



# **Complexity-NET: Engaging with Social Science Workshop**

Chateau de Montvillargenne  
Chantilly, France  
14-15 January 2009

Dr Gavin Salisbury, Coordinator, Complexity-NET ERA-NET  
Cross-Disciplinary Interfaces Programme  
Engineering and Physical Sciences Research Council, UK



# **Complexity-NET: Engaging with Social Science Workshop**

Agenda: Wednesday 14 January 2009

- 11.30    Session 1: Introduction**
- 12.00    Lunch**
- 13.00    Session 2: Setting the scene**
- 15.40    Tea/coffee**
- 16.00    Session 3: European complexity initiatives**
- 16.45    Session 4: European research landscape:  
opportunities for the ERA-NET**
- 18.30    Close of formal proceedings**
  
- 19.15    Session 5: Pre-dinner drinks and networking**
- 20.00    Dinner**



# **Complexity-NET: Engaging with Social Science Workshop**

Agenda: Thursday 15 January 2009

- |              |   |
|--------------|---|
| <b>09.00</b> | <b>Session 6: Complexity case studies</b> |
| <b>11.00</b> | <b>Tea/coffee</b>                         |
| <b>11.20</b> | <b>Session 7: Working together</b>        |
| <b>12.45</b> | <b>Close and lunch</b>                    |



# **Complexity-NET: Engaging with Social Science Workshop**

Aims of this workshop:

- To raise awareness of Complexity-NET in the social sciences community
- To obtain the input of social scientists into the ERA-NET European complexity landscape
- To facilitate discussion between physical scientists and social scientists: to encourage understanding of the complexity research challenges from each others' perspectives, and to help realise the benefits to sharing research tools and approaches



# Complexity-NET: a European Strategy for Complexity Science

**Engaging with Social Science Workshop**

Chateau de Montvillargenne

Chantilly, France

14-15 January 2009

Dr Gavin Salisbury, Coordinator, Complexity-NET ERA-NET  
Cross-Disciplinary Interfaces Programme  
Engineering and Physical Sciences Research Council, UK



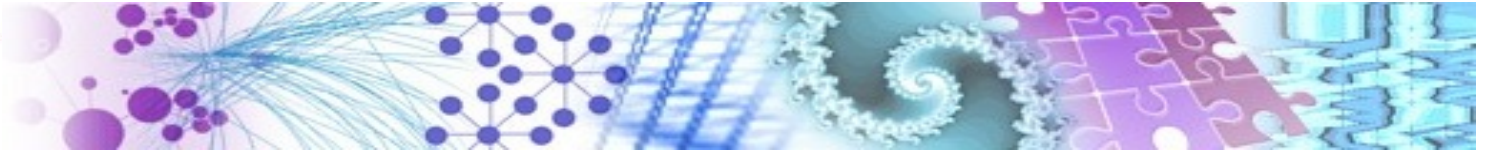
## **Introduction to Complexity-NET: The Ambition**

- Exploiting the growth potential that exists for Complexity Science research across Europe
- To create a stimulating environment for the best Complexity Science researchers, which:
  - Enables sharing of facilities
  - Encourages international mobility and communication
  - Promotes public dialogue
  - Catalyses innovation



## Contributing to a European Research Area

- **ERANET Support**
  - Co-ordination Action by the European Commission through the FP6 ERANET scheme
  - European science and technology funding agencies, research councils and ministries
- **Synergy and Added Value**
  - Support for networking and strategic coordination of planned national research activities in Complexity Science and Complex Systems
  - Opportunity to accomplish together things we find difficult to tackle independently.



