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POLICY GUIDE SERIES

Accelerating the Global Adoption of ENERGY-EFFICIENT AND CLIMATE-FRIENDLY AIR CONDITIONERS

20 per cent of **residential electricity** is used to power air conditioners

The global air conditioner stock is expected to increase from **660 million units** in 2015 to more than **1.5 billion units** by 2030

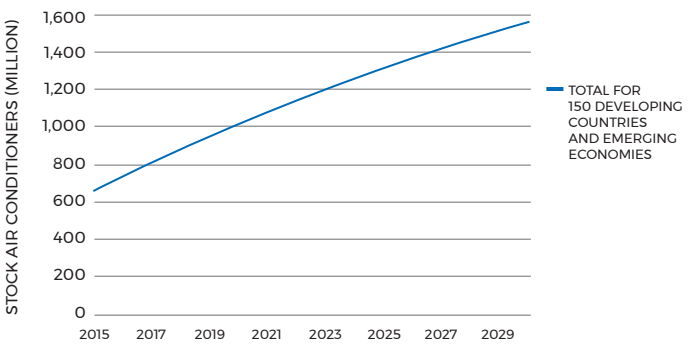
Developing and emerging economies can reduce annual air conditioner electricity demand by **30 per cent** and mitigate **480 million tonnes** or more of **CO_2 emissions** in 2030

United for Efficiency helps these countries transform their markets for air conditioners using a **proven Integrated Policy Approach**

BACKGROUND

Air conditioning brings a welcome improvement to the health, productivity and quality of life of people living in warm climates. Its use is growing rapidly around the world, which poses significant challenges for electricity grids and the climate.

About 20 per cent of residential electricity in warm climates is used for air conditioning. Peak power consumption by air conditioners can threaten the stability of electrical grids, particularly on hot summer days when units are operating at full capacity at the same time. Expanding economies and growing populations are driving ever more demand for these products.



The total number of air conditioners in use is growing rapidly.
Source: United for Efficiency Country Assessments, 2016.

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Over 40 countries have energy efficiency regulations to mitigate the impacts of these products. Many developing and emerging economies have no such policies, so outdated technologies remain common and a lot of electricity is wasted.

Refrigerants released during maintenance, leaking over the course of normal operation, or vented at the end of the product life can be harmful if not handled and processed appropriately. Depending on the type, refrigerants can damage the ozone layer, contribute to climate change, are flammable, and/or are toxic.

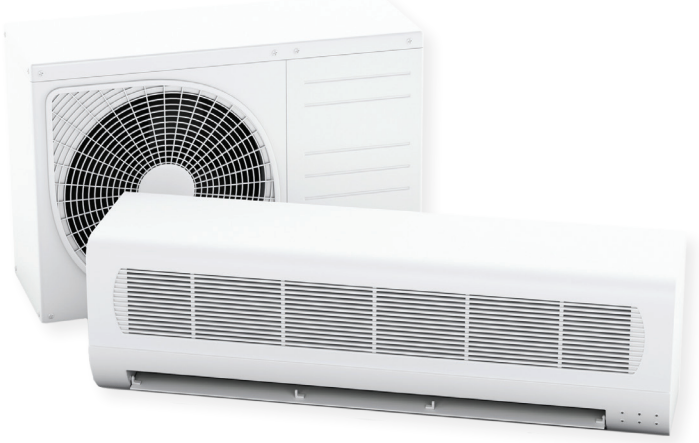
The overall climate impact of an air conditioner varies significantly depending on the performance of the equipment (e.g. how much electricity it uses, and the indirect emissions from generating and delivering that electricity) and the type of refrigerant (e.g. the global warming potential of the refrigerant and the direct emissions when that refrigerant leaks or is vented).

WHY LEAPFROG TO ENERGY-EFFICIENT AND CLIMATE-FRIENDLY AIR CONDITIONERS?

