H2020 PROJECTS WITH SECURED FUNDING

Validation Mechanism Report
State of Progress of H2020 Investment Projects South Mediterranean Region
TA 2008/S 140-186933 (RG/2008/01/FSF) | February 2014

MeHSIP-PPIF
Mediterranean Hot Spot Investment Programme Project Preparation and Implementation Facility (Phase II)

A TA operation funded by the European Union - FEMIP Support Fund
H2020 Projects with Secured Funding - Validation Mechanism of Current Status

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**Disclaimer**

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The authors take full responsibility for the contents of this report. The opinions expressed do not necessarily reflect the view of the European Union nor that of the European Investment Bank.
CONTENTS

EXECUTIVE SUMMARY .................................................................9

1 RATIONALE ..................................................................................18
  1.1 OBJECTIVES & EXPECTED RESULTS ........................................18
  1.2 APPROACH.............................................................................18

2 THE VALIDATION MECHANISM ..................................................19
  2.1 VALIDATION PROCESS ............................................................19
  2.2 COOPERATION WITH OTHER PROGRAMMES & INITIATIVES .........23
    2.2.1 UNION FOR THE MEDITERRANEAN .....................................23
    2.2.2 SUSTAINABLE WATER INTEGRATED MANAGEMENT ...........24
    2.2.3 UNITED NATIONS ENVIRONMENT PROGRAMME / MEDITERRANEAN ACTION PLAN .........24
    2.2.4 EEA: ENPI-SEIS (SHARED ENVIRONMENTAL INFORMATION SYSTEM) ......................24

3 SITUATION UPDATE ON H2020 PROJECTS ...............................25
  3.1 ALGERIA .................................................................................25
  3.2 EGYPT ....................................................................................26
  3.3 ISRAEL ....................................................................................28
  3.4 JORDAN ..................................................................................29
  3.5 LEBANON ...............................................................................31
  3.6 MOROCCO .............................................................................32
  3.7 PALESTINE .............................................................................33
  3.8 TUNISIA ...............................................................................34

4 ANALYSIS & LESSONS LEARNED .............................................37
  4.1 OVERVIEW OF PROJECTS ANALysED ......................................37
  4.2 APPROACH & STRUCTURE OF OUR ANALYSIS .........................39
  4.3 PREPARATION .........................................................................39
    4.3.1 KEY LESSONS LEARNED ....................................................43
  4.4 IMPLEMENTATION .....................................................................45
    4.4.1 STATUS OF PROJECTS UNDER IMPLEMENTATION ..................45
    4.4.2 MAIN CHALLENGES IN PROJECT IMPLEMENTATION ............50
    4.4.3 IMPACT ON IMPLEMENTATION PLANNING ............................55
    4.4.4 LESSONS LEARNED ..........................................................58
  4.5 OPERATION ..............................................................................59
    4.5.1 STATE OF PROJECTS IN OPERATION ....................................59
    4.5.2 MAIN OBSERVATIONS FROM OPERATION ..............................61
    4.5.3 LESSONS LEARNED ..........................................................64
5 FIELD VERIFICATION ON SELECTED H2020 PROJECTS IN OPERATION ..65
5.1 PROCEDURE & SELECTION OF SITES .................................................................65
5.2 ONSITE VISIT TO SAIDA WWTP (LEBANON) ..................................................67
  5.2.1 MAIN FINDINGS ..........................................................................................67
  5.2.2 PERFORMANCE OF THE PLANT .................................................................68
  5.2.3 KEY OBSERVATIONS .................................................................................69
5.3 ONSITE VISIT TO AL HOCEIMA WWTP (MOROCCO) ....................................71
  5.3.1 MAIN FINDINGS ........................................................................................71
  5.3.2 PERFORMANCE OF THE PLANT .................................................................72
  5.3.3 KEY OBSERVATIONS .................................................................................74
5.4 ONSITE VISIT TO COMPLEX CHOUTRANA WWTP (TUNISIA) ......................74
  5.4.1 MAIN FINDINGS ........................................................................................74
  5.4.2 PERFORMANCE OF THE PLANT .................................................................75
  5.4.3 KEY OBSERVATIONS .................................................................................83
6 MAIN OBSERVATIONS, CHALLENGES & KEY LESSONS LEARNED ...........84
  6.1 MAIN OBSERVATIONS ..................................................................................84
  6.2 CHALLENGES FACING H2020 POLLUTION REDUCTION INVESTMENT PROJECTS .84
  6.3 LESSONS LEARNT .......................................................................................85
LIST OF FIGURES

Figure 1  Validation Exercise Process  20
Figure 2  Step 4 - Verification of Project Implementation Phase  22
Figure 3  Step 5 - Project Operation Verification  23
Figure 4  Spread of analysed projects per country  37
Figure 5  Value of analysed projects (m EUR)  38
Figure 6  Distribution of analysed projects per H2020 sector (m EUR)  38
Figure 7  Preparation Studies / Activities  40
Figure 8  Time Lapse between Preparation and Financing  41
Figure 9  Distribution of Projects in the various stages of Project Implementation  46
Figure 10  Percentage of Projects Delayed per Delaying Factor  51
Figure 11  Other Reasons Delaying Project Implementation  52
Figure 12  Delays in Project Implementation Plans  56
Figure 13  Percentage Spread in Years of Delay in Implementation  56
Figure 14  Spread of operational projects among sectors (%)  61
Figure 15  Operational projects as a percentage of projects per sector with secured Financing  61
Figure 16  Operational Responsibility  62
Figure 17  Time Gap between Completion date and Operation Date  63
Figure 18  Variations of the concentration in BOD5 at the input and the output of the WWTP  72
Figure 19  Variations of the concentration in COD at the input and the output of the WWTP  73
Figure 20  Variations of the concentration in TSS at the input and the output of the WWTP  73

LIST OF TABLES

Table 1  H2020 Projects stuck at Preparation Phase  43
Table 2  H2020 Projects undergoing an update of Feasibility Study  47
Table 3  H2020 Projects at Detailed Design Stage  47
Table 4  H2020 Projects at Tendering of Works Stage  47
Table 5  H2020 Projects under Construction  48
Table 6  H2020 Projects Reported as Completed  49
Table 7  H2020 Projects Reported as Partially Completed  50
Table 8  H2020 Projects Reported as Pending  50
Table 9  H2020 Projects in Operation  60
Table 10  H2020 Projects in Partial Operation (also introduced as Table 7)  62

LIST OF ANNEXES

Annex 1  Validation Mechanism Questionnaire  88
Annex 2  Horizon 2020 Project List - Financing Secured (INITIAL VERSION / NOVEMBER 2012) - 50 PROJECTS  91
Annex 3  10 ‘dropped projects’  97
Annex 4  Horizon 2020 Project List - financing secured (UPDATED / SEPTEMBER 2013) - PART OF THE ANALYSIS  98
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>Biochemical Oxygen Demand</td>
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<tr>
<td>BoQ</td>
<td>Bill of Quantities</td>
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<td>BOT</td>
<td>Build - Operate - Transfer</td>
</tr>
<tr>
<td>CB/MEP</td>
<td>Capacity Building/Mediterranean Environment Programme (H2020 Component)</td>
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<tr>
<td>COD</td>
<td>Chemical Oxygen Demand</td>
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<td>EC</td>
<td>European Commission</td>
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<td>Environmental Impact Assessment</td>
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<td>European Neighbourhood Policy Instrument</td>
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<td>FEMIP</td>
<td>Facility for Euro-Mediterranean Investment and Partnership</td>
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<td>FS</td>
<td>Feasibility Study</td>
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<td>H2020</td>
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<td>IE</td>
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<td>kVa</td>
<td>Kilovolt-Ampere</td>
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<td>MCC</td>
<td>Millennium Challenge Corporation</td>
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<td>MEDPOL</td>
<td>Mediterranean Pollution Monitoring Programme</td>
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<td>MeHSIP-PIIF</td>
<td>Mediterranean Hot Spots Investment Programme - Project Preparation and Implementation Facility</td>
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<tr>
<td>MoE</td>
<td>Ministry of Environment</td>
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<td>MoMA</td>
<td>Ministry of Municipal Affairs</td>
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<td>MoPIC</td>
<td>Ministry of Planning and International Cooperation</td>
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<td>NAP</td>
<td>National Action Plan</td>
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<tr>
<td>OPC</td>
<td>Organic Pollutant Load</td>
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<tr>
<td>PE</td>
<td>Population Equivalent</td>
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<td>PPP</td>
<td>Public Private Partnership</td>
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<td>PSI</td>
<td>Private Sector Involvement</td>
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<td>SAP</td>
<td>Strategic Action Programme</td>
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<td>SEIS</td>
<td>Shared Environmental Information System (H2020 Component)</td>
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<td>Solid Waste</td>
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<td>Sustainable Water Integrated Management - Support Mechanism</td>
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<td>ToR</td>
<td>Terms of Reference</td>
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<tr>
<td>TSS</td>
<td>Total Suspended Solids</td>
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<tr>
<td>UfMS</td>
<td>Union for the Mediterranean Secretariat</td>
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<td>United Nations Environment Programme / Mediterranean Action Plan</td>
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<tr>
<td>WW</td>
<td>Wastewater</td>
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<td>WWTP</td>
<td>Wastewater Treatment Plant</td>
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EXECUTIVE SUMMARY

At a Donor meeting in Barcelona in April 2012 DG ENV stated that they needed to be able to establish how successful the H2020 Initiative has been to date in achieving the aim to implement investment projects to reduce land based pollution sources in the Mediterranean Sea emanating from three sectors Wastewater, Solid waste and industrial and emissions. Since substantial funds have already been allocated, a method needed to be developed to determine how many of the projects that have been financed, have reached the operation phase. As part of this exercise, those projects that have been subject to delay need to be analysed, and the reasons for delay identified, so that in future, measures can be taken to minimise or eliminate the causes of delay or at least account for this delay in project planning and financing terms; this analysis can inform an assessment of the realistic time needed to develop a project from feasibility study through to commissioning and operation. An assessment to verify that completed projects are operating in a sustainable manner in accordance with the design criteria was an additional indicator that would ultimately provide the actual measure of success.

MeHSIP-PPIF was given the task to undertake a Validation Study, for those projects with secured financing, to address the above issues as part of the extended mandate between April and December 2013. The scope of the assignment had to be tailored so that the available resources could achieve a meaningful result. The objectives of the approved MeHSIP-PPIF scope were:

1) to provide a “snapshot” of the status of implementation, that is what phase the project has reached in the Project cycle; and provide an indication of the sustainability of investments made in pollution reduction projects;

2) to provide a methodology to allow analysis of the success of pollution reduction efforts under the H2020 initiative (including the Barcelona Convention) thereby generating some lessons which may be used in future project promotion; and

3) to establish a model to be followed by any future entity designated to maintain the H2020 project list and monitor successful implementation of depollution projects.

To achieve these objectives the validation exercise was conducted across all phases of the investment project cycle which included the identification, preparation, implementation and operation phases of the project.

In order to avoid misunderstanding, projects with ‘secured financing’ are defined as those projects that have financing packages agreed, and loan agreements in place. These projects will have already undergone some form of project preparation, normally in the form of a feasibility study thereby reaching a point where the technical scope of the project has been defined, and sufficiently accurate cost estimates have been prepared to enable financing institutions to proceed with arranging financing packages; such packages will normally comprise a combination of loans from IFIs, grant components, and Government contributions which have all been agreed with the respective Government or Promoter.

The current H2020 Project List, identified under UNEP/MAP’s National Action Plans (NAPs) and inputs by various IFIs and Government entities, maintained under the MeHSIP-PPIF Facility is presented in three different parts:

1) Pollution reduction projects that have secured financing;
2) Pollution reduction projects that have yet to secure funding (H2020 Pipeline); and
3) Pollution reduction projects that have been identified under MeHSIP-PPIF as mature enough to take further technically and that warrant initiation of financing negotiations (MeHSIP-PPIF Pipeline).

This validation exercise concerns only category 1) above; that is all H2020 projects with ‘secured financing’. The validation exercise is to determine their status vis-à-vis the various phases of the project cycle. The development of projects is a dynamic process, and therefore the cut-off date of 1 April 2013 was taken for determining the list of projects to be included in the analysis.

The validation exercise was executed by undertaking field missions to meet Promoters, IFIs, and Donors in the respective countries in order to capture the widest possible information about the projects. Constructive cooperation and collaboration with other ongoing initiatives, notably UfM, UNEP/MAP and EEA (ENPI-SEIS), greatly assisted the process. In addition to partners working under the H2020 umbrella this exercise was also supported through a partnership established between SWIM-SM1 (EU-funded technical assistance) and MeHSIP-PPIF to mobilise experts to carry out three (3) field verification visits to some of the selected sites that were found to be operational.

At the cut-off date at the start of this study there were 50 ‘financing secured’ projects that were recorded on the Horizon 2020 Project List. A questionnaire was drawn up in order to obtain consistent and comparable information across the projects and the countries. As a result, during the in-country missions MeHSIP-PPIF was informed that ten of these projects have been dropped2 by the respective Promoters. MeHSIP-PPIF also found out that seven new projects3 have now secured funding, and these projects have been included in this analysis. In five instances, insufficient information was provided by the Promoters to enable valid results to be obtained, so these 5 projects have been excluded. The net result is that 42 projects were included in the full Validation Exercise.

The chart below presents an overview of the spread of these 42 projects constituting the basis of the analysis in terms of sector and country. An important point to highlight is that out of the 42 projects analysed, 40 of these have moved from the preparation phase to the implementation phase.

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1 Sustainable Water Integrated Management – Support Mechanism
Projects that have financing secured will have already completed the identification and preparation stages. However, the study included these phases in the analysis in order to:

- Obtain information to provide an indication of the time taken from identification of a project to completion of implementation and commencement of operation; and
- Where projects have been subject to long delays between identification and securing finance, sometimes the scope or needs will have changed significantly thus requiring the feasibility study to be revised or updated.

The analysis undertaken was carefully drawn from the responses to the questionnaire prepared for this purpose which were translated into data sheets to extract quantitative information where possible. It covers the following phases of the investment project cycle as follows:

**Preparation:** It is well established that the main preparatory exercise for a successful investment project is a high-quality feasibility study that clarifies important aspects and defines the scope of the investment projects. Those projects with limited preparation tend to have more issues in the later stage of implementation.

The information received indicated that the average time required to complete all preparation studies is generally not less than 3 years. The Preparation phase is also considered to be the best time to establish a good consultation process with stakeholders and beneficiaries that should also continue throughout the project cycle phases. Two projects (in Jordan and Tunisia) although having completed the preparation phase but had not progressed to the implementation phase.

**Implementation:** there are five discrete stages under the implementation phase that define the status of the project and these stages formed the basis of the validation exercise, which are:

- Review/Updating of Feasibility Study;
- Detailed design;
- Procurement;
- Under construction; and
- Post-commissioning and Operation.
Of the 40 remaining projects that have reached the implementation phase, it is noted that 65% have been identified to be in the last two stages of the implementation phase, namely: 16 projects (i.e. 40%) ‘under construction’ amounting to a total value of 1,699.50 M Euro and 10 projects (i.e. 25%) ‘completed’ which means that they have commenced operation, these amounting to 418.70 M Euro.

The following bar chart shows the spread of the projects between the five stages constituting the implementation phase.

_Was the following bar chart shows the spread of the projects between the five stages constituting the implementation phase._

There are two key factors that were considered in the analysis:

- The time taken in each stage of implementation, and identification of delays; and
- The type of delays incurred and their impact, and where possible the reasons for these delays.

It is noted that the date that the projects reached implementation differs, therefore those still in the detailed design stage generally will be projects that have matured later than those that have reached completion.

There are several factors that were noted as causing delays. Apart from identifying reasons for delay, the analysis also produced a ranking of these factors, depending on the frequency of their occurrence; those that are the most common were found to be:

1) Change in project scope from that presented in an original feasibility study is observed as an important cause for delay; this is generally related to a lack of sound and robust project preparation together with poorly managed consultation with stakeholders and beneficiaries. The need to change scope is often only detected when the project has reached at least the tendering stage therefore also leading to increases in project cost. All these issues not only cause delays but in some cases, Promoters were required to revert back to IFIs to re-package finance arrangements to match the increases in price.

2) There are a group of factors that also frequently cause delays. These include: inappropriate procurement procedures and contract strategies that are not compatible with local
conditions, land acquisition and expropriation; approvals, political unrest, and change in government. The study observed that 15 projects (38%) suffered from those causes of delays, with some affected by more than one of the causes/components listed. The time delay on the original programme for these projects was noted as on average between 2 and 4 years, but in one case reached up to 14 years.

3) Failing National Approval, which relates to projects that were initially identified as priority by the Government, but due to a lack of proper consultation or new emerging requirements, the project faced resistance at national or regional/local Government level(s), surrounding establishments, and/or the local community. Among the cases encountered some had reached an advanced stage of preparation obtaining full approval from IFIs and Governments and secured loan financing before they were stopped.

4) Some factors external to the project, such as 'Government contribution' can also have an impact. These refer to the portion of capital cost to be injected by the partner country Government (Promoter) as part of the financing agreement of an infrastructure project. This portion varies from project to project based on various factors. The main problem occurs when the loan is signed and implementation starts and the portion or components to be financed through Government contribution are delayed, hence delaying the overall project implementation.

Parallel to the delayed projects it is also noted that 14 projects (equivalent to 35%) were recorded as having no delays. The projects analysed above that are identified as having suffered from delays and those without delays are spread among the partner countries. This implies that the reason for delays cannot exclusively be explained due to lack of sufficient administrative capacity. Instead, a state of ‘no delay’ is usually associated with multiple factors contributing to smooth progress. These factors can include, but are not limited to, appropriate administrative in-house skills currently available or acquired through provision of grant support to recruit and/or establish proper TA support.

Delay in project implementation plans means the delay that the implementation of a given project has incurred to date compared to the original planned duration between securing financing and completion. The figure below presents the overall trend in delays among the various projects.
**Operation:** This is the final phase of the project cycle following implementation and commissioning. Verification of the efficiency of operation is one of the most critical assessments as it requires confirmation that all standards have been adhered to, installation of equipment has been undertaken in accordance with the specification, and the project meets its planned performance levels. A key parameter is an assessment of whether the operation of the scheme achieves the intended pollution reduction at the hot spot location identified under H2020. The ten (10) projects that were reported as completed are operational, and amount to a total investment of 418.7 M Euro spread among sectors as shown in the chart below.

These 10 operational projects represent 11% of the total investment portfolio of projects with secured financing.

In order to give the operation phase the appropriate emphasis and to obtain an assessment of the pollution reduction impact of operational projects, MeHSIP-PPIF drew on the resources of the EU-funded SWIM project to undertake technical field verification missions on a selected sample of operational H2020 projects with wastewater treatment plants in Lebanon (Saida), Morocco (Al-Hoceima) and Tunisia (Choutrana). The treatment process varies between the sites from simple screening to tertiary treatment; hence the difference in impact on pollution reduction.

There were only resources available to undertake a high level assessment, but in all cases, there is evidence of keen operators at all the plants aiming to achieve improved results. Clearly, in Lebanon,
little pollution reduction is possible with the basic treatment process adopted, but inherent inefficiencies in the wastewater system were gradually being attended to; at the Morocco plant, where some final treated effluent was being recycled for irrigation, good reductions in the key biological process parameters were observed; reductions were also being achieved at the Tunis plant albeit to a lesser extent. A general observation is that all three plants are already approaching capacity and there will be a need to upgrade or extend the plants in the near future.

One challenge, the treating and disposal of sludge generated, is a common feature. Currently, in Lebanon the national sludge strategy is being finalised; in Morocco sludge is stored on a WWTP site outside town awaiting a strategy for formal disposal. By contrast, in Tunisia, the sludge is dewatered and dried and efficiently transported off-site to an appropriate solid waste site owned by ONAS.

**Main Observations** to be drawn from the validation exercise can be summarized as follows:

- The average time span to bring an infrastructure project from identification to the completion of implementation requires between 7 to 10 years;
- An extended time lapse between end of the preparation phase and the start of the implementation phase negatively affects project outcome; and
- Despite obvious engagement of regional governments resources available for environmental protection remain modest and in continuous need of supplement and support.

**Main Lessons Learnt**

The exercise to validate the status of projects with secured finance has provided several unique opportunities. By recording the stage that these projects have reached, how long they have taken to develop and what issues they have experienced during the implementation phase, in particular those that have had delays, has highlighted some lessons. Additionally, for those projects that have reached operation, we were able to observe whether the expected pollution reduction has been effectively and efficiently achieved by a sustainably operated project. This process has identified ‘lessons learnt’ from each stage of the development of these projects and has provided the opportunity to understand the type and nature of obstacles that may cause delays in order to be taken into account or mitigated if possible in future planning.

Lessons learnt have been highlighted at each stage of the development process. Some aspects are specific to one stage of the project development, but some are fundamental and refer to the same basic issues that can cause delays in more than one stage. Therefore, in this part of the Executive Summary we identify what have been identified as ‘Key Lessons’ learnt, and the full report explains in more detail the impact of all the lessons that have been identified during the study.

It has been found that undertaking sound project preparation is one of the most important single lessons learnt. Many projects would have benefitted by a more robust initial stage. This means that sufficient time and resources need to be allowed at the start of the project to be able to obtain all basic data and information required to define a project sufficiently accurately including impacts and benefits in the widest sense, thus minimising, or eliminating, the need for changes or redesign as the project progresses through implementation. In order to achieve this, and to include other related aspects that need to be taken into account at the start of the project, the following points are relevant:
• The project scope needs to accurately reflect the aims of the project which corresponds to Government priorities, institutional capacity, availability of funds and affordability of consumers;

• Ensuring that other components of the ‘Whole Project’ that are critical to the function of the project but which may be implemented under other parallel financing programmes are being implemented to meet the completion/commissioning requirements of the project;

• An inclusive consultation process with key stakeholders and Associated and Interested Parties from the beginning of the feasibility study phase is vital to ensure a smooth and effective preparation phase;

• These consultation processes need to continue during implementation, which will allow a transparent process to be maintained and ensure that relevant issues are addressed and mitigated as the project proceeds;

• Involvement of the local communities is important at all stages, particularly where land and community activities are affected;

• Sufficiently detailed engineering studies and investigations should be undertaken at the preparation stages and are key to successful and smooth project design and implementation, and to enable sufficiently accurate cost estimates to be prepared;

• These engineering designs lead to the drawing up of Bills of Quantities and/or Price Schedules which reflect the complete works to be constructed and form the basis of the ultimate costing of the project. Early identification of land requirements and a realistic time scale to secure acquiring land are also critical;

• To succeed without delays and additional cost implications, these price documents need to be accompanied with sufficiently detailed specifications for a contractor to be able to fully price the works to be constructed and minimise variations during the construction stage;

• Any changes in scope or project definition from this stage onward results in high cost implications and time delays;

• The inclusion of local and national resources and expertise at an early stage is essential in order to ensure that the local conditions are fully understood and taken into account during the preparation process. In this way valuable time is gained and delays avoided on many fronts such as field surveys where nationals are more familiar with the area in question, required administrative processes and approvals. Further, understanding the hierarchy of the decision-making process and familiarity with particular social cultures and values are also essential;

• Provision for sufficient resources (human, time and financial) to provide adequate technical skills during construction and for operation to ensure sustainability of the project;

• Committing financing before proper project preparation can sometimes negatively affect project implementation since there will tend to be pressure to disburse funds before sufficient detailed engineering design work has been done (i.e. by reducing the essential project preparation time), potentially leading to downstream problems; on the other hand in one case, a comprehensive engineering design team was provided by the financier to undertake the initial engineering planning as a condition of the finance; and

• Ensuring that adequate administrative procedures are undertaken in a timely manner at the promoter’s organization in order to avoid delays in closing financing and affecting implementation plans implementation.

