



REF: PROJECT REFERENCE

# PLANNING OF DISTRUBUTION NETWORK IN ISRAEL

*Empowering Mediterranean regulators for a common  
energy future*



Electricity  
Working Group  
(ELE WG)



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## ABSTRACT

This document discusses the different strategies followed by the MEDREG countries in developing and approving the LT-DNMP and LT-DNIP and the responsibilities associated with them. At the end, a set of conclusions and recommendations are developed in a way to serve as a baseline for the Israeli regulator, as well as any regulator looking to develop their LT-DNMP/LT-DNIP approval process.

## ACKNOWLEDGMENTS

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## DISCLAIMER

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## ABOUT MEDREG

MEDREG is the Association of Mediterranean Energy Regulators, bringing together 27 regulators from 22 countries, spanning the European Union, the Balkans and the MENA region.

Mediterranean regulators work together to promote greater harmonization of the regional energy markets and legislations, seeking progressive market integration in the Euro-Mediterranean basin. Through constant cooperation and information exchange among members, MEDREG aims at fostering consumers rights, energy efficiency, infrastructure investment and development, based on secure, safe, cost-effective, and environmentally sustainable energy systems. MEDREG acts as a platform providing information exchange and assistance to its members as well as capacity development activities through webinars, training sessions and workshops. The MEDREG Secretariat is located in Milan, Italy.

For more information, visit [www.medreg-regulators.org](http://www.medreg-regulators.org)

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# EXECUTIVE SUMMARY

The main objective of this report is to demonstrate on various legal and regulatory policies as well as practical implementation of the Long-Term Distribution Network Master Plan (LT-DNMP) and/or a Distribution Network Investments Plan (LT-DNIP). The study is particularly focused on Israel, yet with the overview of the policies and practices in numerous Mediterranean countries. The foremost consideration is the overall process regarding the approval of LT-DNMP or LT-DNIP. It includes preparatory activities, submission, time frames and deadlines for the approval by the regulator, goals and objectives of LT-DNMP, network readiness, renewals of outdated networks, the bill of quantities/list of projects as well as the mechanism for updating the LT-DNMP.

The report provides an overview of economic aspects of LT-DNMP and LT-DNIP, mainly regarding the determination of costs and the approval of LT-DNIP and examines the policies on incentives and penalties for investing in distribution networks throughout the Mediterranean area.

The study advocates transparency, namely holding public hearing on LT-DNMP and/or LT-DNIP, and publishing the final plan and reports on planned or executed projects.

The general overview of the best practices and regional developments across the Mediterranean region is presented to facilitate the adoption of measures by the member countries.

Since unbundling is the most effective way to promote non-discriminatory investment in infrastructure, fair access to the network for new entrants and market transparency, this report makes the following recommendations to foster and facilitate unbundling process:

- *Unbundling remains the main challenge*, and the energy regulator can therefore impose (with prior necessary legislative changes in some countries) an obligation on distribution system operators to collect and provide regularly grid users with information on qualitative development and investment data, which are necessary for efficient access to the grids for independent power producers (IPPs) and the development of flexible uses;
- *Competition* in energy generation, energy supply and provision of services *would facilitate the development of flexible* uses i.e., electric vehicles charging stations;
- *The Regulator should have authority to approve, partially approve and reject DSO plans*, mirroring the current regulation of TSO plans, since DSO networks are to become more crucial within a decentralized energy system;
- *The member countries would benefit by division of LT-DNIP and LT-DNMP* whereas mid-term to long-term LT-DNMP serves as guidelines for LT-DNIP;

- *NRAs should be granted by the law the power to assess DSOs' master plans* and especially DSOs' investment plans. Regarding the cost determination both cost-base and normative pricing (unit based) should coexist;

Transparency is the key when it comes to the evaluation of long-term investment plans and should be administered throughout the whole process by conducting a public consultation on the proposed plan(s), a public hearing of the operators, and having final plans publicly available.

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# 1

## INTRODUCTION

The intention of the report is to analyze the assessment procedure concerning the distribution network of Israel. Israeli Public Utility Authority (PUA) requested the ad hoc technical assistance from MEDREG to improve/adopt the optimal assessment procedure regarding its distribution networks by means of benchmark analysis throughout the Mediterranean region. To maximize the benefits of the analysis, PUA has jointly designed the survey with the MEDREG ELE WG members.

Israel's domestic energy demand will significantly increase over the coming years as Israel moves to cleaner fuels for both power generation and transportation. In 2040, 13 million people are expected to live in Israel (in comparison to 9 million in 2019). By 2040, the number of vehicles is expected to increase to 6.4 million and the electricity demand will therefore double. In the same time, Israel is promoting agendas to reduce pollution and increase the use of natural gas. Israel has had the second most rapid growth of natural gas use in the world, Coal-generated power dropped from 60% to 30% in 2018.

Israel is an electricity island<sup>1</sup>; its network is not connected to the systems of neighboring countries, and therefore, it must be self-sufficient in meeting its energy demand, which has grown by 3-4% annually over the last years (prior to the COVID-19 pandemic). Overall installed capacity in 2019 totaled 17.7 GW. Israel Electric Corporation (IEC) generates 72% while the rest is produced by the Independent Power Producers (IPPs). The installed capacity should reach 23.35 GW in 2030 to support the electricity consumption forecasts.

