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Principles and recommendations for integrating climate change adaptation considerations under the 2014-2020 European Maritime and Fisheries Fund operational programmes

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SUMMARY

Setting the context

The Commission proposal for the European Maritime and Fisheries Fund[1] (EMFF) envisages climate action on adaptation and mitigation through the EMFF programmes. The proposal includes:

- **clear policy objectives** that shall be pursued through the **six** Union **priorities, some of** which refer to climate action, (priorities 4 and 5).
- **cross-cutting objectives** like innovation, environment and **climate change mitigation and adaptation** to be pursued through the EMFF programmes
- increased **flexibility in designing** the programmes which means that the measures can be programmed in relation to several Union priorities
- an increased **performance orientation** of the EMFF based on ex-ante conditionality and on a performance review system,
- **result orientation** of the programmes - setting targets by specific objectives that are linked to Union's Priorities

What to do at the Programming Stage

For the period 2014-2020, programming encompasses development of **a Partnership Agreement (PA)** setting binding terms between the Member State and the Commission, and **EMFF Operational Programmes** (**OPs)**. Key points to bear in mind when developing these documents:

- Climate adaptation (and mitigation) features as a horizontal issue that must be taken into account in the development of PAs and OPs in line with the Common Provision Regulation (CPR). EMFF OPs must explain how they address this and the other cross-cutting objectives through the six Union priorities of the policy (see EMFF proposal, Article 6), since these OPs need to be developed in full consultation with all relevant government departments and stakeholders.
- Whenever possible, programmes should take into account strategies already in place, including national or regional **adaptation strategies**. The country page on the Climate-ADAPT[2] platform provides up-to-date information on such policies in each Member State;
- The development of **eligibility criteria for measures** can help take into account relevant adaptation strategies, consideration of climate change impacts and how to address them. This can help to ensure that funding is not provided for activities that could exacerbate the negative impacts of climate change.

Key actions to incorporate adaptation in the EMFF OP's strategic objectives

- Assemble and/or develop a robust evidence base from a range of sources, combining formal research with feedback from actors, stakeholders and climate experts, on how expected climate changes can affect the fisheries and maritime sectors. This can be assessed on a case by case basis;

[1] COM (2011) 804 final

[2] http://climate-adapt.eea.europa.eu/web/guest/countries

- On the basis of this evidence, define what should be achieved with EMFF support, to increase the resilience of fisheries, aquaculture and of marine, inland waters and coastal ecosystems and to adapt to climate change, knowing that uncertainty should not lead to inaction as the cost of inaction may be greater.

Key actions when developing priorities and measures for EMFF OPs

- Ensure that the information collected at the previous stage is fed into a **needs' assessment** by Union priority in the SWOT, in particular for Union priorities 4 and 5;
- Identify the **measures** available under the EMFF that can be used to deliver these priorities;
- Identify the **multiple benefits** that can be achieved through the use of the measures identified to respond to climate adaptation needs, for example economic, social and environmental benefits;
- Identify activities that are **not deemed appropriate** for funding because they would act against climate adaptation needs
- Identify **safeguards** that need to be put in place to ensure expenditure is resilient to climate change;
- Design measures sufficiently **flexible** to allow adjustments reflecting evolving projections about climatic changes over time;
- Ensure **coherence** with other elements of the CFP and IMP.

What to do at the Programme Implementation Stage

The overall goal is to create **the necessary conditions for applications so that the award of funding to project beneficiaries and subsequent implementation considers climate change impacts**. This can be done by Managing Authorities, with support from environmental partners/adaptation experts and involves:

- Providing **guidance** and resources for applicants (web-based, printed);
- Making sure that managers have sufficient **knowledge** about how climate change impacts their projects. Formal **advice** and **training** for project applicants can address these needs together with effective support to fisheries and maritime networks;
- Providing guidance and training for those who provide technical support and advice to managers and other actors.

What to do at the Monitoring and Evaluation Stage

Monitoring and evaluation need to be **periodically reviewed** in order to **integrate new information about climate change** impacts throughout the lifetime of the EMFF OPs.

