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Athens (Greece), 26-28 March 2014

Update priority investment projects for protecting the Mediterranean Sea from Pollution (Evaluation of NAP investment portfolio – Regional Analysis)

UNEP/MAP
Athens, 2014

Update Priority Investment Projects for Protecting

The Mediterranean Sea from Pollution

FINAL REPORT

SEPTEMBER 2013

Submitted by:

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Report Coverage page

Project Title:	**Update of priority investment projects for the de-pollution of the Mediterranean Sea from pollution**
Project Ref. Number	HORIZON 2020 – UFMS /NP/0102/2012
Country	The countries involved in the Euro-Med Horizon 2020 Initiative with a particular focus on the non-EU countries, mainly on the Southern and Eastern parts of the Mediterranean, and on Adriatic Balkans countries to a lesser extent.
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Plan Bleu

LIST OF ABBREVIATIONS

ASEP	Adriatic Sea Environment Program
BIL	Billion
CA	Contracting Authority
CB/MED	Capacity Building Mediterranean project
EC	European Commission
EEA	European Environment Agency
EIB	European Investment Bank
EOP	Environmental Operational Programme
EU MS	Member States of EU
GES	Good Environmental Status
FEASIBLE	Financing for Environmental, Affordable and Strategic Investments that Bring on Large-scale Expenditure
H2020	Horizon 2020 Initiative
HS	Hot Spot
ICZM	Integrated Coastal Zone Management
IPA	Instrument for Pre-Accession
KE	Key Experts
LBS	Land-Based Sources Protocol
MAP	Mediterranean Action Plan
MED POL	Programme for the Assessment and Control of Pollution in the Mediterranean region
MeHSIP-PPIF	Mediterranean Hot Spot Investment Programme – Project Preparation & Implementation Facility
NAP(s)	National Action Plan(s)
NEAPs	National Environmental Action Programmes
NIPAC	National IPA Coordinators
NKEs	Non-key Experts
oPt	Occupied Palestinian territory
PEIP	Priority Environmental Investment Programme
RENA	Regional Environmental Network for Accession
SAP	Strategic Action Programme
SAP-BIO	Strategic Action Programme for Specifically Protected Areas & Biological

	Diversity Protocol
SEE	South-East Europe
SC	Steering Committee
SG	Steering Group
ToR	Terms of Reference
UfM	Union for the Mediterranean
UfMS	Secretariat of the Union for the Mediterranean
UWWT	Urban Waste Water Treatment
UNEP	United Nations Environment Programme
WB	World Bank

1 INTRODUCTION

Note to the reader

This report presents technical and factual elements stemming from the expertise of the consultant and contacted persons, which will need to be further discussed at the country level. As such, this material forms the basis for future consultation of the countries and other stakeholders, for example through the next biennium process of UNEP/MAP leading to new NAPs by the end of 2015, or through the process of UfM labelling projects.

1.1 Project Background and objectives of the study

The main objective of the study is to identify a de-pollution investment portfolio necessary to achieve UNEP/MAP 2025 targets, starting from existing plans such as national de-pollution or environmental plans, UNEP NAPs or H2020 lists, but including also new projects or needs that have recently risen because (i) during the last 3 years regional plans have set more ambitious objectives and (ii) new feasibility studies have been developed for the final projects since the year 2025 is getting nearer.

The study will result in the following outcomes which has been achieved while fully taking into account the results from the other two studies being undertaken in parallel (MeHSIP and UNEP/ MAP):

(i) The state of play of investment projects (with secured and unsecured funding).

(ii) The identification of the contribution of the investment projects with secured funding and/or under implementation to achieve pollution reduction targets (which will be expressed by group of substances to be identified and agreed upon with UfMS and UNEP/MAP).

(iii) Investment projects and needs[1] coherent with the achievement of UNEP/MAP 2025 targets in a more forward looking vision for the period up to 2020 – 2025 and propositions to the countries of an updated list of pollution hotspots.

(iv) Recommendations on the way forward taking into account the need for coherence, synergy and joint effective action among different actors and their respective programmes and initiatives in this field.

The study will update the information on the implementation of investment projects and needs aiming at de-polluting the Mediterranean: what has been done during the 2005-2012 period regarding the initial objectives of SAP/NAP and what should be done during the following period up to 2020 or 2025 regarding the revised objectives. This updated information is based on sound environmental and other relevant criteria in order to be used in the evaluation or planning processes of:

[1] The UFM study defines a ''project'' as an on-going or planned de-pollution project with an available pre-feasibility and/or feasibility study. An ''investment need'' is a de-pollution investment project needed to meet the UNEP/MAP 2025 de-pollution targets but has not yet been technically studied and formulated.

- The UfM Secretariat concerning possible projects for UfM labelling.
- UNEP/MAP and its Contracting Parties concerning commitments under the Barcelona Convention and its Protocols or the two year Programme of Work of UNEP/MAP.
- The European Commission concerning H2020 2nd phase or pre-accession programmes in the region.
- Other bilateral or International Financing Institutions concerning projects' funding.

2 IMPLEMENTATION, METHODOLOGY AND CONSTRAINTS

2.1 Approach adopted in implementing the project

The project's first phase was mainly focused on gathering and analysing information on environmental investments affecting the Mediterranean basin. The collection of existing data and information was based on various sources, including regional reports, national policy and strategic documents, project documentation, as well as preliminary contacts with government officials, especially in Egypt and Lebanon. The objective was to establish a preliminary list of de-pollution infrastructure projects and investment needs in the Mediterranean that have affected or may affect directly and indirectly the marine and coastal environment. This was mainly accomplished through an initial screening of NAP of each country against later pipelines.

In order to have a conclusive and updated list of on-going de-pollution investment projects for each country, their description and contribution to de-pollution, to identify investment needs and new projects as reported by the national authorities, donors and IFIs so as to meet the 2025 UNEP/MAP de-pollution objectives for the Mediterranean basin and provide an estimation of pollutant loads reduction per project or investment need, a methodology for the 2nd phase was developed. The countries of the Mediterranean were clustered in three groups (Southern Mediterranean countries, Adriatic countries and Turkey and EU Mediterranean countries) and an approach was developed for each group. Regarding the Southern Mediterranean countries, country visits were undertaken for each country. In case of Jordan, Libya and Syria no country visits were undertaken and local officials were contacted in order to obtain updated information to be included in the country reports. In order to be able to secure the necessary information on on-going projects and future investment needs, a period of between 3-5 days was devoted for each country visit and thenceforth, local NKEs were hired to follow up.

For the Adriatic countries and Turkey it was proposed to follow a two-pronged approach: During the Barcelona MEDPOL Focal Point meeting (18-21 June, 2013) LDK-IME team presented the UfM Project to inform the MEDPOL focal points on the updating of NAPS and side bilateral meetings were held with MEDPOL FPs during the subsequent days of the Barcelona meeting. The second complementary proposed option was to use local NKEs, after contacting the MEDPOL FPs.

Finally, for the EU Mediterranean countries additional documents were consulted and key focal points and resource persons within the Ministries and government agencies were contacted to provide updates on the existing list of projects and the identification of potential investment needs. During the Barcelona meeting, bilateral meetings were also held with EU FPs to request additional information or discuss specific subjects.

It should be pointed out that local NKEs were mobilised to follow-up only on the visits and assist in obtaining any remaining required information, under the strict guidance of the key experts, whereas the synthesis of obtained data (e.g pollution loads quantification) was carried-out by the key experts. The mobilisation process of NKEs was carried out with support from IME.

The outcome of 2nd phase was the compilation of an updated list of de-pollution investment projects, investment needs and new projects for each country.

2.2 Coordination and synergies with relevant agencies and organisations

Throughout the project's duration under the lead of UfMS a number of joint meetings with MEHSIP team, UNEP/MAP/MEDPOL team, EEA team were held in order to maximise synergies, avoid overlapping, coordinate and exchange information and data of mutual interest. Regarding synergies with relevant agencies and organisations, the following can be noted:

- **MeHSIP-PPIF**

In order to contribute to the Horizon 2020 initiative's goal of de-polluting the Mediterranean Sea by the year 2020, MeHSIP-PPIF's mandate is to identify and prepare high priority, sustainable investment projects that will make a significant contribution to de-pollution of the Mediterranean Sea and have a demonstration effect in target sectors (i.e. industrial emissions, solid waste and wastewater). MeHSIP-PPIF maintains an updated Horizon 2020 Project List[2] where all the identified projects are in the Southern region, and are within a certain minimum scale that can be approached by the EIB to support their execution (cost > 25 M€).

Through continuous updating, the 'Horizon 2020 Project List' contains 87 projects[3] across the south Mediterranean countries with an estimated total value of approximately 6,64bn EUR. From those, 52 projects have secured funding[4] and 35 projects have not secured funding. The 52 investment projects that are currently part of the Horizon 2020 Project List and have secured funding are valued at €4,11bn, whereas the 35 investment projects have an estimated value of €2,53bn demonstrating a significant demand for additional funding to allow these projects to be implemented.

[2] The Horizon 2020 Project List includes both projects that have secured funding and projects currently seeking funding and it presents a consolidated overview of on-going and planned environmental projects aiming to contribute to de-polluting the Mediterranean Sea from pollution sources in Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria and Tunisia.

[3] 7th Progress Report of MeHSIP - July 2013.

[4] Secured funding indicates that these projects have secured the required financial resources from national and/or international sources allowing the project in question to be financed and proceed with implementation.

At the last H2020 Steering Committee meeting and the "Pollution Reduction Core Group" held in parallel (Barcelona, 18-19 April 2012) MeHSIP-PPIF was given an extended mandate to improve reporting also on the projects on the Horizon 2020 Project List which have secured funding (currently 50 projects). This is expected to be completed by the end of 2013 and will bring accurate state of progress of these 50 H2020 de-pollution investment projects in the south Mediterranean Sea.

As the two studies (UfMS /LDK-IME/) and MeHSIP-PPIF have a complementary mandate a continuous flow of information on projects and data available was exchanged throughout their implementation.

The coordination of the two studies led by UfMS has achieved 5 joint country visits, mission reports delivered by LDK-IME to MeHSIP and information brought by LDK-IME to MeSHIP's attention. LDK-IME team took into account the information contained in the 7th Progress Report of MeHSIP. The final report of the MeHSIP's complementary study was not available in time.

- **UNEP/MAP**

UNEP/MAP is currently undertaking the evaluation of NAP/SAP MED implementation with the main target of enhancing the sustainability of their implementation. The evaluation of the implementation of the NAPs /SAP MED was mandated by the 17th meeting of the Contracting parties to the Barcelona Convention on the basis of Article 13 of the LBS Protocol, and has two major components: a) the policy/technical framework and b) NAP investment portfolio.

The major deliverables of the policy/legal /technical NAP implementation component will be a regional status report on the level of implementation of SAP-MED/NAPs regional activities and achievement of SAP MED targets, as well as a set of policy recommendations on ways and means to integrate and streamline in NAP/SAP-MED updating process:

- the ecosystem approach implementation (goal, vision, ecological objectives, GES and targets, monitoring and programme of measures);
- the legally binding measures adopted by the Contracting parties in the framework of Article 15 of the LBS Protocol;
- as appropriate the use of market based and economic instruments to control pollution;
- emerging issues and global/regional agendas of Mediterranean relevance;

The NAP/SAPMED implementation status report will also contain country profiles and country facts sheets highlighting major achievements on the national level, in particular information on the status of:

- policy /legal/regulatory/monitoring framework to support NAP/SAP implementation;
- pollution tendency for group of pollutants;
- pollutant loads (national budget) data per sector/subsector/region/sub region/national/ sub-national levels, reported by the contracting parties to the Barcelona Convention and Land Based Sources and Activities (LBS) Protocol in 2003 and 2008, or identified in the annual PRTR reports where available and c) relevant other published data and information;
- historical hot spots;

Analysis covered all 33 SAP MED targets as appropriate with the view to demonstrate any progress achieved as well as challenges and issues at stake for the region and the countries with regards to pollution from land based sources. The report also addresses the existing tools established within MAP and outside MAP system for tracking progress of pollution reduction and/or SAP/NAP implementation in the Mediterranean region at regional and national levels.

It will recommend as appropriate ways and means to enhance their level of compatibility and coherence from the points of view of content, frequency and quality assurance systems applied in data submission. This process will also deliver a set of NAP updated guidelines agreed by the contracting parties to be used by the countries to update their NAPs in the future.

UNEP/MAP contributed to and provided guidance to UfM team work in their assignment to evaluate the status of implementation of the investment component of the NAPs. A continuous flow of information on available data was exchanged throughout the project's implementation. An excellent collaboration between the Focal Points of UNEP/MAP/Medpol and the UfM team of LDK-IME was attained throughout the study, as the FPs provided useful guidance, information and update on de-pollution projects and pollution loads per country and supported the coordination of UfM team work at country level with all stakeholders.

The results of both NAP/SAP evaluation components (policy/technical and investment portfolio) will be put at the disposal of the contracting parties in 2014 with the view to provide them with a very sound basis for updating the current NAPs to better and effectively cope with growing development pollution pressures and drivers and achieve good environmental status in the Mediterranean, thus complying with their legally binding obligations under the Barcelona convention, LBS protocol and SAP MED 2025 targets and commitments in the framework of H2020 imitative.

- **SEIS project**

Another project, Shared Environment Information System (SEIS), is also being implemented by the European Environment Agency (EEA); it aims to improve environmental monitoring and data or information sharing by gradually extending the SEIS principles to the European neighbourhood (South and East neighbours and the Russian Federation). In parallel with the UfM study, ENPI-SEIS project was addressing the three SEIS components — cooperation, content and infrastructure — through enhanced networking with the national capacities on environmental information, with specific outcomes expected by H2020 initiative, notably 6 indicators on de-pollution activities and trends in the Southern countries. Furthermore, it will promote open, public access to information through compatible and freely available exchange tools. Again, a flow of information on available data on certain issues of common interest was exchanged throughout the project's implementation.

The above coordination and synergies were successful due to a synergistic way and a high level of coordination and cross-fertilization between them, which was ensured thanks to a framework mechanism consisting of:

- A joint Steering Committee has been set up by UfMS which provides the needed communication and coordination platform amongst the various partners involved.
- An internal website (FTP server) to share, review and produce documents in a collaborative manner has been created by LDK with access through a password to consultants and collaborating partners.

- Regular working sessions, email exchange and planning arrangements for country visits and information collection are held between the consultants. This was translated in the second phase into joint missions to be conducted in the Southern Countries by MeHSIP, UNEP/MAP, H2020, EEA/SEIS and LDK-IME.
- A final coordination was organised by UfMS in Barcelona by the end of September with LDK-IME, UNEP/MAP and SEIS consultants

2.3 Constraints in implementing the study

The transition period a number of southern countries are going through represented a challenge for those countries and for the LDK-IME team to visit those countries and to secure the required data for the study.

The study faced difficulties for finding up-to-date information during the course of its implementation, particularly in most southern and Adriatic countries. These can be summarised as following:

- Lack of data on pollutants, particularly on industrial pollutants, that can be used in the calculation of pollution loads reduction attached to each project represented a main constraint in the implementation of the study.
- In several instances there were inconsistencies in data provided and reported by different entities.
- Lack of data on size of permanent and seasonal population, size of cities and urban concentrations. For example the precise area of wastewater collection is not defined except in countries applying the UWWT Directive.
- Lack of, and long delays in response from countries to verify data provided in Country Reports and list of projects.
- In several instances information on actual quantity of wastewater, and those discharged into the sea was either not available or denied as for example was the case with Egypt and Tunisia in order not to give a bad image of their respective countries.
- Actual quantities of solid waste generated and composition of waste was not readily available. Solid waste generated by industry was lacking in most countries.

2.4 Methodology for calculating pollution loads and costs

This section summarises the pollution load estimates for Waste Water and Solid Waste projects, referring to total loads of all NAP projects and new projects identified through available reports and databases, communications with country officials, and during country visits. The detailed calculations are presented in **Annex I**.

These estimates are experts' assessments, derived from available information, using appropriate pollution load coefficients per contaminant (population equivalent) and based on the specific characteristics of projects (e.g. treatment efficiencies, population served, etc).

In general, the pollution reduction is calculated as follows:

For WW projects, pollution reduction at a certain year = (Population equivalent at the referred year) x (Percentage Connection to the project) x (Percentage Network Performance to the project) x (Specific typical load per capita per day for each pollutant) x 365 x (Estimated Removal Efficiency in percentage per pollutant depending on the level of treatment of the project).

