MEDITERRANEAN ACTION PLAN (MAP)
REGIONAL MARINE POLLUTION EMERGENCY RESPONSE CENTRE FOR THE MEDITERRANEAN SEA (REMPEC)

Fifth Meeting of the Barcelona Convention Offshore Oil and Gas Group (OFOG) Sub-Group on Environmental Impact

REMPEC/WG.60/INF.6
13 January 2025

Lija, Malta, 19-20 February 2025

Original: English

Agenda Item 3: Mediterranean Offshore Action Plan - 2026-2035

Projection of the offshore sector in the Mediterranean - Policies and regulatory developments in the field of offshore installations

REMPEC
Malta, 2025

Note by the Secretariat

This document has been prepared in accordance with the agreement by the Internal Group of MAP Components coordinated by REMPEC, within the context of the review and updating of the Mediterranean Offshore Action Plan (MOAP), and with the contribution of IOGP. It provides future projections for the offshore sector in the Mediterranean as well as a description of the existing policies and regulatory developments in the field of offshore installations which were considered when reviewing and updating the proposed MOAP 2026-2035.

Background

1. The Twenty third Meeting of the Contracting Parties to the Barcelona Convention Decision IG.26/14 on the United Nations Environment Programme (UNEP)/Mediterranean Action Plan (MAP) Programme of Work and Budget for the Biennium 2024-2025, a process for the review and update of the Mediterranean Offshore Action Plan 216-2024 (the process) was considered and funds allocated. The process has been launched through the work of an Internal Group of MAP Components coordinated by REMPEC and consisted of:

.1 the development of a set of background documents, including a gap analysis and an assessment of the implementation of the current MOAP, the projection for the offshore sector in the Mediterranean for the period 2026-2035, the existing policies and regulatory developments in place in the field of offshore installations; and

.2 the development of an updated MOAP for the period 2026-2035 based on the guiding principle that the MOAP 2026-2035 is a continuation of the previous MOAP, its objectives and partially achieved outcomes. Regarding the governance aspects, i.e. the role of MAP Components and necessary Partnership for its implementation, are addressed, and the resource mobilization is integrated within the MOAP, and aligned with the updated MAP RMS adopted by COP 23.

2. The projection for the offshore sector in the Mediterranean for the period 2026-2035 and the existing policies and regulatory developments in place in the field of offshore installations are set out at **Annex**.

Actions requested by the Meeting

3. The Meeting is invited **to take note** of the information provided.

******

Annex

Projections of the offshore sector in the Mediterranean - Policies and regulatory developments in the field of offshore installations

MOAP 2026-2035
Projections of the offshore sector in the Mediterranean - Policies and regulatory developments in the field of offshore installations

Introduction

1. In accordance with the Decision IG.26/14 on the UNEP/MAP Programme of Work and Budget for the biennium 2024-2025, the UNEP/MAP Coordination Unit (CU) established an Internal Group coordinated by REMPEC composed of the MAP components CU, MEDPOL, SPA/RAC with the view to lead the work for the review and update of the Mediterranean Offshore Action Plan (MOAP) within the Offshore Protocol (OP) for the period 2026-2035 with the participation of the Contracting Parties (CPs) to the Barcelona Convention, MAP Partners and concerned industries, from March 2024 to June 2025.

2. It is identified seven preparatory base documents to be developed to support the work of the Internal Group, and to lead to the development of the MOAP 2026-2035 and its associated Resource Mobilization Strategy (RMS). The seven base documents are:

1. A summary of the process of developing MOAP 2016-2024;
2. A questionnaire to the CPs to conduct an online survey on the ratification and identify their expectations;
3. A gap analysis regarding MOAP 2016-2024;
4. A review of policies and regulatory developments in the field of offshore installations;
5. A collection of data and information regarding the projection of the offshore sector in the Mediterranean basin;
6. Identification of the key elements for the MOAP 2026-2035 specific-objective on governance framework “to ratify the OP”; and
7. Identification of the key elements for the MOAP 2026-2035 specific-objectives on Regional offshore standards and guidelines.

3. The information in this document, which is set out at **Appendix**, combines the two above mentioned deliverables (paragraphs 2.4 and 2.5) which serve as a contribution to the work of the Internal Group. It consists of two parts, Part 1 which provides an overview of the Offshore activities in the Mediterranean Sea with future projection of the offshore sector in the Basin; and Part 2 providing a review of the policies and the regulatory frameworks applicable to offshore installations in the Mediterranean Sea.

4. Part 1 has been developed using data and information available in the public domain as well as some data provided by the International Association of Oil & Gas Producers (IOGP), a UNEP/MAP partner. It is recognized that additional information would exist which for commercial reasons might not be either available at the time of preparing this document or not accessible publicly. It should also be recalled that a questionnaire has been disseminated to the CPs and MAP accredited partners, by Circular Letter No 10/2024 dated 9 July 2024 and Correspondence dated 12 July 2024 respectively, which when responded to, could provide some additional detail although it is believed that the information presented in Part 1 is a near accurate account of the situation and circumstances of offshore activities in Mediterranean sea today.

5. Part II provides a concise compendium of the current regulatory landscape governing offshore oil and gas activities in the Mediterranean Sea involving international, regional and national frameworks. It also provides additional information on the challenges in and opportunities for enhancing the regulatory frameworks.

6. The document covers the following thematic areas:

Part I – Offshore activities

1) International context related with Offshore activities
    a) Geopolitical energy context in the Mediterranean
    b) International context related with oil and gas exploration and production activities
    c) International context related with other offshore activities
2) Overview of the Offshore activities in the Mediterranean Sea
3) Projection of the Offshore sector in the Mediterranean Sea
    a) Activities anticipated
    b) Environmental impact
    c) Technological innovations
4) Considerations for the period 2026-2035

Part II - Regulatory Framework/ International Agreements and Conventions/National Legislation

1) Regulatory framework
    a) International regulations
    b) Regional agreements and arrangements
    c) National regulations
2) Challenges in the regulatory framework
3) Opportunities for enhancing the regulatory framework

Future considerations and opportunities

7. As energy transition progresses towards the use of green energy (e.g wind farms, wave energy etc,), which will inevitably impact offshore activities and how the Mediterranean Sea-bed is exploited, clarity will have to be sought, in the future, on what offshore activities fall within the competence of the Offshore Protocol for it to remain fit for purpose and remain current.

