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Working in partnership to deliver energy innovation...

Mike Colechin

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Innovating to deliver affordable, secure, sustainable low carbon energy for the UK

The ETI is a public-private partnership between global energy and engineering companies and the UK Government.

- Providing new technology and business concepts
- Generating UK economic development
- Building better understanding of energy challenges
- A collaborating force
- Informing policy

ETI's industry and government partnership shares risk and creates affordability for development and demonstration of new technologies

ETI Members



CATERPILLAR



e-on



Rolls-Royce



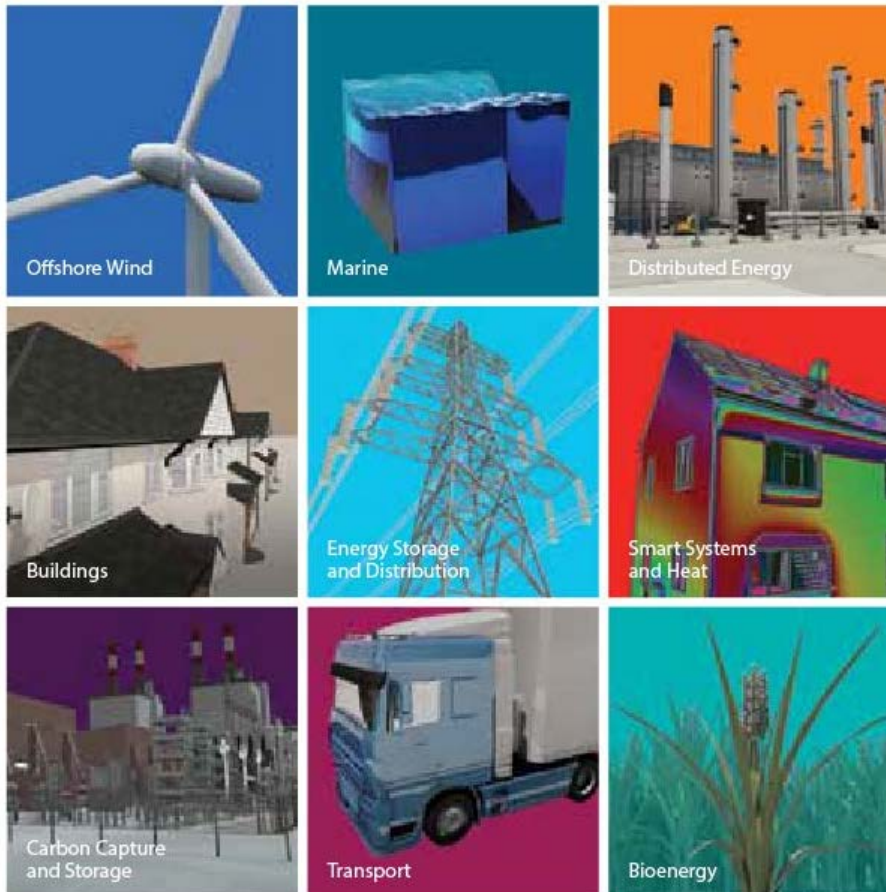
Technology Strategy Board
Driving Innovation

ETI programme associate

HITACHI
Inspire the Next



ETI technology programme areas



Addressing UK Energy Development Priorities:

Efficiency

Systems and technologies for reducing cost and improving buildings and transport

Nuclear

Building supply-chain capacity and financier confidence

Gas

A critical fuel for power heat, storage and potentially for transport

CCS

System demonstration for capture, transport and storage

Offshore renewables

Reducing cost

Bioenergy

Creating the science, technology and business knowledge base for decisions on how to use bioenergy crops



Delivering innovation from strategic planning to technology demonstration

Knowledge building



Bioenergy
Multi-site field trial to study impact of bioenergy crops on soil carbonisation and greenhouse gas emissions – Reporting in 2014



Marine
Optimising wave and tidal array yields – Industry use from 2013 – Reporting in 2014



Carbon Capture and Storage
First comprehensive UK CO₂ Storage database – Delivered in 2013

Developing technology



Energy Storage and Distribution
New approach to storing electricity at scale – Testing up to 2017



Marine
3 phase 11KV Wet-mate connector with integrated communications – Delivered in 2012



Transport
Increasing efficiencies of HDV land and marine vehicles by up to 30% – Testing up to 2017

Demonstrating technology and system solutions



Offshore Wind
New designs for Floating turbine platforms – reducing generation costs – Tank testing and design completed in 2013



Offshore Wind
World leading facility to increase reliability of new turbines – Operational from 2014



Marine
1MW tidal generator providing environmental impact and performance – Operational in 2013



Knowledge building to...

- Inform industry decision making through commercially available projects
- Build a better understanding of decarbonisation potential in developing industries
- Inform policy debate

£50m

of projects focussed on demonstrating technology to date

SMARTtide
Simulated Marine Array
Resource Testing

Now available as a commercial product from HR Wallingford, part of a £0.5m contract from ETI

- Simulated Marine Array Resource Model
- Commercially available from May 2013
- Developed by HR Wallingford as part of ETI Tidal Resource Modelling project

SMARTtide (Simulated Marine Array Resource Testing) model

The poster features a teal background with a white text box containing the title, a list of bullet points, and a small image of a document titled 'SMARTtide Simulated Marine Array Resource Testing'. At the bottom, there is a dark blue map of the UK with the SMARTtide logo overlaid.



Developing technology to...

