Scoping paper - Annotated Outline

V 1 26.02.19 - confirmed after internal Skype

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| **Annotated Outline Scoping Paper** | | | |
|  | | | |
| **Title of chapter / section** | **Main Author and co-authors** | **Notes on content** | **Pages** |
| **1. Objective and analysis criteria** | ETC   * Mikael started | General objective of the scoping paper  Analysis criteria for all the chapters e.g.   * Demand for information: what is (really) needed for what purpose. Is there an approved policy relevance? * Content (Impact, Risk, Adaptation, policy context, …) * How is the content presented? * Target groups * Theory of change (link to chapter 6) | **2** |
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| **2. EEA perspective** | Hans-Martin Füssel |  | **4** |
| 2.1 Reflection on 2016 report |  | i) Data sources + relation to other EEA indicators  ii) Press coverage + impact analysis  iii) Overview of resources and people involved  iv) Reflections on management and process  v) What can/should be improved, even in a Business as Usual scenario | *1,5* |
| 2.2 EEA expectations |  | i) What does EEA want to achieve with this report and how can it be “measured”  - Policy relevance and other evaluation criteria for options  - Target groups (fairly well defined by EEA)  ii) Content: How far to get beyond climate impact assessment with indicators?  - Vulnerability and Risk?  -Cross-sectoral perspective?  - Regional perspective? (e.g. mountains, cities, Scandinavia, Central-, Western-, Eastern-, Southern-Europe)  iii) How much on Adaptation (status / success)? | *1,5* |
| 2.3 EEA internal communication strategies |  | i) What is the latest EEA internal communication strategy? New developments on formats? Target groups? | *1* |

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| **3. good examples for presenting CCIV(A) information** | ETC   * Willem | What do we mean by ‘good presentation of CCIV(A), information?  Goodness is to be judged in relation to a specific need/use -> criteria  Analyze other existing national and international reports (applying analysis criteria above [from chapter 1)]  Criteria:  How far to get beyond climate impact assessment with indicators?  - Vulnerability and Risk?  -Cross-sectoral perspective?  - Regional perspective? (e.g. mountains, cities, Scandinavia, Central-, Western-, Eastern-, Southern-Europe)  iii) How much on Adaptation (status / success)? | **3** |
| **4. The evolving Demand for CCIV(A) information 🡪 policy relevance** | ETC –  MH willing to give it a try | Analyze demand for CCIV(A)information. What is needed by whom? Review:   * 1. Evolving European Policies (can be largely copied from draft SOER 2020) MH: comment . The policy areas are included in the SOER draft, but there’s not that much of an analysis of what kind of information is actually needed to implement or develop the policies further.   2. Evaluation of EU Adaptation strategy and a possible review of the strategy (which is the key demand for information from EEA Climate impacts report)   3. Evolving national adaptation policies and plans | **2** |
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| **5. Landscape of related information suppliers** |  |  | **6** |
| 5.1 external | ETC  - Marc: C3S | i) C3S  - Compare EEA indicators vs. current and planned C3S indicators and variables. What is/will become available through C3S?  - IPCC AR6  - DG CLIMA tender on adaptation modelling  - Others (JRC PESETA III, EU research projects COACCH, …)   * Consider to what extent there are possibilities for the EEA to ‘tap into’ these sources of information in an ‘automatic’ or ‘semi automatic’ way when it comes to at least the ‘hard data’ as this would save resources | *5* |
| 5.2 EEA internal |  | i) Planned other EEA reports and indicators  ii) CLIMATE-ADAPT | *1* |

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| **6. Options and concrete format** |  |  | **10** |
| 6.0 | ETC & EEA jointly | The options to be explored (these can be mentioned in Ch1, but here they would be elaborated to give the reader a deeper insight into what ‘scenarios’ the paper is exploring. 6.3. would the provide the actual results - could also come before 6.3, or in 6.3 as an intro. The thought of making it 6.0 is that then the reader is oriented to reflect on the set up before entering into the more ‘abstract’ text of 6.1 & 6.2 |  |
| 6.1 Assumptions on how policy relevance is to be achieved (program theory) | ETC – Mikael? | Based on lessons learnt from chapter 1-5 | *1* |
| 6.2 Criteria for evaluation of options | ETC – who? | (policy relevance, policy impact, resources needed, cost-effectiveness, comprehensiveness, understandability, ease of access., completeness of scientific evidence, …) 🡪 EEA, see also chapter1 | *1* |
| 6.3 Evaluation of several alternative options for the ’core product’ | ETC - who | i) Business-as-usual  ii) Indicators and potential data source (including C3S)  iii) Diversified: Condensed report + more extensive WWW-products + other products  iv) Slimmed report only – ‘a reader’s digest’ of available assessments  v) Evaluation of several options for additional products (policy briefs, websites) | *8* |
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# Chapter 1 (1st crude draft, MH 26.2. 2019)

In January 2017, EEA published its fourth report on climate change, impacts and vulnerability in Europe (2016 EEA CCIV report). Similar to previous reports, this report presented a comprehensive overview of climate change and its impacts in Europe, which was largely based on 35 indicators. All these indicators were updated in parallel with the publication of the report. Furthermore, the 2016 EEA CCIV report reviewed the policy context for adaptation in Europe, and it gave an overview of multi-sectoral climate change vulnerability and risk assessments in Europe. The focus was on the EU level and the transnational level.

