Energy Efficient Rural Food Processing Utilising Renewable Energy to Improve Rural Livelihoods (RE4Food)

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Collaborative Facilities

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Rural Sustainability - Cockle Park Farm
Cloud Innovation Centre
Energy Storage Test Facility
Thermal Energy System Laboratory

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Energy themes where Newcastle University has key research strength:

Resilient Infrastructure and systems	Intelligent networks and energy storage	Electrochemistry and hydrogen
Bio-resource production, recovery and use	Renewable energy systems	Environmental impact assessment and mitigation
Building, industrial and transport demand reduction	Justice and governance	Logistics and planning
Clean use of fossil fuel	Mechanical and electric power systems	Thermal systems and combustion

RE4Food Background

- **Losses in Sub-Saharian Africa**
  - Roots and tubers (210 mio tonnes, **43%**, agriculture, post harvest and processing)
  - Meat (<20 mio tonnes, **28%**, agriculture, processing, distribution)
  - Fruits and vegetables (90 mio tonnes, **52%**, processing, distribution, agriculture)
  - Cereals (100 mio tonnes, **19%**, mainly post harvest and processing)
  - Dairy (25 mio tonnes, **25%**, post harvest, processing, agriculture)
  - Fish (<10 mio tonnes, **32%**, distribution, processing, post catch)

- **Causes for high losses**
  - Poor harvest facilities
  - No or inadequate opportunities to preserve food stuff
  - Poor storage facilities
  - Poor or no cooling facilities
  - Bad infrastructure and therefore no access to market

Source: FAO 2011

RE4Food Background

- **Preservation processes**
  - Cooking
  - Fermenting
  - Smoking (also dries the product)
  - Drying (weight reduction)
  - Canning
  - Salting
- **Storage**
  - Dry and well ventilated
  - No access for rodents
- **Distribution**
  - Cooling demands
  - Sensitivity to mechanical damage
  - Shelf life

Project Targets and Overview

- **The overall objectives of the project are**
  - To decrease post harvest losses
  - To increase the quality of the products
  - To replace fossil fuels by renewable fuels
  - To create new markets and therefore opportunities for the young generation
- **In addition**
  - Improve food security
  - Ensure the improvement of rural livelihoods and reduce rural depopulation
  - Improve the security of energy supply

Project targets and overview

- **Development of innovative food processing technologies**
  - Increase yield and potentially develop new products
  - Increase food quality
  - Maximise the use of renewable energy sources

- **Techno-economic models**
  - Design of processes
    - Unit operation combinations
    - Raw material/resource utilisation
    - Product quality
  - Integration of renewable energy sources
    - Reduction of reliability on fossil fuel and unsustainable use of wood
  - Evaluation of true impact of losses in terms of
    - Man power
    - Energy losses
    - Monetary aspects

Target groups and key actors

- **Target groups**
  - SMEs
  - Farmers
  - Farmer cooperatives
  - Energy suppliers
  - Food processors
  - Policy makers and regulators
- **Key actors**
  - Research organisations
  - Associations and SMEs

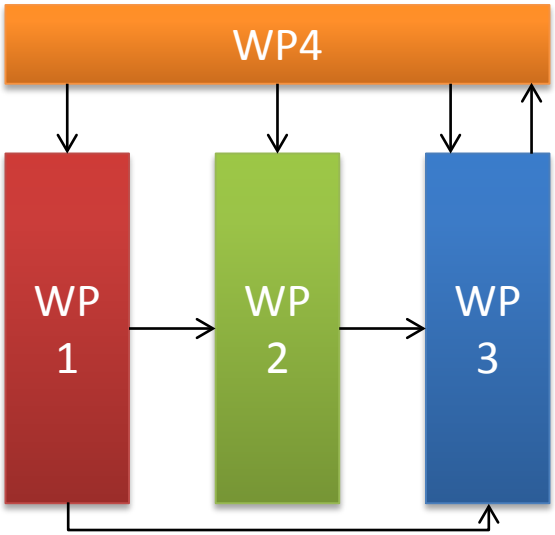
Project work packages

WP1: Evaluate and assess food chains

WP2: Rural food processing & renewable energy use

WP3: Innovative post-harvest food processing using renewable energies

WP4: Stakeholder Engagement, dissemination & knowledge transfer



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Thank you