

NexSys publications in 2022

The publications below include fully funded NexSys publications, publications that were part-funded by ESIPP, NexSys' predecessor programme, as well as publications that were noted as relevant to the programme

Format: Date, Title, Journal, DOI

Refereed original articles

1)

Publication date

2022-01-06

Stability enhancement strategies for a 100% grid-forming and grid-following converter-based Irish power system, *IET Renewable Power Generation*, <https://doi.org/10.1049/rpg2.12346>

2)

Publication date

2022-01-25

Impact of PLL Frequency Limiter on Synchronization Stability of Grid Feeding Converter, *IEEE Transactions on Power Systems*, <https://doi.org/10.1109/TPWRS.2022.3145636>

3)

Publication date

2022-02-24

Grid-forming requirements based on stability assessment for 100% converter-based Irish power system, *IET Renewable Power Generation*, <https://doi.org/10.1049/rpg2.12340>

4)

Publication date

2022-04-27

How just are just transition plans? Perceptions of decarbonisation and low-carbon energy transitions among peat workers in Ireland, *Energy Research and Social Sciences*, <https://doi.org/10.1016/j.erss.2022.102616>

5)

Publication date

2022-05-02

C-E (curtailment - energy share) map: an objective and quantitative measure to evaluate wind curtailment, *Renewable and Sustainable Energy Reviews*, <https://doi.org/10.1016/j.rser.2022.112212>

6)

Publication date

2022-06-22

Flexibility from the electrification of energy: how heating, transport, and industries can support a 100% sustainable energy system, *IEEE Power and Energy Magazine*, <https://doi.org/10.1109/MPE.2022.3167576>

7)

Publication date

2022-07-01

Three-Switch Common Ground Step-Down and Step-Up Single-Stage Grid-Connected PV Inverter, *IEEE*, <https://doi.org/10.1109/TPEL.2022.3145193>

8)

Publication date

2022-07-01

Singular over determined systems of linear differential equations, *Mathematics and Computers in Simulation*, <https://doi.org/10.1016/j.matcom.2022.02.003>

9)

Publication date

2022-07-01

Distributed control of DC grids: integrating prosumers motives, *IEEE Transactions on Power Systems*, <https://doi.org/10.1109/TPWRS.2021.3053847>

10)

Publication date

2022-07-06

Multi-sectoral flexibility measures to facilitate wind and solar power integration, *IET Renewable Power Generation*, <https://doi.org/10.1049/rpg2.12399>

11)

Publication date

2022-07-06

Fast frequency response provision from commercial demand response, from scheduling to stability in power systems, *IET Renewable Power Generation*, <https://doi.org/10.1049/rpg2.12453>

12)

Publication date

2022-07-06

Coordinated investment in wind-rich regions using dynamic line rating, energy storage and distributed static series compensation to facilitate congestion management, *IET Renewable Power Generation*, <https://doi.org/10.1049/rpg2.12484>

13)

Publication date

2022-07-15

Water resource recovery facilities as potential energy generation units and their dynamic economic dispatch, *Applied Energy*, <https://doi.org/10.1016/j.apenergy.2022.119199>

14)

Publication date

2022-08-24

Precipitation, tidal and river level impacts on influent volumes of combined wastewater collection systems: A regional analysis, *Results in Engineering*, <https://doi.org/10.1016/j.rineng.2022.100588>

15)

Publication date

2022-01-01

Mitigation of Wind Induced Accelerations in Tall Modular Buildings, *Structures*, <https://doi.org/10.1016/j.istruc.2022.01.037>

16)

Publication date

2022-01-01

Fluid inerter for optimal vibration control of floating offshore wind turbine towers, *Engineering Structures*, <https://doi.org/10.1016/j.engstruct.2022.114558>

17)

Publication date

2022-05-17

Wind Energy Assessment for Renewable Energy Communities, *Wind*, <https://doi.org/10.3390/wind2020018>

18)

Publication date

2022-01-01

Forecast electricity demand in commercial building with machine learning models to enable demand response programs, *Energy and AI*, [10.1016/j.egyai.2021.100121](https://doi.org/10.1016/j.egyai.2021.100121)

19)

Publication date

2022-01-01

Spine Toolbox: A flexible open-source workflow management system with scenario and data management, *SoftwareX*, <https://doi.org/10.1016/j.softx.2021.100967>