The Israeli Ministry of Energy's goal is to close all coal-powered plants, reach 70% of gas usage and 30% of renewables for electricity generation by 2030 when the ban on imports of gasoline cars also starts. Electric vehicles and trucks on natural gas will transform the transport.

The government has presented an ambitious plan focused to solar power generation, focused on private operators while the grid should be strengthened by the HVDC interconnection between Israel, Greece, and Cyprus.

However, fully bundled market, and the absence of a wholesale market and an independent system operator obstructs new market entrants and makes private investments unfeasible.

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<sup>1</sup> <https://www.trade.gov/country-commercial-guides/israel-energy>

# 2

## THE REFORM OF THE ISRAELI ELECTRICITY SECTOR



The electricity sector in Israel is almost entirely controlled by the IEC, which constitutes a vertical monopoly that operates all the sector's segments - generation, transmission, distribution, and supply as well as system management. IEC, despite its monopoly status, has struggled to thrive in an environment of high labor costs and regulated tariffs. Although in recent years there has been a process of opening the generation and supply segments up to the competition by granting licenses to Independent Private Producers, IEC still de facto maintains the dominate position.

However, the "Document of Principles for Structural Changes in the Electricity Sector and the Israel Electric Corporation" (the "Reform") of 2018. Is a breakthrough initiative that heralds great opportunities for new players and investors. Its intention is to increase competition by:

- *make the electricity market more efficient*, modern, and environmentally sustainable
- *reduce electricity rates* through increased competition
- *reducing and closing* of coal-fired power plants
- *reducing the IEC's share of the generation* through the sale of power plants;
- *separating the system management activity* and transferring to a separate government owned company;
- *opening the supply* to competition;
- *Restructure IEC to provide financial stability* to enable investments in transmission and distribution infrastructure (which requires substantial upgrades

IEC will decrease its share in generation from 60% to 40% and shift from coal to gas and renewable power. IEC will sell five plants with 4.500 MW and build and operate two modern gas-fired combined cycle turbines with a total installed capacity of 1,200 MW, instead of the current coal-fired units that will be shut down and reserved for emergencies.

In supply, IEC's monopoly will reduce from 99% to 60% to enable new suppliers to compete. The reform aims to allow new players not only to serve high-voltage clients but also to supply low voltage clients, including private homes

IEC will retain a monopoly in transmission and distribution and operate through separate profit centers. The annual investments of around \$1 billion purpose is to develop a smart and sustainable grid that will improve the quality of electricity supply<sup>2</sup>.

System Operation of the national electricity system will be transferred to a new government-owned corporation that is not engaged in generation and is separated from IEC.

The Israeli Government released plans in 2021 to reduce GHG emissions. The Ministry of Environmental Protection planned to cut GHG emissions by at least 27% by 2030 and at least 85% by 2050 (compared with 2015 levels), while the Ministry of Energy set a target of 80% reduction in GHG emissions from the energy production until 2050.

The national Infrastructure for Growth initiative makes possible to align major LT-DNMP and LT-DNIP projects along the national infrastructure development and accordingly be financed.

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<sup>2</sup> <https://www.trade.gov/market-intelligence/israel-electricity-equipment-technology>

# 3

## METHODOLOGY

The MEDREG ELE Working Group has:

- *Performed the survey on the assessment of the distribution network in Israel via the questionnaire.* The main objective of the questionnaire was to understand the process and the time framework required for approval of the Long-Term Distribution Network Master Plan (LT-DNMP) and/or the Distribution Network Investments Plan (LT-DNIP) across the Mediterranean region. The information emerged from the questionnaire should assist Israeli authorities to broaden the understanding of the optimal process required to approve an LT-DNMP or LT-DNIP under the circumstances of incorporation of innovative technologies, such as electrical vehicles charging stations, smart metering and other renewable resources.
- *Evaluated the results of the survey* and prepared an assessment report comprising national data and benchmarking, as well as recommendations for improvement.

The MEDREG members have been grouped into three zones for the purpose of the report assessment. These areas are for information purposes only and do not imply any political or economic bias on the part of MEDREG. The three areas are as follows:

**The EU, the Balkans and Turkey**

Albania, Bosnia-Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Montenegro, Portugal, Spain, Slovenia, Turkey

**North Africa**

Algeria, Libya, Morocco, Tunisia

**East Mediterranean**

Egypt, Israel, Jordan, Lebanon, Palestine.

Figure 1. Submission Across MEDREG Zones



Responses to the survey were received from the following countries: Albania, Bosnia-Herzegovina, Cyprus, France, Greece, Italy, Montenegro, Portugal, Turkey, Morocco, and Palestine (figure 1). It is worth mentioning that the answers were not elaborated to the same extent by all the regulators, hence, this has influenced the structure and outputs of the report.

# 4

## ASSESSMENT PROCEDURES OF THE DISTRIBUTION NETWORK PLANS

The chapter provides an overview regarding the approval of the Long-Term Distribution Network Master Plan (LT-DNMP) and the Long-Term Distribution Network Investment Plan (LT-DNIP) across the in the Mediterranean region. It reports on:

- Plans development obligation,
- Plans approval by the regulator and/or other institution
- Plans contents
- Time frames
- Relationship between LT-DNMP and the LT-DNIP
- Investment plan determination methods
- Incentives and penalties mechanism for plan implementation
- Mechanism for updating the plan when there is an under-estimated or over-estimated budget in a particular project
- Publishing and public hearing.

