



Mitigation Enabling Energy Transition in the MEDiterranean region
Together We Switch to Clean Energy

PREPARATION FOR THE DESIGN OF A REGIONAL PROGRAM FOR APPLIANCES IN THE SEMCS



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Regional Center for Renewable Energy and Energy Efficiency
المركز الإقليمي للطاقة المتجددة وكفاءة الطاقة

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The meetMED project is a two-year project funded by the EU and jointly carried out by the Mediterranean Association of the National Agencies for Energy Management (MEDENER) and by the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE). Its main goal is to reinforce regional cooperation aimed at fostering the energy transition in Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Palestine and Tunisia under the umbrella of the UfM REEE platform.

The meetMED team in Brussels coordinates the project partners and experts in implementing the project activities, in the following areas of work: assessing EE and RES strategies and policies; advancing vocational training and public awareness; attracting sustainable RE and EE investments; supporting the UfM Renewable Energy and Energy Efficiency Platform.

The meetMED activities target and benefit a wide range of stakeholders, including policy makers, public authorities, investors and financial institutions as well as local communities and final customers. meetMED supports regional cooperation by building the technical capacity and raising the public awareness necessary to implement RE and EE projects and solutions, while creating synergies with other initiatives targeting energy transition in the Mediterranean region.



MEDENER is an international non-profit organization gathering agencies from the northern and southern Mediterranean countries in charge of implementing public policies on energy efficiency and the promotion of renewable energy sources, by implementing regional projects facilitating the sharing of know-how and best practices among its members and international partners, as well as accelerating the transfer of skills, methods and technologies in the field of energy efficiency and renewable energy.



RCREEE is an intergovernmental organization aiming at enabling the adoption of renewable energy and energy efficiency practices in the Arab region. **RCREEE** brings together regional governments and global organizations to initiate and lead clean energy policy dialogues, strategies, technologies and capacity development in order to increase Arab states' share of tomorrow's energy. Its key work areas are capacity development and learning, policies and regulations, research and statistics, and technical assistance.

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1. Introduction

In order to address climate change, energy security and energy demand issues, the Southern and Eastern Mediterranean countries (SEMCs) are promoting and accelerating the deployment of more energy-efficient technologies using Minimum Energy Performance Standards (MEPS) and energy labelling. The aim is to bring more market transformation towards energy-efficient equipment.

2. The Proposal Objective and Expected Outputs

The proposed regional program for appliances will work towards accelerating the adaptation of Standards and Labels (S&L) and MEPS and improving the effectiveness of national EE programs, which will contribute to the development of EE measures in the SEMCs region. This will be achieved via the alignment or harmonization of national MEPS, labelling and the facilitation of the exchange of knowledge, information and good practices between member countries.

Required factors for the success of the proposed program will include the availability of regional testing facilities and the establishment of supporting coordinated policies as well as regional trade regulations.

Expected outputs of the successful program implementation include:

- An increase in the demand of efficient appliances in the regional market;
- A reduction in the cost of efficient appliances; and
- A reduction in the investments in testing facilities through the utilization of regional testing centers and reduction in regional trade barriers.

This will positively impact local economies via opening wider markets for efficient appliances, which will eventually encourage local stakeholders to participate in the proposed regional labelling and MEPS program.

3. Regional Program: Design Questions

This section includes the main design questions that will be further elaborated in order to draft the general program concept. Thereafter, these design questions will be translated into analysis factors and used to assess the feasibility of implementing the proposed program.

The main design questions are:

- What is the objective of the regional program for appliances?
- What is the proposed type of products' labels to be used?
- Who are the stakeholders (nationally and regionally)?
- Which appliances will be included in the program initially?
- Who will be the authority to issue the labels?
- How to ensure the stakeholders buy-in?
- How are the MEPS technical data defined for the program?
- How will the testing procedures for appliances be conducted?
- How available are the qualified/accredited testing facilities for the program?
- How will monitoring and enforcement work?
- Who will evaluate/assess the program, and how often?

