MEDITERRANEAN WATER KNOWLEDGE PLATFORM

EXCHANGE OF EXPERIENCES WORKSHOP ON WATER INFORMATION SYSTEM (WIS)

BARCELONA – 19 - 20 OCTOBER 2017

STATE OF PLAY AND WAY FORWARD

MEDITERRANEAN WATER KNOWLEDGE PLATFORM OVERVIEW

The project « Mediterranean water knowledge platform » was approved unanimously for UfM label by the Euromed Senior Officials (SOM) during their meeting on 7 April 2014. It is the result of a long process driven by Southern and Eastern Mediterranean countries, since the UfM ministerial conference on water held in Jordan in December 2008, requiring support for integrated data management systems and decision support tools on Integrated Water Resources Management. Although a wider range of South Mediterranean countries were interested in becoming pilots (e.g. Albania, Turkey, Palestine), Jordan, Lebanon, Morocco and Tunisia were sufficiently advanced with the right level of political commitment to be part of national activities of the project first phase.

The overall objective is to improve IWRM thanks to data driven planning while facilitating international reporting on water issues. The specific objectives are:

- to provide a common basis for the development of National Water Information Systems (NWIS) in four pilot countries from the Southern Mediterranean region;
- to deliver an assessment of water resources management and use (drafting of a White Paper) by collecting and exploiting data from the pilot countries.

The project total cost was estimated to 9.5 million Euros, for the first phase, covering:

- Guides, tools, capitalisation, regional training and validation of the benefits for international reporting: M€1.3 (total phases 1&2: M€ 2.7)
- NWIS: Jordan: M€ 0.85 (Total M€1.9); Lebanon: M€ 0.28 (M€2.85); Morocco M€ 1.37 (M€2.15); Tunisia: M€ 2.425 (M€3.33);
- Mediterranean White Paper on Water : M€ 3.3

The beneficiaries are the national and local water authorities and other government agencies involved in the water sector, especially the ministries and their supervised agencies in charge of the environment, agriculture, health and statistical institutes. Data management will be strengthened with a win-win approach for all institutions involved to guarantee success and better appropriation.

The project is based on the knowledge gained on water data management in Europe (Shared and enlarged Environmental Information System -SEIS, Water Information System for Europe -WISE,

INSPIRE Directive for spatial data infrastructure), the United Nations system (System of Environmental Economic Accounting for Water - SEEA-W), in some developed countries (France and Spain - Spanish White Paper in particular) and tools and data provided by the European Space Agency.

ADDRESSING MEDITERRANEAN WATER POLICY PROCESSES

The MWKP is closely related to the UfM regional process on water, known as the UfM Water Agenda and to the sub-regional 5+5 process on water, Water Strategy for the Western Mediterranean (Algiers and its Action Plan (Marrakech, November 2016).

The MWKP is key pillar for the development of the UfM Water agenda following its launch at the UfM Water Ministerial meeting in Malta in April 2017. As decided by this conference, the UfM water agenda will be elaborated and implemented by UfM water expert group (WEG), therefore:

- MWKP will report to the WEG at their bi-annual meetings
- MWKP will coordinate its development to fulfil the needs

Following the last WEG meeting (July 2017, Barcelona), 4 priority work areas were selected:

- Water, energy, food, ecosystems nexus
- Water supply and sanitation
- Climate change adaptation and water
- Water employment and migration

ADDITIONAL INTERNATIONAL, REGIONAL AND SUB-REGIONAL RELEVANT PROCESSES

Three main processes have been considered in the initial implementation of the MWKP:

- Water Strategy of the League of Arab States (LAS), in particular the implementation of a database on water resources shared between Arab countries
- The Mediterranean Strategy for Sustainable Development (UNEP-MAP)
- Pollution reduction of the Mediterranean Sea -H2020 (joint initiative EU / UNEP-MAP supported by the EEA), in particular water related indicators (see concept note in annex) as well as industrial emission to water (see concept note in annex).

For these 3 processes, the MWKP addresses data harmonization should support data harmonization and indicator reporting. The implementation is foreseen in cooperation with the LAS, UNEP-MAP Regional Activity Centers and the European Environment Agency (EEA).

GROWING FOCUS ON WATER DATA MANAGEMENT …….. BUT STILL A LACK OF SUITABLE FUNDING MECHANISMS

Everybody agree on the fact that “Reliable data is a prerequisite for planning, assessment and policy making”, but supporting sustainable data management only appear recently as priority for

international initiatives and funding mechanism are still lacking. In ***addition most of international initiatives focus on indicator reporting and not on reinforcing the long term data production at national and local levels.***

Considering the **Sustainable Development Goals**, the UN Secretary General report highlight: "… *The availability of high-quality, timely and disaggregated data is vital for evidence-based decision-making and to ensure accountability for implementation of the 2030 Agenda*…"1 Indeed, the water SDG (SDG6) moves beyond the MDG focus on basic access targets, to address the broader challenges of achieving universal access to safe water and sanitation, protecting water resources, ensuring sustainability, promoting transboundary cooperation, and reaching the poorest. Providing indicators on its 8 targets will require huge efforts by countries and a considerable amount of data, even with the methodologies provided for monitoring the foreseen indicators (see detailed list in annex).

In addition to the methodological guidelines, various UN agencies are providing free tools that can be implemented by countries and customized to their needs:

- **UNESCO with the WINS** – Water Information Networking System
- **UNEP with IRIS** – Indicator Reporting Information System

The **World Water Data Initiative** (WDDI), launched in 2017 also aims at reaching theSDG6 but with a focus on data harmonization and policy considering cost effectiveness of water data management.

In order to implement a priority Water Action Plan for Climate Resilience, the development of water knowledge, decision support, and information systems (WIS) was proposed as a result of the Water Action Day organised at UN Climate change conference **COP22** (Marrakech, 9 November 2016). **Launching two pilot projects** related to **National Water Information Systems** was foreseen as short term action[2].

[1] Report of UN Secretary-General, Progress towards the Sustainable Development Goals, 2017
[2] Outcome document of the Action Event on Water, COP22, November 9, 2016

PROGRESS SO FAR

The initial funds committed have been focused on national component while regional activities were based on promoters own resources and therefore limited, up to the end of 2016. The current implementation progress is summarized in the following table:

Components	Status	Funding source
Jordan	Definition and technical specification of the NWIS done in 2015 and implementation on going	European Commission delegation grant
Tunisia	MoU signed by 5 Ministers 1st phase of implementation of SINEAU delivered in December 2016 Institutional study and water law revision going-on	African Water Facility + National funds Promoter (French funds)
Morocco	Definition study done in 2015 New water law addressing water information adopted in Oct. 2016 Implementation started in 2017 National multi-stakeholders NWIS working group launched	National funds EC twining project
Lebanon	Preparation of ToR for the feasibility study to be carried end 2017-early 2018	FAO
Regional	Definition of a list of common IWRM indicators (2014) Steering Committee meeting, 2014 (SP) NWIS training session July 2017 (FR) Legal framework analysis (2017) Data management for WFD session as part of SWIM-H2020 regional training, July 2017, (BE)	Promoters/Plan Bleu + ONEMA (FR) + UfMS Promoters + Min. Env (SP) Min. Env (FR) Min. Env (FR) SWIM-H2020 SM (EC)
Other countries	Palestine: first components developed by PWA, shared vision with EQA (Environment) and statistic office Algeria: existing legal framework, responsibility shared between MRE + AGIRE Albania: governmental priority Turkey: Definition study done, Implementation to start soon	

FIRST LESSONS

The first components of NWIS are being implemented in South and Eastern Mediterranean countries without the planned regional coordination, guidelines and exchange of experiences (not implemented due to the lack of funding). Therefore the original action plan of the MWKP has to be reviewed and adapted, considering the experiences resulting from the different countries, updated national priorities and international reporting and commitments.

The key challenges identified from the first national implementations and regional concertation meeting organised in 2017 are related to:

- Multidisciplinary Governance at national level
- Sustainable financing of NWIS and contributing systems (thematic systems)
- Keeping the momentum with the stakeholders during the (long) implementation process
- Developing shared information products
- Streamlining international reporting
- Public data access (open data)
- Integrating data management into planning and investment (i.e. defining data priorities based on water priorities)
- Technical capacity for managing ICT subcontractors: Terms of Reference, validation of system specifications, validation software application against agreed specifications

WAY FORWARD

This preliminary version will be updated during the workshop (19-20 October)

Priorities:

- Supporting the development of effective long term governance and financing mechanisms
    - Developing advocacy on the benefits of WIS
    - Costs analysis of data management components vs monitoring and infrastructure costs
- Developing small scale demonstrators “evidence based / data driven" tools for decision making

Action plan

- Ensuring regional coordination:
    - Steering committee meeting back-to-back with SEIS South Steering Committee meetings
- Providing dedicated support to countries for progressive development of their NWIS and priority decision support tools:
    - Priority focus for the output of their NWIS to be defined by country, e.g.
        - Assessment of water infrastructure for water provision: Large storage dams, WWTP (reuse), desalination (brackish and sea water)
        - ENI-SEIS / H2020 water indicators (see concept note attached)
        - Some Water SDG targets
        - Assessment of ecosystems as Natural Based solutions for IWRM
        - Water Energy Food nexus
    - Example of geographical coverage
        - River Basin Agency Information Systems in Morocco and Algeria
        - Enhancing the National Water Information System of Tunisia (SINEAU) with sub-components related to water mobilization (large dams) and sanitation components and preparing national assessment of water infrastructures.
- Developing guidelines from country’s experiences

ANNEX 1 – Water SDG (6) Indicator methodologies

Targets	Indicator methodologies
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 on drinking water.
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 on sanitation and hygiene
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 on wastewater treatment 6.3.2 on ambient water quality
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1 on water use efficiency 6.4.2 on water stress
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 on integrated water resources management. 6.5.2 on transboundary cooperation
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 on water-related ecosystems
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.a.1 on international cooperation
6.b Support and strengthen the participation of local communities in improving water and sanitation management	6.b.1 on stakeholder participation

ANNEX 2 –Adjustment of H2020 Water indicators_11 October 2017

Methodology and proposal for development of an updated set of H2020 Water indicators

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Date: 11 October 2017

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European Environment Agency

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Update: This document has been updated following the Webinar on Water Indicators with countries that took place on the 27th September 2017 to get feedback and agreement on the approach and set of new indicators. The main changes in relation to the previous version are:

- Revision of Background and Objectives;
- Inclusion of main input received from countries during the webinar under each core water indicator;
- Consolidation of the water indicator set, including new proposed indicators and additional information and (Section 9);
- Change of the term "*satellite indicators*" to the more familiar term "*supporting Indicators*" (Section 6).

1. Background

The UfM Ministerial meeting on Environment and Climate Change, held in Athens on 13 May 2014, emphasized for the 2nd phase the need for all partner countries "to address data needs by applying the principles of Shared Environment Information Systems (SEIS) in line with the commitments under the ECAP Decisions of the Barcelona Convention; also contributing to its regional integrated monitoring." UfM Ministers gave the H2020 Steering Group the mandate to develop and adopt a work programme for the second phase in line with the on-going ECAP/MSFD work, the update National Action Plans (NAPs) and MSSD review.

