



# ANNUAL REPORT 2013

ANNUAL REPORT OF THE INTERNATIONAL  
RISK GOVERNANCE COUNCIL FOR THE  
YEAR 2013

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## Message from the Chairman of the Board



**Philippe Gillet**  
Chairman of the Board

Risk is inherent to human life. It is also a driver of scientific development, innovation or industrial activity. Risk taking is a good thing, which must be encouraged.

At the same time, universities need to convey to their students -as part of their education for life-, and policymakers need to communicate with people, that the trade-offs between opportunities and risk need to be analysed very carefully in order that the negative consequences of events or decisions taken are acceptable.

IRGC is very successful in helping people in policy and business make decisions that account for the perception of a risk, in addition to its scientific assessment and its economic, social or political evaluation. For example, our “risk governance guidelines for unconventional gas development” published in 2013, provide a series of recommendations, ranking from environmental impact assessment, to technical considerations for safe and secure hydraulic fracturing, and to the main elements of policy design and regulatory oversight, which are necessary to provide overall conditions for sustainable development of the resource.

## Message from the Chairman of the Scientific & Technical Council



**Granger Morgan**  
S&TC Chairman

While many organizations work on assessing and managing risks, IRGC is unique in the world in its ability to adopt a broad global perspective on risk governance. While all the members of its academic network engage in research, IRGC itself is not a research organization. Rather it collects knowledge from around the world, synthesizes it, and discusses and refines it, working with practitioners and policy makers.

IRGC provides a remarkably strong neutral convening authority. Through the contact and knowledge of our Board, our Scientific and Technical Council, our advisor and the staff of our Secretariat, we routinely assemble the best experts on specific risk-related subjects from all around the world to explore and advance risk governance knowledge and practice on a wide range of pressing problems.

Over the last ten years, IRGC has commissioned and published a wide variety of reports and prepared synthesis studies and summaries for policy makers as well as reports for non-experts. Many of these have become classics in the risk literature and are widely used by decision makers across government, industry, the NGO community and in academia.

## Message from the Managing Director



**Marie-Valentine Florin**  
Managing Director

2013 has been an exciting and extraordinarily productive year for the International Risk Governance Council. Two main successes stand out.

First, IRGC managed to attract renowned expert speakers and workshop participants and bring together expert practitioners from academia, governments and industry for a series of well-received and highly relevant international conferences and expert workshops on risk issues, while at the same time ensuring that this knowledge is also available and accessible to non-experts.

Second, IRGC successfully facilitated collaborative research and the exchange of ideas in various forms, both within and outside of IRGC's broad academic network resulting in, among others, two peer-review research reports and many invitations for IRGC to present its work at conferences around the globe.

With its network of partner institutions as the backbone of its operations as well as its Switzerland-based secretariat, IRGC will continue its role as a science-based think tank and neutral convening ground for bringing together scientists, policy makers and representatives from industry and civil society to talk about ways to advance the understanding and governance of risks.

Looking ahead, IRGC will further develop and apply concepts and guidelines for risk governance. We will also engage in challenging new projects, including opportunities and risks associated with energy transition, developments in the field of synthetic biology or governance of risk in the cyber physical world. IRGC will explore the potential of a contribution of risk management approaches to these areas by facilitating the delivery of high quality outputs in the form of collaborative events and publications.

Let me conclude by expressing my sincere gratitude to you for your interest in IRGC's work and your continued support of our activities which allows us to make a valuable contribution to better understand and manage risks in our society.

## Acknowledgements

The IRGC's achievements in 2013 would not have been possible without the financial support from IRGC's donors and partners. IRGC would like to thank its main sponsors for their continued trust and support:

- École Polytechnique Fédérale de Lausanne (EPFL)
- Swiss Reinsurance Company Ltd.
- Oliver Wyman
- EU-VRI and the Integ-risk EC project on emerging risks from new technologies
- Portuguese Science and Technology Foundation

In 2013, IRGC further benefited from in-kind contributions, for which IRGC would like to express its gratitude to the following organisations and individuals:

- École Polytechnique Fédérale de Lausanne (EPFL)
- Ministry of Science and Technology, P.R. China
- Counsellors' Office to the State Council, P. R. China
- Tsinghua University, School of Public Policy and Management
- Carnegie Mellon University, Department of Engineering and Public Policy
- Indiana University, School of Public and Environmental Affairs
- Institut für Sozialwissenschaften, Abteilung für Technik- und Umweltsoziologie, University of Stuttgart
- Paul Scherrer Institut
- Swissnex China
- Swiss Re Center for Global Dialogue
- All the other academic institutions which supported members of the Scientific & Technical Council in their work for IRGC

Since 1 January 2013, EPFL has replaced the Swiss State Secretariat for Education and Research as IRGC's main funder. EPFL will contribute funding to IRGC for the 2013 – 2016 budget period.

IRGC would also like to take the opportunity to sincerely thank all the members of the IRGC Foundation Board as well as the Scientific & Technical Council, who all work on a voluntary basis.

The members of these bodies were crucial to IRGC's success in 2013. IRGC thanks all members of its organs as well as their employing organisations for their continued support.



## Summary

### INTRODUCTION

The International Risk Governance Council (IRGC) is a non-profit and independent foundation based in Lausanne, Switzerland, whose purpose is to help improve the understanding and governance of emerging, global systemic risks that have impacts on human health and safety, the environment, the economy and society at large. It does so by drawing on the best scientific knowledge and by combining it with the understanding of specialists in the public and private sectors.

This Annual report of the International Risk Governance Council covers the period of 1 January to 31 December 2013.

This publication is an opportunity to present IRGC's work to its network members, partners, sponsors, workshop and conference participants as well as the wider public. On the following pages, the IRGC Annual Report presents past and current project work, including an outlook on future work areas, it presents conferences and expert workshops organised by IRGC in the past year as well as external events to which IRGC representatives have contributed through presentations or the organisation of workshop sessions. The Report furthermore showcases IRGC's recent publications and introduces readers to its governing bodies and members thereof.