4. The Adopted Methodology

A set of **design questions** was initially identified (*section 3*) that will help in the identification of the task methodology. Relying on the results and analysis provided in the meetMED report “Assessment of Appliances Share of the Total Energy Consumptions in the SEMCs - Special Focus on Air Conditioning Appliances”, the **status of household appliances’ MEPS & labelling** was studied in each of the SEMCs countries and a number of conclusions and recommendations were drawn regarding:

- The proposed regional labelling and MEPS scheme for the regional program;
- The list of appliances that will be included in the regional program initially;
- The countries’ status and readiness to join the regional program.

The above data was used to formulate the design for the regional program as shown in *section 5*.

Thereafter, an overview assessment of the SEM countries’ readiness to join the program was conducted based on their **institutional framework** and the **implemented MEPS and labelling programs** in each country (*section 6*). This was then used to deliver a country-analysis and a relative comparison of SEMCs success in their MEPS and labelling programs based on several **implementation and planning** factors and results was presented (*figure 2* and *table 4*).

Next, a PESTLE analysis was carried out (*section 7*) that gives a better view on the geopolitical and market status in the different targeted countries. This included a number of factors covering **political, economic, social, technological, and legal** factors that might affect the implementation of the program (*table 5*).

4.1. Proposed Future Steps

It is foreseen that, thereafter, a **stakeholders’ identification exercise** (i.e. regionally and nationally) will take place, followed by **stakeholders’ consultation** to get their insights and in-depth data that will help in the formulation

of the program design. This is to be followed by the design of a **key stakeholders' survey** followed by **country missions** in order to:

- Get a better appliances' market view;
- Validate collected data and fill remaining data gaps;
- Get stakeholders' feedback on the proposed program design.

At this stage a thorough study of the SEMCs' trend in implementation of EE measures can be carried out to further **assess their readiness and level of commitment to join the regional program**. A **final workshop** will then be planned **to disseminate the results** of the designed proposal to relevant parties and stakeholders.

5. The Concept and Design of the Proposed Regional Program

The main concept of this proposal focuses on providing a suitable structure and set-up that would facilitate the alignment and harmonization of household appliances' MEPS and labels in the region. This is proposed to be achieved via the introduction of a regional MEPS and the labelling program with the following proposed design:

1. **Labelling for Appliances:** Endorsement label is proposed at the regional level that will not contradict nor null the existing national labelling programs in the SEMCs. Obtaining the regional label will depend on fulfilling a set of technical specifications and the possibility to keep both the national and regional label simultaneously.
2. **MEPS for Appliances:** It is proposed to have mandatory MEPS in order to ensure the required standard and energy performance. However, the threshold for MEPS is to be set individually for each appliance taking into consideration national thresholds in different SEMCs.
3. **Program Implementation:** A regional body (i.e. organization, authority) should take the responsibility of setting-up, structuring and managing the proposed program. However, the regional body is assisted by a steering board that consists of national EE authorities in the different SEMCs along with the main funding party. The regional body will be responsible for the implementation of the program and will communicate with regional authorities as well as relevant national governments. This will encourage the allocation of resources that will help with the program implementation, such as MVE and testing labs, as well as with the enhancement of the regional cooperation with similar initiatives.

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4. The Regional Program Secretariat (See Figure 2): The role of this secretariat is to perform all preparations necessary for the implementation of the program, such as:
 - Study of national markets part of the program;
 - Program design and planning;
 - Selection of appliances to be included in the program;
 - Lobbying and influencing policymakers for the success of the program;
 - Networking and communicating with stakeholders.
5. Issuing of label: The task of issuing the label is the responsibility of the relevant national authorities based on directives and specifications that are set by the regional implementing body;
6. Implementation Phases: The proposed program consists of the following 3 phases:

Endorsement Labelling and Mandatory MEPS

- Alignment of MEPS and Labels;
 - Harmonization of MEPS and Labels;
 - Joining the regional program.
7. Periodic review and update of regional MEPS.

