Interdisciplinarity in the GILDED Project

Nick Gotts, independent researcher,
formerly of The James Hutton Institute,
and before that of The Macaulay Institute –

with thanks to members of the GILDED team, particularly those who commented on the draft of this presentation: Tony Craig, Imre Kovách, Gary Polhill, Fritz Reusswig, Linda Steg, Jan Vávra, Ellen van der Werff

GILDED Basic Facts

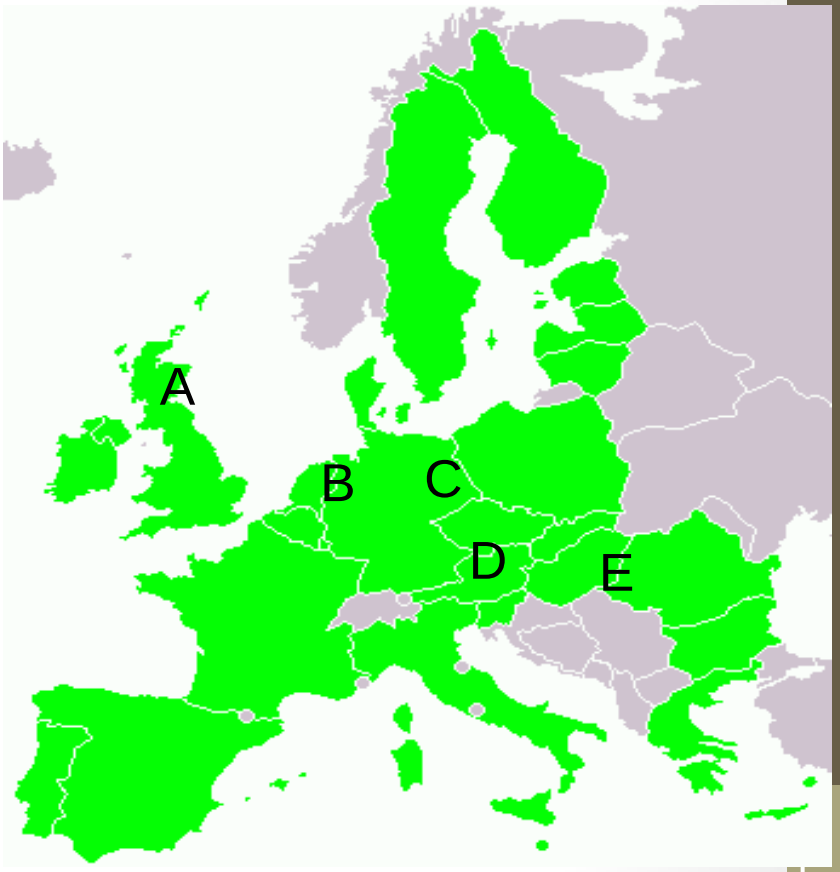
- **G**overnance, **I**nfrastructure, **L**ifestyle **D**ynamics and **E**nergy **D**emand
- FP7 project, December 2008 – April 2012 , on **domestic energy demand**, funded under the topic: *Socio-Economic Factors and Actor Shaping the "Post-Carbon" Society:*

In relation to the EU policy objectives in the field of energy (notably those in the 2006 Green Paper on energy) research will focus on the socio-economic cultural and political factors that shape energy demand and use in various environments (transport, agro-food, materials, housing, consumer behaviour, etc.) and on the necessary changes at systemic level that need to be initiated in order to develop an environmentally-friendly European model of energy policies that respond to the expectations and needs of European citizens, urban and rural communities.

- Five case study areas across Europe, each a city and its rural hinterland
- **Disciplines: social psychology, sociology, political science, policy studies, energy technology studies, software design**
- Methods: desk study, qualitative and quantitative fieldwork (interviews, survey, minor intervention), agent-based modelling

GILDED Partners and Case Study Areas

A. James Hutton Institute, Scotland: Aberdeen and Aberdeenshire
B. University of Groningen, The Netherlands: Assen and Assen Municipality
C. Potsdam Institute for Climate Impact Research, Germany: Potsdam and Brandenburg
D. University of South Bohemia, The Czech Republic: České Budějovice and Budějoviceshire
E. Centre for Social Sciences of the Hungarian Academy of Sciences, Hungary: Debrecen and Hajdú-Bihar County



Map of EU from Wikimedia Commons

GILDED Specific Objectives (1)

- Analyse the **structural factors** shaping current and recent energy demand for direct domestic energy use, food consumption and personal travel in selected case study areas.
- Identify the **socio-economic, cultural and political factors and actors** either facilitating or obstructing reduction of carbon-intensive household energy use.
- **In cooperation with stakeholders** in each case study area, investigate past and current trends in energy demand and use.
- Develop **an agent-based model of household energy use in a local community**, demonstrating the potential outcomes of specific policy implementations.

