



FORD MOTOR COMPANY

Brazil GHG Accounting and Reporting Program

2008 Report

May 2009

Executive Summary:

Ford Motor Company is proud to be a part of the Brazilian GHG Accounting and Reporting Program and to submit the preliminary inventory to the program. As the climate change issue continues to receive increased attention, Ford would like to raise internal and external awareness of CO₂ emissions reporting by way of tracking and reporting its GHG emissions. From a global standpoint, Ford of Brazil participation in the program is consistent with Ford's global efforts to address and report GHG in other countries, such as the US, Australia, Canada, Mexico, Philippines, China, and The European Union.

Overall total absolute emissions of Ford of Brazil remained flat (0.7% decrease as did vehicle production 0.4% decrease). Production levels are expected to increase due to the introduction of a new line up of Ford Vehicles. This will allow the facilities to run more efficiently and will impact both absolute and intensity GHG emissions. Ford intends to support Brazil's efforts by providing annual updates to the Brazil GHG program.

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1. Introduction:

Ford believes that cooperative efforts between governments and industry are required to make progress towards addressing climate change. Ford Motor Company has been dedicated to being an environmentally responsible organization and has always been committed to maintaining and exceeding its environmental standards. This can be seen in our current and future products as well as in our various facility environmental initiatives undertaken over the years.

Ford was the first vehicle manufacturer in Brazil. It started operations in 1919, contributing to the economic and technological development of the country. In 1921 Ford of Brazil headquarters were inaugurated in Sólón Street Bom Retiro district, São Paulo, where this new building housed the first automobile assembly line in the country.

Ford of Brazil made history in 1967 when it acquired majority control of Willys Overland do Brazil S.A shares. This meant the addition of another assembly plant (São Bernardo do Campo). Since then Ford of Brazil has grown and in 2007 it included three assembly plants and one engine plant.

Ford Motor Company participates in other voluntary initiatives worldwide such as the Chicago Climate Exchange (CCX), The Climate Registry (TCR), the Mexican GHG Program, The Philippines GHG Program, the Australian GHG Programme, EU Emissions Trading Scheme (EU ETS), and GHG Reporting in CFMA Chongqing – China. Ford is pleased to participate in the Brazil GHG program and it commits to provide yearly updates of our progress to the program.

This report deals exclusively with Ford manufacturing facilities located in Brazil. Through this report, we present GHG emissions from 2007 to 2008 along with analysis as to what has caused any changes.

1.1 Ford of Brazil:

Ford of Brazil includes the following entities:

- ✓ Northeast Industrial Complex (FNIC) – Vehicle Assembly Plant
- ✓ Ford São Bernardo do Campo Industrial Complex (FSBCIC)– Vehicle Assembly Plant
- ✓ Ford Taubaté Industrial Complex (FTBTIC) – Powertrain Plant
- ✓ Tatuí Proving Ground (TPG) – Tests
- ✓ Ford Motor Company Brazil Ltda – Troller Division (FMCTD) – Vehicle Assembly Plant

Tatuí Proving Ground is not included in this inventory as it is not a manufacturing plant and it is used for testing purposes.

1.2 Ford Northeast Industrial Complex (FNIC):

Product: Ford Ecosport, Ford Fiesta Sedan and Ford Fiesta Hatchback

Founded: October 12, 2001

Plant Capacity: 250,000 units/year

Operation: Vehicle Assembly



Figure 1.1 Ford Northeast



Figure 1.2 Ford Ecosport



Figure 1.3 Ford Fiesta Sedan



Figure 1.4 Ford Fiesta Hatchback

1.2.1 Ford São Bernardo do Campo Industrial Complex (FSBCIC):

Product: Ford KA, Ford Courier, Cargo 815/1317, F-350/4000, F-12000/14000 e F-250