The 1st ENI SEIS II South Support Mechanism Regional workshop on indicators, 17-18 May 2017, Copenhagen, initiated the refinement of the H2020 review mechanism to: i. further develop the current H2020 indicators to reflect the renewed scope of the H2020 priorities applicable to all Mediterranean countries, and ii. take into account other existing indicators sets in coherence with other assessment processes. The meeting reviewed existing regional indicators processes and their links with H2020 and discussed possible amendments of the current set. The meeting provided a way forward for an agreed selection of indicators, which should be further explored at country and regional level. Three thematic webinars (Industrial Emissions, Waste and Water) have been scheduled with countries during September 2017 to discuss and agree on a final list of indicators. The webinar on the H2020 Water Indicators took place on the 27th September 2017.

2. Objectives

This document intends to be a basis to support the development of the H2020 Water indicators for the ENI SEIS II South project. It specifically aims at:

- Providing the rationale and discuss the further development of H2020 Water Indicators for Phase II of ENI SEIS, based on the experiences of Phase I and in line with H2020 and ongoing initiatives (e.g. MSSD, NAPs, SDGs);
- Presenting the approach used for the selection of proposed adjustments and new indicators;
- Presenting the proposed list of new indicators and additional information for the existing 3 Water core indicators.

The proposals presented are based on the outcomes of the Workshop on Indicators and subsequent refinement following the discussions and input received during the Water Webinar with countries.

3. Existing H2020 Core Water Indicators

During the discussions at the May workshop, participants agreed to keep the 3 existing water indicators, with some adjustments. The existing H2020 core water indicators, defined in Phase I of SEIS, are:

	Name of indicator	Link to Indicator Specification sheet developed under Phase 1
IND 3	Share of population with access to an improved sanitation system (total, urban, rural)	IND 3 Specification sheet
IND 4	Volume of waste water collected, of which volume of waste water treated (and type of treatment)	IND 4 Specification sheet
IND 5	Nutrient concentrations in transitional, coastal and marine waters	IND 5 Specification sheet

These indicators are complementary to other existing indicators from ongoing global/regional initiatives, such as SGD, MSSD, IMAP, NAPs. These links are identified in the sections below. It is assumed that if the same indicator is already reported under parallel processes (e.g. SDG), it should not be reported again under H2020 in accordance to the principles of SEIS. However, in most other cases, the further development of H2020 indicators is considered as a mechanism to support progress under other initiatives (e.g. MSSD, NAPs).

4. Approach for developing water indicators

The proposed approach for the elaboration of the H2020 Water indicators is as follows:

i. Identification of the methodological shortcomings and challenges of the H2020 core water indicators (IND3- IND5) identified in the Phase I of the ENI SEIS project and proposal for way forward;

ii. Identification of the methodological aspects of the proposed additional elements for "core indicators" and proposed "supporting indicators"

iii. Justification and adequacy of the proposed water indicators further developed under ENI SEIS II South project through the application of a set of selection criteria.

5. Discussion and adjustment of H2020 indicators

In this section, the Core Water Indicators (IND 3, IND 4, IND 5) and their adjustments or extensions proposed for ENP SEIS South Phase 2 are presented and discussed. It includes challenges identified in Phase 1 and a few points that have been presented to the countries for consideration.

IND 3: Share of population with access to an improved sanitation system (total, urban, rural)

Lack of sanitation poses health risks from contaminated drinking water to life-threatening forms of diarrhea to infants, particularly for poorer segments of the population who are most exposed to inadequate human waste disposal. This indicator gives an indication of the accessibility to sanitation services, e.g. sewerage network.

Links with existing indicators

IND 3 corresponds to Millennium Development Goals (MDGs; 2000-2015) Indicator 7.9: Proportion of population using an improved sanitation facility. Under the Sustainable Development Goals (SDGs; 2015-2030), the definition of the sanitation indicator (SGD 6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water) has been (slightly) revised by referring to "safely managed sanitation services" instead of "improved sanitation systems". According to the SDG metadata[1] for SGD 6.2.1 Metadata-06-02-01 "(…) *the above consultation concluded that post-2015 targets, which apply to all countries, should go beyond the basic level of access and* ***address indicators of safe management of sanitation services, including dimensions of accessibility, acceptability and safety****. The Expert Working Group called for analysis of faecal waste management along the sanitation chain, including containment, emptying of latrines and septic tanks, and safe on-site disposal or transport of wastes to designated treatment sites. Classification of treatment will be based on categories defined by SEEA and the International Recommendations for Water Statistics and following a laddered approach (primary, secondary and tertiary treatment).*" This means that the indicator is extended to consider the management aspects (not just access), linking closely to IND 4 (see below).

IND 3 also corresponds to MSSD indicator 2.14 (See MSSD Factsheet in Annex II) and core NAP indicator EO5(1) (Annex III).

Identified challenges

- **Geographical scope**: In ENP SEIS Phase 1, most of the data obtained for IND 3 was at the national level, with the exception of Morocco that provided data for the coastal watersheds the 16 provinces and prefectures in the coastal hydrological basins of Oued Moulouya and Tangier in the Mediterranean region. Within the context of H2020, it is most relevant to get

[1] https://unstats.un.org/sdgs/metadata/

more information at the sub-regional level, namely at the coastal watershed level[2] (see also Annex IV). However, data at this level may not be available for most countries. There is a need to provide capacity building on developing methodological options for downscaling national data to the coastal watershed level.

Points considered

- Change in the exact definition of the SDG indicator as compared to MDG (from improved sanitation system to safely managed sanitation services) and core NAP indicator EO5(1). Since the MSSD indicator 2.14 will be adjusted to the new SDG definition, we propose to follow this adjustment, while maintaining reference to the previous indicator for time-series continuity.

Input from Webinar with Countries

- **Tunisia**: No data for sanitation in rural areas. They have just started a project on sanitation in these areas.
- **Palestine**: Supports the alignment with SDGs (e.g. in relation to IND3) but raises some concerns about metadata not yet available for certain SDG indicators yet (Tier III).

[2] Coastal watershed data is mainly of relevance for Algeria, Morocco, Tunisia, Libya, Egypt, Jordan. For other countries, such as, Israel, Lebanon and Palestine, the national territories (i.e. not only the Mediterranean hydrological basins) could be considered as the coastal hydrological basins, as in Phase 1.

IND 4 - Volume of waste water collected, of which volume of waste water treated (and type of treatment

The discharge of untreated wastewater directly in freshwater, coastal and marine environments causes enormous health concern. It also represents a significant pressure on aquatic ecosystems as wastewater carries high loads of nutrients (nitrogen and phosphorus), and pathogenic micro-organisms (including coliforms, faecal streptococcus, salmonella etc.). In cities, sewage discharged directly into public sewerage systems generally contains a variety of chemical wastes originating from households and industrial installations.

Links with existing indicators

IND 4 corresponds to SDG indicator 6.3.1 Proportion of wastewater safely treated (indicator classified by SDG process as Tier II[3]; no SDG metadata file available yet); MSSD indicator 2.5 Percentage of wastewater treated (related MSSD factsheet available) and core NAP indicators EO5(2) and EO5(3) – see Annex III and points for consideration below.

Development of IND 4

During the May workshop it was proposed to complement this indicator with more information about the WWTP infrastructure such as **design/actual capacity, age, performances over time**, and with the **quality of effluents** (taking into account information on national standards on effluent quality).

Another extension of IND 4 should include the use of non-conventional water resources, e.g. treated wastewater and desalinated water. In the context of IND 4, it would be logical to strengthen the collection of data and information on the extent of **reuse of treated waste water**.

Identified challenges

- As for IND 3, the most logical geographical scope would be the coastal watershed. That would require the reporting of disaggregated data (volume collected; volume treated; quality of effluent; information on wastewater infrastructure) for each WWTP (above a certain capacity) that falls within the coastal watershed.
- In ENP SEIS Phase 1, the data collected for this indicator had a number of gaps. In some countries, the required dataset is not regularly collected. The results of the metadata survey are expected to provide more information on the availability of data.
- Reported data in Phase 1 showed that the volume of treated wastewater follows closely the volume of collected wastewater. This could be explained by the fact that the volume of wastewater collected is estimated based on the volume of wastewater entering the

[3] Tier II: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries.

WWTPs, whereas the volume of wastewater treated is estimated on wastewater leaving the WWTPs. However, this doesn't give a clear picture of the performance of the WWTPs and effectiveness of the wastewater management and treatment.

- Another shortcoming of the indicator is that the fraction of generated wastewater that remains uncollected (and therefore untreated) is not accounted for.

Points considered

- This indicator can be also expressed in terms of population equivalent (p.e.)[4]; an expression of the per capita contribution of wastewater BOD, as compared to the BOD of standard wastewater. Thus the p.e. indicates the number of people who would be responsible for the wastewater that has the same characteristics (e.g. BOD) as standard wastewater. P.e. is a useful index of the strength of wastewater for the purpose of treatment at a municipal WWTP. When compared to volumes, it provides additional information for assessing changes due to wastewater treatment.

- During the May workshop, the quality of WWTP effluents was discussed under IND 5 "Nutrient concentrations in transitional, coastal and marine waters". However, it would be more logical to include it as an extension of IND 4, as part of the information on the effectiveness of the wastewater management and treatment.

Input from Webinar with Countries

- Countries indicated that there is a limitation on **availability of disaggregated** data at the sub-regional level.
- **Jordan**: Pointed out that the proposed additional information under IND4 on WWT infrastructure is a very important addition. Missing an indicator that addresses the emissions from olive mills, an important issue in Jordan and many other Mediterranean countries.
- **Palestine**: Data on WWT Infrastructure (IND4) can be attempted to be collected.

[4] OECD definition of Population equivalent (in waste-water monitoring and treatment): PE refers to the amount of oxygen—demanding substances whose oxygen consumption during biodegradation equals the average oxygen demand of the waste water produced by one person. For practical calculations, it is assumed that one unit equals 54 grams of BOD per 24 hours. p.e.) https://stats.oecd.org/glossary/detail.asp?ID=2086
EC definition: The organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 g of oxygen per day http://ec.europa.eu/environment/water/water-urbanwaste/info/glossary_en.htm

IND 5 - Nutrient concentrations in transitional, coastal and marine waters

Although the main body of water of the Mediterranean is characterized by very low nutrient concentrations, some coastal hotspots receive excessive loads of nutrients from sewage effluents, river fluxes, aquaculture farms, fertilizers, and industrial facilities, resulting into intense eutrophic phenomena with adverse effects for the marine ecosystem and humans. This explains why eutrophication in the Mediterranean is mostly limited to coastal areas, enclosed bays, river estuaries, coastal lagoons or embayments with restricted water exchange with the open sea. Although eutrophication has been more intense in the Northern part of the basin, special attention also has to be paid to the Southern part where the population keeps on growing steadily, agricultural and industrial activities are in rapid development and sewage treatment facilities are still lacking behind.

Links with existing indicators

IND 5 corresponds to the Common Indicator 13. Key nutrients concentration in water column being developed under IMAP as part of Ecologic Objective 5. *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.* Its further development will be streamlined with the development of IMAP indicators.

