Fuel Economy and CO_2 Emissions of Light-Duty Vehicles in Tunisia

Centre for Environment and Development for the Arab Region and Europe
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ACRONYM	DESCRIPTION
CEDARE	Center for Environment and Development for the Arab Region and Europe
CO_2	Carbon Dioxide
CAMRE	Council of Arab Ministers Responsible for the Environment
GDP	Gross Domestic Product
GFEI	Global Fuel Economy Initiative
GNI	Gross National Income
IMF	International Monetary Fund
LAS	League of Arab States
LDV	Light Duty Vehicle
MEE	Ministère de l'Equipement et de l'Environnement
MEWA	Middle East and West Asia
NEDC	New European Driving Cycle
OECD	Organization for Economic Cooperation and Development
OICA	Organisation Internationale des Constructeurs d'Automobiles
PCFV	Partnership for Cleaner Fuels and Vehicles
SUV	Sports Utility Vehicles
UNEP	United Nations Environment Programme
WB	World Bank

1 INTRODUCTION

As part of the Global Fuel Economy Initiative (GFEI) and the strategic partnership between the Center for Environment and Development for the Arab Region and Europe (CEDARE) and the United Nations Environment Programme (UNEP) under the program titled *Improving Fuel Quality and Fuel Economy in Middle East & West Asia (MEWA)*, the present study aims to assess and fuel economy and carbon emissions of light duty vehicles in Tunisia and to review relevant regulations. This case study contributes to the global effort to reduce fuel-dependence, improve vehicle fleet technologies, and mitigate the environmental and economic impact of inefficient vehicles in pursuit of a more sustainable transport sector.

The scope of this report is limited to new Light Duty Vehicles (LDVs). Future studies may also address on-road vehicles (i.e. the entire stock) and the rest of vehicle classifications.

The report firstly presents background about the context surrounding the automotive industry in Tunisia and the associated environmental, economic and social aspects. An overview of the industry is then presented with a brief summary of the relevant regulations related to the LDVs in Tunisia and the policy environment. The methodology for data collection, calculations and analysis is then explained and the results are presented and discussed. Recommendations for regulations and future studies are presented in the final section of the report.

1.1 OBJECTIVES

The overall aim of this study is to present the case study of Tunisia in terms of the state of the vehicle fuel economy and carbon emission trends of new LDVs in the past years. It is presented in the context of the Global Fuel Economy Initiative (GFEI) target to reduce the global average of *new* LDVs from 8 L/100 km today to 4 L/100 km (50%) by 2030, and to further achieve this 50% reduction for the entire LDV stock by 2050; the *50-by-50* target.

The specific objectives of this study are as follows:

1. Report on the average fuel economy for *new* light duty vehicles in Tunisia and its trend over time.
2. Present follow-up recommendations for policy-makers and regulators.

2 BACKGROUND

Tunisia is a North African and Arab country with a population of 10.9 million in 2013. It is classified as a *low-middle-income* economy according to the World Bank classifications based on Gross National Income (GNI) per capita (WB, 2014). Tunisia had a modest average GDP growth rate of 2.2% over the past three years, 2011-2013 (World databank, 2014). This may be attributed to the significant economic crisis occurring during the year of the 2011 revolution of Tunisia.

For Tunisia, total number of vehicles on the road has been relatively stable from 2005 until 2012, showing steady increase to exceed the one million over that period (OICA, 2014; MEE, 2013a). The vast majority of LDVs are gasoline fueled, being 88% of total LDV sales in 2012.

2.1 LOCAL AIR POLLUTION AND CARBON EMISSIONS

Local air pollution is specifically of concern in the cities of Tunisia as the percentage of population living in urban agglomerates exceeds 60% (Mraihi et al., 2015). Mobile emissions in Tunisia are responsible for a large share of both CO_2 emissions and local pollutants such Sulphur Oxides (SO_x), Nitrogen Oxides (NO_x), and fine Particle Matter (PM), among other pollutants, which are likely to increase in the future with gradual motorization (MEE, 2013a;Mraihi et al., 2015).

With regards to carbon emissions, according to Tunisia's second national communications for the United Nations Framework Convention For Climate Change (UNFCCC), 28% of all carbon emissions from fossil fuels are attributed to the transport sector alone in year 2000 (MEE, 2013b). In more upda-ted studies, this share is noted to be 45% (Mraihi et al. 2015). This shows the relative increase in the contribution of this growing sector.