Due to its central role in the monitoring process, the **Monitoring Committee** must include sufficient climate adaptation expertise. **Data and information** are the backbone of monitoring mechanisms.

- Successful monitoring requires **sound integration of climate adaptation** issues into the indicators within the Common Monitoring and Evaluation Framework (CMEF) as well as the milestones developed at the programming stage;
- A solid **indicator framework** that includes adaptation (even where adaptation is not the main focus of expenditure) and that includes national indicators that go

beyond those prescribed at an EU level, will ensure an effective monitoring of climate resilience;

- **Good cooperation** between Managing Authorities and those involved in providing the data will help to ensure the right data can be collected. Where there are gaps in data availability, efforts need to be made to fill these at the national level.[3]

Guidance for programme evaluators on how best to incorporate climate adaptation into ex ante and ex post evaluations of EMFF OPs should also be provided.

[3] See for instance EEA report on climate change, impacts and vulnerability in Europe: http://www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012

1. INTRODUCTION

1.1. Context

The impacts of climate change are increasingly being felt across Europe, including in the marine and maritime environment. Although uncertainties regarding future impacts of climate change remain a major challenge for policy makers, the European maritime and fisheries sectors, like other economic sectors, will need to define a strategy for sustainable production, management and investment resilient to the impacts of a changing climate.

The Common Fisheries Policy (CFP) and Integrated Maritime Policy (IMP) can play a role in increasing the resilience of the marine and coastal environment to the impacts of climate change and in enabling the long term sustainable development of the maritime and fisheries sectors (including marine and freshwater aquaculture) in a context of changing climatic conditions. The successful integration of climate change adaptation considerations in the CFP and IMP will bring benefits to the economy and to society as a whole by ensuring that relevant ecosystem services continue to thrive and that the production capacity and viability of the fisheries sector is maintained. Early integration of measures for the adaptation to climate change can improve resilience to environmental, climatic and economic risks.

This working document intends to raise awareness among national authorities, experts and stakeholders on the impacts that climate change could have on the maritime and fisheries sectors (including marine and freshwater aquaculture) and on the need to integrate climate change adaptation considerations into our policies. It focuses mainly on the programming cycle of the European Maritime and Fisheries Fund (EMFF) programmes.

This document is based on the Commission's proposal for a Regulation of the European Parliament and of the Council on the European Maritime and Fisheries Fund (EMFF)[4]. Since the proposal is currently under discussion with the European Parliament (EP) and the Council, this working document provides only preliminary considerations. Guidelines on programming can only be finalised after the formal approval of the relevant legislation.

1.2. Objectives

This document aims to ensure that climate change adaptation objectives are embedded in the design of the 2014-2020 EMFF OPs (Operational Programmes). It is addressed to all stakeholders involved in the preparation and consultation of EMFF programmes, including climate experts and external stakeholders.

This working document does not intend to describe the process of designing an OP; it provides advice on how to ensure that climate change adaptation needs are understood and fully integrated into the EMFF OPs for the next programming period. It brings to the

[4] COM (2011)804 final

attention of the MS and stakeholders those issues identified in the Communication 'An EU Strategy on adaptation to climate change'[5], as well as in accompanying documents[6], relevant to the fisheries and maritime sectors.

Discussions with stakeholders on capacity needs and barriers for effective adaptation showed that the cross-sectoral nature of climate change adaptation and the need to integrate it across all elements of the CFP and IMP is a major challenge for national authorities.

2. INTEGRATING CLIMATE ADAPTATION INTO THE INTEGRATED MARITIME POLICY (IMP) AND THE COMMON FISHERIES POLICY (CFP)

2.1. The CFP reform proposals

The reformed CFP aims to bring fish stocks back to sustainable levels, to promote sustainable aquaculture, to provide EU citizens with a stable and healthy food supply for the long term and to promote healthy marine ecosystems. It seeks to bring new prosperity to the fishing sector, end dependence on subsidies and create new opportunities for jobs and growth in coastal areas. The EMFF will contribute to the implementation of the reformed CFP by promoting sustainable and competitive fisheries and aquaculture; fostering the development and implementation of the IMP; promoting a balanced and inclusive territorial development of fisheries areas.

