

2016 EEA report on climate change, impacts and vulnerability - Project Plan -

WORK IN PROGRESS – FOR INTERNAL USE ONLY

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Introduction

What is this project plan about?

This project plan outlines the approach to developing, delivering and disseminating the 2016 EEA report on climate change, impacts and vulnerability (2016 CCIV report). This report will provide a comprehensive overview of climate change and its impacts on environment and on society in Europe. It will also shortly present the state of adaptation in the EU and in EEA member countries. The report will be largely based on EEA indicators but it will also include relevant information that is not suitable for presentation in an indicator format. Publication of is foreseen for Q3/2016.

This project plan comprises three parts:

Part 1 – Background (i.e. what is the context, objective, format, audience, focus?)

Part 2 – Annotated outline (i.e. what is the content of the report?)

Part 3 – Project plan (i.e. what is the project set-up, who is involved, what are the tasks and what is the schedule?)

Annexes

1 – Background

What is the context of the 2016 CCIV report?

EEA, in collaboration with other organisations, has so far published three indicator-based reports on climate change and impacts in Europe (CCIV) with a frequency of every 4 years (2004, 2008 and 2012). EEA plans to publish a new CCIV report in 2016, with most content work being done in 2015.

The target audience of the 2012 CCIV report¹ were decision-makers in EU institutions and in EEA member countries, both at national and subnational level, who are (potentially) involved in the development and implementation of climate change adaptation policies. The report also addressed the wider policy arena (e.g. political advisers, NGOs, journalists) and the scientific realm.

The main objectives of the report were to:

- present observed and projected climate change and its impacts on the environment and society (including relevant uncertainties) through indicators;
- identify sectors and regions most at risk;
- highlight the need for adaptation actions; and
- demonstrate how monitoring and research can improve the knowledge base.

The 2012 CCIV report contained very broad information and indicators on (see Figure 1):

- climate change (atmosphere, cryosphere);
- climate impacts on environmental systems (oceans and marine environment, coastal zones, freshwater systems, terrestrial ecosystems and soil);
- climate impacts on economic sectors (agriculture, forestry, fisheries, energy, transport, tourism) and on human health.

The 2012 CCIV report did not directly cover climate change adaptation, which was covered in the separate EEA Report *Adaptation in Europe*² published in April 2013, covering a range of examples of adaptation actions in practice and the initial EU policy context. Furthermore in 2014 EEA published a report on *National adaptation policy processes in European countries*³. This was the first comprehensive and consistent overview of adaptation policies in European countries, and prepared based on a questionnaire ('self-assessment') to countries. Since its launch in March 2012, EEA maintains and updates (jointly with DG CLIMA) the Climate-ADAPT platform, which provides information for policymakers on adaptation strategies and actions in Europe. Finally, in 2015 EEA intends to publish technical reports on 'national adaptation platforms' and on 'monitoring, reporting and evaluation'. All these EEA products provide complementary information relevant for the main target audiences, but each with a different focus.

¹ <http://www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012>

² <http://www.eea.europa.eu/publications/adaptation-in-europe>

³ <http://www.eea.europa.eu/publications/national-adaptation-policy-processes>

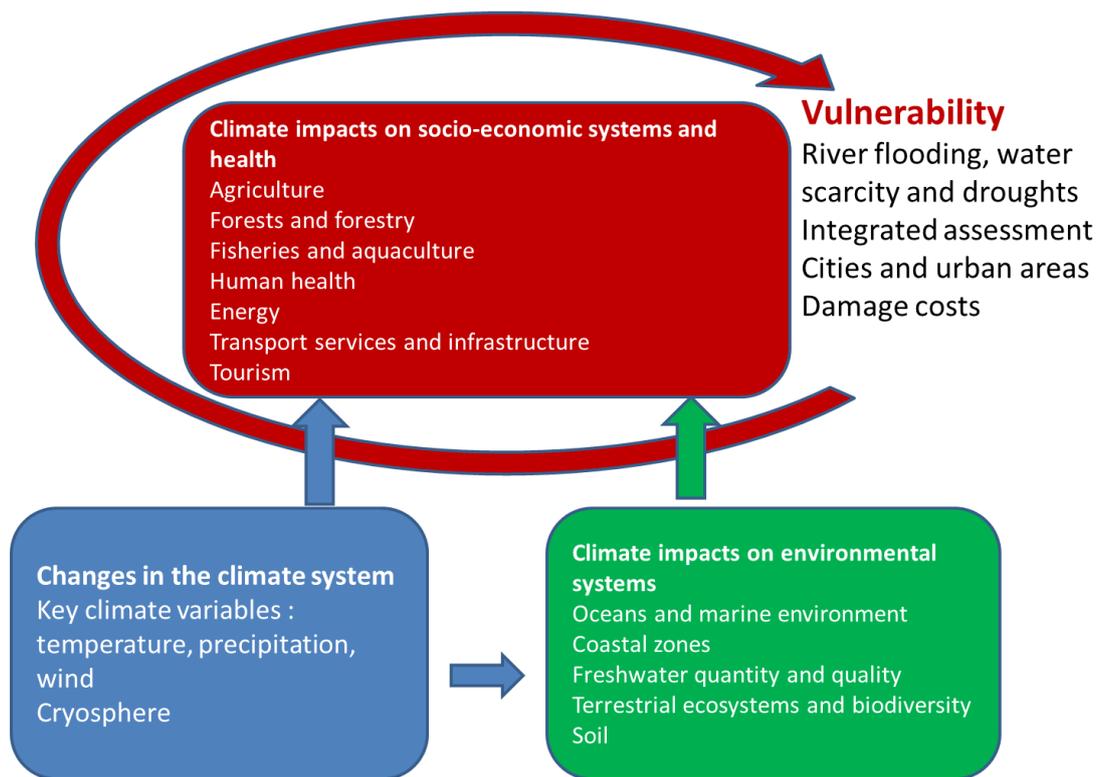


Figure 1. Basic structure of the 2012 CCIV report. EEA indicators cover the following main groups: changes in the climate system, climate impacts on environmental systems, and climate impacts on socio-economic systems and health.

