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Mitigation Enabling Energy Transition in the MEDiterranean region
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Minimum Energy Performance Standards and Energy Labeling Implementation Manual

MED ENER

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

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Disclaimer

ABOUT THE PROJECT

The Mitigation Enabling Energy Transition in the Mediterranean region “meetMED” is an EU-funded project developed by the Mediterranean Association of the National Agencies for Energy Management (MEDENER) and the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE).

With the objective of contributing to energy and climate transition Southern Mediterranean Neighbourhood through a multi-scale, multi-partner inclusive approach, meetMED II activities aim at developing a more stable, efficient, competitive, and climate-resilient socioeconomic environment in Southern Mediterranean countries, by fostering regional cooperation for Energy Efficiency measures and implementing demo actions.

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LIST OF ABBREVIATIONS

AC	Air Conditioner
BTU	British Thermal Unit
COP	Coefficient of Performance
EER	Energy Efficiency Ratio
EOS	Egyptian Organization for Standardization
HSPF	Heating Seasonal Performance Factor
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
MEPS	Minimum Energy Performance Standards
RCREEE	Regional Center for Renewable Energy and Energy Efficiency
SEER	Seasonal Energy Efficiency Ratio
SCOP	Seasonal Coefficient of Performance
TWh	Terawatt-hour

SUMMARY

This manual aims to support decision-makers in promoting and enhancing the implementation of MEPS and energy efficiency labeling schemes across the Arab Mediterranean region, with a special focus on air conditioners (ACs). It begins by providing technical definitions, key metrics, and terminologies related to ACs.

The manual then covers essential components of implementation, including the step-by-step process for establishing MEPS, energy labeling requirements, supporting policies and incentives, and enforcement mechanisms. It also presents a detailed case study of Egypt's experience, highlighting its institutional and regulatory frameworks, specific MEPS and labeling process for air conditioners, and national testing capabilities.

1. INTRODUCTION

Minimum Energy Performance Standards (MEPS) and energy efficiency labeling are two effective measures that have been adopted in many nations to improve energy efficiency for appliances, lower energy use, and lessen the environmental impact of fossil fuel consumption.

Given the importance of MEPS and labeling programs, an increasing number of countries are continually adopting them for several appliances.

Figure 1 shows the number of countries with MEPS and energy efficiency labels for different home appliances. Lighting and air conditioners have the widest adoption, followed by fans, refrigeration (refrigerators and freezers), and wet appliances (such as clothes washers, dryers, washer-dryers, and dishwashers). Fewer countries have such measures for displays (TVs and computer screens), space heating, water heating, and cooking (including hobs, conduction, induction, and gas stoves)[1].

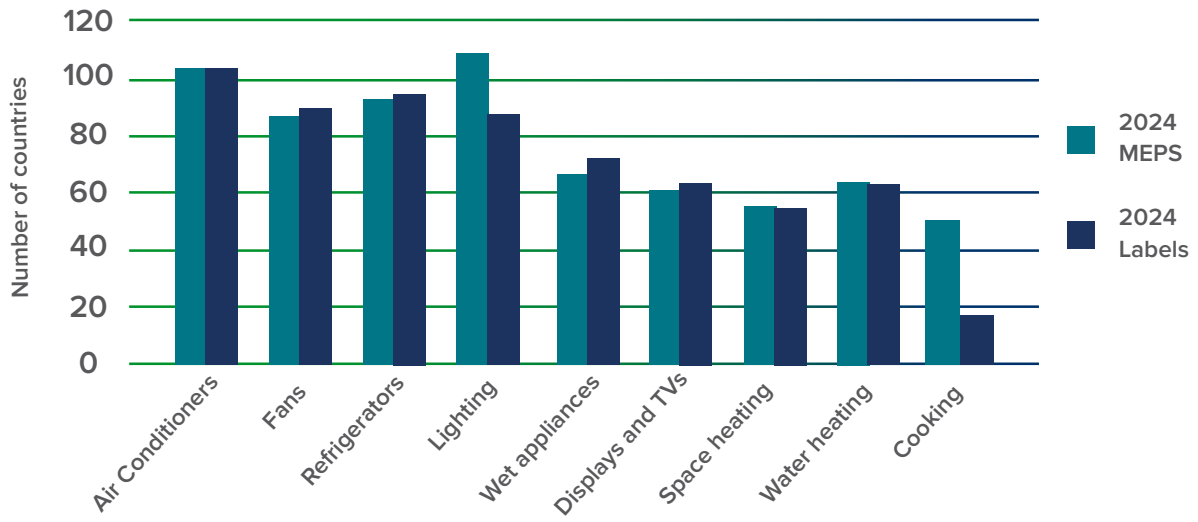


Figure 1: Number of countries with MEPS and labels for appliances (IEA, 2024)

Globally, the adoption of MEPS and labeling programs has led to significant energy savings in countries that have implemented them.

For example, in 2018, in the united States, MEPS saved more than 600 Terawatt-hour (TWh) per year, while the European Union and China have each saved close to or over 400 TWh.

When considering the percentage of national electricity saving, the United States and the European Union have achieved reductions approaching 15%. Figure 2 illustrates these positive impacts, with the left side of the figure showing total electricity saved (TWh/year) and the right side showing the percentage reduction in national electricity consumption [2].

Figure 2: Examples of MEPS impact in different countries (IEA, 2021)

Over the past years, most of the Arab Mediterranean countries have made good progress in developing energy efficiency measures (MEPS and labels) for home appliances.

