

**MEETING DATE:** 6<sup>th</sup> October 2011

**LOCATION:** 170 Queen's Gate, London SW7 5HF

**ATTENDEES:**

<b>Chair:</b>	Nick Winser	National Grid
<b>Members:</b>	David Eytون Ron Loveland John Loughhead Peter Emery Tom Delay Graeme Sweeney Graham Pendlebury Allan Jones Alison Wall Neville Jackson Paul Lewis Sue Ion John Miles Neil Morgan Peter Bance	BP The Welsh Government UKERC Drax Power The Carbon Trust Shell DfT E.ON EPSRC Ricardo Scottish Enterprise RAEng Arup TSB
<b>Non-Members:</b>	Richard Neale Richard Knight Charles Carey Patrick Walsh Diego Villalobos Paul Hollinshead	Atkins ETI SSE BIS Ofgem DECC
<b>Invited speakers:</b>	Keiran Reynolds Richard Yemm Tim Jervis Paul Lazarevic Shaun Fitzgerald Toby Peters Bedwyr Humphreys	Eight19 Pelamis Verus Energy RLtec Breathing Buildings Highview Power Storage NanoGan
<b>Secretariat /Analysis Team:</b>	Ian Welch Farida Isroliwala Richard Heap Jonathan Radcliffe Mark Workman Ilaria Longo	National Grid DECC ERP Analysis Team ERP Analysis Team ERP Analysis Team ERP Analysis Team
<b>Apologies:</b>	David MacKay Jeremy Watson David Clarke Ian Marchant Martin Grant Mike Farley Julian Allwood Duncan McLaren Stephen Trotter	DECC DCLG ETI SSE Atkins Doosan Power Systems University of Cambridge Friends of the Earth ABB

## 1 Chair's introduction

Nick Winser welcomed the guest presenters and ERP members. He stated that the meeting would be a good opportunity for ERP to engage with SMEs, understand the challenges they face, and see how to feed messages in to government and policy makers.

Apologies were noted, in particular from David MacKay who had been due to chair this session. The minutes of the previous meeting were approved.

Some preliminary business was attended to:

- Members were informed that the bio-energy review, which provides evidence supporting the key messages presented in July, was finalized. The paper was on the members' website and would be published assuming no objections were made. It would be distributed on October 12th.
- David Eyton gave an update on the work on industrial efficiency. The steering group recommended finalizing the executive summary and the full report will follow in due course. This could then feed into the government's work on a strategy for industrial efficiency due in November. DE emphasised that the work focused on industrial efficiency, not on how to reduce the carbon emissions, nor the role of CCS or bioenergy. The key messages were:
  - i. Need to address the balance between delivering energy supply and energy efficiency.
  - ii. Need to be careful about off-shoring of carbon emissions, as a consequence of any policy, including the efficiency in industry.
  - iii. There is a large amount of good practise in industry and the sharing of that is encouraged.
  - iv. More research is needed into the efficiency of energy systems especially understanding materials, e.g. water use. It was also noted that obtaining data that were meaningful was difficult at country scales.

**Action:** David invited members to address any comments on the document to Richard Heap in the Analysis Team.

- Jonathan Radcliffe gave an update on follow-up work to the CCC's Renewables Energy Review which was presented at the July meeting. He recalled that one of the key points from the discussion was how a system could manage intermittency with up to 50% renewables generation. Two papers had been circulated: One described the main flexibility components that the CCC used in its report. The second paper took the messages from the first and considered the consequences for technology innovations. Jonathan proposed that reaction from Members to the CCC's scenario be incorporated, and form the basis of a short report from ERP.

Members were asked for initial reaction, and to indicate if they would like to contribute to the analysis:

- Peter Emery was keen to provide feedback, and commented that the CCC's report did not look at the cost of not generating and that there were many other issues such as over-generating.
- Nick Winser highlighted that the CCC scenario had no resilience of flexibility and would only work in a perfect scenario.
- John Miles raised the importance of ERP to speak loudly since this report seems to be highly flawed.