2.2 VEHICLE STOCK AND CAR OWNERSHIP

It is important to clearly differentiate between indicators of the total vehicle stock and the indicators of the *new* vehicles entering the market. In this section, as background, an overview of the total vehicle stock is presented.

Figure 1 in the following page shows that passenger cars constitute the majority of vehicle types and they are the fastest growing category. In 2013, 67% of all motorized vehicle types were private cars, and the total stock crossed one million in that year (MEE, 2013a).

In the period of 2005-2011 alone, passenger car ownership has increased by 36%, from 67 cars/1000 inhabitants in 2005 to 91 in 2011 (WB DataBank, 2014). This lies in a similar range to neighbouring countries in North Africa, e.g. 76 cars per 1000 inhabitants in Algeria, 65 in Morocco and 45 in Egypt in 2011 (WB DataBank, 2014; CAPMAS, 2015).

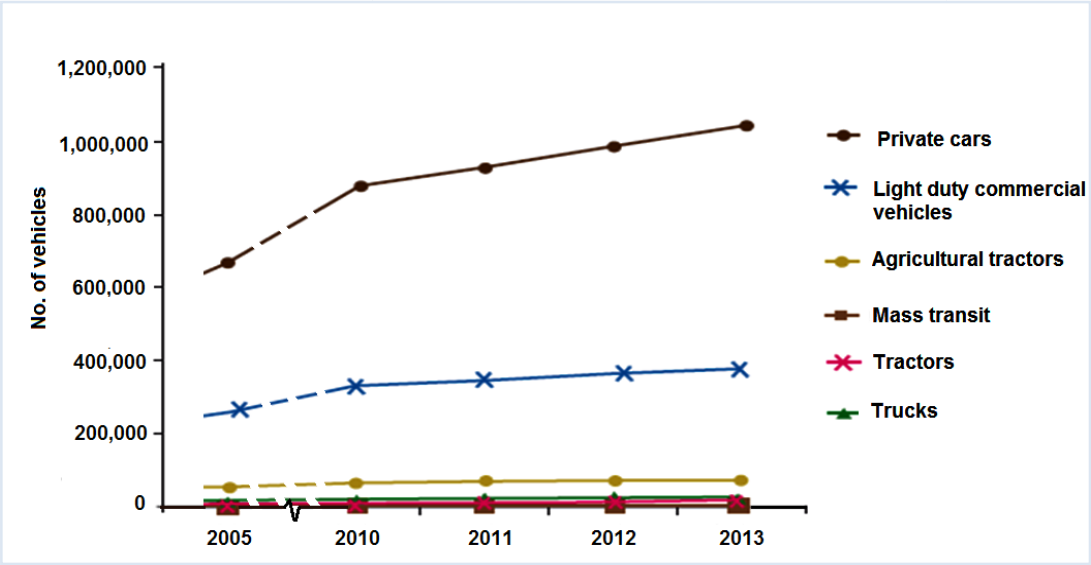

Figure 1: Private cars relative growth in Tunisia, 2005-2013 (MEE, 2013a, edited)

Nevertheless, the ownership rate in Tunisia is several times lower than most EU countries but likely to follow the same trajectory with economic development. For example, Italy, France and Germany in the same year of 2011 had ownership rates of 605, 482, and 530 passenger cars per 1000 inhabitants respectively (WB DataBank, 2014).It is expected for a growing developing country that a business-as-usual scenario of rapid vehicle ownership will occur throughout the economic transition as GDP per capita continues to rise (IMF, 2008).

2.3 Automotive Industry

The automotive industry in Tunisiais a large employer and contributes to 5% of total GDP (IHK, 2011). It produces for both export and local demand. There are several older traditional sectors that provide for industrial growth in Tunisia, such as textiles and clothingand agro-industry, among others. However, in the recent years, the most notable evolution of the industrial sector was the development of the automotive and aeronautics components of which exports have increased by 18% throughout the period 2000-2012 (Trape et al., 2014). Today, investment in automotive components manufacturing for export is a priority sector for the government of Tunisia (US Commercial Service, 2014). Automotive industry players in Tunisia include international groups such as VALEO, SAGEM, LEONI, YAZAKI, FUBA, and LEAR (IHK, 2011).