The reformed CFP, if successfully implemented, could contribute to climate change mitigation and adaptation of the sector by reducing fuel consumption and emissions through the reduction of overcapacity (fewer vessels fishing the same amount of fish) and through the rebuilding of the fish stocks (less fishing time for the same catch). Measures aiming at the protection and restoration of marine biodiversity and ecosystems will increase the resilience of the marine environment to current and projected impacts of climate change. The implementation of local development strategies and the promotion of diversification and innovation will offer new job opportunities to fisheries areas while data collection and improved knowledge will help reduce uncertainty.

2.2. Entry points for mitigation of and adaptation to climate change

Article 8 of the proposal for a Common Provisions Regulation (CPR) stipulates that climate change mitigation and adaptation shall be promoted in the preparation and implementation of Partnership Agreements and programmes for the five European Structural and Investment (ESI) funds[7]. This Regulation defines eleven thematic

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5 COM (2013) 216 final

6 Of particular relevance are the Commission Staff Working Document on "climate change adaptation, coastal and marine issues" (SWD (2013) 133) and the Impact assessment (SWD(2013) 132). All documents are available at http://ec.europa.eu/clima/policies/adaptation/what/documentation_en.htm

7 The ESI funds include: the European Regional Development Fund (ERDF); the Cohesion Fund; the European Social Fund (ESF); the European Agricultural Rural Development Fund (EAFRD); and the European Maritime and Fisheries Fund (EMFF)

objectives including: (4) supporting the shift towards a low-carbon economy in all sectors and (5) promoting climate change adaptation, risk prevention and management. Therefore, the overall framework for the ESI funds includes climate change mitigation and adaptation. The CPR requires Member States to provide information on the support for climate change objectives using the methodology adopted by the Commission.

The EMFF regulation sets the programming requirements. The Thematic Objectives selected are translated into 6 Union Priorities (UP). One of the specific objectives of UP 1 targets climate mitigation objectives; it calls for the diversification of fisheries activities into other sectors of the maritime economy. Some measures under UP 2 and 3 target improvements in energy efficiency as a means to enhance competitiveness. Under UP 4 climate change adaptation is addressed through measures to reduce the impact of fisheries on the environment, to protect marine biodiversity and ecosystems and to promote resource efficiency; under UP 5, through measures to improve water management in aquaculture, to increase energy efficiency and to promote conversion of aquaculture enterprises to renewable sources of energy.

Many measures will be relevant to tackle adaptation and most of them are closely related to improving resource efficiency and the natural environment (Thematic Objective 6). Member States are expected to show in their OPs how they intend to use the measures available to pursue adaptation within their specific national context.

This document highlights the opportunities in the proposed regulation for integrating adaptation priorities into OPs and measures in each Member State. It should help ensure that broad EU objectives are translated into practice at national, regional, and local level.

3. PRINCIPLES TO GUIDE DEVELOPMENT AND IMPLEMENTATION OF 2014-2020 EMFF PROGRAMMES TO MEET ADAPTATION OBJECTIVES

Deciding what to support and how to fund it – based on a strategic evaluation of challenges, priority needs, desired outcomes and funding rules and requirements – is the first step. For the upcoming 2014-2020 period, programming will consist of OPs, linked closely to the ex-ante evaluation, and Partnership Agreements (PA) also covering other ESI Funds.

These documents lay the ground for funding over the next seven years and it is therefore critical that they consider climate impacts, funding opportunities for adaptation and investments aimed at improving the resilience of the fisheries and maritime sectors and of the environment.

The sections below go through all steps of the OP process and highlight a series of principles to guide EMFF funding and the development of OPs to deliver on adaptation.

3.1. Cross cutting principles and approaches

Mainstreaming climate change adaptation in the maritime and fisheries sectors requires coordinated efforts on many fronts throughout all the stages of the EMFF OP cycle.

