

## Summary information

The International Risk Governance Council (IRGC) is an independent organisation whose purpose is to **help the understanding and management of emerging global risks** that have impacts on human health and safety, the environment, the economy and society at large. IRGC's work includes developing concepts of risk governance, anticipating major risk issues and providing risk governance policy recommendations for key decision makers.

IRGC focuses on emerging, systemic **risks for which governance deficits** exist and aims to provide recommendations for how policy makers can correct them. IRGC believes that improvements in risk governance are essential if optimal risk-related decisions are to be made and to maximise public trust in the processes and structures by which they are made.

Many of **these risks are complex, uncertain, or even ambiguous**. In most cases, the potential benefits and negative side-effects interconnect. IRGC's goal is to facilitate a better understanding of risks and their scientific, political, social, and economic contexts and of how to manage them.

IRGC considers that it is important to bring the principles of integrated risk governance of important emerging systemic risks to the highest levels of decision making. It believes that by combining forces governments, academia, industry, and international and large non-governmental organisations can together develop and implement the best options for governing global risks through coordinated and coherent policy making, regulation, research agendas and communication.

### What is risk governance?

Governance refers to the actions, processes, traditions and institutions by which authority is exercised and decisions are taken and implemented. Risk governance applies the principles of good governance to the identification, assessment, management and communication of risks. It incorporates such criteria as accountability, participation and transparency within the procedures and structures by which risk-related decisions are made and implemented.

Global risks are not confined to national borders; they cannot be managed through the actions of a single sector. The governance of global, systemic risks requires cohesion between countries and the inclusion within the process of government, industry, academia and civil society.

Risk accompanies change. It is a permanent and important part of life and the willingness and capacity to take and accept risk is crucial for achieving economic development and introducing new technologies. Many risks, and in particular those arising from emerging technologies, are accompanied by potential benefits and opportunities. The challenge of better risk governance lies here: **to enable societies to benefit from change while minimizing the negative consequences** of the associated risks.

Risk governance is both a **concept and a tool**. It addresses questions such as the understanding of the secondary impacts of a risk and of how it is managed, the development of resilience and the capacity of organisations and people to face unavoidable risks, the empowerment of those responsible for making and implementing decisions, the role of science and technology in policy making, the extent to which a precautionary approach should be used to address

uncertainty and ambiguity and the balancing of an inclusive approach to decision making with the need to reach a decision.

Amongst IRGC's concerns is that important opportunities flowing from new technologies and innovations are not foregone or mismanaged due to inadequate risk governance, including misinformation and poor communications. When these technologies have the capacity to alleviate major global concerns, a failure to adopt them has potentially catastrophic consequences

### Why IRGC was established

IRGC's establishment followed the heightened level of public concern about risks and their management in the late 1990s. The cumulative impact of the BSE (Mad Cow Disease) crisis in Europe and particularly the UK, apprehension about genetic engineering, fears of the global failure of IT systems (the "Millennium Bug") and an increase in the frequency and severity of natural disasters gave the impression that society appeared on the verge of losing control of a number of risks. This anxiety compounded other public concerns about the increasing speed of technological change and the difficulties facing governments, regulators and others involved in risk governance in fully assessing and controlling the associated risks.

The knowledge community, those responsible for providing the best scientific advice on which risk management decisions depend, were also encountering difficulties in meeting the demands for factual certainty; where this was clearly established, there were problems in communicating the knowledge to the decision making community. Decision makers were themselves struggling with problems which

included the burgeoning volume of data, the sheer pace of technical and natural developments, the increase in public expectation of effective risk management and organisational and ownership changes affecting how, and by whom, risk decisions are made.

It was against this background that, in early 1999, the 10th Forum Engelberg, an annual gathering in Switzerland of scientists, government leaders and heads of industry, concluded by resolving to create an independent, international body to bridge the increasing gaps between science, technological development, decision makers and the public and, in doing so, act as the catalyst for improvements in the design and implementation of effective risk governance strategies. It was felt that a new organisation would be better able to do this than the many existing risk-related institutions whose single sectoral, disciplinary and/or geographic emphases made it difficult for them to undertake such a broad mandate. Based in Geneva, Switzerland, the IRGC was formally established in 2003.

More recent events confirm that the issue of risk governance remains of the utmost importance. The outbreak of SARS, spreading rapidly through 27 countries and killing 774 of the 8096 people infected, demonstrated the capacity of a new pathogenic virus to cause considerable health risks and to have a substantial economic impact. Losses, both human and economic, continue to increase from natural disasters such as the tsunami of December 2004, Hurricane Katrina, the Pakistan earthquake of 2005 and flooding across parts of Asia in 2007. The fragility of critical infrastructures has been demonstrated in the early 21st Century by the massive blackouts in the US and Canada and across Italy and other European countries. There are concerns about maintaining secure energy supplies and developing sustainable sources of energy. Most prominent of all global risks are those which derive from the impacts of climate change, with side-effects in many unanticipated areas.

