburg, Austria  
[huppmann@iiasa.ac.at](mailto:huppmann@iiasa.ac.at) | [www.iiasa.ac.at/staff/huppmann](http://www.iiasa.ac.at/staff/huppmann)  
Twitter @daniel\_huppmann | GitHub @danielhuppmann

March 15, 2020

RESEARCH PROFILE	Postdoctoral Research Scholar working on integrated assessment scenarios of climate-change mitigation in the context of sustainable development. Dedicated to open-source scientific software. <a href="#">#freethemodels</a> for open science!
HIGHLIGHTS	Research Scholar at the <a href="#">International Institute for Applied Systems Analysis (IIASA)</a> in the “Energy” research program since October 2015; Author & Chapter Scientist of the <a href="#">Special Report on Global Warming of 1.5 °C (SR15)</a> by the <i>Intergovernmental Panel on Climate Change (IPCC)</i> , published in October 2018; Lecturer at <a href="#">TU Wien</a> for the course <i>Open Source Energy System Modelling</i> .
PREVIOUS EXPERIENCE	Positions at the <a href="#">Whiting School of Engineering</a> , The Johns Hopkins University, Baltimore, and the think-tank <a href="#">Resources for the Future</a> , Washington, DC, spring 2015; Research Associate at the <a href="#">German Institute for Economic Research (DIW Berlin)</a> in the department “Energy, Transportation, Environment”, October 2012–September 2015; <a href="#">Energie-Control Austria</a> (Vienna, March–April 2012), the Austrian energy regulator, Department for Competition and Regulation.
ACADEMIC LEADERSHIP	Coordinator for the scenario ensemble compilation underpinning the quantitative assessment in the IPCC SR15, published as the <i>IAMC 1.5 °C Scenario Explorer hosted by IIASA</i> ( <a href="http://data.ene.iiasa.ac.at/iamc-1.5c-explorer/">data.ene.iiasa.ac.at/iamc-1.5c-explorer/</a> ); Presentation at the UN <i>Climate Change Conference COP24</i> , Katowice, Poland, in December 2018 as part of the <a href="#">PCCB Capacity-Building Hub</a> ; Co-Organizer of the <i>14<sup>th</sup> Workshop on Mathematical Economics in the Energy Sector</i> by the Austrian Operations Research Society (OeGOR), Vienna, June 2019.
PUBLICATIONS (SELECTED)	J. Rogelj, D. Huppmann, et al. A new scenario logic for the Paris Agreement long-term temperature goal. <i>Nature</i> 573(7774):357-363, 2019 doi: <a href="https://doi.org/10.1038/s41586-019-1541-4">10.1038/s41586-019-1541-4</a> D. Huppmann et al. The MESSAGEix Integrated Assessment Model & the ix modeling platform <i>Environmental Modelling &amp; Software</i> , 112:143-156, 2019 doi: <a href="https://doi.org/10.1016/j.envsoft.2018.11.012">10.1016/j.envsoft.2018.11.012</a> D. Huppmann et al. A new scenario resource for integrated 1.5 °C research. <i>Nature Climate Change</i> , 8:1027-1030, 2018 doi: <a href="https://doi.org/10.1038/s41558-018-0317-4">10.1038/s41558-018-0317-4</a>
HONORARY ACTIVITIES	Member of <a href="#">IAESTE</a> , an international traineeship exchange program for students of engineering and natural sciences to gain practical experience abroad; Participant and member of the Austrian organizing committee of the <a href="#">Model European Parliament</a> , a forum for young students interested in politics and the European Union.