The production of a single comprehensive report requires significant resources in terms of writing, editing, review and publishing. Producing a single comprehensive report and the associated web pages for the indicators is, however, not the only way to disseminate European wide information on climate change impacts and vulnerabilities (and associated adaptation actions as appropriate).

The main objective of the report has been to provide policy makers with relevant, easily accessible and updated science based information on the progress and projections of climate change and its impacts in Europe. By producing the report the EEA hopes to satisfy a demand for knowledge and information that arises in the preparation of European wide and national policies. By providing a comprehensive report the EEA gives the reader an opportunity to understand the broad picture of climate change and to gauge different pieces of information for policy development. A secondary objective is to generally raise awareness of the climate change and its consequences with a focus on European perspectives. A third objective is the branding and visibility of the EEA as an actor on the European CCIV(A) arena in relation to its task as defined in relevant documents on the EEA and its role.

This scoping paper explores through which means these objectives can be achieved by examining several options for an EEA CCIV(A) report to be published in 2022 and for related indicators. The objectives and means can be seen to provide alternative ‘theories of change’ [ref.] for EEA’s reporting of climate change impacts, vulnerabilities and to some extent adaptation actions. The theory of change is a brief graphically based presentation of how the EEA may seek to achieve its objectives with respect to publishing CCIV(A) information. To operationalise the theories of change specific options for the publication of the CCIV(A) information will be explored. Options include a ‘business as usual’; a comprehensive short report with substantial additional information available online; a report focussing on ‘new’ knowledge and topics, such as multi-sectoral assessments, multi-hazard assessment and/or climate change impacts from outside Europe. The focus will lie on the added value of an EEA report compared to other existing reports and data platforms (IPCC AR6, Copernicus Climate Change Service – C3S).

The scoping paper assesses the chosen options in terms of their expected effectiveness in achieving policy relevance and in raising policy makers awareness of climate change impacts and vulnerabilities. It also explores tentatively the resource needs, both from EEA and from other institutions and seeks to highlight where the main differences arises between the options.

The purpose of the scoping paper is to serve as an internal discussion paper for the EEA in determining the approach and resources for the future CCIV(A) dissemination.

# EEA perspective

# Examples of presenting CCIV(A) information

**Key messages**

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## Introduction

Information in CCIVs on different scales provide the basis for understanding climate change, its effects, impacts and risks and for developing adequate adaptation strategies. In a democratic environment as the EU, information in CCIVs not only plays an important role in the policy domain, but is as well of high importance for the society as a whole, encompassing many sectoral organizations, ngo’s and the general public. For CCIVs it is quite a challenge to provide adequate and understandable information for these different target groups.

To get an idea of how other organizations than the EEA present their CCIV(A) information, we give some examples which give an overview of i) the coverage of content and ii) the types of publications used. The examples encompass CCIV(A) from national and subnational scale, European scale and global scale.

## Examples of CCIVs

With respect to the ***coverage*** of the presented content we distinguish:

1. Climate change trends and scenarios
2. Effects and Impacts
3. Vulnerability and Risk
4. Cross-sectoral perspectives
5. Sectoral perspectives
6. Regional perspectives   
   (e.g. specific regions, cities, ….)
7. Adaptation (x) and adaptation status/success (X)

With respect to ***types of publications*** we distinguish:

1. Technical publications
2. Policy summaries
3. Attractive booklets/infographics
4. Websites
5. Web-atlas
6. Video/films
7. Data portals

*Table 3.1 Overview of examples of CCIV(A) assessments as to i) coverage and ii) types of publications*