Operation is the ultimate stage of the project cycle. It is the final step that becomes the lasting monument of the overall success and sustainability of the project. The key steps to smooth, efficient and sustainable operation can be summarised as follows:
- Sound preparation at the initial stages of design as outlined above by undertaking sufficient field work and studies to produce a sound base on which to proceed with the subsequent phases of implementation, will usually lead to a realistically priced construction contract, the works built to a proper standard, with quality/appropriate equipment operating at optimum efficiencies, and smooth operation by appropriately trained and skilled operators;
- Involvement of the ultimate operating staff at the earliest possible stage of implementation will provide the best opportunity to have knowledgeable staff running plants, maintaining the networks and managing landfill operations; and
- Sufficient funds need to be available for operating and providing routine maintenance. Since in all of the countries under consideration, the tariffs currently do not cover even basic operation and maintenance costs, it is important that there is a mechanism in place from the start to provide sufficient funds to support appropriately skilled staff as well as for the required operating functions.
1 RATIONALE

At the Donor Group meeting held in Barcelona on the 18th April 2012, it was agreed by all participants that factual knowledge of the status of those projects that have already secured financing would be of great value to Donors, UNEP/MAP, and other organisations associated with H2020. In a follow up meeting that took place in Brussels on 28th July 2012 with the participation of the various concerned organisations namely, EC, EIB UNEP/MAP, UfMS, CB/MEP and MeHSIP-PPIF the Terms of Reference for identifying the status of those 50 depollution projects that have secured finance was approved as part of the extension to the current MeHSIP-PPIF programme. The scope of this assignment is tailored to be consistent with the resources made available for this task.

1.1 OBJECTIVES & EXPECTED RESULTS

The objective of this assignment is:

- to provide a “snapshot” of status of implementation and sustainability of investments made in pollution reduction projects;
- to allow an analysis of how successful pollution reduction efforts have been under the H2020 initiative (including the Barcelona Convention) thereby generating some lessons which may be used in future project promotion; and
- to establish a model to be followed by any future entity designated to maintain the H2020 project list and monitor successful implementation of depollution projects.

1.2 APPROACH

The current H2020 Project List, identified under UNEP/MAP’s National Action Plans (NAPs) and inputs by various IFIs and Government entities, maintained under the Mediterranean Hot-Spot Identification Programme - Project Preparation and Implementation Facility (MeHSIP-PPIF) is presented in three different parts:

- Pollution reduction projects that have secured funding;
- Pollution reduction projects that have yet to secure funding (H2020 Pipeline); and
- Pollution reduction projects that have been identified under MeHSIP-PPIF as mature enough to take further technically and that warrant initiation of financing negotiations (MeHSIP-PPIF Pipeline).

The H2020 Project List used for this validation exercise has been maintained throughout the mandate of MeHSIP-PPIF. Updating this list was mainly based on most recent information obtained from the H2020 Focal Points in the partner countries and the IFIs with relevant country programmes in the three H2020 sectors (industrial emissions, solid waste and wastewater).

Regarding this validation exercise all H2020 projects with ‘secured financing’ were selected to determine their status vis-à-vis the various stages of the project cycle. This validation was executed

42 ‘financing secured’ projects forms the basis of the analysis presented in this report. A detailed explanation on how the final project list was confirmed is presented in chapter 4.
through field missions to meet Promoters, IFIs, and Donors in the respective countries in order to capture the widest possible information about the projects.

2 THE VALIDATION MECHANISM

This chapter sets out the process undertaken to carry out this validation exercise. It also refers to key stakeholders and related programmes/projects that MeHSIP-PPIF liaised with when undertaking the validation of the ‘financing secured’ projects.

2.1 VALIDATION PROCESS

To better understand the applied methodology it is important to remind the reader that this validation exercise is following the Project Development Cycle related to investments in pollution reduction projects, which has the following distinct phases:

- Identification phase;
- Preparation phase;
- Implementation phase; and
- Operation phase.

The following figure (Figure 1) presents an overview of the steps applied in the validation process. The actual analysis is presented in chapter 4 ("Analysis and Lessons Learned") of this report.
Figure 1  Validation Exercise Process

**Step 1 Results**
1. Projects Subject to Implementation
2. Update of H2020 Project List

**Step 2 Results**
1. Priority List of Targeted Projects
2. Updated H2020 Project List

**Step 3 Results**
1. List pending projects with secured financing
2. List problems behind delaying/hindering implementation
3. Time gap between preparation works and loan agreement
4. Projects benefiting from grant support
5. Refined list of projects under implementation

**Step 4 Results**
1. An updated list on progress of projects with secured financing
2. A list of reasons hindering the implementation progress of projects with secured financing
3. An average time gap between completing preparations and starting implementation
4. An average time gap between tendering and awarding of implementation works
5. A list of issues/reasons for delay during construction
6. A more refined list of projects under implementation
7. A list of projects that has progressed to operation phase

**Step 5 Results**
1. An updated list on progress of projects that have completed implementation
2. An updated status on operation of implemented projects
3. A qualified list of reasons impeding or negatively influencing Operation considering technical, financial and institutional aspects
4. Qualified data on average time required for awarding project operation
5. Capacity of Promoters to undertake operational arrangements
6. Type of operational arrangements or operational modality undertaken for various projects
For the purpose of this exercise the focus was on the last three steps (Step 3-5 as depicted in Figure 1) with initial information also collected on the first step (Step 1), which is the identification phase, in order to understand the dynamics behind the project selection for financing. Although the above process could limit this validation exercise to identifying priority projects for verification as proposed under Step 2, MeHSIP-PPIF proceeded to cover all projects on the H2020 Project List with ‘financing secured’. The validation exercise was thereby not limited to cover only the prioritised projects. When expanding the project sample, some challenges were faced in terms of obtaining the required and rather comprehensive data for each project, as had been identified as a potential risk when initiating this validation exercise. The following text provides a brief overview of the approach adopted:

- **Step 3 - Verification on ‘Project Preparation’**: establishes whether the project has had the necessary preparatory studies completed before it proceeded to the implementation phase. This verification is essential, as despite the fact that many projects are being implemented or are operational, it would nevertheless be very informative to know how the preparation was carried out, as useful conclusions might thereby be drawn. In addition, it assists in better understanding any variations from the initial concept or incurred delays and the reasons behind these variations and/or delays.

  This first phase of the screening process provided information that gave insight on those projects that had not advanced beyond the feasibility study stage, although financing had been secured. This allowed for information related to problems and issues to become evident and is presented as part of the analysis under chapter 4 of this report.

- **Step 4 - Verification on ‘Project Implementation’**: validation of the implementation phase is a critical exercise in determining the advancement of a project through its cycle. Information gathered at this stage is more detailed in comparison to the previous step, as the information available, in particular from the Promoter, is much more comprehensive.

  The result of this step (verification of project implementation) defines the stage at which the project is in the implementation process. It shows whether the project is at the detailed design stage; the tendering / procurement stage; the construction stage; or whether the project had completed construction and is being commissioned, or having been taken over by the Operator (which may be the Promoter or a private contractor). The time taken to reach this stage is also noted, including reasons behind any incurred delays.

  The process of carrying out this verification step (Step 4) is shown in the chart (Figure 2) below:
This allows projects to be presented in a tabulated format stating at which stage they are in the implementation scale. At the same time those projects that have reached ‘operation’ are listed and are analysed under the ‘Project operation verification’ stage below.

- **Step 5 - Verification on ‘Project Operation’**: this step collects data related to operation covering, but not limited to:
  1. *who* the operating entity is;
  2. *what type* of operation arrangement is in place;
  3. *what level* of specialist support is being utilised; and
  4. *for what* period a concession arrangement is in place for, if applicable.

Other aspects examined are those related to variations from the project initial conception in terms of addressing fully or partially the pollution problem scope and population or geographic area benefiting from it. Again, the Promoter is the best source to provide the required information, in addition to the operating entity if different from the Promoter.

Initially there were no resources allocated for this step of the validation process through the MeHSIP-PPIF as it was not part of the mandate to also conduct a targeted number of technical field verifications to operational projects. This is why MeHSIP-PPIF established a partnership with another ongoing EU-funded technical assistance programme, SWIM-SM\(^5\), allowing MeHSIP-PPIF to tap on their resources and jointly identify a sample of operational projects to be visited. For this purpose specific ToRs were developed and the required resources approved from SWIM to mobilise experts to carry out the field verification visits to the selected sites. The findings of the three field verification visits carried out jointly by MeHSIP-PPIF and SWIM are presented under chapter 5 of this report.

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\(^5\) Sustainable Water Integrated Management – Support Mechanism
The process of carrying out this verification step (Step 5) is shown in the following figure:

**Figure 3  Step 5 - Project Operation Verification**

This verification process serves to report on lessons learnt from project operations and the best means adopted to guarantee an operational arrangement satisfying all parties be it the Government; IFIs/Donors; or the Operators in case of a private sector.

While designing the validation methodology, MeHSIP-PPIF working assumption was that a relatively large proportion of the projects with secured financing would have reached this phase and be fully operational. Unfortunately, the reality was rather different, as only a handful of projects have actually been commissioned and reached the operation phase. This is why in the section dedicated for operational assessment (chapter 5), it was not feasible to cover samples from all three H2020 sectors (IE / SW / WW). Therefore, the verification of project operation (Step 5) focused on the WW sector.

**2.2 COOPERRATION WITH OTHER PROGRAMMES & INITIATIVES**

The following part sets out MeHSIP-PPIF’s collaboration with initiatives/programmes in a wider context, as all are involved in contributing to enhancing the environment in the Mediterranean region.

**2.2.1 UNION FOR THE MEDITERRANEAN**

MeHSIP-PPIF has carried out this validation exercise in close coordination with the Union for the Mediterranean Secretariat (UfMS) and the consultant (LDK-IME) appointed to undertake the assignment to “Update of Priority Investment Projects for Protecting the Mediterranean Sea from Pollution”. Whereas MeHSIP-PPIF’s mandate was to provide a snapshot for the ‘financing secured projects’ included in the H2020 Project List with an analysis setting out key obstacles/challenges affecting Project Cycle Management, the study commissioned by UfMS aims to assess progress and
success of projects to demonstrate a pollution reduction impact. As most of the projects assessed/reviewed by the respective teams were the same, a number of joint missions⁶ were organised and country mission reports were jointly developed. In addition, MeHSIP-PPIF participated in a number of meetings chaired/co-chaired by UfMS, in order to ensure close and effective coordination between the two studies undertaken in parallel.

2.2.2 SUSTAINABLE WATER INTEGRATED MANAGEMENT

MeHSIP-PPIF also established a partnership with another EU-funded project, namely the "Sustainable Water Integrated Management - Support Mechanism (SWIM-SM), which is a regional technical assistance programme to contribute to the dissemination and effective implementation of sustainable water management policies and practices in the Southern Mediterranean Region. Through the support of SWIM, MeHSIP-PPIF was able to undertake three onsite visits⁷ to facilities that are operational and to draw important lessons learned as well as identifying best practices, as presented in chapter 5 of this report.

2.2.3 UNITED NATIONS ENVIRONMENT PROGRAMME / MEDITERRANEAN ACTION PLAN

Within the United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) structure, the Programme for the Assessment and Control of Pollution in the Mediterranean Region (MEDPOL) remains a key partner for MeHSIP-PPIF as MEDPOL is responsible for the coordination of the National Action Plans (NAPs) with the countries around the Mediterranean Sea including the ENP South partner countries targeted by MeHSIP-PPIF. UNEP/MAP has in parallel to the studies carried out by MeHSIP-PPIF and UfMS (see section 2.2.1) published a separate call to provide support for the "Evaluation of NAP/SAP investment portfolio implementation". MeHSIP-PPIF has throughout the preparation of this study remained in close coordination with UNEP/MAP and has expressed its readiness to make available all its findings to the consultant to be assigned to carry out UNEP/MAP evaluation.

2.2.4 EEA: ENPI-SEIS (SHARED ENVIRONMENTAL INFORMATION SYSTEM)

MeHSIP-PPIF also worked closely with the European Environment Agency (EEA), which is responsible for the “Review, Monitoring and Research” (RMR) component of the Horizon 2020 Initiative. MeHSIP-PPIF took part at the ENPI-SEIS (European Neighbourhood Policy Instrument - Shared Environmental Information System) Steering Committee (Copenhagen, 11-12 June 2013). During the SC, MeHSIP-PPIF presented the approach for the validation ‘snapshot’ for the projects with ‘financing secured’ and requested the support of the representatives from the partner countries to provide relevant data for this task.

⁶ Algeria (10-12 July 2013), Egypt (17-21 March 2013), Israel (3-5 June 2013), Morocco (8-12 April 2013), Palestine (5-7 June 2013).
⁷ Lebanon (Saida WWTP), Morocco (Al Hoceima WWTP) and Tunisia (Choutrana Complex WWTP)
3 SITUATION UPDATE ON H2020 PROJECTS

Chapter 3 provides an overview of the situation on all those H2020 investment projects with ‘secured financing’. The section is structured based on projects per country and provides an update on the status for each project based on information provided by various parties involved in the project in the respective partner country.

Before proceeding to list the projects per partner country, it is important to remind the reader that this validation exercise is focusing only on H2020 investment projects that have secured financing and form part of the H2020 Project List maintained through MeHSIP-PPIF. By secured financing, it is meant those projects that have already undergone some project preparatory activities, for example through the form of a feasibility study leading to closing of financing agreements with: (i) IFIs in the case of loans; (ii) grant agreement in the case of grants; and/or (iii) budget allocation in the case of Government investment/contribution.

3.1 ALGERIA

In the solid waste (SW) sector, based on consultations with relevant country counterparts, Algeria developed around 1,200 master plans for solid waste management across the country. These master plans generated the need for 122 sanitary landfills (known as “Centre d’Enfouissement Technique” - CET) that were enlisted as investment projects. Out of the 122 CETs, 62 are so far completed and operational, covering also coastal cities.

A concrete example reflecting the efforts at the local level is the Wilaya of Algiers (3.5 million inhabitants) where the SW planning covered four (4) major sub-sectors, including (i) municipal solid waste (a total of 4 executed); (ii) inert waste (a total of 3 executed); (iii) rehabilitation and closure of dumpsites (1 in Wadi Smar under rehabilitation and eight (8) others in progress); and (iv) green waste and hospital waste. Further, in Wilaya of Tipaza (620,000 inhabitants) rehabilitation and closure of dumpsites (total 16 with 8 on the coast that are under rehabilitation for closure), sanitary landfills (with 3 under construction and 2 in tendering process) as well as hospital waste (3 incinerators executed).

The Government has established two special waste reception centres, one in the East and one in the West of Algiers and three (3) specialized sites to deal with Zinc. Add to this is the PNAGDS (“Plan National Algérien pour Gérer les Déchets Spéciaux” - National Algerian Plan to manage the special wastes) that offered a comprehensive approach to deal with PCBs (banned from imports since 1987) facilitating their transfer for destruction, and norms for PCB in-situ storage.

In the wastewater sector, extensive efforts by the Government after 2002 resulted in the issuing of the Framework Law (2-02, February 2002) for the protection of the coastal line extending over 97 km. Since 2002, the ONA (“Office National d’Assainissement” - National Sanitation Office - operating under the tutelage of the Ministry of Hydraulic Resources) has started taking over the management of WWTPs from local communities as requested by the Minister of Water. This handing over has led to major improvements of the facilities through the establishment of special enterprises to manage the operation (“Entreprise par Objectif”) owned 50% by the Government and 50% by the private sector. So far, 87 out of the 144 WWTPs are in the hands of ONA. All ONA WWTPs provide secondary treatment and have on site laboratories for regular water sampling and analysis of the inflow and outflow of the plants. The results of the localised laboratory analysis are randomly
audited by ONA’s central laboratory (ISO 17025 certified) with monitoring emphasis on DBO_{5}, TSS, heavy metals and potassium.

3.2 EGYPT

The following table represents the eight (8) projects for Egypt reported to the H2020 project list that were labelled as projects with 'secured financing'. Out of the projects appearing hereunder only five (5) were covered through this validation exercise. The ones that were not covered are EG004, EG011 and EG012 because no information was made available to the validation team during the missions or in the course of undertaking this exercise (note: these projects are marked in grey in the table below).

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG004</td>
<td>Cairo / Gabel El Asfar</td>
<td>WW</td>
<td>Expansion of existing WWTP for biological treatment</td>
<td>130</td>
<td>Increase in capacity of Conventional Activated sludge plant to 2,500 m³/d secondary treatment. Being financed by AfDB. The Promoter is CAPWO (Cairo &amp; Alexandria Potable Water Organization).</td>
</tr>
<tr>
<td>EG005</td>
<td>National</td>
<td>WW</td>
<td>Improved Water and Wastewater Services Programme - IWSP</td>
<td>295</td>
<td>A five year programme which started in December 2010. Financed by five agencies; four IFIs (KfW (lead), EIB, AFD, Swiss and with EU grant TA funds). In the design stage developing wastewater systems in the following Governorates: Beheira, Damietta, Gharbeya and Sharkya. Phase 1 is for the rehabilitation and construction of water and wastewater treatment plants and networks amounting to 52% of the investment; Phase 2 will cover new wastewater treatment plants and networks. Accelerated 2 million € initial stage has commenced. The Promoter is HCWW.</td>
</tr>
<tr>
<td>EG006</td>
<td>National</td>
<td>WW</td>
<td>Integrated Sanitation and Sewerage Infrastructure Project - ISSP</td>
<td>87</td>
<td>Initial project started in 2009 for four years and now has 18 month extension to 2015. Funded by the World Bank. Delays caused by land acquisition procedures and contractual issues. Development of wastewater systems in some districts of Beheira, Gharbeya and Kafr El Sheikh Governorates. All Phase 1 contracts have now been awarded; 19 contracts serving networks in 35 villages; and two Wastewater treatment plants. Approximately 30 million € value has been implemented so far. Gharbeya and Kafr El Sheikh projects planned to be completed in 2013. The Promoter is HCWW.</td>
</tr>
<tr>
<td>EG007</td>
<td>Alexandria</td>
<td>INT</td>
<td>Coastal Zone Management Project</td>
<td>4</td>
<td>Funding secured since 2011. Feasibility study and detailed design of low cost treatment of water discharged to Lake Mariout through Qalaa drain completed in March 2013. Pilot trials of treatment processes undertaken.</td>
</tr>
<tr>
<td>Nr.</td>
<td>Location</td>
<td>Sector</td>
<td>Project title</td>
<td>Value (m EUR)</td>
<td>Situation Update</td>
</tr>
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</tr>
<tr>
<td>EG08</td>
<td>Delta and Upper</td>
<td>IE</td>
<td>Private Public Sector Industry Project-PPSI</td>
<td>28.8</td>
<td>This project is funded by KfW and comprises 34 projects in the industrial sector of which 20 have been fully disbursed. KfW funds amount to 15.6 million € equivalent to 25% of the finance cost, the remainder provided by private industry. Total investment was expected to be c. 31,7m EUR; actual when programme is completed is estimated to c. 28,8m EUR. The promoter is EEAA. Note: a new allocation of 16m EUR - to be integrated into EPAP III - which is also expected to target SME.</td>
</tr>
<tr>
<td>EG09</td>
<td>National</td>
<td>IE</td>
<td>Egyptian Pollution Abatement Programme (EPAP II)</td>
<td>145</td>
<td>EPAP II was completed in 2012. Full disbursement - c. 170m USD (average project size: 3-4m EUR). TA provided through a full-time consultant based at EEAA’s supporting team. The promoter is EEAA. Note: EPAP III is expected start in second quarter of 2014 (funding from: AFD, EIB, EU, KfW, WB (tbc)).</td>
</tr>
<tr>
<td>EG11</td>
<td>Alexandria</td>
<td>WW</td>
<td>Wastewater treatment plant at Amriya</td>
<td>81</td>
<td>Project funded by Government and KfW. Construction expected to be completed and in operation by end of 2013. Project comprises networks and wastewater treatment plant. 2 contracts; awarded to the same contractor. WWTP capacity of 100,000 m³/day for 650,000 people. Location is very close to delta. Project was delayed but now on track and expected to be completed in 2014. Promoter is CAPWO and the operations will be carried out by Alexandria General Organisation for Sanitary Drainage (ASDCO). Relatively small project, including following activities: reduction of leakage; NRW; income / revenue; improve billing system; rehabilitation of networks; training; leak detection. To strengthen the Qena Company for Water and Wastewater (Affiliated Company of HCWW). Currently in construction stage; one contract to replace 15,000 water meters, and replacement of networks; survey of consumers; 60% revenue.</td>
</tr>
<tr>
<td>EG12</td>
<td>Qena</td>
<td>INT</td>
<td>Water supply and sanitation</td>
<td>12.5</td>
<td></td>
</tr>
</tbody>
</table>
3.3 ISRAEL

The following table represents the seven (7) projects from Israel reported to the H2020 that were labelled as projects with ‘secured financing’. All the seven (7) projects were covered during this validation exercise.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL001</td>
<td>Netanya</td>
<td>SW</td>
<td>Landfill mining and reclamation project</td>
<td>35.0</td>
<td>Landfill closed in 1995. Under preparation - feasibility study has been completed ready. Works expected to start in 2013, and will include the removal of waste from the site (c. 2 million m³). Project duration estimated to 5 years. Municipality of Netanya through its fully owned company, Netanya Development and Tourism Ltd, is the project promoter and has secured the funding.</td>
</tr>
<tr>
<td>IL002</td>
<td>Shafdan</td>
<td>WW</td>
<td>Construction of sludge incineration plant or sludge drying plant</td>
<td>244.0</td>
<td>Initial incineration project cancelled due to NGO complaints. Current project includes facilities and technologies for sludge drying, stabilization and composting for reuse in agriculture (bio-fertilizer). Works well under way and expected to be completed in 2015. The project promoter is the Dan Regional Association for Environmental Infrastructure (Association of Municipalities), which includes the seven wealthiest cities of Israel and are sharing the cost for this project. Once completed will address, to a large extent (if not fully), a major hot spot as identified in the NAP.</td>
</tr>
<tr>
<td>IL008</td>
<td>Hana’aman</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>2.2</td>
<td>Works close to being completed. The promoter is the Western Galilee Association of Towns for Environment.</td>
</tr>
<tr>
<td>IL009</td>
<td>Herzliya</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>6.8</td>
<td>Design available. EIA approved. Works not started yet. The funding is secured from a real estate developer. Waste expected to be removed from site.</td>
</tr>
<tr>
<td>IL012</td>
<td>Ayalon</td>
<td>WW (IE)</td>
<td>Rehabilitation of sewage collector and construction of pumping station</td>
<td>123.0</td>
<td>Works on-going and expected to be completed in 1 to 2 years. The project promoter is the Dan Regional Association for Environmental Infrastructure (Association of Municipalities), which includes the seven wealthiest cities of Israel and are sharing the cost for this project.</td>
</tr>
<tr>
<td>IL013</td>
<td>Ashdod</td>
<td>IE</td>
<td>Upgrade of WWTP to biological treatment</td>
<td>38.5</td>
<td>Herbicides industry. One part of the project is in the factory itself -&gt; Pre-treatment (flocculation + sedimentation). One part is outside the factory (few Km) -&gt; biological treatment + MBA + coal. Reduction of herbicides - 170 t/year to 7 t/year. The aim is to reach 1 t/year.</td>
</tr>
<tr>
<td>IL014</td>
<td>Haifa area</td>
<td>IE</td>
<td>Rehabilitation of Kishon River (dredging of river bed, etc.)</td>
<td>50.0</td>
<td>No effluents untreated are now reaching the Kishon river (and then into the Mediterranean Sea). All the treated WW is used for irrigation. Industrial effluents have been treated since 10 years. Still the river bed remains very contaminated. This led to another project for the decontamination of sediment through a treatment plant. Deviation of river course completed. Sediment depollution is expected to be completed in 2016.</td>
</tr>
</tbody>
</table>
3.4 JORDAN

The following table represents the ten (10) projects for Jordan reported to the H2020 labelled as projects with ‘secured financing’. Out of the ten (10) projects only eight (8) were covered in this validation exercise. The projects that were not covered are JO012 and JO016. JO012 because MCC financed the extension of As-Samra WWTP and the Government decided there was no more need to execute this project; consequently it was deleted from their list. As concerns JO016, there was no information provided to the validation team during missions and in the course of undertaking this exercise (note: these projects are marked in grey in the table below).

