

Using Key Type Measures to report climate adaptation action in the EEA member countries



Authors:

Markus Leitner (Environment Agency Austria (EAA), ETC/CCA), Thomas Dworak (Fresh Thoughts, ETC/CCA), Katie Johnson (Euro-Mediterranean Center on Climate Change (CMCC), ETC/CCA), Tiago Capela Lourenço (FCiências.ID, University of Lisbon, ETC/CCA), Wolfgang Lexer (EAA, ETC/CCA), Wouter Vanneville (European Environment Agency, EEA), Angelika Tamasova (European Environment Agency, EEA) and Andrea Prutsch (EAA, ETC/CCA),



Cover design: Image of the Rhine, Düsseldorf, Germany
Cover photo © Markus Leitner (Environment Agency Austria, EAA)
Layout: Markus Leitner

Legal notice

The contents of this publication do not necessarily reflect the official opinions of the European Commission or other institutions of the European Union. Neither the European Environment Agency, the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation nor any person or company acting on behalf of the Agency or the Topic Centre is responsible for the use that may be made of the information contained in this report.

More information on the European Union is available at <http://europa.eu>.

More information on the European Environment Agency is available at <https://www.eea.europa.eu/>.

More information on the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation is available at <https://www.eionet.europa.eu/etcs/etc-cca>.

Copyright notice

© European Topic Centre Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA) 2021

Reproduction is authorized provided the source is acknowledged.

ETC/CCA Consortium Partners: Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC), Czech Environmental Information Agency (CENIA), Klima-Bündnis - Alianza del Clima e.V. (Climate Alliance), Danish Centre for Environment and Energy – Aarhus University (DCE-AU), Environment Agency Austria (EAA), Accademia Europea di Bolzano (EURAC Research), FCIências.ID - Associação para a Investigação e Desenvolvimento de Ciências (FC.ID), Fresh-Thoughts Consulting GmbH (FT), Met Office for and on behalf of Secretary of State for Business, Energy and Industrial Strategy of the United Kingdom of Great Britain and Northern Ireland (Met Office), Environmental Assessment Agency (PBL), Finnish Environment Institute (SYKE), Thetis S.p.A. (Thetis), Helmholtz Centre for Environmental Research (UFZ), Vlaamse Instelling voor Technologisch Onderzoek (VITO), Stichting Wageningen Research, Wageningen Environmental Research (WENR)

DOI: [10.25424/CMCC/Using_Key_Type_Measures_to_report_climate_adaptation_action_in_the_EEA_member_countries](https://doi.org/10.25424/CMCC/Using_Key_Type_Measures_to_report_climate_adaptation_action_in_the_EEA_member_countries)

Suggested citation

Leitner M., Dworak T., Johnson K., Capela Lourenço T., Lexer W., Vanneuville W., Tamasova A. Prutsch A, (2021) “Using Key Type Measures to report climate adaptation action in the EEA member countries”: European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA) Technical Paper 2021/1. DOI: [10.25424/CMCC/Using_Key_Type_Measures_to_report_climate_adaptation_action_in_the_EEA_member_countries](https://doi.org/10.25424/CMCC/Using_Key_Type_Measures_to_report_climate_adaptation_action_in_the_EEA_member_countries)

European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA)
c/o Fondazione CMCC - Centro Euro-Mediterraneo sui Cambiamenti Climatici
V.le Berti Pichat 6/2
40127 Bologna, Italy
Web: <https://www.cmcc.it/>
Email: silvia.medri@cmcc.it

Contents

Acknowledgements	3
1 Executive Summary	4
2 Introduction and background.....	5
3 Assessment of reported information	9
3.1 Overview of information reported by EU Member States on Key Types of Measures.....	9
3.2 Reflections and preliminary conclusions.....	12
4 Towards the next reporting cycle.....	14
4.1 Main challenges.....	14
4.2 Factors that influence the efficiency of environmental monitoring and reporting	16
4.3 Options to overcome the identified challenges and increase reporting efficiency	17
4.4 What can we learn from others? The example of the draft Water Framework Directive Reporting Guidance.....	19
5 Discussion and conclusions	20
5.1 Recommendations for using the information reported in the KTMs.....	21
5.2 Recommendations for those providing information on KTMs.....	22
5.3 The impact of the Climate Law on adaptation reporting	22

Acknowledgements

The authors would like to thank Katie Johnson (CMCC, ETC/CCA) for her valuable comments and language check as well as Silvia Medri (CMCC, ETC/CCA) for the support to prepare this ETC/CCA Technical Paper.

1 Executive Summary

This report is about the use of Key Type of Measures (KTMs) to report on *actions and (programmes of) measures* for adaptation. The rationale, approach and added value were described in 2020 in an ETC/CCA report¹ and in 2021 tested as a voluntary element in the national adaptation reporting under the Energy Union Governance Regulation².

Eight EU Member States (Austria, Czechia, Denmark, Estonia, Germany, Hungary, Portugal and Slovakia) reported in total 228 KTMs in 2021. Measures were reported under each of the five categories of KTMs and eleven categories of Sub-KTMs (see Table 1: KTMs, Sub-KTMs and Specifications).

Although KTMs and Sub-KTMs have been reported, this does not provide insight into the progress in implementing these measures. The actors responsible for implementing measures might also be different than those at the national level, which is only partly coordinating. Therefore, not reporting KTMs does not indicate any lack of adaptation measures and/or adaptation implementation.

There might be adaptation actions occurring in other sectors, which are not being labelled as adaptation, e.g., sustainable agriculture or natural hazard management, because of reporting difficulties in detecting them, i.e., due to monitoring difficulties (autonomous adaptation, implicit adaptation, adaptation 'under cover'), and are consequently not reported as KTMs. Adaptation measures are taken at all governance levels, something that cannot be reflected in the national reporting on adaptation without excessive efforts for the moment.

The combination of the lack of a definition for what adaptation measures and actions are (and therefore a correct labelling) and the partial reporting (a limited number of countries, and for a limited number of measures) allows for the collection a 'good catalogue of examples', but does not give an indication of EU Member States' focus or priorities when it comes to adaptation actions and measures. Not only can the results not be extended towards all EU Member States or EEA member countries, but the information is also only a subset of all ongoing activities for these countries that reported. This catalogue of measures, described within the KTM logic, can be used for mutual learning, cross-fertilization and inspiration across countries. In addition, the structure can also help countries at different stages of the adaptation policy cycle to check if all relevant types of measures are used, for example ex-ante when identifying or assessing adaptation options before adopting a new adaptation policy such as a national or sectoral adaptation plan (NAP or SAP) or ex-post when evaluating a NAP or SAP.

So far, no EU Member States or EEA member country has come back to EEA claiming that the structure of KTMs and Sub-KTMs is incomplete or incompatible with the structure of their actions and (programmes of) measures. Therefore, it is suggested to keep the actual structure for the time being.

¹ Rationale, approach and added value of Key Type of Measures for adaptation to climate change (2020), <https://www.eionet.europa.eu/etcs/etc-cca/products/etc-cca-reports/rationale-approach-and-added-value-of-key-type-of-measures-for-adaptation-to-climate-change>

² <https://eur-lex.europa.eu/eli/reg/2018/1999>

2 Introduction and background

By April 2020, all EU Member States had a national adaptation policy in place³. In almost all EU Member States, the respective policy process started with the development of a National Adaptation Strategy (NAS), which was later followed by a National Adaptation Plan (NAP) and/or one or more Sectoral Adaptation Plan (SAP). Typically, both NASs and NAPs are multi-sectoral, integrated types of policies that cover a broad range of adaptation options, measures and actions and often target similar climate risks and consequential challenges. Despite these similarities, however, the policy documents are highly heterogeneous in the way they are organized and described across EU Member States. Examples of this heterogeneity can be found, for example, in the use of terms and taxonomies, their approach to impacts and vulnerabilities, structure, level of detail and prescriptiveness, the scope and definition of sectors, targets, and the governance levels and actor groups addressed as responsible for implementation.