However, the level of adoption and enforcement of MEPS and labeling remains uneven. Some countries, such as Egypt and Jordan, have established mandatory MEPS and labeling schemes across a broad range of appliances. In contrast, others still struggle with the adoption of MEPS or the enforcement issues.

The key barriers for several countries are the lack of a legal, institutional and/or regulatory framework, the absence of testing laboratories, or outdated facilities, which hinder effective implementation. Furthermore, MEPS and labels often cover only a few types of appliances. Therefore, there is a need for expanded MEPS coverage.

For instance, several have made progress in regulating only a limited range of appliances and still lack standards for other products such as dishwashers, electric ovens, and fans.

Table 1 highlights the variation in the status of MEPS and labeling frameworks, ranging from mandatory implementation to voluntary schemes or standards that still require adoption or enforcement mechanisms.

Overall, while regional progress is clear, there is a need for adopting MEPS and labels for a wider range of appliances, along with , stronger enforcement mechanisms, and investment in technical infrastructure to fully realize energy efficiency goals in the appliances sectors.

Countries		Lighting	Fridges and Freezers	ACs	Washing Machine	DishWasher	Solar Water Heater	TVs	Electric Oven	Vacuum Cleaner	Electric Heater	Laundry Dryer	Fans
Algeria	MEPS												
	Labels												
Egypt	MEPS												
	Labels												
Jorden	MEPS												
	Labels												
Lebanon	MEPS												
	Labels												
Libya	MEPS												
	Labels												
Morocco	MEPS												
	Labels												
Palestine	MEPS												
	Labels												
Tunisia	MEPS												
	Labels												

Existing without local conformity process | Voluntary | Regulations still need to be adopted /enforced for EE limits | Mandatory | Under preparation

Table 1: Status of MEPS and labels in the countries

Source: Based on interviews with local experts, 2024

2. DEFINITIONS AND TERMINOLOGIES

The list below explains the key metrics and terminologies used for implementing MEPS for cooling and heating [3].

Common energy efficiency metrics used in different countries

Energy Efficiency Ratio (EER): This metric expresses how effectively an air conditioner cools when running at full capacity, calculated as the ratio of cooling output BTU (British Thermal Unit) per hour (BTU/h) to the electricity consumed, (W), under a single standardized test condition (35° C dry bulb, 24° C wet bulb), as defined in ISO 5151, except the US.

Coefficient of Performance (COP): COP measures the efficiency of heating (or cooling) at full load, determined by dividing the amount of heating (or cooling) delivered (W) by the power input (W) under a single standardized test condition, as the EER.

Seasonal Energy Efficiency Ratio (SEER): SEER evaluates the average cooling performance of an AC unit over an entire cooling season, taking into account real-world usage patterns and temperature fluctuations.

Seasonal Coefficient of Performance (SCOP): SCOP reflects the average heating/cooling performance of a heat pump or AC throughout the heating season, considering variations in temperature and part-load operation Practically, SCOP and COP are used to evaluate heating performance..

Cooling Seasonal Performance Factor (CSPF): CSPF is estimated by dividing the total cooling by the total energy consumed during the cooling season, providing a measure of seasonal performance.

Heating Seasonal Performance Factor (HSPF): HSPF measures the seasonal heating performance of heat pumps, showing the amount of heat delivered per unit of electricity over the heating season.

Cooling Energy Consumption Efficiency (CEER): CEER indicates the performance of an AC unit at full load, including standby power, by dividing the rated cooling capacity (BTU/h) by the total power consumption (W).

Key Types of Air Conditioning Units

Air Conditioner:
A device that mainly uses the vapor compression refrigeration cycle to lower air temperature within space, expelling heat to the outside environment.

Heat Pump:
Utilizes the vapor compression cycle but can reverse the process, extracting heat from outside air and transferring it indoors. Heat pumps can function as both cooling and heating systems. The COP of a heat pump is equal to the COP of the cooling pump plus one.

Ducted Air Conditioner:
This system uses a fan to distribute conditioned air through a network of ducts, delivering cooled air to various areas as needed.

Constant Speed (Non-inverter) AC:
Operates at a fixed speed, running at full capacity to meet cooling needs or shutting off completely once the desired temperature is reached.

Non-ducted Air Conditioner:
Features an evaporator unit installed directly in the room, delivering cooled air straight from the evaporator into the space.

Variable Speed (Inverter) AC:
These units use compressors with variable speed drives, allowing the compressor speed to adjust according to the required heating or cooling load, improving performance and comfort.

Split System:
An AC configuration where the condenser (outdoor unit) and evaporator (indoor unit) are separate units connected by refrigerant piping and controls. Split systems can be either ducted or non-ducted and may include single split, multi-split, multi-head, or multi-circuit arrangements.

Packaged Unit:
A packaged AC unit is a piece of equipment where the evaporator and condenser are contained in the same package.

3. PROCESS OF ADOPTION OF MEPS FOR APPLIANCES

To successfully implement Minimum Energy Performance Standards (MEPS) and energy labeling programs, a structured, multi-phase approach is required.

The process begins with the initial setup phase, which includes establishing a strong legal foundation, designating a lead authority, and forming an advisory committee of relevant stakeholders. This is followed by the development phase, where essential market and technical data are collected, cost-benefit analyses are conducted, and testing procedures are aligned with international standards.

