Energy and Carbon Footprint

Our Data

In this report, we’ve made several changes to how we are reporting data versus our last report, issued in 2015:

Eliminating Coatings, Inks and Compounds

Going forward, we will not be reporting our data on consumption of coatings, inks and compounds per billion cans as these materials comprise only ~0.1% of the total package weight and are not material to the overall carbon footprint of the package. This is consistent with the fact that metal package LCA analyses do not include this data.

Eliminating Waste Recycling and Reuse

Going forward, we will not be reporting our data on waste recycling and reuse per billion cans as this is inconsistent with our recycling goals. All scrap metal generated in our manufacturing plants is recycled. However, our efforts to reduce spoil-age and other metal efficiency programs will decrease the amount of material available for recycling. Our goal, therefore, is to maximize recycling rates while minimizing the amount of material recycled per billion standard units by ensuring all raw material is converted into saleable product.

Separating Glass and Metal

Beginning in 2015, we added glass container manufacturing to our product portfolio with the acquisition of EMPAQUE. The manufacturing processes for metal cans and glass bottles are materially different. For example, we manufacture the glass used to produce glass bottles, but source the metal used to produce metal containers. Therefore, we will track the performance of these distinct product lines separately going forward. Glass, which we currently manufacture only in Mexico, represents between 1% and 2% of total Company revenue.

Showing 2015 Data Separately

In 2015, we established company-wide sustainability goals with regard to GHG emissions and energy consumption. Beginning with this report, we will be using the new GRI G4 reporting framework, so we will focus all of our future reporting on progress in primary environmental data since 2015. Historical data will still be available separately.

Across the globe, our plants receive recognition for their environmental achievements from external organizations, various levels of government and prestigious industry groups.

Steel and Aluminum

(Tons per billion standard units)
Aluminum consumption per standard unit remained largely flat during this reporting cycle and continues the data trend highlighted in our 2015 Sustainability Report. Ongoing lightweighting and standardization improvements continue to be offset by new capacity additions, many of which are focused on the production of smaller container sizes. While these smaller containers use less overall metal, they require more metal per standard unit of packaged product. Crown has also converted several steel can lines to aluminum during the reporting period to increase efficiencies.

Steel consumption has increased during this reporting period in comparison to our historical data. A large portion of this increase can be attributed to the incorporation of data from assets gained during the acquisition of Mivisa for the first time. In general, Mivisa makes significantly more ends than cans. This scale diverts from how we have traditionally calculated our data and has resulted in increased steel usage. However, it is worth noting that steel usage decreased from 2015 to 2016, demonstrating continued progress over time, including the Mivisa facilities.

### Direct and Indirect GHG Emissions: Metal

While a slight increase in GHG emissions per standard unit was recorded in 2015 when compared to the prior reporting period, it returned to levels in line with historical data in 2016. Continued improvements in existing facilities are offset by new capacity additions. This new capacity is generally less efficient during initial commercialization phases and located in geographic regions with higher indirect GHG emission factors.

### Direct and Indirect GHG Emissions: Glass

As stated earlier, this report marks the first time we have included data from assets gained during the acquisition of EMPaque. These figures are significantly higher than emissions from our metal plants due to the energy intensive process of converting sand to glass. However, it is worth noting that both direct and indirect GHG emissions declined in the second year of this reporting period (2016). As with all of our operations, we will focus on continued improvement to help drive these numbers down in future reporting periods.

### VOC Emissions

As with all of our operations, we will focus on continued improvement to help drive these numbers down in future reporting periods.
VOC emissions per standard unit continued to decline during this reporting period, marking six consecutive years where a decrease was recorded. VOC emissions are used exclusively in our metal packaging manufacturing process, specifically our coating operations where optimization of coating film weights, continued investment in control technologies and water-based materials are driving the downward trend. However, some of the savings are offset by the move away from epoxy-based materials for our food coatings to materials that require higher coating weights and therefore more coating mass to achieve the required protection.

