



PRODUCT EFFICIENCY CALL TO ACTION

FREQUENTLY ASKED QUESTIONS

The Product Efficiency Call to Action aims to set countries on a trajectory to double the efficiency of four key globally traded products - air conditioners, lighting, industrial motor systems, and refrigerator-freezers - by 2030. These products account for over 40% of global electricity consumption.

ABOUT THE CALL TO ACTION

WHAT IS THE PRODUCT EFFICIENCY CALL TO ACTION?

As part of the COP26 Energy Transition Campaign, the UK and IEA have launched a Product Efficiency Call to Action. Our mission is to promote ambitious energy efficiency standards for electrical appliances and equipment. We have two key aims:

1. To drive international ambition that is consistent with the aim of doubling the efficiency of key products sold globally by 2030; and
2. To strengthen the Super-efficient Equipment and Appliances Deployment initiative (SEAD) to support countries in achieving raised ambition more quickly, easily and at a lower cost.

WHY THE CALL TO ACTION?

The Call to Action's primary focus is on four key internationally traded products, which together account for over 40% of global electricity consumption. Doubling the energy efficiency of these products would bring substantial energy demand savings, avoid greenhouse gas emissions, promote business innovation, and ensure consumer access to affordable and high-performing technologies. Additional national benefits include improved air quality, health, jobs, grid stability, energy security, and supporting a clean and resilient economic recovery from the COVID-19 crisis.

The Call to Action's objectives are supported by evidence from [modelling](#) and a range of other studies showing the significant benefits of policies and measures designed to achieve a doubling of efficiency.

WHO CAN JOIN THE CALL TO ACTION?

Any government is welcome to join the Product Efficiency Call to Action. Non-SEAD members can commit to the Product Efficiency Call to Action and are strongly encouraged to become members of SEAD as well.

A range of business and [civil society groups](#) have also endorsed the Call to Action.

HOW CAN I JOIN THE CALL TO ACTION?

Governments can join the Product Efficiency Call to Action by signing the [Joint Statement](#).

To join, please contact the SEAD Initiative: superefficient.org or sead@iea.org

WHAT HAPPENS AFTER COP26?

The SEAD Initiative Secretariat will support signatories to achieve the aims of the Call to Action by providing knowledge, skills and access to networks. A range of well-understood policies can help countries deliver high-ambition progress on product efficiency. To support these efforts, the IEA has developed the Energy Performance Ladder framework, which will be available to support alignment of policy to raise efficiency more rapidly and effectively.

The progress of commitments will be tracked through SEAD and using data published by countries and companies. This tracking will allow SEAD's modelling approach to measure the energy savings from the Call to Action to be updated and also aligned with country commitments.

Countries can publish their commitments through product policy frameworks and roadmaps, Nationally Determined Contributions (NDCs), National Cooling Plans, and Energy Compacts, as appropriate for their national circumstances, and share the documents with the SEAD secretariat.

THE DOUBLING GOAL

WHAT DOES THE AIM OF DOUBLING ENERGY EFFICIENCY MEAN?

A doubling of efficiency would mean a 50% reduction in the average energy consumption of new units or systems of four key products sold. For residential air conditioners, refrigerators and general service lamps, there are already products globally available that are twice as efficient as those typically found in many markets. For industrial electric motors, which are generally already efficient, it is still possible to halve the losses in motors as well as within wider motor-driven systems. For motor-driven systems, which can include components such as variable speed drives and mechanical coupling, it is possible to reduce losses through measures such as early motor replacement, better sizing and improved control.

Countries will work towards this collective global goal with actions at home and abroad—at home through policy and investment (public and private) and abroad through aid, trade and diplomacy.

The impact will be calculated on an aggregate basis, i.e., reductions greater than a doubling might happen for some products and less for others, however as long as overall the collective effort achieves a doubling then this will be considered as meeting the goal.

WHAT ARE THE LIKELY SAVINGS FROM DOUBLING EFFICIENCY?

Using a simple model, initial indicative savings from doubling the energy efficiency of four priority products have been estimated. Across the world, doubling the efficiency of industrial motor systems, air conditioners, refrigerators, and lighting could reduce energy consumption by **6,700 TWh per year** globally, equivalent to the generation of more than 3,000 medium-sized coal-fired power plants,¹ and avoid **2.9 Gt of CO₂ emissions per year**. This estimate is based on a hypothetical scenario whereby all of the product stock is replaced in 2030 with stock that is twice as efficient.

In reality, the timing and size of savings are dependent on the speed and ambition of implementation to improve the efficiency of products sold.

HOW DOES THIS COMPARE TO PAST COMMITMENTS?

Based on the countries that have already signed the Joint Statement, this commitment now surpasses the largest efficiency commitment to date, the [Global Lighting Challenge](#), which estimated an overnight transition to 10 billion high-efficiency LED lamps would avoid around 800 Mt of CO₂ emissions.

WHICH PRODUCTS ARE INCLUDED?

