

# *Calculation of fuel consumption and CO<sub>2</sub> emissions in Côte d'Ivoire: Methodology and Results*



*Hyacinthe Naré*

**Sub-regional workshop on  
sharing results and policy  
strategies for the  
implementation of the Global  
Fuel Economy Initiative in  
ECOWAS countries**

**Abidjan, July 11-13, 2017**

# Le GFEI

# GFEI: Global Fuel Economy Initiative



- L'Initiative Mondiale pour l'Economie du Carburant (GFEI)
  - Partenariat de 6 organisations



FOUNDATION

ITS UC DAVIS  
INSTITUTE OF TRANSPORTATION STUDIES



International  
Transport Forum

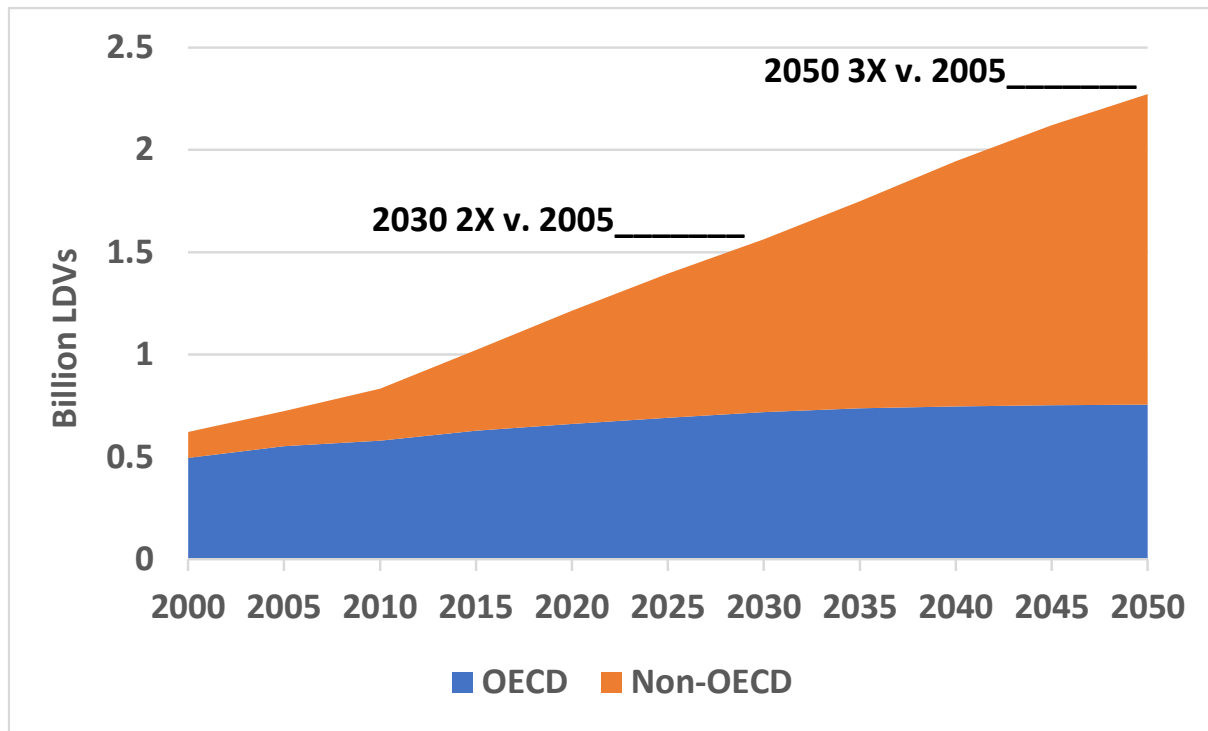


- Promouvoir les améliorations réelles d'économie de carburant et le déploiement maximal des technologies d'économie de carburant
- Aider les gouvernements et les acteurs du transport à promouvoir une plus grande économie de carburant

Source: <https://www.globalfueleconomy.org/>

# GFEI: Le problème

Le nombre de véhicules légers sur la planète pourrait tripler de 2010 à 2050, avec la plus grande partie de cette croissance observée dans les économies émergentes



- Pollution de l'air ambiant
  - Changement climatique
  - Encombrement des voies
  - Accidents
- Etc.

