Development and demonstration of an automated, modular and environmentally friendly multi-functional platform for open sea farm installations of the Blue Growth Industry

D8.2 – *Regulatory aspects related to MSFD and compatibility with MSPD of MOI*

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LIST OF ACRONYMS AND ABBREVIATIONS

AD'OCC	Agence Régionale de Développement Economique: Région Occitanie/Pyrénées-Méditerranée
BGF	The Blue Growth Farm (project)
DIRM	*Direction interrégionale de la mer*
EC	European Commission (also, 1993-2008, the European Community)
EEA	European Economic Area
EIA	Environmental Impact Assessment (process and report)
EU	European Union (since 2009)
GA	Grant Agreement
GB	*Gobierno de Canarias*
HRA	Habitats Regulations Assessment (under UK law)
ICZM	Integrated Coastal Zone Management
ISPRA	*Istituto Superiore per la Protezione e la Ricerca Ambientale*
MATTM	*Ministero dell'Ambiente e della Tutela del Territorio e del Mare*
MOI	Multifunction Offshore Installation – i.e. the type of floating, multi-use, platform that the Blue Growth Farm project is developing.
MPA	Marine Protected Area, a generic term for a site protected under international agreements, EU Directives,and member state laws.
MRE	Marine Renewable Energy (from wind, waves, currents, tides)
MREG	Marine Renewable Energy Generator (device or organisation
MS	Marine Scotland (Directorate of SG)
MS-FHI	Marine Scotland – Fish health Inspectorate
MS-LOT	Marine Scotland – Licensing Operations team
MSFD	Marine Strategy Framework Directive (2008/56/EC)
MSP	Marine/Maritime Spatial Planning – might include T&CP
MSPFD	Maritime Spatial Planning Framework Directive (2014/89/EU)
MSS	Marine Scotland Science
MTES	*Ministère de la transition écologique et solidaire*
ORE	Offshore Renewable Energy – MRE is preferred here …..
RMPP	Regional Marine Planning Partnerships (Scotland)
SEA	Strategic Environmental Assessment (process and report)
SEPA	Scottish Environment Protection Agency
SG	Scottish Government
SLO	Social Licence to Operate
T&CP	Town & Country Planning
WFD	Water Framework Directive (2000/60/EC)

APPLICABLE DOCUMENTS

[AD1] European Commission, Directorate-General for Research & Innovation, Grant Agreement Number 774426 The Blue Growth Farm (GA-2018-774426), 2018.

[AD2] Technical Annex I to the Grant Agreement Number 774426: “Description of Work”, April 2018, Part A and Part B.

1 INTRODUCTION

1.1 The Blue Growth Farm Project and WP8

The present report is an output of Task 8.2 (WP8) of the Blue Growth Farm (BGF) contract [AD1]. The BGF project responds to the EU H2020 call for enabling technologies for "multi-use of the ocean's marine space, offshore and near-shore". The main aims of the BGF project are to produce:

- a design assessment of a fully integrated multipurpose offshore floating platform, hosting aquaculture and wind & wave energy production and services;
- a detailed design, construction, commissioning and operation of a scaled physical prototype (~1:15) of the proposed integrated platform;
- a suitable business model and plan built on the BGF configuration and including Environmental Impact Assessments (EIA) and good practice guidelines.

We will use the acronym MOI – Multifunction Offshore Installation – as shorthand for the type of platform that will be designed, and in the protoype case, built and installed, by the BGF project.

WP8 of BGF deals with "Social Impact and Acceptance, Marine Strategies and Spatial Planning", and includes three tasks:

8.1. Social impact assessment, which also provides guidance for task 8.3;

8.2. Regulatory aspects related to the EU Marine Strategy Framework Directive (2008/56/EC: MSFD) and compatibility with the EU Maritime Spatial Planning Framework Directive (2014/89/EU: MSPFD);

8.3. Specific participatory process for marine users and stakeholders.

1.2 Identification of the document

The present document is identified as Deliverable D8.2 "Regulatory aspects related to MSFD and compatibility with MSPD of MOI" of the Blue Growth Farm Contract [AD1]. According to the Contract, "The objective of this task is to understand governance applying the MSFD and MSPFD to MOI in general and in particular as applied by national and local regulatory authorities to the NOEL representative site. This task will involve:

1. review of directives and of selected transpositions into the law of member states, relevant to MOI planning and environmental impacts;
2. interviews with selected representatives of governance and industry concerning policy and regulation of MOI in relation to MSFD and MSP[F]D;
3. critical analysis of process compatibility with the Marine Spatial Planning [Framework] Directive."

This document provides a theoretical framework for understanding **governance** in relation to the deployment of MOI and the development of an associated industry. It lists some relevant **EU Directives and their transpositions** into the laws of certain Member States. It considers their **implications for MOI design**

and deployment. Finally, it also includes methods for further investigation, including **interviews with selected representatives of government and industry**. It thus begins the work that will be continued until month 40 of the BGF project and reported in D8.5.

1.3 Structure of the document

The contents of the document are organized according to the following sections:

Chapter 1 (this section) provides an introduction to the document and to the BGF project;

Chapter 2 provides a theoretical framework (Figure 1 and

Figure 2) and an introduction to **social licence**, which includes informal local *Social Licence to Operate* (D8.1) and formal public policy and regulation, the subject of this D8.2;

Chapter 3 provides an introduction to relevant EU Directives including (but not limited to) the Maritime Spatial Planning Framework Directive (MSPFD) and the Marine Strategy Framework Directive (MSFD);

Chapter 4 describes the transposition of the Directives into law and policy, and their operational application, in Scotland as part of the UK;

Chapter 5 describes the transposition of the Directives into law and policy, and their operational application, in France, with particular reference to its Mediterranean waters;

Chapter 6 briefly analyses governance applicable to MOI in the Canary Islands as part of Spain;

Chapter 7 briefly analyses governance applicable to MOI in Italy, with particular reference to the NOEL site in Reggio Calabria;

Chapter 8 considers the implications of these directives and member state laws and policies for the design and deployment of MOI;

Chapter 9 draws some preliminary, policy-relevant, conclusions and discusses interviews needed for the next part of the BGF WT8.2

Annex A describes methods that have been, and will be, used for investigation of policy and regulation relevant to MOI, including document analysis, participant observation, and interviews with representatives of governance and industry.

1.4 An introduction to Mobile Offshore Installations

The specifications for a full-scale MOI were as follows in November 2018. They may change.

The MOI will be a floating structure, 180 m long, by 140 m wide, made from concrete caissons, supporting 1 wind turbine at 4 m above sea-level, height 119 m, plus blade radius 89 m (DTU 10MW) and also capturing wave energy by air compression within the caissons. It will produce about 2.000 tonnes/year of salmon, sea-bass or sea-bream (depending on environment) in 6 nets extending to 35 m below sea-level. It will be kept in position in typical water depth of 100 m (max 200 m), by multiple sea-bed anchors, occupying approximately 0.5 x 0.5 km (25 ha). It will be sited at up to 10 nautical miles from a port, with a

high level of automation on board and remote monitoring of generation and farming conditions. More information is available at **www.thebluegrowthfarm.eu**

The BGF project will deploy only a 1:15 scale prototype, at the NOEL test site near Reggio Calabria in southern Italy. However, several WP (including WP8) will study issues that might arise if such structures were to be deployed at typical sites. The BGF document **D2.2**[1] reports a search for these typical sites in the Mediterranean, northern Atlantic and subtropical Atlantic. Subsequent discussion in WP8 has begun to identify three specific sites: near Marseille (Mediterranean); near Islay in Scotland (North Atlantic); and near Gran Canaria (subtropical Atlantic).

1.5 Why are MOI needed?

Marine space close to much of the European coast is considered to be already nearly fully occupied for purposes such as fisheries and aquaculture **[1]**. In addition, objections to development are often based on the visual impact of wind turbines or fish farms. Deployments further offshore (out to 12 nautical miles) opens up additional sea-area and reduces visual impact. In addition, wastes excreted by fish are likely to be dispersed more effectively by stronger offshore currents and turbulence.

However, permanent offshore structures are costly to build and also to remove at the end of their working life. Floating platforms should have lower costs. On site electricity, generated from wind and waves, can provide the operational needs of a fish farm with zero carbon emissions.

1.6 Investigating the governance of MOI deployment

Working to gain SLO, the subject of D8.1, has only recently come to be understood as an important risk reduction strategy for business, albeit one that requires companies to operate in unfamiliar ways by engaging with communities and commissioning research into the grounds on which groups of people come to find a particular industrial activity - such as MOI deployment - to be acceptable or unacceptable. In contrast, a requirement to obey the law seems simple and obvious. So why does D8.2 need to be more than a list of EU Directives and their transpositions into the laws of member states?

The answer to this question is that the application of law to what is called 'Blue Growth' - the use of marine resources by novel industries - is still in its infancy. For example, MSP, which in principle provides a way to harmonise conflicting needs for sea-space, is fully implemented in less than a handful of EU member states. Furthermore it is as if the several institutional parents of the legal infant have different child-rearing strategies. In Scotland, for example, the sectors of government that regulate fish-farming use different criteria from those that regulate renewable energy developments, and have little shared experience of licensing multi-functional developments such as those involving MOI.

Thus WP8 T8.2 includes interviews, with those who help make or seek to influence public policy, in order to discover how such policy might evolve. One of the purposes of this D8.2 is to prepare for these interviews.

[1] "D2.2 – Representative site selection and associated climatology characteristics", by Giulio Brizzi, Maroua Sabbagh, Tim Atack & Lorenzo Facco. The Blue Growth Farm, public report, July 2018.

To do so requires not only an operational plan but also an understanding of the 'polycentric governance' of 'action situations' centered on the 'social licensing' of MOI deployments. The section 2 explains these terms.

1.7 Implications for designers and developers

Finally, the outcomes of this polycentric governance in existing and future laws, policies and decisions, have implications for not only for those who might deploy MOI, but also for the BGF project's work to design structures and operational procedures that will be economically efficient and socially acceptable as well as minimizing impact on the environment. Section 8 considers the implications of the laws reviewed in Section 3 for MOI designers as well as users, arguing that multi-tier social licence requires positive engagement with social concerns that have led to these laws, as well as simple compliance with the laws.

2 THEORETICAL FRAMEWORK

This chapter provides theory about social licence and polycentric governance for the better understanding of public regulation of MOI.

2.1 Governance

One explanation of **governance** [2] is that it concerns

- "the ways in which citizens and groups articulate their interests, mediate their differences, and exercise their legal rights and obligations"

This is an understanding of governance that can be traced back to Aristotle's account of *politics* (in the 4th Century BCE) as the management by Greek-speaking citizens of the affairs of their city-state or *polis.* The term 'governance' is cognate with words in classical Latin and Greek describing the steering of a ship, and in the modern world the 'steering of society' might involve: the making and operation of laws; the outcomes of markets; the flow of information in the media and electronic networks; lobbying by organised groups; and conversations leading to action within communities. Although it is conventional to view it in terms of organisations and institutions, such as parliaments and laws, governance might also be conceptualised as networks of discrete situations each concerned with a collective problem. Within these situations, actors interact with the aim of finding actions that can solve the problem, all the time constrained by higher-order rules and the strategic interests of those they represent. Problem resolution can involve taking or approving action in the biophysical world or in the social world, in the latter case by making or changing laws, polices or social attitudes.

Albeit stabilised by laws that are time-consuming to make or change, governance is dynamic, and occurs on several nested scales or levels. In D8.1 we dealt with the small scale, the level of societal organisation on which local community views could have important consequences for the deployment of a MOI at a particular location. D8.2 considers the larger scales, those of which laws and policies are made that can help or hinder the development of an industry to construct as well as to deploy and to manage MOI.

2.2 Three licences

Legal constraints are not the only way in which a society can help, hinder, permit or block developments such as the deployment of a MOI or the growth of a related industry. Other requirements include the need for a commercial enterprise to be profitable, for the necessary techology to be available, for space to be allocated at sea, and for community and public attitudes to be favourable. Figure 1 suggests that the social, environmental, economic and technical pre-conditions can be seen as four switches controlling development. All need to be switched `on' for a MOI deployment to take place succesfully or an industry to grow. We focus here on the three switches that we call 'economic licence', 'environmental licence' and 'social licence'.

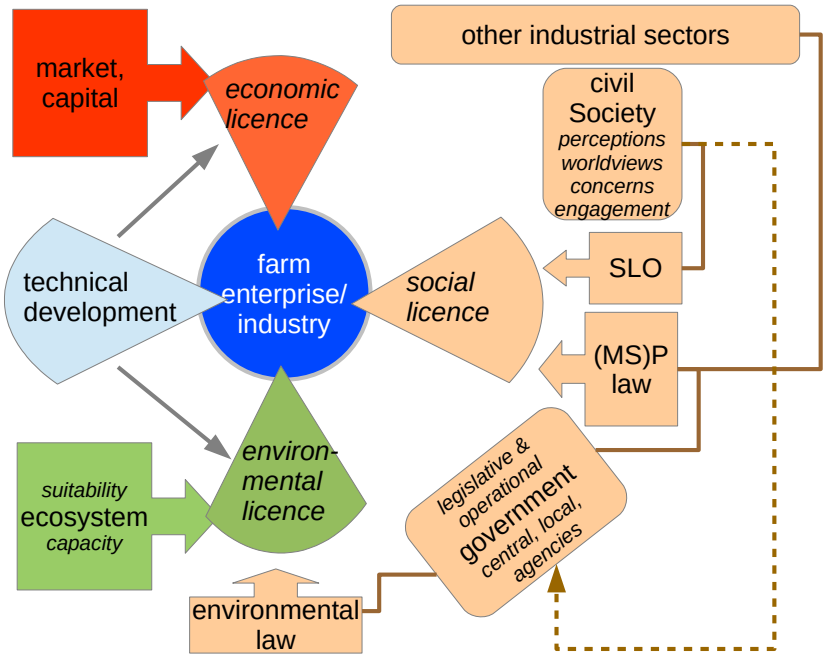

Figure 1 : Three licences for a 'Blue Growth' development

such as that involving the deployment of MOI or the promotion of an industry involving MOI. SLO is 'Social Licence to Operate'; (MS)P is (Marine Spatial) Planning. Developed from figure 5.3 , Tett et al. [3].

Figure 1 simplifies a multitude of social processes and their biophysical correlates. It maps them to the disciplines of economics, environmental science, and social science, each of which provides a paradigm for understanding the relevant processes and a set of validity criteria for evaluating evidence about them. The metaphor of a licence as a switch, either on or off, comes from the suggestion by Luhmann [4] that societal institutions can be understood as programs with binary outputs ('codes'). To extend the metaphor, the software program or hardware circuit controlling the switch might be thought of as combining many inputs into a rising voltage until the switch is triggered.

In more detail, the three licences are:

Economic licence, such as an agreement by a bank or other funder to invest the capital needed for a development, after scrutiny of the developer's business plan to ensure that a profit is likely. More generally, the licence can be thought of as an agreement by society that the development is a good use of societal resources of people, skills, equipment, and space. The funder will usually employ economic criteria to determine viability.

Environmental licence might be a formal requirement of the public consenting process, acquired after preparation and review of an Environmental Impact Assessment (EIA) or Strategic Enviornmental Assessment (SEA) according to criteria that are normally those of the natural sciences. However, the full scope of the licence-as-switch must take account of environmental features that will contribute to or

detract from the operation of MOIs, such as whether water temperatures are optimal for a particular species of farmed fish or extreme wave heights are within structural tolerances.

Social license has formal and informal components. The formal components involve, at the operational level, legal permissions, such as those needed to carry out a development according to planning and environmental protection regulations; and at higher levels of governance, the formation of policy favourable to an industry building and deploying MOI. The informal components are what we call *Social License to Operate* (SLO), which includes the consent of the local community to a specific development, and the tolerance by society-at-large (and communities of interest such as eNGOs and fishermens' organisations) of policies favouring MOI.

