

# LINGKANG JIN, PHD

Energy systems modeler/researcher

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## WHO AM I

Energy system researcher, with mechanical engineering background having over four years of experience in the energy field. I am ready to have an effective role in positions in the energy transition and storage-related sector.

## MY ROLES

### Energy storage specialist

Specialized in investment analysis of energy storage systems integration and control using python based physic informed programming .

### ML/Data scientist

Energy data web scrapping, Supervised and unsupervised machine learning models development, Machine learning-based surrogate modeling.

### Energy/Power systems modeler

Experienced GIS modeling at NUTS2 level of the energy infrastructure, Multi-energy systems modeling and sector coupling.

## EXPERIENCE

Jan 2024 - Now	<b>Postdoctoral Researcher</b> <i>Eindhoven University of Technology, NL</i> <b>Focus:</b> Battery storage and grid assets control for congestion management in Dutch MOOI projects. <b>Skills:</b> Data analysis, APIs, ML, optimization, congestion management, data science, power flow.
Oct 2020 - Nov 2023	<b>Energy Systems Ph.D. Candidate</b> <i>Università Politecnica delle Marche, IT</i> <b>Focus:</b> Storage modeling and integration for multi-carrier energy communities. <b>Skills:</b> Multi-physics systems, EU projects, system planning, optimization models.
Sep 2020 - Oct 2023	<b>Engineering Consultant (Freelance)</b> <i>Remote</i> <b>Focus:</b> R&D thermal/CAD for Nrger; procurement for CAP-XX.
Dec 2019 - Sep 2020	<b>Lab Engineer</b> <i>Whirlpool EMEA, IT</i> <b>Focus:</b> Prototype testing for NVH compliance.

## EDUCATION

Oct 2020 - Mar 2024	<b>Ph.D. in Energy Systems</b> <i>Università Politecnica delle Marche, IT</i> <b>Thesis:</b> Energy storage in multi-energy carrier communities: Li-ion batteries and hydrogen multi-physical details for integration into the planning stage.
Sep 2017 - Nov 2019	<b>M.Sc. in Mechanical Engineering</b> <i>Università Politecnica delle Marche, IT</i> <b>Thesis:</b> Wind resource assessment for a preliminary offshore wind farm project.
Sep 2014 - Jul 2017	<b>B.Sc. in Mechanical Engineering</b> <i>Università Politecnica delle Marche, IT</i> <b>Thesis:</b> Matlab code development for the Laser Doppler Vibrometry testing.

## CERTIFICATES & AWARDS

- Cambridge C1 level English certificate
- European driving license (cat. B), released in Italy
- In Studiis Laus award for the excellent in high school performance

## REFEREES

<b>Dr. Phuonng Nguyen</b> <i>TU Eindhoven, NL</i> P.Nguyen.Hong@tue.nl Postdoc supervisor	<b>Dr. Nikolaos Paterakis</b> <i>TU Eindhoven, NL</i> n.paterakis@tue.nl Postdoc supervisor	<b>Prof. Gabriele Comodi</b> <i>Univ. Pol. Marche, IT</i> g.comodi@staff.univpm.it Ph.D. supervisor
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## SOFT SKILLS

### Social

- Team working person in international context.
- Proactive in the projects.
- Public speaker conferences and lectures.

### Self-organizational

- Critical thinker & goal oriented.
- Independent and willing to adapt in different environments.
- Demonstrated organization skills for webinars and workshops.

## AREAS OF EXPERTISE

### Electrical engineering & energy transition

Battery and hydrogen multi-physic modeling  
Congestion management  
Grid power flow  
Grid & User Assets Management

### Optimization models application

Multi-energy systems & Local Energy Communities  
Multi-objective programming  
LP, MILP, SOCP  
Deterministic optimization models (Pyomo/Gurobi)  
Geo referenced planning (Geopandas)

### Data science & IT

RESTAPI  
HPC computing  
Git  
Python  
Explanatory Data Analysis  
Time series forecast  
Graph Neural Network surrogates

### Mechanical engineering

CAD & CFD  
Turbo-machinery and energy systems  
Thermodynamic cycles analysis

## LANGUAGES

Italian	● ● ● ● ●
Chinese	● ● ● ● ●
English	● ● ● ● ●

# ADDITIONAL INFORMATION

## PROJECTS

ORKEST Optimal integration of network flexibility and asset intelligence to increase large-scale integration of RES, while maintaining reliability

Netherlands Enterprise Agency (RVO)

📅 2025-2026

📍 Netherlands

Congestion management and asset control integration for the RES integration with the active involvement of DSO (Stedin)

**Consortium:** Stedin, Technical University of Eindhoven, DNV (research), Phase2Phase, TecnoIution

**Scale:** National, the Netherlands.

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NetOptimalisatie voor Grootschalige Inpassing Zon- en windstroom Middels Opslag en Software (NO-GIZMOS)

Netherlands Enterprise Agency (RVO)

📅 2022-2025

📍 Netherlands

Congestion management for Large-scale Integration of Solar and Wind Power Through Storage and Software with real demonstrator with active involvement of DSO (ENEXIS).