The following four product types are included in the call to action:

-  Residential single-split and window air conditioners
-  Residential and professional general-service lighting
-  Industrial electric motors with an output power of 0.75-375 kW (1-500 hp)
-  Residential refrigerators and refrigerator-freezers

If a country has achieved high efficiency for a product or has another product with significant energy consumption and potential then this could be included instead of one of the four primary products. We also welcome a focus on heat pumps, which can provide significant energy and CO₂ reductions by displacing fossil fuel heating systems.

Since some countries have already achieved high levels of efficiency for certain products, further ambitious but necessary improvements can come through “systems based” approaches, for example using evaporative cooling with air conditioners, and maintaining and optimising refrigeration equipment (such as by cleaning coils). Wider systems approaches may also consider measures such as building codes or strategic energy management in industrial facilities.

METHODOLOGY & ASSUMPTIONS

HOW IS THE IMPACT ESTIMATED?

Impact assessments are done using a bottom-up stock model. Such a model makes use of the stock and sales of equipment, coupled with average use and efficiency. Different scenarios can be run by changing the efficiency of equipment sold and in the stock. Grid

1. 500 MW at 50% load factor

emission factors are used to convert electricity savings to CO₂ emission reductions.

The impact assessments will be done using CLASP's [Mepsy Appliance & Equipment Climate Impact Calculator](#).

WHAT IS THE GEOGRAPHICAL SCOPE OF THE MODEL ESTIMATES?

All energy and carbon estimates are based on the territorial energy use and CO₂ emissions for a given country, not factoring in exports, or embodied energy/carbon.

HOW IS THE BUSINESS-AS-USUAL BASELINE SCENARIO CALCULATED?

The Business-as-Usual (BAU) scenario is based on 2020 standard levels or average energy consumption data in each country, assuming a 2% annual improvement through to 2030 for motors, air conditioners and refrigerators.² For lighting, the BAU assumes both a continuing transition to efficient light-emitting diodes (LED) as well as an increase in their efficiency (efficacy) between now and 2050.³

WHICH SCENARIOS ARE CURRENTLY USED WITHIN THE MODELS?

Modelling the impacts of doubling energy efficiency of key products sold by 2030 is currently calculated using a conventional stock model using different scenarios:

1. BAU (or Baseline): Future projections reflect what will happen without further policy intervention.
2. Doubling of Efficiency: This is the initial indicative doubling based on the 2030 stock being replaced with products that are twice as efficient.

The doubling scenario is not intended to be a realistic one, it is for assessing the indicative size, and comparing to previous initiatives. Updated energy saving scenarios in line with commitments will be developed.

HOW IS RISING DEMAND, ESPECIALLY IN DEVELOPING COUNTRIES ACCOUNTED FOR?

The energy savings are based on the improvement in energy efficiency or reduction in energy consumption of the four products compared to the Business-as-Usual (BAU) Baseline. The end-use stock model will estimate the relative national savings, even if ownership and demand are rising in an economy or for a specific product (e.g., to provide access to cooling, air conditioning).

WHICH EMISSION FACTORS ARE USED IN THE CALCULATIONS?

The grid emission factors are sourced from the International Finance Institutions, "Harmonized Grid Emission factor data set," used to evaluate Clean Development Mechanism (CDM) renewable energy and energy efficiency projects under the Kyoto Protocol and Paris Climate Agreement. This source weights IEA data on current grid emissions ("operating margin") and future electricity generation units that may not be built because of efficiency ("build margin") using a 33/67 ratio.⁴

FUTURE IMPLEMENTATIONS OF THE MODELS

WHAT DEVELOPMENTS ARE LIKELY?

The models to estimate impact will be further developed in partnership with countries to ensure they reflect national information and understanding.

WHICH ADDITIONAL SCENARIOS NEED TO BE CONSIDERED?

Following the COP26 climate conference, the modelling will be developed with the additional scenarios considered:

1. Potential scenarios: For example, using known Best Available Technology, or cost-effective efficiency levels, would provide alternative aspiration levels for potential scenarios.
2. Other Net Zero scenarios: There are various ways to achieve net zero emissions globally and research should continue to find the optimal combination of technologies, solutions and associated policies.
3. Commitment scenario: This is what countries may commit to, either explicitly, or in plans, or other statements of intent.

2. Improvement rates are based on historically observed rates for appliances in the United States (Gowrishankar, V. and A. Levin, "America's Clean Energy Frontier: The Pathway to a Safer Climate Future," New York, NY: Natural Resources Defence Council, 2017, p. 22.; Mauer, J. and A. deLaski, S. Nadel, A. Fryer, and R. Young, "Better Appliances: An Analysis of Performance, Features, and Price as Efficiency Has Improved," ACEEE Report A132, May 2013).

3. Based on recent improvement rates in LED efficacy, capped at 275 lm/W, the technical efficiency limit.

4. International Finance Institutions, "Harmonized Grid Emission factor data set," July 2019, https://unfccc.int/sites/default/files/resource/Harmonized_Grid_Emission_factor_data_set.xlsx