## 4.1. Approval of LT-DNMP or LT-DNIP

As reported by MEDREG members, the process required in the country to approve LT-DNMP or LT-DNIP has been elaborated in detail by all regulators.

- *The EU, the Balkans and Turkey*

In **Albania**, DSO prepares 5-year investment plan for developing the distribution system in accordance with article 75 of Law no. 43/2015, on Power Sector. This plan shall comprise the investments that have set of mandatory requirements.

In **Bosnia and Herzegovina**, the Distribution System Operators are obliged in accordance with the law to prepare 10-year plan for the development of the distribution system. Regulators have responsibility to approve all development plans - long term and annual plans as well.

In **Cyprus**, the Law Regulating the Electricity Market proscribes that the Distribution System Operator prepares a Distribution Development Program, which aims at ensuring the electricity supply. However, according to the proposed bill, which is under vetting process, the Distribution System Operator shall publish at least every two years a transparent network development plan and will submit it to CERA. The network development plan shall provide transparency on the medium and long-term flexibility services needed and shall set out the planned investments for the next ten years, with particular emphasis on the main distribution infrastructure which is required in order to connect new generation capacity and new loads, including recharging points for electric vehicles. The network development plan shall also include the use of demand response, energy efficiency, energy storage facilities or other resources that the distribution system operator is to use as an alternative to system expansion.

In **France**, DSO only must produce network development plans. These NDP have not been elaborated yet. However, the law establishes that French DSO should consult energy actors on the draft version of their plan and integrate the comments before submitting it to the NRA. Then, the NRA can request amendments of this version. Regarding the DNIP, there is no such process in France as the NRA does not approve distribution investments.

In **Greece**, The Network Development Plan is approved each year preceding the start of each new Regulatory Period, and any other year in which the network operator considers that the Plan needs to be reviewed. In addition, if RAE deems that an approved Network Development Plan needs to be revised, it shall notify the Network Administrator for the revision process to be initiated. For each year in which the Network Development Plan is to be approved or revised, it is prepared by the Network Administrator, who submits it, by March 31 of the same year, to a public consultation. This public consultation must last at least 1 month. Upon incorporation of any comments, suggestions and observations that emerged from the consultation, the Network Development Plan shall be submitted to RAE for approval by June 30 of the same year by the Network Operator, accompanied by the comments received during the consultation process, a description of the necessity and the way of financing but also the economic efficiency of the projects included in the Network Development Plan. RAE may, in its discretion, impose amendments to Network Development Plan. RAE must approve the Plan until the end of September of the year. After its approval, the Network Development Plan is posted on the website of the Network Operator.

In **Italy**, distributors elaborate LT-DNMP containing the perceptive development of their own networks and some indications on investments required (no separate DNIP). The Plan must be submitted to the NRA for publication (not for approval).

In **Montenegro**, under provisions from the Rules for the development and monitoring of the implementation of 10-year plans development of the electricity distribution system the operator is obliged to determine the plan for the next 10 years in the year of submitting the request for determining the regulatory allowed revenue. The Agency shall conduct the public hearing procedure and the report from the public hearing with the views on the remarks given at hearing, shall be delivered to the operator by 30 April at the latest. The operator is obliged to submit the proposal of the development plan with incorporated remarks given at the public hearing to the Agency for giving consent no later than June 1 of the year preceding the first year of the period for which the plan is made. DSO is obliged to determine the investment plan for the period corresponding to the length of the regulatory period and submit it to the Agency for approval together with the 10 years plan, which contains: investments for which a decision has already been made and new investments to be made in the next three years for each year individually.

In **Portugal**, the DSO submits the LT-DNIP to ERSE (NRA) and DGEG (Ministry Department). ERSE is responsible for submitting the proposed LT-DNIP to public consultation. At the end of the public consultation, ERSE has the responsibility to produce a public consultation report and to submit it, along with the answers to the public consultation, to DGEG and to the ORT. ERSE, DGEG and the ORT then do their individual assessment of the LT-DNIP and submit their Opinion, including possible amendment suggestions, to the ORD. With these inputs, the ORD then submits the final LT-DNIP proposal and for Ministry approval.

In **Turkey**, LT-DNMP is prepared by electricity distribution companies as short term (5 years) and medium term (10 years) but they are not approved by the regulator. LT-DNIP is prepared for 5 years by the electricity distribution companies according to the LT-DNMP and approved by the regulatory authority.

- **North Africa**

In **Morocco**, every five years, each electricity distribution network operator draws up a multiannual program of investments (DNIP) in electricity distribution network covering the next five years. Each of them communicates, annually, to ANRE its multiannual program of planned investments in distribution network, duly approved by its deliberative body. The multiannual investment programs may be adjusted to consider, if necessary, new circumstances having a significant impact on the network concerned during the five years envisaged. ANRE monitors the implementation of the above-mentioned multiannual programs and reports on them in its annual activity report.

- **East Mediterranean**

In **Palestine**, the Distribution licensee shall prepare studies and plans for the expansion and development of the distribution network and implement them according to specific implementation programs; to reach acceptable technical and economic levels, taking into account the standards related to the environment and achieving the safety and stability of the subscriber's electrical supply.