3.1.1. Partnership

The partnership principle is already established in fisheries policy. Member States are required to involve social, economic, environmental and other relevant partners in every step of the preparation, implementation, monitoring and evaluation of OPs. The proposed Common Provisions Regulation for 2014-2020 requires that these partners shall be involved at each stage of the programming cycle and are also members of the monitoring committee.

For cross-sectoral issues like climate change adaptation, it is essential that environmental/climate authorities and experts are closely involved in the design as well as in the implementation, monitoring and evaluation of OPs and measures. The advice presented in this document thus encourages experts on adaptation to play an active role in this process.

3.1.2. Research and information on climate change vulnerabilities, risks and responses

Climate change adaptation is a research field which is constantly evolving. A key aspect will be the integration of fisheries data with key climate data on the marine environment. The period between now and 2020 will bring new understanding of specific and more localized climate threats and their impact. There may also be new technical options for adapting to these impacts. Authorities and experts should be able to integrate new information into the OPs, but also at a more operational level. Projects and measures should be designed in a **flexible manner** allowing for adjustments when new information becomes available. It is worth investigating the degree to which technical assistance could be used to fund evidence gathering and integration activities.

Where to look for information on climate change impacts and adaptation over Europe?

The European Climate Adaptation Platform website (http://climate-adapt.eea.europa.eu/), an initiative of the European Commission, provides a forum for stakeholders across the EU to share information on expected climate change in Europe; current and future vulnerability of regions and sectors; national and transnational adaptation strategies; adaptation case studies and potential adaptation options; and tools that support adaptation planning.

3.2. Partnership agreements

3.2.1. Description

The Partnership Agreements (PAs) summarise Member States' plans for implementing the ESI Funds in a way that is consistent with the objectives of the Europe 2020 Strategy. PAs entail obligations for Member States; therefore PAs offer a good opportunity to make sure that the impacts of climate change are taken into account across all programmes.

PAs are to be submitted to the European Commission together with the OPs, once the regulations are adopted. PAs have to be prepared in cooperation with partners, including environmental stakeholders.

3.2.2. Key opportunities for integrating adaptation

Integrating adaptation into the PAs must be linked to the preparation of the OPs. Partnership Agreements pull together the content of these programmes in an integrated way, looking for synergies and opportunities to achieve key priorities in a combined way whenever possible. Adaptation actions can be complemented through different funds.

The Multiannual Financial Framework 2014-2020 will ensure that at least 20% of the European budget is climate-related expenditure. This includes both adaptation to and mitigation of climate change. In addition, this general objective should be reflected in the PA, which must include the total indicative amount of support foreseen for climate change objectives. Although being a small fund compared to other ESI funds, the EMFF should bring its full relevant contribution to this target and EMFF OPs will need to set out the indicative amount of their support to climate change objectives.

A common methodology for tracking climate-related expenditure is currently being developed. It is envisaged that it will be automatically applied to the OPs (using the indicator plan) to calculate the amount of EMFF expenditure contributing to climate action (mitigation and adaptation)[8].

3.3. Operational Programmes

3.3.1. Description

OPs must set out a strategy for meeting national targets in relation to the Union priorities for the fisheries sector. They identify the most appropriate measures to meet such objectives, based on a SWOT analysis (strengths, weaknesses, opportunities and threats) of the situation in the geographical area covered by the programme. They should also include a set of indicators to measure progress towards meeting the targets, as well as the arrangements for programme implementation.

OPs are subject to an ex-ante evaluation, including a Strategic Environmental Assessment (SEA), in order to assess the overall rationale and coherence of the programme.,.

OPs are submitted to the Commission for review and approval, on the basis of their consistency with the Europe 2020 objectives and with the EU relevant regulations underpinning the CFP and IMP.

3.3.2. Key opportunities for integrating adaptation

Situation analysis

[8] This methodology has been developed on the basis of the OECD "Rio markers methodology" for tracking climate finance. The tracking of climate expenditure will be based on the assignment of a Rio marker category to each budgetary item. The three Rio marker categories are: 0% - not climate related, 40% - significantly climate related, and 100% -primarily targeted to climate.