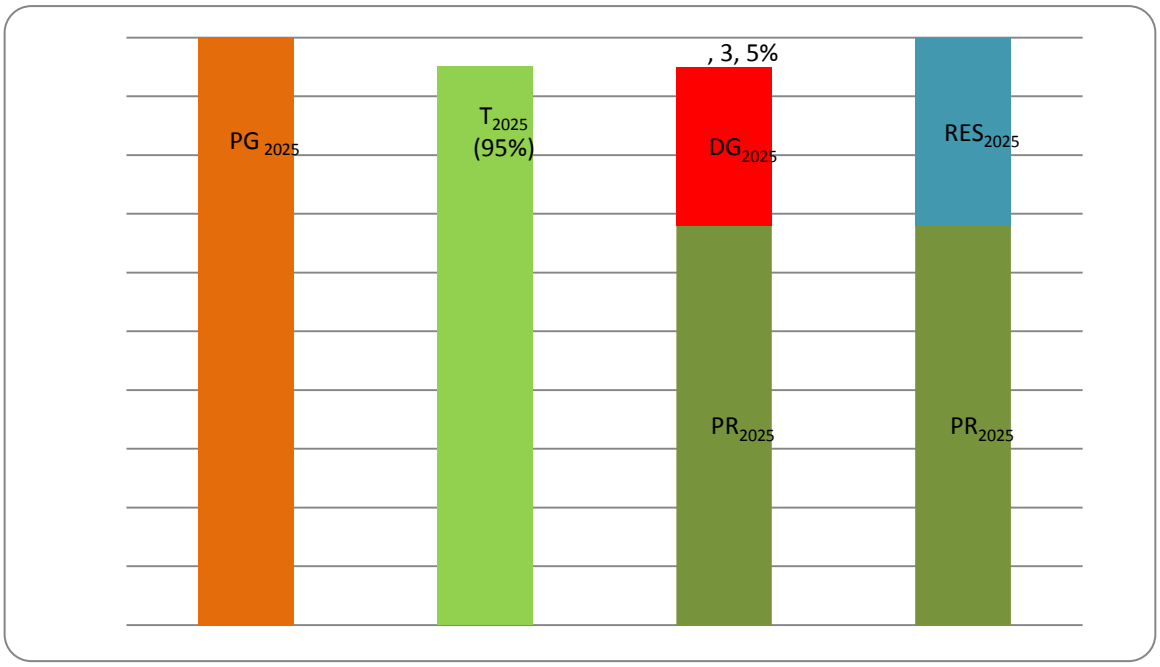
For SW projects, pollution reduction at a certain year = (Leachate production from the project in referred year calculated based on the area, infiltration rate and annual rainfall rate) x (the typical concentration per pollutant in the leachate that is based on the age of the dumpsite/landfill) x (the leachate reduction efficiency (%) of the operational project, based on the type of treatment executed).

Accordingly, the following is calculated:

- Pollution reduction in 2013 (PR_{2013}) refers to pollution reduction currently achieved by the existing operational facilities of projects included in the list of projects identified.
- Target pollution reduction 2025 (T_{2025}) refers to the target pollution reduction which is the highest level of collection and treatment to be achieved in order to comply with the 2025 Medpol targets in the areas where projects have been listed.
- Pollution reduction 2025 for projects with secured funding (PR_{2025}) refers to pollution reduction that is expected to be achieved in the year 2025 by the projects in the list, taking into consideration only the additional facilities that have secured funding, and therefore expected to be operational by 2025, while also taking into account estimated potential population growth by 2025.
- De-pollution Gap 2025 (DG_{2025}) refers to potential gap in pollution load reduction that still needs to be addressed to achieve the target pollution reduction 2025 in the areas where projects have been listed. ($DG_{2025} = T_{2025} - PR_{2025}$)
- Residual pollution 2025 (RES_{2025}) refers to pollution load that is expected to be discharged into the Mediterranean Sea in 2025, even if the MEDPOL 2025 targets are achieved. It is calculated based on the overall Pollution Generation from the population in 2025 (PG_{2025}) minus the pollution reduction from the operational facilities in 2025 ($RES_{2025} = PG_{2025} - PR_{2025}$).

Note: PG_{2025} is always higher than T_{2025} (no treatment can remove 100% of the pollution load), thus in any case some pollution load will end up to the sea.

The graph below illustrates the relationship between the above parameters and shows the overall logic behind the pollution load calculations.



Logic of the contaminants loads calculation process.

Furthermore, investment costs needed to achieve the targets of 2025 were calculated and the details of the calculation can be found in Annex I.

The amount of investment needed for construction/extension of both WWTPs and networks was roughly estimated using standardised cost functions developed by COWI as part of the FEASIBLE model for costing water sector infrastructure.

The cost functions for both collection systems and treatment used the population equivalent (p.e.), as the main cost driver in addition to percentage connection and performance of networks. They also considered the available information on costs of future projects.

The cost functions were adjusted to reflect local prices. Differences in local price and standard costs were accounted for by a price adjustment factor of 80 % for Southern Mediterranean countries.

It is important to note that estimates of investment costs could be produced in most countries except Egypt, Libya and Syria, but only for projects described with available reliable data. Moreover, it was not possible within the scope of the study to verify and validate with countries the cost estimates.

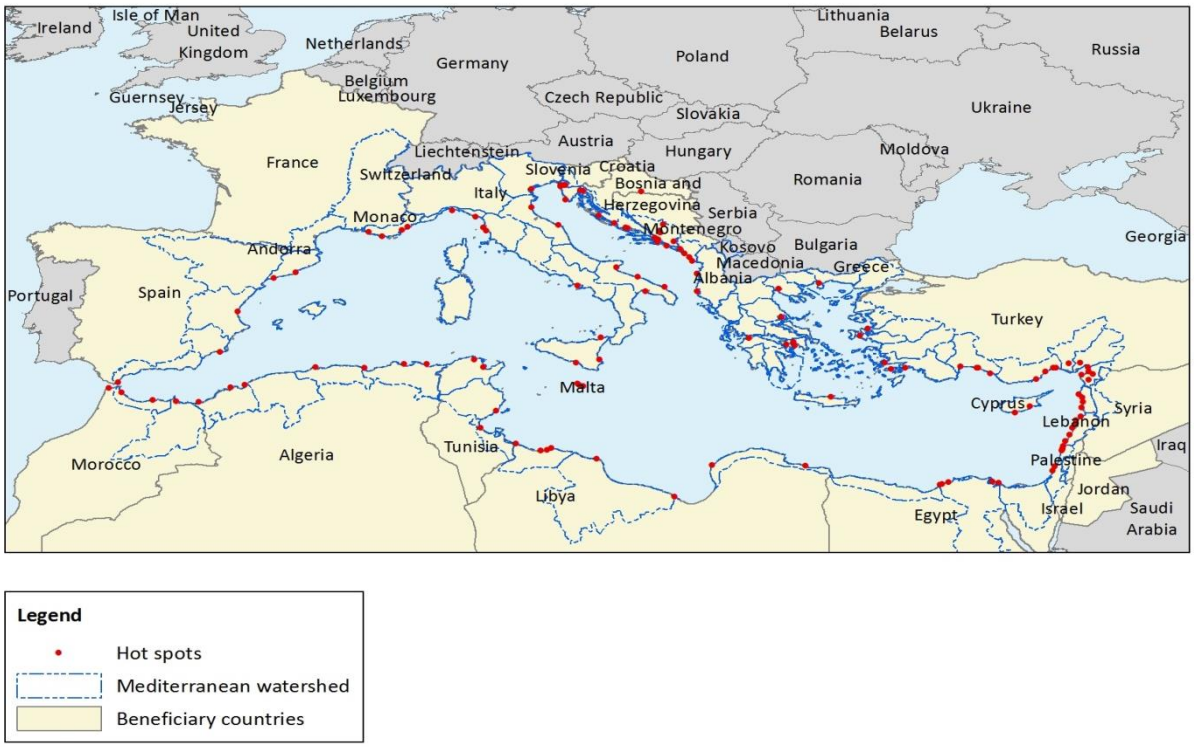
3 MAIN RESULTS

3.1 Qualitative analysis of potential disappearance of hot spots

The nature of the pollution hotspots in the Mediterranean are mostly related to coastal cities and urban coastal agglomerates with considerable population and main industrial facilities discharging directly into the Mediterranean. Various lists and updates of hot spots can be found in the literature;

however, in this study, the hotspots reported are taken from the UNEP/MAP TDA report "Trans-boundary Diagnostic Analysis in the Mediterranean Sea" issued in 2005 without information on hot spots in France, oPt and Montenegro. In the following, Hot spots in France referenced to the UNEP/EEA report, Priority issues in the Mediterranean environment, No4/2006, and the hot spots in Montenegro referenced to the Adriatic Sea Environment Program, World Bank, 2011. In Jordan, which is not part of the Mediterranean watershed area, no Hot Spots were defined.

The following Map shows the 127 hotspots' location in the Mediterranean countries.



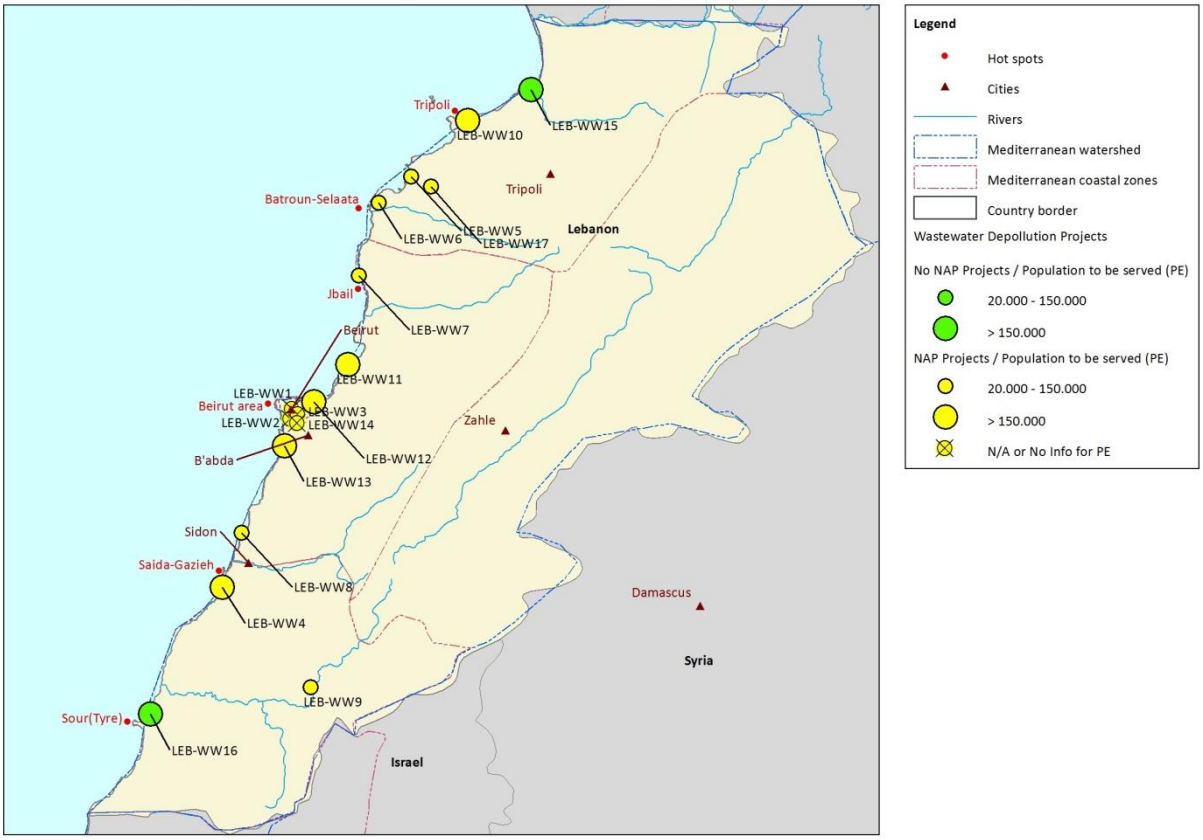
Special thanks to EEA for providing the coastline gis data and PLAN BLEU for providing the Mediterranean watershed, Mediterranean coastal zones and rivers gis data.
Hot spots referenced to the report UNEP/MAP/MED POL, Transboundary Diagnostic Analysis for the Meditarranean Sea, UNEP/MAP, Athens, 2005, except from hot spots in Cyprus, France and Montenegro.
Hot spots in France referenced to the EEA report, Priority issues in the Mediterranean environment, No4/2006.
Hot spots in Montenegro referenced to the Adriatic Sea Environment Program, World Bank, 2011.

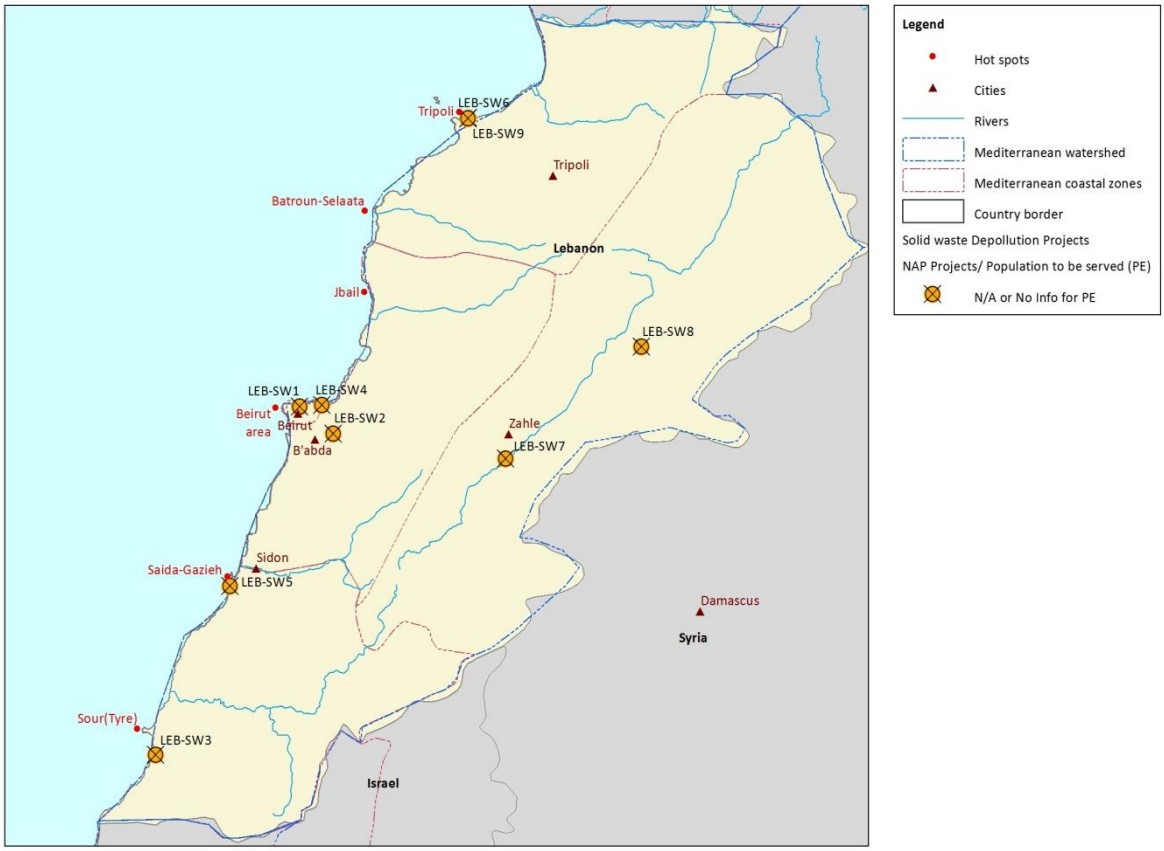
As the hotspots are identified as sources of pollution from Land Based Sources (LBS), their elimination may be directly related to the elimination of the pollution source. However, the following actions should be undertaken for the evaluation of hot spots prior to their elimination:

1. Confirm the link between the pollution sources and the projects, i.e. that in the hot spot area including the river basin upstream, all sources of pollution have been identified and all projects have been identified which are likely to reduce significantly pollution discharges.
2. Confirm that the projects are constructed and operational.
3. Check the performance of the operational projects.

Although the hot spots were identified and reported at the national level, few countries, such as Israel, made an evaluation of hot spots.

Due to lack of information mainly in the industrial sector, and since some hot spots are primarily related to industrial activities, it was difficult for LDK-IME team to adequately evaluate the status of hot spots. However, the maps produced can be used as a tool for the visualisation of the relation between the hot spots and projects. As an example for such visualisation, maps for Lebanon, Algeria and Israel are shown below

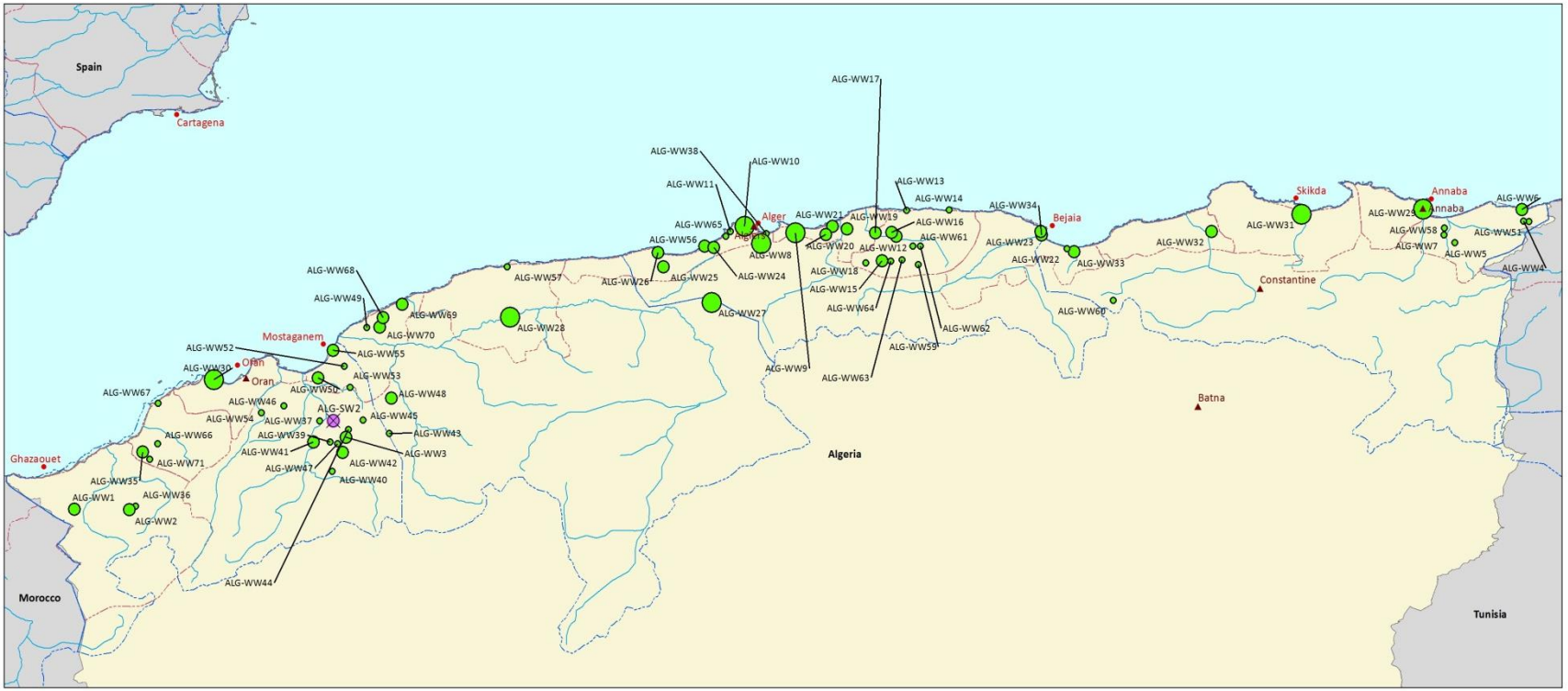




As clearly noted in the map of Lebanon, SW and WW projects are mostly constructed in areas identified as hot spots. However, many of these projects are still not operational therefore deterring a meaningful assessment of hot spots. However, once these projects become properly operational, the hotspots can be proposed for elimination.