**Consortium:** ENEXIS (DSO), Technical University of Eindhoven (research), University of Applied Sciences of Groningen (research), CGI (data management), Energykansen (local energy community), iWell (Technology provider).

**Scale:** National, the Netherlands.

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Gretha

Italian ministry of research

📅 2023

📍 Italy

Research project about developing a novel GReen Energy Technology based on fuel cells, Hydrogen And renewables.

**Consortium:** Universita' Politecnica delle Marche (research), ENAV (Aviation), TECNOSISTEM (engineering), UNINA (research).

**Scale:** National, Italy.

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eNeuron

EU commission/Horizon 2020

📅 2020-2024

📍 Italy

Research project about Optimising the design and operation of local energy communities based on multi-carrier energy systems.

**Consortium:** ENEA(project coordination), EPRI (research), IEN, City of Bydgoszcz (local authority), ENEIDA.io(IOT), IREC (modeling), Universita' Politecnica delle Marche (research), DERlab, Iede, edp Iabellec, Technical University of Eindhoven, Sintef, Tecnalia, Universidad Politecnica de Madrid, ENEA operator, ICONS, Marinha Portuguesa, FOSS.

**Scale:** International, Europe.

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Ricerca del sistema elettrico italiano

Italian ministry of research

📅 2020-2022

📍 Italy

Research project about the development of a methodology for optimal planning for a 'Multi-energy system Energy Community' for medium-long term'.

**Consortium:** ENEA, Universita' Politecnica delle Marche research.

**Scale:** National, Italy.

## TEACHING EXPERIENCE

- **Type:** Lecture (*Energy storage and their role in the power systems*)
  - **Audience:** Electrical engineering MSc students (Electrical Power Systems for EE)
  - **Where:** Technical University of Eindhoven, NL
- **Type:** Lecture (*Master Lecture How to build an optimization model*)
  - **Audience:** MSc Sustainable Energy Technology
  - **Where:** Technical University of Eindhoven, NL
- **Type:** Lecture (*sistemi di accumulo e loro gestione*)
  - **Audience:** Mechanical engineering MSc students
  - **Where:** Universita'Politecnica delle Marche, IT
- **Type:** Lecture (*Pyomo optimizaion model set-up*)
  - **Audience:** Mechanical engineering MSc students
  - **Where:** Universita'Politecnica delle Marche, IT

## MASTER THESIS DAILY SUPERVISION

- Chengyuan Guan, *Optimal Sizing of Hybrid Renewable Energy Solutions for Data Centers: Case Studies of Non-Firm Grid, Reduced- and Off-Grid Scenarios*, MSc Sustainable Energy Technology, Technical University of Eindhoven, 2025.
- Dennis Hollanders, *Graph Neural Networks for Distribution Network Reconfiguration Optimization*, Department of Industrial Engineering & Innovation Sciences Information Systems Research Group, Technical University of Eindhoven, 2025.
- Stefan De Lange, *Hybrid Heat Pump Optimization for Flexibility Provision: Modeling and Simulation*, Department of Electrical Engineering, Technical University of Eindhoven, 2024.
- Fabian Caipa Cure, *Adaptive Distributionally Robust Optimization for Residential Energy Management under Non-firm Capacity Contracts*, Department of Mechanical Engineering, Master's in Sustainable Energy Technology, Technical University of Eindhoven, 2024.
- Francesco Panara, *Study of Hydrogen-to-Power systems: state-of-the-art of alkaline and Proton Exchange Membrane fuel cells and performance evaluation through Python modelling*, Dipartimento di Ingegneria Industrial e Scienze Matematiche, Università Politecnica delle Marche, 2023.
- Filippo Onori, *Design and management of a "Battery Energy Storage System" (BESS) to provide flexibility service to the national electricity grid*, Dipartimento di Ingegneria Industrial e Scienze Matematiche, Università Politecnica delle Marche, 2023.
- Francesca Mennilli, *Study of systems related to Power-to-Hydrogen: state of art of the electrolyser and its modeling using Python*, Dipartimento di Ingegneria Industrial e Scienze Matematiche, Università Politecnica delle Marche, 2022.
- Luca Ciotti, *Study of systems related to Power-to-Hydrogen: state of art of the storage and its modeling using Python*, Dipartimento di Ingegneria Industrial e Scienze Matematiche, Università Politecnica delle Marche, 2022.