Sources: IEA Energy Technology Perspectives, 2012  
ICCT, International Council on Clean Transportation

# GFEI: Objectifs

**Doubler l'économie moyenne de carburant de tous les véhicules neufs d'ici 2030**

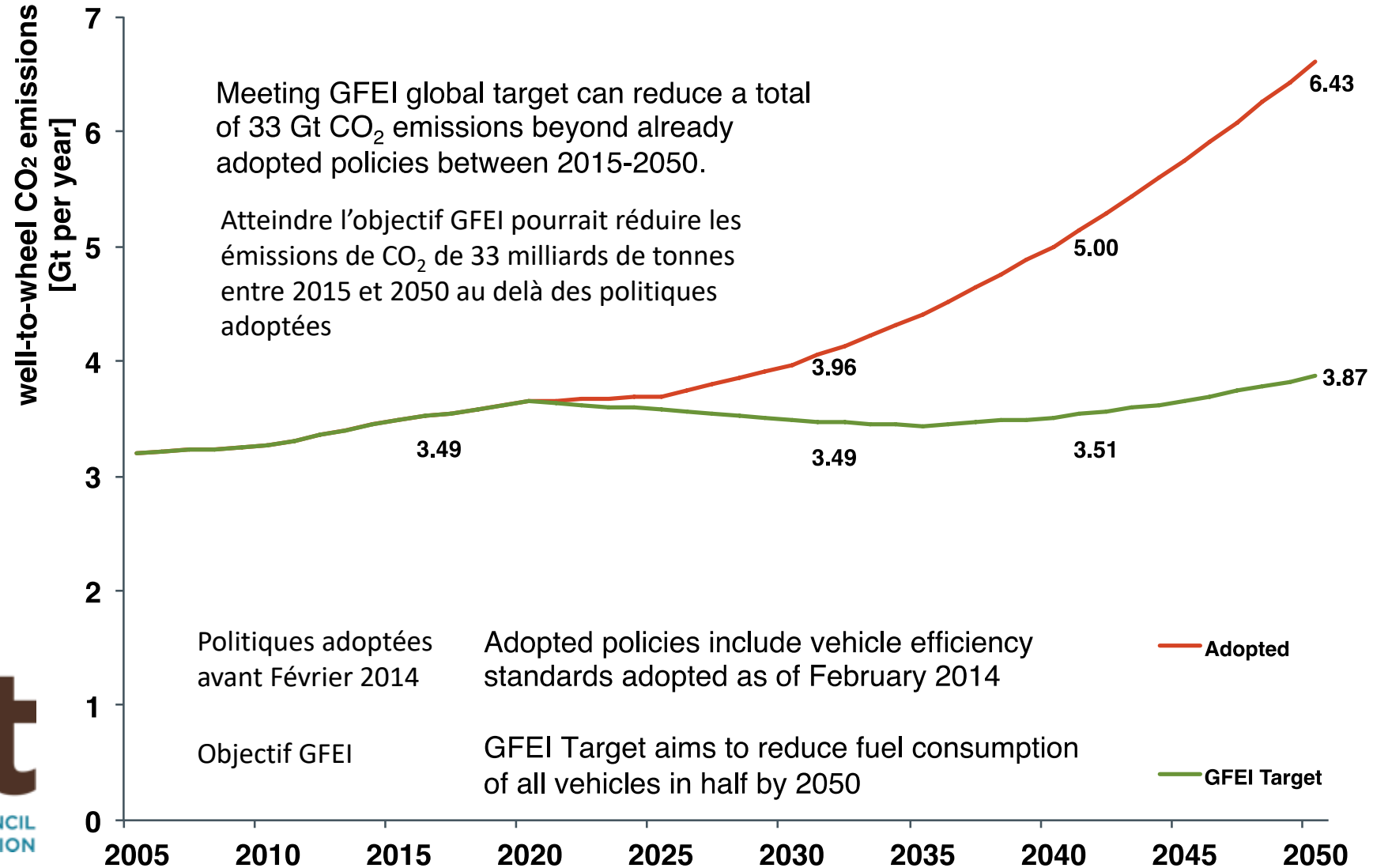
**Doubler l'économie moyenne de carburant de tous les véhicules d'ici 2050**