### KEY ACHIEVEMENTS IN 2013

- After moving to EPFL in June 2012, IRGC consolidated and expanded its operations, with two full-time Visiting Risk Fellows joining the team
- Organised two international conferences with more than 150 participants and over 30 high-profile speakers each
- Co-organised two high-level expert workshops on Slow-developing Catastrophic Risks and on Small Modular Reactors
- Published two collaborative, peer-reviewed reports on the Rebound Effect in Energy Efficiency and Unconventional Gas Development
- Helped to set up the EPFL Center on Risk Analysis and Governance, including the kick-off symposium
- On the occasion of IRGC's 10 year anniversary, conducted a series of interviews with members of IRGC's Scientific & Technical Council, to be published in 2014



“

IRGC's single most important contribution is to serve as a neutral convening authority. Bringing people from a wide variety of perspectives together, trying to understand and communicate about key issues of risks governance is one of its biggest strengths.

**Granger Morgan**

*Professor and Head, Department of Engineering and Public Policy, Carnegie Mellon University; Chairman of the IRGC Scientific and Technical Council; USA*

## 2013 Activities

Events

Publications

Selected contributions



December

### Risk Governance Guidelines for Unconventional Gas Development

Authors: Dr. John Graham (Indiana University), John A. Rupp (Indiana University), and Dr. Austin Mitchell (Carnegie Mellon University). Published in December 2013

This collaborative, peer-reviewed report examines the risks and benefits of unconventional gas development and offers risk governance recommendations to guide deliberations of policymakers, regulators, industry and stakeholders.

IRGC Presentation “Resilience Building as a Risk Governance Option” at the Science and Technology Policy Institute (STEP), Seoul.

November

### CRAG – IRGC Symposium 2013 “Uncertainty: From Insight to Action”

20 – 22 November, EPFL Lausanne, Switzerland

Jointly organised by IRGC and the EPFL Center on Risk Analysis and Governance (CRAG), the international event brought together more than 30 high-profile speakers and over 150 participants from academia, policy and the private sector for an international three day symposium. In two plenary and three workshop sessions, participants explored how to understand, manage, govern and communicate uncertainty in a risk context.

IRGC presentation “Social Media for Crisis Communications: Opportunities and Challenges” at Public Alerting and Social Media during Crises and Disasters Conference, Fraunhofer Institute, Berlin.

June

### Expert workshop “Governance of Slow-developing Catastrophic Risks”

27 – 28 June, Swiss Re Center for Global Dialogue, Rüslikon, Switzerland

Bringing together 20 high-level participants from academia and industry, the workshop addressed two main questions: How can we improve policies to deal with slow-developing risks that have the capacity to cause sudden regime shifts or even systemic collapse? How to improve mutual understanding between scientists and policymakers?

“Risk Governance and social challenges”, Annual Conference, Cercle des Associés en Risk Management, Paris.

April

### The Rebound Effect: Implications of Consumer Behaviour for Robust Energy Policies

Authors: Prof. Inês Azevedo, Prof. Granger Morgan, Dr. Brinda Thomas (Carnegie Mellon University) Prof. Ortwin Renn, Marco Sonnberger (University of Stuttgart). Published in April 2013

A review of the rebound effect literature in energy efficiency and report from expert workshops that IRGC co-convoked in the US and in Germany. This publication aims at raising awareness among scientists, industry experts and policy makers about the extent of the rebound effect and suggests areas where research is needed to better inform science-based energy policies.

IRGC at the 2013 annual conference of the iNTEg-Risk programme in Stuttgart: Presentation of “IRGC’s unconventional gas project” and “elements for a white paper on Integrated Emerging Risk Management”.

January

### International Conference “From Crisis Management to Risk Governance”

9 – 11 January, School of Public Policy and Management, Tsinghua University, Beijing, China

Launching IRGC China as the new Center for Risk Governance hosted at Tsinghua University, the main objective of the conference was to promote risk management and risk governance in a broad context, in particular among key Chinese thought leaders and institutions. The event reached a large audience of government representatives, public sector agencies, academia, business and civil society.

IRGC Unconventional Gas project presentation at the European Commission-JRC - E&I workshop on Safe and Efficient Shale Gas Exploration and Production, Amsterdam.

40 participants from all sectors gathered for a two-day explorative Tällberg workshop at IRGC in Lausanne on “The risks we aren’t seeing”.

## EVENTS

International conference

### “From Crisis Management to Risk Governance”

Tsinghua University, Beijing, China  
9 – 11 January 2013

Jointly organised with Tsinghua University, the Ministry of Science and Technology, and the Counsellor's Office of the State Council, P.R. China, the international conference on crisis management and risk governance was held on the occasion of the launch of IRGC China as the new Center for Risk Governance, hosted at the Tsinghua University School of Public Policy and Management.

The main objective of the conference was to promote risk management and risk governance in a broad context, in particular among key Chinese thought leaders and institutions. The events aimed to reach a large audience composed of government representatives,



public sector agencies, academia, business and civil society. Engaging in collaborative work on the development of instruments and recommendations for risk governance, including regulatory frameworks and public-private partnerships, the participants came

together for a three day conference with plenary sessions and workshops.

The first day was dedicated to a ceremony marking the founding of IRGC China, followed by an international conference where expert speakers presented their views and recommendations for improving risk governance and for promoting better risk governance practices.

On day two, a series of parallel expert workshops was organised on four different topics:

#### Workshop 1: Risk Perception and Risk Culture

This workshop explored the psychological, social and cultural factors that influence risk perception, evaluated and acted upon by individuals and groups. In addressing both Chinese and international risk contexts, participants discussed research and practical policy measures that would enable risk managers to better cope with human dimensions of risk.

