

International Risk Governance Council (IRGC)

Annual Report 2014



An aerial photograph showing a vast, flat landscape covered in a dense layer of white, fluffy clouds. The sky above is a clear, deep blue, transitioning to a lighter blue near the horizon. The perspective is from a high altitude, looking down on the cloud-covered terrain.

Improving the governance of systemic risks

www.irgc.org

Contents

Introduction

Acknowledgements	4
Foreword	5
IRGC Work Priorities and Activities	6

2014 Activities

2014 IRGC Activities at a Glance	7
Events	8
Publications	11
Outlook on 2015	13

Outreach and Impact

Communication and Outreach Channels	14
Academic References	14
Selected Practical Applications	15
Representation and Affiliations	16

IRGC Organisation and Governing Bodies

Organisational Structure	17
Members of IRGC Organs	18

The IRGC Network

Functions and Members of the Network	21
Activities of Network Partners	22

Acknowledgements

As a non-profit foundation, IRGC relies entirely upon funding from its network members and grant-making institutions, both private and public. In 2014, IRGC's main funders were:

- Ecole Polytechnique Fédérale de Lausanne (EPFL)
- Swiss Re
- EU-VRI / iNTeg-Risk



IRGC also benefits from in-kind and project specific contributions from its Academic Network partners as well as other universities, institutions and organisations. In 2014, these included:

- Carnegie Mellon University, Department of Engineering and Public Policy
- IRGC Portugal
- Indiana University, School of Public & Environmental Affairs
- OECD, Regulatory Policy Division
- Duke University, Rethinking Regulation Program
- Helmholtz Alliance Energy-Trans
- Stuttgart University, Economic and Social Science Department
- Karlsruhe Institute for Technology Assessment and Systems Analysis (ITAS)



Foreword

In 2014, IRGC consolidated its collaboration with the Ecole Polytechnique Fédérale de Lausanne (EPFL) and worked towards integrating risk governance in the field of science and technology with a clear policy oriented focus. This emphasis, to ensure relevance to current policy challenges, began with the organisation of a session at the EuroScience Open Forum 2014 about evidence-based policies, and culminated with a conference organised with the OECD Regulatory Policy Division about improving risk regulation.

We believe that concepts and tools for risk governance can extend beyond the field of risk management and contribute to address some of the current problems of policy-making in changing and challenging environments. IRGC's choice to work on risk governance of energy transitions and on how to manage risks in the cyber world reflects an attention to critical matters for our societies.

Philippe Gillet

Chairman of the Foundation Board



IRGC activities are selected in relation to demands and needs of policy- and business decision-makers, as well as contribution from science and technology. We identify issues which current governance arrangements are not fully appropriate to deal with, and organise collaborative thinking to discuss possible new types of arrangements. Some of this work is done in the Scientific and Technical Council, which then organises in-depth project work to elaborate IRGC guidelines and recommendations.

For example, we are now exploring how insights from risk analysis, and in particular in the field of terrorism risk analysis, can be used to improve cyber risk assessment. Cyber risk has so far not been satisfactorily addressed. The cyber security and the risk analysis communities could learn from each other to improve safety and security in the digital world.

Granger Morgan

Chairman of the Scientific and Technical Council



IRGC's value also lies in the facilitation of collaborative research and the exchange of ideas in various forms. With its network of partner institutions as the backbone of its operations as well as its secretariat, IRGC continues its role as a science-based think tank and neutral convening place for bringing together scientists, policy-makers and representatives from industry and NGOs to talk about ways to advance the understanding and governance of risks.

I would like to thank all those who contributed to the success of IRGC in 2014 and I look forward to continuing our mission together with our IRGC partners in the years to come.

Marie-Valentine Florin

Managing Director



IRGC Work Priorities and Activities

The International Risk Governance Council (IRGC) is an independent non-profit organisation which aims to help improve the understanding and management of risks and opportunities by providing insight into systemic risks that have impacts on human health and safety, on the environment, on the economy and on society at large.

Established in 2003 at the initiative of the Swiss government, IRGC is based at Ecole Polytechnique Fédérale (EPFL) in Lausanne, Switzerland, with network partners in Europe, the US and Asia.

As a science-based think tank and neutral collaborative platform with multidisciplinary expertise, IRGC's mission includes developing concepts of risk governance, anticipating major risk issues, and providing risk governance policy advice for key decision-makers.

Drawing upon international scientific knowledge from both the public and private sector, IRGC champions ignored, neglected and emerging issues and can help building bridges between science and policy in today's challenging governance environment.

The three facets of IRGC's work are:

Dialogue: IRGC operates as a neutral, science-based think tank that triggers creative approaches and guidelines. It is well known for its non-partisan convening power that enables multi-stakeholder dialogue.

Science: IRGC builds on the latest scientific knowledge to improve risk governance. It has developed conceptual methods and tools for that purpose and provides science-based policy recommendations to key decision-makers in the public and private sector.

Outreach: IRGC reaches out through its publications, website and events. It disseminates the results of its project work to leaders in various communities.