**Atteindre la cible de 100 pays s'engageant à agir pour l'économie de carburant, conformément aux objectifs du GFEI ('100 pour 50 d'ici 50')**



Source: <https://www.globalfueleconomy.org/>

# Atteindre l'objectif GFEI stabilisera les émissions de CO<sub>2</sub> liées aux véhicules légers , malgré la croissance du parc automobile



# Avantages de l'économie de carburant

Réduction des émissions de CO<sub>2</sub>

Amélioration de la qualité de l'air

Réduction de la dépendance en pétrole

Economies financières



## 300 fewer power stations

The 33Gt of CO<sub>2</sub> that could be saved between 2015 and 2050 is roughly the equivalent of closing 300 coal power stations over the same time period.



From associated improved vehicle emissions standards



## \$2 trillion savings

A total of \$2 trillion could be made in fuel savings by 2025, \$500 billion of which would fund the costs of initiating a transition to electric vehicles.

Source: <https://www.globalfueleconomy.org/>

# Côte d'Ivoire new vehicles fleet analysis

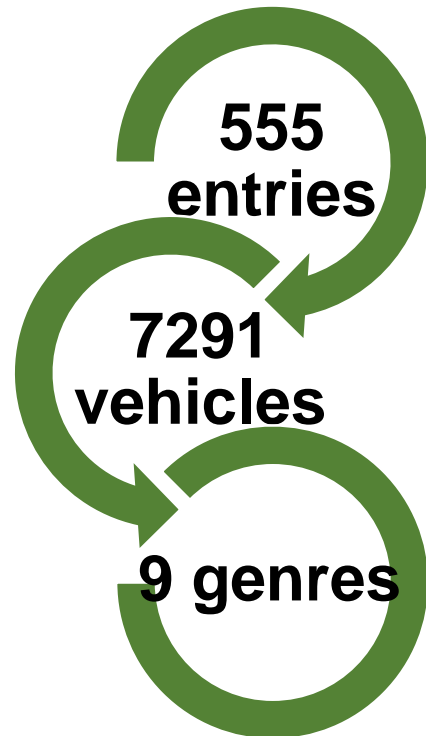


# Côte d'Ivoire new vehicles fleet analysis

*Data*

# The 2015 database

Type Commercial	Genre	Marque	Places	Puissance	Carburant	PTAC	Cylindrée (cm3)	Consommation L/100km	Emission de gaz CO2 (g/km)	Nombre
RANGER 4*4 DC	CAMIONNETTE	FORD	5	10	GAS-OIL	2937	2,493			161
DUSTER	VOITURE PARTICULIERE	RENAULT	5	9	ESSENCE	0	1565			144
CANTER FUSO	CAMION	MITSUBISHI	3	13	GAS-OIL	6500				111



## Genre de vehicules (Heavy-duty vehicles)

Buses (*Autocar-buses*)

Trucks (*Camion*)

## Genre de vehicules (Light-duty vehicles)

Passenger cars (*Voiture particuliere*)

Light Trucks (*Camionnette*)

