# Sinan Küfeoğlu

Address: Helsinki, Finland I Phone: +4479 3434 9538 I Email: sinan.kufeoglu@outlook.com I Nationality: Türkiye, Finland & UK

## Major achievements:

- Most read academic among 32 thousand academics and researchers affiliated with Cambridge University and registered on ResearchGate.
- My book "Emerging Technologies: Value Creation for Sustainable Development" has been downloaded more than 2 million times in three years.

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## Current Position

### Associate Professor
Associate Professor of Electricity Markets and Flexibility at the department of electrical engineering, University of Vaasa, Finland.

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## Professional Experience

### Senior Policy Manager
Office of Gas and Electricity Markets (Ofgem), UK Government, London, United Kingdom
Feb. 2023 – Present

- Responsible for Transmission Network Use of System (TNUoS) charges (~£5bn annually).
- Focused on energy systems management, security, Net Zero compliance, and impact assessment.

### Senior Research Fellow
University of Oxford, Oxford Institute for Energy Studies, UK | Jan. 2022 – Dec. 2022

- Commercial deployment of hydrogen energy in partnership with ExxonMobil, E.ON, JERA, Schlumberger, Saudi Aramco, SNAM, Scotiabank.

### Advisor
European Bank for Reconstruction and Development (EBRD), London, UK | Sep. 2021 – Dec. 2022

- Digital & cyber resiliency in critical infrastructure.

### Consultant
The World Bank, Washington D.C., USA | Mar. 2021 – Aug. 2021

- Future electricity markets, machine learning applications, and Datahub design for developing countries.

**Research Associate**
University of Cambridge, Department of Engineering, UK | Oct. 2020 – Nov. 2022

- Financing & procurement of digital innovation in smart cities within the Centre for Smart Infrastructure and Construction.

**Assistant Professor & International Outstanding Research Fellow (Principal Investigator)**
Istanbul Technical University & TÜBİTAK, Turkey | Jul. 2019 – Apr. 2022

- Awarded *International Outstanding Research Fellowship* (USD 540,000).
- Principal Investigator of *Digitalisation in the Energy Sector* project; led a team of 54 research assistants, interns, and students.
- Built an Open Digital Innovation Hub (budget > $0.5M).
- Taught Industrial Engineering courses.

**Advisor in Education for Sustainable Development**
UNITAR (CIFAL Istanbul), UN Institute for Training and Research | Feb. 2020 – Sep. 2021

**Research Associate & Fortum Foundation Fellow (80% FTE)**
University of Cambridge, Energy Policy Research Group, Judge Business School, UK | Sep. 2017 – Oct. 2019

- Research on electricity tariff reform, blockchain applications, peer-to-peer energy trading, EV integration.
- Collaborated with Ofgem and National Grid.

**Assistant to the Director of Energy Policy Forum (20% FTE)**
University of Cambridge, UK | Sep. 2017 – Oct. 2019

- Managed stakeholders and networks with EDF, Engie, Shell, Ofgem, BEIS, National Grid, RWE, and others.

**Instructor**
Judge Business School, University of Cambridge, UK | Autumn 2017

- Technology Policy I, MPhil in Technology Policy.

**Visiting Lecturer**
University College London, Institute of Sustainable Resources, UK | May 2017 – Sep. 2017

- EU Horizon 2020 project: Innovation pathways, strategies, and policies for low-carbon transition.

**Postdoctoral Researcher**
Aalto University, Finland & Kyushu Institute of Technology, Japan | Nov. 2015 – May 2017

- Climate change-energy nexus, economic assessment of power quality & microgrids.

### Researcher (Doctoral)
Aalto University, Finland | Sep. 2011 – Nov. 2015

- Doctoral research on value of electric power reliability, blackouts, and customer interruption costs.
- Projects: Smart Grids and Energy Markets (SGEM) & Smart Control Architecture for Smart Grids (SAGA).

