











Pakistan



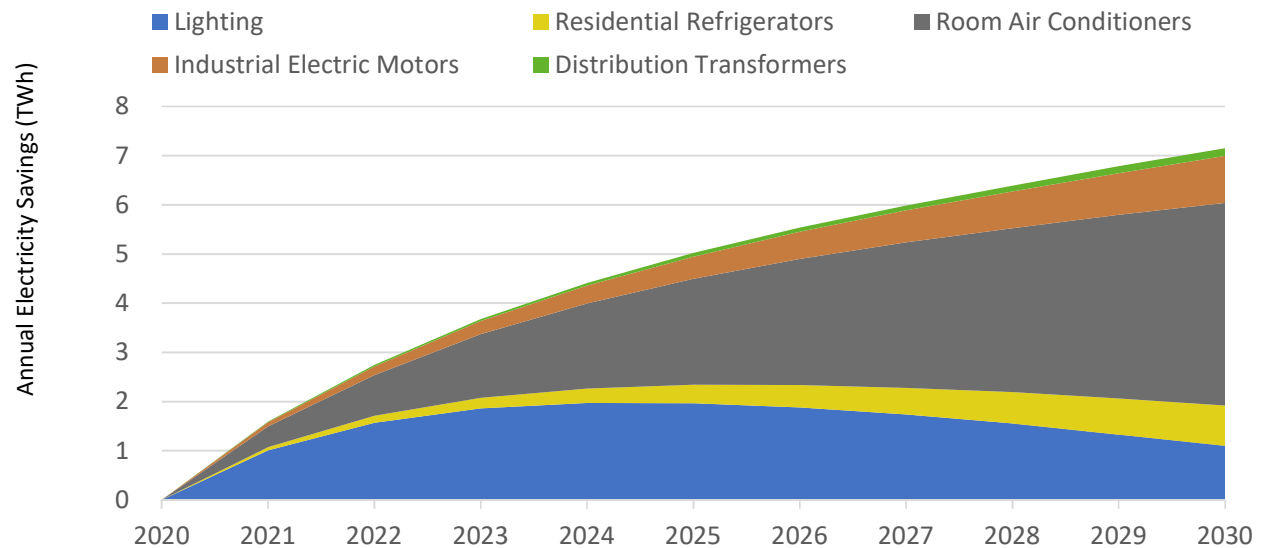
Product scope	Lighting	Cooling		Equipment	
	 All Lighting	 Residential Refrigerators	 Room Air Conditioners	 Industrial Electric Motors	 Distribution Transformers

A summary of the benefits attained from improved energy efficiency through the implementation of Minimum Energy Performance Standards at two levels of ambition (minimum and high). More detailed reports for lighting, cooling and equipment can be downloaded from the United Nations Environment Programme (UNEP) United For Efficiency (U4E) website.

ANNUAL SAVINGS IN 2030*

	Reduce electricity use by over 7.1 TWh which is 7.7% of current national electricity use
	Save electricity worth 720 Million US\$ equivalent to over 3 Power Plants [500MW each]
	Reduce electricity CO ₂ emissions by over 6.1 Million tonnes equivalent to 3.4 Million Passenger Cars

