

# RCUK National Centre for Sustainable Energy Use in Food Chains

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## Mission

To carry out:

- i) research that will have demonstrable impacts on energy demand reduction in the food chain in the short term and
- ii) fundamental research into innovative technologies and approaches that will have significant impacts and contribute to the Government's long term greenhouse gas emissions reduction targets, while taking into consideration socio-economic and behavioural aspects.



# Centre for Sustainable Energy Use in Food Chains



## The Team

**Internationally leading groups with complementary expertise covering all post farm stages of the food chain.**

**Brunel University:** Profs. Savvas Tassou; Maria Kolokotroni; Jim Song; Drs. Yunting Ge; Valentina Stojceska, Hussam Jouhara

**University of Manchester:** Profs. Adisa Azapagic; Ada Wossink; Drs. Kostantinos Theodoropoulos; Laurence Stamford.

**University of Birmingham:** Profs. Peter Fryer; Serafim Bakalis  
Ian Norton;

**33 partner organisations:** 7 major food and drinks manufacturers; 4 major retailers; 8 equipment manufacturers and service providers; 14 professional institutions, KTNs, food related trade associations.

# Centre Themes

HT1: Food Production

HT2: Food Distribution

HT3: Food Retail

HT4: Food Consumption

VT1: Energy and Resource Flows  
including Waste

VT2: Interactions and Integration  
with UK Energy Supply System

VT3: Socio-economic  
Aspects/Human Behaviour

Interactions, Management, Dissemination and Impacts

## HT 1 - Reduction of energy/carbon footprint of food production

- Sustainable energy use in agriculture (direct energy use only).
- Energy demand reduction in food processing operations - high pressure processing, vacuum frying, ohmic heating, microwave baking, that can operate over a wide range of capacities and generating both texture and flavour
- Energy demand reduction in food manufacturing plant: Process integration; energy recovery; process/facility fit



## HT 2 - Energy Demand Reduction in Food Distribution

- Energy in food supply operations
- Supply chain optimisation: plant, depot, transportation, vehicle motive power technologies including electrification of food transport, impact of internet shopping.
- Technologies for storage and distribution. Depots as energy hubs? renewables, food waste for power generation, tri-generation.
- Energy efficient packaging for food transportation.



## HT 3 - Energy Demand Reduction in Food Retail

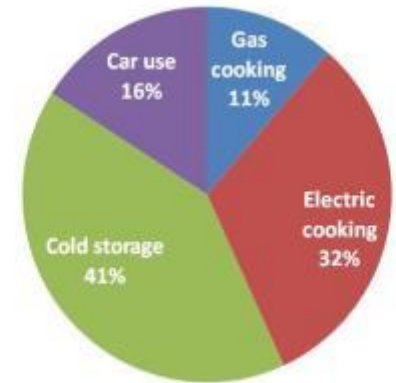
- The future energy efficient store
- Minimisation of environmental impacts of food refrigeration.
- Predictive intelligent controls for demand reduction.
- Energy storage, renewable energy sources and interactions with the grid.





## HT 3 - Energy Demand Reduction in Food Consumption

- Home and catering refrigeration – new technologies
- Influence of food type, preparation and behaviour on energy consumption (home and catering facilities)
- Interaction of catering refrigeration and food preparation equipment with HVAC



## VT 1 - Energy and Resource Flows Including Waste

- Quantification of Energy Demand and Waste in the Food Chain – Data gathering and analysis, previous studies.
- Modelling of energy flows at each stage of the food chain.

## VT 2 - Interactions and Integration with UK Energy Supply System

- Interactions at each stage of the food chain
- Whole Food Chain modelling and energy scenario analysis - UKTM model in collaboration with UCL.

## VT 3 - Socio-economic and behavioural aspects

- **Socio-economic risks and benefits**-How can low energy food technology innovations be intensified and deployed at minimum socio-economic risks and maximum benefits?
- **Corporate behaviour** - Insights into the behavioural constraints to adoption of new, low-energy technologies in the food industry. Workshops, interviews and surveys will be used for these purposes.
- **Consumer behaviour** - examine consumer attitudes and behaviour related to energy, using a range of consumer psychology research methods to identify influence of demographics, disposable income, consumer information etc.

# Thank you