Adapting the industry to climate change: the role of climate services

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The emergence of climate services
A wide-ranging concept

The need for climate services is relatively new, as adaptation to climate change is still nascent
- A recent multiplication of initiatives, located in a few countries
- WMO Conference stressed the need for climate services (September 2009, Geneva)

What climate services cover
- Vulgarisation of climate science / information / awareness raising
- Dissemination of raw climate data
- Maps / standardised indicators
- “Sectoral” indicators, still often standardised
- Tailored climate indicators and studies

The need for climate services: a need for climate indicators
- To date, most indicators used by stakeholders come from external productions
- As a consequence, climate data is scarcely used in adaptation strategies, leading to suboptimal and often similar adaptations to a limited number of climate impacts
- Yet there is a demand for tailored information to better understand a system’s vulnerability, establish priorities, and adapt
The INVULNERABLE project
Defining industrial vulnerability with industrials

2006: opportunity and means for “climate services”, and leadership of some key climate scientists

Industrial vulnerability has been studied through 5 categories

• Resources availability
• Facilities and infrastructure design
• Demand for goods and services
• Industrial process
• Climate hazards

A 4-step methodology aimed at tailoring the work of climate scientists to the industrial partner

1. Identification and selection of climate vulnerabilities
   – What’s the problem?
   – Who are the inner human resources to tackle it?
2. Construction of a relevant climate indicator
   – That answers the industrial’s question
   – That is useable by climate scientists (feasibility study)
3. Detailed analysis of the climate indicator
   – Data identification
   – Trends and uncertainties
4. Communication and discussion with the user
The INVULNERABLE project
Distric heating case study: indicator

Dalkia: limits to the operation of district heating in Texas. Elsewhere in the future?
- Question: will district heating remain adapted and profitable under climate change?
- Relevant climate indicator for Dalkia: evolution of daily temperature variations
- The indicator has been defined after Dalkia’s experience in Texas
- The study covered Europe and China

Chosen climate indicator: the DTR (“Diurnal Temperature Range”)
- Difference between the highest and the lowest temperature during 24 hours

\[
DTR = T_{\text{max}} - T_{\text{min}}
\]

- More precisely, the indicator was defined as the number of days for which the DTR is unusually higher than its reference value (1961-2000 mean), i.e. the number of days where

\[
DTR > DTR_{1961-2000} + \text{vulnerability threshold}
\]
The INVULNERABLE project
District heating case studies: results

Annual mean of the indicator for the 1961-2000 period (left column) and its anomaly between the 2071-2100 and 1961-2000 periods (right column). The results are shown in number of days per year. Doted zones show an accordance of more than 80% of the models on the sign of the anomaly.
Source: Déandris (2010)
Results of the project
Is the methodology workable / duplicable?

Benefits of the methodology:
• The end-users have more capacity and will to take climate change into account
  → Re-analysis of their activity, through the lens of a changing climate constraint
• Better understanding of what can be done with climate data, and what cannot
• Essential preparation to not-so-distant future challenges

Limits of the project:
• The number of vulnerabilities studied remain too low to be usable
• The complete work is much more intensive
• There is a bias in the identification of vulnerabilities: past experience

There is a real need of upgrading the project to go further
Main lessons and outcomes

It is possible to have climate scientists and industrials work together to define relevant indicators …

… But it is a very intensive work, clearly distinct on that point from other climate services …

… And the result is ambiguous

• There are considerable uncertainties
• There is always a possibility to push the study further, and thus postpone the decision-making phase further
• There is a true challenge to have the information actually used by the industry and overcome the ‘fashion’ barrier
• It is only one piece of information needed to take a decision, and other pieces often do not have similar treatment

Question: is it always necessary to have precise climate information? How should the limit be defined? Is it possible to adapt using this climate information?
Thank you

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