



GLOBAL IQ

IMPACT QUANTIFICATION OF GLOBAL CHANGES

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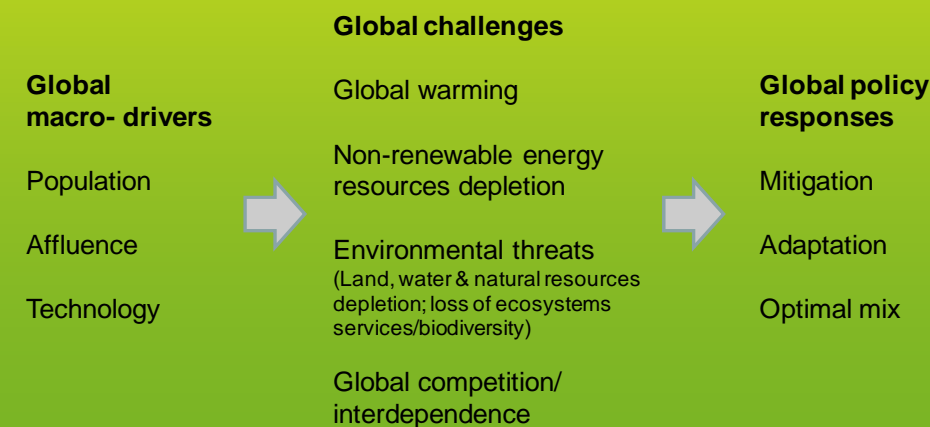
What is Global-IQ?

Impacts Quantification of Global Changes (GLOBAL IQ) is an FP7 Collaborative Research project funded by the European Commission.

About Global-IQ

Today, the world is transforming itself, socially, economically and environmentally. We can think of these transformations together as the process of 'global change': doing so emphasises the increasing interactions between them. But what are the impacts of these interconnected global changes, in the EU and beyond, and what are the best policy responses to manage them?

The objectives of Global-IQ are three-fold: (1) to significantly advance the estimation of the socio-economic impacts of global challenges, at the global, European and national scales; (2) to identify optimal adaptation strategies; and (3) to evaluate the total costs of managing global changes and the optimal mix of adaptation and mitigation.



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LATEST NEWS

- New project website online at: <http://www.global-iq.eu/>;
- Currently developing a GLOBAL-IQ wiki platform;
- Two Framework Papers drafted to define concepts and methods to estimate the total cost of global challenges, and to model the role of adaptation;
- New paper on "Climate change impacts and ambiguity", presented at the AERE Summer Conference 2012, Asheville, North Carolina, and the WEAI Summer Conference 2012, San Francisco;
- Working paper on first attempts to introduce uncertainty into the model GLOBIOM to address global challenges, presented at the 123rd EAAE Seminar in Dublin in February 2012.

RESEARCH HIGHLIGHTS: New paper on "Climate change impacts and ambiguity" by Stergios Athanassoglou and Emanuele Massetti: In this paper we introduce a theoretical framework to establish a relationship between climate change impacts and global greenhouse gas (GHG) concentrations that take into account the ambiguity, i.e. the structural uncertainty, that decision makers face when they have to assess future climate change impacts. We use US agriculture as a case study and estimate the sensitivity of agricultural land values and climate.



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WORK PACKAGE 1: Understanding global changes



Partners:
ISIS (leader), TSE, FEEM, IIASA, PIK.

In today's world, human impacts on the environment are increasingly complex and far-reaching. Therefore the emphasis needs to shift from addressing problems in isolation to studying whole, interconnected systems. We live in a world that is increasingly crowded (a global population of 9 billion or more by 2050, with most growth in developing countries), flat (rising living standards in developing countries, and globalised lifestyles spreading worldwide) and hot (climate change, pushed by rising carbon emissions).

This is why WP1 starts with an interdisciplinary, system overview of global change. It aims to build a common learning process for Global-IQ, involving the project partners in charge of quantifying global impacts in the other work packages. This learning process will share assumptions about and projections of four global challenges: (1) climate change; (2) non-renewable energy resource depletion; (3) environmental threats (land, water and renewable resource depletion; loss of ecosystems services/biodiversity); (4) global competition/interdependence.

A Global-IQ wiki platform has been implemented to help the partners step-by-step, including:

- Designing the Global-IQ conceptual framework;
- Developing and fine-tuning shared assumptions about future socio-economic pathways;
- Initial identification of mitigation and adaptation responses to the global challenges.

Who is Global-IQ?

- *Coordinator:* Fondation Jean-Jacques Laffont, Toulouse School of Economics (TSE), France
- *Deputy Coordinator:* Fondazione Eni Enrico Mattei (FEEM), Italy
- Internationales Institut für Angewandte Systemanalyse (IIASA), Austria
- Potsdam-Institut für Klimafolgenforschung (PIK), Germany
- University of Gothenburg (UGOT), Sweden
- Charles University in Prague, Environment Center (CUNI), Czech Republic
- Istituto di Studi per l'Integrazione dei Sistemi (ISIS), Italy
- Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science, UK (LSE)
- Graduate Institute of International Studies in Geneva (HEID), Switzerland
- Wiener Institut für Internationale Wirtschaftsvergleiche (WIIW), Austria
- Centre for Economic Policy Research (CEPR), UK



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FOCUS ON: Jean-Pierre Amigues

Jean-Pierre Amigues is Scientific Coordinator of Global-IQ. He is Research Director at INRA, part of the Toulouse School of Economics (TSE), from where he also holds a PhD. Jean-Pierre's research interests lie in natural resource and environmental economics, especially water management and climate change. Recent work includes papers on carbon capture and storage, renewable energy, and potential irreversible catastrophic shifts in the assimilative capacity of the environment.