The 2012 CCIV report is 300 pages long and includes more than 100 maps and figures. It is based on 42 indicators from the CLIM indicator set that were published in parallel to the report (see Annex). These indicators were managed by 8 EEA project managers from the ACC⁴ and NSV programmes (with support from the IEA programme). The report also includes a significant amount of policy-relevant information that is not suitable for presentation in an indicator format. Many organisations and experts with a wide variety of expertise and experience contributed (in total almost 100 authors and contributors), including JRC, WHO Europe, ECDC and various ETCs (CCA, ICM, BD). The development of the report was supported by an Advisory Group composed of stakeholders from the Commission, EEA Scientific Committee, key contributing organisations and projects, and selected other experts.

What are key past and planned developments regarding adaptation policy?

In 2013 the Commission published the EU Adaptation Strategy Package⁵, which consists of the *EU Strategy on adaptation to climate change* /*COM/2013/0216 final*/ together with several Commission Staff Working Documents and other documents. The strategy as well as these documents include many references to the EEA 2012 CCIV report. The strategy encourages countries to adopt national adaptation strategies and it aims to improve the knowledge base and to promote adaptation in key vulnerable sectors. Furthermore the 7th Environment Action Programme (7EAP)⁶

⁴ All references to EEA programmes and groups reflect the EEA organogram as of 1 January 2015.

⁵ http://ec.europa.eu/clima/policies/adaptation/what/documentation_en.htm

⁶ Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet', <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D1386>

also mentions adaptation relevant objectives. About half of the EEA member countries had by then adopted national adaptation strategies and several also national adaptation action plans. The EU strategy mentions that the Commission will perform a review in 2017 assessing whether action being taken in the Member States is sufficient. The European Commission (DG CLIMA) has indicated to EEA that an Impact Assessment will be performed in 2016/2017 as input to the foreseen review. As one input to this process EEA has planned the 2016 EEA CCIV report, which is mentioned in our MAWP and AWP2015.

Who are key partners for preparing the report?

As discussed in July 2014 (at JRC, Ispra), EEA and JRC regard their work as complementary with various synergies. EEA aims to provide in the 2016 report an overview of both past and projected impacts based on a range of literature sources. JRC focused in the various PESETA projects of the past on key projected impacts through scenarios that are covered by their own models. For various themes of the EEA report JRC could provide contributions based on the PESETA projects and other work, in particular in the areas of their specific expertise (soil, forests, agriculture, floods, and droughts). Discussions with JRC are planned to be held early 2015 on the exact scope of their contributions.

WHO Europe and ECDC will, as for the previous reports, be requested to provide their relevant information (e.g. related to heatwaves and communicable diseases). The collaboration went well for the previous reports. Discussions with WHO Europe and ECDC are planned to be held early 2015 on the exact scope of their contributions.

The EEA member countries are also regarded as key partners. Various countries have recently prepared or are preparing national climate change impact, vulnerability or risk assessments. For developing the EEA 2016 report we aim to learn from country experiences and expertise. Furthermore as a lesson learnt from previous reports various countries are interested to use similar types of indicators as being used by EEA in its reports. This can lead eventually to use of similar methods and data and thus to improved comparability of the indicators at national level, across Europe.

What are the main scientific developments regarding climate change impacts?

The expected complementarity and added value of the EEA report compared to the much more comprehensive global IPCC Fifth Assessment Report⁷ (AR5; WGI: scientific basis and WGII: impacts, vulnerability and adaptation) is as follows:

- Focusing on Europe (the chapter on Europe in the WGII report of IPCC is rather short)
- Combining a few key indicators on physical climate change with a range of indicators on impacts, as well as information on vulnerability, in one assessment report
- Providing easily accessible and understandable information through indicators (IPCC tends to provide information in complex language, which is also understandable due to their mandate and role).

IPCC focuses much (e.g. in the WGI report) on the latest knowledge on attribution of observed trends to human induced climate change. On this aspect the IPCC is the most authoritative and up to date

⁷ <http://www.ipcc.ch/report/ar5/>

information source and therefore EEA does not cover this aspect in its reports, including the planned 2016 CC IV report, but refers to IPCC.

What are the main data sources for the 2016 report?

None of the 42 indicators covered in the 2012 CCIV report (see Annex) is based on EEA priority data flows, and only 2 of them present data at the national level: the indicator “heating degree days” uses information from Eurostat, and the indicator “floods and health” uses information from the EM-DAT International Disaster Database⁸ communicated via WHO. Most other indicators present information in a higher spatial resolution, typically in the form of maps.

The primary information source on observed and projected changes in the climate system are international databases and initiatives whereby data is sometimes aggregated specifically for EEA. The primary information source on observed and projected impacts of climate change are European institutions (e.g. JRC, ECDC) and European research projects. In most cases it would not be possible to collect and aggregate country level information due to the high spatial resolution required and/or a lack of comparability.