## Countries involved in Complexity-NET

### Complexity-NET European Partners:

-  **United Kingdom** - Engineering and Physical Sciences Research Council, ERA-NET Coordinator
-  **Belgium** - Fonds National de la Recherche Scientifique
-  **Denmark** Danish Agency for Science, Technology and Innovation
-  **Estonia** - Eesti Teaduste Akadeemia
-  **Greece** - General Secretariat for Research and Technology
-  **Hungary** - Nemzeti Kutatási és Technológiai Hivatal
-  **Ireland** - Irish Research Council for Science, Engineering & Technology
-  **Italy** - Istituto dei Sistemi Complessi - Consiglio Nazionale delle Ricerche
-  **Netherlands** - Nederlandse Organisatie voor Wetenschappelijk Onderzoek
-  **Portugal** - Fundação para a Ciência e a Tecnologia
-  **Spain** - Ministerio de Ciencia y Innovación
-  **European Commission** - funded by the Sixth Framework Programme





## The Complexity-**NET** vision

- Stimulating complexity research and innovation:
  - A dedicated strategic plan where coordination of funding for complexity research and training in Europe is a central focus
  - Using a joint action plan to help set the scene for strategic funding of Complexity research and research training on the European level
  - Developing joint national research programmes

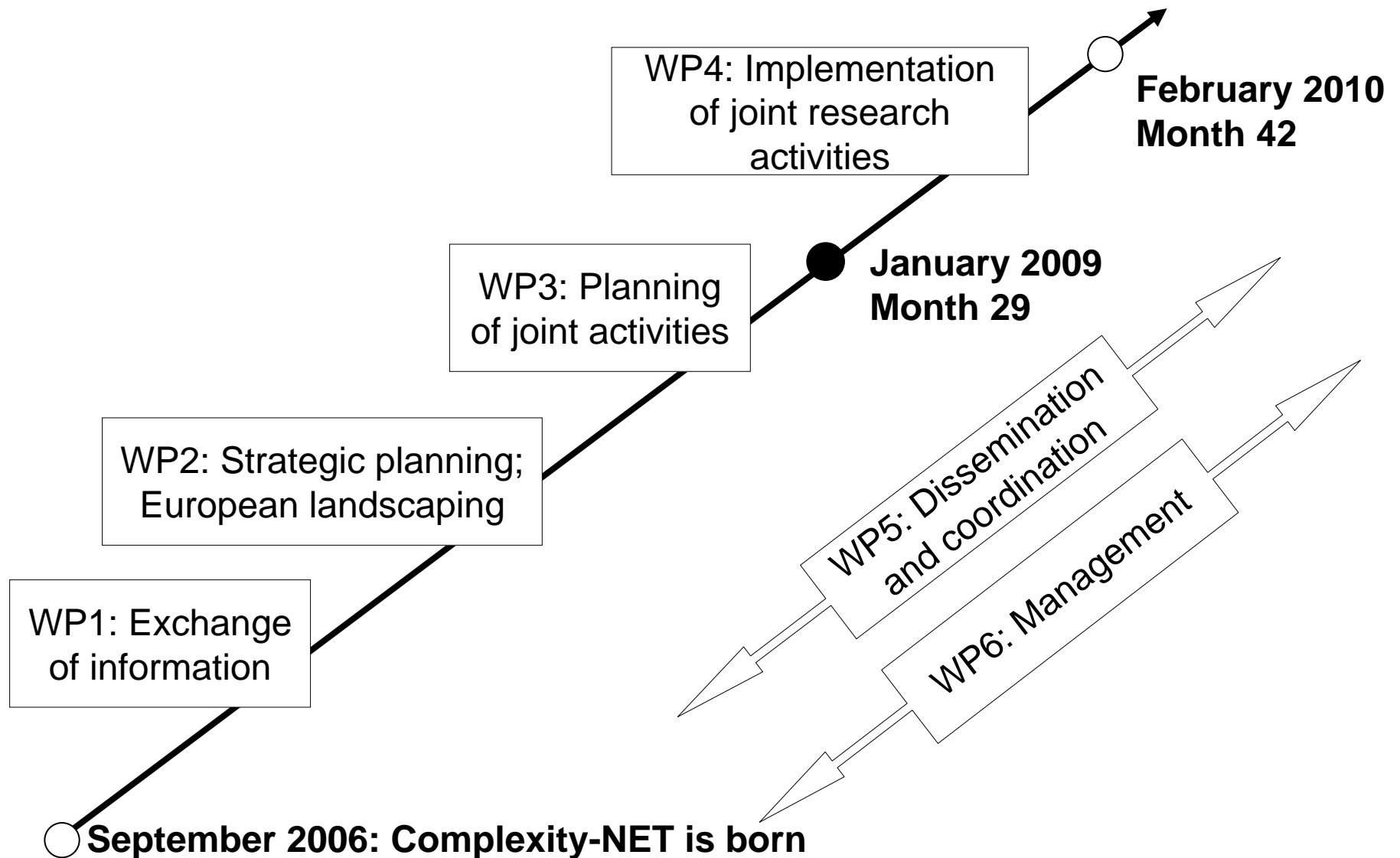


## Turning the vision into reality

- Gather and share information
- Produce national level Complexity Science landscapes
  - National strengths, weaknesses, opportunities and threats
- Document and analyse the European-wide Complexity Science landscape
  - European strengths, weaknesses, opportunities and threats
- Exploit opportunities and oppose threats
  - Identify and recommend strategies
  - Develop and launch a joint action plan



## Where we are now and the road ahead





## **WP1 Information Exchange: National Programmes and Landscapes**

- WP 1 has been completed
