

Why Now?

Economic crises, shortage of resources, environmental change, emerging diseases, terrorism, war, systemic instabilities: Today, we appear to know more about the universe than about our society - but we can change this. It is now the time to use the power of information to explore social and economic life on Earth and discover options for a sustainable future.

In recent decades, revolutionary advances have taken place in computing and information technology and in the science of complex techno-socio-economic-environmental systems. In addition, the availability of new and rich data sources have fundamentally changed our ability to utilise science.

It is the fusion of information and communication technology, supercomputing, data, modelling and visualisation that will open up a whole range of new opportunities.

Multi-scale computer simulations represent the best chance to gain insights into highly complex problems, ranging from traffic flows to evacuation scenarios of entire cities, the spread of diseases, financial and economic instabilities, the occurrence and dynamics of conflicts, or patterns and impacts of environmental change. This advance in science comes at the time where humanity faces pressing problems that stem from our current difficulties in understanding how to manage complex socio-economic systems, especially in their interaction with the rest of the planet.

Now is the right time for a bold approach to make the capabilities of modern science pay off for humanity and our Earth.

"It is time to explore social life on Earth, and everything it relates to, in the same ambitious way we have spent the last century exploring our physical world."

Dirk Helbing (ETH Zürich, CH)

Who is Involved?

Participants include more than 200 teams of scientists from over 80 renowned universities and institutions throughout Europe, with collaborations all over the world. Individuals and a wide range of science organisations have expressed their explicit support. The project now seeks to expand its collaborations with business and industry, with government and administrative institutions, foundations and funding organisations to unleash the full potential of the project and create the societal and economic leverage effect expected by the European Union.

This brochure just sketches the diverse range of ambitious goals pursued by the FuturICT project, a full outline of which is available at <http://www.futurict.eu>.

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FuturICT

FuturICT is at the heart of a revolutionary 21st Century science, which will use and develop information and communication technologies (ICT) to create a decision support system, combining data with models in order to solve the grand challenges humanity is facing.

FuturICT will lift our knowledge of social and economic systems to a new level of understanding, enabling us to discover promising paths towards a sustainable future.



"The World is facing epochal changes and crises. Simulating the coupled techno-socio-economic environmental dynamics on a planetary scale is therefore a project we can't afford *not* to do."

Joshua Epstein, John Hopkins University, USA

www.futurict.eu

Global Forces

Humanity faces urgent and profound challenges ranging from environmental change and shortages of natural resources to financial and economic instability, all linked to the global scale of these problems and the difficulties in managing our collective activities and their consequences. Now, aided by the unprecedented power of modern information and communication technologies, leading European scientists have developed an ambitious plan to meet these challenges and create new opportunities.

A Visionary Plan

FuturICT is a project consortium targeting the European Commission's FET Flagship Programme, which aims to focus €1 billion in funding over ten years to further research initiatives of exceptional scope.

Its goal is to understand human societies and their interaction within and across the multiple entangled layers of the Earth's social, economic and environmental systems through the application of revolutionary advances in data gathering and processing technologies, and to give to individuals, organisations and governments access to expert knowledge supporting their decisions and policies.

How Will It Work?

FuturICT aims to combine the best expertise across all scientific disciplines - from computer science, physics, mathematics, environmental science and economics through psychology, ecology, anthropology and sociology. It will utilise supercomputing facilities, networked systems and laboratories, creating a new kind of data-rich social science, on which intelligent future policies can be based. Among its goals is the creation of a *Living Earth Visualator*: a sophisticated concept that includes the modelling, simulation, and visualisation of social-technological-economic-environmental global changes, acting as an information translator that turns data into information into knowledge. It will be used to simulate global human activity interacting with the Earth ecosystem and to provide *Decision Arenas* for practical policy testing. FuturICT will build *Crisis Observatories* running massive data mining and scenario analyses for the advance detection of possible future crises, such as crashes in financial or housing markets, critical resource shortages in oil, water, or rare minerals, but also impending conflicts, the spread of diseases or harmful environmental changes. A *Knowledge Accelerator* will speed up research, development, and the creation of new business opportunities. Finally, the focus on *Managing Complexity* will develop integrated system designs and new decision-making and governance tools. The panel above gives just a flavour of one of these areas.



Decision Arenas and Crisis Observatories

Many important changes in human systems as well as in most natural systems take place through sudden regime shifts, which often relate to catastrophes. Therefore *Crisis Observatories* will be laboratories devoted to gathering and processing enormous volumes of data on techno-socio-economic systems, as well as natural systems such as the Earth and its ecosystem, to detect early warnings of impending events. Combining data analyses with complementary scientific models, simulations from the *Living Earth Visualator* will be used to provide policy makers a *Decision Arena*, where different scenarios can be visualised and tested. It will also allow experts to be trained in the management of crisis events, and may be used for citizen outreach to widen knowledge and to increase social and political inclusion in the decision making process.

“FuturICT can, I believe, make a significant contribution to the understanding of the evolution and change in societies, meeting the formidable issues of governance, climate change, sustainable economic balance that we are all faced with in the coming decades.”
George Soros (Founder of the Institute for New Economic Thinking)