

Research Councils' Energy Programme and CAT

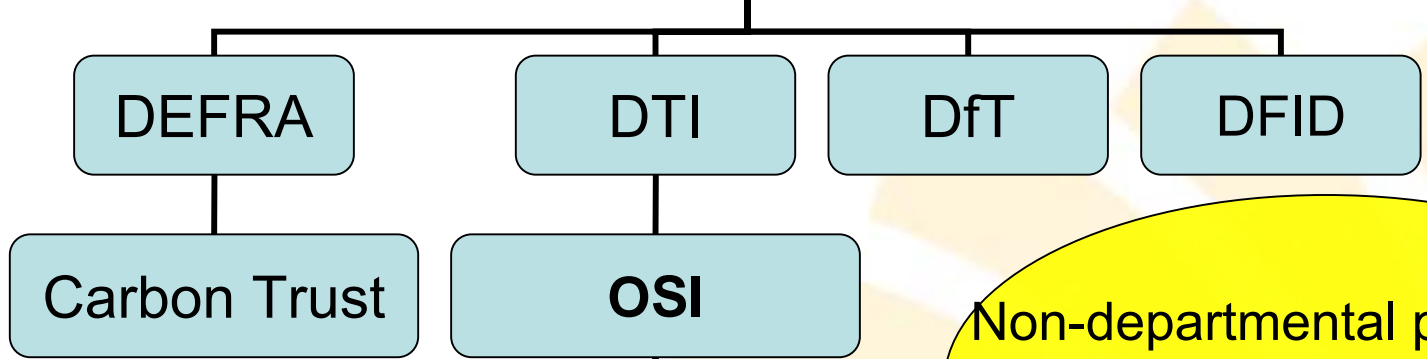
Dr Alison Wall
EPSRC

**The Research
Councils**

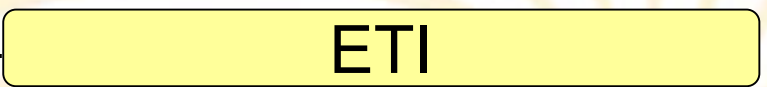
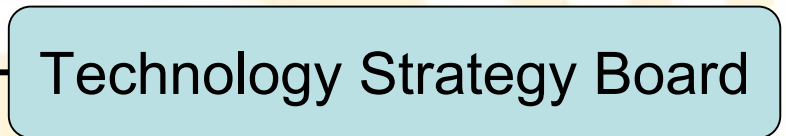
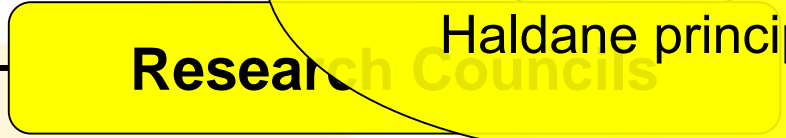
**The energy
portfolio**

Where next?

Government



Non-departmental public body
Arms length from government
Haldane principle



Science Budget

- administered through the Office of Science and Innovation (OSI), part of DTI
- Spending Review 2004: the Research Councils receive the majority of the public funds each year from the Science Budget
 - £2.4 billion in 2005-06
 - £2.6 billion in 2006-07
 - £2.8 billion in 2007-08