In the implementation phase, energy performance thresholds are set based on market feasibility, and plans are established for the regular review and updating of standards to ensure long-term effectiveness and alignment with technological advancements.
The main steps of MEPS implementation are as follows[4]:

Initial Setup Phase:

1. **Create regulatory foundation -** Review current laws and establish comprehensive legislation to provide legal authority and political backing for mandatory energy efficiency standards and labeling requirements.

2. **Designate a responsible authority -** Evaluate existing organizational capabilities for creating, implementing, and maintaining standards and labeling programs. Create a comprehensive plan and assign a government body to lead each program component.

3. **Form advisory committee -** Identify key stakeholders in your market who would be affected by or benefit from the program and engage them as participants in the development process.

Development Phase:

4. **Collect essential information -** Establish data requirements and create a strategy for gathering necessary information to support program analysis, including market conditions, technology capabilities, engineering specifications, and product usage patterns.

5. **Perform cost-benefit evaluation -** Apply economic analysis methods to identify the optimal level of regulatory stringency and assess the level of current efficiency

6. **Align testing procedures -** Where feasible, coordinate energy performance testing methods with international standards (such as International Electrotechnical Commission protocols) to enable testing and minimize trade obstacles (e.g., ISO 5151, ISO 16358-1).

Implementation Phase:

7 **Set energy performance thresholds:** Identify energy efficiency metrics (such as EER) or SEER) that are both technically feasible and economically viable, based on the current efficiency levels available in the market. The thresholds must be ambitious enough to drive improvements without being unrealistically high or below existing performance. Different standards should be established for various types and capacities of ACs to ensure relevance and fairness. Stakeholder engagement is also essential throughout this process to gather technical insights and industry feedback. Once this step finalized, the standards should be officially adopted with strong political backing, supported by a clear regulatory framework, and accompanied by an implementation timeline to guide market transition.

8 **Update and review standards regularly:** Develop plans for regular review and revision of standards every few years to keep them effective.

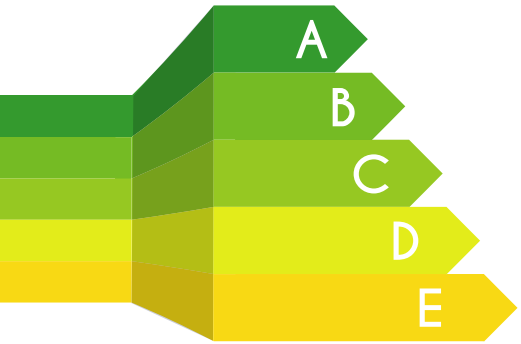
It is also important to consider establishing an online registration platform as this plays a critical role in supporting energy efficiency programs by creating a centralized database of product information.

This database helps policymakers monitor market compliance, track efficiency trends, and evaluate the environmental impact of appliances.

It also enables better **policy development and enforcement** while empowering consumers to make informed purchasing decisions by allowing them to compare the energy performance of available **products[5].**

4. ENERGY EFFICIENCY LABELING

Energy efficiency labels serve as essential tools to inform consumers about appliances energy performance at sales points. They **provide clear,** concise information highlighting energy use, efficiency, or estimated energy costs. **The primary goal** is to empower consumers to make informed, energy-conscious decisions while also motivating manufacturers to produce higher-efficiency appliances that meet acceptable levels of energy efficiency.



Implementing an energy labeling program for receive appliances involves several steps to ensure that consumers receive the right information and that the market continually shifts toward a higher energy efficiency level.

The following outlines the key stages involved in developing and managing a labeling program.

1. Determine product coverage and label type

Figure 3: Examples of comparative labels [5]

The first step is to identify which energy-using appliances will be covered by the labeling program based on their market impact and energy consumption.

The labeling program will be mandatory or voluntary. Labels can take the form of endorsement labels, which are simple and recognizable marks highlighting the most energy-efficient products and are usually voluntary, or comparative labels, which allow consumers to compare energy efficiency across products.

Comparative labels may be categorical, using a step ranking system **(e.g., alphabetic or numbers with green bars)** to indicate relative energy use compared to other models; continuous, using bar graphs or scales to show the range of efficiency without discrete categories; or information-only, providing technical data without direct comparison. **Figure 3** shows examples of comparative and endorsement labels.

Figure 4: Examples of endorsement labels [5]

2. Develop label design and criteria

A clear and simple label design must be developed that can be easily understood by consumers and accepted by all stakeholders. **Alongside the design,** transparent energy performance thresholds and criteria for appliance qualification should be established, based on reliable testing and certification procedures. **Table 2** shows the criteria and reference for putting the level of energy efficiency based on the performance.

Energy Efficiency Level		Label Colors	Energy Efficacy Limits (EER) Btu/hr/Watt
A	أ	Dark Green	EER ≥ 16.0
B	ب	Green	16.0 < EER ≥ 15.0
C	ج	Light Green	15.0 < EER ≥ 14.5
D	د	Yellow	14.5 < EER ≥ 14.0
E	ه	Orange	14.0 < EER ≥ 13.5
F	و	Red	13.5 < EER ≥ 12.5
G	ز	Dark Red	12.5 <EER ≥ 11

Table 2: Label criteria for Acs

3. Product evaluation and certification

Imported or locally manufactured appliances must be subjected to evaluation and certification to verify that they meet the defined energy performance standards.

Only certified products should then be eligible to carry the local label to ensure the **program's credibility and consumer trust.**

4. Label issuance and display

The program must designate an entity or authority responsible for issuing the labels e.g., standardization or energy efficiency authority.

