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Agenda item 7: Indicator-based midterm evaluation of the implementation of National Action Plans/Programme of Measures (2015-2020)

Rational and Approach for Preparing the Indicator-based midterm evaluation of the implementation of National Action Plans/Programme of Measures (2015-2020)

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Meeting on National Baseline Budget Methodologies, Assessments of new Regional Plans and Evaluation of National Action Plans under the LBS Protocol

Videoconference, 22-23 April 2021

Agenda item 5: Midterm Evaluation of National Action Plans/Programme of Measures (2015-2020)

Rational and Approach for Preparing the Indicator-based midterm evaluation of the implementation of National Action Plans/Programme of Measures (2015-2020)

UNEP/MAP
Athens, 2021

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List of Abbreviations / Acronyms

BAT	Best Available Techniques
BEP	Best Environmental Practices
BOD	Biological oxygen demand
CI	Common indicator
CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
CPs	Contracting Parties
EC	European Commission
ECAP	Ecological Approach
EEA	European Environment Agency
ELV	Emission Limit Value
EO	Ecological Objective
EPA	Environmental Protection Agency
EU	European Union
GES	Good Environmental Status
GIS	Geographic Information System
H2020	Horizon 2020 initiative
IPCC	Intergovernmental Panel on Climate Change
ICZM	Integrated Coastal Zone Management
LBS	Land Based Sources
MEDPOL	Programme for the Assessment and Control of Marine Pollution in the Mediterranean
MSFD	Marine Strategy Framework Directive
N	Nitrogen
NAP	National Action Plan
NBB	National Baseline Budget
NH_3	Ammonia
N_2O	Nitrous Oxide
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
OECD	Organization for Economic Cooperation and Development
P	Phosphorus
PCBs	Polychlorinated Biphenyls
POMs	Programme of Measures
POPs	Persistent Organic Pollutants
PRTR	Pollutant Release and Transfer Registers
RP	Regional Plan
SAP-MED	Strategic Action Program for the Mediterranean
SEIS	Shared Environmental Information System
TN	Total Nitrogen
TP	Total Phosphorus
UNEP/MAP	United Nations Environmental Program/Mediterranean Action Plan
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research
WHO	World Health Organization

1. INTRODUCTION

1. The 19th Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Athens, Greece, 9-12 February 2016), hereinafter referred to as the COP19, agreed in Decision IG.22/8 to endorse the Countries' National Action Plans (NAPs) 2016–2025 as unique policy documents comprising legally binding programmes of measures and timetables required to achieve Good Environmental Status (GES) in line with the Regional Plans/LBS Protocol objectives in the framework of SAP-MED.

2. COP19 urged the Contracting Parties to report on the implementation of the NAPs in the framework of Article 13 of the LBS Protocol. It also requested the Secretariat to undertake in 2020 an indicator-based midterm evaluation of the NAPs' implementation based on the existing reporting system and in close collaboration with the Contracting Parties for submission to COP 21.

3. As the NAPs 2016-2025 are anchored upon three Ecological Objectives: EO5 (Eutrophication); EO9 (Contaminants); and EO10 (Marine Litter), the Midterm Evaluation is based on these three main pillars which are reflected in the updated programme of measures directly targeting three types of national actions based on the legally binding measures included in the respective Regional Plans following the hierarchy: (i) prevention measures at source (ii) reduction of pressures and (iii) remediation interventions in line with the **source-to-sea** approach**.**

4. To this end, the aim of this mid-term evaluation is to document progress made from the "benchmarking" point in 2015 to the "current status" in year 2020 looking at possible **reduction/elimination of the "pressures"** (either at source or end-of-pipe) and/or **improvement of the quality of "state",** which in both cases could be attributed, but not only, to implementation of the NAPs/PoMs. The Midterm Evaluation looks at the "Operational Targets" articulated in the NAPs and endeavours to assess their "approximation" to the targets established by using also information collected for the Indicators.

2. METHODOLOGY OF THE EVALUATION

5. The Midterm Evaluation is indicator-based in line with the NAP/H2020 Indicators further developed under the EU-Funded project "Shared Environmental Information System (SEIS)[1] principles and practices in the ENP South region - SEIS Support Mechanism". The NAP/H2020 indicators and relevant IMAP indicators (both included in Annex II) were clustered in the "Pressure-State-Response (PSR)"[2] assessment framework.

6. The NAP/H2020 indicators resulted from an extensive revision and participatory process including a mapping exercise [3] of current regional indicators against the different policies and their reporting requirements, with the aim to explain how the NAP/H2020 indicators are related to the other regional processes.

7. This assessment frame is substantiated by the fact that the "objectives and targets" in the NAPs are perfectly aligned with the "Responses/Actions/Intended Actions" as stipulated in the PSR assessment framework. Moreover, the NAP/H2020 indicators, which were built around, and populated with, data from the 4th Cycle of NBB Update Data Call (2018-2019) and SEIS Data Call (2018-2020), are highly compatible with, and linked to, the "Pressure" as required by the assessment framework methodology. On the other hand, the IMAP Common Indicators are compatible with, and indicative of, the status of the "State", whereas responses are examined taking into consideration the "**source-to-sea"** approach. This means that upstream "Responses" which are closer to sources of pollution are "preferred/prioritized" over downstream fixes or improvement due to their higher effectiveness of improvement of the "state". Therefore, "Responses" in upper stream such as measures on

[1] https://eni-seis.eionet.europa.eu/south
[2] OECD Environmental Indicators Development, Measurement and Use, OECD, 2003
[3] https://forum.eionet.europa.eu/etc-icm-consortium/library/service-contract-eni-south-2017-2018/key-deliverables/d3.2-concept-note-mapping-indicator-processes-and-country-guidance/d3.2-concept-note-mapping-indicator-processes

reduction/phasing out/avoidance at sources, for instance Best Available Techniques (BAT)/Best Environmental Practices (BEP), and control measures for instance ELVs, are considered having higher efficiency of improving the state of marine environment, than the ones on remediation/reclamation measures at downstream.

8. In this respect, it should be noted that the programme of measures in the NAPs are built on the requirements of the Regional Plans with the aim to achieve the EO5; EO9; and EO10. Therefore, targets and operational objectives in the NAPs/POMs are treated as responses and actions to reduce the pressures. And if achieved, this would lead to a general improvement in the marine system (state) that could be attributed, but not only, to the implementation of the NAPs/POMs.

9. The selected indicators under each EO corresponding with “pressure” and “state” are illustrated in Figure 2.1. The illustration shows the interlinkage between the indicators and their respective Ecological Objectives and associated Operational Targets. A progress towards attaining (“approximation” to) the Operational Targets will be evaluated per each EO at the final chapter based on the pressure and state indicator trends.

10. The mid-term evaluation is also complemented by data and information found in relevant reports submitted under the 'Barcelona Convention' Reporting System (BCRS)[4] and the LBS Protocol pertaining to Implementation of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities as illustrated in Figure 2.2. These reports served to provide information for the evaluation of the progress between the “benchmarking point”, i.e. NAP 2015, and “current status,” i.e. midterm year of 2020.

[4] http://www.info-rac.org/en/infomap-system/bcrs-reporting

EO5 Eutrophication: Human-induced eutrophication is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters

Operational Targets:

1. Provide XX% population with connection to sewage networks [2019 to 2025]
2. Provide XX% of agglomerations in excess of 2000 inhabitants with wastewater collection and treatment [2019 to 2025]
3. Reduce by XX% of BOD discharged to water bodies [2018 to 2021]
4. Reduce by XX% nutrient input from agricultural activities discharged to water bodies [2019 to 2020] (No data available)

Pressures			State	
NAP/H2020 IND 3. Access to Sanitation	*NAP/H2020 IND 4. Municipal Wastewater Management*	*NAP/H2020 IND 6.1: Release of nutrients from industrial sectors*	*CI 13: Concentration of key nutrients in water column*	*CI 14: Chlorophyll-a concentration in water column*

EO9 Contaminants: cause no significant impact on coastal and marine ecosystems and human health.

Operational Targets:

1. Phase out/reduce/control quantities or concentrations of POPs (PCB, pesticides) by 2025
2. Phase out/reduce discharges of PAHs by 2025;
3. Reduce discharge of hazardous substances from industrial plants (apply BAT/BEP) by XX% or dispose in a safe manner [2020 to 2025]
4. Reduce discharge of heavy metals (mercury, cadmium, lead, zinc, copper, chromium) by XX% [2019 to 2025];
5. Decontaminate XX% of sites polluted with mercury or phase out/isolate mercury from closed plants by 2025

Pressures		State	
NAP/H2020 IND 6.2. Release of toxic substances from industrial sectors	*NAP/H2020 IND 6.3. Industrial hazardous waste disposed in environmentally sound manner*	*CI 17: Concentration of key harmful contaminants measured in the relevant matrix;*	*CI 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established*

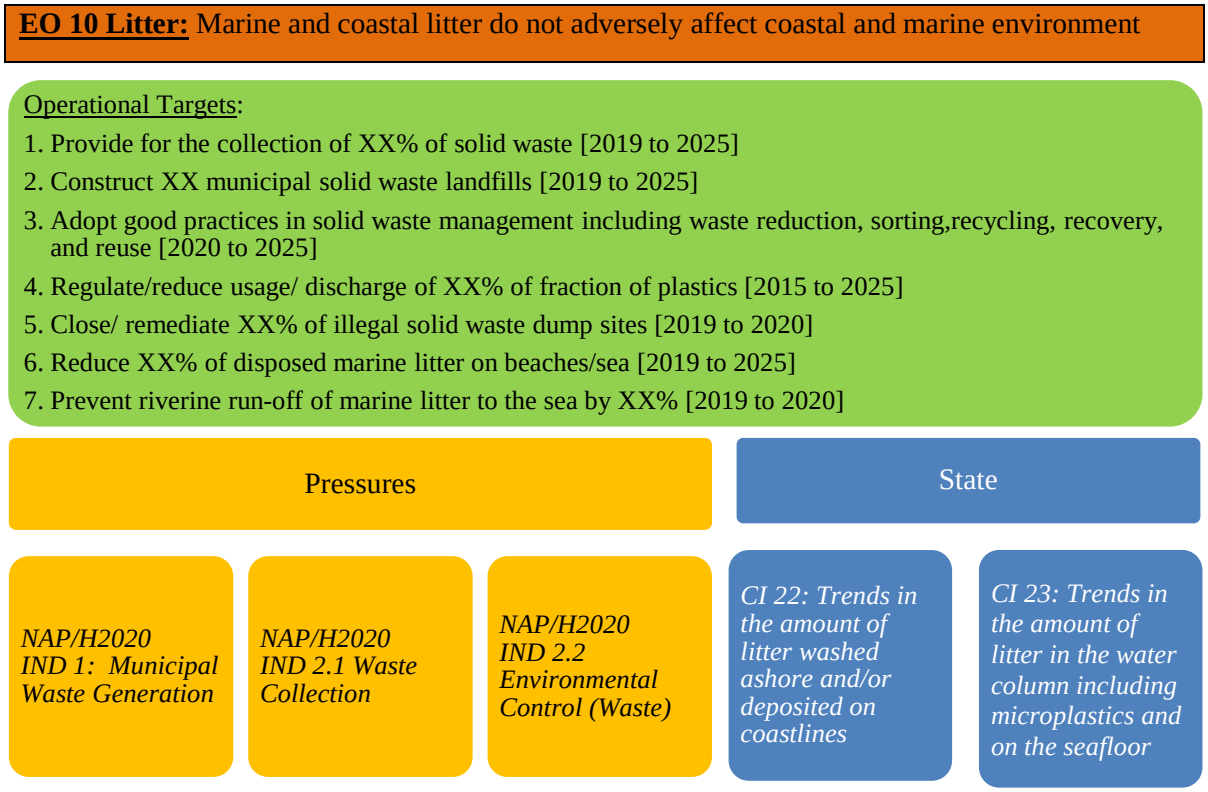


Figure 2.1: *Ecological objectives and linked indicators under Pressure-State-Response framework*

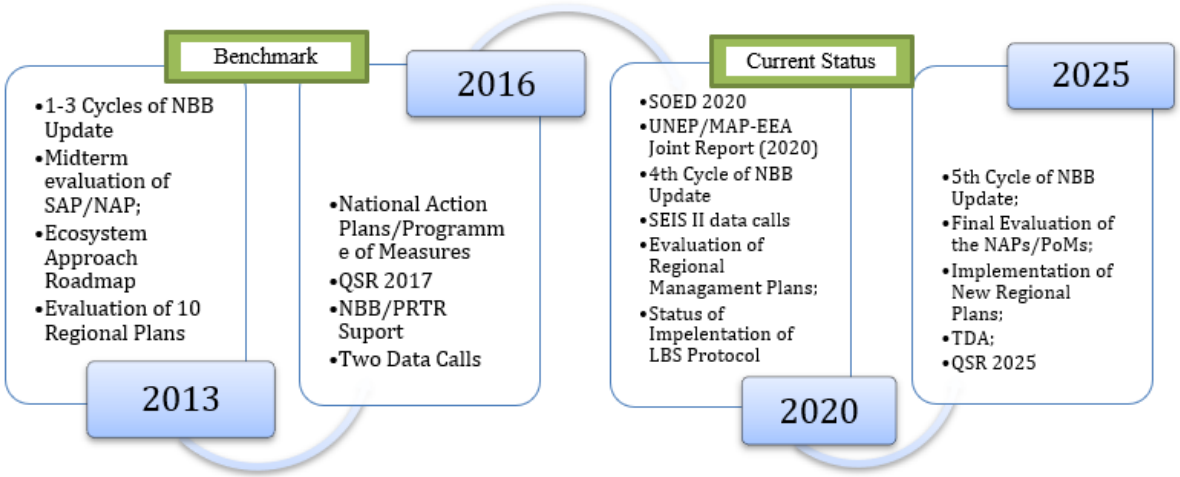


Figure 2.2*: Main timeframe and available assessment tools for the Midterm Evaluations.*

11. Regarding the "regional benchmark" pertinent to the "Pressures" and "State", this evaluation report considers the following major regional assessment and evaluation reports which are assessing the progress and achievements as well as the "current status":

a. The "State of Environment and Development Report" (2020) [5] by UNEP/MAP which gathers evidence from various chapters most closely related to marine and coastal environmental issues and highlights the combined interactions and impacts according to the analytical framework of factors-pressures-state-impacts-responses (DPSIR). The SoED brings a timely compilation and analysis of the most comprehensive and up-to-date knowledge available on the environment and development in the Mediterranean.

[5] https://planbleu.org/wp-content/uploads/2020/11/SoED-Full-Report.pdf

b. "Towards a cleaner Mediterranean: A decade of progress" (No:7/2020 and No:8/2020),[6] a Joint Report by EEA and UNEP/MAP which summarizes the main outcomes of the indicator-based appraisal of the progress observed since the launch of the Horizon 2020 initiative. It is the result of a multifaceted collaborative process among both national and regional actors to set up a regular review and reporting mechanism on pollution pressures in the Mediterranean region. The indicators used in this report were already streamlined and aligned with NAP Indicators therefore, the report presents a good information of the progress and "current status" of implementation of the NAP/PoMs.

c. The Quality Status Report, 2017,[7] which is first report based on the Ecological Objectives and Common Indicators of IMAP, with a view to assess the status of the Mediterranean in achieving GES.

d. Additionally, Implementation status (2000-2015) of Strategic Action Programme to Address Pollution from Land Based Activities (SAP-MED) and related National Action Plans (NAP).

12. Regarding the "Responses", the midterm evaluation report examines data and information provided in:

a. The "Evaluation Report on Implementation of Regional Plans for Reduction of BOD5 from UWWTP and food sector; Reduction of Inputs of Mercury; Elimination of POPs; and Marine Litter Management in Mediterranean", [8]

b. The NBB Reports submitted under 4th Cycle of NBB Update, 2018-2019, [9]

c. The National Implementation Reports of LBS under Barcelona Convention Reporting System (BCRS), [10] 2018-2019,

d. Report on the General Status of the Progress in the Implementation of the Barcelona Convention and its Protocols: Synthesis of the Information Mentioned in the National Implementation Reports for the 2016-2017, [11]

e. Reports from the Commission to the European Parliament and the Council assessing Member States' programmes of measures under the Marine Strategy Framework Directive, 2018, [12] and

f. Commission Staff Working Document Key stages and progress up to 2019 Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC). [13]

It should be noted that there are serious data and information gaps which still hinder the complete and accurate assessment. Therefore, this report utilizes the best available information based on assessment, evaluation and progress reports which are already peer reviewed and accepted by the Contracting Parties to the Barcelona Convention.

[6] https://www.eea.europa.eu/publications/towards-a-cleaner-mediterranean
[7] https://www.medqsr.org/
[8] UNEP/MED IG.24/Inf.15
[9] http://www.info-rac.org/en/infomap-system/nbb-reporting
[10] http://www.info-rac.org/en/infomap-system/bcrs-reporting
[11] UNEP/MED IG.24/Inf.8
[12] COM/2018/562 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:562:FIN&qid=1533034580736
[13] SWD/2020/60 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020SC0060

3. THE BENCHMARK (2015)

13. In 2016, UNEP/MAP MEDPOL issued the report on the implementation status (2000-2015) of Strategic Action Programme to Address Pollution from Land Based Activities (SAP-MED) and related National Action Plans (NAP). For understanding the benchmark on 2015 when the first set of NAPs (2003-2013) were completed, this report evaluated the status of main pressures and their trends (with limited data) by assessing the implementation of SAP-MED/NAP by undertaking a desk review of the legal framework, national strategies and plans and all the available information and data on the state of the environment of each Contracting Party, and analysis of reported and published data by the Contracting Parties on releases of pollutants into the marine environment, mainly in NBB and (e-) PRTR in order to track trends.

14. As part of above-mentioned evaluation, a comprehensive data analysis regarding 2003, 2008 and 2013 NBB data was undertaken and complemented by respective e-PRTR reports where available.

15. Based on referred evaluation report, sectors with major atmospheric emissions in 2013 were determined to be the energy sector (71% of total air emissions) and the mineral industry (13%). Regarding trends, waste and wastewater management, and paper and wood processing industries showed general increasing trends from 2003 to 2013, while some decreasing trends were observed for chemical industry, energy sector, intensive livestock and food and beverage sector from 2008 to 2013. Sectors with major water effluents were waste and wastewater management, mineral industry, energy sector for the water effluents the chemical industry showed general increasing trends from 2003 to 2013.

16. The report highlighted that chemical, mineral industry and production of metals were key sectors to focus attention on; in addition to the need to strengthen monitoring processes in a systematic way by introducing common set of indicators, as well as improving reporting capabilities pointing to the need for harmonization and synergies between NBB and (e-)PRTR was set as a priority. The recommendation of the Evaluation report was fully taking into consideration when updating the NAP Guidelines where a new NBB Methodology was appended.

17. Aiming to assess the main findings regarding the “state” on marine environment in 2017, UNEP/MAP-MEDPOL Programme issued the Report on the Quality Status of Mediterranean, (herein after as QSR 2017). The 2017 QSR, via compilation of IMAP Common Indicators, provided details on the status of marine and coastal ecosystems and endeavoured to identify the trends that were expressed through qualitative and quantitative assessment, and brought forward the findings on the status of information availability.

18. The QSR 2017 was based on IMAP Indicators. Considering their relevance to the NAPs/PoMs, the main findings of this report related to the Common Indicators (CI) under EO5, EO9 and EO10 are also considered.

4. THE LEGALLY BINDING FRAMEWORK OF THE NATIONAL ACTION PLANS

19. As unique policy documents, the NAPs (2016-2025) comprise of programmes of measures and timetables set by the countries to achieve GES in line with the legally binding Regional Plans/LBS Protocol in the framework of SAP-MED. In order to evaluate NAP implementation on national and regional levels, a set of indicators were established for monitoring periodically and reporting on their implementation and effectiveness. These were further developed into NAP/H2020 indicators under ENI SEIS II Project, and populated with two data calls; the 4th Cycle of NBB Update and H2020 Data Calls.

20. The Contracting Parties prepared the Programme of Measures for Pollution Prevention and Control included in their NAPs/POMs taking into consideration measures requiring investments; implementation of BAT and BEP; measures for updating legal instruments, institutional structures, policy frameworks, and national sectoral strategy, some specific actions for hotspots were also proposed, improved monitoring and enforcement legislation and institutional arrangements, and even new strategies for public participation and reporting. Some of the measures had been identified to

require substantive investments and needing additional preparatory work in order to develop its investment portfolio.

