

POLICY RECOMMENDATIONS, PROMISING RESOURCING AND BUSINESS MODELS FOR CLIMATE SERVICES

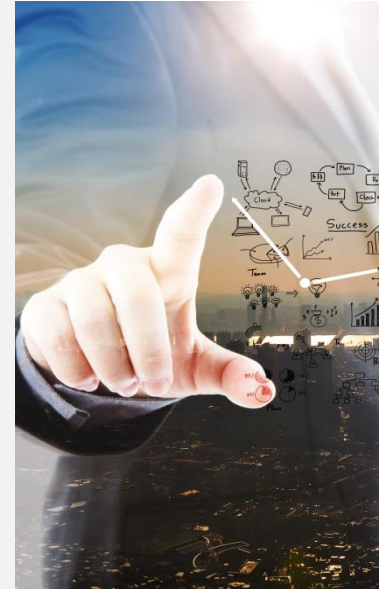
DELIVERABLE 5.4 – POLICY BRIEF

Jaroslav Mysiak¹, Adriaan Perrels², Francesca Larosa¹, Atte Harjanne²

¹ Euro-Mediterranean Center on Climate Change (CMCC), Italy

² Finnish Meteorological Institute (FMI)

December 2018



CLIMATE SERVICES INFORM RISK MANAGEMENT AND CLIMATE SMART DEVELOPMENT

Climate innovation and piloted climate services produce action-oriented knowledge that rally transformational change spurred by the multi-lateral frameworks including the UN [Sustainable Development Agenda](#), the UN [Sendai Framework for Disaster Risk Reduction 2015-2030](#), and UNFCCC [Paris Agreement on Climate Change](#). Governments, businesses and civic society have committed to work together to deliver positive social, environmental and economic impacts.

Climate services help individuals and organisations make climate smart decisions. Historic climate records, catalogues of extreme events, reanalyses, forecasts, projections and indices used in outlooks, early warnings, vulnerability and risk assessments, monitoring and reporting schemes, and financial protection instruments enable higher agricultural productivity, more efficient use and allocation of water, greater financial security and returns on investments, more reliable access to and production of renewable energy, and more effective protection of vulnerable communities and ecosystems.

[Climate services](#) are knowledge-intensive business services that employ advanced technological and professional knowledge. Users may find it difficult to judge their quality or potential. Service

developers and purveyors on the other hand may not fully appreciate values, preferences and circumstantial knowledge that drives individual and collective decisions and policy making, beyond climate information and awareness.

Therefore what characterises climate services is that both users and purveyors play a vital role in co-designing and co-producing such services, ideally in a genuine and mutually beneficial partnership inspiring trust and users' satisfaction. Effective affinity with users' decision context and co-production of knowledge and services constitute a competitive advantages for service providers and positively contribute to high-quality service outcomes.

WHAT BENEFITS?

Climate services generate private and collective benefits. Private benefits materialise through cost and loss reduction, increased yields and incomes, better-informed planning and protection against unforeseen events, and potential of new entrepreneurial ventures. Collective benefits are embedded in greater water, energy and food security; enhanced resilience, adaptive capacity, and policy and business environments conducive for innovation.



EU-MACS – European Market for Climate Services

This project has received funding from the EU's Horizon 2020 research and innovation programme under Grant Agreement No 730500.



Collective benefits get sizeable when reaching a critical mass of uptake and use of climate services. For example, wide spread adoption of irrigation services generates collective benefits through higher reliability of water availability, as well as through the possibility to allocate the conserved water to new users and uses. For the realization of the water savings the climate services' function of informing needs to be complemented with water tariff structures that adequately transform the water saving into monetary savings for consumers.

Sound assessment and transparent disclosure of climate-related risks of assets and economic activity promote sustainable lending, investment and insurance practices. General application of climate risk disclosure by financial actors necessitates other economic actors to properly account for climate risks, and thereby the benefits of disclosure, based on good quality climate services, permeate throughout society. Similarly, resilience and reliability improvements emanating from climate informed land-use and infrastructure planning permeate throughout society.

The costs of user-deployed climate services is not limited to the price paid for their provision. Users' capacity to assimilate climate knowledge for operational management and strategic choices are associated with substantial costs related to business and operational reorganisation, capacity building and knowledge management, above and beyond the price of climate services. Strategic knowledge management positively influences innovation and performance, but many organisations are not fully aware of the implications. The initial costs are progressively lowered and outpaced by benefits obtained from custom-built climate service.

EUMACS STUDIES WHAT DRIVES OR HAMPERS DEPLOYMENT OF CLIMATE SERVICES

As follow-up of the European Research and Innovation Roadmap, the European Commission (EC) promoted a comprehensive analysis of the market potential of climate services. The EU-MACS

project has been a part of these efforts. The study focused on drivers and barriers of innovation and uptake of climate services, assessed diffusion gaps and untapped potential, and identified ways to incentivise demand for and supply of market solutions matching users' knowledge needs. Sustainable finance driving green growth and risk-informed investments, cities as laboratories of climate action, and tourism with multiple spin-off effects on economies served as pilots for the in-depth assessment.