Founded: 1967

Plant Capacity: 149.000 units/year

Operation: Vehicle Assembly



Figure 1.5 Ford São Bernardo do Campo Industrial Complex



Figure 1.6 Ford Ka



Figure 1.7 Ford Courier



Figure 1.8 Cargo 815/1317



Figure 1.9 F-350/4000



Figure 2.0 F-12000/14000



Figure 2.1 F-250

1.2.2 Ford Taubaté Industrial Complex (FTBTIC):

Product: Engine, Transmission and Chassis Component

Found: 1967

Plant Capacity: 280,000 engines/year and 450,000 transmissions/year

Operation: Powertrain



Figure 2.2 Ford Taubaté Industrial Complex



Figure 2.3 Engine



Figure 2.4 Transmission



Figure 2.5 Chassis Component

1.2.3 Tatuí Proving Ground (TPG):

Product: Laboratory and run tests

Found: 1978

Operation: Proving Ground



Figure 2.6 Tatuí Proving Ground



Figure 2.7 Laboratory and run tests

1.2.4 Ford Motor Company Brazil –Troller Division (FMTD):

Product: T4

Found: 1997

Plant Capacity: 1,200 vehicles/year

Operation: Assembly



Figure 2.8 Ford Motor Company
Brazil Ltda – Troller Division



Figure 2.9 T4

1.3 Corporate Practices on Climate Change:

Ford Motor Company is proud to participate in various climate initiatives around the world. Ford believes that climate change is a serious environmental issue and recognizes that it is not possible to wait for all uncertainties to be resolved. In addition to participating in the Brazil GHG Accounting and Reporting Program, Ford has also been proactively participating in the following climate change programs:

Chicago Climate Exchange (CCX): The Chicago Climate Exchange (CCX) is a greenhouse gas (GHG) emission reduction and trading program for emission sources and projects in North America. It is a self regulated, rules based exchange designed and governed by CCX members. These members have made a voluntary, legally binding commitment to reduce their emissions of greenhouse gases by six percent below 2000 baseline year by 2010. Ford is the first and only auto manufacturing participant in this program.

CFMA Chongqing – China Report: In 2008 Changan Ford Mazda Assembly Plant in Chongqing, China became the automotive company in China to report its GHG emissions.

The Climate Registry (TCR): The Climate Registry is a nonprofit organization that establishes consistent, transparent standards throughout North America for businesses and governments to calculate verify and publicly report their carbon footprints in a single, unified registry. Ford became a founding member in 2008 and is the first and only auto manufacturing participant in the program.

Mexico GHG Pilot Program: The Mexico GHG Program started as two year partnership between La Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT), World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD). It is a voluntary program established to help Mexican companies to quantify greenhouse gas emissions. Ford Motor Company was proud to be the only auto

manufacturer to participate in the first phase of the program where we are committed to reporting emissions annually.

EU Emissions Trading Scheme (EU ETS): Ford participates in the EU ETS which commenced in January 2005 and is one of the policies being introduced across Europe to reduce emissions of carbon dioxide and other greenhouse gases. The second phase of this program runs from 2008-2012 and coincides with the first Kyoto Commitment Period. Further 5-year periods are expected subsequently.

Canadian GHG Challenge Registry: Ford voluntarily reports GHG emissions to the Canadian GHG Challenge Registry. It has been reporting annual emissions since 1999. Over the years, it has received the highest level of achievement in the reporting system, which includes two Leadership Awards in the Automotive Manufacturing Sector category as well as qualifying as a Silver Champion level Reporter in 1999 and Gold Champion Level Reporter from 2000 to 2003, 2005 & 2006.

2. Methodology:

The baseline and reporting year are based on actual electricity and natural gas (NG) invoices. The emissions data reported was generated following the greenhouse gas calculation tools contained in the Corporate GHG Accounting and Reporting Guide, which was developed by the World Resources Institute (WRI) and the World of Business Council for Sustainable Development (WBCSD). Specifically, the calculation tools referenced include *Indirect CO2 emissions from the consumption of purchased electricity, heat, and/or steam* and *Revised tool for direct emissions from stationary combustion*, obtained from the website www.ghgprotocol.org. The report includes "direct" emissions characterized as scope 1 in the WRI/WBCSD protocol and "indirect" or scope 2 emissions from the same protocol. Scope 3 is not included in this inventory. All CO2 emissions are included and reported in units of metric tons of carbon dioxide (CO2). Other Greenhouse gases applicable to combustion processes, CH4 and N2O, are estimated to be less than 1% of the total emissions and hence considered de minimus. Other emission sources such as HFCs

from refrigerant leakages during the initial vehicle fill process for the air conditioning units are also considered negligible compared to the company's total emissions. PFCs and SF6 do not apply to the company's manufacturing facilities.