*Coverage*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Assessments* | *i.* | *ii.* | *iii.* | *iv.* | *v.* | *vi.* | *vii.* |
| EEA | X | X | X | X | X | X | X |
|  |  |  |  |  |  |  |  |
| ***Examples of national assessments*** |  |  |  |  |  |  |  |
| UK – Committee on Climate Change | X | X | X | X | X | X | X |
| UK – National (UKCIP) |  | X |  |  |  |  | X |
| UK – National - England (Future World Images: infographics on adaptation) |  |  |  |  |  |  | X |
| UK – National – Scotland |  |  |  |  |  |  | X |
| UK – National - Northern Ireland |  |  |  |  |  |  |  |
| UK – example special interests group: Marine Climate Change Impacts Partnership |  | X |  |  |  |  | X |
| The Netherlands - National CCIV (PBL 2015) | x | x | X | X | X |  |  |
| The Netherlands – Subnational  Climate Impact Atlas | X | X | X |  |  | X |  |
| Switzerland Climate change scenarios | X | X |  |  |  |  |  |
| Germany – federal website | X | X |  |  |  |  | X |
| Germany – Climate Preparedness Services | X | X | X |  | X | X | X |
| Finland – PM |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ***Examples of other European assessments*** |  |  |  |  |  |  |  |
| PESETA (JRC ….) | X |  | X |  |  |  |  |
| Copernicus Climate Change Service | X |  |  |  |  |  |  |
| MedEC (Mediterranean experts on climate and environmental change) – part of the site: Scientific News | X | X | X | X | X | X | X |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ***Examples of global assessments*** |  |  |  |  |  |  |  |
| IPCC | X | X | X | X | X | X | X |
| UK - Met Office, example atlas global food security |  |  | X |  |  |  |  |
| Future Water Challenges | X | X | X | X | X | X |  |
| Climate Central (focus: USA) / Inside Climate News (focus: USA) / Climate Council (focus: Australia) / Climate Change Post (focus: Europe) / Carbon Brief (focus: global) | X | X | X | X | X | X | X |
| World Bank Group | X | X | X |  | X |  |  |
|  |  |  |  |  |  |  |  |

*Types of publications*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Assessments* | *a)* | *b)* | *c)* | *d)* | *e)* | *f)* | *g)* |
| EEA | X |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ***Examples of national assessments*** |  |  |  |  |  |  |  |
| UK – Committee on Climate Change | X | X | X | X |  |  |  |
| UK – National (UKCIP) |  |  |  | X |  |  |  |
| UK – National - England (Future World Images (infographics) on adaptation) |  | X | X | X |  |  |  |
| UK – National – Scotland |  |  |  | X |  |  |  |
| UK – National - Northern Ireland |  |  |  |  |  |  |  |
| UK – example special interests group: Marine Climate Change Impacts Partnership |  |  | X | X |  |  |  |
| The Netherlands - National CCIV (PBL 2015) | X |  |  |  |  |  |  |
| The Netherlands – Subnational  Climate Impact Atlas |  |  |  | X |  |  |  |
|  |  |  |  |  |  |  |  |
| Switzerland CC scenarios and impacts | X |  | X | X | X | X | X |
| Germany – federal website | X |  |  | X |  | X | X |
| Germany – Climate Preparedness Services | X | X | X | X | X |  |  |
| Finland – PM |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ***Examples of other European assessments*** |  |  |  |  |  |  |  |
| PESETA (JRC …) |  |  |  |  |  |  |  |
| Copernicus Climate Change Service |  |  |  |  |  |  |  |
| MedEC (Mediterranean experts on climate and environmental change) | X |  |  | X |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ***Examples of global assessments*** |  |  |  |  |  |  |  |
| IPCC | X | X | X | X |  |  |  |
| UK Met Office, example atlas global food security |  |  | X |  | X |  |  |
| WRI Aqueduct (interactive) |  |  |  | X |  |  |  |
| Future Water Challenges (PBL 2018) | X | X |  | X |  |  |  |
| Climate Central (focus: USA) / Inside Climate News (focus: USA) / Climate Council (focus: Australia) / Climate Change Post (focus: Europe) / Carbon Brief (focus: global) |  |  |  | X |  |  | X |
| World Bank Group |  | X | X | X |  |  |  |
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## A summarizing overview of findings

* Climate change websites often combine information on climate change and energy. These sites often focus on the sectors health, agriculture, infrastructure, energy, and water, and on the indicators temperature and precipitation.
* National websites in the EU generally present information on climate change scenarios and the impacts and vulnerabilities; information on adaptation strategies/measures is not always included (e.g. the Netherlands). There are special sites focused on adaptation, however, linked to national climate adaptation services.
* The UK is an example of a country which in addition to the technical main CCIV report, provides a wide range of websites that in combination address the full spectrum of climate change, impacts, vulnerabilities and adaptation: the site of the Committee on Climate Change presents the full assessment, other sites (UKCIP and the sites for England, Scotland and Northern Ireland) focus on adaptation. In addition there are sites focused on special interests, such as the Marine Climate Change Impacts Partnership for the UK. The site of the Met Office presents a nice example of a web-atlas of climate change vulnerabilities and the effect of adaptation (for food security).
* Switserland uses a wide range of types of publication for their new climate change scenarios: Source R. Hohman 2019.

All information about the new climate scenarios are on the web site [www.klimaszenarien.ch](http://www.klimaszenarien.ch/" \t "_blank). The information is available in English too, certainly the technical report, the booklet and the web-atlas with 20,000 figures.

