NexSys publications in 2023

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

Refereed original articles

Format: Authors, Title, Journal, DOI

1)
G Scarselli, D Quan, V Prasad, PS Rao, M Hardiman, I Reid, NP O'Dowd, N Murphy, & A Ivankovic. Mode I fracture toughness of glass fibre reinforced thermoplastic composites after UV and atmospheric plasma treatments, *Composites Science and Technology*, 10.1016/j.compscitech.2023.109982

2)
Gowthaman Parivendhan, Philip Cardiff, Thomas Flint, Željko Tuković, Muhannad Obeidi, Dermot Brabazon, Alojz Ivanković. A numerical study of processing parameters and their effect on the melt-track profile in Laser Powder Bed Fusion processes, *Additive Manufacturing*, 10.1016/j.addma.2023.103482

3)
Ivan Batistić, Philip Cardiff, Alojz Ivanković, Željko Tuković. A finite volume penalty-based implicit procedure for the treatment of the frictionless contact boundaries, *International Journal for Numerical Methods in Engineering*, 10.1002/nme.7302

4)
D. Dreelan, A. Ivankovic and D J Browne. Grain structure predictions for metallic additive manufacturing processes, *Mater. Sci. Eng.,* 10.1088/1757-899X/1274/1/012013

5)
Bamber Blackman, Fengzhen Sun, Sofia Teixeira De Freitas, Silvio de Barros, Marcio Moreira Arouche & Alojz Ivankovic. Understanding fracture mode-mixity and its effects on bond performance, *Advances in Structural Adhesive Bonding*, 10.1016/B978-0-323-91214-3.00015-6

6)
Zoheb Khan, Xiaoyan Long, Eoin Casey, Denis Dowling, Steven Ferguson. Development of continuous spatially distributed diafiltration unit operations, *Reaction Chemistry & Engineering*, 10.1039/D3RE00013C

7)
Afkousi-Paqaleh, Mohammad, Jafarian, Mohammad, Keane, Andrew. Modelling the Interdependence of Multiple Electricity Markets in the Distribution System Aggregator Bidding*, IEEE Transactions on Energy Markets, Policy and Regulation*, 10.1109/TEMPR.2023.3268440

8)
Y. Yasuda, E.M. Carlini, A. Estanqueiro, P.B. Eriksen, D. Flynn, L. Finn Herre, B.-M. Hodge, H. Holttinen, M.J. Koivisto, E. Gómez-Lózaro, S.M. Martínez, N. Menemenlis, G. Morales- España, C. Pellinger, A. Ramos, C. Smith, T.K. Vrana. Flexibility chart 2.0: an accessible visual tool to evaluate flexibility resources in power systems, *Renewable and Sustainable Energy Reviews*, 10.1016/j.rser.2022.113116

9)
X. Zhao, X. Kestelyn, Q. Cossart, F. Colas, D. Flynn. State residualisation and Kron reduction for model order reduction of energy systems, *Applied Sciences*, 10.3390/app13116593

10)
B. Keyvani, E. Whelan, E. Doddy, D. Flynn. Indirect weather-based approaches for increasing power transfer capabilities of electrical transmission networks, *Wiley Interdisciplinary Reviews: Energy and Environment,* 10.1002/wene.470

11)
Sood, Divyanshu, Alhindawi, Ibrahim, Ali, Usman, McGrath, James A., Byrne, Miriam A., Finn, Donal, O'Donnell, James. Simulation-based evaluation of occupancy on energy consumption of multi-scale residential building archetypes, *Journal of Building Engineering*, 10.1016/j.jobe.2023.106872

12)
Banerjee, Aparajita & Schuitema, Geertje. Spatial justice as a prerequisite for a just transition in rural areas? The case study from the Irish peatlands, *Environment and Planning Part C: Politics and Space,* 10.1177/23996544231173210

13)
McGinley, J., Harmon O'Driscoll, J., Healy, M.G., Ryan, P.C., Mellander, P.E., Morrison, L., Callery, O., Siggins, A. Impact of historical legacy pesticides on achieving legislative goals in Europe, *Science of the Total Environment*, 10.1016/j.scitotenv.2023.162312

14)
Richard O'Hegarty & Oliver Kinnane. A whole life carbon analysis of the Irish residential sector-past, present and future, *Energy and Climate Change*, 10.1016/j.egycc.2023.100101

Refereed conference proceedings

Format: Author list, Title, Conference title, DOI

1)
W. Mendieta, D. Flynn, Grid integration impacts of hydrostatic transmission-based wind turbines IEEE PES PowerTech, 10.PowerTech.2023

2)
S. Stanley, L. Ryan, D. Flynn, Strategies to increase grid flexibility for an isolated system with over 80% renewable electricity in 2030, International Conference on the European Electricity Market (EEM), 10.EEM.2023.1

3)
Vrana Til Kristian, Svendsen Harald G., Korpas Magnus, Couto Antonio, Estanqueiro Ana, Flynn Damian, Holttinen Hannele, Hartel Philipp, Koivisto Matti, Lantz Eric, Frew Bethany. Improving wind power market value with various aspects of diversification, International Conference on the European Electricity Market (EEM), 10.EEM.2023.2

4)

Maryam Pourmahdi-torghabe - Terence O'Donnell - Hamed Heydari-doostabad - Reza Ghazi, Bridgeless Active PFC Modified Cuk-based Rectifiers with Positive/Negative Output Voltage and Low Semiconductors Voltage Stress, 27th International Electrical Power Distribution Conference, DOI not yet available

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

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, *AIIT2022_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)

61)
Publication date
31/08/2022
Ali Ekthiari, 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 CO_2 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