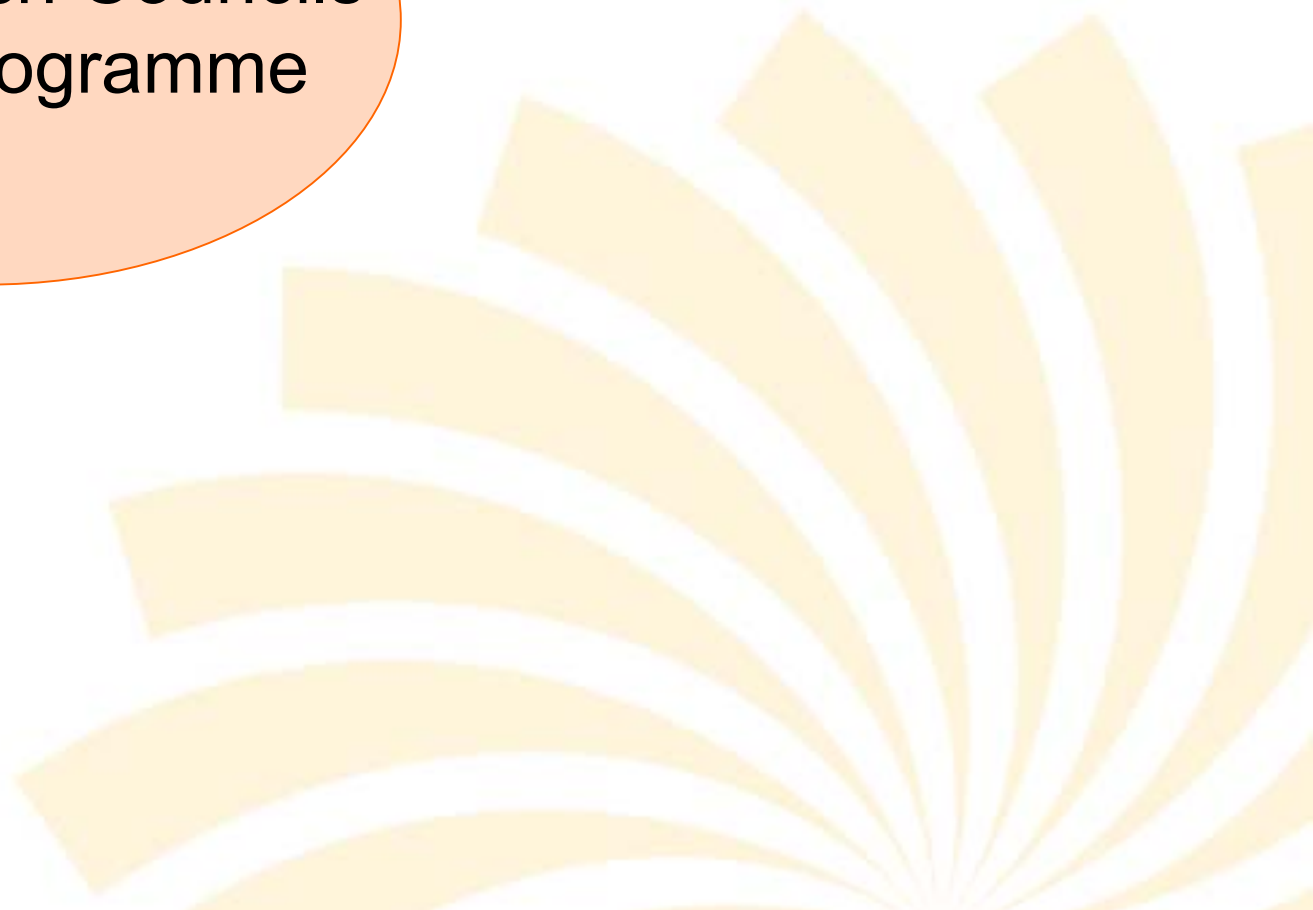
PSA target

- *Improve the relative international performance of the UK research base and*
- *improve the overall innovation performance of the UK economy including through effective knowledge transfer amongst universities, research institutions and business*

