

*Facilitating the creation of a UK Smart Grid industry*

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# Welcome to the Joule Centre Smart Grid Seminar

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**Northwest**  
REGIONAL DEVELOPMENT AGENCY

# History of Joule Centre:

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- formed in 2005 to spearhead collaborative low carbon energy research in the Northwest
  - *by further leveraging through co-ordination & leadership at regional & national level*
  - *by increasing interdisciplinary and collaborative working that delivers real solutions for the benefit of the Northwest*
- funded by NWDA with an initial 5yr budget of £5.2m.
- Joule Centre serves:
  - academic researchers in all the universities in the Northwest
  - SME's and larger businesses in Northwest
  - NWDA in promoting research capabilities of the region
  - public sector organisations

# Joule research funding:

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- Grants to increase the profile and R&D capacity of Northwest Universities in energy technologies
- Financial and management support for specific projects
- Catalyst for encouraging further investment
- Knowledge for NW sustainable energy community
- Since 2006, Joule Centre has awarded 32 grants
- Joule Centre is also a partner in two EU projects.

# Support for industrial collaboration:

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- Joule Centre endeavours to support businesses by linking them with NW academic researchers.
- Joule Centre supports these relationships through:
  - Joule Forum
  - one to one meetings with business
  - targeted media and website
  - supporting other regional and national energy events
  - seminars and conferences

# What Joule has achieved: Research Funding

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- 33 research grant awards, committed expenditure £2.9M
- awards range from £7,000 to £340,000
- matched funding from industry & government of £4.8M
- Joule Centre seeks to promote industrial/regional linkages
- topics include:
  - large scale tidal energy prospects for the region
  - innovation in small wind turbine technologies
  - hydrogen storage & fuel cells
  - demand side management
  - smarter networks
  - low carbon manufacturing
  - materials for 3<sup>rd</sup> generation solar cells

# Joule research on Energy Network Infrastructure:

- Energy infrastructure for offshore grids (Manchester Univ. + TNEI)
- Mini-grids for renewable energy applications (Bolton University)
- Superconducting fault current limiter (Manchester Univ. + Rolls Royce)
- Data capture on distribution networks (Manchester Univ. + BPL)
- Use of ester oils in transformers (Manchester Univ. + ENW)
- Optical detection of transformer degradation (Liverpool Univ. + ENW)

# Research on Hydrogen, Fuel Cells & Wind Turbines:

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- Nano-structured hybrid hydrogen storage materials (Salford Univ.)
- PEM fuel cell test stand for low carbon technologies (Manchester Univ.)
- Hydrogen from methane using non-thermal plasma (Manchester Univ.)
- PV research (Bolton Univ. & Manchester Univ.)
- Mini-grids for renewable energy applications (Bolton University)
- Innovation of small wind turbine technologies (UCLAN)

# NW Energy Research Landscape:

Smarter Networks

Cross-cutting Socio-economic

Low C technology + Carbon Reduction

Energy Skills

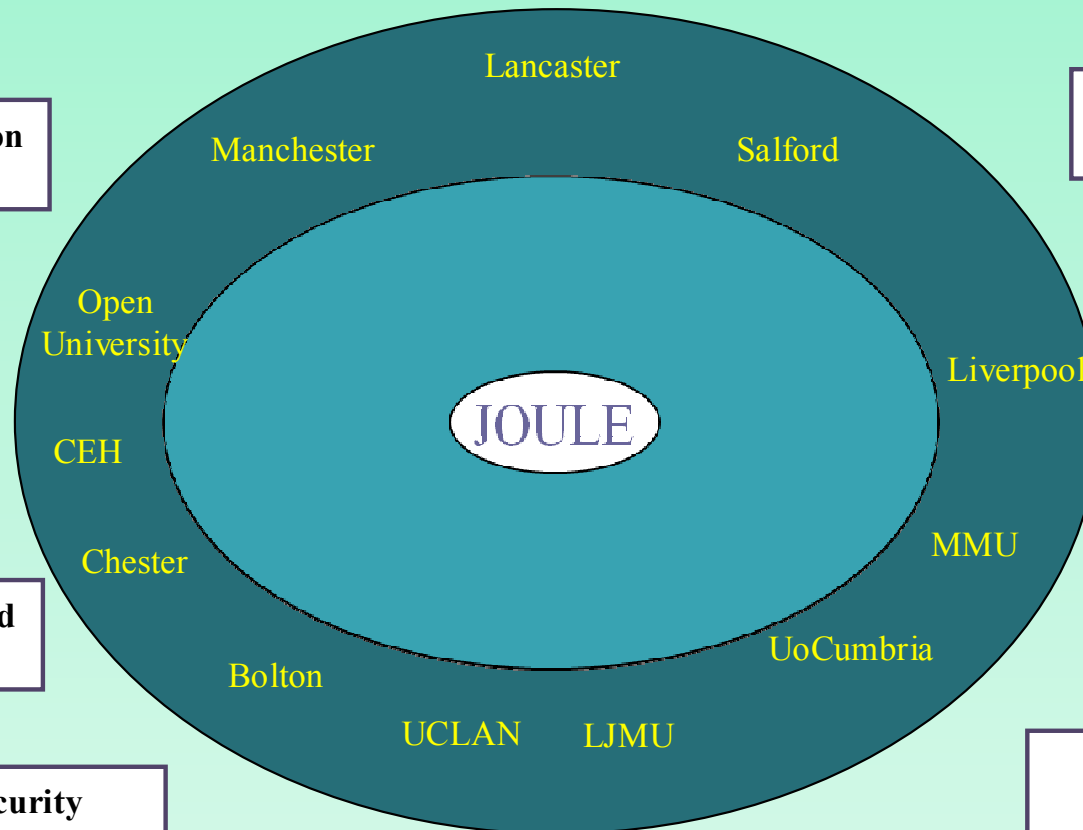
Drivers

Govt policy -2020 vision and affordability

NW Climate change policy

NW business needs and capabilities

Energy Security



Outputs

Collaboration to increase regional capability

Industrial engagement

Increased talent pool

Increased regional energy "GVA"

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# Smarter Energy Networks:

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- NW Universities have internationally recognised research capabilities in electrical networks
- electricity networks have a good fit with the Energy Innovation Centre and numerous world class businesses in the NW
- region also includes world leading consultants who employ a highly skilled graduate/postgraduate workforce
- development of the electrical grid will be one of the main challenges in connecting new generating plant and managing new types of demand

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# Today's Programme:

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- Smart Grid vision – Peter Johnson, Alcatel Lucent
- ADDRESS EU project – Francois Bouffard, Manchester Univ.
- Smart Grid management – Jeff Tolnar BPL Global
- Growing power engineering skills gap – David Healey
- Roundtable review
- Lunch
- “Softpowerline” – David Braine, Powerline Technologies
- Substations Monitoring – David Bidwell, Serveron
- Rapid Fault Location – Martin Speierman, Powersense
- Smart Grid – perspective from USA market - Phil Hunt Grid2Com
- Communications; foundation for Smart Grid - David Healey BPL Global
- Closing remarks - Peter Crossley