

UCD Energy Institute

5th June 2019

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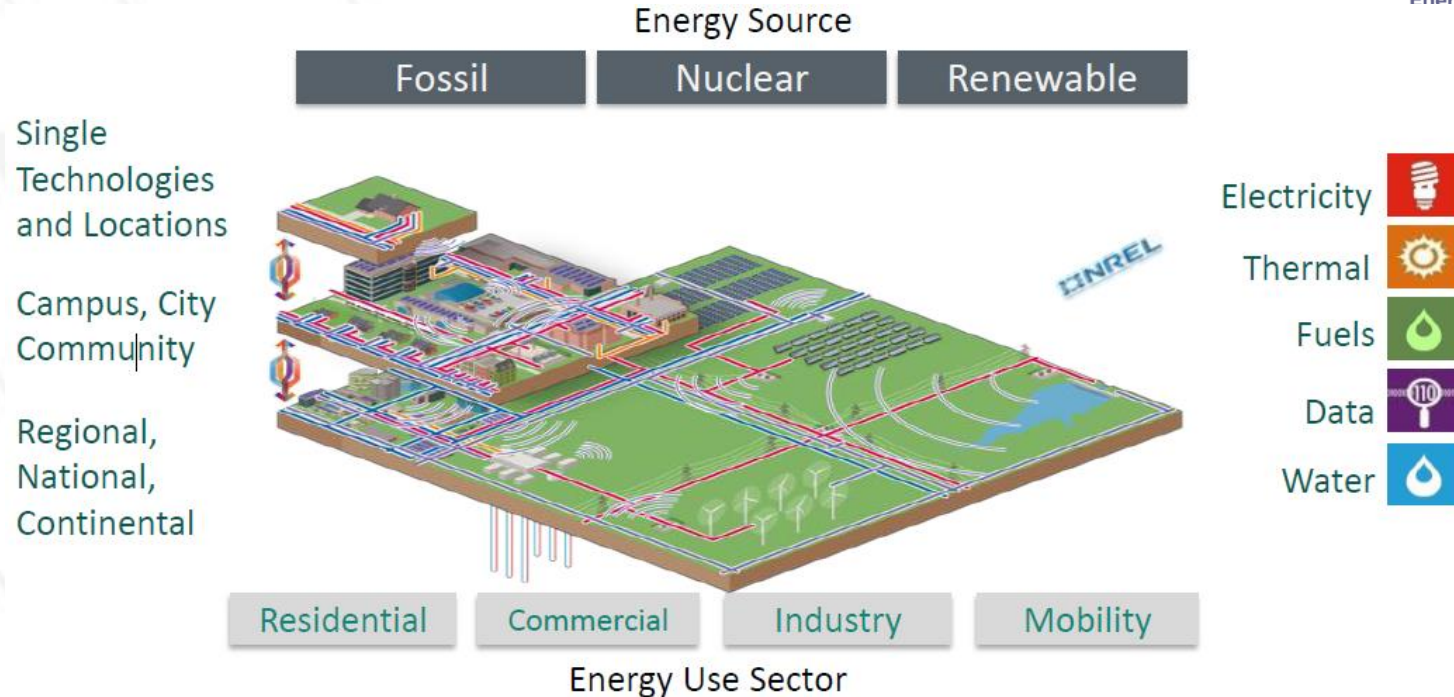
Sustainability
Efficiency
Distributed
Impact
Policy Energy
Technology Consumer
Decarbonisation
Systems



Mission: To deliver world-class energy research and to make a significant contribution to the optimisation, integration and deployment of zero carbon energy involving in particular:

- *Closing the research to industrial deployment gap*
- *Influencing energy policy implementation at Irish and EU level*
- *Strengthening our positive international profile*
- *Impacting constructively on economic growth*
- *Developing a talent pipeline and graduate training for the Irish energy sector*