Investigating social licence for MOI is the task of WP8. SLO was the main subject of D8.1. This D8.2 considers the formal components of social licence.

2.3 Action situations

The conceptual framework devised by Ostrom [5–7], updated by McGinnis & Ostrom [8], and further modified here, will be useful in understanding as well as analysing societal aspects of MOI deployment. The framework focuses on an **Action Situation** and its settings (Figure 2). Although this D8.2 is concerned with matters of public policy, we will initially explain action situations using as an example the proposed deployment of a MOI.

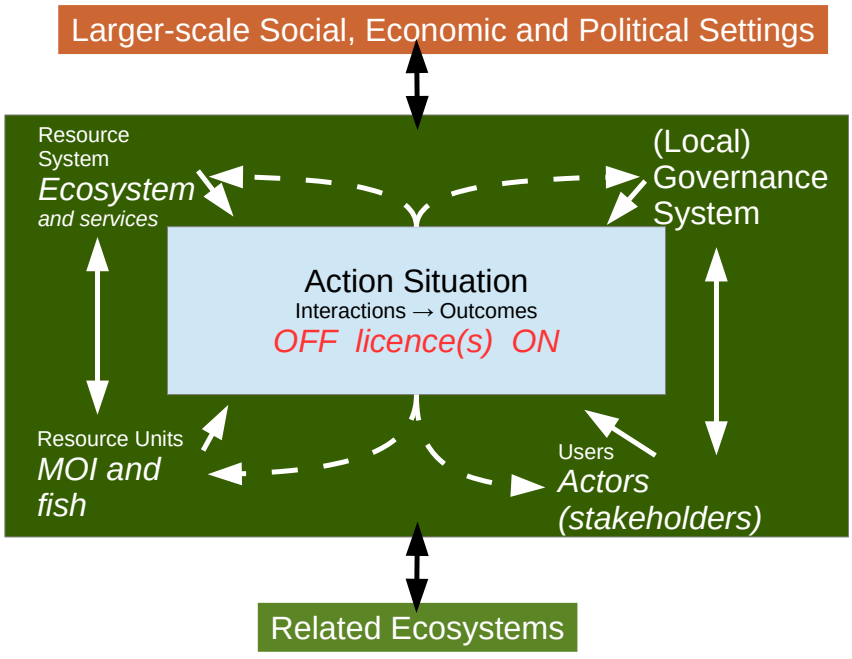

Figure 2 : Description of an action situation (AS),

modified from Ostrom [5–7]. In the present case, the AS concerns an environmental or social licence for an offshore development.

The components of this action situation are:

- The biophysical *resource system* – i.e. the ecosystem(s) in which the resource units are placed; in the language of environmental economics, these systems provide the natural capitals, and ecosystem services such as dispersing fish waste and supplying wind energy.
- The biophysical *resource units* – in the present case, the MOI and the farmed fish that it houses, representing the expenditure of financial capital and the use of intellectual capital; in other cases they might correspond more closely to Ostrom's [6] definition that they are "resource units generated by that system (e.g. fish, water, fodder)"; in either case the resource units must be identifiable so that they can be associated with rights to use.
- The resource *users*, the people and private organisations involved with or concerned about the resource units, who are *actors* with parts to play in the action situation, and may be recognised as *stakeholders* ;
- The local *governance system* - comprising the local institutions and organisations that regulate access to and use of marine resources; the institutions include legal and customary rules for identifying resource units and ascribing rights to them, and the organisations include local government and agencies of central government; traditional power structures and local market processes may also be important.

2.4 Polycentric Governance

These components of an Action Situation are in most cases embedded in larger-scale systems. On the biophysical side, these larger-scale systems include:

- the regional seas or the ocean with which the coastal waters exchange;
- populations of migratory animals (fish, marine mammals, sea-birds) which travel through the local coastal waters;
- the weather systems that generate wind and waves.

On the societal side they are the *larger-scale social, economic and political settings*, which include:

- public and community opinion about renewables and aquaculture, influenced by old and new media;
- national or international environmental Non-Governmental Organisations (eNGO), which can intervene in local situations;
- economic aspects of development (availability of funding, markets for product and insurance); proportion of community income provided externally;
- national government and its laws and policies relevant to MOI.

These settings can themselves be conceptualised as the outcome of action situations on larger scales, and this nesting of action situations is part of what is what is meant by **polycentric governance** [9]. Three levels may be distinguished:

- *operational situations*, where outcomes directly affect the biophysical world as well as society; a relevant example would be the situation generated by a proposal to deploy a MOI in a specified coastal location;
- *collective-choice situations*, where outcomes affect rules that regulate or influence operational situations; a relevant example involves making of national policy or law that regulates maritime spatial planning for aquaculture;
- *constitutional situations*, where outcomes impact on the rules for collective-choice situations; (in the context of the EU and EAA) constitutional situations include the making and implementation of Directives such as the WFD, MSFD and MSPFD.

It is the higher-level situations and settings that are the concern of this D8.2. As an example, a constitutional Action Situation, concerning the need to ensure fair, sustainable and economically efficient access to space in EU coastal seas, led to the publication of the Maritime Spatial Planning Framework Directive in 2014. The MSPFD then became part of the 'larger-scale settings' of collective-choice Action Situations at member state level, where the challenge was to transpose the Directive into national law and devise policy to implement it in ways that were appropriate to the member states' normal processes of governance. It is the resulting national laws and policies that are beginning to provide the settings for operational Action Situations such as MOI deployment.

The other part of polycentric governance is that of overlapping jurisdictions at the same hierarchical level. This presents a challenge to the use of MOI, because ORE and fish-farming components are typically regulated by different government agencies.

2.5 Institutions, Organisations, Stakeholders

This account of governance, as made up from multiple overlapping and nested action situations, is a dynamic model. However, the outcomes of situations tend to be persistent, and are what stabilises societies. At the collective-choice and constitutional levels of governance, the outcomes are often new or modified **institutions**, which are sets of rules that provide the settings of subsequent lower-level action situations. A law is such a rule, and it is effective in its control insofar as citizens accept it as legitimate and insofar as there are mechanisms for enforcing it [10]. The mechanisms include law courts and police, which are existing **organisations** established by earlier laws and customs. A simple definition of an organisation is that it is an embodied insitution, i.e. a body made up of persons and physical equipment that can take action in the biophysical world, guided by the rules of the insitution. The EU action situation that led to the institution of the Maritime Spatial Planning Framework Directive provided the setting in which member states needed to make new national institutions, such as national and regional Marine Plans, and create organisations to operationalise such Plans. Other organisations relevant to MOI include public Environmental Protection Agencies, commercial companies, and industrial sectoral collectives such as those

formed by fishermen. Each has its own purposes and institutions, decided by governments, shareholders, or members.

Stakeholders are actors with a legitimate interest in the outcome of an action situation. This may be because as individuals they expect benefit or harm to come to them from it, or because they represent an organisation with members that expect to be affected by the outcome of the Action Situation. *Stakeholder mapping* is the process in which individual and corporate stakeholders are identified and their opinions typed in relation to an organisation, issue or an action situation [11]. When these are operational action situations, the question arises: to what extent should external actors, such as the media, government agencies, and eNGO (as organisations), or reporters, officials and NGO workers (as individuals), be considered as legitimate stakeholders?

Turning to the collective-choice level of governance, where policy is formed that might help or hinder use of MOI, it is not unusual to find that some actors are labelled as 'policy stakeholders' and that reference is made to a 'policy community', which can include academics and lobbyists as well as public servants and elected representatives. Thus a policy-making process can itself be understood as an action situation, and understanding such situations might be as important as understanding the institutional framework that provides their settings.

Table 1 clarifies the meaning of the key terms, *laws, policies and plans,* as they will be used in this document.

Table 1 : Law, Policy, Plan

understood as institutions, i.e. rules that constrain or empower communicative or biophysical action; providing the settings for action situations.

TERM	EXPLANATION	RELEVANT ORGANISATIONS
Law	*Laws* are rules, made by legitimate authorities at the *collective-choice* level of governance, and supported by sanctions. Include primary legislation (in UK, acts of UK and regional parliaments; in France. national *codes et lois*) and secondary legislation made by governments with powers given by primary law (in UK: regulations and orders; in France, *décrets)*.	*Governments*, including *legislatures* (to make or approve laws), *executives* (to implement them), *courts* (to adjudicate legal matters), *police* (to enforce sanctions).
(Public) Policy	*Policies* are rules intended to guide decisions and achieve designated outcomes. Here the term refers to rules made on behalf of the public, i.e. of society as a whole, even when the outcome applies to a specified sector. A policy may lead to laws or result from laws.	A variety of organisations at *constitutional* and *collective-choice* levels of governance. When outcomes have been specified by law, policy-formation is often regarded as a technical matter.
(Spatial) Plan	*Plans* are rules for implementing a policy. The usual meaning in this document is that of spatial plans, typically sets of maps that show zones defined according to stated policies.	*Planning authorities:* in the present case those responsible for sea-use planning as part of MSP, ICZM, or T&C planning.

2.6 Discussion

Clearly, there is a need to understand, with relevance to MOI:

- Institutions (EU directives and member state laws and policies);
- Organisations (including those responsible for marine planning, those responsible for development licensing, those leading Blue Growth developments, and those that might oppose such developments);
- Action Situations that lead to policy formation;

at the constitutional (EU) and collective-choice (member states and provinces with devolved authority) levels of governance. Some of this understanding will come from analysis of public documents, and some of it from interviews with actors having a part to play in example action situations.

3 EU DIRECTIVES

This chapter includes a list of European Directives relevant to the deployment of MOI.

3.1 Introduction

A European Directive provides a consitutional-level setting for collective-level action; in esssence, it is an instruction from the organisation formed by treaties amongst European states, requiring *member states* to *transpose* the contents of the framework into their own laws. As the association of European states has evolved, so have the processes resulting in the emission of the Directives. For example:

- The Habitats Directive (92/43/EEC) originated in the "Council of the European Communities" and refers to the "European Economic Community" (EEC).
- The Marine Strategy Framework Directive (2008/56/EC) was an output of the "European Parliament and of the Council" of the European Communities (EC) and was also of "EEA relevance", meaning that it was addressed additionally to states such as Norway that were not members of the EU but were members of the European Economic Area (EEA).
- The Maritime Spatial Planning Framework Directive (2014/89/EU) is an output of the "European Parliament and the Council of the European Union".

In addition there are some important documents issued by organs of the EU (and its predecessors), including the Union's executive arm, the European Commission (also, EC). An example is:

- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An Integrated Maritime Policy for the European Union (COM(2007) 574 final).

The Council (of the European Communities, or of the European Union) consists of ministers from the governments of member states.[2] The formal title 'European Union' was used following adoption in 2009 of in the Treaty of Lisbon (2007). For simplicity in this D8.2, we'll refer to the 'EU' as the source of these Directives and Communications, irrespective of the formal titles of the association of states or its organs.

3.2 Directives

Table 2 lists the main EU Directives relevant to the BGF project. Their formal identification includes the year of emission (i.e. publication in the Official Journal), the serial number of the Directive within that year, and an acronym for the name of the association of states at that time.

[2] The Council (of Ministers) is distinct from the European Council (of heads of member states/governments).

Table 2 : Some EU Directives relevant to MOI deployment and industry development

In alphabetical order

ACRONYM OR SHORT NAME	USUAL TITLE AND FORMAL IDENTIFICATION	MOI RELEVANCE
Aquatic Animal Health Directive	Directive 2006/88/EC "on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals"	Sets standards for farmed fish.
Birds Directive	Directive (2009/147/EC) "on the conservation of wild birds" updating Directive 79/49/EEC)	Protects populations of certain species of wild birds; has provided the basis for objection to developments of offshore wind turbines
EIA Directive	Environmental Impact Assessment Directive (2014/52/EU amending 2011/92/EU)	An EIA must be prepared and assessed when public permission is sought to deploy a MOI
Habitats Directive	Directive (92/43/EEC) "on the conservation of natural habitats and wild fauna and flora"	Provides various levels of protection for certain species of wild animals and plants, and for certain types of habitat (spatially-defined examples forming part of the EU Natura 2000 network); some MPA, created as a result of this Directive, may exclude MOI activities
MSFD	Marine Strategy Framework Directive (2008/56/EC) [EAA relevant]	Requires marine sub-regions (e.g. 'greater North Sea', 'western Mediterranean Sea') to be of good environmental status; i.e concerned with aggregate effects of human activities on large scale: c.f. WFD
MSPFD	Maritime Spatial Planning Framework Directive (2014/89/EU)	Requires member states to impliment "maritime spatial planning aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources"; however, does not override states' existing Town & Country planning laws; not yet fully implemented in most member states, and implications for MOI unclear
PPD	Directive 2003/35/EC … providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment …	Implements obligations of the Århus Convention by requiring that the public (including eNGO) are informed, and may express opinions, about potential environmental impacts
SEA Directive	Strategic Environmental Assessment Directive (2001/42/EC)	SEA is required only for major public projects, but could be used to devise national policies for MOI
WFD	Water Framework Directive (2000/60/EC)	Protects the ecological quality of bodies of (amongst others) coastal water, bodies that are of order 10^1 or 10^2 km^2 in size, and thus more relevant than MSFD to operational deployment of MOI within such water bodies.

3.3 Other EU documents

In addition to Directives, the EU issues other types of documents that relevant to policy about, and regulation of, development in coastal waters. These are exemplified in Table 3.

Table 3 : Some other EU documents

ACRONYM OR SHORT NAME	USUAL TITLE AND FORMAL IDENTIFICATION	MOI RELEVANCE
Integrated Maritime Policy report 2012	Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An Integrated Maritime Policy for the European Union (COM(2007) 574 final); with accompanying document SWD(2012) 255 final.	Most recent report, on progress on the Integrated Maritime Policy (launched in COM(2007) 574 final), refers to aquaculture, blue energy and marine spatial planning (amongst other topics).
Mediterranean ICZM protocol 2009	Protocol on Integrated Coastal Zone Management in the Mediterranean [OJ, 4.4.2009, L34/19-29], agreed by the EU as a party to the Barcelona Convention (1976,1995) for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.	Relevant to planning for use of inner coastal waters and land-based facilities, of the Mediterranean Sea. No anologue for other EU seas, despite earlier EU consideration of ICZM as part of the MSPFD.
Organic Regulations 2007	Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91	Includes (art. 15) production rules for aquaculture animals which will apply if farmed fish are to be sold as organic (with enhanced value).

European Council *regulations* apply directly in member states, and do not need transpositions into national laws. The EU *ICZM protocol* is an agreement between states with Mediterranean coastlines, some of which are EU members, an agreement to which the EU is also a contracting party.[3]

[3] Concerning Mediterranean ICZM, see also: **web.unep.org/unepmap/8-iczm-protocol**

4 SCOTLAND

This section describes the UK and Scottish laws and regulations relevant to MOI that result from transposing EU Directive, and lists the public organisations that implement these laws.

4.1 Introduction

This is the first of four chapters dealing with sites studied by the BGF project for potential deployment of MOI or actual deployment of a prototype. The potential North Atlantic site is located on the west coast of Scotland, near the island of Islay, and so this chapter examines the governance framework for MREG and fish-farming in Scotland as a part of the United Kingdom (UK). It includes an account of *transposition of Directives*, as required for the BGF WT8.2 "review of directives and of selected transpositions into the law of member states, relevant to MOI planning and environmental impacts". The analysis presented here is, however, somewhat broader, because it aims to prepare for "interviews with selected representatives of governance and industry concerning policy and regulation of MOI in relation to MSFD and MSPD". Institutional mapping and organisational mapping are essential in understanding the circumstances in which laws, policies and plans are made at the *collective choice* level of governance and thus for identifying who to interview during the next part of WT8.2. Finally this chapter introduces additional concepts relevant at all sites.