What will be the format of the 2016 CCIV report?

The 2016 CCIV report will be published in A4 format containing text, tables, graphs, maps and possibly pictures. The target length is 240 pages (including references and annexes), compared to 300 pages in the 2012 CCIV report. A summary will be published separately.

The shortening compared to the 2012 CCIV report shall be achieved by stricter page limits for individual indicator assessments (though differentiated depending on the policy relevance and the amount of information available), and by selectively dropping or merging some indicators, based on the criteria policy relevance, data availability and complementarity to information available elsewhere. Furthermore, those parts of the introduction that is easily available from other sources, such as the IPCC Fifth Assessment Report, shall be shortened. ACC4 will discuss these ideas together with colleagues within EEA (in particular in NSV) as well as with important external contributors (e.g. ETCs, JRC and WHO) and eventually with the Advisory Group.

What is the link between the printed report and web-based indicators?

The links between the printed report and the web-based indicators were very close for the 2008 and 2012 CCIV reports, which allowed using the same “production line” for the two different output formats. These two lines have already separated to some degree, in particular related to the update frequency and the software used for producing graphics. Any discussion on further differentiation between the printed report and the web-based indicators needs to consider the resource requirements associated with it.

⁸ <http://www.emdat.be/>

What are the main changes compared to the 2012 CCIV report?

<i>From the 2012 CCIV report to the 2016 CCIV report</i>	
These elements stay the same ...	These elements differ ...
<p>Comprehensive climate change report</p> <p>– The 2016 CCIV report will continue to provide relevant information on observed and projected changes in the climate system as well as their impacts on environment and society in order to support adaptation planning at European and national levels.</p>	<p>Focus on most policy-relevant information</p> <p>– Each indicator will be reviewed with respect to technical aspects (e.g. information availability and quality) but also with respect to its relevance for policy-makers.</p>
<p>Indicator-based report</p> <p>– The 2016 CCIV report will continue to be largely based on indicators of climate change and its impacts on environment and society in Europe. The established indicator set underlying this report will largely remain.</p>	<p>More information beyond indicators</p> <p>– The indicator set will be revised in an attempt to shorten it somewhat and to make it more policy-relevant. Furthermore the 2016 CCIV report will provide more information that does not fit within the indicator format, such as case studies on important regional impacts, a review of European level vulnerability assessments, a synthesis of adaptation policy developments and a synthesis of relevant research activities.</p>
<p>Printed report and web-based indicators</p> <p>– The 2016 CCIV report will continue to be published as a printed report, and the underlying indicators will continue to be published on the EEA website.</p>	<p>More frequent indicator updates</p> <p>– Up to 2012, the indicators covered in the CCIV reports were updated every four years when a new report was published (with the exception of one CSI). Half of the indicators underlying the 2012 CCIV report have already been updated online because relevant new information has become available since 2012.</p>

The table above gives a brief overview of what stays the same and what changes in the 2016 CCIV report, compared to its predecessors. Further information on the main changes is presented below:

1. Re-establish links between climate change impacts and adaptation policy

The 2016 CCIV report shall include a limited coverage of adaptation policy. Since EEA already published an extensive report on national adaptation policies in 2014 and in addition EEA will cover the topic monitoring, evaluation and reporting at national level extensively in a 2015 technical report, the 2016 CC IV report will only need to cover changes in countries and EU policies since 2014. Furthermore regarding EU sectoral policies most information is already available on Climate-ADAPT. Still the 2016 CC IV report should start with a brief overview of adaptation policy development at the EU and national level, which builds largely on the recent EEA reports and information in Climate-ADAPT on those topics. Additionally, the sector-based chapters should include some more

information on the consideration of climate change adaptation in sectoral policy-making than was done in 2012, also building on information available in Climate-ADAPT.

2. Refocussing and reducing the underlying indicator set

As part of the preparation of the 2012 CCIV report a full analysis of the underlying indicator set was done, based on a comprehensive list of criteria. The assessment process and the results are described in more detail in an ETC-CCA Technical Paper.⁹ This established indicator set shall be moderately revised in line with evolving policy needs, stakeholder feedback and scientific progress, considering also the goal of reducing the total length of the 2016 CCIV report, compared to the 2012 CCIV report.

In a few cases, new indicators may be added to reflect increased policy concern and/or improvements in the information base. The overall aim is arriving at a reasonably comprehensive but concise set of indicators that score sufficiently high regarding policy relevance on the one hand and data quality and availability on the other.

Once the Copernicus Climate Change Service (C3S) is operational in the 2016/2017, EEA's role in providing indicator-based information about changes in the physical climate system is expected to diminish very significantly because this is a key activity of C3S. Furthermore there could be opportunities for collaboration on future assessment reports which may even be joint, with e.g. C3S focusing on the physical climate change indicators and EEA on impacts and vulnerability. However the development of C3S needs to be seen the coming years and possible collaboration with EEA needs to be discussed before drawing premature conclusions. In any case this is not yet relevant for the 2016 CCIV report.

3. Improved presentation of information related to extreme weather and climate events

Extreme weather and climate events (e.g. floods, droughts and heat waves) are key drivers of climate change impacts and an important trigger for national and local adaptation policies. However, coverage of these events and their impacts in previous EEA CCIV reports was limited. Furthermore, relevant information was distributed across the reports, which were structured based on systems component thinking. For example, information on droughts is available in the 2012 CCIV report in the chapters on the climate system (meteorological droughts), freshwater systems (hydrological droughts), soil (agricultural droughts) and agriculture (agricultural and socio-economic droughts), and vulnerability (economic effects). Options for improving the coverage of information related to extreme weather and climate events in the CLIM indicator set and the 2016 CCIV report will be discussed at a dedicated expert workshop in the first quarter of 2015 (organized by ACC4). Furthermore work is ongoing to improve the indicator(s) on the economic and health impacts of climate-related disasters.