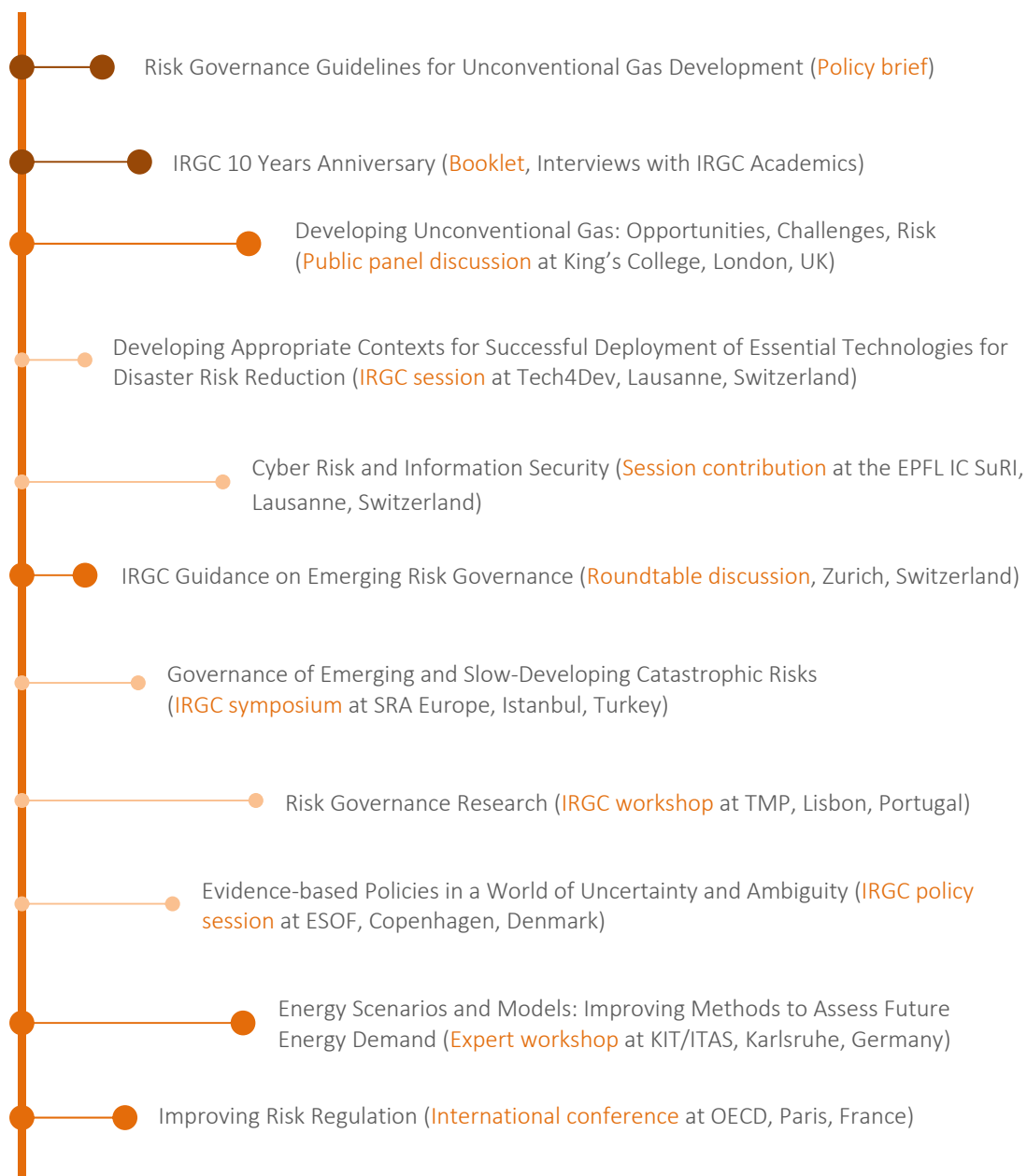
Core Activities

- Develop core risk governance methods and tools, including:
 - A framework for risk governance
 - A review of common deficits in risk governance
 - An analysis of contributing factors to risk emergence
- Provide guidelines for the governance of specific risk issues
- Convene multi-stakeholder events

Key Priorities

- Champion ignored, neglected and emerging issues
- Help organisations better anticipate and respond to risks
- Building bridges between science and policy to facilitate sustainable scientific and technological developments
- Foster the development of coherent risk governance cultures

2014 IRGC Activities at a Glance



- IRGC or IRGC co-organised event
- External event with IRGC contribution
- IRGC publication

Events

More detailed summaries of IRGC events, including outcomes, presentations and background material, are available at: <http://www.irgc.org/events/>

Public panel discussion: **Developing Unconventional Gas: Opportunities, Challenges, Risks**

8 April 2014, King's College, London, UK

This panel was jointly organised with the King's College Centre for Risk Management, and chaired by its director, Prof. Ragnar Löfstedt.

Panellists presented and discussed the main recommendations from their respective organisations: Prof. John Graham, School of Public and Environmental Affairs, Indiana University, IRGC lead author of the Unconventional Gas report; Michael Schütz, DG Energy, European Commission; Marie-Valentine Florin, IRGC; Richard Smith-Bingham, Oliver Wyman Global Risk Center; Lars Sørum, Unconventional Gas, DNV GL – Oil & Gas.

Roundtable discussion: **IRGC Guidance on Emerging Risk Governance**

6 June 2014, Zürich, Switzerland

At this roundtable, IRGC presented its draft Guidelines for the Governance of Emerging Risks, developed under the project leadership of Prof. Ortwin Renn, and discussed them with 40 practitioners and researchers in the field.

The workshop also featured input presentations from four experts, each reflecting on the guidelines as well as offering expertise from their own field and experience: Andrea Altieri, Scientific Committee and Emerging Risks Unit, European Food Safety Authority; Reto Schneider, Head of Emerging Risk Management, Swiss Re; Angela Wilkinson, Strategic Foresight Counsellor, OECD; Gerard Hodgkinson, Professor of Strategic Management & Behavioural Science, Warwick Business School.

Expert workshop: **Energy Scenarios and Models: Improving Methods to Assess Future Energy Demand**

9 – 10 October 2014, KIT, Karlsruhe, Germany

It appears that most past energy forecasts have failed to anticipate correctly the evolution of energy consumption. This is not surprising since there are sources of uncertainty within the models used to make scenarios and predictions, as well as fundamental changes in policy or other exogenous drivers that may change the level of energy demand. People often make deterministic forecasts even though they might know that reality will be different. Improved information and models are needed in order to inform and guide policy-makers. Since understanding and anticipating future energy demand is critical for managing the transitions needed to move towards a sustainable and affordable path, the workshop clarified the following questions:

- How can different scenarios and models – such as trend-extrapolating scenarios, large scale models of the economy (such as general equilibrium models), exploratory scenarios and backcasting scenarios– be used, whether singly or jointly, to improve planning for energy transitions?
- What improvements can be made in the understanding of fundamental components of the energy demand for planning future needs, and in the assessment of associated uncertainties?

Bringing together scientists and decision-makers from governments, industry and NGOs lies at the very core of IRGC's mission. By providing a neutral convening platform, IRGC fosters the free exchange of knowledge and ideas between these communities in order to advance a common understanding of risk management and governance.