In addition, clear guidelines should be set regarding how and where labels are to be displayed on products to maximize visibility and consumer awareness at the point of purchase.

5. Market monitoring and enforcement

Transparent market monitoring protocols are essential to ensure fair participation and compliance with labeling requirements.

Effective enforcement mechanisms must be created or already be in place to maintain program integrity and ensure that only compliant appliances carry the label, identifying it energy efficiency level, and enter the market.

6. Regional coordination and stakeholder engagement

Coordination among **Mediterranean Countries** or within regions is encouraged to harmonize labeling schemes, which facilitate broader adoption by manufacturers and distributors.

Engaging all relevant stakeholders, including suppliers, retailers, and consumer groups, helps support the program's goals and enhances market penetration.

7. Consumers' awareness and market impact

Widespread recognition of the label creates strong market incentives for energy efficiency, accelerating the adoption of new technologies and the evolution of the market.

While labeling alone cannot overcome price differences between inefficient and more efficient products, it acts as a **"pull" mechanism** by increasing consumer awareness and promoting the availability of efficient products.

8. Continuous program evaluation

Ongoing monitoring of consumer response, market trends, and program effectiveness is necessary.

The program should be flexible to adjust labeling criteria, design, and enforcement strategies to maintain relevance and address emerging technologies or market changes.

5. PRODUCT REGISTRATION PLATFORM

The development of an appliance registration platform represents a fundamental component in the successful deployment of **MEPS.** As an integral element of Monitoring, Verification, and Enforcement **(MVE)** frameworks, such a platform plays a crucial role in strengthening regulatory compliance and market surveillance and offers several key benefits as shown in **Figure 5.**

The online appliance registration platform is a crucial step in strengthening energy efficiency programs, as the platform facilitates the creation of a centralized, accessible database containing detailed product information, which serves multiple functions across the regulatory landscape. Hence, for policymakers, it enables real-time monitoring of market compliance, identification of efficiency trends, and evaluation of the environmental performance of appliances. These insights support data-driven policy formulation, periodic **MEPS** revisions, and targeted enforcement actions. Additionally, by making product information publicly available, the platform empowers consumers to make more informed purchasing decisions based on comparative energy performance, thereby encouraging market demand for high-efficiency products.

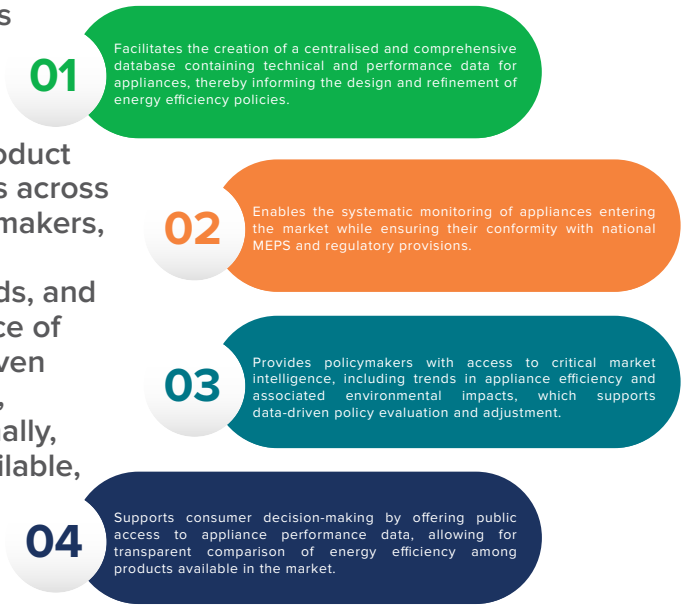


Figure 5: Benefits of product registration platform

The centralised online product registration platform functions as a digital compliance gateway where manufacturers and importers upload detailed information and documentation for appliances prior to market entry. **This system forms** the support of a robust **MEPS** framework by ensuring that all regulated products meet efficiency criteria before being sold. The well-designed registration systems not only encourage the introduction of energy-efficient products but also minimise the administrative burden for both industry stakeholders and regulatory authorities

6. SUPPORTING POLICIES AND INCENTIVES

Supporting policies and incentives for energy efficiency measures encouraging manufacturing or the acquisition of efficient appliances, are limited in the **Arab Mediterranean Region.**

While a few countries have initiated programs to promote energy sustainability, the need remains huge. Therefore, effective financing policies and supporting incentives are crucial for accelerating the adoption of energy-efficient appliances and achieving the goals of **MEPS** in **the Mediterranean Region.**

While a few countries have initiated programs to promote energy sustainability, the need remains huge. Therefore, effective financing policies and supporting incentives are crucial for accelerating the adoption of energy-efficient appliances and achieving the goals of **MEPS** in **the Mediterranean region.**

Any adopted approach should aim to address **key financial barriers,** most notably, the high upfront costs and limited access to finance that often discourage investment in **energy-efficient appliances [7].**

Possible financial mechanisms include concessional loans, green credit lines, revolving loan funds, microfinance, on-bill and on-tax financing, as well as financial incentives such as rebates or subsidies.

These tools can enhance affordability by either spreading payments over time or directly reducing the purchase price of appliances. In addition, offering guarantees and risk-sharing instruments can help lower the perceived risks for lenders/financial institutions.
Such mechanisms should be tailored to local market conditions and supported by complementary measures such as regulatory frameworks, public awareness campaigns, and innovative business models.

