Food Energy Water

LOCAL NEXUS NETWORK FOR REDISTRIBUTED MANUFACTURING

UNIVERSITY OF SURREY

# Feasibility study: Energy

Matthew Leach
Professor of Energy and Environmental Systems
m.leach@surrey.ac.uk
www.surrey.ac.uk/ces
Centre for Environmental Strategy
Faculty of Engineering and Physical Sciences

CENTRE FOR ENVIRONMENTAL STRATEGY University of Surrey

# CES overview

Apply ‘systems thinking’ to environment/sustainability questions, integrating engineering-based approaches with insights from the social sciences

**Postgraduate teaching:** MSc, PhD, EngD, Prac.Doc.

**Research approaches/themes:-**

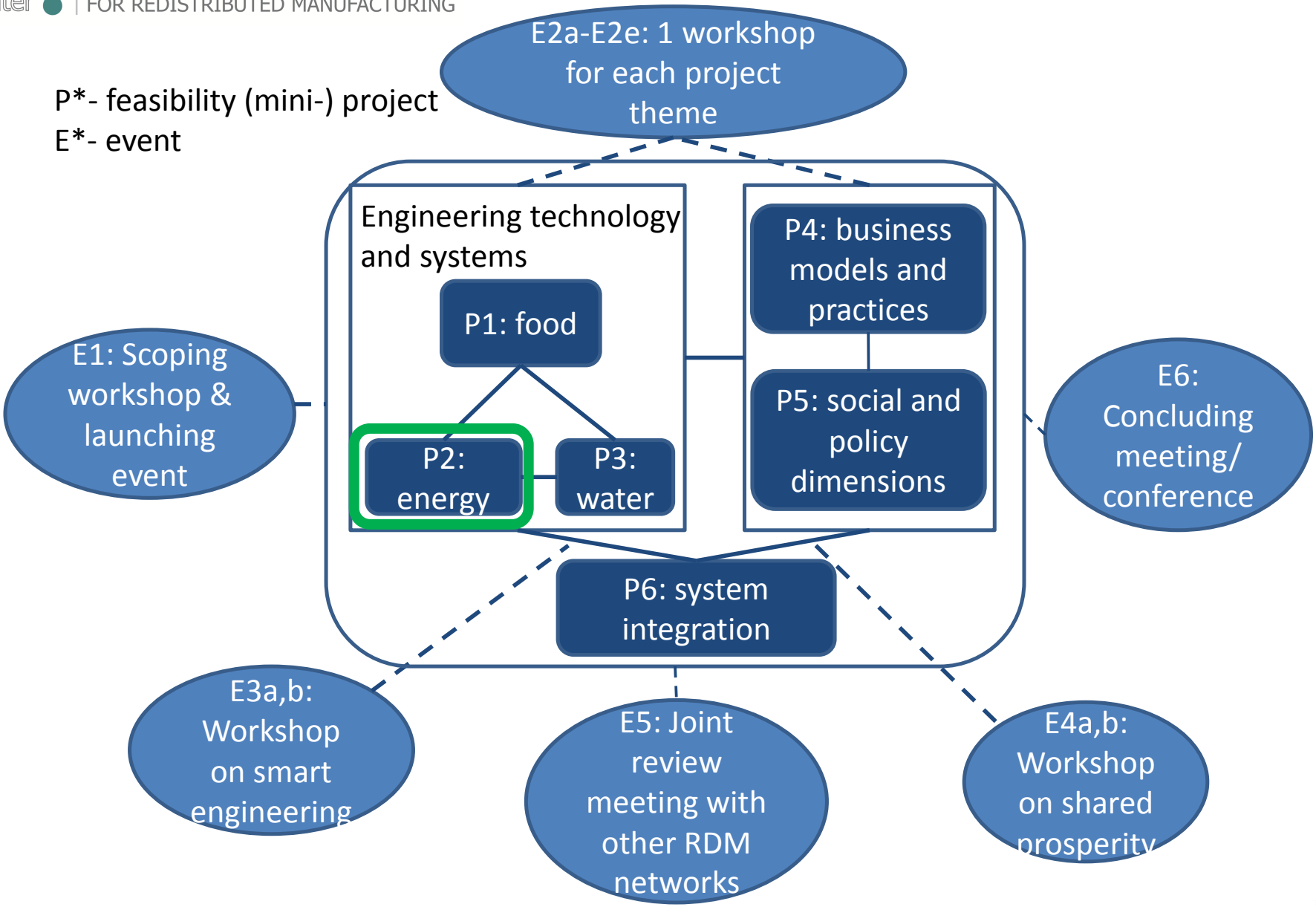
- sustainable systems: tools for analysis
  - eg LCA, carbon footprinting, agent-based models, multi-criteria methods
- social research on sustainability
  - values, attitudes, behaviours. Link to depts Psychology, Sociology, Economics
- policy/governance and corporate strategy for sustainability
  - risk, roles of innovation, CSR, communication, regulation

