



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



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



1972-2012:
Serving People
and the Planet

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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.



Monique Barbut

GEF CEO and Chairperson

For the past two decades, the GEF has championed efforts to expand efficient lighting to developing countries throughout the world. A number of energy efficient lighting initiatives have been implemented and other projects are in the process of being executed in Africa, Asia, Eastern Europe and Latin America and the Caribbean with the support of the GEF.

The GEF is pleased to be working in cooperation with the en.lighten initiative and its partners in governments, civil society and private sector organizations to help accelerate market transformation to efficient lighting technologies on a global scale. To make this transition a reality, governments and international lighting experts have been brought together to share expert guidance on the development and implementation of successful national efficient lighting strategies. Providing country-specific support will lead to the rapid phase-out of incandescent lamps in exchange for efficient alternatives while ensuring that replacement products meet global minimum standards and that spent lamps are disposed of in an environmentally sound manner. By establishing a holistic approach, we are building a brighter future today and for future generations to come.





THE NUMBERS SPEAK

Simply shifting to more efficient lighting technologies from inefficient incandescent lamps in all lighting applications would:

- Save electricity equivalent to the output of more than 400 coal-fired power plants;
- Reduce global electricity consumption by approximately 2.5%;
- Reduce annual CO₂ emissions by at least 230 million tons;
- Be equivalent to taking more than 50 million cars off the road;
- Avoid the construction of 136 power plants which is equivalent to US \$113 billion in investments saved.

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50 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. Efficient lighting can greatly reduce peak energy load. In addition, moving to efficient lighting could significantly impact the ability to harness existing power without having to build expensive generation facilities. For example, India would be able to electrify 35 million homes, and South Africa 4 million homes, from the power saved from replacing all existing incandescent lamps with energy efficient alternatives. 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 around the world have not taken steps towards the transition to energy efficient lighting. Countries that have not made the shift may be unsure about how to begin their own transition, while others may be skeptical about the potential benefits or are lacking 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 around the world.

Policymakers should not only consider the direct energy and cost savings benefits associated with a transition to energy efficient lighting but should also take into account the associated benefits – political, economic and environmental – that can result from such a conversion. 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.





AN INTEGRATED POLICY APPROACH TO EFFICIENT LIGHTING

Countries around the world are beginning to phase out conventional incandescent lamps. Some developed countries have established effective approaches to eliminate inefficient lamps by employing mandatory minimum energy performance standards. Other countries such as Argentina, Brazil, Colombia, Cuba, Ecuador, Ghana, Mexico, Senegal and South Africa have also begun or completed phase-out activities, and 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 include environmental sustainability considerations.

Policy Recommendations

Following an integrated policy approach will significantly increase the likelihood of a successful transition to efficient lighting which, in turn, will lead 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;
- Environmental sustainability actions including establishing maximum mercury content limits and setting up collection, sound disposal and/or recycling programmes for spent lamps.

Integrated Policy Approach

An integrated policy approach ensures that all pertinent policy aspects related to energy efficient lighting are considered in the development of a national or regional efficient lighting transition strategy. This includes four strategic priorities:

- Development of minimum energy performance standards (MEPS);
- Supporting MEPS with complementary policies and other mechanisms;
- Monitoring, verification and enforcement (MVE);
- Environmentally sound management of lighting products.

Each country should determine how these priorities fit within their national context. In addition, an integrated approach involves all relevant authorities and stakeholders to ensure that this strategic approach is a key part a transition process. This includes Ministries of Energy, Ministries of the Environment, energy efficiency agencies, private sector organizations and civil society groups.

Establishing an integrated National Efficient Lighting Strategy will ensure the proper approach to affect the elimination of other inefficient lamp technologies in the future which will result in significant energy and financial savings.



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 strategy.

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 en.lighten 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 costs;
- 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. en.lighten, 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 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 provides country-specific estimated for potential energy savings, CO₂ reductions and financial gains;
- Efficient Lighting Toolkit - delivers best practice guidance on policy provides technical and practical tools for those directly involved in country phase-out activities;
- Detailed guidance document - provides step-by-step direction for the development of National Efficient Lighting Strategies in individual countries and regions;
- Online support centre - includes targeted technical advice for countries, 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 shift to energy efficient lighting;
- Regional Workshops - raise awareness and impart knowledge with comprehensive regional reports created for each session;
- UNEP Collaborating Centre for Energy Efficient Lighting, China - offers a wide range of services to developing countries including laboratory and technical support.

The 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 products.

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