- It involved obtaining, exchanging and documenting information on Complexity related national programmes, including:
  - their respective implementation approaches
  - Complexity Research and Technology Development (RTD) landscapes
  - Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for each country



# WP1 Information Exchange: Outputs D1.1–1.2: National Programmes

Position and status of participants  
Funding modes  
Funding instruments/programmes  
Legal and administrative considerations  
Role of industry

European Network of Funding Agencies  
Coordination of National Complexity Research and Training Activities  
Instrument: Coordinated Action  
Thematic Priority: ERA-NET

*D1.1 Report on complexity relevant national programmes*  
*D1.2 Report on implementation approaches*



# WP1 Information Exchange: Output D1.3: National Landscaping

- 793 researchers and 205 research groups supported by a total of c.136MEuro across the partner countries

Non-linear mathematics and dynamical systems	Fluid dynamics, non-linear optics, plasmas, non-linear waves, solitons	Atmosphere and climate modelling	Optimisation, intelligent systems, pattern recognition, image processing
Time series analysis, synchronisation, prediction, control	Dynamics of interfaces and dislocations	Astrophysical and geophysical systems	Biodynamics, systems biology
Emergence, collective behaviour and pattern formation	Complex materials, catalysis, friction, granular matter	Statistical mechanics, stochastic processes and probability theory	Organisational complexity, complex networks, distributed systems
Phase transitions, critical phenomena	Disordered systems, growth processes, fractals	Non-equilibrium thermodynamics	
Soft matter	Economic complexity, risk, game theory	Biocomplexity, evolution, ecology, bioinformatics	
Environmental and energy transport processes		Complex social systems	



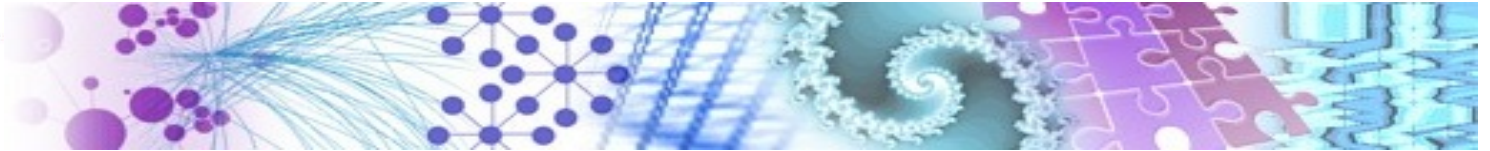
## WP1 Information Exchange: Output D1.3: National Landscaping - Main Conclusions