21. The Contracting Parties further defined specific quantifiable objectives and operational targets for land-based sources aiming to achieve the EcAp-GES and Regional Plans targets in the framework of SAP-MED in line with NAP Methodology. These requirements consist of a set of obligations, categorized into three groups: (a) policy frameworks; (b) legal instruments and institutional arrangements; and (c) pollution prevention and control measures.

22. The Contracting Parties transposed these requirements into their NAPs and Programme of Measures (PoMs). They are considered as responses at the national level to the pressures and degradation of the state of marine environment. Therefore, looking at the implementation of these requirements will give an overall pictur of the implementation of the NAPs.

23. Key commitments and obligations stipulated in NAPs stemmed from GES targets related to each of the Ecological Objectives EO5, EO9 and EO10 as well as relevant requirements are listed in Annex I, Part 1, Part 2 and Part 3, respectively. On the other hand, key requirements on Public awareness, access to information and public participations as well as monitoring and reporting are listed in Annex I, Part 4. The list of all agreed NAP/H2020 indicators and IMAP Common Indicators are presented in the Annex II, Part 1 and Part 2, respectively.

24. On the other hand, Marine Strategy Framework (MSFD) Directive,[14] required some Contracting Parties to develop strategies to achieve GES by 2020 and emphasized the need to cooperate with their neighbours in the marine regions, (North-East Atlantic, Baltic, Mediterranean and Black Sea), when devising and implementing such strategies. The use of existing regional governance structures, such as Regional Sea Conventions, was therefore an important element to be considered. The Directive requires that some of the Contracting Parties to develop monitoring programmes and prepare programmes of measures (POMs) to achieve the GES. The MSFD contains a set of qualitative 'descriptors' for these Contracting Parties to consider when developing their strategies. The links exist between Descriptors and Ecological Objectives and the relevant descriptors for the Ecological Objectives EO5, EO9, EO10 are D5, D9, D10, without excluding D8 (Concentrations of contaminants are at levels not giving rise to pollution effects).

5. PROGRESS AND LINKS BETWEEN THE BENCHMARK AND CURRENT STATUS

25. The NAPs/POMs have been conceived with specific operational targets to be achieved with the view to achieve EcAp-Ecological Objectives EO5, EO9 and EO10, (streamlined with GES) in line with the 2025 SAP-MED targets and the legally binding commitments of the 10 Regional Plans adopted by COP 16, 17 and 18 of the Barcelona Convention.

26. This evaluation aims to track performance of NAP/POMs implementation, progress and achievements made and effectiveness of measures taken by Contracting Parties. Evaluation is presented taking into consideration:

a. Countries which submitted their NAPs as ten Contracting Parties (South Mediterranean, Algeria, Egypt, Israel, Lebanon, Morocco, and Tunisia together with Albania, Bosnia-Herzegovina, Montenegro and Turkey).

b. Countries which submitted PoMs as nine Contracting Parties (North Mediterranean, Cyprus, Spain, France, Greece, Croatia, Italia, Monaco, Malta and Slovenia). These POMs are in line with MSFD.

27. As illustrated in Figures 2.1 and 2.2 and in line with the methodology used, this evaluation has been performed in order to examine and conclude on:

a. Evidence of progress to achieve Ecological Objective EO5, Eutrophication during the period 2015-2020.

[14] 2008/56/EC

b. Evidence of progress to achieve Ecological Objective 9 during the period 2015-2020.
c. Evidence of progress to achieve Ecological Objective 10, Marine Litter, during the period 2015-2020.
d. Evidence of progress to towards, public awareness, access and participation, and to meet monitoring and reporting requirements during the period 2015-2020.

28. As per Midterm Evaluation Methodology, the Ecological Objectives are linked with the key requirement of the NAPs, which are monitored using information from agreed Indicators to assess the "approximation" towards the Operational Targets. Therefore, the following three sub-chapters will provide evidence of, and evaluation on, the progress to achieve the relevant EOs. Conclusions are presented at the end of this evaluation with the outlook for 2025.

29. The criteria for evaluating the future outlook are summarized according to the following legends summarized below:

Legends on the criteria for future outlook	
	Based on the current information and trends (Indicators) in 2015-2020, there is a need **for significant** focus and substantive investment to implement the requirements until 2025
	The requirements are highly likely to be implemented until 2025.
	Despite perturbances, the requirement could be implemented until 2025, however, it will need some focused efforts as well as investment.
	No data is sufficiently arable to have a conclusive evidence-based evaluation.

5.1 Status of Implementation of targeted NAP Measures/PoMs to achieve EO5 (Eutrophication) during the period 2015-2020

30. Key NAP requirements stemming from the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective EO5 on Eutrophication, and associated Operational Targets are presented in Annex I, Table 1.

Looking at Pressure indicators

31. Based on the Joint EEA-UNEP/MAP Report, No. 07/2020 "Towards a cleaner Mediterranean: a decade of progress Monitoring Horizon 2020 regional initiative" and Report No. 08/2020 'Technical assessment of progress towards a cleaner Mediterranean - Monitoring and reporting results for Horizon 2020 regional initiative - Joint EEA-UNEP/MAP Report," and further to collected evidence, it is confirmed that progress is being made towards a cleaner Mediterranean, despite the turbulence in the region.

32. As wastewater generation increases, mainly, but not only, from population growth; a **persistent** driver in the Mediterranean, population count has already surpassed half a billion people in 2014, currently standing at 528 million in 2019.

33. An upward trend in populations with access to sanitation has been observed in all three Mediterranean subregions over the last 20 years. Whereas, it should be evaluated with increasing populations in the regions to have the full picture.

34. Data shows that in Albania, Bosnia and Herzegovina, Montenegro, Israel and Turkey, the population without access to sanitation has been on the decline, despite population growth. It indicates that these Contracting Parties are addressing the needs and rendering the services of their populations in terms of access to sanitation. For some of the Contracting Parties (Cyprus, Spain, France, Greece, Croatia, Italia, Monaco, Malta and Slovenia), the population access to sanitation has remained

constant, in line with constant population growth. In the remining Contracting Parties, however, the population without access to sanitation has been increasing steadily since two decades, this can be partly explained by their steady population growth. For those Contracting Parties, this indicates the need further investment on the infrastructure to cope with the demand for services by growing population.

35. The wastewater management chain generally consists of wastewater generation, collection, treatment and where possible reuse. There are two sources of generation of wastewater: municipal and industrial. Both are collected and directed to treatment systems as illustrated in in Figure 5.1.

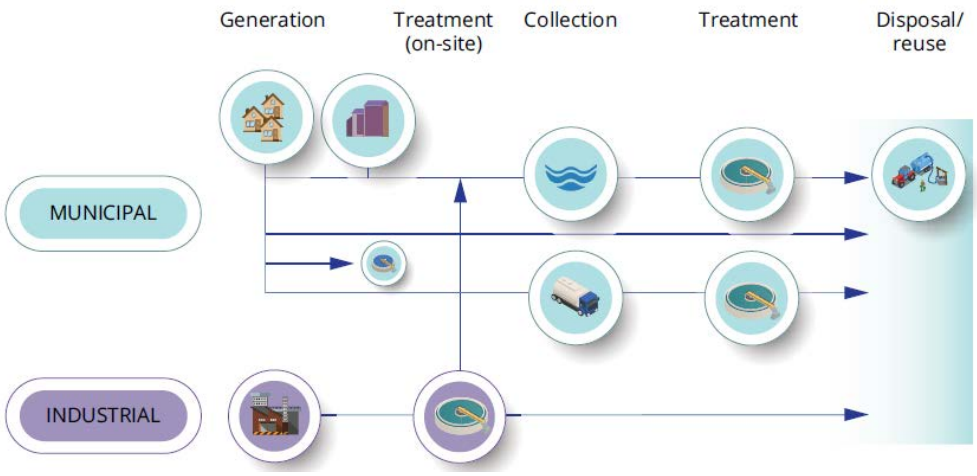


Figure 5.1: *Stages of wastewater treatment management (Source; Joint EEA/MAP Report 08/2020)*

36. Data recently collected from the countries show that in Israel, Morocco, and Tunisia, a steady increase in both volumes of wastewater collected and treated which points to the improved investments and rehabilitation in the wastewater sector. In these countries such as Israel and Tunisia, up to 96% of the collected wastewater is treated already, and Israel using 85% reclamation of sewerage for irrigation. For instance, in Tunisia and Israel, the volume of wastewater collected and treated per capita remains more or less the same fortifying the fact that these contracting parties are increasing their management in line with population growth. For Morocco, under the Wastewater Treatment and Purification Programme (PNA), several wastewater treatment plants have been developed, in line with their NAP, which are collecting and treating up to 93% of the collected wastewater within the coastal administrative regions in Morocco. Also, based on Morocco's report under SEIS, the country planned to install additional eight municipal WWTPs within the period of 2019-2021.

37. Based on the NBB Report 2018, the Algerian coast has 57 operating purification systems with an installed capacity of 8 million PE (Population Equivalent) located in the most important coastal cities, with a purification volume of around 84%. In Algeria, a major industrial depollution program in two main phases has been set up, including the industrial depollution of three large watersheds. This is planned to bring out 260 pre-treatment systems for polluting industrial units and the construction of 6 WWTPs for industrial wastewater. When completed in the future, this will allow considerable reduction of industrial water discharges.

38. It should be noted that, regarding the release of nutrients from urban wastewater, and despite all efforts by the Contracting Parties for implementing NAPs/PoMs in 2015, evidence shows that discharge of untreated wastewater is still a common practice in certain countries. On the other hand, effective implementation of the NAPs and PoMs and increased efficiency of WWTPs in terms of higher treatment levels and coverage rates, would likely decrease the nutrients discharges from industrial sectors by 2030. Although treatment levels have improved significantly since 2005, particularly in some of the Contracting Parties (i.e., Cyprus, Spain, France, Greece, Croatia, Italia,

Monaco, Malta and Slovenia), the tertiary treatment is not at the required level in Mediterranean, having undesired impact in the marine environment. Due to the lack of advanced tertiary treatment, the wastewater sector is still a significant contributor to direct releases of contaminants, in particular nitrogen and heavy metals. Based on the NBB Report 2018, in Egypt, tertiary treatment of wastewater in the two main WWTPs of Alexandria was planned by 2020; however, construction works are not completed yet.

39. Nutrient (TN and TP) loads from wastewater treatment plants are generally higher than from other industries, in particular in the some Contracting Parties to Barcelona Convention (i.e., Cyprus, Spain, France, Greece, Italia and Malta), where TN and TP loads from wastewater treatment plants amount to 90% of total loads. However, in the other Contracting parties, more specifically in southern subregions, total phosphorus loads from other industries are higher, probably related to phosphate-mining activities in certain countries.

40. Industrial activities, such as power-generation plants, food and beverages, textile manufacturing, and the production of pulp and paper are another important source of nutrients depending on whether or not the releases are transferred to the collection system. It should be noted that some sectors such as food packaging and textile are on the rise showing slight shift from the sectors as mapped in benchmark in 2015, as explained under Chapter 2.

41. A comparison of BOD, TN and TP from urban wastewater treatment plants and other industries in Mediterranean coastal hydrological basins is provided in Figure 5.2. This overview is compiled from National Baseline Budget (NBB) reporting as part of the LBS Protocol by some of the Countries as for remining Contracting Parties, it was extracted from E-PRTR which is streamlined with NBB.

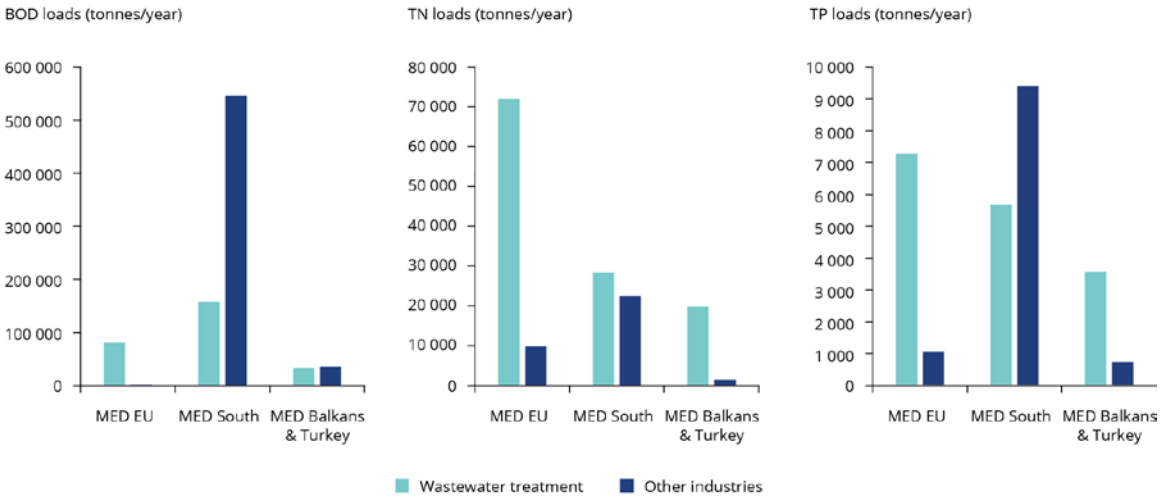


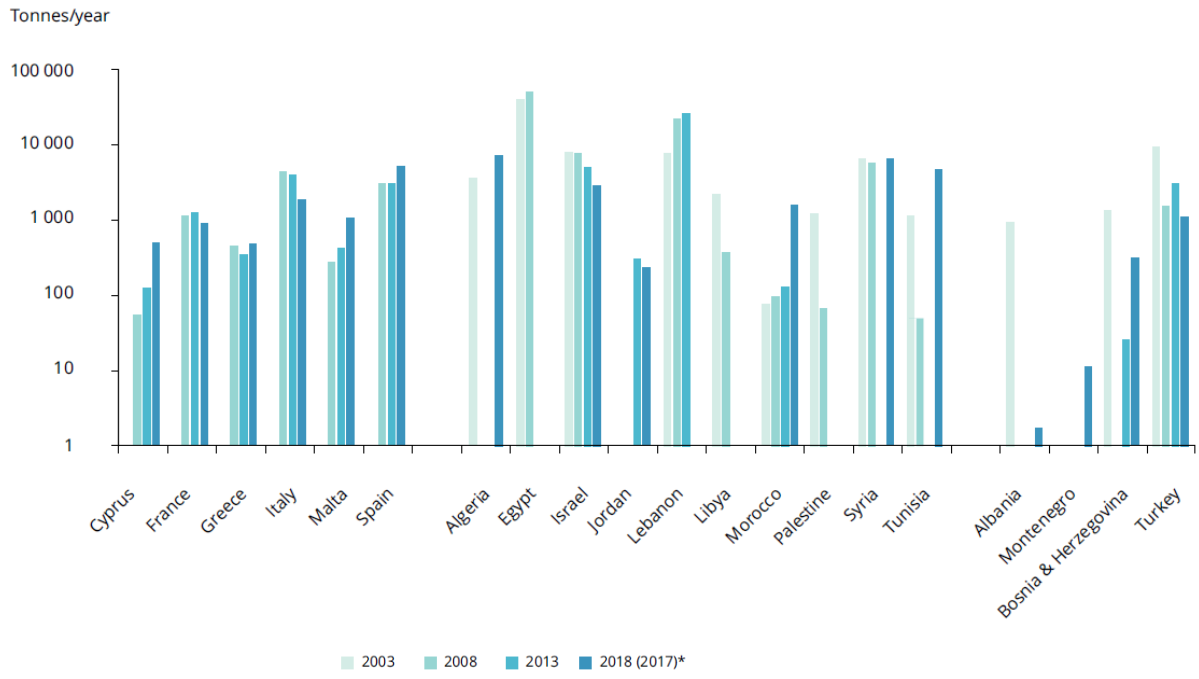
Figure 5.2: *Loads of BOD, TN and TP from wastewater treatment plants and other industries in coastal areas of Mediterranean countries (Source; Joint EEA/MAP Report 08/2020)*

42. Trends in releases of nitrogen, as seen in Figure 5.3, indicate a mixed trend depending on the progress of individual Contracting Parties; however, in general there is downward trend. A consistent decline in releases of TN is observed in Israel and Turkey which is in line with the decrease of BOD releases mainly from the food industry. This can be attributed to more stringent enforcement of legislation targeting.

43. On the other hand, for some of the Contracting Parties (i.e., Cyprus, Spain, France, Greece, Italia and Malta), the principal industries discharging nutrients are the chemical industry and paper and wood production, each constituting more than one third of the discharges. The third sector is the energy sector at almost one quarter of the discharged amount.

44. Decreases in TN in France and Italy are evident based on the PRTR V17 data. In these countries (i.e., Cyprus, Spain, France, Greece, Italia and Malta), it seems that UWWTPs are releasing higher nutrients' loads than the industrial sector, whereas industry is more dominant in the release of heavy metals (evaluated under EO9).

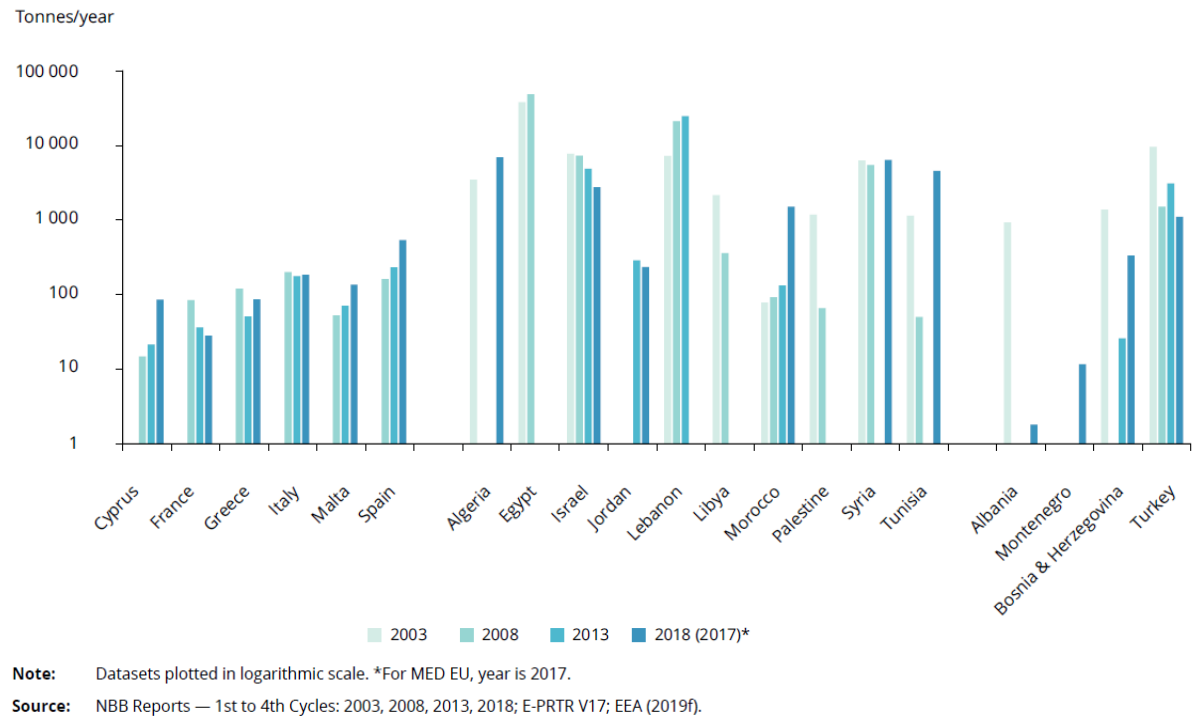
45. The releases of nitrogen, as seen in Figure 5.4, show an inconsistent trend depending on the progress of individual Contracting Parties; however, a slight decline in releases of TP is observed in Israel and Turkey in line with the decrease of TN releases. Despite the relatively lower discharges than the rest of the Contracting Parties (except for France), there is a general increase in TP discharges in the Contracting Parties which are in the north of the Mediterranean (i.e., Cyprus, Spain, France, Greece, Italia, and Malta).



Note: Datasets plotted in logarithmic scale.*For MED EU, year is 2017.

Source: NBB Reports — 1st to 4th Cycles: 2003, 2008, 2013, 2018; E-PRTR V17; EEA (2019f).

Figure 5.3: *TN discharges direct or indirectly to the Mediterranean (tonnes/year) (Source: Joint EEA/UNEP/MAP Report 8/2020).*



Note: Datasets plotted in logarithmic scale. *For MED EU, year is 2017.

Source: NBB Reports — 1st to 4th Cycles: 2003, 2008, 2013, 2018; E-PRTR V17; EEA (2019f).