All such risks have rippling effects and secondary impacts; they all exceed the capacity of any individual country to manage them, reinforcing the need for an organisation such as IRGC to propose governance approaches with global validity.

## Focus and work programme

IRGC's focus embraces all emerging global risks of a systemic nature. Our current programme places particular emphasis on those where governance deficits are identified, in particular in the fields of:

- Mitigation of and adaptation to the impacts of climate change
- Energy security and sustainability
- Emerging technologies
- Governance of unconventional crises

Additionally, a permanent part of our programme is devoted to further developing the concept and tools of risk governance itself, and to making it easier for policy makers, regulators and industry to apply them.

Most of the problem fields prioritised by IRGC are characterised by the scale of their potential impact, their long-term nature and by complexity, uncertainty and ambiguity. They all present substantial challenges to those responsible for developing and implementing

appropriate policy initiatives, not least because of their global nature and the complicated network of international, governmental and other organisations – including business – responsible for their management. The specific risks and issues on which we have worked since 2003 are

- Managing and reducing social vulnerabilities from coupled critical infrastructures
- The risk governance of nanotechnology and its application in food and cosmetics
- Preparedness for an influenza pandemic originating from a developing country
- Governance of the opportunities and risks arising from the increasing production and use of biomass energy
- The regulation of deep geological storage of captured carbon dioxide
- The development of a risk governance approach appropriate to synthetic biology and genomics
- Governance of the risks posed by climate change to low-lying coastal areas and their inhabitants
- Enhancing the governance of disasters and unconventional crises

## Project work

The primary means by which IRGC meets its objectives is through projects, the publication and communication of the results of this project work, and the organising of conferences where attention is focused on major risk issues and their governance. IRGC is deliberately inclusive and proactively networks and works at an international level with experts and decision makers from government, industry, intergovernmental organisations, academia and research institutions, NGOs and other backgrounds.

The IRGC's Board and Scientific and Technical Council are responsible for selecting those risks and issues on which IRGC will conduct project work. Priority is given to those where IRGC believes its independence, multi-disciplinary and multi-sectoral approach and emphasis on risk governance – rather than on risk assessment or management – can provide added value to decision makers.

IRGC projects are led by members of the IRGC's Scientific and Technical Council (S&TC). Project work is undertaken by a combination of members of the S&TC, external experts engaged for their specific knowledge and insights, and the IRGC's Secretariat. IRGC publications are all subject to peer review; publication will include active communication and networking appropriate to each risk issue's audience.

All of IRGC's work is open to external input and participation and we actively seek to collaborate with other organisations, including companies, international organisations, academic and research institutions and NGOs, with appropriate expertise and resources. We welcome such collaborations as valuable opportunities for the sharing of views and knowledge transfer and, additionally, for their assistance in assuring the timely completion of our projects. IRGC has concluded formal Collaboration Agreements with the European Commission's Joint Research Centre (Ispra) and the Russian Academy of Sciences, and has executed a Memorandum of Understanding with the Organisation for Economic Co-operation and Development (OECD), all of which support formal collaborative efforts between the respective organisations.



## Conferences and workshops

IRGC conferences take two forms. At general conferences (such as the Inaugural Conference in Geneva in June 2004 and the General Conference in Beijing in September 2005) each session is devoted to a distinct risk issue. Other conferences form part of a specific project and the programme is devoted to that project's theme, as with conferences on nanotechnology risk governance (July 2006) and the regulation of carbon dioxide capture and geological storage (November 2007). IRGC's conferences allow policy makers, business leaders, NGOs and academic experts to explore risk issues in a neutral environment.

IRGC also organises smaller technical workshops, normally as part of its project work. Since our founding we have organised the following focused workshops, all of which were attended by selected experts from around the world:

- Zurich, February 2004, to examine and discuss, with experts from industry, academia and government, risks within critical infrastructures
- Ismaning, Germany, November 2004, to develop thinking on our risk governance framework together with experts from around the world
- Beijing, April 2005, to discuss lessons learned from the SARS outbreak
- Geneva, May 2005, to identify the key risks associated with nanotechnology
- Zurich, January 2006, to develop recommendations for risk governance strategies for nanotechnology
- Beijing, August 2006, to explore global preparedness for an influenza pandemic
- Washington DC, March 2007, to develop policy recommendations for the effective governance of the risks associated with the geological capture and storage of carbon dioxide
- Divonne, September 2007, to explore and consider solutions to the governance of the opportunities and risks arising from the increasing production and use of biomass energy

In addition to events that we organise ourselves, we accept invitations to attend and contribute to major conferences held by other international organisations such as the European Commission, Society for Risk Analysis, the Crisis and Risk Network, the European Safety and Reliability Association, the Federation of European Risk Management Associations, the Organization for Security and Co-operation in Europe, the Korean National Institute for Disaster Prevention, the World Knowledge Forum, the Institute of Electrical and Electronics Engineers, NATO Science Division, the Alpbach Technology Forum, the American Association for the Advancement of Science and many other national and international bodies.