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
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<th>Project title</th>
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<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>JO007</td>
<td>Greater Amman</td>
<td>SW</td>
<td>Medical and Industrial Waste Treatment Plant for Greater Amman and Middle Governorates (BOT project)</td>
<td>28.5</td>
<td>This has been pending after attempting to delegate the investment to private sector participation.</td>
</tr>
</tbody>
</table>
| JO009| Karak and Kofranjah          | WW     | Expansion and upgrade of wastewater facilities                               | 56            | This project has been divided into six packages: two for Kofranjah (1 networks + 1 WWTP); one package for Karak (WWTP); and three packages for networks in Karak as well.  
  • The first two packages for Kofranjah are under construction and in the final stages towards completion.  
  • The WWTP package for Karak has been delayed by issuing new pre-qualification for contractors.  
  • The three packages for networks in Kofranjah have completed detailed designs and cost estimates have increased compared to feasibility study, so tendering is now on hold waiting extra financing to cover the increase in value. |
<p>| JO010| As-Samra / Wadi Zarka        | WW     | Expansion of WWTP (first option) or construction of a new WWTP (second option) | 166           | This project is being supported by MCC funds and is under progress. The so called COMPACT was signed with MCC in 2010 and entered into force in 2011. After 2 years of negotiations. The financing is split between grants (42% from MCC), government (9%) and soft loans (49% from local Arab Banks). The advantages captured here is that MCC allocated money to start detailed designs during negotiations. This is why construction started in 2012 only one year after the COMPACT’s entry into force. Construction is awarded on BOT basis and is expected to be finalized in 2015 with anticipated 25 years operation period to be paid by the government. |
| JO011| Naur                         | WW     | Construction of sewer pipelines (135km), pump stations, WWTP (9000 m³/day)     | 80            | All preparation studies for this project have been completed including detailed designs that are ready for tendering that resulted in an increase in project value. An obstacle currently blocking the progress is the recent objection on |</p>
<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>the location selected for the WWTP. WAJ is trying to identify a new location.</td>
</tr>
<tr>
<td>JO012</td>
<td>Wadi Zarqa</td>
<td>WW</td>
<td>Construction of a proper cross section: closed Canal (50km)</td>
<td>60</td>
<td>This project has also finalised all preparation studies including detailed designs. However, it is now on hold awaiting decision by MCC to finance an extension of the Samra WWTP (under project JO010 above). If the extension is approved this project might be cancelled.</td>
</tr>
<tr>
<td>JO013</td>
<td>Jerash</td>
<td>WW</td>
<td>Upgrading and expansion of WWTP</td>
<td>8</td>
<td>Feasibility study and detailed designs for this project have been completed in early 2013. WAJ is currently undergoing the prequalification of contractors that should be finalized end of 2013. Tendering is expected in early 2014.</td>
</tr>
<tr>
<td>JO014</td>
<td>Ain Ghazal</td>
<td>WW</td>
<td>Septic treatment facility capacity (10,000 m³/day) (Expansion of Ain Ghazal treatment plant)</td>
<td>2</td>
<td>This is a small project where detailed designs have been completed since 2012 and ready for tendering. It is on hold as only 1 million Euro is currently available and WAJ is seeking more funds to cover the cost.</td>
</tr>
<tr>
<td>JO015</td>
<td>Zarqa Governorate</td>
<td>WW</td>
<td>Wastewater System Reinforcement and Expansion</td>
<td>35.3</td>
<td>This project is being supported by MCC funds and is under progress. The COMPACT signature for this project was signed end of 2010 with an entry into force end of 2011. All preparation studies were financed by the MCC funds. The detailed designs and tender documents were prepared over a period of 2 years with a speedy process of 1 year for contracts to be awarded for construction. Construction works started in parallel to detailed designs in November 2012 with 12 sites currently under construction. The project is supposed to be finalized in 2016A</td>
</tr>
<tr>
<td>JO016</td>
<td>Zarqa</td>
<td>IE</td>
<td>Zarqa Industrial Wastewater Plant (central industrial WWTP, 1,430 cu m/d)</td>
<td>3.3</td>
<td>No information was provided or made available during this validation exercise period</td>
</tr>
<tr>
<td>JO017</td>
<td>Ghabawi Landfill</td>
<td>SW</td>
<td>Integrated SWM Project</td>
<td>40.5</td>
<td>This project is currently under operation following time schedule for the overall planned progress despite few delays incurred on some parts of the project (e.g. the qualification of gas collectors at the national level). To date three cells are completed.</td>
</tr>
</tbody>
</table>
### 3.5 LEBANON

The following table represents the six (6) projects for Lebanon reported to the H2020 that were labelled as projects with ‘secured financing’. All six (6) projects were covered by this validation exercise.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB002</td>
<td>Beirut (south)</td>
<td>WW</td>
<td>WW main collectors</td>
<td>10</td>
<td>Collector completed and linked to Al-Ghadir WWTP.</td>
</tr>
<tr>
<td>LB003</td>
<td>Beirut (north)</td>
<td>WW</td>
<td>WW main collectors</td>
<td>13</td>
<td>Most of the collector is now completed. Delays incurred due to expropriation of land for one lifting station. Works are expected to be completed by end of 2013.</td>
</tr>
<tr>
<td>LB004</td>
<td>Kesrwan</td>
<td>WW</td>
<td>Water and Wastewater Project</td>
<td>198</td>
<td>Most recent feasibility study for this project was updated in 2009. The loan package with EIB and AFD has already been signed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• A major change of project scope has now delayed any progress being done on the project. The scope now includes two smaller capacity WWTPs instead of one with a large capacity. This was due to the difficult site location and space availability.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Tendering for designs is expected to take place in the course of 2013 and tendering for works by mid-2014.</td>
</tr>
<tr>
<td>LB005</td>
<td>Shekka, Koura and</td>
<td>WW</td>
<td>WW treatment and network in north Lebanon connecting</td>
<td>20</td>
<td>Shekka:</td>
</tr>
<tr>
<td></td>
<td>Batroun</td>
<td></td>
<td>three cities to WWTP</td>
<td></td>
<td>• WWTP constructed but not operational (current plans to have it operational in 2015).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 13 km of networks are already completed and 26 km are under construction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• House connections are still to be done.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Out of a total of six pumping stations, three are under execution to be finalised towards the end of 2013. The remaining three are still waiting for land expropriation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Koura:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Out of 78 km to be implemented, 68 km are completed and 10 km expected to be completed by end of 2013.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• House connections are still to be done.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Out of four pumping stations; two are completed with their variations and two are still pending expropriation of land.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Batroun:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Out of 94 km of networks 65 are completed and 29 km to be completed.</td>
</tr>
</tbody>
</table>
### 3.6 MOROCCO

The following table represents the four (4) projects for Morocco reported to the H2020 project list labelled as projects with secured financing. All 4 projects were covered by this validation exercise.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA002</td>
<td>National</td>
<td>WW</td>
<td>Support ONEE in the implementation of the PAN - National Plan for implementing a nationwide strategy on wastewater management (PNA)</td>
<td>201.0</td>
<td>This project corresponds to the 1st phase of the PNA component led by ONEE.</td>
</tr>
</tbody>
</table>
### Mediterranean Hot Spot Investment Programme

**Project Preparation and Implementation Facility (MeHSIP-PPIF)**

A TA operation funded by the European Union - FEMIP Support Fund

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#### Validation Exercise Report

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
</table>
| MA003 | Al Hoceima, Chefchaouen, Taounate, Ras El Ma (PNA), Ferkhana (PNA), Ahfir, Jerada | WW | Construction of 7 WWTPs in the municipalities and extension of primary and secondary collectors | 40.0 | - **Al Hoceima**: completed & operational (this project was proposed and selected by the validation team for a field visit to verify operational modality)
- Chefchaouen: under construction
- Taounate: under construction
- Ras el Mah: not financed
- Ferkhana: not financed
- Ahfir: financed under MA002, on-going
- Jerada: financed under MA002, on-going

Note: onsite assessment carried out for the Al Hoceima WWTP (details presented under chapter 5). |
| MA004 | Nador and 7 small towns, near or on the shore of the Marchica lagoon | WW | Sanitation of Nador city - depollution of the Marchica lagoon
*This project has been replaced by one big project with a bigger WWTP in Nador and has been inaugurated.* | 62.0 | An additional treatment capacity of 23,000 m³/day was financed, through the construction of two new WWTPs in Nador and in Kariat Arkmane. Wastewater collection network was also improved. Extension of Nador WWTP. MoU signed in 2013 (7 M€) |
| MA006 | National | SW | Part of the PNDM: financing local authorities and the private sector to undertake the construction of the infrastructure | 300.0 | WB loans planned into three phases. First two phases of 200 M€ already disbursed. Al Hoceima, Oujda, Berkane, Nador: sanitary landfills completed and operational. |

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### 3.7 PALESTINE

The following table represents the four (4) projects for Palestine reported to the H2020 project list and labelled projects with secured financing. All four (4) projects were covered by this validation exercise.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS001</td>
<td>Gaza City / Middle Area Central / West Nusseirat</td>
<td>WW</td>
<td>Central Area WWTP (tertiary)</td>
<td>90.0</td>
<td>Replacement of old facility of Gaza (note: works of value 19m EUR have been completed on existing WWTP (‘Skeik Ejleen’), in order to ensure effective service till construction of this new WWTP). Networks are completed. Technical designs of WWTP ready (serving 800,000 p). Project signed in 2000 but delayed due to political reasons, which now seem to have been resolved. Works expected to start in 2014 and be completed by 2017. <em>Funding gap of c. 40m EUR</em>, as project value expected to be increased from 70m EUR to 90m EUR (note: KfW has indicated willingness to add 20m EUR - amount paid to cover emergency works of existing WWTP) also some interest from Finnish development agency. Promoter is Coastal Municipalities Water Utility (CMWU), who will also be responsible for the operation of the WWTP.</td>
</tr>
</tbody>
</table>
### Mediterranean Hot Spot Investment Programme - Project Preparation and Implementation Facility (MeHSIP-PPIF)

A TA operation funded by the European Union - FEMIP Support Fund

#### 3.8 TUNISIA

The following table represents the eight (8) projects for Tunisia reported to the H2020 project list and labelled as projects with secured financing. All eight (8) projects were covered by this validation exercise.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>North Gaza Emergency Sewage Treatment Project (NGEST) (tertiary)</td>
<td>35.0</td>
<td>Operational expected in early 2014. Project covers construction of a new treatment plant east of North Gaza (tertiary) + 9 infiltration basins and recovery wells. Planned works for WW re-use (budget: 20m USD - partially secured - 50% from SIDA and discussion with Finland for remaining part). Promoter is Coastal Municipalities Water Utility (CMWU), who will also be responsible for the operation of the WWTP.</td>
</tr>
<tr>
<td>PS02</td>
<td>North Gaza</td>
<td>WW</td>
<td>Emergency works to upgrade existing WWTP (secondary / biological towers)</td>
<td>1.6</td>
<td>Completed. This WWTP is a temporary solution and will be closed when extension of new Khan Younis WWTP is ready (current target: 2020). Funded by ICRC. Promoter is Coastal Municipalities Water Utility (CMWU).</td>
</tr>
<tr>
<td>PS04</td>
<td>Rafah</td>
<td>WW</td>
<td>Construction of temporary WWTP in the west of Khan Younis (aerated lagoons)</td>
<td>1.1</td>
<td>Completed. An urgent hot spot that need further investment to be addressed. Location is where an Israeli settlement used to be. Collection lagoon with no real treatment. Planned to be closed when Khan Younis WWTP becomes operational (target: 2017).</td>
</tr>
</tbody>
</table>

### Situation Update

#### TN003 National WW Loan ONAS IV (various)

- This project covers three new WWTPs and one extension of WWTP and accompanying networks serving 2 million people in 25 communities. 
  - **WWTPs:**
    - FS was undertaken in 2005 and loan signed in 2007 with initial works starting in 2008.
    - In 2010, one WWTP was completed and is now operated by ONAS Enfidha.
    - One WWTP (Menzel Tamim) is under construction and expected to be completed by 2014.
    - One WWTP (Tazarqa/Somaa and Maamoura) is now tendered for construction and expected to be completed in 2015.
    - One existing WWTP (Hammamet South) - planned for extension - is currently in the detailed design phase.
  - **Network:**
    - In 2012 some networks were completed.
    - Another 15 km collector from Charquia to Choutrana is in detailed design phase.

#### TN004 National WW PISEAU II - Water Sector Investment Loan

- Launch of preliminary studies started in 2008 until 2009. The loan agreement was signed in 2009 and detailed
<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Situation Update</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(various)</td>
<td></td>
<td>designs completed in 2011. The project was initially planned to cover (i) one WWTP in Gabes for upgrade and water reuse; and (ii) one WWTP and networks in rural areas. After concluding the detailed designs in 2011 the value of the estimated cost of the project was inferior to initial estimates. This is why the rural package was cancelled and the project is now under evaluation in order to orient the financing only to Gabes WWTP.</td>
</tr>
<tr>
<td>TN006</td>
<td>National</td>
<td>WW</td>
<td>Credit Line Industrial De-pollution</td>
<td>40.0</td>
<td>This is a project run under ANPE and the value represents the AFD credit line that is topped with supporting funds from FOEDP. The loan was signed between AFD and local banks in 2007 as well as with MICI supported with 3 M Euro EU grant under the PEE programme. More than 500 projects have benefited from this credit line for a total value of 166 MDT (approx. 77 M Euro).</td>
</tr>
</tbody>
</table>
| TN007| National         | WW     | Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m) / coverage of a total of 19 WWTP and pumping stations | 127.0         | This project focuses on upgrading 16 WWTPs and constructing 3 new ones. ONAS undertook a feasibility study between 2003 and 2005. The project was designed to have two packages:  
  **Package 1:** 11 WWTP and 50 Pumping stations  
  **Package 2:** 8 WWTP and 80 Pumping stations  
  First Loan batch was signed in 2007 and second loan batch was signed in 2009 and detailed designs completed with works being tendered out.  
  Note: onsite assessment carried out at Choutrana Complex for WWTP (details presented under chapter 5). |
| TN008| Tejerouine, Dahmani / Ksour, Redaiyf / Moularès, hammamet Nort, El Guettar, Ben Guerdane | WW     | Construction of 7 WWTP, connection to sewerage system of Ksar/Gafasar, rehabilitation primary and secondary collectors (220 km), and 27,000 house connections (Tejerouine, Dahmani/Ksour, Redaiyf/Moularès, Tela et feriana, El Guettar, Ben Guerdane) | 40.0          | This project remains in preparation stage where studies for all WWTPs are on-going with the aim to finalise these studies and accordingly sign the loan agreement by the end of 2013. |
| TN009| Al-Attar         | WW     | Construction of WWTP Phase II (BOT Project) (Al-Attar) | 48.0          | The feasibility study was undertaken between 2008 and 2009. The plans were to launch the tender on a BOT basis. BOT arrangements are still not ready and the project is still pending with no works undertaken to date. |
### Situation Update

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Location</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN010</td>
<td>Grand Tunis</td>
<td>WW</td>
<td>Construction of transfer pipes, pumping stations, distribution network for use of treated wastewater in agriculture</td>
<td>500.0</td>
<td>Feasibility study completed in 2008, but the entire project is now on hold. The project was supposed to undertake an economic analysis about the main concept of the project that initially intended to transfer the treated water (where 40% of it is generated in Grand Tunis) inland over 200 km for agriculture reuse purposes. However this has been questioned after the revolution and the project is no more a priority for the country.</td>
</tr>
<tr>
<td>TN013</td>
<td>Mdilla / Sfax</td>
<td>IE</td>
<td>Closure of Sfax Plant and constructing new one in Mdilla</td>
<td>264.0</td>
<td>So far no action has been taken on this project despite the secured financing status.</td>
</tr>
</tbody>
</table>
4 ANALYSIS & LESSONS LEARNED

This chapter presents the analysis of the validation exercise carried out by MeHSIP-PPIF for the H2020 ‘financing secured’ projects listed in chapter 3 and applying the methodology described previously (see chapter 2).

4.1 OVERVIEW OF PROJECTS ANALYSED

At the start of this exercise there were 50 ‘financing secured’ projects that were part of the Horizon 2020 Project List (Annex 2 lists the 50 projects). During the in-country missions MeHSIP-PPIF was informed, as anticipated considering that the process of implementation is dynamic, that some of these projects have been dropped. At the same time, the MeHSIP-PPIF team also found out that seven new projects have now secured funding. These projects are also part of this analysis.

Thus the final list of projects with ‘financing secured’ that are part of this validation exercise numbers 47 projects (see Annex 4). However, based on available information provided during this validation exercise, only 42 projects were retained to be part of the analysis of this report and are distributed as per the following bar charts. The remaining five (5) projects are three (3) in Egypt and two (2) in Jordan with explanations about the reasons of their omission provided under the relevant country section in the previous chapter.

The chart (Figure 4) below presents an overview of the spread of the 42 projects constituting the basis of our analysis in terms of sector and country.

Figure 4  Spread of analysed projects per country

In terms of project value, in total 3,77bn EUR, the distribution per partner country is as follows.

\[^{8}\text{The ‘dropped’ projects, 10 in total, are marked in the list included in Annex 3, which also explains the reason why these projects did not form part of this validation exercise.}\]

\[^{9}\text{IL001, IL008-009, IL012-014 and LB007 (see Chapter 3).}\]
As depicted in the graphs above the projects are quite evenly distributed between the partner countries where MeHSIP-PPIF is active, with the exception of Tunisia where more projects can be observed. The average investment value for a project is c. 90m EUR.

The distribution of the 42 projects when considering the three target sectors of H2020 is depicted in the following graph (Figure 6).

**Figure 5** Value of analysed projects (m EUR)

**Figure 6** Distribution of analysed projects per H2020 sector (m EUR)
4.2 APPROACH & STRUCTURE OF OUR ANALYSIS

The focus in the following three sections (4.3, 4.4 and 4.5) is to reflect the findings of this validation exercise with respect to the evolution of the ‘financed secured’ H2020 projects throughout the various stages of the project cycle (Preparation, Implementation and Operation). In addition, the analysis also tries to shed light on the dynamics associated with infrastructure projects as well as the various possible challenges encountered. The next chapter (Chapter 5 - Field Verification on Selected H2020 Projects in Operation) provides a thorough analysis of sample operational projects describing the status of operation and highlighting standards for pollution reduction, thereby complementing the analysis presented in this chapter.

The main purpose of this analysis section is to record experiences and lessons learned and provide valuable insights to Governments and financing institutions alike in planning for future financing of infrastructure project implementation in the region. This is why the analysis takes us through the three stages of the project cycle; from (1) preparation through to (2) implementation and (3) operation by analysing the data collected from the field pertaining to projects with secured financing.

This analysis was carefully drawn from the responses to the questionnaire prepared for this purpose (see Annex 1) and translated into data sheets to extract quantitative information where possible. When developing the analysis the approach applied, as set out in the mandate given to MeHSIP-PPIF for this exercise, was not to ‘name and shame’ specific projects (or partner countries), but rather to report on findings and observations in an objective manner that would allow for lessons learned to be disseminated and that could be used when planning for or engaging in future infrastructure projects in the region - thereby ensuring a more effective use of the scarce available resources.

