



INTRODUCTION TO FACT SHEETS

About *INVULNERABLE*

Recent progress in science and in climate modeling provides a wealth of information that remains largely underexploited today, particularly in terms of its relevance for industrial activities. As part of the “*INVULNERABLE*” (INDustrial VULNERABILITY) programme, IDDRI and its scientific and industrial partners have been pursuing an innovative methodology since 2006 in order to translate the challenges of global industrial vulnerability in terms that the climate models can help to clarify.

INVULNERABLE approaches the vulnerability of industrial operations in a broad sense, from four main angles:

- Are the statistics used in the design of installations/infrastructure robust in a context of climate change?
- What are the prospects for change in the factors determining the demand for goods or services?
- What are the prospects for change that affect the management of the industrial sector?
- What are the future occurrences of industrial “climate incidents”?

The *INVULNERABLE* programme both promotes the different IPCC indicators and creates its own indicators linked to changes in temperatures and precipitation by intermediation between the expression of specific industrial challenges and the potentialities of climate models. Beyond the global vision, two areas of special interest are examined in more detail: Europe and northern Asia.

The *INVULNERABLE* project brings together IDDRI and different participants, including IPSL, Météo-France, CERFACS and ONERC from the scientific community and GDF-Suez, Veolia and EDF from the business sector.

INVULNERABLE is a work in process that is expected to move forward rapidly; this presentation therefore constitutes the initial results that can be used to illustrate the potential of this innovative approach.

About IDDRI

At the interface between research and decision making, the Institute for Sustainable Development and International Relations (IDDRI) is a think tank that uses scientific research to clarify the political aspects of sustainable development. It addresses the major challenges of transforming development models, necessitated by the degradation of natural resources and climate change. IDDRI has three objectives: informing policy decisions; identifying emerging issues; and leading dialogue between stakeholders whose interests are often at odds. To meet these objectives, IDDRI clarifies the issues at hand, brings together concerned stakeholders and anticipates up and coming issues. It promotes research and mobilizes research teams within its broad international network. It thus encourages a common understanding of concerns, all while putting them in a global perspective.



Content of this dossier

The fact sheets presented here aim to provide series of indicators relevant to the strategic implementation of industrial activities. The fact sheets deal with the following principal aspects:

- the preface sheet describes the climate models used in the IPCC report and the results for 2100. It lists the various scenarios that provide different sets of simulation assumptions for future climate, notably regarding greenhouse gas emissions.
- the technical fact sheet explains how to interpret the other fact sheets, notably the statistics and the description of the likelihood of events.
- the global fact sheet presents global and general

projections of temperature and precipitation as well as the consistency between the models.

- the uncertainty fact sheet outlines and quantifies uncertainties related to future projections, based on model dispersion.
- the Europe and northern Asia fact sheets provide more detailed information on temperature and precipitation projections, including the time horizon 2030-2050, along with explanations of physical phenomena.

Further fact sheets will be added to this dossier as new indicators are developed. This dossier is also available in French.

Credits: The development of the INVULNERABLE methodology is the sequel of a brainchild of **Jean JOUZEL**, director of the Institut Pierre Simon Laplace in Paris. The information contained in the initial fact sheets comes from the latest IPCC report and from scientific articles, some of which are quoted in the IPCC report. The construction of indicators and the production of the fact sheets are the work of **Gwenaëlle PHILIPPON** and **Céline DEANDREIS**, under the coordination of **Pascale BRACONNOT** (IPSL), and with the editorial support of **Élise COUDANE** (IDDRI). The project is guided by a steering committee composed of representatives of Veolia, EDF and GDF-Suez, **Michel COLOMBIER**, **Hubert KIEKEN** and **Cyril LOISEL** from IDDRI, **Pascale BRACONNOT** and **Jean-Louis DUFRESNE** from IPSL, **Pascale DELECLUSE** and **Serge PLANTON** from Météo-France, **Laurent TERRAY** from CERFACS, **Marc GILLET** from ONERC, and **Hervé LE TREUT** representing the scientific committee of the IDDRI Foundation.

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