



The United Nations
Environment Programme/
Global Environment Facility
en.lighten initiative



THE RAPID TRANSITION
TO ENERGY EFFICIENT LIGHTING:
AN INTEGRATED POLICY APPROACH





Mr. Achim Steiner

UN Under-Secretary General and
UNEP Executive Director

The en.lighten initiative is one of the most remarkable public private partnerships to emerge in the context of international climate change efforts. By promoting a globally coordinated effort, the project aims to accelerate the transition to efficient lighting to mitigate climate change, while delivering a more reliable electricity supply and increased energy security to developing and emerging countries.

The initiative has set the target to achieve the global phase-out of conventional incandescent lighting by the year 2016. This is an ambitious goal but it is already happening in many parts of the world. With the creation of the Global Efficient Lighting Partnership, which helps countries to develop both the policy template and also practical measures, a worldwide phase-out by 2016 is not only possible but infinitely achievable.

I encourage countries to mobilize to ensure that existing resources are utilized in a sustainable manner in order to reduce dangerous carbon emissions. The transition to energy efficient lighting is one of the most straightforward and cost-effective approaches to significantly reduce the threat of global climate change and improve the quality of life for citizens of the world. UNEP and its partners would like to invite countries to join this important effort and become members of an international community committed to delivering a brighter and more sustainable future.



Dr. Naoko Ishii

CEO and Chairperson
Global Environment Facility

Throughout its 22-years history, the GEF has championed efforts to remove market barriers and other obstacles to achieving greater energy efficiency. As a significant public sector investor in energy efficiency, the GEF has devoted substantial effort to efficient lighting initiatives as part of the more than 230 energy efficiency and technology transfer projects implemented by the GEF in developing and emerging countries around the world.

The GEF is pleased to have launched the en.lighten initiative, working in cooperation with partners to help accelerate global market transformation to energy-efficient lighting. Improvement in the efficiency of lighting directly reduces pressure on energy supplies, decreases harmful pollution, saves consumers money, provides net savings for national and local governments, and promotes overall economic development.

To ensure a sustainable transition to efficient lighting, the GEF supports the en.lighten initiatives' focus on impacting policies and regulatory frameworks as well as standards and labels. Providing country-specific support ensures that replacement lighting technologies meet global minimum standards and are disposed of in an environmentally sound manner at end-of-life.

Investments in energy efficiency, such as lighting, reflect the vision of the GEF as a partner of choice and a champion of the global commons. We greatly value our partnership with the public and private sectors through the en.lighten initiative, and we are committed to promoting energy-efficient lighting as a pivotal way to meet the climate change challenge.

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THE NUMBERS SPEAK

Simply shifting to more efficient lighting technologies in all lighting applications would:

- Save electricity equivalent to the output of more than 250 large coal-fired power plants
- Reduce global electricity consumption by approximately 5%
- Reduce annual CO₂ emissions by at least 490 million tons
- Be equivalent to taking more than 140 million mid-size cars off the road
- Avoid the construction of 252 power plants which is equivalent to US \$210 billion in investments saved

5%

less global electricity consumption

490

million tons reduced annual CO₂ emissions

250 large coal-fired power plants

252 power plants us \$210 billion in investments saved

2

140 million cars



THE UNTAPPED POTENTIAL OF ENERGY EFFICIENT LIGHTING

Electricity for lighting accounts for almost 20% of electricity consumption and 6% of CO₂ emissions worldwide. According to the International Energy Agency, approximately 3% of global oil demand can be attributed to lighting. If not addressed immediately, global energy consumption for lighting will grow by 60% by the year 2030. This would have dramatic consequences for climate change. The phase-out of inefficient incandescent lamps and their replacement with higher efficiency products such as light emitting diodes (LEDs) or compact fluorescent lamps (CFLs) provides one of the most straightforward and cost effective ways to significantly reduce carbon emissions.

The gap between electricity supply and demand in most developing and emerging countries is increasing rapidly however, that demand is not being met due to the high cost of new power generation and increasing fuel prices. Energy efficient lighting can greatly reduce peak energy load. In addition, efficient lighting could significantly increase the utilization of available power without having to build expensive generation facilities. For example, India would be able to electrify 41 million homes, and South Africa 8 million homes, from transitioning to efficient lighting. In a time of global recession, avoiding the construction of new power plants is financially critical to any country.

Despite technological improvements and the impending climate threat, most developing and emerging countries have not taken steps to transition to energy efficient lighting. Some countries may be unsure about how to begin their own transition, while others may be skeptical about the potential benefits or lack the necessary resources and capacity. The en.lighten initiative is poised to accelerate the efforts that have already begun, with the environmental leadership of some countries, to reduce dangerous carbon emissions and the threat of global climate change.

Policymakers should consider the direct energy and cost savings benefits associated with a transition to energy efficient lighting and take into account the resulting associated benefits – political, economic and environmental. The United Nations Environment Programme (UNEP) together with the Global Environment Facility (GEF) and its partners, encourage countries to join the other nations who have made the decision to combat the global climate threat while improving the quality of light, and life, for their citizens.