In turn, this creates difficulties in developing an EU-wide common monitoring and reporting scheme, as well as for comparative studies, knowledge transmission and cooperation across countries. To tackle these challenges, the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA) was mandated to develop a common and integrative approach, namely Key Types of Measures (KTM) that allows for clustering of adaptation options and measures with the goal of enhancing comparability and the easing reporting procedures under the Energy Union Governance Regulation⁴.

A supplementary goal has been to support the further development of the European Climate Adaptation Platform – Climate-ADAPT⁵ and in particular the Adaptation Support Tool (AST)⁶, by providing a categorisation scheme that can be applied to the various adaptation options that are displayed there, enabling users to quickly retrieve information on relevant measures as well as to trace them back to NAS/NAP documents, when relevant.

Based on a preceding scoping study, the ETC/CCA developed a categorisation system of Key Type Measures (KTM), including attributes for further specification of actions and measures, in 2020⁷. The KTM approach was then applied for the first time in the national adaptation reporting under the Regulation on the Governance of the Energy Union and Climate Action in 2021.

This technical paper provides an initial assessment on the KTM that were reported by the EEA member countries, on a voluntary basis, under the Energy Union Governance Regulation⁸ and its specification in the implementing regulation⁹. It also discusses main challenges of reporting on KTM and options to overcome them in view of the next reporting cycle.

The concept of KTM was initially developed in 2012 for the Water Framework Directive (WFD) to simplify reporting – which met upon significant differences in the level of detail reported in 2010¹⁰ – and was

³ See EU Strategy on Adaptation to Climate Change under <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:82:FIN> and EEA Report No 6/2020 under <https://www.eea.europa.eu/publications/national-adaptation-policies>

⁴ Rationale, approach and added value of Key Type of Measures for adaptation to climate change (2020), <https://www.eionet.europa.eu/etcs/etc-cca/products/etc-cca-reports/rationale-approach-and-added-value-of-key-type-of-measures-for-adaptation-to-climate-change>

⁵ <https://climate-adapt.eea.europa.eu/knowledge/adaptation-information/adaptation-measures>

⁶ <https://climate-adapt.eea.europa.eu/knowledge/tools/adaptation-support-tool>

⁷ Rationale, approach and added value of Key Type of Measures for adaptation to climate change (2020), <https://www.eionet.europa.eu/etcs/etc-cca/products/etc-cca-reports/rationale-approach-and-added-value-of-key-type-of-measures-for-adaptation-to-climate-change>

⁸ <https://eur-lex.europa.eu/eli/reg/2018/1999>

⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1208&from=EN>

¹⁰ 12800 basic measures were grouped into 26 KTM; <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=SWD:2019:30:FIN&qid=1551267381862&from=EN>

further advanced in 2014. KTM's were later also developed for reporting under the EU Floods Directive¹¹. Additionally, EU Member States used this reporting approach for measures under their Flood Risk Management Plans (FRMPs). Within rural development¹², measures are codified and divided in main- and sub-measures and EU Member States are obliged to use a KTM codification to report progress on implementation and budgetary spending.

One of the main desired advantages of KTM's for adaptation is the improvement of the quality of reporting, both in terms of the reported information and the user/reporter experience. In turn, more harmonized reporting, increased relevance and usability of reported data and clearer outputs are expected to support the enhancement of adaptation policy making, implementation and monitoring at the EU-level and consequently at the level of the EU Member States.

In parallel, efforts to structure different policies and measures (PaMs) have been taken on for climate change mitigation. There it is mandatory to report on metadata, such as the type of policy instrument, impacted Union policy, affected sectors and objectives, by choosing the appropriate attributes from a pre-defined list. To facilitate mutual learning, the results are analysed in EEA reports and briefings¹³ and can be accessed in an online EEA viewer¹⁴ and database¹⁵, which allow for filtering in multiple ways and generating national reports with full details of each PaM.

Expected benefits of these approaches on KTM's and PaMs include, for example, the diminution of time spent on reporting in comparison to other possible approaches on reporting of actions and measures, greater ease of reporting with clearer and more homogenous procedures, and the creation of comparable monitoring data across EU Member States, allowing for the advancement of comparative reviews, research and knowledge sharing.

Adaptation plans (NAPs or SAPs) contain a wealth of relevant information and sets of measures and actions specific to the national (or sub-national) and/or sectoral context in a specific country. There are different typologies of measures, and varieties of approaches are used across countries, which makes it difficult to track and compare adaptation action between countries and to gain a coherent Europe-wide picture. Categorizing the diversity of measures and actions in each country by means of a common and straightforward taxonomic framework is a necessary pre-condition for being able to map, capture and appraise the state of play of adaptation action at the EU level as well as for learning from what others are doing.

The main rationale behind the concept of KTM's for climate adaptation is thus the pursuit of a clear and effective reporting approach that can be systematically applied to adaptation options and measures described in national adaptation policies (NASs, NAPs, SAP).

¹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007L0060>

¹² Regulation (EU) No 1305/2013 or Regulation (EU) No 1303/2013 are coded under [Commission Implementing Regulation \(EU\) No 808/2014](#) of 17 July 2014 laying down rules for the application of Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).

¹³ latest full reporting cycle 2019; <https://www.eionet.europa.eu/etcs/etc-cme/products/etc-cme-reports/etc-cme-report-5-2019-overview-of-reported-national-policies-and-measures-on-climate-change-mitigation-in-europe-in-2019>, <https://www.eea.europa.eu/publications/more-national-climate-policies-expected/more-national-climate-policies-expected>

¹⁴ <https://www.eea.europa.eu/themes/climate/national-policies-and-measures/national-policies-and-measures-on-1>

¹⁵

http://pam.apps.eea.europa.eu/?source=%7B%22track_total_hits%22%3Atrue%2C%22query%22%3A%7B%22match_all%22%3A%7B%7D%7D%2C%22display_type%22%3A%22tabular%22%2C%22sort%22%3A%5B%7B%22Country%22%3A%7B%22order%22%3A%22asc%22%7D%7D%2C%7B%22ID_of_policy_or_measure%22%3A%7B%22order%22%3A%22asc%22%7D%7D%5D%2C%22highlight%22%3A%7B%22fields%22%3A%7B%22*%22%3A%7B%7D%7D%7D

Table 1 presents the KTM for adaptation that have been used in the reporting under the Regulation on the Governance of the Energy Union and Climate Action in 2021.

Table 1: KTM, Sub-KTM and Specifications¹⁶

KTM	Sub-KTM ¹⁷	Specifications
A: Governance and Institutional	A1: Policy instruments	<ul style="list-style-type: none"> • Creation / revision of policies • Creation / revision of (implementing) regulations
	A2: Management and planning	<ul style="list-style-type: none"> • Mainstreaming adaptation into other sectors • Creation / revision of technical rules, codes and standards
	A3: Coordination, cooperation and networks	<ul style="list-style-type: none"> • Creation / revision of ministerial coordination formats • Creation / revision of stakeholder networks
B: Economic and Finance	B1: Financing and incentive instruments	<ul style="list-style-type: none"> • Creation / revision of incentive mechanisms • Creation / revision of funding schemes
	B2: Insurance and risk sharing instruments	<ul style="list-style-type: none"> • Creation / revision of insurance schemes and products • Creation / revision of contingency funds for emergencies
C: Physical and Technological	C1: Grey options	<ul style="list-style-type: none"> • New physical infrastructure(s) • Rehabilitation, upgrade and / or replacement of physical infrastructure(s)
	C2: Technological options	<ul style="list-style-type: none"> • Early warning systems • Hazard / risk mapping • Service / process applications
D: Nature Based Solutions and Ecosystem-based Approaches	D1: Green options	<ul style="list-style-type: none"> • Creation of new / improvement of existing green infrastructure • Natural and / or semi-natural land-use
	D2: Blue options	<ul style="list-style-type: none"> • Creation of new / improvement of existing blue infrastructure • Natural and / or semi-natural water and marine areas management
E: Knowledge and Behavioural change	E1: Information and awareness raising	<ul style="list-style-type: none"> • Research and innovation • Communication and dissemination • Decision support tools and databases
	E2: Capacity building, empowering and lifestyle practices¹⁸	<ul style="list-style-type: none"> • Identification and sharing of good practices • Training and knowledge transfer • Reporting on lifestyle practices and behaviours

¹⁶ Rationale, approach and added value of Key Type of Measures for adaptation to climate change (2020), <https://www.eionet.europa.eu/etc/cca/products/etc-cca-reports/rationale-approach-and-added-value-of-key-type-of-measures-for-adaptation-to-climate-change>

¹⁷ Several of the Sub-KTMs have different names in the reporting system, based on earlier thinking, whereas in this report, the authors followed the structure of the published report on Key Types of Measures. While the differences are minor, in the reporting system (ReportNet3) the following Sub-KTMs were named differently: A1: Policy, A3: Coordination and cooperation, B2: Insurance and transfer instruments, C1: Physical, C2: Technological, D1: Green, D2: Blue. All other names for Sub-KTMs were exactly as in this table.

