











# Kazakhstan



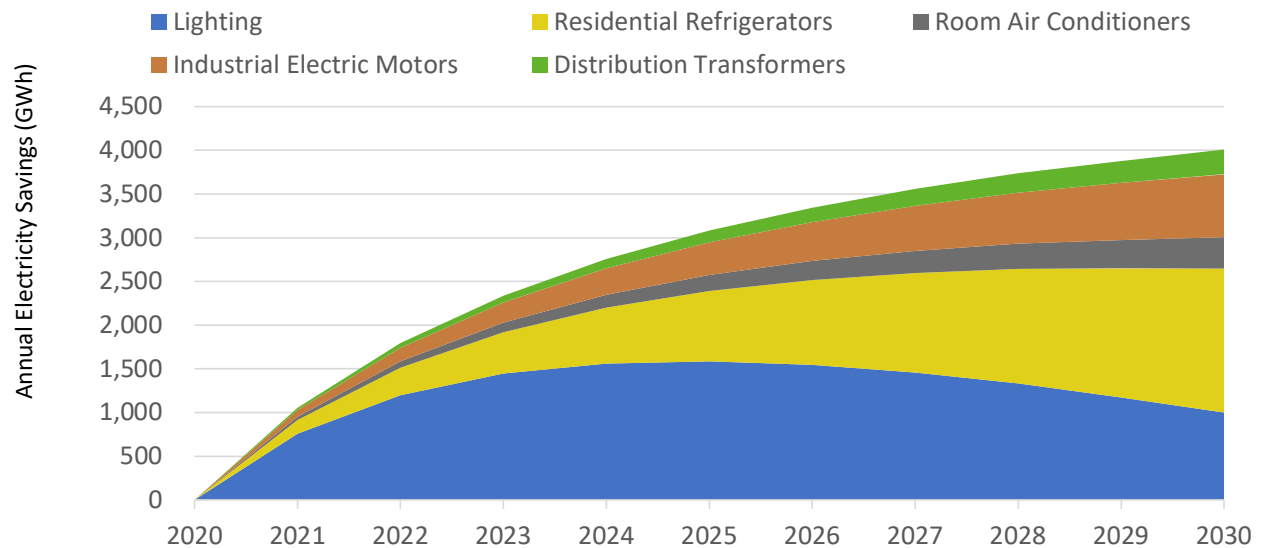
Product scope	Lighting	Cooling		Equipment	
	 All Lighting	 Residential Refrigerators	 Room Air Conditioners	 Industrial Electric Motors	 Distribution Transformers

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 <b>4.0 TWh</b> which is <b>4.0%</b> of current national electricity use
	Save electricity worth <b>260 Million US\$</b> equivalent to over <b>1 Power Plant [500MW each]</b>
	Reduce electricity CO <sub>2</sub> emissions by over <b>3.9 Million tonnes</b> equivalent to <b>2.2 Million Passenger Cars</b>