4.2 Governance

EU member states have the responsibility of *transposing* EU Directives into the laws or regulations or ordinances of their states. On the case of the United Kingdom this process is complicated by the differences in the legal systems in Scotland and the remainder of the UK that were recognised by the 'Act of Union' in 1707 between the two kingdoms of Scotland and England & Wales. Until 1999, however, all laws, even those with effect only in Scotland, were made in the Westminster (London) UK parliament. Thereafter, some law-making powers have been devolved to elected regional assemblies or parliaments in Edinburgh (for Scotland), Cardiff (for Wales) and Belfast (for Northern Ireland), and each of these regional governments (i.e., the executives corresponding to these assemblies) has set up its own organisations for some aspects of marine planning, marine licensing, and marine environmental protection. This results in jurisdictional complexity, as explored in Table 4 and subsequently.

Table 4 : Jurisdictions and related definitions (UK and Scotland)

Taken from various sources. See also **marine.gov.scot page on 'limits and boundaries'**

ACRONYM OR SHORT NAME	EXPLANATION
UK, United Kingdom	The political entity formed by several Acts of Union, including that between England & Wales and Scotland in 1707, with its government (executive and legislature) in London. The London government exercises sovereignity over all parts of the UK, but currently devolves some legislative and executive powers to Scotland. Currently (and at least until 31/01/2020) an EU member state.
Scotland, Scottish Government (SG), Scottish Ministers (SM)	Scotland was an independent political entity until the 1707 Act of Union, and subsequently retained its own legal system. Laws were, however, made in London. In 1999 Scotland recovered its elected legislature in Edinburgh and an executive led by Ministers drawn from elected legislators. See Table 5.
Local Authorities (LA)	Scottish local government has been through several re-organisations: the most recent, in 1994, set up a tier of multi-functional Local Authorities under elected Councils. These Councils are, currently, responsible for most aspects of Town & Country planning, using appointed officials to carry out technical tasks. Two examples are the Argyll & Bute Council (responsible for 6,909 km^2 and 86,400 inhabitants in 2018) and the Shetland Islands Council (responsible for 1,466 km^2 and 23,210 inhabitants in 2011). The lowest level of local government is that of Community Councils (CC), such as that for the island of Islay (a part of Argyll, and with a population of 3,228 in 2011). These CC have few powers but do have the right to be consulted in planning matters.
Law: Acts & Regulations	Within the UK, an *Act* is a law debated and passed by a parliament. A *regulation* or *order* is a law made by a government under powers granted in an Act.
Fish farming	The breeding, rearing or keeping of fish or shellfish (Town and Country Planning Act (Scotland) 1997.
Marine Policy (statement)	According to the (UK) Marine and Coastal Access Act 2009 (s. 44), a Marine Policy Statement is "a document in which ... the policy authorities state general policies ... for contributing to the achievement of sustainable development in the UK marine area ..."
Nautical mile (n.m.)	1852 metres (roughly, a minute of latitude along any line of longitude)
UNCLOS	The most recent United Nations Convention on the Law of the Sea (1982), which came into force in 1994 and to which the UK is a signatory
Sea, (marine) waters	According to the (UK) Marine Strategy Regulations 2010, ""“marine waters” means waters of the sea, and the seabed and subsoil of the waters in question." For this (MSFD) purpose "the sea" includes the EEZ and coastal waters, but not the variable-salinity “transitional waters” of estuaries. In contrast, the Marine (Scotland) Act 2010 extends "the sea" to include "the waters of every estuary, river or channel, so far as the tide flows at mean high water spring tide." The idea of territory in the sea – i.e. ground that may be owned or leased – seems to relate only to the sea-bed and what lies beneath it. The UK claims the right to control fisheries (or to negotiate them as part of the CFP), to regulate marine energy extraction, and to protect the marine environment, but does not seek ownership of fish stocks, free-living marine organisms, or the water and its dissolved contents.
Coastal Baseline, CB	According to UNCLOS, the Coastal Baseline from which distances are measured is usually the tidal low water mark, but may be defined as a series of straight lines between headlands or islands in the case of a complicated coastline. The CB is so defined in Scotland, and embraces the seas surrounding the western and northern island groups; thus the Scottish marine area is larger than might be expected.

Territorial waters	Under UNCLOS, a state's territorial waters extend 12 n.m. from its CB, or to the midline where the territorial waters abuts the waters of another state. They are the sovereign territory of the state.
EEZ: Exclusive Economic Zone	Under UNCLOS, a state's EEZ extends 200 nautical miles from its CB, or to the midline where the EEZ abuts the EEZ of another state. The state controls use of economic resources (including fisheries, seabed mining, renewable energy extraction) and assimilative capacity) here, but the sea itself is considered part of international waters.
UK marine area	Defined in the (UK) Marine and Coastal Access Act 2009 (s.42) as the UK territorial sea plus its EEZ and (depending on international agreements) additional parts of the UK continental shelf.
Scottish offshore region	The part of the UK marine area adjacent to Scotland but outside the Scottish inshore region ((UK) Marine and Coastal Access Act 2009 (s.322)): in most cases the sea between 12 and 200 n.m. from the CB.
Scottish marine area, Scottish inshore region	The Scottish marine area (called the "Scottish inshore region"by the UK Marine and Coastal Access Act 2009 (s.322)) is defined in the Marine (Scotland) Act 2010 (s.1) as the Scottish part of the UK territorial sea (i.e. out to 12 n.m. from the CB), and an area in which the 2010 Act governs planning and licensing of activities except those reserved to the UK government. S.65 of the 2010 Act defines the "Scottish marine protection area" as co-extensive with the marine area. The Scottish Marine Regions Order 2015, made under the 2010 Act, includes a map of the Scottish marine area and shows its division into 11 marine regions for the purposes of environmental protection and marine planning.
Scottish coastal Water Bodies	The WFD, for environmental protection purposes, requires *coastal waters* to be defined as extending offshore at least 1 n.m. from the CB. The Water Environment and Water Services (Scotland) Act 2003, implementing the WFD in Scotland, defined them as extending 3 n.m. from the CB. These Scottish waters, including those that lie between the CB and the mainland, are divided into 457 coastal water bodies; as an example, 'West Islay' is 267 km^2 in area. The **SEPA water classification hub** describes each water body.
Town & Country Planning (T&C)	For most purposes the domain of T&C planning extends only to tidal low water, but can include harbours. However, "since 2007 marine fish farming has required planning permission from Local Authorities in accordance with the [Town and Country Planning (Scotland) Act 1997] This applies to all new fish farms out to 12 nautical miles [from the CB] including modifications to existing ones …" **[12]**.

EU Directives have been transposed into UK and Scottish laws. As a simplification, Scotland is responsible for legislating as well as managing environment and renewable energy generation in Scottish territorial waters, and the UK legislates for waters in the EEZ beyond the 12 mile limit, while assigning some its administrative responsibilities to the Scottish Government. All reporting on the implementation of the Directives is, however, done by the UK administration in London.

Relevant parts of governance at the Scottish collective-choice level are mapped in Table 5. This level may be understood as comprising two sub-levels: that involving legislation and the democratic process of electing governments; and that involving policy and plans, typically a more technical process involving a 'policy community' of civil servants and staff from NDPB but increasingly open to consultation with stakeholders.

Table 5 : Scottish governance at the collective-choice level

Information from **www.legislation.gov.uk** , **www.gov.scot** and **www.parliament.scot (Committees)**. Only bodies (organisations) and offices (posts) relevant to planning, MREG and aquaculture are described here. Our abbrevations for ministers.

BODY OR OFFICE	EXPLANATION
Scottish Parliament (SP)	The UK Scotland Act 1998 (re)created the Scottish Parliament. Members are elected for constituencies by simple majority and from regional lists by proportional representation. General elections normally held every 4 or 5 years. The parliament may not legislate on matters reserved to the UK government and parliament, or contrary to EU law. Its members sit on committees that take evidence and examine policy and legislatation. The First Minister must command a majority in the Parliament.
Scottish Government (SG)	As narrowly defined by the UK Scotland Acts 1998 and 2012, equivalent to the *Scottish Ministers*. Informally used for what is defined by the Acts as the *Scottish Administration*, consisting of the Scottish Ministers and their staff, who are UK civil servants but in Scotland organised into **Directorates**.
Scottish Ministers	As defined by the Scotland Acts, the Scottish First Minister and her ministers (now called Cabinet Secretaries) plus the Law Officers, meeting as the Scottish Cabinet. Supported by what the Acts call Junior Ministers (now simply, Ministers). In law the First Minister is appointed by the UK monarch.
Cabinet Secretary for Environment, Climate Change and Land Reform (CS-ECCLR)	Responsible for (*inter alia*) climate change and environmental protection; biodiversity; Crown Estate; environmental and climate justice
Cabinet Secretary for Communities and Local Government (CS-CLG)	Responsible for the 'social economy of places'
Cabinet Secretary for the Rural Economy (CS-RE)	Responsible for (*inter alia*): fisheries and aquaculture; Highlands & Islands Enterprise (the development agency for the underpopulated region containing most of Scottish aquaculture)
Cabinet Secretary for Transport, Infrastructure and Connectivity (CS-TIC)	Responsible for (*inter alia*): infrastructure investment policy
Minister for Energy, Connectivity and the Islands (M-ECI)	Supports the CS-TIC; responsibilities include: renewable energy industries; cross government co-ordination on islands
Minister for Local Government, Housing and Planning (M-LGHP)	Supports the CS-LCG; responsibilities include (T&C) planning
Minister for Rural Affairs and the Natural Environment (M-RANE)	Supports CS-ELCCR and CS-RE; responsible for (*inter alia*): Marine planning; marine environment; sustainable development

SP *Environment, Climate Change and Land Reform* Committee (ECCLRC)	Remit includes: environment; water quality; Crown Estate Scotland ('owners' of the sea-bed); and marine planning
SP *Rural Economy and Connectivity* Committee (RECC)	Remit: "to consider and report on matters falling within the responsibilit[ies] of" the CS-RE and the CS-TIC
SP *Economy, Energy and Fair Work* Committee (EEFWC)	Remit includes: "matters relating to energy falling within the responsibilities of the Minister for Energy, Connectivity and the Islands
SG Energy and Climate Change Directorate	Reports to CAS-ECCLR and M-ECI amongst others; responsible *inter alia* for policies on energy infrastructure and renewable and low-carbon energy
SG Environment and Forestry Directorate	Reports to CS-ECCLR and CS-RE ; remit includes "strategic sponsorship of the Scottish Environment Protection Agency [**SEPA**], Scottish Natural Heritage [**SNH**] ....; protecting, maintaining and enhancing environmental standards as the UK exits the EU"
SG Marine Scotland Directorate	Reports to CS-ECCLR and CS-RE; remit includes "promoting sustainable, profitable and well-managed fisheries and aquaculture industries; ensuring a sound scientific evidence base exists to inform our marine policies; … promoting sustainable economic growth from the marine renewables industry"
SG Local Government and Communities Directorate	Reports to CS-CLG and M-LGHP; responsible for policies on *inter alia* EIA; and for oversight of T&C planning
Executive Non-Departmental Public Bodies (NDPB)	Including SEPA and SNH (Table 6) "carry out administrative, commercial, executive or regulatory functions on behalf of government" but their staff are not civil servants and they work semi-autonomously under their own chief executives

4.3 UK and Scottish laws

Table 6 lists some of the transpositions of MOI-relevant EU Directives into UK and Scottish law, and gives some of the organisations responsible for implementing these laws.

Table 6 : Some UK/Scotland transpositions of EU Directives

relevant to MOI deployment and industry development, and the public organisations that implement them.

DIRECTIVE	UK/SCOTTISH LAW	UK/SCOTTISH ORGANISATION
Aquatic Animal Health Directive	*Aquatic Animal Health (Scotland) Regulations 2009*	Marine Scotland – Fish Health Inspectorate (MS-FHI)
Birds Directive and Habitats Directive	The (UK) *Conservation (Natural Habitats, &c.) Regulations 1994* and the *Nature Conservation (Scotland) Act 2004*. The (UK) *Conservation of Offshore Marine Habitats and Species Regulations 2017* gives duties to SM in the Scottish offshore region.	Scottish Natural Heritage, advised by (UK) Joint Nature Conservation Committee
EIA Directive	The *Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017* , using powers given in the (UK) *Town and Country Planning (Scotland) Act 1997.*	Depending on development: local T&C authorities, and/or Marine Scotland Licensing Operations Team (MS-LOT).

MSFD	The (UK) *Marine Strategy Regulations (2010)* require monitoring, assessment and management of UK and "devolved waters". In the case of Scotland, the SM are made the "competent authorities" for the devolved "Scottish inshore waters" and the UK-retained "Scottish offshore waters".	(UK) Department of the Environment, Fisheries and Rural Affairs (Defra) supported by "devolved policy authorities" (including the SG sub-directorate Marine Scotland Science (MSS) and Scottish agencies SEPA and SNH)
MSPFD	The *Marine (Scotland) Act 2010* set up a marine planning system for Scotland, leading to a Scottish National Marine Plan in 2015, and provides for licencing for marine renewable energy generation devices	Marine Scotland for policy and National plan; Marine Scotland Licensing Operations Team (MS-LOT), Regional Marine Planning Partnerships (in course of formation). Fish-farming remains under T&C planning.
WFD	*Water Environment and Water Services (Scotland) Act 2003*; *Water Environment (Controlled Activities) (Scotland) Regulations 2011 (updated 2013, 2017)* – often called the *Controlled Activity Regulations (CAR)* – control activities that might "affect Scotland's water environment" including coastal waters as defined in WEWWSA (s.3) and Table 4 – i.e. extending to 3 n.m. from the CB.	Scottish Environment Protection Agency (SEPA)

We approach this complex set of institutions, organisations and interactions by reviewing, briefly, the settings for operational decisions on the consenting of new fish-farms and marine renewable energy generation structures. Table 7 compares the relevance to each sector of the main laws dealing with consenting maritime developments.

Table 7 : Main laws relating to offshore renewable energy and fish-farming in Scotland

i.e., providing settings for operational action situations involving these developments. Not comprehensive. Renewable energy mainly according to Marine Scotland **[13]**, fish-farming mainly according to Scottish Government **[12]** and **SG fish farm consenting web page**.

LAW	MARINE RENEWABLE ENERGY	FISH-FARMING
MSPFD: (UK) Marine and Coastal Access Act 2009 and Marine (Scotland) Act 2010 : give SM powers over marine planning, marine licensing and nature conservation in the Scottish inshore marine region and the Scottish offshore marine region.	Any development requires a Marine Licence under these Acts. MS-LOT will take account of navigation, HRA, EIA, and other matters.	Farms need Marine Licence in respect of navigation, otherwise only relevant for farms in Scottish offshore waters (none yet proposed) or if relevant LA agrees to relinquish planning/licensing powers for inshore waters

(UK) Electricity Act 1989 (s. 36) and Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, applies to any "generating station" of more than 1 MW (inshore) or 50 MW (offshore).	Stations need a consent from MS-LOT taking account of EIA and potential hazards to navigation	Not relevant
SEA Directive: Environmental Assessment (Scotland) Act 2005 requires SEA of relevant public plans and policies in Scottish inshore waters; the (UK) Environmental Assessment of Plans and Programmes Regulations 2004 requires this for offshore waters.		
Habitats & Birds Directives: The UK "Habitats Regulations" are the Conservation of Habitats and Species regulations 2017 (apply to all Electricity Act 1989, s.36 consent applications), the Conservation (Natural Habitats, &c.) Regulations 1994 as amended (apply to Scottish inshore waters), and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (apply to marine licence and s.36 applications in Scottish offshore waters). The (UK) Wildlife and Countryside Act 1981 (as amended) and the Wildlife and Natural Environment (Scotland) Act 2011 protect basking sharks.	Habitats Regulations Assessment (HRA) required; may require a European Protected Species (EPS) licence and a Basking Shark licence.	LA planners must consult with Scottish Natural Heritage (SNH) concerning MPAS, but HRA not needed (for inshore waters)
EIA Directive: The "EIA Regulations" include the Electricity Works (Environmental Impact Assessment) Scotland Regulations 2017 (all Scottish waters), the Marine Works (Environmental Impact Assessment) Scotland Regulations 2017 (Scottish inshore waters), and the (UK) Marine Works (Environmental Impact Assessment) Regulations 2007 (Scottish offshore waters), all as amended.	EIA required; note some differences from HEA, as considered in Scottish Court of Session judgement [2016] CSOH 103 concerning offshore wind-farms and sea-birds	EIA required
Public Participation Directive: "EIA Regulations" and T&C planning require public participation.	Marine Scotland [13] urges early and "continuing engagement between developers, MS-LOT and its advisors, and other stakeholders (including local interest groups and the public)."	Applications for T&C planning consent are open to public support or opposition.