¹⁸ E2 in this table was split into E2 and E3 in the reporting system (ReportNet3). The splitting of E2 and E3 was a remaining item in the system, based on earlier thinking and in this report, the authors followed the structure of the published report on Key Types of Measures. All measures reported under E2 and E3 are shown as E2 in this report.

This assessment of reporting on adaptation actions and measures as KTM is performed at the EEA level and is not intended to compare the KTM reported by EU Member States. It seeks to provide an initial reflection on the challenges and opportunities of using KTM to report on national (and sub-national) adaptation measures and options. In practice, the reporting consisted of a table marked 'voluntary' where countries could report zero, one or multiple records; one for each reported KTM. When reporting a KTM, providing a title, selecting a KTM, Sub-KTM and specification (see Table 1), and a short description of the measure was then a 'mandatory' field. In addition, further optional fields allowed selecting the related climate threats and sectors affected, the implementation status of the measure, the administrative level of implementation, plus free text fields to report the cost of the measure and a weblink.

The assessment of reported information in this report focuses on the 'mandatory' information and here in particular on the classification (for the KTM and Sub-KTM level). The information reported for the optional fields does not allow a further assessment at this stage.

3 Assessment of reported information

3.1 Overview of information reported by EU Member States on Key Types of Measures

The following information is based on information provided by EU Member States via their reporting under the national adaptation actions of the 2018 Regulation on the Governance of the Energy Union and Climate Action. Additional details of the reporting are specified in an implementing regulation¹⁹. By 15 March 2021, and every two years thereafter, EU Member States shall report to the Commission information on their national adaptation actions.

As part of this obligation, EU Member States and EEA member countries²⁰ had the opportunity to report, on a voluntary basis, on actions and (programmes of) measures according to the KTM scheme detailed in Table 1. As of August 19, 2021, eight EU Member States (Austria, Czechia, Denmark, Estonia, Germany, Hungary, Portugal and Slovakia) reported in total 228 KTMs in 2021. Measures have been reported under each of the five categories of KTMs (A-E) and 11 categories of Sub-KTMs (A1-E2).

The total number of KTMs reported by each of the eight EU Member States varies greatly. KTMs reported range from 135 KTMs reported for Austria (59.2% of reported KTMs) down to one KTM for Denmark (0.4%). Germany reported 31 KTMs (13.6%), Hungary reported 28 (12.3%), Portugal reported 21 (9.2%), Slovakia reported five (2.2%), Estonia reported four (1.8%), and Czechia reported three (1.3%). When looking at the following figures, this heterogeneity in the number of KTMs reported by eight EU Member States must be kept in mind in order not to derive misleading conclusions.

Of the 228 Key Types of Measures reported in 2021, the majority, 37%, are reported for category *E: Knowledge and behavioural change*, followed by 29% for *A: Governance and Institutional measures*. 16% of KTMs are for *C: Physical and technological measures* and 14% are for *D: Nature based solution and ecosystem-based approaches* (see Figure 1). Only 4% of KTMs are focused on *B: Economic and Finance*.

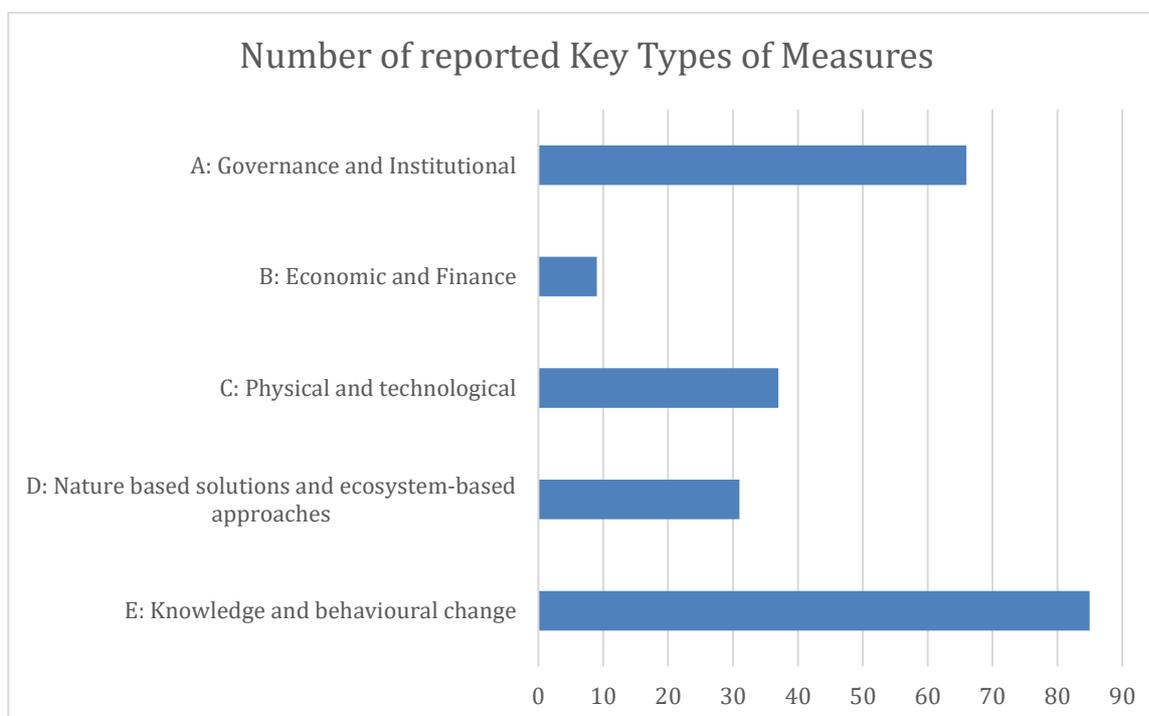


Figure 1: Number of KTMs reported by EU Member States in their 2021 reporting

¹⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1208&from=EN>

²⁰ There were no voluntary submissions on KTMs from non EU Member States at the cut-off date for this report, which was August 19, 2021.

Not only does the number of reported KTMs vary for each of the eight EU Member States, but the number of measures related to each KTM category also differs between countries. The following table shows, which of the eight EU Member States reported on which KTM category (see Table 2).

Table 2: Overview of KTMs reported by EU Member States in alphabetical order

Country	KTM A	KTM B	KTM C	KTM D	KTM E
Austria	x	x	x	x	x
Czechia	x	x			x
Denmark	x				
Estonia			x		x
Germany	x		x	x	x
Hungary	x		x	x	x
Portugal	x	x	x	x	x
Slovakia	x				

Denmark and Slovakia reported only on KTM A, while the other six countries provided measures for several KTM categories. Only Austria and Portugal reported measures for all five KTM categories; Germany and Hungary reported measures for all categories excluding KTM B. All countries except for Estonia reported measures for KTM A. Austria, Czechia and Portugal reported measures for KTM B. Five of the countries reported measures for KTM C, and four countries reported measures for KTM D. Six of the countries reported measures for KTM E.

Czechia reported measures for KTM A, KTM B and KTM E, with one third of the measures in each category. Estonia reported measures for KTM C (50%) and KTM E (50%). In Austria and Hungary, the majority of measures are on KTM E, and in Germany, Portugal, Slovakia and Denmark most measures are on KTM A²¹.