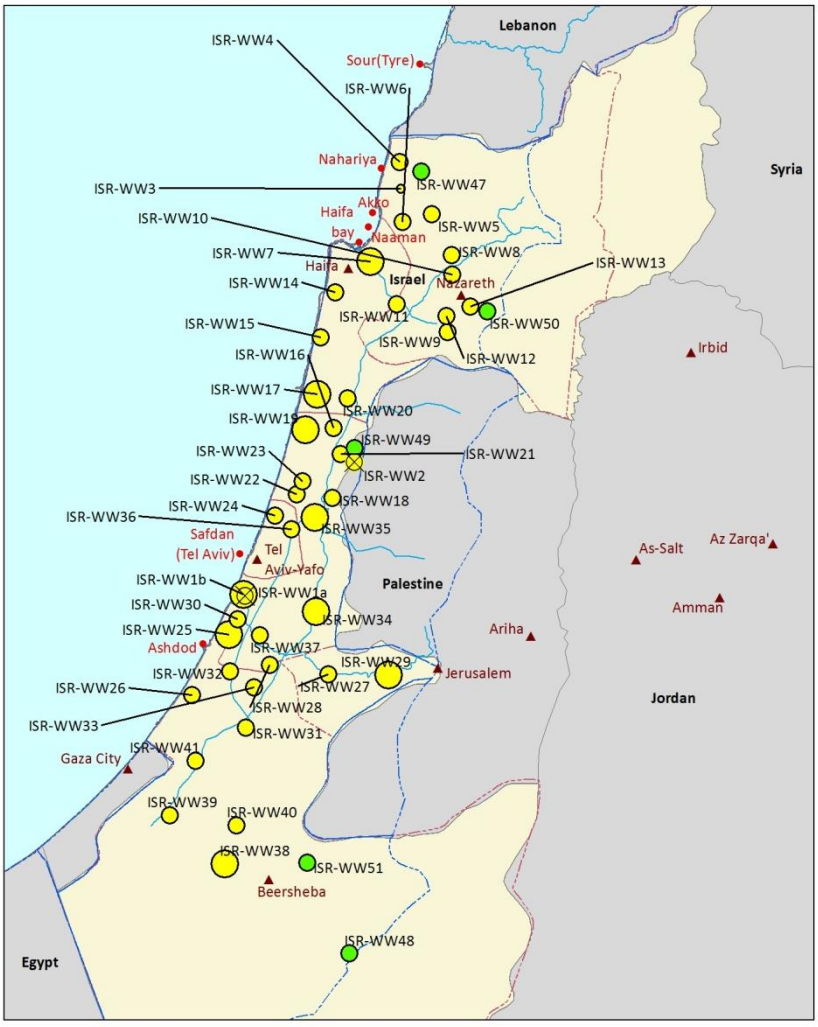
The list of projects in Algeria refers mainly to WW projects but is quite exhaustive and addresses most of the hot spots areas. However, as no information was made available for industrial projects, an assessment of hot spots was difficult to be made and especially mapping the SW and IE projects was not possible for the case of Algeria.

The map of WW projects for the case of Algeria shows that most of the hotspots have WW projects in the vicinity; therefore, where hotspots are only related to WW pollution then those hotspots can be eliminated now if the projects are constructed and operational or in the near future if the projects are under construction.

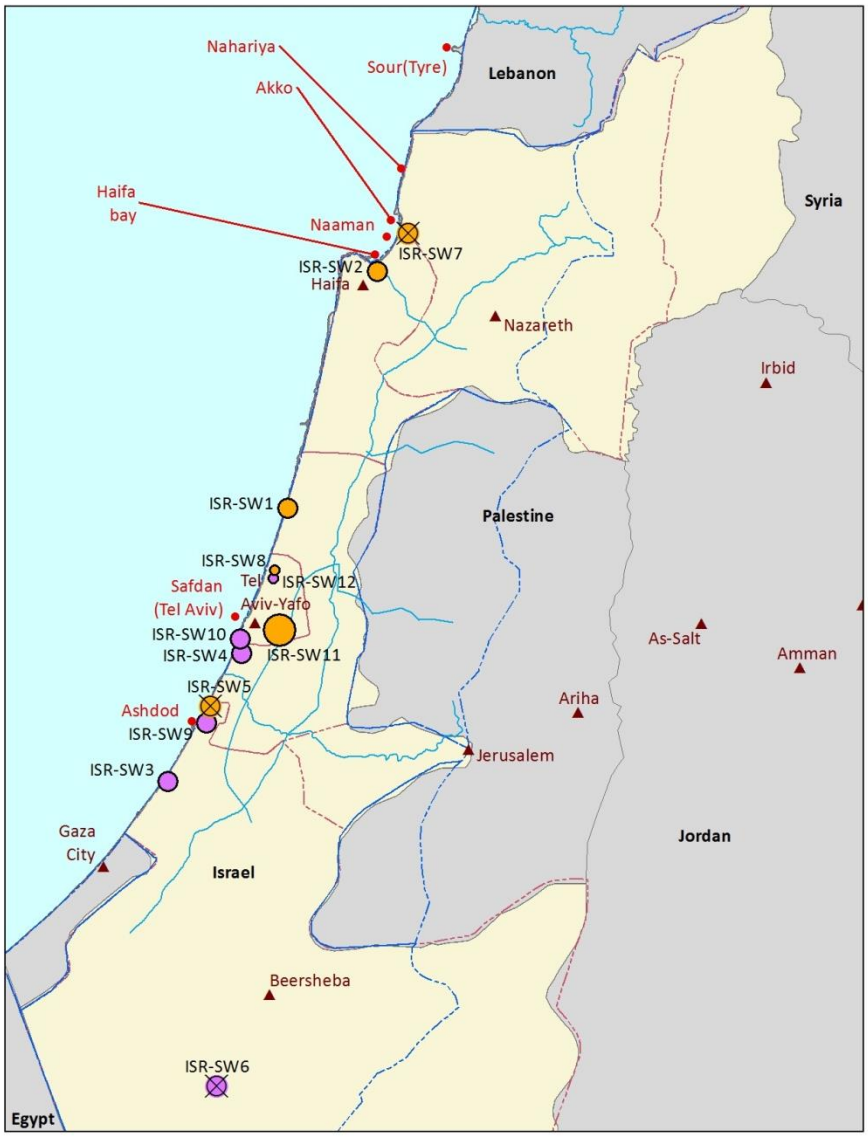


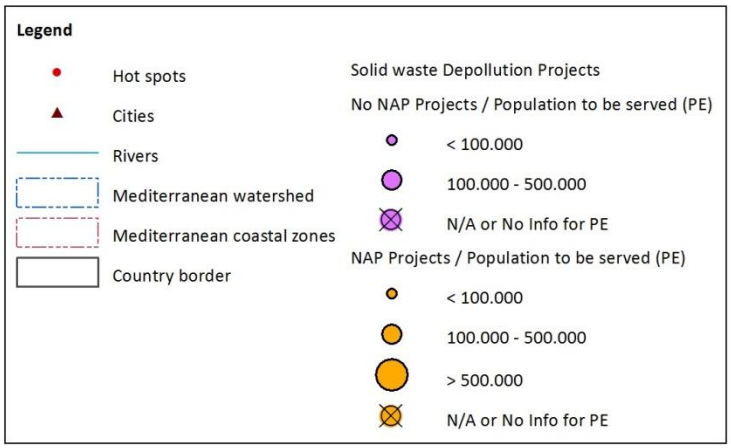
The Solid Waste Depollution Projects ALG-SW1, ALG-SW3, ALG SW4 are not located on the map, due to their characterization as "National scale / various Projects".

The case of Israel is different as the country has already evaluated the initial list of hot spots and it seems that in the near future (2014 or 2015) 3 Hot Spots will have disappeared thanks to projects under construction; there will remain only 3 hot spots: Haifa, Shafdan and Ashod, which are all expected to be eliminated by 2016 at the latest, once polluting activities will have stopped or the de-pollution projects will be completed.



The Wastewater Depollution Projects ISR-WW42, ISR-WW43, ISR-WW44, ISR-WW45, ISR-WW46 are not located on the map, due to their characterization as "National scale / various Projects".


Nahariya
Sour(Tyre)
Akko
Lebanon
Haifa bay
Syria
Naaman
ISR-SW7
ISR-SW2
Haifa
Nazareth
Irbid
ISR-SW1
Palestine
ISR-SW8
Tel
ISR-SW12
Safdan
(Tel Aviv)
Aviv-Yafo
ISR-SW10
ISR-SW4
ISR-SW11
As-Salt
Amman
ISR-SW5
Ashdod
ISR-SW9
Ariha
Jerusalem
ISR-SW3
Gaza
City
Israel
Jordan
Beersheba
ISR-SW6
Egypt


Legend
Hot spots
Cities
Rivers
Mediterranean watershed
Mediterranean coastal zones
Country border
Solid waste Depollution Projects
No NAP Projects / Population to be served (PE)
< 100.000
100.000 - 500.000
N/A or No Info for PE
NAP Projects / Population to be served (PE)
< 100.000
100.000 - 500.000
> 500.000
N/A or No Info for PE

During the anticipated update of the NAPs in 2015, it is expected that countries will perform an evaluation of the hot spots. Furthermore, the Ecosystem Approach (ECAP) targets to achieve good environmental status were adopted by COP 18. Their consideration would complete the LBS approach in revising the criteria for hot spot evaluation and the hot spots list..

For EU-MS, it is known that most investments are already achieved in the SW and WW sectors. So, only WW projects that are not compliant with EC regulations were mapped.

It should be noted that the hotspots and some projects were mapped in accordance to the name of the city or geographical location they refer to, and not in accordance to a known geographical reference with coordinates.

Based on the above hotspot and project mapping process, except for some countries where Hot Spots were not defined (Jordan, oPt) or with insufficient information (Spain, etc.), the study made an attempt to find a certain link between projects and hotspots that may lead to the potential recommendation for the elimination of hotspots. To do so, an analysis through GIS was conducted by linking hotspots to projects that are within a 10 Km distance. The results of this analysis reveal that in all the Mediterranean countries, 152 projects relate to 87 hotspots (within a radius of 10 Km) knowing that the total number of hotspots presented in this report is 127 and the total number of WW and SW projects are 796. These projects are listed in the table presented in **Annex II** showing the name of the hotspot and the relative distance between the project and the hot spot. The percentage distribution of the status of projects which are within 10km distance from hot spots is also presented in a table in Annex II.

The status of the 152 projects is split as follows:

Status of projects	Number of projects
No Info	31
Operational	37
Operational-Extension/Upgrade	9
Planned	13
Under construction	29
Under preparation	33

From the above Table, it is noted that once the projects that are “under construction”, or “under preparation” or “extension/upgrade” are executed and operational, which could be done before the year 2025, they will help to eliminate the hotspots they are linked to. The future update of NAPs should take into consideration the linkage of the projects with the hot spots, especially when a project is within the watershed.

Some hotspots may have no WW or SW projects within the 10 Km distance since they are mainly caused by industrial pollution that could not be mapped during this study. Therefore, the industrial pollution due to a hot spot need to be clearly identified in the future NAPs update in an attempt to properly assess the status of the hotspots and the achievement of the SAP targets.

In some other cases, some projects were found at locations with no reported hotspots. These hot spots may be related to newly developed cities or agglomerations that were not noted in 2005 and accordingly it should be evaluated during the upcoming preparation of the NAPs. . This might be the case for example of Cairo agglomeration or Gaza strip.

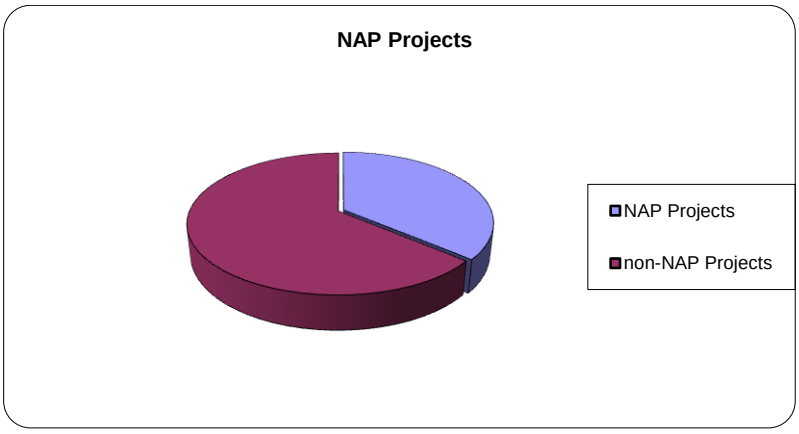
3.2 Regional analysis of project status and contribution to de-pollution targets

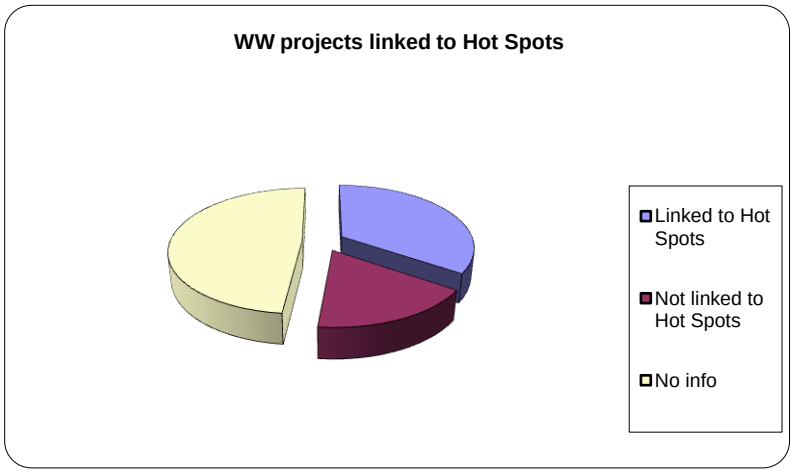
The total number of projects identified under this study is limited to agglomerations of more than 20,000 PE for WW projects and serving 200,000 inhabitants for SW projects in almost all cases. The following table summarises the total number of projects reported in this study:

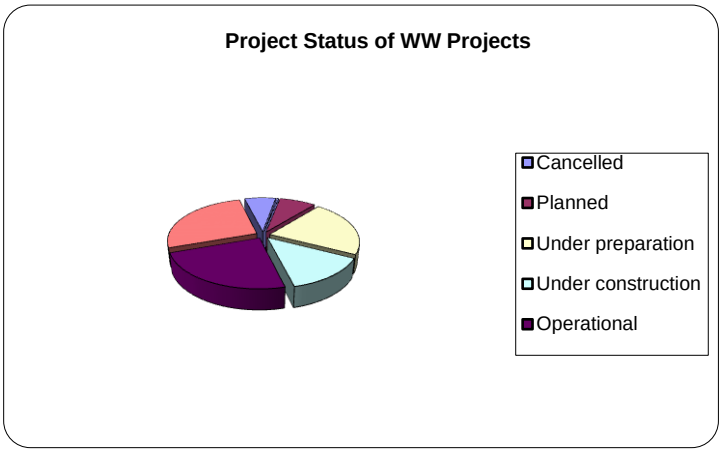
Sector	Number of projects
WW	614
SW	182
IE	117

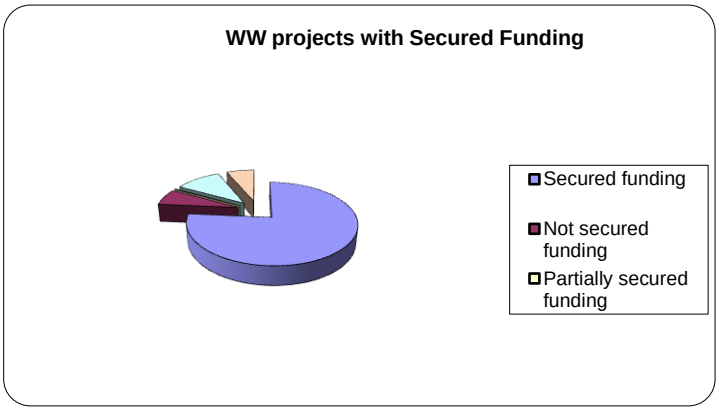
Projects referred to as IE include projects related to Air Pollution, Hazardous Waste, Industrial Emissions and Integrated projects (SW, WW and IE). They are investment projects, which means that feasibility studies, capacity building or information campaigns are not considered.