## Genre de vehicules (Agricultural and construction equipment)

*Chariot elevateur*

*Plateau*

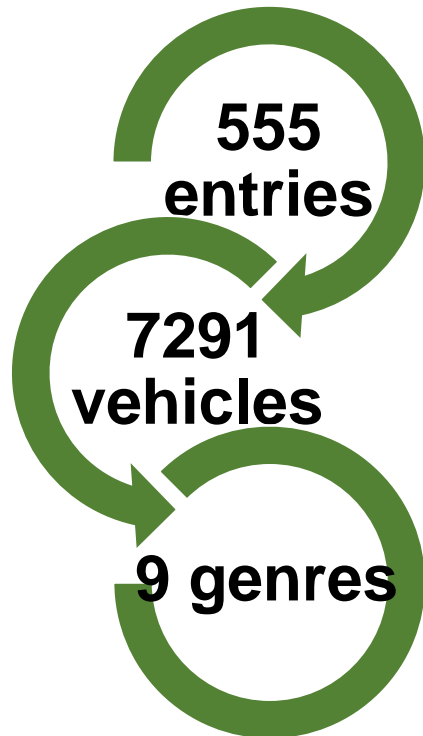
*Tracteur agricole*

*Tracteur routier*

*Vehicule a usage specifique*

# The 2015 database

A focus on Light-duty vehicles: motor vehicles having at least *four wheels* and for the carriage of *passengers and goods*, comprising *no more than eight seats* in addition to the driver's seat, and having a maximum mass ("technically permissible maximum laden mass") *not exceeding 3.5 tons* by the European Commission (Transport Policy 2015).



## Genre de vehicules (Heavy-duty vehicles)

Buses (*Autocar-buses*)

Trucks (*Camion*)



## Genre de vehicules (Light-duty vehicles)

Passenger cars  
(*Voiture particuliere*)

Light Trucks  
(*Camionnette*)



## Genre de vehicules (Agricultural and construction equipment)

*Chariot elevateur*

*Plateau*

*Tracteur agricole*

*Tracteur routier*

*Vehicule a usage  
specifique*



# The ideal database

- Information required

Vehicle Make	Vehicle Model	Variant	fuel_type	Model Year	Gross Vehicle Weight	engine_capacity ( ccm)	Body Type	transmission_type	emission_standard	Number of vehicles registered	Fuel Consumption (L/100km)	CO2 emissions (gCO2/km)
Fiat	Fiat Scudo		Diesel	2015	2780	1997		M	5			
Peugeot	Peugeot Expert		Diesel	2015	2060	1997		A	5			
VW	VW Touran		Petrol	2015	1955	1197		M	6			
Renault	Renault Scenic		Petrol	2015	1945	1197		M	5			
Renault	Renault Scenic		Petrol	2015	1655	1197		M	5			
Skoda	Skoda Roomster		Petrol	2015	1800	1198		M	5			

- Additional information

N	O	P	Q	R	S	T
Year of first registration	Seats	New or secondhand import	Doors	footprint	Kerbweight	etc.

# Côte d'Ivoire new vehicles fleet analysis

*Methodology*

# Data preparation

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- The database includes all vehicles ( heavy-duty, light-duty, agricultural and construction equipment) in 2015
- We extracted all “motor vehicles having at least *four wheels* and for the carriage of *passengers and goods*, comprising *no more than eight seats* in addition to the driver’s seat, and having a maximum mass (“technically permissible maximum laden mass”) *not exceeding 3.5 tons* by the European Commission
- Nearly 36% of the entries were removed and the analysis was conducted on 355 entries

# Calculation of fuel consumption and CO<sub>2</sub> emissions

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- The methodology assumes that all LDVs are imported from the European Union
- The International Council on Clean Transportation (ICCT), a GFEI partner ) has compiled in a database all light-duty vehicles in the European Union, with attributes including fuel consumption and CO<sub>2</sub> emissions.
- The data was extracted from the EU database with all required details

# Example: Mitsubishi camionnette L200 gasoil



<http://1001carreviews.com/mitsubishi/mitsubishi-l200-2015-2016/>

2015 Côte d'Ivoire database

Type Commercial	Genre	Marque	Plac	Puissan	Carburant	PTA	Cylindrée (cm	Consommation L/100k	Emission de gaz CO2 (g/kn	Nomb
L200	CAMIONNETTE	MITSUBISHI	3	10	GAS-OIL	2550	2493.143854			68