Within each of the five categories of KTMs (A-E) there are further specifications for 11 Sub-KTMs (see Table 1). The numbers of Sub-KTMs reported by the eight EU Member States are shown in Figure 2.

In terms of numbers of Sub-KTMs, within A: *Governance and Institutional* most refer to A2: *Management and Planning* and only a few Sub-KTMs refer to A1: *Policy instruments*, and to A3: *Coordination, cooperation and networks*.

Under KTM B: *Economic and Finance*, with a limited number of measures reported under this KTM overall, very few Sub-KTMs refer to B1: *Financing and incentive instruments* and a few to B2: *Insurance and risk sharing instruments*.

Within C: *Physical and technological*, a bigger number refers to Sub-KTM C2: *Technological options* and a few to Sub-KTM C1: *Grey options*.

Under KTM D: *Nature based solutions and ecosystem-based approaches*, the order of magnitude of measures under the different Sub-KTMs is comparable, with a few more Sub-KTMs that refer to D1: *Green options* than to D2: *Blue options*.

²¹ However, the ratio between the different KTMs per country does not automatically reflect key adaptation choices, but is heavily dependent on the governance structure (and the responsibilities of the national level in particular) and makes comparisons between countries not relevant based on the information available today.

In E: Knowledge and behavioural change, most refer to E1: Information and awareness raising, but also E2: Capacity building, empowering and lifestyle practices is tagged for a significant fraction of the measures under KTM E.

Most Sub-KTMs reported are E1: Information and awareness raising directly followed by A2: Management and Planning (E1 and A2 each represent about 20% of the reported Sub-KTMs). The third most reported Sub-KTM was on E2: Capacity building, empowering and lifestyle practices followed by C2: Technological options. These 4 out of 11 categories of Sub-KTMs represent more than two-thirds of the reported measures.

The lowest number of Sub-KTMs reported are for B1: Financing and incentive instruments, B2: Insurance and risk sharing instruments, A3: Coordination, cooperation and networks and C1: Grey options. These 4 out of 11 categories of Sub-KTMs represent less than one-eighth of the reported measures (see Figure 2).

Given the limited number of countries that reported KTMs, and the large differences in the number of KTMs reported per country, the above can not be used for generalised conclusions but should be kept in mind when looking at the relative numbers per country below.

Similar to the KTMs, the number of measures related to each Sub-KTM also differs for each of the eight countries.

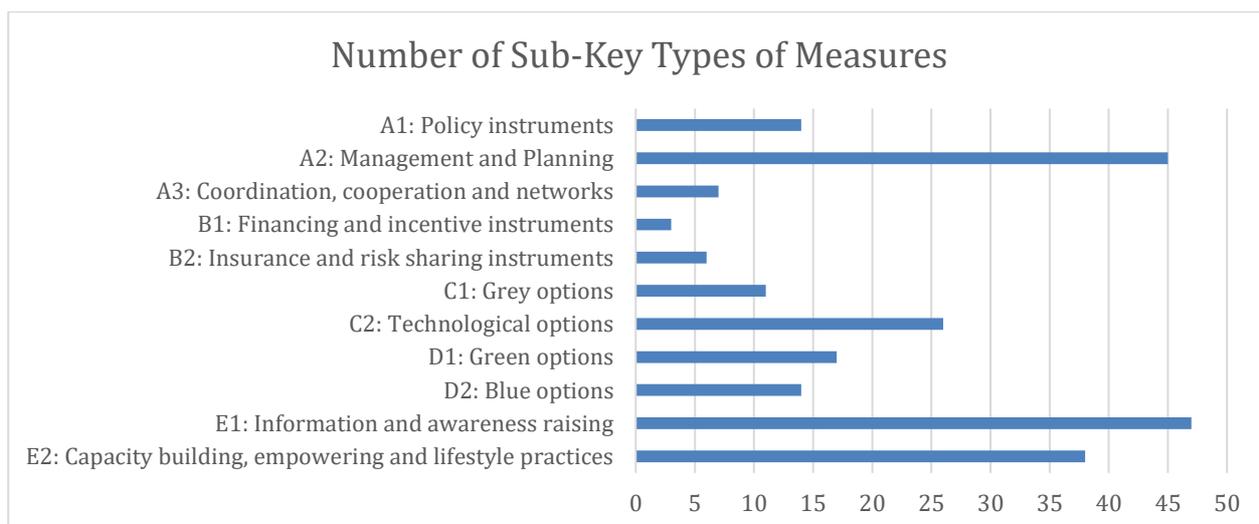


Figure 2: Numbers of Sub-KTMs reported by EU Member States in their 2021 reporting

Denmark reported on one Sub-KTM (A2), Slovakia reported on two (A1, A2), and Czechia and Estonia both reported on three. Hungary reported on seven Sub-KTMs, Germany and Portugal reported on nine, and Austria reported on all 11 Sub-KTMs.

All except for Slovakia and Denmark reported measures on Sub-KTM E1. All except for Czechia and Estonia reported measures on Sub-KTM A2. All except for Denmark and Estonia reported measures on Sub-KTM A1.

Measures reported for Sub-KTM A2 were the highest for Austria, Denmark, Germany and Portugal. For Czechia, an equal number of measures were reported for each of the three Sub-KTM categories addressed. For Slovakia, most measures were on A1 (80%). For Hungary, most measures reported were on E2 (>50%). Half of the measures reported for Estonia were on C2.

Austria was the only country to report on Sub-KTM A3. Austria and Czechia were the only two to report on B1, and Austria and Portugal were the only two to report on B2. All other Sub-KTM categories had at least three of the countries reporting measures.

These numbers (see Figure 3) do not reflect the distribution of measures in adaptation plans (NAPs or SAPs), and small numbers of additionally reported measures already change the picture presented for most countries.

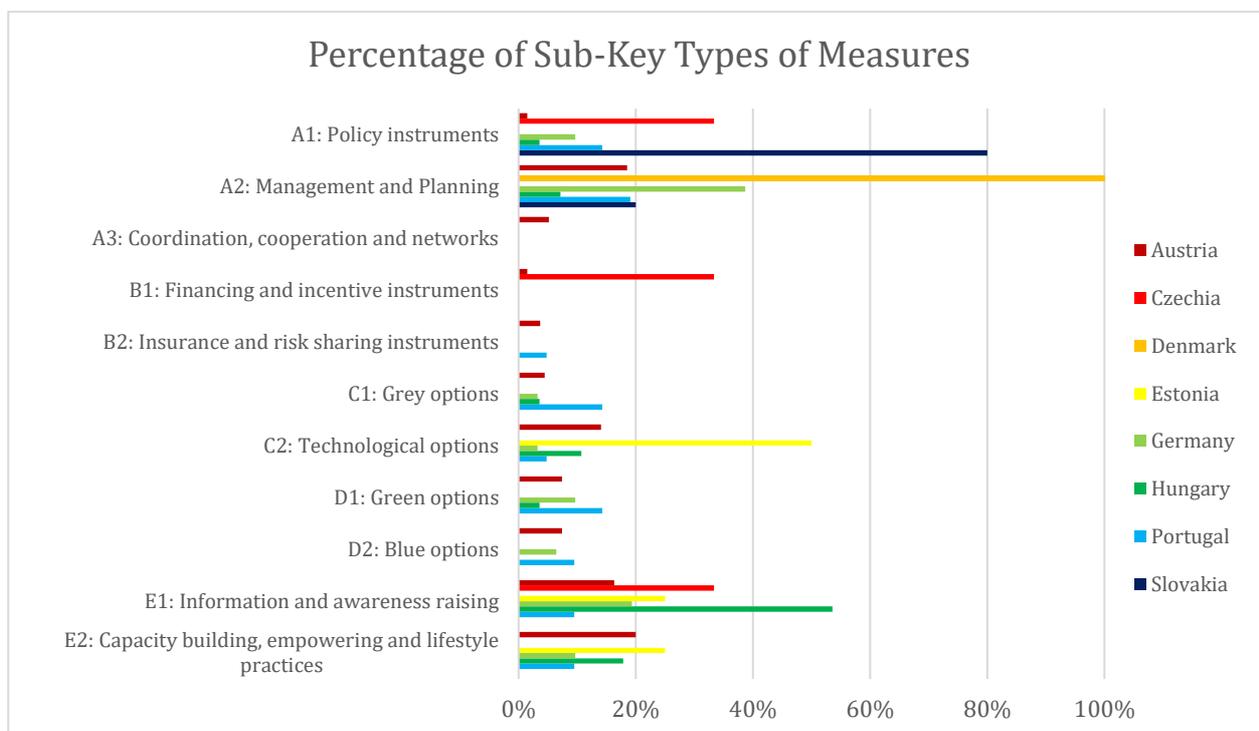


Figure 3: Percentage of Sub-KTMs reported by EU Member States in their 2021 reporting

