

Energy Materials Working Group

***‘Launch of a strategic
research agenda’***

Derek Allen,
Co-chairman,
Energy Materials Working Group

Tate Britain, December 2007



11.30-11.45 Overview of SRA (Derek Allen)

11.45-12.45 Presentation of technical reports

- Fossil (Colin Small, Rolls Royce)
- Nuclear (George Smith, Oxford University)
- Alternative Energy technologies (John Oakey, Cranfield)
- Transmission, distribution & storage (Ziad Melham, Oxford Instruments)

12.45-12.55 Conclusions and way forward (Derek Allen)

12.55-13.15 Discussion (all)

13.15 Closing Remarks –Wyn Jones

13.20 Lunch

What is the SRA?- Industry led, needs driven

A means by which we can;

- Deliver materials solutions to the energy sector to help meet Energy Policy objectives
- Identifying business opportunities for the materials community in UK

and provide;

- **Coordination**
- **Long term strategy and funding policy**
- **A unified 'voice' with influence**
- **'Hooks' into Europe**

which will;

- Advise funding agencies on priority areas
- Help define UK priorities for overseas funding where UK has direct input.(FP7)

Why Energy?

Energy Materials

Security of Supply

Climate change

By Mark Twiss, October 10, 2014

BLACKOUT BRA

Not since the 1970s have we been at greater risk of power cuts. So is it time to stock up on candles?

SINCE the Republic of Ireland's electricity supply was cut off last week, the UK government has been warning of the threat of a similar outage on the streets of Britain in December.

And the area around London is a particular concern, because it is the only area in the country where there is no gas supply. That means the only way to heat the homes and businesses in the area is by using gas. And if the gas supply is cut off, the only way to heat the homes and businesses is by using candles.

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by Michael Hanlon

It would be a disaster if the UK's power supply was cut off for more than a few days. The country's power supply is not as secure as it once was, and the risk of a major outage is increasing. This is because the UK's power supply is becoming more dependent on gas, and gas prices are rising. This means that the UK's power supply is becoming more expensive, and the risk of a major outage is increasing.

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THE CHINA CRISIS

Spectacular growth now biggest threat to environment

Consumption China - growing at nearly 70% a year - rapidly consuming 90 million barrels of oil per day. Total world production today is only 84 million bpd	Wealth China's population will grow from 1.3 billion in 2010 to 1.45 billion in 26 years - when per capita income will be equal to that of the US today	Oil On current trends, China will by 2021 be consuming 90 million barrels of oil per day. Total world production today is only 84 million bpd	Forestry China is already the biggest driver of rainforest destruction, says Greenpeace. Half of all rainforest logs head for China	Global warming By 2025, China will overtake the US as the top emitter of the greenhouse gases causing global warming	Cars By 2021, China would have 1.1 billion cars if it matches current US trends - bigger than the current world fleet of 800 million
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Fuel costs to rise again

Lucinda Kenney and Dominic O'Connell

BRITAIN'S biggest manufacturer companies are being told they need to accept power rationing or face blackouts this winter.

Last week, National Grid Transco (NGT), the monopoly gas and electricity distributor, approached its biggest customers and made clear they needed to consider cutting their use of power over the winter.

Companies that are big users of power, such as Rio Tinto and Alcan, have been approached by NGT to sign special "turn-downs" contracts in which they agree to reduce their power use by a specified amount after just a few hours' notice.

Firms are being offered lucrative deals to encourage them to sign up to the power-rationing programme. They are being promised money upfront and subsequent payments if any power cuts need to be made.

The extraordinary development is in response to concerns that a cold winter could lead to blackouts as Britain's power industry struggles to keep up with demand.

NGT wants to ensure that it has enough power reserves to keep the lights on and the heat turned up in millions of British households during the winter months.

An NGT spokesman said: "Instead of focusing on more generation it is about controlling the demand side."

NGT is run by Roger Urwin, chief executive and is one of Britain's largest public companies with a market capitalisation of £12.3 billion.

Companies that are likely to sign up for the controversial deals are those that do not require continuous heat and power for their manufacturing processes, or have alternative supply sources.

The Energy Intensive Users Group (EIUG), which represents Britain's biggest power users, estimates that 1,400 MW of power — equivalent to that produced by two large power stations — could be made available, but NGT could face a very steep bill.

