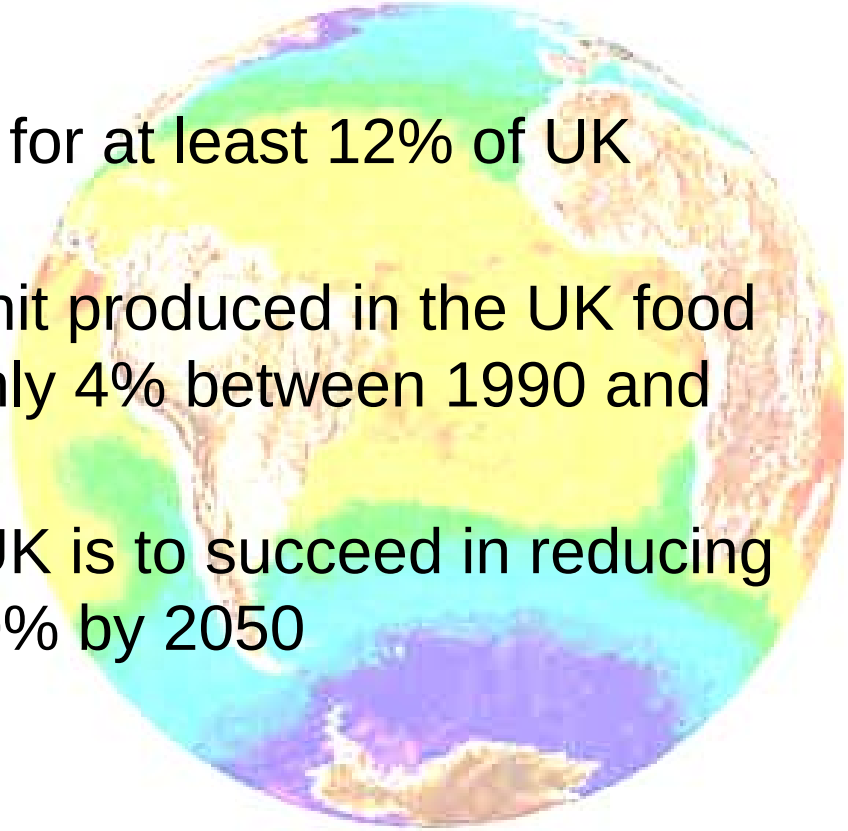
# Fostering the Development of Technologies and Practices to Reduce the Energy Inputs into the Refrigeration of Food


# Climate change

- UK government aims to achieve a 60% reduction in carbon use by 2050
- Food industry accounts for at least 12% of UK energy use*
- Energy efficiency per unit produced in the UK food industry improved by only 4% between 1990 and 2000*
- Needs to be greater if UK is to succeed in reducing carbon emissions by 60% by 2050



*DTI figures

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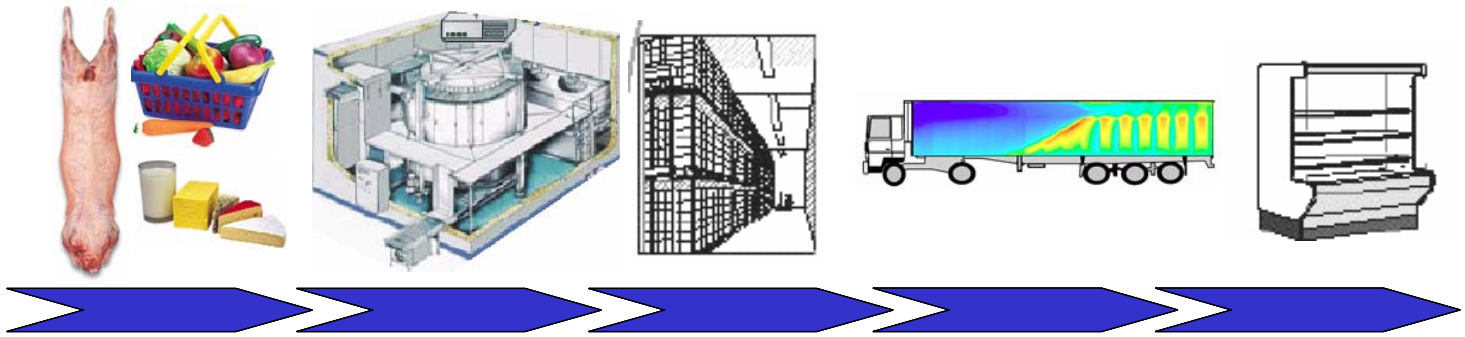
# Aim

- Identify and stimulate development and application of energy efficient refrigeration technologies and business practices for use throughout the food chain whilst not compromising food safety and quality



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# Background

- Sponsored by defra
- Coordinated by FRPERC, University of Bristol
- Partners:
  - Brunel University
  - LSU (London South Bank University)
  - Sunderland University
- 36 month project starting 1 June 2006