3.2 Reflections and preliminary conclusions

Acknowledging that the data provided by eight EU Member States are not representative, neither for an EU wide picture nor for all EEA member countries, nevertheless some observations can be derived from the reported KTMs and Sub-KTMs:

- The highest percentage of KTMs are in *E: Knowledge and behavioural change*; within this KTM, both Sub-KTMs *E1: Information and awareness raising* and *E2: Capacity building, empowering and lifestyle practices* are in the top three of reported measures.
- Several KTMs focus on *A: Governance and Institutional*; within this KTM, the main Sub-KTM is *A2: Management and Planning* (two-thirds) while *A3: Coordination, cooperation and networks* is rarely reported as a Sub-KTM and the only Sub-KTM reported by only one country.
- KTM *C: Physical and technological* are reported less often, with more Sub-KTMs on *C2: Technological options* than *C1: Grey options*.
- *D: Nature based solutions and ecosystem-based approaches* were reported as the fourth most KTM, with a slight dominance of Sub-KTM *D1: Green options* over *D2: Blue options*.
- A very low percentage of KTM *B: Economic and Finance* was reported, with few Sub-KTMs on *B2: Insurance and risk sharing instruments* and even fewer on Sub-KTM *B1: Financing and incentive instruments* were reported.

A few preliminary conclusions or learnings from the first reporting cycle in 2021 can be drawn:

- As shown in chapter 2, eight out of 27 EU Member States reported KTM on a voluntary basis, which is at least a starting point to get a first impression of measures.
- The level of detail for each KTM, Sub-KTM, Specification and Short description of the Measure/Action was provided by all eight EU Member States.
- The information requested when reporting on KTM also refers to the climate threats, sectors affected and status of the KTM. This information was less frequently reported and could not be analysed in a quantitative way.
- In addition, the administrative level of implementation as well as the costs for implementation²² or the status of implementation of the KTM were hardly reported by EU Member States.
- It can generally be assumed that the required efforts in terms of work time vis-à-vis the availability of time resources on the part of the reporters were a barrier for reporting information that is voluntary at the moment. Also, adaptation reporting is more detailed than ever before and in a new system, which may increase the time and effort needed for doing the reporting exercise. Beyond that, it seems very likely that some of the more detailed information requested is either not available or challenging to obtain for the person in charge of reporting.
- When it comes to KTM C: *Physical and Technological*, the fewer number of measures reported may be due to the fact that (in particular for Sub-KTM C1: *Grey options*) the national level has a rather coordinating, initiating or financing role²³, and the ownership and implementation lies rather with the sub-national (or even local) level. The same would appear likely for KTM D: *Nature based solutions and ecosystem-based approaches*.
- Deriving more generalised conclusions from the reported 'actions and (programmes of) measures' (KTM) should be done very carefully, and a direct comparison or benchmarking between EU Member States is not at all possible.
- During the reporting process²⁴, from the opening of the system until publication of this report, no EEA member country came to EEA with a measure that does not fit in the proposed structure²⁵. One of the purposes of adding a table on "actions and (programmes of) measures" was to test the proposed categorisation. At this time, there is no indication that the structure of KTM, Sub-KTM and Specifications should be changed²⁶.

²² Information on the costs for adaptation measures across Europe is still missing, including the lack of a common framework of definitions and methods. EEA is working on this topic in a separate product planned for 2022.

²³ Setting these framework conditions at national level is then rather seen as part of KTM A than C or D.

²⁴ After 15 March 2021, the reporting on adaptation remained open and countries can at any point in time resubmit information to complement or replace previously reported data. Several of the KTM reported were provided in a resubmission after the reporting deadline until August 19, 2021.

²⁵ This is not the same as concluding that the structure is perfect, as this might also be the reason why countries did not report KTM at all or only a subset of the measures in their NAPs and SAPs. However, for the moment there is no reason to change the structure of the KTM and Sub-KTM.

²⁶ With the exception of merging E2 and E3 in the reporting system, as described above, to be in line with the structure proposed in the 2020 [methodological paper](#) again.

4 Towards the next reporting cycle

4.1 Main challenges

Based on the experience of KTMs reported in the first reporting cycle in 2021, challenges were identified in three main areas. These are challenges related to the 'Process and System', 'Resources' and 'Adaptation practice'. Certainly, there are overlaps between these areas of challenges and challenges are certain to differ between EU Member States.

- **Issues related to the reporting process and system**

Due to a rather late opening of the reporting system, ReportNet3²⁷, there was less time to report voluntary information compared to mandatory information. There was the option, e.g., to create supporting reporters, but this was not used widely because it also requires more coordination from the lead reporter(s) of the EEA member countries, which is connected to the issue of increased resources for reporting.

On the other hand, as the reporting on adaptation remains open permanently, countries can at any point in time complement the previously reported information, e.g., with voluntary fields like the KTMs. Several of the KTMs reported have been provided after the reporting deadline as part of a voluntary resubmission²⁸.

Due to the voluntary nature of the reporting on KTMs (*actions and (programmes of) measures*), less information was reported than for the mandatory sections. Additionally, the implementing regulation²⁹ does not explicitly refer to KTMs, but refers to the following section in the implementing regulation, namely "foreseen actions" under para- 3.3. and to "the status of implementation of measures planned under 3.3.-3.6." under para. 4.2.

The new reporting structure and functionalities, the complexity and maybe a lack of user friendliness of the ReportNet3-system; lacking explanations, e.g., on the import of multiline tables, as well as misinterpretations of content to be provided could have presented the reporters with challenges in providing the requested information. Guidance and work aid, such as 'Documentation and help for the 2021 reporting'³⁰ and 'Practical Information on reporting of Key Type of Measures for adaptation actions and measures'³¹ were available to the reporters, but other limitations may have contributed to abstaining from reporting on KTMs. Likely reasons may include that mandatory reporting has been prioritized over voluntary parts and that coordination and information searching were limited by time-constraints on the reporter side.

EU Member State representatives were only partly involved in the development of KTMs. Thus, the understanding of KTMs is open to interpretation and can vary greatly, depending on individual

²⁷ <https://reportnet.europa.eu/>

²⁸ After cross-reading the reported information, an EEA and ETC/CCA 'GovReg Team' provided information to all countries on a voluntary basis. The team did not perform a compliance check. KTMs were one of the elements in the spotlight in all country feedback to countries that did not already report KTMs by 15 March. EEA, seeing the importance on structuring information on measures for the implementation and monitoring, reporting and evaluation phase (MRE) of the adaptation policy cycle explicitly mentioned the plan to make an assessment of the reported KTM information for (mutual) learning purposes while repeating its voluntary nature.

²⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1208&from=EN>

³⁰ Adaptation Reporting - Documentation and help.pdf — Eionet Portal (europa.eu) - <https://www.eionet.europa.eu/reportnet/docs/govreg/adaptation/adaptation-reporting-documentation-and-help.pdf/view>

³¹ Practical_Instruction_Adaptation_KTM_Reportnet3_2021.pdf — Eionet Portal (europa.eu) - https://www.eionet.europa.eu/reportnet/docs/govreg/adaptation/practical_instruction_adaptation_ktm_reportnet3_2021.pdf/view

interpretation of the reporter and/or the person providing the data to the reporter (in particular at the level of the titles of KTMs and sub-KTMs³²).

- **Issues related to resources in the EU Member States / EEA member countries**

Most reporting obligations place burdens on EU Member State authorities and the European Commission. These burdens, while relatively small in relation to the overall impact of the legislation, are still significant and of concern to EU Member State authorities³³.