International conference: **Improving Risk Regulation**
13 – 14 October 2014, OECD, Paris, France

New approaches to regulation may be stimulated by careful research and practical experience, but also spurred by crisis events that alter perceptions and spark demand for policy change. What can we learn from these diverse sources of regulatory change? How can we do a better job of fostering constructive regulatory improvement?

The conference identified, evaluated and discussed the relevance and effectiveness of new approaches to improving risk governance, both as they result from responding to and learning from crises, and as deliberate innovations in how regulatory power is exercised and shared. It built upon:

- Work from the OECD Regulatory Policy Division about “Risk and Regulatory Policy – Improving the Governance of Risk” and recommendations about performance- and consumer-based regulation
- The project on “Recalibrating Risk: Crises, Perceptions and Regulatory Change,” of the Rethinking Regulation program at Duke University, which investigates how regulatory policies and institutions change in response to crisis events, and seeks lessons for the future

- IRGC’s work on the role of regulatory frameworks and institutional arrangements in the context of risk governance, including mechanisms for adaptive regulation that are able to update in response to new information and contexts.

The conference brought together practitioners of risk governance and regulation from private, public and academic organisations interested in sharing knowledge and enhancing their understanding of crises and new forms of risk regulation. It was hosted by and co-organised with the OECD Regulatory Policy Division and the Rethinking Regulation program at Duke University. The conference was held at the OECD Conference Centre in Paris.

Through participation in and contributions to external events, IRGC increases its outreach and has the opportunity to convey its message about risk governance to a broader audience. Feedback to concepts and recommendations received at such events also serve to refine IRGC’s work and align it with its stakeholders’ needs.

External events with IRGC contribution

On 2 June 2014, IRGC contributed to the EFPL IC SuRI seminar in Lausanne, Switzerland, through the organisation of a workshop on **Cyber Risk and Information Security**. It brought together renowned experts who presented and debated problems and solutions in cyber and information security, including privacy issues and cryptography. Panellists included: Prof. Arnaud de la Fortelle, Director of Robotics Lab, Mines ParisTech; John Scott, Chief Risk Officer, Zurich Global Corporate, Zurich Insurance Group; Sylvain Glatz, Telecom Specialist, Swiss Federal Office of Communication (OFCOM / BAKOM);

Victor Schlegel, Head Business Intelligence/Big Data, Swisscom. The workshop also included a special session on **Opportunities and Challenges of Autonomous Cars**, with Jean-Pierre Hubaux, EPFL; Michaël Thémans, EPFL; and the EPFL Center on Risk Analysis and Governance (CRAG), which discussed the opportunities and challenges involved in the development and deployment of autonomous cars on the Swiss and European markets.

In the context of the June 2014 international conference on Technologies for Development in Lausanne, organised by the UNESCO Chair in Technologies for

Development (at the EFPL Cooperation and Development Center CODEV), IRGC hosted a session on **Developing Appropriate Contexts for Successful Deployment of Essential Technologies for Disaster Risk Reduction**. A number of speakers provided different angles on the topic: Xu Jianhua, Peking University and IRGC China: Risk Perception in Natural Disaster Management; Figueroa Raul, Carnegie Mellon University, USA: Reducing the Risk of Building Collapse Catastrophes through Technology and Policy; Edralin Monica, Local Emergency Assessment and Response Network, Philippines: The Local Emergency Assessment and Response Network:

Capacity-Building and Collaboration for Disaster Risk Reduction and Emergency Response; Hossain Md Khalid, RMIT University, Australia: Deployment of Biotechnology for Climate Change Adaptation and the Risk of Maladaptation in Bangladesh: An Agricultural Seed Industry Perspective; Tiwari Prakash C., Kumaon University Nainital, India: Urban Growth and Assessment of its Natural and Socio-economic Risks in High Mountain Ecosystems: A Geospatial Framework for Institutionalizing Urban Risk Management in Himalaya.

At the Society for Risk Analysis Europe Conference in Istanbul in June 2014, IRGC organised a symposium on the **Governance of Emerging and Slow-Developing Catastrophic Risks**. Presentations by IRGC Visiting Risk Fellows Anjali Nursimulu and Chabane Mazri were followed by a panel discussion, moderated by Prof. Ortwin Renn, President of SRA International. Expanding on IRGC's work on the governance of slow-developing catastrophic risks (SDCRs), Anjali Nursimulu discussed the challenges of identifying and taking timely actions on the basis of early warning signals in view of the complex and emergent properties of SDCRs. The presentation on IRGC's draft guidelines for emerging risk

governance by Chabane Mazri focused on the main features of emerging risk identification, characterisation and management strategies.

On 24 June 2014, IRGC organised a policy session on **Evidence-based Policies in a World of Uncertainty** at the EuroScience Open Forum (ESOF) Conference 2014 in Copenhagen. It reviewed how evidence-based policy-making and risk governance are approached and implemented in various parts of the globe with a specific focus on the science – policy – society nexus as well as government communication and the role of stakeholders and lobbies. The session was moderated by Clive Cookson, Science Editor, Financial Times, and featured a number of high profile speakers and panellists: Ann Glover, Chief Scientific Adviser to the President of the European Commission; Grace Naledi Mandisa Pandor, Minister for Science and Technology, South Africa; Helena Bonciani Nader, President, Brazilian Association for the Advancement of Science (SBPC); Lan Xue, Dean, School of Public Policy & Management, Tsinghua University; IRGC China; Jonathan B. Wiener, Professor, Duke University; Member of IRGC Scientific & Technical Council; José Mariano Gago, Member of EuroScience Governing Board, Member of IRGC

Foundation Board; Dirk Hudig, Secretary General, European Risk Forum; Doug Parr, Chief Scientist and Policy Director, Greenpeace

The Technology, Management and Policy (TMP) Graduate Consortium brings together graduate students involved in research across different technical fields who seek to develop and implement effective strategies for dealing with the risks and opportunities associated with those technologies. As part of its support to its academic partners and to encourage education and collaborative activities in universities, the IRGC Secretariat and IRGC Portugal jointly organised a **Risk Governance Research Workshop** at the TMP Consortium 2014 meeting in Lisbon on the risk governance of different economic transformations, with presentations from industry, academics and IRGC. This workshop, chaired by Roberto Sbragia, University of São Paulo, Brazil, and Granger Morgan, Carnegie Mellon University, USA, included panellists from IN+/IST Lisbon, MIT, UNICAMP and IRGC and approached risk governance and industrialisation under increasing uncertainty from complementary viewpoints in order to allow the development of a comprehensive perspective on emerging risks and strategies for sustainable development.