For emissions calculations, the factor of 0.0484 metric tons/MWh was used to convert electricity usage to indirect CO2 emissions based on the latest available emission factor for the consumption of electricity in Brazil as referenced in the Ministry of Technology and Science (MCT) website. A 0.05311 metric tons of CO2/MMBTU emission factor was used to convert natural gas (NG) usage to direct CO2 emissions (Table 2.1).

Table 2.1 Emission Factors

Factors Used (Source WRI Protocol Tool for Stationary Combustion V.4)		
Fuel	Factor	Units
Natural Gas	0.05311	tCO2/MMBTU
Electricity	0.0484	tCO2/MWh

3. Quantification & Baseline Year:

In order to create a reporting format for Ford of Brazil distinctive types of operations, data was grouped together as shown in table below.

Table 3.1 Operation Grouping

Group Name	Plant
Assembly	São Bernardo do Campo Industrial Complex (FSBCIC), Ford Northeast Industrial Complex (FNIC) & Troller Division (FMCTD)
Industrial Complex	*Taubate Industrial Complex (FTBTIC)

*Please note: Taubate Industrial Complex includes Ford's Engine, Transmission and casting operations. It is not possible to separate those operations as electricity and natural gas are measured by single incoming meters.

Ford of Brazil elected the 2007 year as a baseline year. The baseline was elected based on stabilized production rate and energy usage which makes it more representative of our GHG emissions going forward. Ford Northeast Industrial Complex (FNIC) started operations in 2001 ramping up production during the first years, climbing to a more stable production rate beginning in 2007. Also Ford purchased the Troller Division (FMCTD) in 2007.

4. Data:

Ford of Brazil has always been committed to reducing its emissions. The assembly plants have implemented projects to reduce electricity and natural gas consumption. Activities to reduce electricity include: Reduction of light bulbs at process areas, offices and other unused areas, turning off lights and office equipments during breaktime, replacement of air conditioner refrigerant gas to increase energy efficiency and reduce impact on ozone, turning off compressors during the weekends and repairing compressed air leaks. Efforts to reduce natural gas usage include: Delayed start of paint ovens and early shutoff to maximize oven efficiency. Below is a summary of Ford Brazil energy consumption in 2007 and 2008.

Table 4.1 Ford of Brazilian Energy Consumption and Vehicle Production

Group Name	Electricity Consumption (KWh)	
	2007	2008
Assembly	276,057,524	286,779,058
Taubate Industrial Complex	69,521,752	69,315,581
Total Consumption (KWh)	345,579,276	356,094,639
Group Name	Natural Gas Consumption (MMBTU)	
	2007	2008
Assembly	404,932	388,929
Taubate Industrial Complex	72,066	72,690
Total Direct Emissions	476,998	461,619

Assembly Plants Production	Production (unit)	
	2007	2008
São Bernardo do Campo Industrial Complex (FSBCIC)	84,582	125,150
Ford Northeast Industrial Complex (FNIC) Camaçari	249,018	207,038
Ford Motor Company Brazil Ltda – Troller Division (FMCTD)	1,165	1,077
Total	334,765	333,265

4.1 Direct & Indirect Emissions:

Greenhouse gas emissions are primarily the result of energy consumption by means of natural gas (direct emissions/scope 1) or electricity usage (indirect emissions/scope 2) The rate of energy consumption depends heavily on production, and if production increases, so will energy consumption. One of Ford's ongoing goals is to identify new methods that improve energy usage per production unit. Tables 4.1 and 4.2 show direct and indirect emissions for the years 2007 and 2008 by group name and Table 4.3 shows total GHG absolute emissions.