European brands dominate the automobile market in Tunisia; Renault, Volkswagen, Peugeot, Fiat, and Citroen. The American brands GM and Ford are both present but with a minor share (below 12%), while Toyota and other Far East manufacturers remain with no significant presence in Tunisia (US Commercial Service, 2014).

3 REGULATIONS AND POLICY ENVIRONMENT

The Tunisian market is unique in the sense that the vast majority, with the exception of a niche of luxury cars, is determined by the government. A strict quota system is enforced to cap the number of vehicles allowed into the country annually. The quotas are determined by several factors: the country's trade deficit, local demand, and investment arrangements among foreign car makers and domestic parts manufacturers (US Commercial Service, 2014). Cars in the market are predominantly small and economic cars of European brands.

3.1 FUEL SUBSIDIES

Transportation fuel prices have been in steady increase in Tunisia and are presently subject to low subsidies, but are significantly more expensive than fuel prices in the rest of the Arab region such as in the neighbouring Algeria and Libya. For example, the prices are more than double the prices in Egypt in 2012 (GIZ, 2014).

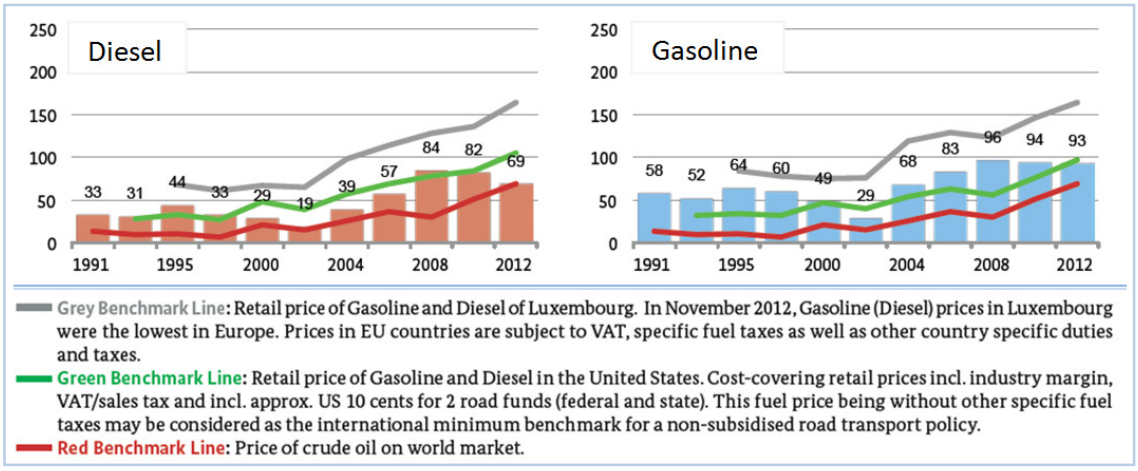

Figure 2: Trends of transportation fuel prices in Tunisia in US-cents/liter for diesel and super gasoline respectively (GIZ, 2014)

Figure 2 shows the gradual increase in fuel prices in Tunisia illustrated in the bar chart, showing diesel and super gasoline, indicating high prices comparable to the US retail price yet lower than the high fuel prices and taxes in the EU.

3.2 SOCIAL ASPECTS OF FUEL PRICE HIKES

Energy subsidies in Tunisia remain a substantial burden on the economy to date, and more so after the revolution due to further economic difficulties. The economic slowdown can be attributed to several factors: political turbulence and the unstable security situation, stagnation in the euro area, and a significant (3.3%) decline in agricultural production (Trape et al. 2014). In such circumstances, it is of great importance for the government to rationalize social spending, especially fuel subsidies, to minimize any unnecessary fiscal burdens. When social protection programme such as subsidy schemes are carefully designed to specifically target the poor, then the social impacts of increases in

fuel prices can be largely mitigated. International experience has also consistently shown that the fossil fuel subsidies are often disproportionately benefiting the richer strata of society and should rather be phased out and transferred to *targeted* support schemes (WB, 2012). Social protection progress however remains relatively untargeted in Tunisia (Trape et al. 2014). There is therefore an opportunity to further improve the measures taken to mitigate the social impact of subsidy phase-outs in advance.