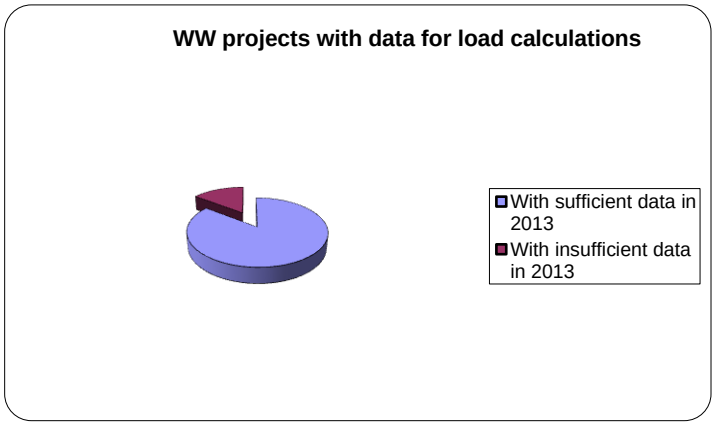
For the 614 WW projects, the following graphs show some important related statistics.









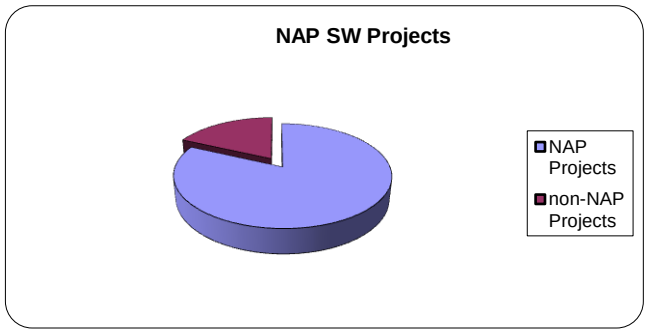


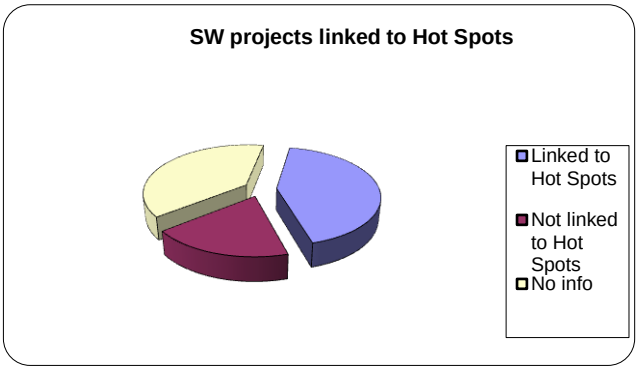
As can be seen from the above graphs, around 64% of the projects are not NAP projects, whereas 35% are linked to hot spots as reported by countries. This is mainly due to the identification of projects other than NAPs that are needed for pollution abatement specifically, although some countries such as Italy and Spain did not have a physical list of projects in their NAPs. Furthermore, 50% of the projects are operational and around 36% are under execution or under preparation. Around 76% of the projects have secured funding. Although some projects may have secured funding, these may remain un-operational for reasons such as lack of funding for operation or lack of supplying networks or political opposition to the project. The link of projects with the hotspots -

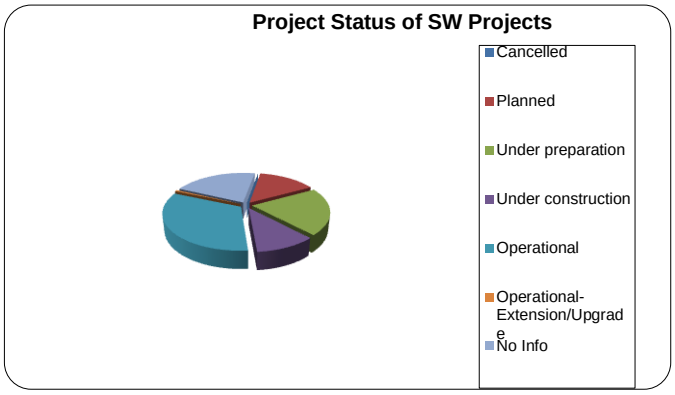
through the 10 Km distance using GIS - shows a result of around 19 % (152 projects out of 796). However, from these projects, only 30% are operational in 2013 with around 41% being under construction or under preparation.

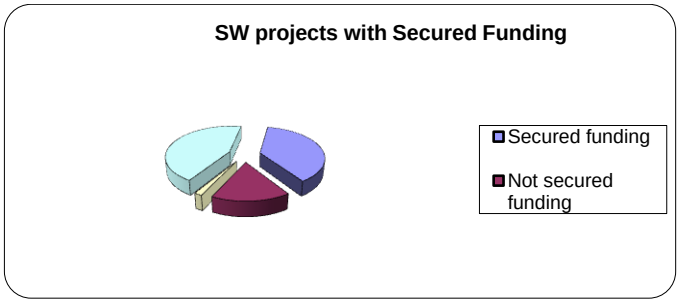
This analysis shows that there is a significant amount of projects that are under execution, which would help achieve the SAP targets for de-pollution of the Mediterranean. However, the impact of these projects and the identified hot spots should be addressed in future during the upcoming update of the NAPs. Moreover, the potential contribution of these projects that will be executed for achieving the targets should be evaluated and reported.

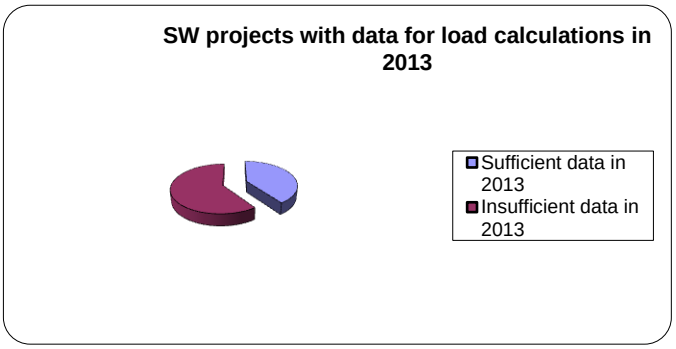
The information obtained for WW projects was more sufficient compared to SW projects whereby focus was on the landfill/dumpsite projects, which may have a potential pollution impact. The following graphs show some statistical data regarding SW.

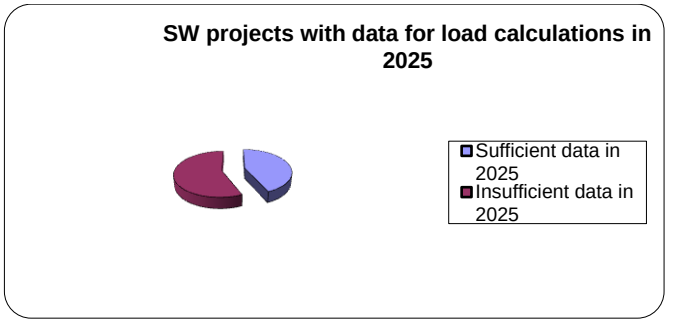





Project Status of SW Projects
Cancelled
Planned
Under preparation
Under construction
Operational
Operational-Extension/Upgrade
No Info


SW projects with Secured Funding
Secured funding
Not secured funding


SW projects with data for load calculations in 2013
Sufficient data in 2013
Insufficient data in 2013


SW projects with data for load calculations in 2025
Sufficient data in 2025
Insufficient data in 2025

As shown in the above graphs 82% are NAPs projects with 43% projects linked to hot spots. Furthermore, 31% of the projects are operational and around 29% are under execution or under preparation. In addition, 38% of the projects have secured funding.

For the SW projects, the issue is much different than for WW. The SW projects are mainly considered as polluting when there are dumpsites that are left without proper rehabilitation thus, polluting the Mediterranean Sea. Therefore, projects such as sorting/treatment facilities and sanitary landfills are reported with sufficient information; but information on SW dumpsites was often not available. In addition, the issue is also to have available volumes where solid waste can be disposed of and after a certain time, the landfill is filled and has to be closed; therefore, reduction at source, separate collection and recycling of waste are necessary. To this respect, information on weight of waste produced and population served was missing – it is one of the indicators that EEA is trying to deliver. Thus, in order to provide a good statistical analysis for the SW projects, a more complete database needs be reported and analysed specifically on SW dumpsites and sanitary landfills.

Furthermore, it was clearly noted from the contaminants load calculation of pollution caused by the SW projects that it is much lower than the contaminant loads caused by WW projects. However, other considerations for SW projects such as littering and visual pollution is important to take into consideration for future data collection.

3.3 Suggestions for updated situation of hot spots and priority projects in the future

It has been clear during the study that on the one hand UNEP/MAP pollution Hot Spots have been a smart and powerful tool in order to mobilise stakeholders and set regional priorities whilst on the other hand the regional situation regarding national pollution hotspots and priority projects has noticeably changed since the completion of the NAP reports.

There is therefore a clear need for the Mediterranean countries to include in the next reporting round to the LBS Protocol in 2015, a national update on the status of their hotspots. This would help in getting an accurate picture of the major sources of pollution at the regional level and how far the countries have gone in the actual reduction of hotspots. Nevertheless, such an update should be based on updated hotspot evaluation criteria so as to consider the LBS requirements as well as the targets adopted in the framework of the Ecosystem Approach, i.e. pressure and state indicators that would help determine what the Good Environmental Status (GES) is for each part of the coast in the Mediterranean countries.

In addition, a distinction has to be made between types of pollutants regarding their areas of origin:

- Certain types of marine pollution, such as microbiological pollution, are located only near the coast and originate mainly from coastal zones (Coastal Administrative Units); they should be taken into account in the updated hotspot list. The standards for bathing waters adopted in Paris 2012 by COP 17 of the Contracting Parties to the Barcelona Convention should be also taken into account.

- Other types of marine pollutants, such as nutrients or hazardous substances, may originate from far away from the coast and transported to the Sea through ground or surface waters (Mediterranean Sea watershed areas); in this respect, this has not been set as a priority in 2005 for the SAP Med Hot Spots assessment.
- Marine litter to implement the regional plan adopted by COP 18 in Istanbul, December 2013

According to the above, it is proposed to take the following criteria into consideration during the future updates of SAP Med and NAPs under the auspices of UNEP/MAP:

1. Amount of pollutants discharged from a single outlet to the Mediterranean Sea (industrial or municipal) rather than just considering the presence of a point source.
2. Extent of pollution discharged in comparison with national or international standards. For example, for a specific outlet discharging wastewater, it should be considered as a hotspot unless the wastewater contaminants comply with national, regional or international standards within a certain range.
3. The trans-boundary impact of various types of pollutants.
4. The origin of the pollution.

The above criteria should be addressed from a regional perspective rather than being a national hotspot or priority sensitive area.

The same applies to the identification of priority projects in the countries. The presence of disinfection in the projects was not provided during the country visits or through communication with the country officials and will need much deeper consultation and fact finding missions at the national level. One proxy indicator that could be used in this regard, if information on microbiological pollution cannot be properly recorded and reported at the country level, is the bathing quality of beaches and marine water. This aspect and the related indicators are usually monitored by most Mediterranean countries and may give some good indication on the current trends and the extent to which microbiological pollution in a particular coastal location may contribute to the maintenance or generation of a hotspot.

3.4 Suggestions for definition and update of priority projects as a regional de-pollution investment portfolio

In line with the overall goals of the assignment, the study has endeavoured to draw up a regional portfolio of de-pollution investment projects or needs necessary regarding pollution to be generated in the area by 2025; this portfolio could receive priority attention from the UfM through its labelling process and from funding agencies (bilateral and multi-lateral donor or international organisations).

This prioritisation exercise was conducted for Wastewater (WW) projects only due to lack of complete and verified information in the other two sectors (SW and IE).

The study has made several trials to develop objectively this regional portfolio, which resulted in two different (List#1 and List#2), which are both presented in Annex IV. The starting point common to the lists #1 and #2 was to consider only projects with sufficient information to calculate a De-pollution gap in 2025. Then, different approaches and criteria were applied.

The following paragraphs provide an explanation of the logic and main priority criteria used for each list.

- ***List#1: Projects with DG in 2025 > 800 t/yr and either linked to a Hotspot or showing a network coverage < 80 %***

Under List#1, the main criteria for the selection of the portfolio of priority investment needs were as follows.

<table>
<tr><td colspan="2">Criterion 1: Projects with enough data to calculate the de-pollution gap (DG_{2025} for BOD_5 in tons per year)</td></tr>
<tr><td>Criterion 2: Projects with linkage to Hotspots (based on available information)</td><td>Criterion 3: Projects with connection to networks of less than 80 %</td></tr>
<tr><td>Result 1 (after Criterion 1 and Criterion 2)
List 1 of priority projects based on above criteria
(Number of Projects: 84)</td><td>Result 2 (after Criterion 1 and Criterion 3)
List 2 of priority projects based on above criteria
(Number of Projects: 77)</td></tr>
<tr><td colspan="2">Proposed General List of priority projects based on above criteria and the combination of List 1 and</td></tr>
</table>

List 2 (Number of Projects: 141 without counting duplicates)
Proposed List of priority projects based on above criteria considering projects of de-pollution gap DG_{2025} > 500 tonne per year (**Criterion 4**) (Number of Projects: 73)

The rationale for adopting the above criteria is based on the following considerations:

- Priority projects are the ones with the highest de-pollution gap for BOD_5 in 2025 (De-pollution Gap for N&P in areas sensitive to eutrophication was not considered), which are the projects that would need funding to help achieve the targets (Criterion 1). The gap can originate from both exceeded WWTP capacity and/or low network coverage and performance rate (leakages). The linkage to hotspots criterion (Criterion 2) is an attempt to prioritise first the projects that can eliminate the hotspots.
- Projects increasing network coverage (criterion 3) are also important and should ensure that treatment plants constructed or to be constructed by 2025 will receive the maximum amount of waste collected and will therefore function at their optimal capacity. For most cities/projects considered in the list, the biggest share of the DG in 2025 can be attributed to insufficient network connectivity and performance.
- The combination of both lists is intended to avoid elimination of projects through successive filtering and at the same time double counting of projects to be avoided.
- The last criterion of DG BOD_5> 800 ton per year (Criterion 4) is intended to eliminate projects with small de-pollution gaps which are not likely to be at the source of a problem of trans-boundary or regional importance.

In addition, the list provided is based on the following assumptions:

- Projects with no information are not considered although they might be important for pollution reduction. Therefore, a temporary selection of projects is made in the following “List#3” for major countries despite the lack of data and, with future updates on the NAPs, the list of priorities can be updated accordingly.
- The BOD_5 is mainly considered for prioritisation since other trials were made for the pollutants N and P resulting in smaller list of projects at the level of Criterion 1 with projects included in the BOD_5 list. Therefore, the current approach is more generic and provides a wider approach.
- The adoption of the DG BOD_5 parameters takes into consideration indirectly several parameters such as the Population Equivalent, the secured funding projects, etc.

List# 1 resulted in a **portfolio of 54 projects** which are presented in Annex IV by growing order of de-pollution gap.

The attached Annex also provides information on the reasons why pollution will still be generated in 2025 and new investments needed. As mentioned above, most of the pollution generated in 2025 will come from population increase which will result in insufficient network connectivity and collection rate. This shows how important is the need to invest in network construction and maintenance for de-polluting the Mediterranean.

- ***List#2: Projects not operational in 2013 and with PE > 100,000 in 2013***

The WW projects were selected based on two main criteria:

- Project status: project not yet operational, under preparation, planned or with no information on the status
- Capacity of WWTP of more than 100,000 PE (no info or N/A were disregarded)

The idea behind this second list is to consider the biggest Mediterranean cities (above 100,000 pop.) which have not yet started or completed their de-pollution projects and which therefore deserve priority attention and support to ensure that they can move quickly and effectively into implementation.

The application of the above criteria resulted in a **portfolio of 38 projects**, among which 21 are not included in the List#1.

The full list#2 is also presented in Annex IV.

- ***List #3: Projects selected by experts although with no available information***

A third list (list #3) was also compiled for major countries in the Mediterranean region (Egypt, Italy, Libya, Spain and Syria) for which there was lack of data to calculate the de-pollution gap. This list was based on experts' knowledge of the specific country given the situation of the locations of the projects and the lack of WW and SW facilities to address the increasing wastewater and solid waste being or expected to be generated in the foreseeable future in the areas. However, for Italy and Spain it was very difficult to identify priority projects for these two countries based on the available data, and list #3 includes only priority projects for Egypt, Libya and Syria (Annex IV).

List #3 resulted in a **portfolio of 10 projects for Egypt, 3 projects in Libya and 3 projects for Syria**.