A multi-faceted financing strategy, guided by national policies and adapted to the specific needs of different sectors (e.g., residential, commercial, and public), can help overcome barriers to the promotion and adoption of energy efficient appliances [7].

For more information, about the relevant financing mechanisms, **check Guidebook on Green Financing Capability for Sustainable Energy in Buildings and Appliances,** prepared under MEETMED II project.

7. MEPS AND LABELING ENFORCEMENT

MEPS and labels enforcement is one of the crucial issues that hinder their implementation in most of **the Arab Mediterranean countries.**

Therefore, the integrity of the **MEPS and labeling** scheme must be safeguarded by the enforcement regime. **Enforcement** must be reasonable and forceful enough to serve as a real deterrent.

The manner in which enforcement agencies or regulators implement remedial action must be flexible and use increasing correction actions starting with informal warnings and leading to prosecution for severe violations. Although prosecution is the most severe action possible, gentler means are used for **most of the enforcement.**

This starts with informing a party that they are breaking the rules and giving them a warning to **fix the problem.** Within a specific time frame, more remedial measures might need to be required.
After that, the product could be taken off the market.
Additional punishments, such as publicizing the noncompliance, paying fines, suspending the operating license, and facing legal action, may be imposed if it is determined that the noncompliance was purposeful rather than the result of a mistake. **The steps** that enforcement agencies will take in each situation must be established.

On one side, it was suggested that penalties must be commensurate with the seriousness of noncompliance and the anticipated intention. **Most enforcement** agencies start by seeking corrective actions and may later seek payment from individuals found to be in violation for any expenses associated with verification tests.

The sale of non-compliant items is always prohibited, and they must either be removed from the market **(if they are already there)** or, if they are discovered before they are put there, denied the right to be sold there. **The ability** to confiscate and destroy non-compliant.

The most crucial stage in creating the necessary legal framework is to evaluate current laws and administrative practices to ascertain whether existing legal frameworks and authorities exist to enforce comparable requirements.

MEPS and labeling regulations can benefit from existing frameworks that are suitable if they exist in order to hasten implementation and lower costs. Nevertheless, there are occasions when it is necessary to construct the requisite legal mandates, powers, and abilities from the ground up.

Additionally, the only way to guarantee that the criteria are followed, desired policy goals are met, and consumer and corporate interests are safeguarded is through an effective compliance mechanism to maintain the integrity of **MEPS and labeling activities.** There are several instances from throughout the world of how governments are effectively establishing compliance regimes, as well as lessons learned from situations where significant difficulties have occurred.

Different jurisdictions have different approaches to application; some focus more on rigorous upstream conformity assessment and market entrance requirements, while others place more emphasis on downstream market surveillance and enforcement. For companies wishing to improve current compliance regimes or implement new ones, an array of techniques utilizing the insights learned is advised. Table 3 shows key aspects to ensure compliance with the requirements of the MEPS and labeling.

Conformity Assessment	Market Surveillance	Enforcement
• Ensures appliances meet MEPS and labeling requirements before market entry. • Includes performance testing, performance declarations, and documentation. • Requires product registration, inspections, and proper record-keeping.	• Conducted by authorities to verify compliance of products already on the market. • Involves monitoring, verifying, and reporting. • Ensures accurate labeling, compliance with energy performance standards, and proper product registration.	• Maintains integrity of MEPS and labeling programs through corrective actions. • Actions can occur at import, point of sale, testing, or post-market. • Enforcement begins with warnings and may escalate to fines, license suspension, or prosecution.

Table 3: Key steps for MEPS compliance

Figure 6: Levels of enforcement escalation

8. EGYPT CASE IN IMPLEMENTING MEPS AND LABELS FOR APPLIANCES

In Egypt, the residential and commercial sectors jointly represent over half of the national energy consumption [8], with the residential sector consuming **38%** and the commercial **sector 15%** as of **2023.** Air conditioning is a major driver of electricity demand in both sectors.

In commercial buildings-particularly high-rise offices-HVAC systems, along with lighting, account for more than two-thirds of total energy use, reflecting the sector's high reliance on thermal comfort technologies [9].

In the residential sector, household appliances comprise **70%** of total consumption, with ACs among the top contributors after lighting and refrigeration [10].This growing dependence on cooling underscores the urgency of implementing efficient programs, such as the Electricity Efficiency Specifications and labeling Program **(EESLP),** which aims to achieve a **10%** reduction in appliance energy use, with a particular emphasis on air conditioning systems [11]. **Figure 7 the consumption pattern of residential and commercial sectors in Egypt.**