EPSRC's mission

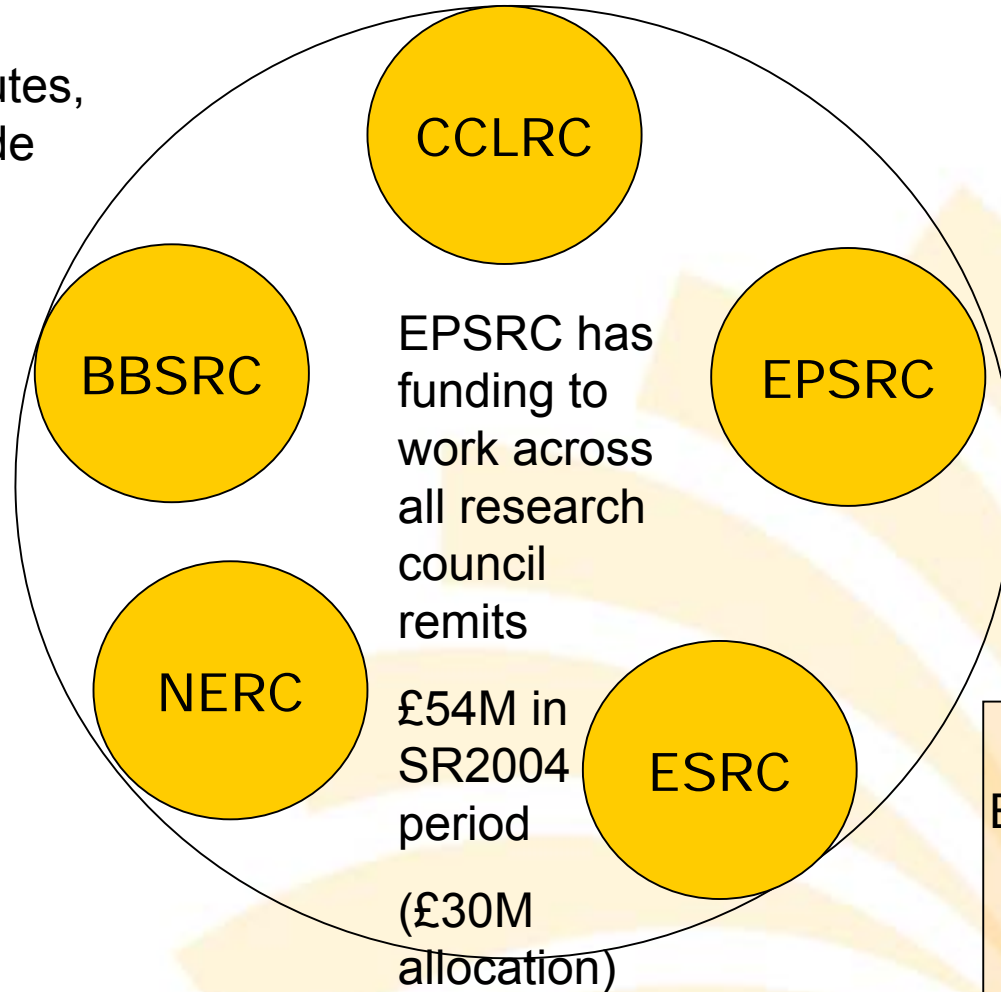
- Promote and support, by any means, high quality basic, strategic and applied research and related postgraduate training in engineering and the physical sciences.
- Advance knowledge and technology (including the promotion and support of the exploitation of research outcomes), and provide trained scientists and engineers, which meet the needs of users and beneficiaries ... thereby contributing to the economic competitiveness of Our United Kingdom and the quality of life.

The Research Councils'
Energy Programme



Working together

- brings together all our energy-related activities
- major managed programmes
- facilities, institutes, responsive mode