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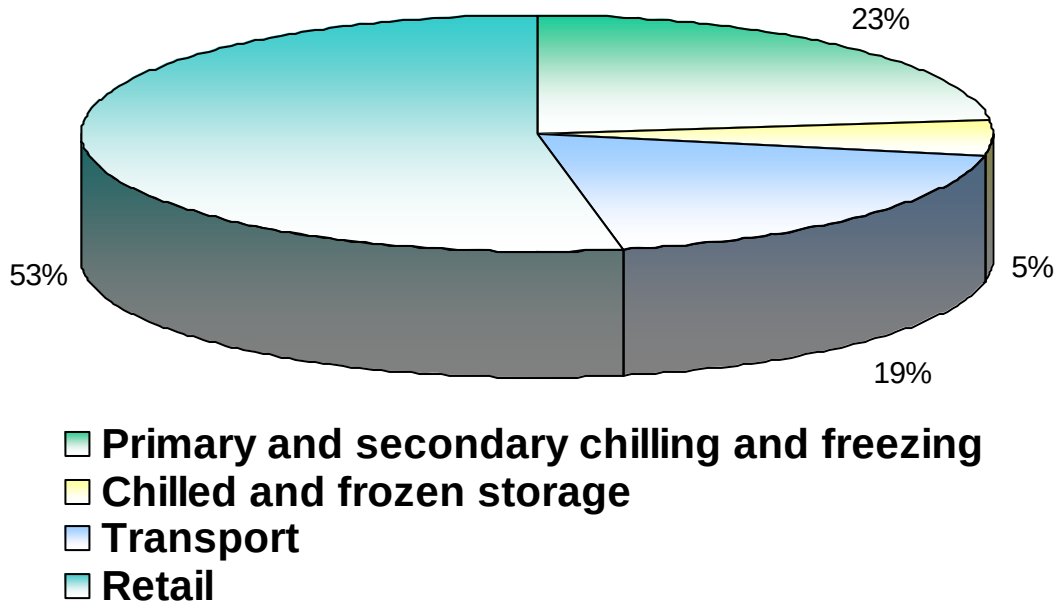
# Work

1. Mapping of energy use
2. Identifying available technologies
3. Feasibility studies on promising current technologies

# 1. Mapping (1-13m)

- Aim to quantify where energy is used in cold chain
- Currently not well documented
- Indication that ~50% used in retail

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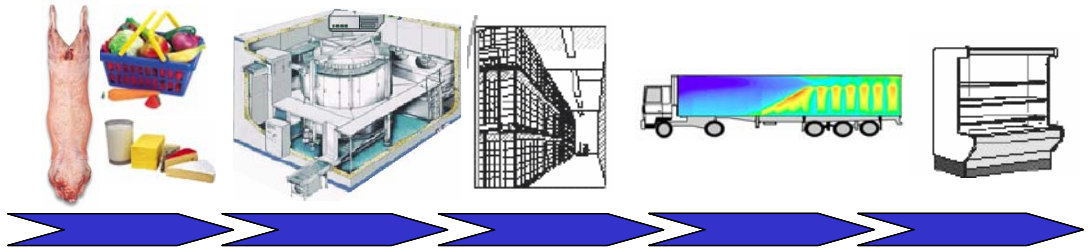
# 1. Mapping (1-13m)

Aim to populate matrix:



| | Chilling | Freezing | Thawing Tempering | Secondary cooling | Chilled Storage | Frozen Storage | Transport | Retail | Catering |
|---|---|---|---|---|---|---|---|---|---|
| Energy used | | | | | | | | | |
| Throughput | | | | | | | | | |
| Energy change in food | | | | | | | | | |
| Efficiency | | | | | | | | | |
| Energy that could be saved | | | | | | | | | |

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# 2. Available technologies (1-26m)

- Identify and rank current technologies, systems or business practice options with most potential to save energy from 1.
- Disseminate energy saving potential of technologies
- Investigate application of current technologies by identifying barriers to their uptake

# 3. Feasibility studies (13-36m)

- Demonstrate feasibility of current unexploited technologies
- Identify gaps where further research needed
- Generate industry led research projects

# Partners

- FRPERC – project management, mapping, feasibility, available technologies in primary chilling/freezing, mathematical modelling
- Brunel – available technologies in storage, transport retail
- LSU – modelling of cold chain, best practice
- Sunderland – assessment of business practices upon equipment requirements and performance

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# Collaborating organisations

- CCFRA
- Dairy UK
- Food & Drink Federation (FDF)
- Chilled Food Association (CFA)
- Meat and Livestock Commission (MLC)
- Federation of Environmental Trade Associations (FETA)
- Cold Storage & Distribution Federation (CSDF)
- Catering Equipment Suppliers Association (CESA)
- Brewing Research International (BRi)
- Food Processing Faraday Partnership (FPFP)
- Institute of Refrigeration (IOR)
- + Companies

- Steering group and stakeholders group to help guide project

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# Outputs

- Used by policy makers to identify opportunities and barriers to energy reduction in refrigeration of foods
- Assist in development of future public funded innovation programmes
- Platform for exploitation through further research, development and demonstration of new technologies and systems that have been identified in the project

# Further information

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