Nicolas Stevens

Researcher in Operations Research & Energy Economics

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Work Experience

Feb. 2025 – present **Post-doctoral researcher**, *Max Planck Institute for Research on Collective Goods & Forward Market Design*, Bonn, Germany
Research under the supervision of Prof. Axel Ockenfels and Prof. Peter Cramton.

Dec. 2024 – Jan.2024 **Post-doctoral researcher**, *CORE, UCLouvain*, Belgium
Under the supervision of Prof. Anthony Papavasiliou.

Sep. 2024 – Feb. 2025 **Visiting Researcher**, *Harvard Kennedy School*, United States
Research under the supervision of Prof. William Hogan. Invited speaker at the Energy Policy Seminar (Harvard) and at the LIDS EIMC2 Seminar (MIT).

Nov. 2020 – Dec. 2024 **PhD student**, *CORE, UCLouvain*, Belgium
The thesis, titled "*Price Formation with Non-Convexities: Theory and Applications for the Electricity Market*", is conducted under the supervision of Prof. Anthony Papavasiliou and Prof. Bert Willems. The thesis focused on electricity markets and, in particular, the pricing mechanisms in electricity auctions, from a computational, modelling and economical perspective. The PhD led to three "first author" journal publications.
Appreciable classes taken during the PhD: Advanced Microeconomics I: individual decision and general equilibrium; Advanced Microeconomics II: game theory and information economics, Social Choice Theory; Robust Optimization.

Sep. 2019 – Nov. 2020 **Senior Consultant in Optimization and Energy Markets**, *N-SIDE*, Belgium
Keeping former responsibilities while endorsing a more senior position: managing a project team, client relationship, lead business development activities. Main projects:
- *Statnett - balancing market study (2019-2020)*: address the problematic of the Norwegian balancing market design in the context of the pan-European reserve activation platform (MARI). The project led to a conference paper.
- *IEX - Indian DA market study (2019)*. Designing the day-ahead market for the Indian main power exchange. The project led to the effective implementation of the market clearing tool.
- *EU Commission - CoordiNet (H2020) (2019-2020)*. "Task leader" in this European project focused on local energy markets. N-SIDE was in charge of implementing a local energy market platform.

Sep. 2016 – Sep. 2019 **Consultant in Optimization and Energy Markets**, *N-SIDE*, Belgium
Working on projects relying on applied mathematics to address issues in the energy sector. Working with various stakeholders (TSO, DSO, Power Exchange). Endorsing the role of coding prototypes, developing mathematical and business strategy, presenting project results to clients. Main projects:
- *Elia - Dynamic reserve dimensioning strategy (2016-2017)*. Main consultant in charge of elaborating the Belgian approach to size the reserve (FRR) needs. The project led to the actual implementation of the approach, used by Elia since 2019. The project led to a journal publication.
- *EU Power Exchanges (Epex, NordPool, OMIE, etc.) - Member of the support team of EUPHEMIA (2017-2018)*. EUPHEMIA is the algorithm developed by N-SIDE and used daily by the power exchanges to clear the European electricity market.
- *Elia - Smart Maintenance Planning (2018)*. Develop an optimization tool for optimal maintenance planning. The project led to the actual implementation of the tool for Elia's daily activities.

Education

2024 **PhD in Applied Mathematics**, *UCLouvain*
The thesis dissertation is titled "*Price Formation with Non-Convexities: Theory and Applications for the Electricity Market*"

2023 **Master in Philosophy**, *UCLouvain*, *Summa cum laude*
Master Thesis in political philosophy about the moral standing of markets ("*L'éthique des marchés et ses limites : l'argument de corruption chez Sandel*").

2020 **Certificate in Philosophy**, *UCLouvain*, *Magna cum laude*

2016 **Master in Engineering, Applied Mathematics**, *UCLouvain*, *Magna cum laude*
Master Thesis in operations research applied to the electricity sector ("*Models and algorithms for pricing Unit Commitment*", co-supervised by ***ENGIE***). Appreciable classes : Operational research, Operational research in electricity market, Stochastic optimisation, Optimisation in production scheduling, Financial mathematics, Non-linear programming, etc.