#### Workshop 2: Innovation and Adaptive Governance in Biotechnology

Technology development strategies and risk governance policies are commonly treated as separate spheres. This workshop focused on how the location, pace and diffusion of technological innovation are affected by the management of associated risks.



#### Workshop 3: Food Safety Governance

This workshop aimed to contribute science-based knowledge for improved food safety governance. The central theme was how changes in food safety governance can contribute to building trust and what approaches and mechanisms are further needed to increase trust.

#### Workshop 4: National Risk Assessment and Country Risk Management

This workshop discussed structures and processes in place to identify and assess large-scale risks that can potentially severely affect territories and population and to compare them according to their expected frequency and severity.

A plenary session on Common themes for Risk Governance on the third day closed the conference.

## Tällberg Workshop with IRGC

EPFL Lausanne, Switzerland  
14 – 15 March 2013

At the joint invitation of the Tällberg Foundation in Stockholm and of IRGC, 40 participants from all sectors interested in exploring the frontiers of their knowledge and sharing with others, gathered for a two-day explorative workshop at IRGC on “The questions we aren’t asking” and “The risks we aren’t seeing”.

The first day was devoted to “The questions we aren’t asking” and organised with the Shell scenario planning team and the Bertelsman Foundation. In an explorative Tällberg-style facilitated conversation, participants uncovered new areas of potential strategic importance for the medium-term. Participants looked for the unexpected “wild cards” but also looked at some key drivers of global change, including the energy transition, the consequences of digitalisation on individuals, relationships, business, government and labour markets.

The second day was devoted to “The risks we aren’t seeing”. It discussed how IRGC’s contributing factors to risk emergence can explain the development of new or unfamiliar risks in various sectors and the inter-relationships between risks and their management.

## “Slow-developing Catastrophic Risks”

Swiss Re Center for Global Dialogue, Rüschlikon,  
Switzerland  
27 – 28 June 2013

IRGC organised an expert workshop on the theme of Governance of slow-developing catastrophic risks (SDCRs), to discuss how scientists and policy makers could together improve the governance of this type of risks. SDCRs are specific to complex, nested systems with multiple interacting feedback loops. While negative feedback contributes to stability, (net) positive feedback may induce runaway effects, eventually reaching a tipping point, so as to trigger phase transitions or regime shifts; the existence of such transitions depends on the non-linearities of the system. Complexity and noise tend to confound the causes and consequences such that timing and impact of regime shifts become difficult to predict.

The two guiding questions for the one-day workshop were:

- How can we improve policies to deal with slow-developing risks that have the capacity to cause sudden regime shifts or even systemic collapse?
- How to improve mutual understanding between scientists and policy-makers?

The workshop emphasised the need for scientific modelling, and consequently how policy can effectively use science as a tool to identify, rationalise, and communicate justifiable choices. It concluded with two questions for further research about the types and features of:

- quantitative models that can be used to model the development of slow-developing catastrophic risks,
- institutions that can work well with scientific models, and be flexible and adaptive.

#### Expert workshop

## “Small Modular Reactors”

Paul Scherrer Institute, Villingen, Switzerland  
18 – 19 November 2013

Under the lead of the Department of Engineering and Public Policy at Carnegie Mellon University, and with support from the MacArthur Foundation, IRGC co-hosted a two day expert workshop at Paul Scherrer Institute, on small modular nuclear reactors (SMRs).

Over the past decade, there has been growing interest in developing and deploying a new generation of small modular nuclear reactors (SMRs). Ideally, these reactors would be manufactured in a factory and shipped to the site. Some are sealed and thus need to be shipped back to manufacturer for refuelling.

Developers promise that these reactors will maintain and enhance nuclear power plants' operational safety compared to existing designs. Some incorporate features that make them more resistant to proliferation than the current fleet of operating reactors, while more ambitious designs promise to at least partially tackle the waste question by producing smaller volumes of waste, or even by utilising spent fuel as fresh fuel.

SMRs hold the potential to make more carbon-free nuclear energy available at smaller scales that would be more affordable than large, conventional reactors. If the vision of factory fabrication does materialise, it might also be possible to reduce the cost per kWe.

Having already evaluated the benefits of and challenges to developing and deploying the first generation of light water SMR designs, the goal of the workshop organisers was to assess the technical and institutional barriers that must be overcome by later generations of SMRs, particularly non-light water designs, for the vision of mass deployment posited earlier to be realised.

#### International conference

## CRAG – IRGC Symposium “Uncertainty: From Insight to Action”

EPFL, Lausanne, Switzerland  
20 – 22 November 2013

On 20 – 22 November 2013, the new EPFL Center on Risk Analysis and Governance (CRAG) and IRGC brought together more than 30 high-quality speakers and over 150 participants from academia, policy and the private sector for an international three day symposium on "Uncertainty: From Insight to Action". In two plenary and three workshop sessions, participants explored how to understand, manage, govern and communicate uncertainty in a risk context.

Speakers at the two plenary sessions about “Understanding and Managing Uncertainty” and “Governing and Communicating Uncertainty” included:

Philippe Gillet  
(EPFL), Wolfgang  
Kröger (ETHZ),  
Janet Hering  
(CRAG, EAWAG,  
ETHZ, EPFL),  
Benjamin Zweifel  
(WSL), Granger

CRAG - IRGC Symposium 2013

## UNCERTAINTY: FROM INSIGHT TO ACTION

20 - 22 November 2013, Lausanne, Switzerland

Morgan (Carnegie Mellon University), Ben Ale (TU Delft), Wändi Bruine de Bruin (Leeds University), Richard de Neufville (MIT), Antoine Bommier (ETHZ), Vivianne Visschers (ETHZ), David Spiegelhalter (Cambridge University), Jonathan Wiener (Duke University), Kenneth Oye (MIT), Ortwin Renn (University of Stuttgart).

These two plenary sessions were complemented with three thematic workshops that ran in parallel on day 2 of the symposium.