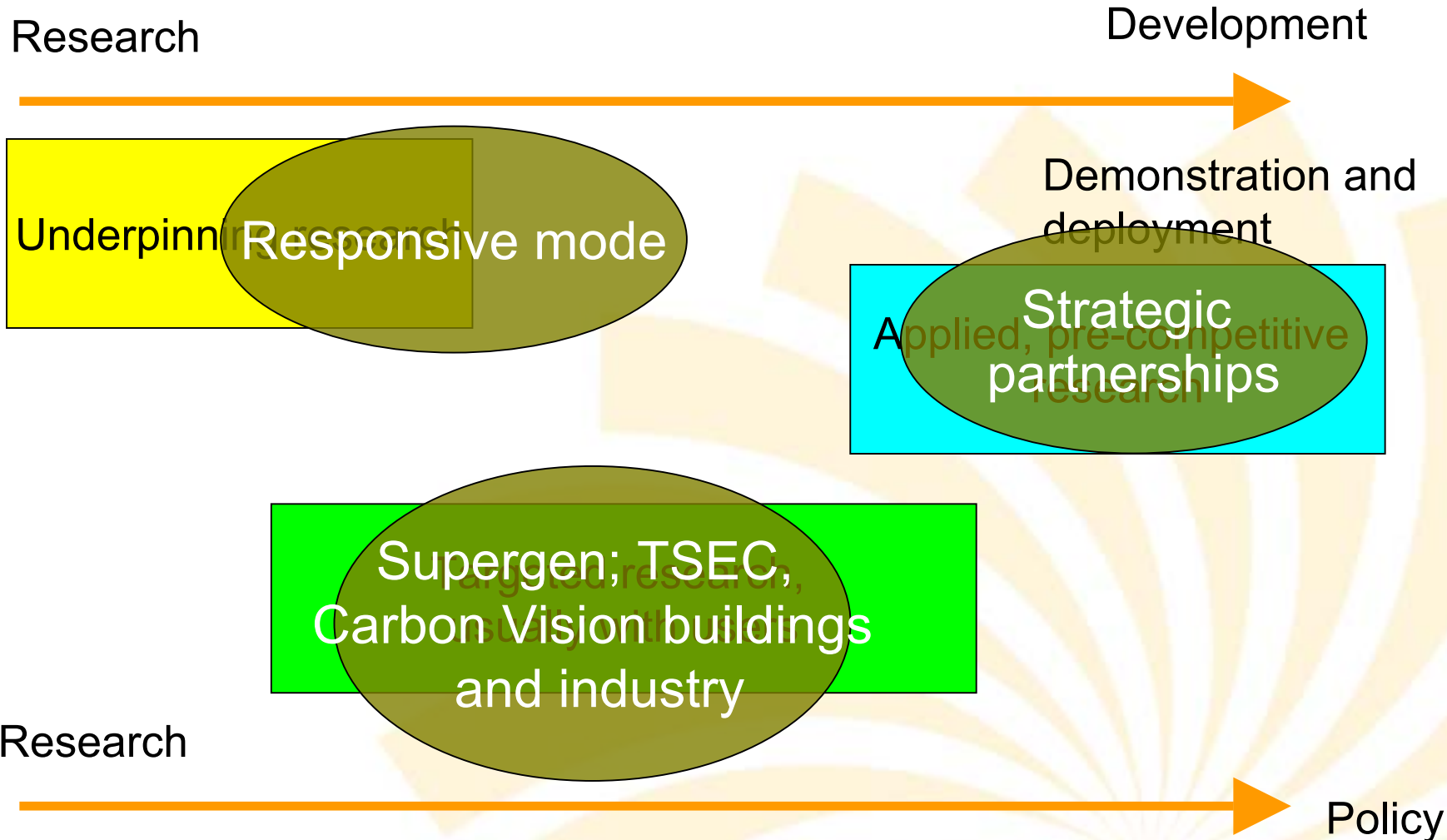


Energy high priority for the Research Councils

Energy Programme Objectives

- To support a **full spectrum of energy research** to help the UK meet the objectives and targets set out in the 2003 Energy White Paper.
- To **work in partnership** with others to contribute to the research and postgraduate training needs of energy-related business and other key stakeholders.
- To increase the **international visibility** and level of international collaboration within the UK energy research portfolio.
- To expand the **UK university research capacity** in energy-related areas.