- Strength in diversity
- Exploitation of new technologies appears low
- Great need for public dialogue
- Consider international cooperation outside EU
- Further strengthen links to economic & social sciences and humanities

European Network of Funding Agencies  
Coordination of National Complexity Research and Training Activities

Instrument: Coordinated Action  
Thematic Priority: ERA-NET

*Report on National Complexity RTD landscapes*



## WP2 Strategic Activities Implementation Options and European Landscape

- WP2 is almost complete and has involved:
  - analysing the European Complexity RTD landscape
  - identifying strategies to exploit opportunities and oppose threats
  - understanding funding processes and limitations
- Currently working to better understand the needs of industry in relation to Complexity Science
- **Outputs (D2.1 and D2.2 available on the website)**
  - **D2.1** Report on strategies and implementation options
  - **D2.2** Report on the European Complexity RTD, with SWOT analysis (copy in your packs; to be discussed this afternoon)
  - **D2.3** Report on Industrial needs in relation to Complexity Science (shortly to be submitted to the Commission)





## WP2 Strategic Activities

### European Research Landscape Workshop (Nov 2007)

#### Keynote Speakers

- **Tamás Vicsek, Eötvös Loránd University (ELTE), Hungary:** 'From "snapshots" to evolution'
- **Steve Lansing, Santa Fe Institute, US:** 'Water Temple Networks' in Bali
- **Peter Grindrod, University of Reading, UK:** 'The Impact of Complexity Analysis'
- **Tassos Bountis, University of Patras, Greece:** 'Complexity - a new science or a new direction in science?'
- **Gregoire Nicolis, Université Libre de Bruxelles, Belgium:** 'Complex Systems Research'
- **Erik Mosekilde, Technical University of Denmark:** 'Complex Phenomena in Biomedical Systems'
- **Miguel Rubi, University of Barcelona, Spain:** 'Complexity in Marine Ecosystems'.
- **Jürgen Kurths, University of Potsdam, Germany:** 'Some problems in Complex System's Science'
- **Paul Bourguine, École Polytechnique, France:** 'Towards a Complex Systems Science'.
- **Antonio Politi, CNR-Istituto Dei Sistemi Complessi, Italy:** 'Complex Systems'
- **Devaraj van der Meer, University of Twente, Netherlands:** 'The effect of air on fine granular matter'
- **Anders Malthe-Sørensen, University of Oslo, Norway:** 'How are complex patterns of the Earth formed'



## **WP2 Strategic Activities**

### **Output D2.2: European Research Landscape**

- Working together – across national borders, discipline borders, and the academic/user interface – towards delivery
  - Increase cooperation between disciplines, especially natural and social sciences
  - Ensure there is delivery of results and follow through
- Education and Training
  - Numbers of trained people need to increase
  - Cross-boundary training needed



## **WP2 Strategic Activities**

### **Output D2.2: European Research Landscape**

- Real-world and big science problems – defining the problems where complexity science can play a role
  - Complexity science needs to start to address real-world and big science problems e.g. energy, transport, finance, environment (to be discussed later)
- Promotion and recognition of Complexity Science- including external perceptions/ visibility/ enthusiasm



