

I PRO 322

Carbon Footprint of Automobiles



Your waste, your responsibility.

What is your carbon footprint?

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PURPOSE

The purpose of this IPRO is to develop and present a “user friendly” way of identifying vehicles with respect to the emission of greenhouse gases throughout their life cycle.

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GOALS/OBJECTIVES

- To find the best fuel efficient cars by observing the following fuel types: electricity, gasoline, bio-diesel, and diesel.
- Research materials such as aluminum, plastic, steel, and glass in respect to the amount of green house gasses that are emitted throughout the production process.
- Examine the Carbon footprint of the cars.

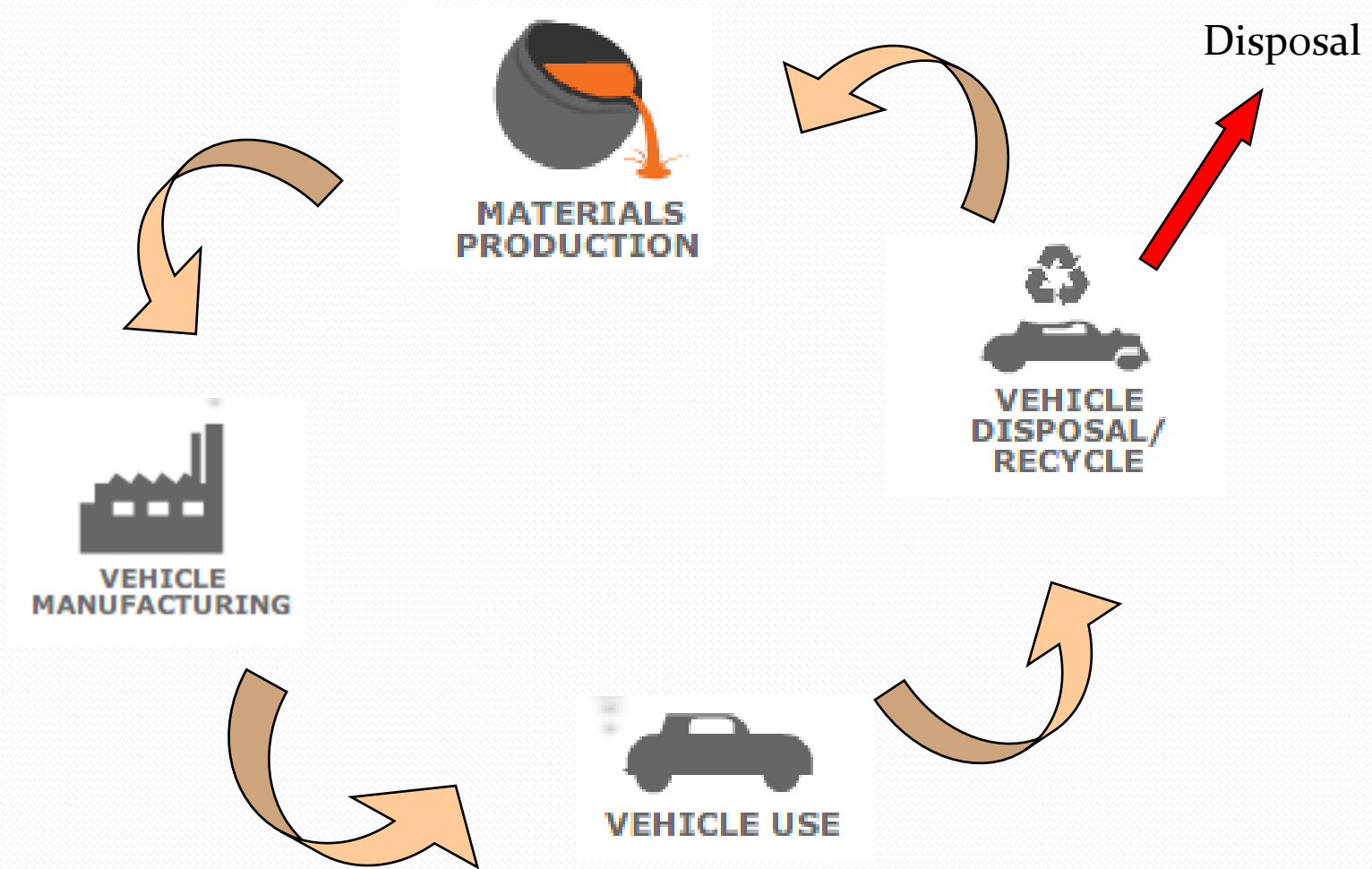
BACKGROUND


- A carbon footprint is defined as the total amount of greenhouse gases produced to directly and indirectly support human activities; usually expressed in equivalent tons of carbon dioxide.
- Individual carbon footprint is the sum of all emissions of carbon dioxide, which are induced by individual activities in a given time frame.
- The carbon footprint is a very powerful tool to understand the impact of personal behavior on global warming.