**Action:** Nick Winser encouraged:

- Members to send comments to Jonathan who would pick up their views on this matter;
- Jonathan to set a date for a meeting where there could be a debate about it; and
- ERP to make suggestions to the CCC through a short report

## **2. SMEs**

Nick introduced the first of two sessions where the SME presenters would talk about the innovations, products and aims of their businesses. The object of this session was:

- Improve ERP's understanding of the challenges faced by SMEs in developing energy technologies in the UK, and the mechanisms in place for addressing them.
- Consider how ERP could incorporate views of SMEs in its work more effectively.
- Potentially initiate further study which could lead to recommendations on support for SMEs.

A summary of the discussions is given below.

### ***Pelamis – Richard Yemm***

Points raised included:

- SMEs are essential to drive technology with an innovation focus. Pelamis currently operated as a micro Original Equipment Manufacturer (OEM), though that wouldn't necessarily be the future business model.
- Venture Capital (VC) was the predominant funding available, but not well suited to this space. Piecemeal money led to inefficiencies from having to meet short-term objectives and also from continuous fund raising.
- Being able to compete on cost was key. Entering the market at £300/MWh was a good hurdle for new technology to achieve, but must be on a track to price level of competitors (i.e. Round 3 off-shore wind)
- Policy stability is what the stakeholders want. The policy pull had created the focus and given credibility for utilities. This had been done better in Scotland than Westminster.
- The big mistake made was moving to an array of machines too soon as the company felt forced to demonstrate the achievable revenue to VC community.

### ***Eight19 – Keiran Reynolds***

Points raised included:

- The technology was in a classic, capital intensive, 'Red Ocean' market, needing to find a niche. Competitiveness needed scale, and scale needed competitiveness.
- It was important to work closely with the supply chain on product costs and R&D. Though the company had an IP agreement for access to university research, this was limited in its relevance to industrialising the technology.
- Tax rules for what constituted an SME worked against a start-up which was part owned by a corporate, and thus not technically an SME.

- Government support for technologies came in cycles. Markets were better at picking winners than Governments – R&D tax credits were an effective mechanism to encourage investment and should be extended.

### ***Verus Energy – Tim Jervis***

Points raised included:

- Verus was looking for tested and proven kit to develop generation capacity from gasification of landfill waste, rather than developing a new technology. Obstacles included:
  - Suppliers' claims not meeting expectations.
  - The practice of developing a power plant was much more complex and non-linear than the theory, needing much guessing of progress.
  - Catch-22 situations with interdependent decision-making from independent organisations. Problems arose because of a lack of joined-upness between organisations.
- Concepts of gasification required technical expertise not evident in Ofgem, which made certification for ROCs challenging.
- Predictable incentives with clear hurdles were important for investor confidence across the sector.
- Getting a contract with heat users that would be around long enough and take the heat at a reasonable enough price to make the investment worthwhile was a significant challenge. To deliver heat would change the way the plant and turbine were designed, so heat was a bonus to the project rather than a core part of it.

### ***Breathing Buildings – Shaun Fitzgerald***

Points raised included:

- After spinning out of a BP-funded research programme in Cambridge, the company attracted VC funding then entered a partnership with mechanical ventilation company which saw changing world and lack of available technology to meet demands.
- This allowed the company to focus on core competencies – understanding ventilation and being good at innovation.
- Support had been mixed:
  - A Carbon Trust Applied Research grant with simple strings attached had worked
  - But Carbon Trust incubation support for developing a business plan had strings which potentially diluted the value of the company to future investors was bad.
- There was a lack of finance available from banks.
- Detailed technology-dependent incentives were a barrier to development, favouring flavour of the month technology areas selected by Government or agencies. Other than Government providing a stable high level policy and desired outcomes, should let the market decide which technologies to support.

- An infrastructure for innovation funding existed, within universities, such as at Imperial (with Imperial Innovations<sup>1</sup>) and Cambridge Enterprise<sup>2</sup>.

