

Based on DTE Network+, the following papers have been published in the top journals:

Published papers

1. S.A. Mansouri, A. Rezaee Jordehi, M. Tostado-Veliz, F. Jurado, M. Marzband, J. A. Aguado, An IoT enabled hierarchical decentralized framework for multi-energy microgrids market management in the presence of smart prosumers using a deep learning-based forecaster, **Applied Energy**, (ISI-Indexed, Q1 IF=11.446, ISSN: 0306-2619), 2023 (<https://doi.org/10.1016/j.apenergy.2022.120560>).
2. F. Hamzeh Aghdam, M. Wijesooriya Mudiyansele, B. Mohammadi-ivatloo, M. Marzband, Optimal Scheduling of Multi-Energy Type Virtual Energy Storage System in Reconfigurable Distribution Networks for Congestion Management, **Applied Energy**, (ISI-Indexed, Q1 IF=11.446, ISSN: 0306-2619), 2023 (<https://doi.org/10.1016/j.apenergy.2022.120569>).

Key contributions:

- ✓ Investigating the optimal operation of a multi-carrier virtual energy storage system (VESS), including batteries, thermal energy storage systems, power to hydrogen and hydrogen to power technologies in hydrogen storage systems, and electric vehicles in dynamic energy storage systems.
- ✓ Proposing a co-optimization of ISO and VESS as a bi-level modeling for scheduling.

3. M.B. Tookanlou, S.A. Pourmousavi, M. Marzband, A three-layer joint distributionally robust chance constrained framework for optimal day-ahead scheduling of e-mobility ecosystem, **Applied Energy**, (ISI-Indexed, Q1 IF=11.446, ISSN: 0306-2619), 2023 (<https://doi.org/10.1016/j.apenergy.2022.120402>).

4. A.Salari, M. Wijesooriya Mudiyansele, S. A. Ahmadi, M. Marzband, M. Zeinali, Fuzzy Q-Learning-Based Approach for Real-Time Energy Management of Home Microgrids Using Cooperative Multi-Agent System, **Sustainable Cities and Society**, (ISI-Indexed, Q1, IF=7.587, ISSN: 2210-6707), 2023.

Key contributions:

- ✓ Proposing a continuous real-time cooperative multi-agent system for home MG including EVs to increase the reliability in grid-connected and islanded modes.
- ✓ The fuzzy Q-learning (FQL) method is investigated to control the agents in the continuous state space and achieve the efficient solution.

5. K. Saberi-Beglar, K. Zare, H. Seyedi, M. Marzband, H. Nafisi, S. Nojavan, Risk-embedded scheduling of a CCHP integrated with electric vehicle parking lot in a residential energy hub considering exible thermal and electrical loads, **Applied Energy**, (ISI-Indexed, Q1 IF=11.446, ISSN: 0306-2619), 2023 (<https://doi.org/10.1016/j.apenergy.2022.120265>).

Key contributions:

- ✓ Investigating the impacts of EVPL as a battery storage in residential energy hub.
- ✓ Proposing integrated demand response programs for heating, cooling, and electricity and setting compensation costs for customers.
- ✓ Proposing risk measure method of downside risk constraint to assess and evaluate the imposed risk by several uncertain parameters.

6. A. S. Daramola, S. E. Ahmadi, M. Marzband, A. Ikpehaic, A cost-effective and ecological stochastic optimization for integration of distributed energy resources in energy networks considering V2G and

CHP technologies, **Journal of Energy Storage**, (ISI-Indexed, Q1, IF=3.517, ISSN:2352-152X) 2023 (<https://doi.org/10.1016/j.est.2022.106203>).

Key contributions:

- ✓ Deploying harmonized natural gas and fuel cell CHP technologies alongside RES and battery energy storage systems to facilitate EVs' G2V and V2G operations.
- ✓ To maximize environmental and economic benefits, the CHP technologies are designed following the hybrid electric-thermal load strategy, such that the system autonomously switches between following the electric load strategy and following the thermal load strategy.

