

El Salvador



The transition to energy efficient lighting in the residential, commercial, industrial and outdoor sectors for all major lamp types would result in the following benefits:

Financial Benefits

30.2 million USD
annual savings



4 months
payback period

Energy Saving Benefits

Potential Savings:

260.7 GWh in annual electricity consumption



4.7% of total national electricity consumption



34.5% of electricity consumption for lighting

Equivalent to:

Power output of 2 small (20MW) power plants

22.4 kilotonnes of crude oil

Climate Change Mitigation Benefits

71.7 kilotonnes annual reduction of carbon dioxide emissions



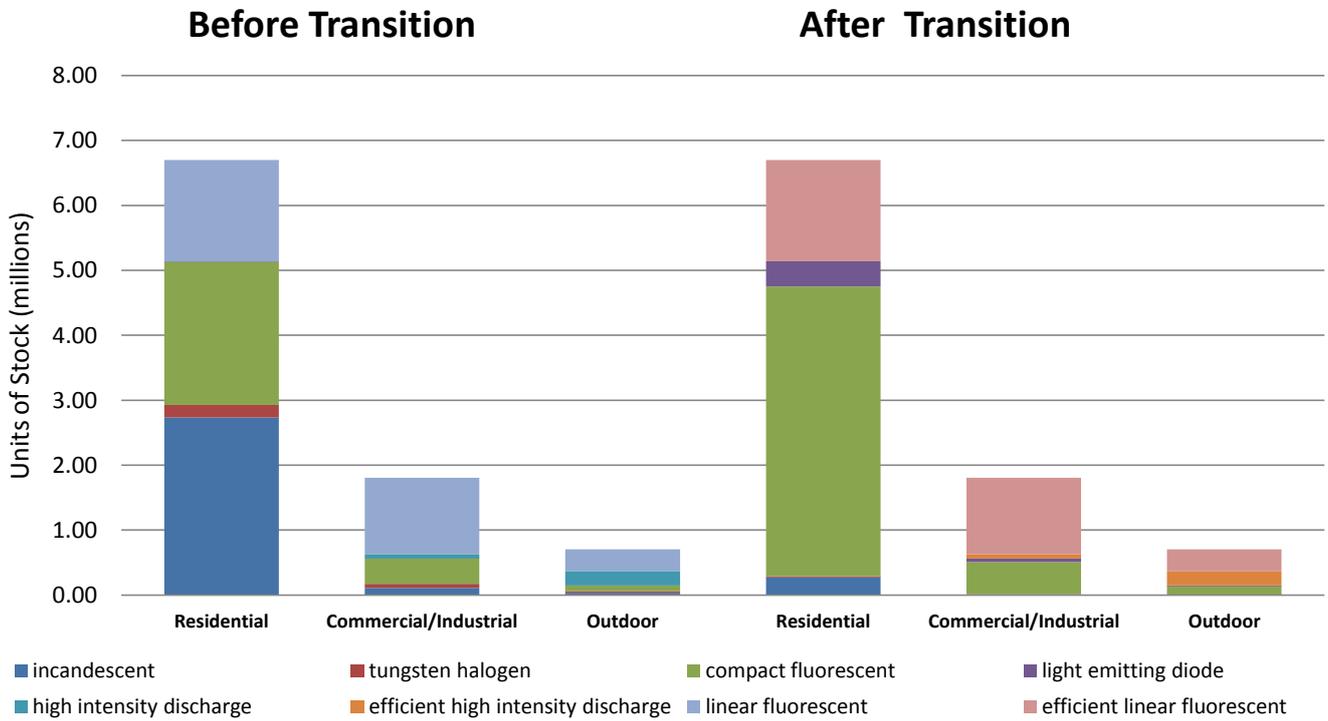
Equivalent to 17.9 thousand mid-size cars off the road

