



# esipp

Energy Systems Integration  
Partnership Programme

## Rethinking our Energy Future: Collaboration and Integration

Energy Systems Integration Partnership Programme Research Symposium

Thursday 30th November

George Moore Auditorium, O'Brien Centre for Science, UCD, Belfield, Dublin 4

08:45 Registration, Tea, Coffee & Poster Viewing

### Session 1 Climate Change and Energy Systems

Chair: Johnny Shine, Chair of ESIPP Governance Committee

#### 09:30 Welcome Address

Johnny Shine, Chair of ESIPP Governance Committee

#### 09:40 Developing the Integrated Energy Network – Research Priorities

Mark McGranaghan, Electric Power Research Institute

#### 10:10 Introduction to the Energy Systems Integration Partnership Programme

Andrew Keane, School of Electrical and Electronic Engineering, UCD

#### 10:20 Climate, Weather and Renewable Energy

Frank McDermott, School of Earth Sciences, UCD

#### 10:40 Questions & Answers

#### 10:50 Poster Session Overview

Martina Assereto, PhD Student, Smurfit Business School, UCD

11:00 PhD Student Poster Session & Coffee Break

### Session 2 Energy Systems Integration Research

Chair: John O'Connell, ERVIA

#### 11:30 Interaction of Energy and Water

Eoghan Clifford, College of Engineering and Informatics, NUI Galway

#### 11:50 Power System Challenges of Increasing Renewables

Damian Flynn, UCD School of Electrical & Electronic Engineering, UCD

#### 12:10 Optimal Investment Decisions in Increasingly Variable Power and Energy Systems

Valentin Bertsch, Economic and Social Research Institute, Dublin

#### 12:30 The role of emotions in public acceptance: the case of the Irish water charges

Geertje Schuitema, School of Business, UCD

#### 12:50 Questions & Answers

13:00 Lunch & Poster Viewing

#### 14:00 Panel Discussion: Targets for 2030 and the role of Energy Systems Integration

Moderator: Lisa Ryan, School of Economics, UCD

Jim Gannon, CEO, Sustainable Energy Authority of Ireland

Elaine Nevin, Director, ECO UNESCO

Connor Powell, Commercial Manager, SSE

Fintan Slye, CEO, EirGrid

#### Questions & Answers

15:30 Closing Remarks & Poster Prizegiving



# Energy Systems Integration Partnership Programme

We would like to welcome you to the inaugural research symposium of the Energy Systems Integration Partnership Programme.

The Energy Systems Integration Partnership Programme (ESIPP) is a research programme focussed on the integration of Energy Systems, such as electricity and gas, along with other infrastructures including data and water. As Energy Systems evolve they are becoming increasingly integrated, and this research seeks to provide an understanding of these interactions, and to identify ways to optimise these systems and energy use.

The main goal of this partnership is to build Energy Systems Integration (ESI) research capacity within Ireland. The research programme is designed to encourage collaboration between experts from academia (UCD, TCD, NUIG, ESRI and DCU), industry and the policy domain to tackle some key research challenges in ESI. Given the nature and scope of ESI, the research is necessarily multidisciplinary in nature, involving the fields of electrical, mechanical and chemical engineering, economics, consumer behaviour and psychology, and earth sciences.

The collaboration is underpinned by a supportive policy system with active participation by the Department of Communications, Climate Action and Environment (DCCAE), the Sustainable Energy Authority of Ireland (SEAI) and the Commission for Regulation of Utilities (CRU).

This symposium aims to showcase the research being carried out through the ESIPP project, while also emphasising the importance of collaboration with a range of stakeholders. The symposium programme features presentations from international experts and a panel discussion with leading industry figures on "Targets for 2030 and the Role of Energy Systems Integration".

ESIPP is financially supported by Science Foundation Ireland under the SFI Strategic Partnership Programme (Grant Number SFI/15/SPP/E3125), industry members and a philanthropic donation by the chair of UCD Energy Institute, Mr. David O'Reilly.

We hope you enjoy the day. For more information on ESIPP please visit [www.esipp.ie](http://www.esipp.ie).