**NOx Emissions: Metal**

(Tons per billion standard units)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx Emissions</td>
<td>3.6</td>
<td>3.3</td>
</tr>
</tbody>
</table>

NOx emissions per standard unit remained largely flat in this reporting period and in comparison with historical data. Continued improvements in existing facilities are offset by new capacity additions. This new capacity is generally less efficient during initial commercialization phases. In addition, the global trend towards greater package variety and SKUs reduces run lengths and impacts efficiency.

**NOx Emissions: Glass**

(Tons per billion standard units)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx Emissions</td>
<td>90.5</td>
<td>88.9</td>
</tr>
</tbody>
</table>

The glass manufacturing process is gas intensive, leading to higher NOx emissions per standard unit when compared to metal packaging. However, as also noted in the direct and indirect GHG emissions chart, there was a decline in NOx emissions in the second year of this reporting period (2016). As with all of our operations, we will focus on continued improvement to help drive these numbers down in future reporting periods.

**Energy Consumption: Metal**

(Tons per billion standard units)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane</td>
<td>63,843.2</td>
<td>65,304.1</td>
</tr>
<tr>
<td>Electricity</td>
<td>12,219.4</td>
<td>12,219.4</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>58,173.0</td>
<td>66,275.8</td>
</tr>
</tbody>
</table>

Energy consumption per standard unit has remained largely flat when compared with historical data with an increase in 2015 in natural gas and electricity. Continued improvements in existing facilities are offset by new capacity additions. This new capacity is generally less efficient during initial commercialization phases. In addition, the global trend towards greater package variety and SKUs reduces run lengths and impacts efficiency.
Energy Consumption: Glass

The glass manufacturing process is energy intensive, leading to higher usage of natural gas, electricity and propane per standard unit when compared to metal packaging.

Energy Consumption: Waste Disposal

While there was an increase in waste-to-landfill per standard unit from 2015 to 2016, both years show a significant decrease in the use of this disposal method when compared to historical data.

External Awards

Across the globe, our plants receive recognition for their environmental achievements from external organizations, various levels of government and prestigious industry groups. Here are just a few of the awards we’ve received during this reporting period:

The La Crosse Area Occupational Safety and Health Council (LAOSHC) recognized our La Crosse, Wisconsin (U.S.) beverage can plant with a Corporate Safety Award based on total hours worked and the number of lost time cases.

Our Olympia, Washington (U.S.) beverage can plant was recognized by the Department of Ecology of the State of Washington as a Pollution Prevention success story by cutting its dangerous waste by 99.9% over almost 20 years.

The Minnesota Safety Council awarded our Faribault, Minnesota (U.S.) aerosol can plant with the Minnesota Governor’s Safety Award in 2016 in recognition of its improved safety record.

Our Seattle, Washington (U.S.) food can plant earned a five-star rating from King County’s EnviroStars Program in recognition of its efforts to reduce hazardous waste and for leadership in prevention and recycling efforts.

The Trinidad and Tobago Manufacturers Association awarded our lithography plant in Trinidad with the Green Manufacturer of the Year award for 2016.

Our Crown Food España S.A.U. plant was recognized by CNMC (National Commission on Markets and Competition) for having 100% of its electricity supplied by renewable energy sources.
The Da Nang, Vietnam beverage can facility received a “Friendly-Environment Products” award in 2015 from the Department of Natural Resources and Environment following an energy audit and appraisal by the government. The plant was in the top 10% of all participating corporations facilities. The Ministry of Industry awarded our food can facility in Haadyai, Thailand with a Green Level 3 Award in recognition of its excellent performance in green and systematic management of the environment, monitoring, evaluation and review for continuous improvement. Our food can facility in Samrong, Thailand was also recognized by the country’s Ministry of Industry. The plant received the “Good Environmental Governance” award in 2015 in recognition of its environmental management.