Table 4.2 Direct Emissions by Group Name

Group Name	Direct Emissions tCO2	
	2007	2008
Assembly	21,506	20,656
Taubate Industrial Complex	3,827	3,861
Total Direct Emissions	25,333	24,517

Table 4.3 Indirect Emissions by Group Name

Group Name	Indirect Emissions tCO2	
	2007	2008
Assembly	13,361	13,880
Taubate Industrial Complex	3,365	3,355
Total Indirect Emissions	16,726	17,235

Table 4.4 Total Absolute GHG Emissions

Group Name	Total Absolute Emissions tCO2	
	2007	2008
Assembly	34,867	34,536
Taubate Industrial Complex	7,192	7,215
Total Absolute Emissions	42,059	41,752

4.2 Analysis – Absolute Emissions:

Ford recognizes the importance of Climate Change and continually seeks ways to reduce the impact of our operations have on the environment. All the plants in Brazil have implemented energy saving projects and good engineering practices. Overall the Assembly plants combined have decreased their absolute emissions by 1.0%. The Taubate Industrial Complex increased its absolute emissions by 0.3% compared with 2007 this increase is attribute to changes the plant is undergoing to accommodate the launch of a new product. Total absolute emissions of all facilities combined decreased by 0.7%, which means that Ford of Brazil has kept its GHG emissions and production numbers relatively flat over the last two years.