### ***Highview Power Storage – Toby Peters***

Points raised included:

- The company had been privately financed to £11m (from '*friends, fools and family*') and £1m support from DECC to install a pilot plant. The challenge had been scaling-up to commercial plant.
- The current regulatory environment does not value the role of rechargeable energy storage sufficiently to get the investment, though the market is expected to be there from 2020. Grant funding is needed to cover the gap in the UK.
- Highview is focusing on overseas markets for deployment opportunities. This may lead to a foreign corporate (with access to markets, capital and state funding) buying the company.

### ***RLtec – Paul Lazarevic***

Points raised included:

- The unique dynamic demand technology helped balance the grid by switching appliances on/off in response to AC frequency, rather than using generation plant.
- Since its invention in 1999 it had been funded initially by VC, with Carbon Trust investment and DECC grants more recently. Grant awards at an earlier stage would have significantly accelerated development.
- Key to growth had been a change in National Grid rules to allow dynamic demand through frequency response, and approval for its use under the CERT scheme, which funded a NPower Demonstration project.
- However, changes to policy and regulation leading to the discontinuation of CERT meant that it was no longer viable to deploy the technology in domestic fridges.
- Access to capital was needed to fund projects. Banks had not been interested in providing finance. Public funds difficult to access, but valuable. Low interest loans would have most impact on growing the company.

### ***NanoGaN – Bedwyr Humphreys***

Points raised included:

- The company began as a classic University spin-out with innovative technology needing investment. Carbon Trust Applied Research grant ran out after three years, support continued by Welsh Government. Now owned by IQE.
- Funding process costly – spent £30,000 on consultants to prepare proposal and took 6 months to get feedback. A gatekeeper could provide immediate feedback to save time.
- Struggle to get people with the right skills.

<sup>1</sup> <http://www.imperialinnovations.co.uk/>

<sup>2</sup> <http://www.enterprise.cam.ac.uk/>

- Public funding is focused at early stage innovation: Research Councils provide £100m/year in photonics, Technology Strategy Board has just £5m/year available. This appears to be the ‘tail wagging the dog’ - the balance should be reversed to support commercialisation and manufacturing.
- Modelled on Germany’s Fraunhofer institutes, TICs may fill the gap, but still low funding levels. TICs will have £50m/year funding, compared to £1.5bn for Fraunhofers.
- Competition is with China which has 5-year rolling plan for LED companies with 80% equipment subsidies. Strategic vision for the UK is weak and fragmented.

### **General discussion on the SME session**

Points raised in the discussion covered:

- Private funding streams from venture capital and corporates (including corporate venturing):
  - The advantages/disadvantages of different streams and what the tensions between them are.
  - Access to, and availability of, such funding in the UK, compared to other countries.
- The balance of public funding available across different innovation stages, from university research through to technology demonstration.
- The role start-ups play in developing energy technologies, and advantages they may have over corporate RD&D.
- The significance of stable policy/regulation, and how achievable that is. What the specific issues are for the energy sector, compared to other sectors.
- The sessions had focused on start-ups... understanding the challenges faced by established SMEs is another important aspect for ERP to consider.
- Whether the experience from SMEs can be better institutionalised in an enduring way

NW summed up by proposing that these issues, and views from ERP, be crystallized concisely in a paper for ERP under three main headings: the role of SMEs; flows of investment; impact of Government policy.

### **Actions**

- Analysis Team to draft a paper on the issues covered, including engagement with TSB on more generic challenges for start-ups.
- ERP to consider further engagement with SMEs more generally, possibly meeting some established SMEs.

### **3. A.O.B.**

Nick noted that he would shortly be reaching the end of his three-year term as industry co-chair, and would therefore be writing to Members setting out the plan to appoint the next co-chair.

### **4. Date of next meeting – 17 January, 2012**

The next meeting is on the 17th January, 10 a.m. – 12 noon, in central London. Ellen MacArthur would be speaking at a post-plenary event on the circular economy, which Nick thoroughly recommended Members and colleagues attend.