Figure 5.4: *TP discharges direct or indirectly to the Mediterranean (tonnes/year) (Source: Joint EEA/UNEP/MAP Report No:08/2020).*

46. The recent evaluation of the European UWWTD (EC, 2019c), with the aim of assessing whether the Directive is still fit for purpose 30 years after its adoption, shows that it has been highly effective in reducing loads of BOD, TN and TP from urban point sources (domestic/urban wastewater and similar industrial pollution). Modelling results show that, between 1990 (when the Directive was adopted) and 2014, across the EU, BOD, nitrogen (N) and phosphorus (P) loads in treated wastewater fell by 61%, 32% and 44%, respectively, clearly contributing to the improved quality of EU water bodies and ensuring the safety of EU bathing-water sites.

47. The 2017 Mediterranean Quality Status Report, (QSR 2017) is a good source of evidence for the status under the relevant EOs, before adoption of the NAPs in 2015, based on the agreed IMAP indicators. However, the main drawback which needs to be considered is the lack of data for a comprehensive assessment of the “state”.

48. Based on the evidance presented in the Commmission Report (2018), [15] for nutrirnt inputs, Greece, Cyprus, Slovenia, Spain and Croatis in their national programmes, have referred to measures taken in their river basin management, plans to achieve compliance with the ‘good ecological status’ goal laid down by the Water Framework Directive and to comply with the parameters laid down by other water-related legislation.

49. The POMs were evaluated for Descriptor 5, for Greece, Croatia, Cyprus, Spain, France, Italy, Malta, Slovenia, in the accompaniying Staff Working Document (2019)[16] to Report of the Commission, refered above, checked the coverage of established measures in Member States’ in relation to (i) the pressures and activities reported, and (ii) the GES definitions and environmental targets. The report indicated that regarding Descriptor 5 (EO5), Italy, Malta, Croatia, Greece and

[15] Report from the Commission to the European Parliament and the Council assessing Member States’ programmes of measures under the Marine Strategy Framework Directive {SWD(2018) 393 final}.
[16] Commission Staff Working Document – Key stages and progress up to 2019 – Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC) {COM(2020) 259 final} - {COM(2020) 61 final}- {COM(2020) 62 final}

Cyprys have addressed the key pressures in their programmes of measures while Spain, France and Slovenia have partially addressed pressures. Regarding Descriptor 5 (EO5), ie., GES related environmental targets, were addressed by Spain, Italy, Malta, Slovenia, Croatia, Cyprus and Greece and partially addressed by France.

Looking at the State Indicators

50. The QSR 2017 states that nutrient concentrations causing eutrophication in areas, with available data, were in line with characteristic values for coastal regions (UNEP/MAP, 2017a). In a more recent assessment of nutrient enrichment and eutrophication in European seas (EEA, 2019b) through the application of the HEAT+ [17] tool, several coastal areas near the Mediterranean's largest cities were classified as problem areas for eutrophication. However, both studies concluded that a full assessment of nutrient enrichment at the scale of the Mediterranean Basin was not possible due to the availability of insufficient data — both spatial and temporal — and a lack of science-based threshold values (EEA, 2019c; UNEP/MAP, 2017a).

51. Using chlorophyll *a* (Chl a) concentration as a proxy for eutrophication and for hotspots of inorganic nutrient inputs, the maximum monthly concentration of Chl a in the 2003, 2012 and 2017 was retrieved based on CMEMS satellite products.[18] The distributions of Chl a confirm that the Mediterranean basin is largely oligotrophic in the centre, with a Chl a gradient from west-to-east. The historically known hotspots in the Alboran Sea, Gulf of Lions, Gulf of Gabès, Adriatic, Northern Aegean and the SE Mediterranean (Nile–Levantine) are clearly shown.

52. Almost 46% of the European coastal waters is failing to meet good ecological status for eutrophication; however, the extent of the areas affected is decreasing in some countries. Eutrophication occurs in the vicinity of riverine outflows within the Mediterranean Sea.[19]

53. Available data show that in areas where assessment is currently possible, key nutrient concentrations in the water column fall within ranges that are characteristic of coastal areas and in line with the main processes occurring in the specific area. The assessment based on chlorophyll a concentration in the water column shows that, with only a limited set of data for France, in the Western Mediterranean all stations in the Gulf of Lion were in a less than moderate state. Slovenia, Croatia and Montenegro were assessed in the Adriatic, with all stations showing good environmental status. Cyprus, Israel and the Mersin area in Turkey were also assessed, showing that stations in Cyprus have a good status while Israel and the Mersin area in Turkey have a moderate status (UNEP/MAP, 2017a).[20]

54. Some progress has been reported in the NBB Report in 2018. In Lebanon, as the eutrophication of the Litani River, had become a pressing national concern, in 2016, several initiatives and projects had been developed and implemented so far (completed and ongoing), such as the Development of the updated roadmap for pollution abatement of the Litani River and Lake Qaraoun, (2019), Development of the business plan for combatting pollution of the Litani Lower River Basin (2019), Lake Qaraoun pollution prevention project (2016-2023) and Sustainable Land Management in the Qaraoun catchment (2016-2020).

55. In Egypt, reported NBB data show some slight but insufficient improvement in the water quality from 2014 up to 2018 based on their eutrophication parameters (NO2, NO3, NH4, TN, DIN, PO4, TP, Si, SPM, chlorophyll-a) and physical parameters (salinity, electric conductivity, pH) along

[17] HEAT+: The new version of HELCOM eutrophication assessment tool (HEAT) developed for purpose of pan-European assessment
[18] OCEANCOLOUR_MED_CHL_L4_REP_OBSERVATIONS_009_078
[19] Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC), {SWD(2020) 60 final} - {SWD(2020) 61 final} - {SWD(2020) 62final}https://ec.europa.eu/info/sites/info/files/com2020_259_final_en.pdf
[20] UNEP/MAP QSR 2017

all Mediterranean Egyptian coastal waters; however there is a need for prudence, due to the different assessment methodologies.

56. The QSR 2017 report indicates that for making a comprehensive and more meaningful assessment, improvement in data quality is indispensable. An improvement of data availability would be required in order to establish time series of data capable of determining significant trends. Criteria for reference conditions and boundaries for key nutrients in the water column should be determined and harmonized throughout the Mediterranean region, as well as reference conditions for coastal water type and boundaries for *chlorophyll a* concentration in the water column for the Southern Mediterranean region (UNEP/MAP, 2017a).[21] Currently, UNEP/MAP under the CORMON is developing such documents.

Looking at the Legal and Institutional framework

57. UNEP/MAP MEDPOL has conducted a fully-fledged report on evaluation of the implementation of the 10 Regional Plans in 2019, based on this information, it can be inferred that almost 90% of the Contracting Parties have national regulations setting ELVs for urban wastewater in place in line with the values set in the Regional and NAPs for BOD reduction from urban wastewater (ELV 50 mg/l O_2). Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia, Spain and Turkey have stricter ELVs for urban wastewater treatment plants (minimum reduction 70-90%) based on the 91/271/EEC Directive (25 mg/l O_2) in contrast with the ELV of the Regional Plans set at 50 mg/l O_2 for the same reduction percentage.

58. Looking more particularly to the food sector, Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain have adopted the Industrial Emissions Directive (2010/75/EU) which sets authorization conditions for industrial installations (including food sector), with emission limit values (ELVs) based on the BAT. Other countries do not have specific ELVs set for the food sector. Some countries have ELVs for industrial installations such as Israel and Turkey. These are in line with the ELV of the Regional Plans set at 30 mg/l O_2 for the food sector.

59. With regards to monitoring and enforcement provisions, approximately one half of the Contracting Parties have in place monitoring plans (Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain) or preparation of these plans is in progress. Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain have adopted the Industrial Emissions Directive (2010/75/EU) which sets authorization conditions for industrial installations, including emission limit values (ELVs) and monitoring/reporting requirements. Also, in Turkey, Online Environmental Permits System which sets authorization conditions for industrial installations, enables facilities to apply for environmental permits and licenses since 2014.

60. With regards to inspections, work is also in progress for consolidating monitoring and reporting plans in Albania, Bosnia & Herzegovina and Montenegro. In general, their systems (Albania, Bosnia & Herzegovina and Montenegro) for collection, management and data sharing are, if not missing, very limited. The other countries, e.g. Algeria, Egypt, Lebanon, Morocco, Tunisia have no evidence of a systematic implementation of monitoring and reporting systems. [22] However, it should be noted that based on the reporting under 4th Cycle of NBB Update (2018), there is evidence of the capability of these countries to extract and collected widely dispersed (decentralized) data in their internal administrations.

61. Most of the Contracting Parties have a programme for construction or development of their WWTPs particularly for agglomerations larger than 2000 inhabitants. However, few countries have completed their construction programme at present which indicate that the progress is not sufficient as foreseen by the NAPs. Most Contracting Parties are, at different levels of progress in building

[21] UNREP/MAP QSR 2017, https://www.unep.org/unepmap/resources/2020-edition-state-environment-and-development-mediterranean-soed

[22] UNEP/MED IG.24/Inf.15 : Evaluation Report on the Implementation of the Regional Plans for Reduction of BOD5 from Urban Wastewater and in the Food Sector; Reduction of Inputs of Mercury; Eliminations of POPs; and Marine Litter Management in the Mediterranean, Naples, Italy, 2-5 December 2019

infrastructure for collecting and treating urban wastewater. For instance, in their NBB 2018, Montenegro reported and extension of sewerage systems and construction of WWTP for the towns of Bar and Ulcinj. It is evident that the status of treatment of wastewater is directly related to the economic situation in the country. Most countries in the northern Mediterranean are at more advanced stage in wastewater treatment compared to countries of the south and east due to the economic situation in countries exacerbated with social turbulences including refugees.

Evaluation findings of legal, institutional and response measures

62. The key NAP requirements stemmed from the obligations of the Land based Sources and Activities Protocol of the Barcelona Convention, the Ecosystem Approach targets and the legally binding measures of the Regional Plans in the framework of SAP-MED are evaluated in Table 5.1 based on the available evidence presented in this chapter for EO5. Where applicable, this evaluation also includes the results of the assessments of POMs for D5 (EO5). [23]The "outlook" for achieving these requirements is also presented. It should be noted that, these requirements are closely linked with the NAP Operational Targets, yet, implementing these Policy, Legal and Institutional and Preventive requirements are the means to attain the Operational Targets which are very country specific.

[23] Commission Staff Working Document – Key stages and progress up to 2019 – Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC) {COM(2020) 259 final} - {COM(2020) 61 final}- {COM(2020) 62 final} https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020SC0060

Table 5.1: Evaluation findings of legal, institutional and response measures under EO5 including future outlook

NAP/PoM Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
Policy	Enforce the adopted ELVs by monitoring discharges from municipal wastewater treatment plants into the environment	Enforcement is a big challenge in the regions especially with some countries where gaps do exist regarding the implementation of formal procedure for authorizations, monitoring and reporting system. Approximately, less than half of Contracting Parties have not yet, consolidated formal authorization system. Despite efforts made to overcome this gap, enforcement remains, due to one or another reason, the biggest challenge in the Mediterranean.	
	Adopt emission limit values (ELV) for BOD5 in urban wastewater after treatment in accordance with the requirements of the "regional guideline on the reduction of BOD5 from urban wastewater"	Almost all Contracting Parties have legislations regulating setting ELVs for urban wastewater in line with NAPs and Regional Plans. The process is on good track, where only a few countries needs to amend their national regulations to comply. For CP which are members state of EU, Directive 91/217/EEC on urban wastewater treatment is in place.	
Legal and institutional	Monitor discharges from municipal wastewater treatment plants and take necessary measures to enforce national regulations	More than half of the Contracting Parties have established monitoring programmes, as indicated in NAPs and Regional Plans of their discharges form their Urban Wastewater Treatment Plans, especially in bigger agglomerations. Work is in progress for consolidating monitoring and reporting plans in Albania, Bosnia & Herzegovina, Egypt, and Montenegro and partially Morocco.	
	Report on the implementation of the measures on the reduction of BOD5 from urban wastewater and on their effectiveness [On a biennial basis]	The Contracting Parties are regularly reporting the measures for the implementation at national level under LBS Reporting Format. The reposing rate has been slightly in increase, and the Compliance Committee is monitoring and advocating further increase.	
Pollution prevention and control	Ensure that all agglomerations of more than 2000 inhabitants collect and treat their urban wastewater before discharging them into the environment	Collection and treatment of municipal wastewater is generally on the rise, as is wastewater generated as a result of the steady increase in population in the region. However, this rise in mostly in large agglomerations. For small agglomerations, especially in rural areas, the collection of wastewaters is still a major problem for some countries, yet alone the sufficient treatments after collection is not in place for smaller agglomerations. (For the agglomeration more then 100.000, see the requirement below)	
	Prevention of direct and indirect effects of nutrient over-enrichment in the marine environment	The state of eutrophication still remains the same or has changes slightly since 2015. The hotspots of eutrophication remain the same. Indication that either prevention measures were limited, or less likely, the status would need more time to recover.	
	Reduce nutrient inputs, from agriculture and aquaculture practices into areas where these inputs are likely to cause pollution	Since 2015 up until 2019, no major shift on reducing the nutrient import from agriculture or aquaculture has been made. In 2019, UNEP/MAP initiated the preparation of two relevant management plans for agriculture and aquaculture. Considering the data is very scarce, UNEP/MAP has initiated a preparation of	

NAP/PoM Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
		estimation techniques for non-point sources and aquaculture to be able to monitor the situation in coherent and compatible data.	
	Industrial Food Plants which discharge more than 4000 PE into water bodies shall meet the following requirements: COD 160 mg/l or TOC 55 mg/l and BOD 30 mg/l	The food packaging sector remains to be one of the dominant sectors in region regarding releases of nutrients. However, not all Contracting Parties have adopted the ELVs in the NAPs needed to urgently improve or modify national regulations ensure compliance with the regional plan or national action plans. Contracting Parties which are also member states of EU, have developed a number of BEP and BAT; however, it is not possible to track the progress for each individual country.	
	Dispose all wastewater from industrial installations which are sources of BOD, nutrients and suspended solids	More than half of the Contacting Parties had ELV in place especially for CP which implement and transpose the Directive 2010/75/EU (Industrial Emission Directive). It should be noted that the ELVs in this directive are set in BATs and BREFs. Despite further steps are needed to ensure a full implementation, it is expected that industrial wastewater treatment will be more on focus in coming years. It should be noted that the majority of nutrients are discharged not from industry but from cities. Also, it is known that, the transfers from industry to UWWTPs are evident.	
	Promotion of separate collection of rain waters and municipal wastewaters	There is no sufficient data regarding the collection of rainwater (storm water) and its disposal. It highly depends on the date on the collection system establishment and the need for such collections. UNEP/MAP is currently developing regional plan on urban storm water where the targets will be set.	
	Coastal cities and urban agglomerations of more than 100,000 inhabitants are connected to a sewer system	Large coastal cities seem to improve their collection and connection to sewer systems. Detailed analyses especially in the south show a stark difference between urban and rural population access to basic sanitation services. Contrary to rural areas, improvement in large coastal cities are visible; however, not fully sufficient to match the increasing levels of population and tourism fluctuations.	
	Take necessary measures to establish adequate urban sewer and wastewater treatment plants that prevent run-off and riverine inputs of litter	The leakage of marine litter from unregulated dumpsites, as well as from municipal wastewater treatment plans seem to be still a big challenge. Especially, when the evidence indicates the increasing number of marine litter in the marine environment. There are no sufficient data to evaluate the status of the pressure or prove an increases quality of the state.	
	Limit concentrations of key nutrients in the marine environment to levels which are not conducive to eutrophication	Evidence shows that the eutrophication hotspots in the Mediterranean still remain. The distributions of Chl a confirm that the Mediterranean Basin is largely oligotrophic in the centre, with a Chl a gradient from west to east. The recognized hotspots in the Alboran Sea, Gulf of Lion, Gulf of Gabès, Adriatic, Northern Aegean and the southeast Mediterranean (Nile-Levantine) are clearly visible.	

NAP/PoM Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
	Promotion of reuse of treated effluents for the conservation of water resources	With the exception of a few countries, such as Israel and Tunisia which rely heavily on wastewater reuse as a non-conventional source of water, the uptake of wastewater reuse in the south subregion has been slow and uneven. In general, after an increase in the proportion of directly reused wastewater since 2012, there is a slight decrease observed between 2013 to 2019. In the same period, in the norther Mediterranean countries, a steady increase in the direct reuse of wastewater led by France and Spain.	
	For food sector installation discharges into the sewerage system, the competent authorities shall establish ELVs and an authorization compatible with the operation and the emission discharge values of the urban wastewater treatment plant	Except for Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain under directive 2010/75/EU as well as Israel and Turkey with their own national regulations, the ELV for food sector is not set. However, these countries constitute half of the Contracting Parties in the Mediterranean, indicating the other half needs to be supported to establish such ELVs in line with the NAPs and the Regional Plans.	

5.2 Status of Implementation of targeted NAP Measures/PoMs to achieve EO9 (Contaminants) during the period 2015-2020

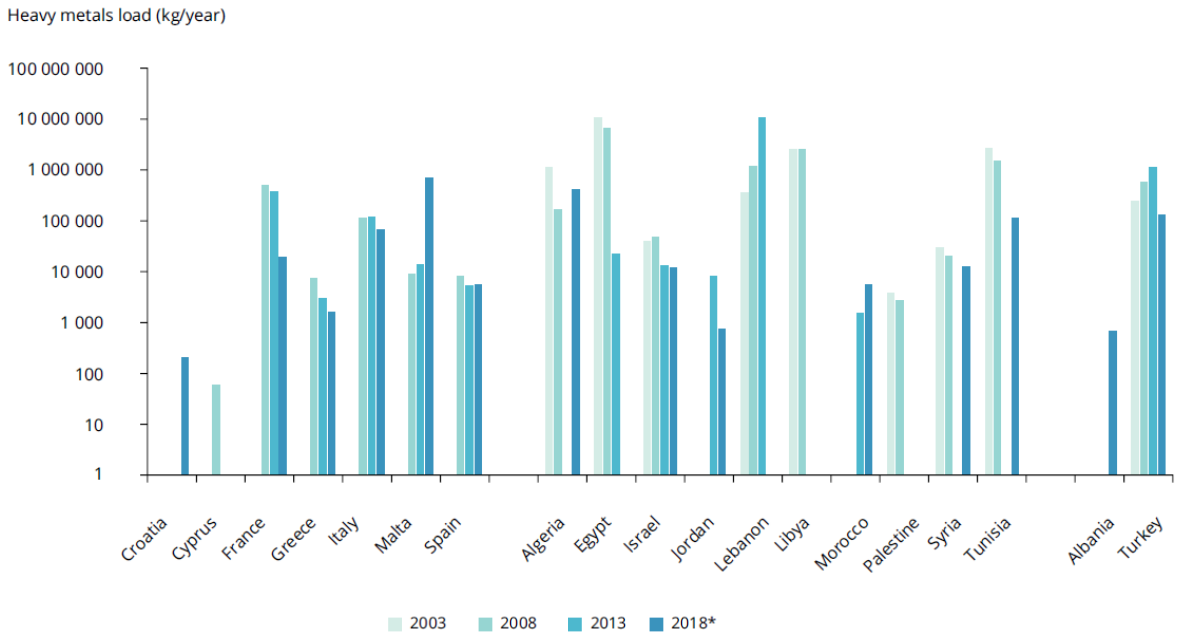
63. Key NAP requirements stemming from the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective EO9 on Contaminants, and associated Operational Targets are presented in Annex I, Table 2. This chapter looks at the evidence regarding pressures state and legal and institutional framework based on the relevant Indicators.

Looking at Pressure indicators

64. The Joint EEA-UNEP/MAP Reports, No 07/2020 'Towards a cleaner Mediterranean: a decade of progress Monitoring Horizon 2020 regional initiative' and the No 08/2020 "Technical assessment of progress towards a cleaner Mediterranean - Monitoring and reporting results for Horizon 2020 regional initiative" - Joint EEA-UNEP/MAP Report, are providing reliable evidence on the current status of state and pressures based on the NAP indicators.

65. The principal sector contributing to the release of heavy metals in southern countries is mainly manufacturing of refined petroleum products. For Albania, Bosnia and Herzegovina, Montenegro and Turkey, the main contributing sectors are refining of petroleum products, the tanning and dressing of leather and the manufacturing of cement. For the Contracting Parties to the Barcelona Convention which are also member states of EU, the principal sector responsible for the release of heavy metals is energy production.