Development of IND 5

The Workshop participants also proposed to look at **Bathing Water Quality**.

In the Mediterranean region, a number of assessments of the state of microbial pollution have been carried out in collaboration with World Health Organization (e.g. UNEP/WHO 1996 MTS 108; UNEP/MAP-MED POL/WHO 2008 MTS 170). The MAP Technical Reports Series (MTS) no. 108 consolidates and updates all data from 1985-1995 on the state of microbiological pollution of the Mediterranean Sea regarding coastal recreational and shellfish growing areas. Monitoring data were submitted from national MED POL monitoring programmes, MED POL research projects, EC annual reports on bathing waters and other national and international sources. The more recent MTS 170 provides a series of data on microbial pollution in the Mediterranean Sea during the 1996-2006 decade based on the results of compliance monitoring programmes that highlight directly the degree of compliance to the national, Mediterranean or EC legislation. In addition, it shows the trend with respect to compliance monitoring and compares the data with the results of the 1996 report.

The EEA bathing water quality indicator (EEA CSI 022) describes the changes over time in the quality of identified bathing waters (inland and coastal) in EU in terms of compliance with standards for parameters introduced by the EU Bathing Water Directive (76/160/EEC), i.e. microbiological parameters (total coliforms and faecal coliforms) and physicochemical parameters (mineral oils, surface-active substances and phenols), as well as in terms of meeting standards for parameters introduced by the New Bathing Water Directive (2006/7/EC), i.e. microbiological parameters

(intestinal enterococci and *Escherichia coli*). The revised Bathing Water Directive (BWD) of 2006 updated and simplified these rules. It requires Members States to monitor and assess the bathing water for at least two parameters of (faecal) bacteria. In addition, they must inform the public about bathing water quality and beach management, through the so-called bathing water profiles. These profiles contain for instance information on the kind of pollution and sources that affect the quality of the bathing water and are a risk to bathers' health (such as waste water discharges).

The data are expressed in terms of percentage of inland and coastal bathing waters complying with the mandatory values and guide values for microbiological and physicochemical parameters (assessment under the Bathing Water Directive (76/160/EEC) in previous years) and with the mandatory value for *E.coli* and guide values for *E.coli* and intestinal enterococci respectively (assessment during transition period). The data are also expressed in terms of percentage of inland and coastal bathing waters of excellent and at least sufficient quality (assessment under the New Bathing Water Directive (2006/7/EC).

Identified challenges

As identified in IMAP Indicator Assessment Factsheet, the main challenges associated to IND 5 are:

- Criteria for reference condition and boundaries for key nutrients in the water column have to be built and harmonised through the Mediterranean region;
- Coastal Water types for key nutrients in the water column have to be built and harmonised through the Mediterranean region;
- A clear sampling strategy with a simplified approach in monitoring design and data handling needs to be developed.

Points considered

- The data required for an eventual bathing water quality indicator should be available in ENP South countries

Input from Webinar with Countries

- **Israel**: Israel monitors bathing water quality but uses intestinal *enterococci* as main indicator, as they concluded is a better indicator for faecal contamination in marine waters. Available national standards on bathing water quality should be taken into consideration.
- **Jordan:** Data exists for swimming pools and bathing sites.
- **Palestine**: They will consult internally to check regulations and requirements on bathing water quality.
- **Tunisia**: Limitation on data availability for water quality and disaggregation at sub-regional level.

6. Proposed "supporting indicators" on water resource management

Taking into account the enlarged scope of the second phase of H2020 to the whole water area (freshwater and marine), participants of the May workshop pointed out the importance to address water resources with a particular focus on water scarcity/water shortage issues as well as non-conventional water resources (see also section on IND 4).

Several indicators have been identified in existing lists that may be considered in the context of H2020. These include:

1. **Change in water-use efficiency over time (SDG 6.4.1) – Water efficiency index (MSSD 2.2),**
2. **Exploitation index of renewable natural resources (MSSD 2.12)**
3. **Water Exploitation Index+ (EEA CSI 018)**
4. **Level of water stress - freshwater withdrawal as a proportion of available freshwater resources (SDG 6.4.2, SCP 2.1)**

The proposed indicators on water resource management should be considered as "supporting indicators", as a way to distinguish them from the "core" H2020 indicators. Given the core scope of the H2020 Initiative to "Depollute the Mediterranean Sea" and its tight timeframe, it is considered that although the supporting indicators could be used to strengthen the regional assessment, their development will not go as far as that of the core indicators. This implies that no specific specification/assessment sheet will be produced as part of the ENP-SEIS II South project and no reporting on these indicators is expected by the countries under the H2020 Initiative. However, the capacity of the countries to produce these indicators in the future will be assessed and support on their development for the purpose of other reporting obligations/initiatives, will be provided, as necessary.

Methodological details of these indicators are included in Annex I.

Input from Webinar with Countries

- **Tunisia**: Agreement to include water resource indicators, as water scarcity is an important issue for Tunisia. Suggestion to add an indicator on water desalination (non-conventional water sources).

7. Other information

For this sector, participants of the May indicator workshop raised the importance to explicitly introduce **climate change** as a key driver of change.

The aspects of water governance, water pricing, awareness raising and the nexus pollution/public health have also been identified as relevant elements to be further explored and analysed in the

framework of H2020 – in particular in relation with long term investments and post 2020 vision. These aspects will not be addressed using specific H2020 indicators (neither core nor supporting indicators).

8. Evaluation of the adequacy of new indicators

8.1 Selection criteria

A number of selection criteria have been defined to help in the further development of the H2020 Water indicator set and to offer a factual basis for the justification of the selection of new indicators. These are:

1	Be simple, straight-forward, concise, easy to interpret
2	Be issue specific yet relevant to all countries
3	Build on existing indicators process in the region to ensure full use of existing information and data
4	Provide realistic and representative baseline of the current situation
5	Contribute to a balanced DPSIR distribution
6	Provide a comprehensive, yet non-exhaustive coverage of the priority areas
7	Allow for periodic review and update in line with future developments
8	*Is in line with extension of H2020 scope*
9	*Allow for in-depth analysis in relation to previous assessments*
10	*Is able to reflect the effectiveness/impact of new investments*
11	*Is relevant to other regional processes (e.g. EcAP, MSSD)*
12	*To a large extent answers the key H2020 policy question: "What is the progress in depolluting the Mediterranean Sea?"*

Note that criteria 1-7 were used in ENI SEIS I and are now supplemented by 5 additional criteria (8-12) to provide a more comprehensive analysis and assess the added value of new indicators.

The additional indicators discussed above were scored against these criteria:

LEGEND				
Rate	***the extent to which indicator fulfils criterion***			
	Positive/large extent			
	Neutral			
	Negative /low extent			

In the scoring, it was assumed that all criteria carry the same weighting for the sake of simplicity. The scoring is based on 10-5-1 points, corresponding to Green-Yellow-Red categories.

Priority Area	Proposed in relation to H2020 Core Indicator	Indicator/supporting information	1	2	3	4	5	6	7	8	9	10	11	12
Water	IND 4	*WWT Infrastructures (design/actual capacity, age, performance, etc)*												
Water	IND 4	*Volume of (treated) wastewater re-used*												
Water	IND 5	*E. coli (Bathing water quality)*												
Water	IND 4	*Quality of Municipal WWT effluents*												
Water	"Supporting indicators" on water resource management	*E.g. Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1)*												

Priority Area	Proposed in relation to H2020 Core Indicator	Indicator/supporting information	1	2	3	4	5	6	7	8	9	10	11	12	SCORE
Water	IND 4	*WWT Infrastructures (design/actual capacity, age, performance, etc)*	5	10	1	10	5	5	10	5	10	10	1	5	77
Water	IND 4	*Volume of (treated) wastewater re-used*	10	5	1	10	5	10	10	10	10	5	1	1	78
Water	IND 5	*E. coli (Bathing water quality)*	10	10	5	5	10	5	10	5	10	10	5	10	95
Water	IND 4	*Quality of Municipal WWT effluents*	5	10	5	10	10	5	10	5	10	10	10	10	100
Water	"Supporting indicators" on water resource management	*E.g. Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1)*	5	10	10	10	5	1	5	10	10	1	10	1	78

8.2 DPSIR distribution

Criterion 5: *Contribute to a balanced DPSIR distribution* is based on the mapping of the indicators (core and additional ones) according to their indicator types (DPSIR). This mapping shows that the core water indicators are mainly Response indicators, implying that proposed Pressure/State/Impact water indicators are favourably scored (green). Note that the allocation of indicators to DPSIR framework was approached from the perspective and objectives of H2020 Initiative. This can be subject to discussion and other interpretation, especially if applied to another context e.g. management of freshwater resources.

				DPSIR Framework				
		Indicator	Sub-Indicator/ Suporting information	**Driver**	**Pressure**	**State**	**Impact**	**Response**
H2020 CORE INDICATORS								
Water	IND 3	Share of total, urban and rural population with access to an improved sanitation system						
Water	IND 4	Volume of wastewater collected, of which volume of wastewater treated						
Water	IND 4	Volume of wastewater collected, of which volume of wastewater treated	Type of treatment					
Water	IND 5	Nutrient concentrations in transitional, coastal and marine waters						
NEW INDICATORS				"x" - contributing to a balanced distriution across DPSIR				
Water	*IND 4*	Volume of wastewater collected, of which volume of wastewater treated	*WWT Infrastructures (design/actual capacity, age, performance, etc)*					
	IND 4	Volume of wastewater collected, of which volume of wastewater treated	*Volume of (treated) wastewater re-used*					
Water	*IND 5*	Bathing Water Quality	*E.g. Faecal coliforms*			x	x	
Water	*IND 4*	Quality of effluents from Municipal WWTPs	*Nutrients from Municipal WWT effluents*		x			
Water	*Supporting Indicators*	Water Resource Management	Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1)	x	x			

9. Consolidation of the proposed list of water indicators for SEIS Phase II

Based on the input received from the countries during the May workshop and Water webinar, it is proposed to organize the Water indicators as follows:

WATER	"Meta-Indicator " / Policy Theme	Indicator
IND 3	***Access to Sanitation***	**3.1** Share of total, urban and rural population with access to an improved sanitation system and proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
IND 4	***Municipal Wastewater Management***	**4.1** Volume of municipal wastewater produced **4.2** Volume of wastewater collected, of which volume of wastewater treated Additional information: • Wastewater Treatment Infrastructure (design/actual capacity, age, performance over time); • Type of Treatment (primary, secondary, tertiary); • Quality of Effluent (BOD5 and/or nutrients) **4.3** Volume of (treated) wastewater re-used
IND 5	***Coastal and Marine Water Quality***	**5.1** Nutrient concentrations in transitional, coastal and marine waters **5.2** Bathing Water Quality e.g. Enterococci
Supporting Indicators **(new in Phase II)**	***Freshwater resource management***	Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1) Specifically for the Use of non-conventional sources of water: Volume of seawater desalinised

- **Access to Sanitation**: The previous Indicator (*Share of total, urban and rural population with access to an improved sanitation system*) will be complemented by the new SDG 6.2.1 Indicator (*Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water*)
- **Municipal Wastewater Management**: will be extended to include indicators that reflect not only the input and output of WWTPs but also production and re-use of wastewater (production, collection, treatment and re-use). Elements on WWTP infrastructure and quality of effluents will complement the Indicators.
- **Coastal and Marine Water Quality**: will be complemented by bathing water quality of coastal waters, as a "State" or even "Impact" indicator, if considered from recreation/coastal tourism perspective.
- "Supporting Indicators" [5] on **freshwater resource management**, following the extension of the H2020 scope to include freshwater systems. A few indicators from ongoing initiatives already exist that can be taken into consideration.