## 4.2. Preparation, Submission, Time Frames and Approval Deadlines

Preparation and submission of the plan(s) by the distribution system operator is mandatory in all countries, except In Portugal. In Cyprus, DSO is obliged to prepare the Distribution Development Program, but it is not mandatory to submit the plan for approval.

Regarding time frames in which DSO must submit the LT-DNMP, there is no universal approach for the whole Mediterranean region.

- **The EU, the Balkans and Turkey**

In **Albania** LT-DNMP is submitted every 5 years and updated every tariff period.



In **Bosnia and Herzegovina**, LT-DNMP is submitted successively every year, covering the ten-year period.

DSO in **France** submit LT-DNMP every other year.

In **Greece**, DSO submits a LT-DNMP until March 31st of the same year, before the start of a new regulatory period, or at the request of NRA.

In Italy, plan must be published annually.

In **Montenegro**, DSO shall submit to the Agency a draft development plan no later than March 31 of the year preceding the first year of the period to which the development plan relates.

In **Turkey**, after expiration of LT-DNMPs, DSO prepares short term LT-DNMP every five years and every ten years it is obliged to prepare medium term LT-DNMP.

- *North Africa*

**Morocco** (5 years)

- *East Mediterranean*

Regarding **Palestine**, the licensee shall submit the annual plans for this development and its implementation programs on annually basis.

The countries that require the DSO to prepare a DNMP considered the following period of time to be covered within the plan:

- *The EU, the Balkans and Turkey*

**Albania** (5 years), **Bosnia and Herzegovina** (10 years), **Cyprus** (N/A), **France** (between 5 and 10 years), **Italy** (the plan is multiannual), **Montenegro** (10 years), **Greece** (5 years), **Turkey** (5 years for short term and 10 years for medium term).

- *North Africa*

**Morocco** (5 years)

- *East Mediterranean*

**Palestine** (yearly)

The duration from the moment it is required to submit a plan until the plan is approved by the regulator differs between countries and are as follows:

- *The EU, the Balkans and Turkey*

**Albania** (3-5 months), **Bosnia and Herzegovina** (not specified by law), **Cyprus** (N/A), **France** (the law concerning NDPs was implemented beginning of 2021, expected submissions by first quarter of 2022), **Italy** (no approval needed), **Montenegro** (not specified by law), **Greece** (6 months), **Turkey** (9 months)

- *North Africa*

**Morocco** (Regulator can give opinion but without mandatory approval in maximum of 2 months)

- *East Mediterranean*

**Palestine** (1 month)

As for the approval of the LT-DNMP by the regulator prior to execution, 6 countries DSOs that have developed plan (Albania, Bosnia and Herzegovina, France, Greece, Palestine, Montenegro) must submit it to the regulator for the approval, while remaining 4 (Cyprus, Italy, Morocco, Turkey) have not to do it. Currently, Cyprus is changing its legislation, towards plan submission to the NRA for approval. Having in mind this, finding of this report can be beneficial for the process currently undergoing in Cyprus.

### 4.3. Goals and Objectives of the LT-DNMP

Related to major goals and objectives of LT-DNMP and whether there is the requirement to determine those goals and objectives by the regulator, practice among Mediterranean countries is quite different as can be seen from the following:

- *The EU, the Balkans and Turkey*

In **France**, regulator requires that LT-DNMP foresee better integration of the flexibilities and provide long term transparency over the investments necessary for new loads.

In **Greece**, there is set of objectives that regulator considers and LT-DNMP must: enhance, develop, or change key features of the network. Also, it is required of the DSO to develop smart metering systems and important systems for the supervision, control, and operation of the network, as well as data collection. Projects and measures aimed specifically at improving the DSO's quality of services (e.g., reducing network losses) and substantial changes in the customer service infrastructure with comments on the projects to be implemented and measures to be taken, focusing on the necessity or expediency of their implementation and the desired results are required to be enlisted into LT-DNMP. Indicative timetable and budgeted costs of such projects must be enclosed as a part of LT-DNMP.

**Italy** requires, consistency with general objectives related to competition (ability to provide connections when required), transparency (information on network status and development), adequacy (investments required by market) to integrate in LT-DNMP

In **Montenegro**, regulator mandates DSO to incorporate requirements from National energy and climate plan as well as considering future power plant projects and projects, use of energy from renewable sources, transmission system development plan, and local energy plans into LT-DNMP.

In **Turkey**, regulator requires that DSO respond to changing consumption and/or generation trends in the region. DSO is obliged to include plans and targets for the continuity of supply and the improvement of technical and commercial quality indicators and to include plans and targets for reducing technical and non-technical losses. LT-DNMP should be established by dividing into sub-projects under different scenarios in the short and medium term and should be updated by the distribution company in different periods according to the needs.

As for **Albania, Bosnia and Herzegovina, Cyprus** and **Portugal**, regulator does not set determine goals and objectives of the LT-DNMP

- *North Africa*

**Morocco** (no regulatory mandated goals or objectives)

- *East Mediterranean*

In **Palestine**, regulator requires that DSO include losses reduction, outages reduction and access to energy in LT-DNMP.