### **Workshop 1: Risk Quantification**

Risk quantification is a key element of risk analysis and governance, and has its roots in statistics and stochastic modelling. Its purpose is to measure the likely sizes of risks and their physical and economic consequences, in order to underpin their management and insurance. The focus of this workshop was on the interplay between extreme value statistics, insurance, and risk management. It addressed academics and practitioners from various domains, albeit with a particular emphasis on environmental, financial and insurance applications, in order to foster the interaction of researchers across and beyond EPFL with an interest in the methods and applications of risk quantification.

Speakers: Hansjörg Albrecher (University of Lausanne), Paul Embrechts (ETHZ), Claudia Klüppelberg (TU Munich), Johanna Neselehova (McGill University), Andreas Schrafft (Swiss Re), Jonathan Tawn (Lancaster University)

Organised by: Anthony Davison (EPFL), Damir Filipovic (EPFL, Swiss Finance Institute)

### **Workshop 2: Decision-making Under Uncertainty: Behavioural Aspects**

When facing risky decisions, individuals often make choices that deviate from those of a fully rational homo economicus. The “human touch” in decision making under risk was the theme of this workshop, with speakers from academia and practice exploring the effects of behavioural shortcomings on individual and group payoffs, as well as on the stability of systems such as financial markets. Central questions included how decision makers respond to incentives, and how behavioural insights can inform the design of systems that are resilient to both human (mis)behaviour and randomness. Applications ranged from resource allocation and market mechanisms to operations and risk management.

Speakers: Peter Bossaerts (University of Utah), Thomas Epper (ETHZ), Boris Galonske (Oliver Wyman), Pierre Lauquin (Nestlé), Martin Weber (University of Mannheim)

Organised by: Rüdiger Fahlenbrach (EPFL), Thomas Weber (EPFL)

### **Workshop 3: Governance of Energy Transition**

Many countries, among which Switzerland and Germany, have announced ambitious plans to phase out nuclear energy and to substantially reduce their CO2 emissions. Switching production to more renewable energy sources (in particular wind and solar) implies a profound energy transition, which is only achievable if the major uncertainties related to anticipating future energy demand can be addressed and if consumer behaviour is well understood and can be triggered to sustainable actions. Countries that undertake a transition of their energy system need to address the challenges and corresponding economic, social and political risks. The workshop explored good practices and possible models for successful energy transition.

Speakers: Ines Azevedo (Carnegie Mellon University), Rainer Carius (Ministry for the Environment Baden-Württemberg), Ilan Chabay (IASS), Aline Clerc (FRC), Matthias Gysler (Swiss Federal Office of Energy), Sophia Becker (ZIRIUS, University of Stuttgart), Andreas Rüdinger (IDDRI), Wolfgang Weimer-Jehle (University of Stuttgart)

Organised by: Daniel Favrat (EPFL), Matthias Finger (EPFL), Ortwin Renn (University of Stuttgart, IRGC)

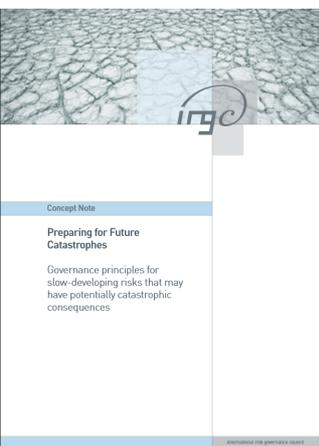
## PUBLICATIONS

### Preparing for Future Catastrophes

Governance principles for slow-developing risks that may have potentially catastrophic consequences

Concept note published in January 2013

Following discussions and findings from a workshop organised in 2011 on “slow-developing catastrophic risks” (SDCRs), IRGC published a concept note written by Dr. Len Fisher (University of Bristol) on ‘Preparing for Future Catastrophes’, discussing governance principles for slow-developing risks that may have potentially catastrophic consequences.



After a short introduction to slow-developing catastrophic risks, providing examples in the field of biodiversity, financial systems or demographic change, and outlining key characteristics, this paper looks at the science behind them and how we handle them. The importance of focusing holistically on the complex adaptive systems/networks forming our societies, economies and ecosystems is emphasised in developing policy advice. The numerous issues and difficulties surrounding risk governance of SDCRs are also catalogued. The paper concludes with an outline of a framework approach that governments could take in developing more robust risk governance processes.

Elaborating upon the inevitability and predictability of SDCRs, the concept note intends to:

- Convey the message that the potential for SDCRs is built into the very fabric of our complex socio-political-economic world, just as it is in the ecosystems of which we are a part, and that their occurrence is inevitable;

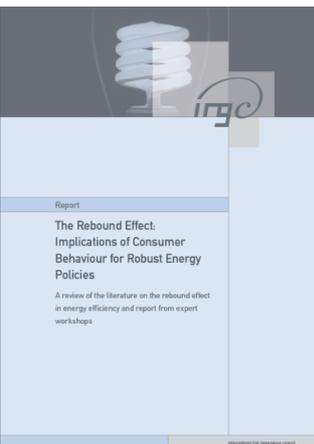
- Address the question of whether SDCRs can be predicted in time to take practical, effective action to avert them;
- Show that the development of resilient social and economic structures, able to respond and adapt rapidly to sudden change, is the best (and often the only) way to cope effectively with SDCRs; and
- Outline that new thinking and processes may be needed in order to develop such resilient structures.

Conveying the message that traditional administrative boundaries need to be transcended to deal successfully with SDCRs, this paper defends the value of resilience and presents some political and social strategies to improve the relationship between science and policy.

## The Rebound Effect: Implications of Consumer Behaviour for Robust Energy Policies

A review of the literature on the rebound effect in energy efficiency and report from expert workshops

Report published in April 2013



This collaborative, peer-reviewed research report aims at raising awareness among scientists, industry experts and policy makers about the extent of the rebound effect and suggests areas where research is needed to better inform science-based energy policies. The report presents a review of the literature on the rebound effect in energy efficiency and draws on findings from two expert workshops, organised in 2011 in Washington DC and Stuttgart, sponsored

by The Climate and Energy Decision Making Center at Carnegie Mellon University (USA) and the University of Stuttgart (Germany).