3.3 CUSTOMS AND TAXATION

The key features of the customs and taxation environment for vehicles in Tunisia are as follows (US Commercial Service, 2014):

- A progressive tax on all vehicle imports is imposed, rising with vehicle age up to the limit of five years.
- A high consumption tax is imposed on automobiles with large capacity engines purchased through authorized distributers; 67% for gasoline engines and 88% for diesel engines. The rate is deliberately controlled to allow automobiles to be competitive with vehicles purchased privately in Europe and elsewhere that are shipped back to Tunisia.
- A higher consumption tax is imposed on automobiles with large capacity engines that are *not* purchased through authorized distributers; up to 277% for gasoline engines and 360% for diesel-fueled engines.

The five years limit also applies to Tunisians abroad who ship their vehicles to Tunisia, in order to avoid influx of older inefficient vehicles from abroad.

4 METHODOLOGY

The methodology used was in principle based on the Global Fuel Economy Initiative (GFEI) methodology provided through the online GFEI toolbox[1]. It is used to harmonize global efforts in constructing baselines and identifying trends of national fuel economy and CO_2 emissions of light-duty vehicles (LDVs). LDVs include mini, small, compact, family and big cars in addition to light vans and sport utility vehicles (SUVs) (Annex 1).

The new LDVs data are compiled from sales data from automotive markets consultant Matthias Gasnier and is based on compiled manufacturers' data and expert estimation to include all car sales through authorized dealers. A sample of the data set is presented in Annex 2 with notes on the assumptions. The data set includes the following vehicle characteristics:

- Vehicle make
- Vehicle model and type
- Model production year
- Engine size (in cubic meters; cc)
- Vehicle origin
- Fuel type
- Sales per vehicle model and fuel type

Based on the available data, the fuel economy figures were obtained for each vehicle as available from manufacturers and normalized to the New European Driving Cycle (NEDC) where needed using the online tool of the International Council for Clean Transport (ICCT)[2]. Manufacturers' specifications manuals and compilations of the French Environment and Energy Management Agency (ADEME) have also been used to assign the best available fuel economy and CO_2 emissions figures for each LDV model[3]. Models for which emission factors were not attainable were less than 1 % of all models covered in the study years.

Information on total vehicle stock was also researched and provided in the background section in order to put results into perspective and facilitate the analysis.

[1] GFEI toolbox: http://www.unep.org/transport/gfei/autotool/about.asp
[2] ICCT conversion tool: http://www.theicct.org/info/data/GlobalStdReview_Conversionfactor.xlsx
[3] ADEME's online resource for data on fuel economy and energy emissions of new cars: http://carlabelling.ademe.fr/

5 RESULTS AND DISCUSSION

Figure 3 shows average annual fuel economy (l/100km) trends for new LDVs in Tunisia for the years 2005, 2008, 2010 and 2012.Figures are for both gasoline and diesel LDVs combined, noting that gasoline fueled LDVs are about 90% of sales in all years**.** The separate figures for average fuel economy for diesel and gasoline vehicles are shown in Table 1.

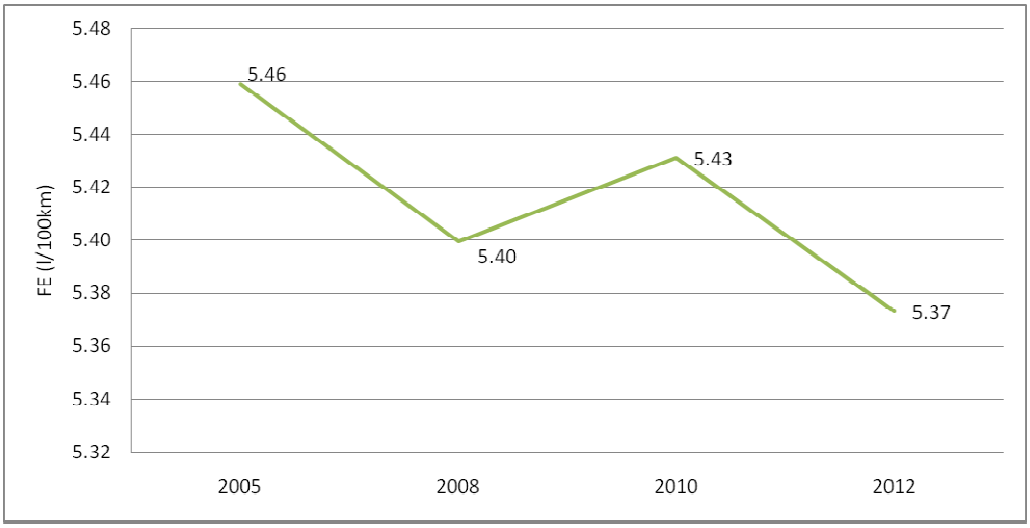

Figure 3: Average Fuel Economy of new LDVs (l/100km, NEDC driving cycle) in Tunisia since 2005