## Curriculum Vitae – Dr. Daniel Huppmann

---

CURRENT	<p>Research Scholar at the <a href="#">International Institute for Applied Systems Analysis</a> (IIASA) in the “Energy” research program since October 2015;</p> <p>Scientific Lead of the <i>Modeling Platform Development Team</i> since February 2019.</p>
PREVIOUS POSITIONS	<p>Research Associate at the <a href="#">German Institute for Economic Research</a> (DIW Berlin) in the department “Energy, Transportation, Environment”, October 2012–September 2015;</p> <p>Postdoctoral Fellow at the <a href="#">Whiting School of Engineering</a>, The Johns Hopkins University, Baltimore, January–June 2015;</p> <p>Visiting Fellow at <a href="#">Resources for the Future</a>, Washington, DC, in spring 2015.</p>
EDUCATION	<p>Doctoral dissertation defended in June 2014 at <a href="#">Berlin University of Technology</a> for the academic degree <i>Dr.rer.oec.</i> (equiv. PhD in Economics, grade: <i>Summa cum laude</i>), written within the <a href="#">DIW Berlin Graduate Center of Economic and Social Research</a>;</p> <p>Graduated as <i>Diplom-Ingenieur</i> (Dipl.-Ing., equiv. MSc, 5-year degree) in Mathematics from <a href="#">Vienna University of Technology</a> in November 2010;</p> <p>Austrian high school final exam (<i>Matura</i>) passed with distinction at the <a href="#">Theresianische Akademie Wien</a> in June 2003.</p>
PROFESSIONAL EXPERIENCE	<p><a href="#">Energie-Control Austria</a> (Vienna, March–April 2012), the Austrian energy regulator, Department for Competition and Regulation; tasked with implementing a short-term electricity spot price forecast model;</p> <p><a href="#">ACTED</a> (Tajikistan, July–August 2006), a development cooperation agency; in charge of two projects on microfinance and market surveying;</p> <p><a href="#">Deloitte</a> (Paris, July–October 2005), an international financial services and audit firm; working in the EMEA Learning and Development department in Paris; responsible for preparation and logistics of training seminars;</p> <p>Government Accountability Project (Washington, DC, June–July 2004), an NGO and law firm focused on freedom of speech and whistleblower protection.</p>
ACADEMIC LEADERSHIP	<p>Author of the Summary for Policymakers and Chapters 2, 4 &amp; 5 of the Special Report on <a href="#">Global Warming of 1.5 °C (SR15)</a> by the <i>Intergovernmental Panel on Climate Change (IPCC)</i>, published in October 2018;</p> <p>Project lead for the scenario ensemble compilation underpinning the quantitative assessment in the IPCC SR15, published as the <i>IAMC 1.5 °C Scenario Explorer hosted by IIASA</i> (<a href="http://data.ene.iiasa.ac.at/iamc-1.5c-explorer/">data.ene.iiasa.ac.at/iamc-1.5c-explorer/</a>);</p> <p>Presentation at the UN <i>Climate Change Conference COP24</i>, Katowice, Poland, in December 2018 as part of the <a href="#">PCCB Capacity-Building Hub</a>;</p> <p>Co-Organizer of the <i>14<sup>th</sup> Workshop on Mathematical Economics in the Energy Sector</i> by the Austrian Operations Research Society (OeGOR), Vienna, June 2019;</p> <p>Member of the Advisory Board of the <a href="#">reFUEL</a> project funded by an <i>ERC Starting Grant</i> (Prof. Johannes Schmidt) at the University of Applied Life Sciences, Vienna (BOKU);</p> <p>Officer for Communication &amp; Outreach of the INFORMS Section “<a href="#">Energy, Natural Resources, and the Environment</a>” (ENRE) from 2016 until 2018;</p> <p>Conference Vice-Chair of the <i>10<sup>th</sup> Trans-Atlantic Infraday Conference</i>, held at the Federal Energy Regulatory Commission (FERC), Washington, D.C., November 2016;</p> <p>Committee Member for the <i>Student Travel Award 2016</i> of the INFORMS Section “<a href="#">Energy, Natural Resources, and the Environment</a>” (ENRE), chaired by Mark M. Nejad, University of Oklahoma</p> <p>Invited Session Chair for the session “Modelling the German <i>Energiewende</i>” at the 20<sup>th</sup> IFORS Conference, Barcelona, July 2014.</p>