The report addresses the following questions:

- What is known about the magnitude of the rebound effect for different end-users?
- What are the uncertainties involved?
- How should the rebound effect be taken into consideration, if at all, in the development of effective and robust energy efficiency policies?

This publication has been researched and written by Prof. Inês Azevedo, Prof. Granger Morgan, Dr. Brinda Thomas (all Carnegie Mellon University), Prof. Ortwin Renn and Marco Sonnberger (both University of Stuttgart)

## Risk Governance Guidelines for Unconventional Gas Development

Report published in December 2013

Based on concerns that unconventional gas development is both under- and overregulated in different parts of the world, the idea behind this project is that by applying a set of recommended actions, risks to the environment, climate, economy or society will be significantly reduced while the benefits of utilising this newly available resource will be strengthened.

This report attempts to offer risk-governance recommendations for unconventional gas to guide the deliberations of policymakers, regulators, industry and stakeholders, taking into account various countries and context conditions. These recommendations are designed to facilitate the establishment of the appropriate balance between a government-led energy policy, industrial development activities, and securing public (especially local) acceptance. The report emphasises the need for strong technical management of the risks, as well as the value of regulatory oversight to provide clarity and confidence. It also stresses the need to involve community in the decisions and risk and benefit sharing.

The report was co-written by Dr. John Graham (Indiana University), John A. Rupp (Indiana University), and Dr. Austin Mitchell (Carnegie Mellon University).

**All IRGC publications are available at:**  
[www.irgc.org/publications](http://www.irgc.org/publications)



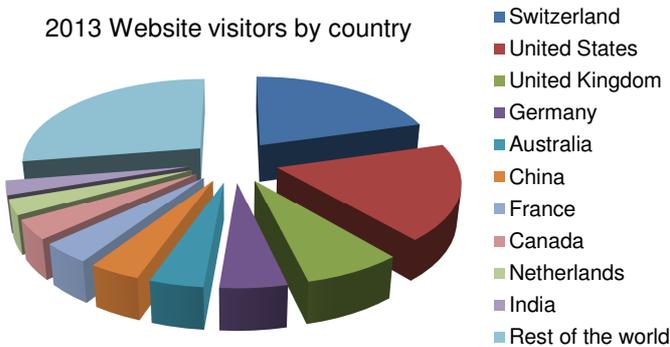
## Communication and Outreach

[www.irgc.org](http://www.irgc.org)

After its complete remodelling in 2012, IRGC's website continued to attract more visitors over the course of 2013, compared to the same period in 2012. A total of 24,054 visits (17,222 unique visitors, of which 70.7% were new visitors) made for a 31% increase in website visits compared to 2012.

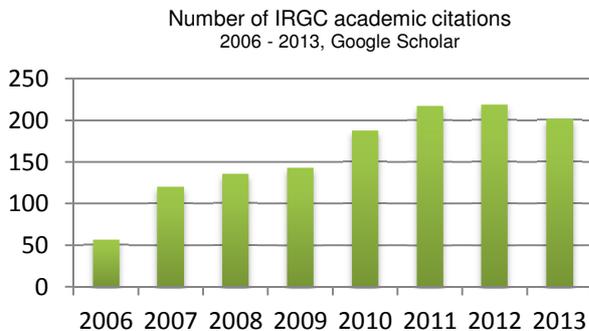
The website is regularly updated with the latest events, publications and project updates.

2013 Website visitors by country



### References to IRGC in research and academic publications

IRGC's publications were cited in academic and research papers over 200 times in 2013, according to Google Scholar. A trend over the past 7 years is illustrated by the graph below:



### Newsletter

In 2013, the IRGC secretariat sent out a total of 7 newsletters to its regular contact database, consisting of 2,400 subscribers, as of December 2013. The list grew by 50% compared to the previous year, while at the same time having been cleaned up. The database consists of scientist, policy makers, industry representatives as well other people interested in or affiliated to IRGC's work. IRGC's newsletter has a worldwide reach in more than 30 countries, with Switzerland, the US, France, China, and the United Kingdom accounting for around 65% of all opens). In terms of content, the newsletters mainly covered publications and event announcements as well as reports about past workshops and conferences.

### Informational and promotional material

IRGC's main informational hard-copy distribution material for events and promotion, the 4-page IRGC summary information, was refined and updated by the Secretariat. Its goal is to provide in-depth insight into IRGC's activities and mission to an interested audience in a condensed form.

In addition, IRGC created a flyer version of the summary information outlining its main mission and goals on a brief and clear foldable flyer, with the intention of raising awareness of IRGC's existence and introduce people to its work.





IRGC and the work it has done are referred to quite often nowadays. Today for instance someone from the insurance industry told me that IRGC's risk governance concept has become a kind of a standard and its reports a kind of landmark reports.

**Wolfgang Kröger**  
*Founding rector of IRGC, Executive Director  
Risk Center at the Federal Institute of Technology  
(ETH), Zürich, Switzerland*

## IRGC Organisation and Governing Bodies

IRGC's decentralised network structure of public, private and scientific institutions involved in risk governance is supported by its Foundation Board, Scientific and Technical Council (S&TC) and Advisory Committee.