4. Expanded information on climate change impacts and vulnerability beyond indicators

Not all information that is relevant for the development of climate change adaptation policies can be presented in formal EEA indicators. Furthermore, the standard format of indicators tend may not be attractive for all readers. Hence we would like to expand the reporting of non-indicator-based

⁹ http://cca.eionet.europa.eu/reports/TP_2-2013

information on climate change impacts and vulnerability in two ways. First, selected relevant information about climate impacts on specific systems and sectors should continue to be included even if it does not fit into the indicator format. Particular focus will be on illustrative case studies and other information that is regarded appealing for the target audience. The amount of such information could be increased compared to the 2008 and 2012 CCIV reports. Second, a review of new European level vulnerability assessments (e.g. follow-up PESETA, CLIPC-C, possibly new ESPON Climate, IMPACT2C) are proposed to be presented in a dedicated chapter.

5. Improved coverage of relevant EU research and of knowledge gaps

“Bridging the Knowledge Gap” is one of the actions of the EU Adaptation Strategy, and 35% of the research budget of Horizon 2020 is earmarked for climate-change related research. At the same time the EEA has agreed to be part of an Environmental Knowledge Community on Adaptation. We plan to improve coverage of activities to address the knowledge gap through increased monitoring and research, following further discussion with DG RTD and other stakeholders. One concrete example is including again an overview of relevant EU-funded research projects, possibly including key results (as in the 2008 CCIV report).

2 – Annotated draft outline

An annotated draft outline of the 2016 CCIV report is presented below. Some adjustments may be made over the coming months as a result of further discussions with EEA colleagues, external contributors and the Advisory Board.

Annotated draft outline of the 2016 EEA CCIV report			
Title of chapter / section ¹⁰	EEA coordinator, ETC-CCA coordinator and non-ETC contributors	Main (proposed) changes compared to 2012 EEA CCIV report, indicators ¹¹ and regional case studies	Pages
Executive Summary	Hans-Martin Füssel (ACC4)		4
Technical Summary			12
1. Introduction			20
• Purpose and scope	Hans-Martin Füssel (ACC4)		
• Changes compared to the 2012 report	Hans-Martin Füssel (ACC4)		
• Links to other EU and EEA activities	Hans-Martin Füssel (ACC4)		
• Adaptation policies in Europe	Stephane Isoard (ACC4)	New section	
2. Changes in the climate system			30
• Human influence on the climate system	Hans-Martin Füssel (ACC4)	More information on trends and projections related to extreme weather and climate events	
• Atmosphere	Hans-Martin Füssel (ACC4) JRC-IES?	CLIM001: Global and European mean temperature CLIM003: Temperature extremes CLIM002: Mean precipitation CLIM004: Heavy precipitation (indicator changed) CLIM005: Storms	
• Cryosphere	Hans-Martin Füssel (ACC4) / Mikael Hilden (SYKE)	CLIM010: Arctic and Baltic Sea ice CLIM009: Greenland and Arctic ice sheets¹² (indicator changed) CLIM007: Glaciers CLIM008: Snow cover CLIM011: Permafrost (indicator discontinued)	
3. Climate change impacts on environmental systems			45
• Oceans and marine environment	Johnny Reker (NSV4)	Merged with former sections on fisheries CLIM013: Sea surface temperature CLIM043: Ocean heat content CLIM044: Ocean acidification <i>CLIM0xx: Oxygen content (tbd)</i> (potential new indicator) CLIM014: Marine phenology (key information kept in text box) CLIM015: Distribution of marine species (indicator changed by including information on fish species)	

¹⁰ Titles in *italics* indicate that the section title and/or scope is still under discussion

¹¹ Indicators in **bold** are included in the (revised) EEA Core Set of Indicators

¹² The exact scope of the (new) Core Set Indicator on cryosphere is still under discussion