[5] Previously referred to as "Satellite Indicators"

Annex I – Methodological Details of Proposed "Supporting Indicators"

1. **Change in water-use efficiency over time (SDG 6.4.1) – Water efficiency index (MSSD 2.2)**

6.4.1 Change in water-use efficiency over time: Classified by SDG process as Tier III[6] for which no metadata file is yet available.

Water efficiency index (MSSD 2.2): MSSD factsheet_Water Efficiency Index and PEGASO Water Efficiency Index methodological factsheet.

This index allows the monitoring of progress in terms of the water saved as a result of the demand to reduce the water loss and wastage during the process of both the transport and the use. It is subdivided into total and sectoral efficiency (drinking water, agriculture and industry).

2. **Exploitation index of renewable natural resources (MSSD 2.12)**

Although this indicator is an MSSD indicator, no indicator factsheet is yet available under the revised MSSD. *This implies that either the indicator is still under development and may be modified, adapted or replaced as necessary.* According to 2006 MSSD Factsheet, this indicator measures the relative pressure of annual abstraction (A) over traditional renewable natural drinking water resources (R).

(A / R) x 100

A: Amount of annual traditional renewable natural water volumes consumed for all other purposes, including volume losses during transport ;

R: Annual traditional renewable natural water flow volume. Country resources are individually defined by surface run-off and underground flows, either formed or entering the territory. Volumes are measured on the basis of hydrological data, in reference to average values over sufficiently long periods to ensure stability, and to avoid double accounting of surface and underground water.

The renewable resources exploitation index can sometimes exceed 100%.

3. **Water Exploitation Index+ (EEA CSI 018)**

The WEI+ is a water **scarcity** indicator that provides information on the level of pressure that human activity exerts on the natural water resources of a particular territory. This helps to identify those areas prone to water stress problems. The purpose of implementing the WEI+ at spatial (e.g. sub-basin or river basin) and temporal (monthly or seasonal) scales, which are finer than the annual average at the country scale, is to better capture the balance between renewable water resources and water use. A

[6] Tier III: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested

detailed specification and assessment factsheet for WEI+ in Europe (EEA CSI 018) is available. Note that WEI+ differs from the previous WEI approach by enabling the depiction of more seasonal and regional aspects of water stress conditions across Europe.

The regionalised WEI+ is calculated according to the following formula:

WEI+ = (abstractions – returns)/renewable water resources.

Renewable water resources are calculated as 'ExIn + P – Eta – ΔS' for natural and semi-natural areas, and as 'outflow + (abstraction – return) – ΔS' for densely populated areas.

Where: ExIn = external inflow; P = precipitation; ETa = actual evapotranspiration; ΔS = change in storage (lakes and reservoirs); outflow = outflow to the downstream/Sea.

It is assumed that there are no pristine or semi-natural river basin districts or sub-basins in Europe. Therefore, the formula 'outflow + (abstraction – return) – ΔS' is used to estimate renewable water resources.

The WEI+ is part of the set of water indicators published by several international organisations, such as the United Nations Environment Programme (UNEP), the Organisation for Economic Co-operation and Development (OECD), Eurostat and the Mediterranean Blue Plan. There is an international consensus about the use of this indicator.

Once water asset accounts are implemented according to the United Nations System of Environmental Accounting Framework for Water (2012), the necessary parameters for calculating water use and renewable freshwater water resources are harvested

4. **Level of water stress - freshwater withdrawal as a proportion of available freshwater resources (SDG 6.4.2, SCP 2.1).**

This SDG indicator measures the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after taking into account environmental water requirements. Main sectors, as defined by ISIC standards, include agriculture; forestry and fishing; manufacturing; electricity industry; and services. This indicator is also known as **water withdrawal intensity** (SDG 6.4.2 Metadata-06-04-02). According to the SDG classification, it is classified as Tier II.

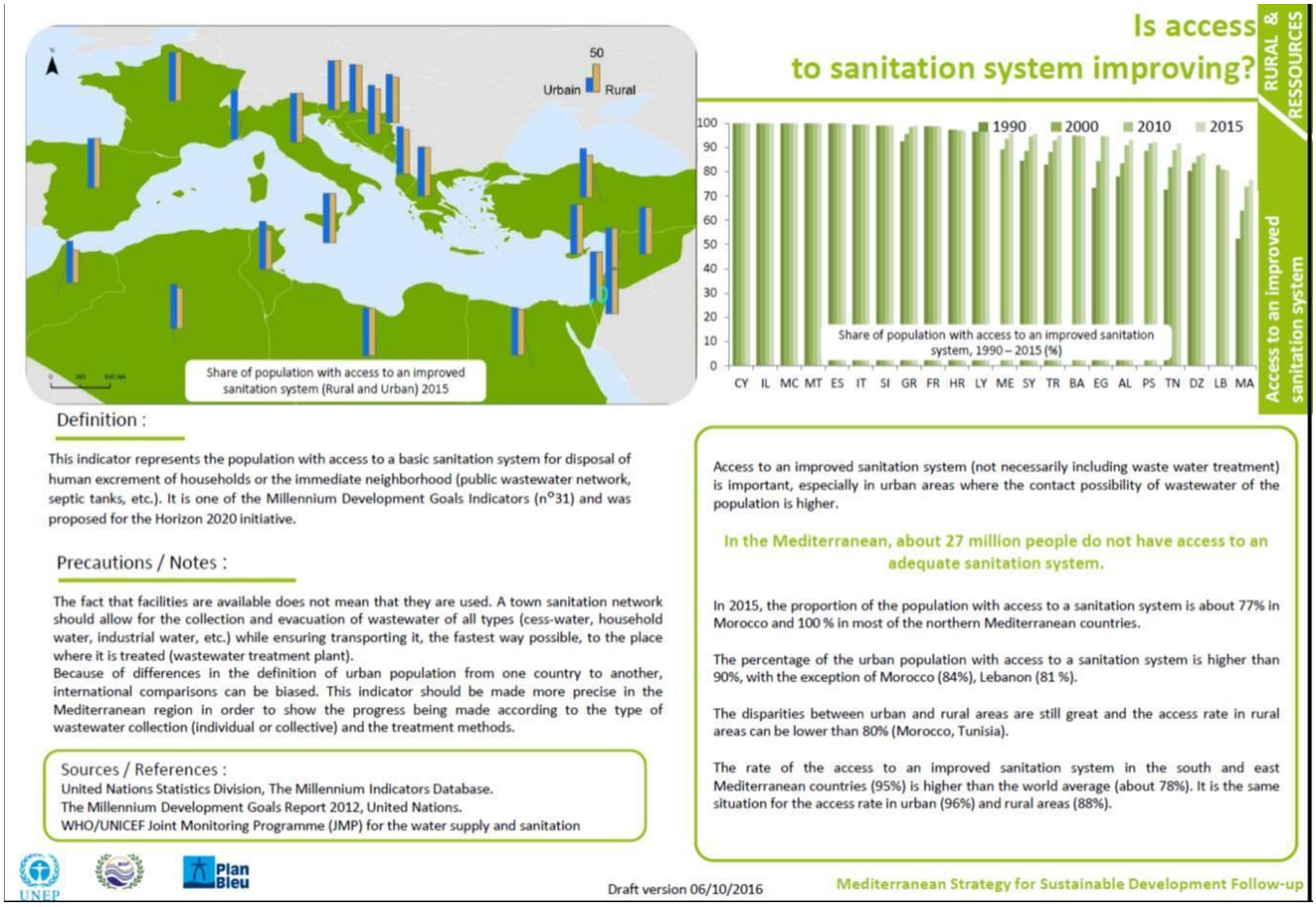
Total freshwater withdrawal (TWW) is the volume of freshwater extracted from its source (rivers, lakes, aquifers) for agriculture, industries and municipalities. It is estimated at the country level for the following three main sectors: agriculture, municipalities (including domestic water withdrawal) and industries. Freshwater withdrawal includes primary freshwater (not withdrawn before), secondary freshwater (previously withdrawn and returned to rivers and groundwater, such as discharged wastewater and agricultural drainage water) and fossil groundwater. It does not include non-

conventional water, i.e. direct use of treated wastewater, direct use of agricultural drainage water and desalinated water. TWW is in general calculated as being the sum of total water withdrawal by sector minus direct use of wastewater, direct use of agricultural drainage water and use of desalinated water.

Total renewable freshwater resources (TRWR) are expressed as the sum of internal and external renewable water resources. The terms “water resources” and “water withdrawal” are understood here as freshwater resources and freshwater withdrawal. Internal renewable water resources are defined as the long-term average annual flow of rivers and recharge of groundwater for a given country generated from endogenous precipitation. External renewable water resources refer to the flows of water entering the country, taking into consideration the quantity of flows reserved to upstream and downstream countries through agreements or treaties.

Environmental water requirements (Env.) are the quantities of water required to sustain freshwater and estuarine ecosystems.

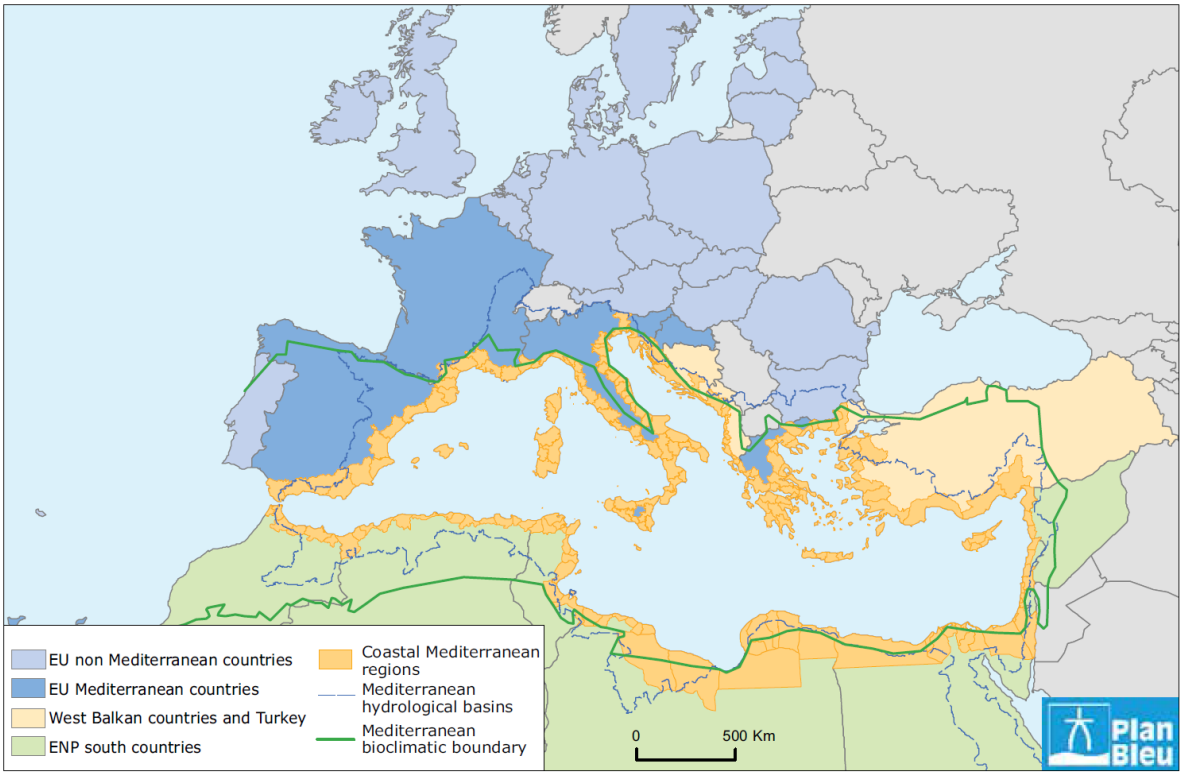
Annex II – MSSD Indicator 2.14 Factsheet