(**UK) Energy Act 2004** as amended by the Scotland Act 2016 allows public navigation rights to be extinguished for a "generating station" in Scottish inshore waters, unless this would "interfere with recognised sea lanes essential to international navigation". The Acts also allow "safety zones" during construction or operation, and require a decommissioning program (including financial guarantees).	May facilitate or forbid development. Safety zones (out to 500 m) must be detailed in EIA. Decomissioning plan must be submitted and approved after development consent. Financial guarantees may be sought.	Not relevant.
Aquatic Animal Health Directive: Aquatic Animal Health (Scotland) Regulations 2009	Not relevant	Need an Aquaculture Production Business Authorisation from MS-FHI.
WFD: Water Environment (Controlled Activities) (Scotland) Regulations 2005 and updates.	May need a CAR licence from SEPA for construction, operation, decommission.	Need a CAR licence from SEPA for emissions of waste and chemicals.

4.4 Sea-bed leasing

Both fish-farms and renewable energy structures make use of the sea-bed, to moor floating structures or as a base for permanent structures. Most of the UK sea-bed out to 12 n.m from the coastal baseline (and some intertidal land) is part of the **Crown Estate**, the UK monarch's public property. It is managed, and its use let, by a public corporation headed by the Crown Estates Commissioners, who deliver resulting profits to the UK treasury.[4] In 2017 control of the Scottish holdings were transferred to a separate **Crown Estate Scotland**, and revenues given over to the Scottish treasury.[5] The (UK) Scotland Act 2016, and the Scottish Crown Estate Act 2019, formalise this devolution, and the 2019 Act additionally provides for parts of the sea-bed to be managed by local communities and local public authorities. The Crown Estate Scotland (CrEsS) is required to charge market rates for sea-bed leases, unless there is a public-good case for lower charges. Fish-farms are charged an annual rent related to the amount of fish produced, currently £27.50 per tonne (gutted weight) of salmon.

Sites for offshore wind, wave and tidal energy generation must also be leased from the Estate. Using this power, the SCE, in liason with the Scottish Government, controls and encourages the growth of ORE through **leasing rounds [14].** One of these rounds is about to commence at the time of writing, and involves the CrEsS inviting applications from developers for 10-year Option Agreements to use the seabed for wind energy capture devices. Applications will only be accepted for areas identified as suitable for this purpose in the draft Sectoral Marine Plan for Offshore Wind [15], which fall both within Scottish Territorial Waters (out to 12 nm from the CB) and the Renewable Energy Zone (12 to 200 nm, EXPLAIN). CrEsS proposes to make a charge per km^2 for which the application is made. Once a proposed development has gained necessary consents (see below), the Option can be converted to a Lease of 40 to 50 years for a windfarm of specified generating capacity, with rent set at 1 to 2% of the revenues from power generation.

CrEsS (2018 – as above) explains its role in relation to that of Marine Scotland as follows:

[4] Website: The Crown Estate
[5] Website: The Crown Estate Scotland

In offshore renewable energy, we are seabed manager, catalyst and supportive partner. Marine Scotland, as the regulator, is responsible for strategic marine planning, environmental considerations, regulatory compliance and assessing consent applications for projects. Marine Scotland grants consents for projects. Crown Estate Scotland grants a lease of the seabed only once the consents and other required permissions are in place.

CrEsS is required to generate value for society, not only providing income to the public purse from leasing but also enouraging sustainable and socially-beneficial development. It is not a democratically accountable body but works with the Scottish Government and with (in this case) maritime stakeholders to develop policy [14]. It uses some of its income to help Blue Growth, for example recently sponsoring a set of scenario analyses for offshore energy that includes a case where wave energy generation is used to power a fish farm [16].

4.5 Consenting of maritime renewable energy developments

The Scottish Government's Directorate Marine Scotland is the lead body in planning and licensing the deployment of structures aimed at harvesting wind, wave and tidal energy in Scottish inshore and offshore waters [13]. The 'Licensing Operations Team' (MS-LOT) is advised by several other organisations, who are statutory consultees for license applications (Table 8). It may also set up a "Marine Renewable Facilitators Group", involving a wider range of stakeholders.

Table 8 : Statutory consultees for an application to deploy a marine renewable energy device in Scotland

taken from Marine Scotland [13].

BODY	RELEVANT DUTIES
Marine Scotland (MS) including MS-LOT and MSS	The SG Directorate Marine Scotland (MS) oversees planning and policy; is Licensing Operations Team (MS-LOT) deals with licensing; Marine Scotland Science (MSS) provides scientific advice including scientific reviews of EIA and HRA.
Historic Environment Scotland	Provides advice on impacts on historic environment (e.g. wrecked ships)
Local authority	Advice on landscape and visual impact and socio-economic considerations
MCA (UK Marine & Coastguard Agency)	Responsible for navigational safety
Northern Lighthouse Board	Gives permissions for marker buoys and lights
Planning Authority: Local Authority (LA) or RMPP Regional Marine Planning Partnership (RMPP)	Licensing must comply with LA Plan or Regional Marine Plan (see section 4.7); LA must give planning permission for shore facilties.
SEPA (Scottish Environment Protection Agency)	Maintaining Ecological Quality of coastal water bodies (as per WFD) and CAR licencing (by law inside 3 .n.m. from CB, and implication is that advice will be accepted by MS-LOT for any site.)

SNH (Scottish Natural Heritage)	Conservation of habitats and species(as per Birds and Habitats Directives), by means of marine protected areas and measures to prevent impact on protected species (especially, wild salmonids, marine mammals, sea-birds); provides guidance on landscape (visual) impacts.

Consent by Scottish Ministers for offshore developments may be subect to legal challenge. In 2016 the Scottish Court of Session found against the decision to consent several large wind-farms in the North Sea near the east coast of Scotland, on the grounds (brought by an eNGO) that they would possibly harm populations of sea-birds.[6] Interpretation of the UK transposition of the Habitats Directive was crucial to this case. The judgement was overturned in 2017,[7] but the challenge resulted in considerable cost and delay, not to mention embarassement for the Scottish Government, and brings out the need not only for good EIA but also for understanding the roles of all organisations involved in the action situation that centered on the proposed development.

4.6 Consenting of marine fish-farming developments

A planning circular **[12]** provides (paragraph 89) a good summary:

> *Since 2007 marine fish farming has required planning permission from Local Authorities in accordance with the [Town and Country Planning (Scotland) Act 1997]. This applies to all new fish farms out to 12 nautical miles including modifications to existing ones (although the role of planning authorities currently only extends to 3 nautical miles). Fish farming is therefore unique amongst marine activities in that it requires a consent from a terrestrial planning authority. ... In the future, should fish farming extend beyond 12 nautical miles a marine licence from Marine Scotland would be required as the primary consent to develop.*

For example, an application for permission to install a new fish farm in coastal waters of Argyll must be submitted to the planning department of Argyll & Bute Council, while an application for a farm in the waters around the Shetland Isles must be submitted to the Shetland Islands Council. In either case the application will be circulated by the authority to *statutory consultees*, including SEPA, SNH and MSS (Table 9), whom the developer should have consulted in advance of their application. It will also be publically advertised, leading in some cases to submissions of statements of objection or support by citizens and organisations with an interest in the development site. Technical matters (including environmental impact) might be dealt within a small group of local authority planners and officials working for the statutory consultees. However, should the application prove controversial, it will receive consideration by councillors, who are elected representatives from within the LA area. In some cases a LA planning decision may be subject to legal challenge, or reconsidered by the Scottish Government.

[6] "Judgement of Lord Stewart in the Outer Court of Session in 2016 in favour of the petition by RSPB against the consent granted by Scottish Ministers in 2014 for construction of 4 wind-farms." Search at **www.scotcourts.gov.uk** with reference [2016] CSOH 103. See also **[32]**.

[7] Search at **www.scotcourts.gov.uk** with reference [2017] CSIH 31.

Table 9 : Statutory bodies involved in an application to deploy a fish-farm in Scotland

Not comprehensive. Taken from Anon [17] 'Working Arrangements'; see also Scottish Government [12] 'Planning Circular 1/2015', and SSPO (2014) 'Planning Application Protocol'.

BODY	DUTIES
Local Authority	Giving or refusing consent to development, taking account of conformity to planning policies, reports from statutory consultees, and (in some cases) public opinion
Marine Scotland including MSS, MS-LOT and MS FHI	Estimation of water-body assimilative capacity and maintainance of the 'Locational Guidelines' indicating where new farms may be sited; minimisation of impacts of farm on wild fish (through lice and disease spread and escapes of farmed fish); licensing of farm structures in relation to navigation; licensing of discharges from boats transferring fish; Aquaculture Production Business Authorisation (by MS Fish Health Inspectorate)
SEPA	Maintaining Ecological Quality of coastal waters (as per WFD) and CAR licencing
SNH	Conservation of habitats and species(as per Birds and Habitats Directives), by means of marine protected areas and measures to prevent impact on protected species (especially, wild salmonids, marine mammals, sea-birds); provides guidance on landscape (visual) impacts.

4.7 Marine Spatial Planning and Policy-making

The Marine (Scotland) Act 2010 set up a marine planning system for Scotland in advance of the MSPFD. The Act led to the publication of a National Marine Plan [18], containing chapters on the main maritime sectors including Aquaculture and Offshore Renewables.[8] There are many supporting documents and policies relating to the expansion of these sectors, including *locational guidelines*:

- Locational guidelines for (fin-)fish-farming were first issued in 2002 [19] and are regularly revised.[9] They refer to inshore waters, exclude fish farming from most of the east and north coasts of the Scottish mainland, and categorize west coast and island water-bodies for their capacity to assimilate dissolved and particulate waste from existing and new fish-farms.
- Draft locational guidelines for the development of offshore wind energy were issued In 2012 [15]: they map Scottish inshore and offshore waters to show potential regions that seem suitable for deployment of energy generators from wind at sea, and also show other uses of the sea that might be in competition.[10]

The next policy step involves the setting up of Regional Marine Planning Partnerships (RMPP)

> *"Regional marine planning powers will be delegated to the Partnerships by Scottish Ministers. These powers will not include licensing or consenting as these will remain the responsibility of consenting bodies such as Marine Scotland and Local Authorities. The first partnerships are in the Clyde and Shetland Isles regions."* [13]

[8] See also **Marine Plan on-line** for recent updates.
[9] Latest version of the guidelines at: **SG publications: Locational Guidelines**
[10] Most recent version of maps available by way of **Marine Scotland link page for wind RLG**

However, it is as yet unclear how even the existing RMPP for the Clyde and Shetland are dealing with the reconciliation of sectoral demands in their waters, or how planning will be further developed for other regions beyond what is currently stated in locational guidelines.

4.8 Discussion

The Scottish example[11] illustrates several of the key issues for the development of an industry involving MOI: the different rules and jurisdictions applying to fish-farming and offshore renewable energy; the incomplete development of MSP as a process for encouraging multi-use; and the potential for legal challenges to become part of action situations.

Finally, although the MSFD and the MSPFD have been transposed into UK and Scottish law, the importance of these directives to the development and deployment of MOI is unclear. Transpositions of the WFD and the Habitats Directive(s) have been more important in operational situations than have those of the MSFD. Authorisations for the siting of fish farms takes place through a Town & Country planning process, rather than MSP. This could change in the next few years as Regional Marine Planning Partnerships come into being. The Scottish National Marine Plan has provisionally identified zones for offshore renwable energy, and the current interest, by bodies such as the Crown Estate Scotland, in 'multi-use' of the sea could lead to the development of planning policies favouring MOI.

[11] Although the UK may leave the EU (Brexit) at the end of January 2020, this not expected to have any immediate effect on the laws and policies described in this section. It is the policy of the present Scottish government to maintain, as far as it is allowed by the UK government, Scottish laws based on EU Directives.

5 FRANCE

This chapter describes transpositions of the relevant European Directives into French law and policy as well as the public organisations that implement these laws.

5.1 Introduction

The preceeding section used the example of Scotland (within the UK) to illustrate how EU Directives, transposed into national law, provide the settings for licensing marine developments and for the formation of policy about the use of the sea. This section provides the analogous institutional map and organisational map for MOI in France. It is a preliminary account, based on document analysis. As in the Scottish case, this section deals with environmental as well as social regulation, because minimising environmental impact is a requirement of formal and informal social processes resulting in authorisation for development. Also as in the case of Scotland, it is necessary to distinguish between the operational level and the policy-forming levels of governance.

Concerning action situations at the operational level, this section asks *what laws in France govern the following formal licensing processes*:

- the authorisation of marine renewable energy developments?
- the authorisation of marine fish-farming developments?
- the authorisation of occupancy of space on the sea-bed?

Concerning the higher levels of governance, *what are the processes that lead to the laws, plans and policies that provide the settings for operational action situations?* This section attempts to trace the laws and policies back to:

- The MSFD, as an over-arching environmental directive, but also taking account of the nature conservation requirments of the Birds and Habitats Directives, and the water-body-scale ecological quality requirements of the WFD;
- The MSPFD as the basis for Marine (or Maritime) Spatial Planning, taking account of relevant Town & Country Planning (T&CP) and perhaps ICZM;

Finally, there is a need to know *which public and private organisations are obliged by law or their own interests to participate in the authorising or policy-forming processes.*

5.2 Environmental and Energy Law and Organisations

Boivin & Emorine **[20]** provide an overview of environmental law.[12] Unlike the UK, France has a written constitution. In this constitution, alongside the 1789 Declaration of the Rights of Man and of the Citizen,

[12] uk.practicallaw.thomsonreuters.com/Browse/Home/International/EnvironmentGlobalGuide

and 1946 Declaration of Economic and Social Rights, is the 2004 Environmental Charter [21]. This is a statement of principles, with which environmental laws must comply.

Codification is an impotant feature of French law. The Environmental Code brings together most of the relevant acts and decrees.[13] Similarly, an Energy Code brings together laws and regulations relating to energy generation, distribution and use.[14] This formal codifications of laws relating to topics such as energy and environment distinguishes French from UK and Scottish governance. The *codes en vigeur* provide an up-to-date account of relevant law in one place, and recent relevant legislation explicitly updates one or more codes. However, French "water law remains … rather complex and difficult to access …since the legal rules governing water protection and management are scattered in several codes …" [22].

MTES, *le Ministère de la transition écologique et solidaire* (the Ministry for Ecological and Inclusive Transition, Table 10), is responsible for energy and environmental policy and oversight. Implementation of the policies takes place through (i) agencies, such as ADEME and IFREMER, and (ii) the public administration in the 95 *départements* into which metropolitan France is divided. The departmental chief executive is the prefect (*préfet),* appointed by, and responsible to, central government, but working with an elected departmental council. The lowest level of government is that of communes, which have elected councils and mayors. Departments are grouped into regions, with centrally-appointed regional prefects and councils elected by the region. One such region is *Provence-Alpes-Côte d'Azur* (PACA) with Marseille as its administrative capital.