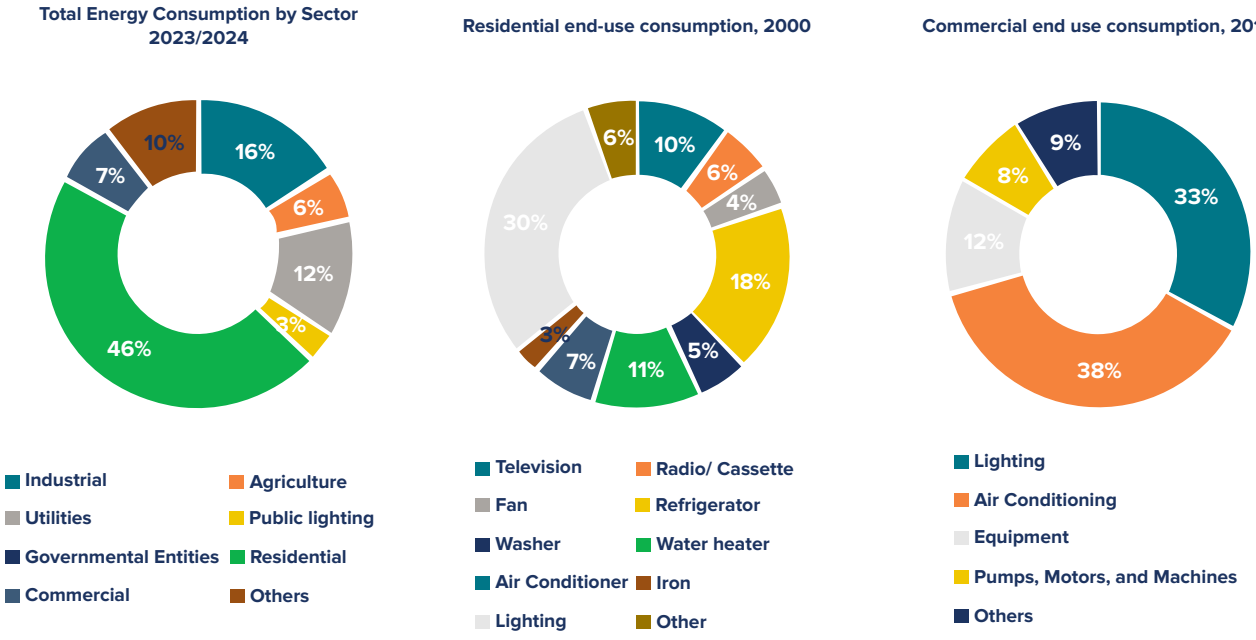


Figure 7: Residential and commercial sectors consumption pattern in Egypt

Egypt's 2022 National Energy Efficiency Action Plan (NEEAP) integrates the **second phase** of the Electricity Efficiency Specifications and labeling Program **(EESLP)**, reinforcing the country's regulatory framework on **(MEPS)** and labeling.

The plan targets a reduction of **12.9 million** toe in annual fuel consumption for power generation by enhancing appliances and building energy standards. **Under the Electricity Law**, energy efficiency labeling is mandated for all electrical equipment, requiring visible placement and penalizing noncompliance through ministerial decree.

The policy also promotes market transformation via equipment replacement programs and encourages public authorities to incorporate energy efficiency grading into the Terms of Reference **(ToR)** during the procurement of electrical appliances **[11].**

8.1 Institutional Framework

Egypt's institutional framework for enforcing **(MEPS)** and labeling is founded on a multi-tiered structure involving key regulatory and technical bodies.

The Egyptian Organization for Standardization & Quality (EOS)[1], in coordination with the Ministry of Industry, leads the development and issuance of **MEPS** and labeling standards & regulations, ensuring stakeholder engagement and legal enforcement.

Technical oversight is supported by specialized entities, including the Ministry of Electricity and Renewable Energy **(MoERE)**, energy efficiency units within various ministries, and accredited testing laboratories such as those under **GOEIC and EOS.**

The Egyptian Accreditation Council (EGAC) ensures the credibility of testing facilities. Enforcement is carried out through the National Authorities. EOS is responsible for approving the testing report and licensing the manufacturer or his legal representative for labeling appliances, control authorities and market surveillance bodies such as the **GOEIC**, the Egyptian Federation of Industries **(EFI)**, and the **Industrial Control Authority (ICA)**which oversee compliance for both imported and locally manufactured appliances.

8.2 Regulatory Framework

Egypt's regulatory framework for energy efficiency is underpinned by a comprehensive set of ministerial decrees mandating the implementation of **(MEPS)** across a broad range of household appliances.

These measures, most notably Decrees **142/2024, 197/2023, 499/2023, and 1002/2017,** are legally binding and aligned with international standards **such as IEC and EU** regulations, except for ACs, which adhere to ISO standards.

1. www.eos.org.eg

Moreover, these specifications, along with the relevant ministerial decrees and references, are summarised in **Table 4.**

The Egyptian Organization for Standardization & Quality (EOS)[2] in coordination with the Ministry of Industry, spearheads the development of these standards, ensuring technical consistency and legal enforceability[14]. While nearly all MEPS are mandatory, a few, such as those for fluorescent lamps, remain voluntary.

The regulatory instruments include detailed technical specifications and mandatory labeling requirements, with penalties for non-compliance, reinforcing Egypt's commitment to reducing energy consumption and aligning appliance performance with national efficiency and sustainability goals. The energy efficiency standards issued for household appliances are listed **as follows:**

1. **Domestic water pumps**
2. **Electric air fans**
3. **Refrigerators and freezers**
4. **Air conditioners**
5. **Dishwasher machines**
6. **Televisions and display screens**
7. **Electric water heaters**
8. **Washing machines**
9. **Vacuum cleaners**
10. **High-quality lighting tasks and Lamps**
11. **Electric boilers (kettle)**
12. **Electric ovens**