66. Contrary to releases of nutrients, attributed mainly to UWWTPs, heavy metals are principally released from large industrial facilities. For instance, Albania reported five industrial facilities discharging heavy metals which are manufacturers of cement (Albania NBB, 2018). Bosnia and Herzegovina reported a single energy production facility and around 10 cement manufacturing plants as the main contributors to releases of heavy metals (Bosnia and Herzegovina NBB, 2018). In Israel, two fuel manufacturing facilities and nine thermal power generation plants release most heavy metals into water (Israel NBB, 2018). In Lebanon, heavy metals are released mainly by 21 thermal-power generation plants and other combustion installations as well as 8 mineral industries that produce cement clinker in rotary kilns (Lebanon NBB, 2018). In Tunisia, five relatively large cement manufacturing plants are reported to produce heavy metals (Tunisia NBB, 2018). Turkey has reported an increase in their industrial installations for production of energy nearly 54% in 5 years.



Note: Datasets plotted in logarithmic scale. *For MED EU, year 2017.

Sources: NBB Reports — 1st to 4th Cycles: NBB, 2003, 2008, 2013, 2018, E-PRTR V17; EEA (2019f).

Figure 5.5: *Cumulative Loads of Heavy Metals from industrial sectors, directly and indirectly to the environment (Source: Joint EEA-UNEP/MAP Report).*

67. Direct releases from UWWTPs are also a significant contributor to the discharge of heavy metals which are transferred from the industrial facilities to the UWWTPs (EEA, SoER, 2020). At the national level, water releases from UWWTPs in France contribute almost 45% of heavy metals (weighted by eco-toxicity); 18% from energy supply; 13% from the chemical industry; and 8% from the food and beverages sector. In Italy, 71% is from UWWTPs, 12% from the chemical industry and 8% from ferrous metals industries. Spain is similar where 84% of heavy metals releases into water are from UWWTPs, 10% from energy supply and 2% from the chemical industry.

68. General decreases of the releases of heavy metals from Contracting Parties which are also Member State of the EU, is observed. Also, decreasing trends in Egypt, Tunisia and Turkey, followed by slight decrease in Israel are evident. However, it is known that in the Mediterranean Sea, there are still some coastal hotspots with lead contamination in biota and mercury in sediments.

69. On the legal and institutional side, all Mediterranean countries have developed measures to combat industrial pollution such as the promulgation of regulatory texts to set levels of releases to the environment (ELVs), and to specify methods of management and treatment of industrial waste. In EU countries, the Industrial Emission Directive sets the ELVs based on the BATs and BREFs. In other countries, the authorization system is in place, but the ELVs are not set or need to be updated for certain sectors. Beside the EU countries as well as Turkey and Israel, where monitoring of permit conditions, permitting and authorizations is in progress, for the rest of the region, there is a need to improve the monitoring of industrial discharges.

70. More than half of the Contracting Parties have regulations in place regarding prohibiting and/or restricting the manufacture, export and import of mercury and setting national ELVs in line with the values set in the Regional Plan which is in concurrence with NAPs. In that respect, most countries have met the deadline for 2019. For example, Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain set 0.05 mg/Nm^3 for waste gas and 0.03 mg/l for discharges of wastewater from the cleaning of waste gases from waste incineration plants and waste co-incineration plants. Mercury emissions from the flue-gases of kiln firing processes are also restricted to 0.05 mg/Nm^3. Showing the ELV are strictly observed.

71. Regarding POPs and new POPs, recent information indicates that most of the Contracting Parties have legal and administrative measures on POPs in place. Israel and Turkey are currently finalizing their legal frameworks. Algeria, Morocco, Tunisia need to update national legislation to include new POPs.[24]

72. Although not sufficient, progress has been made by all Contracting Parties in the Mediterranean region to monitor and control industrial pollution. In most cases, countries have limited, decentralized infrastructure to monitor and implement adopted regulations. This poses a significant obstacle, particularly in eastern and southern countries for sustainable data management and for development of an integrated knowledge base which in return hinders the ability of enforcement authorities to implement the respective regulations especially for the countries of Algeria, Egypt, Tunisia, Bosnia and Herzegovina, Albania and Montenegro.

73. From a technical point of view, reinforcement of the capacities of different departments with equipment for measurement and analysis of pollutants as well as strengthening the capacity of national reference laboratories is essential for the effective implementation and compliance to regulations.

74. Chlor-alkali installations using mercury cells have been identified within the Mediterranean region in Algeria and Morocco. Historical contaminated sites did exist in Albania, Bosnia and Herzegovina (the installations are on Sava River Basin), Israel and Tunisia which were closed down and sites' remediations are in progress. At EU level, all the chloralkali plants already ceased their activities by December 2017 and environmental sound management of mercury is taking place.

[24] UNEP/MED IG.24/Inf.15

75. Briefly, on the legal and institutional side, most of Mediterranean countries have developed measures to combat industrial pollution such as the promulgation of regulatory texts to set levels of releases to the environment (ELVs), and to specify methods of management and treatment of industrial waste. However, the future for the industries releasing heavy metals is do not indicate a promising outlook, unless some serious action is taken. Especially with the releases to water and air.

76. In the 2018 NBB report by Montenegro, out of 13 institutional measures, almost all measures relating to building of institutional capacities for implementation of monitoring of the sea and wastewater at outfalls, monitoring of PCBs in waters and sediments, promoting solid waste recycling, establishing cross-border cooperation with Albania with respect to the River Bojana, improving the network of air stations on the coast and promotion of sustainable transport have been implemented or partially implemented. In 2019, the country adopted the Law on Industrial Emissions, which prescribes the procedure for obtaining an Integrated Permit that must contain emission limit values (ELV) in accordance with BAT. Directive on Medium Combustion Plants has been transposed. Equipment containing PCBs is being collected and exported. At Shipyard Bijela additional testing was performed for a clearer definition of the re-cultivation and rehabilitation of the location, which is one of 5 “hot spot” locations and will be rehabilitated from the World Bank funds. Some measures started to be implemented, such as rehabilitation of the Shipyard Bijela, export of PCBs equipment and pyralene oils and waste. Particularly important project is rehabilitation of the Port Milena canal (hot spot A) and connecting it with the River Bojana for the purpose of its cleaning and revival (NBB 2018, Montenegro).

77. Albania acceded to the Protocol on Pollutant Release and Transfer Registers in 2009. The decision of Council of the Ministers, No. 742 dated 09.09.2015) enabling the functioning of the Pollutant Release and Transfer Register (PRTR) entered in force in June 2016. The PRTR requirements apply to data on the emissions of about 300 companies. This includes routine, intentional and accidental release of pollutants, in addition to the transfer of waste and wastewater pollutants. In early 2017, the National Environmental Agency launched an online reporting tool for the PRTR to ensure the flow of information from the operators. The main industrial facilities have obtained an environmental permit in compliance with the environmental permitting legislation transposing the EU Industrial Emissions Directive. Based on inventories and studies made within the frame of UNDP and UNEP projects, an initial nine priority hotspots were identified in 2000, of these, seven were rehabilitated while the remaining two were still in the process of rehabilitation in 2016. (NBB 2018, Albania).

78. Based on the 2018 NBB Report of Lebanon, the following actions have been taken: development of the updated roadmap for pollution abatement of the Litani River and Lake Qaraoun, (2019); development of the business plan for combatting pollution of the Litani Lower River Basin (2019); Lake Qaraoun pollution prevention project (2016-2023); sustainable land management in the Qaraoun catchment (2016-2020); and installation of the PRTR software at the Lebanese Ministry of Environment. Since May 2015, the Ministry of Environment is involved in the implementation of a project on “PCB Management in the Power Sector Project”, (NBB 2018, Lebanon).

79. Based on the Commmission Report (2018), [25] for Contaminant in seafood, number of Contracting Parties reported actions more generally aimed at reducing the presence of contaminants in the sea, a number of Contracting Parties, report several measures which stem from EU requirements, such as those needed to achieve compliance with the Directives on nitrates, urban waste water, air emissions, ship source pollution, and the REACH regulation as well as international commitments either under MARPOL or the Regional Sea Conventions (Barcelona Covention) are also referred to.

80. The POMs were evaluated for Dicreiptors 8 and 9 (EO9) for Greece, Croatia, Cyprus, Spain, France, Italy, Malta, Slovenia, in the accompaniying Staff Working Document (2019)[26] to Report of

[25] Report from the Commission to the European Parliament and the Council assessing Member States’ programmes of measures under the Marine Strategy Framework Directive {SWD(2018) 393 final}.
[26] Commission Staff Working Document – Key stages and progress up to 2019 – Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy

the Commission, refered above, checked the coverage of established measures in Member States' in relation to (i) the pressures and activities reported, and (ii) the GES definitions and environmental targets. The report indicated that regarding Descriptor 8 (EO9), Spain, France, Malta, Croatia, Slovenia and Cyprys have addressed the key pressures in their programmes of measures while Italy and Greece have partially addressed pressures. Regarding Descriptor 5 (EO5), ie., GES related environmental targets, were addressed by Spain, Slovenia, and Cyprus and partially addressed by France, Italy, Malta, Coratia, Greece. Regarding Descriptor 9 (EO9), GES and environmental targets were addressed by Spain, Slovenia, France, Italy, Malta, Croatia, Greece and Cyprus.

Looking at State indicators

81. Regarding Contaminants, the 2017 Mediterranean Quality Status Report, (QSR 2017) sets the good source of evidence for the "state" under the relevant EOs, before adoption of the NAPs in 2015, with the agreed indicators. Definitely, as stated in the Implementation Report of MSFD, there is room for improving the monitoring of marine pollution through more effective data mining and joint monitoring networks and harmonized methodological approaches at a regional scale.[27] As mentioned earlier, the lack of data for a comprehensive assessment is somehow blurring the picture. The information for the state based on the CI17 and CI18 are rather limited.

82. Based on the Review of the status of the marine environment in the EU, the following has been reported: A proportion of the waters in the Ionian Sea and Central Mediterranean and in the Black Sea have been reported with an unknown status (52% of the area assessed).

83. According to an independent assessment (EEA, 2019f) 'non-problem areas' and 'problem areas' for Europe's seas have been identified. The percentage of 'non-problem areas' in the Mediterranean Sea is 7%. However, these results should be interpreted with caution since they are affected by the list of substances being monitored and by the spatial coverage. This analysis is based upon all substances for which monitoring data is available and for which threshold values are agreed upon. Chemical status is based upon a subset of substances.

84. Emerging contaminants, such as phenols, pharmaceutical compounds, personal care products or polycyclic fragrances are currently under investigation. Some conclusions on the status are: lead levels in mussels, which were above maximum levels established in food regulation in 8% of assessed stations. The areas of concern are the coasts of southeast Spain, Italy and Croatia (known hotspots).

85. In the Mediterranean region, the assessment of biological effects is still in an initial phase (i.e. method uncertainty assessments and confounding factors evaluations), which limits the implementation in the long-term marine monitoring networks (UNEP-MAP, 2018). There is room for improvement through further data mining and further developments of the quality of the monitoring networks, i.e. better spatial coverage, in the Mediterranean Sea.

86. The monitoring of some legacy pollutants for which measures are already in place (e.g. bans of TBT, PCB, DDT, etc.) should be reviewed. For instance, non-pesticidal use of TBT is still ongoing in some countries and DDT is still used in Asia and Africa, which could be the reason for an observed increase in DDT concentrations in the Mediterranean Sea (EEA, 2019f). Moreover, these substances are very persistent and therefore are still present in the marine environment at significant concentrations.

87. In the Mediterranean Sea, there are known coastal hotspots, especially due to Pb contamination in biota and mercury in sediments, where the need for further measures and actions has been already recognized. Metal concentrations (Hg, Cd, Pb) in fish and seafood from different

Framework Directive (Directive 2008/56/EC) {COM(2020) 259 final} - {COM(2020) 61 final}- {COM(2020) 62 final}

[27] Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC), {SWD(2020) 60 final} - {SWD(2020) 61 final} - {SWD(2020) 62final}https://ec.europa.eu/info/sites/info/files/com2020_259_final_en.pdf

European locations are normally below the established regulatory levels.[28] High levels of lead contamination is evident in Tobruk bay in Libya due to uncontrolled industrial discharges.

Looking at the Legal and Institutional framework

88. On the legal and institutional side, all Mediterranean countries have developed measures to combat industrial pollution such as the promulgation of regulatory texts to set levels of releases to the environment (ELVs), and to specify methods of management and treatment of industrial waste. In EU countries, the Industrial Emission Directive sets the ELVs based on the BATs and BREFs. In other countries, the authorization system is in place, but the ELVs are not set or need to be updated for certain sectors. Beside the EU countries as well as Turkey and Israel, where monitoring of permit conditions, permitting and authorizations is in progress, for the rest of the region, there is a need to improve the monitoring of industrial discharges.

89. More than half of the Contracting Parties have regulations in place regarding prohibiting and/or restricting the manufacture, export and import of mercury and setting national ELVs in line with the values set in the Regional Plan which is in concurrence with NAPs. In that respect, most countries have met the deadline for 2019. For example, Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia and Spain set 0.05 mg/Nm^3 for waste gas and 0.03 mg/l for discharges of wastewater from the cleaning of waste gases from waste incineration plants and waste co-incineration plants. Mercury emissions from the flue-gases of kiln firing processes are also restricted to 0.05 mg/Nm^3. Showing the ELV are strictly observed.

90. Regarding POPs and new POPs, recent information indicates that most of the Contracting Parties have legal and administrative measures on POPs in place. Israel and Turkey are currently finalizing their legal frameworks. Algeria, Morocco, Tunisia need to update national legislation to include new POPs.[29]

91. Although not sufficient, progress has been made by all Contracting Parties in the Mediterranean region to monitor and control industrial pollution. In most cases, countries have limited, decentralized infrastructure to monitor and implement adopted regulations. This poses a significant obstacle, particularly in eastern and southern countries for sustainable data management and for development of an integrated knowledge base which in return hinders the ability of enforcement authorities to implement the respective regulations especially for the countries of Algeria, Egypt, Tunisia, Bosnia and Herzegovina, Albania and Montenegro.

92. From a technical point of view, reinforcement of the capacities of different departments with equipment for measurement and analysis of pollutants as well as strengthening the capacity of national reference laboratories is essential for the effective implementation and compliance to regulations.

93. Chlor-alkali installations using mercury cells have been identified within the Mediterranean region in Algeria and Morocco. Historical contaminated sites did exist in Albania, Bosnia and Herzegovina (the installations are on Sava River Basin), Israel and Tunisia which were closed down and sites' remediations are in progress. At EU level, all the chloralkali plants already ceased their activities by December 2017 and environmental sound management of mercury is taking place.

94. Briefly, on the legal and institutional side, most of Mediterranean countries have developed measures to combat industrial pollution such as the promulgation of regulatory texts to set levels of releases to the environment (ELVs), and to specify methods of management and treatment of industrial waste. However, the future for the industries releasing heavy metals is do not indicate a promising outlook, unless some serious action is taken. Especially with the releases to water and air.

[28] Commission Staff Working Document – Review of the status of the marine environment in the EU – Towards clean, healthy and productive oceans and seas - Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC) {COM(2020) 259 final} - {SWD(2020) 60 final} - {SWD(2020) 62 final} https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020SC0061&qid=1616256158587

[29] UNEP/MED IG.24/Inf.15

95. In the 2018 NBB report by Montenegro, out of 13 institutional measures, almost all measures relating to building of institutional capacities for implementation of monitoring of the sea and wastewater at outfalls, monitoring of PCBs in waters and sediments, promoting solid waste recycling, establishing cross-border cooperation with Albania with respect to the River Bojana, improving the network of air stations on the coast and promotion of sustainable transport have been implemented or partially implemented. In 2019, the country adopted the Law on Industrial Emissions, which prescribes the procedure for obtaining an Integrated Permit that must contain emission limit values (ELV) in accordance with BAT. Directive on Medium Combustion Plants has been transposed as well as Montenegro reported that they prepared several action plans, which are in line with NAP implementation such as, Action Plan for the implementation of the Stockholm Convention (2014-2021) provides for the elimination of the use of all PCBs by 2020, the elaboration of studies for the remediation of polluted areas by 2018, and their remediation until 2021, National Waste Management Plan 2015-2020, National Waste Management Plan by 2030, National Strategy for Chemicals Management with the Action Plan for the period 2015-2018 etc. (NBB 2018, Montenegro).

96. Albania acceded to the Protocol on Pollutant Release and Transfer Registers in 2009. The decision of Council of the Ministers, No. 742 dated 09.09.2015) enabling the functioning of the Pollutant Release and Transfer Register (PRTR) entered in force in June 2016. The PRTR requirements apply to data on the emissions of about 300 companies. This includes routine, intentional and accidental release of pollutants, in addition to the transfer of waste and wastewater pollutants. In early 2017, the National Environmental Agency launched an online reporting tool for the PRTR to ensure the flow of information from the operators. The main industrial facilities have obtained an environmental permit in compliance with the environmental permitting legislation transposing the EU Industrial Emissions Directive. Based on inventories and studies made within the frame of UNDP and UNEP projects, an initial nine priority hotspots were identified in 2000, of these, seven were rehabilitated while the remaining two were still in the process of rehabilitation in 2016. (NBB 2018, Albania).

97. Israel in their NBB Report indicated that, in 2013, the State of Israel ratified Aarhus Convention's Kiev protocol and Environment Protection Law was legislated. This Law requires from all major industrial activates in Israel to submit a yearly pollutant release and transfer reports. Within the framework of the Environment Protection Law, a PRTR system was established (MIFLAS, according to the Hebrew acronym). This Law includes a list of industrial activities with emissions and activity size thresholds. Each factory/enterprise reports to the PRTR system independently, and all of the data is reviewed for quality control by the Ministry of Environmental Protection to ensure the veracity and accuracy of the information presented to the public. Data records from PRTR are published regularly (NBB 2018, Israel).

98. Based on the 2018 NBB Report of Lebanon, the following actions have been taken: development of the updated roadmap for pollution abatement of the Litani River and Lake Qaraoun, (2019); development of the business plan for combatting pollution of the Litani Lower River Basin (2019); Lake Qaraoun pollution prevention project (2016-2023); sustainable land management in the Qaraoun catchment (2016-2020); and installation of the PRTR software at the Lebanese Ministry of Environment. Since May 2015, the Ministry of Environment is involved in the implementation of a project on "PCB Management in the Power Sector Project", (NBB 2018, Lebanon).

Evaluation findings of legal, institutional and response measures

99. The key NAP requirements stemmed from LBS Protocol, the Ecosystem Approach targets and the legally binding measures of the Regional Plans in the framework of SAP-MED are evaluated in Table 5.2 based on the available evidence presented in this chapter for EO9. The "outlook" for achieving these requirements is also presented. It should be noted that, these requirements are closely linked with the NAP Operational Targets, yet, implementing these Policy, Legal and Institutional and Preventive requirements are the means to attain the Operational Targets which are very country specific.

Table 5.2: Evaluation findings of legal, institutional and response measures under EO9 including future outlook

	NAPs/PoMs Requirements (Responses/Actions)	Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
Policy	Application of BAT and BEPs for environmentally sound management of POPs	Most of the Contracting Parties have legal and administrative measures on POPs in place. Israel and Turkey are currently finalizing their legal frameworks. Algeria, Morocco, Tunisia need to update national legislation to include new POPs. No particular information has been gathered regarding the applications of BEPs for environmentally sound management of POPs as this measure is not explicitly considered by the Stockholm Convention.	
	Concentration of priority contaminants in biota, sediment or water is kept within acceptable limits	Heavy metal concerns are found in the coastal sediment compartment for Pb and HgT indicating an impact of these chemicals. For HgT, 53% of the sediment stations assessed are above the ERL, set as regional assessment criteria for acceptable environmental conditions for the Mediterranean basin, although sub-regional differences have to be taken into account. For the other contaminant, the results indicate that they are within the acceptable limits, however, the data is very scarce to make a conclusive evaluation.	
	Safeguard of the ecosystem function and maintenance of the integrity and biological diversity of species and habitats	No available and comprehensive data to make a conclusive evidence of progress.	
	Minimization of effects of released contaminants to the marine environment such as not to give rise to acute pollution events	No available and comprehensive data to make a conclusive evidence of progress.	
	Prevention of acute pollution events and minimization of their impacts	No available and comprehensive data to make a conclusive evidence of progress.	
	Adopt National ELVs for mercury emissions based on values included in the "regional plan on the reduction of inputs of mercury" from other than Chlor Alkali industry	More than half of the Contracting Parties have regulations in place regarding prohibiting and/or restricting the manufacture, export and import of mercury and setting national ELVs in line with the values set in the Regional Plan and NAPs.	
	Prohibit the installation of new Chlor alkali plants using mercury cells and vinyl chloride monomer production plants using mercury as a catalyst	Eight Contracting Parties (Croatia, France, Lebanon, Malta, Monaco, Montenegro, Slovenia and Syria) have ratified Minamata Convention. The Convention shares similar measures with the Mercury Regional Plan including a ban on new mercury mines, the phase-out of existing ones, etc.	