It is important to note that the study has faced important limitations in the development of the above lists. The main constraint encountered lied in the lack of, or uneasy access to, basic project information, especially in countries like Egypt, Libya, and Syria which are experiencing important institutional instability. This has led to significantly reduce the scope and completeness of the analysis since projects without information could not be considered.

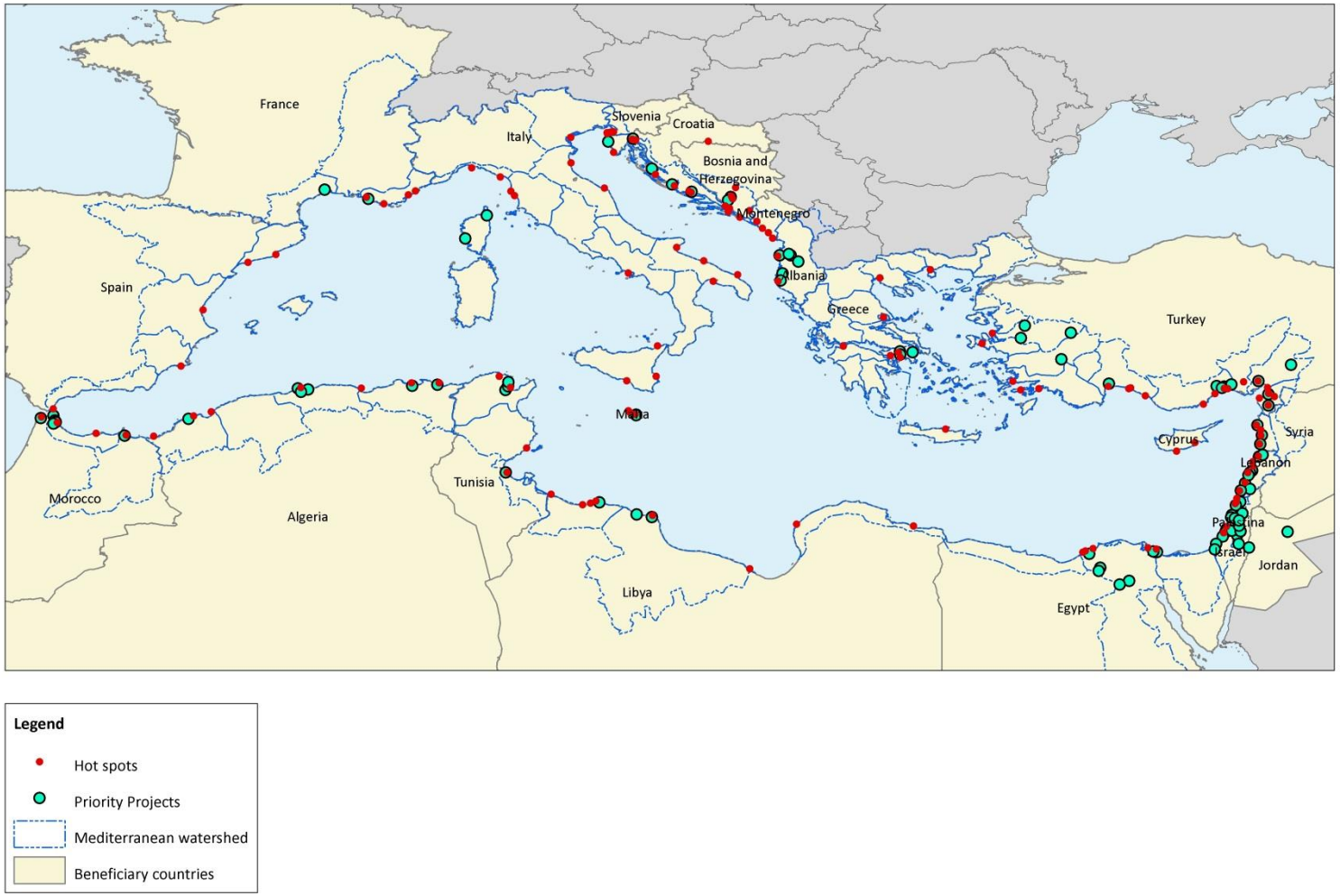
For this reason, the above lists and their resulting projects should not be seen as a final and definite selection. They should rather be regarded as a first attempt to prioritise investment needs across the region which must be further refined and improved under the lead of the UFMS and its partners. One key pre-requirement for coming to a final and comprehensive list of priority investments will be to fill in the existing project information gaps by involving and interacting closely with the project promoters and their national authorities since:

1. The link between a project and a Hot Spot may happen even if they are separated by more than 10 km, depending on the physical characteristics of the area;
2. Various other information may be taken into consideration, such as industrial sites changing their activities or specific pollutants released, depending on the reasons why the source, activity or area was initially chosen as a pollution Hot Spot
3. Some hypotheses have to be checked project by project, such as the population growth up to 2025 or the ratio of connection to sewage networks.

Summarising, this first attempt to select priority projects which are now necessary to protect the common Sea from land-based sources of pollution shows clearly that:

1. Sewerage systems in the EU countries are almost all in place (even if situation in Spain and Italy could not be assessed) whilst
2. Large sewerage systems are still necessary in non EU countries, particularly since population and economic growth will make necessary to extend networks and/or upgrade treatment plants in many areas notwithstanding the facilities existing or under construction.

The projects of the three lists are depicted in the following map.


France
Slovenia
Croatia
Italy
Bosnia and Herzegovina
Montenegro
Albania
Spain
Greece
Turkey
Malta
Cyprus
Syria
Lebanon
Tunisia
Morocco
Algeria
Palestina
Israel
Jordan
Libya
Egypt
Legend
Hot spots
Priority Projects
Mediterranean watershed
Beneficiary countries

4 FUNDING CONSTRAINTS

The consolidated project list of de-pollution investments includes both projects that have secured funding and projects seeking funding. 'Secured funding' indicates that the projects have secured the required financial resources from national and/or international sources allowing the project in question to be financed and to proceed with implementation. Based on the findings of this study, out of total number of the 614 wastewater NAP projects, 16 projects or 2.6 % were identified as projects with no secured funding out of which only 5 projects directly are linked to hotspots. More broadly, 87 NAP projects out of the total number of wastewater projects or 14.1% were identified as projects with either no secured funding or N/A or with no information for secured funding, out of which 24 projects are directly linked to hotspots.

Out of the total number of 182 solid waste NAP projects, 16 projects or 8.8 % were identified as projects with no secured funding out of which 12 projects are directly linked to hotspots. 93 NAP projects out of the total number of solid waste projects - i.e. about 51% - were identified as projects either with no secured funding or N/A or with no information for secured funding, out of which 38 projects are directly linked to hotspots.

It is evident from the above figures that the NAP identified wastewater and solid waste projects which managed to secure funding at least for 83.3% of the wastewater projects and 40.2% of the solid waste projects respectively, within the first seven year of the 10 year plan. Notwithstanding this good result, the status of funding could have been even better if projects met the eligibility criteria for funding by international financial institutions.

In case of the **European Investment Bank (EIB)**, eligibility criteria for funding include the following:

- Investment cost per project should exceed EUR 25m. The loan provided by the EIB can cover up to 50% of the total cost of the project. On average this share covers one third of the total cost of the project.
- EIB also finances multi-component, multi annual investment projects using a single framework loan. Projects funded are usually implemented by a national public sector entity and include infrastructure and urban renovation projects as well as transport, and energy efficiency and renewable energy projects.
- The project should be in compliance with the Bank's lending objectives, and must be technically, financially, economically, and environmentally viable.
- The terms of funding will depend on the type of investment and security offered by the third party.
- Regarding the interest rate, this can be either fixed, convertible or revisable in order to allow for flexibility for changing interest rate during the duration of the loan at specific set periods.
- EIB may also charge fees for the appraisal of projects and for other legal services that the Bank may provide.
- Accounts for the financed projects are held in Euros as well as in currencies of the collaborating countries.

- Loan repayments are usually done on a semi-annual or annual basis. A grace period may be agreed upon for the construction phase of the project.

EIB generally fund projects that support the EU external cooperation and development policies; natural and urban systems such as water, waste, and clean air; promote social and economic cohesion and the development of poor regions; small and medium size enterprises; investment in human resources for improved health and education; industrial activities and improved competitiveness; and increase energy supply, including energy efficiency and alternative sources of energy.[5]

In case of the **Development Grant Facility (DGF)** of the World Bank, the eligibility criteria for requesting grants include the following:

- A clear comparative advantage for the World Bank's involvement, which does not at the same overlap with the role of other donors.
- The project has to be in line with the Bank's resource and development objectives and is not in conflict with the work of other entities of the Bank.
- Covers a program with multi country benefits such as protecting fragile ecosystems with regional implications.
- Funding by the bank assists in securing additional funding for the funded project.
- Good standing and credibility of the sponsoring institution.
- The Bank Group should not be involved in the management of the collaborating institution requesting funding.
- The project should include a clear and viable phase out strategy once the finding has been used up.
- Engagement of the Bank in the project should enhance and strengthen partnerships with major actors in the development field.[6]

Regarding the **Kreditanstalt für Wiederaufbau (KfW)**, eligibility criteria for funding Nationally Appropriate Mitigation Activity (NAMA), which may also generally apply to wastewater and solid waste projects, include eligibility of the submitting agency, endorsement by the national government, reasonable time frame for the implementation of the project, feasibility of the project, cooperation with a qualified delivery organization, degree of maturity, and concept for phase out of the project[7].

The following part of this section focuses on the main constraints for the funding of projects, whether it is for the intention to start off a new facility or upgrade/expand an existing one.

Based on country visits and consultation meetings - this concerns only the Southern Mediterranean countries - a number of general - not related to individual projects - factors affecting the funding of investment projects have been identified. These include the following:

[5] EIB website

[6] The Development Grant Facility: FY98 DGF Annual Review and Proposed FY99 DGF Budget (R98-258, October 28, 1998).

[7] How Development Banks can Finance the Implementation of NAMAs, UNFCCC, Warsaw-12 November 2013, Jochen Harnissch, KFW-Competence Center for Environment and Climate

Lack of adequate tariffs and market incentive measures

Although in certain southern countries such as inTunisia a social system for water tariffs has been set in place for a long time and levels of pricing have been estimated so as to cover at least operational costs for sewage and a fund for subsidising industries investment is in place, in others southern countries such as Egypt, Lebanon, Libya, Syria, it is noted lack of adequate tariff systems completed by market incentive systems. Adequately designed tariffs first, and market incentive systems in a second step, should therefore be introduced in order to capture the full cost of services and influence attitudes towards more sustainable patterns of consumption and production. Lack of these tools reduces the capacities of countries recover initial and operating costs, and consequently the financial standing and credibility of countries to attract loans and investments. In this respect, a recommendation about economic instruments will be found in section 5 below.

Political uncertainty

The transition period and the resultant insecurity and political instability and unpredictable macroeconomic policies in Egypt, Lebanon, Libya, oPt, Syria, and Tunisia provide a disincentive for financial development institutions and donors to provide funding for investment projects. This is also true for public as well as private sector spending. Countries should therefore aim at providing a stable, secure, and predictable macroeconomic environment in order to attract foreign direct investment as well as public and private expenditures. This includes predictable policies with respect to exchange rates, interests' rates, tax systems, and regulations governing investments and transfer of funds.

Lack of adequate maintenance of facilities

Lack of adequate and regular maintenance of existing operational projects in the Southern Mediterranean countries including Algeria, Egypt, Lebanon, Libya, Jordan, Morocco, oPt, Syria, and Tunisia contribute to the rapid deterioration of equipment and facilities and consequently to the inefficient functioning and operation of existing plants. Lack of proper maintenance of previously financed projects may be a reason for discouraging future investments for new projects and facilities. Maintenance plans supported by sufficient budgetary allocations should therefore be provided for the proper maintenance and operation of facilities to ensure their operation at optimum capacity. In this respect, a recommendation about technical issues will be found in the section 5 below.

Lack of data

Lack of readily available data on existing pollution loads, capacities, and future investment needs thus makes it difficult for investors, multilateral development organisations, finance institutions to identify investment needs and priorities in countries. This was evident in case of Libya and Syria, where a post-war assessment should be useful, but also – to a lower extent – in case of Egypt and Tunisia. Measures should therefore be taken to create a database system on projects as referred to in section 5 below, with a combined role between the UfM Secretariat, UNEP/MAP or EEA and the countries.

Capacity constraints

Lack of adequate technical capacity represents another constraint in attracting and accommodating additional investments. This includes capacity of national institutions, public and private projects promoters, local engineering consultants and experts to design good project meeting acceptable

technical standards, conduct feasibility studies, undertake tendering procedures, examine of pre-qualification of consultants, subcontracting, construction, implementation of projects, technical and financial reporting on projects, complying with IFIs' procedures, and monitoring and assessment. As referred to in section 5 below a long-term capacity development programme should be initiated and implemented to meet countries' needs for skilled and professional staff.

Social Impacts

Public opposition for some projects delayed their construction and in some cases resulted in stopping the projects although funding was secured. This can be seen as a problem but also as an opportunity since it is nowadays well-known by professionals that a key factor of success is to involve local stakeholders and potential beneficiaries right from the beginning in the conception of the project through specific consultation and dialogue. In this respect, section 5 below will mention the possibility of regional cooperation in this field.

5. RECOMMENDATIONS

5.1 Mediterranean countries

Based on the outcome of the study, which included extensive literature review, country visits, and consultation meetings, this section of the report is intended to propose a set of recommendations that countries of the region may wish to consider to improve the environmental situation of the Mediterranean Sea. Though the proposed recommendations focus primarily on Southern and Adriatic countries, some may also be relevant to the EU Mediterranean countries and Turkey.

Technical priorities

It is important that all necessary measures are taken by Mediterranean countries to de-pollute and prevent any potential future pollution of their coastal areas, marine ecosystem, and the Mediterranean Sea. As referred to in section 3.3 above, the prevention of microbiological pollution should be given high priority in the efforts to de-pollute the Mediterranean Sea among other pollutants.

It is proposed that while countries should devote efforts to securing funds and implementing priority projects or investment needs identified in section 3.4 above as well additional future investment needs and projects, due consideration should also be given to securing funding for the maintenance and upgrading of existing facilities. In order to ensure continuous and regular maintenance of facilities and networks, it is proposed that a maintenance plan supported by the necessary budgetary allocations be part of the costing and design of facilities.

Air pollution in the form of CO_2 and methane emissions resulting from different economic activities and solid waste has serious socioeconomic and environmental implications for the Mediterranean region. It is expected that by 2025 energy demand for Southern and Eastern Mediterranean countries will increase by 50% compared to 2006, out of which fossil fuel account for 94% of energy supply compared to 75% for the EU Mediterranean countries[8]

[8] Blue Plan's sustainable development outlook for the Mediterranean, July 2008

Sustainable Consumption and Production

Based on the projections arrived at by the study, due to increased economic activities, population growth, and increased rate of urbanization particularly in the southern Mediterranean countries, the level of investments required in these countries is rather high and may therefore be difficult to secure. This is particularly so given the current global financial and economic situation. Even if secured, it may be beyond the absorptive capacities of some countries. Accordingly, and unless countries shift from a business as usual scenario to a more sustainable path of development aimed at changing consumption and production towards more sustainable pattern, meeting the 2025 de-pollution targets may be difficult to achieve.

It is therefore proposed to shift emphasis from dealing with end of pipe solutions to addressing the root causes of pollution and waste generation. This includes measures aimed at promoting sustainable production and consumption and reducing waste generated. It also includes introducing measures to upgrade the wastewater and solid waste management and industrial production processes as means to increase the efficiency and functioning of facilities and networks, and reduce pollution. Following a green sustainable path through adopting appropriate policies will aim at reducing and eventually avoiding waste. It will emphasize waste reduction, reuse, recovery, and recycling. This applies to both Southern and Adriatic countries as well as EU Mediterranean countries. The latter group of countries though have already adopted the EU policies and taken measures towards achieving this end.

Most Southern Mediterranean countries resort to landfills as the main solution for the discharge of solid waste. EU Mediterranean countries on the other hand have resorted to reducing the volume of waste discharged in landfills and increasing the percentage of recycled waste. It is therefore proposed that Southern and Adriatic countries adopt the same hierarchy for solid waste management. This will contribute to increased resource efficiency and reduce the potential negative impacts represented in methane emissions and leachates from landfills. Regional Plan on marine litter adopted by COP 18 contains strict measures regarding solid waste management.

Economic instruments

Cost of services provided in most Southern Mediterranean and Adriatic countries do not capture the full cost involved. Adequate tariff systems supported by market incentive measures need to be introduced to capture the cost of services provided for solid waste and wastewater:

1. Water tariffs charged to the customer include the sanitation service paid in the same bill as the water supply; they are the best way to cover the costs and optimize the quality and performance of the service because it creates a direct relation between the operator and the customer. The average level of tariffs must in general be raised so as to cover full operation and maintenance costs of the service and, even better, so as to cover loans reimbursement costs.

   Of course, water pricing must be differentiated for social reasons, not resulting in excessive burdens on the public, particularly middle and low income families, and without providing a disincentive for private sector engagement.

2. Environmental fees based on the polluter – pays principle can be charged on the water bill but supposing a wider redistribution system defined by law so as to bring funds to public entities or government.

This will not only generate additional financial resources for governments or public entities to finance some investment or to reimburse loans delivered by IFIs, but will also induce a change in consumption and production towards more sustainable patterns. Moreover, as earlier stated, it will enhance the financial credibility and standing of countries for attracting investments.