Figure 1: Proposed Design

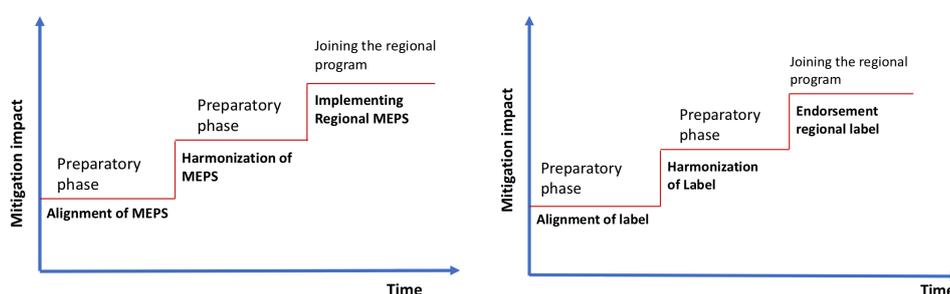


Figure 1, above, shows the proposed hierarchy for the program implementation at the national MEPS and labelling levels. The final program goal is the regional harmonization of MEPS and labels. Ideally, this is reached after fulfilling

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the steps shown in the above schematic diagram, but this is subject to modification and customization to fit the current status for each of the countries.

Figure 2: Proposed Regional Program Set up

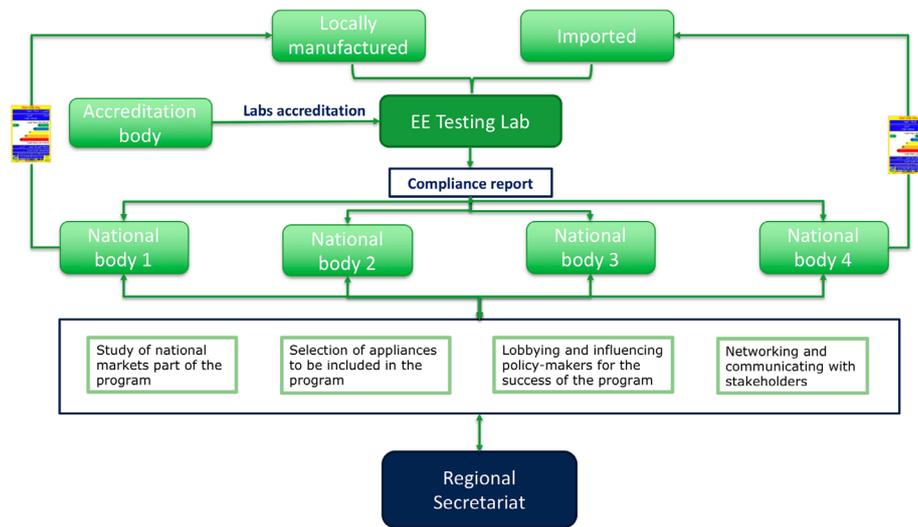


Table 1: Regional Program Design Factors

Analysis factors	Algeria	Egypt	Jordan	Lebanon	Tunisia	Morocco	Libya	Palestine
GDP per capita,	✓	✓	✓	✓	✓	✓	✓	✓
Population	✓	✓	✓	✓	✓	✓	✓	✓
Number of subscribers	✓	✓	✓	✓	✓	✓	✓	✓
Number of dwellings	x	✓	✓	✓	x	x	x	✓
Installed capacity (Power mix)	✓	✓	✓	✓	✓	✓	✓	✓
Structure of electricity generation in SEMC by energy sources	✓	✓	✓	✓	✓	✓	✓	✓
Final electricity consumption (GWh) (Trend 2007 - 2017)	✓	✓	✓	✓	✓	✓	✓	✓
Electricity consumption by sectors in SEMC	✓	✓	✓	✓	✓	✓	✓	✓
Residential electricity consumption (Trend 2007 - 2017)	✓	✓	✓	✓	✓	✓	✓	✓
Households appliances share from total electricity consumption in residential sector	x	x	✓	✓	✓	x	✓	x
AC share from the residential	x	✓	✓	✓	✓	x	✓	x
Electricity consumption by sectors in SEMC	✓	✓	✓	✓	✓	✓	✓	✓
Losses in power grids in SEMC	✓	✓	✓	✓	✓	✓	✓	✓
Energy-saving potential of household electrical appliances in SEMC								
Identify if the MEPS is implemented in the country	✓	✓	✓	✓	✓	✓	✓	✓
Identify the list of appliances with MEPS (Implemented - Under development - Not applicable)	✓	✓	✓	✓	✓	✓	✓	✓
Type and consumption (Regional program)	x	x	x	x	x	x	x	x
Identify if the L&S is implemented in the country	✓	✓	✓	✓	✓	✓	✓	✓
Identify list of appliances with S&L	✓	✓	✓	✓	✓	✓	✓	✓
National initiatives								
Availability of testing labs	✓	✓	✓	✓	✓	✓		✓
Energy consumption pattern in the residential sector (especially at peak hours) – To know which appliance will make the larger impact with regard to energy savings	x	x	x	x	x	x	x	x
Institutional setup	✓	✓	✓	✓	✓	✓		✓
Local stakeholders (Private – industrial associations – NGOs, etc ...)	✓	✓	✓	✓	✓	✓	✓	✓
Policies, laws and regulations – Mandatory or voluntarily (Table)	✓	✓	✓	✓	✓	✓	✓	✓
Monitoring, verification and enforcement measures – What is the most common type of verification and in which country what is used?	✓	✓	✓	✓	✓	✓	✓	✓
Incentives – Scrapping campaigns, financial (Taxes and imports)	✓	✓	✓	✓	✓	✓	✓	✓
Awareness campaigns	✓	✓	✓	✓	✓	✓	✓	✓

6. Status of MEPS and Labels in the SEMCs

