India

Energy efficiency benefits from industrial electric motors and distribution transformers with the implementation of Minimum Energy Performance Standards at two levels of ambition (minimum and high).

**ANNUAL SAVINGS IN 2030***

- Reduce electricity use by over **28 TWh** which is **2.1%** of current national electricity use
- Save electricity worth **2 Billion US$** equivalent to over **13 Power Plants [500MW each]**
- Reduce electricity CO₂ emissions by over **29 Million tonnes** equivalent to **16 Million Passenger Cars**

**EVEN GREATER SAVINGS POSSIBLE WITH MORE STRINGENT REGULATION**

* Denotes savings are from the Minimum Ambition Scenario.

U4E COUNTRY ASSESSMENT, OCTOBER 2020 (UPDATE)
## Detailed Benefits

### Annual Savings in 2025, 2030 and 2040*

<table>
<thead>
<tr>
<th>Product</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial Electric Motors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity (TWh)</td>
<td>14</td>
<td>28</td>
<td>61</td>
<td>0.3</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Electricity Bills (Million US$)</td>
<td>960</td>
<td>2,000</td>
<td>4,300</td>
<td>18</td>
<td>41</td>
<td>100</td>
</tr>
<tr>
<td>CO2 Emissions (Million tonnes)</td>
<td>14</td>
<td>29</td>
<td>62</td>
<td>0.3</td>
<td>0.6</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Distribution Transformers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cumulative Savings by 2030 and 2040*

<table>
<thead>
<tr>
<th>Product</th>
<th>2030</th>
<th>2040</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial Electric Motors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity (TWh)</td>
<td>150</td>
<td>610</td>
<td>3.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Electricity Bills (Million US$)</td>
<td>11,000</td>
<td>42,000</td>
<td>210</td>
<td>930</td>
</tr>
<tr>
<td>CO2 Emissions (Million tonnes)</td>
<td>160</td>
<td>620</td>
<td>3.1</td>
<td>14.0</td>
</tr>
<tr>
<td><strong>Distribution Transformers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Contribution to Cumulative Electricity Use by 2040

- **Business As Usual**
- **Minimum Ambition Scenario**
- **High Ambition Scenario**

* Denotes savings are from the Minimum Ambition Scenario.
**Country Data and Input Assumptions**

<table>
<thead>
<tr>
<th>GENERAL INFORMATION</th>
<th>ELECTRICITY MARKET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Residential Electricity tariff</td>
</tr>
<tr>
<td>1.35 Billion</td>
<td>0.07 US$ / kWh</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>Transmission and distribution loss factor</td>
</tr>
<tr>
<td>2,016 US$</td>
<td>19.4%</td>
</tr>
<tr>
<td>Electrification level</td>
<td></td>
</tr>
<tr>
<td>92.4%</td>
<td></td>
</tr>
<tr>
<td>CO₂ Emission Factor</td>
<td></td>
</tr>
<tr>
<td>0.82 kg / kWh</td>
<td></td>
</tr>
</tbody>
</table>

### ASSUMPTIONS

<table>
<thead>
<tr>
<th>Product</th>
<th>Efficiency Level</th>
<th>Type of Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Electric Motors</td>
<td></td>
<td>3-phase induction motors used in the industrial sector</td>
</tr>
<tr>
<td>(IEC level)</td>
<td>Business As Usual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IE3</td>
<td></td>
</tr>
<tr>
<td>Distribution Transformers</td>
<td></td>
<td>Three-phase liquid-filled</td>
</tr>
<tr>
<td>(Model regulation level)</td>
<td>See note</td>
<td>Three-phase dry-type</td>
</tr>
<tr>
<td></td>
<td>See note</td>
<td>Single-phase liquid-filled</td>
</tr>
<tr>
<td></td>
<td>Level 2</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** BAU is based on local MEPS for all types while the minimum ambition scenario level is set as half way between local MEPS and Level 2.

### 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 new industrial electric motors and distribution transformers. 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

- Electricity savings from each product are estimated using a top-down approach using data including electricity consumption (total, industrial and motors) and industrial GDP as detailed below.
- Industrial GDP (2018) comes from the World Bank with future growth forecasts derived from the Shared Socioeconomic Pathway (SSP3) used in the Intergovernmental Panel on Climate Change’s (IPCC) sixth assessment.
- GDP per capita data (2018) comes from the World Bank with future growth forecasts derived from the IPCC’s SSP3 scenario.
- Population (2019 and future forecasts) comes from the UN Population Division.
- Future electricity demand is based on forecasts from the IEA’s World Energy Outlook 2018 and the IPCC’s SSP3 scenario.
- 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.
- 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