NAPs/PoMs Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
	Cease releases of mercury from the activity of Chlor alkali plants	Historical chlor-alkali plants using mercury cells have been or are currently being remediated in Albania, Bosnia & Herzegovina (the installations are on Sava River Basin), Croatia, Cyprus, France, Greece, Israel, Italy, Malta, Slovenia, Spain and Italy. On the other hand, measures to reduce mercury emissions from existing chlor-alkali plants in Algeria and Morocco are being undertaken. Lebanon and Montenegro reported not to have stocks or sites contaminated with mercury.	
	Prohibit and/or take legal and administrative measures necessary to eliminate the production and use, import and export of POPs and their wastes	Based on data on production of POPs reported to Stockholm Convention by the Mediterranean countries, it can be observed that there is no current production of POPs in Mediterranean countries. In addition, data on total production, export, import and disposal of POPs reported to Stockholm Convention show that PCBs are the main POP waste either exported or disposed by the Countries.	
	Support, promotion and facilitation of programmes of assistance in pollution control and reduction in the area of scientific, technical and human resources	No data to evaluate this requirement	
	Support, promotion and facilitation of capacities to apply, develop and manage access of cleaner production technologies as well as Best Available Techniques (BAT) and Best Environmental Practices (BEP)	As data indicates, in the business-as-usual scenario, it is unlikely the current state of industrial processes will not achieve developing capacity on sustainable an innovative infrastructure including energy efficiency and applying cleaner technologies.	
	Provision of information to the public about bathing water quality and implemented management measures	Despite different bathing water quality calcification are applied across the region, countries mostly make the information publicly available. The bathing water profile are consistent on the Contracting Parties which are member state to EU and Israel, consistent profiles do exist in Turkey despite slightly different than EU methodology. Tunisia and Morocco have large number of stations monitoring the bathing water quality, different approach than EU, the bathing water quality seems to be slightly increasing from "good or satisfactory" levels.	
Legal and institutional	Monitor releases of mercury into water, air and soil in order to verify compliance with the requirements	More than two thirds of the Contracting Parties have in place, or work is in progress for consolidating monitoring plans for mercury. However, considering the Industrial Emission directive is in place for the EU countries, more vagarious efforts needs to be put in place for monitoring. Ratification of Minamata Convention may give s significant boost in terms of capacity building, monitoring.	
	Monitor bathing water quality	Vast majority of countries do monitor their bathing waters. Analysis of bathing water quality in the MED EU is thorough and complete, thanks to the reporting established under the European Bathing Water Directive. The bathing water legislation in Turkey is also harmonized, but not the same, with EU Directive 2007/6/EC. Albania, Montenegro, Bosnia Herzegovina lacks consistent data for the trends indicating insufficient monitoring. Tunisia Israel, and Morocco do monitor the bathing water quality, the last two periodically publish the results of bathing water monitoring.	

NAPs/PoMs Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
	Prepare bathing water profiles or beach profiles	Contracting Parties which are member states of EU, provide bathing water profiles, regularly most of the time. For the rest of the contracting parties, data of water quality is published, however, except for Turkey and Israel, beach profiles are either not developed or are consistent.	
Pollution prevention and control	Phase out discharges and emissions and losses of mercury, cadmium and lead	The heavy metal discharges show mixed terms; however, the releases are non in general declining trends, despite some countries do show decreasing trends. The data gaps especially in the south region is obvious. Data gaps can be closed with estimations for mostly air emissions.	
	Eliminate to the fullest possible extent pollution of the Mediterranean Sea caused by discharges, emissions and losses of zinc, copper and chrome	The heavy metal discharges show mixed terms; however, the releases are non in general declining trends, despite some countries do show decreasing trends. The data gaps especially in the south region is obvious. Data gaps can be closed with estimations for mostly air emissions.	
	Phase out to the fullest possible extent discharges, emissions and losses of organomercuric compounds and reduce those of organolead and organotin compounds	The data gaps especially in the south region is obvious. Data gaps can be closed with estimations for mostly air emissions.	
	Phase out inputs of PAHs	With regards to the trends of discharge of polyaromatic hydrocarbons, it is not possible to infer from the limited number of best available data the actual trends in their emissions.	
	Eliminate to the fullest possible extent pollution caused by discharges, emissions and losses of organohalogen compounds	Unfortunately, tracing the implementation of NAPs to phase out Organohalagen compounds were not possible due to the data gaps.	
	Eliminate to the fullest possible extent inputs of radioactive substances	Unfortunately, tracing the implementation of NAPs to eliminate radioactive substances were not possible due to the data gaps.	

NAPs/PoMs Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
	Dispose all hazardous wastes in a safe and environmentally sound manner	The trends especially for the south countries indicate that generating the HW is higher than it is environmentally sound disposal, indicating an accumulation of HW in "temporary" storage facilities. It should be noted that the storage of industrial hazardous waste cannot be seen as a sustainable ay of managing it. Identifying countries' available means and capacities for the treatment and disposal of hazardous waste is a critical and urgent step towards coping with the amounts of hazardous waste generated annually that accumulate in storage centers.	
	Restore marine and coastal habitats that have been adversely affected by anthropogenic activities	No sufficient data for evaluate this requirement.	
	Identify existing sites which have been historically contaminated with mercury	Under the MEDProgramme (GEF funded project) the contaminated sites are identified in 2019. Further studies are on the way for de-contamination work.	
	Apply environmentally sound management measures to sites which have been historically contaminated with mercury	Under the MEDProgramme (GEF funded project) the contaminated sites are identified in 2019. Further studies are on the way for de-contamination work.	
	Progressively reduce total releases of mercury (to air, water and to products) from existing Chlor alkali plants until their final cessation	To comply with this provision, urgent measures need to be adopted in countries were chloralkali plants are still operating (i.e. Algeria and Morocco).	
	Identify stockpiles consisting of or containing POPs [deadline passed]	Under the MEDProgramme (GEF funded project) stockpiles of existing PCBs and POPs has been updated. In Algeria, Morocco, Tunisia and Lebanon. These stockpiles are being planned for disposal especially in Algeria and Lebanon.	
	Phase out inputs of the 9 pesticides and PCBs and reduce inputs of unwanted contaminants: hexachlorobenzene, dioxins and furans	The terms furans and dioxins are used to describe two groups of environmental pollutants: polychlorinated dibenzofurans (PCDF) and polychlorinated dibenzo-p-dioxins (PCDD). There is a huge gap in the south and east of the Mediterranean on their releases, hindering to have a conclusive evidence on their reduction performance.	

NAPs/PoMs Requirements (Responses/Actions)		Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
	Adopt the criteria and standards for bathing waters in the Mediterranean region based on Intestinal enterococci	Most of the contracting parties has built their water quality standards based on *e. coli*. In the the region still there is no regional standard accepted by the Contracting Parties for *Intestinal enterococci* except Contracting Parties which are also member state of EU.	

5.3 Status of Implementation of targeted NAP Measures/PoMs to achieve EO10 (Marine Litter) during the period 2015-2020

100. Key NAP requirements stemming from the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective EO10 on Marine Litter, and associated Operational Targets are presented in Annex I, Table 3. This chapter will try to look at the pressure and state related indicators as well as legal and institutional framework.

Looking at the pressure indicators

101. The Joint EEA-UNEP/MAP Report No 07/2020 "Towards a cleaner Mediterranean: a decade of progress Monitoring Horizon 2020 regional initiative" and the No 08/2020 "Technical assessment of progress towards a cleaner Mediterranean" are providing reliable evidence on the current status of state and pressures based on the NAP indicators.

102. When looking at the Municipal Solid Waste generation in the Mediterranean, which if not managed properly could exert a huge pressure on environment by leakages of marine litter, MSW generated in the southern and eastern shores of the Mediterranean is less that of the EU and relatively modest compared to global trends, primarily due to lower population and income levels.

103. Noting that in almost all Contracting Parties to Barcelona Conventions, from 2014 onwards an average increase of 2% of Municipal Solid Waste generation is observed. This is particularly evident in Malta (+9.8%) and Slovenia (+9.2%). Similarly, Albania, Bosnia and Herzegovina, Montenegro and Turkey seems to follow this increasing trend of MSW after 2015, reaching 423 kg per capita/year in 2017 (+2% over the 2009 levels, and +5% over 2014 levels), although with marked differences between Turkey (+9.4%) and Montenegro (-7.5%).

104. A change in the composition of MSW, has been observed in past years. In 2018, organic and green waste was the predominant type of waste, especially in the south countries with an average of 56%, as well as in Albania, Bosnia and Herzegovina, Montenegro and Turkey with an average of 38% but less in the Contracting Parties to the Barcelona Convention which are the also member states of EU, with an average of 41%. Changing consumption patterns, largely resulting from the import of manufactured goods, are driving change in waste composition where organic portion is decreasing in expense of plastic content. Thus, if not properly managed, increasing the probability of leakages via various entry point to marine environment.

105. In most Mediterranean countries, the root causes of plastic pollution are found in the increase of plastic use, unsustainable consumption patterns, ineffective/inefficient waste management and loopholes in plastic waste management. Plastic ranges from 5% (Morocco) to 14% (Israel) of the total waste generated (World Bank in UNEP/MAP, 2015). Inputs of plastics into the sea, as estimated in 2015, are at the level of over 260,000 tonnes per year or 730 tonnes per day, depending on the coastal population, which may vary depending on the country, representing more than 2% of the total inputs in the world's oceans.

106. There are cases where another pressure seems to be the armed conflict in Syria that started in the beginning of 2011 imparts a heavy pressure on Lebanon's already fragile infrastructure and resources resulting from refugees which reached 1.1 Million (UNHCR, 2017). In 2014, the incremental quantity of MSW generated by displaced people was estimated to be in the order of 683 tons per day (MOE/EU/UNDP, 2014). The same study reported that around 48% of this incremental MSW quantity goes to Solid Waste Management Facilities (SWMF) where full or partial treatment is practiced, and the remaining 52% are sent to open dumpsites (MOE/EU/UNDP, 2014).

107. For some southern countries, good waste collection and transport seems to be well established mostly in cities, whereas varying from country to country it is poorly managed in rural areas.

108. In the period 2014-2017, the disposal of waste in landfills and sanitary landfills declined in CPs, which are also Member States of EU, it remained more or less stable in Albania, Bosnia

Herzegovina, Montenegro and Turkey, and increased in south countries. In the latter countries, waste is normally discharged into open dumps.

109. More than half of the waste collected in southern Mediterranean countries, are disposed in open dumps (54%), mainly because it is considered to be a cheap way of disposing of solid waste. (Figure 5.7). This indicates a deviation of implementation of NAP targets, or progress is not on track.

Country	Open dump	Landfill unspecified	Controlled landfill	Sanitary landfill	Recycling	Composting	Year(s)
Algeria			2	89	8.0	1	2016, 2013
Egypt (a)	81	7			12.0		2013
Israel		75			24 (b)		2017
Jordan	45	48			7.0		2014
Lebanon	29		48		8.0	15.0	2014
Libya							
Morocco	52			37	8.0	1.0	2014
Palestine (c)	32		65		3.0		2013
Syria	80	20			2.5	1.5	
Tunisia	21	70			4.0	5.0	2014
AVERAGE	**54**	**44**	**28**	**63**	**10.0**	**6.0**	

Source: World Bank, (2018):

(a) Egypt State of Environment Report (2016), as cited by H2020 National Report for Egypt (2019);

(b) H2020 National Report for Israel (2020);

(c) H2020 National Report for Palestine (2020).

Figure: 5.7: *Share of waste treated and disposal of some countries, available in 2018 (Source: Joint EEA-UNEP/MAP Report, 8/2020)*

110. Despite important improvements, the collection of MSW is still a significant issue in most of south countries, where only a few countries are succeeding in reaching full waste collection coverage, which remains particularly difficult in rural areas, where waste is usually illegally dumped or burned.

111. Although data on uncontrolled dumpsites are very limited, there is evidence on breaches of Landfill Directive (1999/31/EC) by Italy, Greece, Slovenia, and Spain. In the Balkans and Turkey, for example, Bosnia and Herzegovina need to align its regulation with the EU Landfill Directive by closing or rehabilitating non-compliant landfills which are still a eventual source for potential marine litter leakages.

112. Based on the 2018 NBB Report of Lebanon (Governorates of Mount Lebanon and of Keserwan & Jbeil), several small-scale facilities (<50 tons/day) have been established as a result of the 2015 solid waste crisis. However, the main facilities in the area are Hbaline (150 tons/day), Ghosta (150 tons/day), Karantina (1200 tons/day), and Ammroussieh (1100 tons/day), in addition to sea landfills at Costa Brava and Bourj Hammoud, and to some planned facilities (example Beit Meri (400 tons/day). These facilities in general face limited public acceptance, limited administrative support, basic sorting systems, limited treatment capacities for organic fractions, limited to no leachate treatment capacities, limited landfilling capacities, and log routing distances. The Law (Law 80/2018) had been issued and entered into force in 10 October 2018, covering the municipal solid waste, construction and demolition waste and hazardous waste.

113. Based on the NBB 2018 Report of Montenegro, construction of a transfer station in Kotor and Herceg Novi has been implemented so far, including construction of a composting plant in Kotor and construction of MRF plant in Bar. All of these measures are demanding financially, but they are still being implemented, although with a slight delay.

114. Based on the NBB 2018 Report of Israel, the Netanya landfill remediation process has started in 2015, which was source of littering to the shoreline. The phenomenon is decreasing gradually over the years and is expected to cease by the end of the remediation process totally. Israel, reported also that the “Shafdan” stopped emitting sludge to the sea in February 2017. The cease of discharge from

this point source occurred after the establishment of an inland solution for treating the WWTP sludge, and using it for agricultural use. (NBB 2018, Israel)

115. The POMs were evaluated for Dicreiptors 10 (E10) for Greece, Croatia, Cyprus, Spain, France, Italy, Malta, Slovenia, in the accompaniying Staff Working Document (2019)[30] to Report of the Commission, which checked the coverage of established measures in Member States' in relation to (i) the pressures and activities reported, and (ii) the GES definitions and environmental targets. The report indicated that regarding Descriptor 10 (EO10), Spain, France, Malta, Slovenia and Greece have addressed the key pressures in their programmes of measures while Italy, Croatia and Cyprus have partially addressed their pressures. Regarding Descriptor 10 (E10) related GES definition and related environmental targets were addressed by Spain, Italy, Malta, Slovenia, and Greece, and partially addressed by France, Coratia and Cyprus.

Looking at the State Indicators

116. The data is very scattered and varies drastically. The QSR 2017 reported that the information on beach marine litter (CI 22) exists but the picture is still fragmented and is geographically restricted to the northern part of the Mediterranean. Plastics are the major components with cigarette butts, food wrappers and plastic bags being the top marine litter items. Land-based sources are predominant, but they have to be further specified. Tourism is directly affecting marine litter generation on beaches. Information on the distribution, quantities and identification of beach marine litter sources needs to be further advanced.

117. Also, the same QSR report indicated that looking at Common Indicator 23, in Mediterranean, has been reported at quantities measuring over 2 cm range from 0 to over 600 items per square Km. The 2015 UN Environment/MAP Marine Litter Assessment report states that approximately 0.5 billion litter items are currently lying on the Mediterranean Seafloor. There is considerable variability in the abundance of seafloor marine litter items ranging from 0 to over 7,700 items per km² depending on the study area. The information on floating and seafloor marine litter in the Mediterranean is fragmented and is spatially restricted mainly to its northern part and no basin-scale conclusions can be exerted as information is only available at local level. However, there are many areas with significant marine litter densities. Plastic is the major marine litter component, found widespread in the continental shelf of the Mediterranean, ranging up to 80% and 90% of the recorded marine litter items

118. Briefly looking at the other sources where the data is also fragmented and dispersed. The estimates by Jambeck et al. (2015), adapted from UNEP/MAP (2015), calculate the quantity of mismanaged plastic waste and of plastic waste entering the Mediterranean. It emerges that there is a high variability in the amounts of plastic waste littered across the Mediterranean, with an average of about 1 kg per capita/year, ranging from a minimum of 0.15 kg per capita/year in Morocco, to 2.16 kg per capita/year in Israel.

119. In most Mediterranean countries, the root causes of plastic pollution are found in the increase of plastic use, unsustainable consumption patterns, ineffective/inefficient waste management and loopholes in plastic waste management. Plastic ranges from 5% (Morocco), to 14% (Israel) of the total waste generated (World Bank in UNEP/MAP, 2015). Inputs of plastics into the sea, as estimated in 2015, are at the level of over 260,000 tonnes per year or 730 tonnes per day, depending on the coastal population, which may vary depending on the country, representing more than 2% of the total inputs in the world's oceans.

120. At the level of Mediterranean watersheds, another study (Weiss et al. 2019) modelled plastic flows into the Mediterranean Sea, as shown in the Figure 5.8. The study shows the plastic estimation inputs from the catchments of the Mediterranean.

[30] Commission Staff Working Document – Key stages and progress up to 2019 – Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC) {COM(2020) 259 final} - {COM(2020) 61 final}- {COM(2020) 62 final}

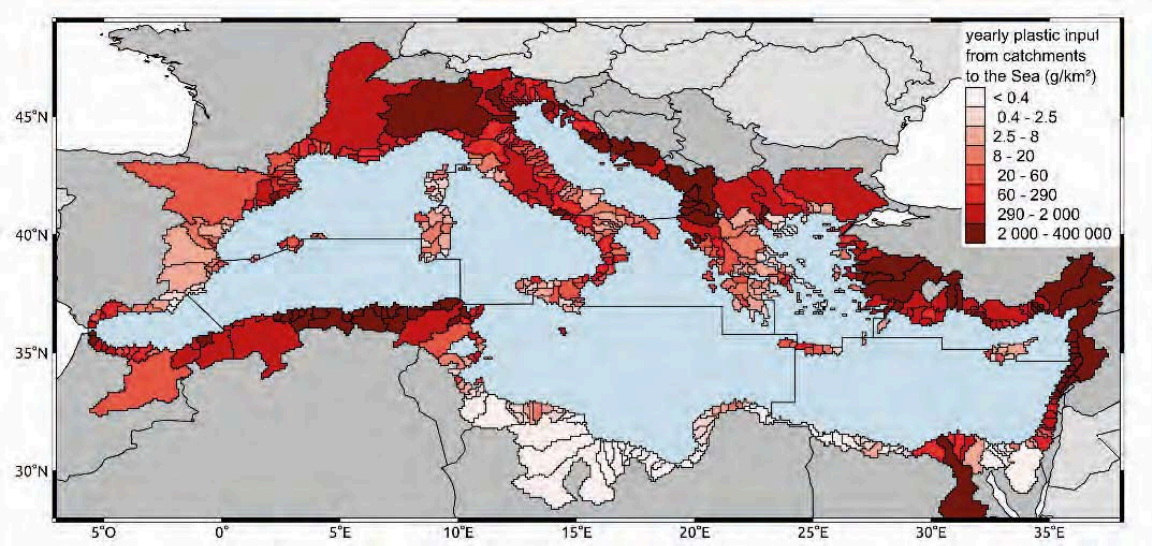


***Figure 5.8**: Estimate of annual specific plastic flows (kg/m3) discharged by watersheds into the Mediterranean Sea. Flows calculated based on Lebreton et al. 2017 (Source: Weiss et al. 2019)*

121. Figure 5.9 summarizes the results of citizen-led marine litter data collection activities on Mediterranean beaches, including the number of surveys performed and the temporal range. The results show that plastic pieces represent 74-95% of all marine litter found in Mediterranean beaches by count, with an average of 86%, followed by glass (4% on average) and metal (3.5%). These figures are in line with a compilation of available studies and publications listing of the main marine litter items found on European beaches (Addamo et al., 2017), developed by the European Commission's Joint Research Centre (JRC) within the Marine Strategy Framework Directive (MSFD; 2008/56/EC) Technical Group on Marine Litter, compiled. The results of this report show that synthetic polymer materials represented 84% of all marine litter items found on European beaches in 2016. Approximately 50% of marine beach litter items are Single-Use Plastics (SUPs), including bottles, bags, caps/lids, strings and cords, cigarette butts, crisp packets, and sweet wrappers, while plastic fragments (size ranges: 0-2.5 cm and 2.5-50 cm) represent about 25% of marine litter. A recent study classified the litter found at the beach of Hammamet in Tunisia (Fondation Heinrich Böll, 2019); 68% of the litter washed ashore consisted of plastic items, followed by paper (10%), metals (7%), textile (7%), and cigarette butts (3%). In parallel, in a study from UNEP in Egypt on the beaches of three Mediterranean coastal cities (Matroh, Alexandria, and Port Said), synthetic polymer materials reached 94% of total litter washed ashore (H2020 National Report for Egypt, 2019).