Background

- CO₂ is the predominant form, contributing to over 75% of all the greenhouse gases present in our atmosphere.
- When power plants and heating systems are combined, automobiles are the second leading source of CO₂ emissions.
- There are more cars on the road in the US than all of the countries in the European Union combined.

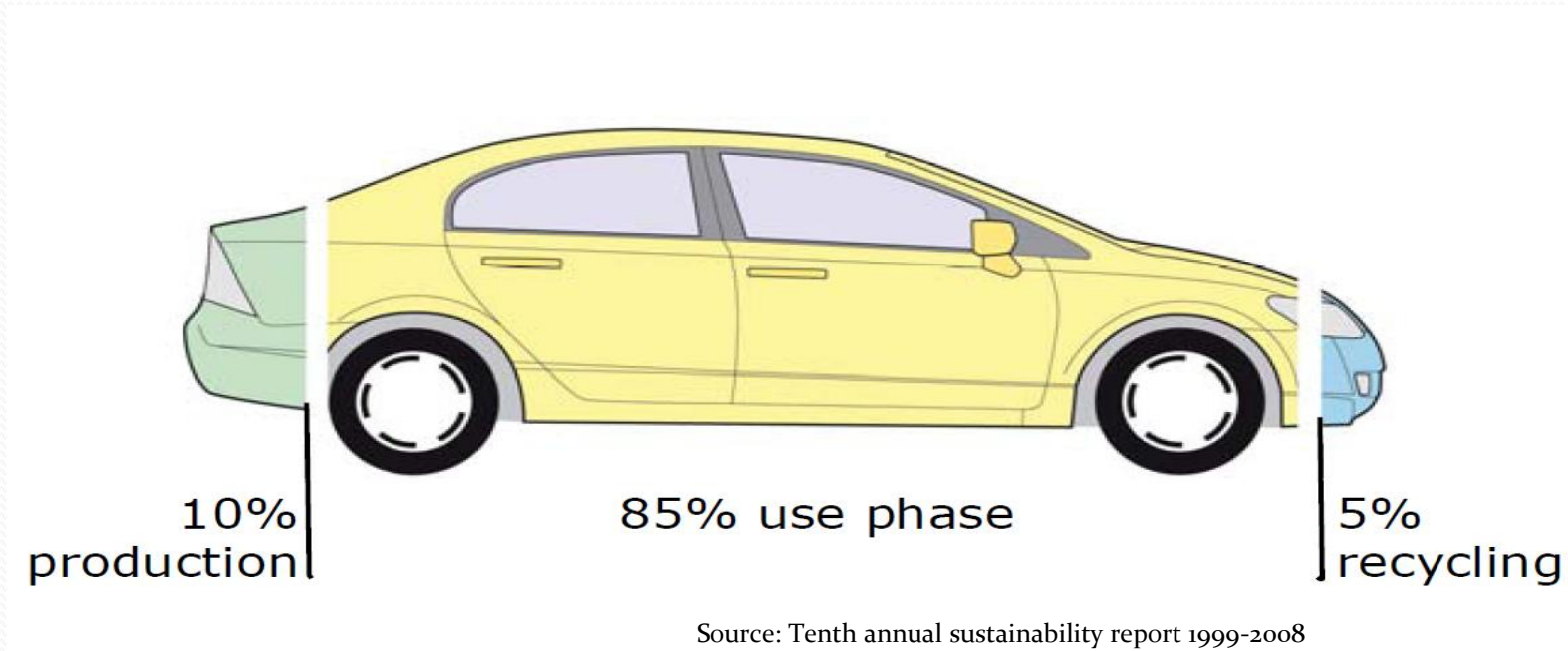
LIFE CYCLE assessment



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- Life cycle begins with the manufacturing of each part of the vehicle .
 - Calculating how much greenhouse gasses are emitted through the different parts of a car to the assembly and lastly the recycling is an important part of knowing the life cycle of a car.



