

Laurent DROUET

Scientific computing, PhD in Integrated Assessment Modeling

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PROFESSIONAL EXPERIENCE

- Current* Senior Researcher at RFF-CMCC, EUROPEAN INSTITUTE ON ECONOMICS AND THE ENVIRONMENT (EIEE), Milan, Italy
- JULY 2018 *Scientific computing, Integrated Assessment Modeling*
- JUNE 2018 Senior Researcher at FEEM, FONDAZIONE ENI ENRICO MATTEI and Affiliate Researcher at CMCC, FONDAZIONE CENTRO EURO-MEDITERRANEO SUI CAMBIAMENTI CLIMATICI, Milan, Italy
- SEP 2012 *Integrated Assessment Modeling*
- JUL 2012 Post-doctoral Fellow at CRTE, CRP HENRI TUDOR, Esch-Sur-Alzette, Luxembourg
- JUL 2009 *Energy system modeler, Scientific computing*
- JUN 2009 Consultant at ORDECSYS, Chêne-Bourg, Switzerland
- NOV 2006 *Energy/Optimization Modeler, Scientific computing*
- JUN 2009 Post-doctoral Fellow at REME, EPFL, Lausanne, Switzerland
- FEB 2006 *Environmental economics modeler, Scientific computing*

EDUCATION

- 2006 Ph.D. in *Economy and Social Sciences*, **University of Geneva**, Switzerland
Visitor at the Paul Sherrer Institute, Villingen, Switzerland at the Energy Economics Groups.
- 2002 DESS in *Applied Mathematics and Computer Sciences*, **Institut des Mathématiques Appliquées**, Angers, France

PAPERS IN JOURNAL

K. Ricke, **L. Drouet**, M. Tavoni, K. Caldeira. *Country-level Social Cost of Carbon*. **Nature Climate Change**, accepted.

G. Luderer, Z. Vrontisi, C. Bertram, O. Edelenbosch, R. Pietzcker, J. Rogelj, HS De Boer, **L. Drouet**, J. Emmerling, O. Fricko, S. Fujimori, P. Havlík, G. Iyer, K. Keramidas, A. Kitous, M. Pehl, V. Krey, K. Riahi, B. Saveyn, M. Tavoni, D. Van Vuuren, E. Kriegler. *Residual fossil CO₂ emissions in 1.5–2°C pathways*. **Nature Climate Change**, 25 June 2018.

D. McCollum, W. Zhou, C. Bertram, HS 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, K. Riahi. *Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals*. **Nature Energy**, 18 June 2018.

Z. Vrontisi, G. Luderer, B. Saveyn, K. Keramidas, L. Reis, L. Baumstark, C. Bertram, H-S. de Boer, **L. Drouet**, K. Fragkiadakis, O. Fricko, S. Fujimori, C. Guivarch, A. Kitous, V. Krey, E. Kriegler, E. Broin, L. Paroussos, D. van Vuuren. *Enhancing global climate policy ambition towards a 1.5°C stabilization: a short-term multi-model assessment*. **Environment Research Letters**, Volume 13, Issue 4, 044039, 2018.

J. Rogelj, A. Popp, K. V. Calvin, G. Luderer, J. Emmerling, D. Gernaat, S. Fujimori, J. Strefler, T. Hasegawa, G. Marangoni, V. Krey, E. Kriegler, K. Riahi, D. P. van Vuuren, J. Doelman, **L. Drouet**, J. Edmonds, O. Fricko, M. Harmsen, P. Havlík, F. Humpenöder, E. Stehfest, M. Tavoni. *Scenarios towards limiting global mean temperature increase below 1.5°C*. **Nature Climate Change**, 8, 325–332, 2018.

I. Mouratiadou, M. Bevione, D. L. Bijl, **L. Drouet**, M. Hejazi, S. Mima, M. Pehl, G. Luderer. *Water demand for electricity in deep decarbonisation scenarios: a multi-model assessment*. **Climatic Change**, Volume

147, Issue 1–2, 91–106, March 2018.

H.L. van Soest, L. Aleluia Reis, **L. Drouet**, D.P. van Vuuren, M.G.J. den Elzen, M. Tavoni, K. Akimoto, K.V. Calvin, P. Fragkos, A. Kitous, G. Luderer, K. Riahi. *Low-emission pathways in 11 major economies: comparison of cost-optimal pathways and Paris climate proposals*. **Climatic Change**, Volume 142, 491–504, June 2017.