Fall 2015 **Master exchange program**, *Polytechnique Montréal*

2014 **Bachelor in Engineering, Mechanics & Applied Mathematics**, *UCLouvain*, *Magna cum laude*
Appreciable classes : Numerical analysis, Graph theory, Game theory, Optimisation, etc.

Publications

Peer-Review Journal Articles

Ponthiere, G., and Stevens, N. (2025). The Morality of Markets. A Critique. *Mathematical Social Sciences*, 134: 14-19

Stevens, N., Papavasiliou, A., and Smeers, Y. (2024). On some advantages of convex hull pricing for the European electricity auction. *Energy Economics*, 134, 107542.

Stevens, N., Smeers, Y., and Papavasiliou, A. (2024). Indivisibilities in investment and the role of a capacity market. *Journal of Regulatory Economics*, 66, pp. 238–272.

Stevens, N., & Papavasiliou, A. (2022). Application of the Level Method for Computing Locational Convex Hull Prices. *IEEE Transactions on Power Systems*, 37(5), 3958-3968.

Mezghani, I., Stevens, N., Papavasiliou, A., and Chatzigiannis, D. I. (2023). Hierarchical coordination of transmission and distribution system operations in European balancing markets. *IEEE Transactions on Power Systems* 38 (5), 3990-4002.

De Vos, K., Stevens, N., Devolder, O., Papavasiliou, A., Hebb, B., and Matthys-Donnadieu, J. (2019). Dynamic dimensioning approach for operating reserves: Proof of concept in Belgium. *Energy Policy*, 124, 272-285.

Peer-Review Conference Papers

Papavasiliou, A., Bjørndal, M., Doorman, G., & Stevens, N. (2020). Hierarchical Balancing in Zonal Markets. *17th International Conference on the European Energy Market (EEM)*, pp. 1-6, IEEE.

Absil, P. A., Sluysmans, B., and Stevens, N. (2018). MIQP-based algorithm for the global solution of economic dispatch problems with valve-point effects. *Power Systems Computation Conference (PSCC)*, pp. 1-7, IEEE.

Working Papers

Stevens, N., O'Neill, R., and Papavasiliou, A. Average incremental cost pricing in electricity auctions.

Stevens, N., Papavasiliou, A., and Smeers, Y. Can capacity markets account for asset performances?

Teaching

Lecturer

Quantitative Energy Economics, 2022–2023, 2023–2024 (UCLouvain: LINMA2415): teach a share of the lectures of the semester.

Guest lecturer for Energy Markets and Demand, 2025 (UCLouvain: LLSMS2052)

Guest lecturer for CEER Training Academy Programme 2025 ("Electricity Market Designs in the Evolving Political Context ")

Teaching Assistant

Quantitative Energy Economics, 2022–2023, 2023–2024 (UCLouvain: LINMA2415)

Combinatorial optimization, 2021–2022, 2022–2023 (UCLouvain: LINMA2450)

Economics (for engineers), 2021–2022 (UCLouvain: LEPL1803)

Project in applied mathematics, 2020–2021 (UCLouvain: LFSAB1507)

Supervision and mentoring

Member of one master thesis supervision committee, 2024 ("Economic impact of congestion risk and optimal portfolio for siting renewable assets in Texas" by Anthony Chung).

Reviewing activities

Reviewer for The Energy Journal, Energy Economics, IEEE Transactions on Energy Markets, Policy, and Regulation, IEEE Transactions on Power Systems.

Languages

French	Native Speaker
English	Professional and Fluent, C1
Spanish	Basic level
Dutch	Basic level

Computer skills

Languages	Python, Julia & JuMP, Ampl, GAMS, Matlab, C, Java, VBA
Software	LaTeX, Microsoft Power Point, Word, Excel.