Figure 3 : Polycentric environmental end energy governance in France

PACA flag from Wikipedia comons, by Diades - own work, CC BY-SA 3.0.

[13] Available in English translation (up to 2006) at URL: **www.legifrance.gouv.fr/Traductions/en-English/Legifrance-translations** The most recent version of the code is available (in French only) at URL: **www.legifrance.gouv.fr** – search under "*code de l'environnement*".

[14] The Energy Code is available (in French only) at URL: **www.legifrance.gouv.fr** – search under "*code de l'énergie*", or follow links to "*les codes en vigeur".*

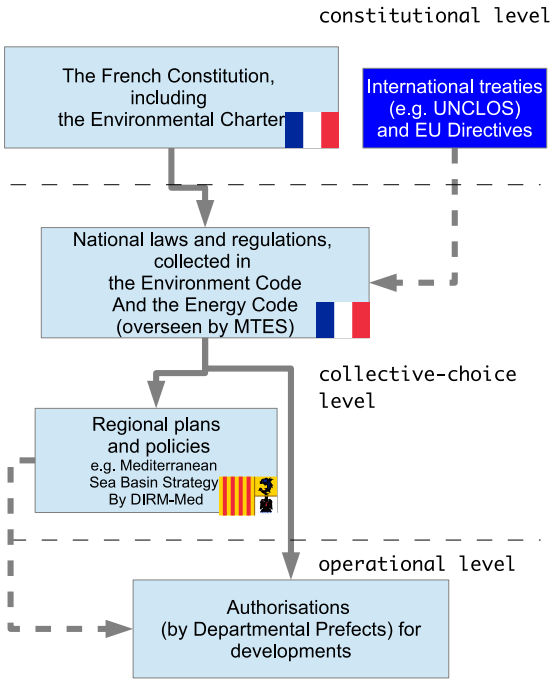

Table 10 : French public organisations with Environmental roles relevant to MOI

From various sources (including the URL stated) and Boivin & Emorine [20]

ACRONYM	TITLE	RELEVANCE
(Ministry of Agriculture	*Ministère de l'Agriculture et de l'Alimentation* (Ministry of Agriculture and Food) at URL: agriculture.gouv.fr	Includes *Direction des pêches maritimes et de l'aquaculture*, responsible for policies, although these are implemented by the DIRM agencies of MTES
MTES	*Ministère de la transition écologique et solidaire* (Ministry for Ecological and Inclusive Transition), at URL: www.ecologique-solidaire.gouv.fr/ Has had many previous names, including Ministry of Environment.	MTES is responsible for many "*établissements publics*" ('agencies') such as IFREMER and ADEME. The *Direction générale de l'aménagement, du logement et de la nature* (DGALN) oversees Water Boards and the AFB. The *Direction générale de l'energie et du climat (DGEC) includes responsibility for renewable energy.* The remit of *Inspection générale des affaires maritimes* (IGAM) includes fisheries and the cultivation of marine organisms.
IFREMER	*Institut français de recherche pour l'exploitation de la mer, at URL: wwz.ifremer.fr*	A marine research agency of MTES, and may be invited to advise on marine environmental impacts
(Water boards)	*Agence de l'eau Rhône-Méditerranée-Corsem at URL: www.eaurmc.fr* It is one of 6 water boards in Metropolitan France, all agencies of MTES.	Responsible for water supply and quality in the Rhône basin, the other rivers draining into the Mediterranean Sea, and the WFD ecological quality in the water-bodies close to shore.

ADEME	*Agence de l'Environnement et de la Maîtrise de l'Énergie Changement climatique* (French Environment and Energy Management Agency) at URL: **www.ademe.fr**	"ADEME supports renewable energies with a view to promoting sustainable development. ... ADEME is active both upstream in the value chain (support for research programmes) and downstream (deployment support)." An agency of MTES.
AFB	*Agence française pour la Biodiversité*, at URL **www.afbiodiversite.fr** . Created January 2017 by law 2016-1087 of 8 August 2016.	Implements public policies concerned with the understanding, preservation, management and restoration of biodiversity in terrestrial, aquatic and marine environments. An agency of MTES; its work includes management of Natura 2000 sites.
CNPMEM	*Comité national des pêches maritimes et des élevages marins* (National Committee for Marine Fisheries and Mariculture) at URL: **www.comite-peches.fr**	An autonomous public body, "bringing together all the professions of the fishing and marine farming sector, it represents and defends the general interests of fishermen to the national and community authorities."
PACA	*Provence-Alpes Côte d'Azur* region, one of 13 regions into which metropolitan France is divided.	Each region is administered by a government appointed regional prefect and an elected council, and has planning responsibilities.
DREAL	Regional Directorates for Environment, Land Planning and Housing *(Directions régionales de l'environnement, de l'aménagement et du logement)* formed under a law of 2009 by grouping regional agencies including those for environment *(DIREN)*	Devolved regional authorities, overseen by MTES, and managed by a government-appointed regional prefect, which, amongst other tasks, implement national environmental policies. DREAL Occitanie is based in Toulouse, DREAL PACA in Marseille.
AD'OCC	*Agence Régionale de Développement Economique: Région Occitanie/Pyrénées-Méditerranée* ***www.agence-adocc.com*** Regional Economic Development Agency formed in 2018 by merger of 6 smaller agencies.	Acts as "an interface between the worlds of business and research"; its *Filière du futur* for Marine Renewable Energy is sited in Montpellier
DIRM-med	*Direction interrégionale de la Mer Méditerranée* (Maritime Directorate for the (French) Mediterranean), URL: **www.dirm.mediterranee.developpement-durable.gouv.fr/**.	One of 4 semi-autonomous DIRM embracing French waters. Manages some maritime facilities, regulates fisheries and aquaculture, and is responsible for coastal zone (*le littoral)* and marine planning, in *the regions Languedoc-Roussillon, Provence-Alpes Côte d'Azur* and *Corse*, with seat in Marseille. Like other DIRM, is under the authority of *préfets coordonnateurs* (the *préfet maritime* plus one of the *préfets de region),* who provide the secretariat for the *Conseil Maritime de Façade* made up of public and corporate stakeholders.
	Département – the main unit of local government, with an elected *conseil départemental* and a centrally appointed *préfet*; example, *Bouches-du-Rhône*, with prefecture in Marseille and more than 2 million inhabitants	There are 95 departments in metropolitan France, averaging about half a million inhabitants. They prepare development plans and consider development applications. Coastal departments have an office for maritime affairs. The *préfet* issues permits and enforces compliance (with the support of the regional DREAL).

CDPMEM 06	*Comité departemental des pêches maritimes et des élevages marins des Alpes maritimes* (Departmental committee for marine fisheries and marine farming in Alpes maritimes) at URL: **www.cdpmem06.org**	Departmental analogue of CNPMEM, representing local fishers and sea-farmers; most coastal departments have a CNPMEM
	Commune – the smallest unit of local government, with an elected *conseil municipal* and *maire* (mayor). Examples in *Bouches-du-Rhone*: Marseille (with about 870 thousand population) and the adjacent Cassis (with just over 7 thousand)	There are more than 36 thousand communes in metropolitan France, many with few inhabitants. Coastal communes are statutory consultees for applications for marine authorisations.

Finally, environmental NonGovernmental Organisations (eNGO) have been and remain active in the drafting of environmental policies, such as those in the law *Grenelle II* of 2010. The Environment Code (L.142-2) gives them rights to bring actions in civil and criminal courts **[20]**.

5.3 Transpositions of EU directives

Table 11 sumarises the main transpositions into French law of the Marine Strategy Framework Directive (MSFD) and the Maritime Spatial Planning [Framework] Directive (MSP[F]D). The Water Framework Directive (WFD) has been included in the table, on the grounds that the monitoring and management of water quality in coastal water bodies is especially relevant to the operation of fish farms in such water bodies. However, their extension offshore is in some cases (such as the Occitan coast) quite limited.

Table 11 : Transpositions of the key EU Directives into French law

DIRECTIVE	MAIN FRENCH LAW	RELEVANCE TO MOI
MSFD	Transposed into the Environment Code (articles L. 219-9 to L. 219-18 and R. 219-2 to R. 219-17) by art. 166 of law 2010-788 of 12 July 2010 concerning the national commitment to the environment, called the "*loi Grenelle 2*", and through the decree No. N011-492 of 5 May 2011 concerning the creation and implementation of action plans for the marine environment	Applied through through Action Plans for the Marine Environment (PAMM) to four MSFD sub-regions including the Western Mediterranean Sea; likely to impact on MOI only through specific Programmes of Measures relating to fish-farming or MREG.
MSPFD	Art. 123 of Law no.2016-1087 for the "reconquest of biodiversity, nature and landscapes" introduced MSP into the Environment Code. Decree no. 2017-724 of 3 May 2017 defined *documents strategiques de façade* (DSF) as tools for applying the MSFD and ICM (Integrated Coastal Management = ICZM) as well as the MSPFD to the French coast and adjacent waters	DIRM-Med could provide a policy forum for discussion of multi-use of marine space

WFD	Law 2004-388 of 21 April 2004 transposing the WFD and Law 2006-1772 of 30 December 2006 on water and aquatic environments.	*L'agence de l'eau Rhône Méditerranée Corse* is responsible for (WFD-defined) water quality in the coastal waters of the Gulf of Lion, the *Côte d'Azur* and Corsica. The relevant water bodies are shown in the agency's app *Qualité Médit*.

5.4 Sea-bed leasing

Although the processes by which states allocate the use of the sea-bed for development are different in Scotland and France, the outcome seems similar for both fish-farming and ORE. In Scotland, the sea-bed owners and leasors are Crown Estate Scotland (CrEsS). In France it is the French State that controls use of the sea-bed. It does not appear to constrain fish-farming developments so long as they satisfy the concerns of regional and local authorities. In the case of MREG, the MTES from time to time invites tenders for the use of certain areas of the sea-bed for this purpose [**23**].[15] Successful wind-farm applicants pay a start-up fee that may be likened to an advance rent for a concession that can last up to 40 years.[16]

In both countries the public initiative and decision making in the case of MREG is explained, at least in part, as a result of the need to harmonize the deployment of MRE devices with the planning of energy grids. Winning a MRE tender entitles a developer to obtain an operating licence and conclude a power purchase agreement. Further consents must be obtained from other regulatory authorities.

5.5 Consenting of renewable energy developments

Since 2017, a developer of an offshore wind farm (*un parc éolien*) have been able to apply for a "single environmental authorisation" covering: the use of water; permission to operate; occupation of the public domain; and certifications in relation to navigation by air and sea, and marine protected areas **[23]**. Town and Country planning does not apply, but there must be a public enquiry to ascertain the opinion of the public and relevant public authorities.

Several authorities are involved in the authorisation. Most crucial is the relevant *préfet* if the farm is to be located in the **maritime public domain,** out to 12 n.m. from the CB: the prefect must approve occupation of the public domain and also mitigation of environmental impacts (according to the Environment Code) and effects on Marine Protected Areas. They will be supported in this task by the relevant DREAL and Water Board and the AFB.

The relevant authority for a farm, including a floating wind farm, located further offshore (in the EEZ) is the AFB, and there is an annual fee payable to this agency **[23]**.

[15] According to (Barthelemy & Rubio 2018), MTES guarantees that the French national company EDF will buy the electricity generated at the price proposed in the winning tender, if necessary compensating EDF from the proceeds of a tax on energy consumption.

[16] The fee for occupying the *maritime public domain* was set in 2017 at 1,000 euro per turbine, 1 euro per metre of connecting cable and 6,000 per MW capacity. See articles R.2124-1 and L.2125-1 of the *General Code on Public Properties.*

5.6 Consenting of fish-farming developments

At least 80% of mariculture in France concerns the cultivation of shellfish. According to the French Ministry of Agriculture and Food, sea-farming (mainly of *bar* and gilthead seabream) has stagnated since 1995, with an annual production of about 5000 tonnes. This has been ascribed to a shortage of suitable sites and competition for these sites with other coastal activities, such as tourism.[17]

Table 12 : Laws relevant to marine fish-farming in France

Based on FAO summary (Andrea 2005); see also BGF D4.1

LAW	RELEVANCE
le décret du 9 juin 1852 sur la pêche maritime (Decree January 9th, 1852 on Maritime Fisheries)	Establishes the need for authorisation for aquaculture in salt waters
le décret No 83-228 fixant le régime de l'autorisation des exploitations de cultures marines (Decree No.83-228 establishing the authorization system for marine aquaculture)	Defines procedures for obtaining such authorisation
décret n°85-453 appliquant la loi n°83-630 relative à la démocratisation des enquêtes publiques et de la protection de l'environnement (Decree No.85-453 implementing Law No.83-630 concerning the democratization of public enquiries and the protection of the environment.)	A public enquiry may be required, depending on size and location of project
la Loi No.97-1051 sur la pêche maritime et les cultures marines (Law No.97-1051 on Maritime Fisheries and Mariculture), amending *la Loi No.42-427 relative aux titres de navigation maritime* (Law No.42-427 concerning Maritime Navigation Titles)	Defines mariculture as a 'rural activity' and includes "aquaculture vessels" in a new navigational category; implies that MOI will need a muster roll as well as a navigational permit

According to the FAO **[24]**,

> *The Fisheries Law of 1997 clarifies the double nature of mariculture, defining it as a rural activity on the one hand, and including aquaculture vessels in a new navigation category on the other. ... The amendment to [law 42-427] actually provides that a fourth category of navigation, specifically concerning marine aquaculture, must be created next to those of commerce, maritime fisheries and leisure. This includes the creation of the corresponding muster roll (*rôle d'équipage*). If the total navigation needed to exploit a maritime concession lot is three miles or more, the vessel must receive a muster roll. Below this distance, vessels only need a navigation permit, but may as well receive a muster roll. In addition, the conduct of aquaculture in salt waters requires the granting of a special authorization ... [according to procedures] defined by Decree No.83-228 ...*

Applications for aquacultural concessions are processed by the relevant Departmental or Inter-Departmental Director of Maritime Affairs (Directeur Départemental ou Interdépartemental des Affaires Maritimes), which is a local authority attached to the Ministry of Infrastructure. Authorisations are issued

[17] **https://agriculture.gouv.fr/la-pisciculture-production-et-consommation** (visited 23 September 2019): "*La pisciculture : production et consommation*" 27/08/2017, *Ministère de l'Agriculture et de l'Alimentation*

by the Prefect of the relevant Department on the basis of the opinion of the local Commission for Marine Aquaculture (*Commission des cultures marines*), with advice from tax authority, local health service, consumers' service, IFREMER, concerned Municipal Authorities and relevant professional organizations such as CDPMEM. Public consultations may take place.

Farmers of fin-fish and shellfish find these processes cumbersome and slow **[25,26]**. It is unclear whether they apply to installations beyond the territorial waters – for example to MOI moored beyond 12 nm from the CB.