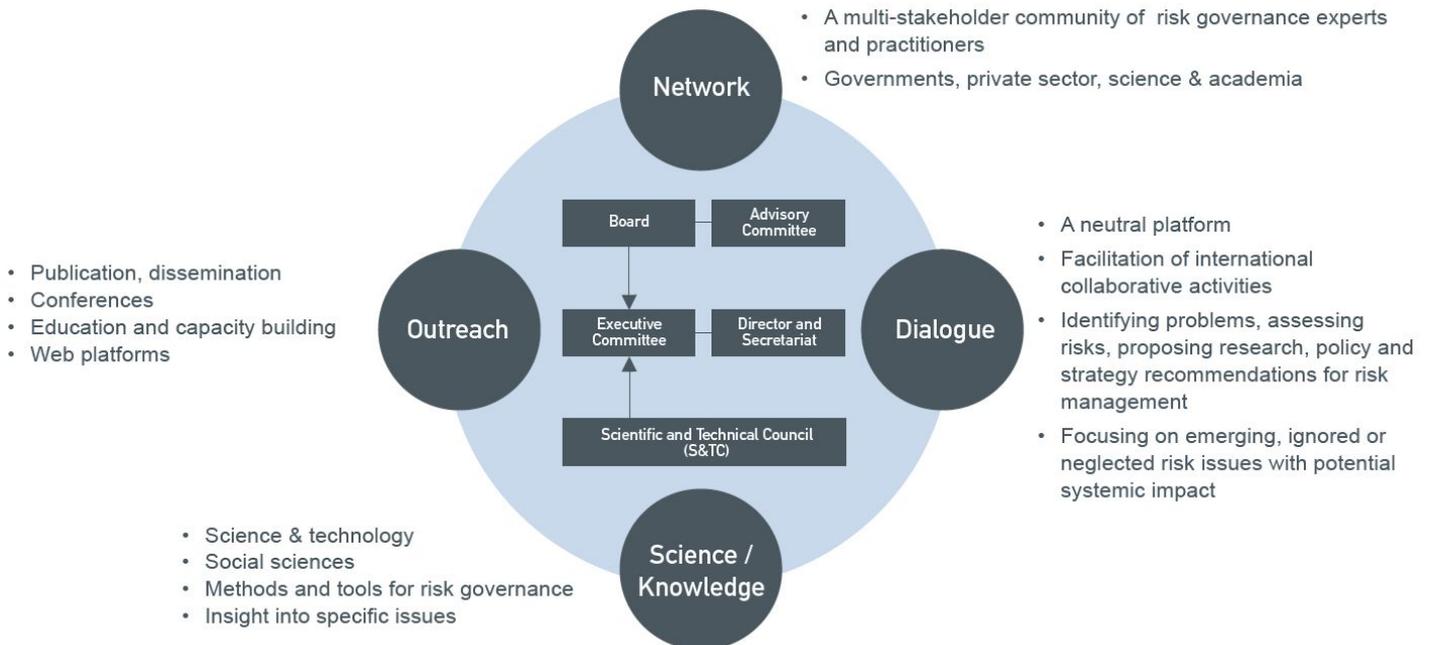
The **Board of Foundation** is the main strategic, oversight and decision-making organ of IRGC.

The **Scientific & Technical Council (S&TC)** is the leading scientific authority, providing quality assurance and scientific input to the work program. It provides the scientific basis for both the Foundation's core work

on the concept and practice of risk governance and the individual projects through which IRGC develops risk governance recommendations for specific issues. S&TC members hold office on an individual basis.

The **Advisory Committee** is a group of advisors and ambassadors.

The **Secretariat** is responsible for facilitating collaborative activities, managing joint research initiatives, and carrying out general administration, communication and dissemination of project work.



## MEMBERS OF THE BOARD OF FOUNDATION



Chairman **Philippe Gillet**  
Vice-president and Provost,  
EPFL Lausanne, Switzerland



Vice-chairman **Charles Kleiber**  
Former State Secretary for Education and  
Research (Swiss Federal Department of  
Home Affairs), Switzerland



**John Drzik**  
President, Global Risk and Specialties,  
Marsh, Inc.; Chairman, Marsh & McLennan  
Companies Global Risk Center, USA



**José Mariano Gago**  
Former Minister for Science Technology  
and Higher Education, Laboratory for  
Particle Physics (LIP), Portugal



**Christian Mumenthaler**  
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Switzerland



**Margareta Wahlström**  
Assistant Secretary-General, Special  
Representative of the SG for Disaster Risk  
Reduction (UNISDR), Switzerland



**WANG Weizhong**  
Vice-minister, Ministry of Science and  
Technology, People's Republic of China

## MEMBERS OF THE SCIENTIFIC & TECHNICAL COUNCIL



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Professor and Head of the Department of  
Engineering and Public Policy, Carnegie  
Mellon University, USA



**Dr. V.S. Arunachalam**  
Founder and Chairman, Center for Study of  
Science, Technology and Policy  
(CSTEP), India



**Prof. Wändi Bruine de Bruin**  
Professor of Behavioural Decision  
Making, Leeds University Business School,  
UK



**Prof. John D. Graham**  
Dean, School of Public and Environmental  
Affairs, Indiana University, USA



**Prof. Manuel Heitor**  
Professor, Instituto Superior Técnico,  
Technical University of Lisbon, Portugal



**Prof. Janet Hering**  
Director, Swiss Federal Institute of Aquatic  
Science and Technology; Professor of  
Environmental Biogeochemistry, ETH  
Zurich; Professor of Environmental Chemis-  
try, EPFL, Lausanne, Switzerland



**Prof. Kenneth Oye**  
Associate Professor of Political Science  
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cy and Management, Tsinghua  
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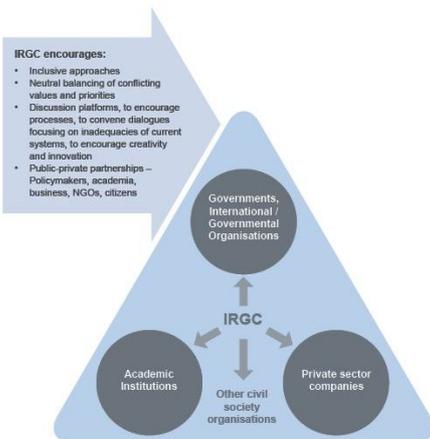
## MEMBERS OF THE ADVISORY COMMITTEE