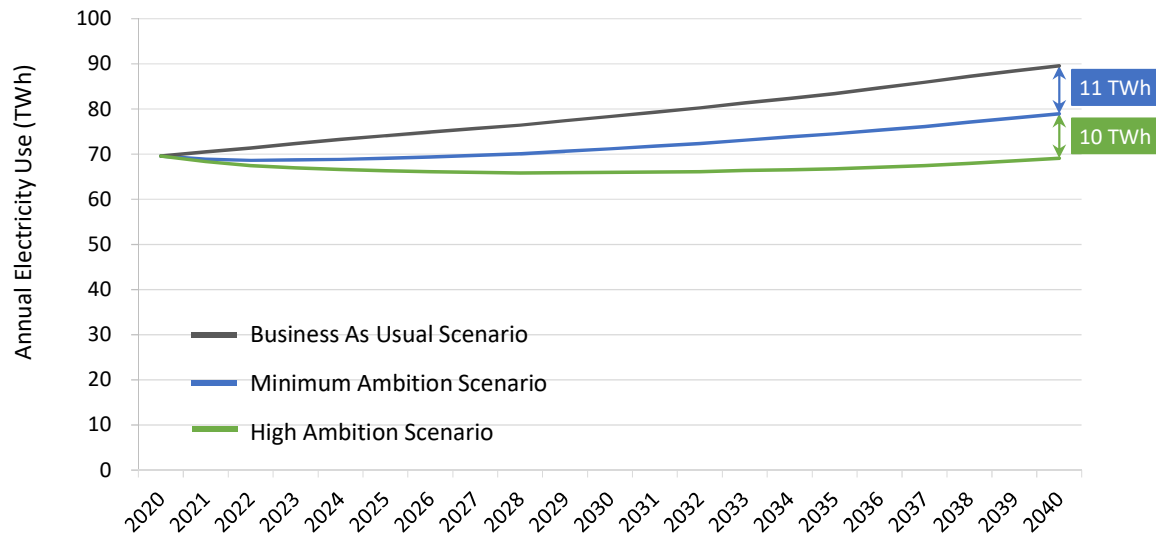
ELECTRICITY SAVINGS OVER TIME*



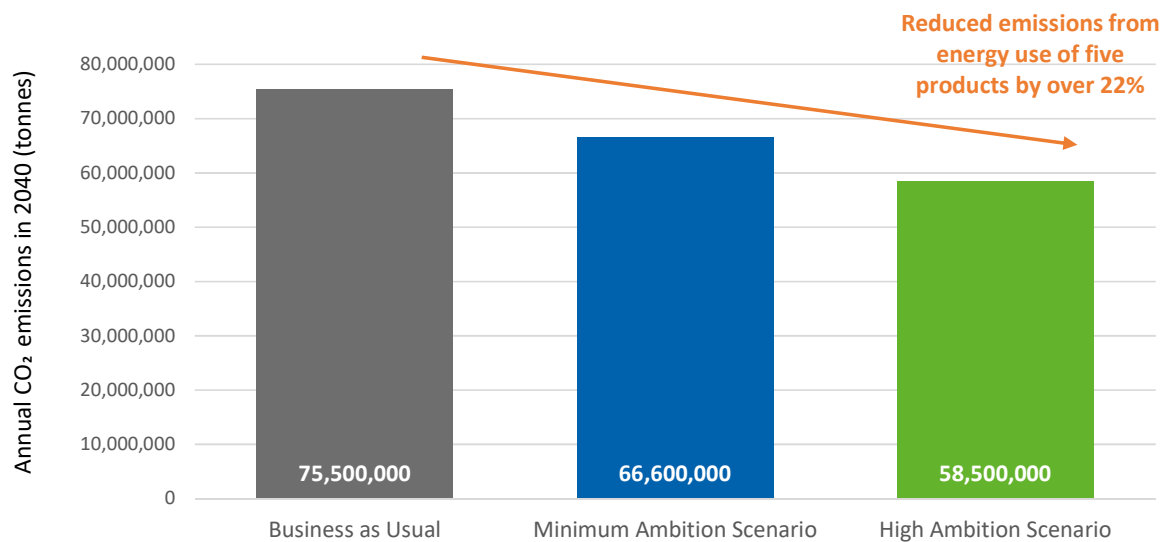
* Denotes savings are from the Minimum Ambition Scenario.

AND EVEN MORE BENEFITS

THE MORE AMBITIOUS THE REGULATION, THE MORE SAVINGS ARE POSSIBLE



MEET GLOBAL CLIMATE GOALS BY SIGNIFICANTLY DECREASED EMISSIONS



OTHER BENEFITS ACHIEVED IN 2030*



Increased grid connection to

3600 Thousand households









Reduced direct GHG emissions by

1 Million tonnes







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DETAILED BENEFITS

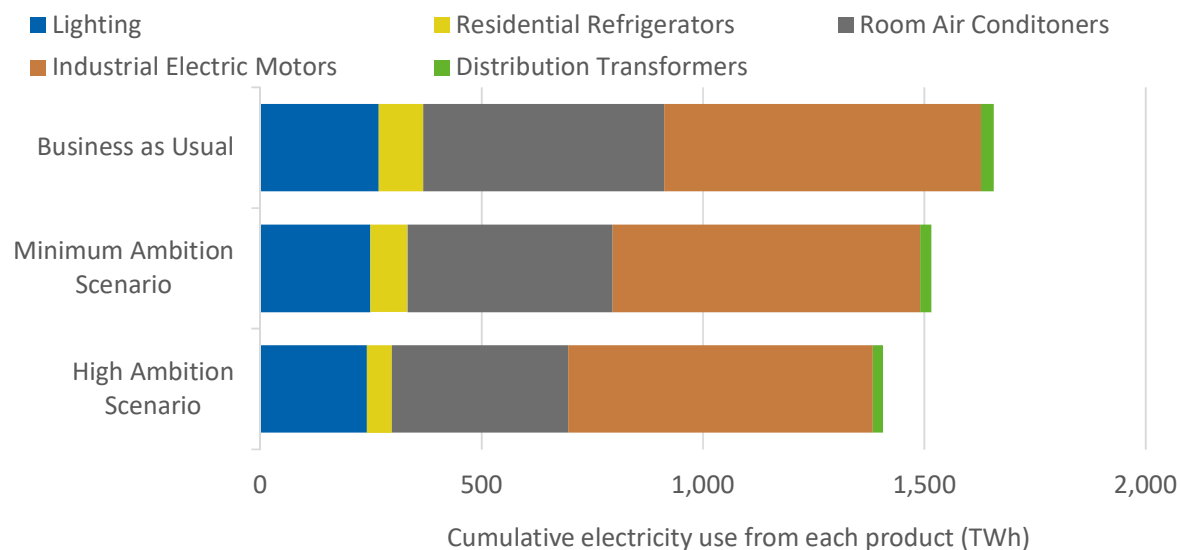
ANNUAL SAVINGS IN 2030 AND 2040*

		Lighting 		Cooling 				Equipment 			
				Residential Refrigerators		Room Air Conditioners		Industrial Electric Motors		Distribution Transformers	
		2030	2040	2030	2040	2030	2040	2030	2040	2030	2040
	Electricity (GWh)	1,100	25	820	1,600	4,100	6,400	960	2,100	160	380
	Electricity Bills (Million US\$)	110	2.5	82	160	410	640	96	210	16	38
	CO2 Emissions (Thousand tonnes)	700	21	700	1,400	3,500	5,500	820	1,800	130	320