The use of market-based incentives in order to capture the full cost of services provided influence consumption towards more sustainable patterns is not adequately used, particularly in southern and Adriatic countries. In some southern countries such as Algeria for example financial support is provided to industries that adopt measures to reduce industrial pollution. It is therefore proposed to promote the use of economic instruments such as taxes, fees, charges, tariffs and deposit refund systems to support command and control mechanism and in a manner that influence behaviours and consequently consumption and production practices towards more sustainable patterns and consequently reduced waste generation. Appropriate instruments should be selected and designed in a manner that captures the cost of services provided, and internalise environmental externalities. They should also be designed to attract investments in these sectors through for example subsidies and tax cuts.

Improved national tools

In a number of instances, particularly in Southern countries such as Algeria, Egypt, Lebanon, Libya, Jordan, oPt, Morocco, Syria, and Tunisia, though regulations related to wastewater and solid waste management have been introduced, enforcement and compliance is lacking. It is therefore proposed that a tight monitoring and enforcement systems are set in place in order to ensure compliance in these countries. This may include the installation of air and water monitoring stations, and regular inspections. Moreover, self-monitoring reporting should be instituted in law and supported by incentive measures to penalise non-compliance and provide incentives for regular measurements, reporting and compliance, in accordance with LBS protocol of UNEP/MAP Barcelona Convention.

Information on projects, their status, pollutants removed, and impacts of projects could not be gathered through the study in most Southern and Eastern Mediterranean countries, such as Algeria, Egypt, Libya, Jordan, oPt, Syria, and Tunisia. In order to ensure the availability of sufficient and reliable information on projects and pollutants, countries should:

(1) require, based on a regulatory basis from consultants in charge of feasibility studies or from managers in charge of facilities' operation, detailed information on de-pollution projects, related Hot Spots and pollutant loads, future investment needs and projects costs, donors or IFIs involved, evaluation of projects performance, and extent of addressing pollution;

(2) create and maintain a data base to include these information at the national level. The data base should be continuously updated and validated, at least once per year. Particular emphasis should be laid on data for industrial and hazardous waste. The SEIS project and the UfM regional project on water knowledge are already working towards achieving this end. It is therefore proposed that information systems in countries should be built on the SEIS principles.

It was evident through country visits such as in case of Egypt and Tunisia that there is a lack of national level coordination between financial institutions and different agencies dealing with wastewater and solid waste management and relevant ministries such as industry, agriculture, water, tourism, municipal development, and housing. The update process of the NAPs in 2014-2015 is an opportunity to take up this issue and enhance stakeholder and national coordination; MeHSIP project preparation facility could also help on the above issues.

It is therefore proposed that a national level coordination mechanism is created to ensure adequate synergies and coordination between institutions involved in solid waste and wastewater management. Several countries, particularly Southern Mediterranean countries such as Jordan, Libya, Syria, Tunisia, oPT, and Adriatic countries such as Bosnia and Herzegovina, Croatia, and Montenegro experience limited absorptive capacity due to shortage of professional and skilled labour. A balance between investment in physical and human capital is needed in order to ensure that the required skills at all level are available to support solid and liquid waste management activities. As a complement to what the "Capacity Building" component of H2020 initiative has already set in place through training sessions and field visits, it is proposed that a needs assessment be conducted in countries to identify the immediate and long-term capacity building needs and requirements, including long-term exchange of experience and knowhow transfer (see § on regional cooperation) through the UfM regional project supporting professional training centres in the Mediterranean and on-the-job training programmes developed to meet identified need. Sufficient budgetary provisions should be made available for the purpose. It is also proposed that the technical assistance component for funding projects should emphasise on-the-job training and capacity building to ensure that capacities are built once the funding and technical assistance component of projects have been utilised.

Public awareness and communication campaigns need to be designed and launched to raise the awareness of the different stakeholders, including industry, agriculture, tourism, municipalities, the private sector, and the general public to the need to reduce water consumption and the generation of solid waste. Special emphasis should be laid on the benefits of greening economic activities as means to avoid and reduce waste, and optimise the resource use.

Revision of UNEP/MAP planning documents

The outcome of literature review and country visits revealed that in several instances there is room for furthering close links between UNEP-MAP Land-Based Sources NAPs preparations and updates, implementation and guidance with the other policy and planning tools in countries. A more in depth integration of NAP priorities into country's national plans could be better achieved by following a participatory and transparent approach in order to involve key stakeholders, the public and private sector as well as civil society. In doing so it should take into account the NAPs guidelines that will be updated in 2014, the EU Directives for Countries in a pre-accession process and the ecosystem approach (ECAP). It is proposed that national institutions and experts be actively involved and are given a lead role in this process.

Regional Cooperation

Efficient professional networks specific to the Mediterranean region are already in place, such as the Mediterranean Network of Basin Organizations (MENBO) in charge of waste water de-pollution through integrated water resources management or such as SWEEP-NET in charge of solid waste management, but they dedicate their efforts to exchange of experience and expertise. The study did not come across major regional or joint investment projects on solid waste or sewage management in the Mediterranean region. It is therefore proposed that emphasis should be laid on joint and regional cooperation about investment projects in the region. A twinning exercise between project promoters and local authorities North of the Mediterranean and Southern or Adriatic countries should be explored in order to promote technology transfer and development, and exchange of information, knowledge, and good practices. This is possible either for public entities and private companies.

Appropriate technologies for wastewater treatment, recycling of sludge into compost, recycling of treated wastewater for use in irrigation (on this topic, South – South cooperation could be fruitful), production of compost, waste to energy and biofuel are essential in order to address the de-pollution of the Mediterranean region.

Emphasise should be laid on enhancing cooperation between countries of the region on technology transfer and development. Collaboration in this area can go a long way in reducing pollution of the Mediterranean and avoiding the future degradation of its marine and coastal ecosystem.

The de-pollution of the Mediterranean Sea is the collective responsibility of countries of the region. Promoting Integrated Coastal Zone Management, SCP and green economy is therefore key consideration in achieving this objective. SWITCH MED is a EU funded project implemented by UNIDO, based on the MED TEST methodology set up through experiments on industrial sites, and by UNEP/MAP & DTIE, which aims at achieving this objective. This project might be extended by the UfM to a larger area. Such an initiative and similar ones should be supported by countries of the region in order to address the de-pollution of the Mediterranean.

5.2 Union for the Mediterranean (UfM)

The following are a set of recommendations proposed for future action by the UfM Secretariat, taking into account the Memorandum of Understanding signed recently with UNEP/MAP but, mainly, its priority objective which is to deliver projects contributing to cooperation, security and sustainable development in the region:

- Make the study available through an executive summary in different languages (Arabic, English, French) in hard and soft copies and on the UfM website.
- Join the UNEP/MAP in initiating a process for revising the projects component of the NAPs based on updated guidelines - which may include the criteria for the review and identification of hotspots in the Mediterranean region on the basis of suggestions referred to under section 3.3 - and on the country reports prepared under the study. This process may involve national and regional workshops as well as national level seminars/ consultations. The process should ensure a national level dialogue and the involvement of relevant institutions involved in the subject.

- Support countries which set in place on a voluntary basis the continuous monitoring of de-pollution projects with related information as mentioned above in “improved national tools” of § 5.1; this will notably be done through the UfM project of a regional platform on water knowledge starting in 2014 and in coherence with UNEP/MAP, H2020 and indicators through SEIS implementation.

  This could be the basis for regular assessments in cooperation with UNEP/MAP of the state of play of projects implementation, building on experience gained, including problems and constraints encountered in terms of availability and reliability of data, collaboration with relevant institutions, soundness of the outcome and their use in policy formulation and planning.

- Select flagship projects in the regional priority list outlined in § 3.4 above and identify which countries would request the UfM label to get support for political recognition, technical improvement if needed or fund-raising help in order to deliver between 3-5 projects annually. A project preparation facility should be managed by the UfM with means enlarged as compared to H2020 first phase so as to accelerate feasibility studies and preparation of projects implementation.

ANNEXES

Annex I: Contaminants Load Calculation Methodology for WW and SW projects

Cost estimation for WW works

Annex II: Projects within 10km distance from hot spots (geographic information analysis).

Annex III: 22 Country Reports

Annex IV: Lists of potential priority projects

Annex I: Contaminants Load Calculation Methodology for WW and SW projects

Part 1: Contaminants Load Calculation Methodology for WW projects

In the absence of real data for projects already executed, under implementation, or planned, an expert model was created to estimate the potential pollution reduction from projects.

The following describes the methodology adopted for calculating the contaminants' loads reduction resulting from operational projects in 2013 and from those anticipated to be operational by 2025. In addition to the anticipated pollution reduction, the calculation includes the target pollution reduction by 2025, the de-pollution gap in order to achieve the targets for 2025 and the residual pollution.

1. Calculation for pollution reduction in 2013

The estimated pollution reduction in 2013 refers to the pollution reduction achieved by the operational facilities in 2013. The formula for these calculations is described below:

$PR_{2013} = SPE_{2013} \times NP \times (SL \times 365) \times RE$ [1]

Where:

PR = Pollution reduction resulting from the existing operational facilities, in 2013 (t/year)

SPE= Population Equivalent in 2013, which is served by the operational WWTP.

This is equal to:

$SPE = PE_{2013}$[9] $\times$ CR [2.a]

(if the capacity of the WWTP is higher than the product)

Or SPE = Capacity of the WWTP [2.b]

(if the product is higher than the capacity of the WWTP)

Where:

CR = the % of PE connected to the WWTP, in 2013 (0 – 100%)

NP = Networks performance due to leakages, in 2013 (0 – 100%)

SL = Specific load production per capita per day for each of the pollutants.

These factors are given in Table 1 for each considered pollutant

Table 1: Typical Specific load production per pollutant

	COD	BOD5	TSS	NH4-N	TP	TN	NO3-N	Hg	Cd	POP
Typical Influent Values (g/cap/d)	135	60	75	14	2	15	1	n/a	n/a	n/a

RE = the removal efficiency (%) per pollutant depending on the level of treatment of the project as described in table

Table 2: Typical Removal efficiency per pollutant for each level of treatment

Treatment Level of Operational Project		COD	BOD5	TSS	NH4-N	TP	TN	NO3-N[10]	Hg	Cd	POP
PS	Preliminary Screening	5%	5%	5%	5%	5%	5%	-95%	n/a	n/a	n/a
PT	Primary	20%	20%	50%	5%	5%	5%	-95%	n/a	n/a	n/a

[9] The overall Population Equivalent (connected or not) in the area served by the WW project

[10] Any level of treatment of the wastewater increases the NO3-N releases to the environment

Treatment Level of Operational Project		COD	BOD5	TSS	NH4-N	TP	TN	NO3-N[10]	Hg	Cd	POP
	Treatment										
ST	Secondary Treatment	90%	90%	90%	80%	20%	5%	-75%	n/a	n/a	n/a
NR	ST & Nutrients Removal	90%	90%	90%	95%	70%	85%	-10%	n/a	n/a	n/a
TT	Tertiary Treatment	95%	95%	95%	95%	85%	85%	-10%	n/a	n/a	n/a
NT	No Treatment	0%	0%	0%	0%	0%	0%	-100%	n/a	n/a	n/a

2. Calculation for pollution reduction in 2025

The calculation for pollution reduction was done by the following settings:

- Target pollution reduction for 2025, T_{2025}
- Pollution reduction from future facilities that will be operational by 2025 (or have secured their funding), PR_{2025}
- De-pollution Gap for achieving the target reduction (T_{2025}), DG_{2025}
- Residual Pollution ending to the Med Sea, RES_{2025}

i. Target pollution reduction for 2025

The Target pollution reduction (T_{2025}) of each project is defined as the required reduction of generated pollution (by the overall population in the area/agglomeration in 2025) in order to meet the MEDPOL 2025 targets.

For (T_{2025}), it is assumed that all the population is connected to a WW project implementing Secondary Treatment (ST), if it discharges in a non-sensitive[11] receptor or Tertiary Treatment (TT), if the receptor is sensitive. Moreover, the network performance is estimated to be 100%.

Accordingly, the T_{2025} is calculated as follows:

$T_{2025} = PE_{2025} \times (SL \times 365) \times RE_{ST}$ or RE_{TT} (depending on the receptor type) in t/year [3]

where

PE_{2025} = the overall Population Equivalent (connected or not) in the area served by the WW project in 2025

NP = as defined above

SL = as defined in Table 1. RE_{ST} = Removal efficiency of Secondary Treatment as defined in Table 2. RE_{TT} = Removal efficiency of Tertiary Treatment as defined in Table 2.**Error! Reference source not found.**

ii. Pollution reduction for 2025

[11] As defined by the EU Urban Wastewater Directive 91/271/EEC

The formula for the calculation of the anticipated pollution loads reduction from the future operational project follows the same logic as for 2013:

$PR_{2025} = SPE_{2025} \times NP \times (SL \times 365) \times RE_{2025}$ [4]

Where:

PR_{2025} = the pollution reduction due to the future operational facilities, in 2025 (t/year)

SPE_{2025}= the Population Equivalent in 2025, which is served by the project. This is equal to

$SPE = PE_{2013} \times CR$ [5.a]

(if the capacity of the future WWTP is higher than the product)

Or SPE = *Capacity of the future WWTP* [5.b]

(if the product is higher than the capacity of the future WWTP

Where:

CR = as defined above, for 2025
NP = as defined above, for 2025
SL = as defined above in Table 1.
RE_{2025} = Removal efficiency of future facilities, as defined in Table 2.

iii. De-pollution Gap for 2025

The De-pollution Gap is the difference the target pollution reduction for 2025 and anticipated pollution reduction for 2025:

$DG_{2025} = T_{2025} - PR_{2025}$ [6]

At the same time, the de-pollution gap is calculated as percentage of the target pollution reduction:

$\% = DG_{2025} / T_{2025}$ [6.a]

iv. Residual pollution for 2025

The residual pollution load is the remaining portion of the pollution that is still discharged to the Environment, which is calculated as the pollution generated by the overall population (for 2025) in the area served by the project, minus the load reduction achieved by the project in 2025. Following is the formula for residual pollution calculation

$RES_{2025} = G_{2025} - PR_{2025}$ [7]

Where: $G_{2025} = PE_{2025} \times (SL \times 365)$ [8] [12]

Part 2: Contaminants Load Calculation Methodology for SW projects

In the absence of real data for projects already executed, under implementation, or planned, an expert model was created to estimate the potential pollution reduction from projects while

[12] Note the difference with the T_{2025}

differentiating between Sanitary landfills and open dumpsites since the level of possible pollution is different.

Within the similar methodological approach of the WW projects, the contaminants' loads for SW projects were conducted for mainly disposal sites (sanitary landfills or open dumpsites) depending on the type of works implemented. However, the calculation is not based on the population served by the project as is the case for WW projects but on the area servicing the projects out of which the leachate generation is calculated:

The following describes the methodology adopted for calculating the contaminants' loads reduction resulting from operational projects in 2013 and from those anticipated to be operational by 2025. In addition to the anticipated pollution reduction, the calculation includes the target pollution reduction by 2025, the de-pollution gap in order to achieve the targets for 2025 and the residual pollution.

1. Calculation for pollution reduction in 2013

The estimated pollution reduction in 2013 refers to the pollution reduction achieved by the operational facilities in 2013. The formula for these calculations is described below:

$PR_{2013} = L_{2013} \times C \times RE$ [9]

Where:

PR = the pollution reduction due to the operational project, in 2013 (t/year)

L = the Leachate Production in 2013, produced at the dumpsite or the sanitary landfill of the SW project. This is equal to

$L = S_{2013} \times R_{2013} \times INF_{2013}$ *(in m^3/year)* [10]

where:

S = is the surface area of the dumpsite/landfill, in 2013 (m^2)
R = is the annual rainfall in the area, in 2013 (m/year)
INF = is the estimated infiltration ratio (0 - 100%)

C = the typical concentration per pollutant in the leachate. This is based on the age of the dumpsite/landfill (Young < 10 years and Old > 10 years) and is defined in Table 3.

Table 3: Typical concentrations in leachate per pollutant

Dumpsite/Landfill Age	COD	BOD5	TSS	NH4-N	TP	TN	NO3-N	Hg	Cd	TOC
< 10 years	5.390	3.000	500	300	30	600	20	0,001	0,03	2.000
> 10 years	500	200	400	40	10	170	10	0,0001	0,01	160

RE = the leachate reduction efficiency (%) of the operational project, based on the type of treatment executed as presented in the next table:

Table 4: Type Reduction Rate efficiency per type of treatment

Type of Treatment	Reduction Rate
None	0%
Coverage	30%
Rehabilitation	60%

Relocation	95%
Sanitary Landfill	95%

2. Calculation for pollution reduction in 2025

The calculation results with the following:

- Target pollution reduction for 2025, T_{2025}
- Pollution reduction from future facilities that will be operational by 2025 (or have secured their funding), PR_{2025}
- De-pollution Gap for achieving the target reduction (T_{2025}), DG_{2025}
- Residual Pollution ending to the Med Sea, RES_{2025}

i. Target pollution reduction for 2025

The Target pollution reduction (T_{2025}) of each project is defined as the required reduction of generated pollution loads (by the overall population in the area/agglomeration in 2025) in order to meet the MEDPOL 2025 targets.

In order to calculate (T_{2025}) it was assumed that all the population should be served by a sanitary landfill.

