



Next-generation high-capacity battery

Combine with a grid interface

ECOBoost

# Ford Motor Company Mexico GHG Program Report 2007

SPARK PLUG

Lightning bolt symbol

Technical drawing of a car chassis on a grid background. The drawing is rendered in a light blue color against a darker blue grid. Handwritten notes in a cursive font are scattered around the car. The notes include 'Next-generation high-capacity battery' at the top left, 'Combine with a grid interface' at the top right, 'ECOBoost' on the left side, and 'SPARK PLUG' near the bottom center. A lightning bolt symbol is visible on the right side of the drawing.

# **Contents**

A dark grey Ford SUV is shown from a rear three-quarter view, parked on a paved surface. The background consists of a dense line of green trees under a clear sky. The vehicle's rear features include a red spoiler, a Ford logo on the tailgate, and a license plate area. The text of the contents is overlaid on the left side of the image.

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# **Ford of Mexico & Climate Change**

**Ford believes that Climate Change is a serious environmental issue and has proactively participated in various Climate Change programs such as**

- **The Mexican GHG Program**
- **The European Union Emissions Trading Scheme (EU-ETS)**
- **Chicago Climate Exchange (CCX)**
- **The Philippines GHG Program**
- **The Australian GHG Challenge Plus**
- **The Climate Registry (TCR)**

**Ford Motor Company is proud to be part of the Mexican GHG Program for the fourth consecutive year.**

# Organizational Limits

Ford believes in protecting the environment by continuously improving its manufacturing process to reduce emissions and minimize waste.

Ford of Mexico sets yearly targets and objectives at all business units to surpass all legal requirements.

Ford of Mexico consists of three business units:

Hermosillo Stamping and Assembly Plant: Manufactures the Ford Fusion, Mercury Milan and Lincoln MKS.

Chihuahua Engine Plant: Manufactures four cylinder Duratec I4 Engines.

Cuautitlan Industrial Complex: Manufactures the F-150, 250, 350, and Auto Fiesta Ikon.

All Ford of Mexico plants have been ISO14001 certified and have obtained the PROFEPA Clean Industry award since 1999.

# Operational Boundaries

## Emissions Considered:

This inventory includes “direct” emissions characterized as Scope 1 in the WRI/WBCSD protocol and “indirect” or Scope 2 emissions from the same protocol. Scope 3 emissions from other indirect emissions such as employee travel, transportation of products, materials and waste are not included since they constitute a small percentage compared to our overall emissions and are considered de minimus.

CO2 emissions are included in this inventory. Ford Motor Company has decided not to include emissions related with CH4 and N2O gases in this inventory since the amounts are not significant and will not impact the overall totals. Table (1) below shows the totals for CH4 and N2O.

Other gases (HFCs, PFCs, SF6) do not apply to the company’s manufacturing processes and are considered de minimus.

Table 1: Non-CO2 Emissions

Total CH4-CO2e								
	2000	2001	2002	2003	2004	2005	2006	2007
CHIHUAHUA ENGINE	21	21	20	16	13	12	12	11
CUAUTITLAN SITE	23	19	14	15	11	10	10	10
HERMOSILLO ASSEMBLY	32	25	22	16	18	26	40	35

Total N2O-CO2e								
	2000	2001	2002	2003	2004	2005	2006	2007
CHIHUAHUA ENGINE	258	263	247	199	165	152	146	136
CUAUTITLAN SITE	291	234	180	192	141	128	124	122
HERMOSILLO ASSEMBLY	398	315	280	202	228	328	499	442

# Methodology

In this inventory Ford includes data from 2000-2007. Ford uses the year 2000 as a baseline. The baseline year serves as a benchmark for all projections and emission targets and it was selected to be consistent with the North American CCX Phase II baseline.

The data used to calculate the baseline year and reporting years is based on actual electricity and natural gas invoices. Consistent with the Chicago Climate Exchange (CCX), the factors used for direct and indirect conversions are:

- Natural Gas (0.05311Tons of CO<sub>2</sub>/MMBTU)
- Electricity (0.59 Tons of CO<sub>2</sub>/MWh)

# Emissions Data

Direct Emissions result from sources owned by Ford of Mexico (e.g. boilers, ovens, bag houses, etc). One of Ford's goals is to reduce the amount of CO2 emissions per unit built. Table 2 below shows direct emissions from 2000-2007.

Table 2: Direct CO2 Emissions

Annual Direct Emissions Metric Tons of CO2-Scope 1							
	2000	2001	2002	2003	2004	2005	2006
<b>CHIHUAHUA ENGINE</b>	1,795	1,461	1,486	1,371	1,525	969	722
<b>CUAUTITLAN SITE</b>	10,455	8,808	8,047	10,641	6,797	4,270	4,184
<b>HERMOSILLO ASSEMBLY</b>	12,343	10,474	8,928	6,212	12,113	13,041	23,757
<b>Totals</b>	24,593	20,743	18,460	18,223	20,435	18,280	28,663

Indirect Emissions: Include all emissions generated outside Ford's perimeter by burning fossil fuel to generate electricity. Ford of Mexico continuously monitors their electricity consumption. Table 3 shows indirect emissions per year.