**Dr. George H. Atkinson**, Founder and Director of the Institute on Science for Global Policy (ISGP), USA; **Prof. Dr Adolf Birkhofer**, Institute for Safety and Reliability, TU Munich, Germany; **Philippe Busquin**, former member of the European Parliament, Belgium; **Dr. KunMo Chung**, Honorary President, Korea Society of Risk Governance, Republic of Korea; **Prof. Jean-Pierre Contzen**, the Von Karman Institute for Fluid Dynamics, Belgium; **Donald Johnston**, Former Secretary-General, OECD, France; **Prof. Ralph Eichler**, President, ETH Zurich, Switzerland; **Prof. Richard R. Ernst**, Laboratory for Physical Chemistry, ETH Zurich, Switzerland; **Dr. Harvey Fineberg**, President, Institute of Medicine, The National Academies, USA; **Walter Fust**, Former Head of Swiss Agency for Development and Cooperation, Federal Department of Foreign Affairs, Switzerland; **Prof. Dr. Wolfgang Kröger**, Founding Director of IRGC; Managing Director, Risk Center, ETH Zurich, Switzerland; **Liu Yanhua**, Counsellor, Counsellor's Office of the State Council, People's Republic of China; **Dr. Michel Maila**, President and CEO, Global Risk Institute, Toronto, Canada; **Dr. Claude Martin**, Former Director General, WWF International, Switzerland; **Dr. Richard A. Meserve**, President, The Carnegie Institution for Science, USA; **Dr. Michael Osborne**, Former Director, International Futures Programme, OECD, France; **Dr. Warren M. Washington**, Senior Scientist, Climate Change Research, National Centre for Atmospheric Research, USA.

## IRGC Academic Network

IRGC aims at reaching a global community of public and private policymakers while simultaneously ensuring a strong local, contextual and cultural rooting. In order to achieve this goal, IRGC has adopted a decentralised structure and facilitates a network of academic and scientific institutions active in the field of risk governance.

Thanks to the cooperation and knowledge transfer among its network members, this structure allows IRGC to address the diversity of cultures and contexts, to maximise its impact in terms of geographic outreach, to deal with a diverse audience, and to increase its economic efficiency.



Network members contribute to IRGC's work, via the provision of funding, expertise, or research work. In return, members benefit from access to the entire network

and the significant pool of knowledge and useful contacts this represents. They also have the opportunity to participate in events organised by the IRGC network, and to influence the further development of IRGC's activities.

Network members work with the IRGC Foundation Board, Scientific & Technical Council and Director to develop activities, in the context of the following main functions:

**1. Facilitation of collaborative international activities** in the field of risk governance. IRGC assumes a convening role and provides a neutral platform for workshops or conferences, acting as a vehicle to disseminate the results of academic applied research to international organisations, the private sector and governments. These activities summarise or synthesise risk knowledge, research output and governance methods for governments and business leaders.



**2. International cooperation in education, communication and outreach to decision-makers** and others concerned with risk governance. In particular, the network provides opportunities to promote new and advanced international educational and training programmes in risk governance at the PhD level or for executives. Training and capacity building will increasingly become a central activity for IRGC, allowing it to disseminate its knowledge to a wider audience and foster the implementation of IRGC concepts in risk decision-making.

**3. Development of specific risk governance policy options and recommendations based on substantive analysis**, where needed. These activities identify, frame, draw attention to and analyse ignored, neglected or emerging risk issues for governments, for business and for the risk community. Such project work on specific risk issues can be led and conducted by network members, when relevant to their own field of operations and expertise.

#### NEW IRGC MEMBERS IN 2013

- IRGC China: *to facilitate risk-related research in China and help policy makers improve the quality of decision-making regarding risks*
- EPFL Center on Risk Analysis and Governance (CRAG): *an interdisciplinary unit to share and develop risk expertise*
- Helmholtz Alliance Energy-Trans: *research and interaction to facilitate energy transition.*
- Duke program “Rethinking Regulation” at the Kenan Institute for Ethics, Duke University: *interdisciplinary research, teaching, and outreach project exploring the broad terrain of regulatory governance.*

## Activities of IRGC network partners

### IRGC PORTUGAL

Set up in late 2011, IRGC Portugal is a consortium of five Portuguese Associate Laboratories with competencies in policy research, technological change, robotics, energy policy, network security and biotechnology. It involves the two leading Portuguese engineering schools, IST in Lisbon and FEUP in Porto, and was launched with a grant from the Portuguese Science and Technology Foundation, FCT. It is coordinated from IN+, the *Center for Innovation, Technology and Policy Research* of IST Lisbon.

By the end of 2013, IRGC Portugal had engaged a research team and conducted research project work as follows:

- **Biotechnology risk governance**, with emphasis on regulatory frameworks. A major national task force was implemented, together with the Gulbenkian Platform on “The Future of Health”.
- **Industrialisation, geography and policy under increasing uncertainty**, with emphasis on:
  - Governing emerging risks in South Atlantic and new innovation dynamics in Oil & Gas industries,
  - Governing deindustrialisation.
- **Design for uncertainty in urban contexts.**

IRGC Portugal is also engaged in building **networks with institutions in Portuguese-speaking countries**, with emphasis on Brazil.

**Outreach activities** included the organisation of the XV Latin Ibero American Congress on Management of Technology, Porto 27-31 October 2013 (<http://www.altec2013.org/>) which involved about 750 experts, structured workshops on Industrialisation, Geography and Policy” and a series of “Urban Dialogues on Risk and Resilience”, aimed at shaping a “la-

boratory of public participation” focusing on vulnerable urban areas.

All publications are available at:  
<http://www.irgc-portugal.org/>

### UNIVERSITY OF STUTTGART

Ortwin Renn organised presentations of new approaches for coping with emerging threats and risks at the Annual SRA meeting in Baltimore in December 2013. Presentations at two sessions relied on IRGC concepts and methods, in particular on a characterisation of emerging risks that was first developed in the IRGC concept note on “Improving the management of emerging risks – risks from new technologies, system interactions and unforeseen or changing circumstances” published in 2011.