Figure 4.1 Ford of Brazil Assembly Plants Absolute Emissions

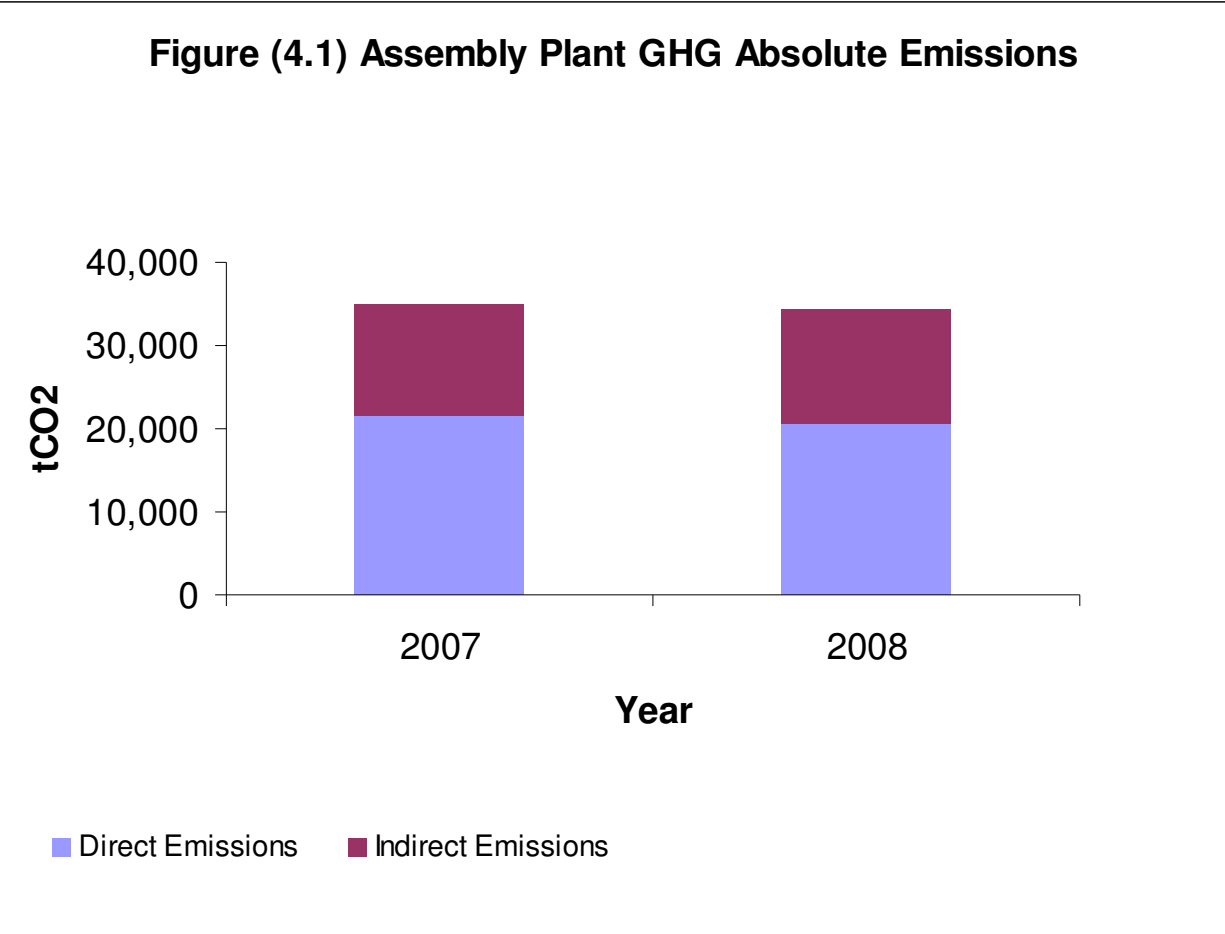
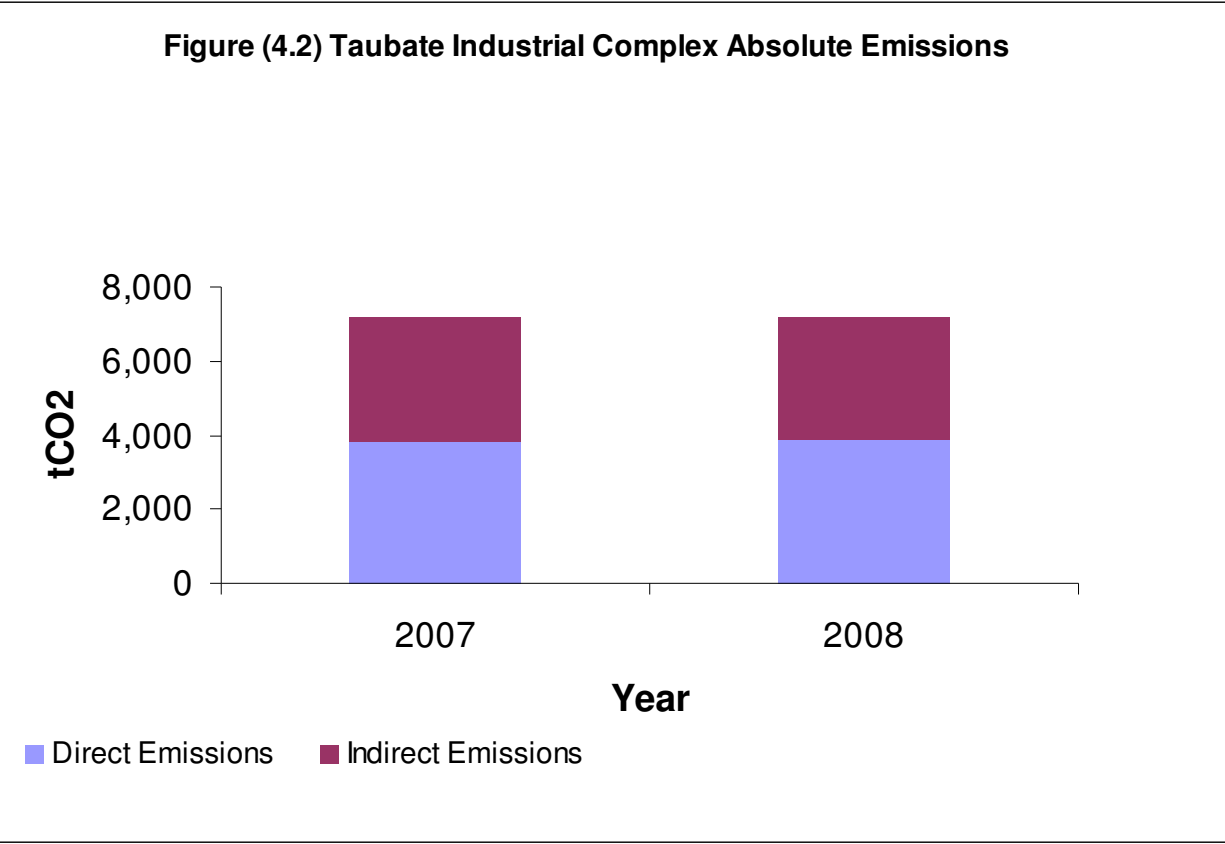