2015 EU database

Manufactu	OEM	Segment	Model	fuel_type	transmissi	driven_wh	origin_mar	emission_	Total	CO2_Emis	fuel_cons_combined_averag	
Mitsubishi	Mitsubishi	G Pick-Up	Mitsubishi L200 Pick-Up	Diesel	A	All	Japan		4	2	233	8.8



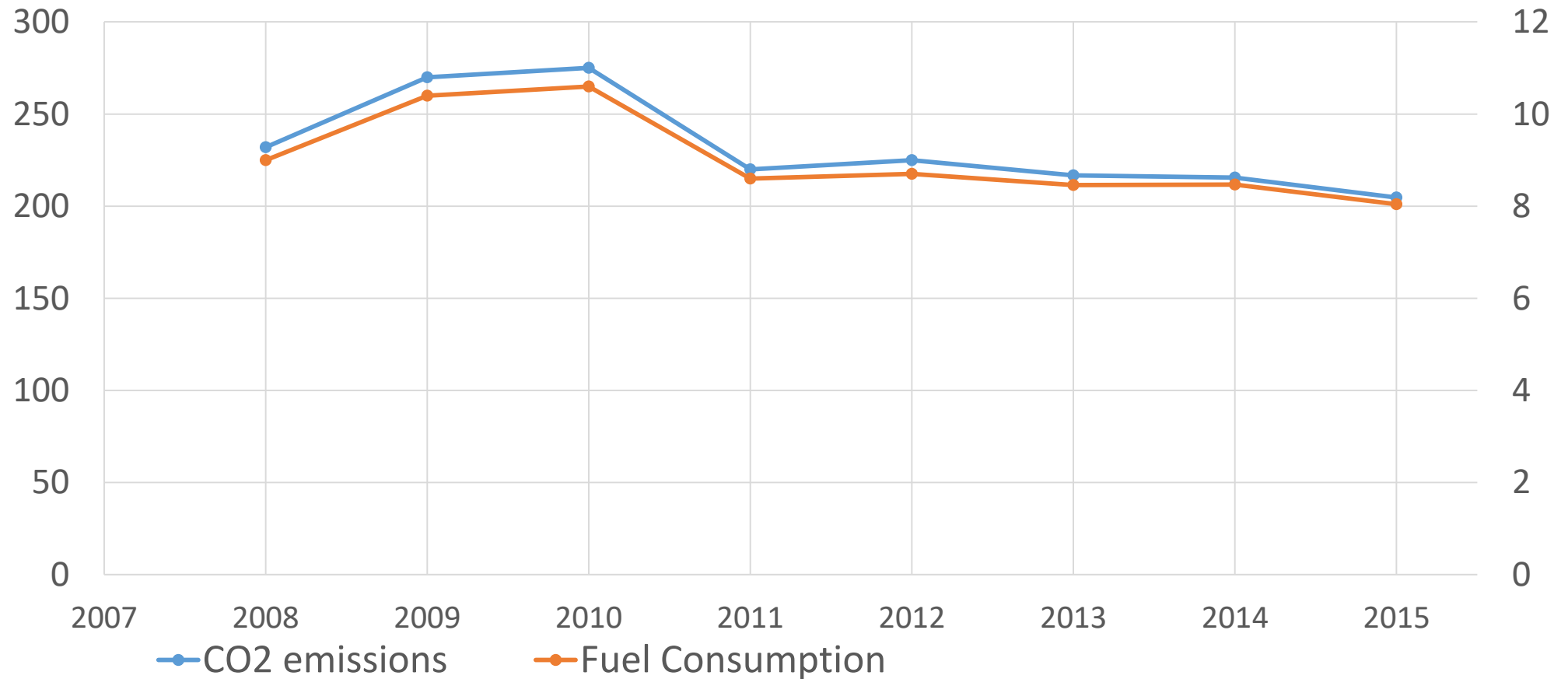
# Côte d'Ivoire new vehicles fleet analysis