Reporting is time-consuming if NAS / NAP / SAP measures or actions are not available in a format that can be easily transferred or translated into the KTM and Sub-KTM structure, and if the information is not available in English. Moreover, in many EU Member States no centralised system for collecting information on adaptation in certain sectors exists due to, e.g., a federal structure of the state system or lacking reporting obligation. Resources for bringing this scattered information together might be lacking.

It may also be the case that the person in charge of reporting does not have the knowledge or permission of other institutions to report on KTMs and Sub-KTMs. Thus, in such cases, vertical and horizontal consultation with other relevant actors would be needed, which is time-consuming or can be costly, if a contractor needs to be hired for that work-step.

The number of Key Types of Measures reported by each of the eight EU Member States varies greatly, depending in part on the individual interpretation of the reporter / personnel filling in the data, on the one hand, but also related to the way the NAS / NAP / SAP is being defined and structured, on the other hand.

The distribution of the measures over the different categories of KTMs and Sub-KTMs cannot be seen as an indication of a country's priorities as the reported information always remains a sub-set of all measures. The focus of the EU reporting is clearly on the national level, while adaptation measures are taken at all governance levels (probably with different distribution over the different KTMs). As regards mainstreaming at the national level, adaptation measures that are not an explicit part of the dedicated adaptation plans (NAS/NAP/SAP), but are planned on the sub-national level, can have a different distribution over the KTMs. Besides, including sectoral measures in the reporting would require a clear approach to tag measures as adaptation measures or adaptation-relevant measures, which until now is absent in most countries as well as at the European level.

Another issue refers to double reporting in different reporting streams. For example, many flood protection measures are also climate adaptation or adaptation-relevant measures and need to be reported under the Water Information System Europe (WISE), but may also be reported voluntarily under the KTMs for adaptation. To avoid creating unnecessary administrative burdens, KTM reporting adaptation is voluntary.

- **Issues related to the adaptation practise in the EU Member States / EEA member countries**

EU Member States and EEA member countries face challenges in providing information on KTMs due to the diversity of their NAS / NAP / SAP and the definitions therein. Further processing of available information to make it fit the KTM structure may thus be needed, which inevitably increases resources needed. As the reporting on KTMs is now focused at the national level, and the responsibilities of that governance level also differs from country to country, differences in the ratio between the different KTMs

³² The available documentation in theory reduces this window of understanding but needed to be consulted separately.

³³

https://ec.europa.eu/environment/legal/reporting/pdf/Reporting%20and%20monitoring/support_fitness_check_report.pdf

reported do not automatically reflect different choices on adaptation. The ratios between KTM are biased by the governance structure that makes comparisons between countries not relevant given the limited amount of information presently available.

EU Member States and EEA member countries categorize their respective adaptation measures and actions in different ways, e.g., as grey, green/blue and soft measures or actions, or they do not categorize them at all. Also, not every NAP / SAP has a list of measures or actions, and where available other sources could be used, making the KTM classification more challenging. Thus, the suggested structuring needs to be done by the reporter, and that is time-consuming and may not always work in an intuitive way. Even if countries have already monitored or evaluated their NAS / NAP / SAP, using quantitative or qualitative criteria or indicators, which are mostly combined with expert judgements³⁴, the monitoring and evaluation exercise may often not be structured in a way that can easily be translated into KTM categorisation, especially concerning the implementation of certain measures or actions.

The partial involvement of EU Member State representatives in the preparation of the KTM concept may have contributed to limitations in compatibility with the different forms of structuring of adaptation measures within the national policy documents (NAS / NAP / SAP).

- **Issues related to the state of play in the EU Member States / EEA member countries**

The combined observation from:

- a) a relatively high number of measures reported under *A2: Management and Planning*;
- b) a relatively low number of measures reported under *D: Nature based solutions and ecosystem-based approaches* and *C1: Grey options*;

and the fact that all EU Member States have a dedicated adaptation policy in place might indicate the need for more detailed information in the AST³⁵ (in particular for the steps 5 and 6, *Implementing Adaptation and Monitoring and Evaluating Adaptation*).

Monitoring and reporting are done throughout the full adaptation policy cycle³⁶. It is easier for a coordination body to keep track of progress during the planning phase of the policy cycle compared to the implementation phase. During implementation, the responsibilities for the development of different measures are distributed horizontally (thematically) and vertically (different governance levels), requiring a more developed MRE mechanism to keep track.

The lack of an MRE system capable of following the progress of measures in some countries, or the information being structured differently, might hamper the reporting of KTM. Future revisions of the AST³⁷ should primarily focus on sufficient and targeted links to Climate-ADAPT database items and additional resources that provide not only the methodological concepts for MRE, but also examples of good practice for different sectors/themes and different governance levels.

4.2 Factors that influence the efficiency of environmental monitoring and reporting

For reporting obligations to satisfy the objectives for which they have been designed, it is necessary for obliged entities to fulfil them, and for the data reported to be of sufficient quality and sufficiently up-to-date to serve the required purpose.

³⁴ https://www.eionet.europa.eu/etcs/etc-cca/products/etc-cca-reports/tp_3-2018

³⁵ <https://climate-adapt.eea.europa.eu/knowledge/tools/adaptation-support-tool>

³⁶ See, e.g., EEA Report 06/2020 Monitoring and evaluation of national adaptation policies throughout the policy cycle (<https://www.eea.europa.eu/publications/national-adaptation-policies>)

³⁷ <https://climate-adapt.eea.europa.eu/knowledge/tools/adaptation-support-tool>

Quality relates to both the accuracy and completeness of the data provided. Deficiencies in quality can result in incomparable data, prohibit EU level assessment, generate biased evidence, make enforcement more challenging and ultimately undermine the effectiveness of the reporting process. Timely data refers to data that is up-to-date both at the point of delivery and at the point at which it is required for decision-making³⁸. Fulfilling quality requirements has implications for the resources needed for reporting and thus directly relates to its efficiency.

Sub-factors that influence the above-mentioned issues are³⁹:

- The number of entities required to report: For some items of legislation, it may require thousands of different entities to report (e.g., communities), greatly increasing the administrative burden.
- The time taken to meet each reporting obligation: The time taken for reporting is influenced by a range of factors, such as content (e.g., level of detail), format (e.g., numerical, text or geospatial data) and the process (method of processing, transmission and analysis, and the degree to which this is automated).
- The frequency of reporting: The frequency of reporting – and the potential nonalignment with national cycles - is also a direct determinant of administrative burdens, as more frequent reporting increases the number of reports required and hence the time and cost involved.
- The hourly cost of time: The cost of time of, e.g., staff is also a major determinant of the costs of reporting.

These factors and their possible influence on resource needs and efficiency need to be outweighed by the benefits of reporting. This means that whatever is done with the reported information needs to create an understanding of what the data will be used for as well as a benefit to those who are reporting (EU Member States and EEA member countries) and to the receiver of the information (here the EU level, with an interest in the reported information from both European Commission DG CLIMA and EEA).

This is important to understand in order to ensure a better reporting in the next reporting cycle.

4.3 Options to overcome the identified challenges and increase reporting efficiency

In this chapter, we propose possible solutions related to the challenges and issues identified in chapter 4.1 Main challenges.

Reporting process and system

Generally, even if more time is available for reporting, the focus is naturally on reporting mandatory information rather than voluntary information.

Since several EU Member States reported for other voluntary tables/fields, it seems quite promising that the added value of reporting, like mutual learning, cross-fertilization and inspiration across EU Member States using KTM's will become more of a relevant issue in the coming years. This might also allow for the identification of areas where adaptation efforts are less developed.

³⁸

https://ec.europa.eu/environment/legal/reporting/pdf/Reporting%20and%20monitoring/support_fitness_check_report.pdf

³⁹

https://ec.europa.eu/environment/legal/reporting/pdf/Reporting%20and%20monitoring/support_fitness_check_report.pdf

Another issue refers to double reporting in different reporting streams. For example, a lot of flood protection measures are also adaptation-related measures and need to be reported under the Water Information System Europe (WISE), but also voluntarily under the KTMs for adaptation. Therefore, how to refer to information with a similar level of detail provided elsewhere needs to be further developed once more reporting flows become available in ReportNet3 and will automatically introduce new challenges (different thesaurus, harmonisation, creating reports, etc.)