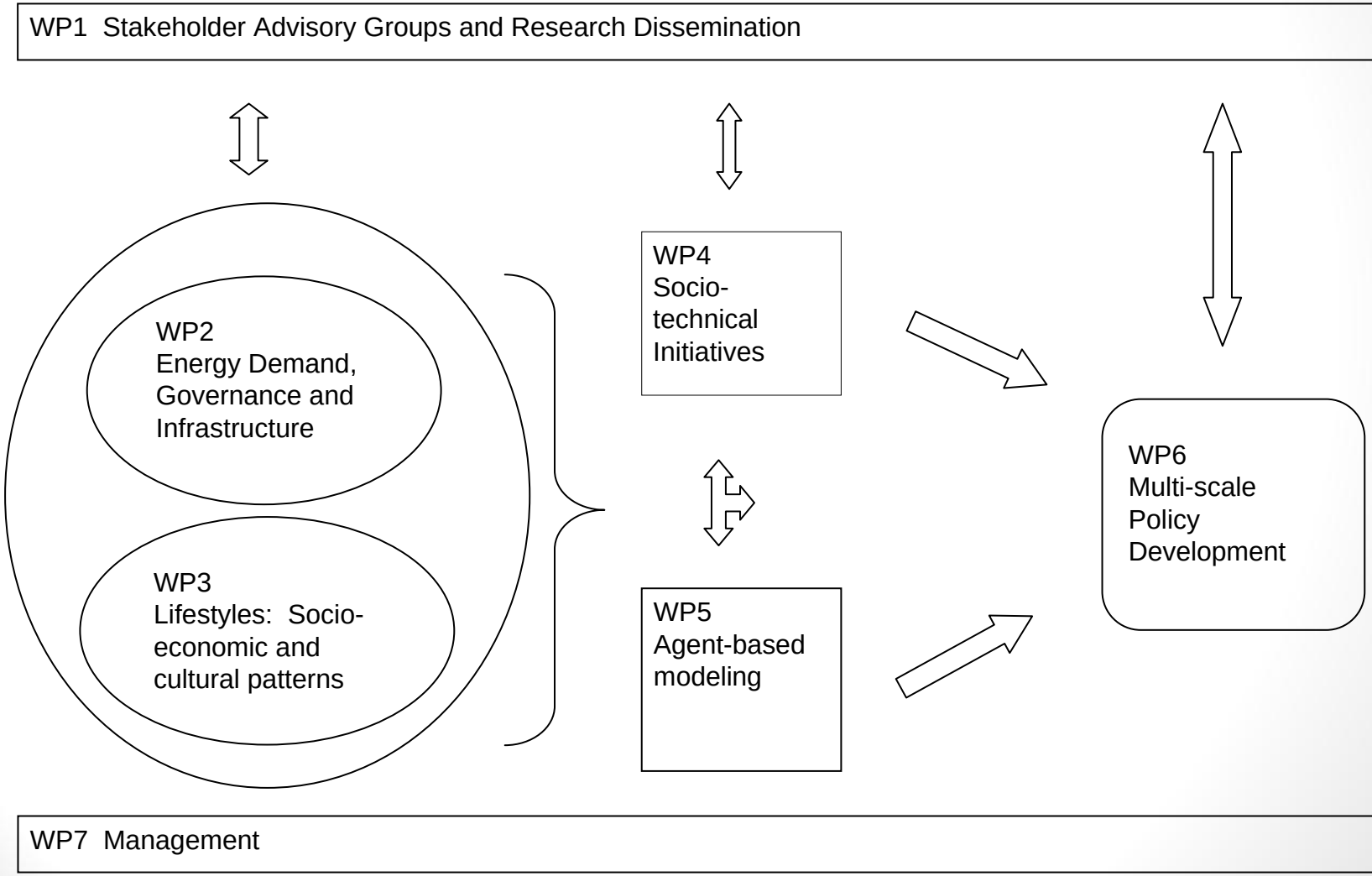
GILDED Specific Objectives (2)

- Identify **systemic changes** necessary to make European energy policies more environmentally friendly.
- Identify **policy instruments, at levels from local government upwards**, to bring about such systemic changes.
- Ensure relevance of research findings through the direct engagement of local stakeholder advisory groups, regular dissemination of study findings, and **a sequence of policy briefs**.