### Teaching Assistant
Middle East Technical University (METU), Turkey | 2006–2007, 2009–2010

- Courses: Electromechanical Energy Conversion I & II, General Physics I & II laboratories.

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## Supervision of Graduate Students

**D.Sc. (Aalto Univeristy)**

- Niyazi Gündüz, *Value of Continuity of Electricity Supply*, Aalto University, 2015–2019

**MPhil (University of Cambridge)**

- Donato Melchiorre, *Feasibility of Using Electric Vehicles as Domestic Storage Systems*, 2017–2018
- Gaomin Liu, *New Business Models for Energy Trading Through Peer-to-Peer Energy and Flexibility Markets*, 2017–2018
- Dennis Khah, *Transitioning to Sustainable Transport and Achieving Carbon Budget Targets in the U.K.*, 2018–2019
- Shahvez Ul Haq, *Sustainable Mobility: Carsharing in Urban California*, 2020–2021

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## Education

- **Doctor of Science (Distinction)** – Aalto University, Finland | 2011–2015
- **MSc, Electrical Engineering** – Aalto University, Finland | 2010–2011
- **BSc (Hons), Electrical & Electronics Engineering** – METU, Turkey | 2004–2009
- **EIT ICT Labs Smart Energy Summer School** – Imperial College London & Karlsruhe Institute of Technology | 2012

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## Honours & Awards

- TÜBİTAK International Outstanding Research Fellowship (USD 540,000) | 2019–2023

- Fortum Foundation Postdoctoral Grant (EUR 30,000 & GBP 12,000) | 2017–2018
- Fulbright Opportunity Grant (USD 30,000) | 2008–2009
- METU Merit Scholarship (USD 10,000) | 2006–2007

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## Languages

- Turkish, English: Fluent
- Finnish: C1 (Listening, Reading, Writing), B1 (Speaking)
- French: B1 (Reading, Writing), A2 (Speaking)

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## Computer Skills

- Microsoft Office (Advanced), Matlab, C programming
- Simulation tools: ADS, KeyCreator, Genesys, Simplorer, Xilinx, Multisim

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## International Collaborations

- Aalto University, Finland
- Beijing Institute of Technology, China
- Hong Kong Productivity Council, China
- Kyushu Institute of Technology, Japan
- Istanbul Technical University, Turkey
- KEPCO & Seoul National University, South Korea
- Zurich University of Applied Sciences, Switzerland

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## Publications

### Peer-reviewed Journal Articles

1.F. Heymann, M. Galus, and S. Küfeoğlu. “Autonomous policy making -analysis and foresight for digitalizing energy systems”, Energy Research & Social Science, 2025.

2.S. Küfeoğlu, E. Açıkgöz, T. Arslan, J. Priesmann, A. Praktiknjo. “Designing the Business Ecosystem of a Decentralised Datahub,” Energies, 2022.

3.H. Chen, X., Niu, J., Xiang, M., He, W. and S. Küfeoğlu, “Estimating the marginal cost of reducing power outage durations in China: A parametric distance function approach”. Energy Policy, 155, p.112366. 2021.

4.H. Chen, L. Simin, L. Qiufeng, S. Xueli, W. Wendong, H. Rong, and S. Küfeoğlu. "Estimating the impacts of climate change on electricity supply infrastructure: A case study of China." Energy Policy, vol. 150, pp. 112119, 2021.

5.S. Küfeoğlu, S. Üçler, H. Chen. "Daylight Saving Time Policy," Energy Reports, vol. 7, pp. 5013-5025, 2021.

6.D. Aycı, F. Öğüt, U. Özen, B. B. İşgör, and S. Küfeoğlu. "Energy Optimisation Models for Self-Sufficiency of a Typical Turkish Residential Electricity Customer of the Future." Energies 14, no. 19: 6163, 2021.

7.S. Küfeoğlu and S. Üçler. " Designing the Business Model of an Energy Datahub," The Electricity Journal, vol.32, no.2, pp. 106907, 2021.