Efficiency of reporting is expected to increase in the next reporting cycle in 2023, because the existing reported information and content is pre-filled, on the one hand, and due to the experience gained by reporters after the first reporting during 2021, on the other hand.

When discussing the changes to the dataflow for the 2023 reporting and the preparation of new reporting templates, there should be a joint reflection of the 2021 reporting experience between the reporters from EU Member States and DG CLIMA as well as EEA on KTMs. This could foster learning, ensure coherence and ease the technical process (e.g., import files). It can also improve the connectedness between the KTMs content and the key affected sectors reported.

In addition, guidance and support to reporters should be further improved in order to enhance understanding of the concepts and approaches so that more EU Member States and EEA member countries are likely to report on KTMs.

Resources in EU Member States / EEA member countries

EEA member countries can be encouraged to report on KTMs related to their key affected sectors. This information and knowledge can help others to derive measures and actions to deal with climate-related risks accordingly.

To further improve the concept of KTMs and highlight the benefit to reporters, there is the option to deliver trainings and guidance that can be delivered to the relevant actors who should report on KTMs during the next reporting cycle. The previously highlighted reflection with EU Member States representatives can ensure a more targeted categorisation.

Adaptation practise in the EU Member States / EEA member countries

There should be a joint reflection with EU Member States / EEA member countries reporters on the categorisation of KTMs and the way NAS / NAP /SAP measures can be best translated into the KTM categorisation scheme, acknowledging diversity across Europe and not aiming for completeness.

A more elaborated guidance on examples of KTMs and prefilled information serving for inspiration could help reporters for the next reporting cycle.

The suggested KTMs are not able to fully address the complex and integrated nature of adaptation and of its reporting needs. The KTM categorisation does not completely remove the difficulty that several adaptation options and measures can, in principle, fall within multiple categories and be described using multiple attributes. It will remain up to EU Member States to select the best suited category. Further, reporting KTMs and Sub-KTMs as such does not convey any information on the progress in implementing these measures. That is why information on the state of implementation should become a mandatory field, including preferably an estimation of implementation progress (e.g., in percent or on a qualitative scale).

Structuring *actions and (programmes of) measures* in a framework like the KTMs can be useful and beneficial to Member States when preparing (ex-ante) and evaluating (ex-post) their policies. There is no

need to cover all Sub-KTMs, but structuring the measures can open up the discussion if all instruments available are considered and used efficiently and effectively.

4.4 What can we learn from others? The example of the draft Water Framework Directive Reporting Guidance

Article 18 of the WFD requires the European Commission to publish assessment reports on the implementation of the Directive and to submit them to the European Parliament and to the Council. The assessment is based on information reported by EU Member States, comprising the published River Basin Management Plans (RBMPs) and accompanying documentation required according to Article 15. The RBMPs on which these assessment reports are based are comprehensive documents that cover many aspects of water management, consisting of hundreds to thousands of pages of information, published in national languages. The assessment of the RBMPs is a very challenging and complex task and involves dealing with extensive information in more than 20 languages. The quality of the European Commission's assessments relies on the quality of the Member States' reports⁴⁰. Poor or incomplete reporting has led to wrong and/or incomplete assessments and to "Pilot cases" between the European Commission and Member States. In order to overcome this shortcoming, the concept of KTMs and a voluntary reporting to WISE was developed in 2012 to simplify reporting under the WFD. It helped the European Commission to better understand the actions at the EU Member State level⁴¹.

Under the Energy Union Governance Regulation, the European Commission needs to prepare a climate action progress report⁴². However, this does not include an assessment based on all supporting documents, and does not specify which elements should be included. It is based on the reported information (normally in English), consisting of the mandatory and voluntary fields in the reporting on adaptation. As such, the European Commission has no strong lever to force EU Member States to report in accordance with the KTMs. A progress report mainly based on textual information will be qualitative in the sense of, e.g., descriptive, but might not bringing extensive added value at the EU level.

It could be discussed, if the future Climate Law or changes to the implementing regulation(s) of the Governance Regulation can support a harmonised reporting approach that can allow for a better EU wide reporting and assessment of KTMs, but also allow EU Member States to better understand what others are doing. Additionally, the Climate Law references other international reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC) in a more explicit way than the Governance Regulation⁴³.

⁴⁰ WFD Reporting Guidance 2022

⁴¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=SWD:2019:30:FIN&qid=1551267381862&from=EN>

⁴² where adaptation is only one out of several topics

⁴³ although the implementing regulation for the adaptation actions already considers the agreements reached in Katowice for future adaptation reporting. On adaptation, the Table of Content for the eight National Communication will remain the same as for the seventh National Communication so changes (and more detail will only come into force for the ninth National Communication). Due to different approaches and evolving ideas at Member State and European level, it is not possible to map links between reporting on adaptation at EU level to a separate Adaptation Communication and/or a more elaborated part on adaptation in the National Energy and Climate Plans at this point.

5 Discussion and conclusions

The main rationale behind current efforts to develop KTMs and report on them for adaptation is the pursuit of a clear and effective reporting approach that can be systematically applied to adaptation options and measures described in national adaptation policies, such as NASs / NAPs / SAPs, or in other adaptation-related policies at sectoral or sub-national territorial/administrative levels. As already stressed earlier in this report, national and regional “catalogues of measures and options” are structured or categorised in different ways due to EU Member States or EEA member countries governance structures, relevance of sectors and themes linked to priorities, its decentralized implementation and through the promotion of mainstreaming. However, experiences in other reporting areas have shown that the EU reporting requirements modify the existing structures in the long term. Common reporting schemes such as the one for the Water Framework Directive (WFD), which asked EU Member States to report along structured categories, allows for a better comparison of the situation in EU Member States but also allows for better EU level wide assessments.

In the next reporting cycle in 2023, reporting in general might be easier due to what should mostly be an update of existing reported information and content, on the one hand, and due to the experience gained from reporters after the first reporting during 2021, on the other hand.

Since many EU Member States reported information for other voluntary fields in ReportNet3, it seems quite promising that the added value of reporting, like mutual learning, cross-fertilization and inspiration across EU Member States and EEA member countries using KTMs will become more of a relevant issue in the coming years. This might also allow for the identification of areas where adaptation efforts are less developed.

Structured and EU wide agreed reporting schemes, such as they exist for the Water Framework Directive (WFD), the Marine Strategy Framework Directive (MSFD) and the Floods Directive (FD), allow an easier and more systematic assessment of the work on the EU Member States level and a better comparison across EU Member States. Adaptation options and measures as part of NASs and/or NAPs and/or SAPs are extremely heterogeneous in terms of detail and scope and can be highly influenced by, e.g., the dimension of a country, its governance and administrative set up, and its science-practice interfaces, which might make reporting on KTMs challenging.

Generally, a joint reflection of the 2021 reporting experience between the reporters from EU Member States / EEA member countries and DG CLIMA as well as EEA is needed, specifically on the categorisation of KTMs and the way NAS/NAP/SAP measures can be best translated into the KTM categorisation scheme, acknowledging diversity across Europe and not aiming for completeness. This can foster learning, ensure coherence and ease the technical process (e.g., import files).

To further improve the concept of KTMs and highlight the benefit to reporters, trainings and guidance can be delivered to the relevant staff that should report on KTMs during the next reporting cycle. The reflections with EU Member States / EEA member countries representatives can ensure a more targeted categorisation and increase the number of reported KTMs.

Further improved guidance and additional support to reporters can make the concepts and approach of KTMs clearer and more EU Member States / EEA member countries are likely to report on KTMs. A more elaborated guidance on examples of KTMs and prefilled information serving for inspiration might help reporters for the next reporting cycle.

EEA member countries can be encouraged to report on KTMs, if the connectedness between the KTMs content and the key affected sectors are reported. This information and knowledge can help others to derive measures and actions to deal with climate-related risks accordingly.