The integration of climate adaptation into OPs consists of two key elements:

- Consideration of how climate change might impact the different types of supported projects in the OP;
- Consideration of opportunities for direct funding of climate change adaptation activities - Identifying and prioritising specific adaptation actions that fit together with national and regional adaptation strategies, when available; the need to ensure the long term sustainability of the fisheries sector in a context of climate changes; and the need to increase the resilience of the environment and associated ecosystem services.

It is important, therefore, to make sure that a sufficiently robust knowledge evidence base is in place. In most cases, a substantial research effort and assessments will be necessary to gather the required information and to have it available in time. However, the evidence may be insufficient as there is a degree of uncertainty regarding expected climate impacts. This may lead to conservative estimates of the impacts of climate change but it should not prevent action.

Priorities and measures

Establishing which measures should be supported in order to deliver the objectives identified through the situation analysis is one of the most important parts of the programming process. Experience from the current European Fisheries Fund programmes has shown that priorities for funding do not always reflect the results of the SWOT analysis. Therefore it is important to make sure that climate adaptation considerations are taken into account when identifying the measures to be supported. Member States may decide to deliver climate adaptation objectives through national measures; if so, this should be reflected in the OP.

Based on results of the SWOT analysis, the types of actions that need to be funded in order to protect biodiversity and to improve the resilience of the marine environment should be identified in the first place. Then, relevant measures available within the EMFF need to be identified. On a longer term a dedicated modelling framework/toolbox should be implemented which allows to analyse the impact of various measures in a dynamic manner.

Whenever possible, measures in the EMFF should aim to deliver multiple objectives and should be designed to achieve the specific objectives of the Union priorities they are programmed for. This is the case for all actions aiming to improve the resilience to climate change: the other co-benefits should be highlighted.

However, conflicting objectives may occur. This should be highlighted and appropriate processes put in place to decide what trade-offs are acceptable. The process established should be transparent and clearly explained in the OP, using relevant indicators.

Where appropriate and feasible, safeguards should be put in place for specific measures to ensure that expenditure takes account of possible climate impacts. Climate "proofing" of all measures would limit the negative impacts of climate change. Some may have been established already in the EU implementing regulations and simply need to be translated into national rules, whereas others may need to be adopted to address the local situation.

Programme Assessment (ex-ante evaluation and SEA)

The Common Provisions Regulation (Article 48) calls for an *ex ante* evaluation of programmes, which should incorporate a Strategic Environmental Assessment (SEA) where appropriate. These can be extremely important tools for mainstreaming adaptation.

Overall, the ex-ante evaluation examines consistency of the programme strategy with funding priorities and the regional situation. For the next programming period, the ex-ante evaluation should be more fully integrated into the programme design process by involving the evaluators from an early stage of programme development. It is therefore a chance to assess to what extent climate impacts are taken into account in funding priorities, particularly if opportunities were missed during the early programming stages.

With its focus on environmental issues, the SEA represents another important opportunity to see how responsive the programme is to climate change impacts that could threaten environmental objectives, or the adaptation needs of the Member State. The SEA is of particular value for measures that do not directly address environmental objectives – for example those focusing on enhancing the competitiveness of the sector – because it can open the door for the input of environmental authorities, experts and stakeholders. As a specifically designed evaluation process, it will assess the programme's consistency with wider environmental objectives, including adaptation. Experience from many Member States from the 2007 – 2013 period have shown that SEAs were carried out late in the programming process, and had relatively little effect on assessing or improving the overall impact of programmes on the environment.

So far, SEA has been designed to assess impacts on the environment, rather than vice-versa – e.g. to assess impacts of a changing climate on a programme. However climate change impacts are closely related to the environment, in particular biodiversity and eco-systems. The Commission's guidance on integrating climate change and biodiversity into SEA[9] provide good advice on how climate change adaptation can be integrated into SEA.