• Coastal zones	Hans-Martin Füssel (ACC4)	CLIM012: Global and European sea-level rise <i>Regional sea-level rise in Denmark (tbc)</i>	
• Freshwater systems	Wouter Vanneuville & Peter Kristensen (NSV2) JRC-IES	CLIM016: River flow CLIM017: River floods CLIM018: Meteorological and hydrological droughts (indicator changed) CLIM019: Water temperature CLIM020: Lake and river ice cover (key information kept in text box)	
• Terrestrial ecosystems	Hans-Martin Füssel (ACC4) / Andreas Marx (UFZ) JRC-IES	Merged with former sections on soil and forests CLIM029: Soil moisture CLIM027: Soil organic carbon CLIM028: Soil erosion (key information kept in text box) CLIM023/025: Plant and animal phenology (merging of two indicators) CLIM022/024: Distribution of plant and animal species (merging of two indicators) CLIM034: Forest growth (key information kept in main text) CLIM035: Forest fires <i>SEBIO11: Impact of climate change on bird populations (tbd)</i> <i>SEBIO10: Invasive alien species in Europe (tbd)</i> (potential new indicators in CCIV report) CLIM026: Species interactions (key information kept in main text)	
4. Climate change impacts on society and economy			40
• Agriculture	Hans-Martin Füssel (ACC4) / Jörgen Olesen (Aarhus U) JRC-IES	CLIM030: Agricultural growing season CLIM031: Agrophenology CLIM032: Water-limited crop productivity CLIM033: Irrigation water requirement <i>The Austrian Mostviertel (Source: MACSUR)</i>	
• Energy	Hans-Martin Füssel (ACC4) / Andrea Bigano (CMCC)	CLIM045: Heating degree days <i>Impacts of variability in runoff on thermal power generation (Source: ToPDAd)</i>	
• Transport	Hans-Martin Füssel (ACC4) / Ángel Aparicio (UPM)	<i>Rain extremes and their impact on public transport in Zürich (Source: ToPDAd)</i>	
• Tourism	Hans-Martin Füssel (ACC4) / Andrea Bigano (CMCC)	<i>Decreasing reliability of winter snow cover in Alpine and Nordic ski tourist areas (Source: ToPDAd)</i>	
• Human health	Hans-Martin Füssel (ACC4) / Markus Leitner (EAA) WHO ECDC JRC-IES	<i>CLIM046: Floods and health</i> (indicator may be changed, expanded and/or moved to section on disaster impacts) CLIM036: Extreme temperatures and health CLIM006: Air pollution by ozone and health (indicator likely not included in the report, but key information kept in main text) CLIM037: Vector-borne diseases	
• Disaster impacts	Wouter Vanneuville (NSV2) / Jaroslav Mysiak (CMCC)	<i>New separate section (links/overlaps with section on human health to be further discussed)</i> <i>CLIMxxx: Number of extreme weather events</i> (potential new indicator) CLIM039: Damages from weather and climate-related events	

5. Europe's vulnerability to climate change¹³			30
• <i>European mega-trends</i>	Tobias Lung (IEA2)	New section on demographic, socio-economic and other non-climatic megatrends relevant for Europe	
• Cross-border impacts of climate change	Tobias Lung (IEA2) ACC FWC?	New section on the effects on Europe of climate change impacts happening outside Europe	
• Pan-European vulnerability assessments	Tobias Lung (IEA2) / Mikael Hilden (SYKE) JRC?	New section reviewing key European-wide climate change vulnerability assessments	
• Regional vulnerability assessments	SNE (ACC4) / Mikael Hilden (SYKE)	New section reviewing key climate change vulnerability assessments in European regions	
• Climate risks in urban regions	Birgit Georgi (ACC4)		
6. Strengthening the knowledge base			15
• Indicator and data needs	Andre Jol (ACC4)		
• Copernicus Climate Change Service	Andre Jol (ACC4)	New section describing the current state and planned development of the C3S	
• <i>European research projects¹⁴</i>	Hans-Martin Füssel (ACC4)	Placeholder for a potential new section providing an overview of key EU research projects; alternatively selected projects could be asked to provide text boxes throughout the report (e.g. on regional case studies)	
7. References			30
Annexes	Hans-Martin Füssel (ACC4)		15
• Abbreviations and acronyms			
• Emission and socio-economic scenarios			
• Uncertainty in observations and projections			

¹³ In the context of this (tentative) chapter title, the term *vulnerability to climate change* is to be interpreted in an integrative manner, as in the UNFCCC and in the IPCC Third and Fourth Assessment Reports.

¹⁴ Depends on further discussion with DG RTD

3 – Project setup and schedule

1. EEA programmes preparing the 2016 CCIV report

The 2016 CCIV report will be an EEA “Cross-Programme project” (also known as “Type 4” project) coordinated by ACC4. Important internal contributions will be provided by NSV1, NSV2, NSV3 and NSV4 and by IEA2; lesser contributions may be provided by ACC1 and ACC3. Various external organisations will also provide important contributions. More detailed information is provided below sorted by organisation. Furthermore, an EEA coordination group is proposed, whereby the exact composition still needs to be decided. This coordination group is suggested to meet every 2 months in order to provide oversight of the progress of the work and to give advice if and how the project plan would need to be adjusted.

EEA project leader

- Hans-Martin Füssel (ACC4)

EEA coordination group

- Hans-Martin Füssel and Andre Jol (ACC4)
- Ivone Pereira Martins (NSV1)
- Beate Werner (NSV2)
- Andrus Meiner (NSV3)
- Trine Christiansen (NSV4)
- Teresa Ribeiro (IEA2)
- Brendan Killeen (COM1)
- Sigfus Bjarnason (EDO1/OSE0)

EEA authors and contributors

The tasks of EEA content contributors include:

- preparing draft sections of the report, including figures and maps;
- participating in contributors’ meetings;
- coordinating and checking relevant thematic inputs from external experts (where relevant);
- ensuring consistency and avoiding overlaps with related thematic contributions; and
- addressing comments from the Advisory Group and from the Eionet consultation.

Detailed information on proposed EEA contributions is provided in Annex C.

Overview of meetings

Regular contributors meetings will be organised, chaired by Hans-Martin Füssel and Andre Jol (ACC4). Participants include EEA content contributors, other EEA colleagues when relevant, selected ETC experts and possibly some experts from other organisations. The aim is to obtain a shared understanding of the objectives, scope, content and progress of the report, to discuss draft sections and to agree on actions to improve their quality. Meetings with individual contributors will be scheduled on an ad-hoc basis as needed.

The following meetings are foreseen at EEA (see also the time schedule below).

- *Advisory group*: twice
- *Coordination group*: every two months
- *Full contributors meetings*: three times
- *Individual contributors meetings*: as needed

2. Other organisations contributing to the 2016 CCIV report

For the 2016 CCIV report we are seeking input and contributions from a similar wide variety of organisations as for the 2012 report.