A. Gambhir, **L. Drouet**, D. McCollum, T. Napp, D. Bernie, A. Hawkes, O. Fricko, P. Havlik, K. Riahi, V. Bosetti, J. Lowe. *Assessing the Feasibility of Global Long-Term Mitigation Scenarios*. **Energies**, Volume 10, Number 1, January 2017.

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P. Kyle, N. Johnson, E. Davies, D. L. Bijl, I. Mouratiadou, M. Bevilacqua, **L. Drouet**, S. Fujimori, Y. Liu, and M. Hejazi. *Setting the System Boundaries of “Energy for Water” for Integrated Modeling*. **Environmental Science & Technology**, Volume 50, Number 17, pp 8930–8931, 2016.

L. Drouet. *Energy economics: Cheap oil slows climate mitigation*. **Nature Climate Change**, Volume 6, pp 660–661, July 2016.

L. Drouet, J. Emmerling. *Climate policy under socio-economic scenario uncertainty*. **Environmental Modelling & Software**, Volume 79, Pages 334–342, May 2016. Impact Factor: 4.42.

L. Drouet, V. Bosetti, M. Tavoni. *Selection of climate policies under the uncertainties in the Fifth Assessment Report of the IPCC*. **Nature Climate Change**, Volume 5, Pages 937–940, July 2015. Impact Factor: 15.30.

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E. Igos, B. Rugani, S. Rege, E. Benetto, **L. Drouet**, D. Zachary, T. Haas. *Integrated environmental assessment of future energy scenarios based on economic equilibrium models*. **Metallurgical Research & Technology**, Volume 111, Number 3, Pages 179–189, 2014.

J. Farlin, **L. Drouet**, T. Gallé, D. Pittois, M. Bayerle, C. Braun, P. Maloszewski, J. Vanderborght, M. Elsner and A. Kies. *Delineating spring recharge areas in a fractured sandstone aquifer (Luxembourg) based on pesticide mass balance*. **Hydrogeology Journal**, Volume 21, Issue 4, Page 799–812, 2013.

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Mitigation Policies After 2012 — Coupling the Residential Sector. **Environmental Modeling & Assessment**, Volume 17, Issue 3, Page 193–207, June 2012.

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L. Drouet, A. Haurie, J.-P. Vial and M. Vielle. *A game of international climate policy solved by a homogeneous oracle-based method for variational inequalities.* In: *Advances in Dynamic Games.* **Annals of the International Society of Dynamic Games**, 2011, Volume 11, Part 5, Pages 469–488, 2011.

R. Gainza-Carmenates, J.-C. Altamirano-Cabrera, P. Thalmann and L. Drouet. *Trade-offs and performances of a range of alternative global climate architectures for post-2012.* **Environmental Science & Policy**, Volume 13, Issue 1, Pages 63–71, February 2010.

L. Drouet, A. Haurie, F. Moresino, J.-P. Vial, M. Vielle and L. Viguier. *An oracle based method to compute a coupled equilibrium in a model of international climate policy.* **Computational Management Science**, Volume 5, Numbers 1–2, Pages 119–140, 2008.

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L. Drouet, N. Edwards, A. Haurie. *Coupling climate and economic models in a cost-benefit framework: A convex optimisation approach.* **Environmental Modeling and Assessment**, Volume 11, Number 2, Pages 101–114, 2006

C. Beltran, L. Drouet, N. Edwards, A. Haurie, J.-P. Vial and D. Zachary. *An Oracle Method to Couple Climate and Economic Dynamics.* In: *The Coupling of Climate and Economic Dynamics.* **Advances in Global Change Research**, Volume 22, Pages 69–95, 2005.

L. Drouet, A. Haurie, P. Thalmann, M. Vielle and L. Viguier. *A Coupled Bottom-Up/Top-Down Model for GHG Abatement Scenarios in the Swiss Housing Sector.* **Energy and Environment**, pages 27–61, 2005.