8.S. Küfeoğlu and D. Khah. "Emissins Performance of Electric Vehicles: a Case Study from the United Kingdom," Applied Energy, vol. 260, pp. 114241, 2020.

9.S. Küfeoğlu, S.W. Kim, Y.G. Jin. "History of electric power sector restructuring in South Korea and Turkey," The Electricity Journal, vol. 32, no. 10, pp. 106666, 2019.

10.S. Küfeoğlu and M. Pollitt. "The impact of PVs and EVs on Domestic Network Charges: a case study from Great Britain," Energy Policy, vol. 127, pp. 412-424, 2019.

11.S. Küfeoğlu, D. Melchiorre, K. Kotilainen. "Understanding Tariff Designs and Consumer Behaviour to Employ Electric Vehicles for Secondary Purposes in the United Kingdom," The Electricity Journal, vol. 32, no. 6, pp. 1-6, 2019.

12.S. Küfeoğlu and M. Ozkuran. "Bitcoin mining: A global review of energy and power demand," Energy Research & Social Science, vol. 58, pp. 101273, 2019.

13.S. Küfeoğlu, N. Gunduz, H. Chen, M. Lehtonen. "Shadow Pricing of Electric Power Interruptions," Energies, vol. 11, no.7, pp.1-14, 2018.

14.T. Kerdphol, F.S. Rahman, Y. Mitani, M. Watanabe, S. Küfeoğlu. "Robust Virtual Inertia Control of an Islanded Microgrid Considering High Penetration of Renewable Energy," IEEE Access, vol. 6 pp. 625-636, 2018.

15.T. Kerdphol, F.S. Rahman, Y. Mitani, K. Hongesombut, S. Küfeoğlu. "Virtual Inertia Control-Based Model Predictive Control for Microgrid Frequency Stabilization Considering High Renewable Energy Integration," Sustainability, vol. 9, no. 5, pp. 773, 2017.

16.N.Gündüz, S. Küfeoğlu, M. Lehtonen. "Impacts of natural disasters on Swedish electric power policy: a case study," Sustainability, vol. 9, no. 2, pp. 230, 2017.

17.S. Küfeoğlu and M. Lehtonen. "Macroeconomic assessment of voltage sags," Sustainability, vol. 8, no. 12, pp.1304, 2016.

18.S. Küfeoğlu and M. Lehtonen. "Interruption costs of service sector electricity customers, a hybrid approach," International Journal of Electrical Power & Energy Systems, vol. 64, pp. 588-595, 2015.

19.S. Küfeoğlu and M. Lehtonen. "Comparison of different models for estimating the residential sector customer interruption costs", Electric Power Systems Research, vol. 122, pp. 50-55, 2015.

20.S. Küfeoğlu, S. Prittinen, M. Lehtonen. "A Summary of the Recent Extreme Weather Events and Their Impacts on Electricity," International Review of Electrical Engineering, vol. 9, no. 4, pp. 821-828, 2014.

21.S. Küfeoğlu and M. Lehtonen. "A novel hybrid approach to estimate customer interruption costs for industry sectors," Engineering, vol. 5, no. 10A, pp. 7, 2013.

22.S. Küfeoğlu and M. Lehtonen. "Customer interruption costs estimations for service sectors via customer survey method: a case study," International Review of Electrical Engineering, vol. 8, no. 5, pp. 1532-1538, 2013.

23.W. Luo, M. Puolakka, M. Viikari, S. Küfeoğlu, A. Ylinen, L. Halonen. "Lighting Criteria for Road Lighting: A Review," Light & Engineering, vol. 20, no. 4, 2012.