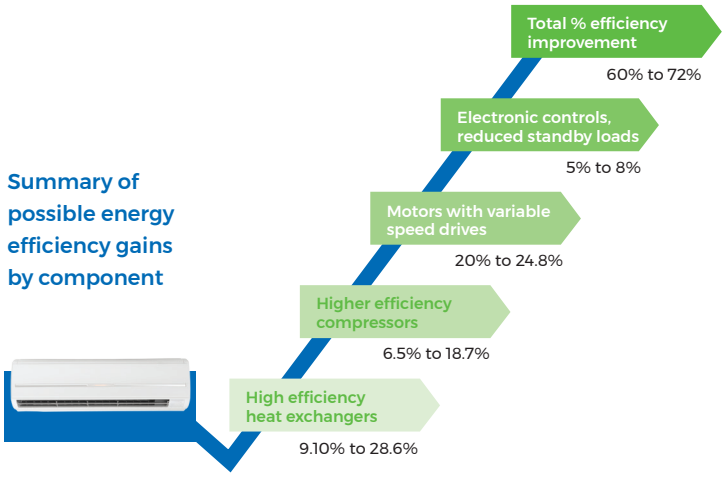
The global air conditioner stock is expected to increase from 660 million units in 2015 to more than 1.5 billion units by 2030. Now is the time to ensure that this demand is met by energy-efficient and climate-friendly products.

Getting this transition right unlocks multiple benefits for governments, businesses and consumers. There are plenty of useful examples from around the world of lower electricity bills for residents and businesses, reduced peak loading at power plants and related pollution, less harmful refrigerants released in the air, and less material sent to landfills.

These benefits can only be realised through a widespread and lasting shift to energy-efficient and climate-friendly technologies.

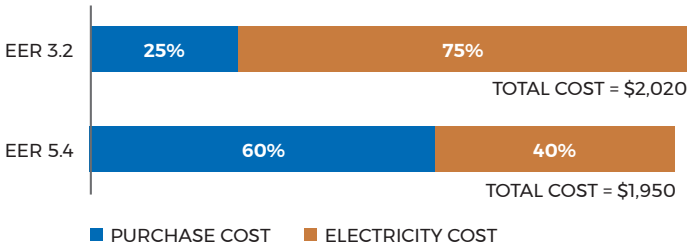


Fortunately, there are proven ways to accelerate the adoption of such products and to eliminate outdated technologies from the market. **Well-designed and implemented policies can enable governments to reduce annual electricity demand for air conditioning by 30 per cent or more and save 480 million tonnes of CO_2 emissions in 2030.** Moreover, a number of technologies are readily available to enhance the performance of air conditioners.



Various efficient technologies and components can improve the energy efficiency of air conditioners.

Energy-efficient and climate-friendly air conditioners typically have a higher up-front price, but this investment is returned over time in the form of lower electricity bills. The total cost of ownership over the lifetime of the air conditioner can be much lower for an efficient unit. The payback time varies depending on the purchase price, hours of operation, and the cost of electricity.

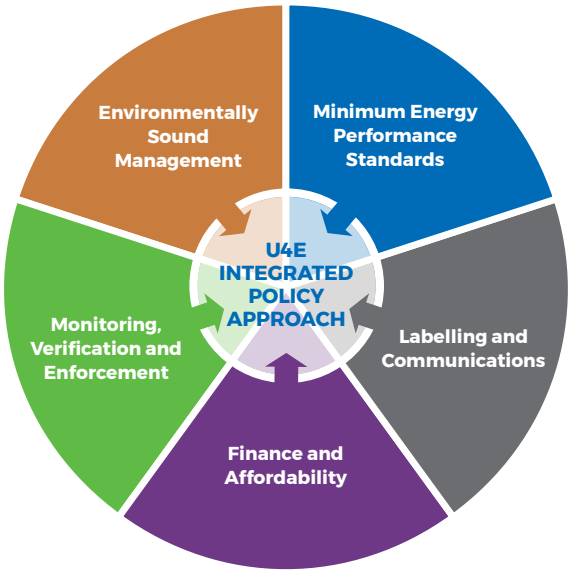


Example from India on the total life cycle cost of 1.5 tonne air conditioners with a lower energy efficiency rating of 3.2 or higher energy efficiency rating of 5.4.