“Workshops, for example, are often a one-time occasion where people come together, where there is a lot of excitement but then no follow-up. With IRGC it is different. There is a long term relationship-building that leads to the writing of reports, results are made publicly available and are updated as we learn new information. Thus the outcome of IRGC workshops is actually often used by practitioners and policy-makers.

Prof. Wändi Bruine de Bruine

Professor of Behavioural Decision Making, Leeds University Business School; IRGC Scientific & Technical Council

Publications

All material published by IRGC, including frameworks and methods as well as reports on special issues, and more risk-related information, is available at: <http://www.irgc.org/publications/>

Risk Governance Guidelines for Unconventional Gas Development

In this policy brief, IRGC offers recommendations aimed at helping countries make wise decisions about whether and how to develop gas from unconventional reservoirs. The brief contains recommendations to guide risk governance. It is accompanied by a major peer-reviewed report that covers the key technical, policy, and political issues and provides complete risk governance guidelines.

IRGC 10 Years Anniversary Booklet

On the occasion of IRGC's 10 year anniversary, IRGC published a series of interviews with IRGC academics. Asked to provide insight into risk, risk governance and the challenges ahead, the booklet contains a collection of insightful interviews illustrative of the diversity of views about risk and risk governance on the one hand, and the uniqueness of IRGC's ability to convey those views in a coherent and common message of evidence-based guidelines for improving the governance of major current and future systemic risks.

IRGC Guidance to Stakeholder Engagement (Online Platform)

In February 2014 IRGC launched its online Stakeholder Engagement Resource Guide. The resource guide introduces stakeholder involvement as an important part of the risk governance process for developing and implementing science-based research, policy, strategies, and practices. It proposes an annotated bibliography of existing manuals for stakeholder participation and is designed to help practitioners work on stakeholder engagement by providing them

with background information on the various perspectives and to guide them to relevant materials.

Available on: <http://www.irgc.org/risk-governance/stakeholder-engagement-guide/>

IRGC publications, in the form of guidelines, concept notes, opinion pieces, reports or policy briefs, are the main output of an IRGC collaborative project, which typically includes a series of workshops and scientific exchanges, involving relevant stakeholders. IRGC publications are approved by the Scientific & Technical Council and freely available online.

IRGC Guidelines for Emerging Risk Governance (forthcoming)

The governance of emerging risks has been one of IRGC's core work areas since 2010. Following its work on Contributing Factors to Risk Emergence, Improving Emerging Risk Management in Industry, and Public Sector Governance of Emerging Risks, IRGC will publish a guidance document for policy- and decision-makers on how to deal with new and unfamiliar risks.

Assessment of Future Energy Demand: A Methodological Review (forthcoming)

This Concept Note was further developed on the basis of a background paper to the October 2014 IRGC workshop. Set in the context of current energy transitions, it includes a review of different types of scenarios and models used to inform energy policies, with a focus on how the demand side is included. In line with IRGC's focus on risk governance, it is motivated by the realisation that failure to anticipate changes in energy consumption by different groups constitutes a major risk to private and public investors (investing in the wrong technology) and policy-makers

(inability to maintain energy security, affordability and sustainability). The paper is written for decision-makers who commission or use energy scenarios developed by others, as well as energy modellers.

Small Modular Reactors (forthcoming)

Following a collaborative expert workshop, co-organised by the Climate and Decision-making Center

at Carnegie Mellon University (CMU), the Paul Scherrer Institut (PSI) and IRGC in November 2013 at PSI in Baden, Switzerland, CMU proposed an opinion piece for publication by IRGC. It will emphasise the need to overcome institutional challenges, in order to facilitate the development of SMRs in the world, for decentralised electricity generation.

IRGC Related Publications

A selection of papers published in 2014 by IRGC members or project partners highlighting the use of IRGC concepts in various fields.

Dreyer, M. & Renn, O. (2014). EFSA stakeholder and public involvement policy and practice: A risk governance perspective. In A. Alemanno & S. Gabbi (Eds.), *Foundations of EU food law and policy* (pp. 171-191). Dorchester: Ashgate.

Dreyer, M. & Renn, O. (2014). EFSA's involvement policy: Moving towards an analytic-deliberative process in EU food safety governance? In C. Holst (Ed.), *Expertise and democracy* (pp. 323-352). Oslo: University of Oslo Press.

Florin, M.-V. (2014). Dealing with the challenge of evidence-based decision-making in situations of uncertainty and emergency. *European Journal of Risk Regulation*, 3, 303-308.

Florin, M.-V., Xu, J. (2014). Risk governance: An overview of drivers and success factors. Input paper prepared for the Global Assessment Report on Disaster Risk Reduction 2015.

Klinke, A. & Renn, O. (2014). Expertise and Experience: A deliberative system of a functional division of labor for post-normal risk governance. *Innovation: The European Journal of Social Science Research*, 27(4), 442-465.

Lindoe, P. H., Baram, M. & Renn, O. (Eds.). (2014). *Risk Governance of offshore oil and gas operations*. New York: Cambridge University Press.

Müller-Grabherr, D., Florin, M.-V., Harris, B., Crilly, D., Gugic, G., Vegter, J. Slob, A., Borowski, I. & Brils, J. (2014). Integrated river basin management and risk governance. In J. Brils, W. Brack, D. Müller-Grabherr, P. Negrel & J. E. Vermaat (Eds.), *Risk-informed management of European river basins* (pp. 241-264). Heidelberg: Springer.