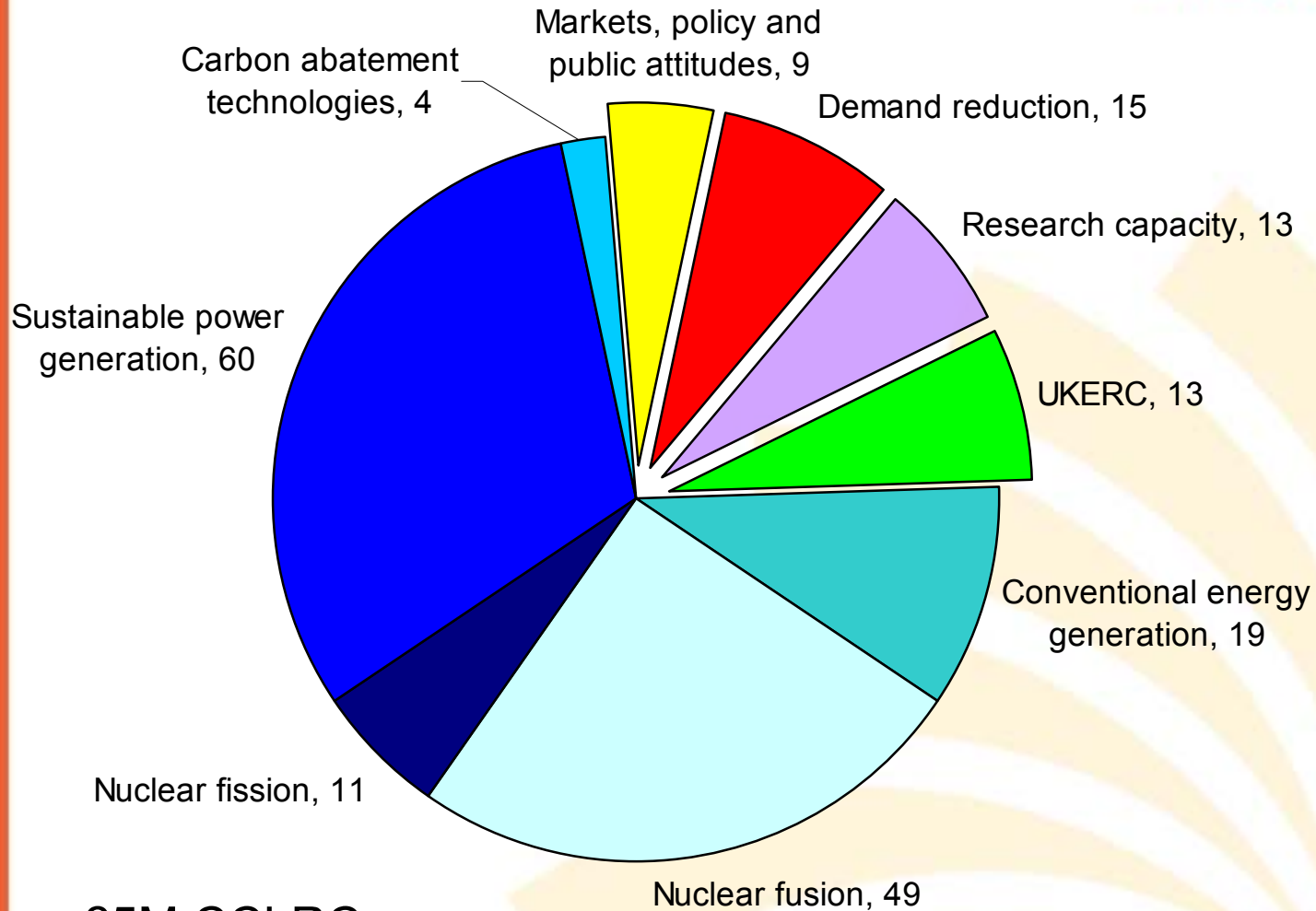
Position in the innovation chain



Current portfolio

- Strong in generation and supply:
 - SUPERGEN
 - TSEC
 - Nuclear fission: KNOO and EngD
 - Nuclear fusion
- Responsive mode/institutes/facilities
- Science and Innovation awards and research chairs
- Carbon Vision

Current portfolio (£M)



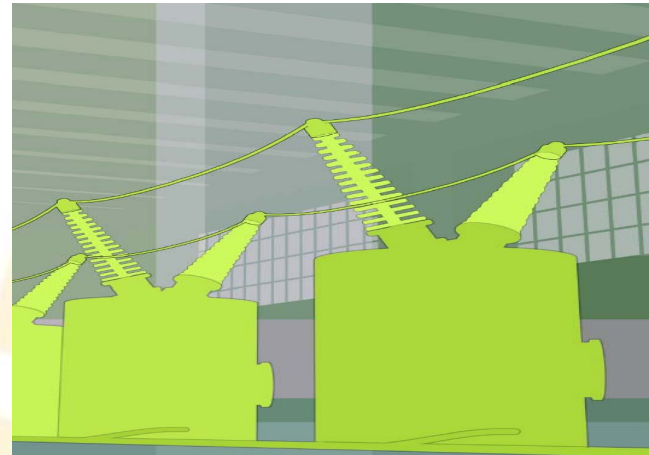
Strong in power generation and supply

+£5M CCLRC facilities

UK Energy Research Centre

Highlights include:

- Input to energy review (including modelling input)
- Intermittency report
- Energy Research Atlas (first release)
- Meeting place including G8 meeting



CAT portfolio

£9.5M by research topic contribution:

Coal technology

Combustion

Energy generation – conventional

(View through grants on the web)

TSEC

The UK Carbon Capture and Storage
Consortium

£2M

EPSRC funding

DTI Technology Programme

Optimisation of CO₂ Separation and H₂ Combustion for Near-zero Powerplant

£400k

Oxycoal UK £600k

Supergen

Biomass (£3M)

Conventional plan lifetime extension (£2M)

EPSRC funding

Responsive mode

Clean Coal Technology: A Novel Process for the Combustion of Coal Using an Oxygen Carrier: Cambridge, £260k

Development of a Process for the Production of Ultra Clean Coal: Nottingham, £126k

Investigation of Synergistic Activity During the Co-Pyrolysis of Coal and Biomass: Leeds, £190k

Modelling the Uncertainty and Risks Associated with the Design and Life Cycle of CO₂ Sequestration in Coalbed Methane Reservoirs Imperial, £127k

Where next?