8. As this transition progresses, a number of country scenarios can be envisaged which will create challenges for the application of the Offshore Protocol to these different scenarios. It can be envisaged that some countries, with governmental support in certain cases, will seek to develop green energy (e.g wind or wave energy) and progressively move away from the traditional oil and gas sectors. Others might retain the traditional oil and gas sectors. Whilst others might opt for both. The development of renewable energy also means that some countries which before had no offshore interest will now begin to venture in this area of offshore activity.

9. The regulatory framework for offshore oil and gas activities in the Mediterranean Sea is complex and multifaceted, involving national, regional, and international regulations. While significant efforts have been made to establish a robust regional governance structure through the efforts of the Barcelona Convention system, challenges such as regulatory fragmentation and enforcement issues particularly at national level, as well as geopolitical tensions persist. Enhancing the regulatory framework requires harmonization of regulations, strengthening regional cooperation, building regulatory capacity, promoting public participation, and leveraging technology. By addressing these challenges and seizing these opportunities, Mediterranean countries can ensure the sustainable and responsible exploitation of their offshore resources, balancing economic development with environmental protection and geopolitical stability.

******

APPENDIX

PART I – Offshore activities

1) International context related with Offshore activities

a) Geopolitical energy context in the Mediterranean

1. Offshore oil and gas activities in the Mediterranean Sea have significant geopolitical ramifications. The discovery and exploitation of hydrocarbon resources have potential to alter the balance of power in the region. As exemplified by the gas discoveries in the Easter Mediterranean, boundary disputes among countries exist, complicating the allocation of marine spaces and more specifically, in this context, complicating exploration and production activities for oil and gas.

2. Furthermore, the strategic importance of the Mediterranean, as a transit route for energy supplies to Europe, heightens the political stakes necessitating robust mechanisms for dispute resolution and cooperation.

3. Regional cooperation frameworks, such as the East Mediterranean Gas Forum (EMGF), play a crucial role in fostering collaboration and dialogue among Mediterranean Countries (see paragraph 64 for the role of the EMGF).

4. The regional context cannot be considered in isolation. For example, the Organization of the Petroleum Exporting Countries (OPEC) plays a crucial role in regulating the supply and prices of oil on the global market. Decisions made by OPEC can have significant geopolitical economic impacts. The International Energy Agency (IEA) in its *World Energy Outlook* report of 2023, recalled that conflict and uncertainty provide an inauspicious backdrop. Following Russia's invasion of Ukraine, instability in the Middle East could lead to further disruption to energy markets and prices. This underscores the frailties of the fossil fuel age, and the shift for energy security as well as for more sustainable and alternative green energy.

b) International context related to the offshore oil and gas exploration and production

5. At the onset, it should be underlined that the international efforts to combat climate change have an impact on policies related to fossil fuel production and consumption with countries committing to reduce carbon emissions. Increasing investments in renewable energy sources (e.g. wind, wave and solar) challenge the dominance of oil and gas. More recently, as reflected in the in the 'Oil Market Reports' of the IEA, the Covid-19 crisis caused a temporary decline in global oil demand as well as a reduction of the multinational oil companies (sometimes referred to as the "Majors") exploration budget. Changes are also on-going in the demands of oil/gas following international sanctions on one of the main producers post-February 2022.

6. The report from the IEA "Oil 2024, Analysis and Forecast to 2030" introduces the fact that, divergent regional economic trajectories, and, the accelerating deployment of clean and energy-saving technologies, are combining to progressively slow the pace of oil demand growth, with a plateau emerging in the final years of the IEA's forecast, which runs to 2030.

7. It forecasts that, based on today's market conditions and policies, global oil demand will level off at around 106 mb/d towards the end of the decade amid the accelerating transition to clean energy technologies. Surging electric vehicles (EV) sales and continued efficiency improvements of vehicles, and the substitution of oil with renewables or gas in the power sector, will significantly curb oil use in road transport and electricity generation. Similarly, initiatives by international modes of transport, that is shipping and air, are also being undertaken to curb the use of and reliance on a hydrocarbon based fuel. Total oil demand is nevertheless forecast to rise by 3.2 mb/d between 2023 and 2030, supported by

increased use of jet fuel and feedstocks from the booming petrochemical sector. Indeed, consumption of naphtha, liquified petroleum gas (LPG) and ethane will climb by 3.7 mb/d over the forecast period.

8. According to the report, it is anticipated that refiners will need to progressively modify their product output to meet divergent trends for distillates as gasoline demand falls amid an increase in the market share of electric vehicles while jet fuel consumption rises (while global jet fuel demand will not surpass 2019 levels until 2027).

9. In contrast to other segments of oil demand, overall petrochemical activity continued to expand during the pandemic years as the interruption to demand from manufacturing, textiles and construction was more than offset by increased plastic use in packaging, and medical and protective equipment. Indeed, overall demand for ethylene – the most important petrochemical building-block molecule – may have fallen slightly in 2022 as this demand subsided. In addition, some important manufacturing growth areas, including clean energy technologies like EVs and solar panels, are relatively polymer intensive.

10. The report indirectly illustrates that the 'transition' is more in what oil is used for, rather of its non-use. At another scale, it is important to recall that the energy '*transition*' puts the emphasis on critical minerals which exploitation heavily relies on oil powered machinery. Similarly, the development of windfarms relies on oil powered machinery and 'fossil fuels' based materials (e.g: steel structures and wind turbine blades made of fiber glass/carbon). There is also the societal misconception of what electricity is. To many, electricity is seen as a source of energy, but in reality, it is a vector of energy; and a source of energy is still needed to produce electricity. As a result, despite a societal pressure to transit from "fossil fuels" to green energy there is still a demand (and a need) for «fossil fuels»/«fossil energy» and the '*transition*' itself towards renewable energy is also a factor for an increasing demand in energy.

11. Policy decisions regarding energy transition and climate change will continue to influence the future of offshore oil and gas exploration. As countries commit to reducing greenhouse gas emissions and transitto renewable energy sources, the role of hydrocarbon-based fuels in their energy mix may decline. However natural gas is often seen as a transitional fuel that can bridge the gap between coal and oil and renewables, maintaining its relevance at least in the short term.

c) International context related with other offshore activities

12. At a global level, changes are on-going in regard to the evolution of other offshore activities, such as, offshore wind farms, Carbon Capture and Storage (CCS), Carbon Capture Utilization and Storage (CCUS), and Deep-sea mining.