## **WP2 Strategic activities**

### **Output D2.2 - European Research Landscape**

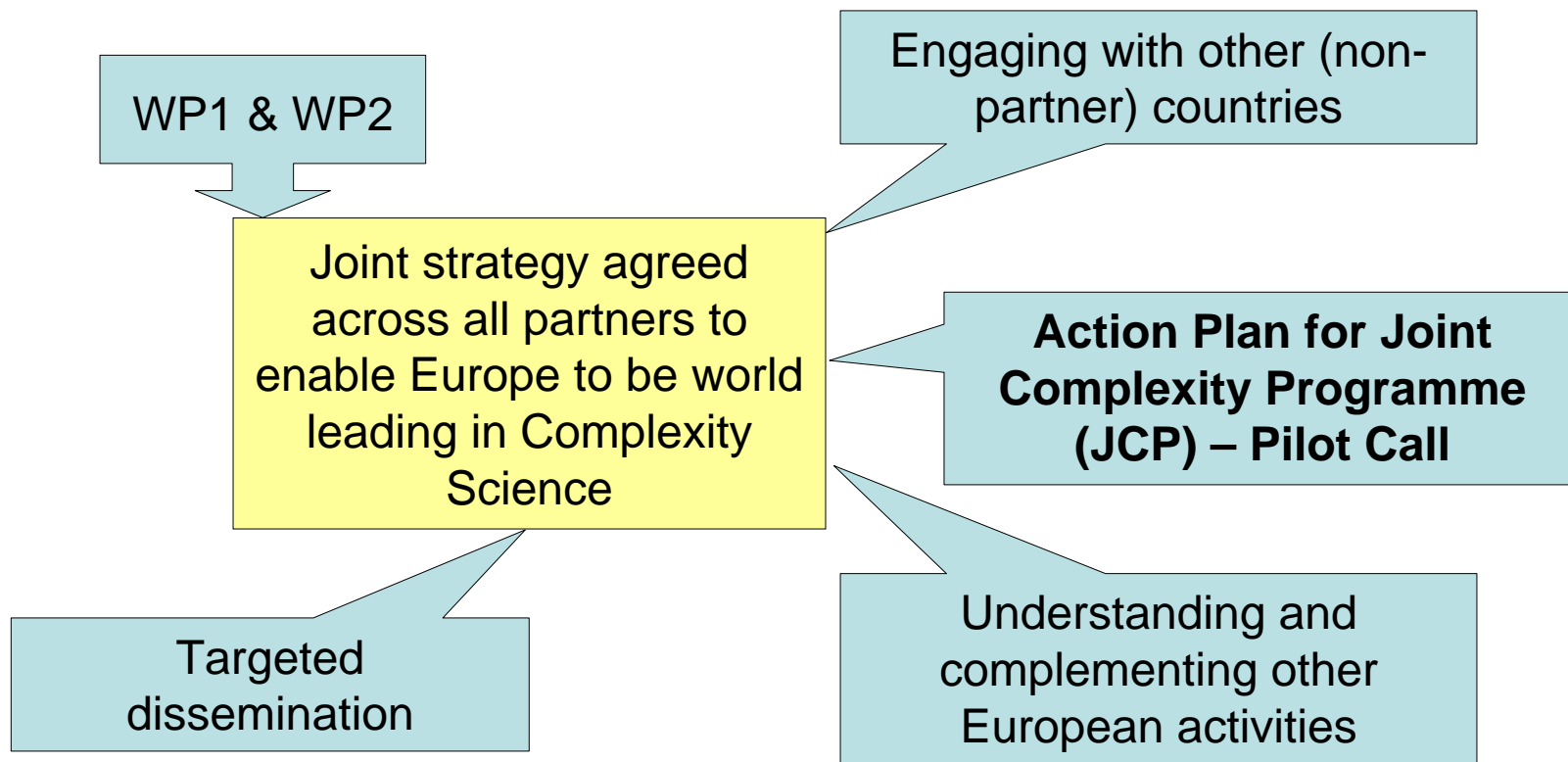
#### **Key conclusions to feed into strategy:**

- Complexity Science research - high relevance to industry, society and policy making
- Current impact on society is limited and must be substantially improved
- Improving impact requires more research and training across traditional scientific disciplines
- Both “challenge-driven” and “investigator-driven” approaches are important



