

**Water and risk management facing climate change:
Towards the local adaptation**

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***CC Adaptation Strategy in Italy:
from national level to the Alpine region***

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EU - policy context

- **GREEN PAPER** “*Adapting to climate change in Europe - options for EU action*” (2007)
- **WHITE PAPER** “*Adapting to climate change: Towards a European framework for action*” (2009)
 - ✓ Every effort must be made to adopt national or regional adaptation strategies at the member states
 - ✓ Adaptation strategies in Europe most be implemented in two faces:
 - FI** (2009 -2012): preparing the ground
 - FII** (from 2012): adoption of the National Adaptation Strategies
- **EU ADAPTATION STRATEGY (EAS)** “*An EU Strategy on adaptation to climate change*” (April 2013)
 - ✓ Encourage all Member States to adopt comprehensive adaptation strategies
 - ✓ Provide funding to support capacity building on adaptation (LIFE, cohesion fund)
 - ✓ Bridge the knowledge gap
 - ✓ Further develop Climate-ADAPT platform
 - ✓ Mainstreaming adaptation into EU policies

Climate-Adapt

The European platform for adaptation information (March 2012, DG Clima)

<http://climate-adapt.eea.europa.eu/>

What are European countries doing?

Choose your country GO

- National and transnational adaptation strategies
- Adaptation case studies and potential adaptation options
- Tools that support adaptation planning

» [Read more](#)

Share your information

Search the database

News

- » Nov 2012 New assessment of climate trends and impacts in Europe highlights need for adaptation planning and action
- » Nov 2012 Austrian climate change adaptation strategy adopted (D only)
- » Nov 2012 WMO 2012 Congress proceedings available
- » Nov 2012 Community Response Wizard - adaptation guide assists Finnish municipalities

» [News archive](#)

Events

- » 26 Nov - 7 Dec 2012, UNFCCC Climate Change conference, Doha, Qatar
- » 17-19 April 2013, 7th European Conference on Sustainable Cities & Towns, Geneva, Switzerland
- » 31 May - 2 June 2013, Resilient Cities 2013, Bonn Germany - final call for contributions

» [More events](#)

EU sector policies

- Agriculture & Forestry
» [Read more](#)
- Water management
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» [View all sectors](#)

EU information systems

- WISE** Water
WATER INFORMATION SYSTEM FOR EUROPE
- Biodiversity
BIODIVERSITY INFORMATION SYSTEM FOR EUROPE

- ✓ Provide advice from **agencies**, ministries, Adaptation Steering Group and **best practices** from **countries and EU projects**
- ✓ Support governmental decision-makers concerning **climate change adaptation strategies, policies and specific actions**



European Commission



European Environment Agency

The Italian National Adaptation Strategy

Who?

- ✓ **MATTM**, Ministry for Environment, Land and Sea: it started the work toward a NAS: 27/02/2012 Preliminary Meeting, (IMELS, Roma) “State of knowledge on CC in Italy;
- ✓ **CMCC**, Euro-Mediterranean Center for Climate Change: it supports the preparation of technical contents of NAS and acts as scientific coordination;
- ✓ **TEC**, Technical Board for the National Adaptation Strategy: production of the Review Report of the scientific-technical knowledge in different national sectors;
- ✓ **UPO**, National Advisory Group for adaptation: review of the NAS involving decision-makers in the consultation process.

Structural approach: NAS and NAP

National Adaptation Strategy (NAS):

- Involvement of **stakeholders** and **decision-makers**.
- Analysis of possible **mainstreaming of adaptation** in the different sectoral policies.
- **Recommendations and guidelines** to build up adaptive capacity in different sectors and at different spatial scales (national, regional and local) and to reduce societal costs.
- Review after n years.
- A National Adaptation platform

National Adaptation Plan (NAP):

- **Implementation** of NAS with **governance** and **funding** allocation.
- **Monitoring** and **evaluation** of implementation (**Indicators**).

Methodological approach

TOP DOWN:

Technical Panel – c. 100 Italian scientists/sectoral experts

Coordinator: **CMCC**

Institutional Panel – Ministries, regional authorities, province authorities and municipalities