WORK PACKAGE 2: Non-market impacts and behavioural analysis of key sectors

Partners: CUNI (leader), TSE, ISIS, HEID.



Environment Center
Charles University
in Prague

WP2 is devoted to behavioural issues, split into different sector-dedicated tasks. Firstly, it will conduct monetary valuation of the non-market effects of climate change and mitigating policies. Large-scale health effects will also be analyzed under conditions of changing population. Then it will conduct an analysis of residential energy demand, including preferences for the adoption of energy-saving and renewable micro-generation technologies. Lastly, it will analyse links between trade and climate policy.

WORK PACKAGE 3: Models to estimate socio-economic impacts of global changes

Partners: IIASA (leader), FEEM, PIK, ISIS, WIIV.



WP3 can be considered a stepping stone on the way to running the scenarios with and without adaptation in WPs 4-5. As such, it also

forms the link to WP1, which develops the global challenges to be addressed by the Global-IQ models. In a nutshell, WP3 sets up the models so that they can incorporate the global challenges, quantifying their impacts

and determining corresponding adaptation strategies. The models cover several areas/sectors: agriculture and forestry, water and energy, transport, infrastructure, tourism, EU competitiveness, labour markets, international trade, financial stability, population, health and migration.

Even though no model covers all of these sectors or is suitable to address all of the global challenges, the complete framework does. In order for this analysis to be consistent, the models will need to be harmonized in the sense that they share the same basic assumptions. For this reason and also to facilitate communication with other WPs, the first task carried out in WP3 was concerned with making an inventory of all Global-IQ models, their variables, characteristics (e.g. spatial and temporal resolution) and major assumptions.



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WORK PACKAGE 4: Scenarios of socio-economic impacts of global changes

Partners: PIK (leader), FEEM, IIASA, ISIS, WIIW.

WP4 is the 'assessment-box' of the project. It builds on the scenarios designed in WP1 and the models developed in WP3 to analyse socio-economic dynamics at the EU, national and macro-regional levels. We will compare a set of scenarios, in order to investigate the impacts of a variety of global changes. The set of scenarios will not include assumptions on adaptation, but provide the basis for WP5, where adaptation will be explored in more detail.

Focal points of the analysis will be the agriculture and forestry sectors, fossil fuels and biomass, international trade and transport, competitiveness and labour markets. WP4 will also produce an estimate of the total cost of different combinations of global changes by using five prominent economic models.



WORK PACKAGE 5: Autonomous and planned adaptation: total impacts of global change

Partners: FEEM (leader), IIASA, PIK, ISIS, WIIW.

WP5 aims to assess the impacts of global change, when the system is allowed to adapt to them as fully as possible. The analysis will allow us to identify the mix of mitigation/adaptation strategies that maximizes social welfare, as well as to assess the total costs of the global challenges, emphasising inter-linkages between economic growth, vulnerability and adaptation.

In particular, WP5 will define socio-economic transformations in different sectors, such as agriculture and forestry, energy, transport, infrastructure and tourism. Adaptation scenarios in the labour market, in international trade and in population are also envisaged. Given the existence of uncertainty, sensitivity analysis will be performed.

The project partners involved in WPs 3-5 have already held several web-conferences to define a theoretical framework for studying total costs of, and adaptation to, the global challenges. Two papers have been drafted to guide our work. The first defines concepts and methods to estimate the total cost of global challenges. The second starts by defining adaptation from a conceptual point of view and then provides guidelines for how modellers should run scenarios with and without it. The aim is that the three core modelling work-packages (3-5) develop in tandem. These "Framework Papers" will be presented to all project partners for discussion at the annual project meeting of Global-IQ this coming October, and will guide future work in the project.



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WORK PACKAGE 6: Discounting, risk and uncertainty in modelling impacts

Partners: UGOT (leader), TSE, FEEM, IIASA, PIK, LSE.



The debate within the economics community, following the publication of the UK Government's "Stern Review on the Economics of Climate Change" (2006), has stressed the importance of taking into account time, risk and uncertainty when analysing policies to mitigate and adapt to global change.

Questions of how to discount the future costs and benefits of current climate-change policies, as well as the analysis of climate risk and uncertainty, have stimulated many recent contributions in economics. WP6 will make several new contributions to this line of research, by developing theoretical innovations on risk, uncertainty and discounting, and by applying a selection of them numerically using integrated models developed in other work packages.

WP6 partners held a detailed meeting at the annual conference of the European Association of Environmental and Resource Economists in Prague this June.

NEWS/EVENTS

18th-19th October 2011 Kick-off meeting at TSE in Toulouse

10th-12th October 2012 Next partners meeting in Prague



PUBLICATIONS

Athanassoglou, S. and E. Massetti (2012). "Climate Change Impacts and Ambiguity." Mimeo, FEEM and Yale.

Fuss S., Havlik P., Szolgayova J., Obersteiner M and Schmid E (2012). "Agricultural price volatility under climate change: the impact of multiple objectives on commodity prices". Paper prepared for the 123rd EAAE Seminar, Dublin, February 23-24, 2012.

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