4.3 PREPARATION

The preparation phase is the phase when the Promoter initiates the studies needed to mature the project sufficiently to be considered a bankable project and be in a position to secure financing. By definition this phase does not apply to projects that have secured financing. However, some projects with ‘secured financing’ may have been subject to delays in the process, and could therefore still be undergoing some preparatory activities/studies, especially applicable when a significant time gap has occurred between the end of the preparation phase and the beginning of the implementation phase. This is why the main purpose behind the verification of the project preparation step (see Step 3 in Figure 1) in the context of this validation exercise was to develop a clear picture about the project preparation dynamics, which might allow some lessons learnt to be drawn.

A set of questions was prepared for this phase in order to have a broad spectrum of areas covered allowing for a comprehensive information base to be established. The questions covered a variety of factors that can be analysed to generate quantitative information on the preparation process and the way it had been carried out.

It is well established that the main preparatory exercise for a successful investment project is a high-quality feasibility study that clarifies important aspects of the investment projects. This is even more critical for infrastructure projects with an environmental component, as the socio-economic benefits for the target population need to be fully captured, in order to allow for a complete analysis of the project’s overall feasibility and impact. Most of the feasibility studies carried out for the projects
analysed in this report had been either funded directly by the Governments or from development partners’ sources (IFIs/Donors).

The below chart (Figure 7) reflects the nature and variety of the preparation dynamics across the partner countries. It shows a number of aspects related to the feasibility study (FS) in terms of whether a proper (i.e. “full”) FS has been developed for a given project. Furthermore, in order to shed additional light on the dynamics around the project preparation, Figure 7 also presents whether the FS was mainly externally or internally financed and whether technical assistance support was provided to undertake the FS.

**Figure 7 Preparation Studies / Activities**

By analysing the above bar chart the main conclusions that can be drawn are the following:

1. The majority (95%) of the projects were subject to a feasibility study;
2. Contrary to a commonly held notion, Governments in the partner countries did contribute their own resources to a significant number of the FSs developed (more than 40%), thereby supporting quite substantially the activities of the project preparation phase. This important finding can be interpreted as follows:
   a. demonstrating a high level of ownership by national governments;
   b. a positive indication about partner country Governments honouring their environmental commitments in relation to the Barcelona Convention for protecting the Mediterranean Sea;
   c. indicating level of priority attached by the Government on a specific project; and
   d. a willingness for Governments to engage with IFIs/Donors in jointly supporting this critical phase.

3. In 50% of the cases Governments did not have technical assistance support to undertake the FS. This finding can be interpreted in either of the following ways:
   a. Not all Governments’ Promoters have the qualified skills and/or necessary resources to undertake or lead FSs, hence the reason why 50% of the projects had TA for the FS; or
b. Governments did not want to seek external funds (e.g. grants) for preparatory studies when those funds could be used in more productive areas.

Another aspect related to project preparation is shown in the chart (Figure 9) below. It should be noted that out of the 42 projects that form the basis of the analysis, only 29 projects were considered when generating the line chart below due to either (i) lack of available information; or (ii) the project is an “umbrella project” under which a number of sub-projects are implemented, therefore not allowing for a fair comparison.

Figure 8  Time Lapse between Preparation and Financing

Based on discussions with Promoters and financing partners another important element for consideration at the preparation phase is the time required to complete all preparation studies. As shown in the chart, the duration needed to complete the preparatory studies varies quite significantly between projects. The time lags recorded during this validation exercise showed a minimum of 1 year (for one project) stretching to a maximum of five (5) years to finalise relevant studies. The variation of time is not based on a specific reason, but rather on a number of reasons, which are mainly related to administrative procedures that are country specific.

Most projects fall in the period between two (2) and four (4) years reflecting an average of three (3) years as a ‘time average’ to be considered for completing required studies. This is a clear message for Promoters/Governments that the process of taking a project from the start of the preparation phase into a bankable project sufficiently matured for loan negotiations to commence is currently safely considered not to be less than 3 years. In addition, there is time needed to close the loan agreement and secure approval by the respective administrative levels at both the Government’s and the financing institution’s side.
In a very few cases, when financing is committed before finalisation of the preparation studies, this could lead to pressure being exerted on the Promoter to proceed with the implementation quickly, in order to meet deadlines for committed funds. Our observations indicate that this pressure to proceed with the commitments can negatively affect the quality of the preparatory studies, which may subsequently translate into serious problems/delays in the execution of these projects. One of the main advantages of MeHSIP-PPIF perhaps is that the project preparatory studies are provided through a grant and although the partner country needs to provide certain commitments, the actual financing arrangements are not developed before the studies have reached an advanced level that allows for accurate cost estimates to be established.

Before presenting the key lessons learned from the preparation phase, a case study for one of the projects that MeHSIP-PPIF has supported in preparing is introduced, in particular to highlight specific innovative features that could be considered for future project preparation activities under the H2020 initiative and beyond.

**Wastewater Expansion for Kafr El Sheikh Governorate - part of Integrated Pollution Reduction Programme for Lake Burullus (Egypt) - investment value: 170m EUR (Promoter: HCWW)**

Each project and the particular situation in all the partner countries differ, so as the projects develop, MeHSIP-PPIF had the opportunity to direct each individual project most effectively towards the ultimate goal: to reach a point where sufficient technical, environmental and financial analyses have been undertaken for loan negotiations to reach a mutually satisfactory conclusion, and therefore pave the way for the construction and implementation stage to proceed.

MeHSIP-PPIF can maximise the potential advantage of using grant funds for the development of projects, and can ensure that the path planned for the projects is undertaken in the most cost-effective and streamlined manner to achieve the required results without involving unnecessary tasks.

In the case of the Lake Burullus pollution reduction project in the Kafr El Sheikh Governorate (Egypt) lessons to be extracted are particularly valuable given the recent successful completion of the feasibility study stage of the wastewater component of this project. In order to ensure that obstacles experienced by previous or ongoing programmes in the wastewater sector in Egypt were avoided, the feasibility study included a number of innovative features, including: (i) prioritisation of districts in the Governorate based on objective criteria and an exercise undertaken by the beneficiary (KSWSSC); (ii) updating of the Master Plan through undertaking a cluster optimisation exercise; and (iii) preparation of detailed designs for two top priority village clusters.

The results of some of these innovative features are already evident, as the number of new WWTPs were reduced based on the outcome of the cluster optimisation exercise. The longer planning period invested into this project has provided a solid ground as MeHSIP-PPIF has been able to draw on relevant experiences learned from other active IFIs in the Kafr El Sheikh Governorate, allowing for the identification of success factors.

Through this approach MeHSIP-PPIF has attempted to address the challenge of developing tailored TORs for the intended feasibility study that is cost-effective and at the same time ensures that the cost estimates are robust and can be relied upon as a basis for the EIB to initiate loan negotiations, which are currently ongoing (with a NIF grant having been provisionally approved).
4.3.1 KEY LESSONS LEARNED

Analysing the preparation stage provides valuable insights about the importance that needs to be attached to this stage and the weight it should be given in overall project planning. The importance is further revealed and highlighted under section 4.4 ("Implementation") where the impact of proper project preparation is demonstrated. It should be noted that out of the 42 ‘financing secured’ projects considered for the analysis in this section only two (2) projects remain at the preparation phase as shown in the following table (Table 1) and have not yet moved into the implementation phase.

Table 1

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Value (m EUR)</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>JO007</td>
<td>Jordan</td>
<td>SW</td>
<td>Medical and Industrial Waste Treatment Plant for Greater Amman and Middle Governorates (BOT project)</td>
<td>28.5</td>
<td>This has been pending after attempting to delegate the investment to private sector participation.</td>
</tr>
<tr>
<td>TN013</td>
<td>Tunisia</td>
<td>IE</td>
<td>Closure of Sfax Plant and constructing new one in Mdilla</td>
<td>264.0</td>
<td>Recent political changes and the current economic situation have delayed the closure of the plant.</td>
</tr>
</tbody>
</table>
This section is concluded by presenting the main lessons learned from this exercise.

**Key Lessons Learned**

1. A high-quality project preparation is one that includes the following:
   a. Project scope reflecting real needs and considering capability of promoter and affordability of users;
   b. Suitably experienced consultants guided by a clear ToR;
   c. Consultation with stakeholders to involve interested and affected parties at an early enough stage to minimize the impact of potential issues which if these emerge later could have an impact on project design and cost, and cause delays;
   d. Suitable site selected and permits secured;
   e. Field verification and close collaboration with project promoter;
   f. An early scoping mission to prepare the ESIA is then undertaken providing sufficient details on the project’s impact (see point “g” hereunder);
   g. Obtaining sufficient data to enable the project to be defined in sufficient details to enable accurate cost estimates to be developed;
   h. Consideration of partner country’s own resources and capacities as well as institutional context and the compatibility of these with proposed project’s technology, implementation strategy, procurement requirements and sustainability;
   i. Recommendation of institutional arrangements/requirements to ensure efficient management during implementation through to operation; and
   j. Thorough ESIA to cover all environmental and socio-economic aspects and impacts of project implementation and their mitigation.

2. In developing feasibility studies and detailed designs for project tendering it is important to involve local/national resources and expertise in order to optimize the preparation process.

3. Committing financing before proper project preparation (i.e. detailed feasibility study) in an attempt to speed the process can actually result in more serious delays taking place during the implementation stage and affecting negatively all parties involved.
4.4 IMPLEMENTATION

The next aspect to verify following validation of the preparation step (Step 3) is how far a project has entered the implementation stage of the project cycle. There are five discrete stages under the implementation phase that define the status of the project in question and these stages formed the basis of the validation the implementation step (Step 4). These five stages are:

- Review/Updating of Feasibility Study;
- Detailed design;
- Procurement;
- Under construction; and
- Post commissioning and Operation (see next section - 4.5).

Concerning the first bullet point the feasibility study (FS) stage is part of the project preparation phase, which usually precedes the implementation phase but in some cases when there is a time gap between the two phases certain updates in the FS will need to be undertaken. These updates might relate to various components of the FS; from rather straightforward adjustments to more complex, particularly if it entails a change of scope or selected site. However, given that projects considered for this validation exercise have already secured financing, the working assumption was that the analysed projects had entered the implementation phase despite the fact that a few of these projects are still updating their feasibility studies.

It is also important to highlight the complexity of reporting on the status of some of these projects with ‘secured financing’. This complexity stems from the fact that a considerable number of these projects represent national plans. For example, in Egypt and Morocco a number of analysed projects are so called “umbrella projects”, as the financing arrangements form part of a package deal that covers more than one project. This means that those projects appearing on the H2020 Project List under one reference number are actually a bundle of distinct projects that are being executed according to an agreed implementation plan but at a different pace. This created a challenge in terms of reporting on how to define to which stage precisely in the project cycle the specific “umbrella project” has reached. A similar type of challenge was those projects, which although not directly linked to an “umbrella national plan/programme”, but still had a ‘bundled’ approach. For example, in Palestine and Tunisia, a number of integrated wastewater projects contain cases where networks have been completed and WWTPs are either under construction or at tendering stages.

For the above described cases, they are considered for the purpose of this analysis as having achieved ‘partial completion’. Therefore, these ‘financing secured’ projects do not appear under the completed category, but are included in the category defined as “Under Construction”. For easy reference Table 7 in the next section (4.4.1) was created to distinguish these projects from the ones that are fully completed.

4.4.1 STATUS OF PROJECTS UNDER IMPLEMENTATION

The following bar chart (Figure 9) shows the spread the projects under implementation between the five stages constituting the implementation phase.

---

10 For this stage of the project cycle only 40 out of the 42 ‘financing secured’ projects were considered after removing the following two (2) projects: 1) JO007: this project was not included as it is a BOT project for private sector financing that so far has not entered into the implementation phase; and 2) TN013: the intended commencement of the works for the closure of the SFAX industrial facility has not yet taken place.
As explained at the beginning of the “Implementation” section (4.4) the first category, “Update Feasibility Study”, in the chart above (Figure 9), which is usually associated with the project preparation phase, appears here in the implementation phase because some projects that have closed their financing agreements and were ready for implementation had been blocked due to changes required in the project’s scope or a change in location. Such changes are considered as major and therefore require an updating of the feasibility study. This was observed for two ‘financing secured’ projects (LB004 and LB006) analysed and is referred to in Table 2 below, where the Promoter reported that resistance or obstacles blocking this project have been resolved and following a quick FS update, the projects are now advancing in the implementation process. As concerns projects appearing under “Pending”, these are projects that although having secured financing were subsequently subject to one (or more) of the delaying factors and were then put on hold awaiting further consideration by the Government.

The bar chart above (Figure 9) also demonstrates that more than 60% of the projects have been identified to be in the last stages of the implementation phase: 40% ‘under construction’ and 25% ‘completed’. The projects that fall under the latter category, ‘completed, have had all the works finalised and the project has either entered into operation or is progressing towards finalisation of operational arrangements. The tables below (Tables 2 to 8) hereunder provide a listing of all projects that are considered under one of the implementation stages as shown in Figure 9 above. The tables also translate the percentages in the above bar chart to projects and investment values. Here it is important to highlight those projects with partial completion status as previously explained, these projects are listed in a separate table (Table 7) below.
### H2020 Projects undergoing an update of Feasibility Study

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB004</td>
<td>Lebanon</td>
<td>WW</td>
<td>Water and Wastewater Project</td>
<td>CDR</td>
<td>198</td>
</tr>
</tbody>
</table>

### H2020 Projects at Detailed Design Stage

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN004</td>
<td>Tunisia</td>
<td>WW</td>
<td>PISEAU II - Water Sector Investment Loan (various)</td>
<td>ONAS</td>
<td>91.0</td>
</tr>
<tr>
<td>TN008</td>
<td>Tunisia</td>
<td>WW</td>
<td>Construction of 7 WWTP, connection to sewerage system of Ksar/Gafsar, rehabilitation primary and secondary collectors (220 km), and 27,000 house connections (Tejerouine, Dahmani/Kssour, Redaiyf/Moularès, Tela et feriana, El Guettar, Ben Guerdane)</td>
<td>ONAS</td>
<td>40.0</td>
</tr>
</tbody>
</table>

### H2020 Projects at Tendering of Works Stage

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG005</td>
<td>Egypt</td>
<td>WW</td>
<td>Improved Water and Wastewater Services Programme - IWSP</td>
<td>HCWW</td>
<td>295</td>
</tr>
<tr>
<td>IL001</td>
<td>Israel</td>
<td>SW</td>
<td>Landfill mining and reclamation project</td>
<td>Municipality of Netanya</td>
<td>35.0</td>
</tr>
<tr>
<td>IL009</td>
<td>Israel</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>Municipality of Herzliya</td>
<td>6.8</td>
</tr>
<tr>
<td>JO009</td>
<td>Jordan</td>
<td>WW</td>
<td>Expansion and upgrade of wastewater facilities</td>
<td>WAJ</td>
<td>56</td>
</tr>
<tr>
<td>JO011</td>
<td>Jordan</td>
<td>WW</td>
<td>Construction of sewer pipelines (135km), pump stations, WWTP (9000 m³/day)</td>
<td>WAJ</td>
<td>80</td>
</tr>
<tr>
<td>JO013</td>
<td>Jordan</td>
<td>WW</td>
<td>Upgrading and expansion of WWTP</td>
<td>WAJ</td>
<td>8</td>
</tr>
<tr>
<td>PS001</td>
<td>Palestine</td>
<td>WW</td>
<td>Central Area WWTP (tertiary)</td>
<td>Palestinian Water Authority</td>
<td>90.0</td>
</tr>
</tbody>
</table>
### Table 5: H2020 Projects under Construction

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG006</td>
<td>Egypt</td>
<td>WW</td>
<td>Integrated Sanitation and Sewerage Infrastructure Project - ISSP</td>
<td>HCWW</td>
<td>87</td>
</tr>
<tr>
<td>EG008</td>
<td>Egypt</td>
<td>IE</td>
<td>Private Public Sector Industry Project - PPSI</td>
<td>EEAA</td>
<td>28</td>
</tr>
<tr>
<td>IL002</td>
<td>Israel</td>
<td>WW</td>
<td>Construction of sludge incineration plant or sludge drying plant</td>
<td>Association of Municipalities</td>
<td>244</td>
</tr>
<tr>
<td>IL008</td>
<td>Israel</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>Western Galilee Association of Towns for Environment</td>
<td>2.2</td>
</tr>
<tr>
<td>IL012</td>
<td>Israel</td>
<td>WW</td>
<td>Rehabilitation of sewage collector and construction of pumping station</td>
<td>Dan Regional Association for Environmental Infrastructure</td>
<td>123</td>
</tr>
<tr>
<td>JO009</td>
<td>Jordan</td>
<td>WW</td>
<td>Expansion and upgrade of wastewater facilities in Karak and Kofranjah</td>
<td>WAJ</td>
<td>56</td>
</tr>
<tr>
<td>JO010</td>
<td>Jordan</td>
<td>WW</td>
<td>Expansion of As Samra WWTP (first option) or construction of a new WWTP (second option)</td>
<td>WAJ</td>
<td>166</td>
</tr>
<tr>
<td>JO015</td>
<td>Jordan</td>
<td>WW</td>
<td>Wastewater System Reinforcement and Expansion in Zarqa Governorate</td>
<td>WAJ</td>
<td>35.3</td>
</tr>
<tr>
<td>LB003</td>
<td>Lebanon</td>
<td>WW</td>
<td>WW main collectors</td>
<td>CDR</td>
<td>13</td>
</tr>
<tr>
<td>LB005</td>
<td>Lebanon</td>
<td>WW</td>
<td>WW treatment and network in north Lebanon connecting three cities Shekka, Koura and Batroun to WWTP</td>
<td>CDR</td>
<td>20</td>
</tr>
<tr>
<td>MA002</td>
<td>Morocco</td>
<td>WW</td>
<td>Support ONEE in the implementation of the National Plan for strategy on wastewater management (PNA)</td>
<td>ONEE</td>
<td>210</td>
</tr>
<tr>
<td>MA003</td>
<td>Morocco</td>
<td>WW</td>
<td>Construction of 7 WWTPs in the municipalities and extension of primary and secondary collectors</td>
<td>ONEE</td>
<td>40</td>
</tr>
<tr>
<td>MA006</td>
<td>Morocco</td>
<td>SW</td>
<td>Part of the PNDM: financing local authorities and the private sector to undertake the construction of the infrastructure</td>
<td>MOI / Env</td>
<td>300</td>
</tr>
<tr>
<td>PS001</td>
<td>Palestine</td>
<td>WW</td>
<td>Expansion and upgrading of wastewater services in Gaza; Middle Area Central; and West Nusseirat (Wadi Gaza). Partial completion where networks are completed.</td>
<td>Palestinian Water Authority</td>
<td>90</td>
</tr>
<tr>
<td>PS002</td>
<td>Palestine</td>
<td>WW</td>
<td>North Gaza Emergency Sewage Treatment Project including construction of a new treatment plant east of North Gaza in addition to construction of nine infiltration basins and recovery wells</td>
<td>Palestinian Water Authority</td>
<td>35</td>
</tr>
<tr>
<td>TN003</td>
<td>Tunisia</td>
<td>WW</td>
<td>Loan ONAS IV (various)</td>
<td>ONAS</td>
<td>123</td>
</tr>
<tr>
<td>TN007</td>
<td>Tunisia</td>
<td>WW</td>
<td>Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m) / coverage of a total of 19 WWTP and pumping stations - Partial completion through the completion of Choutrana Complex that is operational.</td>
<td>ONAS</td>
<td>127</td>
</tr>
</tbody>
</table>

**TOTAL Investment Portfolio under Implementation**: 1,699.50
From the projects with secured financing the above table shows that 16 projects (out of the 40) with a total of 1,699.50 M Euro are currently under construction with clear potential of moving to operation. The two tables that follow show those projects that have been fully completed (Table 6) and partially completed (Table 7).

**Table 6  H2020 Projects Reported as Completed**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG010</td>
<td>Egypt</td>
<td>IE</td>
<td>Egyptian Pollution Abatement Programme (EPAP II)</td>
<td>EEAA</td>
<td>145</td>
</tr>
<tr>
<td>IL013</td>
<td>Israel</td>
<td>IE</td>
<td>Upgrade of WWTP to biological treatment</td>
<td>AGAN (Private company)</td>
<td>38.5</td>
</tr>
<tr>
<td>IL014</td>
<td>Israel</td>
<td>IE</td>
<td>Rehabilitation of Kishon River (dredging of river bed, etc.)</td>
<td>Ministry of Environment + private companies</td>
<td>50</td>
</tr>
<tr>
<td>JO017</td>
<td>Jordan</td>
<td>SW</td>
<td>Ghabawi Landfill - Integrated SWM Project</td>
<td>GAM</td>
<td>40.5</td>
</tr>
<tr>
<td>LB002</td>
<td>Lebanon</td>
<td>WW</td>
<td>WW main collectors for South Beirut</td>
<td>CDR</td>
<td>10</td>
</tr>
<tr>
<td>LB007</td>
<td>Lebanon</td>
<td>WW</td>
<td>Wastewater Treatment and network in Saida</td>
<td>CDR</td>
<td>30</td>
</tr>
<tr>
<td>MA004</td>
<td>Morocco</td>
<td>WW</td>
<td>Sanitation of Nador city - depollution of the Marchica lagoon and extension to additional treatment capacity of 23 000 m³/day through two new WWTPs in Nador and in Kariat Arkmane</td>
<td>ONEE</td>
<td>62</td>
</tr>
<tr>
<td>PS004</td>
<td>Palestine</td>
<td>WW</td>
<td>Emergency works to upgrade existing WWTP (secondary / biological towers)</td>
<td>Palestinian Water Authority</td>
<td>1.6</td>
</tr>
<tr>
<td>PS005</td>
<td>Palestine</td>
<td>WW</td>
<td>Construction of temporary WWTP in the west of Khan Younis (aerated lagoons)</td>
<td>Palestinian Water Authority</td>
<td>1.1</td>
</tr>
<tr>
<td>TN006</td>
<td>Tunisia</td>
<td>WW</td>
<td>Credit Line Industrial De-pollution</td>
<td>ANPE</td>
<td>40</td>
</tr>
</tbody>
</table>

**TOTAL Investment Portfolio Reported as Completed**  418.70
Table 7  H2020 Projects Reported as Partially Completed

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS001</td>
<td>Palestine</td>
<td>WW</td>
<td>Expansion and upgrading of wastewater services in Gaza; Middle Area Central; and West Nusseirat (Wadi Gaza) Partial Completion where networks are completed</td>
</tr>
<tr>
<td>TN003</td>
<td>Tunisia</td>
<td>WW</td>
<td>Loan ONAS IV (various) Partial Completion of WWTP &amp; Networks</td>
</tr>
<tr>
<td>TN007</td>
<td>Tunisia</td>
<td>WW</td>
<td>Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m) / coverage of a total of 19 WWTP and pumping stations Partial completion through the completion of Choutrana Complex that is operational.</td>
</tr>
</tbody>
</table>

Table 6 lists the 10 projects with a total value of 418.7 M Euro worth of investments in pollution reduction that have been completed, whereas the next table (Table 7) lists projects that have been partially completed (note: it was difficult to obtain accurate estimates of the value of the completed components this is why the full project value is referred to). However, they are fully accounted for in Table 5 above for projects under construction.