Coordinator: **MATTM**

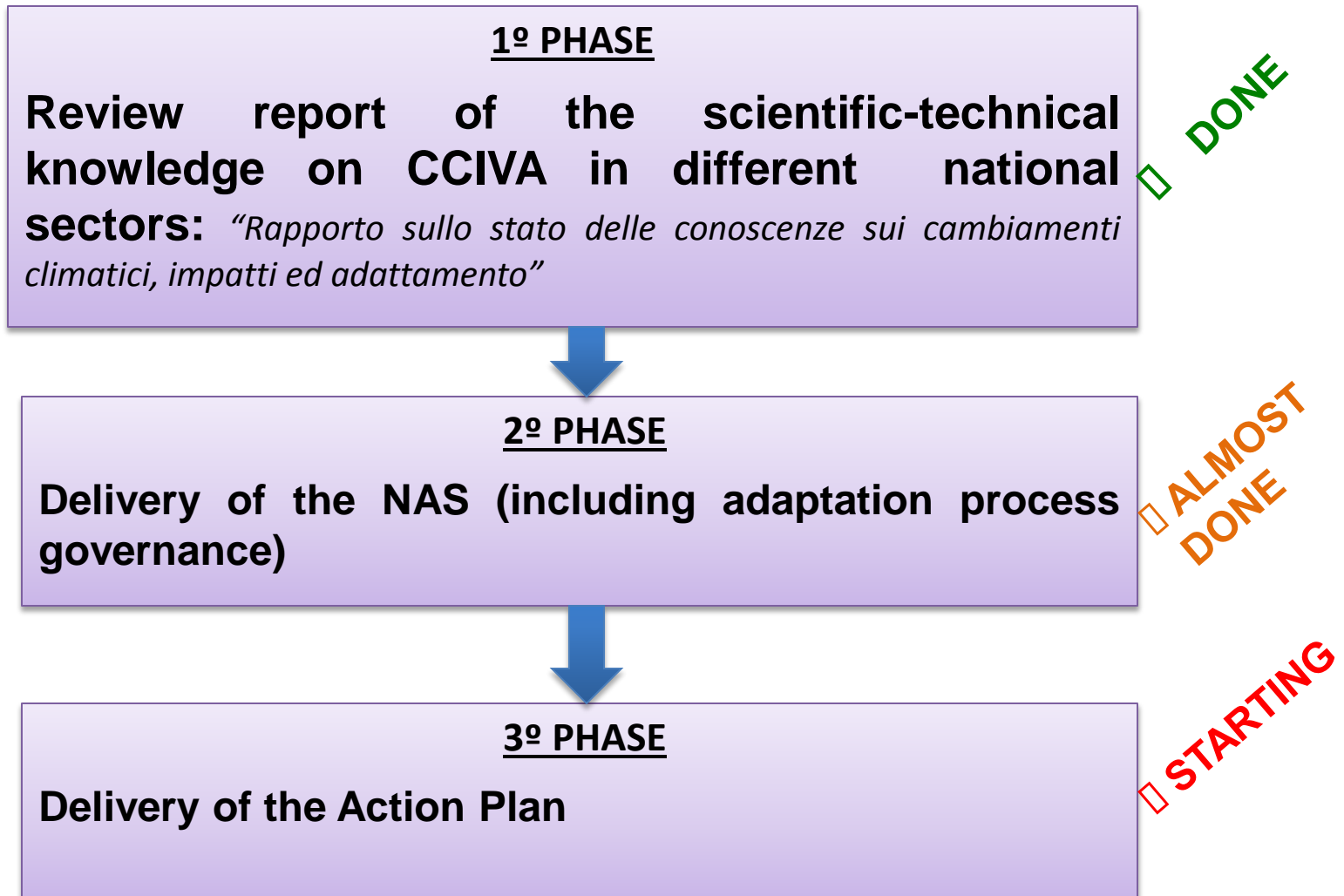
BOTTOM-UP:

Participative process - transparency, sharing with national stakeholders (civil society, scientific community, private sector...)

Italian NAS: impacts and vulnerability *assessment* (CCIVA)

- Definition and identification of **sectors**.
- Assessment of **present and expected impacts** of climate change for each sector.
- Assessment of the **vulnerabilities** of each sector to the present and future climate.
- Assessment of **adaptative capacity** of each sector.
- Evaluation of **already implemented adaptation measures** in sectors.
- Tentative **estimate of costs of both adaptation and inaction** for each sector (if possible).

Italian NAS: the development process



Italian NAS: the sectors

Physical Environment :

- 1) *Water resources (quantity and quality)*
- 2) *Desertification, land degradation and droughts*
- 3) *Hydro-geologic risk*

Human health and ecosystems:

- 4) *Human health*
- 5) *Terrestrial ecosystems*
- 6) *Marine ecosystems*
- 7) *Inner water ecosystems*
- 8) *Forestry*

Energy, agriculture and fishery:

- 9) *Agriculture and food production*
- 10) *Aquaculture and fishery*
- 11) *Energy*
- 12) *Coastal zones*
- 13) *Tourism*
- 14) *Urban and metropolitan centers*

Critical infrastructures:

- 15) *Cultural heritage*
- 16) *Transport*

Special cases :

- 17) *Mountain areas (Alps and Apennines)*
- 18) *Po river basin*

The mountain areas in the NAS: why?

HIGHLY VULNERABLE AREAS TO CLIMATE CHANGE IMPACTS

- ✓ The increase of **temperature** in Italian mountain areas in the last thirty years **has been three times higher** than the average increase in the northern hemisphere (Alcamo, 2007).
- ✓ The **rainfall pattern has been modified**, consisting in a reduction of rainy days and **an increase in intense rainfall events** both in the Alps and Apennines (Brunetti et al., 2006).
- ✓ The temperatures increase is **accelerating the cryosphere melting processes** (including glaciers, permanent snow and permafrost) and the consequent **increase in the associated risks** (Mercalli et al., 2009 and Margottini et al., 2007).
- ✓ Acceleration of melting processes and changes of the rainfall patterns, will result in significant **changes in the hydrological regime in mountain areas**, consisting in a **reduction of the summer run-off** and especially in a considerable **increase in winter run-off** with consequences in the **geological risks** (Lautenschlager et al., 2008) and **future availability of water resources** (Weingartner et al., 2007).
- ✓ Furthermore... mountain areas are characterized by a **high social and ecological importance and** also by a **high vulnerability to a wide range of natural hazards** as well as a growing **anthropogenic and environmental pressures**.

The mountain areas: main elements analyzed

CHAPTER 1- climatological characterization: current trends and future projections of the main climatic variables (rainfall, snowfall, temperatures, heat waves and storms)

CHAPTER 2- Evaluation and estimate of the present and future *CC impacts for each sector* (Hydrological cycle and water quality, ecosystems, biodiversity and protected areas, Natural hazards: glacial hazards, slope stability and landslides, soil degradation: water erosion and desertification, Air Quality, Tourism, Built Environment and Mobility, Human Health, Agriculture, Energy) considering their *vulnerability* to present an future climate

CHAPTER 3- Evaluation of *existing adaptation measures* in each sector, and estimation of their adaptive capacity

CHAPTER 4- Proposal of possible *future adaptation measures* and actions for each sector

Thanks for your attention