*Results*

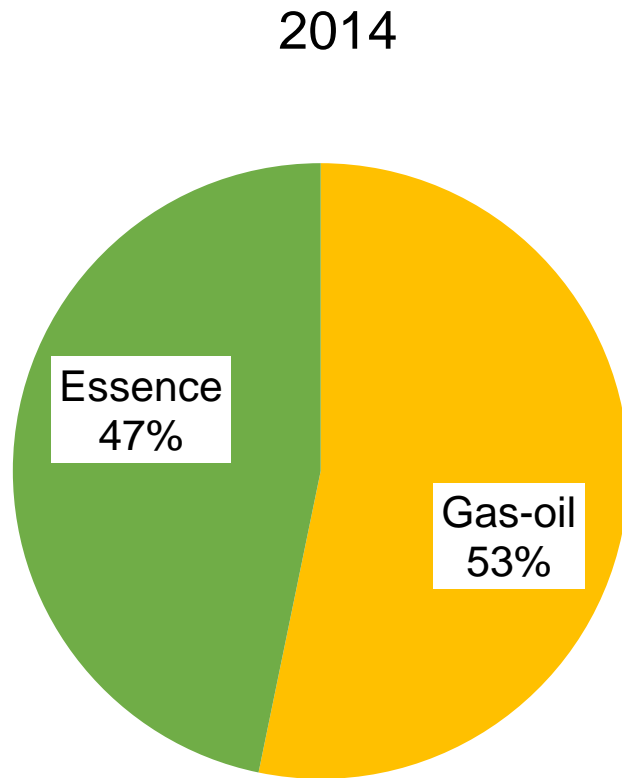
# Résultats

	Fuel consumption (l/100km)	CO <sub>2</sub> emissions (gCO <sub>2</sub> / km)
2015	7.98	189.73
2015 ( Top 10)	8.04	204.73
2014( Top 10)	8.46	216.7
2013 ( Top 9)	8.47	215.5