5.7 Maritime spatial planning and policy making

According to the European MSP platform **[27]**,

> *On 8th August 2016, the [MSPFD] was transposed into French legislation through the entry into force of art.123 of law no. 2016-1087 for the "reconquest of biodiversity, nature and landscapes". The article modifies the French Environmental code through the introduction of the notion of maritime spatial planning defined as "the process by which the State defines and organises human activities at sea in an ecological, economic and social perspective. It does not apply to activities related to defense or national security".*

As made clear in decree 2017-724, article 123 integrates implementation of the MSFD, the MSPFD, the development of a sustainable blue economy, and ICZM. The main tools for MSP are a *Stratégie nationale pour la mer et le littoral* , adopted 22 February 2017 under decree 2017-222,[18] and the *documents stratégiques de façade* (DSF, Sea Basin Strategy Documents) for each of four maritime regions (in metropolitan France).[19] These implement the MSPFD and the MSFD to suit local conditions and include *carte des vocations* (maps showing zones and their designated roles or uses). In the context of BGF, the maritime region of interest is that of the Mediterranean, which includes coastal areas of *Occitanie* and *Provence-Alpes- Côte d'Azur.*

As required by article L 219-9 of the Environment Code, *DIRM-Mediterranée* has prepared and very recently adopted a *Plan d'action pour le milieu marin (PAMM*) that includes a programme of surveillance and a programme of measures aimed to bring French Mediterranean waters into (MSFD) Good Environmental Status by 2020.[20]

The law on the Modernisation of Aquaculture and Fisheries of 2010, and the Decree of 2011, introduced the concept of *Schéma Régional de Développement de l'Aquaculture Marine* (Regional Schemes for the Development of Marine Aquaculture), or SDRAM. These were to be developed by DIRM in order to identify areas suitable for further aquaculture development, i.e. as part of MSP. In the case of DIRM-Med, 17 suitable sites were identified in Occitanie (5 existing), and 10 sites in PACA, where there are already 15. The policy was aimed at supporting artisanal farms, but two years after publication of the SDRAMS, no new

[18] English version of this 'National Strategy for Seas and Coasts' available from URL: https://www.ecologique-solidaire.gouv.fr/sites/default/files/17094_National-Strategy-for-the-Sea-and-Coastal_EN_fev2017.pdf

[19] DSF (in French obtainable from: **www.merlittoral2030.gouv.fr**

[20] Version in English version of DSF obtainable from: **www.geolittoral.developpement-durable.gouv.fr/documents-english-version-r549.html**

farms had been created. According to [26], this was because the main constraint on fish-farming development was the administrative burden of application for authorisation, and because of the weak legal weight of SDRAM, in comparison with other planning policies.

The Mediterranean DSF lists, under "emerging activities", the identification of preferred sites for aquaculture through SDRAM, and the identification of pilot farms and "areas with with commercial potential for floating wind power projects". However, the accompanying map shows these activities in different locations in the Gulf of Lion, with fish-farming close to the shore and wind-power areas further offshore.

5.8 Discussion

So far as the key EU directives are concerned, it seems that the scale of the MSFD is so large as to have little direct consequence for MOI. In Water Bodies defined for WFD purposes, it is the need to attain WFD good water quality and ecological status that will be the main environmental impact constraint on MOI. In the EEZ beyond territorial waters, the environmental impact constraints seem to relate to mainly to biodiversity and the avoidance of effects on MPA, as regulated by transposition of the Habitats Directive. There is ambiguity concerning the regulation of environmental impact by fish farms that are within territorial waters but outside WFD water bodies, although there no current examples of these in French Mediterranean waters.

Whereas Marine Spatial Planning through DSF seems likely to provide the main route to developing policy for MOI deployments, the institutional and organisational analyses reported here have shown the complexities involved in relation to planning and authorising MREG and fish-farming even as individual activities, and thus suggest that the authorisation of MOI will be difficult. However, document analysis (the source of the information in this section) can only go so far. There is a need for the BGF project to:

- Collect information from industry-sector stakeholders –fish-farmers and developers of MREG – concerning their experiences with planners and regulators
- Enter into discussion with DIRM-Med concerning multi-use and MOI, given the current DSF identification of separate zones for aquaculture and for floating wind-power.

6 SPAIN

This chapter gives a preliminary account of laws and policies applicable to MREG and fish-farm deployments in the waters of the Canary Islands.

6.1 Introduction

The third site identified in BGF D2.2 for hypothetical deployment of a full-scale MOI was in the coastal waters of the Spanish island of Gran Canaria. The island is part of an an archipelago (*Las Islas Canarias*) of volcanic origin that stretches west across the Atlantic from near the coast of North Africa. The surrounding waters, including those of the deep ocean, are part of the MSFD "Macronesian biogeographic" sub-region, which includes Portuguese waters around Madeira and the Azores. There are some unresolved ambiguities (under UNCLOS) over the extent of the EEZ and of the territorial waters in the archipelago. Most of the archipelago's population of 2.1 million (in 2018) live on the two major islands of Tenerife (905 thousand) and Gran Canaria (847 thousand). The proposed BGF site is near the town of Arinaga, on the eastern side of Gran Canaria and in the municipality of Agüimes.

The BGF project has no partners in the Canary Islands, and so it has been difficult to gather information locally. This chapter presents a short account of governance in relation to MOI, based on a preliminary analysis of documents collected for BGF D4.1.

6.2 Governance

The Canary Islands have a special status, both within the EU and as an autonomous community of Spain. Government authority is partly devolved, so that regulation relevant to MOI is governed both by laws of the Spanish state and by laws of the Canaries Government (*Gobierno de Canarias,* GC). An elected parliament sits in Santa Cruz de Tenerife, but government departments are divided amongst the twin capitals of the archipelago, respecting a historic and continuing division into two provinces. The capital of the western islands, and the joint capital of the archipelago, is in Santa Cruz de Tenerife; that of the eastern islands and the other joint capital, is in Las Palmas de Gran Canaria.

Each of the 7 main inhabited islands of the archipelago has an island council (*Cabaldo Insular)*, and are divided in municipalities *(municipios)* with elected mayors (*alcaldes*).

6.3 MSP

According to the European MSP platform, the relevant Spanish Ministry is that for Agriculture, Food and Environment (*Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente*), but "there are currently no maritime spatial plans in existence in Spain". An EU funded project, MarSP (Macaronesia Marine Spatial Planning), involving Portugal and Spain, aimed to develop MSP schemes for Azores, Madeira and the Canary

Islands in line with the MSPFD and "following an Ecosystem Based Approach"; this project ends in December 2019 and does not include Spanish public authorities as partners.[21]

6.4 Aquaculture

Fisheries and aquaculture are controlled by the Spanish government in the EEZ, whereas they are regulated in territorial waters by the GC, which in 2018 issued a Regional Plan for the Management of Aquaculture (*Plan Regional de Ordenación de la Acuicultura de Canarias*: PROAC)[22].

Marine aquaculture licences are issued by the GC Vice Ministry of Fisheries and Water, after consulting various public bodies including *la Agencia Canaria de Protección del Medio Natural* (ACPMN).

6.5 Marine Renewable Energy

MRE in the form of offshore wind power generation is included in the GC preliminary energy startegy (*Estrategia Energética de Canarias 2015-2025*)[23]; although eolian zones are yet to be identified, it appears that most of the development will occur in the coastal waters of the two main islands (Gran Canaria and Tenerife). The imperative appears to be to send power ashore to replace expensive fossil fuel generation of electricity for the main population centres.

6.6 EIA

EIA are evaluated by a Territorial and Environmental Planning Commission (*La Comisión de Ordenación del Territorio y Medio Ambiente de Canaria*, COTMAC), which has subdivisions for the western islands (Tenerife etc) and the eastern islands (Gran Canaria etc).

6.7 Discussion

The lack of a specific GC authority in charge of MSP is an obstacle to further discussions about policy for MOI and multi-use. Given the participation of ULPGC in the MarSP project, it might be worth commencing such discussions in the academic community.

[21] The **EU MSP platform** contains information about MSP in Spain and about the MasSP project. *Universidad de Las Palmas de Gran Canaria* (ULPGC) is the relevant local partner in MasSP.

[22] *Gobierno Canarias*: **Decreto 102/2018, de 9 de julio por el que se aprueba definitivamente el Plan Regional Ordenacion Acuicultura de Canarias - PROAC**

[23] Initiative E1_1.2 "*Promover el desarrollo de las energías renovables marinas, especialmente la eólica offshore*"

7 ITALY

This chapter gives a preliminary account of laws and policies applicable to MREG and fish-farm deployments in Italian waters, and a short account of planning aspects of the prototype deployment at the NOEL site.

7.1 Introduction

Full-scale MOI deployments at sites near Islay (Scotland), in the Gulf of Lion (France), and near Gran Canaria (Spain) are hypothetical, the purpose of identifying sites being to enable the BGF project to investigate issues influencing environmental licence and social licence across a variety of authorisation regimes that are in part harmonized by EU Directives. In the case of Italy, BGF will deploy a 1/15th scale prototype at the NOEL facility in Reggio Calabria, and we use that site as the focus for a fourth case study even if the actual prototype does not include a fish farm. As in the case of Spain, only a preliminary account is given of the laws and policies that provide the settings for action situations involving MOI.

7.2 Governance

The state of Italy is divided into regions (*regioni,* e.g. Calabria), these into provinces (*province*), and within these municipalities (*comuni*). Municipalities have administrative responsibilities, whereas regions, although subordinate to the state, can make some laws. Legislation on land use and planning is shared between regions and state, and administered by provinces and municipalities. Only the state can make environmental laws.[24] Metropolitan cities (*città metropolitane*) are a special category equivalent to province, and in 2015 the former province of Reggio di Calabria, within the region Calabria, became the 'metropolitan city of Reggio Calabria'. The municipalities within the metropolitan city include the city of Reggio Calabria itself.

7.3 MSP, MSFD and WFD

In 2016 the Italian Parliament approved a decree to transpose the MSPFD, but MSP has not yet been fully implemented. The Ministry of Infrastructure & Transport (*Ministero delle Infrastrutture e dei Trasporti* : MIT) has been notified to the EU as the competent authority.[25] At present the use and protection of marine space is managed by both national and regional authorities, according to the type of use. Energy is managed at a national level, whereas fishing, aquaculture, tourism and coastal protection are dealt with by the regions. Coastal plans, managed by municipalities, substitute inefficiently for the lack of national MSP and ICZM.[26]

[24] Information from the Italian constitution as at April 2014, in English translation at **www.servat.unibe.ch/icl/it00000_** made for the International Consitutional Law project

[25] According to **www.msp-platform.eu**

[26] See Falzo **[38]** concerning complexities and difficulties of coastal planning, including "institutional and administrative fragmentation" and failure to enforce laws. Cantazano et al. **[39]** report the variety of extents to which ICZM is implemented by regions.

Implementation of the MSFD is in the charge of the Environment ministry (MATTM: *Ministero dell'Ambiente e della Tutela del Territorio e del Mare)*. A MSFD monitoring programme has been devised for Italian territorial waters and some offshore waters, envisaging a restricted set of indicators (mainly fish marine reptiles, mammals and birds, with some attention to seagrass and pelagic habitats) **[28]**. The programme has been implemented through MATTM's autonomous agency ISPRA (*Istituto Superiore per la Protezione e la Ricerca Ambientale*) and through agreement with Universities and the national research council (CNR: *Consiglio Nazionale delle Ricerche*).[27] However, the MSFD refers to large scales and so it is unclear what implications the programme, or any subsequent program of measures, has for MOI deployments.

The WFD, operationalised on the scale of small bodies of coastal water, might be more relevant. The provisions of the WFD have been transposed into the Italian Code of the Environment,[28] and WFD water quality and ecological status are assesed on a regional basis, where the ARPA (*Agenzia Regionale per la Protezione Ambientale*, reporting to ISPRA) of each coastal region are supposed to carry out the monitoring of its coastal marine waters. However (and in contrast to the case in western Scotland) these water bodies are narrow, and might not include proposed offshore deployments of MOI.[29]

7.4 Marine Renewable Energy

A draft Integrated National Energy and Climate Plan sets growth targets for offshore wind generation of 900 MW by 2030.[30] The plan was prepared by national government ministries for Economic Development, Environment, and Infrastructure & Transport. Of these, MATTM and MIT seem most relevant to the present study. A single offshore wind development, is currently in hand near Taranto. A proposed wind-farm on the coast of Sicily had its consent by the Infrastructure ministry annuled by a local court on the grounds of an inadequate EIA.[31]

7.5 Aquaculture

There is a national Strategic Plan for the development of Aquaculture 2014-2020, made by the Ministry of Agriculture, Food and Forestry Policies (*Ministero delle Politiche Agricole, Alimentari e Forestali*: MiPAAF) in response to the EU Common Fisheries Policy, implemented with support from the European Maritime and Fisheries Fund (EMFF) administered through the regions **[29]**. Authorisations for aquacultural development within 1 km from the coast are in most cases given by municipalities; in cases further offshore by the *Direzione Generale pesca e acquacoltura* in MiPAAF. In any case the authority must consult other

[27] ISPRA: **www.isprambiente.gov.it** (english text)
[28] Legislative Decree 152/2006 (Environmental Protection Code): see **[40]**
[29] EC assessment of WFD coastal monitoring for the cycle ending in 2012, shows no data from the coastal water bodies of the Southern Appenine River Basin District that includes Calabria.
[30] EC translation at **ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_it_necp.pdf** . The offshore wind-power amount is tiny compared with a total renewable target of 93 GW.
[31] According to **www.4coffshore.com**, visited 13.11.2019, "Following years of disputes, the CGA (Administrative Justice Council for Sicily) has cancelled the granting of the consent to build the wind farm ("single authorisation") that was issued by the Ministry of Infrastructure and Transport in 2013. The cancellation had already been granted by the Palermo TAR (regional administrative court) but was today also confirmed by the CGA. This is due to a lack of preliminary investigation and objections to the wind farm on archaeological and ecological grounds." The challenge came from Sicilian environmental and cultural associations.

interested public bodies, and authorisation for a farm covering more than 5 hectares will depend on a satisfactory EIA. An aquaculture company must be declared as producer to the Ministry of Agriculture, and fish health at farms will be surveilled by the local health company (ASL: *Azienda Sanitaria Locale*).[32]

7.6 Authorisation for the BGF protoype at the NOEL site

The requirement for multiple authorisations was simplified in the case of the BGF prototype, partly because the prototype does not include a fish-farm and partly because the deployment will take place at the NOEL site in Reggio Calabria. NOEL, the Natural Ocean Engineering Laboratory, is managed by the Mediterranea University of Reggio Calabria (UNIRC). Its general authorisation for engineering experiments was issued in 1997; the BGF protoype deployment requires a further authorisation from the *Capitaneria di Porto* (of Reggio Calabria).

The *Capitaneria* is organisationally part of the Italian Coast Guard (*Comando Generale del Corpo delle Capitanerie di Porto - Guardia Costiera*), thus under the command of the Italian Navy and the Ministry of Defence. In authorising development within the spatial area of its jurisdiction it is replicating what a municipality would do elsewhere. In granting such authorisation it consults a nuber of bodies, including

- *Agenzia del Demanio*, the State Property Agency
- *Genio Civile regionale*, which in Calabria is the regional Department of Infrastructure, Public Works and Transport
- Municipality of Reggio Calabria concerning bathing and tourism
- Metropolitan city of Reggio Calabria concerning landscape and environmental impact
- Several authorities concerned with navigation (MARI FARI, Mare Idrografico, MARI Sicilia)

An EIA is an essential component of the application, and one has been prepared for the NOEL deployment as BGF deliverable D4.4. It deals with environmental and landscape impacts of the prototype structure including turbine. It is scrutinised by the provincial authority (the metropolitan city of Reggio Calabria) as well as being screened for compliance with the Environment Code by MATTM.

7.7 Discussion

This account suggests that operational authorisations for a full-scale MOI in Italian waters will require application to multiple authorities, and that there is no obvious single point of contact in the governance structure at the collective-choice level at which to initiate discussion of multi-use policies.

It is clear that a good EIA is an important component of operational applications, and that in the hypothetical case of deployment of a full-scale MOI in southern Italian waters it must include a good

[32] The AZL are autonomous public companies that deal with veterinary matters as well as providing public hospitals. Their responsibilities in relation to aquaculture include fish health, controls on feed, transport of fish and residues in flesh, and authorization for feed stocking and fish processing.

assessment of the impact of fish farming as well as of the physical structure of the platform and the MREG. Such EIA could draw on the examples provided in BGF D4.1 for the French, Scottish and Spanish sites.

Finally, the localisation of planning, and the example of the challenge to an offshore wind farm, suggests that the acquisition of Social Licence to Operate is also important in gaining authorisation for MOI deployment in Italian waters.