WORKING PAPERS

F. Babonneau, G. Corcos, L. Drouet, J.-P. Vial, *NeatWork, a tool for the design of gravity-driven water distribution systems for poor rural communities* **Optimization Online**, No. 2017–10–6240, October 2017.

M. Tavoni, V. Bosetti, S. Shayegh, L. Drouet, J. Emmerling, S. Fuss, T. Goeschl, C. Guivarch, T. S. Lontzek, V. Manoussi, J. Moreno-Cruz, H. Muri, M. F. Quaas, W. Rickels, *Challenges and Opportunities for Integrated Modeling of Climate Engineering*, **FEEM Working Paper**, No. 038.2017, September 2017.

J. Emmerling, L. Drouet, L. Aleluia Reis, M. Bevione, L. Berger, V. Bosetti, S. Carrara, E. De Cian, G. De Maere D’Aertrycke, T. Longden, M. Malpede, G. Marangoni, F. Sferra, M. Tavoni, J. Witajewski-Baltvilks, P. Havlik *The WITCH 2016 Model — Documentation and Implementation of the Shared Socioeconomic Pathways* **FEEM Working Paper**, No. 042.2016, June 2016.

A. Markandya, E. De Cian, L. Drouet, J. M. Polanco-Martínez, F. Bosello. *Building Uncertainty into the Adaptation Cost Estimation in Integrated Assessment Models.* **FEEM Working Paper**, No. 021.2016, March 2016.

H. van Soest, L. Aleluia Reis, D. van Vuuren, C. Bertram, L. Drouet, J. Jewell, E. Kriegler, G. Luderer, K. Riahi, J. Rogelj, M. Tavoni, M. den Elzen. *Regional Low-Emission Pathways from Global Models.* **FEEM Working Paper**, No. 110.2015, December 2015.

M. Labriet, L. Drouet, M. Vielle, A. Haurie, R. Loulou, A. Kanudia. *Assessment of the Effectiveness of Global Climate Policies Using Coupled Bottom-up and Top-down Models.* **FEEM Working Paper**, No. 23.2015, April 2015.

L. Drouet, V. Bosetti, M. Tavoni. *Robust selection of climate policies under current knowledge of uncertainties.* **IQ SCENE: Innovative techniques for Quantitative SCenarios in ENergy and Environmental research**, London, March 2014

L. Drouet and S. Rege. *Luxembourg Energy Review — Energy Reference Scenario for Luxembourg*. CRP Henri Tudor report, LUXEN Project, D1.1, 2012.

L. Drouet and D. Zachary. *ETEM Luxembourg, a reference energy scenario*. CRP Henri Tudor report, LEAQ Project, D1.1, 2011.

L. Drouet and J. Thénicié. *ETEM: An Energy/Technology/Environment Model to Assess Urban Sustainable Development Policies*. ORDECSYS, 2008

J.-C. Altamirano-Cabrera, L. Drouet, A. Sceia, P. Thalmann and M. Vielle. *Coupling GEMINI-E3 and MARKAL-CHRES to simulate Swiss Climate Policies*. Report for the Swiss FOEN, 2008.

L. Drouet, M. Labriet, R. Loulou and M. Vielle. *A master program that will drive the coupling of GEMINI-E3 and MARKAL-TIMES models*. TOCSIN report 5.1, 2008.

D. Bicchetti, L. Drouet, P. Thalmann, M. Vielle. *The feasibility of a world-wide tax on anthropogenic emissions of greenhouse gases: Levels and impacts of world-wide taxes on greenhouse gases*. Study prepared for the Swiss Federal Environment Office. Climate Economics at the NCCR Climate Research Paper, April 2007.

L. Drouet. *Modélisation intégrée du changement climatique: contribution de l'optimisation par oracle*. PhD Thesis, **University of Geneva**, 2006.

V. Bosetti and L. Drouet. *Accounting for Uncertainty Affecting Technical Change in an Economic-Climate Model*. **FEEM Working Paper**, No. 147.05, December 2005.

OTHER

Technical support of the book of P. Gerrard, R. M. Johnson. *Mastering Scientific Computing with R*. Packt Publishing, February 2015, 978-1783555253.

OPEN-SOURCE SOFTWARE

Neatwork: Optimal design of gravity-driven water supply network and Monte-Carlo network simulations.

Gdxtools: R package to manipulate GAMS data exchange files.