## PUBLICATIONS

### Journal Articles

- L. Jin, R. Nogueira Nakashima, G. Comodi, and H. L. Frandsen, "Alkaline electrolysis for green hydrogen production: A novel, simple model for thermo-electrochemical coupled system analysis," *Applied Thermal Engineering*, vol. 262, p. 125 154, 2025, ISSN: 1359-4311. DOI: <https://doi.org/10.1016/j.applthermaleng.2024.125154>.
- L. Jin, M. Rossi, A. Monforti Ferrario, F. Mennilli, and G. Comodi, "Designing hybrid energy storage systems for steady green hydrogen production in residential areas: A gis-based framework," *Applied Energy*, vol. 389, p. 125 765, 2025, ISSN: 0306-2619. DOI: <https://doi.org/10.1016/j.apenergy.2025.125765>.
- L. Jin, M. Kazemi, G. Comodi, and C. Papadimitriou, "Assessing battery degradation as a key performance indicator for multi-objective optimization of multi-carrier energy systems," *Applied Energy*, vol. 361, p. 122 925, 2024, ISSN: 0306-2619. DOI: <https://doi.org/10.1016/j.apenergy.2024.122925>.
- F. Mennilli, L. Jin, M. Rossi, and G. Comodi, "Assessment of a naoh-based alkaline electrolyser's performance: System modelling and operating parameters optimisation," *International Journal of Hydrogen Energy*, vol. 85, pp. 625–634, 2024, ISSN: 0360-3199. DOI: <https://doi.org/10.1016/j.ijhydene.2024.08.175>.
- A. Pizzuti, L. Jin, M. Rossi, F. Marinelli, and G. Comodi, "A novel approach for multi-stage investment decisions and dynamic variations in medium-term energy planning for multi-energy carriers community," *Applied Energy*, vol. 353, p. 122 177, 2024, ISSN: 0306-2619. DOI: <https://doi.org/10.1016/j.apenergy.2023.122177>.
- M. Rossi, L. Jin, A. Monforti Ferrario, *et al.*, "Energy hub and micro-energy hub architecture in integrated local energy communities: Enabling technologies and energy planning tools," *Energies*, vol. 17, no. 19, 2024, ISSN: 1996-1073. DOI: 10.3390/en17194813.
- L. Jin, M. Rossi, L. Ciabattoni, M. Di Somma, G. Graditi, and G. Comodi, "Environmental constrained medium-term energy planning: The case study of an italian university campus as a multi-carrier local energy community," *Energy Conversion and Management*, vol. 278, p. 116 701, 2023, ISSN: 0196-8904. DOI: <https://doi.org/10.1016/j.enconman.2023.116701>.
- L. Jin, M. Rossi, A. Monforti Ferrario, J. C. Alberizzi, M. Renzi, and G. Comodi, "Integration of battery and hydrogen energy storage systems with small-scale hydropower plants in off-grid local energy communities," *Energy Conversion and Management*, vol. 286, p. 117 019, 2023, ISSN: 0196-8904. DOI: <https://doi.org/10.1016/j.enconman.2023.117019>.
- E. Marchegiani, F. Ferracuti, A. Monteriù, *et al.*, "Li-ion battery aging model robustness: An analysis using univariate and multivariate techniques," *Journal of Energy Storage*, vol. 72, p. 108 591, 2023, ISSN: 2352-152X. DOI: <https://doi.org/10.1016/j.est.2023.108591>.
- L. Jin, A. Monforti Ferrario, V. Cigolotti, and G. Comodi, "Evaluation of the impact of green hydrogen blending scenarios in the italian gas network: Optimal design and dynamic simulation of operation strategies," *Renewable and Sustainable Energy Transition*, vol. 2, p. 100 022, 2022, ISSN: 2667-095X. DOI: <https://doi.org/10.1016/j.rset.2022.100022>.
- A. Nadeem, M. Rossi, E. Corradi, L. Jin, G. Comodi, and N. A. Sheikh, "Energy-environmental planning of electric vehicles (evs): A case study of the national energy system of pakistan," *Energies*, vol. 15, no. 9, 2022, ISSN: 1996-1073. DOI: 10.3390/en15093054.