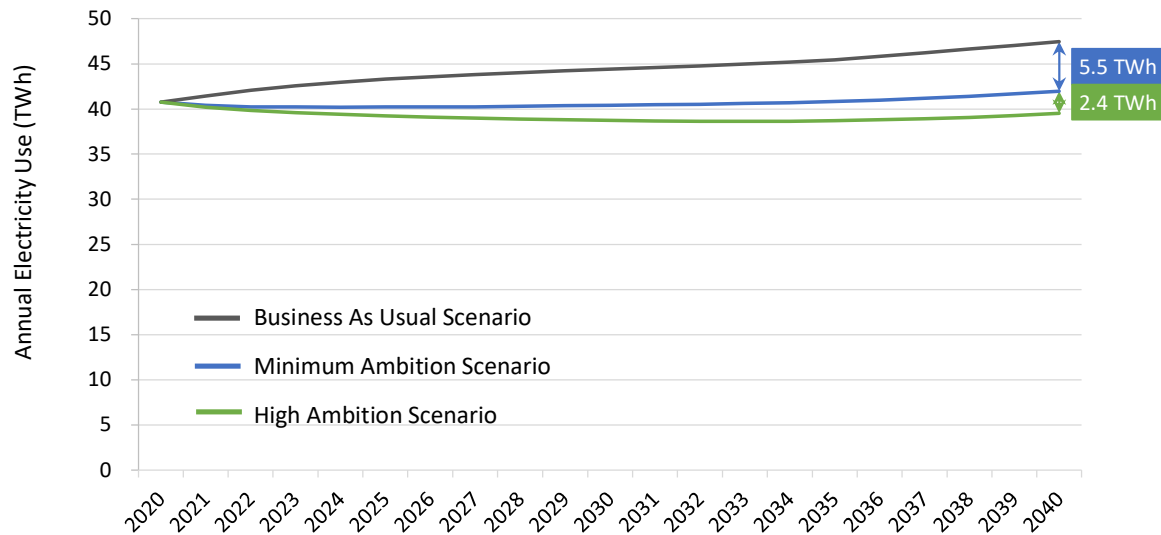
## ELECTRICITY SAVINGS OVER TIME\*



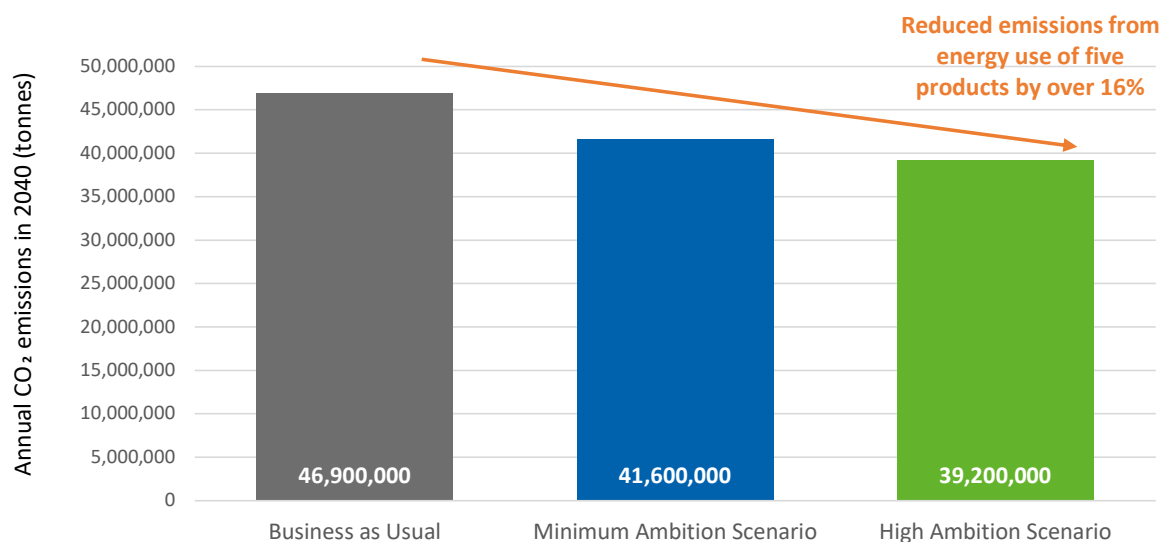
\* Denotes savings are from the Minimum Ambition Scenario.

# 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\*



Reduced annual electricity subsidies by

**57 Million US\$**









Reduced cumulative direct GHG emissions by







**160 Thousand tonnes**

# DETAILED BENEFITS

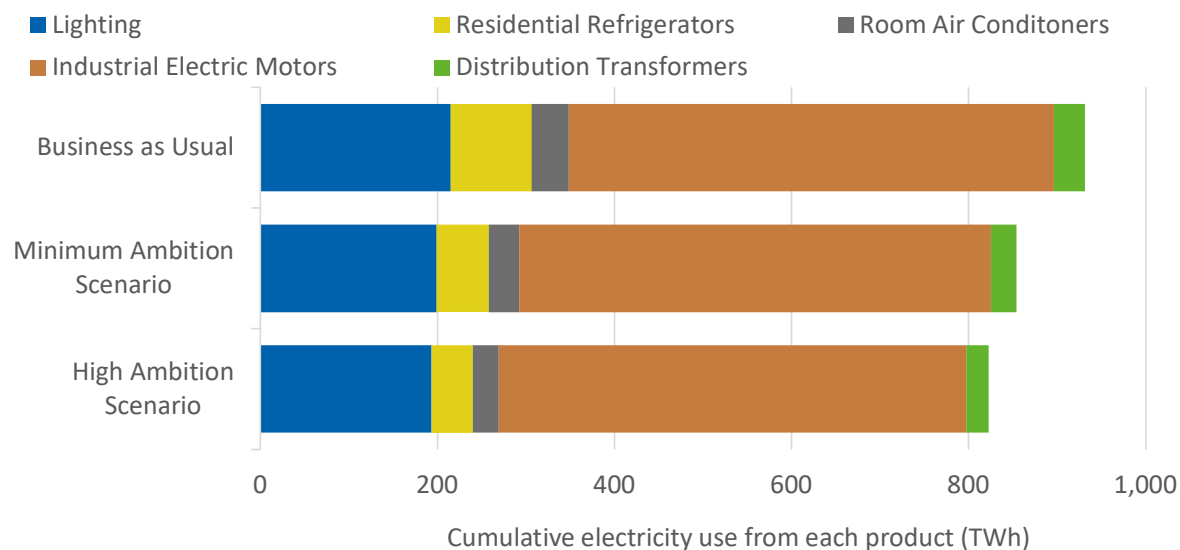
## ANNUAL SAVINGS IN 2030 AND 2040\*

		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)	1,000	51	1,600	2,700	360	620	720	1,500	280	630
	Electricity Bills (Million US\$)	65	3.3	110	180	24	40	47	94	18	41
	CO2 Emissions (Thousand tonnes)	1,000	51	1,600	2,700	360	610	710	1,400	280	630

## 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)	13	16	8.9	33	2.0	7.3	4.0	15	1.5	6.2
	Electricity Bills (Million US\$)	850	1,000	580	2,100	130	470	260	980	99	400
	CO2 Emissions (Million tonnes)	13	16	8.9	32	2.0	7.2	4.0	15	1.5	6.2

## 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	18.4 Million	Residential Electricity tariff	0.07 US\$ / kWh
GDP per capita	9,331 US\$		
Electrification level	100.0%	Transmission and distribution loss factor	6.7%
CO2 Emission Factor	0.93 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 Linear HID	15W CFL 36W T8 70W HPS	15 108 307	10W LED 20W LED 50W LED	10 60 219	7W LED 16W LED 40W LED	7 48 175	800 lumen light bulb: 1,000 hrs/year 4 foot tube: 3,000 hrs/year Poletop street light: 4,380hrs/year
		Residential Refrigerators	607		263		131		2-door refrigerator freezer of average size 270 liters
			Room Air Conditioners	614		409		297	
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 (2019 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 US 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.