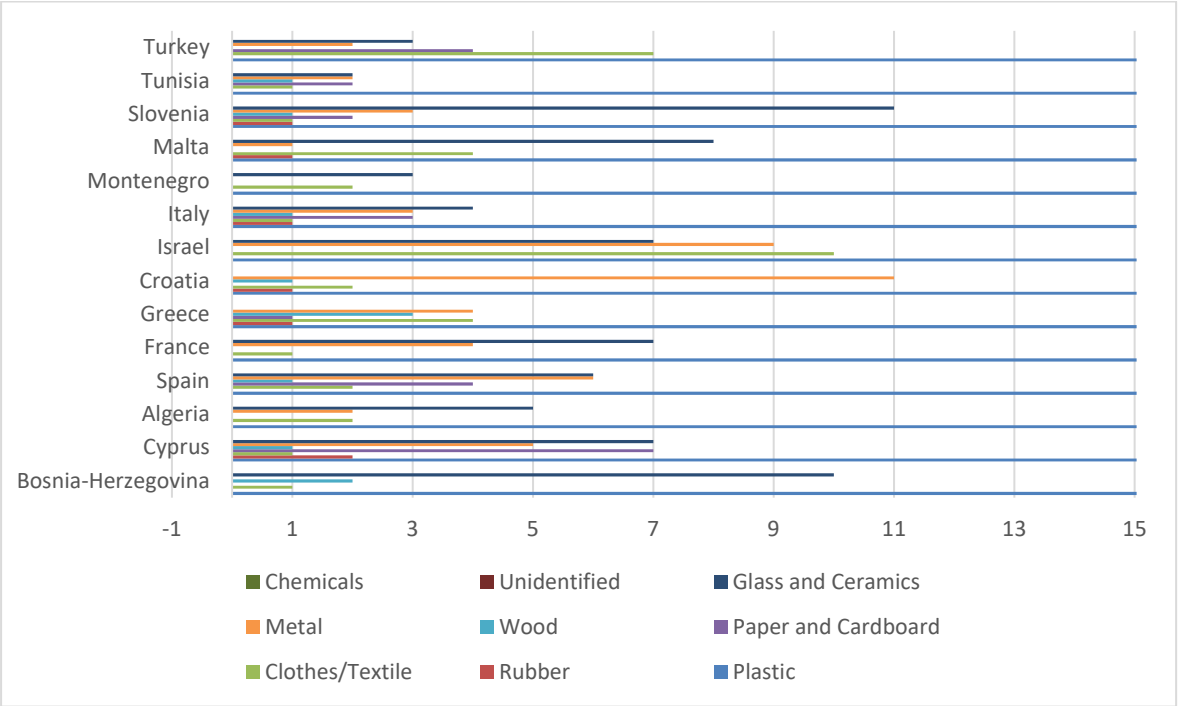


Figure 5.9: *Composition (%) of beach marine litter in Mediterranean countries*

122. Particularly, the marine litter from smoking-related activities is a serious problem in the Mediterranean beaches, where it accounts for almost 40% of total marine litter items, and 53.5% of the top ten items counted in 2013, a figure that is considerably higher than the global average (UNEP/MAP, 2017).The contribution of fishery-related litter, on the other hand, could be estimated to be between about 3% and 15% of marine litter (Addamo et al., 2017).

123. On the sea-floor of the northern-western basin, plastics and fishing-related items (some of which are also made of plastic) have represented the same percentage of litter for more than 20 years (UNEP/MAP, 2017a), but information still remains scarce, especially on the specific issue of abandoned, lost or otherwise discarded fishing gear (ALDFG), which may account for a large or even the largest part of marine litter items in many areas (UNEP/MAP, 2015).

124. The QSR 2017, flagged that, the Mediterranean Sea is impacted by floating marine litter items, with concentrations comparable to those found in the 5 sub-tropical gyres (UNEP/MAP, 2017). A floating litter abundance of 0-600 items per km2 has been recorded (UNEP/MAP, 2017). Recent research shows that floating marine litter items are mainly constituted of artificial polymer materials, such as plastic bags, wrappings, bottles, tableware, and polystyrene boxes used by fishermen (Bigagli et al., 2019). Significant hotspots of marine litter have been identified in areas near to land, and have recorded an increase of floating marine litter during spring and summer (Arcangeli et al., 2018; Campana et al., 2018). The Mediterranean seafloor seems also to be highly impacted by marine litter items, with approximately 0.5 billion litter items (Wilson et al., 2015) and densities ranging between 0 and more than 7700 items per km², especially in deep-sea canyons (UNEP/MAP, 2017).

125. On the other hand, micro-litter is still not fully assessed in region wide scale, but the concentrations of micro-litter in the Mediterranean Sea are high, different surveys report concentrations above 10^5 particles/km², up to $4x10^5$ particles/km² (Cincinelli, 2019). A study from the Mediterranean Sea (focused in Italy) showed that 85% of the assessed turtles had ingested litter.[31]

[31] Commission Staff Working Document – Review of the status of the marine environment in the EU – Towards clean, healthy and productive oceans and seas - Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive

126. Evidently, still, the limited spatial and temporal availability of data and information on marine litter in the Mediterranean, with most data found for the northern shores and for limited temporal ranges, together with the lack of consistency and comparability (Bigagli et al., 2019), hinder the possibility to generate conclusions at basin scale on the quantity and distribution of marine litter in the Mediterranean, as well on accumulation and loading rates and the corresponding fluxes (UNEP/MAP, 2017).

Looking at the Legal and Institutional framework

127. Efforts in the past 5 to 6 years to curtail some single-use plastic items are likely to have some positive impact on inputs of plastic into the environment. However, these might be insufficient to compensate for the increase in plastic-waste generation resulting from the drivers of population, tourism and consumption. In addition, there are other sources of marine litter. Overall plastic tends to accumulate in the environment if both prevention and remediation measures are not implemented.

128. The fraction of plastics in the MSW generated varies widely between countries. In some of Contracting Parities (i.e., Spain, France, Italy, Cyprus, Greece, Malta), data show an increase in plastic packaging waste in recent years. No trends for rest of the Contracting Parties, but increases are highly probable based on the evidence that plastic waste generation increased with higher MSW generation. It is expected that an overall improvement by 2030 as the result of the EU Directive 2019/904 (EC, 2019) and other policies to restrict single-use plastics in the region.

129. The lack of infrastructure of plastic recycling is one of the issues that could exacerbate the plastic marine litter. Despite lack of data for meaningful trends for regions on recycling, except for Contracting Parties which are member state of EU, the indication is that recycling rates remain very low. Available for recycling plastic fraction and plastic packaging data also indicate that there has been improved significantly over the last decade, for Contracting Parties which are also member to EU. The region has moved and is still vigorously moving to ban single use plastics, Restriction of single-use plastics: Recent laws have been put in place to restrict plastic bags in some MED South, as well as for broader single-use plastics in CPs which are also member states of EU.

130. The UNEP/MAP Report on Evaluation of the Regional Plans[32] indicated that, regarding policy, legal and institutional framework, almost one third of the countries have particular legislation or regulatory frameworks addressing marine litter specifically. The remaining Mediterranean countries have laws and strategies in place to deal with municipal solid waste, which naturally include marine litter. Missing from these laws and legislations are specific legal measures addressing particularly marine litter, relevant to the provisions of the Regional Plan on Marine Litter Management in the Mediterranean. Nearly one third of the updated versions of the NAPs include dedicated sections on marine litter and relevant reporting formats, however, the progress since 2015, of enforcing these policies are not on desired level.

131. Most Contracting Parties have adopted national legislation on the prevention of marine litter through sectorial policies and strategies such as waste management and protection and the integrated management of the coast. Some countries have also put in place policies for recycling and initiatives for reducing the use of single-use plastic bags tackling the major marine litter items found in the Mediterranean. The progress on promulgating of legal instruments are on track, however, on implementation and enforcement these legislations are problematic.

Evaluation findings of legal, institutional and response measures

132. The key NAP requirements stemmed from LBS Protocol, the Ecosystem Approach targets and the legally binding measures of the Regional Plans in the framework of SAP-MED are evaluated in Table 5.3 based on the available evidence presented in this chapter for EO10. The “outlook” for achieving these requirements is also presented. It should be noted that, these requirements are closely

[32] UNEP/MED IG.24/Inf.15 Evaluation Report on the Implementation of the Regional Plans for Reduction of BOD5 from Urban Wastewater and in the Food Sector; Reduction of Inputs of Mercury; Eliminations of POPs; and Marine Litter Management in the Mediterranean, Naples, Italy, 2-5 December 2019

linked with the NAP Operational Targets, yet, implementing these Policy, Legal and Institutional and Preventive requirements are the means to attain the Operational Targets which are very country specific.

Table 5.3: Evaluation findings of legal, institutional and response measures under EO10 including future outlook

	Requirements in NAPs/POMs (Responses/Actions)	Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
Policy	Adopt preventive measures to minimize inputs of plastic in the marine environment	Efforts has been made by majority of the Contracting Parties which are starting to set policies for preventing plastic waste and marine litter. Most of the legislations are in place, especially in the Contracting Parties which are also member states to EU, as well as Israel and Turkey. However, enforcement seems to be problematic in southern countries coupled with slow transition to circular economy for the whole region.	
	Enforce measures to combat illegal dumping including littering on beaches and illegal sewage disposal in coastal zones and rivers	Uncontrolled dump sides still pose a threat to the environment in Mediterranean, especially the south countries, considering 54% of the MSW is deposited in open dump sides these includes Egypt and Lebanon, where the issue still needs further improvement, especially in the later. Unfortunately, the available data, complemented with estimations is indicating that for the southern the waste is normally discharged into open dumps, creating considerable negative impacts on the environment and human health. Although almost all south countries have some policies that dictate how waste should be managed, there are several factors that constrain the waste management system, such as missing or weak legislation and enforcement.	
	Seek direct cooperation with other Contracting Parties, with assistance of the MEDPOL or competent international and regional organizations, to address trans-boundary marine litter cases *[As appropriate]*	No data is available to measure the effect of this actions. Trans-boundary cooperation remains challenge and this transboundary cooperation between Contracting Parties should be promoted to address trans-boundary marine litter cases.	
Legal and institutional	Report on the implementation of the National Marine Litter Monitoring Programme [On a biannual basis]	Contracting Parties continues to report the implementation of the Marine Litter Regional Plan in BCRS. However, the data is scarce and very limited. The situation is expected to improve, considering the development in NBB/PRTR Methodologies and especially in IMAP.	
	Design National Monitoring Programme on Marine Litter	The some of the Contracting Parties have developed National Monitoring Programmes on Marine Litter. The remaining Contracting Parties are developing/finalizing/adopting the National Monitoring Programmes on Marine Litter. However, the monitoring programme are not fully implemented, in some countries rather in design stage. Under IMAP, there has been a lot of efforts to support Contracting Parties on developing monitoring pragrammes on ML, however, implementing of these developed monitoring programmes would require significant funding and capacity building.	
	Establish Regional Data Bank on Marine Litter	A fully fledged data regional data bank is nor established yet in the regions which will include all Contracting Parties to the Barcelona Convention. There are significant efforts to establish such data bank under IMAP	

	Requirements in NAPs/POMs (Responses/Actions)	Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
Pollution prevention and control	By the year 2025 at latest, to base urban solid waste management on reduction at source, separate collection, recycling, composting and environmentally sound disposal in all cities and urban agglomerations exceeding 100.000 inhabitants and areas of concern	Waste collections systems are established in almost all big cities in the Mediterranean, (exceeding 100,000). And the collection rates are improving over time. Reduction at source and separate collection, are not at the desired levels especially in south countries. However, it should be noted that the majority of the Contracting Parties are vigorously moving towards zero waste initiatives to reduce (at least on pilot scale) the waste at source and ensure separate collection followed with appropriate waste management final disposal.	
	Reduction of fraction of plastic packaging waste that goes to landfill or incineration	Recent laws have been put in place to restrict plastic bags in some south Contracting Parties, as well as for broader single-use plastics in the Contracting Parties, which are also EU member states. The fraction of plastics in the municipal solid waste generated varies widely between Contracting Parties which are also EU member states, and the data shows an increase in plastic packaging waste in recent years. No trends for south and Balkans & Turkey are possible although we can infer that plastic waste generation increased with higher municipal solid waste generated generation. It should be noted that the region is taking a step to ban single use plastic or introduce economic mechanisms to reduce their usage.	
	Ensuring adequate urban sewer systems, WWTP and waste management systems to prevent run-off and riverine inputs of Marine Litter	Wastewater and waste collection system are in place in vast majority of the Contracting Parties in big urban agglomeration. However, in some countries it is failing to accommodate the ever-growing population and urban sprawl. Collection and treatment in rural agglomerations continues to be a problem. leading to a accumulation of unregulated dumpsites which are obvious leakage points for marine litter entries to the marine system	
	Application of cost effective measures to prevent any marine littering from dredging activities	Most of the Contracting Parties, does not have any specific regulation to avoid marine litter from dredging activities. There are only couple of Contracting Parties who established monitoring of the marine litter during dredging operations. The issues is handled by ad-hoc decisions making mostly for macro-litter which are found in the dredged materials by dredgers. MEDPOL has developing best practices on establishing coherent monitoring for dredging and disposal operation of the dredged material.	
	Implement programmes on regular removal and sound disposal of accumulations/hotspots of marine litter	No data to evaluate.	
	Close to the extent possible existing illegal solid waste dump sites	Despite all efforts, the closure of existing illegal dumping sides are not going as expected in the sought and east region. There are improvement in Israel, however, the data indicates that still substantive amount of collected waste is not disposed in sanitary conditions, meaning they are dumped illegally. Although data on uncontrolled dumpsites are very limited in EU, there is evidence on breaches to Landfill Directive by Italy, Greece, Slovenia, and Spain. In Balkans & Turkey, for example, Bosnia and Herzegovina need to align with the EU Landfill Directive by closing or rehabilitating non-compliant landfills.	

	Requirements in NAPs/POMs (Responses/Actions)	Effect of the Response/Actions on Decrease on "Pressures" or/and Improvement on the "State" (2015-2020)	Outlook (2020-2025)
	Remove existing accumulated litter from Specially Protected Areas of Mediterranean Importance (SPAMI) and litter impacting endangered species	No data to evaluate	
	Control of impacts of litter on marine life to the maximum extent practicable	No clear data to evaluate this response/action. In Europe, there are sizeable gaps in the data on litter on the seabed, in the surface layer and water column, micro-litter and effects on marine species (especially entanglement). The MSFD is tackling the urgent need to coordinate monitoring methodologies at national, regional and EU levels.	
	Explore and implement National Marine Litter Cleanup Campaigns; participate in International Coastal Cleanup Campaigns and Programmes; apply "Adopt-a-Beach" or similar practices; and apply "Fishing for Litter" practices	Marine Litter Cleanup Campaigns are being implemented in all Contracting Parties. The countries, supported by UNEP/MAP, have also explored and implemented fishing-for-litter schemes, as well as improved port reception facilities, including the application of charges at reasonable costs and no-special-fee systems. In addition, five Mediterranean countries have joined the CleanSeas campaign. Policy action by sub-national authorities, industry-based solutions and large-scale green economy initiatives support the transition towards a more sustainable economy, promoting the transfer of environmentally-sound technologies to industry, policy changes and incentives to enable the circular economy, providing innovative and long-term solutions. Public participation in issues related to marine litter management is quite widespread in all Contracting Parties.	
	Urban solid waste management is based on reduction at source with the following waste hierarchy: prevention, re-use, recycling, recovery, and environmentally sound disposal	Contracting Parties are trying implementing specific measures to prevent marine litter from reaching the Mediterranean marine environment such as separating sewage and storm water networks, constructing traps to prevent riverine inputs of marine litter. Also common is the establishment of institutional structures needed to prevent marine litter and developing policies and strategies for reducing marine litter, such as recycling schemes, EPR, etc.	
	By the year 2025 at latest, to base urban solid waste management on reduction at source, separate collection, recycling, composting and environmentally sound disposal	This measure is far from being achieved in almost half of the Contracting Parties. Recycling and composting are symbolic and presenting actual room for improvement, while landfilling and illegal dumping are still the major waste management alternatives in several Mediterranean countries.	
	Properties and quantities of marine litter do not cause harm to the coastal and marine environment: ☐ Characteristics of litter in the marine and coastal environment ☐ Impacts of litter on marine life	The presence of litter has been confirmed in all compartments of the marine environment (shoreline, water column and seafloor). Plastic items are the most abundant component of marine litter. Single-use plastics represent 50% of all European beach litter items by count, and fishing gear containing plastics accounts for another 27%. Ingestion of plastic by marine species is also widespread in the European seas: 85% of the turtles assessed in the Mediterranean Sea had ingested litter.	

5.4 Status of Implementation of NAP Measures/PoMs regarding monitoring and reporting as well as public awareness, access to information and public participation during the period 2015-2020

133. Regarding public awareness, access to information and participation, monitoring and reporting requirements. The relevant requirements, there are set out in in the Table 4 of the Annex I. There are no Operational Targets directly associated with these requirements.

134. There are no direct operation targets set in the NAPs, however, the NAP Methodology requires to transpose some key requirements in the NAPs. These key requirements are listed in the Annex I, part 4, and this chapter will look at these requirements, because it is demanded by the PSR Framework methodology. As indicated in the PSR Framework, "Responses" also may include "where possible, the changes in awareness and behaviour ("societal response"). This is obviously catalysing effect for achievement of the NAP Operational Targets, therefore, needs to be also considered. Monitoring and reporting requirements but also public awareness, access to information and public participation are the main drivers for such societal responses.

135. Countries have adopted National Action Plans under the LBS regulatory framework, and introduced legal measures concerning Emission Limit Values (ELVs) for specific industrial sectors and/or specific pollutants, and Environmental Quality Standards (EQSs) for receiving waterbodies. The legislation encompasses measures regarding the establishment of monitoring and reporting systems for Strategic Action Programme (SAP-MED) priority pollutants, regulation of wastewater and air emission discharges from industrial and urban installations and use of sanctions in the event of non-compliance.

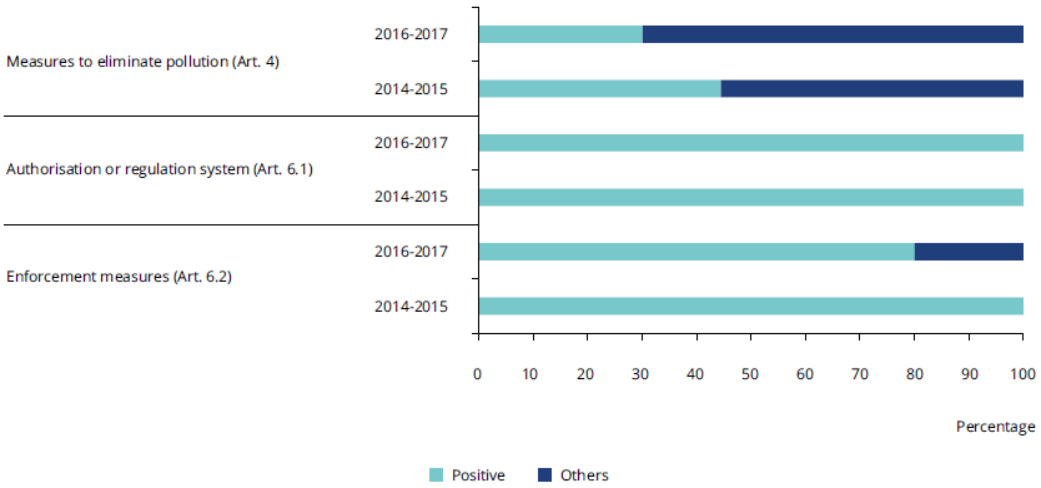
136. On the other hand, steps have been taken by all Contracting Parties in the Mediterranean region to monitor and control industrial pollution. From a regional perspective, industrial emissions are addressed under the Barcelona Convention Protocol Concerning Pollution from Land-Based Sources and Activities (LBS). Under the LBS's policy and regulatory framework, ten legally binding regional plans were adopted by the Contracting Parties to the Barcelona Convention with concrete measures to prevent and control releases of nutrients, POPs, mercury and marine litter.

137. Contracting Parties are obliged to report the information contained in the national implementation reports every biennium in general and on implementation of LBS Protocol in particular. Under the national implementation of the LBS Protocol, the Contracting Parties are obliged to report their progress of implementation of regional plans and more importantly on the NAPs. These reports are submitted by the Contracting Party through the new online Barcelona Convention Reporting System (BCRS).[33]

138. Figure 5.10 shows the difference before and after the benchmarking i.e., before and after NAPs Update (2015). The figures indicate that the majority of the reported Contracting Parties have appropriate measures in place to reduce the pressures and phase out pollutions. Figures also show that Countries do have the legal framework and administrative capacity in place in most of the cases. However, after 2015, the percentage dropped since the NAPs were updated. Despite, lower figures in pre 2015, the Contracting Parties clearly have substantive challenges in enforcement.