20)

Publication date

2022-08-01

Diversification, concentration and renewability of the energy supply in the European Union, *Energy*, <https://doi.org/10.1016/j.energy.2022.124097>

21)

Publication date

2022-09-01

Curvature-Based Control for Low-Inertia Systems, *IEEE Transactions on Power Systems*, <https://doi.org/10.1109/TPWRS.2022.3184189>

22)

Publication date

2022-05-04

Citizen science and environmental justice: exploring contradictory outcomes through a case study of air quality monitoring in Dublin, *Local Environment*, <https://doi.org/10.1080/13549839.2022.2068143>

23)

Publication date

2022-03-31

Accurate identification of influential building parameters through an integration of global sensitivity and feature selection techniques, *Applied Energy*, <https://doi.org/10.1016/j.apenergy.2022.118956>

24)

Publication date

2022-10-01

A linked data approach to multi-scale energy modelling, *Advanced Engineering Informatics*,
<https://doi.org/10.1016/j.aei.2022.101719>

25)

Publication date

2022-08-01

Information management in the facilities domain: investigating practitioner priorities, *Facilities*,
<https://doi.org/10.1108/F-02-2022-0033>

26)

Publication date

2022-09-08

Adoption of renewable home heating systems: An agent-based model of heat pumps in Ireland,
Renewable and Sustainable Energy Reviews, <https://doi.org/10.1016/j.rser.2022.112853>

27)

Publication date

2022-09-10

Perceptions of Electric Scooters Prior to Legalisation: A Case Study of Dublin, Ireland, the 'Final
Frontier' of Adopted E-Scooter Use in Europe, *Sustainability*, <https://doi.org/10.3390/su141811376>

28)

Publication date

2022-01-01

Gender Mainstreaming the European Union Energy Transition, *Energies*,
<https://doi.org/10.3390/en15218087>

29)

Publication date

2022-07-06

Identification of Gaps and Barriers in Regulations, Standards, and Network Codes to Energy Citizen
Participation in the Energy Transition, *Energies*, <https://dx.doi.org/10.3390/en15030856>

30)

Publication date

2022-01-01

Ultra-low wide bandwidth vibrational energy harvesting using a statically balanced compliant
mechanism, *International journal of Mechanical Sciences*,
<https://doi.org/10.1016/j.ijmecsci.2022.107130>

31)

Publication date

2022-01-01

Feedback-driven error-corrected single-sensor analytics for real-time condition monitoring,
International journal of Mechanical Sciences, <https://doi.org/10.1016/j.ijmecsci.2021.106898>

Refereed Review Articles

32)

Publication date

2022-07-06

Guest Editorial: Special Issue from 9th International Conference on Renewable Power Generation, *IET Renewable Power Generation*, <https://doi.org/10.1049/rpg2.12522>

33)

Publication date

2022-07-27

Analysis and Mitigation of Harmonic Resonances in Multi-Parallel Grid-Connected Inverters: A Review, *Energies*, <https://doi.org/10.3390/en15155438>

34)

Publication date

2022-01-01

Information modelling for urban building energy simulation - A taxonomic review, *Building and Environment*, <https://doi.org/10.1016/j.buildenv.2021.108552>

35)

Publication date

2022-06-17

Sensors Special Issue: Vibration Energy Harvesting for Wireless Sensors, *Sensors*, <https://doi.org/10.3390/s22124578>

36)

Publication date

2022-12-26

Data to Intelligence: The Role of Data-Driven Models in Wastewater Treatment, *Expert Systems with Applications*, <https://doi.org/10.1016/j.eswa.2022.119453>

Refereed Conference/Meeting Proceedings

37)

Publication date

2022-05-02

A novel approach to fault detection and diagnosis in industrial water distribution system: A case-study, *12th Eastern European Young Water Professionals Conference*

38)

Publication date

2022-06-26

Voltage dip induced frequency dips for power systems with high shares of distributed wind energy, *IEEE 13th International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2022)*

39)

Publication date

2022-06-21

Grid-forming converter current limiting design to enhance transient stability for grid phase jump events, *IFAC 11th Symposium on Control of Power and Energy Systems (CPES)*

40)