ETCs

Regarding ETCs, contributions on the following themes are foreseen and planned in their respective Action Plans for 2015:

- ETC CCA: support to coordination, content input on physical climate change, terrestrial biodiversity and ecosystems (with ETC BD), impacts on economy and society, and cross-cutting vulnerability assessments
- ETC ICM: oceans and marine environment, coastal zones, freshwater systems
- ETC BD: terrestrial biodiversity and ecosystems, forests

ETC-CCA management

- Andreas Marx (UFZ; task manager)
- Mikael Hilden (SYKE; deputy task manager)

JRC

The 2008 CCIV report was published jointly with JRC and WHO, which took a lot of effort to achieve (e.g. needed approval of directors of both organisations). The 2012 CCIV report was published as an EEA Report only but both organisations contributed data and assessment texts to it, with JRC contributing to about a quarter of the indicators. EEA wishes to have a similar arrangement for the 2016 CCIV report agreeing with JRC on a contribution rather than having a joint report.

JRC has confirmed its willingness to contribute to this report. Peeter Pärt has been nominated to coordinate the JRC contributions, which will come primarily from JRC-IES. A meeting is planned with JRC to take place in April 2015 to discuss in detail the various potential contributions from potentially a range of JRC-IES groups and experts.

WHO, ECDC

For human health impacts good collaboration has been established in 2008 and 2012 with WHO (for health impacts of heat waves and floods) and with ECDC (for climate change impacts on communicable diseases). Both organisations have agreed at the Head of Program/Group level that this collaboration will continue in 2016.

Advisory Group

As for the 2012 CCIV report, an external advisory group of high-level experts will be established to provide advice regarding scope and content of the report. This group will consist of representatives from policymakers and from research, including the European Commission (DG CLIMA, RTD, ENV and JRC), EEA Scientific Committee, selected international and European organisations (including WHO and ECDC), key research projects, and several EEA member countries. Two meetings are foreseen, to be chaired by Hans-Martin Füssel and Andre Jol (ACC4).

The main tasks of the advisory group are to provide advice on:

- Scope, structure and content of the report
- Identify best available data sources
- How to address uncertainty throughout the report
- Proposals how to improve reports in future

Further information on the composition of the Advisory Group is provided in Annex B.

3. Software tools

We plan using the following software tools:

Authoring drafts

Draft sections of the 2012 CCIV report were authored in Word, primarily due to its general availability, advanced features for commenting and reviewing (“tracked change”) and the possibility for offline use. Individual contributions (chapters or sections) were created in separate Word documents based on a uniform template. At defined stages, these files were combined into a single document (by careful use of the “Master document” feature) for external review and/or editing. At the end, a single Word document containing the full report (including all references) was handed over to (former) OSEO for final layout (using Adobe InDesign). This procedure has generally worked well, and we suggest using the same procedure again for the 2016 CCIV report. We had also considered using the new SOER fiches management tool. However, conversations with users have suggested that this tool is more appropriate for creating “indicator-sized” contributions than for creating a comprehensive report, which requires several rounds of external review and editing as a single document. Notably, the fiches tool has been used for creating the individual fiches for SOER2015 but not for the Synthesis Report. We would welcome if some features of the fiches management tool (e.g. tracking changes, creating PDF files) could be implemented in the indicator management tool.

Reference management

The 2012 CCIV report was the first EEA report that used zotero for managing and formatting all (>1000) references for the printed report and (in a different format) for the web-based indicators. References were stored in a single structured database in the “cloud” that was accessible to all contributors. The same procedure is suggested for the 2016 CCIV report.

Exchange of documents

The preparation of the 2012 CCIV report was facilitated by a dedicated group and password-protected folder structure on the Eionet Forum¹⁵, which was used for the exchange of documents between contributors from EEA, ETC and other organisations. The same procedure is suggested for the 2016 CCIV report.

Indicator management and publication

Updates of all indicators included in the 2012 CCIV report were entered into the EEA indicator management system and were published online at the same date when the printed report was published. It was feasible to convert each indicator subsection of the printed report into an indicator specification and assessment using an (almost) standard procedure due to a consistent structure of the individual indicator sections and the use of the zotero reference management system. Manual adjustments were needed primarily for cross-references to figures, maps, tables and other indicators. The same procedure is suggested for the 2016 CCIV report. However, as indicated above, we would welcome if some of the features of the SOER fiches management tool (e.g. tracking changes, creating PDF files) could be implemented in the indicator management tool.

External review

Review of the various drafts of the 2012 CCIV report by the Advisory Board was done by sharing the full report as a Word and PDF file. For the Eionet review, the draft report was converted into a series of HTML documents that could be used by the “talkback consultation” tool developed by (former) OSE2. These conversion efforts were justified because this tool enables easy tracking and follow-up of the many (i.e. hundreds) comments received through the Eionet review.

Map production

The production of the >60 maps for the 2012 CCIV report (many of them with multiple panels) was done by an *intramural* EEA consultant using ArcGIS, with some support from ETC-CCA. In our experience, the recent use of *extramural* consultants for EEA map production has led to considerable delays and efficiency losses. Considering the large number of maps and the related efficiency requirements, we hope that map production for the 2016 CCIV report can again be done *intramural*.