8 IMPLICATIONS FOR MOI DESIGN AND DEPLOYMENT

8.1 Introduction

According to the theoretical analysis set out in section 2, the use of MOI must be considered in terms of several tiers of governance of Blue Growth. At the operational level, a proposal to deploy an MOI provides the focus of an action situation for which the settings include the laws and policies of national states and their provincial and local governments. At the collective-choice level, the heterogenous legislative and administrative action situations that provide the operational settings are themselves regulated by higher level policies and laws, including those originating at constitutional level situations in the EU. As argued in D8.1 as well as this D8.2, the acquisition of formal and informal social licence requires actions by designers and potential users of MOI that go beyond simple compliance with laws. This is especially the case in situations in which the intersection of laws and policies for energy generation and those for aquaculture may create obstacles for MOI use rather than facilitate more efficient multi-use of the sea. Thus the argument in this section is that MOI design, and MOI use policies, must positively address the environmental and social issues that led to the laws, so that

- EIA may demonstrate positive measures to reduce environmental impact;
- Developers can respond to concerns about social and environmental impact of MOI that may otherwise lead to withdrawal of SLO at community level;
- the net benefits of MOI deployment can be evaluated in collective-choice action situations even when there are intersectional challenges to MOI use or concerns in society-at-large about MOI environmental and social impacts.

Another way to understand these issues is in terms of socially acceptable answers to questions that are likely to arise in community engagement events or policy-making situations. Examples of questions posed at meetings in Scotland are given in Table 13. In the absence of research about MOI, we have adapted questions relating to renewable energy generation and fish-farming as separate activities. We have categorised these questions in relation to the sub-headings used in this section, which group EU directives (and by implication the transposed national laws) according to main theme. Appropriate design of MOI structures and processes is likely to allow more socially acceptable answers.

Some of the questions relate to carbon-budget/global warming matters. Although EU and national state policies concerning carbon emissions have not been reviewed in preceding sections, we briefly consider them in this section in relation to MOI design because of the increasing importance of the 'climate emergency' in shaping public opinion.

Table 13 : Example 'Frequently Asked Questions' during consultations in Scotland

Adapted from questions asked during meetings that were either about MRE or fish-farming.

THEME	MARINE RENEWABLE ENERGY	FISH-FARMING
Animal health		What is done to protect fish health and well-being in farms?
Environment	Doesn't construction/deployment and operation of MREG damage the sea-bed?	Don't the chemicals and antibiotics, used to treat fish diseases and parasites, harm the environment?
Conservation	Do wind turbines present a threat to bird populations?	Are fish-farms harmful to (species or habitats within) Marine Protected Areas?
Carbon emissions	What is the carbon footprint of manufacturing, installing, and decommissioning a wind turbine compared with the amount of carbon it will save in production of electricity?	What is the carbon footprint of a farmed fish compared with that of a free-range chicken?
Planning and process	Why are marine wind-farms allowed near scenically beautiful coasts?	Why doesn't <named environmental protection organisation> properly enforce environmental laws when these are broken by fish-farming?

8.2 Animal Welfare

The *Aquatic Animal Health Directive*, national laws and regulations, and public opinion, require farmed fish to kept humanely and healthily. Net design must allow good water flow to provide adequate oxygen and remove dissolved wastes. In addition, profitability as well as concerns about the consequences of escapes for wild populations (especially of salmonids), require secure keeping. Consequently, fish farm design should allow biosecure import of young fish, physically secure containment of growing fish at stocking densities that allow for natural behaviours and the observation and treatment of disease, and humane harvesting methods. These requirements may pose major design challenges for nets and other farm structures deployed in the offshore conditions for which MOI are intended.

8.3 Environment: MSFD and WFD

The *Marine Strategy Framework Directive* (MSFD) and the *Water Framework Directive* (WFD) both protect the European marine environment. The MSFD aims for 'Good Environmental Status' according to 11 'Qualitative Descriptors' that together embrace most aspects of marine ecosystem state and human pressures thereon. However, the MSFD is concerned with large sea-areas, such as the 'Greater North Sea' or the Western Mediterranean. Although it may have some implications for the totality of MREG or the totality of fish-farms, it is unlikely that any 'Programs of Measures' implemented under transpositions of the MSFD will target MOI in particular.

In contrast, the WFD aims at good ecological status in water bodies that are sufficiently small to be potentially liable to disturbance by large structures such as an MOI. The Directive's relevant provisions, summarised in Table 14, are more limited than those of the MSFD but are more applicable to MOI

deployment. In the case of Scotland, for example, both MREG and fish-farms must seek licences under the Controlled Activities Regulations, which were made under a Scottish law transposing the WFD. Although the WFD specifies its application only as far as 1 nautical mile from the CB, it is, nevertheless desirable for MOI to be designed with the Directive in mind even if the MOI will be deployed further offshore. This is because some jurisdictions (e.g. Scotland) apply WFD transpositions to waters that are quite a long way from the coast, and also because the criteria provided by the WFD concerning chemical pollution as well as impact on phytoplankton, phytobenthos and zoobenthos, are likely to be influential in any scrutiny of EIA.

Conclusions that can be drawn from Table 14 are these:

- Design the platform to minimise use of potentially harmful compounds;
- Minimize use of chemical therapeutants and antibiotics during the farming of fish;
- Deploy MOI in regions of high dispersion, to minimize local impact of wastes (such as nutrients and fish faeces) that are harmful only in large quantities.

Table 14 : Provisions of the WFD relevant to MOI

simplified from WFD ANNEX V section 3.2.4 part dealing with 'good' status in coastal waters; the provision 'shall be minimally disturbed ..' implicitly continues as follows: '(compared to reference conditions) by human activity'

PROVISION	IMPLICATION FOR MOI	AMELIORATION
Transparency and nutrient concentrations are insufficiently perturbed (from reference conditions) to cause substantial disturbance to the biological elements above	Nutrients (compounds of N and P) that are excreted by farmed fish or released on decay of particulate waste, can (if in excess) result in *eutrophication*, with symptoms that include decreased water transparency	Deploy MOI in offshore waters of high dispersion, to ensure that waste inputs are adequately diluted
Phytoplankton composition, abundance and biomass shall be minimally disturbed …	*Eutrophication* is diagnosed by excess growth of some kinds of phytoplankter [30]	Deploy MOI in offshore waters of high dispersion
The coverage of appropriate sea-bed types by seaweeds or sea-grasses shall be minimally disturbed ..	Eutrophication-related decrease in water transparency will decrease maximum depth for phytobenthos; particulate waste desposition may harm (especially) sea-grass	Deploy MOI in offshore waters of high dispersion, in water depths too great for seaweeds or seagrasses.
The "diversity and abundance of invertebrate taxa" in or on the sea-bed, shall be minimally disturbed ..	The decay of its organic content may deprive some components of the sea-bed fauna of oxygen, whilst enriching others. Moorings may disturb the sediment community.	Deploy MOI in offshore waters of high dispersion to ensure that particulate wastes do not accumulate on the sea-bed.
Concentrations of specific synthetic pollutants (see Annex VIII) shall remain below standards	Anti-fouling compounds used on structures, and chemotherapeutants and antiobiotics used with fish, might increase in water or in sediment. Possibility of leakage of compounds of mercury and cadmium or of PCB or hydrocarbons?	Minimise use of these compounds; deploy MOI in waters of high dispersion

Concentrations of specific non-synthetic pollutants (see Annex VIII) shall remain below standards	Non-synthetic pollutants refers to 'natural' substances such as nutrients and organic wastes that are harmful only in excess	Deploy MOI in waters of high dispersion

8.4 Conservation: Species & Habitats

Concerns relating to impacts on sea-birds, marine mammals, and wild salmonids have been amongst the most powerful causes of opposition to both fish-farming and MREG. Salmon farming in Scotland has given rise to concerns about spread of parasitic sea-lice from farmed to wild salmon, about shooting of predatory seals, and about the use of acoustic deterrence devices to keep predators away [31]. The public is concerned that wind turbines are dangerous to birds, and a failure to show that a planned offshore wind-farm would not have a deleterious effect on populations of certain sea-birds was key to the judicial revocation in 2016 of development consent [32], the judge in this Scottish case citing the Habitats Directive and its transposition into UK law. Indeed it is the Birds and Habitats Directives that will most likely provide the basis for legal cases against MOI.

National transpositions of the Habitats Directive have required and allowed national agencies (such as SNH in Scotland and AFB in France) to designate some sea-bed features, and some populations of organisms, for protection against human activities that might damage these features or populations. Such protection is above that provided by general provisions such as those of the WFD. The use of the catch-all term 'Marine Protected Area' (MPA) for a variety of protective designations, can, however, mislead because such areas are not, usually, protected against all human activity, only those activities that damage the designated features. Normal planning and consenting procedures typically prevent the location of damaging activities in MPAs, additionally, experience in Scotland sugests that even co-location of fish farms with protected features that will not be impacted by farming, tends to be avoided because of extra costs and likely negative impact on public opinion of the farming company.

Clearly, the engineering of the BGF MOI must aim to minimise direct effects of the turbine on sea-birds, especially as they might be attracted to floating platforms by the presence of fish or somewhere to perch. Design could also help to reduce the risk of farmed fish escaping or of predator seals posing a risk to the fish. However, such considerations, whilst beneficial for economic and environmental licence, may not be enough to secure social licence, unless communicated to the public.

8.5 Carbon emissions

The EU and member states, recognizing the climate emergency, have well-developed strategies for reductions in outputs of greenhouse gases. These strategies include a shift from the use of fossil fuels to the use of energy from renewable sources such as MRE. However, the manufacture and operation of MREG devices may themselves lead to the release of greenhouse gases. Thus it is desirable, from the perspective of securing SLO, for BGF to provide a 'carbon budget' for the construction, deployment, operation, and recovery, of the platform, turbine and accessory structures of the BGF MOI.

A general problem for MREG is the need for investment in cable etc to bring electricity ashore and carry it to the centres of population and industry where most of it is used. In addition to carbon costs there is the

need for a scarce metal, copper, for cables, and the effects of distribution networks on marine and terrestrial habitats and on landscape. The BGF MOI will use some of its MRE to operate the fish farm aboard the platform, and, perhaps, to power electrically-driven service boats. As modern fish-farms and farming operations typically use large amounts of fossil fuels, this local recycling will aid in the switch to renewable energy, with power being exported from the MOI not in cables but, in effect, in fish. Such a narrative might be further developed and could prove helpful in gaining SLO.

8.6 Planning and process

Relevant Directives are the: MSPFD, PPD, EIA and SEA. In addition there are national processes designed to implement these Directives at both policy and operational levels; and in some cases it is also necessary to take account of Town & Country planning processes.

The formal part of social licence corresponds, at operational level, to authorisations to develope a wind-farm or a fish-farm at a particular location. As discussed in earlier sections, obtaining a full set of authorisations for either MREG or fish-farming is complex. The analysis in those sections suggests that, under current regulations, the task of getting authorisations for MOI, that combine MREG and fish-farming, is likely to be quite difficult.

Thus there is a need to give attention to the constitutional-choice level of governance, seeking discussions with marine planning agencies such as Marine Scotland or DIRM-Med in order to ascertain or develop policy on multi-use of the sea (of which MOI are a special case) and the shift of fish-farming offshore.

Although this implies technical discussions, it will be important also to consider public opinion on multi-use. Indeed, if one route to a shift in policy involves a Strategic Environmental Assessment, there will necessarily be public consultation. Landscape (or seascape) issues are likely to play a part in deciding citizens' and communities' views on our new technology, and it would thus be useful to develop visualisation software that allows MOI designs to be viewed against particular seascapes.

In addition to minimizing biophysical impacts of MOI, it is also necessary that society-at-large is convinced of such minimisation. In principle it is the function of regulating organisations to monitor and control impact, but there is evidence of fallling public trust in the regulators' abilities or will to do this.[33] Thus MOI design should include features likely to increase community trust in MOI operations, for example by providing live video feeds.

[33] We have evidence for Scotland of this diminishing trust in regulators of fish-farms, and hypothesise that it is the result of the prioritisation of efficiency in monitoring and regulation, with lower visibility of regulatory staff.

9 POLICY CONCLUSIONS AND WAY FORWARD

This chapter draws tentative, policy-relevant, conclusions from the analyses in preceding chapters and considers additional work needed for the D8.5 due at the end of the project.

9.1 Introduction

D8.2 contributes to the following work-task of BGF WP8:

> **Task 8.2: Regulatory aspects related to the Marine Strategy Framework Directives and compatibility with the Marine Spatial Planning Directive**
>
> The objective of this task is to understand governance applying the MSFD and MSPFD to MOI in general and in particular as applied by national and local regulatory authorities to the NOEL representative site. This task will involve:
>
> - review of directives and of selected transpositions into the law of member states, relevant to MOI planning and environmental impacts;
>
> - interviews with selected representatives of governance and industry concerning policy and regulation of MOI in relation to MSFD and MSPD;
>
> - critical analysis of process compatibility with the Marine Spatial Planning Directive.

The main topic of this D8.2 has been the "review of directives and of selected transpositions into the law of member states, relevant to MOI planning and environmental impacts", and the analyses in chapters 4 through 7 have led to some tentative conclusions about environmental and social licensing of MOI in European waters, and enabled the identification of next steps for firming up these conclusions. This chapter presents those conclusions and next steps. First, however, it will be useful to remind the reader of Ostrom's model of governance and to revisit the Marine Spatial Planning Framework Directive (MSPFD) and the relevant Nature-Protection Directives. Note that the acronym MSP is used here sometimes to refer to the process of Marine Spatial Planning, sometimes to Marine Spatial Plans, and sometimes to both: the context should make clear which use is intended

9.2 Ostrom's model of polycentric governance

Ostrom's model of polycentric governance was discussed in section 2.4 and illustrated in

Figure 2. At the heart of the model is the concept of **an Action Situation** (AS) where issues are discussed leading to an outcome that might taken place in the physical world or the social world. An application for authorisation for MOI deployment would be an *Operational* AS, determined in part by settings (national and regional laws, policies and plans) that are outcomes of higher level AS, especially those at the *Collective Choice* level. Settings for this level are provided by national constitutions (e.g. that of the French Republic), international agreements (such as UNCLOS) and EU Directives, the results of *Constitutional* level AS.

Settings at the operational level also include those associated with national economies, public opinion, media, etc, and at the collective-choice level the settings include effects of the global economy etc.

This hierarchy of levels is a part of polycentric governance; the other part is that of overlapping jurisdictions at the same hierarchical level, as when Marine Spatial Planning (MSP) and Town & Country Planning (T&CP) overlap in their control of maritime developments. Both aspects of polycentric governance have been explored in this D8.2 by institutional and organisational mapping, mainly reported here in tables but exemplified by the simplified map of Figure 3 for the governance of MREG and aquaculture in France.

9.3 The Maritime Spatial Planning Framework Directive

WT8.2 also requires "critical analysis of process compatability with the [Maritime] Spatial Planning [Framework] Directive". Althought this will feature at greater length in D8.5, it seems useful to present here some of the key points in the MSPFD relevant to MOI (Table 15).