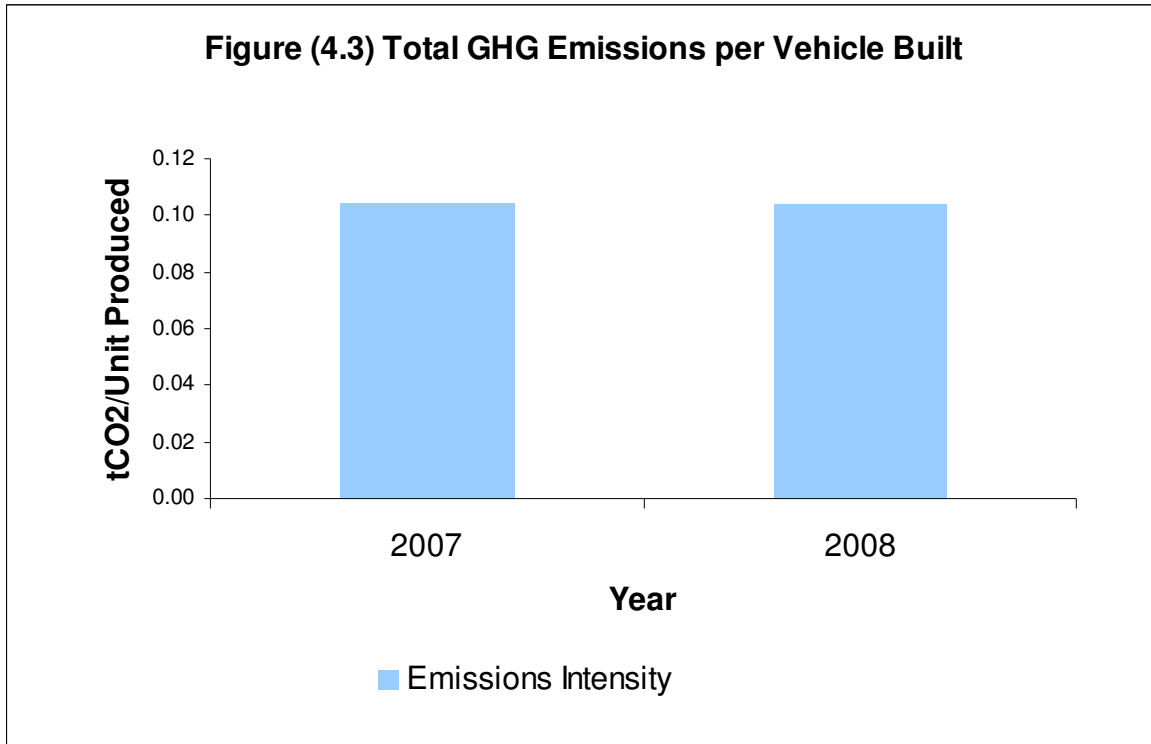
Figure 4.2 Ford of Brazil Taubate Industrial Complex Emissions



4.3 Analysis – Emissions Intensity:

In 2008 Ford's overall GHG emissions intensity (emissions/vehicle) remained flat (0.5% decrease) despite the 0.4% overall decreased in vehicle production. This reduction may be attributed to all actions undergoing at the plants to reduce energy consumption and GHG emissions.

Figure 4.3 Emissions Intensity Assembly Plants



Emissions Intensity at Taubate Industrial Complex are not included in this intensity calculation as it is not possible to split energy usage by type of operation (transmissions, engines and castings) at this time.

5. Conclusion:

Ford Motor Company is proud to be part of Brazilian GHG Program. Ford recognizes the importance of the climate change issue and supports emissions reporting at a national level. The commitment to improve energy efficiency (energy consumption per production unit) and reduce greenhouse gas emissions intensity is a priority to Ford of Brazil. We are working on ways of identifying areas that can be improve in order to reduce the amount of energy consumed per manufacturing process. One example is the use of the Global Emissions Manager (GEM) database, a standard now at all Ford facilities around the globe used to track GHG emissions and energy data.

Overall total absolute emissions of Ford of Brazil remained flat (0.7% decrease as did vehicle production 0.4% decrease). Production levels are expected to increase due to the introduction of a new line up of Ford Vehicles. This will allow the facilities to run more efficiently and will impact both absolute and intensity GHG emissions. Ford intends to support Brazil's efforts by providing annual updates to the Brazil GHG program.

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