Renn, O. (2014). *Das Risikoparadox: Warum wir uns vor dem Falschen fürchten*. Frankfurt am Main: Fischer Taschenbuch.

Renn, O. (2014). *Stakeholder involvement in risk governance*. London: Ark Publications.

Renn, O. (2014). Emerging Risks: Methodology, classification and policy implications. *Journal of Risk Analysis and Crisis Response*, 4(3), 114-132.

Renn, O. (2014). A generic model for risk governance: Concept and application to technological installations. In P. H. Lindoe, M. Baram & O. Renn (Eds.), *Risk governance of offshore oil and gas operations* (pp. 9-33). New York: Cambridge University Press.

Renn, O. & Klinke, A. (2014). Risk governance and resilience: New approaches to cope with uncertainty and ambiguity. In U. Fra Paleo (Ed.), *Risk governance: The articulation of hazard, politics and ecology* (pp. 19-42). Heidelberg: Springer.

Renn, O. & Dreyer, M. (2014). Risk Governance: Ein neues

Steuerungsmodell zur Bewältigung der Energiewende. In J. Ostheimer & M.

Vogt (Eds.), *Die Moral der Energiewende. Risikowahrnehmung im Wandel am Beispiel der Atomenergie* (pp. 211-229). Stuttgart: Kohlhammer.

Renn, O. & Klinke, A. (2014). Risk governance: Application to urban planning. *ITU Journal of the Faculty of Architecture*, 11(1), 5-19.

Rosa, E. A., Renn, O. & McCright, A. M. (2014). The Risk society revisited: Social theory and Governance. Philadelphia: Temple University Press.

Schweizer, P.-J. & Renn, O. (2014). IRGC project 'a resource guide for developing and implementing science-based stakeholder involvement research: Policy, strategies, and practice'. In DIALOGIK (Ed.), *Innovativ und Partizipativ: Einblicke in die Arbeit von Dialogik* (pp. 25-42). Stuttgart: Universität Stuttgart und DIALOGIK.

Spruijt, P., Knol, A. B., Vasileiadou, E., Devilee, J., Lebrecht, E. & Petersen, A. C. (2014). Roles of scientists as policy advisers on complex issues: A literature review. *Environmental Science & Policy*, 40, 16-25.

Wielinga, P. R., Jensen, V. F., Aarestrup, F. M. & Schlundt, J. (2014). Evidence-based policy for controlling antimicrobial resistance in the food chain in Denmark. *Food Control*, 40, 185 - 192.

Outlook on 2015

In 2015, the IRGC Secretariat will continue to carry out and build upon work in the focus areas defined by the Foundation Board, supported by the Scientific & Technical Council, in its 2013 – 2015 strategic work plan.

Alongside work on core risk governance issues, in particular emerging and slow-developing catastrophic risks and improving risk regulation, IRGC's two main priorities will be in the fields of energy transition and cyber risks. These two issues provide targeted opportunities for IRGC to address highly topical challenges.

Work on Core Risk Governance Issues

The IRGC [Guidelines for Emerging Risk Governance](#) will be published in spring 2015. The project aims to help organisations better anticipate and deal with emerging issues. Emerging risk and opportunities are often linked, which makes it worthwhile for organisations to have dedicated processes to scan, filter and select management approaches from a variety of possible options.

In 2015, IRGC will also publish a report elaborated on the basis of a 2013 workshop on [slow-developing catastrophic risks](#). IRGC intends to draw attention to the possibility of large regime shifts in complex adaptive systems and subsequent dangerous collapse, with cascading consequences.

Furthermore, following the October 2014 conference on Improving Risk Regulation, IRGC will further develop its work in this area. IRGC will edit a publication on [Improving Risk Regulation](#), which will present various ways to improve the relevance, impact and efficiency of public regulation. In particular, those include (1) insights from behavioural sciences for public regulation, (2) considering private or transnational regulation in combination with public regulation, (3) learning from incorporating flexibility and adaptability into regulation, as in the case of pharmaceutical regulation and (4) learning from how the private sectors embeds risk management and sustainability management into its own internal regulation.

Planning Adaptive Risk Regulation

7 – 8 January 2016, London, UK

The conference will be jointly organised with the Department of Science, Technology, Engineering and Public Policy, University College London (UCL STEaPP).

More information:

<http://www.irgc.org/event/planning-adaptive-risk-regulation/>

Energy Transitions

IRGC's project on the risk governance of energy transitions focuses on the demand side. It highlights the need to better understand the drivers and other factors of energy demand and to manage energy behaviour and participation of end- consumers. In order to attain energy independence or sustainability, among others, many countries are embarking on energy transitions, sometimes envisaging a reduction of energy consumed per capita. This calls for an integrated risk governance approach, at the interface of technology, resources, public perception and behaviour, financing, regulation and policy.

Cyber Risk

In its second focal area, IRGC considers addressing two specific challenges:

- The field of cyber security increasingly adopts an approach to security issues with a "risk" mind set: From threat assessment to impact assessment and from risk mitigation to resilience management. IRGC will explore how to help organisations better face risks in the cyber world.
- The field of data protection is of increasing importance to all those working with large data sets. Collection, access and use of medical data in particular requires societal trade-offs between research needs, medical care benefits and privacy risks. IRGC aims to provide key governance principles and recommendations to address these issues.

Outreach and Impact

Communication and Outreach Channels

IRGC's two main regular communication channels are the IRGC website (www.irgc.org) and the IRGC Secretariat email newsletter.

The IRGC main [website](#) contains all relevant information about IRGC and our work on core risk governance and specific issues. The website is updated regularly and features front page announcements about latest news, current projects and upcoming events.

From the website publication section, all IRGC publications can be downloaded at no cost. A selection of related risk governance literature and case material is also available.

The events section contains a list of upcoming and past events, including summaries and speaker presentation slides.

The IRGC Secretariat [Newsletter](#) currently has around 3,000 subscribers. Newsletters are delivered on a monthly basis, covering IRGC and risk governance related publications, event announcements, as well as reports from past workshops and conferences.

The newsletter readership is global, with the top four countries (reader share) being Switzerland (19.9%), USA (12.6%), Germany (5.1%) and France (5.1%).