## Organisational structure and finances

IRGC's structure comprises the Foundation Board, the Scientific and Technical Council (S&TC), the Advisory Committee and the Secretariat.

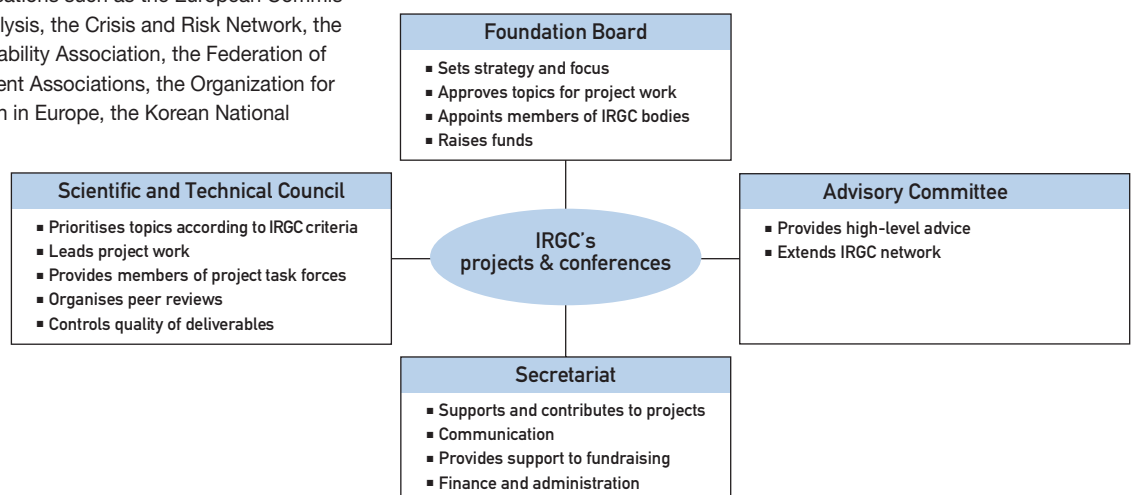
The IRGC's Foundation Board is responsible for strategy, planning, project approval, finances, fundraising and governance, including the appointment of our external auditors. The S&TC is responsible for preparing the IRGC's programme of activities, prioritising and leading project work, and for cooperation and interaction with other organisations. Members of our Advisory Committee provide strategic advice to the Foundation. The Secretariat, based in Geneva, is responsible for IRGC's administration and communication and provides support to projects.

As a not-for-profit foundation, the IRGC relies entirely upon income from grant-making institutions, both private and public. Since 2003 IRGC has received **financial contributions** from:

- Swiss Secretariat for Education and Research; Swiss Agency for Development and Cooperation; US Environmental Protection Agency and Department of State; Austrian Federal Ministry for Transport, Innovation and Technology; Korean National Program for Tera-level Nanodevices; Electricité de France; Swiss Re; Oliver Wyman Limited; Allianz Technology Center; E.ON Energie AG; Aare-Tessin AG für Elektrizität; ETH Domain.

IRGC has also benefited from **in-kind contributions** from:

- Ministry of Science and Technology of the People's Republic of China; Chinese Academy of Engineering; Chinese National Center for Disease Control; Swiss Re Centre for Global Dialogue; European Commission's Joint Research Centre Ispra; Delft Technical University; ETH Zurich; Paul Scherrer Institute; OECD; World Business Council for Sustainable Development; UK Health and Safety Executive; and from many other individuals and organisations.



## IRGC's Founders and Members of the IRGC's organs

### Board

- Donald J. Johnston (Chairman) *formerly Secretary-General, OECD (1996-2006)*
- Christian Mumenthaler (Vice-Chairman), *Chief Risk Officer and member of the Executive Board, the Swiss Reinsurance Company, Switzerland*
- Pierre Bérroux, *Senior Vice President, Risk Group Controller, Electricité de France, France*
- John Drzik, *President and CEO, Oliver Wyman, USA*
- Walter Fust, *Director-General, Swiss Agency for Development and Cooperation, Switzerland*
- José Mariano Gago, *Minister for Science, Technology and Higher Education, Portugal*
- John D. Graham, *Dean, Frederik S. Pardee RAND Graduate School, USA*
- Charles Kleiber, *State Secretary for Education and Research, Swiss Federal Department of Home Affairs, Switzerland*
- Wolfgang Kröger, *Director, Laboratory for Safety Analysis, Swiss Federal Institute of Technology Zurich, Switzerland*
- Liu Yanhua, *Vice-Minister for Science and Technology, People's Republic of China*
- L. Manning Muntzing, *Energy Strategists Consultancy Ltd, USA*
- Björn Stigson, *President, World Business Council for Sustainable Development, Switzerland*

Additionally, under the terms of the Memorandum of Understanding between IRGC and the OECD, the OECD has observer status at meetings of the IRGC Board. The current nominated observer is Dr. Michael Osborne, Director of the OECD's International Futures Programme.