Table 8 hereunder lists two (2) projects from Tunisia that have secured financing but they were both put on hold by the Government since then and have not advanced into the implementation stage. They are considered under this study as “pending projects”.

Table 8  H2020 Projects Reported as Pending

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN009</td>
<td>Tunisia</td>
<td>WW</td>
<td>Construction of WWTP Phase II (BOT Project) (Al-Attar)</td>
</tr>
<tr>
<td>TN010</td>
<td>Tunisia</td>
<td>WW</td>
<td>Construction of transfer pipes, pumping stations, distribution network for use of treated wastewater in agriculture - Grabd Tunis</td>
</tr>
</tbody>
</table>

4.4.2 MAIN CHALLENGES IN PROJECT IMPLEMENTATION

Despite the fact that the projects under consideration have already secured financing this validation exercise was also mandated to identify and highlight aspects and factors that have delayed the process towards implementation.

The following graph (Figure 10) demonstrates the occurrence for each of the causes of delays. It should be noted that a project can be subject to more than one cause of delay. As is shown in Figure 10, ‘Change in Scope’ and ‘Others’ are the most frequently quoted factors behind incurred delays of projects during the implementation phase.
The following section presents an analysis of the delaying factors, as shown in the chart above. It should be noted that the delaying ‘factors/groups’ were partially present in the designed questionnaire (see Annex 1) and other were a direct result of responses provided by the partner countries/respondents. Considering the high occurrence of the "Others" category, a specific section was dedicated, in order to shed light on the underlying reasons grouped under it (see point B in the section below).

A. FS Scope Change

Along with ‘Others’ (see next section) this is the most frequently observed reason causing delays in moving forward in the implementation phase. Changes basically refer to a substantial change in the project scope from its initial conception as designed and proposed in the original feasibility study. During this validation exercise it was observed that a change in scope has been detected most commonly at the tendering stage and this can be attributed to various factors, including:

1. Poor quality of planning and engineering design

Projects often suffer from a lack of attention to detail and quality. There is a tendency to cut corners by technical consultants in areas such as field investigation and topographical surveys, as well as detailing the components of a project. This danger is particularly likely to occur when budgets allocated for such studies by governments or donors are not sufficient to cover high quality designs. Detailed designs are a vital stage of the project cycle. These engineering designs lead to the drawing up of Bills of Quantities and/or Price Schedules which reflect the complete works to be constructed and form the basis of the ultimate costing of the project. To succeed without delays and additional cost implications, these price documents need to be accompanied with sufficiently detailed specifications for a contractor to be able to fully price the works to be constructed with the minimum of unknowns to be encountered during the construction stage. A good design team will produce documents that will be straightforward for eligible contractors to tender for. Deficiencies in detailed designs will surface during the tendering process or in technical submissions and if not dealt with at an early stage prior to award of contract will lead to more disruptive impacts on the project during the construction stage. Contractors bidding for projects with such deficiencies will detect
major omissions and gaps which will either be identified in their bids, and thus affect the cost and commencement of the implementation process or worse, be left unresolved and become major issues later during construction.

2. Change in Needs

The change in needs may occur either due to poor planning as mentioned under the previous point or a lack of stakeholders’ consultation at the initial stages. Another cause for the change in needs can be attributed to an extended delay between the end of project preparation and initiation of implementation, as during this intervening period baseline data/conditions (e.g. number of housing units, transportation network, market prices) and/or considerations/priorities would have been subject to change. This is why any change in needs directly affects the original scope of a project, thereby causing a significant deviation that needs to be addressed through further preparatory studies (e.g. changes in designs and mitigation measures required from the EIA), resulting in overall delay of the project’s implementation process.

B. Others

This is not a single factor, but rather a category made up of multiple factors that may or may not occur simultaneously for the same project. As shown in the above chart (Figures 10) this category is quoted as the most occurring cause (along with ‘FS scope change’ - see previous section) behind project delays. Figure 11 below shows the various delaying factors that constitute the “Others” category. The “Others” category can be divided into two main sets of factors:

- ‘External factors’ (shown as green bars in Figure 11): delays are caused by factors outside the project’s dynamics; and
- ‘Internal factors’ (shown as blue bars in Figure 11): delays are caused by factors which are directly related to the project’s dynamics and decision making process.

The findings revealed that 15 of the delayed projects had “Others” as one of the causes of delays. As shown in the graph below (Figure 11), for instance, 13% of the delayed projects (i.e. two out of 15) were due to expropriation reasons.

*Figure 11* Other Reasons Delaying Project Implementation
The following provides a detailed description of each of the factors contained under "Others" and reflected in the above chart.

1. **External Factors**

Those are the factors appearing in green in Figure 11 and are factors outside the project implementation dynamics yet registered as causing delays. These are:

#### 1.1. Change in Priority

Although all projects on the H2020 Project List are priority projects, as officially reported by respective partner country Governments, priorities could change at a given time in the process. This change has been recorded during this exercise for a couple of projects due to political and technical reasons. As concerns the political reasons, the given project had been conceived as a priority project under the previous regime, but subsequently dropped after the Arab Spring and on solid economic grounds. Regarding the technical reasons, the given project had been identified as a priority at the start of MeHSIP-PPIF in 2009 through to 2012, but was delisted from the H2020 Project List at the end of 2012, as it was substituted by a more efficient and effective investment. For both projects, by the time the final decision was taken to delist the project from the priority list implementation had been delayed by over three (3) years despite a relatively advanced preparation status.

#### 1.2. Changes in Government

In the last few years changes in Government has proven to be a frequent occurrence among countries in the region. The impact of these changes has a direct effect on infrastructure project planning. Irrespective of the reasons behind such change the impact is always a delay in decision making and consequently a delay in implementation. In some countries transition between ministers is seldom a smooth one. New Ministers always need some time before they are aware of what is happening in their Ministries let alone the possibility of coming in with a new agenda. This is why it is observed that even in a best case scenario the momentum is lost due to such change and in the worst case scenario projects often reach a deadlock as they are blocked due to incompatibility between transitional Governments.

#### 1.3. Political unrest or upheaval

Political unrest in the region has been lately aggravated after the Arab Spring however this phenomenon existed in various forms in the region for quite some time. Although it has not been reported as a major factor behind delays in project implementation across countries it still applies to a few of the projects.

2. **Internal Factors - Process / Project specific challenges**

Those are the factors appearing in blue in Figure 11 above and are factors directly related to the project implementation dynamics and registered as causing delays. These are:

#### 1.1. Expropriation (land acquisition)

Expropriation of required land for the project is often a complicated matter among most Governments in the region, requiring several administrative procedures and special laws to be issued and associated budgets to be allocated prior to taking any action. During this validation exercise, expropriation, although not frequently encountered and is usually the
Government’s responsibility, has been a delaying factor due to an oversight in ensuring that all necessary procedures have been put in place by the time implementation is due to commence.

1.2. Procurement Process & Procedures

Procurement by itself is a complex process that requires in most cases compatibility between processes and procedures applied by IFIs and Governments. However, the main delays recorded associated with procurement are not necessarily linked uniquely to the compatibility or compliance but also to other issues like:

- Shortage in human resources required to finalise the procurement process on schedule by the promoter;
- Incapacity of the Promoter to conduct procurement of sophisticated technologies which requires the presence of technical assistance; and
- The need for retendering due to poor estimates at feasibility study stage.

1.3. Lengthy local procedures for approving financing

Committing to projects’ financing requires a specific process and set of approvals that in many cases are rather time consuming and affected by any Government change. Following the preparation phase a loan agreement needs to be signed for the financing and launching of the project’s implementation. However, with most Governments in the region any fund, be it grant or loan, entering the country needs to follow certain legal requirements to be approved/accepted. Despite the similarities in those procedures the time needed to reach a final approval varies from one country to another. This variation is a very complex matter that is associated with several internal considerations, including politics and economics as well as administrative, that falls outside the analysis carried out in this report. However, the fact remains that national procedures for loan/funding agreements associated to infrastructure projects are a delaying factor to implementation and need to be considered when engaging in infrastructure projects.

C. Fail National Approval

Coming directly under “Scope Change” and “Others” this is the third most frequently occurring cause behind the delay of project implementation. It mainly relates to projects that were initially identified as priority by the Government, but due to a lack of proper consultation or new emerging needs the project faced resistance at national or regional/local Government level(s); surrounding establishments; and/or the local community. In some cases the main reasons behind this resistance relates to the inappropriate choice of site location where the project is planned to be erected, in others it relates to a change in political leadership and/or the emergence of new findings that were not considered during the feasibility study. Among the cases encountered some have reached an advanced stage of preparation obtaining full approval from IFIs and Governments and secured loan financing before they were stopped.

D. Government Contribution

Ranking in fourth position is ‘Government contribution’, which refers to the portion of capital cost to be injected by the partner country Government (Promoter) as part of the financing of an infrastructure project. Usual practice between IFIs and Governments is that each party to the financing agreements injects a portion of the capital cost towards implementing the project. This
portion varies from project to project based on various factors. In some cases it is a matter of IFI requirements setting a certain percentage as Government contribution. In other cases, this portion is dictated by availability of international financing in addition to the grant portion provided through various Donors (e.g. EU) and/or other funds/instruments. The main problem occurs when the loan is signed and implementation starts. Some financing agreements identifies the portion or components to be financed through Government contribution and it is usually those portions and/or components that are delayed, hence delaying the overall project implementation planning due to lack of funds from the Government’s side or delays in disbursing the allocated funds to contractors due to administrative procedures or inadequate planning in acquiring the necessary approvals.

E. Interest by Contractors

Ranking in fifth position is the interest by contractors during the bidding process. Based on the cases encountered the main issue leading to lack of interest by contractors is poor project preparation at the feasibility study phase that leads to low quality tender documents with weak technical details and/or inaccurate cost estimates imposing unreasonable tender ceiling costs. This is further confirmed by the following delaying reason called “FS Estimates”.

F. Feasibility Study Estimates

Also ranking in fifth position jointly with “Interest by contractors” are inaccurate “Feasibility study estimates”. This relates to cost estimates and capital investments where budgets allocated for investment projects could sometimes change either due to poor preparation or due to inflation in market prices that is incurred when a long period of time separates establishment of cost estimates from actual start of tendering or works/construction. This will certainly affect the loan agreement that was signed for this purpose and until the additionally needed financing is secured the project might suffer from continuing delays in implementation.

4.4.3 IMPACT ON IMPLEMENTATION PLANNING

Delay in project implementation plans means the delay that the planning of a given project has incurred to date compared to what were the initial plans between securing financing and completion. Figure 12 below presents the overall trend in delays among the various projects.
An important finding that can be extracted from the pie chart (Figure 13) above is that 50% of the projects fall in the category, two (2) to four (4) years of delays in the implementation plans. This is an important figure to be kept in mind when planning for infrastructure projects by both Governments and IFIs. Another observation is that 35% of the projects are showing no (i.e. zero years) delay in their implementation planning.

Before presenting the key lessons learned from the implementation phase, a case study for one of the projects that MeHSIP-PPIF has supported in preparing is presented, in particular to highlight the extensive consultative approach applied by MeHSIP-PPIF in preparing this project.
Integrated de-pollution programme of Lake Bizerte (Tunisia) – investment value: 70m EUR (Promoter: Ministry of Environment)

Public consultation is an aspect that has proven to be vital in gaining the stakeholders’ buy in. This has resulted in a positive impact in the case of Tunisia and the Lake Bizerte project, where consultation around the project’s components and interventions has been carried out since the very beginning. The consultation process was initiated at the project inception phase and has progressed with the project to the scoping and diagnostic phases. Consultations have helped the project in identifying main polluting hotspots, including a number that were not initially considered. The consultation process underway in the context of the Lake Bizerte project resonates with the gradual opening of the Tunisian society following the “Jasmine revolution” of January 2011. The elections that took place in October 2011 seem to have confirmed the openness and transparency that form vital elements of the democratic consolidation process ongoing in Tunisia.

A concrete and significant outcome of this inclusive and continuous consultation, also demonstrating the commitment by the stakeholders, was the signing on 16th October 2012 of a Charter of Sustainable Development (‘Charte pour le Lac de Bizerte’) for Lake of Bizerte at the Ministry of Environment. The Charter recognises the lake’s fragile ecosystem as well as the increasing pressure of industrial activities and development. The Charter sets out the need to adopt an integrated approach for the sustainable development of the lake and the importance of awareness and participation of all involved parties to ensure a high degree of efficiency in the development.

This open and transparent process, therefore, not only supports ownership by stakeholders and national counterparts, it also establishes MeHSIP-PPIF as a credible initiative towards real pollution abatement around the Mediterranean Sea. It also, even if not officially stated, encourages the Government to commit towards stopping pollution around the Lake Bizerte given the transparency between all concerned stakeholders and their active participation in shaping an integrated depollution initiative of the lake. MeHSIP-PPIF will look to draw from this positive experience and promote similar inclusive consultation processes in other pollution reduction projects across the south Mediterranean region, in particular when the projects are of an integrated nature, as the Lake Bizerte project. Thereby, allowing for the consultation process to become a catalyst for further promoting conservation across the region. It should be noted that the signing of the ‘Charte pour le Lac de Bizerte’ was made in close cooperation with the capacity building component of the Horizon 2020 initiative (CB/MEP).

Finally, the loan negotiations are currently ongoing with a provision NIF grant having been approved for this project.
4.4.4 LESSONS LEARNED

Key Lessons Learned

1. Proper engineering studies and investigations at the preparation stages are key to successful and smooth project implementation as it avoids having:
   a. Inaccurate cost estimates in terms of capital investment that can impact on loan agreements and financial commitments
   b. Incorrect field information that impacts projects scope

2. A major impact on project implementation planning is having an extended time lapse between end of preparation phase and start of implementation phase which can affect:
   a. Cost estimates based on market prices that could be subject to inflation
   b. Basic considerations upon which FS was completed (i.e. changes in demography and population projections, changes in urban planning, new developments etc.)
   c. Finances earmarked by IFIs and need to obtain appropriate waivers
   d. ESIA studies in the case of serious delays that might require updating based on local laws applied

3. Political support obtained at the preparation stage might not be the same during implementation especially in the region where change in political leadership is a very dynamic process.

4. Although, an inclusive and continuous consultation process with key stakeholders is vital to ensure a smooth and effective preparation phase, it is equally important that the consultation modalities/forum established continue also during the implementation stage, in order for key stakeholders to remain fully informed about the project and its progress (and having the opportunity to voice any remaining concern in a conducive environment).

5. Frequently loan agreements are only ratified following specific laws issued in this respect that has proven to be time consuming and should be accounted for in the overall schedule of project planning.

6. A safe margin of three (3) years should be allowed for in project implementation plans.
4.5 OPERATION

Operation is when implementation has been completed and projects are commissioned and start performing to the criteria for which the project was designed. This is a critical stage of the project cycle and the primary indicator as to whether the pollution reduction investment will achieve the intended objectives; and this is dependent on many factors even when the project has completed construction satisfactorily. Even when a project has entered this phase, several aspects still need to be verified to establish that the operation is being undertaken efficiently and in accordance with the intended design parameters, in order that the pollution reduction impact will be achieved. This is why the verification of operation is one of the most critical assessments as that task includes, inter alia: (i) confirmation of construction to the required standards; (ii) installation of appropriate equipment; (iii) successful commissioning; and (iv) operation in accordance with the designed O&M philosophy. In addition to these technical aspects, details of contracts signed with operators (e.g. performance requirements and monitoring), compliance with environmental regulations, and ensuring that sufficient budgets are allocated for operation and maintenance, are also important.

A key parameter is an assessment of whether the operation of the scheme does achieve the intended pollution reduction at the hot spot location identified under H2020. A suitable and appropriate design is the first requirement, and this needs to be followed by efficient operation in order to achieve the desired result.

There are so many potential variables in the quality of wastewater that can affect the efficiency of the treatment processes even in the most robust of designs that places a huge responsibility on the operator to manage and ensure smooth operation of the plant. Monitoring along with regular sampling and analyses are important tasks that need to be maintained to ensure efficiency, and maintaining adequate levels of staff trained in the relevant aspects to the necessary level of skill required for the type of plant is critical to its performance and long-term sustainability.

4.5.1 STATE OF PROJECTS IN OPERATION

As stated in Table 6 (section 4.4.1), 10 H2020 projects with ‘secured financing’ were reported as completed. All 10 projects appear to be operational as shown in Table 8 below, which also summarises the investment value of 418.7 million Euro of the projects that are currently operational in the region with a pollution reduction impact.
### Table 9  H2020 Projects in Operation

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB002</td>
<td>Lebanon</td>
<td>WW</td>
<td>WW main collectors</td>
<td>CDR</td>
<td>10</td>
</tr>
<tr>
<td>LB007</td>
<td>Lebanon</td>
<td>WW</td>
<td>Wastewater Treatment and network in Saida</td>
<td>CDR</td>
<td>30</td>
</tr>
<tr>
<td>JO017</td>
<td>Jordan</td>
<td>SW</td>
<td>Ghabawi Landfill - Integrated SWM Project</td>
<td>GAM</td>
<td>40.5</td>
</tr>
<tr>
<td>TN006</td>
<td>Tunisia</td>
<td>WW</td>
<td>Credit Line Industrial De-pollution</td>
<td>ANPE</td>
<td>40</td>
</tr>
<tr>
<td>MA004</td>
<td>Morocco</td>
<td>WW</td>
<td>Sanitation of Nador city - depollution of the Marchica lagoon and extension to additional treatment capacity of 23 000 m$^3$/day through two new WWTPs in Nador and in Kariat Arkmane</td>
<td>ONEE</td>
<td>62</td>
</tr>
<tr>
<td>EG010</td>
<td>Egypt</td>
<td>IE</td>
<td>Egyptian Pollution Abatement Programme (EPAP II)</td>
<td>EEAA</td>
<td>145</td>
</tr>
<tr>
<td>IL013</td>
<td>Israel</td>
<td>IE</td>
<td>Upgrade of WWTP to biological treatment</td>
<td>AGAN (Private company)</td>
<td>38.5</td>
</tr>
<tr>
<td>IL014</td>
<td>Israel</td>
<td>IE</td>
<td>Rehabilitation of Kishon River (dredging of river bed, etc.)</td>
<td>Ministry of Environment + private companies</td>
<td>50</td>
</tr>
<tr>
<td>PS004</td>
<td>Palestine</td>
<td>WW</td>
<td>Emergency works to upgrade existing WWTP (secondary / biological towers)</td>
<td>Palestinian Water Authority</td>
<td>1.6</td>
</tr>
<tr>
<td>PS005</td>
<td>Palestine</td>
<td>WW</td>
<td>Construction of temporary WWTP in the west of Khan Younis (aerated lagoons)</td>
<td>Palestinian Water Authority</td>
<td>1.1</td>
</tr>
</tbody>
</table>

**TOTAL Investment Portfolio in Operation = 418.7**

The portfolio of investment that has reached the operation phase is spread between the three H2020 sectors of IE, SW and WW as shown in Figure 14.
In addition, Figure 15 below compares the projects that have reached the operational phase (10 in total) against the overall portfolio of ‘financing secured’ (42 in total). This means that in total 24% of the overall portfolio of investment projects with ‘secured financing’ is now in operation. In terms of sector representation, while 80% of IE projects with ‘secured financing’ of a value of 273.5m EUR are operational, only 17% of SW and WW projects with ‘secured financing’ of a value of 145.2m EUR have reached operation.

4.5.2 MAIN OBSERVATIONS FROM OPERATION

Table 10 below lists the three (3) projects reported previously as ‘partially completed’. The listed projects, include: (i) ‘bundled’ projects (PS001); and (ii) WWTPs that are currently operational and were financed under a “umbrella package/programme” (TN003 and TN 007) and that also included other components described previously in this report under the relevant country’s section (see chapter 3).
Table 10  H2020 Projects in Partial Operation (also introduced as Table 7)

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Sector</th>
<th>Project title</th>
<th>Promoter</th>
<th>Value (m EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS001</td>
<td>Palestine</td>
<td>WW</td>
<td>Expansion and upgrading of wastewater services in Gaza; Middle Area Central; and West Nusseirat (Wadi Gaza)</td>
<td>Palestinian Water Authority</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Partial Completion where networks are completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TN003</td>
<td>Tunisia</td>
<td>WW</td>
<td>Loan ONAS IV (various)</td>
<td>ONAS</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Partial Completion of WWTP &amp; Networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TN007</td>
<td>Tunisia</td>
<td>WW</td>
<td>Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m) / coverage of a total of 19 WWTP and pumping stations</td>
<td>ONAS</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Partial completion through the completion of Choutrana Complex that is operational.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The main challenge as concerns these three (3) projects was to determine what portion of the overall investment is actually under operation and what portion remains to be completed. As a consequence these projects were not seen as operational as part of this validation exercise and therefore not considered for the operational investment portfolio for this report.

Another important observation under the operation phase is demonstrated in Figure 16 below, which identifies the division of operation responsibility between Government and private enterprises across the H2020 sectors based on the results of this validation exercise.

Figure 16  Operational Responsibility

This can be read from different perspectives as follows:

1. **First** it can be interpreted as Governments are still heavily involved in the WW sector compared to other H2020 sectors for, but not limited to, the following reasons:
a. The sector is still not seen as lucrative enough to attract private sector operators and this is due to:
   i. Weak/low tariff structures that are not covering O&M cost;
   ii. Inefficient billing and collection procedures resulting in a lower than expected revenue stream, thus exacerbating the lack of cost recovery; and
   iii. Non-existence in some cases of any form of tariff, making it very unattractive for private sector involvement.

b. Governments still maintain a strong hold of this sector due to its social and political sensitivity.

c. However, looking at these through a positive lens one can see that there is still a lot of scope in the WW sector for partnerships between the public and private sectors.