The work was done based on a mandate given in the first action plan including significant resources. Since Swiserland was not entirely happy with the old scenarios from 2011 not finding their way into practical work, MeteoSwiss gave a contract for a stakeholders’ needs analysis (available only in German: [https://www.meteoschweiz.admin.ch/home/suche.subpage.html/de/data/blogs/2016/3/analyse-der-nutzerbeduerfnisse-zu-nationalen-klimas.html?query=klimaszenarien&pageIndex=0&tab=search\_tab](https://www.meteoschweiz.admin.ch/home/suche.subpage.html/de/data/blogs/2016/3/analyse-der-nutzerbeduerfnisse-zu-nationalen-klimas.html?query=klimaszenarien&pageIndex=0&tab=search_tab" \t "_blank)). Following the stakeholder analysis, they tried to come up with a range of products that is expected to better fulfill the requirements of a real climate service.

* There is quite a number of news portals (websites) that present climate change vulnerabilities, impacts and adaptation strategies for all climate aspects (temperature, precipitation, …) and all relevant sectors (agriculture, infrastructure, …). They often have a geographical focus (USA, Australia, Europe), include infographics and videos, and are run by journalists with a back up of scientific expertise. Their focus is not on policy but on explaining science to a wide audience. Communication is based on short or long-read articles. Climate Signals (main focus USA) is a bit different than other news sites: the information is related to past and current extreme events with a ‘climate change signature’ that lights up on a world map; by clicking on these events additional information is shown.
* On a global scale, the NASA presents vulnerabilities and impacts via YouTube (f.i. the development of temperature anomalies since 1900 and the disappearing of Arctic Sea ice).
* More and more, leading newspapers (Washington Post, New York Times) publish in depth, long-read articles on aspects of climate change, often including (and sometimes interactive) infographics.
* Some global organizations (UNDP, UNFCCC, World Bank, recently also Global Center on Adaptation) also present news and information on climate change vulnerabilities, impacts and adaptation. The added value of the news on these websites is not quite clear at first glance. The World Bank Group also has a special ‘Climate Change Knowledge Portal’ that presents information (text and infographics) for 3 geographical subunits: country, region and watershed; these subunits can be selected from a world map on the site.

## Conclusions

PM

**References**: links to the documents/websites

National examples

* The Netherlands: Adaptation to climate change in the Netherlands - Studying related risks and opportunities - https://www.pbl.nl/en/publications/adaptation-to-climate-change-in-the-netherlands  
  Climate Impact Atlas ([www.klimaateffectatlas.nl](http://www.klimaateffectatlas.nl))
* Germany: Site of the federal government (<https://www.umweltbundesamt.de/en/topics/climate-energy/climate-impacts-adaptation>); Climate Preparedness Services (<https://www.klivoportal.de>)
* UK: [www.ukcip.org.uk](http://www.ukcip.org.uk); [www.defra.gov.uk/adaptation](http://www.defra.gov.uk/adaptation); [www.adaptationscotland.org.uk](http://www.adaptationscotland.org.uk); [www.climatenorthernireland.org.uk](http://www.climatenorthernireland.org.uk); <https://www.theccc.org.uk>; [www.mccip.org.uk](http://www.mccip.org.uk); <https://www.metoffice.gov.uk/food-insecurity-index/>
* Switserland: [www.klimaszenarien.ch](http://www.klimaszenarien.ch/" \t "_blank).  
  [https://www.meteoschweiz.admin.ch/home/suche.subpage.html/de/data/blogs/2016/3/analyse-der-nutzerbeduerfnisse-zu-nationalen-klimas.html?query=klimaszenarien&pageIndex=0&tab=search\_tab](https://www.meteoschweiz.admin.ch/home/suche.subpage.html/de/data/blogs/2016/3/analyse-der-nutzerbeduerfnisse-zu-nationalen-klimas.html?query=klimaszenarien&pageIndex=0&tab=search_tab" \t "_blank))

European examples

* Copernicus: https://climate.copernicus.eu
* MedEC (Mediterranean experts on climate and environmental change): <http://www.medecc.org>

Global examples

* Climate Central (USA): https://www.climatecentral.org
* Inside Climate News (USA): https://insideclimatenews.org
* Climate Signals (mainly USA): http://www.climatesignals.org
* Climate Council (Australia): <https://www.climatecouncil.org.au>
* Climate Change Post (Europe): https://www.climatechangepost.com
* Carbon Brief (global): https://www.carbonbrief.org
* IPCC
* UNDP: https://www.adaptation-undp.org
* NASA
* UNFCCC: https://unfccc.int
* World Bank: <http://www.worldbank.org/en/topic/climatechange> en <https://climateknowledgeportal.worldbank.org>

# The evolving Demand for CCIV(A) information

**Key messages/recommendations:**

* The demand for CCIV(A) information is simultaneously diversifying and becoming more specific with respect to focus and spatial and temporal resolution. This is driven by (successful) mainstreaming of climate change adaptation.
* There is large variation between policy areas in terms of available knowledge. Sectors that have a long history of concern for climate change (water, agriculture, biodiversity…) have initiated numerous studies that suggest a strong demand for syntheses. Other sectors (buildings….) have a shorter tradition and for these general overviews may be the first step towards formulating policies.
* …

## Knowledge needs reflected in the EU adaptation strategy and its evaluation

The EU Adaptation strategy and its evaluation have highlighted information needs. The strategy set as one of its goals to “Bridge the knowledge gap” and it specifically foresaw mainstreaming of adaptation in the Covenant of Mayors, climate proofing of the common agricultural policy, the cohesion policy and the common fisheries policy, more resilient infrastructures and the development of insurance and other financial products for resilient investment and business decisions. All of these depend on adequate CCIV(A) information.