7. S. Hussain, S. Thakur, S. Shukla, J. Breslin, Q. Jan, M. Marzband, Y. S. Kim, M. A. Rathore, Enhancing the Efficiency of Electric Vehicles Charging Stations based on Novel Fuzzy Integer Linear Programming, **IEEE Transactions on Intelligent Transportation Systems**, (ISI-Indexed, Q1, IF=9.551, ISSN: 15580016), 2023.

8. A. Mansour Saatloo, A. Mehrabi, M. Marzband, N. Aslam, Hierarchical User-Driven Trajectory Planning and Charging Scheduling of Autonomous Electric Vehicles, **IEEE Transactions on Transportation Electrification**, (ISI-Indexed, Q1, IF=5.790, ISSN: 23327782), 2022 ([10.1109/TTE.2022.3196741](https://doi.org/10.1109/TTE.2022.3196741)).

Key contributions:

- ✓ Introducing a novel trajectory planning and charging/discharging scheduling of on-move A-EVs.
- ✓ Employing an integrated Edge-UAV model with the aim of a real-time and decentralized operation.

Academic impact: Publishing a paper in IEEE transactions on transportation electrification (IF=6.519). In addition, a master thesis has been defined to extend this project.

Industrial impact: Accelerating the autonomous electric vehicles integration with the smart grids.

9. S. E. Ahmadi, M. Marzband, A. Ikpehai, A. Abusorrah, Optimal stochastic scheduling of plug-in electric vehicles as mobile energy storage systems for resilience enhancement of multi-agent multi-energy networked microgrids, **Journal of Energy Storage**, (ISI-Indexed, Q1, IF=3.517, ISSN:2352-152X) 2022 (<https://doi.org/10.1016/j.est.2022.105566>).

Key contributions:

- ✓ Presenting an optimal scheduling of plug-in electric vehicles as mobile power sources for enhancing the resilience of multi-agent systems with networked multi-energy microgrids.

10. M. Moafi, R. Rouhi Ardesliri, M. W. Mudiyansele, M. Marzband, A. Abusorrah, M. Rawa, J. M. Guerrero, Optimal coalition formation and maximum profit allocation for distributed energy resources in smart grids based on cooperative game theory, **International Journal of Electrical Power & Energy Systems**, (ISI-Indexed, Q1, IF=4.63, ISSN: 0142-0615), 2022 (<https://doi.org/10.1016/j.ijepes.2022.108492>).

Key contributions:

- ✓ Presenting a three-level gameplay-based intelligent structure to evaluate individual and collaborative strategies of electricity manufacturers, considering network and physical constraints

11. S. A. Mansouri, E. Nematbakhsh, A. Ahmarinejad, A. Rezaee Jordehi, M. S. Javadi, M. Marzband, A hierarchical scheduling framework for resilience enhancement of decentralized renewable-based microgrids considering proactive actions and mobile units, **Renewable & Sustainable Energy Reviews**, (ISI-Indexed, Q1, IF=16.799, ISSN:1364-0321), 2022 (<https://doi.org/10.1016/j.rser.2022.112854>).

Key contributions:

- ✓ Presenting a hierarchical three-stage framework for distribution system resilience enhancement in the presence of DC-MGs
- ✓ Increasing network readiness through performing proactive actions

12. D. Sadeghi, S. E. Ahmadi, N. Amiri, M. Marzband, A. Abusorrah, M. Rawa, Designing, optimizing and comparing distributed generation technologies as a substitute system for reducing life cycle costs, CO2 emissions, and power losses in residential buildings, **Energy**, (ISI-Indexed, Q1, IF=7.147, ISSN: 0360-5442), 2022 (<https://doi.org/10.1016/j.energy.2022.123947>).