3

off the road



AN INTEGRATED POLICY APPROACH TO EFFICIENT LIGHTING

Countries around the world are beginning to phase out inefficient incandescent lamps. Some developed countries have established effective approaches to eliminate inefficient lamps via mandatory minimum energy performance standards. Other countries such as Chile, Jordan, the Philippines and Tunisia are planning phase-out activities. China has announced that it will complete its transition to efficient lighting by 2016. To mobilize efforts to make a global transition a reality, UNEP has convened governments and international lighting experts from over 40 organizations to provide guidance on the development and implementation of successful National Efficient Lighting Strategies. These strategic recommendations have been incorporated into a flexible and innovative approach which ensures that the transition activities are assimilated into national policy and will include environmentally sound management considerations.

Policy Recommendations

Following an integrated policy approach will significantly increase the likelihood of a successful transition to efficient lighting, leading to national financial, energy and environmental benefits. It will also streamline the process for those involved in designing and implementing policy.

The en.lighten recommendations constitute the most effective way of achieving a global transition to energy efficient lighting and include:

- Minimum energy performance standards (MEPs) to ensure the efficiency and quality of energy-saving lighting products;
- Supporting policies and mechanisms to restrict the supply of inefficient lighting and promote the demand for energy-saving products;
- Monitoring, verification and enforcement (MVE) programs to discourage the distribution of non-compliant products;
- Environmentally sound management including; establishing maximum mercury content limits and setting up collection, sound disposal and/or recycling programmes for spent lamps.

National Efficient Lighting Strategy

An integrated policy approach ensures that all pertinent policy aspects related to energy efficient lighting are considered in the development of a National Efficient Lighting Strategy.

Each country should determine how the elements of the integrated policy approach fit within their national context and ensure that all relevant authorities and stakeholders are involved to guarantee a consensus-based process in the development of a National Efficient Lighting Strategy. Participating national stakeholders include: ministries related to energy and the environment; distribution companies; energy efficiency agencies; private sector organizations and civil society groups.

Once the National Efficient Lighting Strategy has been finalized and approved by all relevant stakeholders, countries should ensure the support and cooperation of high level authorities to guarantee the full adoption and implementation of the strategy into the existing national regulatory framework.



1 Minimum Energy Performance Standards

Minimum energy performance standards (MEPS) are regulatory measures specifying minimum efficiency levels acceptable for products sold in a particular country or region. MEPS define what products can be marketed and which ones should be eliminated. MEPS are the foundation from which to ensure the success of any efficient lighting transition.

Countries should define the parameters, stringency and implementation period. Performance standards should specify the maximum permissible energy consumption limit for a given lumen output, or the minimum efficacy that a product must meet. Additional lighting quality guidelines may be stipulated, for example, rated lifetime, lumen maintenance and colour temperature.

MEPS legislation includes or refers to product labelling requirements. The enlighten initiative can analyse MEPS to assist countries to establish their national levels and to reduce the possibility of incompatible approaches which would limit the widespread acceptance of energy efficient lamps. Countries are encouraged to review existing standards to learn from best practices.

Country Action: Develop MEPS to ensure that high performance and good quality products are available in countries. MEPS should be based on national and regional conditions while taking into account global activity and technology evolution.

2 Supporting Policies and Mechanisms

MEPS provide the baseline that determines the performance and quality of the products accepted into a market. In order to ensure the effectiveness and smooth implementation of MEPS, a range of complementary policies and measures can be implemented.

The success of any National Efficient Lighting Strategy depends, in part, on the selection and combination of complementary policies to meet the specific needs of a country, including:

- Regulatory and control mechanisms: laws and implementation regulations that require certain devices, practices or system designs to improve energy efficiency;
- Economic and market-based instruments: market mechanisms that are often initiated and promoted by regulatory incentives but can contain elements of voluntary action or participation;

- Fiscal instruments and incentives: mechanisms that impact prices, such as taxes aimed at reducing energy consumption or financial incentives to overcome initial cost differences;
- Information and voluntary action: initiatives that persuade end users to change or modify their behaviour by providing relevant information and examples of successful implementation.

Country Action: Supporting policies and mechanisms should be established to ensure the successful implementation of MEPS. These mechanisms should be carefully designed by government and national stakeholders on the basis of the country conditions and circumstances.

3 Monitoring, Verification and Enforcement Systems

The success of a transition strategy depends heavily on a well-functioning system of monitoring, control, and testing facilities capable of ensuring enforcement and full compliance with MEPS. Unless effective and timely market surveillance systems are enforced, substandard products will continue to enter national markets in increasing numbers, reducing energy and financial savings. Poor quality products may also create unfulfilled expectations and disappointment on the part of end users who will refrain from purchasing these products on an ongoing basis in the future.

The aim of compliance activities is to protect citizens from products that fail to perform as declared in order to guarantee that satisfaction is in line with expectations. Additionally, they ensure that government regulators fulfil the objectives of their efficient lighting initiatives. The same activities also protect suppliers by ensuring that each manufacturer is subject to the same programme entry conditions.