The evaluation of the EU adaptation strategy (COM(2018) 738 final) notes that progress has been made in bridging knowledge gaps but that “none of the priority knowledge gaps have been closed and new gaps have emerged” (p. 7). The following ‘new’ gaps have been identified: “ecosystem-based adaptation, relationship to sustainable development goals, global transboundary (spillover) effects of climate change impacts and risks, adapting infrastructure and mountainous areas, long-term lack of water resources, high-end climate change, health, coastal areas, biodiversity” (SWD(2018) 461 final, p. 16). The list shows the interlinkage between CCIV and Adaptation information.

The report on the evaluation foresees that to advance further “the Commission could envisage exchanges of information on successful adaptation measures between stakeholders and with the scientific community. To an extent, bottom-up, co-designed adaptation can spur action and learning in spite of incomplete evidence, in line with the precautionary principle. Structured science-policy dialogues could be held regularly, for example, in the context of the biennial European Climate Change Adaptation” (p.12).

The evaluation of the EU adaptation strategy suggests that the role of the CCIV(A) information is to provide input and feedback into the policy dialogues and processes that design and revise policies. The demands are likely to become increasingly specific as policy areas evolve. At a European level there is a particular need for understanding the diversity of CCIV(A) across Europe in order to formulate policies that are sufficiently flexible in implementation, yet specific enough to allow for a meaningful mainstreaming of climate change measures. The following section explores this demands from a sector perspective.

## Mainstreaming generates new demands for knowledge

As highlighted by the evaluation of the evaluation of the EU adaptation strategy (SWD(2018) 461 final), the demand for reliable and comprehensive information on climate change impacts, vulnerabilities and adaptation is expected to increase. An important driver is the progress of climate change itself, with increasing recognisable impacts. These impacts raise awareness and an interest to understand the phenomenon across geographical scales within different sectors. Another important and partly related driver is the policy development at different levels of governance. Evidence based policy development needs a solid and coherent base of information. In particular, progress in mainstreaming climate change adaptation in a wide set of policies create specific demands for CCIV(A) information (Table 4.1) to help the sectors in identifying relevant hazards, exposures, vulnerabilities and eventually risks (of impacts).

Table 4.1 (Tentative idea). The specific demands that can be envisioned for different policy areas

|  |  |
| --- | --- |
| Policy area | Specific demands for CCIV(A) information at the EU level |
| Agriculture | The 9 objectives of the future CAP include explicitly climate change action, but many of the other objectives are also potentially affected by climate change. The impacts of climate change on agricultural practices is of key interest in order to avoid conflicting policy demands and maladaptation. <https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en>  For the CAP the variability in exposure to climatic variables across Europe and within seasons is key. Information on the vulnerability of specific farming practices (crops, animal husbandry) is of interest for designing subsidies that are expected to increase robustness in the face of climate change. For example, projections suggest that irrigated crop yield will decline for most crops and regions in Europe, in large part due to a shortening of the growing season. Yield changes for rain-fed crops depend on regional water availability and crop-specific water requirements. (Evaluation of the EU Strategy on adaptation to climate change (SWD(2018) 461 final)) Documenting and tracking this development is important. |
| Biodiversity | Actions to safeguard biodiversity include the Natural Capital Financing Facility (NCFF) operated by the European Investment Bank (EIB) providing loan or equity financing and technical assistance to natural capital projects. These NCFF projects aim to generate revenues or save costs while delivering on biodiversity and climate adaptation objectives. (Evaluation of the EU Strategy on adaptation to climate change (SWD(2018) 461 final)). Strategic policy development for such funds needs specific information on CCIV for key components of the biodiversity. The evaluation also showed that ‘nature’ is one of the focal areas for CC studies in European funding and hence there is also a demand for syntheses. See also Green Infrastructure (GI) — Enhancing Europe’s Natural Capital. COM(2013) 249 |
| Buildings | Detailed climate change related regulations on buildings have not, with the exception of energy efficiency, not so far been a major topic at the European level. The development of standards aiming to improve the resilience of European infrastructure to the adverse effects of climate change <https://www.cencenelec.eu/standards/sectors/climatechange/pages/default.aspx> will create specific demands, but most likely with an emphasis on the national level (see Table 4.2) |
| Coastal areas | … |
| Disaster risk reduction | … |
| Ecosystem-based approaches | Recognition of “multiple benefits including for biodiversity, ecosystems, climate change adaptation, climate change mitigation, air and soil quality and societal well-being. This multi-functionality should be better embedded in the assessment of adaptation options” (COM(2018) 738 final, p. 15). |
| Energy | … |
| Finance | … |
| Forestry | … |
| Health | “Reinforcing the links between public health and adaptation, notably to improve cross-sectoral cooperation on risk assessment and surveillance and to increase the awareness and capacity of the health sector,… to address current and emerging climate-related health risks. For example, the Commission could further support the development and sharing of best practice and new knowledge on climate-related health risks” (COM(2018) 738 final, p. 16). |
| Marine and fisheries | … |
| Transport | … |
| Urban | “assessment and mapping of social vulnerability to climate-related events, as well as identifying and involving vulnerable groups” (COM(2018) 738 final, p. 16). |
| Water management | … |