HONORS & AWARDS	<p>Winner of the <i>2016 Young Researcher Prize</i> (with Sauleh Siddiqui), awarded by the INFORMS Section “Energy, Natural Resources, and the Environment” (ENRE);</p> <p>Conference Presentation Award for Young Researchers (<i>Vortragsprämie</i>) for a talk given at the INFORMS Annual Conference 2013 in Minneapolis, endowed by the <a href="#">German Bundesbank</a> and awarded by the <a href="#">Verein für Socialpolitik</a>, in December 2013;</p> <p>Funding grant for a 10-week research assistant position for a BSc student from the United States within the <i>RISE program</i> (Research Internships in Science and Engineering) by the <a href="#">German Academic Exchange Service (DAAD)</a>, in June–August 2013;</p> <p>Research grant and dissertation sponsorship awarded by <a href="#">Energie-Control Austria</a> within the special series “10 years of e-control”, in May 2011;</p> <p>“Wirtschaft-Ethik-Religion” award (<i>business-ethics-religion</i>) by the Federation of Austrian Industry for a study on corporate social responsibility (CSR) for multinational enterprises written as part of the Matura examinations, awarded in October 2003.</p>
TEACHING EXPERIENCE	<p>Lecturer at <a href="#">Technische Universität Wien</a> for the course <i>Open Source Energy System Modelling</i> in the summer semesters 2019 &amp; 2020 (<a href="#">link to TISS</a>);</p> <p>Lecturer/Adjunct Faculty at <a href="#">Webster Vienna Private University</a>, for the course <i>International Affairs: Power &amp; Technology</i>, in the fall semester 2017;</p> <p>Lecturer at the Oppdal PhD Winter School on <i>Stochastic programming in energy</i>, organized by <a href="#">NTNU Trondheim, Department of Industrial Economics &amp; Technology Management (IØT)</a>, in March 2016;</p> <p>Lecturer at the InfraTrain Autumn School on <i>One- and two-level energy modelling</i>, organized by the <a href="#">Workgroup on Infrastructure Policy, TU Berlin</a>, in October 2014; Teaching Assistant at the InfraTrain from 2009–2012, for various courses on stochastic dynamic optimization and equilibrium modelling;</p> <p>Lecturer at the Bad Hofgastein PhD Winter School on <i>Stochastic programming with applications in energy, finance and insurance</i>, organized by <a href="#">University of Vienna, Department of Statistics and Operations Research</a>, in April 2014;</p> <p>Lecturer at the Oppdal PhD Winter School on <i>Managing uncertainty in energy infrastructure investments</i>, organized by <a href="#">NTNU Trondheim, IØT</a>, in March 2011.</p>
STUDENT SUPERVISION	<p>Ryan Hanna, PhD candidate at the University of California, San Diego (UCSD), supervision &amp; mentoring in the <i>2017 Young Scientist Summer Program (YSSP)</i> at IIASA;</p> <p>Clara Orthofer, PhD candidate at the Technical University Munich (TUM), supervision &amp; mentoring in the 2016 YSSP at IIASA; winner of IIASA’s <i>2016 Peccei Award</i>;</p> <p>Alex Koberle, PhD candidate at the Energy Planning Program, COPPE/ UFRJ, Brazil, co-supervision &amp; mentoring in the 2016 YSSP at IIASA;</p> <p>Lissy Langer, co-supervision of MSc thesis submitted at TU Berlin in September 2015, written at Johns Hopkins University with financial support by the PROMOS program; currently a PhD student at TU Berlin;</p> <p>Simon Donges, co-supervision of MSc thesis submitted at TU Berlin in June 2015;</p> <p>Benjamin Boldt, co-supervision of MSc thesis submitted at TU Berlin in July 2014;</p> <p>Lukas Wuttke, co-supervision of BSc thesis submitted at TU Berlin in October 2013;</p> <p>Shayna Rose, at the time undergrad student at Johns Hopkins University, supervision during an internship at DIW Berlin funded by the DAAD RISE program, summer 2013; currently enrolled as a MSc student at Georgetown University.</p>
PROFESSIONAL MEMBERSHIP	<p>International Association for Energy Economics (IAEE), Institute for Operations Research and the Management Sciences (INFORMS), Gesellschaft für Operations Research e.V. (GOR), Österreichische Gesellschaft für Operations Research (OeGOR), Strommarkttreffen (<a href="http://www.strommarkttreffen.org">www.strommarkttreffen.org</a>)</p>