This part of the report assesses the status of MEPS and labels in the SEM region in order to give an overall assessment of the success of each country in the implementation of their respective MEPS and labelling programs. The countries' profiles, developed in above mentioned meetMED report, are used to identify the deployed MEPS and labels, existing policies and regulatory frameworks as well as the appliances' electricity consumption.

6.1. Institutional Framework

The table below summarizes and categorizes the key institutions involved in the EE for appliances. It is realized that most of the SEMCs have announced energy targets as well as National Energy Efficiency Action Plans (NEEAP). Moreover, most of the countries have dedicated authorities and implementing agencies for Energy Efficiency (EE).

Table 2: Mains stakeholders involved in MEPS and Labels

	Energy Authority	Energy Efficiency Authority	Standardization Authority	Testing Labs	Accreditation Body
Algeria	Ministry of Energy and Mines	National Agency for the Promotion and Rationalization of Energy Use	Algerian Institute of Standardization	LPEE CDER	ALGERAC
Morocco	Ministry of Energy, Mines & Sustainable Development	Moroccan Agency for Energy efficiency	Moroccan Institute of standards Normalization and Certification.	CPEE CETIM Maroc LPEE	NA
Tunisia	Ministry of Energy, Mines and Renewable Energies	National Agency for Energy Conservation	National Institute of Standardization and Industrial Property	CERTN Global Efficient Lighting CETIM Tunisia	TUNAC
Lebanon	Ministry of Energy and Water	Lebanese Center for Energy Conversion	Lebanese Standards Institution	IRI	NA
Libya	Ministry of Electricity and Renewable Energy	NA	Libyan National Centre for Standardization and Metrology	NA	NA
Egypt	The Ministry of Electricity and Renewable Energy	EE Units in Different Ministries	Egyptian Organization for Standardization and Quality	EOS GOIEC NREA	EGAC

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	Energy Authority	Energy Efficiency Authority	Standardization Authority	Testing Labs	Accreditation Body
Palestine	Palestinian Energy Authority	NA	Palestine Standards Institution	NA	NA
Jordan	Ministry of Energy and Mineral Resources	NA	Jordan Standards and Metrology Organization	NERC RSS	NA

6.2. Existing MEPS and Labels for SEM Countries

This part of the report covers the existing MEPS and labels in all the eight countries subject of the study, by providing a comparative analysis of all countries in order to measure their achieved development in the implementation of EE measures. It identifies and assesses the currently deployed energy efficiency measures, policies, legal and regulatory frameworks as well as challenges in order to assess the progress and develop recommendations for the improvement of each country.