## Evolving national adaptation policies and plans

The national adaptation policies and plans develop rapidly, partly following the respective EU policies, partly in response to national needs and policy developments. The needs that arise due to the linking of disaster risk management (Sendai framework) and climate change adaptation affect the CCIV knowledge needs. In addition to the long term perspectives of adaptation policies there is a greater demand for near future projections and rapidly updated information on climate change impacts and their wider consequences.

Table 4.2 The evolving need for CCIV(A) information that is demanded by policy makers at the national level

|  |  |
| --- | --- |
| Policy area | Specific demands for CCIV(A) information at the National level |
| Agriculture | The specific changing conditions for agriculture and the implementation of the CAP in such a way that climate risks can be reduced. The Adaptation preparedness scoreboard Country fiches (SWD(2018) 460 final) show that Agriculture is one of the sectors that nearly all countries refer to. This suggests that there is a considerable (emerging) demand for cross country comparison of the CCIV(A) information on agriculture |
| Biodiversity |  |
| Buildings | Progress in standardisation <https://www.cencenelec.eu/standards/sectors/climatechange/pages/default.aspx>  will increase the demand for spatially detailed information on climatic variables with specific significance for buildings. The implementation of such standards will require detailed information that can support national or even local building regulations. |
| Coastal areas |  |
| Disaster risk reduction |  |
| Ecosystem-based approaches |  |
| Energy |  |
| Finance |  |
| Forestry |  |
| Health |  |
| Marine and fisheries |  |
| Transport |  |
| Urban |  |
| Water management |  |

# Chapter 5

## PESETA III:

**Key messages/recommendations:**

* PESETA III focuses on the economic evaluation and on risk from the economic perspective 🡪 Own models to evaluate this
* Depending on the availability of PESETA IV the EEA report authors should coordinate with JRC to include Economic and Spill-over/transboundary analysis from PESETA into the EEA report (only available for specific sectoral impacts)
* Authors of PESETA can offer an external contribution 🡪 above info can be added in a box directly by the authors of PESETA to avoid a new summary of a summary
* Adaptation data, when available (see table) can be incorporated into EEA report
* **Intro: Author? Objective?**

The PESETA III study is part of a series of projects of the Joint Research Centre (JRC) which aim at quantifying the possible biophysical and economic consequences of future climate change in Europe focusing on eleven impact areas

* methodological framework that integrates climate and socio-economic projections, impact models and economic analysis
* **Data Sources**

Climate changes scenarios: Implementation of EURO-CORDEX climate projections consistent with the high-end emission scenario (Representative Concentration Pathway RCP8.5). Focus on two periods/scenarios: end of the century (2071-2100), with GWL >3°C (high warming scenario) and ~ 2025-2055 where GWL = 2°C (2°C warming scenario)

Socio-economic scenarios: The economic evaluation of impacts is made within a specific setting of the state of the economy: static (the economy as of today) Vs dynamic (the economy of the future). Most of the analyses follow the static approach. This implies assessing climate impacts as if future climate occurs in the present, affecting today's economy and population. Some impact categories also consider dynamic projections of socio-economic conditions based on the ECFIN Ageing Report[[1]](#footnote-2) and the Shared Socio-economic Pathways[[2]](#footnote-3) (SSPs) consistent with RCP8.5, namely SSP3 and SSP5

* **Data Content (which sectors, which topics: risk, adaptation, economic evaluation?)**

11 Sectors/impact areas: coastal floods, river floods, droughts, agriculture, energy, transport, water resources, habitat loss, forest fires, labour productivity, and mortality due to heat.

Adaptation measures suggested to reduce damage and population affected 🡪 not for all sectors. For some sectors adaptation scenarios are modelled, for other sectors brief adaptation measures are mentioned.