Other Environmental Benefits

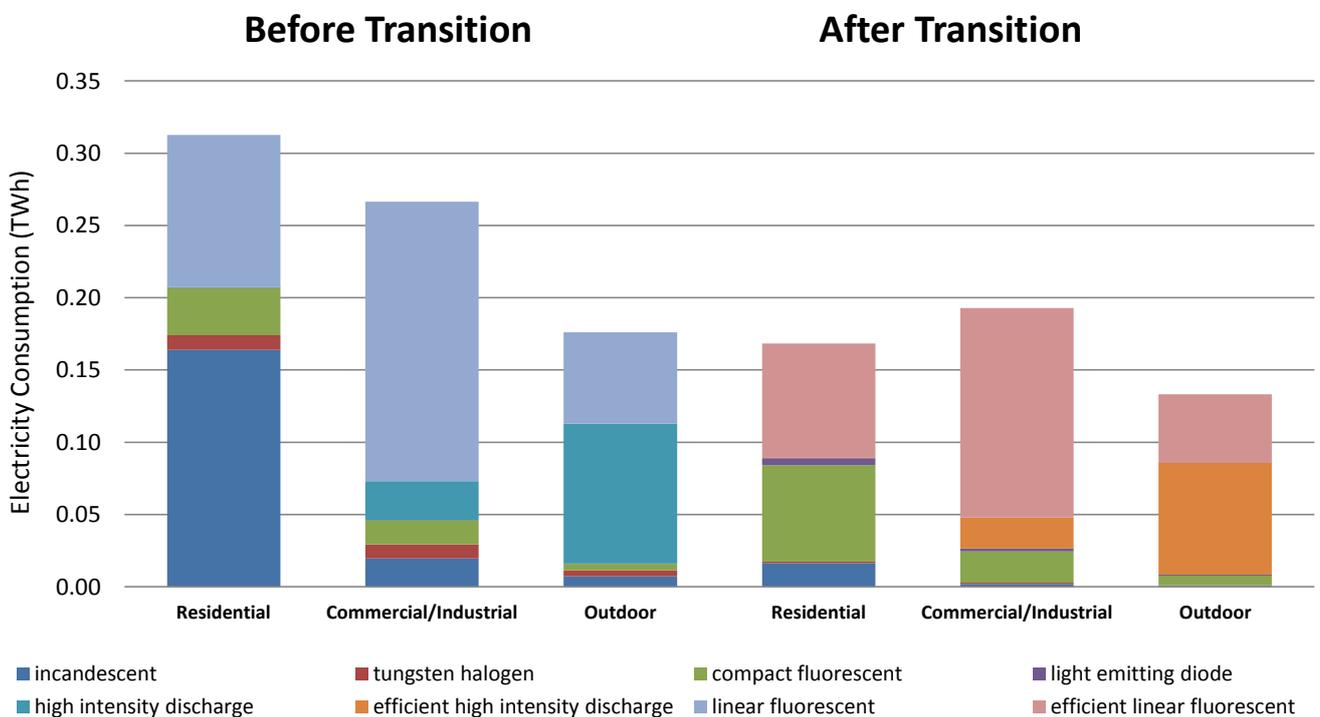


0.2 kilograms of mercury emissions avoided

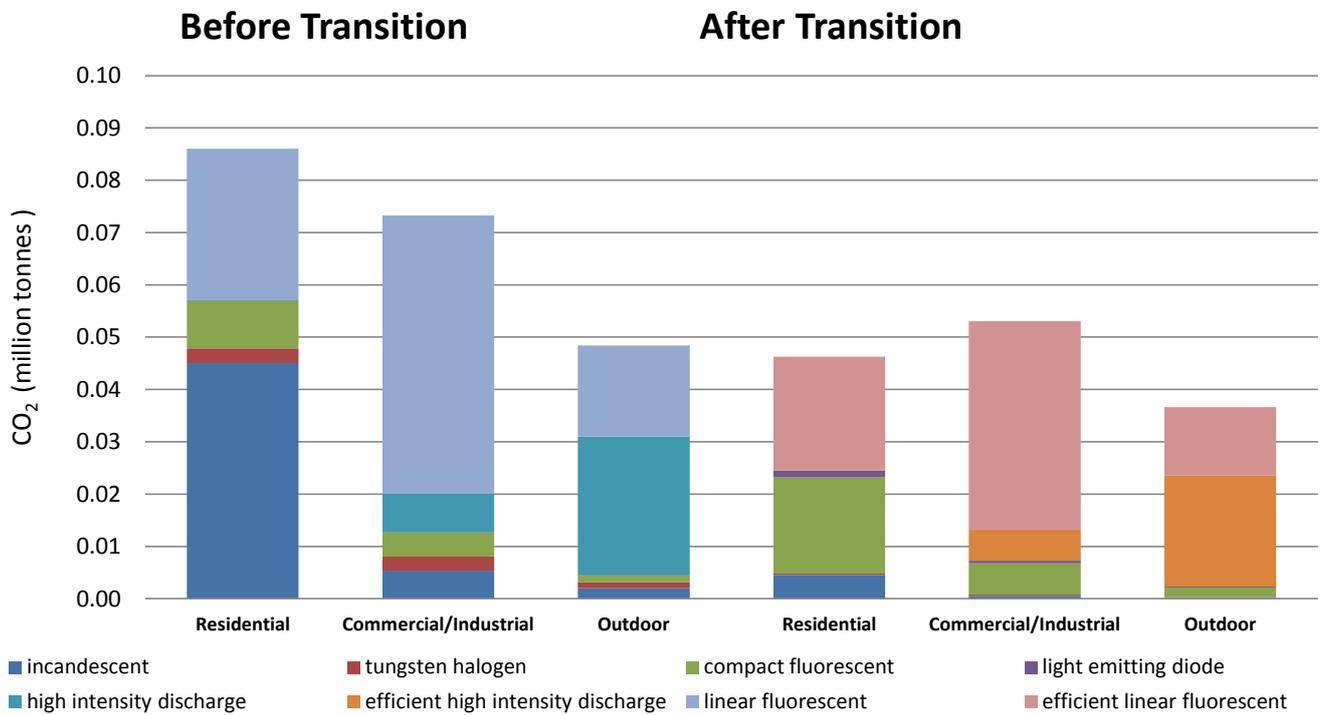
Installed Stock of Lamps (by sector, by lamp type)