2. **Second** in the SW sector it shows, despite only one SW project identified as operating, which by no means is a representative sample, that this is a sector that attracts the private sector. This is based not only on the results of the validation exercise (including the results depicted in Figure 17), but also based on the impression the validation team observed from the field and from engagement with Governments.

3. **Third** is the strong presence of private enterprises in the industrial sector which is more or less expected due to the high involvement of proprietary equipment and technology necessarily being used by industry.

The final observation is one related to the time gap between the completion of a project and its entering into operation irrespective of who is operating it. The following line chart (Figure 17) reflects this finding showing a spread from one (1) to four (4) years with an average of two (2) years as minimum time required for a project to enter into operation after it has been commissioned.

*Figure 17  Time Gap between Completion date and Operation Date*

![Time Gap between Completion & Operation (In years)](image)

Some examples of reasons for the time gap occurring were identified during the validation process:

- In one instance, the DBO contractor needed to receive a completion certificate from the construction of the plant before the operation phase could commence. Tidying up of minor
construction defects has taken time and although not directly affecting the operation of the plant, had a contractual implication which caused the time gap;

- Another example resulted from omissions and inadequate provisions in the plant design coupled with construction undertaken by an inexperienced contractor, with no provision allowed for a competent operator to take over the plant following commissioning. In addition, the network component of the project was not dovetailed to be fully operational at the completion of construction of the WWTP. Thus, several years elapsed before a proper operating contract was put in place, following which substantial improvements in plant performance have resulted; and

- Some projects are components of a larger overall scheme and are dependent on the related components being completed at the same time. This occurs, in particular for the "umbrella" type of projects described in previous sections, but in some instances these projects are implemented independently. Operation of these component projects is not possible until the other related projects have been completed, thus producing a time gap.

4.5.3 LESSONS LEARNED

Key Lessons Learned

Operation is the ultimate stage of the project cycle. It is the final step that becomes the lasting monument of the overall success and sustainability of the project. The impact, image and smooth functioning of the plant are there for all to see. But it is the processes actually leading up to this stage that dictate how successful the lasting impression will be. Therefore, many of the key lessons learned will already have been identified in previous project cycle stages, but since these are important it is worth repeating some of them.

The key steps to smooth, efficient and sustainable operation can be summarised as follows:

1. Good preparation at the initial stages of design by undertaking sufficient field work and studies to produce a sound base on which to proceed with the subsequent phases of implementation, will usually lead to a realistically priced construction contract, the works built to a good standard, with quality/appropriate equipment operating at optimum efficiencies, and smooth operation by appropriately trained and skilled operators.

2. Involvement of the ultimate operating staff at the earliest possible stage of implementation will provide the best opportunity to have knowledgeable staff running plants, maintaining the networks and managing landfill operations.

3. Sufficient funds need to be available for operating and providing routine maintenance. Since in all of the countries under consideration, the tariffs currently do not cover even basic operation costs, it is important that there is a mechanism in place from the start to provide sufficient funds to support appropriately skilled staff as well as for the required operating functions.

4. Routine sampling, with key analyses and regular monitoring and reporting all lead to ensuring that problems will be detected at the earliest opportunity providing the maximum chance to put in place corrective measures speedily.

5. Careful planning and phasing of integrated projects has found to be lacking in several instances, where if a more holistic approach combined with realistic project implementation planning was undertaken this would lead to maximum utilisation of investments and avoid costly infrastructure components only able to operate well below the design capacity, and some cases left lying idle.
5 FIELD VERIFICATION ON SELECTED H2020 PROJECTS IN OPERATION

In order to give the operation phase the right weight and to better reflect the pollution reduction impact of operational projects, MeHSIP-PPIF joined hands with the EU-funded SWIM project to undertake technical field verification missions to a selected number of H2020 projects that are operational. The selection of projects was mainly governed by ensuring the readiness by the Promoter and accessibility to the site given the constraints that both MeHSIP-PPIF and SWIM have in terms of timing.

This chapter provides the information/data coupled with an analysis originating from these field missions. These field missions were coordinated closely with the Promoter and detailed discussions took place on site with the relevant Government authorities and operators.

Finally, it should be noted that the following sections provide an overview of the initial observations from the three WWTP sites visited and are expected to be completed by the end of 2013.

5.1 PROCEDURE & SELECTION OF SITES

In the previous chapter, Table 9 (see p. 56) lists the projects that were identified as completed and in operation. Also, as identified above, some projects have several different components or sub-projects where either one component has been completed, and in operation, while other components are still under construction (see Table 5, p. 44). It can be seen from these tables that the majority of projects that have reached operation stage in the partner countries that are regularly visited under the on-going MeHSIP-PPIF are in the wastewater sector. It was therefore considered as an added benefit to choose three operating WWTPs to visit from different countries which would also enable an indicative comparison of effectiveness of the pollution reduction across the region in one sector. The aim of this component is therefore to identify three completed WWTP currently operating that have progressed towards achieving pollution reduction in the Mediterranean Sea under the banner of the H2020 initiative.

A spread across the partner countries was intended. First, the complete picture of the number of plants that have reached the operation stage was required, and this procedure is outlined in the previous chapter (chapter 4). A review of the projects identified in Tables 4 and 5 (chapter 4) indicated that projects in Lebanon, Morocco and Tunisia met the criteria. Further, information on the exact stage of the projects being considered was obtained during the missions to the respective countries and from meetings with the Promoters. During these meetings, the aim of the site visits was explained and endorsement from the promoters obtained to ensure that they supported the Validation procedure. This process led to the selection of the following projects to be visited:

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11 The planned date for completion of this Validation Exercise Report is December 2013; however, the capture of the required information on the projects that have secured finance is complete, and has been analysed in the sections above, and the only component of the validation exercise that still requires time to be completed is that relating to the findings and analysis of the visits to operational sites which took place towards the latter part of the study. Bearing in mind the opportunity to present the findings at the H2020 Steering Committee meeting on the 19th - 20th November, an initial draft has been prepared to accompany the previous chapters (chapter 1 – 4) that are to be considered complete. This section will be subject to amendment as the analyses of the information obtained during the plant site visits is absorbed, analysed and commented on.

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LBo07 (Lebanon): Wastewater treatment and network in Saida. Onsite visit carried out to - Saida WWTP;

MA003 (Morocco): Construction of 7 WWTPs in the municipalities and extension of primary and secondary collectors. Onsite visit carried out to - Al Hoceima WWTP; and

TN007 (Tunisia): Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m EUR) / coverage of a total of 19 WWTP and pumping stations. Onsite visit carried out to - Complex Choutrana WWTP.

As mentioned above, this exercise is intended to provide a factual statement of how the operation stage is functioning, and is not intended in any way to be an audit. In the event, in all three partner countries, complete cooperation and support was provided, and in each case including attendance by the Promoter’s representatives for either the complete or part of the visits to the WWTPs.

The site visits aimed to assess the integrity and quality of the WWTP in terms of design, efficiency, operation capacity to treat the quality and quantity of effluent being received by the plant, and to undertake an evaluation of the operation, the adequacy of management systems, pollution reduction achieved, and actual benefits to the environment and public health. Key aspects to be addressed were to assess:

- Quality of completed works (especially in comparison to the intended results and plans for potential upgrading);
- Appropriateness of treatment process in terms of pollution reduction impact and of ultimate sustainability, given the local circumstances;
- Adequacy of operation management (staff qualification & training, supervision, monitoring performance indicators, quality control & assurance, etc.);
- Performance guarantee levels, such as, inflows quality and quantity, effluent quality, consistency of operation, process flow and other process requirements such as chemicals, physical parameters, detention time etc., and capacity of operation;
- Characteristics of influent in the plant e.g. domestic, industrial and percentage of each category connected;
- Quality of the sludge processing and elimination;
- Technical challenges and/or gaps, if any, identified by the promoter or contractor that are or could hinder proper operation;
- Allocation of regular and sufficient funds for proper operation, maintenance and replacement;
- Main beneficiaries of the project in terms of geographical & population coverage; and
- Main pollution reduction objectives achieved by the project if possible.

The following sections outline the key points observed and noted as a result of the visits to the three chosen operating WWTP sites. These sections are subject to more detailed updates which will be provided once the detailed analyses of the plants have been concluded.
5.2 ONSITE VISIT TO Saida WWTP (LEBANON)

The plant chosen for operation validation was Saida WWTP in Lebanon (LB007). The following information has been received from the beneficiary, the Water Establishment:

- Preliminary treatment only with a 2km sea water outfall;
- Nominal capacity: 50,000 m³/d;
- 96,600 people connected to plant; and
- Constructed in 2005 with an operation and maintenance contract awarded in 2012.

5.2.1 MAIN FINDINGS

The visit to the Saida WWTP took place on the 19th September 2013. MeHSIP-PPIF, together with a wastewater expert from SWIM were accompanied by the operations plant manager and the mechanical engineer.

In contrast to the Al Hoceima WWTP in Morocco which treats effluent to tertiary treatment standard (see following section, 5.3), the WWTP at Saida provides only the components for preliminary treatment of the wastewater entering the plant. Thus not only are there fewer treatment stages to observe and evaluate, the residual quality of effluent leaving the plant will not be able to achieve the same level of pollution reduction as the WWTP at Al Hoceima.

The Saida WWTP was constructed in 2005. The funding for the project was provided by the Japan Bank for International Cooperation (JBIC), the consultants who designed the plant were NJS Consultants, a Joint Venture which comprised Nippon Jogesuido Sekkei and TEI S.P.A.

The civil construction was executed by “The Arab Contractors Osman Ahmad Osman Co” from Egypt. The mechanical works was carried out by Subal Engineering (Lebanon), the electrical works was carried out by Beta Engineering (Lebanon).

The contract values for the networks, network pump stations and the treatment plant was approx. $37 million.

The WWTP is currently being operated under a new three (3) year operations contract with a Lebanese company, Saba Makhlof Company. The value of the contract is $2.5 million for the current operation set up which started in October 2012. The operations contract consists of managing, operating and maintaining:

- Three network pump stations
- 35 km of sewage network
- WWTP at Saida

The operations team consists of 45 staff.

Although the WWTP construction was completed in 2005, the WWTP was only accepting 5,000 m³/d of sewage for the first seven (7) years of operation due to network deficiencies and lack of an effective operating contract. The WWTP provides screening and grit removal before the sewage is discharged to a 2,190 m long outfall. The plant has been designed with a capacity of up to 129,600 m³/d.
In October 2012 the new operating contract was awarded. The new operations team have investigated the more significant deficiencies in the network and undertaken construction and rehabilitation work at key locations where flows were hindered or blocked, and hence have improved the network delivery to the point that 24,000 m$^3$/d dry weather flow is now being treated by the WWTP. Based on a flow per person of 130 litres, the existing WWTP provides treatment for a population equivalent of 107,000.

The plant is not designed to provide removal of Biochemical Oxygen Demand (BOD), Suspended Solids, Nitrogen or Phosphorous.

The core purpose of the plant is to improve the water quality on the Saida Beaches by:

- Removal of large objectionable objects which have to be diverted from the WWTP; and
- Reduction in Faecal Coliforms by sea dilution and sunlight degradation.

5.2.2 PERFORMANCE OF THE PLANT

The Saida wastewater network system consists of 160 km of gravity pipe which discharges to the Saida Coastal Area WWTP. The operations team at the WWTP are also responsible for the three main feed pump station and 36 km of the network.

The existing facilities at SAIDA provide only preliminary treatment of screening and grit removal of the raw sewage before it is pumped to a 2190 m outfall. The Saida WWTP includes the following components:

- an intake chamber at the WWTP;
- an intake wet well which provides a buffer for the intake pumps;
- intake pumps consisting of five dry installed submersible pumps provided in a covered dry well;
- the pumped sewage is discharged to dedicated bell-mouths in a feed channel upstream of intake flat teeth screens.
- two fine screens provided in the preliminary works designed to:
  - prevent discharge of larger sized objects (e.g. plastic packaging etc.) to the sea
  - prevent blockage of the outfall pumps and outfall diffuser
- there are two fine screening by pass channels
- the screenings collected by the fine screens are discharged to a screw conveyor
- a screw compactor discharges the screenings to a skip
- the screened sewage discharges to a channel that feeds two 6 m diameter cross flow detritus tanks that are used for grit removal
- the grit removed wastewater gravitates over broad crested weirs to a long buffer tank upstream of the outfall pumps
- buffer tank and three outfall pumps located in an outfall pump building. These pumps are dry installed submersible pumps
- a 2,190 m long outfall which discharges to the Mediterranean sea with diffusers provided at the end of the outfall pipe to aid dispersion.
- the plant was initially supplied with a 1,280 kVA diesel electric generator installed in a building but this was found to be oversized and to consume too much fuel, so the WWTP plant has now been equipped with a smaller 500 kVA generator which is located outside the generator building in a kiosk.
### Key Observations

Problems associated with the design of the plant were identified, and these are outlined briefly below. However, the key aspect that was not taken into consideration from the outset during the conceptual design stage is the lack of allowance of land for the footprint required to accommodate the future treatment upgrade to provide primary settlement and biological treatment.

**Plant design problems:**

The screening was originally provided and located after the intake pumps. This is not good practice because the intake pumps themselves need protection from blockage by large objects. Ideally automatic coarse bar screening should have been design upstream of the intake pumps. To protect the intake pump the operator has had to install coarse manual mesh screens upstream of the intake pumps.

The tooth rake fine screen provided is not a robust reliable design, the raking teeth are made from plastic and many have broken. It is a very difficult and laborious job to replace any broken teeth, as all the rake teeth from a row have to be removed to replace just one broken one.
The operator is considering replacing the rake tooth screens with two 10 mm raked bar screens, which would be located in the intake reception chamber. This solution would protect the intake pumps and be far more operationally reliable.

No means has been provided to enable the intake wet wells to be drained down and cleaned. A simple sump chamber with penstock should ideally have been provided next to the intake wet well which would allow full wet well drain down with a temporary submersible pump.

The odour control system uses expensive activated carbon. No air heating system has been provided on the odour control units thus results in the activated carbon being degraded very quickly by moisture. A lower operational cost odour control system should have been considered by the designers, for example a simple biological packed tower scrubber, or the use of a hypochlorite scrubber.

The screen house odour control system is inappropriate because all the air for the activated carbon is intended to be extracted by a duct system at high level inside roof of the building. However large side shutter doors of the building are left open to allow easy operator vehicle access, therefore no effective odour control is possible. The building is therefore redundant. A better solution would be to have no building but to have close fitting covers on the screen channels and on the screens and extract the much smaller volume of air under these covers to the odour control unit.

The outfall has not been designed with sufficient consideration to allow a proper calibrated electromagnetic flow meter to be installed.

The WWTP has been constructed without a long term strategy for upgrading the pollution removal achieved by addition of future processes of primary settlement and future biological treatment. The site on which the WWTP is located has a very limited foot print. A medical waste incinerator facility has been already constructed on the site further restricting the available foot print for additional wastewater treatment process facilities.

The current available foot print will allow only primary settlement to be accommodated. The sludge produced by the primary settlement would need to be stored and thickened or dewatered on site. To reduce foot print demand the sludge would be mechanically thickened with outdoor drum thickeners or dewatered with a centrifuge.

Secondary biological treatment would typically use activated sludge with a biological aeration basin and secondary clarifiers for separation of the biomass and the final cleaned effluent. Smaller foot print biological treatment process such moving bed bioreactors (MBBR) or Sequence batch reactors (SBRs) could be also be used.

There will not be sufficient space on the existing site to achieve biological treatment. Achieving biological treatment will require reclamation of land from the sea or pumped transfer of the screened and degritted and primary settled wastewater to another location.
5.3 ONSITE VISIT TO AL HOCEIMA WWTP (MOROCCO)

The plant chosen for operation validation was the El Hoceima WWTP (part of MA006). The following outline information about the El Hoceima plant was provided by the Promoter, ONEE:

- Population connected to the network in 2012 is 57,000 inhabitants;
- Capacity of the WWTP: 9600 m³/d;
- Taken over by ONEE since 2004;
- Treatment process is activated sludge; and
- Currently operated by ONEE.

5.3.1 MAIN FINDINGS

The visit to the Al Hoceima WWTP took place on the 26th September 2013. MeHSIP-PPIF, together with a wastewater expert from SWIM were accompanied by Ingenieur ONEE/Branche Eau/DAE/PP, Chef de STEP and the plant engineer.

Al Hoceima city is located in the extreme north of the Kingdom of Morocco, on the Mediterranean Coast between the provinces of Chefchaouen and Nador, 340 km east of Tangier and 170 km from the Algerian border (Saidia). The WWTP plant has capacity to serve more than 127,000 population equivalent (PE) habitants and its nominal capacity is 9,600 m³/day. The plant serves the residents during winter and has to cope with a substantial increase in flow during the two summer months due to the influx of tourists. The wastewater is purely from domestic users and there is no industrial wastewater being discharged to the plant.

An original plant at the site was commissioned in 1996, and this older plant was refurbished over two years, and an extension built over one year with completion of both components in 2011. The project was implemented under a DBOT by a Portuguese contractor. There is a two-year operating phase under the contract, where the contractor and ONEE jointly operate; however this phase has not yet commenced due to the remaining outstanding defects (which are minor) that have not yet been completed by the contractor. During this two-year period, the contractor is responsible for the operation; however, it is clear that the day-to-day running of the plant is in fact being undertaken by ONEE staff. Once the plant has been finally handed over, ONEE will take over full responsibility for the operation.

The investment cost amounted to 120 million dirhams\textsuperscript{12}, of which financing was allocated as follows:

- 50% of the works were financed by ONEE-Water Branch with the support of AFD; and
- 50% of the works were financed by the National Program for Wastewater, known as PNA.

The following characteristics of the plant were noted:

- The WWTP of the city of Al Hoceima is served by a sewer network of about 93.66 km. The network has seven (7) pumping stations and there are six (6) stormwater spillways; and
- The treatment of the wastewater is undertaken in three (3) steps: (i) pre-treatment (PT), (ii) secondary Treatment (ST) using activated sludge process; and (iii) tertiary treatment (TT) using membranes and UV disinfection. 3% of the final effluent is recycled to irrigate the WWTP compound. Sludge treatment is undertaken by sludge thickening and sludge

\textsuperscript{12} C. 10.7m EUR (currency exchange of 11/11/2013 - 1 EUR = 11.1876 MAD}
dewatering by centrifuges. Sludge is stored and then transported to the Imzouren-Beni Bouayach WWTP, pending ONEE reaching an arrangement with the Municipality to dispose the dried sludge in a controlled tip.

The following parameters were provided:

- Average daily flow (summer): 9,600 m³/day;
- Peak hourly flow (summer): 710 m³/h;
- BOD₅ pollution load (summer): 3,800 kg/day;
- COD pollution load (summer): 10,300 kg/day; and
- TSS pollution load (summer): 4,300 kg/day.

There are standards in Morocco to which WWTP must comply with in terms of effluent discharge, sludge treatment and air quality. Records obtained from the plant operators confirmed the performance of the plant, and is presented in the next section.

5.3.2 PERFORMANCE OF THE PLANT

The performance of the plant is demonstrated by the following figures which show the reduction in BOD, COD, and TSS through the plant.

*Figure 18* Variations of the concentration in BOD₅ at the input and the output of the WWTP

- The quality of the effluent in the sea, in terms of BOD₅, complies with the value recommended by the Required Purification Levels (RPL) of the Contract, which is 25 mg of O₂/L; and
- The COD concentration of the effluents at the WWTP input is clearly too loaded with respect to the typical range of the Moroccan wastewater (500-750mg/l).
Figure 19  Variations of the concentration in COD at the input and the output of the WWTP

- The quality of the effluent in the sea, in terms of COD, complies with the value recommended by the Required Purification Levels (RPL) of the Contract, which is 90 mg of O₂/L; and
- The total suspended solids (TSS) concentration of the affluent is in general in the typical range of urban Moroccan wastewater according to the SDNAL 1998(250-500mg/l) references.

Figure 20  Variations of the concentration in TSS at the input and the output of the WWTP

- The quality of the effluent in the sea, in terms of TSS, complies with the value recommended by the Required Purification Levels (RPL) of the Contract, which is 35 mg of O₂/L; and
- The microbiological analyses of the final effluent obtained at the laboratory show that the effluent can be reused for certain categories of irrigation. As in the case of the WWTP, the purified water is used for garden irrigation, and for washing and cleaning of structures and equipment.

Other related factors observed were:

- Operator staff levels and skills: there are eleven total operation staff employed at the site. Training of the staff is an on-going process during this joint operation phase; regular monitoring of the adequacy of skilled staff in future years would be beneficial; and
- There is a well-equipped laboratory on the site that analyses appropriate samples on a regular basis.
5.3.3 KEY OBSERVATIONS:

- The overall impression is that the plant has been constructed to a good standard, incorporating equipment which has been supplied by reputable manufacturers and meets the required performance for the optimum efficient operation of the plant processes. The final effluent is visibly clear and discharges from a clean clarifier tank. The site is very well kept and tidy and is clearly looked after with pride by the operators.
- The sludge treatment is currently not fully compliant; the dryness is less than 22%, and the final disposal to spare land adjacent to another ONEE wastewater plant is a temporary solution until an agreement can be reached to dispose at a controlled landfill site.
- There is clearly a good example of pollution reduction achieved by the plant, demonstrated by the significant reduction in BOD and COD loads since the construction of the rehabilitated and new extensions to the plant that were completed in 2011.
- There are some areas of concern that warrant some further investigation. The most important of these relate to the overloading of the plant in terms of organic load, and consequentially how long the plant will be able to perform to the current efficient standard without this feature affecting the treatment processes.

5.4 ONSITE VISIT TO COMPLEX CHOUTRANA WWTP (TUNISIA)

The plant chosen for operation validation was the latest plant constructed at the Choutrana complex known as Choutrana 2 WWTP (part of TN007) with the following characteristics:

- The treatment is extended aeration with sludge press and dewatering with no odour control
- Nominal capacity: 40,000 m³/d
- PE 333,000
- Operation started in 2007
- Operated by ONAS

5.4.1 MAIN FINDINGS

The visit to the Choutrana 2 WWTP took place on the 24th October 2013. MeHSIP-PPIF, together with a wastewater expert from SWIM were accompanied by Chef du Département Central du Management, Responsable de la Direction Épuration du Grand Tunis and Chef de la station d’épuration Choutrana 2.