Where next?

- Scientific Advisory Committee – to look across the whole programme
- *Professor Nigel Brandon – Energy Senior Fellow (international and innovation focus)*
- Key partners: UKERC, ERP, DTI, DEFRA, DfT, Carbon Trust

New for CSR2007

- Sustain work on: power generation and supply
- Grow work on:
 - **Demand and consumption**
 - Security of supply
 - Heat and other energy vectors
 - Transport
 - Underpinning science and engineering
 - Research capacity

Top priority

**From the cross-Council
Scientific Advisory Committee**

Research Councils Energy Programme

£77M pa (£100M+?)

- Broad spectrum of energy research
- Engineering, biological, physical economic, social and environmental sciences.
- Range from highly speculative projects to directed precompetitive research in close collaboration with business and policy makers.
- (Usually) freedom for researchers to follow the most promising lines of research inquiry as they arise.
- Range from long term view – 2020 to 2050 (most projects), to research leading to demonstration or input to policy in less than 5 years (smaller number of projects)
- Research capacity for the long term – especially PhD level.
- Major facilities research and campus developments at RAL, DL. Also Culham for fusion.
- Independent
- UKERC – networking, research, training, research into policy, landscaping and road mapping.

1 – 3 (4): basic research, prove feasibility, (limited) development



Energy Technologies Institute – public private partnership

£50M / £50M

- Selected small number of highly focussed technology areas.
- High directed and targeted technical, economic, social and environmental research and limited early stage demonstration to drive these technologies along the innovation chain to deployment.
- Including research to overcome issues arising during demonstration and deployment.
- Looking for some resulting deployment within 10 years.
- Capacity building for immediate research needs.

3-6: prove feasibility, development, (limited) demonstration

Getting involved

- Exploiting outputs from research
- Collaborating on research and postgraduate training
- Taking part in peer review activities
- Involvement in EPSRC's longer term strategic planning

Strategic Partnerships with EPSRC

Collaborations include:

ALSTOM


 **Rolls-Royce**



RWE

ABB

e-on | UK

 **ScottishPower**

SIEMENS

National Grid Transco

 **Doosan Babcock Energy**

 **British Energy**

Why Collaborate?

Leverage on research funds, and shared risks/costs with EPSRC - funded research project

Access to research findings ahead of competitors – new ideas and technologies

Influence over how we spend our research & training budget

Access to skilled academic experts carrying out leading-edge research, sources of expert advice, specialist facilities

Access to young engineers and scientists for future employment

Strategic Partnerships

- to address our PSA target of better exploitation

Principles

- Peer review
- Pre-competitive research
- Publish results according to normal academic practice
- No exclusive agreements

Strategic Partnerships

- Shared research agenda
- Real research challenges
- Academic ideas
- Real user engagement
- Route to exploit results

E.ON/EPSSRC Strategic Partnership

- Joint support (50:50) for a £10M research programme into low carbon energy solutions
- Following broad themes:
 - . Pathways to a low carbon economy
 - . Energy efficiency technologies
 - . Distributed generation
 - . Cleaner fossil fuel technologies
- Technical scopes for future calls are being developed

Energy Research Summits



Third summit

User requirements for
postgraduate training

May 2007 Aberdeen



Energy Research Summits



Second summit

September 2006

CAT

*Improving efficiency –
materials, biomass*

Storage

*Carbon capture
technologies scale-
up*

- pre-Combustion
- post-Combustion
- oxy fuel combustion



New funding

Other strategic partnerships?

Responsive mode

New funding

Materials for energy next call?

Developing our international
strategy
India and China top priorities

New funding

£5M call for feasibility research proposals for underpinning science and engineering for energy

To pump-prime our new delivery plan

CAT being considered for the next round of Science and Innovation awards