Table 15 : Some relevant text from the MSPFD (2014/89/EU)

P refers to preamble, a to article, in the Directive

	TEXT	COMMENTARY
P(15)	*Maritime spatial planning will contribute, inter alia, to achieving the aims of … Directives … 2009/147/EC … 92/43/EEC …2000/60/EC … 2008/56/EC*	The Birds Directive, the Habitats Directive, the WFD and the MSFD, collectively referenced here as 'Nature Protection' Directives
P(19)	*The main purpose of maritime spatial planning is to promote sustainable development and to identify the utilisation of maritime space for different sea uses as well as to manage spatial uses and conflicts in marine areas. Maritime spatial planning also aims at identifying and encouraging multi-purpose uses …*	MSP seen as governance for Blue Growth. Introduces aim of multi-functional use of marine space, exemplified in MOI
P(23)	*… Where maritime spatial plans are likely to have significant effects on the environment, they are subject to Directive 2001/42/EC …*	This is the SEA Directive. SEA might be a necessary part of a public policy of multi-use.
a.2.1	*This Directive shall apply to marine waters of Member States … It shall not apply to coastal waters or parts thereof falling under a Member State's town and country planning,*	A difficulty if MREG zoning considered within MSP and aquaculture zoning within T&CP
a.3.2	*'maritime spatial planning' means a process by which the relevant Member State's authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives*	Definition that contributed to the conceptualisation of economic, social and environmental licences in Figure 1
a.3.4	*'marine waters' means the waters, the seabed and subsoil as defined in point (1)(a) of Article 3 of Directive 2008/56/EC and coastal waters as defined in point 7 of Article 2 of Directive 2000/60/EC and their seabed and their subsoil.*	These Directives are the MSFD and the WFD

a.5.1	*When establishing and implementing maritime spatial planning, Member States shall consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem based approach, and to promote the coexistence of relevant activities and uses*	Grows from P(19) and a.3.2, and promotes multiple use. Note that there are several interpretations of 'an ecosystem based approach' .
a.5.2	*Through their maritime spatial plans, Member States shall aim to contribute to the sustainable development of energy sectors at sea, … of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment ….*	MREG and aquacultural sectors specifically identified, as is the need for environmental protection
a.9.1	*Member States shall establish means of public participation by informing all interested parties and by consulting the relevant stakeholders and authorities, and the public concerned*	Refers to consultation by publicly mandated processes

Although these extracts (e.g. preamble 19) emphasise the MSPFD as a constitutional-level driver of improved governance for sustainable Blue Growth, the analysis of its transposition into laws and policies in four EU Member States suggests something more complex, as Member States struggle to balance needs for growth with existing uses and the environmental quality requirements of the MSFD and WFD.

9.4 'Nature Protection' Directives

The term 'Nature Protection' is a useful umbrella for four Directives concerned with the maintenance of viability in the parts of the world that are seen as 'nature' and thus as distinct from the part occupied by humans. As introduced in Table 2, these are the Habitats Directive and the Birds Directive, concerned with the conservation of certain species and habitats, and the WFD and the MSFD, concerned with maintaining good conditions in aquatic ecosystems.[34] The WFD aims at good Water Quality -- in essence, freedom from pollution plus Good Ecological Quality (measured by indicators of some physical, chemical and biological 'quality elements') -- within (*inter alia* coastal) Water Bodies, which are of a size such that their quality could be impacted by a few major developments including those of MOI.[35] The MSFD aims at Good Environmental Status (GES), characterised by 11 'qualitative descriptors' covering all parts of marine ecosystems on the large scale of sub-regions such as 'the Greater North Sea' or 'the Western Mediterranean'.[36]

Although the description of Task 8.2 mentions only the MSFD, it is difficult to see circumstances in which this Directive's transpositions might affect operational Action Situations concerning MOI.[37] It is at this

[34] Ecosystems comprise biota (understood as forming populations belonging to species) and the physico-chemical environment with which they interact.
[35] The WFD (art 2.21) defines the term 'ecological quality' as "an expression of the quality of the structure and functioning of aquatic ecosystems" even if the implementation details in annex V suggest a focus on a indicators of state in only a few ecosystem components.
[36] The MSFD (art 3.4) defines 'environmental status' as "the overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems …", where 'environment' is used in the alternative sense (equivalent to 'nature') of that external to human society.
[37] However, the MSFD list of Qualitative Descriptors might be considered to provide a good set of topics for an EIA.

operational level that the three other Directives are potentially relevant as settings for AS decisions and for legal challenges to authorisations. At the collective-choice level, at which national laws are made and policy formed, the 'nature protection' aspect of MSP might be sumarised as concerning spatial localisations of Programs of Measures for MSFD and WFD and for the avoidance of disturbance to features for which MPA have been designated.

9.5 The problem of multiple jurisdictions

Marine **multi-use** (MU) requires identification of zones where several sectoral activities can be carried on at the same time; significant deployment of **MOI** require policies that will allow use of platforms combing several sectoral activities. In the cases that we have examined, both challenges are rendered more complex by:

- Differences in governance for MREG and fish-farms (summarised in Table 16).
- Spatial jurisdictional issues, such as those relating to T&CP versus MSP, and to the extent of WFD coastal water bodies (notionally 1 n.m. from the Coastal Baseline (CB) but in Scotland, especially, encompassing much more of the sea).

Table 16 : Governance for MREG and Fish-farming authorisations

Summarised from chapters 4 to 7. Fish welfare and food regulation not included. TTW = Territorial waters, EEZ = Exclusive Economic Zone (beyond 12 n.m. from Coastal Baseline (CB))

COUNTRY	MREG	FISH-FARMING
France	MTES requests tenders for use of sea-bed in defined areas. In TTW, authorisation by departmental prefect, consulting national AFB and regional DREAL and *Agence de l'eau* (all are agencies of MTES); in EEZ, by the AFB; EIA and public consultation required in either case	In TTW, auithorisation by departmental prefect, on opinion of *Commission des cultures marine,* consulting IFREMER, municipal authorities, CDPMEM, etc.
Italy	MIT, with EIA scrutinised by MATTM; in NOEL case, the Port authority.	Within 1 n.m. of CB, municipality or equivalent, consulting other public bodies, EIA scrutinised by MATTM. Offshore, MiPAAF.
Spain/Canaries	Unknown (further information sought)	In TTW, authorisation by GC vice ministry of Fisheries and Water, consulting ACPMN etc. EIA evaluated by COTMAC.
UK/Scotland	CrEsS frequests tenders for lease in defined areas. Authorisation from SG sub-directorate MS-LOT, consulting MSS and agencies SEPA, SNH, etc, compliant with national or regional Marine Plans	Authorisation by Local Authority using T&CP, consulting MSS, SEPA, SNH, etc for EIA evaluation.

Thus it is, currently, difficult to identify a consistent set of regulations that will allow MOI or even multi-use, and in some cases no single organisation to discuss this with.

9.6 The effect of public opinion

BGF WT8.1 concerns the investigation of Social Licence to Operate (SLO) for MOI deployments and thus as a factor relevant to operational AS. D8.1 included recommendations for gaining SLO at this level. Public opinion is also relevant to collective choice level action situations: it can influence law-making, policy-making, and lead to external inputs to AS, as when nationally-supported eNGO take part in challenges (at the operational level) to authorisations for development.

Public opinion is to be distinguished from stakeholder opinion, especially at the collective choice sublevel of making policies and plans. Typically, *boundary rules* determine who (which representatives of which organisations) shall be involved in policy-forming AS. Stakeholders have (or should have) a clear view of the interests they represent, whereas public opinion is typically more diffuse and complex. Nevertheless, in a recent Scottish case, a challenge originating at an operational level escalated to the collective choice level in a surprisingly rapid fashion.[38] Research for T8.1 is suggesting that public opinion in Italy and Scotland tends to be more negative towards fish-farming than towards wind-farming or other MREG, it is possible that policy-level discussions of multi-use or MOI might be derailed by effects of the less favourable opinion of fish-farming.

9.7 The current state of MSP in relation to Multi-use and MOI

In addition to its role in nature protection, the MSPFD is concerned with support of Blue Growth, and resolution of sectoral conflicts. In principle, MSP offers a route to providing plans and policies that will encourage MOI as a part of Blue Growth and will favour synergy between the two sectors of MREG and fish-farming. In practice, although there are some national and regional strategies for MRE and aquaculture, and developing interest in multi-use, MSP implementation is incomplete and (reflecting their governance), deals differently with the two components of MOI (Table 17).

Table 17 : Current state of MSP relevant to MOI

Summarised from from chapters 4 to 7 and **www.msp-platform.eu**. MU = multi-use (including MOI); TTW = territorial waters; 'nearshore' defined here as close to (within c. 1 n.m. of) land (as distinct from Coastal Baseline, CB)

COUNTRY	STATE OF MSP	MREG ZONING	AQUACULTURE ZONING	MU/MOI POLICY/PLAN
France	National and regional plans (PAMM and DSF)	DSF-Med identifies eolian areas for development	DIRM-Med has identified SDRAM	No MU/MOI policy, and no overlap between MREG and SDRAM
Italy	National plan in preparation	No information	No information	No policy

[38] The case involved an application for authorisation to harvest seaweeds (kelp) from the west coast of Scotland. The action of transient protest groups supported by eNGO and a political party in the Scottish parliament, resulted in a new law to prevent any such harvesting.

Spain/Canaries	National and Canary Islands plans in preparation	No plan	GC regional plan	No information
UK/Scotland	Scottish National Marine Plan (SNMP); some regional plans in preparation	SNMP has maps for MREG in TTW	Guidance on sea-loch capacity; presumption against development on N. Sea coast	CrEsS interest in MU, but no policy

9.8 EIA as a potentially unifying process

MSPFD, concerned as it is with policies and plans, does not mention EIA, which relate to operational matters. However, in the absence of effective MSP (as a governance process able to designate and enforce zones for particular sorts of developments including co-use), EIA can play an key operational role in gaining authorisation for MOI. Good EIAs, which identify all potential environmental and social-environmental impacts from platform, MREG, and fish-farm, and demonstrate ameliorations, can provide a vehicle for dealing with the several jurisidictions involved in regulating the different sectors. As exemplified by the application for authorisation to deploy the BGF prototype at the NOEL site, the authorising authority can act as a one-stop shop, consulting all interested public parties on the basis of the information presented in the development's EIA and reaching a decision based on technical responses to that consultation and on the balance of local interests (which could be understood as determining the SLO).

If this were the case, there would no need of a MSP policy specifically favouring MOI or designating suitable areas for them: the spatial development of MOI would emerge organically at sites where technical conditions were suitable and economic, social and environmental licences could be aquired by the developers. However, this argument takes no account of cumulative effects of multiple deployments, nor of national interests in efficient use of marine resources.

9.9 The way forward

The contribution of this D8.2 to BGF WP8 T8.2 will be completed by deliverable D8.5, due M40, with title "Regulatory aspects related to MSFD and compatibility with MSPD of MOI, final report". The main practical activity in T8.2 during the remaining term of the BGF project will be "interviews with selected representatives of governance and industry concerning policy and regulation of MOI in relation to MSFD and MSPD". Given the identification of MSP as the collective-choice governance process most likely to improve the settings for operational AS involving MOI, priority will be given to identifying and meeting with officials and researchers concerned with implementing MSP at regional level (Table 18). The objectives will be (i) to corroborate conclusions obtained from document analysis; (ii) to gain information about multi-use policies within regional MSP, and (iii) to help those policies develop. Methods are desribed in Annex A.

Table 18 : Organisations that BGF should approach concerning MU and MOI

Drawing on discussions in chapters 4 to 7

COUNTRY	MSP ORGANISATION	COMMENTS
France	DIRM-Med:	Key document is Mediterranean DSF
Italy	MIT (*Ministero della Infrastrutture e dei Trasporti*)	
Spain/Canaries	*Gobierno de Canarias*, and ULPGC	UGCLP part of project to develop a spatial plan for Macaronesia
UK/Scotland	MS: Marine Scotland (directorate of Scottish Government)	Perhaps also consult (office of) SG Minister forRural Affairs and the Natural Environment

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Annex A : Methods for acquiring policy-relevant information

Introduction

Methods for aquiring the further information necessary to complete BGF Task 8.2, are described here.

Document analysis

Much of the information about governance presented in the body of this report has been assembled from published documents and web-pages, and exemplifies the kind of information on laws available from public sources such as **eur-lex.europa.eu** and **www.legislation.gov.uk**. Although it is hoped that the lists in chapters 4 and 5 cover most of the legislation relevant to MOI deployment in Scottish or French Mediterranean waters, the purpose of the research is sociological, not legal. Thus the document analysis will continue to relate to the themes, introduced in section 2, of: governance level; laws and policies as institutions; organisations as actors; and action situations.

Interviews with policy stakeholders

Operational stakeholders have an interest in a particular MOI deployment, and are exemplified by the members of the Reggio Calabria Stakeholder Reference Group described in D8.1. *Policy stakeholders* are those, usually representing organisations, who have an interest in policies and plans. Stakeholder lists such as this can be compiled from accounts of public consultations on national or regional marine plans. Priority will be given to interviewing officers in public authorities working to develop marine spatial plans and policies.

The organisations will be asked to nominate an appropriate person for interview. The aims, in interviewing these policy stakeholders, will be

(i) to aquire further factual information about existing laws, policies and plans; and

(ii) if possible, to discover personal opinions about relevant Blue Growth developments.

In both cases, the focus will be on MOI as *intersectional*, i.e. potentially regulated by more than one set of laws and policies.[39] Intersectionality might be seen as an obstacle to MOI deployment, but insofar as MSP aims to harmonize competing sectoral uses of the sea, planning could privilege MOI as implenting multiple marine uses at a single location. The BGF project is, after all, a response to an H2020 call for the development of technology to enable such multiple use.

Participant Observation and Action Research

Participant observation is usually thought of as an anthropological method, in which a researcher becomes part of the social group that they are studying, whilst striving to apply the epistemological standards of

[39] The terms 'intersectoral' and 'intersectional' both seem appropriate because MOI lie in two intersections of sets: the intersection of the set comprised of the aquaculture and renewable energy industry sectors, and the intersection of the set comprised of the several sectors of government that regulate these activities. 'Intersectional' seems to get closer to the question – will MOI developments be defeated because of the challenge of synthesising appropriate regulation or encouraged because they increase the efficiency of use of maritime resources?

their own discipline to the evidence that they obtain. The group, and their situation, should not be changed by the research (although there might be other causes of change). *Action research* [33] is a way of implementing *critical theory* [34]. It is value-driven and involves engagement with a social group in order to understand and if possible improve a situation. Billing et al. [35] describe research into community attitudes in the Western isles of Scotland to the imposition of Marine Protected Areas on these communities; it appears that the research process aided a community to come to a better arrangement with the SG agency designing a contested MPA. This, however, concerned an operational-level action situation. If there is indeed a 'policy community' at the collective-choice level of governance, and if academics are a part of this community, then we may observe as well as contribute to debate. Indeed, some of the analyses in this report have emerged from participation in Scottish fora involving policy-makers, planners, and academics.

Ethical and data-privacy issues

GDPR issues will arise in connection with interviewing policy stakeholders, once these have been identified by their organisations. We will resolve these issues with an appropriate privacy statement, similar to that provided to members of the Stakeholder Reference Group in Reggio Calabria (section 5 in BGF D8.1).

Ethical issues arise in connection with Action Research. A researcher must consult the relevant 'policy community' about the terms by which information, gained during community engagement, can be published. If any of this information might be personally identifying, then the GDPR will be applied, and the relevant individuals provided with appropriate privacy statements.

Discussion

This deliverable has set out theoretical and methodological frameworks for research, at the policy-making or collective choice levels of governance, into the settings for operational-level decisions concerning the deployment of MOI. Our methods will be somewhat similar to those of Inderberg et al. [36], who investigated the influences on (land-based) windpower licensing decisions in Norway. They used document analysis, plus interviews with developer and regulatory stakeholders to "map and discuss formal rules and informal practices", which we interpret as referring to the institutional settings and actors' behaviours in action situations centering on a licensing decision. However, action situations concerning MOI deployment are likely to be more complex because their intersectional settings, in the Scottish case, at least. Some of the issues discussed in this D8.2, and likely to arise during the research, have to some extent been addressed by research carried out by previous H2020 projects, and academic literature on the issue is beginning to emerge (e.g. Stuiver et al., [37]). We will draw on this literature, together with the results of further research, in BGF D8.5 "Regulatory aspects related to MSFD and compatibility with MSP[F]D of MOI, final report".