### Conference Proceedings

- L. Jin, S. Zhan, S. Cudjoe, and N. G. Paterakis, "Empowering low-voltage grids: Real-world implementation of home batteries for effective congestion management," in *2025 IEEE Kiel PowerTech*, 2025, pp. 1–6. DOI: 10.1109/PowerTech59965.2025.11180463.
- X. Li, J. J. Markus, S. De Lange, L. Jin, K. Kok, and N. G. Paterakis, "Hybrid heat pump flexibility allocation: Quantified thermal comfort-based congestion management," in *2025 IEEE International Conference on Environment and Electrical Engineering and 2025 IEEE Industrial and Commercial Power Systems Europe (EEEIC / ICPS Europe)*, 2025, pp. 1–6. DOI: 10.1109/EEEIC/ICPEurope64998.2025.11169153.
- H. Zhang, L. Jin, K. Kok, and N. G. Paterakis, "Surrogate model-based reinforcement learning for bidding strategies in local flexibility markets," in *2025 IEEE International Conference on Environment and Electrical Engineering and 2025 IEEE Industrial and Commercial Power Systems Europe (EEEIC / ICPS Europe)*, 2025, pp. 1–6. DOI: 10.1109/EEEIC/ICPEurope64998.2025.11169071.
- L. Jin, X. Li, S. De Lange, H. Slootweg, and N. G. Paterakis, "Response allocation of domestic hybrid heat pumps flexibility for congestion management," in *2024 IEEE PES Innovative Smart Grid Technologies Europe (ISGT EUROPE)*, 2024, pp. 1–5. DOI: 10.1109/ISGTEUROPE6299.2024.10863630.

- F. Mennilli, L. Jin, M. Rossi, and G. Comodi, "A fitting process for the optimal modelling of an anion exchange membrane (aem) electrolyser," in *Proceedings of the ASME Turbo Expo 2024: Power for Land, Sea, and Air*, vol. 2: Ceramics and Ceramic Composites; Coal, Biomass, Hydrogen, and Alternative Fuels, Jun. 2024, V002T03A017.
- M. D. Somma, L. Jin, N. Bianco, and C. Papadimitriou, "Advancing multi-energy hub design: An integrated approach for optimizing residential clusters in high res penetration scenarios," in *2024 International Conference on Smart Energy Systems and Technologies (SEST)*, 2024, pp. 1–6. DOI: 10.1109/SEST61601.2024.10694519.
- J. C. Alberizzi, M. A. Pérez Estevez, M. Renzi, L. Jin, M. Rossi, and A. Alberizzi, "Optimal management of a hydro – wind energy system with hydrogen storage," in *2023 12th International Conference on Power Science and Engineering (ICPSE)*, 2023, pp. 46–50. DOI: 10.1109/ICPSE59506.2023.10329307.
- A. Bechmann, T. Barlas, H. L. Frandsen, L. Jin, and R. N. Nakashima, "The hydrogen wind turbine: Design of a wind turbine optimised for hydrogen production," 1, vol. 2507, IOP Publishing, May 2023, p. 012 010. DOI: 10.1088/1742-6596/2507/1/012010.
- M. Di Somma, A. Buonanno, M. Caliano, *et al.*, "Stochastic energy management for the italian univpm campus as a multi-carrier energy hub participating in the day-ahead market," in *IEEE EUROCON 2023 - 20th International Conference on Smart Technologies*, 2023, pp. 251–256. DOI: 10.1109/EUROCON56442.2023.10199000.
- L. Jin, R. N. Nakashima, H. L. Frandsen, and G. Comodi, "Alkaline electrolysis for green hydrogen production: Techno-economic analysis of temperature influence and control," in *Proceedings of the 36th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS)*, 2023. DOI: 10.52202/069564-0082.
- L. Jin, M. Rossi, F. Caresana, L. Pelagalli, and G. Comodi, "Metal hydrides in hydrogen storage: Optimization of dynamic control strategies," 1, vol. 2648, IOP Publishing, Dec. 2023, p. 012 056. DOI: 10.1088/1742-6596/2648/1/012056.
- F. Mennilli, L. Jin, M. Rossi, A. Mugnini, and G. Comodi, "Energy analysis of a hydrogen integrated system in the residential sector," 1, vol. 2648, IOP Publishing, Dec. 2023, p. 012 057. DOI: 10.1088/1742-6596/2648/1/012057.