The analysis of the national and regional data shows that “Comparative Labelling” is predominant in the region. On the other hand, mandatory MEPS are the most used in the region. Records show that Libya is the only country in the region that did not authorize any appliance label so far. No country in the region has adopted any labelling or MEPS for fans except for Egypt that has MEPS for fans under development. However, the reason why fans are included in this report -as a stand-alone appliance- is because some studies consider it as part of the cooling/air conditioning systems.

Table 3: Existing MEPS & Labels in the SEM countries

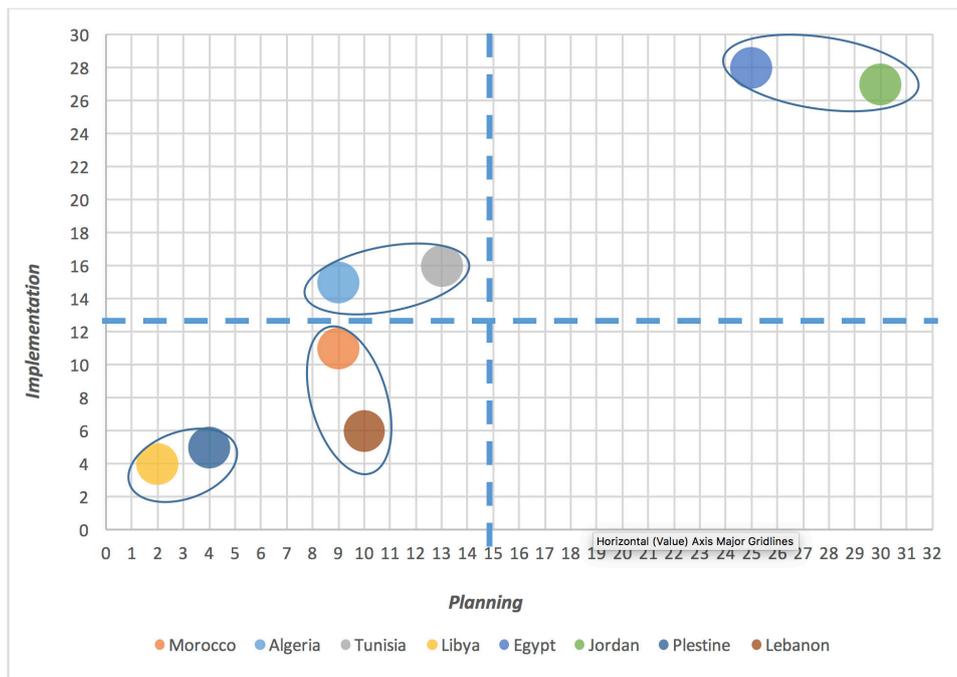
Country	Lighting		Refrigerators Freezers		Air Conditioners		Washing Machines		Dishwasher		Solar Water		TV		Electric Oven		Vacuum Cleaners		Electric heaters		Laundry Dryer		Fans	
	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels	MEPS	Labels
Algeria	•	•	•	•	•	•																		
Egypt	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•
Jordan	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Lebanon	•	•	•	•	•	•																		
Libya	•																							
Morocco		•	•	•	•	•					•													
Palestine																								
Tunisia	•	•	•	•	•	•	•	•			•													

•	Implemented
•	Planned

6.3. meetMED Target SEMCs Categorization

The eight SEMCs were evaluated for their progress in the implementation of MEPS and labels and their progress was assessed against these factors and their results were documented. Thereafter, the previously mentioned analysis factors were used to create a **scoring system** by which the countries were evaluated on their successful planning and implementation of EE measures. A **categorization** of the countries based on their obtained scores was performed and accordingly the countries are categorized into 4 groups as shown below in Figure 3 and Table 4.