Figure production

The production of most of the >50 figures for the 2012 CCIV report (many of them with multiple panels) was done by (former) OSE0 using Adobe InDesign. In some cases, complex figures from external “trusted” sources (e.g. IPCC) were reproduced as is. Since 2012, most figures in the indicators underlying the 2012 CCIV report have been converted to DaViz (using primarily *extramural* consultants) following considerable pressure from the IMS team. Considering the large number of figures and the related efficiency requirements, we would like to avoid that the figure production for the online indicators and the printed 2016 CCIV report uses separate production lines requiring separate quality control. We do not currently have a clear understanding whether DaViz figures can be exported easily into Adobe InDesign for producing high-quality figures for the printed report. If such an export was not possible, we would prefer using only InDesign for figure production. In well

¹⁵ http://projects.eionet.europa.eu/cc_ive_report

justified cases (e.g. for complex figures from trusted sources and/or where the underlying data is not readily available), we would again reproduce high-resolution figures from the original source.

4. Preparations undertaken to date

Indicator updates since 2012

Half of the 42 indicators included in the 2012 CCIV report have already been updated after publication of the report; updated assessments of several other indicators are currently being prepared (see Annex). The primary objective for these updates has been inclusion of new information, in particular from the IPCC Fifth Assessment Report (AR5). Furthermore, coverage of climate change (impact) indicators in the revised CSI has increased from one to four, which are updated on an annual basis. The update process also included a shift from static to dynamic figures (DaViz).

Stakeholder consultations

In 2014 we have invited stakeholder feedback on the 2012 CCIV report as well as the planned 2016 report through direct discussions with JRC, DG CLIMA and others as well as via two structured stakeholder elicitation. First, at the 8th Eionet workshop on Climate Change Impacts, Vulnerability and Adaptation on 24 June 2014 we organized a dedicated session on the 2016 CCIV report. This session was prepared by a background paper that helped structuring the discussion and gathering feedback.¹⁶

Second, considering the feedback from the Eionet workshop we designed an online stakeholder survey (together with the COM programme). Following the approval from SMT, this survey was sent to key stakeholders (Commission, NRCs for CCIVA, NFPs, country contacts in ministries through the former Adaptation Steering Group, international organisations, several European networks) in September 2014.¹⁷ This survey addressed the following topics:

- Use of the 2012 CCIV report
- Content and scope of the 2012 report
- Quality and comprehensibility of the 2012 report
- Content and scope of the planned 2016 report
- Format and preparation of the planned 2016 Report

We received 33 responses in total, including from 16 national governments. The feedback from this survey was very helpful for drafting this project plan and also for identifying potential members of the Advisory Group. Detailed information on the survey and the results is available in the (draft) summary report.¹⁸

Internal discussions

¹⁶ http://forum.eionet.europa.eu/nrc-climate-change-adaptation/library/workshops-meetings/2014-eionet-workshop-climate-change-impacts-vulnerability-and-adaptation/meeting-documents/eionet-workshop/2014.06.13-eionet_vr_assessments_final

¹⁷ <http://forum.eionet.europa.eu/nrc-climate-change-adaptation/library/collaborating-tools/user-survey-2016-cciva-report>

¹⁸ G:\ACC\1.4 Vulnerability & adaptation\1.4.1 CC & hazard indicators\2016 report\Survey_2016_results_summary.docx

In 2014 we have discussed the planning of the 2016 CCIV report and the expected contributions and responsibilities with all members of the coordination group and all EEA members of the project team. These colleagues have considered the expected contributions in the 2015 work planning of collaborating ETCs where appropriate. The HoPs of ACC, NSV and IEA have also been informed on the planning progress. Agreement on the general scope and content of the report was achieved in a meeting involving the project manager, the ACC4 HoG, the ACC HoP and the Executive Director in November 2014. An earlier version of this project plan has been discussed and agreed by SMT in December 2014.

Discussions with external contributors

Initial discussions on the scope and content of the report have been held in 2014 with key external contributors (JRC, WHO and ECDC) as well as with key stakeholders (DG CLIMA). NFPs and NRCs-CCIVA have been informed in an Eionet meeting as well as through the stakeholder survey. Further information on these consultations is provided above.

5. Further planning and time schedule of the report

The report shall be published in Q3/2016. The exact time schedule for the planned impact assessment and the review by DG CLIMA (2016/2017) is not yet clear. However it is expected that a meaningful contribution to the Commission process can be achieved with the proposed schedule through sharing final draft reports with DG CLIMA and through close cooperation with the authors of the Impact Assessment and the underlying Background Report, during the first half of 2016.

The project comprises five main phases, which are described in the table below.

Table – Time schedule for the project

2015	Phase	Milestone / Deliverable
Jan	Phase 1 – Project preparation	- Kick-off meeting of ETC-CCA back-to-back with meeting of EEA contributors <i>(21 January)</i>
		- Draft project plan shared with internal and external contributors and key stakeholders (DG CLIMA, JRC, DG RTD)
		- Establish Advisory Group and send invitations
Mar		- Expert workshop on extreme climate and weather events <i>(18-19 March)</i>
		- First meeting of Advisory Group <i>(26 March)</i>
Apr	Phase 2 – Prepare first draft report	- Meeting at JRC (Ispra) <i>(foreseen in period 13-23 April)</i>
		- Final list of indicators and of all new/changed figures
		- Finalize project plan (including final list of experts)
		- Second contributors meeting <i>(28 April)</i> : template, references, treatment of uncertainty, etc.
May		
Jun		
Jul		
Aug		- Draft assessments and figures for all indicators <i>(14 August)</i>
		- Annotated outlines of other chapters
Sep		- First draft report sent to Advisory Group
Oct	Phase 3 – Prepare second draft report	- Second meeting of Advisory Group <i>(week of 5 Oct)</i>
		- Third EEA contributors meeting <i>(week of 26 Oct)</i>
Nov		
Dec		- Updated draft assessments and figures for all indicators (considering the comments from the Advisory Group)
		- Full text of all chapters (except summary)
2016	Phase	Milestone / Deliverable
Jan		- Second draft report sent for extended Eionet Review
Feb	Phase 4 – Prepare final draft report	
Mar		- Fourth EEA contributors meeting <i>(week of 7 March)</i>
Apr	Phase 5 – Production and publication	- Full report including summary (considering the comments from the Eionet Review)
		- Full report sent for language editing
May		- All Graphs and maps completed
Jun		- Full report sent for lay-out
Jul		
Aug		- Report laid out
		- Report approved by ED
		- Report sent for printing
		- Indicators finalized on the web
Sep		- Release of printed publication
		- Indicators published