Offshore wind sector

13. The report from the IEA "Renewable 2023, Analysis and Forecast to 2028" provides a forecast of the deployment of renewable energy technologies in electricity, transport and heat to 2028 while also exploring key challenges to the industry and identifying barriers to faster growth.

14. It is anticipated that Solar photovoltaic (PV) and wind will account for 95% of global renewable expansion, benefiting from lower generation costs than both fossil and non-fossil fuel alternatives. Countries are moving at different speeds in embracing these forms of green energy. For example, despite the phasing out of national subsidies in 2020 and 2021, deployment of onshore wind and solar PV in China is accelerating, driven by the technologies' economic attractiveness as well as supportive policy environments providing long-term contracts. In parallel, Solar PV and onshore wind additions through 2028 is expected to more than double in the United States, the European Union, India and Brazil compared with the last five years.

15. The report highlights that the implications of the new macroeconomic environment are manifold for both governments and industry. Firstly, inflation has increased equipment costs for onshore and offshore wind and partly for solar PV (excluding module costs). Secondly, higher bank interest rates are

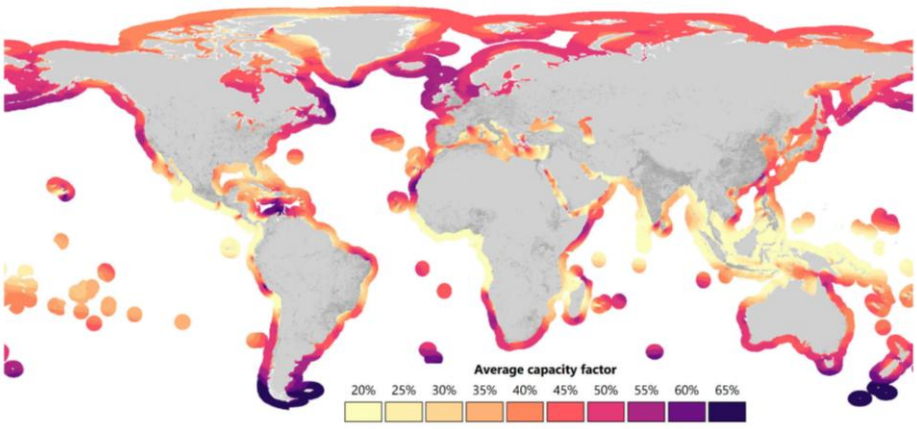
increasing the financing costs of capital-intensive variable renewable technologies. With regard to the acquisition of finance, financial institutions such as banks sometimes view maintenance costs as an operational investment and not a capital one and hence loans for maintenance for capital-intensive projects might be hard to come by which can act as a deterrent to finance capital-intensive variable renewable technologies Thirdly, policy has been relatively slow to adjust to the new macroeconomic environment.

16. On the other hand, drawing a parallel with the offshore oil and gas sectors, it is interesting to note the following:

i. Timescales: having an offshore installation producing oil or gas takes time. Similarly, the development of an offshore wind farm also takes time (considering all the phases up to the electricity grid connection). Indicative timing for offshore wind farms is about 7 to 11 years depending the size of the project and the complexity of the site;
ii. Logistics: logistics are key for offshore activities. The Barry Rogliano Salles (BRS) Group Annual Review for 2023 highlights the importance of a strong and efficient supply chain to install floating wind farms. In addition to the need for large onshore storage areas, this report identifies that securing access to installation vessels (foundation installation vessels, WTIV, cable-layers, etc.) may become a challenge for several developments in the years to come. That said, it further highlights subsea vessels leaving the conventional oil and gas markets, presumed permanently, to work in offshore wind installation;
iii. Human resources: human capacity is also a key aspect to consider. The creation of a "Skills Passport" for recognizing and transferring skills between offshore sectors can facilitate workforce mobility and ensure that professionals competencies are validated across them. Such a passport has been introduced in the North Sea Transition and Offshore Wind Sector deals, which were agreed between two industries (related to the offshore oil and gas, and offshore wind sectors) and the UK government.

17. In 2019, the IEA published a report "Offshore Wind outlook 2019". Figure 1 below provides an overview of the Average capacity factors for offshore wind, reflecting the quality of the wind resources available offshore around the world.

Figure 1: Average simulated capacity factors for offshore wind worldwide (Source IEA)



Average capacity factors reflect the quality of the wind resources available offshore around the world

Notes: Inland dots depict population density of more than 500, 2 000 and 8 000 people per km^2 with darker shades of grey.

Source: IEA analysis developed in collaboration with Imperial College London based on Renewables.ninja.

CCS and CCUS

18. It is recalled that the terms *carbon capture and storage* (CCS), *carbon capture and utilization* (CCU), and *carbon capture, utilization, and storage* (CCUS) are closely related and often used interchangeably.

19. The IEA reports that CCS technologies are expected to play a significant part in the global climate response (Carbon Capture, Utilisation and Storage - Energy System - IEA). Following the ratification of the Paris Agreement in 2015 by the UN Climate Change Conference (COP 21), the ability of CCS to reduce emissions from fossil fuel used in power generation and industrial processes – including from existing facilities – is seen as crucial to limiting future temperature increases to "well below 2°C," as laid out in the Agreement.

20. The IEA introduces the CCUS as a process involving the capture of CO_2, generally from large point sources like power generation or industrial facilities that use either fossil fuels or biomass as fuel. If not being used on-site, the captured CO_2 is compressed and transported by pipeline, ship, rail or truck to be used in a range of applications or injected into deep geological formations such as depleted oil and gas reservoirs or saline aquifers.

21. According to the IEA, CCUS deployment has been behind expectations in the past but momentum has grown substantially in recent years, with over 500 projects world-wide in various stages of development across the CCUS value chain. Nevertheless, even at such level, CCUS deployment would remain well below what is required in the Net Zero Scenario to address climate change.

22. More specifically, with growing plans to equip facilities with CO_2 capture, a gap is starting to emerge between anticipated demand for CO_2 storage and the pace of development of storage facilities. In the absence of further efforts to accelerate CO_2 storage development, through government or private sector exploration, the availability of CO_2 storage could become a bottleneck to CCUS deployment.

23. The IEA highlights that Europe continues to make progress to advance CO_2 transport and storage infrastructure with now over 160 Mt CO_2 of storage capacity planned by 2030, mostly around the North Sea.