## Current activities and next steps

- WP3: Preparing a Joint Action Plan – shortly to be finalised

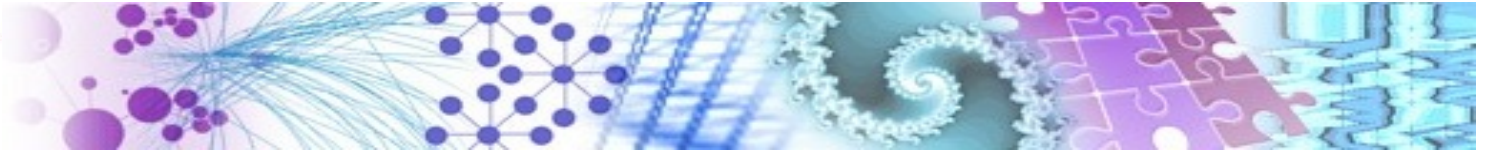


- WP4 Implementing the Action Plan: imminent



## Next Steps: Implementing the strategy

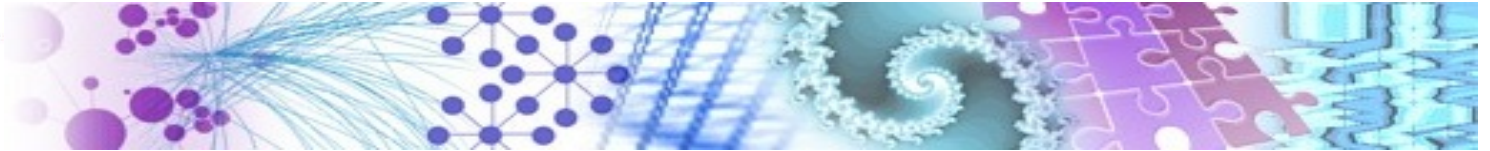
- Networking opportunities, in particular:
  - physical and social scientists (this workshop)
  - complexity scientists and users of complexity, including business, industry and policy makers
- JCP – Pilot Call under development:
  - specifically for research in complexity science, rather than relying on complexity science being supported by existing calls with non-complexity titles
  - themed call, relating to real world challenges and/or investigator-driven activities



## Next Steps: Challenges and Opportunities in Developing the JCP

- Partner countries having different priorities and different budgets
- Partner countries having different rules and regulations about funding
- Amount of funding available

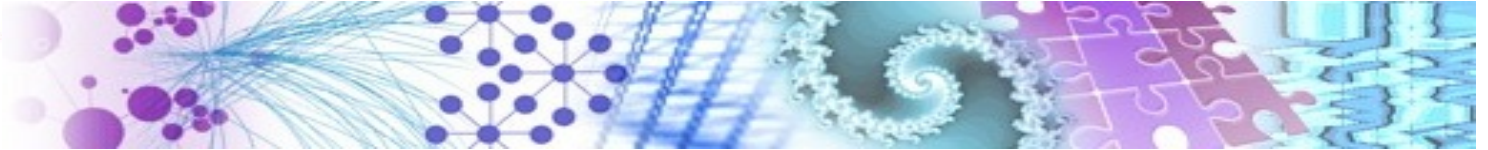
- Strengthen European activity by better engagement between institutes and organisations
- Continue to build a vibrant research community, breaking down barriers in the process
- Raised awareness of complexity science
- Greater ability to demonstrate the usefulness of complexity
- Possibility to support training activities in the future



## **Pilot Call: current status**

- All partner countries interested in participating, subject to final ratification by budget holders
- Details of process and call themes to be finalised within the next month
- Projects will involve investigators from at least three partner countries, with maximum monetary value of €500k and duration of 24 months
- Call due to be launched in March/April, projects to be funded in spring 2010





Thank you for your attention

Contact details:

Dr Gavin Salisbury, Coordinator

Barbara Richardson, Administrative  
Coordinator

**Tel:** + 44 (0) 1793 444485

**Fax:** + 44 (0)1793 444456

**Email:** [ComplexityNet@epsrc.ac.uk](mailto:ComplexityNet@epsrc.ac.uk)

**Website:** <http://www.complexitynet.eu>