### IRGC CHINA

Since its establishment in January 2013, IRGC China has started working on a series of projects building on previous work, including risk profiles in China, risk perception and communication on urban air pollution, and risk trade-offs in regulating chemicals. The focal risks that the center is concerned about at this moment are those within health, environmental and safety domains, while the planned scope is beyond that which will cover social and economic risks as well. Risks are to be studied from scientific, psychological, sociological, economic, cultural and political perspectives. Collaborative projects are expected to be developed among research fellows in IRGC China and together with our international IRGC network members as things move along.

## IRGC Secretariat

The IRGC Secretariat implements decisions taken by the Foundation Board. In particular, the Secretariat is responsible for:

- Facilitating collaborative activities
- Managing joint research initiatives
- Carrying out general administration, communication and dissemination of project work

As of December 2013, the IRGC Secretariat team comprised:



**Marie-Valentine Florin**

Managing Director



**Marcel Bürkler**

Project and Event Manager



**Chabane Mazri**

Visiting Risk Fellow



**Anjali Nursimulu**

Visiting Risk Fellow



**Laurence Wharton**

Secretary

Have also supported the Secretariat in 2013:

**Anne-Sylvie Borter** Graphic design, **Christine d'Anna-Huber** Communication, **Harry JH** Graphic design, **Susanne Nieke** Communication, **James Nolan** Website, **Vivien Stone** Copy editing.

Research interns for temporary assignments: **Eric Fisher**, **Maria Lisiakova**.

Has left IRGC in 2013: **Naima Amarouche** Project Manager.



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IRGC is very strong on showing that risk prevention and risk reduction do not depend only on technological means, but on the interaction between technology, organization and behaviour. The combination of all three is governance: how do we control, how do we cope, how do we deal with potentially dangerous situations.

**Ortwin Renn**

*Professor of Environmental Sociology, University of Stuttgart; Member of the IRGC Scientific & Technical Council; Germany*

## IRGC in 2013 by the numbers

- 2** • Peer-review research reports published: Rebound Effect, Unconventional Gas Development  
• International Conferences organised, Beijing and Lausanne

**3** Expert workshops

**4** Full-time equivalent staff in the IRGC secretariat

**7** Newsletters sent out from the IRGC secretariat

**8** IRGC partners in the academic network

**10** Years of IRGC existence

**33** Speakers and **200** registered participants at the CRAG – IRGC Symposium on Uncertainty

**41** Speakers and **150** individual participants at the Conference in Beijing

**201** Academic references to IRGC's publications

**847** New subscribers to the IRGC mailing list

**25,054** Total IRGC website visits

## 2014 Outlook

In 2013, the IRGC Foundation Board, supported by the expertise of the Scientific and Technical Council (S&TC), decided to strengthen IRGC's mission for policymaking. IRGC's role is to translate, aggregate and synthesise more than to develop its own deep expertise of risk governance issues. It is a conduit of advice to help decision makers navigate wisely between the scope of available choices on a given topic.

IRGC's programme for 2014 focuses on three sectorial priority areas where it can make a valuable contribution to systemic risk governance.

- Energy Transition
- Biotechnology
- Cyber Physical Risk



In **energy transition**, IRGC's focus will be on how the demand and consumer behaviour side can be taken into account more effectively. The project will explore how scenario development, and in particular backcasting approaches, can improve the anticipation of future energy demand. It will also consider how energy efficiency and saving can be improved if we understand better how consumer behave in practise and if and how behavioural change can be triggered. It will finally aim to formulate overall risk governance guidelines for leading and managing energy transitions on a country basis.

In the field of **biotechnology and synthetic biology in particular**, IRGC will explore the potential for and features of adaptive and flexible risk-based regulation to accom-

pany new developments such as personalised medicine or other applications of synthetic biology.

**Cyber-physical risk** constitutes the third IRGC priority area in 2014. IRGC is currently working on exploring a potential contribution of risk management approaches in the field of cyber-physical security with particular focus on critical infrastructure and services, and cyber-physical systems.

### Concepts for risk governance

IRGC is working on the development of a protocol for **emerging risk governance**, which organisations in the public and private sectors will be able to use as guidelines to better understand the early development of emerging risks and thus deal with unfamiliar threats before they affect them. Identification, anticipation, development of management options and integration of emerging risk management in organisations' strategic planning decision cycle are some of the elements of the IRGC protocol.

IRGC's aim with the protocol will be to support organisations in their task to improve their early warning of emerging issues, to characterise, categorise and prioritise them, and eventually begin to think about how they may deal with them. The guidelines highlight the need for organisations to develop an appropriate internal risk culture if they are to optimally anticipate and respond to new risks.

#### 2014 IRGC INTERNATIONAL CONFERENCE

- 13-14 October 2014, Paris
- Co-organised with the OECD regulatory policy division and the Duke University program "Rethinking Regulation"

## How you can be part of the IRGC

As an independent, non-partisan, non-profit foundation and neutral convening platform for scientists, policy-makers, industry and civil society in the area of risk governance, IRGC relies entirely on sponsoring and partnerships.

Whether you are a company, a governmental agency, or a foundation, sponsoring IRGC brings many benefits to your organisation:

- Access to a broad network of top-level academic institutions hosting some of the leading scientists in their respective fields
- Visibility in the form of presence at IRGC events, and credit on IRGC publications
- Opportunity to expand professional network as well as knowledge on latest developments in risk governance by participating in IRGC's experts workshops or taking part in a facilitated research initiative network.

If you consider IRGC as potential partner for future collaboration, please do not hesitate to get in touch with Marie-Valentine Florin ([marie.florin@irgc.org](mailto:marie.florin@irgc.org)).

# The International Risk Governance Council

*Building bridges to improve the understanding  
and management of systemic risks*



international risk  
governance council

[www.irgc.org](http://www.irgc.org)