Deep-sea mining

24. The surge for renewable energy/clean energy has put certain critical minerals under the spotlights. In September 2023, the IEA hosted the first ever "*International summit on critical minerals and their role in clean energy transitions*". Since 2023, the debate for deep-sea mining, in international waters at the International Seabed Authority (ISA) is becoming more focused. In July 2024, the 29th session of the Council and Assembly of the ISA will be held and progress in the negotiations of the draft exploitation regulations is expected. An international Mining code is expected in 2025.

25. In June 2024, Norway proposed opening its waters to deep-sea mining with an announcement of the first licensing round for seabed minerals on the Norwegian continental shelf for public consultation. Norway's proposal will open up 280,000 sq km of its national waters for companies to apply to mine these sources. Within the Norwegian projects, it is anticipated that a further five to 10 years of research into impacts on biodiversity is needed as well as more exploration and mapping activity.

26. Initiated in 2018, an EC funded project called GeoERA MINDeSEA (Metallogeny and Geological Potential for Strategic and Critical Raw Materials) addresses an integrative metallogenetic study of principal types of seabed mineral resources (hydrothermal sulfides, ferromanganese crusts, phosphorites, marine placers and polymetallic nodules) in the European seas. It provides datasets and maps of existing data on seabed mineral occurrences in European waters, including the Mediterranean Sea.

2) Overview of the Offshore activities in the Mediterranean Sea

27. In 2021, a study commissioned by REMPEC (EP/MED WG.498/Inf.4) provided a comprehensive analysis of the trends and outlook of marine pollution from ships and activities, and of maritime traffic and offshore activities in the Mediterranean Sea, including offshore oil and gas activities. In a recent comprehensive study conducted by UNEP/MAP (the Mediterranean Quality Status Report 2023 prepared by UNEP/MAP hereafter referred to as "MED QSR 2023"), it is reported that the Mediterranean oil and gas resources (onshore and offshore) are assessed at close to 7% of the oil and over 9% of the world's conventional gas resources. Whilst an overall decreasing trend has been observed in oil production in the Mediterranean Sea, including a marked variability after 2001, as compared to the substantially stable global trend since 2001, the same study conducted by UNEP/MAP reports that more than two hundred offshore oil and gas platforms were active in the Mediterranean in the second half of 2010.

28. Today, the main offshore oil producers in the Mediterranean sea are Egypt (e.g. Zohr Field, which is primarily a natural gas field but also produces condensates) and Libya (e.g. Bouri and Al Jurf fields), whereas Italy (e.g. in the Adriatic and Ionian seas, as well as in the south and west of Sicily), Tunisia (e.g. El Borma, Ashtart, Cercina Fields), Greece (e,g. Prinos and Epsilon Fields) and Spain (the one most noteworthy was the Casablanca Oil Field located offshore near Tarragona) have a downward trend in oil production. It would seem that exploring new opportunities is being done with caution due to environmental and regulatory consideration.

29. Compared to the offshore oil production, the Mediterranean Sea plays a more significant role in gas production at the global level, with the trend in offshore gas production showing a clear and marked increase since the 1980s. Egypt is the main offshore gas producer in the Mediterranean Sea (the majority of the fields are located off the Northern coast of Egypt), historically, followed by Italy. In recent years, the Italian production of offshore natural gas decreased significantly, while the production of Israel, and to a certain extent Cyprus, has greatly increased, in particular, owing to the discovery of, and production in, the rich Leviathan, Karish and Tamar gas fields and the Aphrodite, Calypso and Glaucus fields respectively. As recent as July 2024, it was reported that the company Energean will be investing 1.2 billion dollars to develop the Katlan gas field off Israel's Mediterranean coasts. In the coming years, other Eastern Mediterranean countries are expected to enter the offshore gas market as producers. In this connection, Türkiye has also intensified its offshore exploration efforts in the Eastern Mediterranean. Figure 2 provides information on the Offshore assets per main Mediterranean producing country to date.

Figure 2: Offshore assets per main producing Mediterranean country

Country	Producing	Under Development	Unsanctioned	Sum
Egypt	61	5	21	87
Italy	8	2	1	11
Israel	5	4	10	19
Libya	5	2	2	9
Tunisia	9	0	5	14
Turkey	3	0	0	3
Cyprus	0	0	4	4

7

Source: IOGP

3) Generic projection of the Offshore sector in the Mediterranean Sea

30. A key element to be kept in mind when making future projections is the timescale; as described in paragraph 16. The timescale for an offshore project to be fully commissioned is usually around 10 years. Therefore, a project to be commissioned in the second implementation period of the MOAP (2026-2035) would be mainly projects presently under construction or authorized or presently in their early planning phase.

a) Activities anticipated

Oil and gas exploration and production

31. At this stage, major changes are not expected in the oil and gas exploration and production sector in the Mediterranean Sea. In terms of development and production, the area of interest would be the offshore gas fields of the Eastern Mediterranean area, against the backdrop of a complicated geopolitical context. Figure 3 provides a projection of the offshore hydrocarbons production to 2035, for some of the main Mediterranean producing countries.

Figure 3: Sum of hydrocarbons per main producing country (thousand boepd)