* **Impact** 🡪 **which models?**

Climate impacts: Changes in climatic conditions are converted into a wide range of impacts (mostly direct impacts), **some of which** are translated into monetary terms

Economic impact: CGE methodology (GEM-E3-CAGE CGE model)- combination of a detailed sector structure of the economic system with an appropriate modelling of the markets for production factors (e.g. capital, labour, resources, and energy). It allows the comparison of heterogeneous climate impacts taking into account also the indirect effects occurring via the market system (analysis carried out only for 6 sectoral impacts)

* **Aspects EEA could profit from:** PESETA III could be useful to add data on the economic impact for the available sector:

Economic analysis:assessment of potential impact on welfare (expressed as consumption) due to six impact categories (residential energy demand, coastal floods, inland floods, labour productivity, agriculture and heat-related mortality) 🡪 i.e. comparison of Expected Annual Damage- EAD and Expected Annual number of People Affected- EAPA under different scenarios; impact on crop prices;

Monetary evaluation 🡪 does not include all sectors. The economic dimension of climate impacts only considers six sectoral impact (five impacts can be easily expressed in terms of welfare losses, so they can be compared with GDP. On the contrary, the health welfare losses are valued through the VSL (Value of Statistical Life), which is not a market effect.

Spill-over/transboundary analysis: estimate of the additional welfare impact in the EU associated to changes in trade flows due to climate impacts occurring in third countries associated to four impact areas (residential energy demand, river flooding, labour productivity and agriculture).

Now in EEA report it is part of a sub-chapter 6.3 “projected economic impacts of CC in Europe”🡪 PESETA II already mentioned

* **What could EEA add? What is missing in PESETA III?**
* EEA addresses more sectors/systems, generally more in detail compared to PESETA III. PESETA 🡪 No different chapters on Climate change impacts on environmental systems and Climate change impacts on social systems. Impacts on society and environment are mixed

Missing:

* More detailed spatial resolution (local/regional)
* Better understanding of extreme events (in EEA report there is a dedicated sub-chapter)
* Non-market climate impact areas (e.g. natural ecosystems, climate catastrophes, migration)
* Integration of various impact models (e.g. land-water-energy nexus)
* **New PESETA IV: news? Content/structure? When?**

The new JRC PESETA IV project addresses some of those research challenges (see “missing” points above). The project will intend to better capture the uncertainty from climate modelling, with **additional climate runs** beyond the five core models of JRC PESETA III, and also add the focus on 1.5ºC, 2ºC and higher warming levels (3ºC or 4ºC) and 2050, thus considering the temperature goals of the Paris agreement. **Three new impact areas will be included**: forest ecosystems, human health (both heat- and cold-related mortality) and windstorms. The river floods and coastal floods models will explore **adaptation measures**, including their costs and benefits; and **additional inter-sectoral links** will be considered. Communication issues (particularly to policymakers) will also receive particular attention.

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|  | **Reports** | |
| **Sector** | **PESETA III** | **EEA** |
| Coastal flood | * Considers sea level rise, high tides and storm surges * Projected economic damage + projected affected population * Adaptation mentioned | * Part of cc impacts on env. systems (sea level rise) 🡪 info on past trends + projections |
| River floods | * Does not consider pluvial and flash floods * Expected economic damages of river floods + expected population affected * Adaptation mentioned + risk if adaptation measures are not improved | * Part of cc impacts on env. systems (freshwater systems) 🡪 info on past trends + projections |
| Drought | * Soil drought risk * No economic evaluation, no adaptation info | * Soil moisture is part of cc impacts on env systems 🡪 past trends + projections |
| Agriculture | * Impacts on rain-fed agriculture * Impacts on irrigated agriculture * Economic impact included * No adaptation | * Indicators: water-limited crop yield, crop water demand |
| Energy | * Impact on heating and cooling demand * Adaptation mentioned | * Focus on heating and cooling degree days * Also focuses on electricity production and energy infrastructure |
| Transport | * Airports, seaports, inland waterways while PESETA II roads and rail. * Three climate hazards: coastal flooding, river flooding and droughts * Adaptation mentioned | * Road, rail, water-borne, aviation * Extreme events: Heat waves, cold spells, heavy precipitations, snowfall, storms/winds |
| Water resources | * Average flows, low flows and groundwater + Water Exploitation Index * Adaptation mentioned |  |
| Habitat loss | * Change in the extent of the Mediterranean climate zone * Change in the extent of the arid climate zone * Change in Natura 2000 zones * Adaptation mentioned | - |
| Forest fires | * Vegetation moisture * Forest fire danger * No adaptation scenarios modeled but adaptation mentioned (literature review) | - |
| Labour productivity | * Impacts under the high emission scenario * Impacts under the 2°C scenario * Adaptation mentioned |  |
| Mortality due to heatwaves |  | -Extreme temperatures and health |