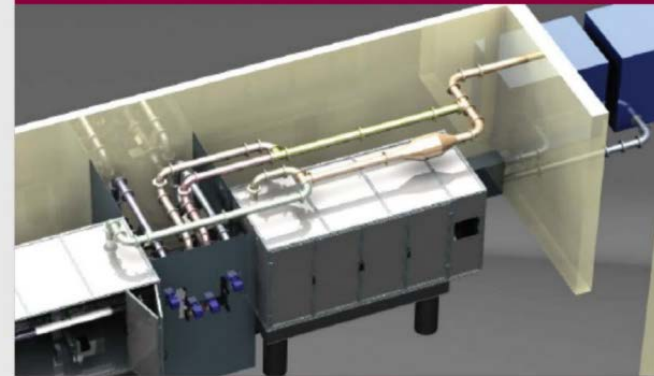
- Build supply chain capability
- Create economic opportunities
- Exploit UK technologies knowledge and skills

£66m of projects focussed on demonstrating technology to date

High efficiency SCR

In supply from Caterpillar, Johnson Matthey, Loughborough University

- £4.5m contract from ETI
- Visualisation rig operational Q3 2013 at Loughborough University
- Test cell and vehicle demo in 2016 (Caterpillar, Peterlee)





Demonstrating technology to...

-
- De-risk technology
 - Accelerate low carbon technology innovation
 - Build investor confidence

£97m of projects focussed on demonstrating technology to date

CCS storage site development

£2m investment from ETI kick-starting National Grid programme to appraise Southern North Sea aquifer

- Storage development and qualification is the longest lead time item in the CCS chain and the greatest uncertainty
- Drilling completed in Summer 2013





The ETI works with:





ETI Insights

Developed from ETI projects and in-house analysis

Carbon Capture and Storage

- » **Carbon Capture and Storage – Potential for CCS in the UK**
A demonstration of the system wide importance of CCS through its capability and flexibility to reduce carbon emissions from a large range of activities
- » **Optimising the location of CCS in the UK**
An examination of how informed decisions about CCS infrastructure location is critical to help keep costs and risks low
- » **A picture of CO₂ storage in the UK – Learnings from the ETI's UKSAP and derived projects**
An analysis providing estimates of the size and cost of equipping the UK with a CCS infrastructure which allows it to meet its 2050 climate change targets

Transport

- » **An affordable transition to sustainable and secure energy for light vehicles in the UK**
An analysis of the light vehicle market and its energy supply infrastructure to define a potential carbon transition path that is affordable, secure and sustainable for the UK



Available to download
at www.eti.co.uk



Informing policy to underpin market developments

48 UK Advisory boards with ETI staff members

13 Select committee appearances

41 Responses to Government consultations

71 Third party policy documents referencing ETI insights





Academic research partnership building knowledge and developing skills

| | | |
|--|---|---|
| <p>University of Edinburgh University of Oxford Queens University Belfast University of Manchester Cranfield University University of Strathclyde University of Sheffield</p> <p>Offshore Wind</p> | <p>University of Edinburgh University of Oxford Queens University Belfast University of Manchester</p> <p>Marine</p> | <p>UCL University of Manchester Cranfield University</p> <p>Distributed Energy</p> |
| <p>UCL</p> <p>Buildings</p> | <p>University of Manchester University of Strathclyde</p> <p>Energy Storage and Distribution</p> | <p>Cranfield University University of Strathclyde University of Sheffield</p> <p>Smart Systems and Heat</p> |
| <p>University of Edinburgh Heriot Watt University University of Durham Imperial College London University of Nottingham</p> <p>Carbon Capture and Storage</p> | <p>Loughborough University University of Aberdeen University of Sussex Imperial College London University of Leeds UCL</p> <p>Transport</p> | <p>Cranfield University Aberystwyth University University of Aberdeen University of Edinburgh University of Southampton University of York University of Cambridge Imperial College London University of Leeds</p> <p>Bioenergy</p> |

£6.5^m Invested in skills development for future engineers

- Co-funded with EPSRC
- University of Edinburgh
- University of Exeter
- University of Strathclyde

9 IDCORE Industry partners

£19^m Spend to date on Universities and Research Institute contracts

29 Universities and Research Institutes in projects

£71^m Value of ETI projects involving Universities and Research Institutes

75 Industry groups from 51 companies in projects with Universities

29 Students on the IDCORE programme



The next five years

Engaging the Sector

Economic and commercial impact

- Increased support for business development as well as technology development
- Increased engagement with supply chain partners and co-funders on major demonstration projects

Offshore Wind

Very long blade

- Next generation high performance wind turbine blade development
- In development by Blade Dynamics for test from 2015



Transport

Accelerating the introduction of fuel efficient technologies into the market through research and development work that benefits the industry



Industry Growth

Skills development

- Developing supply chain capabilities
- Investing in future engineers through the IDCORE programme
- Linking academia and industry



Bioenergy

Waste Gasification

- Competition to design and build the most efficient, economical and commercially viable waste gasification demonstrator plant





Registered Office
Energy Technologies
Institute
Holywell Building
Holywell Park
Loughborough
LE11 3UZ

Energy Technologies Institute (SSH)
6220 Bishops Court
Birmingham Business Park
B37 7YB



For all general enquiries
telephone the ETI on
01509 202020.



For more information
about the ETI visit
www.eti.co.uk



For the latest ETI news
and announcements
email info@eti.co.uk



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