Figure 3: SEMCs Categorization



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Table 4: SEMCs Categorization

Category I	Countries of Advanced Progress in the adaptation of EE measures <i>(Egypt and Jordan)</i>
Category II	Countries of Medium Progress in the adaptation of EE measures <i>(Tunisia and Algeria)</i>
Category III	Countries of Increased Progress in the adaptation of EE measures <i>(Lebanon and Morocco)</i>
Category IV	Countries of Minimum Progress in the adaptation of EE measures <i>(Libya and Palestine)</i>

6.4. Election of Appliances as Part of the Regional Program

The appliances with most widespread authorized MEPS and labels in the region are “AC”, “Refrigerators” and “Lightings”, since their MEPS and Label are present in six countries. “Solar Water Heaters” have MEPS in four countries. MEPS for “Washing Machines” are adopted in two countries and labeling is under development in one country. “TV” has MEPS and labels in two countries, but it is considered in this report because it is an appliance that is found in almost every household.

7. Assessment of the Targeted SEMCs Readiness to Join the Program

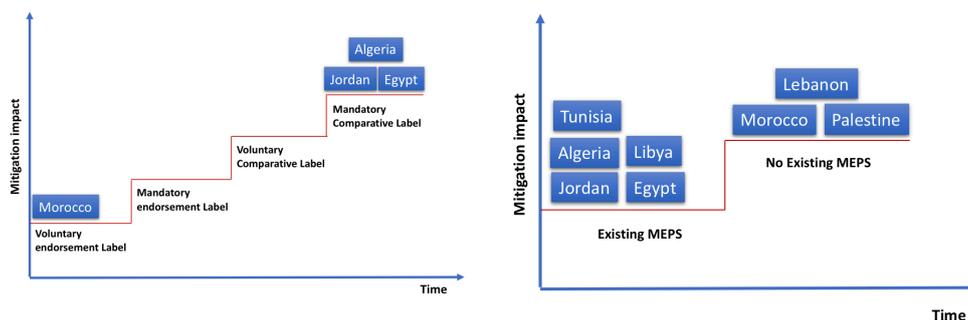
In this section, an assessment is done on the readiness of the countries to join the regional program. This was done based on a study on the current status of implementation of MEPS and labels as well as a preliminary PESTLE analysis to assess the suitability of the market and socioeconomic environment in the country to adopt this program.

7.1. SEMCs Current Status of Implementation

In this part, in order to assess the SEMCs current status in the implementation of MEPS and appliances labelling, the schematic diagram from Figure 4 was utilized to identify the status of each country as will be shown below.