Energy Systems Integration

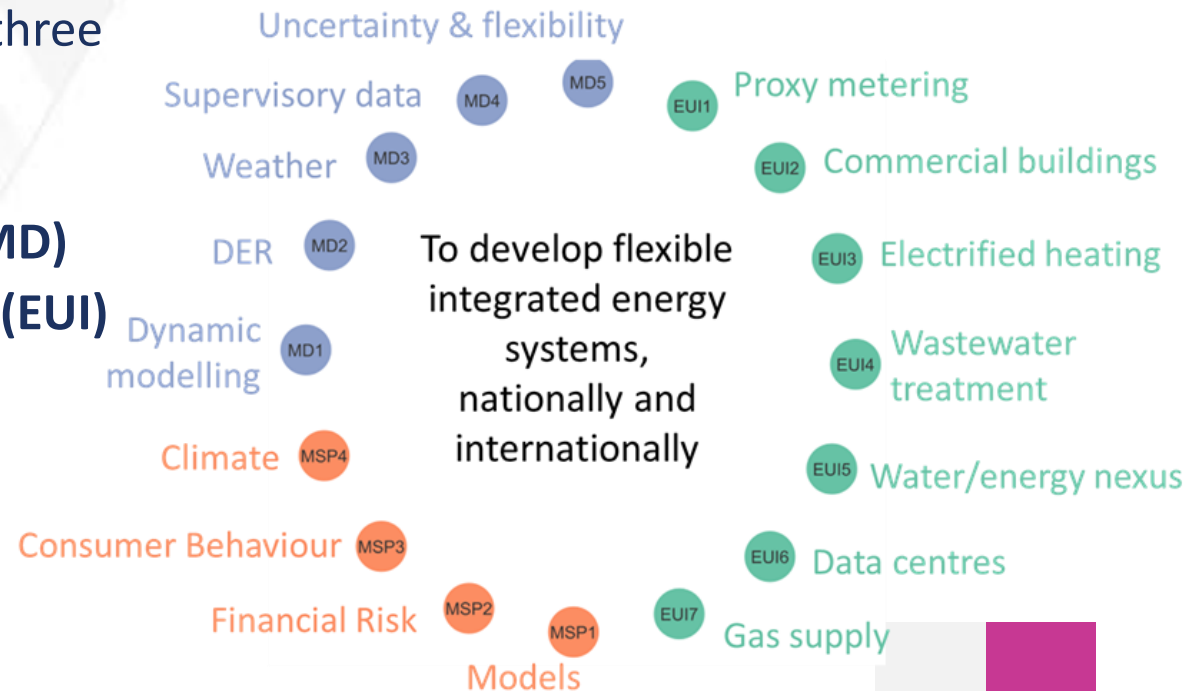


- Optimization of energy systems across multiple pathways and scales
 - Control variables are technical economic and regulatory
- Programme of research targeting decarbonisation and Climate Action focussed on energy systems
- Focus on the interfaces where the coupling and interactions are strong and represent a challenge and an opportunity

Energy Systems Integration Partnership Programme (ESIPP)



- €11m SFI – Industry - Philanthropy
- 25 academics from 13 Schools across 5 institutions
- 16 interconnected Work Packages organised into three strands
- Three strands:
 - **Modelling & Data (MD)**
 - **End Use Integration (EUI)**
 - **Markets & Strategic Planning (MSP)**

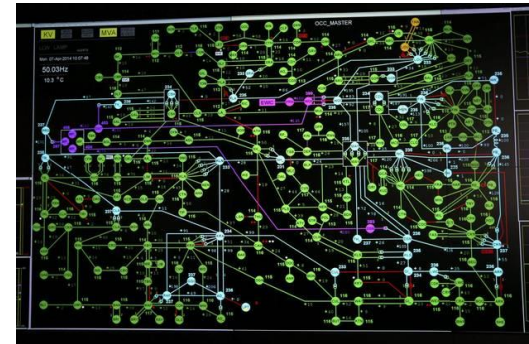
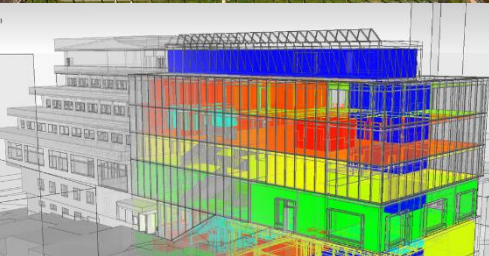
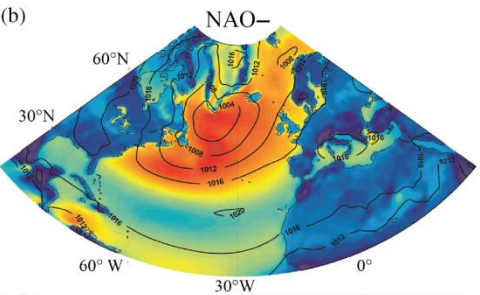
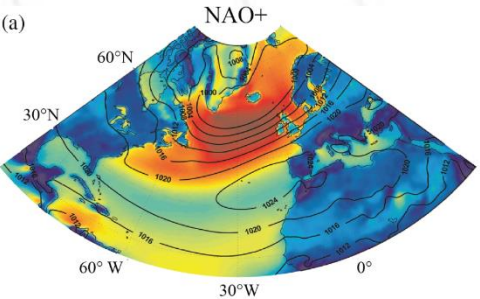