The suggested KTM categories are not able to fully address the complex and integrated nature of adaptation and of its reporting needs. The KTM categorisation does not completely remove the difficulty that several adaptation options and measures can, in principle, fall within multiple categories and be described using multiple attributes. It will be up to the EU Member States and EEA member countries to select the one that fits most.

Only when the reporting on the status and progress of measures at the national level, through horizontal and vertical governance mechanisms, is in place, will countries be able to provide that information to the European level without too much additional effort. Further streamlining and eventually modifying the KTM categories is not excluded but so far no request for changes to the structure of KTM categories, Sub-KTM categories and specifications has been made. Besides modifications to the structure, additional guidance can help countries to 'translate' their national MRE system into KTM reporting. Updating of the AST⁴⁴, including information from the reporting on KTM categories, should focus on the implementation and MRE step by providing targeted links (including examples of good practice).

5.1 Recommendations for using the information reported in the KTM categories

KTM categories, as they are currently defined, need to be understood as a catalogue with examples. Deriving conclusions from the reported "actions and (programmes of) measures" (KTM categories) that can be more generalised need to be done very carefully, and a direct comparison or benchmarking between EU Member States is not possible at all. Even if KTM categories are defined, the reported information can vary in terms of content and details provided.

KTM categories reported thus far serve for inspiration and there is certainly a big diversity of adaptation actions and measures taken at the EU Member States level. Only because an EU Member State did not report KTM categories or a low number of KTM categories does not mean that no or little work on adaptation is being performed. It also depends on whether an EU Member State has an, e.g., statutory requirement (e.g., climate act) or a more "voluntary" approach towards reporting requirements on measures. In addition, the governance of adaptation and a potential focus of mainstreaming of adaptation into different, e.g., sectoral policies can be a reason why fewer KTM categories are reported at the national level. Moreover, for those countries who reported KTM categories, the reporting result does not reflect the country's priorities. For any of them, it is a subset of all activities ongoing at the different governance levels, and for most of them, there are ambiguous methodologies to tag all measures that are adaptation-relevant.

Because reporting requirements are continuously developing as adaptation policies (e.g., NAS, NAP, SAP) evolve, the reported KTM categories will also evolve over time and there might be a need for modifying the KTM categories categorisation.

The picture presented in this report might change at any point in time as the reporting on adaptation remains 'open' and resubmission of information is possible at any time. To have the latest overview of the available measures, the Climate-ADAPT country profiles⁴⁵ are a source of information, as well as the detailed overview of the reporting per country⁴⁶.

To increase the usability of the information for practitioners dealing with adaptation measures, it would be good to map the KTM categories, Sub-KTM categories or even the specifications against the 59 adaptation options⁴⁷ currently used in Climate-ADAPT. Structured as green, grey and soft, those adaptation options have a focus on KTM categories C: *Physical and Technological* and D: *Nature based solutions and ecosystem-based Approaches*. KTM categories provide added value, in particular by splitting the soft measures over all 5 KTM categories and putting equal

⁴⁴ <https://climate-adapt.eea.europa.eu/knowledge/tools/adaptation-support-tool>

⁴⁵ <https://climate-adapt.eea.europa.eu/countries-regions/countries>

⁴⁶ <https://reportnet.europa.eu/public/dataflow/110>, available in the table 'ActionsMeasures'

⁴⁷ <https://climate-adapt.eea.europa.eu/knowledge/adaptation-information/adaptation-measures>

emphasis on the policy, economic and behavioural measures. KTMs are sector and hazard independent, while the adaptation options have additional filtering possibilities for different climate impacts and sectors, supporting practitioners looking for specific options dealing with the climate hazards of concern and/or for a specific economic sector. As the adaptation options are mentioned in each of the 103 case studies⁴⁸ on Climate-ADAPT, it would be useful if the KTMs were also mentioned here.

5.2 Recommendations for those providing information on KTMs

Learning from KTMs reported by others and the experience thus far on adaptation measures in the NAS / NAP / SAP, and the way in which this information is being categorised, can be valuable. In several countries, horizontal and vertical coordination includes reporting of measures (e.g., via Monitoring or Progress reports). Without looking at other countries for inspiration, the idea of structuring measures in a “taxonomy” is helpful during several stages of the adaptation policy cycle to evaluate if all relevant types of measures are used to the most effective and efficient level. Due to the wide variety of governance structures, traditions and approaches in countries, this does not require having all KTMs and/or Sub-KTMs covered for any NAS, NAP, SAP, regional adaptation plan etc.

Reporting without any detailed specifications and guidelines results in a diverse set of information and different levels of detail, often rendering the collected information incomparable and partly not used once the reporting is made. Thus, the provided guidance document will be further developed, e.g., also providing more examples to reporters on KTMs developed in other EU Member States, based on a joint reflection of the first experiences with KTMs in the 2021 reporting on adaptation.

For the next reporting cycle, there will be more time available and the reporters will be more familiar with the system as well as with the structure of content to be provided. Furthermore, reporters will have experience from the first reporting cycle and information already available in the system to be updated. Thus, there might be more time available to report on KTMs. The further improvement of the guidance, as mentioned above, will assist reporters. At the same time, there is no necessity to wait until 2023, as the reporting can be updated (resubmission) at any point in time. Especially in the situation where no update of NAS, NAP or SAP is planned in between now and early 2023, reporting measures now can already save time during the reporting in 2023⁴⁹.

Due to the heterogeneous structure of adaptation policies, joint reflection between national reporters of EU Member States can support the efforts to increase the reporting of KTMs and a shared understanding of the current categorisation, and might simplify or ease the reporting in the next cycle.

5.3 The impact of the Climate Law on adaptation reporting

The next reporting under the Governance Regulation is foreseen for 15 March 2023, and every two years thereafter.

The Climate Law⁵⁰ has been in place since July 2021. While the Law itself does not make direct changes to Article 19 on national adaptation actions in the Governance Regulation, it requires regular progress assessments by the European Commission on enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change. This might change the need for the type and the level of detail of information reported by EU Member States. The first progress assessment will be made by 30 September 2023.

⁴⁸ <https://climate-adapt.eea.europa.eu/knowledge/tools/case-studies-climate-adapt>

⁴⁹ In the case the dataflow is updated and its structure changed for the 2023, a very likely situation, prefilling of the new dataflow with information reported in the current dataflow is foreseen.

⁵⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1119&rid=1>

In 2023, there will not only be the reporting under the Governance Regulation for Article 19 on national adaptation actions, as the reporting under Article 17 (Integrated national energy and climate progress reports) also has an adaptation component. A new implementing regulation for Art. 17, might change the reporting templates (webforms, tables) for the 2023 reporting on adaptation.

Potential changes to the exiting implementing regulation⁵¹ regarding structure, format, submission processes and review of information reported by EU Member States on climate aspects (including adaptation, Article 19) might take place as well. This would require reaching a respective agreement between the EU Member States and the European Commission. These future changes can, besides other reasons, be a consequence of progressing views at the international level concerning the Enhanced Transparency Framework (ETF) for the Paris Agreement. The modalities, procedures and guidelines for the ETF agreed in 2018 during the COP in Katowice were taken into account when developing the actual implementing regulation of Article 19.

Different policy developments might or might not change the reporting needs on adaptation. If they change, they will have to be agreed upon around the middle of 2022 so that they can be integrated into reporting elements and the reporting templates, quality check rules and the pre-filling from the 2021 reporting, and allow time for testing, in order to be in place for the March 2023 reporting deadline.

⁵¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1208&from=EN>

European Topic Centre on Climate Change
Impacts, Vulnerability and Adaptation
(ETC/CCA)
c/o Fondazione CMCC - Centro Euro-
Mediterraneo sui Cambiamenti Climatici
V.le Berti Pichat 6/2
40127 Bologna, Italy
Web: <https://www.cmcc.it/>
Email: silvia.medri@cmcc.it

The European Topic Centre on Climate Change
Impacts, Vulnerability and Adaptation Climate
Change Impacts, Vulnerability and Adaptation
(ETC/CCA) is a consortium of European
institutes under contract of the European
Environment Agency.