REVIEWER	Nature Energy, Energy Economics, Energy Policy, The Energy Journal, European Journal of Operational Research (EJOR), Climatic Change, Networks & Spatial Economics (NETS), Mathematical Methods of Operations Research (MMOR), IEEE Transactions on Power Systems (IEEE TPS), Technological Forecasting & Social Change, Optimization & Engineering
HONORARY ACTIVITIES	<p>Member of <a href="#">IAESTE</a>, an international traineeship exchange program for students of engineering and natural sciences to gain practical experience abroad;</p> <ul style="list-style-type: none"> <li>– <i>National Secretary</i> of IAESTE Austria in 2007, head of the exchange program and representative of the National Committee on the international level;</li> <li>– <i>Board Member</i> of IAESTE A.s.b.l. (IAESTE International) in 2010;</li> </ul> <p>Participation in the <a href="#">Model European Parliament</a>, a forum for young students interested in politics and the European Union; President of the General Assembly and head of the organising committee in several national and international sessions;</p> <p>Facilitator and workgroup leader at the <i>Waves of Democracy</i> in Brandbjerg, Denmark, in September 2006, an EU-funded project bringing together students to discuss participatory democracy &amp; citizens' rights.</p>
LANGUAGES	German (native); English (CAE, "A"-grade); French (Berlitz, "1"-grade); Russian (basics).
COMPUTER LITERACY	Office (MS Office); Math & programming (GAMS, Python, R, $\LaTeX$ ); Graphics (Adobe CS); Collaborative tools (Git, SVN); Web & Database (Java, ORACLE, SQL, HTML 5).
MISCELLANEOUS	Date of birth: January 3, 1985; Place of birth: Vienna, Austria; Military service: October 2003–May 2004, 3425 Langenlebern, Austria; office duties.

## Publications – Dr. Daniel Huppmann

---

### INTERNATIONAL REPORTS

Contributing Author to Chapter 3 of the [Emissions Gap Report 2019](#), published by *UN Environment* in November 2019;

Contributing Author to the Summary for Policymakers as well as Chapters 2 and 5 of the [Special Report on Global Warming of 1.5 °C \(SR15\)](#) by the *Intergovernmental Panel on Climate Change (IPCC)*, published in October 2018;

Contributing Author to Chapter 3 of the [Emissions Gap Report 2018](#), published by *UN Environment* in November 2018.

### PEER-REVIEWED PUBLICATIONS

J. Rogelj, D. Huppmann, V. Krey, K. Riahi, L. Clarke, M. Gidden, Z. Nicholls and M. Meinshausen. A new scenario logic for the Paris Agreement long-term temperature goal. *Nature* 573(7774):357-363, 2019 doi: [10.1038/s41586-019-1541-4](https://doi.org/10.1038/s41586-019-1541-4)

C. Orthofer, D. Huppmann, and V. Krey. South Africa after Paris – Fracking its Way to the NDCs?, *Frontiers in Energy Research*, 2019 doi: [10.3389/fenrg.2019.00020](https://doi.org/10.3389/fenrg.2019.00020)

D. Huppmann, M. Gidden, O. Fricko, P. Kolp, C. Orthofer, M. Pimmer, N. Kushin, A. Vinca, A. Mastrucci, K. Riahi, and V. Krey. The MESSAGEix Integrated Assessment Model and the ix modeling platform *Environmental Modelling & Software*, 112:143-156, 2019 doi: [10.1016/j.envsoft.2018.11.012](https://doi.org/10.1016/j.envsoft.2018.11.012) (electronic preprint: [pure.iiasa.ac.at/15157/](https://pure.iiasa.ac.at/15157/))

M. Gidden and D. Huppmann. pyam: a Python Package for the Analysis and Visualization of Assessment Models *The Journal of Open-Source Software (JOSS)* 4(33):1095, 2019, doi: [10.21105/joss.01092](https://doi.org/10.21105/joss.01092)