Core strengths of ESIPP

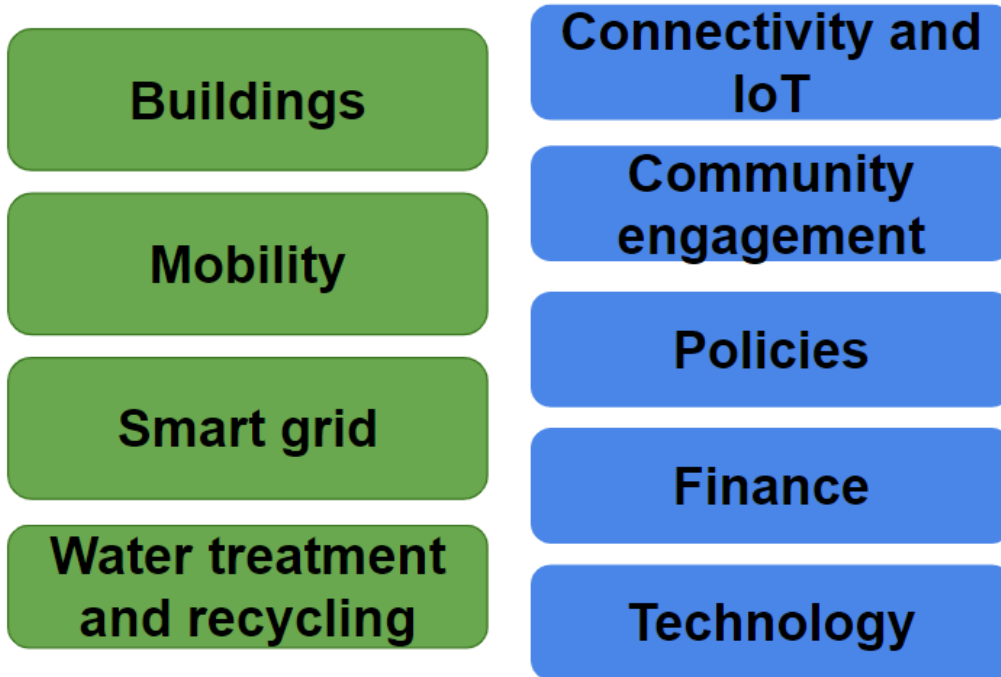
Multidisciplinary research team

- Power Systems
- Gas Networks
- Climate and Weather
- Residential and Commercial Buildings
- Energy Economics
- Wastewater Treatment
- Data Centres
- Market structures – incentives and risks
- Consumer Behaviour

Integration and Optimisation



Research Activities



Functional areas:

- Technology implementation
- Data analytics and management
- Modelling, control and optimisation strategies
- Policy, markets and financial measures
- Monitoring and validation
- Strategies for end-user and public engagement
- Knowledge transfer and capacity building
- Dissemination, outreach and exploitation

Research areas:

❖ Smart buildings

- Control and optimisation of building energy systems.
- Building energy flexibility assessment for demand response programs.
- Energy, environmental and cost assessment of technologies.
- Application of data analytics and machine learning techniques.