13. D. Sadeghi, N. Amiri, M. Marzband, A. Abusorrah, K. Sedraoui, Optimal sizing of hybrid renewable energy systems by considering power sharing and electric vehicles, **International Journal of Energy Research**, (ISI-Indexed, Q1, IF=3.741, ISSN: 1099-114X), 2022 (<https://doi.org/10.1002/er.7729>)

Under review journal papers

1- Local Energy Market Design for Power- and Hydrogen-based Microgrids Considering a Hybrid Uncertainty Controlling Approach, Under review in IEEE Transactions on Smart Grid.

Key contributions:

- ✓ Proposing a community of integrated power and hydrogen microgrids to integrate plugin and fuel cell electric vehicles.
- ✓ Developing a fast ADMM-MEC model to preserve the data privacy of the microgrids.
- ✓ Introducing a tri-level hybrid uncertainty management model to consider the full uncertainty.

14. A Robust Bi-Level Optimization Framework for Participation of Multi-Energy Service Integrated Power and Natural Gas Markets, Under review in Applied Energy

Key contributions:

- ✓ Proposing a bi-level scheduling for multi-energy service providers to participate in the integrated power and natural gas market.
- ✓ Introducing an iterative-based two-step framework to solve the robust bi-level approach and to investigate the effect of the flexible energy sources on prices set by the integrated power and natural gas markets.

15. A Robust Privacy-Preserving Scheme for Integration of a Virtual Energy Hub Plant in Wholesale Market, Under review in Energy

Key contributions:

- ✓ Introducing a virtual energy hub plant comprised of multiple independent energy hubs that working together to participate in energy markets.
- ✓ Introducing a decentralized algorithm based on mobile edge computing (MEC) system and analytical target cascading theory (ATC) to preserve the data privacy of the energy hubs.

16. A Multi-Objective Heuristic-Based Stochastic Optimization Algorithm for Techno-Economic and Environmental Operation of Distribution Networks Considering G2V and V2G Technologies, Second revise in Sustainable Energy, Grids and Networks

Key contributions:

- ✓ Proposing a flexible multi-objective optimization approach to evaluate and deploy V2G and G2V technologies considering techno-economical and environmental factors.

17. Robust Multi-Objective Optimization for the Iranian Electricity Market Considering Green Hydrogen and Analyzing the Performance of Different Demand Response Programs, second revise in Applied Energy

Key contributions:

- ✓ Introducing a robust optimization method considering the uncertainty to reach the most confident plan for the retailer based on uncertainty in RES and price.
- ✓ Considering a hydrogen storage (HS) system in coordination with RES, and the systems performance is evaluated by the mid-term pricing for more accurate results.

18. Holistic Cost Benefits Analysis for Electric Vehicle Parking Lots Integrated Renewable Energy Source and Battery Storage System, Under review in Energy Storage

Key contributions:

- ✓ Investigating the energy management strategy at parking lots based on time-of-use tariff to reduce the peak-to-valley power demand from the grid and maximize the use of PV generation.
- ✓ Analyzing the financial benefits for suggested parking lots, and comprehensive benefits for the power grid and society also investigated from various aspects.

19. Resilience enhancement of power systems using phase shifters, storage systems and demand response, Under review in Energy Storage

Key contributions:

- ✓ Phase shifters as series flexible AC transmission systems (FACTS) devices are integrated in power systems to improve the resilience against hurricanes. Besides phase shifters, batteries (static and mobile) and demand response are the tools which are used for resilience enhancement of the power system

20. Placement and Capacity of EV Charging Stations by Considering Uncertainties with Energy Management Strategies, Under review in IEEE transactions on industry applications

Key contributions:

- ✓ Applying CS investor, PEV user, and distribution network operator who could approach to CS's optimal location and capacity.
- ✓ To keep down the peak power demand from the grid and utilize renewable energy more efficiently, energy management strategies (EMS) have been applied through the control of charging and discharging of the battery storage system (BSS)

21. Risk Oriented Participation of Wind Power Plants in Day-ahead, Balancing and Hydrogen Markets in Presence of Shared Multi-Energy Storage Systems, Under review in IEEE transactions on industry applications

Key contributions:

- ✓ Presenting a bidding strategy for simultaneous participation of wind farms in day-ahead, balancing and hydrogen markets in presence of shared multi-energy storage (SMES) systems.