## Session 1: Climate Change and Energy Systems



### **Johnny Shine, Chair of ESIPP Governance Committee**

Johnny Shine is Chairman of the ESIPP Governance Committee and a member of the UCD Energy Institute Advisory Board. He has served as Managing Director of eir Networks and prior to that served in the roles of Deputy Chief Executive ESB and Chairman/Managing Director ESB Networks. He holds a MBA and an Electrical Engineering Degree from UCD.



### **Mark McGranaghan, EPRI, USA**

Mark McGranaghan is Vice President of the Integrated Grid Sector for the Electric Power Research Institute (EPRI). He leads the teams responsible for EPRI's research involving technologies, systems, and practices for the power distribution system and customer systems, as well as the related information, communication and cyber security infrastructure and systems.



### **Andrew Keane, University College Dublin**

Andrew Keane is Head of the School of Electrical and Electronic Engineering and Head of the Energy Institute at University College Dublin. Andrew is the Lead Principal Investigator in the ESIPP project and his research interests include the impact of new energy resources on the power system from the residential network up to the high voltage transmission system.



### **Frank McDermott, University College Dublin**

Frank McDermott is Head of the UCD School of Earth Sciences in UCD. Understanding the spatio-temporal variability in the NAO and other climate system teleconnections such as the East Atlantic pattern are a particular focus of Frank's current research as these are crucial in determining multiannual variations in the power output of windfarms and PV installations in western Europe.



### **Martina Assereto, PhD Student, UCD Smurfit Business School**

Martina Assereto is a PhD student at the UCD Smurfit Business School. Her current area of research focusses on a real options approach to evaluating and mitigating the financial risks of renewable energy integration systems.

## Session 2: Energy Systems Integration Research



### **John O'Connell, Commercial & Regulation, Ervia**

John currently works within the Ervia Commercial & Regulation team. He initially joined Irish Water as Regulation Manager and before that he worked at the Commission for Energy Regulation on markets and network regulation.



### **Eoghan Clifford, National University of Ireland, Galway**

Eoghan Clifford is a chartered engineer and currently works as a senior lecturer in Civil Engineering, NUI Galway. He is the Programme Director of the BSc Project & Construction Management at NUI Galway and lectures in various water and transport engineering modules. His current research team comprises 19 research staff and postgraduate students.



### **Damian Flynn, University College Dublin**

Damian Flynn is an associate professor in the School of Electrical & Electronic Engineering at UCD. His research interests include power system analysis, integration of renewables into electrical networks, and power system flexibility and control. He is also interested in advanced modelling and control techniques applied to power plant.



### **Valentin Bertsch, Economic and Social Research Institute**

Valentin serves as manager of the Energy Policy Research Centre (EPRC) and as research area coordinator for Energy and Environment in The Economic and Social Research Institute (ESRI). He is an energy economist and also an expert in decision analysis and model-based energy systems analysis, particularly the integration of grid constraints in power systems models, targeted at power generation and transmission expansion planning.



### **Geertje Schuitema, University College Dublin**

Geertje Schuitema is a Lecturer in Consumer Behaviour and Technology Adoption at the School of Business and the Energy Institute at UCD. She works across the lead groups in the Energy Institutes on all aspects related to consumer behaviour and public acceptance in the energy field.

## Panel Session: Targets for 2030 and the Role of Energy Systems Integration



### **Moderator: Lisa Ryan, University College Dublin**

Lisa Ryan is the ESIPP lecturer in energy economics in the School of Economics. She joined the UCD Energy Institute as senior researcher in energy economics in September 2014. She was the senior energy economist in the Energy Efficiency Unit at the International Energy Agency (IEA) in Paris until summer 2013. Lisa is currently a Board Member of SEAI.



### **Jim Gannon, CEO, SEAI**

Jim Gannon is Chief Executive of SEAI, having joined the organisation in May 2016. He was formerly Director of Energy and Environment at RPS, with the bulk of his career focusing on policy development and project delivery in the renewable and conventional energy sectors. Jim also serves as a member of the national Climate Change Advisory Council.