European Projects



National Funded Projects



Energy Storage and Demand-Side Flexibility within Future Electricity Markets €0.8m

AMPSAS (Advanced Modelling for Power System Analysis and Simulation) €1.7m

Active Distribution System (ADEPT) Management Enabled by Distributed Power Electronics €1.2m

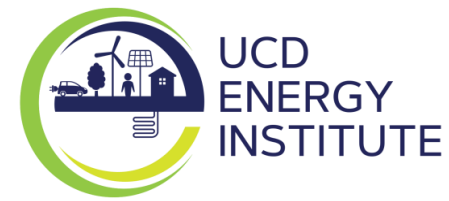


European Projects





UCD Sustainable Energy Community



Our University Our City Our Home

Top 1% higher education institution worldwide

Over 32,000 students and staff

133 hectares campus

Residential and commercial buildings

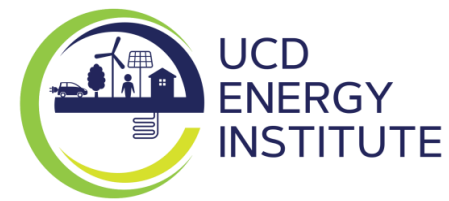
On site thermal and electric generation
systems

EV charging stations

Real-time & historical metering devices
capture UCD's energy & water consumption



UCD Sustainable Energy Community



- Work together towards SDG goals
- Increase Energy Awareness
- Contribute to the decarbonisation of UCD
- Promote Sustainable Behaviours
- Promote multidisciplinary research and collaborations
- Increase the impact of UCD in the community
- Propose local energy efficiency targets
- Provide accurate and scientific information to general public
- Set an example and support more than 100 nation wide SECs



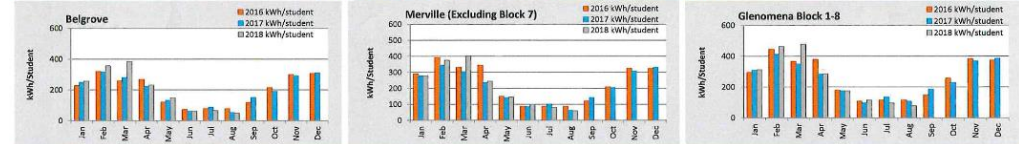
UCD campus



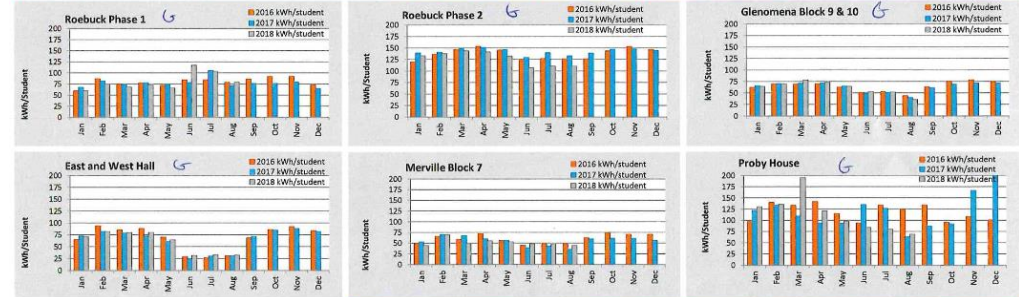
UCD Building Energy Report UCD Residences August 2018



Electricity - (Space Heating & Consumer Loads)



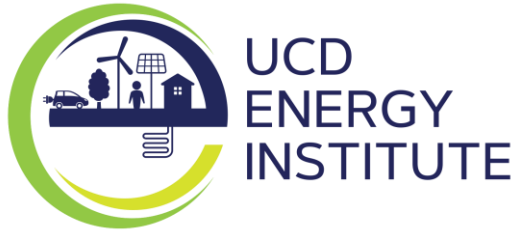
Electricity - (Consumer Loads)



Notes and Student Numbers:

Proby House-114 Students
 Merville- 606 Students
 Notes: Social space/games room in House 1 Glenomena
 Office in House 6 and games room at the bottom of House 7 Belgrove
 Roebuck Phase 1-300 Students
 Glenomena Bk 1-4 - 568 Students
 The Landrette is in House 24 on the ground floor Belgrove
 Roebuck Phase 2-133 Students
 Glenomena Bk 9-10 - 168 Students
 East&West Hall - 142 Students
 Belgrove-779 Students
 Ashfield- 354 Students

- Heat and Electricity Consumption in UCD Residences
- Several blocks/zones/houses
- Passive buildings
- Community engagement study



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