More information and a sign up form for the IRGC Secretariat newsletter is available here:
<http://www.irgc.org/newsletter/>

Academic References

IRGC's concepts and methods, as well as its recommendations to specific risk governance issues, continue to be widely cited. In 2014, IRGC publications were referenced over 250 times in academic and business literature, according to Google Scholar.

"The approaches described by (...) IRGC are examples of the types of comprehensive assessments needed to address the concerns associated with the introduction of novel technologies in our societies."

Tapin, D., Legault, G. A. & Patenaude, J. (2014). Assessing the social acceptability of new technologies: Gaps and tensions between science and regulation. *BioéthiqueOnline*, 3(19).
<http://bioethiqueonline.ca/docs/3/19.pdf>

The IRGC Secretariat receives regular citation requests for the IRGC framework, methods and special issue publications in reports, academic journal articles, books or educational material. While academic members of IRGC's Scientific and Technical Council routinely use IRGC material in their work, [IRGC concepts are also taught](#) elsewhere. The University of Amsterdam, for instance, uses IRGC reports as study material in its class on New Risks and Regulation (Dr. J. R. Popma, November 2014).

“**W**hat I love about IRGC is that it has a global audience for its message. It's interested in people in developing countries and in developed countries and it doesn't let national politics get in the way of simply telling the truth about risk and risk governance.

Prof. John D. Graham

Dean, Indiana University School of Public and Environmental Affairs; IRGC Scientific & Technical Council

Selected Practical Applications

The IRGC framework and other risk governance concepts, tools, as well as recommendations on specific risk governance issues are also applied by practitioners. IRGC concepts supported the development of specific risk management frameworks in the following examples:

European Commission, Common Implementation Strategy for the Water Framework Directive (2000/60/EC)

Application of the IRGC Risk Governance Framework in “Towards risk-based management - integrating assessments and management”, EC. (2010). Guidance Document No. 26 Guidance on Risk Assessment and the Use of Conceptual Models for Groundwater, Technical Report.

Chairman of the Joint Chiefs of Staff (CJCS), United States Armed Forces

“The CJCS serves as the principal military advisor to the President, the Secretary of Defense, and the National Security Council. He is also required to annually submit to Congress his assessment of the strategic and military risks in executing the missions called for in the National Military Strategy. At the intersection of these two responsibilities lies the Chairman's Risk Assessment System; which incorporates the major tenets of the International Risk Governance Council's 2003 White Paper- Risk Governance-an Integrative Approach. This framework has now been employed by three different Chairmen (...).”

Rouse, J. F., Arete Associates, Joint Staff, Abstract for the T2-H Symposium: Risk and Strategic Decision Making in the Pentagon, at the SRA Annual Meeting 2013.

<http://birenheide.com/sra/2013AM/program/singlesession.php3?sessid=T2-H>

Environmental Research and Technology Development Fund of the Ministry of the Environment, Japan

“The IRGC's risk governance framework was therefore considered and ultimately

adopted, as this provides explicitly for governance. In conjunction with this, it was decided, as a rule, to use the IRGC's definitions of the terms described above.”

ICA-RUS REPORT 2013 - Redefining the Climate Change Issue from a Risk Management Perspective (March 2013)
http://www.nies.go.jp/ica-rus/report/ICA-RUS_REPORT_2013_eng.pdf

United States Nuclear Regulatory Commission (US NRC)

Inclusion and review of the IRGC Risk Governance Framework under “A.2.3 Risk Governance Framework International Risk Governance Council”, US NRC (April 2012). A Proposed Risk Management Regulatory Framework.

<http://pbadupws.nrc.gov/docs/ML1210/ML12109A277.pdf>

CEN Workshop Agreement DIN CWA 16649 on managing emerging technology-related risks

CEN workshop agreements are reference documents elaborated under the supervision of the European Committee of Standardization. DIN CWA 16649 builds upon the Risk Governance Framework developed by IRGC and the International Standard ISO 31000. It sets the base for a standard framework for emerging risk in technology related risks.

<http://www.standardsdoc.com/din-cwa-16649-p-412021.html>

Representation and Affiliations

World Economic Forum (WEF)

IRGC is represented in the Advisory Committee of the WEF Global Risk Reports 2015 and 2016 by Marie-Valentine Florin.

http://www3.weforum.org/docs/WEF_Global_Risks_2015_Report15.pdf

European Commission Horizon 2020

Within the EU Framework Programme for Research and Innovation, IRGC is represented by Marie-Valentine Florin, as member of the expert advisory group to the Science With and For Society (SWAFS) programme.

<http://ec.europa.eu/programmes/horizon2020/en/h2020-section/science-and-society>

United Nations Economic and Social Council (ECOSOC)

Since July 2012, IRGC has **special consultative status** with the United Nations Economic and Social Council (ECOSOC). This enables IRGC to

engage with ECOSOC and its subsidiary bodies, as well as with the United Nations Secretariat, programmes, funds and agencies, including opportunities to consult with Member States and the UN system at large. Consultative status also enables ECOSOC bodies to seek expert information or advice from IRGC on a subject matter relevant to IRGC's work.

<http://www.un.org/en/ecosoc/index.shtml>

Sustainable Development Solutions Network (SDSN)

In July 2014, IRGC became a **member** of the Sustainable Development Solutions Network (SDSN), a global initiative for the United Nations open to universities, research institutions, foundations, civil society, and other organizations with deep expertise in one or more areas related to sustainable development. Membership allows IRGC to gain visibility through broader stakeholder outreach as well as access to project collaboration opportunities and to advance an agenda focusing on governance deficits and risks that are often ignored or neglected in the transition towards sustainability.

<http://unsdsn.org/>

“One of IRGC's most important tasks is the outreach to and exchange with other organisations working on risk governance as well as with practitioners. It is often a challenge to speak to a wide and various audience of people in academia, business and the public sector. But we believe that, in doing so, we can help people better understand their respective objectives, constraints, and priorities. This can prepare for improved collective governance of risk”

Marie-Valentine Florin
Managing Director, IRGC

IRGC Organisation and Governing Bodies

Organisational Structure

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

The Foundation Board 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 programme.