### **Elaine Nevin, Director, ECO UNESCO**

Elaine Nevin is the National Director (Chief Executive Officer) of ECO-UNESCO since 2002. She has worked in the field of environmental education since 1995. Elaine is the Chairperson of the Advisory Group on the National Dialogue on Climate Change. She was appointed to the Environmental Protection Agency in 2011 and was reappointed to the EPA Advisory Committee in 2016; she is a member of the Advisory Committee for the National Strategy on Education for Sustainable Development.



### **Connor Powell, Commercial Manager, SSE**

Connor is a Commercial Manager in SSE's Wholesale division, responsible for optimising an energy portfolio of generation and demand across the island of Ireland. This includes developing commercial strategies for existing and new physical assets across both spot and forward markets. He previously worked in Market Regulation on the development of electricity and gas trading arrangements, providing advice and guidance for SSE's I-SEM implementation.



### **Fintan Slye, CEO, EirGrid**

Fintan is Chief Executive of EirGrid. He had previously held the position of Director of Operations of EirGrid, in which he had responsibility for the operation of the power system in Ireland and Northern Ireland, as well as for managing EirGrid and SONI's programme of work to facilitate the integration of world-leading levels of renewables on the power system.

## Poster Exhibition

No	Student Name	Poster Title
1	Federico Caruso	Assessment of power requirement of a waste water pump working under transient conditions
2	Hafiz M. Hashim	Fault Detection and Diagnosis in Water Distribution Systems
3	Dominik Seiler	Characterising the energy dynamics in industrial manufacturing systems
4	Alessia Sgobba	Assessment of on site solar and wind energy at a manufacturing facility in Ireland
5	Anjukan Kathirgamanathan	Data-Driven Models in the Assessment of Energy Flexibility of Commercial Buildings
6	Matteo Giberti	Demand and Response capabilities of small-scale wastewater treatment plants
7	Qipeng Liu	Energy system integration in large-scale wastewater treatment plant (WWTP)
8	Eoin Daly	Energy Consumption in Wastewater Treatment - Comparison of Weather Data and Energy Consumption
9	Sukanya D. Saikia	Modelling Water Energy Nexus in WWTPs under climate change and population growth scenarios
10	Bryan Coyne	The future of data centre cooling, energy consumption and climate change
11	Jaakko McEvoy	Adaptive Liquid Cooling Methods in Microchannel
12	Mohamed Ali Ekhtiari	Modelling of Gas Network in an Interconnected Energy System
13	Aruna Chandrasekar	Increasing the efficiency of gas usage in an interconnected gas and electricity network
14	Devasanthini Devaraj	The future role of gas networks in integrated energy network
15	Junru Chen	Comparison between Virtual Synchronous Generator and Synchronous Generator in Power System
16	Ismail Ibrahim	Provision of Power System Support Services From Distributed Energy Resources
17	Valentin Rigoni	Decentralized solutions for LV networks with Distributed Generation
18	Eadaoin Doddy	An Investigation of Systematic Errors in Solar Radiation for Reanalysis Datasets
19	Seanie Griffin	Wind speed accuracy and wind-solar correlations in reanalysis datasets
20	Usman Ali	An Intelligent Knowledge-based Energy Retrofit Recommendation System for Residential Buildings at an Urban Scale
21	Paul Beagon	Characterisation of neighbourhood heat energy demand before large-scale retrofit
22	Mohammad Haris Shamsi	A generalization approach for reduced order modelling of commercial buildings
23	Ran Li	Evaluating Power System Flexibility Needs With Stochastic Unit Commitment Model
24	Dana Kirchem	The potential to harness demand-side flexibilities from large-scale wastewater treatment plants in an integrated energy system
25	Martina Assereto	Volatility modelling using GARCH as an input for real options: the case of solar energy in the U.S.
26	Linda Mastrandrea	Coordinating energy policy and environmental goals across electricity markets: a demand side perspective
27	Vanja Medugorac	Public Engagement with Decentralized Energy Systems
28	Ivan Petrov	Incentives for Energy Efficiency in the Residential Rental Market
29	João M. Correia	Large scale atmospheric circulation patterns and solar energy resources in Ireland and the UK