## 4.4. Network Readiness

Referring to LT-DNMP or LT-DNIP requirements for network readiness<sup>3</sup> for projects like smart metering, electric vehicles (EV) charging stations penetration, and connection of new distributed energy resources (DER), countries have different approach:

- *The EU, the Balkans and Turkey*

In **Bosnia and Herzegovina**, the law stipulates that DSOs develop a distribution system in accordance with the increase of the consumption of electricity, which implies that all types of electricity consumption should be respected.

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<sup>3</sup> By "network readiness" it is meant that the network is capable to accommodate any unknown future DER or EVCS in any location.).

In **Cyprus**, DSO should consider the possibility of taking energy efficiency/demand response measures and/or the possibility of decentralized generation that could replace the need to upgrade or replace the electricity potential.

In **Italy**, network readiness is measured against regulatory provisions as ARERA introduced criteria to secure the network resilience, and distributors have to demonstrate that they comply with these criteria when elaborating and updating their plans.

In **Portugal**, the consumption and production scenarios are adopted by the DSO (ORD), in line with a dedicated governmental report on security of supply, including 10 years ahead generation consumption scenarios and it is assessed if the scenarios used are in line with future expectations of distribution network development.

For **Turkey**, DSOs are obliged to elaborate its network readiness.

**Albania, France, Greece, Montenegro** do not have any regulations regarding network readiness.

- **North Africa**

In **Morocco**, LT-DNIP may be adjusted to consider, if necessary, new circumstances having a significant impact on the network concerned during the five years envisaged, including the deployment of distributed energy renewables projects with the future opening of MV/LV networks.

- **East Mediterranean**

In **Palestine**, DSO must consider smart metering, as more than 130.000 smart meters have been already installed.

## 4.5. Renewals of Old Networks and Bill of Quantities/List of Projects

Regarding the bill of quantities or a list of projects required to be completed within LT-DNMP and envisaged renewal of old networks, the regulators have responded the following:

- **The EU, the Balkans and Turkey**

In **Albania, Bosnia and Herzegovina, Greece, Italy, Montenegro** and **Turkey**, DSOs are obliged to compile bill of quantities/list of projects and plans for renewal of old networks in LT-DNMP. In **France** and **Portugal**, DSO must include plan for renewal of old networks in LT-DNMP. Regarding, **Cyprus**, responses have not been submitted

- **North Africa**

In **Morocco**, DSO is obliged to compile bill of quantities/list of projects and plans for renewal of old networks in LT-DNMP.

- *East Mediterranean*

In **Palestine**, DSO is obliged to compile bill of quantities/list of projects and plans for renewal of old networks in LT-DNMP.

## 4.6. Mechanism for Updating the LT-DNMP

Concerning the existence of a mechanism for updating the LT-DNMP, the regulators have responded the following:

- *The EU, the Balkans and Turkey*

In **Albania**, LT-DNMP has to be updated every tariff period. According to the Rules for the development and monitoring of the implementation of ten-year plans development of the electricity distribution system

In **Montenegro**, DSO shall, if necessary, update the development plan to include any changes arising from objective reasons. If the development plan is updated during the regulatory period, the operator shall submit to the Agency a draft of the updated development plan no later than 30 June of the year preceding the first year of the update period. In case of updating the development plan, the operator is obliged to pay a one-time fee to the Agency in the amount of 5,000 EUR and proof of payment shall be submitted with the draft updated development plan. The Agency shall conduct the public hearing procedure and the report from the public hearing with the views on the remarks given at hearing, shall be submitted to the operator no later than July 31 of the year preceding the first year of the update period. The operator is obliged to submit a proposal for an updated development plan with incorporated remarks given at the public hearing to the Agency for approval no later than September 1 of the year preceding the first year of the update period.

In **Bosnia and Herzegovina**, the ten-year plan for the time base has a rolling principle according to which the first year in a row is omitted, and the tenth year is added.

In **Greece**, the Network Development Plan must be updated during the year preceding the start of each new regulatory period, and during each year that the DSO considers it necessary that the Plan has to be reviewed. Furthermore, if the NRA deems that the previously approved NDP needs to be revised, it should notify the DSO about the beginning of the revision process.

In **Italy**, LT-DNMP has to be updated annually.

In **Turkey**, LT-DNMP is updated every 5 years according to the status of the network.

Meanwhile, in **France, Cyprus, and Portugal**, there is no mechanism for updating LT-DNMP.

- *North Africa*

In **Morocco**, there is no obligation for LT-DNMP update.

- *East Mediterranean*

In **Palestine**, DSO is obliged to update LT-DNMP on annual basis.

## 4.7. Relationship Between LT-DNMP and LT-DNIP

The approval of the LT-DNMP and LT-DNIP follow different routes in each country and can be summarized as seen here below:

- *The EU, the Balkans and Turkey*

In **Bosnia and Herzegovina** there is no difference between LT-DNMP and LT-DNIP since there is only 10-year plan for the development of the distribution system.

In **Italy**, investments required by the Plans have to be detailed and documented when DSOs present their unbundled accounts to the NRA in order to get the investments covered by the distribution tariffs. A DNIP is then not required because financial and economic data are in any case submitted separately to the NRA.

In **Montenegro**, DSO has to determine the investment plan (LT-DNIP) for the period corresponding to the length of the regulatory period and submit it to the Agency for approval together with the 10-year plan (LT-DNMP), which contains: investments for which a decision has already been made and new investments to be made in the next three years for each year separately.