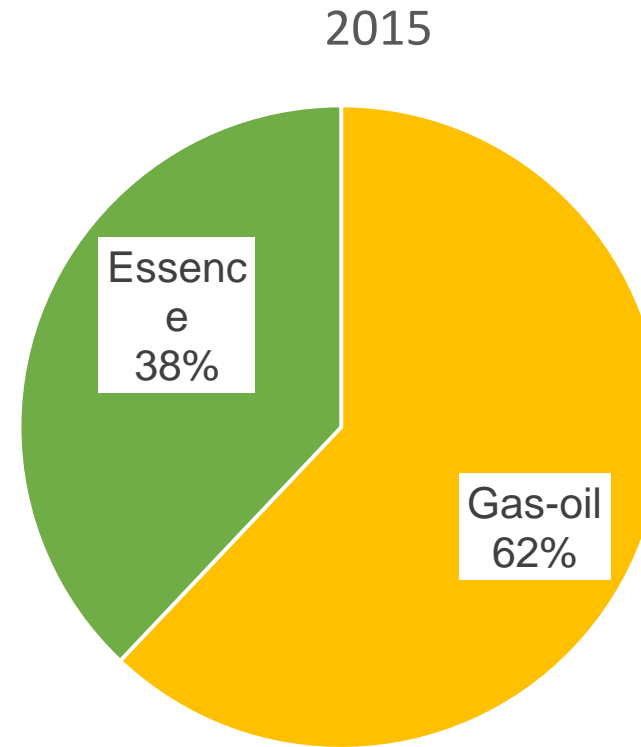
# Comparaison 2008-2015



# Increasing share of diesel vehicles in top 10 models



Gas-oil  
Essence

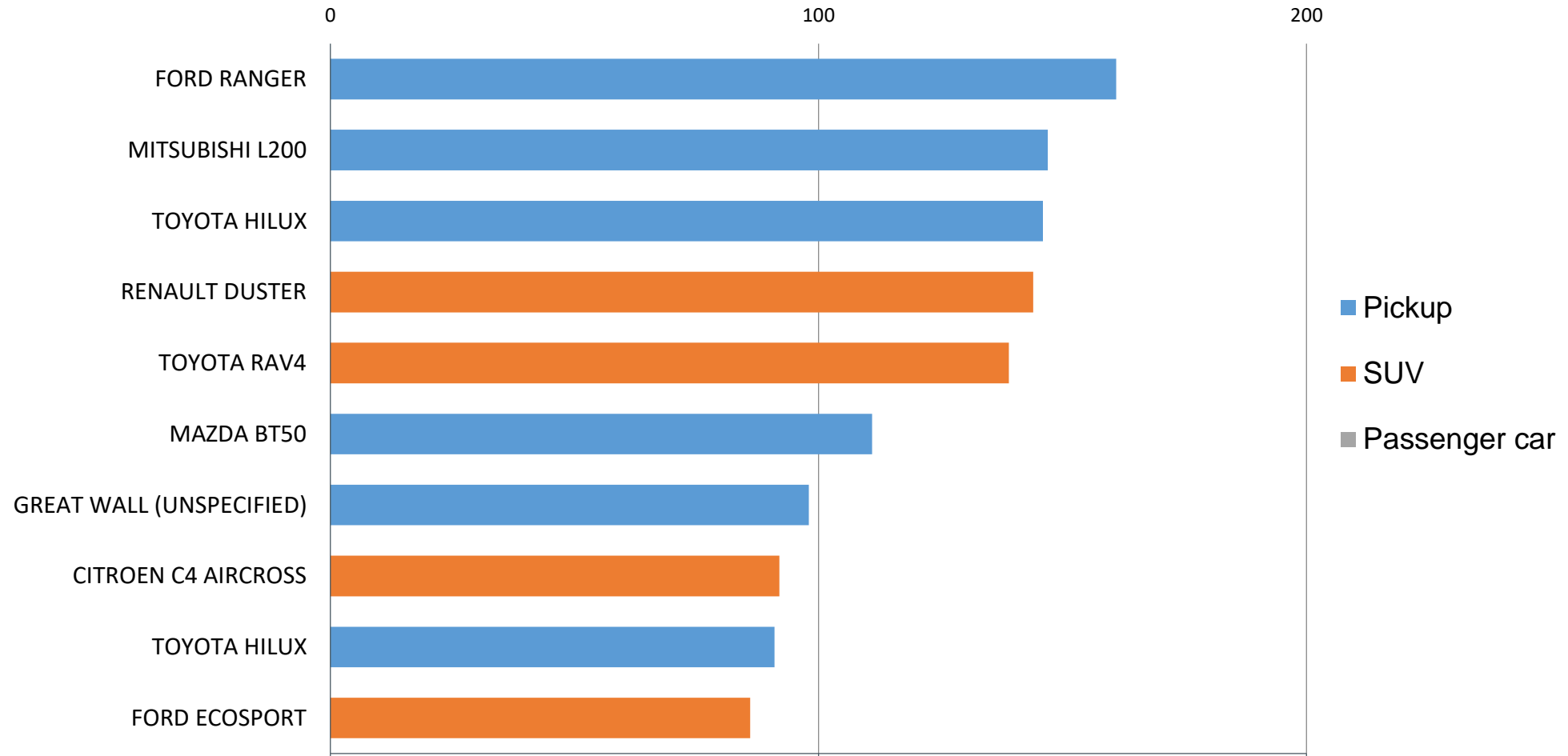


Les véhicules  
gasoil non  
contrôlés sont  
sources de  
pollution de l'air

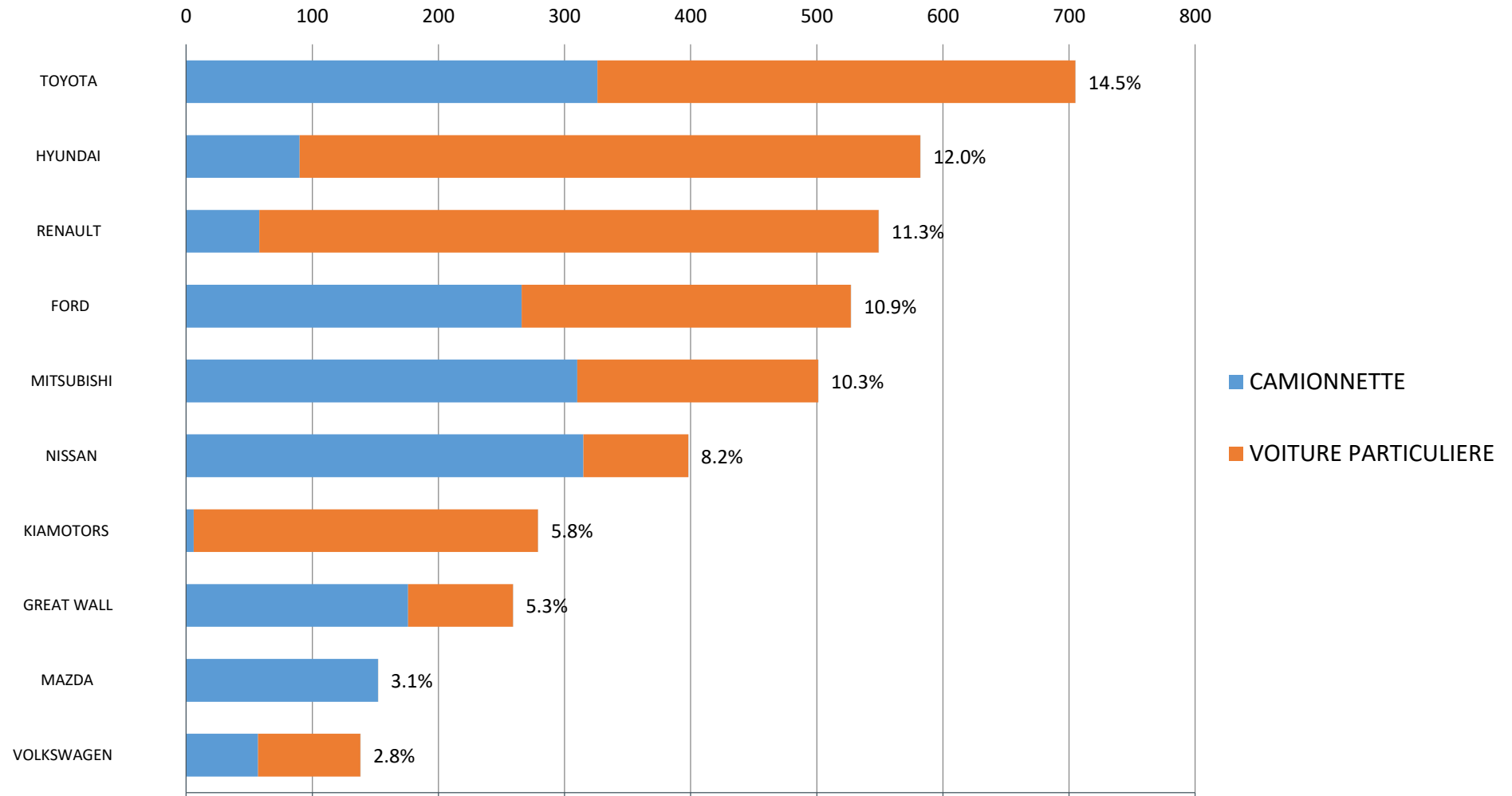
2014 data is based on BestSellingCars.com and 2015 from Cote d'Ivoire's database

# The market

# Camionnettes et véhicules utilitaires dominant les modèles les plus vendus



# Les 10 marques les plus vendues



# The way forward



# The way forward

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- Continue building a robust database
- Compile data for motorcycles, tricycles, buses
- Understand the end-of-life of vehicles
- Integrated transportation policies
- Mass Transit BRT

Merci  
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