S. Parkinson, V. Krey, D. Huppmann, T. Kahil, D. McCollum, O. Fricko, E. Byers, M. Gidden, B. Mayor, Z. Khan, C. Raptis, N. Rao, N. Johnson, Y. Wada, N. Djilali, and K. Riahi. Balancing clean water-climate change mitigation trade-offs. *Environmental Research Letters* 14(1), 2019, doi: [10.1088/1748-9326/aaf2a3](https://doi.org/10.1088/1748-9326/aaf2a3)

O. Oke, D. Huppmann, M. Marshall, R. Poulton, and S. Siddiqui. Mitigating environmental and public-safety risks of United States crude-by-rail transport. *Networks & Spatial Economics*, 19(2):521–555, 2019 doi: [10.1007/s11067-018-9387-0](https://doi.org/10.1007/s11067-018-9387-0)  
earlier version published as: *DIW Discussion Paper 1575*, 2016

D. Huppmann, J. Rogelj, V. Krey, E. Kriegler, and K. Riahi. A new scenario resource for integrated 1.5 °C research. *Nature Climate Change*, 8:1027-1030, 2018  
doi: [10.1038/s41558-018-0317-4](https://doi.org/10.1038/s41558-018-0317-4)

A. Grubler, C. Wilson, N. Bento, B. Boza-Kiss, V. Krey, D. McCollum, N. Rao, K. Riahi, J. Rogelj, S. De Stercke, J. Cullen, S. Frank, O. Fricko, F. Guo, M. Gidden, P. Havlík, D. Huppmann, G. Kiesewetter, P. Rafaj, W. Schoepp and H. Valin. A low energy demand scenario for meeting the 1.5°C target and sustainable development goals without negative emission technologies. *Nature Energy* 3(6): 515-527, 2018  
doi: [10.1038/s41560-018-0172-6](https://doi.org/10.1038/s41560-018-0172-6)

D. McCollum, W. Zhou, C. Bertram, H. S. de Boer, V. Bosetti, S. Busch, J. Després, L. Drouet, J. Emmerling, M. Fay, O. Fricko, S. Fujimori, M. Gidden, M. Harmsen, D. Huppmann, G. Iyer, V. Krey, E. Kriegler, C. Nicolas, S. Pachauri, S. Parkinson, M. Poblete-Cazenave, P. Rafaj, N. Rao, J. Rozenberg, A. Schmitz, W. Schoepp, D. van Vuuren and K. Riahi. Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals. *Nature Energy*, 3(7):589–599, 2018  
doi: [10.1038/s41560-018-0179-z](https://doi.org/10.1038/s41560-018-0179-z)

D. Huppmann and S. Siddiqui. An exact solution method for binary equilibrium problems with compensation and the power market uplift problem. *European Journal of Operational Research*, 266(2):622-638, 2018 doi: [10.1016/j.ejor.2017.09.032](https://doi.org/10.1016/j.ejor.2017.09.032)  
earlier version published as: *DIW Discussion Paper 1475*, 2015 and on arXiv ([1504.05894](https://arxiv.org/abs/1504.05894))

A. Zerrahn and D. Huppmann. Network expansion to mitigate market power: How increased integration fosters welfare. *Networks & Spatial Economics* 17(2):611-644, 2017  
doi: [10.1007/s11067-017-9338-1](https://doi.org/10.1007/s11067-017-9338-1), earlier version published as: *DIW Discussion Paper 1380*, 2014

G. Marangoni, M. Tavoni, V. Bosetti, E. Borgonovo, P. Capros, O. Fricko, D. Gernaat, C. Guivarch, P. Havlik, D. Huppmann, N. Johnson, P. Karkatsoulis, I. Keppo, V. Krey, E. Broin, J. Price and D. van Vuuren. Sensitivity of projected long-term CO<sub>2</sub> emissions across the Shared Socioeconomic Pathways. *Nature Climate Change* 7(2):113-117, 2016 doi: [10.1038/nclimate3199](https://doi.org/10.1038/nclimate3199)

S. Yeh, Y. Cai, D. Huppmann, P. Bernstein, S. Tuladhar, and H. Huntington. North American natural gas and energy markets in transition: Insights from global models. *Energy Economics*, 60:405-415, 2016 doi: [10.1016/j.eneco.2016.08.021](https://doi.org/10.1016/j.eneco.2016.08.021)