3.4. Implementation

3.4.1. Description

There are a number of ways in which Managing Authorities and implementing bodies can support the implementation process and the delivery on adaptation. These include providing support, guidance and assistance to applicants and beneficiaries, either directly or through intermediaries, such as extension services and private advisors.

3.4.2. Key opportunities for integrating adaptation

Establishing the eligibility criteria is an important step for the managing authorities to mainstream climate adaptation. Eligibility criteria stipulate the conditions under which funding can be awarded to applicants; one condition should be the climate resilience of

[9] *Practical guidance for integrating climate change and biodiversity into SEA procedures*, DG ENV, forthcoming 2012

the planned activities. They will be linked with the safeguards established during the programming phase (see above).

Possible eligibility criteria related to climate change adaptation could be

- The applicant must demonstrate understanding of the way in which climate change may impact upon the planned activities.
- The application should be in line with the national/regional climate change adaptation strategy or national climate change risk assessment (where a strategy is not available).

Embedding climate change adaptation into the OPs as well as into eligibility criteria provides incentives for beneficiaries when applying for funding. However, lack of knowledge and information could prevent beneficiaries from seizing such opportunities. Hence, raising awareness and knowledge among potential applicants is needed to achieve effective uptake and implementation of adaptation measures. This can be resource intensive but can improve outcomes in the long-term as adaptation actions will be increasingly needed.

The services and experts that provide advice to applicants must have the necessary knowledge and skills on climate adaptation.

Advice and training in relation to climate adaptation can also be provided directly to beneficiaries, by ensuring that written guidance for applicants incorporates information on climate adaptation or by providing funding for training, seminars and workshops for participants.

Managing Authorities can support the implementation process through assistance and guidance to project applicants via:

- **Resources:** Provide extension services, private advisers and potential applicants with relevant technical resources. These can aim at general awareness-raising or specific technical information. National studies, adaptation strategies and other resources on impacts, adaptation options and their implementation will also be useful. These can be provided through a dedicated space on the website of the Managing Authority and could even be provided as links on application forms;
- **Training:** Training sessions, bringing together groups of beneficiaries or focusing on specific subjects or sectors, can have an important effect on awareness raising and also building technical capacity. Training sessions could also be offered to personnel running extension services and private advisers;
- **Good practices:** Provide examples of good practices in integrating climate change adaptation

3.5. Monitoring and evaluation

3.5.1. Description

Monitoring and reporting on programme implementation and their outcomes is challenging; it is also a critical stage in this process.

In addition, knowledge is developing at a rapid pace. As a result, important information may become available within the lifetime of current OPs, particularly in areas where research currently lags behind. This means that monitoring efforts in relation to climate adaptation need to be reviewed regularly so that new evidence can be incorporated into the monitoring and evaluation process during the lifetime of the programme.

Climate change experts should be aware of these challenges and ready to assist Managing Authorities and the programme monitoring committee in tackling these challenges.

3.5.2. Key opportunities for integrating adaptation

Overall, monitoring, reporting and evaluation follows the overarching performance framework, with its indicators, milestones and targets as set out in the Partnership Agreement. The indicators developed at the programming stage will be used by the Monitoring Committee during the annual review meetings and will also feed into the annual implementation reports as well as into progress reports on the implementation of the Partnership Agreement. Even when it is not feasible to develop robust indicators, the requirement to assess to what extent OPs have addressed climate adaptation needs should be included into the specifications for *ex* ante and ex post evaluations.

Data and information are essential for effective monitoring and evaluation. A solid indicator framework that includes adaptation (even where adaptation is not the main focus of expenditure) will determine the data requirements for monitoring climate resilience as programmes are implemented. This framework can be complemented with national indicators and data (i.e. DC MAP, national sources) that go beyond those prescribed at EU level to ensure that as much information as possible is collected to help inform assessments of progress against programme priorities. Good cooperation between Managing Authorities and information sources will help to ensure the right data can be collected and fill gaps in data availability. It will be important to consider all types of data requirements, both quantitative and qualitative. Qualitative information can be useful to show progress in moving towards climate resilience objectives, particularly where there are difficulties in measuring outcomes quantitatively.