Publication date

2022-06-21

Grid-forming converter angular speed freezing to enhance transient stability in 100% grid-forming and mixed power systems, *IFAC 11th Symposium on Control of Power and Energy Systems (CPES)*

41)

Publication date

2022-06-26

Harmonic Resonance Mitigation and Impedance Stability Improvement of Converter-Based Resources in Active Distribution Grids, *2022 IEEE 13TH INTERNATIONAL SYMPOSIUM Power Electronics for Distributed Generation Systems*

42)

Publication date

2022-10-22

Fault Prediction and Classification for a Doubly-Fed Induction Generator based Wind Turbine by using Random Forest Classifier, *The 9th Renewable Power Generation Conference (RPG Dublin Online 2021)*, <https://doi.org/10.1049/icp.2021.1353>

43)

Publication date

2022-01-01

Predicting Vehicles Parking Behaviour for EV Recharge Optimization, *SEBD 2022: The 30th Italian Symposium on Advanced Database Systems, June 19-22, 2022, Tirrenia (PI), Italy.*

44)

Publication date

2022-09-15

The future of transport and stakeholders engagement: a bibliometric analysis of the scientific literature, *AII2022 INTERNATIONAL CONGRESS*, 10.1080/22797254.2022.2141659

45)

Publication date

2022-08-22

A Sustainable GIS-Based Serious Game Approach to Improve Railways Resilience, *Fifth International Conference on Railway Technology*

46)

Publication date

2022-11-14

First- and last-mile connections to public transport in Dublin: analysis of pre-COVID-19 travel behaviour, *Transport Research Arena*

47)

Publication date

2022-11-14

A simplified index to improve active mobility infrastructure based on digital survey: the case of Dublin, *Transport Research Arena*

48)

Publication date

2022-12-12

First- and last-mile connections to public transport in Dublin: Analysis of mobility patterns, user experiences and preferences, *International Association for Travel Behaviour Research*

49)

Publication date

2022-11-10

Towards a Distributed Autonomous Organisation for Financing, Governing and Disbursing Revenues of a Battery Energy Storage System, *2022 IEEE 1st Global Emerging Technology Blockchain Forum: Blockchain & Beyond (iGETblockchain)*

50)

Publication date

2022-11-10

Dissolving Metaphors in Peer-To-Peer Energy Trading: Towards a More Concrete Understanding of Metering, Legitimacy and Revenue Flows, *2022 IEEE 1st Global Emerging Technology Blockchain Forum: Blockchain & Beyond, Online, 07 Nov 2022-11 Nov 2022*

51)

Publication date

2022-01-01

Integration of Distributed Energy Generation in Energy Citizen side: Key Barriers and Enablers, *2022 22nd International Scientific Conference on Electric Power Engineering (EPE)*, <https://doi.org/10.1109/EPE54603.2022.9814138>

52)

Publication date

2022-07-06

A Dynamic Process to Identify the National Smart Grid Research & Innovation Status and Priorities, *2022 22nd International Scientific Conference on Electric Power Engineering (EPE)*, <https://doi.org/10.1109/EPE54603.2022.9814119>

Books

53)

Publication date

2022-09-01

Advances in Power System Modelling, Control and Stability Analysis, 2nd Edition, 978-1-83953-575-8

Book Chapters

54)

Publication date

2022-01-01

Characterising Urban Morphology for Urban Climate Modelling 978-3-030-87598-5

56)

Publication date

2022-08-24

Chapter Two - Measuring flow velocity and turbulence fields in thermal sciences using particle image velocimetry: A best practice guide, 978-0-323-98979-4

57)

Publication date

2022-09-01

Modelling Power Systems with Stochastic Processes, 978-1-83953-575-8

58)

Publication date

2022-09-01

Combined voltage and frequency control with power electronics-based devices, 978-1-83953-575-8

59)

Publication date

2022-09-01

Shooting-based Stability Analysis of Power System Oscillations, 978-1-83953-575-8

Technical Reports

60)

Publication date

22/03/2022

Kelly O, Illingworth S, Butera F, Steinberger J, Blaise M, Dawson V, Huynen M, Martens P, Bailey S, Savage G, White P, Schuitema G, Cowman S, Tertiary Education in a Warming World; Reflections from the field, *Worldwide Universities Network*, [Tertiary Education in a Warming World; Reflections from the field \(ucd.ie\)](https://www.ucd.ie/teiw/)