F. Feijoo, D. Huppmann, L. Sakiyama, and S. Siddiqui. North American natural gas model – Impact of cross-border trade with Mexico. *Energy*, 112:1084-1095, 2016 doi: [10.1016/j.energy.2016.06.133](https://doi.org/10.1016/j.energy.2016.06.133) earlier version published as: *DIW Discussion Paper 1553*, 2016

L. Langer, D. Huppmann, and F. Holz. Lifting the US crude oil export ban: A numerical partial-equilibrium analysis. *Energy Policy*, 97:258-266, 2016 doi: [10.1016/j.enpol.2016.07.040](https://doi.org/10.1016/j.enpol.2016.07.040), earlier version published as: *DIW Discussion Paper 1548*, 2016

T. Brijs, D. Huppmann, S. Siddiqui, and R. Belmans. Auction-based allocation of shared electricity storage resources through physical storage rights. *Journal of Energy Storage*, 7:82-92, 2016 doi: [10.1016/j.est.2016.05.009](https://doi.org/10.1016/j.est.2016.05.009) earlier version published as: *DIW Discussion Paper 1566*, 2016

D. Huppmann and J. Egerer. National-strategic investment in European power transmission capacity. *European Journal of Operational Research*, 247(1):191-203, 2015 doi: [10.5547/01956574.33.4.1](https://doi.org/10.5547/01956574.33.4.1) earlier version published as: *DIW Discussion Paper 1379*, 2014

D. Huppmann and R. Egging. Market power, fuel substitution and infrastructure – A large-scale equilibrium model of global energy markets. *Energy*, 75:483-500, 2014 earlier version published as: *DIW Discussion Paper 1370*, 2014

D. Huppmann, S. A. Gabriel, and F. U. Leuthold. A note on allowing negative energy prices in a discretely constrained MPEC. *Energy Economics*, 40:1023-1025, 2013

D. Huppmann. Endogenous production capacity investment in natural gas market equilibrium models. *European Journal of Operational Research*, 231(2):503-506, 2013 earlier version published as: *DIW Discussion Paper 1253*, 2012

D. Huppmann and F. Holz. Crude oil market power – A shift in recent years? *The Energy Journal*, 33(4):1-25, 2012

R. Egging and D. Huppmann. Investigating a CO<sub>2</sub> tax and a nuclear phase-out with a multi-fuel market equilibrium model. *IEEE Conference Proceedings*, 9<sup>th</sup> International Conference on the European Energy Market (EEM), 2012

D. Huppmann, R. Egging, F. Holz, S. Ruester, and C. v. Hirschhausen. The world gas market in 2030 – Development scenarios using the World Gas Model. *International Journal of Global Energy Issues*, 35(1):64-84, 2011

#### POLICY BRIEFS & EDITORIALS

D. Huppmann and D. Livingston. *Stumbling to a new equilibrium: Understanding the current upheaval in the global crude oil market*. *IAEE Energy Forum Q3*, 2015

D. Huppmann and F. Holz. *What about the OPEC cartel?* *DIW Roundup* 58, 2015

D. Huppmann and F. Holz. *Modelling the impact of climate and energy policies*, *DIW Roundup* 44, 2014

A. Zaklan, K. Bernoth, D. Huppmann, C. Kemfert, and C. v. Hirschhausen. *Entwicklung der Erdölmärkte: Reservekapazität im Nahen Osten wirkt derzeit stabilisierend*, *DIW Wochenbericht* 78(21):3-9, 2011

C. v. Hirschhausen, F. Holz, D. Huppmann, and C. Kemfert. *Weltölmärkte: Angebotsmacht der OPEC ungebrochen*, *DIW Wochenbericht* 76(23):370-375, 2009

#### DISSERTATION & MSc THESIS

D. Huppmann. *Strategic behaviour in energy markets: Advances in complementarity and multi-stage equilibrium modelling*, *TU Berlin*, 2014

D. Huppmann. *Strategic investment decisions in crude oil production capacity and the impact on future supply bottlenecks*, *Vienna University of Technology*, 2010