	Decree number	Specification number	Name of specification	Applied for	Reference	Mandatory/ Voluntary
1	Decree 445/2024	8441/2024	Environmentally friendly standards for energy efficiency of domestic water pumps	-	(EU) No 547/2012	Mandatory
2	Decree 124/2024	7821/2024	The energy efficiency of household electrical appliances: Methods of measuring and calculating the energy efficiency of electric air fans.	Single-phase AC circuits, 50 Hz, with a voltage not exceeding 250 V.	IEC 60879	Mandatory
3		3794/2024	The energy efficiency of household electrical appliances and similar methods of measuring and calculating the energy consumption of refrigerators with/without freezers and freezers.	Devices operated using AC, 50 Hz and a voltage not exceeding 250 volts for single-phase devices and 480 volts for other devices.	IEC 62552-3/2015	Mandatory
4	Decree 502/2023	3795/2023	Seasonal thermal energy requirements for ACs - Room ACs (window - split).	- Non-ducted, fixed speed AC, - Non-ducted, variable speed with capacity up to 10.55 kW only. - Ducted, fixed speed with capacity up to 20 kW (68,300 BTU/h) only for split units.	ISO 5151, ISO 13253/2017	Mandatory
5	Decree 499/2023	7820/2023	The energy efficiency of household electrical appliances and similar methods 8434 of measuring and calculating the energy efficiency of household electrical energy dishwashing machines.	Single-phase, AC dishwashing machines.	IEC 60436	Mandatory
6		7993 / 2023	Efficient energy of television and display screens.	Electronic displays, including televisions, monitors, and digital signage displays	EU 1062/2010	Mandatory
7	Decree 197/2023	5806/2023	The energy efficiency of household electrical appliances and similar methods of measuring and calculating the energy efficiency of electric water heaters.	Domestic electric water heaters with a tank capacity of up to 150 liters, and a single-phase electrical voltage not exceeding 250 volts. It does not apply to water heaters that use any other energy sources.	IEC 60379/1987	Mandatory
8		8187 / 2023	The energy efficiency of household electrical appliances Methods of measuring and calculating the energy efficiency of electric instantaneous water heaters.	The energy efficiency of household electrical appliances Methods of measuring and calculating the energy efficiency of electric instantaneous water heaters.	Commission Regulation (EU) No 812/2013	Mandatory
9		4100/2023	The energy efficiency of household electrical appliances and similar methods of measuring and calculating the energy consumption of washing machines.	Electric washing machines with a rated voltage not exceeding 250 V, 50 Hz.	IEC 60465/2003 + cor1/2005	Mandatory
10	-	8057 / 2023	Efficient energy of household electrical appliances - Methods of measuring and calculating the effective energy of vacuum cleaners.	Dual-power vacuum cleaners (mains electrical source and battery). It is not applied to vacuum cleaners that operate with water only, vacuum cleaners that operate with dry and water, or vacuum cleaners that operate in both a dry and wet places.	Regulation (EU) No 665/2013 & IEC 62885-2/2016	Mandatory
11	Decree 196/2023	7823-1/ 2023	Efficient energy of lamps and lighting units Part 1: Efficient energy of lamps.	(a) Filament lamps (b) Fluorescent lamps (c) Compact fluorescent lamps	Commission Regulation (EU) No 874/2012 and No 1194/2012	Mandatory
12	Decree 1002/2017	8058 / 2017	The energy efficiency of household electrical appliances Methods of measuring and calculating the energy efficiency of electric boilers.	-	IEC 60350-1/2015 & Regulation (EU) No 65/2014	Mandatory

Table 4: Decrees and relevant specifications issued in Egypt for energy-efficient appliances[15]

2. https://www.eehc.gov.eg/CMSEehc/en/energy-efficiency/energy-efficiency/
3. https://www.eos.org.eg/ar/standardSearch?number=5806&title=&sector=&obligatory=&reference

8.2.1 The Minimum Energy Performance Standards (MEPS) for Air Conditioners

The MEPS for ACs follows ISO 5151 and ISO 13253/2017 requirements. Previously, three separate MEPS[4] were established for each type of AC[15]. However, in 2023, these were consolidated into a single MEPS, 3795/2023, [15][16], for both window and split ACs.

The existing standards for ACs are currently applicable to capacities up to 50-65 TR, with no MEPS set yet for commercial units.

Ministerial decrees typically grant manufacturers and importers a notice period of 6 or 12 months to adjust their specifications and ensure full compliance with the new standards. This grace period allows businesses to adapt to the updated requirements before the decree is enforced in both local and international markets. By offering this transition time, the government aims to facilitate a smoother implementation of the standards, minimizing disruption while ensuring that all products meet the updated specifications.

Furthermore, the Egyptian Electricity Holding Company (EEHC) has set best practices for various appliances to promote energy efficiency and rationalization [14]. These practices play a key role in raising awareness of energy-saving appliances among the public.

The MEPS includes a timetable for implementation and an update of the specifications. The energy efficiency levels of the ACs MEPS of 2024 used (EER) as the performance indicator while the new air conditioner MEPS of 2025 uses (SEER) as the performance indicator for their specifications. This new MEPS will be forced to be implemented starting from January 2025 (see Table 5).

Unit Description	Energy Efficiency Ratio (EER), 2024	Seasonal Energy Efficiency Ratio (SEER), 2025
Ducted AC with fixed-speed compressor	11	9
Non-ducted AC with fixed-speed compressor	11	9.5
Ducted AC with variable speed compressor	-	12
A non-ducted AC with a variable-speed compressor	13	12

Table 5: Energy efficiency level for ACs MEPS of 2024, 2025

8.2.2 Labeling for Air Conditioners

The Minister of Industry and Trade issued necessary decrees establishing minimum consumption standards and requiring energy efficiency labels. This decree also required producers and importers to place energy efficiency labels prominently on their devices, allowing a six-month or twelve-month period for compliance. Different labels are created for various appliances. Figure 8 Shows samples of labels of some appliances approved by EOS, such as refrigerators, ACs, electric water heaters, and automatic washers.