3.5.3. Annual Implementation Report.

The model of the Annual Implementation Report (AIR) for the EMFF incorporates the applicable provisions in both the CPR and the EMFF Regulations. The CPR outlines the common rules for all five ESI funds for both the content and timing of the AIR. Article 44 of the CPR outlines all the information that the AIR should cover. Among the information that MS will need to provide every year there is the data for a financial table. This table will include the percentage of contribution from EMFF to climate change

objectives. MS should define this percentage in their first reporting; based on this percentage, the tracking of the contribution to climate change objectives will be automatically calculated in subsequent years.

3.5.4. Common indicators in the EMFF.

The EMFF foresees the use of a limited number of common indicators to assess progress of programme implementation towards achieving the objectives. These common indicators will be the basis for monitoring and evaluation and to review the performance of the programmes. They will allow the aggregation of data at Union level, measuring the progress towards the objectives of the Europe 2020 strategy. A preliminary list of common indicators has been proposed following informal discussions in meetings of the Evaluation expert group for the EMFF organised by the Commission between May 2012 and March 2013.

In line with Article 24 of the CPR, a list including different sets of common indicators has been defined: context indicators, result indicators, financial indicators and output indicators.

Some of these indicators are related to climate change objectives.

- Output indicator n°11: "Number of projects aiming at the protection and restoration of marine biodiversity and ecosystems and mitigating climate change".
- Output indicator n°15: "Number of firms supported for projects aiming at limiting the impact of aquaculture on the environment".
- Result indicator n°4: "Change in fuel used per amount of fish caught (litres/Kg of landed catch)
- Output indicator n°1: number of projects supporting innovation and competitiveness in fisheries
- Output indicator n°20: number of projects enhancing human capital, job creation and health/safety in fisheries

These indicators can capture the information needed to monitor and evaluate EMFF contribution to climate change adaptation.

4. ANNEX

4.1. Examples of EMFF measures and their potential for adaptation[10]

EMFF measures	Thematic focus	Type of adaptation/mitigation
Art. 28 Innovation	Improved performance, energy efficiency	Mitigation: – New sources of energy for fishing vessels (biofuels, solar or wind energy) – New ways to manage fish stocks reducing energy consumption by fishing fleet (ITCs, TURFs, etc) Adaptation – Targeting new fish species Mitigation and adaptation: – improved fish processing to reduce energy consumption and CO_2 emissions.
Art. 29 Advisory Services Art. 30 Partnerships between scientists and fishermen Art. 31 Promoting human capital and social dialogue Art.48 Management, relief and advisory services for aquaculture farms Art. 49 Promoting human capital and networking Art. 85 Scientific advice and knowledge	Improved knowledge	Mitigation and adaptation: Transferring knowledge on current and projected climate change impacts and adaptation measures.
Art. 32 Facilitating diversification and	Reduce fishing pressure, improve marine ecosystems	Mitigation e.g. by relieving pressure on fish stocks through removal of vessels from fishing Adaptation e.g. by creating businesses resilient

[10] Please note that a tracking methodology on climate-related expenditure is to be proposed by the Commission at a future stage. Therefore, the examples provided below cannot prejudge on the results of this exercise.

job creation		to current and projected changes in climatic conditions
Art. 34 Support to systems of transferable fishing concessions of the CFP		Mitigation e.g. by reducing fishing effort (i.e. time engines of fishing vessels have to be kept running) and by improving status of marine ecosystems (ie. reducing unwanted by-catches and discards).
Art. 35 Support to the implementation of conservation measures under the CFP Art. 36 Limiting the impact of fishing on the marine environment Art. 37 Innovation linked to conservation of marine biological resources Art. 38 Protection of marine biodiversity and ecosystems within sustainable fishing activities	Improve resilience of marine ecosystems	Adaptation e.g. by improving status of marine ecosystems and in particular their resilience to climate change
Art. 39 Mitigation of climate change	Reducing emissions and increase energy efficiency	Mitigation by reducing emission of pollutants or green-house gases with energy saving devices, greater use of renewable or less polluting sources of energies
Art. 41 Fishing ports, landing sites and shelters Art. 42 Inland fishing	Increase energy efficiency, construction of shelters, improving safety, environment protection	Mitigation and adaptation, e.g. increasing energy efficiency. Adaptation, e.g. construction or modernisation of shelters better managing the risk of extreme weather events