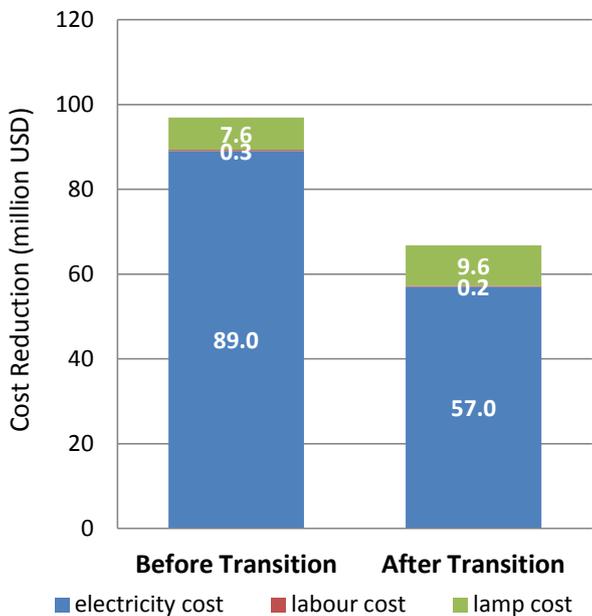
Total Electricity Consumption (by sector, by lamp type)



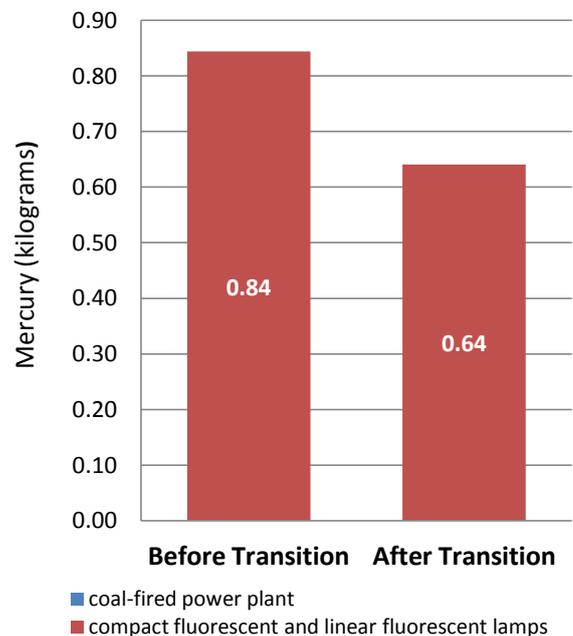
CO₂ Emissions (by sector, by lamp type)



Cost Reduction (by source) ¹



Mercury Emissions (by source) ²



Notes:

- 1.Represents the annual operating cost for all lamps, including installation, maintenance, replacement and electricity costs.
- 2.Coal-fired power plant emissions and mercury released when recycling compact fluorescent and linear fluorescent lamps.