Annex III – List of proposed core NAPs indicators under EO5

EO	Proposed core NAPs indicators	NAPs Update Guideline Indicator /H2002 Ref. No	IMAP Indicator Ref. No	SDG Indicator Ref. No	Common priority measures
EO5	1. Share of population with access to an improved sanitation system (total, urban, rural)	WW01		6.2.1	Build/ extend sewage networks
	2. Volume of wastewater collected, of which volume of wastewater treated(in population equivalent)	WW02			
	3. Wastewater treated (in population equivalent)	WW03		6.3.1	Build/ expand/ upgrade municipal wastewater treatment plants
	4. Total loads of BOD5, Total nitrogen, Total phosphorus discharged to the Mediterranean Sea from urban wastewater treatment	WW05			
	5. Concentration of key nutrients in the water column	WW06	13 (5.1.1)		

Annex IV – Coastal hydrological basins draining into the Mediterranean Sea



ANNEX 3 – H2020 - Industrial Emissions Indicators

Methodology and proposal for development of an updated set of H2020 industrial emissions indicators

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1. Background

The final declaration of the UfM Ministerial meeting on Environment and Climate Change, held in Athens on 13 May 2014, undertook to address outstanding data needs by applying the principles of Shared Environment Information Systems (SEIS) in line with the commitments under the Ecosystem Approach (EcAp) Decision of the Barcelona Convention, also contributing to its regional integrated monitoring programme. On this basis, and further to the strategic orientations given at the 2014 Ministerial in Athens, a work programme for the H2020 second phase has been developed and approved by the H2020 Steering Group meeting held in Barcelona on 17 December 2014. Within this work programme, the envisaged activities of the Review and Monitoring (RM) component, co-chaired by EEA and UNEP/MAP, are organised around the following four key objectives:

1. To enhance optimal national information systems allowing for systemic production of indicator-based reporting and sharing of data;
2. To expand the existing H2020 priorities with a particular focus on water, solid waste and industrial emissions, identify and address additional priority areas;
3. To ensure the sustainability of the governance setup of the H2020 review processes;
4. To encourage the integration of outcome of the H2020 review in the policy making process at regional and national level.

In order to support the work of the H2020 RM group, an ENI South Support Mechanism, funded by the EU, was established. The support mechanism is intended to ensure proper linkages with the agreed work programme of H2020 for the second phase of work (2015-2020). The review and monitoring component of the work programme for 2015-2020 anticipates the preparation of the second indicator-based H2020 assessment report by April 2019.

In this document, we present the conceptual approach for developing an updated set of indicators building-up on the current H2020 industrial emissions indicator (IND 6) identified in phase I of the ENI SEIS project. This is followed by a proposed set of updated indicators for monitoring impacts of industrial emissions on the Mediterranean marine environment.

2. Conceptual approach for elaborating industrial emissions indicators

The updated set of industrial emission indicators has to provide a snap shot of the achievements of existing initiatives for pollution prevention and control, and the on-going interventions for addressing key environmental issues affecting the Mediterranean marine environment. For that purpose, four key aspects are considered for the indicators:

- Complementarity to existing indicators established by initiatives and programmes such as IMAP, NAP, Regional Seas, MSSD, SCP, SDG, SCP, etc.;

- Fulfilment of the requirements stipulated in the legally binding decisions adopted under Article 15 of the LBS Protocol of the Barcelona Convention;
- Relationship to planned operational targets and investment measures included in the updated NAPs of the Mediterranean countries; and
- Linkage to key environmental issues identified in the updated list of hotspots (2015).

In order to analyse each of the aforementioned aspects, the following key points are assessed:

- Survey of existing indicators from Regional Seas Programme (RS),[1] IMAP, NAP, SCP and particularly from MSSD and SDG, and determination of where synergies exist for the updated set of H2020 industrial emissions indicators.
- Survey of relevant monitoring and reporting requirements of ECAP decisions and legally binding regional plans under the LBS Protocol of the Barcelona Convention.
- Review of common operational targets; priority investment measures; efficiency and effectiveness of current institutional and legal frameworks; and status of updated hotspots in 2015 as specified in the updated NAPs of the Mediterranean Countries.

Based on the results of the aforementioned assessment, the key issues to be addressed in the updated industrial emissions indicators are identified, and a list is formulated as a proposal for further discussion and approval by the Countries.

3. Survey of existing indicators from other programmes and initiatives

A close examination of the "existing indicators" from the Regional Seas Programme,[1] H2020, IMAP, NAP, MSSD and SDG yielded the categorization of these indicators into "state", "pressure" and "response" indicators. These are tabulated below:

"State" indicators related to industrial emissions	
Trends for selected priority chemicals including POPs and heavy metals	Regional seas, MED POL,
Concentration of status of selected pollutant contamination in biota and sediments and temporal trends	Regional seas, MED POL, IMAP
Number of pollution hotspots	Regional seas, NAP
Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood	IMAP
Concentration of key harmful contaminants in the relevant matrix (biota, sediment, seawater)	NAP, MED POL
Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution	IMAP
Share of contaminated sites with toxic, persistent and liable to accumulate substances in the coastal area which have been closed/remediated including spills from industrial accidents	NAP

[1] The Governing Council of the United Nations Environment Programme endorsed the regional approach to controlling marine pollution several times before UNEP brought together a task force of scientists and officials to shape a Plan of Action for the Mediterranean, adopted in its final form in Barcelona in February 1975. Since then, 143 countries participate in 18 Regional Seas Conventions and Action Plans; one of which is the Mediterranean. http://www.unep.org/regionalseas/

"Pressure and response" indicators related to industrial emissions	
Waste generated and treated by type of waste and treatment type	MSSD
The amount of hazardous wastes environmentally soundly managed or exported by Y categories and by disposal/recovery operation (D-disposal, R- recovery, as well as treated in waste to energy facilities)	NAP
Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	NAP, MAP reporting system
Hazardous wastes generated per capita and proportion of hazardous wastes treated, by type of treatment	SDG, MAP reporting system
Release of toxic substances and nutrients from industrial sectors	H2020, NAP
Number of substances covered by national standards (ELV), for point source discharges into water or air	NAP

Based on the above tabulated indicators, it is inferred that:

- "State" indicators deal with concentrations of pollutants, trends, levels, occurrence, origin, etc. These are addressed principally by H2020/NAP, IMAP and the Regional Seas Programme.
- "Pressure" indicators deal with amounts and quantities of generated wastes, release of toxic substances, etc. These are addressed mainly by MSSD, H2020/NAP and SDG.
- "Response" indicators deal with the amounts of treated wastes and type of treatment, in addition to existing legal frameworks. These are addressed principally by MSSD, H2020/NAP, and SDG.

Therefore, it is concluded that:

- There is a good set of indicators addressing marine pollution "state" under the MAP system. Hence, these can be considered as complementary to any updated set of indicators to be developed.
- The present indicator addressing the "release of toxic substances and nutrients" under the current H2020 initiative does provide the necessary data and information on "pressures" impacting the Mediterranean marine environment. Therefore, this indicator provides the necessary framework for selecting priority substances reflected in the legally binding decisions for developing this indicator.
- The indicators related to "response" measures, particularly the MSSD and SDG indicators, are limited only to treatment of generated wastes and related quantities. Expanding on the scope of these indicators to cover other areas of response is needed, particularly in relation to pollution prevention and control measures. In that respect, it is emphasized that the SDG indicators are to be regarded as the main drivers for updating the scope of the industrial emissions indicators. SDG indicators are a measure of the strength of economic activities which represent at the same time the drivers of pollution generation and environmental pressures on the marine and coastal ecosystems. As these economic activities contribute to the wealth of the Mediterranean countries and to the social well-being of its people, both of which constitute two of the three pillars of sustainable development, it is anticipated that the updated indicators should lead to an effective monitoring process capturing the principle of sustainable development, while promoting at the same time the creation of functional synergies among all stakeholders.

a) Survey of requirements of the legally binding decisions

Relevant legally binding decisions on industrial emissions under the UNEP/MAP system include the following:

- Decision IG.19/8: Regional plan on the elimination of Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Mirex and Toxaphene
- Decision IG.19/9: Regional plan on the phasing out of DDT.
- Decision IG.20/8.1: Regional plan on the reduction of inputs of Mercury
- Decision IG.20/8.2: Regional plan on the reduction of BOD_5 in the food sector
- Decision IG.20/8.3: Regional Plan on the elimination of Alpha hexachlorocyclohexane; Beta hexachlorocyclohexane; Hexabromobiphenyl; Chlordecone; Pentachlorobenzene; Tetrabromodiphenyl ether and Pentabromodiphenyl ether; Hexabromodiphenyl ether and Heptabromodiphenyl ether; Lindane; Endosulfan, Perfluorooctane sulfonic acid, its salts and perfluorooactane sulfonyl fluoride

As can be inferred, the key pollutants addressed by these decisions include persistent organic pollutants (POPs), mercury, and BOD_5 from the food sector. The requirements and commitments stipulated in these decisions can be classified into two groups:

- Requirements entailing the establishment of institutional structures and legal frameworks by the Countries in order to ensure that:
    - BOD related discharges into water are monitored.
    - Releases of mercury into water, air and soil from all activities are monitored.
    - National ELVs for mercury emissions from other than Chlor-Alkali industry are adopted.
    - Metallic mercury is prohibited from re-entry into market.
    - Import and export of POPs/DDT (unless under special provisions) are prohibited.
    - Stock piles consisting of POPs are identified to the extent practicable.
- Requirements entailing the implementation of pollution prevention and control measures to ensure that:
    - Inputs of mercury emissions from all sectors are reduced.
    - Mercury containing wastes are isolated and contained to avoid potential contamination of air, soil or water.
    - Total releases of mercury (to the air, the water and to the products) from existing Chlor-alkali plants are progressively reduced until their final cessation.
    - Environmentally sound management of metallic mercury from decommissioned plants is achieved.
    - Inputs of POPs into the marine environment are eliminated.
    - Wastes of POPs/DDT are handled, collected, transported and stored in environmentally sound manner.
    - POPs/DDT are disposed such that the persistent organic pollutant content is destroyed or irreversibly transformed.