## Books

1.Sinan Küfeoğlu, Financing the Green Transition, Springer Nature, Sustainable Development Goals Series, 2025 (in print).
2.Sinan Küfeoğlu, Exploring the Hydrogen Economy: Horizon Scanning for Business Cases, Edward Elgar Publishing, 2025.
3.Sinan Küfeoğlu, Net Zero: Decarbonizing the Global Economies, Springer Nature, Sustainable Development Goals Series, 2024.
4.Sinan Küfeoğlu, Hydrogen Economy: A Horizon Scanning for Business Cases, Edward Elgar, 2024.
5.Sinan Küfeoğlu and A. Talip Akgun: Cyber Resilience in Critical Infrastructure, Routledge, 2023.
6.Sinan Küfeoğlu, Emerging Technologies: Value creation for Sustainable Development, Springer Nature, Sustainable Development Goals Series, Connecting the Goals, 2022.
7.Sinan Küfeoğlu, Home of the Future: Digitalisation and Resource Management, Springer Nature, Sustainable Development Goals Series, SDG 11: Sustainable Cities and Communities, 2021.

## Peer-reviewed Conference Proceedings

1.S. Küfeoğlu, “Smart Contract Development for Peer-to-Peer Energy Trading “, International Scientific Conference on Power and Electrical Engineering, Riga, Latvia, 2022.
2.S. Küfeoğlu and D. Melchiorre, “Electric Vehicles and Batteries as Domestic Storage Units in the United Kingdom,” International Conference on Smart Power & Internet Energy Systems, Bangkok, Thailand, 2020.
3.M. Lehtonen, S. Küfeoğlu, N. Gunduz, “On the Evaluation of Customers Interruption Costs due to Unexpected Power Outages,” IEEE 59th International Scientific Conference on Power and Electrical Engineering of Riga Technical University (RTUCON), Riga, Latvia, 2018.
4.S. Küfeoğlu, M. Pollitt, K. Anaya, "Distribution System Operators in the World," The 36th USAEE/IAEE North American Conference, Washington D.C., USA, 2018.
5.S. Küfeoğlu, N. Gündüz, M. Lehtonen, "Customer Interruption Cost Estimations for Distribution System Operators in Finland," IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe), Sarajevo, Bosnia and Herzegovina, 2018.

6.S. Küfeoğlu, N. Gündüz, M. Lehtonen, "Climate change concerns and Finnish electric power supply security performance," IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe), Ljubljana, Slovenia, 2016.
7.S. Küfeoğlu, M. Lehtonen, "A review on the theory of electric power reliability worth and customer interruption costs assessment techniques,"13th International Conference on the European Energy Market, Porto, Portugal, 2016.
8.S. Küfeoğlu, M. Lehtonen, "A Comparison of Direct Worth and Relative Worth Studies for Outage Cost Estimations in Industry Sectors," In IEEE PES Innovative Smart Grid Technologies Conference Asia (ISGT-Asia), Bangkok, Thailand, 2015.
9.S. Küfeoğlu, S. Prittinen, M. Lehtonen,"Customer Interruption Costs Calculation of Finnish Electricity Customers," 12th International Conference on the European Energy Market, Lisbon, Portugal, 2015.
10.S. Küfeoğlu, M. Lehtonen, "Cyclone Dagmar of 2011 and its impacts in Finland," IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe), pp. 1-6, Istanbul, Turkey, 2014.
11.S. Küfeoğlu, M. Lehtonen, "Evaluation of power outage costs for industrial sectors in Finland," 22nd International Conference and Exhibition on Electricity Distribution, CIRED, vol. 2013, no. 615, Stockholm, Sweden, 2013.

### Peer-reviewed Technical Reports

1.S. Küfeoğlu, From Hydrogen Hype to Hydrogen Reality: A Horizon Scanning for the Business Opportunities, Department of Engineering, University of Cambridge, Working Paper, 2023.

2.S. Küfeoğlu, G. Liu, K. Anaya, M. Pollitt. “Digitalisation and New Business Models in Energy Sector,” Faculty of Economics, University of Cambridge, Working Paper, 2019.