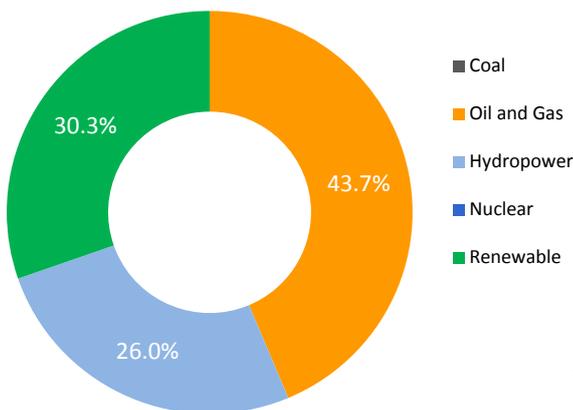
Country Lighting Assessment

Country Specific Data and Input Assumptions

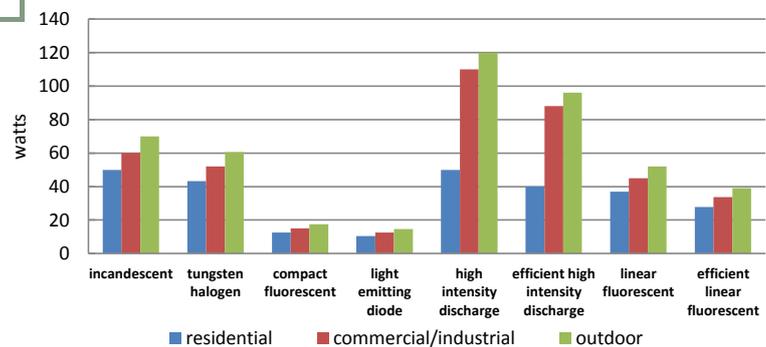
General Information	
Population	6.2 million
Area (km ²)	21.0 thousand
GDP per capita	3,426 USD/person
Electrification level	86.4%
Electricity Market	
Installed generating capacity	1.1 GW
Total electricity production	6.3 TWh
Total electricity consumption	5.6 TWh
GDP/unit electricity consumption	3.8 USD/kWh
Share of lighting	13.6%
Average Electricity Prices	
Residential	0.139 USD/kWh
Commercial/Industrial	0.103 USD/kWh
Outdoor	0.103 USD/kWh
Annual coal power plant production	N/A

CO ₂ Emissions Data	
Total CO ₂ emissions	6.51 Mt
CO ₂ emission factor	275 g/kWh
CO ₂ trading price	17.5 USD/tonne
CO ₂ trading value	1.3 million USD
Air and Ground Pollutants	
Mercury emissions from coal combustion	N/A
SO ₂ emissions from coal combustion	N/A
NO _x emissions from coal combustion	N/A
Mercury released during compact fluorescent and linear fluorescent lamp recycling	11.0%
Mercury Content per Lamp	
Compact fluorescent	2.5 mg/lamp
Linear fluorescent	10 mg/lamp
Efficient linear fluorescent	5 mg/lamp

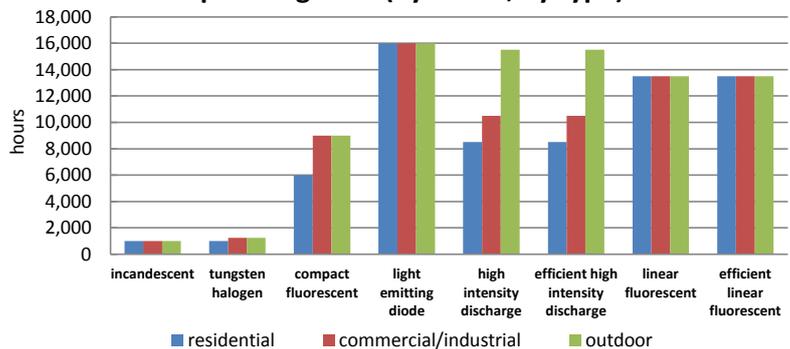
Electricity Production Mix



Lamp Wattage (by sector, by type)



Lamp Average Life (by sector, by type)





Data Sources

General Information

- **Population** data (data for 2010) comes from the [World Bank](#).
- **Area** data comes from the [United States Central Intelligence Agency \(US CIA\), 2012](#).
- **GDP per capita** (current USD) is calculated using GDP/population. GDP in current USD (data for 2010) is from the [World Bank](#). For countries without GDP value in 2010, an estimate is forecast based on the trend from the previous five years (2005 through 2009). For countries without any GDP value from the World Bank, the [US CIA data](#) is used.
- **Electrification level** data is taken from the [World Bank](#) (data for 2009). For countries without the data from the World Bank, data from [Buckminster](#) and [World dataBank](#) have been cited.