## IPCC WG II AR5/AR6:

**Key messages/recommendations:**

* The IPCC WGII report has a more general aim, not only focusing on risk from the economic perspective. It also covers sectors more widely compared to PESETA III.
* Adaptation plays a key role in the AR5 report 🡪 also in AR6 each chapter will mention adaptation options
* The AR5 Europe regional document (and consequently the AR6 one) does not go in depth in the description of impacts. This type of information can serve as a starting point which needs to be expanded through other studies.
* **Data Sources:**

Climate changes scenarios: Representative Concentration Pathways (RCPs). WGI AR5 is based primarily on results from the RCP CMIP5, WGII AR5 also uses results from the SRES CMIP3

Five Shared Socioeconomic Pathways (SSPs): link of each RCP’s climate path to a range of human development pathways. They include: (1) storylines, which are descriptions of the state of the world; (2) IAM quantitative variables (such as population, gross domestic product (GDP), technology availability); and (3) other variables, not included in the IAMs, such as ecosystem

productivity and sensitivity or governance index.

* **Data Content (which sectors, which topics: risk, adaptation, economic evaluation?):**

Impacts on different sectors are defined through a literature review process

Wide range of sectors which cover physical, biological, and human systems.

**AR5**:

* Natural and Managed Resources and Systems and their use: Freshwater resources, Terrestrial and inland water systems, Coastal systems and low-lying areas, Ocean systems, and Food security and food production systems
* Human Settlements, Industry, and Infrastructure: Urban areas, Rural areas
* Human Health, Well-Being, and Security: Human health: impacts, adaptation, and co-benefits, Human security, and Livelihoods and poverty

**AR6:** The overall number of sectorswill decrease compared to AR5 (no rural areas, no human security, freshwater and terrestrial systems will be joined in one chapter). Each chapter on sectors in AR6 will focus on observed impacts and on projected, adaptation and mitigation responses and their interactions with sustainable development.

**Impacts:** in AR5 main impacts are assessed per sector and per region/subregion (southern, atlantic, alpine etc) 🡪 table 23-4 of regional document

**Risks:** key risks from climate change are identified

**Adaptation**: Adaptation options are only addressed in some sector chapters in the AR5 regional report. In the general AR6 document, adaptation options will be addressed in each sector chapter. In the AR6 regional documents adaptation might be addressed more in depth (“Diverse adaptation options including opportunities, enablers, limits, barriers, adaptive capacity, and finances” is one of the guidance points listed in the AR6 regional outline).

* **Europe regional chapter:** the number of pages of AR6 will be similar to AR5. In AR5, the chapter is structured around key policy areas and it summarizes the latest scientific evidence on sensitivity climate, observed impacts, projected impacts, and adaptation options with respect to:
* Production systems and physical infrastructure
* Agriculture, fisheries, forestry, and bioenergy production
* Health protection and social welfare
* Protection of environmental quality and biological conservation.
* **Aspects EEA could profit from**

The IPCC regional document on Europe could function as a first step to gather information on relevant sectors. Sector specific subchapters however are very brief; many sectoral impacts are not described through maps (EEA carried out a more in-depth analysis of the sectors. Therefore if EEA decides to keep the same approach IPCC regional information needs to be expanded through other documents).

Risk assessment is mentioned as part of the regional chapter in AR6 “Summary Table and/or figures with WGI and WGII information, combined with risk assessment (e.g., SREX SPM.1)”. Main risks per sector are already mentioned in AR5 🡪 however they were not identified through a quantitative risk assessment process

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| --- | --- | --- |
|  | **Reports** | |
| **Sector** | **IPCC AR5 Regional EU** | **EEA** |
| Production systems and physical infrastructure | * Settlements (Coastal flooding, River and Pluvial Flooding, Windstorms, Mass Movements and Avalanches) * Built environment * Transport * Energy Production, Transmission and Use * Industry and Manufacturing * Tourism * Insurance and banking | * In the EEA CCIV report there is a different distribution of these topics in different chapters.   EEA goes more in depth (i.e. tourism in EEA has two more detailed sections on summer and winter tourism) |
| Agriculture, Fisheries, Forestry, and Bioenergy Production | * Plant (Food) Production (A) * Livestock Production * Water Resources and Agriculture * Forestry * Bioenergy Production * Assessment of Climate Change Impacts on Ecosystem Services by Sub-region * Fisheries and Aquaculture |  |
| Health and Social Welfare | * Human Population Health * Critical infrastructure * Social impacts * Cultural heritage and landscapes |  |
| Protection of Environmental Quality and Biological Conservation | * Air Quality * Soil Quality and Land Degradation * Water Quality * Terrestrial and Freshwater Ecosystems * Coastal and Marine Ecosystems |  |
| Cross-Sectoral Adaptation Decision Making and Risk Management |  |  |

Suggestions: write major changes/updates between EEA reports both in content and approaches in bullet points or in a box (in other reports it is not very intuitive to spot what has been added or changed)

1. European Commission, 2014 and 2015; Havik et al., 2014 [↑](#footnote-ref-2)
2. Riahi et al., 2017 [↑](#footnote-ref-3)