According to the 2004 census, the population of the municipality of Tunis was 728,453 inhabitants. During the twentieth century, the agglomeration has developed significantly outside the boundaries of the municipality, extending to more than 30 km in diameter to reach the suburbs of the Ariana to the north, and to the Marsa or Soliman in the south. The urban population was approximately 2,412,500 inhabitants in 2004, nearly 20% of the population of the country.

There are seven WWTP serving Grand Tunis. Of these, two are located in the Choutrana complex situated on the North of Tunis. The site of the complex of Choutrana comprises two WWTP, namely: Choutrana 1 and Choutrana 2, which together treat mainly the wastewater of the area of Tunis City called Borj Louzir. The complex of Choutrana receives a share of industrial effluents representing approximately 13% of the incoming stream. Both WWTP are operated by ONAS. This complex serves more than 1.28 million population equivalent (PE). Its nominal rated capacity is 118,000 m³/d.
The design of the two WWTPs is based on the principle of a biological process of treatment using activated sludge. Choutrana 1 was commissioned in 1986 and then extended and rehabilitated in 1998. Choutrana 2 was commissioned in 2007.

**Plant description:**

Choutrana 2 WWTP incorporates the following stages for the treatment of wastewater: Pre-treatment (PT), and secondary treatment (TS), and sludge handling. There is no provision for tertiary treatment (TT). Details of the treatment stages are outlined below:

1. **Pre-treatment (PT):**
   - The pre-treatment stage includes a Pumping Station with capacity of 1660 m³/h equipped with the 4 pumps (2 duty / 2 standby) each of unit flow rating of 830 m³/h; and
   - Two mechanical degritters are provided to eliminate coarse grit greater than 12 mm size. In addition, two lines are incorporated for elimination of oils, greases and sand.

2. **Secondary treatment:**
   - Biological reactors; there are two parallel streams, each line having two aeration basins of capacity 15,000 cu m. Air is provided through fine bubble diffusers from eight air compressors located in a nearby building. Means of releasing air trapped in the biomass are provided. Each reactor includes a contact zone where the sludge is extracted from the basins; and
   - Clarifiers: four clarifiers of unit volume of 2200 m³, each equipped with a scraper bridge and extraction points for the recirculation of sludge.

3. **Treatment of sludge:**
   - The sludge treatment stages are sludge thickening and mechanical dewatering. Two thickeners of capacity 1,250 m³/thickeners are provided; and
   - Dried sludge is then transported off site to a dedicated solid waste disposal site.

4. **Treatment of odours:**
   - The Choutrana 2 WWTP has a unit for odour treatment consisting of five bio-filters.

5. **Plant operation:**
   - There is a control building that houses a control room equipped with a computer providing a visual plan of the plant and allowing for remote control of the plant operation.

5.4.2 **PERFORMANCE OF THE PLANT**

Data on the performance of the plant was provided by ONAS. This section outlines those aspects of the plant performance for which data was made available. It was noted that the plant has been in operation now for five years and it appears that certain aspects of the plant analyses indicate levels of performance that imply that the plant is already close to operating at its design capacity. A summary of performance features are shown in the table below:
### Tableau: Caractéristiques des Eaux Usées Brutes

<table>
<thead>
<tr>
<th>Paramètre</th>
<th>Valeur de Conception</th>
<th>Valeur 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population en hab</td>
<td>333 000</td>
<td>500 000</td>
</tr>
<tr>
<td>Débit moyen journalier Qmj en m3/j</td>
<td>40 000</td>
<td>42 228</td>
</tr>
<tr>
<td>Débit de pointe Qp en m3/h</td>
<td>2 000</td>
<td>1 897</td>
</tr>
<tr>
<td>DBOS en Kg/j</td>
<td>20 000</td>
<td>17 339</td>
</tr>
<tr>
<td>DBOS en mg/L</td>
<td>500</td>
<td>411</td>
</tr>
<tr>
<td>DCO en Kg/j</td>
<td>40 000</td>
<td>42 306</td>
</tr>
<tr>
<td>DCO en mg/L</td>
<td>1 000</td>
<td>1002</td>
</tr>
<tr>
<td>MES en Kg/j</td>
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<td>18 162</td>
</tr>
<tr>
<td>MES en mg/L</td>
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<td>430</td>
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<tr>
<td>NTK en Kg/j</td>
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<td>2 224</td>
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<tr>
<td>NTK en mg/L</td>
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<td>53</td>
</tr>
<tr>
<td>Pt en Kg/j</td>
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<tr>
<td>Pt en mg/L</td>
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</table>

#### Typologie des Eaux Usées Brutes

<table>
<thead>
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<th>Valeur 2012</th>
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<tr>
<td>Rejet spécifique en l/hab/j</td>
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</tr>
<tr>
<td>Charge spécifique en DBOS à l'entrée en g/hab/j</td>
<td>60</td>
</tr>
<tr>
<td>DCO/DBOS</td>
<td>2,0</td>
</tr>
<tr>
<td>MES/DBOS</td>
<td>0,80</td>
</tr>
<tr>
<td>C/N/P</td>
<td>100/18/5</td>
</tr>
</tbody>
</table>

The flow capacity of the WWTP is 40 000 m³/d. The daily flow at the entrance to the WWTP is recorded as 42 228 m³/d, exceeding the plant’s rated capacity by 6%. Monthly records of mean flows are illustrated in the graph below.
The average daily flow values recorded this year (2013) will reach 45,536 m$^3$/d which exceeds the rated capacity of the WWTP by 14%.

Incoming raw wastewater to the WWTP is overloaded in terms of BOD$_5$. Indeed, in five years of operation the average value has already reached 87% of the rated capacity of the WWTP. In 2012, the maximum monthly level reaches 97%. Monthly variations of this parameter, representing the organic carbon pollution, are shown in the following graph:

The results of the analyses of the BOD$_5$ in the effluent are shown in the graph below, which indicates that all values comply with the required national standards.
The average and maximum values of the pollution loads measured as COD, as recorded in 2012, exceed the rated capacity of the WWTP respectively by 6% and 15%. Monthly variations of COD are shown by the following graph:

![Variations Mensuelles de la DCO à l’Entrée de la STEP](image)

The results of the analyses of the COD of the effluent are shown in the graph below, which indicates that all these effluent COB values comply with the required national standards.

![Variations Mensuelles de la DCO à la Sortie de la STEP](image)

Similarly, the average and maximum concentrations of total suspended solids entering the plant, as recorded in 2012, exceed the rated capacity respectively by 14% and 28%. Monthly changes in TSS are shown by the following graph:
The results of the analyses of the effluent TSS are shown in the graph below, which indicates that all values comply with the required national standards.

The WWTP does not contain de-nitrification or phosphorus removal. Consequently the results of analyses of TKN and Pt, show that the values recorded during the year 2012 do not meet the standards. The results of bacteriological analyses (Fecal Coliforms) and parasitological (helminth eggs) were not provided.
The nitrogen levels recorded in 2012 remain below the nominal capacity of the WWTP. However, the maximum value of the TNK has already reached 83%. The five records of phosphate loads sampled in 2012 are lower than the rated capacity of the WWTP.
Evaluation of Organic Pollutant load (OPC)

The variation of the OPC is recorded in the following graph. The values fluctuate between 15,452 and 19,429 kg BOD5 / d. In summer the OPC reaches the biomass capacity of the WWTP.
Variations Mensuelles de la DBO₅ à la Sortie de la STEP

30 mg/L

Variations Mensuelles de la DCO à la Sortie de la STEP

90 mg/L

Variation Mensuelle des MES à la Sortie de la STEP

30 mg/L
5.4.3 KEY OBSERVATIONS

As can be seen from the performance outlined above, the plant is succeeding to reduce the pollution load entering the plant satisfactorily, although certain key parameters such as levels of faecal coliforms are not measured. Also, there is no facility within the plant for the reduction of Nitrogen or Phosphates.

There are indications that the plant is already operating at close to its design capacity only five years after commissioning; indeed certain fundamental aspects such as incoming flows and loads are already exceeding the design capacity levels. However, despite this the plant continues to reduce the BOD, COD and TSS levels to below the required levels thus complying with the required standards. Records indicate that compliance is greater than 95% and in some cases 98% which indicates good performance.

- Generally, a minimum operating period of ten years would be expected to be allowed for in the design of a WWTP. Therefore, possible reasons for the plant approaching full capacity so early were considered and could be attributed to the following: incomplete, insufficient or possibly inaccurate baseline data regarding existing flows and loads and underestimation of future predictions of these key parameters which would be needed to form the basis of an appropriate design in terms of sizing components and structure, at the preliminary design study stage (APS);
- A lack of optimisation of the design of the treatment plant components perhaps due to inexperience regarding the process design parameters and requirements needed to provide sufficient capacity within the plant to accommodate future increased throughputs at the time of preparing the detailed design of the plant; and
- Lack of consideration of a phased approach to the construction of the plant to accommodate the expected and planned increase of throughput over a more realistic period of ten years.

Of note is the fact that sludge treatment and handling is undertaken efficiently at Choutrana. The sludge is dewatered and dried and transported off-site to an appropriate solid waste site owned by ONAS. The number of staff and skill levels of staffing at the Choutrana complex are somewhat unbalanced since there is apparently an excess of staff level at Choutrana 1 whereas potentially too few at Choutrana 2. One way of rectifying this would be to transfer some staff from one site to the other.
6 MAIN OBSERVATIONS, CHALLENGES & KEY LESSONS LEARNED

Following on from the analysis that has been presented in the two preceding chapters (Chapter 4 and 5) and taking into account the significant understanding gained regarding the regional dynamics in the preparation, implementation and operation of pollution reduction infrastructure projects several messages can be drawn as presented in the following grouping:

6.1 MAIN OBSERVATIONS

- An extended time lapse between the end of the preparation phase and start of the implementation phase negatively affects project planning as the baseline data is likely to have changed, in particular relating to the social, economic, political and technical aspects of the project(s);

- Despite obvious engagement of partner country Governments resources available for environmental protection remain modest and in continuous need of supplement. This has been observed at various phases of the project cycle;

- It is wise to consider that a normal time span to bring a pollution reduction infrastructure project from its inception to completion (i.e. satisfactory commissioning) requires between seven (7) to ten (10) years;

6.2 CHALLENGES FACING H2020 POLLUTION REDUCTION INVESTMENT PROJECTS

- Political support may vary between project phases due to change in Government, whereby a project that was identified as a priority under a certain political leadership might be put on hold with a shift in Government;

- Administrative procedures required to ensure compliance with specific laws for ratifying loan agreements have proven to be time consuming and contributing to the delay in launching the implementation phase on time;

- Procurement of services for engineering studies and designs, and the procurement procedures required to be adhered to for the appointment of contractors to undertake construction as well as for construction supervision is a complex set of procedures that requires, in addition to compatibility between processes and procedures applied by IFIs and Governments, dedicated resources and specific skills that are usually not available at the Promoters’ organisations in the region;

- Sustainability of investments remains a challenge where the enabling environment does not provide for regulating appropriate tariff charges for services rendered by the operator, and where billing and revenue collection is inefficient or weak. In addition, where enforcement of the environmental laws are not applied in practice even where permits have been issued, this reduces the reality of projects meeting the environmental norms and standards.
6.3 LESSONS LEARNT

- An inclusive consultation process with key stakeholders at all stages is vital to ensure a smooth and effective preparation phase;

- Consultations should continue during implementation through a transparent process creating a forum for information exchange and awareness. This will not only ensure continuous ownership by the affected community but also establishes a credible initiative by the Promoter towards real pollution abatement;

- Involvement of the staff of the beneficiary organization as early as possible in the implementation process will result in a greater in-house knowledge and understanding of the project design and operating functions thus providing a more sure foundation for future operation of the plant to be undertaken as efficiently as possible;

- Proper project preparation through qualified engineering studies and field investigations is vital, not only for a successful and smooth project implementation, but also to ensure investment optimisation. Projects that are poorly prepared without careful attention to detail and understanding of its requirements have often resulted in significant delays during the implementation phase due to alterations and deviations from the tender documents that fell short in providing accurate information about the project;

- Another key issue to ensure proper preparation is to complement international expertise with local/national resources and expertise; thereby optimising the understanding of all projects aspects; and

- Frequently delays caused by poor preparation may cause a domino effect on other aspects of the project cycle. For example, change(s) to: (i) original scope; (ii) priority needs; (iii) budget estimates; or (iv) Government planning, leads to additional complications and subsequent delays.

Overall, and albeit the stated challenges and obstacles in developing and implementing critical pollution reduction projects, one can still take a bright perspective, as this study established a strong commitment by the partner country Governments across the southern and eastern parts of the Mediterranean, although (still) not at the intended pace to achieve targets and objectives that were initially identified through their respective National Action Plans (NAPs). This can be attributed to a genuine will by those Governments to meet these commitments, but which are often delayed by obstacles related to the political context and the continuous need for supplementary resources both at the financial and human capacity levels.

To this end and in order to maintain this relatively advanced mode that has even gained more momentum during the mandate of MeHSIP-PPIF (2009 to 2013), the H2020 initiative is in a position where it could through its main partners ensure that the management of the H2020 pollution reduction portfolio of investment projects is institutionalised. This can happen through:

- Assigning a coordinating entity that could support the preparation of projects as well as ensuring regular monitoring of project advancement by instilling a regular monitoring tool and mechanism in collaboration with the partner country Governments;

- Working on building capacities of sector institutions in better understanding the project cycle dynamics. This can happen by involving sector related institutions in training events.
that would improve their understanding of the project cycle and the requirements of financing institutions through improving project preparation capacities. This will in its turn lead to reducing the time required to advance the project to a stage where it is considered ‘bankable’, thereby further facilitating the negotiations between Promoters and financiers.

To complete this report the following table presents a snapshot of each of the 42 ‘financing secured’ projects analysed and their status in the implementation cycle (note: the three different colours appearing in the bar chart represent the three different H2020 sectors, as set out in the table’s legend).
SNAPSHOT OF FINANCING SECURED PROJECTS

- EG005
- EG006
- EG007
- EG008
- EG010
- IL008
- IL001
- IL002
- IL009
- IL012
- IL013
- IL014
- JO007
- JO009
- JO010
- JO011
- JO013
- JO014
- JO015
- JO017
- LB002
- LB003
- LB004
- LB005
- LB006
- LB007
- MA002
- MA003
- MA004
- MA006
- PS001
- PS002
- PS004
- PS005
- TN003
- TN004
- TN006
- TN007
- TN008
- TN009
- TN010
- TN013

- Waste Water
- Integrated
- Industrial Emissions
- Solid Waste
### Annex 1 Validation Mechanism Questionnaire

The following presents an overview of the questionnaire used in field visits.

<table>
<thead>
<tr>
<th>Country:</th>
<th>Promoter:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Ref No. On H2020 List:</td>
</tr>
<tr>
<td>Sector:</td>
<td>IFIs:</td>
</tr>
<tr>
<td>Project Total Cost:</td>
<td></td>
</tr>
</tbody>
</table>

#### A. How was the project preparation phase:

1. Was a FS prepared with all its components? (EIA, FINANCE, Designs, etc...)
2. How long did it take to complete the FS?
3. How was the preparation study/activity funded? Donor? Or Government? Or Others?
4. Did the preparation include consultation with stakeholders?
5. How long was the gap between completion of preparation and signing loan agreement?
6. Have all permits been received?
7. Is the project co-financed?
   7.1. By Whom?
   7.2. Percentage per IFI?
   7.3. Portion of Gov?
   7.4. Grant portion?
8. How long was the gap between loan agreement and start of implementation?
9. Does/did the project include a TA for Implementation? Cost of TA (Euro and
A. Has the project progressed to implementation? If YES move to section B if NO continue hereunder

1. What are the main problems that stopped/delayed implementation?
   1.1. Did not pass appraisal?
   1.2. Did not pass national loan committee?
   1.3. FS results differed a lot from actual tendering results?
   1.4. Contractors were not interested in tender?
   1.5. Involvement of more than one promoter for the project?
   1.6. Timely provision of government contribution to investment?
   1.7. FS components needed adjustment or update?
   1.8. Lack of required permits
   1.9. Others?

2. Is the project still on the list of priorities?

3. Are you seeking other sources of financing?

B. What stage of implementation has the project reached:

1. Update Feasibility study? If Yes continue - if No move to Q2
   1.1. Financial
   1.2. ESIA
   1.3. Institutional
   1.4. Expected time to finalize?

2. Detailed design?
   2.1. Pending? If Yes why?
   2.2. Tendering stage? Expected date of completion?
   2.3. Contract awarded? When?
   2.4. Ongoing progress? Expected date of completion
   2.5. Completed? When?

3. Procurement of works?
   3.1. Pending? If Yes why?
   3.2. Tendering stage? Expected date of completion?
   3.3. Contract awarded? When?
   3.4. Ongoing progress? Expected date of completion? *(Also answer Q4 after)*
   3.5. Completed? When?

4. Under construction?
   4.1. Construction Completed? *(If No continue if YES move to Q5)*
   4.2. Has it been delayed or deviated from its initial plan?
      4.2.1. How much? And what aspects of deviation can be noted?
      4.2.2. Main reasons why?
      4.2.3. New date of completion?

5. Post commissioning and Operation? *(If YES move to section B under Operation verification)*
A. Has the project progressed to Operation? If YES move to section B if NO continue hereunder

1. What are the main problems that stopped/delayed Operation?
   1.1. Did not pass testing/commissioning? (Explain main problems/deficiencies)
   1.2. Did not agree on Operation modality?
   1.3. Tendering process was delayed? (By how long?)
      1.3.1. Due to administrative procedures?
      1.3.2. Need for TA for Operational contracts?
   1.4. Tendering process was repeated? (how many times?)
      1.4.1. Non-compliance with procedures?
      1.4.2. No interest shown by Operators?
   1.5. Lack of financing for operation?
   1.6. Others? Specify

2. Has it been awarded to Operator but not started yet?
   2.1. How long has it been pending?
   2.2. Reasons for this delay?
   2.3. Any recent attempts to get it started?
      2.3.1. What is the recent progress on this?
      2.3.2. When is it expected to start?

B. Under what modality has the project entered its operational phase?

1. Was the transition assisted by a Technical Assistance or PMU?
2. Is the project operated by the Government/Promoter?
3. Is the project operated by the private sector?
   3.1. What type of private sector partnership was adopted?
   3.2. How long is the operation contract for?
   3.3. Who is overseeing the operational compliance with the PPP contract?
4. How long did the process take between Implementation and Operation?
5. Any problems encountered during operation?
6. Is the project/facility operated as intended and at design capacity?
7. Are there sufficient funds for planned operation, maintenance and replacements?
8. Who are the main beneficiaries of the project in terms of geographical and population coverage?
9. What are the main pollution reduction objectives achieved by this project?
### Horizon 2020 Project List - Financing Secured (INITIAL VERSION / NOVEMBER 2012) - 50 PROJECTS