3.N. Hughes, E. Goudouneix, D. Calbay, S. Küfeoğlu. “Annex 6 – National innovation systems in a global context: comparison of the impacts of innovation in wind power and solar PV in four European countries.” In Verdolini, E. (ed.) D2.4 Report on the sectoral and national (plus EU) innovation system case studies. INNOPATHS – Innovation pathways, strategies and policies for the Low-Carbon Transition in Europe. 2019.

4.D. Melchiorre and S. Küfeoğlu. “Economic Assessment of Using Electric Vehicles and Batteries as Domestic Storage Units in the United Kingdom,” EPRG, University of Cambridge Working Paper, 2018.

5.S. Küfeoğlu, M. Pollitt, K. Anaya. “Electric Power Distribution in the World: Today and Tomorrow,” EPRG, University of Cambridge Working Paper, 2018.

6.N. Gunduz, S. Küfeoğlu, C. Winzer, M. Lehtonen. “Regional Differences in Economic Impacts of Power Outages in Finland,” EPRG, University of Cambridge Working Paper, 2018.

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## Teaching Experience

- Pedagogical training: A! Peda Intro, Aalto University, 2013

•Spring 2023 / EE510, Value Creation for Sustainable Development/ 8 ECTS / Instructor – Ostim Technical University

We review the principles of 34 emerging technologies and their applications toward achieving the United Nations Sustainable Development Goals. We draw on reviews of the business models of 650 companies worldwide and offer a theoretical background in innovation and entrepreneurship. Through this course, the students will gain experience in literature review, quantitative and qualitative analysis, writing and presentation skills. They will also practice creating a start-up with a reliable business model.

•Autumn 2022 / EE510, Emerging Technologies / 8 ECTS / Instructor – Ostim Technical University

The main purpose of this course is to acquaint students with the recent technologies and developments in energy and sustainability fields, which will constitute the core of future smart cities. Through this course, the students will gain experience in literature review, quantitative and qualitative analysis, writing and presentation skills. They will also practice creating a start-up with a reliable business model.

•Spring 2022 / EE510, Emerging Technologies / 8 ECTS / Instructor – Ostim Technical University

The main purpose of this course is to acquaint students with the recent technologies and developments in energy and sustainability fields, which will constitute the core of future smart cities. Through this course, the students will gain experience in literature review, quantitative and qualitative analysis, writing and presentation skills. They will also practice creating a start-up with a reliable business model.

•Spring 2021 / ENV5001, Sustainable Energy and the Environment / 8 ECTS / Instructor – Bahcesehir University

Definition of sustainable systems. Environmental, social, and economic sustainability. Principles and definitions: scope of sustainability; global targets; consumption, population, the relation between technology and resources, environmental impacts; measure of sustainability; ecological footprint analysis. Environmental scope: analysis and decoupling of the relation between economic growth and environmental degradation; natural and economic externalities; economic opportunity analysis. Social scope: socio-economic and sociotechnical perspectives.

•Spring 2021 / ISL465E, Introduction to Entrepreneurship & Innovation / 4 ECTS / Instructor – Istanbul Technical University

The entrepreneurial and innovation process, Entrepreneurial and innovative creativity, Relationship between entrepreneurship and innovation, Sources of innovation, Search strategies for innovation, Assessing opportunities and risks of innovation projects, Business models and capturing value, New product development, Exploiting knowledge and intellectual property Social and sustainability-led innovation and entrepreneurship.

•Autumn 2020 / END 443E, Business Planning and Innovation / 5 ECTS / Instructor – Istanbul Technical University

To teach how to plan a business starting from the phase of thought till the phase of business generation, how to select the business areas that an organisation will enter, and how to teach evaluation approaches to enter a business area.

•Autumn 2020 / GEP 02212, Emerging Technologies and Value Creation in Smart Cities / 5 ECTS / Course organiser and Instructor – Istanbul Technical University

Business model and start-up creation in Smart Cities. Carbon management, carbon credits. Smart buildings. Data management. Energy efficiency, energy savings, domestic applications. EVs, grid services, EV sharing, fleet management, smart charging and smart parking. Grid services, grid performance and monitoring. Platforms, Peer-to-Peer energy trade, flexibility, storage. Smart metering, billing and switching.