61)

Publication date

31/08/2022

Ali Ekhtiari, Eoin Syron Rhode Green Energy Hydrogen injection, Offaly County Council

62)

Publication date

01/10/2022

B. Keyvani, D. Flynn Incorporation of Dynamic Line Rating Systems in Economic Dispatch for Ireland, EirGrid

63)

Publication date

01/04/2022

B. Keyvani, D. Flynn Spatial Potential for Weather-Based Indirect Dynamic Line Rating Systems in Ireland, EirGrid

64)

Publication date

01/10/2022

Ali Ekhtiari, Eoin Syron, Liam Nolan, Paul O'Dwyer, Testing of Blends of Hydrogen and Natural Gas (HyTest), Gas Networks Ireland, <https://www.gasnetworks.ie/docs/hydrogen-blend.pdf>

Further detail on publications of note during 2022 involving academics on the NexSys programme

Ekhtiari, Ali, Damian Flynn, and Eoin Syron. 2022. Green Hydrogen Blends with Natural Gas and Its Impact on the Gas Network, *Hydrogen*, 3, no. 4: 402-417, <https://doi.org/10.3390/hydrogen3040025>

This work investigates the possibility of injecting green hydrogen into the gas network as a means to provide storage option for excess renewable generation. The case study used is the Irish gas system and the work establishes some quantitative guidance on the percentages of hydrogen which could be injected without significantly affecting gas network operational variables. Resulting reductions in CO₂ emissions are also evaluated.

Rabiee, A. Keane and A. Soroudi, Enhanced Transmission and Distribution Network Coordination to Host More Electric Vehicles and PV, *IEEE Systems Journal*, vol. 16, no. 2, pp. 2705-2716, June 2022, <https://doi.org/10.1109/JSYST.2021.3092785>

The topic is of some significance considering the anticipated growth in EV and PV domestic installations and the consequent need for enhanced coordination between the TSO and DSO.

Saikia, SD., Ryan, PC., Nuyts, S., Clifford, E., 2022. Precipitation, tidal and river level impacts on influent volumes of combined wastewater collection systems: A regional analysis. *Results in Engineering*, 15, 100588, <https://doi.org/10.1016/j.rineng.2022.100588>

Hashim, H., Clifford, E., Ryan, P.C., (2022). False alarm moderation for performance monitoring in industrial water distribution systems. *Advanced Engineering Informatics*, 52: 101592. <https://doi.org/10.1016/j.aei.2022.101592>

Liu, Q., Li, R., Dereli, RK., Flynn, D., Casey, E., 2022. Water resource recovery facilities as potential energy generation units and their dynamic economic dispatch. *Applied Energy*, 318. 119199, <https://doi.org/10.1016/j.apenergy.2022.119199>

Fox, S.; McDermott, J.; Doherty, E.; Cooney, R.; Clifford, E., 2022. Application of Neural Networks and Regression Modelling to Enable Environmental Regulatory Compliance and Energy Optimisation in a Sequencing Batch Reactor. *Sustainability*, 14, 4098. <https://doi.org/10.3390/su14074098>

Carroll, P., 2022. Perceptions of Electric Scooters Prior to Legalisation: A Case Study of Dublin, Ireland, the 'Final Frontier' of Adopted E-Scooter Use in Europe, *Sustainability*, 14, 18. <https://doi.org/10.3390/su141811376>

LaMonaca S, Ryan L., 2022. The state of play in electric vehicle charging services – A review of infrastructure provision, players, and policies, *Renewable and Sustainable Energy Reviews*, 154, <https://doi.org/10.1016/j.rser.2021.111733>

Sopeña, J.M.G., Pakrashi, V. and Ghosh, B., 2022. A spiking neural network based wind power forecasting model for neuromorphic devices. *Energies*, 15(19), p.7256, <https://doi.org/10.3390/en15197256>

Inturi, V., Balaji, S.V., Gyanam, P., Pragada, B.P.V., Geetha Rajasekharan, S., and Pakrashi, V., 2002. An integrated condition monitoring scheme for health state identification of a multi-stage gearbox through Hurst exponent estimates. *Structural Health Monitoring*, 22(1), pp.730-745. <https://doi.org/10.1177/14759217221092828>