

# Introduction

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# Français or English?

# Who are we?

- **I4CE** : Institute for Climate Economics
- **Our vision** : Harnessing economics for the climate
- **Missions:**
  - an initiative of **Caisse des Dépôts and Agence Française de Développement**. The *think tank* provides **independent expertise and analysis on** economic issues linked to climate & energy policies in France and throughout the world.
  - aims at helping public and private decision-makers to improve the way in which they **understand, anticipate, and encourage the use of economic and financial resources** to promote the transition to a **low-carbon resilient economy**.
- **3 programs:**
  - **Industry, Energy and Climate:** understanding policies for the low-carbon transition in the industry and energy sectors
  - **Finance, Investment and Climate:** analyzing the mainstreaming of climate change into financial decision-making by public and private entities.
  - **Territories and Climate:** identifying and analyzing courses of action in the fight against climate change in the agriculture and forestry sectors as well as urban areas.

# IPCC results – brief summary

- Significant increase in average surface temperatures, of 0.85°C between 1880 and 2012 – 19 out of the last 20 years, for instance, are among the top 20 hottest years since 1850.
- Warming of oceans and increase in their level: between 1901 and 2010, the average global sea level increased by 17 to 21cm, mainly due to melting icesheets and expansion due to the increase in the water temperature.
- Reduction in the cryosphere (water in its solid state): the Arctic ice pack in particular shrank at a rate of between 3.5% and 4.1% per decade during the period 1979-2012.
- All continents are concerned by those impacts and effects.
- It is *extremely likely* (95%) that human influence has been the dominant cause of the observed warming since the mid-20th century.

# Main issues for adaptation to climate change impacts at a local level

- Adaptation strongly depends on the context (geographical, economical, etc. ) and requires data on possible climate change impacts

## ■ Schematic map of potential impacts of climate change in France by 2100

### FOR ALL REGIONS:

- More accute warming in the summer and in the South-East region
- High increase of the number of days of heatwaves in the summer
- Evaporation with low water flows and reduced water resources available for agriculture
- Negative consequences on farming yields
- Shift of popular touristic areas

### CITIES:

- Heatwaves: increase in local pollution, with an impact on health and energy consumption (building renovation required).
- Urban flooding: overflowing of drainage network.

### FIRES:

- Extension in the risk of forest fires towards the north of France

### MOUNTAINS:

- Reduction in the surface area of ski slopes, leading to a reduction in tourism - heightened natural risks of flooding, avalanches and landslides.
- Biodiversity: changes to phenology and reduction in the number of species in valleys.

### COASTS:

- Coast threatened by erosion and/or submersion
- Risks of more frequent partial submersion of polders and sand barriers.
- Ports and associated industries threatened by flooding.
- Change to the distribution of fishery resources with an increase in the north.



Source: CDC Climat Research, 2015, based on IPCC (2014), MEDDE (2014 et 2015), ONERC (2010) and Météo France.

# Main issues for adaptation at the local level

- Adaptation = complex notion (linked with development, risk management, resilience, etc.), advantage to have a systemic vision, mainstreaming
- Overcoming multiple barriers (financial, legal, organizational, cognitive)
- Involvement of stakeholders
- Using economic analysis (multi-criteria analysis, etc.) as a useful decision-making tool
- Securing the funding for adaptation was perceived as a challenge by 85% of cities (Carmin et al. 2012)