Accordingly, it is concluded that the updated set of indicators should provide data and information on:

- The ability of countries to establish necessary institutional structures and legal frameworks for enforcement of measures for pollution prevention and control; and

- The nature of environmental management measures implemented by industrial facilities for pollution prevention and control with the aim of informing H2020 on the required investment measures for funding and support.

b) Survey of countries' environmental priorities

Priorities for reducing impacts on the Mediterranean marine environment have been identified by the Countries in the updated NAPs with respect to:

- Operational targets to meet deadlines set by SAP-MED/ legally binding requirements;
- Priority investment measures;
- Change in status of pollution hotspots from 2002 to 2015, and key environmental issues; and
- Abilities of the existing institutional and legal structures in the Countries to meet the legally binding requirements.

Regarding the operational targets, two common targets were identified by at least seven Mediterranean countries as follows:[2]

- Reduce by XX% of BOD discharged to water bodies
- Reduce discharge of hazardous substances from industrial plants (apply BAT/BEP) by XX% or dispose in a safe manner.

Regarding priority investment measures, three common measures were identified by at least seven countries as follows:[2]

- Build/ expand/ upgrade industrial wastewater treatment plants;
- Build/ expand/ upgrade hazardous waste landfill facility; and
- Remediate contaminated industrial sites.

Concerning status of pollution hotspots, the Mediterranean Sea registered 120 pollution hotspots in 2002 spread across 18 countries. In 2015, this number had dropped to 28 hotspots and 40 high risk areas. Principal industrial pollutants identified in the updated hotspots are nutrients for southern countries; phosphogypsum and hazardous wastes in Tunisia; highly toxic chemicals in Israel, heavy metals, POPs and PAHs in the Balkans. In response to this situation, 117 projects have been either planned or under implementation across the Mediterranean in order to control industrial emissions and prevent their adverse impacts on the environment.[3]

Regarding capacities of the current institutional and legal structures in the countries, the "mid-term evaluation of SAP/NAP implementation" indicates that over 85 percent of national laws address requirements for monitoring, permitting, inspection and application of sanctions; however, supporting institutional structures for enforcement of permitting and compliance are only found in two thirds of the countries.

Accordingly, it is concluded that the updated indicators should provide data and information on:

- The extent to which countries have built/ expanded/ upgraded industrial wastewater treatment plants;

[2] Synopsis of updated NAPs: Hotspots, sensitive areas, targets, measures, indicators and investment portfolios. UNEP(DEPI)/MED WG.426/3 (2016)

[3] According to UfM's database on "Pollution Reduction Projects' Regional Selection Tool." http://ufm.net.mytempweb.net/WasteWaterProjects.aspx

- Status of pollution hotspots with special focus on hazardous waste landfill facilities and contaminated sites; and
- Capacities of the current institutional and legal structures.

with the aim of informing H2020 on the type of measures to be funded for reducing impacts of industrial emissions on the Mediterranean marine environment.

4. Proposed set of updated H2020 industrial emissions indicators

The development of an updated set of indicators that serves to inform H2020 on the necessary measures to be funded for reducing impacts of industrial emissions on the Mediterranean marine environment should take into consideration the following issues:

- The scope of existing "status" indicators is sufficiently covered under the MAP system (IMAP). However, there is a need to consider the status of pollution hotspots with special focus on hazardous waste landfill facilities and contaminated sites.
- The scope of "pressure" indicators is sufficiently covered under the current H2020 indicator addressing the "release of toxic substances and nutrients". The current indicator aggregates various priority pollutants identified in SAP-MED and the legally binding decisions. It also covers those identified in the updated hotspots, particularly nutrients and toxic substances.
- The scope of existing "response" indicators can be expanded to cover not only treatment of generated wastes and related quantities, but also preventive environmental management measures implemented by industrial facilities including the building/ expansion/ upgrading of industrial wastewater treatment plants.
- Finally, additional indicator(s) can be formulated for informing about the capacities of the current institutional structures and legal frameworks in the Countries for handling data collection and enforcement of implementation of measures for pollution prevention.

By taking into account the aforementioned issues, we propose below an updated set of H2020 industrial emissions indicators that complement existing indicators, particularly SDG; address the requirements of the legally binding decisions; are in line with operational targets and priority investment measures identified by Countries; and can be associated with key environmental issues identified in the updated hotspots.

No.	Title of indicator
IND 6-1	Release of nutrients from industrial sectors *[pressure indicator]*
IND 6-2	Release of toxic substances from industrial sectors *[pressure indicator]*
IND 6-3	Per capita hazardous wastes treated/ recovered/ disposed in hazardous waste facilities *[response indicator]*
IND 6-4	Share of implemented environmentally sound management initiatives for upgrading industrial installations and remediating contaminated sites *[response indicator]*
IND 6-5	Share of enforced Emission Limit Values (ELV) to those adopted in national regulations for priority substances impacting the Mediterranean marine environment *[response indicator]*

The five aforementioned indicators address the release of priority substances identified in legally binding regional plans and SAP-MED provisions which impact the Mediterranean marine environment. They also focus on priority measures implemented by Countries for pollution prevention and control, in addition to assessing the effectiveness and efficiency of the implemented measures in terms of treatment capacity, ability to recover and dispose of hazardous wastes. The indicators finally touch on specific aspects related to capacities of existing institutional and legal structures of Countries in enforcing the implementation of pollution prevention and control measures. The indicators establish the necessary framework for informing on H2020 progress (and post 2020 horizon); and for highlighting the necessary pollution prevention and control measures to reduce adverse impacts of industrial emissions on the Mediterranean marine environment.

ANNEX

Preliminary Indicators Fact Sheets

A preliminary version of the fact sheets for the aforementioned indicators is included in the Annex. As the indicators are still under review, information provided is limited to key points found in a typical fact sheet. This includes justification for indicator selection; definition of indicator; policy context and targets; and methodology for calculation of the indicator.

Industrial Emissions Indicator IND 6.1:
Release of nutrients from industrial sectors

Rationale

Justification for indicator selection

This indicator represents the emissions from industrial sources from individual facilities within the Mediterranean coastal zone with regard to nutrients. It is a pressure indicator.

The main reason for selection of nutrients is due to the effects of nutrients on the marine environment. This is manifested by enhanced productivity which these can result in changes in species diversity, excessive algal growth, dissolved oxygen reductions and associated fish kills and, it is suspected, the increased prevalence or frequency of toxic and other species algal blooms. This process is linked to the "eutrophication" phenomena.

Eutrophication can result from an augmentation of nutrient inputs to coastal and marine areas as a consequence of human activities. Marine eutrophication is mainly an inshore problem that affects lagoons, harbours, estuaries and coastal areas which are adjacent to river mouths of highly populated river basins and/or which receive sewage from coastal cities.

Indicator definition

Nutrients

The main anthropogenic sources of nutrients are: municipal sewage; industrial wastewater; agriculture; and atmospheric emissions. Of concern are biodegradable organic matter (BOD) of industrial wastewater effluents discharged from the food sector, Total Nitrogen (TN) and Total Phosphorus (TP) from agricultural effluents collected by the hydrologic network in the coastal zone of the Mediterranean Sea.

(1) BOD: This indicator presents information on the BOD estimate of industrial wastewater effluents discharged from food sector industries listed in Appendix I of Decision IG.20/8.2 within the hydrological basin discharging directly or indirectly into the Mediterranean Sea.

(2) Total nitrogen (TN): This indicator comprises the ions nitrate, nitrite and ammonium in the dissolved phase (DIN) and the organic forms of nitrogen (mostly proteins and other N-containing substances) existing in biota and other particulate materials (PON) and in dissolved organic matter (DON).

(3) Total phosphorus (TP): This indicator comprises the dissolved ion phosphate and the organic forms of phosphorus existing in biota and other particulate materials (POP) and in dissolved organic matter (DOP).

The principal contributors to BOD discharges from industrial sources are manufacturers of food and beverages including slaughtering, preparing and preserving meat; manufacture of dairy products; canning and preserving of fruit and vegetables; canning, preserving and processing of fish, crustaceans and similar foods; manufacture of vegetable oils and fats; sugar factories and refineries; distillation; wine production and beer manufacturers.

The nutrient load from agriculture, mainly intensive agriculture, represents a high proportion of the total anthropogenic load of nutrients to the coastal zones. Intensive agriculture, which encompasses high crop production or high density animal husbandry, can be a major contributor to nutrients due either to the use of large quantities of fertilizers, or the production of high amounts of solid and liquid manure by farm animals. Intensive aquaculture can also be a source of nutrients through dispersion of food and excretions from the organisms.

Units

BOD pollution load indicator may be reported to population-equivalent and measured as Biological Oxygen Demand (BOD) load per year.

Policy context and targets

Policy context description

In 1999 the parties to the Barcelona Convention adopted a Strategic Action Programme to Address Pollution from Land-Based Activities (SAP-MED). SAP-MED identified categories of pollutants and activities to be eliminated or controlled by the Mediterranean countries by 2025. In this context, countries have prepared inventories of all pollution sources on their coasts called the National Baseline Budget of emissions and releases (NBBs), as well as National Action Plans (NAPs) describing the policies and investments that each country intends to undertake to reduce pollution from identified "pollution hotspots." SAP-MED includes special provisions on nutrients and suspended solids.

The Horizon 2020 Initiative, which aims to reduce the pollution of the Mediterranean Sea by 2020, recognizes industrial emissions as one of the three priority areas causing major pollution in the Mediterranean Sea.

The UN Global Programme of Action for the Protection of the Marine Environment against Land-Based Activities and the Convention for the Protection of the Mediterranean Sea against Pollution have identified contaminants or groups of contaminants whose dumping or land-based discharges are prohibited or limited (Barcelona Convention and Protocols). In particular, the Strategic Action Programme, adopted by the Contracting Parties to the Barcelona Convention in 1997 contains several obligations for the countries to reduce pollution from different sectors and substances, including nutrients.

In 2012, the Contracting parties adopted the Regional Plan on the reduction of BOD5 in the food sector in the framework of the implementation of Article 15 of the LBS Protocol.

Targets

Several regional targets with regard to nutrients are defined in the framework of SAP-MED and related Regional Plans to be achieved by 2010 and 2025. The agreed targets may be also reviewed in the framework of UNEP/MAP Ecosystem approach roadmap implementation in synergy with EU Marine Strategy (MSFD) Directives. H2020 is also providing for de-pollution of the Mediterranean by 2020.

Methodology

Methodology for indicator calculation

There are three possible methodologies for calculating this indicator. These are:

1. Emissions factors
2. Field measurements
3. Modelling

The most commonly used method is based on emission factors.

Emission factor definition (as given by EPA): An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant. Such factors facilitate estimation of emissions from various sources of air pollution. In most cases,

these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average).

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

Where:

E = emissions;
A = activity rate;
EF = emission factor, and
ER =overall emission reduction efficiency (%).