CUMULATIVE SAVINGS BY 2030 AND 2040*

		Lighting 		Cooling 				Equipment 			
				Residential Refrigerators		Room Air Conditioners		Industrial Electric Motors		Distribution Transformers	
		2030	2040	2030	2040	2030	2040	2030	2040	2030	2040
	Electricity (TWh)	16	18	4.3	17	23	80	5.1	21	0.8	3.5
	Electricity Bills (Million US\$)	1,600	1,800	430	1,700	2,300	8,000	510	2,100	82	350
	CO2 Emissions (Million tonnes)	14	16	3.7	15	20	68	4.4	18	0.7	3.0

CONTRIBUTION TO CUMULATIVE ELECTRICITY USE BY 2040








* Denotes savings are from the Minimum Ambition Scenario.

Country Data and Input Assumptions



GENERAL INFORMATION		ELECTRICITY MARKET	
Population	197 Million	Residential Electricity tariff	0.10 US\$ / kWh
GDP per capita	1,473 US\$		
Electrification level	75.0%	Transmission and distribution loss factor	17.4%
CO2 Emission Factor	0.70 kg / kWh		

ASSUMPTIONS

Product			Unit Energy Consumption (kWh/year) or Efficiency Level						Type of Product
			Business As Usual		Minimum Ambition Scenario		High Ambition Scenario		
Lighting		GSL	15W CFL	15	10W LED	10	7W LED	7	800 lumen light bulb: 1,000 hrs/year
		Linear	36W T8	108	20W LED	60	16W LED	48	4 foot tube: 3,000 hrs/year
		HID	70W HPS	307	50W LED	219	40W LED	175	Poletop street light: 4,380hrs/year
Cooling		Residential Refrigerators		342		302		151	2-door refrigerator freezer of average size 250 liters
		 Room Air Conditioners		2,717		2,793		1,706	A mix of 3.5 kW and 7 kW split units with a weighted-average cooling capacity of 5 kW
Equipment		Industrial Electric Motors (IEC level)		IE0		IE2		IE3	3-phase induction motors used in the industrial sector
		 Distribution Transformers (Model regulation level)		See note		Level 1		Level 2	Three-phase and single-phase liquid-filled and three-phase dry-type power distribution transformers

Distribution transformers Note: it is assumed that distribution transformers have losses in line with those assumed in the CENELEC harmonization research for the development of the EU standards.

METHODOLOGY

The analysis uses the UNEP-U4E's Country Savings Assessment Models to estimate the impacts of implementing policies that improve the energy efficiency of each product analysed. The savings potential in each scenario assumes Minimum Energy Performance Standards (MEPS) are introduced in 2020 at two different levels of ambition (minimum and high) as shown above.

ASSUMPTIONS AND DATA SOURCES

- Market size is based on data from industry partners, the UN COMTRADE database and market penetration forecasts generated by U4E Country Savings Assessment Models using data on population, climate, income and other macroeconomic indicators as detailed below.
- Population (2018 and future forecasts) comes from the UN Population Division.
- GDP per capita data (2018) comes from the World Bank with future growth forecasts derived from the IPCC's SSP3 scenario.
- Cooling Degree Days are based on average monthly temperatures from weatherbase.com, degreedays.net or given by wunderground.com.
- Current total electricity consumption comes from the World Bank and the U.S. Energy Information Administration (EIA) with future forecasts derived from the International Energy Agency's (IEA) World Energy Outlook 2018.
- Residential electricity tariffs are based on IEA data.
- Transmission and distribution loss factor is a regional average calculated from electricity production and consumption data published by the IEA.
- Electrification levels come from the IEA's World Energy Outlook 2018 and the World Bank.
- CO2 emission factors come from the IEA and the Institute of Global Environmental Strategies (IGES) and are assumed constant in future years.
- Product typical characteristics are based on analysis from the UNEP-U4E Model Regulation Guidelines and other data from UNEP-U4E industry partners and technical experts including the US Lawrence Berkeley National Laboratory (LBNL), the International Copper Association (ICA) and GIZ.
- The approach of calculating the potential direct emissions saving of refrigerators and air conditioners is based on expert input from GIZ and LBNL.
- Additional to the above sources, a questionnaire was used to gather data from country officials.
- In a small number of instances, additional data was obtained from internet research or by using proxy data from similar markets.

Further details of the modelling approach and assumptions are available on the U4E website. For more information contact: U4E@un.org



* Denotes savings are from the Minimum Ambition Scenario.