**Applied (largely) to:-**

1. systems analysis for lower carbon processes & products
2. low carbon energy systems
3. water resources and policy
4. lifestyles and the environment

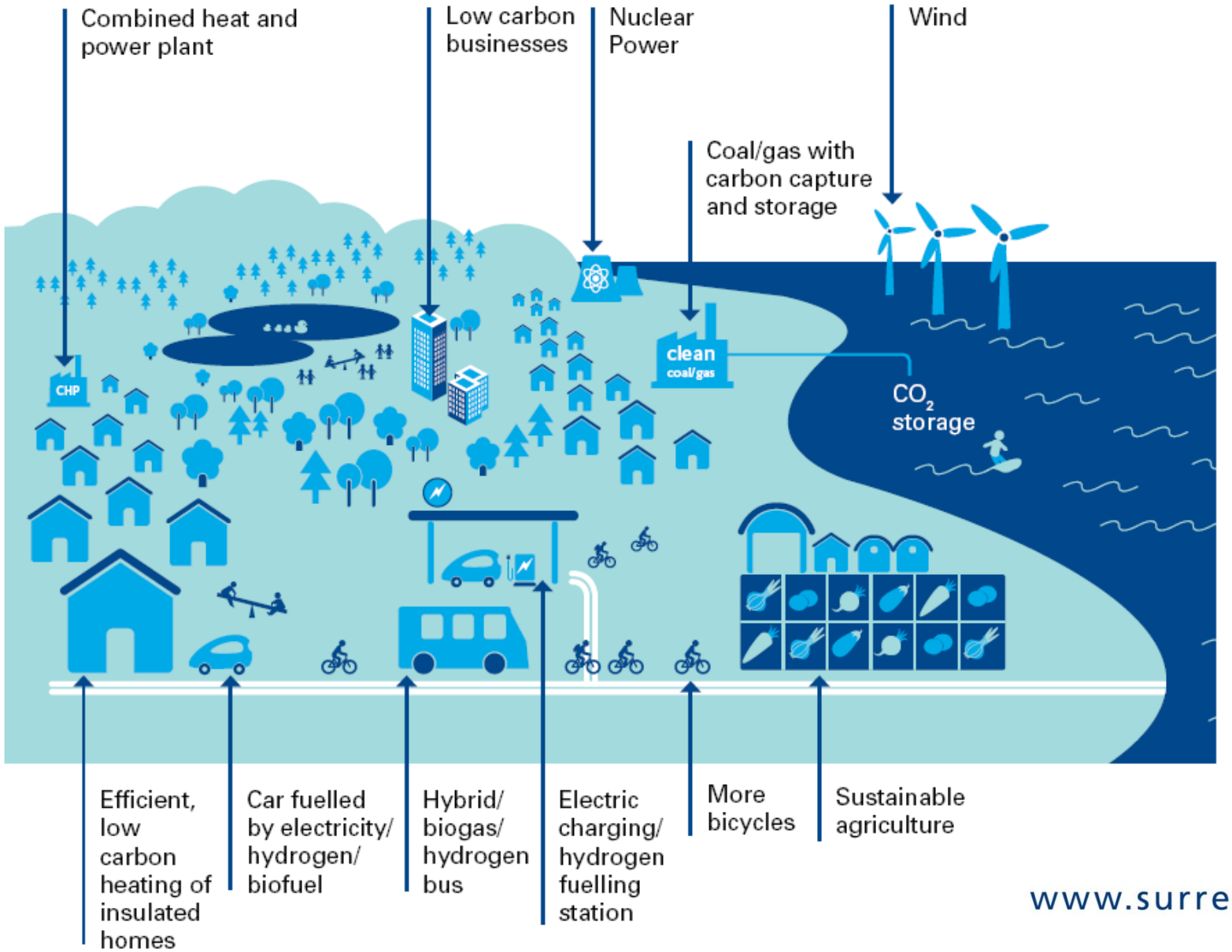
Food Energy Water LOCAL NEXUS NETWORK FOR REDISTRIBUTED MANUFACTURING

P*- feasibility (mini-) project
E*- event



# A vision for 2050 (source: UK's Low Carbon Transition Plan)

UNIVERSITY OF SURREY




www.surrey.ac.uk

# Energy Feasibility Study: rationale

Growing opportunities for, and interest in, localised production of energy:

- May be an energy supplier for local food systems
- Could use waste arisings from food production (and water/ww systems) as input resource
- Whilst also developing for other business and residential users

# Energy Feasibility Study: overview

Using two case studies as background for empirical data collection and for developing new thinking…

1. Assess requirements for energy supply (electricity and heat of different qualities) to localised food systems (eg production, storage), including typical temporal (diurnal and seasonal) variations
2. Assess potential for energy recovery from waste food arisings across the local supply chain, plus arisings from local wastewater treatment
3. Develop local energy system scenarios, incl other potential users
4. Evaluate energy generation and storage technologies suitable for implementing the scenarios: efficiency, cost effectiveness, safety, and environmental impact

# Integrating the engineering feasibility with the wider project