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

Rooted in the principles of good governance, IRGC works by being:

- Open: Freely shared project outcomes
- Accountable: Peer-reviewed, evidence-based project work and recommendations
- Collaborative: Multi-stakeholder approach bringing together academia, policy and industry
- Independent: Autonomous choice of subjects, experts and partners

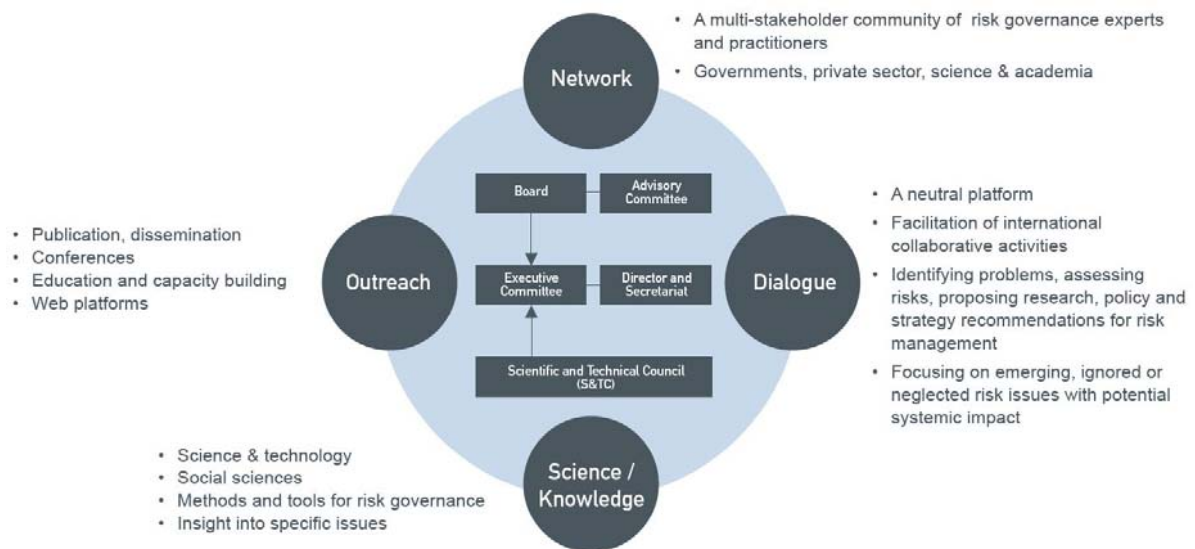


Figure 1: IRGC organisation overview

Members of IRGC Organs

(as of 31 December 2014)

More information about the individual members of the different IRGC organs is available here:

<http://www.irgc.org/about/organisation-structure/>

Foundation Board



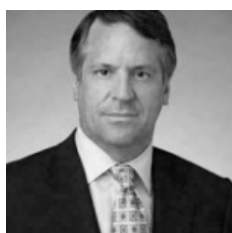
Philippe Gillet
Chairman

Vice-President and Provost,
EPFL, Switzerland



Charles Kleiber
Vice Chairman

Former Chairman of the Board
(2010-12); Former State
Secretary for Education and
Research, Switzerland



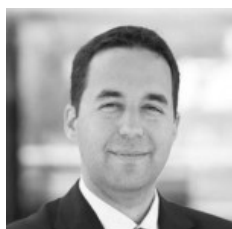
John Drzik

President, Global Risk and
Specialties, Marsh, Inc.;
Chairman, Marsh & McLennan
Companies Global Risk Center



José Mariano Gago

Former Minister for Science,
Technology and Higher
Education; Laboratory for
Particle Physics (LIP), Portugal



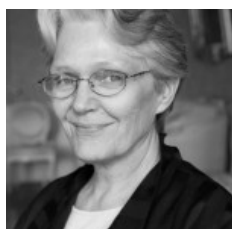
Christian Mumenthaler

CEO Reinsurance and Member
of the Executive Committee,
Swiss Re, Switzerland



Daniele Tonella

CEO, AXA Technology Services,
France



Margareta Wahlström

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



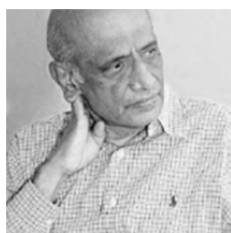
WANG Weizhong

Vice Minister, Ministry of
Science and Technology,
People's Republic of China

Scientific & Technical Council



Prof. Granger Morgan
Chairman
Carnegie Mellon University, USA



Dr. V.S. Arunachalam
CSTEP, India



Prof. W. Bruine de Bruin
Leeds University Business School, UK



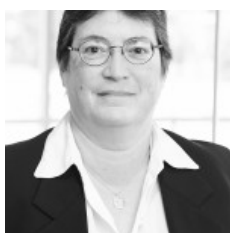
Dr. Gérard Escher
EPFL, Switzerland



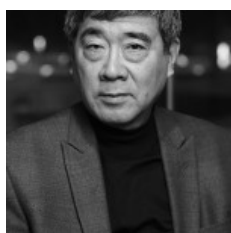
Prof. John Graham
Indiana University, USA



Prof. Manuel Heitor
Técnico Lisboa, Portugal



Prof. Janet Hering
ETHZ; EPFL; EAWAG, Switzerland



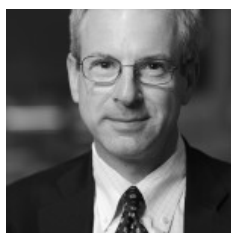
Prof. Kenneth Oye
Massachusetts Institute of
Technology (MIT), USA



Prof. Arthur Petersen
University College London, UK



Prof. Ortwin Renn
University of Stuttgart, Germany



Prof. Jonathan Wiener
Duke University, USA



Prof. XUE Lan
Tsinghua University, China

IRGC Secretariat Permanent Staff



Marie-Valentine Florin
Managing Director



Laurence Wharton
Secretary



Dr. Anjali Nursimulu
Risk Fellow



Marcel Bürkler
Project & Event Manager

IRGC would like to thank the following people who have also supported the IRGC Secretariat in 2014: Anne-Sylvie Borter Graphic Design, Michael Hill Research intern, Christine d'Anna-Huber Communications and copy editing, Harry Husni Graphic design, Mideia Kostogianni Research intern, Chabane Mazri Visiting Risk Fellow, on leave from INERIS Paris, James Nolan IT.

