

# How Energy Efficiency Cuts Costs for a 2° C Future

The world's largest and fastest-growing economies can help limit global warming to 2° C for significantly lower costs by prioritizing energy efficiency in the transport, buildings, and industrial sectors.

A new report – “How Energy Efficiency Cuts Costs for a 2° C Future” – analyzes how energy efficiency policies and programs in Brazil, China, Europe, India, Mexico, and the U.S. can **reduce the cost of economy-wide decarbonization by up to \$250 billion per year** for these regions, with no net cost to society through 2030.

“How Energy Efficiency Cuts Costs for a 2° C Future” modeled several pathways to identify the contribution of energy efficiency to achieving the internationally-agreed 2° C upper limit for climate change. The results show that, by following an energy efficiency pathway, policymakers can achieve low cost energy reductions through to 2030 while also cutting carbon emissions from the energy supply. In contrast, an energy intensive pathway that focuses primarily on decarbonizing energy supply with more limited energy efficiency policies can help achieve a

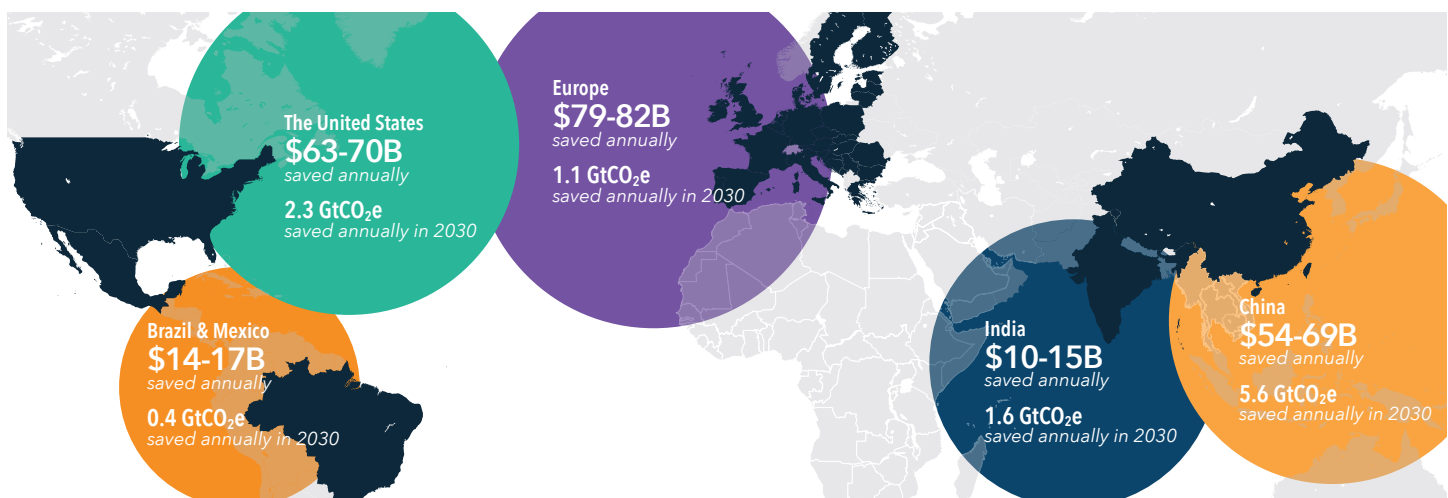
2° C future, but at substantially greater expense.

Between now and 2030, **energy efficiency can reduce the global cost of limiting warming to 2° C by up to \$2.8 trillion** compared to a more energy intensive pathway.

The potential annual savings of the energy efficiency pathway vary by nation. Annual savings range from 0.1 to 0.4 percent of annual GDP and are not sensitive to macroeconomic shifts or to changes in fuel price.

In addition, **the cost savings from an energy efficiency pathway can eliminate energy poverty**. Recent research by the World Bank shows that the world can achieve universal access to electricity through investments of between \$40 billion and \$100 billion annually. The \$250 billion saved in the regions studied could help finance this critical goal.

**Energy efficiency in Brazil, China, the E.U., Mexico, and the U.S. can reduce the cost of decarbonization by up to \$250 billion per year and reduce annual emissions by 11 billion metric tons (Gt) of CO<sub>2</sub>e in 2030 – roughly two-thirds of the GHG reductions needed in these regions to limit warming to 2° C.**



## TRACK RECORD UNDERPINS FUTURE POTENTIAL

While modeled results suggest significant future savings from current and new energy efficiency policies and programs, the future costs of decarbonization in China, the E.U. and the U.S. have already been reduced by at least \$750 billion between 2015 and 2030 by energy efficiency policies that have been adopted since 1990. These gains have been realized in the transport, buildings, and industry sectors through policies such as fuel economy and appliance standards, building energy codes, and best practices in industrial energy management.

The “Efficiency Cuts 2° C Costs” report takes account of moderate “rebound effects” from energy efficiency in some sectors and regions, where new energy demand partially consumes the gains made by energy efficiency. Compensating for rebound effects, the analysis finds that energy efficiency continues to provide the lowest-cost carbon abatement for most policy interventions in the regions studies.

## OTHER KEY FINDINGS

- **Extensive use of carbon capture and sequestration (CCS) in utility power plants is largely avoidable** through 2030 by combining a portfolio of least-cost energy efficiency policies and lower-cost renewable energy.
- **Existing buildings in the E.U. and U.S. represent huge potential emissions savings** that may be achieved through new policies and programs resulting in large scale retrofits.
- **There are significant opportunities in India to improve energy efficiency.** Few sectors there are currently subject to best practice efficiency standards. India can prioritize efficiency gains while strengthening its economy and making decarbonization more affordable.
- **China, Brazil, and Mexico have already begun the process of “leapfrogging” toward less energy-intensive economies** and are currently realizing avoided lock-in costs and related economic benefits.



As part of the global commitment to limit warming to 2° C, building codes and retrofits in the U.S. could also save roughly \$20 billion annually compared to other emissions reduction pathways.

## LOOKING AHEAD

The “Efficiency Cuts 2° C Costs” report finds that the mix of energy efficiency potential across different regions is heterogeneous, with some regions seeing substantial potential for cost savings in sectors where other regions see less potential. This reinforces the need for policymakers to consider domestic energy consumption patterns when prioritizing efficiency interventions.

While cost savings are lower in some regions, such as India, this finding reinforces the need for energy efficiency. Because of increasing energy demand in these regions, a significant amount of energy efficiency is required in order for them to contribute to any cost effective pathway that can help limit warming to 2° C.

Across regions, the recent round of INDCs submitted for the 2015 international climate negotiations mostly state national emission reduction targets, but plans for realizing those targets will have to be further developed. **Energy efficiency must factor prominently as nations look for the lowest cost options to limit warming to 2° C.**

“How Energy Efficiency Cuts Costs for a 2° C Future” shows that the world’s largest energy consuming countries and regions have much to gain from prioritizing energy efficiency in the policy queue. In addition to nearly \$3 trillion in savings for decarbonization, such policies bring substantial societal and economic benefits in reducing the cost of energy access, reducing the need for more expensive expansions of energy supply, improving business competitiveness, creating jobs, and improving air quality and human health.