In **Turkey**, LT-DNIP is prepared for 5 years period by the DSO according to the LT-DNMP and approved by the regulatory authority. However, only LT-DNIP is approved by the authority.

**Greece, Cyprus, France, Portugal** don't have LT-DNIP while in Greece the LT-DNMP includes budget estimates that may be updated as project implementation proceeds.

It is important to note that in **Albania, Montenegro** and **Turkey** exist requirement that LT-DNMP needs to be followed by an LT-DNIP to implement the LT-DNMP.

- *North Africa*

In **Morocco**, the attention is paid mainly to the multiannual investment plan, which is supposed to include projects and their financial estimates.

- *East Mediterranean*

In **Palestine**, the approval is separated whereas the LT-DNIP approved during tariff calculations. Also, LT-DNMP needs to be followed by an LT-DNIP to implement the LT-DNMP.

## 4.8. Determination of Pricing Methods and Approval of LT-DNIP

Approach on methodology of pricing methods and approval of investments included in LT-DNIP varies through region which can be seen from the following:

- *The EU, the Balkans and Turkey*

In **Bosnia and Herzegovina**, the regulator approves the LT-DNIP according to cost-based principle for investment in distribution network (substations and lines) and for connections of new customers it is based on normative prices.

In **France**, the regulator does not approve LT-DNIP, but normative pricing is used when determining cost of network investments.

In **Greece**, there is no formalized method. To evaluate LT-DNMP budget estimates, the Regulator may look at how proposed costs compare to actual costs of similar recent projects, if such suitable projects exist and question the DSO about any significant deviations. For projects that this approach is not possible, the regulator may ask the Operator to present in detail their project cost estimation. Approved LT-DNMP projects are eventually included in the RAB based on actual costs incurred. Furthermore, in case of material deviation of actual costs from budget estimates included in the LT-DNMP, the Regulator has the option to conduct ex-post assessment, to be satisfied that only prudent investments and economically efficient costs are included in the RAB.

In **Italy**, the regulator does not approve LT-DNIP, but methodology used is a mixed one: as a rule, investments are valued through the standardized pricing methodology also used in other Countries, like Israel. Distributors can however ask for getting their investments valued at actual costs, and it is up to the NRA to decide whether it is the case to acknowledge full actual cost.

In **Montenegro**, the regulator approves LT-DNIP and values investment using cost base principle.

In **Portugal**, the regulator does not approve LT-DNIP, but normative pricing is used when determining cost of network investments.

In **Turkey**, the regulator approves LT-DNIP and depending on type of the investment uses either per unit price or cost based principle.

In **Albania**, the regulator approves LT-DNIP but there is no information on principle used while **Cyprus** currently have not provided information on this topic.

- *North Africa*

In **Morocco**, cost-based principle is used for determining investments.

- *East Mediterranean*

In **Palestine**, the regulator approves LT-DNIP on cost based, considering network and consumer's requirements and available budget.

## 4.9. Supervision, Incentives, and Penalties

When it comes to supervision, incentives, and penalties, the first issue has been whether the approved LT-DNMP and/or LT-DNIP include an incentives and penalties mechanism for plan implementation. In the following text there is an overview of such mechanisms if they are implemented in regulatory framework:

- *The EU, the Balkans and Turkey*

In **Greece**, an incentive mechanism is in place for "Projects of Major Importance" (i.e. projects that the Regulator has accepted and with substantial economic benefits for the network or the market). If such projects are completed within the planned schedule, they can receive a WACC premium ranging from 0.5% to 2% for 4 to 7 years, according to a Decision taken by the regulator, as an incentive for the DSO to undertake the cost of the project implementation and its timely completion, taking into account the overall benefit that this project will bring to the network users and by assessing its impact on distribution network charges. In case of delayed project implementation, the regulator may decide to reduce the level of the WACC premium.

In **Italy**, if the investments are not realized, they are not covered by tariffs.

In **Montenegro**, approved planned investments are included in the RAB in advance with WACC premium. Adjustments of planned investments on which DSO obtained return on assets and planned depreciation are made ex post, which means that after each regulatory period NRA calculates corrections in such a manner that DSO can keep return on assets and depreciation only for realized value of investments. Adjustments of prices related to return on assets and depreciation determined based on planned investments are calculated as the difference between the realized and planned values, increased by the rate equal to half of the interest rate under which the last Montenegrin Government bond was issued.

In **Turkey**, unit prices are used for network investments. If DSO can complete the investment by less than that unit price, the company retains the difference as a profit from this investment. If the costs are higher than unit price, DSO is at a loss from investment.

In **Albania, Bosnia and Herzegovina, Cyprus, and Portugal** there are no mechanisms for supervision, incentives regarding either LT-DNMP or LT-DNIP.

- *North Africa*

In **Morocco**, the main incentive for the implementation of the DNIP is that ANRE sets the tariff for the use of the distribution network which considers the capital charges including a remuneration for investments as well as operating charges.

- *East Mediterranean*

In **Palestine** there is no such mechanism.