However, insiders said NGT would have to pay enough to cover customers' lost production time. The amount would have to be at least equivalent to, if not more than, the cost to the customer of keeping its facilities powered up and running.

Companies can pay as much as £0 to use one megawatt of power for an hour during times of peak demand, compared with the average price of about £15, so NGT could face a very steep bill.

The contracts could be worth a total of £56,000 an hour to companies that sign up. NGT would have to pay enough to cover customers' lost production time. The amount would have to be at least equivalent to, if not more than, the cost to the customer of keeping its facilities powered up and running.

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UK COAL CHALLENGES DRAX BIDDER

BRITAIN'S biggest coal producer is planning a legal challenge to thwart BHP Billiton's bid for the Drax power station.

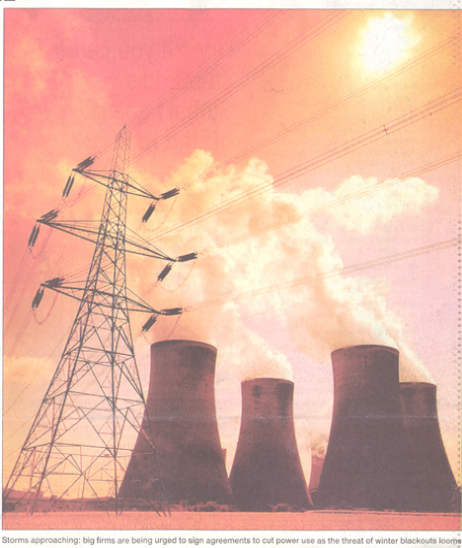
UK Coal, the coal giant, has announced an £800 million investment in Rio Tinto's Drax power station, a big customer for UK Coal, taking 7.5m tonnes of its 13m tonne annual production. The station is up for grabs because its owner, the American power company AES, has handed control to the plant's creditors, which are led by banks and bondholders.

BHP has tabled the highest offer so far for the station's debt — control of the coal brings control of the station — offering 70p in the pound for the outstanding loans, against Goldman Sachs's £4p and International Power's 55p.

However, BHP's offer is in line with British competition law. It has offered to supply Drax with coal for the next 15 years but only on the basis that it will meet 100% of Drax's needs from 2010 to 2012, and 80% for the following eight years.

McPhee said this would make BHP a dominant supplier in the market for coal delivered to plants like Drax. "We need to consider all our options," he said.

BHP declined to comment but insiders said that UK Coal would not completely lose out if its competitor won the bid. This is because BHP would have to source some of Drax's coal from other suppliers.



Affordable Energy

Storms approaching: big firms are being urged to sign agreements to cut power use as the threat of winter blackouts looms