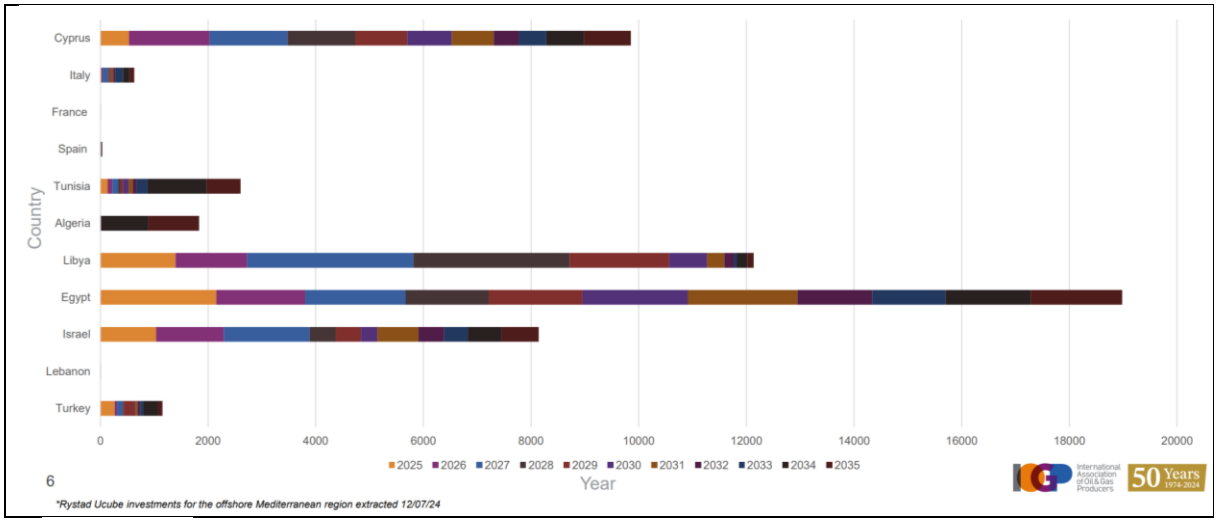
Year	Italy	Turkey	Cyprus	Israel	Egypt	Libya	Tunisia	Sum Year
2025	26.93	0.47	0	491.25	685.76	97.27	20.34	1,322.05
2026	29.82	0.34	0	529.28	663.97	91.25	18.81	1,333.50
2027	29.09	0.25	0	579.63	629.07	90.86	17.88	1,346.81
2028	28.42	0.19	10.54	598.64	622.68	96.70	18.68	1,375.89
2029	25.33	0.14	66.52	656.41	655.94	107.46	19.05	1,530.87
2030	19.89	0.11	143.93	690.283	699.06	103.51	18.35	1,675.16
2031	15.85	0.08	175.85	705.27	679.41	149.43	18.55	1,744.48
2032	13.79	0.06	186.20	712.57	646.87	196.52	16.87	1,772.92
2033	11.97	0.05	225.72	701.59	622.72	195.86	15.04	1,772.97
2034	12.94	0.04	253.44	694.33	583.44	192.24	12.63	1,749.07
2035	16.85	0.03	252.19	672.26	548.77	191.28	23.70	1,705.12
Sum Country	230.92	1.83	1,314.43	7,031.56	7,037.74	1,512.43	199.9551	

4

Source: IOGP

32. Figure 4 shows the future projected investments in the Offshore Mediterranean sector per main producing countries. It illustrates some projected offshore developments in Algeria and Tunisia after 2030 as well as the major investments that will take place in the Eastern Mediterranean area.

Figure 4 : Future projected investments in the Mediterranean Offshore sector (M/USD)



Source: IOGP

33. In relation with the expected overall decreasing trend in oil production in the Mediterranean Sea it is anticipated that decommissioning activities will take place progressively as the EU makes progress on the subject matter. Decommissioning is currently on the agenda of the European Union Offshore Oil and Gas Authorities Group (EUOAG) which also have authorities from the EU's neighborhood policy and partnerships initiatives attending the plenary meetings (Egypt, Israel, Lebanon and Montenegro).

Offshore wind sector in the Mediterranean Sea – Offshore floating photovoltaic

34. Further developments are expected in the Offshore wind sector in the Mediterranean Sea as technological progress is made on the floating wind turbine / floating wind farms.

35. However as shown in Figure 1, the wind resource in the Mediterranean Sea is not the same as in the North sea/Northern Europe, neither is the sea depth. The latter would be a determining factor in the development of offshore wind farms, and offshore floating PV. The MED QSR 2023 acknowledges that the offshore wind sector is expected to grow in the coming decades, inter alia due to new developments in technologies for floating platform construction and anchoring systems making them more suitable to deep waters. That said, another factor would be the appropriate development of the electricity grid onshore to accommodate these sources of renewable offshore energy.

36. TGS/4C Offshore (Global Offshore Renewable Map | 4C Offshore) presents an overview of the various offshore wind farms projects with their status (e.g.: early planning, authorized, pre-construction, fully commissioned, etc.). Numerous projects are under their early phases around Sardinia, Sicily and Italy, and some development zones are being considered in the Aegean Sea and off the Spanish coast. These developments were also highlighted by reports from the NGO Oceana, referring to information from the European Wind Energy Association (EWEA).

37. While the Offshore wind sector is in its development phase, there is a view that governments need to be supportive of these projects, notably by facilitating associated research programs and initial studies, as well as financial subsidies if necessary. With support from the European Union, it is foreseen that the first significant developments of offshore wind farms in the Mediterranean Sea will be in waters in countries which are Member states of the EU. In the EU Mediterranean countries, MED QSR 2023 notes that production of electricity by offshore wind farms could reach 12 gigawatts in 2030.

38. Oil and gas offshore platforms, traditionally used solely for hydrocarbon extraction are increasingly being re-repurposed for a variety of other applications. These multipurpose uses can

enhance the sustainability of the structure and rather than opt for a traditional decommissioning project, extend the life of a platform and provide economic benefits. Hybrid platforms that support hydrocarbon extraction and wind production are technologically feasible, even though no evidence of such hybrid platforms existing in the Mediterranean region was available. Wind turbines can be installed on or near these platforms utilizing existing infrastructure for energy transmission. In the context of a multipurpose use, platforms can host wave and tidal energy converters. These devices can be integrated into a platform's structure, taking advantage of strong marine currents and/or wave activity to generate renewable energy.

39. The above raises the question of whether the offshore renewable energy sector, in this case offshore wind farms, individually or as part of a hybrid platform fall within the framework of the Offshore Protocol. The issue has been raised, particularly within the context of discussions on the review of the EcAp roadmap policy and within the Intersessional Correspondence Group (ICG) on decommissioning established after the 4th Meeting of the Barcelona Convention Offshore Oil and Gas Group (OFOG) Sub-Group on Environmental Impact (23-24 May 2023).

CCS and CCUS in the Mediterranean Sea

40. Platform-reservoir complex can be also repurposed for carbon capture and storage by injecting CO_2 into depleted oil and gas reservoirs. This process helps climate change reduce atmospheric CO_2 levels. CCS can be combined with Enhanced Oil Recovery (EOR) techniques where CO_s is injected into oil fields to increase oil recovery rates. This dual-purpose approach extends the life of an oil field while sequestering CO_2.

41. The Ravenna hub was set to start injecting 25 kt CO_2 per year offshore Italy in 2024, and storage projects continue to make progress in Croatia (Geothermal CCS Croatian Hydrocarbon Agency (azu.hr), France and Greece (Prinos CO2 | Energean PLC) but no other significant developments are expected within the next future.