- ✓ Risk-management using conditional value at risk (CVaR) will be done for various risk-aversion parameters to clarify the results for different strategies.

22. Optimal Hierarchical Energy Management System Based on Machine Learning Approach, first revise in IEEE transactions on industrial electronics

Key contributions:

- ✓ Proposing a home energy management system aims to minimize the overall cost of energy consumption for MGs, and smart charging/ discharging of electric vehicles while meeting the load demand, and energy storage charging requirements.
- ✓ Suggesting a combination of optimization, and machine learning methods to solve sequential decision problems, multi-level optimal hierarchical designs, coordinated algorithms, and plug-and-play operations that are provide offline and online.

23. A Novel Coordination Strategy Based on Virtual Load Distribution for Hierarchical Control of Multiple Home-Energy-Hubs, Under review in IEEE transactions on industrial electronics

Key contributions:

- ✓ Proposing a novel coordination strategy in order to optimal supply of adjacent load demands (including EVs) in home communities including multiple home energy hubs.
- ✓ Developing a metaheuristic optimization algorithm, simulated annealing, is utilized to solve the virtual load distribution problem, finding the optimal distribution of adjacent demands.

24. Hierarchical Energy Management System Based on Bi-Level Fuzzy Logic Control in Neighborhood Home Microgrids, Under review in Sustainable Cities and Society.

Key contributions:

- ✓ A three-level hierarchical energy management system is proposed, which controls the power converters at the primary, secondary and tertiary levels using a bi-level fuzzy logic control to manage energy on each home MG and the neighborhood home MG considering EV planning, respectively.

25. Two-Stage Stochastic-based Scheduling of Multi-Energy Microgrids with Electric and Hydrogen Vehicles Charging Stations, Cryptocurrency Miners, Storages and Responsive Demands considering transactions through pool market and bilateral contracts, Under review in Sustainable Cities and Society

Key contributions:

- ✓ Risk constrained scheduling of a multi-energy microgrid (MEMG) has been carried out with the consideration of the uncertainties of price of electricity purchased from pool market, electrical, thermal and hydrogen demands, PV and wind power, EV charging station and hydrogen vehicle charging station loads and cryptocurrency miner load.
- ✓ Bilateral contracts have been used as a certain source of electric energy, in addition to the pool market as an uncertain source and their impact on operation of MEMG has been evaluated.
- ✓ Effect of different contingency events on the operation of MEMG has been studied.

26. Industrial energy hubs with electric, thermal and hydrogen demands for resilience enhancement of mobile storage-integrated power systems, Under review in international journal of hydrogen energy

Key contributions:

- ✓ The main objective is to use and assess the potential of large industrial energy hubs (EHs) in resilience enhancement of power systems
- ✓ A stochastic MILP model has been developed considering the uncertainties in damaged transmission lines, hurricane time and repair time.
- ✓ The effect of responsive demands on power system resilience has been evaluated.

27. Co-optimisation of power and gas networks connected to industrial energy hubs, under review in International Journal of Electrical Power and Energy Systems

28. Smart Electric Vehicles Charging/Discharging Scheme based on Game Theory for Multiple Home Microgrids, under review in Energy

29. An interval-based nested optimization framework for deriving flexibility from smart buildings and electric vehicle fleets in the TSO-DSO coordination, under review in Applied Energy

Conference papers

1- A. M. Saatloo, M. W. Mudiyansele, M. A. Mirzaei, A. Mehrabi, M. Marzband, and N. Aslam, "Risk-averse decentralized optimal scheduling of a virtual energy hub plant equipped with multi energy conversion facilities in energy markets", 2022 57th International Universities Power Engineering Conference (UPEC)