Carbon footprint through the life cycle



Source: Tenth annual sustainability report 1999-2008

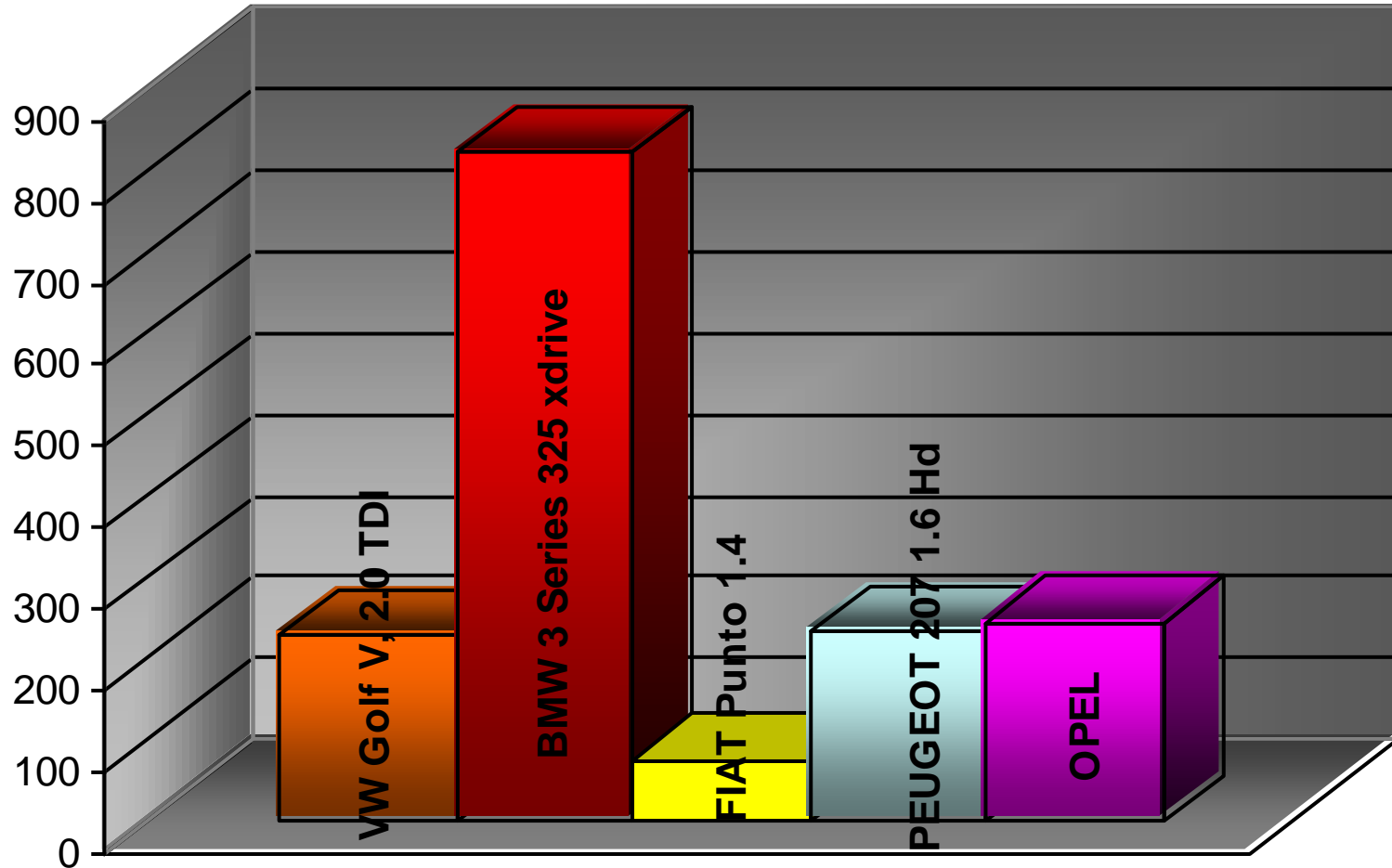
Production: production, logistics and energy for sales and support functions

In-use: CO₂ from distance driven, CO₂ from servicing and after sales functions

Disposal: CO₂ from end-of-life operations

CO2 emissions / vehicle

kg/vehicle



Car, model	Fuel type	Motor capacity (cc)	CO ₂ emission (g/ km)
BMW 116i	Gasoline	1595	139
BMW 118d	Diesel	1795	119
Volkswagen Golf	Diesel	1595	109
Volkswagen Golf	Gasoline	1395	139
Peugeot 407 SW	Diesel	1560	129
Peugeot 407 SW	Gasoline	1749	143
Fiat Punto	Diesel	1248	119
Fiat Punto	Gasoline	1368	155
Opel Astra	Diesel	1678	136
Opel Astra	Gasoline	1798	169

CO₂ emissions by manufacturer and motor work capacity

OBSTACLES

- Inadequate availability of technology to develop a simple device for tracking GHG emission is limited.
- Communication difficulties between both VGTU and IIT students.
- Due to time differences, more time management and special arrangements will be needed to have successful working sessions.
- Lack of precise and abundant information on emissions of different production processes, etc.

CURRENT PROGRESS

- The cars being studied by IIT group:
Ford Taurus, BMW 335d, Volkswagen Jetta TDI, Toyota Prius, and the Civic GX.
- Chicago Auto Show
- Data from VGTU group

Future Works

- Total carbon footprint for each vehicle
- Research on manufacturing and recycling process
- Using a uniform unit of measure for data comparison



Thank You

Questions?