42. As with the 'recent' offshore wind sector, the importance of the country/regional support to initiate the groundwork for the projects must be considered. However, unlike the ambiguity that exists in the legal framework applicable to windfarms highlighted above, the international legal framework for CCS and CCUS is better defined (see paragraph 60 below).

Marine and seabed mining

43. Marine and seabed mining is defined by the OECD as the production, extraction and processing of non-living resources in the seabed or seawater. This includes extraction of minerals and metals from the seabed (in shallow waters or in the deep sea), marine aggregates (limestone, sand and gravel) and minerals dissolved in seawater. Marine mining refers to the exploration and exploitation of marine minerals such as iron ore, tine, copper, manganese and cobalt. Deep-sea mining is done at depths of 800 to 6,000 meters, primarily targeting deposits of polymetallic nodules, manganese crust and sulphides and is an emerging sector.

44. The MINDeSEA project (Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials (MINDeSEA) – GeoERA) provides maps of existing resources in the Mediterranean sea but to date there are no active commercial operations taking place. As highlighted in the MED QSR2023, potential areas for seabed mining have been identified in the Mediterranean Sea, with sulphide deposits identified along the Italian and Greek coastlines (Piante and Ody, 2015). The MINDeSEA project also revealed promising prospects in placer deposits near the coasts in the Eastern Mediterranean – Greece and Cyprus, as well as ferromanganese crusts in the Western Mediterranean off the coasts of Spain and Morocco (Sakellariadou et al., 2022).

45. While the economic potential of deep-sea mining is assessed as significant, the Mediterranean is not considered a priority area for these activities. The UfM Blue Economy report concluded there

were no projects that have been granted a mining licence in the Mediterranean and no deep-sea activities by 2017, with the exception of the 2007 exploration project in the Tyrrhenian Sea in Italy. The slow development of deep-sea exploitation in the Mediterranean can be partially attributed to technological development in the region and the lack of a dedicated regulatory system (UfM, 2017). However, exploitation of the Mediterranean seabed may become more economically attractive with increasing global prices for relevant resources.

b) Environmental impact

46. The main pressures identified on the marine environment, from activities relating to the oil and gas sector, as per OSPAR are: 1-Produced waters, 2-Chemicals (from drilling activities, discharges of produced waters, maintenance of installations, and plastics and microplastics), 3-Naturally Occuring Radioactive Materials, 4-Drilling fluids and cutting piles, 5-Installations and pipelines, 6-Accidental spills, 7-Atmospheric emissions, 8-Light, 9-Noise and 10-Carbon dioxide storage.

47. With regards to the development of renewable energy, the MED QSR 2023 notes that the expansion of marine energy production may lead to significant environmental impacts, many of which are not yet sufficiently studied: adverse impacts on bird behaviour, abundance and survival, especially if offshore wind farms are located on major migratory routes; impacts on behaviour and abundance of marine mammals including through underwater noise; increased marine traffic to service the infrastructure; impacts on ecosystem structure, functions and processes; but also including potential positive impacts on biodiversity through the artificial reef effect of marine infrastructure. While knowledge gaps persist, marine renewables may hinder the achievement of good environmental status for biodiversity or seafloor integrity and the management of marine spaces (Galparsoro et al., 2022).

48. Similarly, this same report brings to the fore that potential environmental issues linked to deep-sea mining are not well known, which questions on the sustainability of such a practice; the main pressures (with potential to cause harmful environmental consequences) are linked to extractive techniques, underwater noise and light, and water and/or chemical discharges (UNEP/MAP and Plan Bleu, 2020).

49. In the short to medium term, the developmental phase of projects relating to the Offshore wind sector, and to any new offshore activity for that matter, implies exploration and mapping activity (seismic operations) meaning pressure from the impact of noise.

c) Technological innovations

50. Technological innovations play a crucial role in the future for all types of sea-bed exploration. In the oil and gas sectors, advances in seismic imaging, drilling technologies and data analytics have enhanced the ability to locate and extract hydrocarbons more efficiently and safely. Technologies such as 3D and 4D seismic imaging allow for detailed mapping of underwater geology, reducing the risks associated with drilling.

51. As the ‘transition’ is made to develop other sources of offshore energy, ocean mapping becomes an even more important tool. The use of more sophisticated Remotely Operated Vehicle (ROVs) and autonomous underwater vehicles (AUVs), or drones, for surveys illustrate this aspect and make previously inaccessible areas of the Mediterranean seabed more accessible.

52. Partly related to the development of unmanned and autonomous vehicles, numerous digital innovations are expected to streamline operations and increase efficiency in exploration and production. The development of computer/software systems utilizing data-enhanced technologies (“Artificial Intelligence”) should allow significant progress in remote monitoring and predictive maintenance. In parallel, progress is also made in digital visualization to access to real-time data and information. At the global scale, it is interesting to note that these innovations are energy demanding.

53. From an installation/structure perspective, significant research and developments (R&D) are on-going in relation with the floating structures and anchoring systems of the offshore wind turbines; this R&D having influence on the other offshore floating activities.

4) Considerations for the period 2026-2035

54. As energy transition progresses towards the use of green energy, which will inevitably impact offshore activities and how the Mediterranean Sea-bed is exploited, clarity will have to be sought, in the future, on what offshore activities fall within the competence of the Offshore Protocol for it to remain fit for purpose.

55. As this transition progresses, a number of country scenarios can be envisaged which will create challenges for the application of the Offshore Protocol to these scenarios. It can be envisaged that some countries, with governmental support, will be aiming at developing green energy, e.g wind and/or wave energy, and progressively move away from the traditional oil and gas sectors. Others may retain the traditional oil and gas sectors. Whilst others might opt for both. The development of renewable energy also means that some countries which before had no offshore interest will now begin to venture in this area of offshore activity.

56. Transition also indirectly means, commissioning of offshore structures, decommissioning of existing structures and/or repurposing of existing structures.

57. As this transition progresses, synergies with the agendas of other inter-governmental groups, such as the EU Offshore Oil and Gas Authorities Group (EUOAG), should be identified and enhanced as these become more relevant if duplication and possibly incompatibility of initiatives are to be avoided. This will contribute to ensuring that the regional framework remains current and relevant.