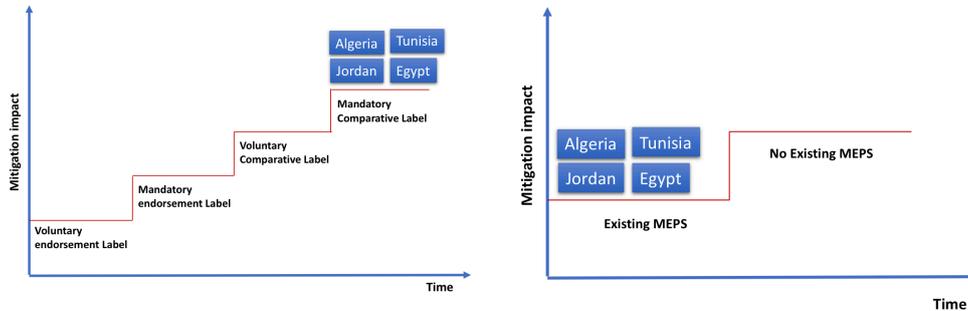
1) Lighting

Figure 4: SEMCs MEPS and Labels Current Status in Lighting



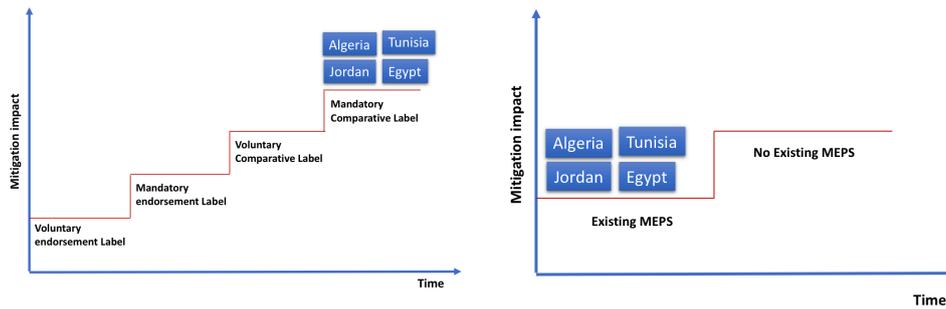
2) Refrigerators and Freezers

Figure 5: SEMCs MEPS and Labels Current Status in Refrigerators



3) Air Conditioning

Figure 6: SEMCs MEPS and Labels Current Status in AC



7.2. PESTLE Analysis

In this part, a PESTLE analysis is conducted in order to assess the countries' readiness to join a regional program for MEPS and labeling. Based on this analysis, it can be concluded that countries like Algeria, Tunisia, Egypt and Morocco can easily be involved in a regional program. Additionally, countries like Algeria and Lebanon are ranking second and could join the program if further efforts are made at political, economic and legal levels. Finally, considering the current critical political and economic situations in Palestine and Libya, being a part of the regional program for MEPS and Labeling might be difficult in the present moment.

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Table 5: PESTLE Analysis

	Factors	Egypt	Lebanon	Jordan	Palestine	Morocco	Algeria	Tunisia	Libya
Political	<ul style="list-style-type: none"> Political Stability Political Will (e.g. International Agreements) Stakeholders needs or demands Lobbying by interest groups 	H	M	H	L	H	M	H	L
Economic	<ul style="list-style-type: none"> Availability of local Industry Availability of Finance Schemes for EE and RE Market Demand (e.g. population) Economic situation and prospects of EE and RE industries 	H	M	H	L	H	M	H	L
Technological	<ul style="list-style-type: none"> Availability of RE & EE Technology Availability of Skilled labor (Know How) Utilization level of EE and REs technologies Access to EE and RE technologies 	H	H	H	M	H	M	H	L
Social	<ul style="list-style-type: none"> Demographics and population trends Public Perceptions Media views Education levels Potential for knowledge exchange 	H	H	H	M	H	H	H	M
Environmental	<ul style="list-style-type: none"> Commitment to Environmental issues (Climate Change Agreement) Existence of environmental policies and regulations Level of CO₂ emissions 	M	M	M	L	M	M	M	L
Legal	<ul style="list-style-type: none"> Existing Policies and Legislations for EE and RE Existing incentives for RE and EE Existence of regulatory bodies for EE and RE technologies 	H	M	H	H	H	M	H	L
Score	H=3 ; M=2 ; L=1	17	14	17	10	17	13	17	7

8. Conclusions

Globally, the harmonization of energy efficiency regulations for appliances is increasingly expanding. In fact, regional alignment and/or harmonization programs address product labelling, minimum energy performance standards as well as testing procedures. However, the absence of harmonization poses considerable challenges for equipment manufacturers, importers, retailers and consumers and reduces the effectiveness of the deployed EE regulations.

Many regions all over the world started deploying highly efficient household appliances due to the ongoing technological development and implementation of national EE action plans. Expansion of regional and international trade supports dissemination of energy-efficient appliances in different countries including in those lacking clear energy efficiency targets and regulations. However, the absence of such regulations leaves regional markets vulnerable to importation of inefficient devices and delays the establishment/enforcement of quality regulation related to regionally manufactured household appliances. The lack of regional energy efficiency MEPS and labeling programs limits consumers' choice as a viable market tool. In combination, these factors lead to spread low energy-efficient equipment all over the region.