Description of data

Annual load per pollutant per administrative region.

Geographical coverage

Administrative regions of the whole Mediterranean sea watershed.

Temporal coverage

Three data series are available: 2003, 2008 and 2015.

Basis for aggregation

Due to the very complex nature of this indicator, the only possible aggregation is per substance (measured in the same phase) at the national level or at the coastal hydrological basin.

Trend analysis:

Can be performed based on the three data series in 2003, 2008 and 2015 for a limited number of substances and only in some countries.

Industrial Emissions Indicator IND 6.2:
Release of toxic substances from industrial sectors

Rationale

Justification for indicator selection

This indicator represents the emissions from industrial sources from individual facilities within the Mediterranean coastal zone with regard to substances that are toxic, persistent and liable to bioaccumulate and from organohalogenated compounds. It is a pressure indicator.

The main reason for selection of toxic substances is due to the fact that industrial development in the Mediterranean countries varies greatly from one country to another. From the thirty sectors of activity primarily considered in the Annex I of the LBS Protocol, twenty-one are industrial.

Furthermore, most countries in the region have an important public industrial sector which is composed of large industries including energy production; oil refineries; petrochemicals; basic iron and steel metallurgy; basic aluminum metallurgy; fertilizer production; paper and paper pulp; and cement production.

On the international level, priority has been given to toxic, persistent and bioaccumulable pollutants for their effects on human health, biodiversity and the preservation of ecosystems and long-term and long-distance effects.

All of these pollutants are generated in large quantities by industries and their discharge into the environment can cause damage to human health, ecosystems, habitats and biodiversity.

Indicator definition

Toxic substances

Substances that are toxic, persistent and liable to bioaccumulate include organic and inorganic substances. The former are called "Persistent Organic Pollutants" (POPs), and the latter consist of some heavy metals (Hg, Cd and Pb) and some organometallic compounds.

(1) POPs: This indicator presents information on organic compounds from natural or anthropogenic origins that possess toxic properties, resist physical, chemical and biological degradation, bioaccumulate in high concentrations through the food web, and are transported through air, water and migratory species. POPs can be divided into three groups:

i. Pesticides including Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Mirex and Toxaphene included in Decision IG. 19/8, and DDT covered by Decision IG. 19/9.

ii. Industrial chemicals including Alpha hexachlorocyclohexane; Beta hexachlorocyclohexane; Hexabromobiphenyl; Chlordecone; Pentachlorobenzene; Tetrabromodiphenyl ether and Pentabromodiphenyl ether; Hexabromodiphenyl ether and Heptabromodiphenyl ether; Lindane; Endosulfan, Perfluorooctane sulfonic acid, its salts and perfluorooactane sulfonyl fluoride covered under Decision IG. 20/8.3, in addition to PCB.

iii. Unwanted chemicals: including Hexachlorobenzene, dioxins and furans (PCDD, PCDF).

Successive releases of these chemicals over time will result in the continued accumulation and ubiquitous presence of POPs in the global environment. Their high persistence poses a risk of causing adverse effects to the environment and human health. The primary transport routes of POPs into the marine and costal environment include atmospheric deposition and surface run-off.

(2) Heavy metals: This indicator presents information on heavy metal annual emissions reported from point sources in the Mediterranean Sea area (land based sources/coastal zone discharged to air or water). These include:

- **Mercury**. The most important industrial sources of mercury are combustion of coal in power plants; chlor/alkali production; manufacture and disposal of batteries; waste incineration and roasting and smelting in non-ferrous metal smelters.
- **Cadmium**. The most important industrial sources of cadmium are zinc and lead metal processing; electroplating; the production of cadmium compounds; pigment production; the manufacture and disposal of batteries; the production of stabilizers for plastics and phosphate fertilizers.
- **Lead**. The most important industrial sources of lead are lead metallurgy; the manufacture and disposal of batteries; additives for petrol; enamels and ceramic glazes and glass manufacture.

Mercury, cadmium and lead reach the environment through liquid discharges and atmospheric emissions.

Mercury is covered by the legally binding Decision IG.20/8.1, while Chromium, Lead, Cadmium and Zinc are included under the provisions of the SAP-MED.

Organohalogen compounds

Organohalogen compounds consist of a wide group of organic substances with different levels of chloration, and a very diverse uses, from plastics to pesticides. The following organohalogen compounds have negative environmental effects which require their reduction, control and monitoring.

(1) Halogenated aliphatic hydrocarbons: This indicator presents information on chlorinated solvents which are commercially produced in large quantities; the most commonly used solvents are dichloromethane (methylene chloride); 1,1,1-trichloroethane; trichloroethylene; and tetrachloroethylene (perchloroethylene).

(2) Halogenated aromatic hydrocarbons: This indicator presents information on chlorobenzenes, polychlorinated naphtalenes (PCNs), polybrominated diphenyl ethers and polybrominated biphenyls; which are used as solvents and flame retardants.

(3) Chlorinated phenolic compounds. This indicator presents information on Chlorophenolic compounds which consist of chlorinated aromatic substances. The acidic character of these compounds influences their behavior in the aquatic environment. Chlorophenols, and mainly pentachlorophenol, have been used extensively as pesticides (mainly fungicides and bactericides) in wood protection.

(4) Organohalogenated pesticides: This indicator presents information on organohalogenated compounds which are used principally as pesticides. All these compounds have some toxic characteristics and some of them can disrupt the endocrine systems of humans and wildlife.

Organohalogen compounds are all addressed under the provisions of the SAP-MED.

Units

Toxic substances indicators may be reported in kg (TEQ) emissions per year per contaminant

Policy context and targets

Policy context description

In 1999 the parties to the Barcelona Convention adopted a Strategic Action Programme to Address Pollution from Land-Based Activities (SAP-MED). SAP-MED identified categories of pollutants and activities to be eliminated or controlled by the Mediterranean countries by 2025. In this context, countries have prepared inventories of all pollution sources on their coasts called the National Baseline Budget of emissions and releases (NBBs), as well as National Action Plans (NAPs) describing the policies and investments that each country intends to undertake to reduce pollution from identified "pollution hotspots." SAP-MED gives priority to substances that are toxic, persistent and liable to bioaccumulate, in particular persistent organic pollutants (POPs) including pesticides and PCBs.

The Horizon 2020 Initiative, which aims to reduce the pollution of the Mediterranean Sea by 2020, recognizes industrial emissions as one of the three priority areas causing major pollution in the Mediterranean Sea.

The UN Global Programme of Action for the Protection of the Marine Environment against Land-Based Activities and the Convention for the Protection of the Mediterranean Sea against Pollution have identified contaminants or groups of contaminants whose dumping or land-based discharges are prohibited or limited (Barcelona Convention and Protocols). In particular, the Strategic Action Programme, adopted by the Contracting Parties to the Barcelona Convention in 1997 contains several obligations for the countries to reduce pollution from different sectors and substances.

In 2009 and 2012 the Contracting parties adopted several Regional plans (legally binding measures, programmes and timeframes based on Article 15 of the LBS Protocol)

- Regional Plan on the elimination of Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Mirex and Toxaphene in the framework of implementation of Article 15 of the LBS Protocol (2009)
- Regional Plan on the phasing out of DDT in the framework of the implementation of Article 15 of the LBS Protocol (2009)
- Regional Plan on the elimination of Alpha hexachlorocyclohexane; Beta exachlorocyclohexane; Hexabromobiphenyl; Chlordecone; Pentachlorobenzene; Tetrabromodiphenyl ether and Pentabromodiphenyl ether; Hexabromodiphenyl ether and Heptabromodiphenyl ether; Lindane; Endosulfan, Perfluorooctane sulfonic acid, its salts and perfluorooactane sulfonyl fluoride, in the framework of the implementation of Article 15 of the LBS Protocol (2012)
- Regional Plan on the reduction of inputs of Mercury in the framework of the implementation of Article 15 of the LBS Protocol (2012)
- Regional Plan on the reduction of BOD5 in the food sector in the framework of the implementation of Article 15 of the LBS Protocol (2012)

European Union Directive 75/442/EEC on wastes and Directive 91/689/EEC on hazardous wastes regulate pollution reduction and elimination by the EU Member states. Most heavy metals are also on the EU's list of priority substances [2455/2001/EC (EU, 2001a)].

Toxic substances are addressed in the Water Framework Directive (2000/60/EU), the Dangerous Substances Directive (76/464/EEC); Directive (2008/105/EC) on environmental quality standards in the field of water policy, the Waste Management etc. Halogenated hydrocarbons are also on the EU's list of priority substances [2455/2001/EC (EU, 2001a)].

Targets

Several regional targets with regard to toxic substances indicators are defined in the framework of SAP-MED and the Regional Plans be achieved by 2010, 2015 and 2025. The agreed targets may be also reviewed in the framework of UNEP/MAP Ecosystem approach roadmap implementation in synergy with EU Marine Strategy (MSFD) Directives. H2020 is also providing for de-pollution of the Mediterranean by 2020.

Methodology

Methodology for indicator calculation

There are three possible methodologies for calculating this indicator. These are:

1. Emissions factors
2. Field measurements
3. Modelling

The most commonly used method is based on emission factors.

Emission factor definition (as given by EPA): An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant. Such factors facilitate estimation of emissions from various sources of air pollution. In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average).

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

Where:

E = emissions;
A = activity rate;
EF = emission factor, and
ER =overall emission reduction efficiency (%).

Description of data

Annual load per contaminant per administrative region.

Geographical coverage

Administrative regions of the whole Mediterranean sea watershed.

Temporal coverage

Three data series are available: 2003, 2008 and 2015.

Basis for aggregation

Due to the very complex nature of this indicator, the only possible aggregation is per substance (measured in the same phase) at the national level or at the coastal hydrological basin.

Trend analysis:

Can be performed based on the three data series in 2003, 2008 and 2015 for a limited number of substances and only in some countries.

Industrial Emissions Indicator IND 6.3:

Per capita hazardous wastes treated/ recovered/ disposed in hazardous waste facilities

Rationale

Justification for indicator selection

This indicator reflects the provisions of the Strategic Action Programme (SAP-MED) and the legally binding requirements in the regional plans which call for treatment and sound disposal of hazardous wastes. In fact, the indicator provides a measure of the commitments of the individual Countries to meet the obligations and deadlines set in the legally binding decisions regarding hazardous wastes management as reflected in their operational targets defined in their NAPs which call for reduction of discharge of hazardous substances from industrial plants or disposal in a safe manner.

This indicator also reflects the degree to which countries adhere to the timetable for implementation of the investment priorities with regards to hazardous waste management as defined in their updated NAPs in terms of construction/ expansion and upgrading of their industrial wastewater treatment plants and hazardous wastes disposal facilities.

Indicator definition

Definitions

This indicator highlights three types of hazardous wastes management including treatment, recovery and disposal. Below are definitions of key terms of this indicator:

(1) Hazardous waste means wastes categories featuring on the list drawn in Annex I of the Basel Convention, with hazardous characteristics as detailed in Annex III of the Basel Convention.

(2) Hazardous waste facility means a site or facility for the disposal of hazardous wastes or other wastes which is authorized or permitted to operate for this purpose by a relevant authority of the State where the site or facility is located [Basel convention, Article 2(5)].