### Scientific and Technical Council

- Prof. Dr. M. Granger Morgan (Chairman), *Head, Department of Engineering and Public Policy, Carnegie Mellon University, USA*
- Dr. Lutz Cleemann, *Executive Vice President and Head of the Allianz Technology Center in Ismaning, Germany*
- Prof. Dr. Manuel Heitor, *Secretary of State for Science, Technology and Higher Education, Portugal*
- Professor Carlo C. Jaeger, *Head, Social Systems Department, Potsdam Institute for Climate Impact Research (PIK), Germany*
- Prof. Ola M. Johannessen, *Director, Nansen Environmental and Remote Sensing Center, Bergen, Norway*
- Prof. Dr. Wolfgang Kröger, *Director, Laboratory for Safety Analysis, Swiss Federal Institute of Technology Zurich, Switzerland*
- Dr. Patrick Lagadec, *Director of Research, Ecole Polytechnique, Paris, France*
- Professor Ragnar E. Lofstedt, *Professor of Risk Management, Director of King's Centre of Risk Management, King's College, London, UK*
- Dr. Jeffrey McNeely, *Chief Scientist, IUCN - The World Conservation Union, Switzerland*
- Dr. Stefan Michalowski, *Head of the Secretariat, Global Science Forum, OECD*
- Dr. D. Warner North, *President, NorthWorks Inc., and Consulting Professor, Department of Management Science and Engineering, Stanford University, USA*

- Prof. Dr. Norio Okada, *Disaster Prevention Research Institute, Kyoto University, Japan*
- Prof. Dr. Ortwin Renn, *Professor for Environmental Sociology, University of Stuttgart, Germany*
- Dr. Mihail Roco, *Chairman, Subcommittee on Nanoscale Science, Engineering and Technology, National Science and Technology Council; Senior Advisor for Nanotechnology, National Science Foundation, USA*
- Prof. Dr. Joyce Tait, *Director, ESRC Centre for Social and Economic Research on Innovation in Genomics, United Kingdom*
- Prof. Shi Peijun, *Professor and Vice-President, Beijing Normal University; Vice-Dean, Chinese Academy of Disaster Reduction and Emergency Management, Ministry of Civil Affairs and Ministry of Education, Beijing, People's Republic of China*
- Dr. Hebe Vessuri, *Head, Department of Science Studies, Venezuelan Institute of Scientific Research, Venezuela*
- Dr. Timothy Walker, *Former Director General, Health and Safety Executive, United Kingdom*

### Advisory Committee

- Dr. George H. Atkinson, *former Science and Technology Advisor to Secretary of State, Department of States, USA*
- Prof. Dr. Adolf Birkhofer, *Managing Director, Institute for Safety and Reliability, Germany*
- Philippe Busquin, *Member, European Parliament*
- Dr. KunMo Chung, *President, the Korean Academy of Science and Technology, Korea*
- Prof. Jean Pierre Contzen, *Chair Professor, Technical University of Lisbon, Portugal*
- Prof. Ralf Eichler, *President, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland*
- Prof. Dr. Richard R. Ernst, *Laboratory for Physical Chemistry, Swiss Federal Institute of Technology, Zurich, Switzerland*
- Dr. Harvey Fineberg, *President, Institute of Medicine, the National Academies of Science, USA*
- Dr. Claude Martin, *former Director General, WWF International, Switzerland*
- Dr. Richard A. Meserve, *President, The Carnegie Institution, USA*
- Dr. Warren M. Washington, *Senior Scientist, Climate Change Research, National Centre for Atmospheric Research, USA*

### IRGC's Founders

- Adolf Ogi, *UN Special Advisor on Sport for Development and Peace*
- Olaf Kübler, *former President, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland*
- Bennett Johnson, *former US Senator, USA*
- Donald Johnson, *Secretary General, OECD*
- World Business Council for Sustainable Development, represented by Björn Stigson
- KunMo Chung, *President, Korean Academy of Science and Technology*

### Founding Rector

- Prof. Dr. Wolfgang Kröger, *Director, Laboratory for Safety Analysis, Swiss Federal Institute of Technology Zurich, Switzerland*

### Secretary General

- Christopher Bunting