Involvement of multiple (SSH and non-SSH) disciplines in GILDED

- Role of non-SSH disciplines in GILDED:
  - **Energy technology studies.** While GILDED's focus was on the social science of domestic energy demand and use, it was *essential* to our research to assess the technical and infrastructural constraints on household decisions.
  - **Software design.** Design, construction and use of an agent-based model of direct domestic energy use in a small community was a key part of the project, necessitating the inclusion of this discipline.
- **Integration between SSH disciplines** (social psychology, sociology, political science, policy studies) was just as important as integration of SSH and other disciplines
- Instruments used in GILDED to ensure that disciplines were integrated as fully as possible:
  - Co-ordinating Group
  - Stakeholder Advisory Groups
  - Workpackage Structure

GILDED Workpackage Structure



The benefits of interdisciplinarity in GILDED

- Combining insights from a range of disciplinary traditions and literatures.
- Enabling the simultaneous investigation of technical, structural, socio-economic, political and cultural barriers to reducing domestic energy demand.
- Encouraging the participation of a wide range of stakeholders.
- Facilitating the formulation of policy recommendations at a range of scales from local to EU-wide.

Barriers to interdisciplinarity encountered in GILDED

- Absence of specialists in some of the disciplines at key points (energy technology studies, policy studies)
- Absence of at least one key discipline from the project proposal: economics
- Some disciplines effectively confined to one partner (political science, software design)
- Specialist vocabularies, initial unfamiliarity with each others' disciplines (e.g. with regard to potential, needs and limitation of agent-based modelling)
- Need for time for *teams* to get to know and understand each other, devise fruitful approaches to collaboration: emphasises importance of time management
- Problems in devising a questionnaire that would cover all teams' requirements, and ask questions in a form all were happy with, but still be manageable for participants

Main Interdisciplinary Outputs from GILDED

- Questionnaire and Carbon Footprint Calculator suitable for use across all the case-study areas, and integrating work from social psychology and energy technology studies.
- CEDSS (**C**ommunity **E**nergy **D**emand **S**ocial **S**imulator). Agent-based model of domestic energy demand, integrating work from social psychology, energy technology studies and software design
- Series of four policy briefs, and a set of final policy recommendations, integrating findings from all disciplines involved.

Questionnaire and Carbon Footprint Caclulator

- Integration of social psychology, political science, energy technology studies
- Participants completed it twice, a year apart
- Participants divided into controls, and experimental group, who made commitment to reduce energy use in specific ways
- Covered direct domestic energy, personal transport, food
- Questionnaire covered beliefs about energy and climate change, attitudes, pro-environmental behaviours
- Carbon footprint calculator the first devised for use across the EU.
- Results fed into design and calibrations of agent-based model CEDSS.

CEDSS Agent-Based Model

- Focused on household purchase decisions affecting direct domestic energy use (space heating, hot water, electrical appliances)
- Agent-based modelling well-suited to inter-disciplinary integration.
- Knowledge elicitation exercises with non-modelling project members, and Scottish stakeholder advisory group, contributed to design.
- Intended to be based on questionnaire and carbon calculator results – these were used, but left considerable gaps with respect to electrical appliances, inter-household social links and influences.
- Used to generate policy-relevant scenarios of future energy demand under a range of economic and policy assumptions.

Policy Brief Conclusions (1)

- **Income** is considerably more important than any other aspect of lifestyle, including **environmental values** in determining household energy use.
- In all countries, however, there were **some pro-environmental behaviours** for which **values** did make a significant difference.
- In persuading households to reduce energy demand, a focus on **sustainable resource use** is potentially more effective than one on climate change.
- Energy patterns differ considerably **between rural and urban areas**, but these differences themselves differ between countries.
- Households are often locked into dependence on existing energy and transport infrastructure, reducing scope for behavioural change.

Policy Brief Conclusions (2)

- Private households tend to focus on easy and inexpensive **routine** behaviour changes rather than more effective changes requiring higher **investment**.
- There is a widespread preference for **government** to take a lead in reducing energy demand through regulation (but these must be perceived as fair), but **NGOs** are the most trusted actors, particularly in providing information.
- A range of **governance structures** can effectively reduce energy demand, but **local governments** need more powers and resources to be effective agents of change.
- Local intermediaries such as members of **civil society organizations** can make a key contribution, and **could benefit from direct links to European organisations**.
- Our agent-based model, CEDSS, suggests that **both price signals and regulation** could reduce domestic energy use.

A final question

Is it useful to distinguish between:

- multidisciplinarity: a project in which disciplinary specialists collaborate, but remain within their disciplinary "comfort zones";
- interdisciplinarity: specialists in a range of disciplines make sustained efforts to produce work which is more than the sum of its disciplinary parts;
- transdisciplinarity: such efforts are aimed at solving real social as well as scientific problems, and cross the boundaries between natural and social sciences?