For countries that are currently introducing new S&L programs, such as Morocco and Lebanon, the adoption of existing test protocols for assessing appliances' EE is strongly preferable rather than creating a new protocol. In fact, at the national level, adopting existing protocols ensures repeatability and reproducibility along with known facility needs and defined benefits and issues. As for manufacturers and importers, harmonization or alignment within the region would provide large benefits in avoiding costs by minimizing investments in testing facilities and test resources and allowing for economies of scale for manufacturing, which directly affects the countries' growth.

Finally, the deployment of regional EE measures including MEPS and labels in the region can be achieved through the available bilateral, regional and international support mechanisms.

9. Recommendations and Future Steps

1. Only 3 out of the 8 countries targeted in the SEM region have a lab accreditation body. Hence, regional cooperation to adopt regulations on recognizing testing reports from accredited labs in other countries will help decrease the high testing facilities cost and support countries with insufficient institutional and human capacities to service such laboratories.
2. Considering that in the current regional context testing facilities and labs are missing, focusing primarily on regional harmonization of testing procedures would be both efficient and cost-effective.
3. It is important to review and study the prioritization of household appliances at national and regional level by investigating and analysing the impact of appliances' use patterns on electricity consumption and load profiles.
4. Noting that insufficient importance is given to developing compliance and enforcement frameworks, it is crucial to incorporate efficient mechanisms at national and regional level at an early stage during MEPS and labelling policy planning.
5. A detailed household appliance market analysis along with a cost-benefit analysis for MEPS and labels policy options at national and regional level - including analysis of the impact of policies on suppliers and consumers - will support identifying the best fit regulations that should be adopted.
6. It is necessary to assess the institutional capacity and technical needs, including mapping the existing domestic testing facilities and their degree of technical and human capacity needs as well as to identify necessary interventions to fill the existing gaps.
7. A scrapping campaign shall be developed at regional level by providing incentives (discounts) to decrease the cost of efficient appliances.
8. The creation of regional platforms is required for exchanging knowledge between different key stakeholders at regional level and for disseminating the required technical data for the MEPS and S&L.

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9. Capacity building for national stakeholders, lobbying and communication with regional stakeholders shall be ensured.
10. Efficient awareness campaigns shall be established through governmental, non-governmental organizations and media in order to promote the use of energy-efficient products.
11. The involvement of consumer protection entities in the market monitoring process of MEPS and labels should be enabled in order to benefit from their extensive experience in ensuring products' quality and safety.
12. International and regional trade agreements are essential to the deployment and dissemination of energy-efficient technologies and measures to facilitate the commercial exchange of energy-efficient goods.
13. The reduction of customs duties of efficient household equipment in the SEMCs region shall be harmonised in order to simplify the regional trade for importers and manufacturers.
14. High-level political support and commitment is required in order to ensure the sustainability of the program.

This publication is a product of the meetMED (Mitigation Enabling Energy Transition in the Mediterranean region) project which is funded by the European Union and jointly implemented by the Mediterranean Association of the National Agencies for Energy Management (MEDENER) and the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE). The conclusions of this report result from the analysis of the Country Policy Papers prepared by the meetMED Regional Expert Network (REN) – a network composed by experts coming from 13 Mediterranean countries – the aim of which is to support national governments in the implementation of EE and RE policies enhancing national programmes and frameworks in the region. Since 2012, the eight target countries (Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Palestine and Tunisia) have improved their energy efficiency and renewable energy sectors, having put in place long-term national energy strategies that set ambitious targets for energy savings and renewable energy penetration. Nevertheless, several challenges still hinder the development of EE and RE, particularly related to governmental, technical or information aspects. This report identifies a set of recommendations that can be implemented to promote the development of both sectors. Awareness of the population for EE and RE benefits should be one of the main objectives of the countries since the lack of knowledge is a clear barrier to the dissemination of good practices. Regional cooperation should be encouraged to facilitate the energy transition in the Southern and Eastern Mediterranean Countries (SEMCs) – cooperation will accelerate the implementation of common measures and help overcome shared barriers.



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