Accordingly, the T_{2025} is calculated as follows

$T_{2025} = (PE_{2025} / LC_{2025}) \times L_{2025} \times C \times LRE_{SL}$ (in t/year) [11]

Where:

PE_{2025} = the overall Population Equivalent in the area served by the SW project in 2025

LC_{2025} = the design capacity of the sanitary landfill in 2025 (in PE)

L_{2025} = as defined above, for 2025

C = as defined in Table 3.

LRESL = Leachate reduction efficiency of a Sanitary Landfill, as defined in Table 4.

ii. Pollution reduction for 2025

The formula for the calculations of the estimated pollution loads reduction from the future operational facilities follows the same logic as for 2013:

$PR_{2025} = L_{2025} \times C \times RE$ [9]

Where:

PR_{2025} = the pollution reduction due to the operational project, in 2025 (t/year)

L_{2025} = the Leachate Production in 2025, produced at the dumpsite or the sanitary landfill of the SW project, as defined above

C = the typical concentration per pollutant in the leachate, as defined in Table 3.

LRE = the leachate reduction efficiency (%) of the operational facilities of the project, based on the type of treatment implemented as defined above (Table 4).

iii. De-pollution Gap for 2025

The De-pollution Gap is the difference the target pollution reduction for 2025 and anticipated pollution reduction for 2025:

$DG_{2025} = T_{2025} - PR_{2025}$ [6]

At the same time, the de-pollution gap is calculated as percentage of the target pollution reduction:

$\% = DG_{2025} / T_{2025}$ [6.a]

iv. Residual pollution for 2025

The residual pollution load is the remaining portion of the pollution that is still discharged to the Environment which is calculated as the pollution generated by the overall population (for 2025) in the area served by the project, minus the load reduction achieved by the project in 2025. Following is the formula for residual pollution calculation

$RES_{2025} = G_{2025} - PR_{2025}$ [7]

Where: $G_{2025} = PE_{2025} / LC_{2025} \times L_{2025} \times C$ [8]

Part 3: Cost Estimations for WW works

Since additional works are needed to achieve the de-pollution targets, an estimation of additional investment needs was computed for each of the projects that would result in the following:

1. Cost of extension of WWTP in case the capacity of the WWTP is less than the population that will be connected in 2025 and/or cost of upgrade in case the WWTP require to be upgraded, in terms of treatment level (e.g. up to secondary or tertiary treatment).
2. Cost of extension of Networks to achieve 100 % connection to any WWTP in case less than 100% connection to the WWTO is estimated to be achieved by 2025.

The total is considered as an estimate of the investment needs for each of the countries in the WW sector.

The cost calculation methodology followed the approach adopted in the study "Compliance Costs of the Urban Wastewater Treatment Directive" a study that was completed in September 2010 for the EC DG Environment by COWI. Since the study was intended to estimate the costs of EU MS countries, a corrective factor of 80 % was considered for Southern countries on the total cost figure.

In the above referenced study, the approach that has been developed to assess the costs of compliance with the Urban Wastewater Treatment Directive is to apply standardised cost functions. The applied cost functions have been developed as part of comprehensive cost model: Financing for Environmental, Affordable and Strategic Investments that Bring on Large-scale Expenditure (FEASIBLE) model. These functions are described below:

Costing of networks extension function:

$C_{N\text{-}ext} = -190.3 \ln(\Delta PE_{2025}) + 2828.8$ [9]

where

ΔPE_{2025} = the remaining Population Equivalent not connected to the WWTP by 2025

Costing of WWTP extension functions:

For the calculation of the cost for extension of the WWTP the functions used per type of treatment level is presented in the following table:

		Cost functions EUR per PE Load in p.e.	
	Treatment level	2,000-100,000	>100,000
1	Primary (Mechanical)	=10^(-0.2073*log(ΔPE_{2025})+3.6385)*0.23	92
2	Secondary (mechanical biological)	=10^(-0.2632*log(ΔPE_{2025})+4.0149) *0.23	115
3P	Advanced with P-removal	=10^(-0.2808*log(ΔPE_{2025})+4.1823) *0.23	138
3N	Advanced with N-removal	=10^(-0.2612*log(ΔPE_{2025})+4.2600) *0.23	207
3NP	Advanced with N and P removal	=10^(-0.2722*log(ΔPE_{2025})+4.3608) *0.23	230

Where:

ΔPE_{2025} = the remaining Population Equivalent not connected to the WWTP by 2025.

Advanced = Tertiary treatment

In case, of WWTP upgrade the difference between the required upgrade and the designed WWTP in 2025, was calculated as the difference between the functions of the respective treatment levels from the table above (e.g. in case of upgrade from primary to secondary the cost is calculated by the function No 2 minus the cost function No 1 from the table above).

The use of FEASIBLE model presents several advantages that include:

- It is a tested and documented approach.
- The cost functions use the person equivalents, PE, as the main cost driver which is the main input data for the expert model developed under this study.
- It has been used to prepare the cost assessment for compliance with the UWWTD in Turkey and partly in the accession countries.
- The cost functions are adjusted to reflect national price levels.

The model specifically includes the following:

- Investment costs for additional collection infrastructure based on number of PE that still needs to be connected; and
- Investment costs of additional treatment infrastructure based on the required treatment technology and capacity.

However the model does not include costing of the following:

- Costs of renovation of existing systems necessary to deliver the UWWTD requirements;
- Sludge treatment and disposal; and
- Costs of compliance with other Directives (e.g. Bathing Water Directive and WFD)

It should be noted that this approach takes into consideration that the initial data collected during site visits, available reports and provided information from the countries are accurate to the extent possible which is not always the case in some countries. Accordingly, when further validation is conducted at the country level then different cost figures may be found.

Annex II: Projects within 10km distance from hot spots (geographic information analysis)

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
Albania	**Durres**	ALB-SW5	5,480	Operational	No Info
		ALB-WW9	5,831	Operational	1443.25
	Vlora	ALB-SW4	8,598	Under preparation	No Info
		ALB-WW6	8,594	Under construction	No info
Algeria	**Alger**	ALG-WW10	9,832	Operational	1084.05
		ALG-WW38	9,409	Operational	82.39
	Annaba	ALG-WW29	9,297	Operational	2518.03
	Bejaia	ALG-WW23	9,048	Operational	346.90
	Mostaganem	ALG-WW55	7,664	Under construction	242.83
Bosnia	**Alumina facto**	BOS-SW1	3,548	Under Construction	0.00
		BOS-WW2	3,830	Under preparation	3509.48
	Bileca	BOS-WW6	3,032	Under construction	31.21
	Konjic	BOS-WW4	2,629	Under construction	305.51
	Mostar	BOS-SW1	3,548	Under Construction	0.00
		BOS-WW2	3,830	Under preparation	3509.48
	Neum	BOS-SW2	9,995	Under preparation	No Info
		BOS-WW1	9,999	Under preparation	616.27
		CRO-WW16	7,389	Under preparation	0.00
Croatia	**Dubrovnik**	CRO-WW4	1,530	Under construction	0.00
		CRO-WW43	8,151	Under preparation	654.37
	Kastela bay	CRO-SW4	5,258	Under preparation	4.83
		CRO-WW34	2,332	Under construction	0.00
		CRO-WW8	3,128	Under preparation	0.00

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
	Oil refinery	CRO-WW10	3,048	Under preparation	0.00
		CRO-WW28	2,980	Under preparation	0.00
	Pula	CRO-WW25	6,316	Under construction	0.00
		CRO-WW26	8,877	Under construction	442.37
	Rijeca	CRO-SW6	8,449	Under Construction	10.34
		CRO-WW10	3,048	Under preparation	0.00
		CRO-WW28	2,980	Under preparation	0.00
	Sibenik	CRO-WW32	4,250	Under preparation	0.00
		CRO-WW40	8,356	Under preparation	867.24
	Split	CRO-SW2	6,080	Under preparation	19.32
		CRO-SW4	5,258	Under preparation	4.83
		CRO-WW34	2,332	Under construction	0.00
		CRO-WW8	3,128	Under preparation	0.00
	Ston	CRO-WW16	7,389	Under preparation	0.00
		CRO-WW35	1,225	Under construction	No info
	Zadar	CRO-SW10	2,743	Under preparation	2.53
		CRO-WW2	7,673	Operational	544.03
		CRO-WW42	2,628	Under construction	0.00
Cyprus	**Larnaca**	CYP-WW6	7,443	Under construction	0.00
Egypt	**Alexandria**	EGY-SW2	7,105	Under preparation	No Info
		EGY-WW19	9,926	Under Preparation	No info
		EGY-WW7	3,260	No Info	No info
	El' Mex bay	EGY-SW2	7,105	Under preparation	No Info
	Port Said	EGY-SW5	3,008	No info	No Info
		EGY-WW18	5,925	Under preparation	No info

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
France	**Marseille**	FRA-WW1	7,926	Operational	13125.16
Greece	**Elefsis Bay**	GRE-WW1	5,642	Operational-Extension/Upgrade	1294.16
	Thermaikos Gulf	GRE-WW2	9,997	Operational	68.40
Israel	**Akko**	ISR-SW7	4,540	Under Construction	6.18
		ISR-WW3	7,929	Under preparation	45.86
		ISR-WW6	7,930	Under preparation	213.74
	Ashdod	ISR-SW5	5,199	Under preparation	23.85
		ISR-SW9	2,984	Planned	11.88
		ISR-WW25	6,607	Under construction	440.37
	Haifa bay	ISR-SW2	4,294	Under Construction	14.25
		ISR-SW7	4,540	Under Construction	6.18
		ISR-WW7	6,524	Under preparation	1297.27
	Naaman	ISR-SW2	4,294	Under Construction	14.25
		ISR-SW7	4,540	Under Construction	6.18
		ISR-WW6	7,930	Under preparation	213.74
	Nahariya	ISR-WW3	7,929	Under preparation	45.86
		ISR-WW4	4,616	Under preparation	200.41
		ISR-WW47	9,780	Under preparation	176.62
	Safdan (Tel A	ISR-SW10	5,684	Under preparation	0.00
		ISR-SW4	9,413	Planned	10.31
Italy	**Bari-Berletta**	ITA-WW73	4,990	Operational-Extension/Upgrade	3881.18
	Brindisi	ITA-WW88	4,953	Operational-Extension/Upgrade	849.38
	Genova	ITA-WW40	8,990	Operational-Extension/Upgrade	644.19
	Milazzo	ITA-W104	6,011	Operational-Extension/Upgrade	237.56
		ITA-W108	7,588	Operational-Extension/Upgrade	146.78

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
	Rosignano Sol	ITA-WW55	4,937	Operational-Extension/Upgrade	621.05
Lebanon	**Batroun-Selaa**	LEB-WW6	3,725	Under construction	195.13
	Beirut area	LEB-SW1	4,608	No Info	No Info
		LEB-SW4	8,866	Planned	11.80
		LEB-WW1	4,768	Operational	No info
		LEB-WW12	8,470	Planned	14309.46
		LEB-WW14	7,445	Under construction	No info
		LEB-WW2	5,803	Under construction	No info
		LEB-WW3	6,245	Under construction	No info
	Jbail	LEB-WW7	3,182	Under construction	325.22
	Saida-Gazieh	LEB-SW5	2,376	Under preparation	0.00
		LEB-WW4	3,801	Operational	4097.71
		LEB-WW8	9,431	Under construction	572.38
	Sour(Tyre)	LEB-SW3	7,381	Planned	1.71
		LEB-WW16	4,423	Under construction	1300.86
	Tripoli	LEB-SW6	2,364	Under preparation	0.61
		LEB-SW9	2,399	Planned	No Info
		LEB-WW10	3,300	Under construction	6504.30
Libya	**Benghazi**	LIB-SW15	4,096	No info	No Info
		LIB-WW13	7,295	No Info	No info
	Janjour	LIB-SW6	4,290	No info	No Info
		LIB-WW5	4,276	No Info	No info
	Mishratah	LIB-SW11	6,051	No info	No Info
		LIB-WW10	6,054	No Info	No info
	Tobruq	LIB-SW20	8,887	No info	No Info

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
		LIB-WW15	7,810	No Info	No info
	Zawia	LIB-SW5	2,719	No info	No Info
		LIB-WW4	2,726	No Info	No info
Malta	**La Cumnija**	MAL-WW3	701	Operational	229.72
		MAL-WW5	416	Operational	331.73
		MAL-WW7	624	Planned	229.72
	Raz il-Hobz	MAL-WW3	701	Operational	229.72
		MAL-WW5	416	Operational	331.73
		MAL-WW7	624	Planned	229.72
	Wied Ghammieq	MAL-WW4	4,782	Operational	1156.32
		MAL-WW6	3,884	Planned	2698.08
Morocco	**Al Hoceima**	MOR-SW4	3,414	Operational	0.00
		MOR-WW1	2,706	Operational	667.09
	Nador	MOR-SW5	6,218	Operational	0.00
		MOR-WW18	4,277	Operational	1182.71
		MOR-WW7	9,324	Operational	376.63
	Tager	MOR-SW1	9,413	Under preparation	104.92
		MOR-WW8	4,297	Operational	23145.70
	Tetouan	MOR-WW11	4,127	Under preparation	2301.89
Serbia-Montenegro	**Bar**	MON-SW6	2,320	Planned	0.00
		MON-WW7	3,515	No Info	429.90
	Boka Kotorska	MON-WW5	7,696	No Info	305.83
	Budva	MON-SW4	3,733	Planned	No Info
		MON-WW6	3,747	No Info	690.99

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
	Ulcinj	MON-WW8	1,884	No Info	94.61
Slovenia	**Badasevica**	ITA-WW36	5,916	Operational-Extension/Upgrade	474.34
		ITA-WW37	7,130	Operational-Extension/Upgrade	1120.38
		SLO-WW1	2,534	No Info	No info
		SLO-WW2	1,801	No Info	No info
		SLO-WW3	1,840	No Info	No info
		SLO-WW4	1,569	Operational	199.30
	Dragonja	CRO-WW31	5,044	Under preparation	0.00
		CRO-WW37	7,316	Under construction	0.00
		SLO-WW2	1,801	No Info	No info
		SLO-WW3	1,840	No Info	No info
		SLO-WW5	3,520	No Info	No info
		SLO-WW6	2,413	Operational	74.16
		SLO-WW7	1,408	No Info	No info
	Izola	SLO-WW1	2,534	No Info	No info
		SLO-WW2	1,801	No Info	No info
		SLO-WW3	1,840	No Info	No info
		SLO-WW5	3,520	No Info	No info
		SLO-WW6	2,413	Operational	74.16
		SLO-WW7	1,408	No Info	No info
	Piran	CRO-WW31	5,044	Under preparation	0.00
		SLO-WW2	1,801	No Info	No info
		SLO-WW3	1,840	No Info	No info
		SLO-WW5	3,520	No Info	No info
		SLO-WW6	2,413	Operational	74.16

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
		SLO-WW7	1,408	No Info	No info
	Rizana river	ITA-WW36	5,916	Operational-Extension/Upgrade	474.34
		ITA-WW37	7,130	Operational-Extension/Upgrade	1120.38
		SLO-WW1	2,534	No Info	No info
		SLO-WW4	1,569	Operational	199.30
Syria	**Banias**	SYR-WW3	3,351	No Info	No info
	Jableh	SYR-WW4	1,867	No Info	No info
	Lattakia	SYR-WW2	3,616	No Info	No info
	Tartous	SYR-SW1	3,331	No info	No Info
		SYR-WW1	2,467	No Info	No info
Tunisia	**Gabes**	TUN-SW19	3,386	Operational	0.00
		TUN-SW20	9,445	No Info	0.00
		TUN-SW21	7,984	Operational	0.00
		TUN-WW2	3,550	Under construction	217.07
		TUN-WW8J	4,425	Under Preparation	No Info
	Lac de Bizerte	TUN-SW2	7,194	No Info	0.00
	Lac sud Tunis	TUN-WW10	9,692	Under Preparation	293.68
		TUN-WW8B	8,928	Under Preparation	No Info
		TUN-WW9	8,150	Under Preparation	0.00
	Sfax	TUN-SW17	4,417	No Info	0.00
Turkey	**Adana**	TUR-SW1	3,154	No info	No Info
	Alanya	TUR-SW5	6,011	Planned	No Info
		TUR-WW2	6,038	Operational	799.19
	Antakya	TUR-WW16	935	Operational	1644.26
	Bodrum	TUR-SW19	2,562	Planned	No Info

Country	Hot spot	Project	Distance (m)	Project status	De-pollution gap for BOD_5 (t/year)
		TUR-WW36	1,904	Operational	268.78
	Cesme-Alacati	TUR-WW22	5,605	Operational	452.16
	Ceyhan	TUR-WW1	1,234	Operational	820.89
	Datca	TUR-SW20	1,324	Operational	No Info
	Dortyol	TUR-SW26	9,248	Under Construction	No Info
		TUR-WW14	9,037	Under construction	560.96
	Erdemli	TUR-SW16	2,924	Planned	No Info
		TUR-WW29	2,169	Operational	374.69
	Iskenderum	TUR-WW17	2,388	Operational	1422.99
	Kirikhan	TUR-WW18	236	Under construction	561.88
	Manavgat	TUR-SW6	1,466	Operational	No Info
		TUR-WW9	1,392	Operational	729.72
	Mersin	TUR-SW13	3,517	Operational	0.00
		TUR-WW30	7,474	Operational	17762.34
		TUR-WW35	8,360	Operational	17762.34
	Side	TUR-SW6	1,466	Operational	No Info
		TUR-WW9	1,392	Operational	729.72

Annex IV: Lists of potential priority projects

- **List #1: Projects with DG > 800 t/yr and linked to Hotspots or with network connectivity < 80 %**