The second issue is related to mechanism for updating the plans in case there is an under-estimation or over-estimation of cost compared to budget for investments. Regulatory approach differs from country to country, as follows:

- *The EU, the Balkans and Turkey*

In **Greece**, as said in Section 2.2, DSO submits a LT-DNMP until 31st of March of the same year, before the start of a new regulatory period, or each year DSO considers necessary or at the request of NRA. However, it is not strictly necessary to do so, particularly for relatively small changes, since CAPEX is included in the RAB at incurred (actual) cost and ex-post CAPEX assessment is limited to cases of significant deviations in the overall approved plan costs. Meanwhile, in **Turkey**, DSO may request additional investment for that planning period. The request can be accepted or rejected by the authority. In **Portugal**, the NRA has legal duties in supervising the implementation of the approved LT-DNIP, both in terms of budget and schedule.

In **Albania, Bosnia and Herzegovina, Cyprus, Italy, Montenegro**, and **France** there is no such mechanism in place.

- *North Africa*

In **Morocco**, there is no such mechanism in place.

- *East Mediterranean*

In **Palestine** plans are updated annually.

## 4.10. Public Concern

Countries chose different approach relating to holding public hearing on LT-DNMP and/or LT-DNIP, the publishing of the final plan and reports of planned or executed projects, which can be seen from the following:

- *The EU, the Balkans and Turkey*

In **Albania**, both LT-DNMP and LT-DNIP are available for the public hearing after which the final plans are published. There are no reports on execution of the plans.

In **Bosnia and Herzegovina**, LT-DNMP is put to the public hearing after which the final plan is published. There are no reports on execution of the plan.

In **France**, LT-DNMP is only available for public hearing, with no subsequent reports.

In **Greece**, LT-DNMP is put to the public hearing after which the final plan is published. There are publicly available periodic reports on execution of the plan.

In **Italy**, LT-DNMP is not submitted for a public hearing, although there are final plans and periodic reports publicly available.

In **Montenegro**, both LT-DNMP and LT-DNIP are available for public hearing after which the final plans are published. There are no dedicated publicly available periodic reports on execution of the plan, yet execution of plan can be seen from decision on approving the tariffs for DSO.

In **Portugal**, after the public consultation organized by NRA on draft LT-DNIP, the NRA shall issue a public a report on public consultation summarizing main comments by stakeholders and send it both to DSO and Govern. These comments shall be considered by DSO in final version of LT-DNIP.

In **Turkey**, there are no public hearing regarding LT-DNMP or LT-DNIP, however their final versions are publicly available.

- **North Africa**

In **Morocco**, LT-DNIP is not put on public hearing, although there are final plans and periodic reports publicly available.

- **East Mediterranean**

In **Palestine**, there is no public hearing or reports concerning the either the LT-DNMP or LT-DNIP.



- *Across the Mediterranean, distribution network master plans and investment plans are generally prepared as a single document.* Both LT-DNMP and/or LT-DNIP plans are of great importance for predictability for all grid users. TSO, investors, and consumers can accurately predict both short term and medium to long-term network developments and act accordingly. Preparation and submission of the plan(s) by DSOs is mandatory in all the countries but Portugal, where only a LT-DNIP plan is submitted.
- *Transparency should be one of the cornerstones for a sustainable development.* Thus, conducting public hearings for the plan(s) are desirable and would ensure smoother development.
- *Regulators throughout MEDREG region employ various methodologies for cost determination and approval of investments* which are subsequently transposed into tariffs either by means of cost based or normative pricing (unit based).
- *IEC, being the monopolistic retailer and owner of the distribution and transmission network could leverage on network savings, further improving cost-effectiveness and easing short-term congestion problems.* IEC may also benefit from preferential financing conditions due to better credit ratings, allowing for further cost-reductions.
- *Expansion of innovative technologies and renewables requires having the right infrastructure and stimulating incentives in place.* Time-of-use rates are mandatory for large electricity consumers, but not fully employed for residential consumers.
- *The role of the Regulatory Authority for Energy of Greece (RAE) which is an independent administrative authority, with financial and administrative independence under the supervision of YPEN, could serve as a single best practice example for the further development of the Israeli Electricity Authority* as RAE monitors the operation of the energy markets, including electricity from RES. Greece has built a strong interconnection between neighboring Member States, i.e. Italy (HVDC) and Bulgaria, as well as Albania, North Macedonia and Turkey which can be a very good example for North Africa and East Mediterranean countries that have not developed strong and independent regulator and transboundary interconnections.

# 6

## RECOMMENDATIONS

- The Electricity Authority of Israel should be independent of all stakeholders.
- Since the unbundling remains the main challenge, the regulator can impose an obligation on distribution system operators to collect and regularly provide grid users with information on quantitative development and investment data.
- European Union's guidelines for successful unbundling process that specify the unbundling requirements (legal, functional, and accounting) and indicate the relevant steps could serve for the setting of the liberalized market.
- Growth in electrical vehicles and renewable energy requires to further elevate the peak load and overview the considerable strain on the distribution network.
- The unbundling must be accelerated to meet the RES targets by 2030.
- Introduction of the carbon tax should secure favorable conditions for return on investments, but awareness should be raised on distortions within the grid.
- The regulator should distinguish LT-DNIP and LT-DNMP so that LT-DNMP reflect mid-term to long-term development and constitutes the guidelines for LT-DNIP.
- Transparency can be implemented throughout the whole process of the approval of the plans and should result in the publication of the final plans as well as reports concerning the execution of the approved plan.
- Further unbundling of the IEC.