Figure 8: Approved label by EOS (1) air conditioning, (2) refrigerator, (3) Automatic washers, (4) electric water heater [17]

The installation of the energy efficiency card on all relevant appliances ensures transparency in energy usage and contributes to the broader goals of energy conservation and sustainability in Egypt. By informing consumers about energy usage, the energy efficiency card encourages more informed purchasing decisions and promotes the adoption of energy-efficient appliances.

For the ACs label, the energy efficiency levels in the old label of the air conditioners are described as an increase in +, as shown in Figure 8. After reaching A+++++, this scheme becomes unreliable to be used for further enhancing efficiency. Therefore, EOS has issued new energy efficiency levels consisting of S1, S2, S3 ... and S7 as shown in Figure 9.

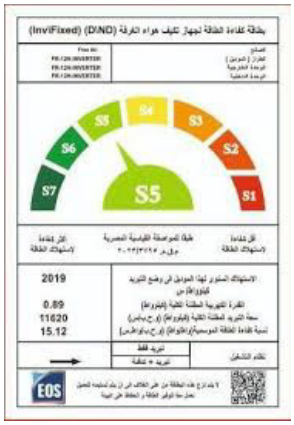


Figure 9: The air conditioner label for 2025

This label is issued based on the energy efficiency level that measures the (SEER).The previous label considered the (EER) as the performance factor.

8.2.3 Testing Capabilities

Egypt has established a robust and technically sophisticated infrastructure for verifying compliance with energy efficiency standards, particularly through enhanced testing and certification processes.

The Ministry of Industry and Foreign Trade, supported by entities like EOS, NREA, and EGAC, has implemented stringent monitoring mechanisms and invested in upgrading laboratories accredited under ISO/IEC 17025:2017[18]. These facilities ensure standardized testing procedures and are supported by an online platform for test registration, allowing real-time data integration and enforcement tracking.

Accreditation and periodic inspections, especially at major ports and industrial zones, help prevent the circulation of non-compliant appliances and reinforce the regulatory framework for both local and imported goods.

A decentralized yet harmonized institutional framework supports testing of a wide array of appliances across multiple certified labs. **Notably, EOS, GOICA , and NREA** operate overlapping appliances such as electric refrigerators, electric washers, and electric air conditioning to validate the energy performance of common household devices, while **EGAC** oversees the accreditation process. **[19],[20]. GOIEC** has a large number of quality testing laboratories **(~ 133 labs)**[8] to control the quality and safety of products according to the Egyptian standard specifications or the international standard specifications, which enhances throughput and resilience.

The industrial laboratories test the shipments of imported appliances according to Ministerial Resolution **No. 770 of 2005,** in addition to testing the shipments of appliances that the external customer requests to be tested according to the national standard specifications and international standard specifications.

This procedure is applied to protect consumers and customers from commercial fraud or importing a type that violates the terms of import contracts and national and international standard specifications.

The testing protocols follow international benchmarks, such as **IEC and ISO,** but are interpreted through national standards, ensuring contextual relevance and local compliance while aligning with global efficiency norms.

Air conditioning systems are a focal point within **Egypt's testing** ecosystem due to their high energy intensity in both residential and commercial sectors. Dedicated labs at **NREA** assess fixed-speed and variable-speed units[9]. Collaborating with the General Authority for Export and Import Control, **the EOS, and local companies** have the capability to test up to **65,000 BTU/h** for split systems and **36,000 BTU/h** for window units[17]. conforming to **ISO 5151** and Egyptian Standard **3795.**

These facilities are instrumental in enforcing MEPS through regulatory decrees like Decision **No. 171/2011,** which mandates before market entry. **Over 2,100** fixed-speed units and **150 variable-speed** units have been tested, underscoring the critical role these laboratories play in sustaining national energy efficiency objectives and curbing electricity demand from cooling systems.

8. 1.Cairo International Airport 38 laboratories
2.Alexandria Port 12 laboratories
3.Dekheila Port 22 laboratories
4.Port Said Port 14 laboratories
5.Industrial laboratories in East El-Tafria 12 laboratories under construction
6.Damietta Port 13 laboratories
7.Industrial laboratories in Suez - Adabiya Port 2 laboratories
8.Industrial laboratories in Suez - Sokhna Port 20 laboratories (modern laboratories)

Non-ducted AC testing and performance rate specifications are set based on **ISO 5151: 2017 /AMD 1:2020 - testing** and rating for performance[21]. The testing procedures follow the same international specifications; however, the results of the tests follow the local specifications **ES 3795.**

A laboratory management agreement was signed with **EOS and NREA.** The cost for setting up the testing labs was **USD 4.2 million. NREA** comprises two laboratories for air conditioners: one for fixed speed ACs established **in 2010,** and the second is variable speed ACs established **in 2020.** All labs undergo periodic reviews by the Egyptian Accreditation Council **(EGAC)** to renew their certification[17].

The Energy Efficiency Testing Laboratory for Variable Speed ACs was established **in 2020** in collaboration with the Energy Efficiency Improvement Project to uphold Egyptian standards and ensure compliance with energy efficiency labels. It tests both locally manufactured and imported variable-speed air conditioning units, including ducted and ductless models. **The laboratory** evaluates split units adhering to Egyptian Standard **3795.** So far, **over 150** tests have been conducted [17].

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