Our Objectives

Energy Materials

Materials underpin the entire energy infrastructure

Help meet Government Energy Policy objectives of:-

- Reduced CO2
- Security of supply
- Affordable electricity

AND

- Provide wealth creation for the UK

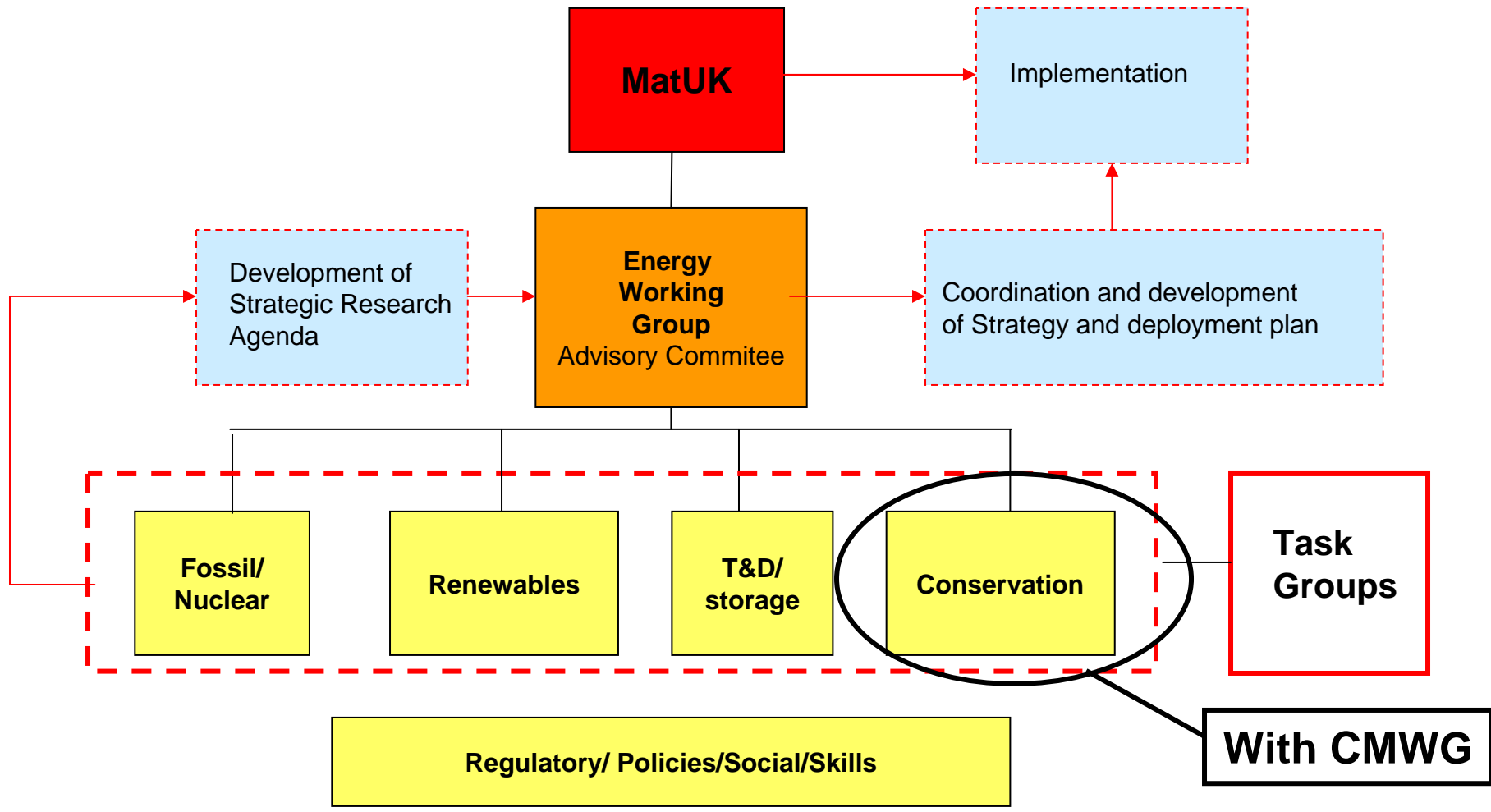
“Globally the overall value added of the low carbon energy sector could be as high as \$3 trillion per year worldwide by 2050... if Britain maintains its share of this growth there could be over a million people employed here in our environmental industries within the next 2 decades ”