# ANNEX 1

## PREVIOUS MEDREG REPORTS AS A RELEVANT SOURCE OF INFORMATION

For the purpose of System Operator Data Information Schemes for Monitoring and Planning Purposes in Egypt, the Egyptian energy regulator EgyptEra prepared the report describing and analyzing the role that EgyptEra will have to play in defining and implementing the new monitoring and data collection activities and provides details of the implementation strategy from the Short Run to the Long Run. The report was prepared under the MEDREG Electricity Working Group scope of work (**REF.: MED20-30GA – 3.1.2**) in 2020. In that report, several best practices and information on the Egyptian regulator were presented. Like the unbundling procedure, developed by the EnCS, this report also provides types of unbundling, the importance of sufficient and effective unbundling, access to information, monitoring functions of the NRAs, practical implementation and implementation strategy.

The Egyptian example relies also on the EU approach performing an analysis of requirements on the availability of and the access to the different data and information throughout the whole value chain of the electric power supply in the liberalized wholesale electricity market. EgyptEra will have a demanding task to implement from scratch the entire set of market and SO monitoring activities, and to additionally introduce an effective process to streamline the great quantity of information that will be required to the relevant operators.

As it can be seen, the presented step approach towards sector unbundling is similar in both documents. Israeli regulator should consider that its transmission system is not interconnected, so the unbundling process should be effective and lasting less than it is envisaged in the Egyptian report. Besides, Israeli electricity system is much smaller and at the same time more advanced, having much more investment, compared to the Egyptian case, so the reform should be quicker and more effective.

Another useful piece of information targeting infrastructure investment in Southern and Eastern Mediterranean Countries (SEMCs) is Regulatory options for the stimulation of infrastructure investments Fact finding and review of challenges in investment in infrastructure (**Ref: MED18-25GA-5.1.2**), prepared and published by MEDREG in 2018.

Finally, the Mediterranean Electricity Markets, Observatory National electricity systems and regional overview 2018 data (**REF: MED19-28GA-3.1.1**), report published in 2019 by the MEDREG Electricity Working Group can be considered as a complementary report to the one mentioned previously.

The report presents diverse forms of governance and unbundling regimes that exist in MEDREG countries. The primary objective of the unbundling rules is ensuring independence of transmission services from generation, production, and supply, to allow competition. The internal structures of the electricity markets vary greatly between MEDREG's members and regions. In the EU, the Balkans and Turkey, wholesale and retail competitions are almost fully open, but it's rarely the case in other countries.

The northern and southern Mediterranean energy markets show different characteristics, potentialities, and complementarities. Countries on both banks can use these synergies to exchange energy and meet the targets of the energy transition in the next decades. Therefore, well-designed, integrated, and efficient electricity infrastructures, through the shared use of energy, can pave the way towards the achievement of development and security goals in the Mediterranean regions.



ANNEX 2  
LIST OF ABBREVIATIONS

ABBREVIATION	MEANING & DEFINITIONS
ANRE	National Electricity Regulator Authority, Morocco
ARERA	Italian Regulatory Authority for Energy, Networks and Environment
CAPEX	Capital expenditures are funds used by a company to acquire, upgrade and maintain physical assets
CERA	Cyprus Energy Regulatory Authority
EGYPTERA	Egyptian Electric Utility and Consumer Protection Regulatory Agency
ERSE	Energy Services Regulatory Authority, Portugal
NDC	Nationally determined contribution
DER	Distributed energy resources
DGEG	Directorate-General for Energy and Geology, Portugal
DNIP	Distribution network investment plan
DNMP	Distribution network master plan
DSO	Distribution System Operators are responsible for distributing electricity to final consumers
EAST MEDITERRANEAN	MEDREG's statistical region consisting of Egypt, Israel, Jordan, Lebanon, Palestine
ELE WG	Electricity Working Group of MEDREG
ENCS	Energy Community Secretariat
EU	Political and economic union made up 27 European member states
EU, BALKANS, AND TURKEY	MEDREG's statistical region consisted of Albania, Bosnia-Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Montenegro, Portugal, Spain, Slovenia, Turkey
EV	Electric vehicles
GHG	Gas that contributes to the greenhouse effect by absorbing infrared radiation
HVDC	High-voltage direct current
IEC	Israel Electric Corporation
IPP	Independent power producer
LT-DNIP	Long-Term Distribution Network Investment Plan
LT-DNMP	Long-Term Distribution Network Master Plan
L-TSO	Legally unbundled Transmission System Operators
LV	Low Voltage
MEDREG	Association of Mediterranean Energy Regulators, consisted of 27 members from 22 countries
MENA	Middle East and North Africa countries
MV	Medium Voltage
NORTH AFRICA	MEDREG's statistical region consisted of Algeria, Libya, Morocco, Tunisia
NRA	National Regulatory Agencies
PERC	Palestinian Electricity Regulatory Council
PUA	The Electricity Authority of Israel
RAB	Regulatory Asset Base
RAE	Regulatory Authority for Energy, Greece
REGAGEN	The Energy and Water Regulatory Authority of Montenegro
RES	Renewable Energy Sources
WACC	Weighted Average Cost of Capital

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