Electricity Data

- **Installed generating capacity** (estimates for 2010) is forecast based on data from the [U.S. Energy Information Administration \(EIA\)](#) (2001 through 2005).
- **Total electricity production and consumption** (data for 2010) is sourced from the World Bank. For countries without a total electricity production and consumption value in 2010, an estimate is forecast based on the trend from the previous five years (2005 through 2009). For countries without any value from the World Bank, the US CIA data for electricity [production](#) and [consumption](#) is used.
- **Average electricity price** in the residential and professional sector was provided by the International Energy Agency (IEA, data covers OECD countries in 2010). The electricity price in the outdoor sector is set the same as the electricity price in the professional sector. For other countries where the IEA did not have an electricity price, market research was conducted to collect the information. The reference year (from 2002 to 2012) varies due to the quality of data available. (NOTE: due to the adjustment of electricity price in individual country, the values shown are best estimates but may not be accurate.)
- **Electricity production mix** data shown here comes from the World Bank (data for 2009). Five different sources are shown: [coal](#), [oil and gas](#) (calculated using the Electricity Production from coal, oil and gas source minus the electricity production from coal source), [hydroelectric](#), [nuclear](#), [renewable](#) (excluding hydro electric). For countries without data from the World Bank, the data is generated through a crosscheck of [US CIA](#) and [US EIA](#).
- **GDP/unit electricity consumption, share of lighting and annual coal power plant production** are calculated for each country from the above data.

CO₂ Emissions Data

- **Total CO₂ emissions** (estimates for 2010) is based on data from the [World Bank](#) (2004 to 2008).
- **CO₂ emission factor** is taken from the IEA (estimates for 2010 covering 138 countries based on data from 2005 to 2009). For countries without CO₂ emission factors from the IEA, findings from a study "[2010 Environment Performance Index](#)" is used. For countries without CO₂ emission factor from either of these two sources, the value is calculated based on nearby countries and then corrected using the electricity production mix data.
- **CO₂ trading price** represents a [global average value for 2010](#).
- **CO₂ trading value** is calculated for each country from the above data.



Air and Ground Pollutants

- For countries with electricity production from coal source:
 - Mercury emissions from coal combustion** (mg/kWh) are set based on the UNEP toolbox global average.
 - SO₂ emissions from coal combustion** (g/kWh) are based on a [research paper](#).
 - NO_x emissions from coal combustion** (g/kWh) are based on a [research paper](#).
- **Mercury released during compact fluorescent and linear fluorescent lamp recycling and mercury content per lamp** are based on industry consultation.

Lighting Data

- Estimates of the installed stock of lamps were provided by OSRAM and Philips for all lamp types on a regional basis for the year 2010.
- Estimates of the typical lamp wattage, lamp price, operating hours, lamp lifetime, installation labour, and other factors were developed for countries based on industry consultations, internet research and country feedback.
- Several countries estimated their national markets based on local market and experts.
- For certain countries without domestic manufacturing of lamps, imports and exports of lamps from the [UN Comtrade](#) database were used to calculate six years (2005 through 2010) of net imported lamps. Using these shipment data and taking into account typical operating hours and lamp lifetimes, a time-series stock model was developed and the installed stock of lamps for each country was estimated.

Others

- The average annual household electricity consumption is assumed to be 2000 kWh/year for countries with access to electricity (electrification rate) of less than 60%.
- TWh of electricity savings are converted and reported in [crude oil energy equivalents](#) according to the conversion factor of 11.63 MWh/toe, or 1 TWh = 86 ktoe.
- A plant factor of 85% is assumed when converting the electricity savings to power plant electricity production equivalent.
- The annual CO₂ emissions for a car are based on a mid-size car with a CO₂ emission factor of 160 g CO₂/km and a yearly distance of 25,000 km, emitting 4 tons of CO₂.

If you have any comments or can provide additional data sources, please [contact us](#).