The FE trends show very minor fluctuation (within 2%) but a general overall improvement is observed reaching 5.37 l/100km in 2012. Furthermore, emission rates, shown in Table 1, show similar overall improvement. Table 1 also shows a steady level of annual average fuel economy of new LDVs over the same years. Although the new LDVs are predominantly gasoline fueled, Table 1 shows the average FE for new diesel LDVs separately to note that they also fall within the similar range.

Table 1: Average Fuel Economy and emission rates of new gasoline and diesel fueled LDVs (NEDC driving cycle)

	2005	2008	2010	2012
FE of Gasoline fueled LDVs (l/100km)	*5.44*	*5.43*	*5.46*	*5.37*
FE of diesel fueled LDVs (l/100km)	*5.66*	*5.09*	*5.17*	*5.37*
Average FE of all new LDVs (l/100km)	5.46	5.40	5.43	5.37
Average CO_2 emission rate, all new LDVs(gCO_2/km)	135	136	136	134

It was notable that although sales have slightly decreased between 2010 and 2012, the number of models increased to further diversify the choices becoming 77 models in the market in 2012. Table 2 shows the top 10 LDV models in 2012 in terms of sales. Together, the top 10 (of 77 models) represent 67% of all sales in the same year and most of them are of relatively small engine sizes, most commonly 1200 cc.

Table 2: Top 10 LDV models in 2012 in terms of sales

Model	Fuel Type	Engine size (Liter)	Total sales	Fuel Economy (l/100km)
Renault Symbol	Gasoline	1.2	4774	5.8
VW Polo	Gasoline	1	3273	3.99
Kia Rio	Gasoline	1.2	2636	4.13
Ford Fiesta	Gasoline	1.2	2326	5.8
Fiat Punto	Gasoline	1.2	1906	5.7
Peugeot 206	Gasoline	1.4	1869	6
VW Golf	Gasoline	1.2	1213	4.61
Chevrolet Aveo	Gasoline	1.2	1183	3.92
Citroen C3	Gasoline	1.6	1161	6.1
Seat Ibiza	Gasoline	1.2	1122	5.5

The two factors of the limited purchasing power in Tunisia, together with the regulatory environment favouring smaller LDVs (in terms of engine size) are both likely to be the key influencing factors creating this distribution of low-consumption small-engine vehicles dominating the market. Furthermore, the operating cost is relatively high if comparing the fuel prices with prices of neighbouring countries Algeria and Libya.

Table 3 below shoes the annual average engine size of all the new LDVs in Tunisia throughout the period 2005-2012.

Table 3: Average engine size of new LDVs

Year	Average Engine Size
2005	1.2
2008	1.3
2010	1.3
2012	1.3

The table above gives a more representative indication of average engine sizes showing that the average new LDV engine has been consistently small.

5.1 AVERAGE ANNUAL FUEL ECONOMY IN GLOBAL CONTEXT

To put the study results into perspective, Table 4 compares the figures of Tunisia with OECD and non-OECD country averages as well as the global average.

Table 4: Annual average fuel economy of new LDVs in context (units: l/100km, based on NEDC driving cycle)

	2005	2008	2010	2012	2030
GFEI [a]	**8.07**				**4.03 (global target)**
Global[a]	8.07	7.67			
OECD[a]	8.21	7.66			
Non-OECD[a]	7.49	7.68			
Tunisia	5.46	5.40	5.43	5.37	

a: Source: GFEI (2013)

Table 4 shows that the average fuel economy for new LDVs in Tunisia approx. 5.4 l/100km throughout the years, which is already 33% less than the global baseline of 8 l/100km in 2005. If the global trend follows the trajectories suggested by GFEI (2.7% annual decrease), then the global average will reach 5.4 l/100km by 2020. Tunisia is therefore among the countries in a very good position to achieve and even exceed the GFEI targets of 2030.