RECOMMENDATIONS TO POLICYMAKERS

Policymakers are encouraged to follow United for Efficiency's *Integrated Policy Approach* to transform their air conditioner markets. A national strategy for air conditioners should be developed to show how such a transformation is to unfold in the years ahead.

The strategy development process brings key stakeholders together to foster a shared vision for the market and to identify the resources and mechanisms needed to pursue it. The goal is clarity for consumers, sellers and manufacturers on the current status and future trajectory of the sector, and their role in the process.



Neighbouring countries should harmonise policies and share resources and experience to the extent practicable. The aim is to lower trade barriers for energy-efficient and climate-friendly products and to minimise the costs to implement their strategies. For example, products can be tested at one laboratory in the region rather than conducting separate testing in each country.

An Integrated Policy Approach includes:

Standards are essential to market transformation. Mandatory minimum energy performance standards and stipulations for noise levels, refrigerant properties, rated lifetime, and cooling capacity should be adopted. Adopt ISO 16358 for testing cooling capacity and performance. Technical, economic and market analysis should be conducted to inform the standards-setting process.

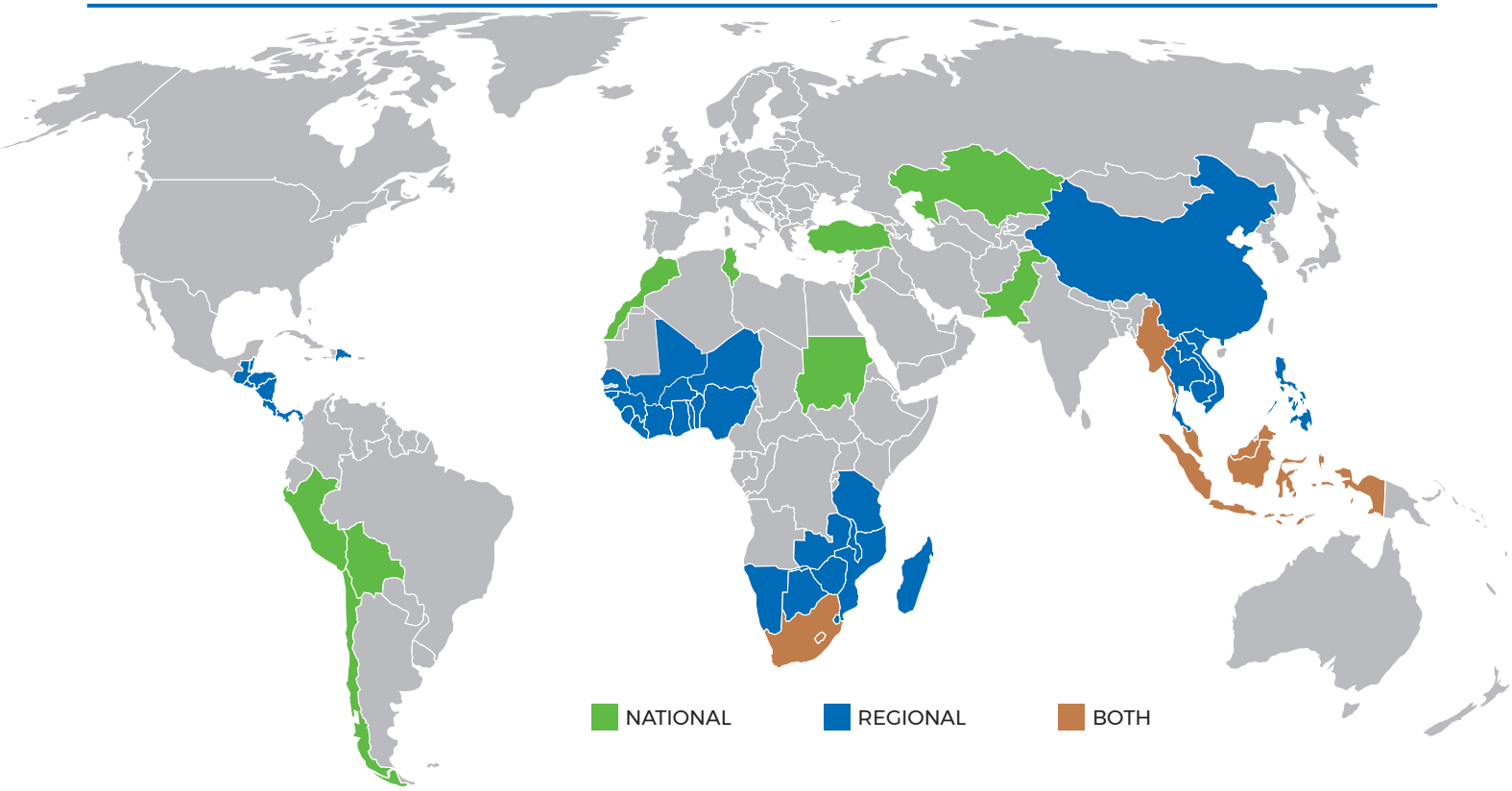
Labelling and communications support standards by ensuring that information about products is clearly and consistently conveyed. Labels may include an endorsement of performance, a comparison of the product to other products and/or additional information to help purchasers make informed decisions. Countries should consider using a well-recognised existing label to minimise trade barriers and compliance costs for manufacturers. Awareness campaigns should help people and businesses understand their role in market transformation, such as how to apply labelling information in their purchasing decisions and how changes in their habits impact electricity use.