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
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<td>DZ001</td>
<td>Algeria</td>
<td>Gazaouet</td>
<td>WW</td>
<td>Construction of WWTP</td>
<td>N/A</td>
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<td>EG003</td>
<td>Egypt</td>
<td>Cairo / Abu Rawash</td>
<td>WW</td>
<td>Untreated domestic sewage</td>
<td>CAPWO</td>
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<td>No</td>
<td>410.0</td>
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<td>Expansion of existing WWTP for biological treatment</td>
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<td>Yes</td>
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<td>Improved Water and Wastewater Services Programme - IWSP</td>
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<td>Integrated Sanitation and Sewerage Infrastructure Project - ISSIP</td>
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<td>Alexandria</td>
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<td>Private Public Sector Industry Project - PPSI</td>
<td>EEAA</td>
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<td>Egyptian Pollution Abatement Programme (EPAP II)</td>
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<td>Wastewater Treatment Amriya</td>
<td>CAPWO - Alexandria General Organisation for Sanitary Drainage (ASDCO)</td>
<td>Ongoing</td>
<td>Yes</td>
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<td>IL002</td>
<td>Israel</td>
<td>Shafdan</td>
<td>WW</td>
<td>Construction of sludge incineration plant or sludge drying plant</td>
<td>Dan Regional Association for Environmental</td>
<td>Ongoing</td>
<td>Yes</td>
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<td>Israel</td>
<td>Alexander river</td>
<td>WW</td>
<td>Construction of WWTP at Alexander river</td>
<td>Water Authority</td>
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<td>No</td>
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<td>Retamim</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>Southern Judea Association of Towns for Environment</td>
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<td>No</td>
<td>8.6</td>
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<td>JO007</td>
<td>Jordan</td>
<td>Greater Amman</td>
<td>SW</td>
<td>Medical and Industrial Waste Treatment Plant for Greater Amman and Middle Governorates (BOT project)</td>
<td>Nasser Group</td>
<td>Pending</td>
<td>Yes</td>
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<td>JO009</td>
<td>Jordan</td>
<td>Karak and Kofranjah</td>
<td>WW</td>
<td>Expansion and upgrade of wastewater facilities</td>
<td>WAJ</td>
<td>Ongoing</td>
<td>Yes</td>
<td>56.0</td>
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<td>Jordan</td>
<td>As-Samra OR Wadi Zarqa</td>
<td>WW</td>
<td>Expansion of WWTP (first option) or construction of a new WWTP (second option)</td>
<td>WAJ</td>
<td>Under preparation</td>
<td>Yes</td>
<td>136.0</td>
<td>N/A</td>
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<td>WW</td>
<td>Construction of sewer pipelines (135km), pump stations, WWTP (9000 m³/day)</td>
<td>WAJ</td>
<td>Under preparation</td>
<td>Yes</td>
<td>80.0</td>
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<td>Construction of a proper cross section: closed Canal (50km)</td>
<td>WAJ</td>
<td>Ongoing</td>
<td>Yes</td>
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<td>JO013</td>
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<td>Upgrading and expansion of WWTP</td>
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<td>Under preparation</td>
<td>Yes</td>
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<td>Ain Ghazal</td>
<td>WW</td>
<td>Septic treatment facility capacity (10,000 m³/day) (Expansion of Ain Ghazal treatment plant)</td>
<td>WAJ</td>
<td>Under preparation</td>
<td>Yes</td>
<td>2.0</td>
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<td>Zarqa Governorate</td>
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<td>Wastewater System Reinforcement and Expansion</td>
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<td>Zarqa</td>
<td>IE</td>
<td>Zarqa Industrial Wastewater Plant (central industrial WWTP, 1,430 cu m/d)</td>
<td>MoE/Zarqa Chamber of Industry</td>
<td>Ongoing</td>
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<td>Amman Municipality</td>
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<td>Beirut (south)</td>
<td>WW</td>
<td>WW main collectors</td>
<td>CDR</td>
<td>Ongoing</td>
<td>Yes</td>
<td>10.0</td>
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<td>WW</td>
<td>WW main collectors</td>
<td>CDR</td>
<td>Ongoing</td>
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<td>Kesrwan</td>
<td>WW</td>
<td>Water and Wastewater Project</td>
<td>CDR</td>
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<td>198.0</td>
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<td>Lebanon</td>
<td>Shekka, Koura and Batroun</td>
<td>WW</td>
<td>WW treatment and network in north Lebanon connecting three cities to WWTP</td>
<td>CDR</td>
<td>WWTP completed, networks ongoing</td>
<td>Yes</td>
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<td>Dora-Bourj Hammoud</td>
<td>WW</td>
<td>Wastewater Treatment and network in Greater Beirut Wastewater System</td>
<td>CDR</td>
<td>Pending</td>
<td>Yes</td>
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<td>National Plan for implementing a nationwide strategy on wastewater management (PNA)</td>
<td>ONEP</td>
<td>Ongoing</td>
<td>Yes</td>
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<td>Al Hoceima, Chefchaouen, Taounate, Ras El Ma (PNA), FerKhana (PNA), Ahfir, Jerada</td>
<td>WW</td>
<td>Construction of 7 WWTPs in the municipalities and extension of primary and secondary collectors</td>
<td>ONEP</td>
<td>Ongoing</td>
<td>Yes</td>
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<td>Sanitation of Nador city -</td>
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<td>Ongoing</td>
<td>Yes</td>
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<td>Morocco</td>
<td>Oum Rabia'</td>
<td>WW</td>
<td>depollution of the Marchica lagoon</td>
<td>ONEP</td>
<td>Under preparation</td>
<td>Yes</td>
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<td>SW</td>
<td>Part of the PNDM: financing the private sector to undertake the construction of the infrastructure</td>
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<td>Yes</td>
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<td>PS001</td>
<td>Palestine (Gaza)</td>
<td>Gaza City / Middle Area Central / West Nusseirat</td>
<td>WW</td>
<td>Central Area WWTP (tertiary)</td>
<td>Palestinian Water Authority</td>
<td>Ongoing</td>
<td>Yes</td>
<td>90.0</td>
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<td>PS002</td>
<td>Palestine (Gaza)</td>
<td>North Gaza</td>
<td>WW</td>
<td>North Gaza Emergency Sewage Treatment Project (NGEST) (tertiary)</td>
<td>Coastal Municipalities Water Utility (CMWU)</td>
<td>Ongoing</td>
<td>Yes</td>
<td>35.0</td>
<td>Yes</td>
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<td>Palestine (Gaza)</td>
<td>Rafah</td>
<td>WW</td>
<td>Emergency works to upgrade existing WWTP (secondary / biological towers)</td>
<td>Coastal Municipalities Water Utility (CMWU)</td>
<td>Completed</td>
<td>Yes</td>
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<td>Palestine (Gaza)</td>
<td>Khan Younis West</td>
<td>WW</td>
<td>Construction of temporary WWTP in the west of Khan Younis (aerated lagoons)</td>
<td>Coastal Municipalities Water Utility (CMWU)</td>
<td>Completed</td>
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<td>Syria</td>
<td>Banias</td>
<td>WW</td>
<td>Conversions of units 3 &amp; 4 of WTPP from fuel oil to gas</td>
<td>Banias refinery</td>
<td>Pending</td>
<td>Yes</td>
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<td>Syria</td>
<td>Banias</td>
<td>WW</td>
<td>Rehabilitation and upgrade refinery WWTP (chemical and biological treatment)</td>
<td>Banias refinery</td>
<td>Pending</td>
<td>Yes</td>
<td>12.0</td>
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<td>Facilities for recycling and treatment of fuel oil sludge from refinery</td>
<td>Banias refinery</td>
<td>Pending</td>
<td>Yes</td>
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<td>Syria</td>
<td>Tartous</td>
<td>WW</td>
<td>Syria Horizon 2020 Water Project (Banias and surrounding villages: Hreisun, Jobar, Al Ghamkah and Al Dabousiah river catchments)</td>
<td>Ministry of Housing and Construction</td>
<td>Pending</td>
<td>Yes</td>
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<td>Loan ONAS IV (various)</td>
<td>ONAS</td>
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<td>Yes</td>
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<td>Credit Line Industrial De-pollution</td>
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<td>TN007</td>
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<td>National</td>
<td>WW</td>
<td>Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m) / coverage of a total of 19 WWTP and pumping stations</td>
<td>ONAS</td>
<td>Ongoing</td>
<td>Yes</td>
<td>127.0</td>
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<td>Tunisia</td>
<td>Tejerouine, Dahmani / Ksour, Redaïyf / Moularès, hammamet Nort, El Guettar, Ben Guerdane</td>
<td>WW</td>
<td>Construction of 7 WWTP, connection to sewerage system of Ksar/Gafsar, rehabilitation primary and secondary collectors (220 km), and 27,000 house connections (Tejerouine, Dahmani/Ksour, Redaïyf/Moularès, Tela et feriana, El Guettar, Ben Guerdane)</td>
<td>ONAS</td>
<td>Under preparation</td>
<td>Yes</td>
<td>40.0</td>
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<td>Construction of WWTP Phase II (BOT Project) (Al-Attar)</td>
<td>ONAS</td>
<td>Ongoing</td>
<td>Yes</td>
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<td>Tunisia</td>
<td>Grand Tunis</td>
<td>WW</td>
<td>Construction of transfer pipes, pumping stations, distribution network for use of treated</td>
<td>ONAS</td>
<td>Pending</td>
<td>Yes</td>
<td>500.0</td>
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<td>Valorisation of organic waste or biomass</td>
<td>ANGED</td>
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<td>TN013</td>
<td>Tunisia</td>
<td>Mdilla / Sfax</td>
<td>IE</td>
<td>Closure of Sfax Plant and constructing new one in Mdilla</td>
<td>GCT</td>
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<td>Yes</td>
<td>264.0</td>
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</table>
## Annex 3 – 10 ‘dropped projects’

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Country</th>
<th>Location</th>
<th>Sector</th>
<th>Project Title</th>
<th>Promoter</th>
<th>Reason why project was dropped</th>
</tr>
</thead>
<tbody>
<tr>
<td>DZ001</td>
<td>Algeria</td>
<td>Gazouet</td>
<td>WW</td>
<td>Construction of WWTP</td>
<td>N/A</td>
<td>Algeria has informed from the outset that it was not interested in MeHSIP-PPIF’s services.</td>
</tr>
<tr>
<td>EG003</td>
<td>Egypt</td>
<td>Cairo / Abu Rawash</td>
<td>WW</td>
<td>Untreated domestic sewage</td>
<td>CAPWO</td>
<td>Change of strategy - currently being tendered as a PPP.</td>
</tr>
<tr>
<td>IL003</td>
<td>Israel</td>
<td>Alexander river</td>
<td>WW</td>
<td>Construction of WWTP at Alexander river</td>
<td>Water Authority</td>
<td>Project permanently on hold due to political considerations.</td>
</tr>
<tr>
<td>IL007</td>
<td>Israel</td>
<td>Retamim</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>Southern Judea Association of Towns for Environment</td>
<td>Project scope/status is unclear / not confirmed.</td>
</tr>
<tr>
<td>MA005</td>
<td>Morocco</td>
<td>Oum Rabia’</td>
<td>WW</td>
<td>Wastewater reuse project with 7 WWTP and part is related to Phosphogypsum</td>
<td>ONEP</td>
<td></td>
</tr>
<tr>
<td>SY001</td>
<td>Syria</td>
<td>Banias</td>
<td>WW</td>
<td>Conversions of units 3 &amp; 4 of WTPP from fuel oil to gas</td>
<td>Banias refinery</td>
<td>MeHSIP-PPIF not active in the country due to ongoing civil war.</td>
</tr>
<tr>
<td>SY002</td>
<td>Syria</td>
<td>Banias</td>
<td>WW</td>
<td>Rehabilitation and upgrade refinery WWTP (chemical and biological treatment)</td>
<td>Banias refinery</td>
<td>MeHSIP-PPIF not active in the country due to ongoing civil war.</td>
</tr>
<tr>
<td>SY003</td>
<td>Syria</td>
<td>Banias</td>
<td>SW</td>
<td>Facilities for recycling and treatment of fuel oil sludge from refinery</td>
<td>Banias refinery</td>
<td>MeHSIP-PPIF not active in the country due to ongoing civil war.</td>
</tr>
<tr>
<td>SY004</td>
<td>Syria</td>
<td>Tartous</td>
<td>WW</td>
<td>Syria Horizon 2020 Water Project (Banias and surrounding villages: Hreisun, Jobar, Al Ghamkah and Al Dabousiah river catchments)</td>
<td>Ministry of Housing and Construction</td>
<td>MeHSIP-PPIF not active in the country due to ongoing civil war.</td>
</tr>
<tr>
<td>TN012</td>
<td>Tunisia</td>
<td>National</td>
<td>SW</td>
<td>Valorisation of organic waste or biomass</td>
<td>ANGED</td>
<td></td>
</tr>
<tr>
<td>Nr.</td>
<td>Country</td>
<td>Location</td>
<td>Sector</td>
<td>Project Title</td>
<td>Promoter</td>
<td>Status</td>
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</tr>
<tr>
<td>EG004</td>
<td>Egypt</td>
<td>Cairo / Gabal el Asfar</td>
<td>WW</td>
<td>Expansion of existing WWTP for biological treatment</td>
<td>CAPWO</td>
<td>Ongoing</td>
</tr>
<tr>
<td>EG005</td>
<td>Egypt</td>
<td>National</td>
<td>WW</td>
<td>Improved Water and Wastewater Services Programme - IWSP</td>
<td>HCWW</td>
<td>Ongoing</td>
</tr>
<tr>
<td>EG006</td>
<td>Egypt</td>
<td>National</td>
<td>WW</td>
<td>Integrated Sanitation and Sewerage Infrastructure Project - ISSIP</td>
<td>HCWW</td>
<td>Ongoing</td>
</tr>
<tr>
<td>EG007</td>
<td>Egypt</td>
<td>Alexandria</td>
<td>INT</td>
<td>Coastal Zone Management Project</td>
<td>EEAA</td>
<td>Ongoing</td>
</tr>
<tr>
<td>EG008</td>
<td>Egypt</td>
<td>Delta and Upper Egypt</td>
<td>IE</td>
<td>Private Public Sector Industry Project - PPSI</td>
<td>EEAA</td>
<td>Ongoing</td>
</tr>
<tr>
<td>EG010</td>
<td>Egypt</td>
<td>National</td>
<td>IE</td>
<td>Egyptian Pollution Abatement Programme (EPAP II)</td>
<td>EEAA</td>
<td>Ongoing</td>
</tr>
<tr>
<td>EG011</td>
<td>Egypt</td>
<td>Alexandria</td>
<td>WW</td>
<td>Wastewater Treatment Amriya</td>
<td>CAPWO - Alexandria General Organisation for Sanitary Drainage (ASDCO)</td>
<td>Ongoing</td>
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<tr>
<td>EG012</td>
<td>Egypt</td>
<td>Qena</td>
<td>INT</td>
<td>Water Supply and Sanitation Qena I</td>
<td>Qena company for Water and Wastewater (QCW)</td>
<td>N/A</td>
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<tr>
<td>IL001 (new)</td>
<td>Israel</td>
<td>Netanya</td>
<td>SW</td>
<td>Landfill mining and reclamation project</td>
<td>Municipality of Netanya</td>
<td>Ongoing</td>
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<tr>
<td>IL002</td>
<td>Israel</td>
<td>Shafdan</td>
<td>WW</td>
<td>Construction of sludge incineration plant or sludge drying plant</td>
<td>Dan Regional Association for</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Nr.</td>
<td>Country</td>
<td>Location</td>
<td>Sector</td>
<td>Project Title</td>
<td>Promoter</td>
<td>Status</td>
</tr>
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<tr>
<td>IL008</td>
<td>Israel</td>
<td>Hana’aman</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>Western Galilee Association of Towns for Environment</td>
<td>Ongoing</td>
</tr>
<tr>
<td>IL009</td>
<td>Israel</td>
<td>Herzliya</td>
<td>SW</td>
<td>Rehabilitation of closed landfill</td>
<td>Municipality of Herzliya</td>
<td>Ongoing</td>
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<tr>
<td>IL012</td>
<td>Israel</td>
<td>Ayalon</td>
<td>IE</td>
<td>Rehabilitation of sewage collector and construction of pumping station</td>
<td>Dan Regional Association for Environmental Infrastructure</td>
<td>Ongoing</td>
</tr>
<tr>
<td>IL013</td>
<td>Israel</td>
<td>Ashdod</td>
<td>IE</td>
<td>Upgrade of WWTP to biological treatment</td>
<td>AGAN (Private company)</td>
<td>Ongoing</td>
</tr>
<tr>
<td>IL014</td>
<td>Israel</td>
<td>Haifa area</td>
<td>IE</td>
<td>Rehabilitation of Kishon River (dredging of river bed, etc.)</td>
<td>Ministry of Environment + private companies</td>
<td>Ongoing</td>
</tr>
<tr>
<td>JO007</td>
<td>Jordan</td>
<td>Greater Amman</td>
<td>SW</td>
<td>Medical and Industrial Waste Treatment Plant for Greater Amman and Middle Governorates (BOT project)</td>
<td>Nasser Group</td>
<td>Pending</td>
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<tr>
<td>JO009</td>
<td>Jordan</td>
<td>Karak and</td>
<td>WW</td>
<td>Expansion and upgrade of wastewater facilities</td>
<td>WAJ</td>
<td>Ongoing</td>
</tr>
<tr>
<td>JO010</td>
<td>Jordan</td>
<td>As-Samra OR</td>
<td>WW</td>
<td>Expansion of WWTP (first option) or construction of a new WWTP (second option)</td>
<td>WAJ</td>
<td>Under preparation</td>
</tr>
<tr>
<td>JO011</td>
<td>Jordan</td>
<td>Naur</td>
<td>WW</td>
<td>Construction of sewer pipelines (135km), pump stations, WWTP (9000)</td>
<td>WAJ</td>
<td>Under preparation</td>
</tr>
<tr>
<td>Nr.</td>
<td>Country</td>
<td>Location</td>
<td>Sector</td>
<td>Project Title</td>
<td>Promoter</td>
<td>Status</td>
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<tr>
<td>JO012</td>
<td>Jordan</td>
<td>Wadi Zarqa</td>
<td>WW</td>
<td>Construction of a proper cross section: closed Canal (50km)</td>
<td>WAJ</td>
<td>Ongoing</td>
</tr>
<tr>
<td>JO013</td>
<td>Jordan</td>
<td>Jerash</td>
<td>WW</td>
<td>Upgrading and expansion of WWTP</td>
<td>WAJ</td>
<td>Under preparation</td>
</tr>
<tr>
<td>JO014</td>
<td>Jordan</td>
<td>Ain Ghazal</td>
<td>WW</td>
<td>Septic treatment facility capacity (10,000 m³/day) (Expansion of Ain Ghazal treatment plant)</td>
<td>WAJ</td>
<td>Under preparation</td>
</tr>
<tr>
<td>JO015</td>
<td>Jordan</td>
<td>Zarqa Governorate</td>
<td>WW</td>
<td>Wastewater System Reinforcement and Expansion</td>
<td>WAJ</td>
<td>Under preparation</td>
</tr>
<tr>
<td>JO016</td>
<td>Jordan</td>
<td>Zarqa</td>
<td>IE</td>
<td>Zarqa Industrial Wastewater Plant (central industrial WWTP, 1,430 cu m/d)</td>
<td>MoE/Zarqa Chamber of Industry</td>
<td>Ongoing</td>
</tr>
<tr>
<td>JO017</td>
<td>Jordan</td>
<td>Ghabawi Landfill</td>
<td>SW</td>
<td>Integrated SWM Project</td>
<td>Amman Municipality</td>
<td>Ongoing</td>
</tr>
<tr>
<td>LB002</td>
<td>Lebanon</td>
<td>Beirut (south)</td>
<td>WW</td>
<td>WW main collectors</td>
<td>CDR</td>
<td>Ongoing</td>
</tr>
<tr>
<td>LB003</td>
<td>Lebanon</td>
<td>Beirut (north)</td>
<td>WW</td>
<td>WW main collectors</td>
<td>CDR</td>
<td>Ongoing</td>
</tr>
<tr>
<td>LB004</td>
<td>Lebanon</td>
<td>Kesrwan</td>
<td>WW</td>
<td>Water and Wastewater Project</td>
<td>CDR</td>
<td>Under preparation</td>
</tr>
<tr>
<td>LB005</td>
<td>Lebanon</td>
<td>Shekka, Koura and Batroun</td>
<td>WW</td>
<td>WW treatment and network in north Lebanon connecting three cities to WWTP</td>
<td>CDR</td>
<td>WWTP completed, networks on going</td>
</tr>
<tr>
<td>LB006</td>
<td>Lebanon</td>
<td>Dora-Bourj Hammoud</td>
<td>WW</td>
<td>Wastewater Treatment and network in Greater Beirut Wastewater System</td>
<td>CDR</td>
<td>Pending</td>
</tr>
<tr>
<td>LB007</td>
<td>Lebanon</td>
<td>Saida</td>
<td>WW</td>
<td>Wastewater Treatment and network in Saida</td>
<td>CDR</td>
<td>Completed/OPerational</td>
</tr>
<tr>
<td>MA002</td>
<td>Morocco</td>
<td>National</td>
<td>WW</td>
<td>National Plan for implementing a nationwide strategy on wastewater management (PNA)</td>
<td>ONEP</td>
<td>Ongoing</td>
</tr>
<tr>
<td>MA003</td>
<td>Morocco</td>
<td>Al Hoceima,</td>
<td>WW</td>
<td>Construction of 7 WWTPs in the</td>
<td>ONEP</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Nr.</td>
<td>Country</td>
<td>Location</td>
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</tr>
<tr>
<td>MA004</td>
<td>Morocco</td>
<td>Chefchaouen, Taounate, Ras El Ma (PNA), FerKhana (PNA), Ahfir, Jerada</td>
<td>WW</td>
<td>municipalities and extension of primary and secondary collectors</td>
<td>ONEP</td>
<td>Ongoing</td>
</tr>
<tr>
<td>MA006</td>
<td>Morocco</td>
<td>Nador and 7 small towns, near or on the shore of the Marchica lagoon</td>
<td>WW</td>
<td>Sanitation of Nador city - depollution of the Marchica lagoon</td>
<td>ONEP</td>
<td>Ongoing</td>
</tr>
<tr>
<td>PS001</td>
<td>Palestine (Gaza)</td>
<td>Gaza City / Middle Area Central / West Nusseirat</td>
<td>WW</td>
<td>Central Area WWTP (tertiary)</td>
<td>Palestinian Water Authority</td>
<td>Ongoing</td>
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<tr>
<td>PS002</td>
<td>Palestine (Gaza)</td>
<td>North Gaza</td>
<td>WW</td>
<td>North Gaza Emergency Sewage Treatment Project (NGEST) (tertiary)</td>
<td>Coastal Municipalities Water Utility (CMWU)</td>
<td>Ongoing</td>
</tr>
<tr>
<td>PS004</td>
<td>Palestine (Gaza)</td>
<td>Rafah</td>
<td>WW</td>
<td>Emergency works to upgrade existing WWTP (secondary / biological towers)</td>
<td>Coastal Municipalities Water Utility (CMWU)</td>
<td>Completed</td>
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<tr>
<td>PS005</td>
<td>Palestine (Gaza)</td>
<td>Khan Younis West</td>
<td>WW</td>
<td>Construction of temporary WWTP in the west of Khan Younis (aerated lagoons)</td>
<td>Coastal Municipalities Water Utility (CMWU)</td>
<td>Completed</td>
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<tr>
<td>TN003</td>
<td>Tunisia</td>
<td>National</td>
<td>WW</td>
<td>Loan ONAS IV (various)</td>
<td>ONAS</td>
<td>Ongoing</td>
</tr>
<tr>
<td>TN004</td>
<td>Tunisia</td>
<td>National</td>
<td>WW</td>
<td>PISEAU II - Water Sector Investment Loan (various)</td>
<td>ONAS</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Nr.</td>
<td>Country</td>
<td>Location</td>
<td>Sector</td>
<td>Project Title</td>
<td>Promoter</td>
<td>Status</td>
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<tr>
<td>TN006</td>
<td>Tunisia</td>
<td>National</td>
<td>WW</td>
<td>Credit Line Industrial De-pollution</td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>TN007</td>
<td>Tunisia</td>
<td>National</td>
<td>WW</td>
<td>Programme WWTP (complementary to programme WWTP financed by KfW: 36.5m) / coverage of a total of 19 WWTP and pumping stations</td>
<td>ONAS</td>
<td>Ongoing</td>
</tr>
<tr>
<td>TN008</td>
<td>Tunisia</td>
<td>Tejerouine, Dahmani / Kssour, Redaiyf / Moularès, hammamet Nort, El Guettar, Ben Guerdane</td>
<td>WW</td>
<td>Construction of 7 WWTP, connection to sewerage system of Ksar/Gafsar, rehabilitation primary and secondary collectors (220 km), and 27,000 house connections (Tejerouine, Dahmani/Kssour, Redaiyf/Moularès, Tela et feriana, El Guettar, Ben Guerdane)</td>
<td>ONAS</td>
<td>Under preparation</td>
</tr>
<tr>
<td>TN009</td>
<td>Tunisia</td>
<td>Al-Attar</td>
<td>WW</td>
<td>Construction of WWTP Phase II (BOT Project) (Al-Attar)</td>
<td>ONAS</td>
<td>Ongoing</td>
</tr>
<tr>
<td>TN010</td>
<td>Tunisia</td>
<td>Grand Tunis</td>
<td>WW</td>
<td>Construction of transfer pipes, pumping stations, distribution network for use of treated wastewater in agriculture</td>
<td>ONAS</td>
<td>Pending</td>
</tr>
<tr>
<td>TN013</td>
<td>Tunisia</td>
<td>Mdilla / Sfax</td>
<td>IE</td>
<td>Closure of Sfax Plant and constructing new one in Mdilla</td>
<td>GCT</td>
<td>Under preparation</td>
</tr>
</tbody>
</table>