Art. 45 Innovation Art.46 Investments in off-shore and non-food aquaculture	Energy and resource efficiency, promotion of renewable energies	Mitigation: – improved aquaculture production techniques, using less energy or producing less CO_2 emission – reliance on new sources of energy (biofuels, solar or wind energy) Adaptation – switch to fish species or fish production, processing and distribution techniques better adapted to changing climate conditions
Art. 47 New forms of income and added value	Diversification, energy efficiency, reduce transport	Mitigation: – development of fish direct marketing to reduce carbon footprint for consumers – reliance on new sources of energy (biofuels, solar or wind energy) Adaptation e.g. by developing alternative sources of income, new aquaculture species in the face of current and projected changes in climatic conditions
Art. 50 Increasing the potential of aquacultures sites	Improved spatial planning and management	Adaptation e.g. by identifying suitable areas in the face of current and projected changes in climatic conditions.
Art. 52 Promotion of aquaculture with high level of environmental protection	Improved water management, energy efficiency, promotion of renewable energies	Mitigation : – promoting conversion of aquaculture enterprises to renewable energy; Mitigation and adaptation: – increasing energy efficiency – Adaptation reducing water consumption in aquaculture or ensuring release of clean water downstream. - promoting forms of aquaculture better suited to current and projected changes in climatic conditions
Art. 53 Conversion to eco-management and audit schemes and organic aquaculture	Improved management and energy efficency	Mitigation and adaptation, e.g. by developing organic or energy efficient aquaculture.

Art. 54 Aquaculture providing environmental services	Protection of the environment, improved resilience	Adaptation, e.g. by developing aquaculture that provides environmental services, very often considered as part of a cost-effective package of adaptation measures to a changing climate.
Art. 60 Fisheries areas Art. 61 Integrated local development strategies Art.62 Fisheries local action groups Art 64 Preparatory support	Sustainable development of coastal and inland fisheries areas	Fisheries Local Action Groups can contribute to mitigation and adaptation action through the actions they promote, in line with overall sustainable development objectives Link towards integrated coastal management strategies as promoted by Recommendation 2002/413/EC may contribute to mainstreaming adaptation across the different policy areas applicable in coastal areas and help mitigation.
Art. 69 Production and marketing plans Art. 72 Processing of fisheries and aquaculture products	Energy and resource efficiency	Mitigation as production and marketing plans may contribute to the reduction of fishing effort and of the carbon footprint of seafood (eg by shortening distribution circuits, thus reducing waste and energy consumption. Adaptation as marketing plans may consider potential impacts of a changing climate (in particular extreme events such as heat waves) on distribution circuits
Art. 79 Data collection	Improved knowledge, reduce uncertainty	Data collection can contribute to adaptation, e.g. when they contribute to improving the conditions for effective decision making by providing knowledge on current and projected climate impacts on marine and maritime issues
Art. 81 Integrated Maritime Policy Scope and objectives Art 82 Eligible operations	Maritime spatial planning, marine knowledge, integrated coastal zone management	Mitigation and adaptation, e.g. when improving the availability of relevant information and limiting pressure on the marine ecosystems in particular increasing their resilience to current and projected changes in climatic conditions
Art. 86 Control and enforcement	Improved implementation of the policy	Mitigation, when limiting greenhouse gas emissions

Art.91 Technical assistance at the level of the Commission	Support for the implementation of the regulation	Technical assistance allows FLAGs to contribute to mitigation and adaptation action.
Art. 92 Technical assistance at the initiative of the Member States		Technical assistance allows knowledge transfers (e.g. on climate change impacts) to contribute to mitigation and adaptation action.