“

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 risk governance in one of its biggest strengths.

Prof. Granger Morgan

Chairman of the IRGC Scientific & Technical Council

The IRGC Network

IRGC aims to reach a global community of public and private policy-makers while simultaneously ensuring a strong local, contextual and cultural rooting. In order to achieve this aim, IRGC 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 that occurs 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 diverse audiences, and to increase its economic efficiency.

Every network member is an active contributor to IRGC's work, whether via the provision of funding, expertise, and research work, or a combination of these. In return, members benefit from access to the entire network and the significant pool of knowledge and useful contacts this represents.

Public and private sector organisations as well as universities and scientific organisations all participate in and benefit from the policy development and specific project work, which is accomplished through coordination and collaboration within the network, at minimal cost.

Functions and Members of the Network

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

1. **Facilitation of collaborative international activities in the field of risk governance.** IRGC provides a neutral convening platform for workshops and conferences, disseminating results of academic applied research to international organisations, the private sector and governments.
2. **International cooperation in education, communication and outreach to decision-makers in risk governance.** In particular, the network provides opportunities to promote new and advanced international educational and training programmes in risk governance at the PhD and executive level.
3. **Development of specific risk governance policy options and recommendations based on substantive analysis.** These (network partner led) activities identify, frame, draw attention to and analyse ignored, neglected or emerging risk issues for governments, for business and for the risk community.

IRGC network members and affiliates currently include the following institutions:

North America

- Carnegie Mellon University (CMU), Department of Engineering and Public Policy, USA
- Indiana University, School of Public and Environmental Affairs, USA
- Massachusetts Institute of Technology (MIT), Program on Emerging Technologies, USA
- (upcoming) Duke University, Program on Rethinking Regulation, USA

Europe

- EPFL Center on Risk Analysis and Governance (CRAG) Lausanne, Switzerland
- IRGC Portugal (a research consortium based at IST Lisbon)
- The Helmholtz Alliance ENERGY-TRANS, Germany
- (upcoming) University College London, Department on Science, Technology, Engineering and Public Policy, UK

Asia

- Center for Science, Technology and Policy (CSTEP), India
- Tsinghua University, School of Public Policy and Management, host of IRGC China, Center on Risk Governance

Activities of Network Partners

IRGC Portugal

By the end of 2014, IRGC Portugal (<http://www.irgc-portugal.org/>) has established an agenda with competencies in different and complementary areas, including risk governance and policy research.

1. **Industrial production, geography and policy under increasing uncertainty in Aeronautics:** a sectorial research platform was launched to analyse deindustrialization risks and related issues, and foster technical change in diverse socio-economic vulnerable regional contexts. <http://in3.dem.ist.utl.pt/technology-policy-aerospace/>
2. **Governing emerging risks and new innovation dynamics in the Atlantic:** an international consortium in the form of an *International Observatory of Global Policies for the Sustainable Exploration of Atlantic*, “OIPG” was set up to stimulate participatory risk governance activities, support the design of public policies and the sustainable development of industry, and foster the development of Atlantic regions. <http://www.oipg.org/>
3. **New regulatory frameworks for harnessing knowledge, technology and innovation for sustainable public health:** new forms of regulations in the medical sector, including for advanced therapies and medical devices, are being studied and encouraged in Portugal. A comparative analysis of new regulatory approaches (e.g., “intelligent and integrative”), as discussed by the European Medicines Agency (EMA) and the US Food and Drug Administration (FDA), was concluded in collaboration with the Gulbenkian Foundation and the Gulbenkian Platform on “The Future of Health.
4. **Design for uncertainty in urban contexts:** a platform for action research on vulnerable communities in the city of Lisbon was developed and promoted under the title “Street Labs”. It focuses on risk communication and stake-holder engagement processes to help

shape perceptions and behaviours.
<http://www.narua.pt/>

2. **A global network in Portuguese speaking countries** was developed together with a comprehensive analysis of science and technology policies for developing regions, with emphasis on Latin America. A Special Issue of the Journal of Technology Management and Innovation was published about “Technical Change and Innovation Policies in Latin America: Lessons Learned”.
<http://www.jotmi.org/index.php/GT/issue/view/vol9-issue4a>

Cooperation and knowledge transfer among its network members allow IRGC to address a diversity of cultures and contexts. Network members contribute actively to IRGC’s work and in turn benefit from access to the entire network and the significant pool of knowledge and contacts.

IRGC China

In 2014, IRGC China, Center for Risk Governance, School of Public Policy and Management, Tsinghua University, made progress in institutional development and capacity building, as well as academic research. It initiated a series of studies in the field of risk governance.

- Together with the Development and Research Center, China Geological Survey, IRGC China initiated a project on the supply of mineral products. The preliminary investigation was carried out on the basis of the IRGC risk governance framework.

- Funded by the Center for Industrial Development and Environmental Governance, a project on governing risks posed by air pollution in megacities such as Beijing was started.
- A two-day workshop on the regulation of genetic data and the regulation of chemicals will be held in May 2015.
- To formally introduce the concept and research field of risk governance to China, a book entitled *Introduction to Risk Governance in Public Domains* was outlined and it is planned to be published in 2015.

2014 saw the constitution of a stable research team, consisting of a dozen members including faculty members, postdocs, graduate and undergraduate students, who collectively conduct research on the various aspects of risk governance.

“

I think IRGC has done a lot of very interesting work convening experts and government officials and make them better understand the importance of risk governance. IRGC offers many occasions to people from different countries to exchange ideas and learn from each other.

Prof. XUE Lan

Dean, School of Public Policy and Management, Tsinghua University;
IRGC Scientific & Technical Council

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International Risk Governance Council (IRGC)

EPFL CM 1 517

CP 99

CH-1015 Lausanne

Switzerland

Tel: +41 21 693 82 90

info@irgc.org

www.irgc.org