PART II - Regulatory Framework/ International Agreements and Conventions/National Legislation

1) Regulatory framework

58. The legal frameworks governing oil and gas activities in the Mediterranean Sea are multifaceted, involving international conventions, regional agreements, and national regulations. These legal frameworks aim to balance the economic benefits of hydrocarbon exploitation with the need for environmental protection and geopolitical stability. Effective implementation and enforcement of these legal frameworks are essential for sustainable and responsible development of the Mediterranean's oil and gas resources. By fostering cooperation and adhering to established legal norms, Mediterranean countries can harness their hydrocarbon potential while preserving the ecological and geopolitical integrity of the region.

Key components of this framework include:

a) International regulations

59. The primary legal instrument governing maritime activities, including oil and gas exploration, is the United Nations Convention on the Law of the Sea (UNCLOS). Adopted in 1982, UNCLOS provides a comprehensive framework for the rights and responsibilities of states concerning the use of the world's oceans. It provides a legal framework for maritime activities, including the rights and responsibilities of states concerning marine resource exploitation and environmental protection. Salient features relevant of UNCLOS with a bearing on offshore activities are:

i. Exclusive Economic Zones (EEZs): Under UNCLOS, coastal states have the right to establish EEZs extending up to 200 nautical miles from their baselines. Within their EEZs, states have sovereign rights for exploring and exploiting natural resources, including oil and gas. The delineation of EEZs is crucial for determining which state has the authority to exploit resources in specific maritime areas;
ii. Continental Shelf: UNCLOS also grants coastal states rights to the continental shelf, which can extend beyond the EEZ up to 350 nautical miles from the baselines, allowing for the exploration and exploitation of seabed resources; and
iii. Environmental Protection: UNCLOS mandates that states take measures to protect and preserve the marine environment, including the prevention, reduction, and control of pollution resulting from oil and gas activities.

60. The maritime zone in the Mediterranean Sea coastal states is characterized by a number of distinctive features with important implications for the conservation and management of fisheries. One of these features is the general restraint shown by coastal States in exercising their rights to extend national jurisdiction over water in the Mediterranean Sea. While most states have established the 12 mile delimitation for territorial waters, not all have claimed an exclusive economic zone (EEZ), a fishing zone or a prevention, a pollution zone extending in these waters. That said, a promising outcome of cooperation within the framework of the Barcelona Convention, more specifically under the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol), calls upon countries to establish MPAs (Marine Protected Areas). This includes the ongoing development of a specific-wide network of Specially Protected Areas of Mediterranean Importance (SPAMIs). SPAMIs may be set up in marine areas subject to parties' jurisdiction and in areas situated partly or wholly on the high seas. Homing in on offshore activities, multilateral and bilateral arrangements also exist which by clarifying jurisdictional areas have ramifications for potential offshore oil and gas exploration development activities such as for example the MOU signed by Greece and Egypt in 2020 to delimit their respective EEZ in the Eastern Mediterranean.

61. The International Convention for the Prevention of Pollution from Ships (MARPOL) adopted by International Maritime Organization (IMO) plays a role in regulating oil discharges and atmospheric emissions from offshore installations, in particular FPSOs and FSUs. The IMO has also adopted the International Convention on Oil Pollution Preparedness, Response and Co-operation OPRC Convention on preparedness and response to accidental oil pollution which also contains elements to address oil spill pollution from offshore units. From the safety side, the IMO has adopted a Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU) Code which provides an international standard for MODUs. The Code facilitates their international movement and operation and ensures a level of safety for such units and personnel on board, equivalent to that required by the 1974 SOLAS Convention and the Protocol of 1988 relating to the International Convention of Load Lines, 1966, for conventional ships engaged on international voyages. A Protocol for the Suppression of Unlaw Acts against the Safety of Fixed Platforms located on the Continental Shelf to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation has also been adopted by the IMO. The IMO London Protocol deals with the prevention of marine pollution by dumping of wastes and other matter at sea. Within the larger context of offshore activities and repurposing of dead oil fields, and CCS/CCUS mentioned above, the Protocol has been amended to address the issue of carbon capture and storage in sub-seabed geological formations.

62. There are currently no global rules regulating liability and compensation for pollution damage resulting from offshore drilling activities. No specific international agreement has been adopted so far. That said the offshore pollution liability agreement (OPOL) is a private regime, limited in its geographical scope (North Western Europe), on compensation for damages and is considered capped at a rather low level. Typically, OPOL members, oil and gas operators, are required to comply with the agreement's provisions.

b) Regional agreements and arrangements

63. The Barcelona Convention, adopted in 1976, is a key regional agreement aimed at reducing pollution in the Mediterranean Sea. It includes protocols on pollution from exploration and exploitation of the continental shelf and seabed and its subsoil. The Offshore Protocol of the Barcelona Convention, which came into force in 2011, sets out specific measures to prevent, reduce, and control pollution from offshore activities. It mandates environmental impact assessments (EIAs), safety measures, and emergency response plans, among others. The 1976 Emergency Protocol which lead to the adoption of the 2002 Prevention and Emergency Protocol which entered into force in 2004 mimics the IMO OPRC Convention at the regional level addressing emergency response from fixed oil installations and makes the link with provisions of the Offshore Protocol on emergency response. In addition to the SPA/BD Protocol mention above, other Protocols could also have some relevance when considering offshore oil and gas activities such as the LBS Protocol which addresses land-based activities in the main that can affect the marine environment, including waste from oil and gas operations.

64. The EU Directive on Safety of Offshore Oil and Gas Operations (2013/30/EU) entered into force in 2013. EU countries including those in the Mediterranean had to transpose the directive into national rules and regulations by 2015 and transitional periods for the industry applied until mid-July 2018. It was intended to address shortcomings identified, following the incident in the US Gulf of Mexico at a drilling operation controlled by an EU based company in 2010 which sparked worldwide concerns as to whether the risks of offshore activities were adequately addressed.

65. The Eastern Mediterranean Gas Forum (EMGF or EGF) also known as the EastMed Gas Forum, established in 2019 with its formal charter signed in 2020 which entered into force in 2021, is a regional organization that promotes cooperation among Mediterranean countries for the development of natural gas resources. Headquartered in Egypt, it is a testament to the collaborative efforts of Mediterranean countries to harness their hydrocarbon resources and create a regional gas market, providing a platform for dialogue and cooperation. Member states include Egypt, Cyprus, France, Greece, Israel, Italy, Jordan, and Palestine whilst the EU, the World Bank Group and the U.S have observer status. The Forum

aims to create a regional gas market, optimize resource development, and enhance security and stability in the region.