139. It is very obvious that, despite the fact that authorizations processes are in place, the Parties have difficulties to enforce the agreed measures to ensure compliance. This stark gap is also flagged in the State of Environment Development report published by UNEP/MAP, which strongly recommends inclusion of more systematic operational and enforcement instruments in environmental policies. This also includes public access to information which may, in consequence, urge more compliance by the stakeholders.

[33] http://www.info-rac.org/en/infomap-system/bcrs-reporting



Note: Figure shows number of Contracting Parties (CPs) reporting on the legal, institutional and enforcement frameworks with regards to the Land Based Sources Protocol of the Barcelona Convention for the reporting periods 2014-2015 and 2016-2017.

Source: Barcelona Convention Reporting System, UNEP/MAP and InfoRac, 2020.

Figure 5.10: *Legal institutional and enforcement framework comparison between the benchmark and after the benchmark year (2014-2015; 2016- 2017)(Source: Joint EEA-UNEP/MAP Report, 8/2020)*

140. Particular and detailed information regarding the reporting performance and status of implementation of various Protocols and NAPs could be found in the "General Status of the Progress in the Implementation of the Barcelona Convention and its Protocols: Synthesis of the Information Mentioned in the National Implementation Reports for the 2016-2017 Biennium (updated)".[34] This report, also provides insight on the issues such as public awareness, access to information and public participations.

141. Based on the evidence provided by the UNEP/MED IG.24/Inf.8, regarding the "application of the precautionary principle (Article 4.3.a of the Barcelona Convention)", all reported Contracting Parties in 2017 indicated that they had incorporated the precautionary approach into their domestic legislation. Such integration has been achieved through general laws, such as environmental protection acts or environment and sustainable development acts; as well as sectoral laws regulating specific issues of environmental protection, such as air protection acts, waste management acts, water acts, or environmental impact assessment acts. For instance, in a reporting Contracting Party, this principle is enshrined and recognized in its Constitution, and in another one in the Treaty on the Functioning of the European Union (TFEU).

142. Similarly, regarding implementation of the "polluter pays principle (Article 4.3.b)", in the same report referred above, all reporting Contracting Parties reported that they had incorporated the polluter pays principle into their domestic legislation. This has been taken forward through their core legal instruments for environmental protection, such as environmental protection acts, codes, charters or treaties, as well as sectoral legislation for the protection of water and air and for the management of hazardous wastes.

143. Looking closely to the implementation and using of BAT and BEP (Article 4.4.b of BC), as evidence also were evaluated under the relevant Chapter 5.1; 5.2; and 5.3 in details, some Contracting Parties (6 out of 11) indicated having put in place the legal and regulatory framework for the use of BAT and BEP. This has translated into the adoption of industrial sectoral regulations as well as legislation transposing the IPPC (Integrated Pollution Prevention and Control) Directive (2008/1/EC). However, as discussed in relevant chapters, a reporting Contracting Party reported that the said framework is not in place and another CP reported that work to embed BAT and BEP into its national policies and regulations is under development during the year of 2018.[35]

[34] UNEP/MED IG.24/Inf.8
[35] UNEP/MED IG.24/Inf.8

144. Based on the data from BCRS, regarding the establishment of a system to monitor the pollution of the marine environment and its coastal areas (Article 12), the majority of Contracting Parties reported having established environmental monitoring programmes and articulated the legal and regulatory framework for the implementation of their programmes through general and/or sector-oriented acts covering water, air, nature protection, or solid wastes. These monitoring programmes include national marine and/or coastal monitoring programmes, land-based sources monitoring programmes and bathing quality monitoring programmes.

145. The Commission Report [36] indicated that, regarding monitoring coherence is medium to low in the Mediterranean Sea region, where more consistent monitoring is recommended for a number of descriptors under MSFD. The report also underlined that, in Mediterranean, some countries have also extensively made use of standards agreed in the framework of Regional Sea Conventions including Barcelona Convention.

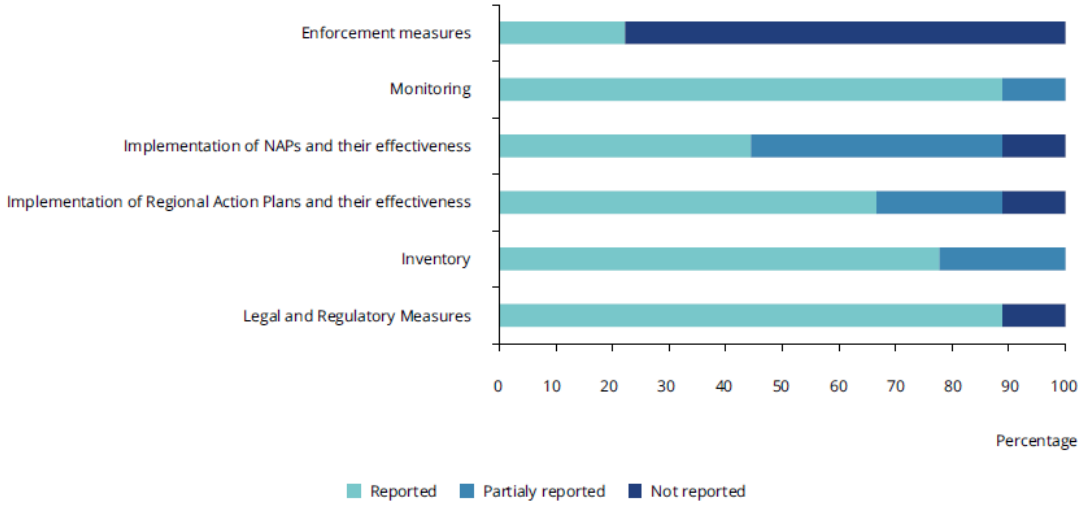
146. Moreover, three reporting Contracting Parties specifically mentioned the establishment of their monitoring programmes following the UNEP/MAP MED POL methodology and criteria. Two of those also referred to the alignment of their monitoring programmes with the UNEP/MAP Ecosystem Approach (EcAP) and the Integrated Monitoring Assessment Programme (IMAP), combined with the Marine Strategy Framework Directive (MSFD) (2008/56/EC) and the Water Framework Directive (WFD) (2000/60/EC). Only two reporting Contracting Parties noted work undertaken under the monitoring programme for the Adriatic Sea area.

147. Looking more in depth into the Implementation reports of the Contracting Parties, for the years 2016-2017, it can be inferred that the implementation of NAPs effectiveness is problematic due to several reasons as discussed in this this Midterm Evaluation Report. Figure 5.11 illustrates that, based on reported data, the Contracting Parties have very low enforcement capacity leading to, among others, comparatively low to mediocre implementation effectiveness of the NAPs.

148. Obviously, the enforcement measures remain to be a major problem. There are obstacles of weak institutional structures and personnel seems to be limited. These are main challenges which obstruct not only a timely implementation of the NAPs, but also other policy and regulatory frameworks which have synergetic effect on the reduction of pressures and subsequently improvement of the state of the marine environment.

149. Finally, at national level, the poor management of data are also exacerbating this situation. The most detrimental effect is that, the lack of sufficient monitoring is, consequently, obstructing any possibility of clear, data based assessments which could guide the policy makers in more efficient way to adapt and modify their policies in shorter times in more cost effective manner.

[36] Commission Staff Working Document, (2019), SWD (2020) 60 Final



Note: As of September 2019, during the biennium, only nine Contracting Parties completed reporting under the LBS Protocol. The figure illustrates the proportion of number of 'Reported', 'Partially Reported' or 'Not Reported' data to the total number of fully completed reporting by these respective Contracting Parties.

Source: Barcelona Convention Reporting System, UNEP/MAP and InfoRac, 2020.

Figure 5.11: *Compliance with reporting with regards to implementation of LBS Protocol reported by Contracting Parties for the year 2019 (Source: Technical assessment of progress towards a cleaner Mediterranean - Monitoring and reporting results for Horizon 2020 regional initiative - Joint EEA-UNEP/MAP Report, 8/2020)*

150. The key NAP requirements stemmed from LBS Protocol, the Ecosystem Approach targets and the legally binding measures of the Regional Plans in the framework of SAP-MED are evaluated in Table 5.4 based on the available evidence presented in this chapter for monitoring and reporting, public awareness, access to information, public participation. The “outlook” for achieving these requirements is also presented. It should be noted that, there are no direct Operation Targets for these requirements.

Table 5.4: Key requirements for Monitoring and Reporting, public awareness, access to information and public participation

Requirements in the NAP/POMs (Responses/Actions)		Based on the BCRS Reports	Outlook (2020-2025)
Public Participation Policy	Facilitation of public access to scientific knowledge and activities for protection and management of the environment Facilitation of public access to scientific knowledge and activities for protection and management of the environment	No significant data available to yield to conclusive evaluations	
	Mobilization, participation and involvement of major actors concerned in protection and management of the environment (local and provincial communities, economic and social groups, consumers, etc.)	No significant data available to yield to conclusive evaluations. majority of Contracting Parties has the public participation principle in their legislations.	
Monitoring and reporting	Establish a monitoring programme of the inputs of priority pollutants identified in the SAP- MED and of the quality of the marine environment	Significant efforts have been made to improve IMAP, NBB and overall BCRS. The BCRS reporting modules are clustered as follows: • BCRS Reporting; • IMAP Pilot Reporting; • InfoMAPNode • MEDPOL Info System • NBB Reporting	
	Establish systems of inspection to ensure compliance with conditions laid down in the authorizations and regulations	No significant data available to yield to conclusive evaluations. However, low inspections and enforcement in the region imply that such system is still not in place effectively.	
	Establish a permanent river water quality/quantity register	No significant data available to yield to conclusive evaluations	
Monitoring	Publish a report on the State and Evolution of the Mediterranean Environment [on a regular interval]	The state of reports is regularly published. Recent reports relays more and more in the data collected/report to the Barcelona Convection under several reporting obligations. Mainly, NBB and IMAP. The data is also streamlined with other regional and global requirements, such as (e) PRTR, and MSFD, WFD etc., increasing the comparability of the data.	

Requirements in the NAP/POMs (Responses/Actions)		Based on the BCRS Reports	Outlook (2020-2025)
	Application of a unified reporting system for implementing the provisions of the Barcelona Convention, the Protocols, the SAP- MED, the Regional Plans and ECAP objectives	Several data dictionaries and measurement protocols are under development. This is pawing a strong way to unification of reporting formats. Also, the reporting system BCRS is being streamlined with other Reporting Obligations.	
Public access to information	Provide to the public access to information available on the state of the environment of the Mediterranean and its evolution, and of the measures taken to improve it	The reports are publicly accessible in different languages making them accessible to the public. and all meeting and thematic report are publicly assessable in accordance with UN rules and procedures at https://www.unep.org/unepmap/meetings and for data at http://www.info-rac.org/en/infomap-system/bcrs-reporting	

6. GAPS AND CONCLUSIONS

151. Based on the evidence collected from available data and published information, it can be concluded that, in general, progress is being made towards the implementation of the requirements of the NAPs/POMs. In recent years, the ambitions for tackling pollution have taken greater priority on the national, regional and global political agenda. However, it can be concluded that the implementation of NAPs will require significant efforts not only by national actors, but also by streamlined assistance and financial and technical support from international institutions.

152. The criteria for evaluating the future outlook of the operational targets are as follows:

Based on the available data, cumulative progress towards the Operational Target (from regional perspective) is in line.	
Based on the available data, cumulative progress towards the Operational Target (from regional perspective) is not in line	
Based on the available data, cumulative progress towards the Operational Target (from regional perspective) will need further attention.	
No sufficient data	

Achievements of the operational targets under EO5

153. Based on the evaluation findings included in Table 5.1 for the legal, institutional and prevention measures under EO5, Table 6.1 provides the outlook for the achievement of the related NAP operational targets.

Table 6.1: Future outlook for achievement of NAP operational targets under EO5

NAP Operational Targets under EO5 **and findings**	**Approximation to target** ***Can the targets be achieved?***
Provide XX% population with connection to sewage networks [2015 to 2025] Connection to sanitation is raising in the regions and improving over time. The main challenge is continuing the investment to cope with ever increasing population needs in some countries. Where some countries are on track to increase the access of population to sanitations, some others are struggling to cope with this persistent pressure.	
Provide XX% of agglomerations in excess of 2000 inhabitants with wastewater collection and treatment [2019 to 2025] Collection and treatment of municipal wastewater is generally on the rise, as is wastewater generated as a result of the steady increase in population in the region. However, this rise in mostly in large agglomerations. For small agglomerations, especially in rural areas, the collection of wastewaters is still a major problem for some countries. The issue of tertiary treatment is lagging behind which is also affecting the releases of TN and TP as well as some heavy metals.	
Reduce by XX% of BOD discharged to water bodies [2018 to 2021] Almost all of the Contracting Parties have legislation in place regulating setting ELVs for urban wastewater in line with NAPs and Regional Plans to reduce BOD. The process is on good track. The regional plans on Management of Municipal Wastewater Plants is establishing new targets and commitments which is expected to serve as catalytic effect to boost approximation to the target. A special focus on investment in	

NAP Operational Targets under EO5 **and findings**	**Approximation to target** ***Can the targets be achieved?***
upgrade/construction of new UWWTPs the region is needed as well to decouple this catalytic effect.	
Reduce by XX% nutrient input from agricultural activities discharged to water bodies [2019 to 2020] Insufficient data to evaluate the approximation to the target.	

154. Further to the conclusions presented per Operational Target, the following general conclusions are reached:

a. Despite the data gaps, which are blurring the picture of having a precise evaluation of the implementation of measures in the NAPs, the pressures on the upstream, collection and treatment of municipal waste water as well as heavy metals in releases from industrial production processes, growing population, fluctuations from tourism, are increasing. Tertiary wastewater treatment is lagging behind in Mediterranean.

b. In some countries, most of the generated wastewater is still discharged untreated or insufficiently treated to the Mediterranean, despite the measures in the agreed NAPs/POMs.

c. It seems that generally large cities are collecting and treating (treatment varies) their own wastewater reducing pressures from bigger agglomerations, at least the data indicates an increase. However, growth of the coastal population is pressurizing the infrastructure.

d. Eutrophication hotspots in the Mediterranean have not changed drastically in the past 5 years.

e. Legal framework is largely in place on the national level; however, institutional capacity is relatively low.

f. Application of BAT/BEP is still a dominant challenge in some of the countries. This means that preventive measures need a significant push to reach the Operational Objectives set.

g. Monitoring and pollutant inventory efforts are clearly increasing overall. However, the issue still remains regarding data quality and credibility of the data.

Achievements of the operational targets under EO9

155. Based on the evaluation findings included in Table 5.2 for the legal, institutional and prevention measures under EO9, Table 6.2 provides the outlook for the achievement of the related NAP operational targets.

Table 6.2: Future outlook for achievement of NAP operational targets under EO9

NAP Operational Targets under EO9 **and findings**	**Approximation to target** ***Can the targets be achieved?***
Phase out/reduce/control quantities or concentrations of POPs (PCBs, pesticides) by 2025 Despite the lack of consistent trends leading to a comprehensive evidence on the releases of POPs from industrial processes, there is high commitment and tremendous efforts on removing the PCBs in the region. Therefore, the increase of the removal of PCBs is expected be achieved. There are several initiatives, most notable the MED Programme, which is making significant contribution to achieve this target.	

NAP Operational Targets under EO9 **and findings**	**Approximation to target** ***Can the targets be achieved?***
Phase out/reduce discharges of PAHs by 2025 The data, as indicated in this report, is not coherent and consistent enough to make a conclusive evaluation. However, the Contracting Parties are taking necessary legal measures to control the discharges of PAH.	
Reduce discharges of hazardous substances from industrial plants (apply BAT/BEP) by XX% or disposal in safe manner (2020-2025) The introduction of BAT/BEP processes are missing in most of the south and east countries with couple of exceptions. CP which are also EU member states already introduced BAT/BEP in their industrial processes, due to the Industrial Emission Directive. On the other hand, disposal of hazardous waste is still big challenge, limited data indicates that the HW is mostly temporary stored, rather than environmental sound disposal.	
Reduce discharges of heavy metals (mercury, cadmium, lead, zinc, copper, chromium) by XX% (2019-2025) Slight decreasing trends in the discharges of heavy metals has been observed, but more visible in EU Member states, in the regions, despite varying figures from country to country. An expected success could be catalyzed by investing more on the target of BAT/BEPs, which my in turn accelerate more prominent downfall. The issue of tertiary treatment is far lagging behind in the region, which is also affecting the releases of TN and TP as well as some heavy metals.	
Decontaminate XX% of sites polluted with mercury or phase out/isolate mercury from closed plants by 2025 Decontamination is expected to progress towards upward trend via GEF Funded Metaprogramme II project implemented by UNEP/MAP. The increasing number of signatures of Minamata Conventions is expected to have a catalytic effect towards achievement of this target.	

156. Further to the conclusions presented per Operational Target, the following general conclusions are reached:

a. The releases of toxic substances, despite a slight decline, are not conclusive enough to yield to a consistent trend. In several Contracting Parties, a decrease is visible on heavy metals and some PCDD, PCDFs, PAHs and VOC.

b. The achievement of NAPs Operational Targets will need a significant push in terms of enforcement, especially in industrial sectors. However, the public sector institutional capacity would need to be flexible and supportive enough to enable this advance to happen.

c. The reports still confirm some problematic pollutants in sediments. Despite the scarce data, heavy metals in sediments such us lead and total mercury are problematic (although localized in their impacts). Either the legacy of the past, or due to continuation of heavy metal releases, the improvement in sediments should not be expected immediately. Consequently, focus should be placed on reduction of heavy metals, especially from industrial discharges.

d. Despite a general improvement with most bathing sites being classified as sufficient/good or excellent and upward trends in countries that have reported under H2020, poor bathing water quality sites due to pollution from domestic and industrial effluents still require attention in view of measures to be taken

e. The enforcement measures remain to be a major problem. There are obstacles of weak institutional structures, a lack of competences and skilled enforcement officers, and a limited number of personnel.

Achievements of the operational targets under EO10

157. Based on the evaluation findings included in Table 5.3 for the legal, institutional and prevention measures under EO10, Table 6.3 provides the outlook for the achievement of the related NAP operational targets.

Table 6.3: Future outlook for achievement of NAP operational targets under EO10

NAP Operational Targets under EO10 **and findings**	**Approximation to target** ***Can the targets be achieved?***
Provide for the collection of XX% of solid waste (2015 to 2025) Despite the collection rates are increasing in majority of the countries, especially in the big cities, the rural areas are not in good track. Also, collecting the municipal solid waste does not means that it will be disposed in regulated landfills. It seems that still around half of the collected MSW is dumped in other places than regulated landfills	
Construct XX number of Municipal solid waste landfills (2015-2025) The construction of regulated landfills are planned, as per information in the NBB Report presented (Lebanon, Egypt, Tunisia, Montenegro and Morocco), however, the data indicates that there is still not enough number of regular landfills serving the need of the population in some countries.	
Adopt good practices in solid waste management including waste reduction, sorting, recycling recovery and reuse (2020-2025) Majority of the Contracting Parties which are starting to set policies for preventing plastic waste and marine litter. Most of the legislations are in place, especially in the Contracting Parties which are also member states to EU, as well as Israel and Turkey. Recycling and reuse is not very prominent, or at least, the data is limited in most countries. Also, enforcement seems to be problematic in southern countries coupled with slow transition to circular economy for the whole region. For instance, Morocco, Israel, and Montenegro indicated that they have mandatory targets for recycling.	
Regulate/reduce usage/discharges of XX% of fraction of plastics (2015-2025) The fraction of plastics in the municipal solid waste generated varies widely between Contracting Parties which are also EU member states, and the data shows an increase in plastic packaging waste in recent years. No conclusive trends for south and east are possible, although we can infer that plastic waste generation increased in general since, there is evidence that the organic fractions in most of the sough countries decreased in the expense of increasing the plastic fraction. It should be note that the region is taking big step to ban single use plastic, or at least include economic incentives to reduce it.	
Close/remediate XX% of illegal solid waste dump sides (2015-2020) There is no data for rehabilitation of open dumpsite, meaning closing of illegal dump sites. But due to the economic conditions of the countries, it seems that this target would not be attained, unless significant investment is channeled. Only Egypt, Morocco, and Montenegro indicated that they have plans to close the illegal dumpsites by 2030.	