Monitoring, verification and enforcement ensures the integrity of market-transformation. Programme administrators must oversee products sold in the market, help verify compliance with standards and labels (e.g. through product testing), enforce these requirements, and report the results so that consumers and businesses trust and benefit from air conditioners that meet their energy and quality claims. The Energy Efficiency Ratio (EER) or Seasonal Energy Efficiency Ratio (SEER) - depending on the countries' level of experience with standards and the local context - should be used as a metric for assessing product performance.

Financial mechanisms help address the barriers to investment in energy-efficient and climate-friendly products, such as higher purchase prices and uncertainty of the life-cycle cost savings. Public procurement officials, consumers and businesses may use a variety of approaches – existing budgets, bulk procurements, grants, rebates, loans, leases, utility bill financing schemes, credit guarantees and so on – to scale-up investments.

Environmentally Sound Management and Health considerations are crucial to ensure products do not cause undue harm to people or the planet during manufacturing, operation, or recycling and disposal. Ensure compliance with safety requirements, such as ISO 5149 and IEC 60335-2-40. Consider the implications of the phase-out of some existing refrigerants under the Montreal Protocol and the emergence of new refrigerants when assessing requirements for mandatory and voluntary policies and programmes. Collect and process the steel, copper, aluminium, plastics and the refrigerant at the end of the product life.

CURRENT UNITED FOR EFFICIENCY NATIONAL PROJECTS AND REGIONAL HARMONISATION ACTIVITIES



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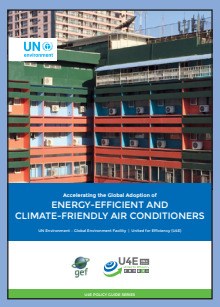
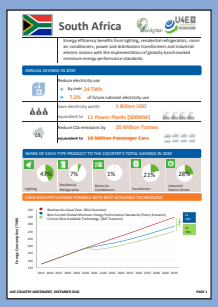
ABOUT UNITED FOR EFFICIENCY

United for Efficiency is a global initiative led by UN Environment, funded by the Global Environment Facility, and supported by leading companies, expert organisations and public entities with a shared interest in transforming markets for lighting, appliances and equipment.





Download the full policy guide and review the 150 United for Efficiency Country Savings Assessments at our website.

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