FINANCE

The financial sector, including commercial and development banks, (re)insurance, pension funds and other asset managers, as well as supporting services such as risk expertise & modelling, has started to integrate risks of climate change and climate policy into risk management systems, but with the exception of multilateral development banks and the insurance sector this process is still in an early phase, in particular regarding physical risks of climate change.

A crucial driver for the unfolding of a climate services market for financial services is the general adoption of climate risk disclosure as set out by the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD). Implementation of disclosure is expected to be promoted by the increased cooperation of macro-prudential regulators in Europe as well as by the Sustainable Finance initiative of the EU.

Development of financial sector specific climate impact indicators, such as impact sensitivity indicators for different asset portfolios, is highly needed, but requires further research.

TOURISM

Tourism is both (i) impacted by climate change, by altering tourism demand, and (ii) contributes to its causes. It generates ca. 10% of the global GDP and is a major means of wealth redistribution.

Sector specific climate indices such as thermal comfort help to identify optimally suitable conditions for planning, investments and sustainable development in tourism destinations.

Public concessions and safety certification of tourism infrastructures have a potential for developing customised climate, health and environmental services.

The attractiveness of tourist locations responds to climate variability and change. Reliable [seasonal and sub-seasonal climate forecasts](#) can drive short-term adaptation. Hence, for many actors in the tourism industry seasonal climate services seem the most natural entries to the market of climate services. Nevertheless, operators of capital intensive tourism infrastructure can (also) display concerns about longer term impacts of climate change.

Regional scale is often the most natural unit level for exploiting climate services. Due to complex interdependencies and prevalence of small size tourism operators, collaborative development and use of climate services is recommendable.

URBAN PLANNING

Cities are manifestations of social, economic and cultural acceleration, and therefore represent high concentrations of damageable tangible and intangible assets.

Urban climate services necessitate micro-climate data and high-resolution models that realistically reproduce city-specific processes, boundary conditions and fluxes of energy and physical properties. [A range of integrated urban hydro-meteorological, climate and environmental services](#) are needed to inform climate adaptation in cities, ranging from multi-hazard early warnings, risk-informed urban design and infrastructure, zoning choices, and vulnerability and risk assessments.

As compared to many other user segments cities are more familiar with inclusive consultative processes. [Co-design of climate services](#) is both easier to accomplish and necessary in this user segment. The [EU Urban Agenda](#) and the action plans established thereunder have acknowledged the importance and fostered development of climate services. Many cities have already some experience and familiarity with deploying them.

However, fragmentation of administrative competences and responsibilities within and across city borders hinder development of integrated urban services. [Comprehensive requirements and gaps analysis](#) conducted in cooperation with service providers help to identify common and differentiated needs and specify a coherent package of climate services for the city.

RESOURCING MODELS

Business design innovations from information markets in conjunction with sustainable business innovations prompt a diversity of mechanisms to capture and detain value generated by targeted use of climate information and knowledge. The full potential of business model innovation has yet to be exploited and the market growth will depend on the ability to harness these innovations.

With respect to climate services the innovations concern inter alia: pricing models (such as freemium, and performance based), models of cooperation of different types of actors, merit based input and output sharing models, use of crowd-sourcing (ideas, observations, quality ratings, funding) and integrated quality assurance, communication and marketing models. Many of these concepts have been already used in other markets, but are new to the climate services market, whereas the combination of several concepts may effectively entail a new innovation.

Many existing climate services rely on individual service contracts or homogenous subscription or freemium models. Data-centred services are provided through knowledge sharing portals or subscription-based expert service, in case of more customisable sector- or user-specific climate information. Expert services are extendable via brokerage and marketplace services, and can be provided via mobile apps.

Some climate services e.g. for sustainable tourism development and urban planning necessitate engagement of public and private partners. Public-Private Partnerships (PPPs) are normally long-lived relationships with mutually beneficial cost and risk sharing agreements, jointly exploiting

the intellectual property rights. PPPs inspired by Develop-Pilot-Transfer combine strengths of public and private providers, and are especially suitable for research-oriented public providers.

Consultancy-based services are often employed for strategic planning and coaching. Climate information and knowledge is often integrated in terms of references following larger scope such as climate adaptation or business transformation.

Other innovative resourcing architectures are inter alia differential pricing, pay-for-success, and innovative service financing. Differential pricing may be tied to a proportion of the actual value that users gain by assimilating the service-provided knowledge in their decision making. Pay-for-success is bound to performance indicators such as prediction skills of seasonal or sub-seasonal forecasts. In collaborative structures for service development and provision merit based contributions may be matched with weighted shares in costs or revenues or in tailored use rights.