NAP Operational Targets under EO10 **and findings**	**Approximation to target** ***Can the targets be achieved?***
Reduce XX% of *disposed* marine litter on beaches/sea (2015-2025) The marine litter in the beaches are increasing in particular areas, stimulated by above mentioned factors such as insufficient number of regulated dump side, significantly insufficient collection rates in the rural etc. as well as slow but steady increase of the plastic fraction of the municipal solid waste stimulated by, but not only, changing the consumption patterns. Majority of the Contracting Parties who developed NAPs, indicated that they do not have even an national assessment for marine litter and its impacts.	
Prevent riverine run-off of marine litter to the sea by XX% (2019-2020) The data, as indicated in this report, is not coherent and consistent enough to make a conclusive evaluation for the progress of reduction of run-off inputs from riverine pathway.	

158. Further to the conclusions presented per Operational Target, the following general conclusions are reached:

a. There is a need for construction of solid waste treatment plants, i.e., sanitary landfills. It is obvious that despite the legal framework as stipulated by the NAPs/POMs, waste collection rates in rural areas are low. These gaps are causing significant leakage points for marine litter.

b. Large urban agglomerations are better off with collection of waste than small agglomerations.

c. Only few countries succeed in reaching full waste collection coverage, which remains difficult especially in rural areas, where waste is usually illegally dumped or burned. The picture is particularly poor in suburbs and in slums, where a sizable share of the population lives and where waste collection services are very limited.

d. Plastics are gaining prevalence in the waste composition, in certain Counteracting Parties recycling is higher, but not sufficient.

e. Vast majority of the waste collected ends up in unregulated dumpsites, in several countries.

f. Banning of single use plastics is gaining accelerations, which is promising, considering the floating litter is mostly consistent of single use plastics.

g. There is a need to significantly increase regional efforts to manage the waste, in accordance with waste hierarchy aiming more on reduction or banning single use plastics.

h. There is a need to focus more on reducing or containing the entry points of marine litter, these are closing the illegal dumpsites, and most importantly constructing regulated

159. Finally, and with regards to the enabling conditions rendered by public awareness, access to information, monitoring and reporting, the following conclusions are reached:

a. There is an improvement of established infrastructure enabling public access to information especially at regional level.

b. There have been tremendous efforts to put in place a coherent, resilient and responsive marine pollution monitoring.

c. Despite significant improvements in the past 5 years, the lack of sufficient monitoring is still hindering clearer, data-based assessments which could guide the policy makers in more efficient way to adapt and modify their policies in shorter times in more cost

160. Finally, looking at time span of 5 years for the implementation of the NAP/POMs might be too zoomed-in evaluation giving limited angle of view. Therefore, it should be taken into consideration that, there is a time lag between reducing pressures and seeing improvements in the marine environment. It is envisaged that the real impact can be observed in longer time span.

Annex I

NAP Requirements from the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective EO5, Eutrophication, Ecological Objective EO9, Contaminants, Objective EO10 Marine Litter

Part 1

EO5: Eutrophication					
GES targets					
Reduction of BOD emissions from land based sources	*Reduction of nutrients emissions from land based sources*	*Decreasing trend in Chlorophyll-a concentrations in high risk areas affected by human activities*	*Increasing trend of transparency in areas impacted by human activities*	*Decreasing trend in the frequency of the occurrence of HABs*	*Increasing trend in dissolved oxygen concentrations in areas impacted by human activities*

Table 1. Requirements of the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective EO5, Eutrophication

No.	**Requirements**	
EO5	Policy	Enforce the adopted ELVs by monitoring discharges from municipal wastewater treatment plants into the environment
EO5		Adopt emission limit values (ELV) for BOD5 in urban wastewater after treatment in accordance with the requirements of the "regional guideline on the reduction of BOD5 from urban waste water"
EO5	Legal	Monitor discharges from municipal wastewater treatment plants and take necessary measures to enforce national regulations
EO5		Report on the implementation of the measures on the reduction of BOD5 from urban waste water and on their effectiveness [On a biannual basis]
EO5	Pollution prevention and control	Ensure that all agglomerations of more than 2000 inhabitants collect and treat their urban wastewater before discharging them into the environment
EO5		Prevention of direct and indirect effects of nutrient over-enrichment in the marine environment
EO5		Reduce nutrient inputs, from agriculture and aquaculture practices into areas where these inputs are likely to cause pollution
EO5		Industrial Food Plants outlined in Appendix I which discharge more than 4000 PE into water bodies shall meet the following requirements: COD 160 mg/l or TOC 55 mg/l and BOD 30 mg/l
EO5		Dispose all wastewater from industrial installations which are sources of BOD, nutrients and suspended solids
EO5		Promotion of separate collection of rain waters and municipal wastewaters
EO5		Coastal cities and urban agglomerations of more than 100,000 inhabitants are connected to a sewer system
EO5		Take necessary measures to establish adequate urban sewer and wastewater treatment plants that prevent run-off and riverine inputs of litter
EO5		Limit concentrations of key nutrients in the marine environment to levels which are not conducive to eutrophication
EO5		Promotion of reuse of treated effluents for the conservation of water resources

EO5		In case the food sector installation discharges into the sewerage system, the competent authorities shall establish ELV and an authorization compatible with the operation and the emission discharge values of the urban waste water treatment plant
EO5/ D5*		Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters: ☐ Nutrients levels ☐ Direct effects of nutrient enrichment ☐ Indirect effects of nutrient enrichment

Part 2

EO9: Contaminants				
GES targets				
Reduction of contaminants emissions from land based sources	*Decreasing trend in the occurrences of acute pollution events*	*Decreasing trend in the frequency of cases of seafood samples above regulatory limits for contaminants*	*Increasing trend in the percentage of intestinal enterococci concentrations within established standards*	*Decreasing trend in the frequency of the occurrence of HABs*

Table 2. Requirements of the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective EO9, Contaminants

No.	**Requirements**	
EO9	Policy	Application of BAT and BEPs for environmentally sound management of POPs
EO9		Concentration of priority contaminants in biota, sediment or water is kept within acceptable limits
EO9		Safeguard of the ecosystem function and maintenance of the integrity and biological diversity of species and habitats
EO9		Minimization of effects of released contaminants to the marine environment such as not to give rise to acute pollution events
EO9		Prevention of acute pollution events and minimization of their impacts
EO9		Adopt National ELVs for mercury emissions based on values included in the “regional plan on the reduction of inputs of mercury” from other than Chlor Alkali industry
EO9		Prohibit the installation of new Chlor alkali plants using mercury cells and vinyl chloride monomer production plants using mercury as a catalyst
EO9		Cease releases of mercury from the activity of Chlor alkali plants
EO9		Prohibit and/or take legal and administrative measures necessary to eliminate the production and use, import and export of POPs and their wastes
EO9		Support, promotion and facilitation of programmes of assistance in pollution control and reduction in the area of scientific, technical and human resources

EO9		Support, promotion and facilitation of capacities to apply, develop and manage access of cleaner production technologies as well as Best Available Techniques (BAT) and Best Environmental Practices (BEP)
EO9		Provision of information to the public about bathing water quality and implemented management measures
EO9	Legal	Monitor releases of mercury into water, air and soil in order to verify compliance with the requirements
EO9		Monitor bathing water quality
EO9		Prepare bathing water profiles or beach profiles
EO9	Pollution prevention and control	Phase out discharges and emissions and losses of mercury, cadmium and lead
EO9		Eliminate to the fullest possible extent pollution of the Mediterranean Sea caused by discharges, emissions and losses of zinc, copper and chrome
EO9		Phase out to the fullest possible extent discharges, emissions and losses of organomercuric compounds and reduce those of organolead and organotin compounds
EO9		Phase out inputs of PAHs
EO9		Eliminate to the fullest possible extent pollution caused by discharges, emissions and losses of organohalogen compounds
EO9		Eliminate to the fullest possible extent inputs of radioactive substances
EO9		Dispose all hazardous wastes in a safe and environmentally sound manner
EO9		Restore marine and coastal habitats that have been adversely affected by anthropogenic activities
EO9		Identify existing sites which have been historically contaminated with mercury
EO9		Apply environmentally sound management measures to sites which have been historically contaminated with mercury
EO9		Achieve environmentally sound management of metallic mercury from the decommissioned plants [To be achieved following decommission]
EO9		Progressively reduce total releases of mercury (to air, water and to products) from existing Chlor alkali plants until their final cessation
EO9		Take appropriate measures to isolate and contain mercury containing wastes
EO9		Identify stock piles consisting of or containing POPs [deadline passed]
EO9		Phase out inputs of the 9 pesticides and PCBs and reduce inputs of unwanted contaminants: hexachlorobenzene, dioxins and furans
EO9		Ensuring that water quality in bathing waters and other recreational areas does not undermine human health
EO9		Adopt the criteria and standards for bathing waters in the Mediterranean region based on Intestinal enterococci
EO9/ D8*		Concentrations of contaminants are at levels not giving rise to pollution effects: ☐ Concentration of contaminants ☐ Effects of contaminants
EO9/ D9*		Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards: ☐ Levels, number and frequency of contaminants

Part 3

EO10: Marine Litter		
GES targets		
Decreasing trend in the number of marine litter items deposited on the coast	*Decreasing trend in the number of marine litter items in the water surface and the seafloor*	*Decreasing trend in the cases of entanglement or/and a decreasing trend in the stomach content of the sentinel species*

Table 3. Requirements of the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED - Ecological Objective 10, Marine Litter

No.	**Requirements**	
EO10	Policy	Adopt preventive measures to minimize inputs of plastic in the marine environment
EO10		Enforce measures to combat illegal dumping including littering on beaches and illegal sewage disposal in coastal zones and rivers
EO10		Seek direct cooperation with other Contracting Parties, with assistance of the MEDPOL or competent international and regional organizations, to address trans-boundary marine litter cases *[As appropriate]*
EO10	Legal	Report on the implementation of the National Marine Litter Monitoring Programme [On a biannual basis]
EO10		Design National Monitoring Programme on Marine Litter
EO10		Establish Regional Data Bank on Marine Litter
EO10	Pollution prevention and control	By the year 2005 at latest, to base urban solid waste management on reduction at source, separate collection, recycling, composting and environmentally sound disposal in all cities and urban agglomerations exceeding 100.000 inhabitants and areas of concern
EO10		Reduction of fraction of plastic packaging waste that goes to landfill or incineration
EO10		Ensuring adequate urban sewer systems, WWTP and waste management systems to prevent run-off and riverine inputs of Marine Litter
EO10		Application of cost-effective measures to prevent any marine littering from dredging activities
EO10		Implement programmes on regular removal and sound disposal of accumulations/hotspots of marine litter
EO10		Implement adequate waste reducing/reusing/ recycling measures in order to reduce the fraction of plastic packaging waste that goes to landfill or incineration without energy recovery
EO10		Close to the extent possible existing illegal solid waste dump sites
EO10		Remove existing accumulated litter from Specially Protected Areas of Mediterranean Importance (SPAMI) and litter impacting endangered species

EO10		Explore and implement National Marine Litter Cleanup Campaigns; participate in International Coastal Cleanup Campaigns and Programmes; apply “Adopt-a-Beach” or similar practices; and apply “Fishing for Litter” practices
EO10		Control of impacts of litter on marine life to the maximum extent practicable
EO10		Urban solid waste management is based on reduction at source with the following waste hierarchy: prevention, re-use, recycling, recovery, and environmentally sound disposal]
EO10		By the year 2025 at latest, to base urban solid waste management on reduction at source, separate collection, recycling, composting and environmentally sound disposal
EO10 /D10 *		Properties and quantities of marine litter do not cause harm to the coastal and marine environment: ☐ Characteristics of litter in the marine and coastal environment ☐ Impacts of litter on marine life

Part 4

Table 4: Requirements related to, public awareness, access to information and public participation, monitoring and reporting

Requirements		
Public participation	Policy	Facilitation of public access to scientific knowledge and activities for protection and management of the environment
		Mobilization, participation and involvement of major actors concerned in protection and management of the environment (local and provincial communities, economic and social groups, consumers, etc.)
Monitoring	Legal	Establish a monitoring programme of the inputs of priority pollutants identified in the SAP- MED and of the quality of the marine environment
		Establish systems of inspection to ensure compliance with conditions laid down in the authorizations and regulations
		Establish a permanent river water quality/quantity register
Public awareness	Policy	Enhancement of public awareness and education of pollution, and involvement of various stakeholders with regard to marine litter management including activities related to prevention and promotion of sustainable consumption and production
Public access	Legal	Provide to the public access to information available on the state of the environment of the Mediterranean and its evolution, and of the measures taken to improve it
		Collect information on the state of treatment and disposal of liquid and solid wastes
Reporting	Legal	Publish a report on the State and Evolution of the Mediterranean Environment [on a regular interval]
	Policy	Application of a unified reporting system for implementing the provisions of the Barcelona Convention, the Protocols, the SAP- MED, the Regional Plans and ECAP objectives

**Relevant requirements for* Contracting Parties which are also Member State to EU, *in compliance with the* "Commission Decision 2010/477/EU of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters", repealed in 2017 by the Commission Decision (EU) 2017/848.

Annex II
List of NAP/H2020 Indicators and Common Indicators

Part 1: List of NAP/H2020 Indicators:

Indicators	Sub-indicators
IND 3. Access to Sanitation	3.1 Share of total, urban and rural population with access to an improved sanitation system (ISS)
	3.2 Proportion of population using safely managed sanitation services (SMSS)
IND 4. Municipal Wastewater Management	4.1 Municipal wastewater collected and wastewater treated
	4.2 Direct use of treated municipal wastewater
	4.3 Release of nutrients from municipal wastewater
IND 5. Coastal and Marine Water Quality	5.1 Nutrient concentrations in transitional, coastal and marine waters
	5.2 Bathing water quality
IND 6.1. Release of nutrients from industrial sectors	6.1.1. Total BOD load discharged from industrial installations to the Mediterranean marine environment.
	6.1.2. Total Nitrogen load discharged from industrial installations to the Mediterranean marine environment
	6.1.3. Total Phosphorus load discharged from industrial installations to the Mediterranean marine environment.
IND 6.2. Release of toxic substances from industrial sectors	6.2.1. Total heavy metals load released from industrial installations to the Mediterranean marine environment.
	6.2.2. Furans and dioxins load released from industrial installations to the Mediterranean marine environment.
	6.2.3. Polycyclic aromatic hydrocarbons (PAH) load released from industrial installations to the Mediterranean marine environment.
	6.2.4. Volatile organic compounds (VOC) load released from industrial installations to the Mediterranean marine environment.
IND 6.3. Industrial hazardous waste disposed in environmentally sound manner	6.3.1. Total quantity of generated hazardous waste from industrial installations.
	6.3.2. Quantity of industrial hazardous waste disposed in environmentally sound manner relative to total quantity of generated hazardous waste from industrial installations.
IND 6.4. Compliance measures aiming at the reduction and/or elimination of pollutants generated by industrial sectors	6.4.1. Number of industrial installations reporting periodically loads of pollutants discharged to the marine and coastal environments relative to the total number of industrial installations.
	6.4.2. Number of environmental inspections carried out by enforcement authorities in which industrial installations were found to be in breach of laws and regulations relative to the total number of executed inspections.
	6.4.3. Number of eliminated hotspots identified in the updated NAPs relative to the 2001 and 2015 baseline
IND 1. Municipal Waste Generation	IND 1.A Municipal waste composition
	IND 1.B Plastic waste generation per capita
	IND 1.C% of population living in Coastal Areas
	IND 1.D% of Tourists in Coastal Areas

IND 2. "Hardware" of waste management	IND 2.A Waste Collection IND 2.A.1 Waste Collection Coverage IND 2.A.2 Waste Captured by the formal waste sector
	IND 2.B Environmental Control IND 2.B.1% of waste to uncontrolled dumpsites IND 2.B.2 Uncontrolled dumpsites in Coastal Areas IND 2.B.3 Waste going to dumpsites in Coastal Areas
	IND 2.C Resource Recovery IND 2.C.1% of plastic waste generated that is recycled
IND 3. "Software" of waste management	3.A MARINE LITTER & WASTE MANAGEMENT FRAMEWORK IND 3.A.1 Is there a National Assessment for ML and its impacts? IND 3.A.2 Is there a National Plan or Strategy for ML? IND 3.A.3 Is there a National Plan or Strategy for Waste Management? IND 3.A.4 Is there a National Law on Waste? IND 3.A.5 Is there a national plan or target to close the dumpsites before 2030? IND 3.A.6 Is there a National Information system for waste management in place?
	3.B RESOURCE RECOVERY IND 3.B.1 Is there a National Plan or Strategy for Waste Prevention? IND 3.B.2 Are there mandatory targets for recycling - recovery of packaging waste? IND 3.B.3 Are there EPR or Deposit- Return schemes for packaging waste? IND 3.B.4 Are there national policies to eliminate or reduce single-use plastics? IND 3.B.5 Are there financial incentives for reuse – resource recovery activities?
	3.C SUSTAINABLE CONSUMPTION AND PRODUCTION IND 3.C.1 Are there Sustainable Consumption and Production plans or strategies? IND 3.C.2 Are there green procurement rules for the public sector in place? IND 3.C.3 Are there policies to support sustainable tourism? IND 3.C.4 Are there policies to support eco-labelling and eco-design?

Part 2: List of IMAP Indicators (Common Indicators)

Ecological Objective	**IMAP Indicators**
EO 1 Biodiversity	
Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	Common Indicator 1: Habitat distributional range (EO1) to also consider habitat extent as a relevant attribute
	Common Indicator 2: Condition of the habitat's typical species and communities (EO1)
	Common Indicator 3: Species distributional range (EO1 related to marine mammals, seabirds, marine reptiles)
	Common Indicator 4: Population abundance of selected species (EO1, related to marine mammals, seabirds, marine reptiles)

	Common indicator 5: Population demographic characteristics (EO1, e.g. body size or age class structure, sex ratio, fecundity rates, survival/mortality rates related to marine mammals, seabirds, marine reptiles)
EO 2 Non-indigenous species	
Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem	Common Indicator 6: Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species)
EO 3 Harvest of commercially exploited fish and shellfish	
Populations of selected commercially exploited fish and shellfish are within biologically safe limits, exhibiting a population age and size distribution that is indicative of a healthy stock	Common Indicator 7: Spawning stock Biomass (EO3);
	Common Indicator 8: Total landings (EO3);
	Common Indicator 9: Fishing Mortality (EO3);
	Common Indicator 10: Fishing effort (EO3);
	Common Indicator 11: Catch per unit of effort (CPUE) or Landing per unit of effort (LPUE) as a proxy (EO3)
	Common Indicator 12: Bycatch of vulnerable and non-target species (EO1 and EO3)
EO 4 Marine food webs	
Alterations to components of marine food webs caused by resource extraction or human-induced environmental changes do not have long-term adverse effects on food web dynamics and related viability	To be further developed
EO 5 Eutrophication	
Human-induced eutrophication is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters.	Common Indicator 13: Concentration of key nutrients in water column (EO5);
	Common Indicator 14: Chlorophyll-a concentration in water column (EO5)
EO 6 Sea-floor integrity	
Sea-floor integrity is maintained, especially in priority benthic habitats	To be further developed
EO7 Hydrography	
Alteration of hydrographic conditions does not adversely affect coastal and marine ecosystems.	Common Indicator 15: Location and extent of the habitats impacted directly by hydrographic alterations (EO7) to also feed the assessment of EO1 on habitat extent
EO 8 Coastal ecosystems and landscapes	
The natural dynamics of coastal areas are maintained and coastal ecosystems and landscapes are preserved	Common Indicator 16: Length of coastline subject to physical disturbance due to the influence of man-made structures (EO8);
	Candidate Indicator 25: Land use change (EO8)
EO 9 Pollution	
Contaminants cause no significant impact on coastal and marine ecosystems and human health	Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater)
	Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established (EO9)
	Common Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9);
	Common Indicator 20: Actual levels of contaminants that have been detected and number of contaminants which have exceeded

	maximum regulatory levels in commonly consumed seafood (EO9);
	Common Indicator 21: Percentage of intestinal enterococci concentration measurements within established standards (EO9)
EO 10 Marine litter	
Marine and coastal litter do not adversely affect coastal and marine environment	Common Indicator 22: Trends in the amount of litter washed ashore and/or deposited on coastlines (EO10);
	Common Indicator 23: Trends in the amount of litter in the water column including microplastics and on the seafloor (EO10);
	Candidate Indicator 24: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles (EO10)
EO 11 Energy including underwater noise	
Noise from human activities cause no significant impact on marine and coastal ecosystems	Candidate Indicator 26: Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animal
	Candidate Indicator 27: Levels of continuous low frequency sounds with the use of models as appropriate

Annex III
List of References

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