Monitoring, verification and enforcement (MVE) activities encompass a wide range of actions:

- Monitoring is a measurement process to verify product efficiency;
- Verification is the measurement process through which declarations of

conformance by lighting suppliers are confirmed;

- Enforcement is the action taken by programme administrators or other responsible parties against suppliers of non-compliant products.

Policymakers and programme implementers should integrate MVE activities into every aspect of their lighting programme. To enhance the MVE capacity of various countries, the sharing of information and skills between countries and across regions provides an effective means through which to promote best practice quickly and thoroughly. Governments should therefore, devote more attention to existing programmes for the transfer of expertise and information. International and regional cooperation for enforcement through the sharing of test capacities, programmes and test data, is highly recommended for conducting cost-effective and efficient MVE activities.

Country Action: Design and implement monitoring, verification and enforcement measures to ensure that products in the market comply with the established MEPS. These measures should be adapted to specific country and market conditions to ensure that only quality products are available to end users.

4 Environmentally Sound Management of Lighting Products

Maximum mercury and other hazardous substance content standards should be established in line with global best practice. Ensuring the availability of quality lamps in the market and verifying their compliance with maximum mercury limits is essential to minimize health and safety risks.

Special attention should be given to the development of a legal framework for environmentally sound, end-of-life activities, making this a high national priority and ensuring coordinated law enforcement. Policy and legislation should be carefully drafted and implemented before the establishment of formal collection channels and recycling facilities. These are key areas of sustainability in lighting that merit the attention of national regulators in their efforts to implement a comprehensive lighting policy.

These recommendations reflect global international initiatives addressing hazardous waste such as the "Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal," and the "Intergovernmental Negotiating Committee" for the development of a legally binding agreement on mercury.

Country Action: Engage in environmental sustainability actions, including the reduction of mercury levels in lamps to the maximum allowable level, in line with global best practice, and ensure that legislation and environmentally sound end-of-life systems are established for spent lamps.





THE GLOBAL EFFICIENT LIGHTING PARTNERSHIP PROGRAMME

The Global Efficient Lighting Partnership Programme is a voluntary opportunity for countries to work with en.lighten to achieve a coordinated national or regional transition to efficient lighting. The en.lighten initiative, along with its international partners, supports national regulators or regional bodies in the development of lighting specific regulatory measures to phase-out inefficient light sources. Regulatory measures can directly influence the efficiency of electrical products thus, they constitute the most cost-effective and sustainable method for implementing energy efficient lighting programmes.

The Partnership assists countries to develop policies, strategies and actions for the phase-out of inefficient lighting products and to bring more innovative and energy efficient lighting technology into the mass market. It was established to help develop a set of common objectives for all participants; provide technical support to reach these goals within a given timeframe; assist each participant to identify mutual barriers; and, in some cases, reveal opportunities to combine resources for efficiency and financial reasons. This transparent process of coordinating activities across countries in pursuit of a common objective can also reduce the costs of compliance for manufacturers which will encourage them to deliver high quality products at acceptable prices so that a self-sustaining market for efficient lighting can be created.

Comprehensive Support

The en.lighten initiative has developed informative and practical tools to support committed countries in their efforts to transition to efficient lighting to reach the global phase-out target of 2016.

- Country Lighting Assessments - analyze the potential benefits gained through the global adoption of efficient lighting and provide country-specific estimates for potential energy savings, CO₂ reductions and financial gains;
- Energy Efficient Lighting Toolkit - delivers best practice guidance on policy and provides technical and practical tools for those directly involved in country phase-out activities;
- Global Policy Map - rates activity level for four elements of the integrated policy approach in the residential sector and shows the readiness of countries to transition to efficient lighting;
- Online support centre - includes targeted technical advice for countries, as well as webinars and training videos to improve understanding about executing a transition to efficient lighting;
- Centre of Excellence - comprised of over 50 lighting experts representing over 30 countries - offers recommendations, technical guidance and efficient lighting expertise to assist countries in the transition to energy efficient lighting;
- UNEP Collaborating Centre for Energy Efficient Lighting, the Global Efficient Lighting Centre China - offers a wide range of services to developing countries including laboratory testing and technical support.

UNEP/GEF en.lighten initiative

The en.lighten initiative was established to accelerate a global market transformation to environmentally sustainable lighting technologies by developing a coordinated global strategy and providing technical support for the phase-out of inefficient lighting. This will lead to a significant reduction of global greenhouse gas (GHG) emissions to mitigate climate change.

en.lighten assists countries in accelerating market transformation with environmentally sustainable, efficient lighting technologies by:

- Promoting high performance, energy efficient technologies and highlighting best practice initiatives in developing and emerging countries;

- Developing a global policy strategy to phase-out inefficient and obsolete lighting products resulting in the reduction of GHG emissions from the lighting sector;
- Substituting traditional fuel-based lighting with efficient alternatives, with an emphasis on environmentally sound management practices.

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