Various social entrepreneurial models have been experimented for low-income or less knowledge-developed regions. Under 'no loss, no dividends' business model all profits are reinvested to sustain business operations and investors only receive returns of initial investments.

Apart from the product and users' characteristics the regulatory conditions under which providers and users operate may affect the viability or simply the feasibility of the resourcing model. For various complex climate services regulatory limitations, e.g. on segregation of public and private activities, may discourage initiatives to develop these.

RECOMMENDATIONS

Determined policy action on climate change, supported across the whole spectrum of political groupings, is conducive for systematic exploitation of climate services. Markets respond to policy-induced incentives and targets by intensified search for non-polluting, climate-resilient, and efficient resource management practices. Extensive information is required for optimally

phased planning, reporting, monitoring and evaluation of climate adaptation actions.

Climate services can play a major role for climate and multi-hazard risk assessments compelled by existing European legislations and the Sendai Framework. Therein specified requirements should be progressively harmonised in international standards. Development progress and performance assessment of climate risk-related services can be included in state-of-the art reviews, as a part of UNISDR Global Assessment Report on DRR and Global Stocktake of the Paris Agreement.

There is no single optimal policy mix for the promotion of climate services. Instead states, regions, sectors, and other groupings can compose their strategy best fitting to their needs, abilities and market conditions and still achieve comparable levels of uptake, provided crucial pre-conditions are met or improved in the process.

A range of cross-domain weather, climate, hydrological and environmental services can better serve the knowledge needs of decision and policy makers in sustainable development, climate adaptation and disaster risk reduction domains. Rather than dealt with in isolation, the shared concerns may be better addressed within the realm of integrated climate risk-related services.

Assessment and disclosure of climate related risks can be promoted through cross-compliance schemes and required ex-ante conditionality under the European Structural and Investment Funds and other funding instruments. In various sectors, notably *finance, urban planning, and governance of infrastructure*, obligations related to **transparent and consequent reporting of climate-related risks, based on quality assured information**, are a prerequisite for engendering adequate action. In turn this will drive demand for climate services, also beyond the target sectors.

An effective organization and coordination of multilateral actions, including through climate partnerships across public and private sectors, creates positive incentives, more diverse resource

bases, and favourable conditions for climate service market development. User fora such as those established for the [Copernicus programme](#), and climate innovation summits such as those regularly held by [Climate KIC](#) and [Climate Service Partnership](#), should be promoted at national and regional levels to foster building of vibrant community.

Stronger partnerships and ad-hoc spaces for discussion are capable of boosting a knowledge-based economy and increasing the opportunities of exchange. Mutual learning is essential to support the generation of new ideas and to increase the customer base and the range of potentially interested stakeholders. Platforms and user fora create the opportunities to showcase the potential of climate services and the economic and nonmonetary benefits users can gain by employing them within their organisations.

Evidence-based and transparent policy and decision making requires rigorously established evidence. **Quality assurance needs to be managed throughout the entire value chain of climate services.** Development of a certified Quality Management Framework for climate co-development and delivery, building upon the efforts of WMO and Copernicus Climate Change Services, is vital for stimulating market development. Standardization enhances market transparency.

Effective means of sharing and reusing information and knowledge are often crucial for development of new climate services and are highly conducive to better awareness and understanding of available climate services and their suitability for different user needs. Open data policies and practice of re-use of public-sector information vary across the EU member states. More efforts should be made to make public information accessible and affordable.

Web-based knowledge portals, open-data hubs, and climate data centres can be designed to help communicate and share knowledge produced by

climate services. Publication of case studies, policy recommendations and practical methodological guides can generate positive effects and contribute to spreading knowledge within the climate and business community.

Upscaled support and continuous assessment of marketplaces of climate services, including inventories or more sophisticated observatories, as well as comparative assessments of available services can make it easier to access markets and connect users with most fitting service providers. Both (i) improved management of and access to information through well-designed climate data centres, and (ii) search for alternative services e.g. through brokerage and coaching, should be promoted. Diffusion of climate services can be fuelled by investing in capacity building, transfers of knowledge, and interdisciplinary curricula, not the least within different user segments, and underlying academic activities.

Multi-disciplinary approaches are vital to embrace the perspective of different users and to communicate with them. Science and specific knowledge require an effective translation to meet users' needs.

Innovative models of service organization merit to be supported particularly in less competitive and less knowledge-developed regions as a part of development and cohesion programs. Competitive dialog within the context of public procurement stimulates development of climate services for public sectors when service specification and requirements to be met are not entirely clear at the beginning of the tendering process.

Website:	http://eu-macs.eu/
Publications	http://eu-macs.eu/outputs
Contact	adriaan.perrels (at) fmi.fi
	@EU-MACS_H2020