No	Project Number	Location	Project Status	Financing Secured	Additional project Name	DG BOD5 in 2025 (t/year)	Reasons for additional investments
1	**MOR-WW 8 (bis)**	Tanger	Operational	Yes	Upgrade of WWTP treatment – Phase II	23,145.7	Treatment level (Primary) below MEDPOL target
2	**TUR-WW 30 (bis)**	DOĞU AKDENİZ	Operational	Yes	MESKİ Karaduvar I WWTP and networks – Phase II	17,762.3	New WWTP capacity will be exceeded and network connection below MEDPOL target
3	**TUR-WW 35 (bis)**	DOĞU AKDENİZ	Operational	Yes	MESKİ Karaduvar II WWTP and networks – Phase II	17,762.3	New WWTP capacity will be exceeded and network connection below MEDPOL target
4	**LEB-WW 12(bis)**	Dora	Planned	Yes	Dora WWTP and networks – Phase II	14,309.5	New WWTP capacity will be exceeded and network connection below MEDPOL target
5	**TUR-WW 4 (bis)**	ORTA AKDENİZ	Operational	Yes	ASAT - HURMA WWTP and networks – Phase II	13,991.1	New WWTP capacity will be exceeded and network connection below MEDPOL target
6	**FRA-WW 1 (bis)**	Marseille	Operational	Yes	Networks upgrade/extension	13,125.2	Future network connection below MEDPOL target
7	**GRE-WW 3 (bis)**	Athens	Operational	Yes	WWTP PSYTTALIA – Phase II	10,326.3	New WWTP capacity will be exceeded
8	**PAL-WW 10 (bis)**	West Bank	Under preparation	Yes	Hebron networks – Phase II	9,041.0	Future network connection below MEDPOL target
9	**MOR-WW 10 (bis)**	Tétouan	Under construction	Yes	WWTP and sewerage networks – Phase II	7,004.3	Primary treatment only and future network connection below MEDPOL target
10	**LEB-WW 10 (bis)**	Tripoli	Under construction	Yes	Tripoli sewerage networks – Phase II	6,504.3	Future network connection below MEDPOL target
11	**ISR-WW 1b (bis)**	Center	Under preparation	Yes	Shafdan sewerage networks upgrade – Phase II	5,013.1	Future network performance (leakages) below MEDPOL target
12	**LEB-WW 4 (bis)**	Saida	Operational	Yes	Wastewater collectors in Saida – Phase II	4,097.7	Future network connection below MEDPOL target
13	**TUR-WW 13 (bis)**	BÜYÜK MENDERES	Operational	Yes	Denizli Belediyesi Merkezi WWTP and networks – Phase II	3,945.0	New WWTP capacity will be exceeded ; treatment level and future network connection below MEDPOL target

14	**ALG-WW 8 (bis)**	Alger	Operational	Yes	Baraki WWTP and networks – Phase II	3,902.6	New WWTP capacity will be exceeded and network connection below MEDPOL target
15	**PAL-WW 7 (bis)**	West Bank	Operational	Yes	Nablus West Sewerage WWTP and networks – Phase II	3,606.9	New WWTP capacity will be exceeded and network connection below MEDPOL target
16	**BOS-WW 2**	Mostar	Under preparation	No	Construction of main sewerage collectors and WWTP for Mostar[13]	3,509.5	Project funding not secured. Future network connection below MEDPOL target
17	**TUR-WW 25 (bis)**	CEYHAN	Under preparation	Yes	KAHRAMANMARAŞ WWTP and networks – Phase II	3,304.9	New WWTP capacity will be exceeded ; future treatment level and network connection below MEDPOL target
18	**LEB-WW 11 (bis)**	Keserwan	Planned	Yes	Keserwan WWTP and networks – Phase II	3,284.7	New WWTP capacity will be exceeded and network connection below MEDPOL target
19	**FRA-WW 2 (bis)**	Montpellier	Operational	Yes	Networks upgrade/extension (Maera Phase II)	2,796.1	Future network connection and performance below MEDPOL target
20	**MAL-WW 6 (bis)**		Planned	Yes	Malta South networks – Phase II	2,698.1	Future network connection below MEDPOL target
21	**ALG-WW 29 (bis)**	Annaba	Operational	Yes	Annaba WWTP and network –Phase II	2,518.0	New WWTP capacity will be exceeded and network connection below MEDPOL target
22	**MOR-WW 11**	Martil	Under preparation	No info	Construction of sewerage networks and WWTP[4]	2,301.9	Project funding not known. Primary treatment only and future network connection below MEDPOL target
23	**MOR-WW 12 (bis)**	Mdiq	Operational	Yes	Wastewater treatment and network upgrade– Phase II	2,183.7	Primary treatment only and future network connection and performance below MEDPOL target
24	**ALB-WW 16**	Kamza	Planned	No	Kamza Water Supply and Wastewater Project[4]	2,059.7	Project funding not secured. Future network connection below MEDPOL target
25	**TUR-WW 34 (bis)**	DOĞU AKDENİZ	Operational	Yes	Tarsus Belediyesi WWTP and networks – Phase II	1,864.6	New WWTP capacity will be exceeded and network connection below MEDPOL target
26	**PAL-WW 11**	West Bank	Under preparation	No	Wastewater treatment Ramallah region[4]	1,822.8	Project funding not secured. Future network connection and performance below MEDPOL target
27	**MOR-WW 9 (bis)**	Fniq	Operational	Yes	Wastewater network– Phase II	1,813.6	Future network connection and performance below MEDPOL target

[4] Original projects not funded yet can still be redesigned and scaled up so as to absorb the depollution gap in 2025. For this reason, their number and name remain unchanged in the list.

28	**PAL-WW 8 (bis)**	West Bank	Under preparation	Yes	Regional Sewerage Tulkarem networks – Phase II	1,778.4	Future network connection and performance below MEDPOL target
29	**ALG-WW 9 (bis)**	Alger	Operational	Yes	Reghaia networks – Phase II	1,734.5	Future network connection below MEDPOL target
30	**TUR-WW 16 (bis)**	HATAY SULARI	Operational	Yes	Hatay Belediyesi WWTP and networks – Phase II	1,644.3	New WWTP capacity will be exceeded ; treatment level and future network connection below MEDPOL target
31	**TUN-WW 6 (bis)**	Al-Attar	Planned	Yes	Al-Attar treatment upgrade – Phase II	1,642.5	Future treatment level below MEDPOL target
32	**LEB-WW 13 (bis)**	Ghadir	Operational-Extension/Upgrade	Yes	Ghadir networks – Phase II	1,626.1	Future network connection below MEDPOL target
33	**ALB-WW 9**	Durres	Operational	No info	Durres city networks – Phase II	1,443.2	Project funding status not known. Future network connection below MEDPOL target
34	**TUR-WW 17 (bis)**	HATAY SULARI	Operational	Yes	İskenderun Belediyesi WWTP and networks – Phase II	1,423.0	New WWTP capacity will be exceeded and network connection below MEDPOL target
35	**TUR-WW 42 (bis)**	BÜYÜK MENDERES	Operational	Yes	Uşak Belediyesi WWTP and networks – Phase II	1,415.6	New WWTP capacity will be exceeded and network connection below MEDPOL target
36	**LEB-WW 16 (bis)**	Tyr	Under construction	Yes	Sour WWTP and networks – Phase II	1,300.9	New WWTP capacity will be exceeded and network connection below MEDPOL target
37	**GRE-WW 1**	Elefsina	Operational-Extension/ Upgrade	No	WWTP of Thriasio[4]	1,294.2	Project funding not secured
38	**CRO-WW 39**	Vir	Under preparation	No	Collection and treatment of waste water[4]	1,222.0	Project funding not secured
39	**LEB-WW 15 (bis)**	Beirut	Planned	Yes	Aabdeh WWTP and networks – Phase II	1,203.3	New WWTP capacity will be exceeded and network connection below MEDPOL target
40	**MOR-WW 18 (bis)**	Nador	Operational	Yes	Nador networks – Phase II	1,182.7	Future network connection and performance below MEDPOL target
41	**MAL-WW 4 (bis)**	Sant Antnin	Operational	Yes	Sant Antnin Urban WWTP and networks – Phase II	1,156.3	New WWTP capacity will be exceeded and network connection below MEDPOL target
42	**PAL-WW 9 (bis)**	West Bank	Under preparation	Yes	Salfit sewerage networks – Phase II	1,151.1	Future performance below MEDPOL target

43	**FRA-WW 5**	Bastia Nord	Planned	No	Networks and upgrade of Bastia-Nord WWTP[4]	1,106.9	Project funding not secured. Future network connection and performance below MEDPOL target
44	**ALG-WW 10 (bis)**	Alger	Operational	Yes	Beni Messous WWTP and networks – Phase II	1,084.1	New WWTP capacity will be exceeded and network connection below MEDPOL target
45	**ALG-WW 30 (bis)**	Oran	Operational	Yes	Ain Turk WWTP and networks – Phase II	1,084.1	New WWTP capacity will be exceeded and network connection below MEDPOL target
46	**CRO-WW 23**	Porec-Jug	Under preparation	No	Upgrading/extension of existing network and WWTP[4]	1,071.2	Project funding not secured.
47	**TUR-WW 31 (bis)**	DOĞU AKDENİZ	Operational	Yes	Mezitli Belediyesi WWTP and networks – Phase II	1,028.2	New WWTP capacity will be exceeded ; treatment level and future network connection below MEDPOL target
48	**ALG-WW 31 (bis)**	Skikda	Operational	Yes	Skikda networks – Phase II	997.3	Future network connection below MEDPOL target
49	**BOS-WW 3**	Citluk and Medjugorje	Under preparation	No	Construction of separate collectors and separate WWTPs[4]	957.5	Project funding not secured. Future network connection below MEDPOL target
50	**TUR-WW 28 (bis)**	GEDİZ	Under preparation	Yes	TURGUTLU WWTP upgrade/extension and networks – Phase II	924.9	New WWTP capacity will be exceeded ; future treatment level and network connection below MEDPOL target
51	**PAL-WW 14 (bis)**	West Bank	Under preparation	Yes	Jenin networks – Phase II	895.6	Future network connection and performance below MEDPOL target
52	**CRO-WW 40**	Vodice	Under preparation	No	Collection and treatment of waste water[4]	867.2	Project funding not secured.
53	**TUR-WW 1 (bis)**	CEYHAN	Operational	Yes	CEYHAN WWTP upgrade/extension and networks- Phase II	820.9	New WWTP capacity will be exceeded ; future treatment level and network connection below MEDPOL target
54	**TUR-WW 26 (bis)**	GEDİZ	Operational	Yes	Akhisar Belediyesi WWTP upgrade and networks – Phase II	807.7	New WWTP capacity will be exceeded ; treatment level and future network connection below MEDPOL target

[4] Original projects not funded yet can still be redesigned and scaled up so as to absorb the depollution gap in 2025. For this reason, their number and name remain unchanged in the list.

- **List #2: Projects not operational in 2013 and with PE > 100,000 in 2013**

No*	Number	Name of Project	Status of Implementation	Budget	PE
1	LEB-WW 12	Dora WWTP	Planned	No info	2,200,000
2	ISR-WW 1b	Shafdan expansion of existing WWTP	Under preparation	No info	2,141,818
3	LEB-WW 10	Tripoli WWTP	Under construction	70.00	1,000,000
4	ALB-WW 2	Construction of sewerage system and WWTP for Tirana city	Under construction		756,675
5	TUN-WW 6	Construction of WWTP Phase II (BOT project)	Planned	48.00	750,000
6	PAL-WW 10	Hebron Wastewater Management Project	Under preparation	No info	695,000
7 new	ISR-WW 7	Haifa WWTP	Under preparation	No info	554,255
8	LEB-WW 11	Keserwan WWTP	Planned	No info	505,000
9	TUN-WW 1	Loan ONAS IV (various)	Under construction	123.00	500,000
10 new	ISR-WW 29	W. Jerusalem WWTP	Under preparation	No info	498,133
11	TUN-WW 11	Programme of improving the capacity of wastewater treatment in North Pole of Tunisia (North zone of Grand Tunis)	Under Preparation	40.00	430,000
12	TUR-WW 25	Kahra manmaras WWTP	Under preparation	No info	428,724
13	MOR-WW10	Construction of sewerage networks and WWTP	Under construction	No info	374,118
14	MAL-WW 6	Malta South	Planned	No info	350,000
15 new	PAL-WW 3	South Khan Younis WWTP (New)	Under preparation	No info	320,835
16 new	CRO-WW 28	Collection and treatment of waste water	Under preparation	No info	274,673
17 new	ISR-WW 34	Ayalon WWTP	Under preparation	No info	274,636
18 new	CRO-WW 34	Collection and treatment of waste water	Under construction	No info	250,671
19 new	JOR-WW 3	East Coast WWTP construction with pump station	Planned	No info	250,000
20 new	PAL-WW 6	Intermediate WWTP - West Nurreirat (Wadi Gaza)	Under construction	1.4	247,150
21 new	ISR-WW 19	Netanya WWTP	Under construction	No info	235,764

No*	Number	Name of Project	Status of Implementation	Budget	PE
22 new	JOR-WW 1	Wastewater System	Planned	No info	230,000
23	LEB-WW 16	Sour WWTP	Under construction	28.00	200,000
24 new	TUN-WW 9	5th Sanitation of low income neighbourhoods	Under Preparation	30.00	200,000
25 new	ISR-WW 25	Ashdod WWTP	Under construction	No info	188,145
26	LEB-WW 15	Aabdeh WWTP	Planned	No info	185,000
27 new	ALB-WW 6	Construction of sewerage system and of WWTP for Vlora city	Under construction		181,346
28 new	TUN-WW 2	PISEAU II-Water Sector investment loan (Gabes WWTP)	Under construction	3.00	180,220
29 new	ISR-WW 17	Hadera WWTP	Under preparation	No info	154,952
30 new	ISR-WW 5	Karmiel WWTP	Under preparation	No info	146,121
31 new	GRE-WW 7	WWTP Artemida -Rafina	Planned	No info	131,671
32 new	ALB-WW 1	Construction of sewerage system and WWTP for the Fier city	Under preparation		123,600
33	ISR-WW 26	Ashkelon WWTP	Under preparation	No info	121,558
34	TUR-WW 28	Turgutlu WWTP	Under preparation	No info	119,985
35 new	FRA-WW 3	Upgrading of Ajaccio WWTP (Les Sanguinaires)	Under construction	No info	118,000
36 new	LEB-WW 9	Nabatieh WWTP	Under construction	8.50	100,000
37 new	ALB-WW 13	Construction of sewerage system and wWTP of Elbasan city	Planned		100,000
38	BOS-WW 2	Construction of main sewerage collectors and WWTP for Mostar	Under preparation	No info	100,000

*NB: The mention “new” means that this project was not already included in List #1

- **List #3: Projects selected by experts although with no available information**

No	Number	Location	Project Name	Project Status	Financing Secured	DG BOD_5 in 2025 (t/year)	Reasons for DG BOD_5 in 2025
1	EGY-WW 3	Cairo/Abu Rawash	Untreated domestic sewage	Under preparation	No	No info	No info
2	EGY-WW 4	Cairo/Gabal El Asfar	Expansion of existing WWTP for biological treatment	Under preparation	No	No info	No info
3	EGY-WW 9	Alexandria	Construction of El Mex-El Agamy 300,000m^3/day wastewater treatment plant, construction of 13 pumping stations and one sea outfall	No info	No	No info	No info
4	EGY-WW 13	Al Behira	Construction of sewer network and WWTP for the cities of Kafr El Zayat, Shubrakit, Damieta, Mhmoudia, Samanoua, Kafr El Dawar, Abu El matameer, El Mahmoudia, Zarka, Edku, Hosh Eisa, Abo Hommos	No info	No	No info	No info
5	EGY-WW 15	Port Said	Construction of sewer network and a WWTP for El Garabaa El'manasra area west of the city	No info	No	No Info	No info
6	EGY-WW 16	Port Fouad	Construction of a WWTP for Port Fouad district east of Suez Canal	No info	No	No Info	No info
7	EGY-WW 17	Sharkya	Horizon 2020 Wastewater programme for Sharkya Governorate	No info	No	Under preparation	No info
8	EGY-SW 4	Al Behira	Construction of recycling and organic fertilizer plant near Edku	Yes	No	No info	No Info
9	EGY 3	Alexandria	Application of cleaner technologies and wastewater treatment plants in the companies of: Ratka paper, national paper, Mist Dairy Siclam, Eastern Linnen, Abu Qir Fertilizer, Edfinal Canning, Arab United Textiles, Siouf Spinning, Alexandria Pharmaceuticals	Yes	No	No info	No info
10	EGY 6	Al Behira	Application of cleaner technologies and wastewater treatment plants for the companies: Ismadye, Misr Rayon, El Beida Dye	Yes	No	No info	No info
11	SYR-WW 1	Tartous	Construction of Tartous municipal WWTP	No Info	No info	No info	No info
12	SYR-WW 2	Lattakia	Construction of Lattakia Municipal WWTP	No Info	No info	No info	No info
13	SYR-WW 3	Banias	Construction of Banias municipal WWTP	No Info	No info	No info	No info
14	LIB-WW 7	Tripoli	Construction of aen zara WWTP	No Info	No info	No info	No info
15	LIB-WW 9	Zliten	Extension of WWTP	No Info	No info	No info	No info
16	LIB-WW 10	Misratah	Extension of WWTP	No Info	No info	No info	No info