•Autumn 2020 / INE 4016, Designing an Open Digital Innovation Hub/ 5 ECTS / Course organiser and Instructor – Bahcesehir University

This course aims to understand the digitalisation in technology sector, particularly in the energy and sustainability fields. As a first step, the course work will review Big Data, IoT, Artificial Intelligence, Machine Learning and Deep Learning applications worldwide. After this, it will focus on Blockchain technology and its possible applications. Peer-to-Peer (P2P) trade options will also be included. Students will form hypothetical start-ups to introduce innovative business models.

•Spring 2020 / EEE4930, Emerging Technologies and Value Creation in Smart Cities / 5 ECTS / Course organiser and Instructor – Istanbul Technical University

•Spring 2020 / END622E, Technological Innovation and Strategic Management / 5 ECTS / Instructor – Istanbul Technical University

To develop strategic management processes, a framework to understand the structure and dynamics of businesses prone to innovative transformations caused by highly complex and advanced technologies. External environment analysis, competition analysis, analysis of internal resources and capabilities, development of strategies, delivery of innovation and added value, case studies.

•Autumn 2017 / TP1, MPhill Technology Policy I / Instructor – Judge Business School, University of Cambridge

In Search of ‘Good’ Technology Policy, Case: Clean air policy in London and Beijing, Human behaviour, prediction and technology, Discussion: Electrical energy storage, Case: Lessons from smart electricity meters. Politics, the policy process and technology, Discussion: Scientific agriculture, Case: GM foods in the UK.

•Spring 2016 / S039Z-LZ Contemporary Topics in Electric Power Business / 4 ECTS / Course organiser and Instructor – Aalto University

Innovative technologies and innovation design of disruptive technologies. Energy storage technologies: pumped hydro storage (PHS), pumped water, compressed air energy storage (CAES), and batteries. Energy generation technologies: biomass, heat pumps, energy from waste. District heating & cooling. Zero energy and smart buildings.

•Spring 2016 / S-18.4118 Protective Relaying and Distribution Automation / 5 ECTS / Instructor – Aalto University

•Spring & Autumn 2015 / S039Z Europe's Energy Future / 4 ECTS / Course organiser and Instructor – Aalto University

The worth of electric power reliability and the economic impacts of power interruptions. The impacts of climate change on electric power. European energy policies. The European Union 2020, 2030 and 2050 energy goals. European Internal Electricity Market. Demand Side Management. Smart Grids. Energy regulations. The Energy Trillema concept.

•Autumn 2015 / ELEC-E8413 Power Systems / 5 ECTS / Teaching Assistant – Aalto University

•Spring 2010 / EE362 Electromechanical Energy Conversion II / 4 cr. (7 ECTS) / Teaching Assistant

•Autumn 2009 / EE361 Electromechanical Energy Conversion I / 4 cr. (7 ECTS) / Teaching Assistant

•Spring 2007 / PHYS106 General Physics II / 5 cr. (6.5 ECTS) / Teaching Assistant

•Autumn 2006 / PHYS105 General Physics I / 5 cr. (6.5 ECTS) / Teaching Assistant

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## Memberships

- IEEE – Institute of Electrical and Electronics Engineers
- IAEE – International Association for Energy Economics
- USAEE – United States Association for Energy Economics

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## Reviewer for Journals

- IEEE Transactions on Power Systems
- IEEE Transactions on Power Delivery
- Energy Policy (Elsevier)
- Applied Energy (Elsevier)
- Science of the Total Environment (Elsevier)

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## Select Public Engagements & Media

- Speaker: South Korea National Assembly, The role of an independent regulator in the British energy landscape

- Speaker: UK House of Lords, Small Modular Nuclear Reactors
- Speaker: UK House of Commons, Post-Brexit Industrial Strategy
- Media: Interviewed by BBC News, Nature, Der Spiegel, China Radio International