(3) Treatment of hazardous waste means any method, technique, or process, including neutralization or incineration, designed to change the physical, chemical, or biological character or composition of a hazardous waste, so as to neutralize such waste or to render such waste less hazardous, safer for transport, amenable for recovery or reuse, amenable for storage, or reduced in volume [US EPA, 6 CCR 1007-3 Section 260.10]

(4) Recovery of hazardous waste means operations which may lead to the possibility of resource recovery, recycling, reclamation, direct re-use or alternative uses as defined in Annex IV(B) of the Basel Convention.

(5) Disposal of hazardous waste means operations which do not lead to the possibility of resource recovery, recycling, reclamation, direct re-use or alternative uses as defined in Annex IV(A) of the Basel Convention.

Units

This indicator may be reported as amount of hazardous wastes (in kilograms) treated/ recovered/ disposed per capita per year (i.e. three distinct indicators are reported depending on the amounts of hazardous wastes which are treated, recovered or disposed).

Policy context and targets

Policy context description

In 1999 the parties to the Barcelona Convention adopted a Strategic Action Programme to Address Pollution from Land-Based Activities (SAP-MED). It foresees the implementation of national and regional actions for pollution reduction and control. Proposed actions include measures such as reduction and phasing out of toxic substances, environmental sound collection and disposal of hazardous wastes, applying BAT/BEP in industrial processes, etc.

In 2009 and 2012 the Contracting parties adopted several legally binding measures and plans targeting specific industrial pollutants including persistent organic pollutants (POPs), mercury, and BOD5 from the food sector. The decisions include a number of legal requirements entailing reduction and elimination of releases, isolation and containment of wastes, and safe handling, collection, transport, storage and disposal of hazardous wastes.

Waste Framework Directive 2008/98/EEC sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. It explains when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. The Directive lays down some basic waste management principles: it requires that waste be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odors, and without adversely affecting the countryside or places of special interest.

Targets

Several regional targets with regard to such indicators are defined in the framework of SAP MED 1997 and Regional Plans, 2009 and 2012 to be achieved by 2010, 2015 and 2025. The agreed targets may be also reviewed in the framework of UNEP/MAP Ecosystem approach roadmap implementation in synergy with EU Waste Framework Directive. H2020 is also providing for de-pollution of the Mediterranean by 2020.

Methodology

Methodology for indicator calculation

The proposed methodology for calculating this indicator is based on dividing the total quantities of hazardous wastes which are treated; or recovered; or disposed in hazardous wastes landfill facilities over the total number of inhabitants living in the water shed area or administrative region where the hazardous waste originates (regardless of where the waste is treated, recovered or disposed).

Description of data

- Annual amount of treated/ recovered/ disposed hazardous waste in a water shed area or administrative unit (in kilograms).
- Number of inhabitants in a water shed area or administrative unit where the hazardous waste originates from

Geographical coverage

Administrative regions of the whole Mediterranean sea watershed.

Trend analysis

Can be performed once sufficient data are collected, but not earlier that 2020.

Industrial Emissions Indicator IND 6.4:

Share of implemented environmentally sound management initiatives for upgrading industrial installations and remediating contaminated sites

Rationale

Justification for indicator selection

This indicator reflects the prevention and control measures that are called for in the Strategic Action Programme (SAP-MED) and stipulated in the legally binding measures and regional plans in the framework of the implementation of Article 15 of the LBS Protocol of the Barcelona Convention.

These legally binding requirements extend beyond the simple treatment and disposal of toxic substances. They also address upgrading of industrial installations, decommissioning of industrial plants, remediating contaminated industrial sites, etc.

This indicator also reflects the degree to which countries adhere to the timetable for implementation of the investment priorities included in their updated NAPs and their commitment to meet the obligations and deadlines set in the legally binding decisions and provisions of SAP-MED as reflected in their operational targets.

The indicator also reflects the progress made in resolving key environmental issues in the identified hotspots which were updated in 2015, and the commitment of countries to allocate the necessary resources for eliminating identified hotspots.

Indicator definition

Definitions

This indicator highlights two types of pollution prevention and control measures that constitute an aggregated set of indicators reflecting the Countries' commitments to implement the requirements of the legally binding decisions and regional plans in the framework of the implementation of Article 15 of the LBS Protocol of the Barcelona Convention, and the priority investment measures stipulated in the updated NAPs. These indicators include upgrading industrial installations and remediating contaminated sites. A key aspect of this indicator is the environmentally sound management of the relevant pollution prevention and control measures. Below are definitions of key terms of this indicator:

(1) **Environmentally Sound Management** of hazardous wastes or other wastes means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes [Basel convention, Article 2(8)].

(2) **Industrial installation** is a facility intended for use in the manufacture or processing of products involving systematic labor or habitual employment. It consists of a fixed or semi-fixed location of a complete system or a self-contained unit, with its accompanying assemblies, accessories and parts.

(3) **Contaminated site** is defined as a site at which substances occur at concentrations: (1) above background levels and pose or are likely to pose an immediate or long-term hazard to human health or the environment, or (2) exceeding levels specified in policies and regulations [Government of Canada; http://www.tbs-sct.gc.ca].

Units

This indicator maybe reported as the yearly number of "implemented" environmentally sound management measures for upgrading industrial installations or remediating contaminated sites as a percentage of the total number of installations and sites which need upgrading or remediation in a Country based on an actual survey of the state of environment in an administrative region.

Policy context and targets

Policy context description

In 1999 the parties to the Barcelona Convention adopted a Strategic Action Programme to Address Pollution from Land-Based Activities (SAP-MED). It foresees the implementation of national and regional actions for pollution reduction and control. Proposed actions include environmental prevention and control measures such as applying BAT/BEP in industrial processes, remediation of contaminated sites, etc.

In 2009 and 2012 the Contracting parties adopted several legally binding measures and plans targeting specific industrial pollutants including persistent organic pollutants (POPs), mercury, and BOD5 from the food sector. The decisions include a number of legal requirements entailing pollution prevention and control measures such as decommissioning of industrial plants, and safe handling, collection, transport, storage and disposal of hazardous wastes.

Targets

Several regional targets with regard to such indicators are defined in the framework of SAP MED 1997 and Regional Plans, 2009 and 2012 to be achieved by 2010, 2015 and 2025. The agreed targets may be also reviewed in the framework of UNEP/MAP Ecosystem approach roadmap implementation in synergy with EU Waste Framework Directive. H2020 is also providing for de-pollution of the Mediterranean by 2020.

Methodology

Methodology for indicator calculation

The proposed methodology for calculating this indicator is based on number of permits given by responsible authorities whether for upgrading industrial installations or remediating contaminated sites as a percentage of the total number of industrial installations and contaminated sites surveyed and found to require upgrading or remediation.

Description of data

- Annual number of permits issued per administrative region classified into the following actions:
  - Upgrading industrial installations.
  - Remediating contaminated sites.
- Total number of industrial installations and contaminated sites surveyed and found to require upgrading or remediation,

Geographical coverage

Administrative regions of the whole Mediterranean sea watershed.

Trend analysis

Can be performed once sufficient data are collected, but not earlier that 2020.

Industrial Emissions Indicator IND 6.5:

Share of enforced Emission Limit Values (ELV) to those adopted in national regulations for priority substances impacting the Mediterranean marine environment

Rationale

Justification for indicator selection

This indicator reflects the ability of existing legal and institutional structures in the Mediterranean Countries to meet the provisions of SAP-MED and requirements of the legally binding decisions and regional plans in the framework of the implementation of Article 15 of the LBS Protocol of the Barcelona Convention. For example, SAP-MED requires countries to "formulate and adopt, as appropriate, environmental quality criteria and standards for point source discharges and emissions of heavy metals (mercury, cadmium and lead)." The legally binding decision on the reduction of inputs of BOD5 from selected food sectors (Decision IG20/8) requires "the reduction of pollution load by application of BET and BAT." It further states that "in case the food sector installation discharges into the sewerage system, the competent authorities shall establish Emission Limit Value (ELV) as indicated in Table of Article IV" of the Decision.

On the other hand, the "mid-term evaluation of SAP/NAP implementation" indicates that over 85 percent of national laws of Mediterranean Countries address requirements for monitoring, permitting, inspection and application of sanctions; however, supporting institutional structures for enforcement of permitting and compliance are only found in two thirds of these countries.

Therefore, there is a risk that some legal requirements may not be possible to implement due to lack of certain capacities in some Countries. Hence, there is a need to define an indicator which offers the means by which the ability of countries to enforce pollution prevention and control measures stipulated in regional decisions and plans can be assessed.

Indicator definition

Definition

This indicator presents information on the Emission Limit Values adopted in national legislation, and physically enforced on the ground, as a percentage of the Emission Limit Values which are adopted legally, but are not implemented physically by industrial polluters.

The figure obtained through this indicator suggests whether the Country in question possesses the institutional structures and legal frameworks necessary to enforce its adopted legal requirements. If reflects presence of trained and competent personnel in its institutions, and availability of needed monitoring and inspection instruments needed to enforce the legal provisions and to ensure compliance.

The indicator is defined based on Emission Limit Values. These legal requirements to be met by various industries are usually adopted in environmental legislation in order for industries.

Units

As this indicator is defined as the share or ratio of enforced "Emission Limit Values" to those which are adopted, this indicator has not units. It is expressed as a percentage value.

Policy context and targets

Policy context description

In 1999 the parties to the Barcelona Convention adopted a Strategic Action Programme to Address Pollution from Land-Based Activities (SAP-MED). It foresees the provision of support to formulate programmes of cooperation for capacity-building and the development of institutions, including relevant technology and management training, human resources (scientific and technical personal) and public education.

In 2009 and 2012, the Contracting parties adopted several legally binding measures and plans targeting specific industrial pollutants including persistent organic pollutants (POPs), mercury, and BOD5 from the food sector. The decisions include a "Technical Assistance" component stipulating that "For the purpose of facilitating the implementation of the measures, capacity building, including transfer of know-how and technology will be provided by the Parties and the Secretariat to the Contracting Parties in need of assistance."

Hence, SAP-MED and the legally binding decisions and plan both recognize the importance of building the capacities of institutional structures in order to enable the Countries to meet their legal obligations. The proposed indicator is expected to provide a normative figure on the ability of the countries to meet their commitments.

Targets

There are no set targets for this indicator.

Methodology

Methodology for indicator calculation

The proposed methodology for calculating this indicator is based on the percentage ratio of ELVs of priority substances which are found on the ground to be compliant with limits set by national legislation to the total number of ELVs of the same substances which have been adopted in national legislation.

Description of data

The data required for this indicator consist of two figures:

- Number of ELVs of priority substances which were adopted by national legislation and are included in Indicators IND 6.1 and IND 6.2 (i.e. nutrients and toxic substances).
- Number of instances when inspected Emission Limit Values (ELV) have been actually found to be compliant with the requirements set in national legislation based on findings reported by national/ local environmental authorities.

Geographical coverage

Administrative regions of the whole Mediterranean sea watershed.

Trend analysis:

Can be performed once sufficient data are collected, but not earlier that 2020.