Annex A – List of indicators

The table below shows all indicators included in the 2012 CCIV report, the date of the last update, and the indicator manager. 21 out of 42 indicators were updated in 2014 (shown in green), and 4 more are planned to be updated by early 2015 (shown in yellow).

CLIM code	Indicator name	Update	Indicator manager
001	Global and European Temperature	Aug-14	Blaz Kurnik
003	Temperature extremes	Aug-14	Blaz Kurnik
002	Mean precipitation	Aug-14	Blaz Kurnik
004	Precipitation extremes	Sep-14	Blaz Kurnik
005	Storms	Nov-14	Hans-Martin Füssel
008	Snow cover	Aug-14	Hans-Martin Füssel
009	Greenland ice sheet	Aug-14	Hans-Martin Füssel
007	Glaciers	Mar-14	Hans-Martin Füssel
011	Permafrost	Jun-14	Hans-Martin Füssel
010	Arctic and Baltic sea ice	Nov-14	Hans-Martin Füssel
043	Ocean acidification	Jun-14	Trine Christiansen
044	Ocean heat content	Aug-14	Trine Christiansen
013	Sea surface temperature	Mar-14	Trine Christiansen
014	Phenology of marine species	Nov-12	Trine Christiansen
015	Distribution of marine species	Nov-12	Trine Christiansen
012	Global and European sea level rise	Sep-14	Hans-Martin Füssel
016	River flow	Apr-14	Wouter Vanneuvillle
017	River floods	Nov-12	Wouter Vanneuvillle
018	River flow drought	Nov-12	Wouter Vanneuvillle
019	Water temperature	Nov-12	Peter Kristensen
020	Lake and river ice cover	Nov-12	Peter Kristensen
023	Plant and fungi phenology	Nov-12	Hans-Martin Füssel
025	Animal phenology	Nov-12	Hans-Martin Füssel
022	Distribution of plant species	Nov-12	Hans-Martin Füssel
024	Distribution and abundance of animal species	Nov-12	Hans-Martin Füssel
026	Species interactions	Jul-14	Hans-Martin Füssel
027	Soil organic carbon	Nov-12	Geertrui Louwaagie
028	Soil erosion	Nov-12	Geertrui Louwaagie
029	Soil moisture	Nov-12	Geertrui Louwaagie
030	Growing season for agricultural crops	Nov-12	Hans-Martin Füssel
031	Agrophenology	Nov-12	Hans-Martin Füssel
032	Water-limited crop productivity	Aug-14	Hans-Martin Füssel
033	Irrigation water requirement	Jul-14	Hans-Martin Füssel
034	Forest growth	Nov-12	Annemarie Bastrup-Birk
035	Forest fires	Nov-12	Annemarie Bastrup-Birk
046	Floods and health	Sep-14	Hans-Martin Füssel
036	Extreme temperatures and health	Sep-14	Hans-Martin Füssel
006	Air pollution by ozone and health	Nov-12	Alberto Gonzalez
037	Vector-borne diseases	Nov-12	Hans-Martin Füssel
047	Heating degree days	Nov-12	Hans-Martin Füssel
039	Damages from weather and climate events	Nov-12	HFÜ/Wouter Vanneuvillle

Annex B – Composition of Advisory Group

The lists below show the institutions and organisations represented in the Advisory Group for the report. A first meeting is scheduled for 26 March 2015; a second meeting is planned for October 2015.

EEA and related organisations

- European Environment Agency
- EEA Scientific Committee
- European Topic Centre on Climate Change impacts, vulnerability and Adaptation
- European Topic Centre on Biological Diversity

European Commission

- DG Joint Research Centre
- DG Climate Action
- DG Environment
- DG Research and Innovation (tbc)
- DG Agriculture and Rural Development
- DG Health and Food Safety

Other European networks, organizations and projects

- World Health Organisation, Regional Office for Europe (tbc)
- European Centre for Disease Prevention and Control (not available 26 March)
- EPA Network – Interest Group on Adaptation
- ENCA – Interest Group on Climate Change Adaptation
- European Centre for Medium-Range Weather Forecasts
- EU and other projects: EURO-CORDEX, IMPACT2C, CLIP-C, IMPRESSIONS

Regional conventions and networks

- Arctic Monitoring and Assessment Programme
- Alpine Convention
- Carpathian Convention
- Council of the Baltic Sea States

EEA member countries

- Germany
- Spain
- Sweden
- United Kingdom (not available 26 March)

Annex C – EEA contributors and resource planning

This annex is not included in this version of the project plan.