66. Bilateral and multilateral MoUs have been signed between Mediterranean countries to facilitate cooperation in oil and gas exploration and exploitation. For example, in 2018, Cyprus and Egypt signed a MOU in 2018 to establish a direct subsea natural pipeline from the Aphrodite gas field in the Cyprus Exclusive Economic Zone (EEZ) to Egypt. This agreement aims to facilitate the transportation of gas from Cyprus to Egypt for the liquefaction and re-export to Europe and other markets. Sometimes, these MOUs also tend to be part of a broader geopolitical and/or economic strategy, such as addressing maritime boundaries. They help define rights and responsibilities, reduce conflicts and in the long run also promote cooperation in exploring and exploiting offshore resources.

c) National regulations

67. Each Mediterranean country with offshore oil and gas activities has its own regulatory regime. For example, Italy's Ministry of Economic Development oversees hydrocarbon exploration and production, ensuring compliance with environmental and safety regulations. Similarly, Egypt's Ministry of Petroleum and Mineral Resources regulates the sector, with a focus on maximizing economic benefits and ensuring safety. These national regimes might vary in detail but in essence reflect much of the provisions in the Offshore Protocol of the Barcelona Convention and govern exploration, production, environmental protection, and safety standards. In cases where the Mediterranean country is an EU member, the EU Directive on Safety of Offshore Oil and Gas Operations (2013/30/EU) is adhered to. Notwithstanding the similarities between the Directive and the Offshore Protocol, it is often a challenge for a country to become a Party to the Protocol, if it has already encapsulated the provisions of the Directive in its national law as it requires the country to tweak existing regulations which are based on the Directive, to be brought in line with the provisions of the Offshore Protocol. This can prove administratively and legally challenging for the country.

68. That said, these national frameworks typically include:

i. Licensing and Concessions: Governments grant licenses or concessions to companies for exploration and production activities. These agreements outline the terms and conditions, including financial obligations, operational requirements, and environmental safeguards;
ii. Environmental Impact Assessments (EIAs): National laws often require companies to conduct EIAs before commencing oil and gas activities. These assessments evaluate the potential environmental impacts and propose mitigation measures; and
iii. Safety and Operational Standards: Regulations set safety and operational standards for oil and gas activities to minimize risks to workers and the environment. These standards cover drilling operations, waste management, and emergency response procedures.

2) Challenges in the regulatory framework

69. Despite the existence of these regulations, several challenges hinder effective governance of offshore oil and gas activities in the Mediterranean:

1. *Fragmentation and Inconsistency*:
    i. The regulatory landscape is fragmented, with varying standards and enforcement mechanisms across different countries. This inconsistency can lead to regulatory gaps and uneven levels of environmental and safety protection.
    ii. The lack of harmonization among national regulations complicates cross-border cooperation and the management of transboundary environmental impacts.

2. *Enforcement and Compliance*:
    i. Ensuring compliance with regulations is a significant challenge. Limited resources, insufficient monitoring, and lack of enforcement capacity can undermine the effectiveness of regulatory frameworks.
    ii. Administrative and bureaucratic inefficiencies in some countries further complicate regulatory enforcement.

3. *Geopolitical Tensions*:
    i. Territorial disputes and geopolitical tension, if they exist, create uncertainties hinder cooperative regulatory efforts. These tensions can lead to overlapping claims and conflicting regulations, complicating the governance of offshore activities.

4. *Environmental Risks*:
    i. The Mediterranean's semi-enclosed nature makes it particularly vulnerable to pollution. Accidental oil spills, discharge of hazardous substances, and routine operational discharges pose significant environmental risks. Apart from the primary risks associated with actual exploration and exploitation operations such as blowouts, leaks and fire etc., other risks originating from ancillary operations related to offshore operations such as loading oil from a terminal, operations of and logistic and supply vessels around platforms need to be considered.
    ii. The cumulative impact of multiple offshore installations and activities exacerbates these risks, necessitating stringent and coordinated regulatory measures.

3) Opportunities for enhancing the regulatory framework

70. To address these challenges and enhance the regulatory framework for offshore oil and gas activities in the Mediterranean, several strategies can be considered:

1. *Harmonization of Regulations*:
    i. Harmonizing national regulations to create a coherent and consistent regional framework can improve governance, specifically if based on the Offshore Protocol's legal framework. Hence the importance of ratifying the Offshore Protocol as a first step. Adopting common standards for environmental protection, safety, and emergency response can facilitate cooperation and ensure a high level of protection across the region.

2. *Strengthening Regional Cooperation*:
    i. Enhancing regional cooperation through bodies like the Barcelona Convention and the East Mediterranean Gas Forum (EMGF) can foster collaborative approaches to regulatory challenges. Joint initiatives for monitoring, enforcement, and emergency response can improve regulatory effectiveness.
    ii. Developing regional agreements on data sharing, environmental monitoring, and best practices can support better decision-making and risk management.

3. *Capacity Building and Technical Assistance*:
    i. Investing in capacity building and providing technical assistance to regulatory authorities can enhance their ability to enforce regulations effectively. Training programs, technology transfer, and funding support can strengthen monitoring and compliance capabilities.

4. *Public Participation and Transparency*:
    i. Involving stakeholders, including local communities, non-governmental organizations, and industry representatives, in the regulatory process can improve transparency and accountability. Public participation in environmental impact assessments and decision-making processes can enhance the legitimacy and effectiveness of regulations.

5. *Leveraging Technology*:
    i. Utilizing advanced technologies for monitoring and enforcement can improve regulatory oversight. Remote sensing, satellite monitoring, and real-time data collection can enhance the ability to detect and respond to environmental incidents.
    ii. Digital platforms for reporting and compliance tracking can streamline regulatory processes and improve transparency.

71. In conclusion, the regulatory framework for offshore oil and gas activities in the Mediterranean Sea is complex and multifaceted, involving national, regional, and international regulations. While significant efforts have been made to establish a robust governance structure, challenges such as regulatory fragmentation, enforcement issues, and geopolitical tensions persist.

72. Enhancing the regulatory framework requires harmonization of regulations, strengthening regional cooperation, building regulatory capacity, promoting public participation, and leveraging technology. By addressing these challenges and seizing these opportunities, Mediterranean countries can ensure the sustainable and responsible exploitation of their offshore oil and gas resources, balancing economic development with environmental protection and geopolitical stability.

_____