Table 3: Indirect CO2 Emissions

Annual Indirect Emissions Metric Tons of CO2-Scope 2								
	2000	2001	2002	2003	2004	2005	2006	2007
<b>CHIHUAHUA ENGINE</b>	47,136	48,516	45,398	36,299	29,747	27,884	26,939	24,981
<b>CUAUTITLAN SITE</b>	44,831	35,607	26,161	25,784	19,980	20,061	19,268	18,928
<b>HERMOSILLO ASSEMBLY</b>	63,094	49,214	44,136	32,066	31,184	49,226	70,998	62,370
<b>Totals</b>	155,061	133,337	115,695	94,149	80,911	97,171	117,205	106,278

Ford now uses its Global Emissions Manager (GEM) database to ensure environmental metrics such as CO2 emissions are tracked consistently worldwide.

# Absolute Emissions

Ford of Mexico acknowledges the importance of climate change and is always looking for ways of minimizing its manufacturing impact to the environment. All Plants in Mexico have implemented energy efficiency projects and best practices. These practices and reduced production at our assembly facilities have contributed to the reduction of absolute emissions between 2006 and 2007. Table 4 shows total annual emissions from 2000 and 2007.

**Table 4: Total Absolute Emissions (2000-2007)**

Total Annual Metric Tons of CO <sub>2</sub> e (Scope 1 & Scope 2)								
Plant	2000	2001	2002	2003	2004	2005	2006	2007
<b>CHIHUAHUA ENGINE</b>	48,931	49,977	46,884	37,670	31,272	28,853	27,661	25,876
<b>CUAUTITLAN SITE</b>	55,286	44,415	34,208	36,425	26,777	24,331	23,452	23,239
<b>HERMOSILLO ASSEMBLY</b>	75,437	59,688	53,064	38,278	43,297	62,267	94,755	83,937
<b>Totals</b>	<b>179,654</b>	<b>154,080</b>	<b>134,155</b>	<b>112,372</b>	<b>101,346</b>	<b>115,451</b>	<b>145,868</b>	<b>133,052</b>

# Analysis

All plants in Mexico have implemented projects to reduce their electricity and gas consumption. Activities to reduce electricity include: installation of equipment to reduce energy, programming of air conditioners, energy reduction in non operating areas, adjustments on the automatic start of compressors, turning off compressors during the weekends, and repairing air leakages. Efforts to reduce natural gas usage include: Starting paint ovens one hour later, following instructions to light ovens efficiently, and turning off paint equipment during the night. For Analysis purposes the facilities have been grouped by type of operation as shown below in Table 5.

Table 5: Plants grouped by operation

Operation	Facilities Included
Assembly	Hermosillo and Cuautitlan Assembly Plants
Engines	Chihuahua Engine

Production data played an important role in this analysis and it is listed below in table (6)

Table 6 Production Data by type of operation

Total Production by Type of Operation								
Plant	2000	2001	2002	2003	2004	2005	2006	2007
Assembly	398,857	448,413	409,803	312,724	304,811	326,942	331,055	332,515
Engine	278,986	236,691	182,895	136,160	93,290	134,569	330,228	293,879

# Analysis - Engine

The Chihuahua Engine Plant has experienced production increase in the last couple of years. In 2007 the plant reduced its absolute emissions by 47% compared to the baseline year (2000) and 6% compared to 2006. This was accomplished despite the 0.5% production increase between 2006 and 2007. The greenhouse gas reduction is mainly due to projects and activities undergoing at the plant to reduce energy consumption and improve energy efficiency (GHG absolute emissions are illustrated in Figure 1).

The Plant reduced the greenhouse gas emissions intensity by 37% compared to the baseline year (2000) and 7% compared to 2006 (Figure 2).