Gordon Brown, November, 2007

AND

- Influence and align EU programmes

ORGANISATION

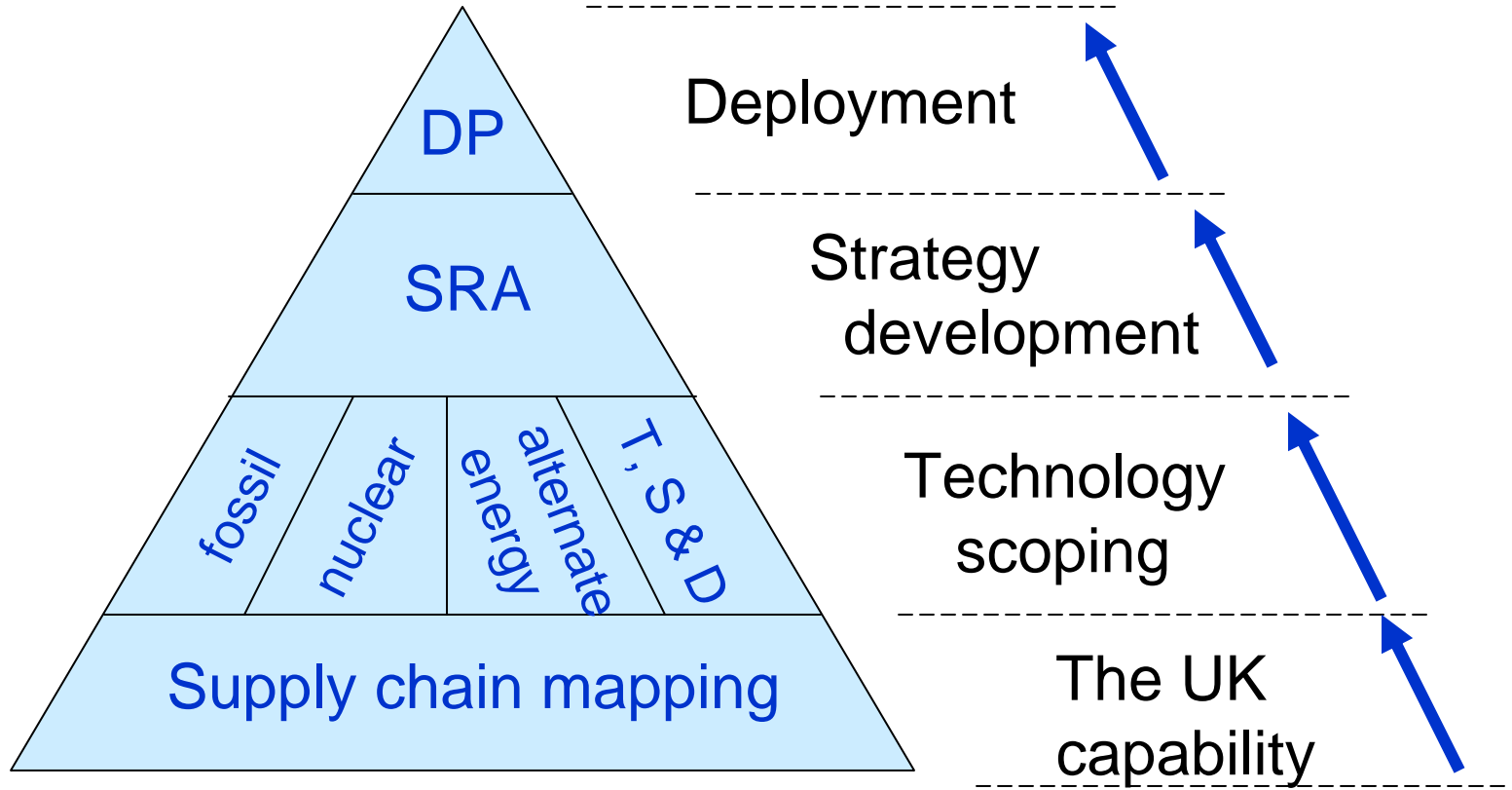


Who's involved?

Energy Materials

- Advisory Committee,
Industry; Alstom, EON UK, Johnson Matthey, UKAEA, Siemens, Pilkington, Doosan Babcock, British Energy, BP, Rolls Royce, BNFL, Corus, Alcan, Granta, National Grid, RWE, AREVA, Pilkington, Rolls Royce Fuel Cells, UKAEA, Oxford Instruments,
Other organisations; Materials KTN, IoM3, MoD, QinetiQ, NPL, Manchester University, TWI, Oxford University, BERR, Imperial College, Cranfield University, UKERC, EPSRC, Namtec, UKTI and RDA's.
- Secretariat supplied by BERR
- 100's of companies around the UK have been consulted throughout the process

Developing the Strategic Research Agenda



What are we delivering?

Energy Materials

...4 key technology scoping reports and the SRA



What are we delivering?

Energy Materials

...and a Consultation Document on the UK Energy Materials supply chain

MaterialsUK
Owned by the materials community

The Mapping of Materials Supply Chains in the UK's Power Generation Sector

The cover features a central blue silhouette of the United Kingdom. Surrounding the map are several small images: solar panels, a power turbine, a power plant, a glowing blue energy source, and wind turbines. At the bottom, there is a row of logos for partner organizations: DOOSAN, Doosan Babcock Energy, bp, ALSTOM, SIEMENS, NPL, Rolls-Royce, RWE, e-on UK, and corus.

The SRA covers the following issues;

- Overview of energy market
- UK materials supply chain
- Sustainability/Natural resources
- Skills
- International collaboration
- Technology challenges
- Funding
- Recommendations
- Technical annexes