Figure 1 Engine Absolute Emissions

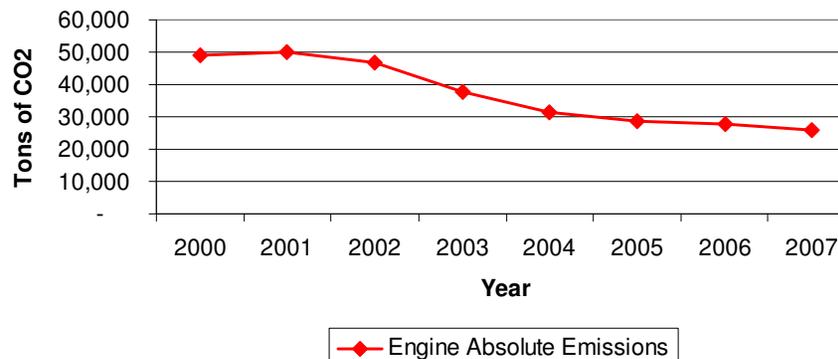
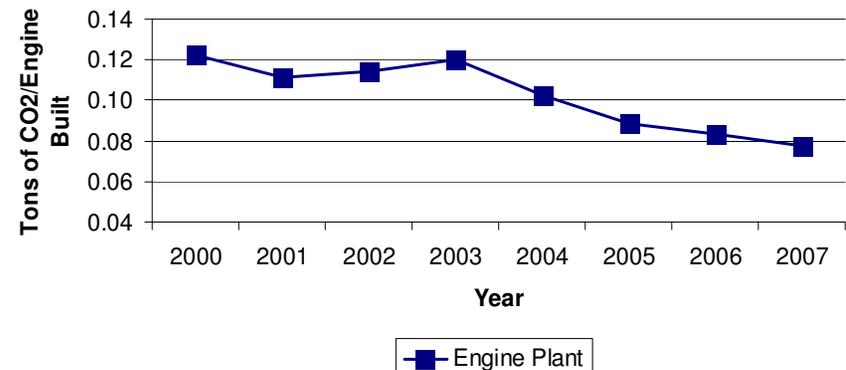


Figure 2 Total GHG Emissions per Engine Built



# Analysis - Assembly

The plants combined (Hermosillo Assembly and Cuautitlan) reduced their absolute emissions by 18% compared to the baseline year (2000) and 9% compared to 2006 (Figure 3). This reduction is attributed to the plants efforts to continuously monitor their energy consumption and becoming more effective at identifying inefficiencies that may occur in their manufacturing processes. Also in 2007 the plants experienced an 11% production decrease which impacted both their absolute and intensity emissions.

Emissions intensity decreased 22% compared to the baseline year (2000) and increased 2% compared to last year (Figure 4). This year over year increase is the result of the plants not running at full capacity. Emissions intensity is expected to decrease in the next few years with the introduction of the Ford Fiesta in Cuautitlan.

Figure 3 Assembly Plant GHG Absolute Emissions

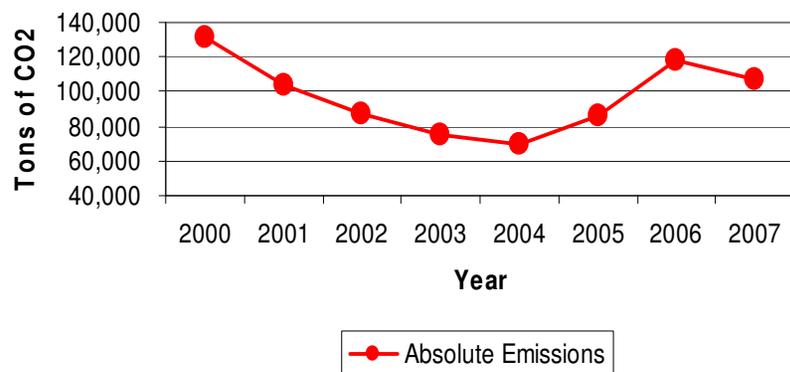
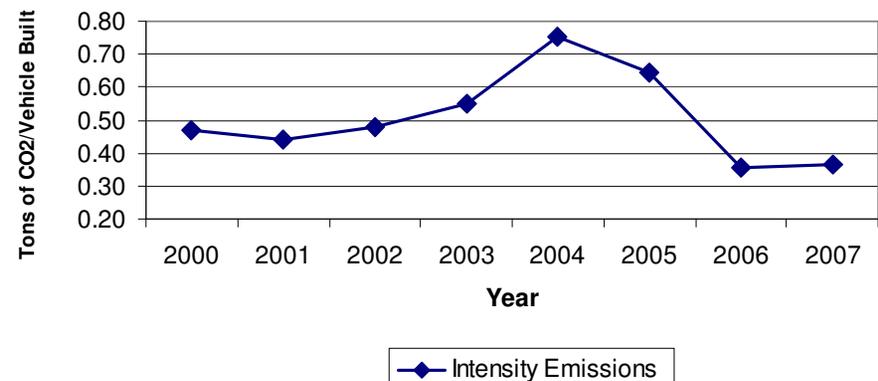


Figure 4 Total GHG Emissions per Vehicle Built



# Conclusions

- Ford Motor Company is proud to be part of The Mexican GHG Pilot Program. Ford recognizes the importance of the climate change issue and supports emissions reporting at a national level.
- In this 2007 inventory, we presented Ford of Mexico data from 2000-2007. Ford of Mexico is committed to maintaining and exceeding its environmental standards.
- Overall, Ford of Mexico has reduced its Greenhouse Gas (GHG) emissions by 26% in 2007 compared to the baseline year (2000) and 9% from 2006.
- Ford will continue to support Mexico's national efforts by providing annual updates to the program.

The 2007 GHG inventory has been developed by the Ford Environmental Quality Office on behalf of all Mexican Facilities. For more information please contact Claudya Arana ([carana@ford.com](mailto:carana@ford.com)) or Carlos Velazquez ([cvelazq1@ford.com](mailto:cvelazq1@ford.com)).