Furthermore, with regards to the average emission rates shown in Table 1(p.10), the low rate reflects a relatively high standard in the global context. It is already very close to the EU targets of phasing-in average emissions rates of new cars of 130 g/km (5.6 l/km) by 2015 (GFEI, 2013).

However, further studies on the total stock of vehicles in Tunisia must be conducted to see if the 2050 global target of GFEI for *all* cars is also easily achievable in Tunisia. Furthermore, monitoring of the total fuel consumption of vehicles must also be put into considerations, noting that more having efficient vehicles does not guarantee less consumption and emissions in absolute terms, especially if holistic approaches to sustainable mobility are not taken.

6 CONCLUSIONS

Fuel economy in Tunisia and emissions rates of new LDVs are in a relatively good position, at a significantly lower level than that of the global average and even lower than the trajectory of the GFEI global targets (2.7% annual decrease from 8 l/100km in 2005). This may be attributed to several factors, including the regulatory environment favouring small cars, the relatively high gasoline and diesel prices (compared to neighbouring countries), and the low GDP-per-capita. However, restrained demand due to socio-economic constraints might mean that there is significant latent demand that would rise later once the economy improves, especially that the total stock is increasing significantly as illustrated in Figure 1(p.6), as well as car ownership rates.

As an emerging economy at an early stage of motorization, Tunisia has a very good opportunity to adopt a sustainable approach to transportation planning to avoid going through the same business-as-usual trajectory of high motorization experienced in many developed countries in the past. A sustainable approach would require holistic planning of the transport sector and city planning to favour public transport and non-motorized transport as well as improved land-use planning, increased awareness about sustainable mobility, among other similar measures in order to compliment the steps taken to improve the vehicle technologies. It is important that decision makers, planners, and citizens are made aware of the advantages of being at an early stage of motorization in order to plan in advance for more sustainable cities.

Furthermore, despite being in a good position in terms of new LDVs, it is important to ensure careful monitoring of the vehicle stocks and flows and their impact on energy resources and emissions in order to monitor, evaluate, and improve the development trends of the sector.

6.1 MONITORING, EVALUATION AND INFORMATION EXCHANGE

Formal monitoring and evaluation mechanisms are necessary to ensure an annual assessment of both the vehicle stock and the new LDVs (and other categories of vehicles eventually), including assessment of fuel consumption, in order to have a better understanding of the improvement in the vehicle stock and its impact on energy resources and the environment. This also facilitates comparison with other countries.

It has been a challenge throughout the study period to obtain official data about vehicles, specifications, regulations, and plans, etc. However, as a constructive step for further engagement in the cleaner vehicles debate, public authorities have been informed of the study through the League of Arab States (LAS), and formal written communication through LAS was conducted to inform relevant authorities in Tunisia about the study, as well as the presentation of interim results of the case study of Tunisia in the League of Arab States at the regional forum of the Council of Arab States Responsible for the Environment (CAMRE) titled *'Promoting Better Vehicular Fuel Quality and Fuel Economy Policies for the Arab Region'* held in Cairo in November 2014. One of the key issues discussed during the forum was indeed the lack of information and disaggregate data and efficient means for information exchange.

Part of the monitoring, evaluation and information exchange can be the encouragement of industry reporting (whether compulsory or voluntary), such as already conducted in numerous developing countries including India, Brazil, Philippines, and Turkey[4].

This will also help showcase the results of the existing policies in Tunisia and the quota system so that it may offer lessons learnt for other countries with similar conditions.

6.2 Future Studies

The scope of this study has been limited to *new* LDVs. A gap of information still exists with regards to the entire vehicle stock and the consumption trends, as well as the end-of-life vehicles. In order to have a better understanding of the impact of LDVs on carbon emissions and energy resources, it is recommended to proceed to the next step of this study and investigate the state of the entire vehicles stock and identify the opportunities to effectively manage stocks and flows of vehicles and fuels and to ensure sustainability of the sector based on reliable information about it and stakeholder involvement. With this future study, a stronger argument can be made with regards to the importance of improving availability and exchange of sector-specific information to facilitate international cooperation in achieving the global and national targets of cleaner fuels and vehicles.

[4] For case studies on various regulations, see:http://www.unep.org/transport/gfei/autotool/nextsteps/case_study_at_a_glance.asp

7 REFERENCES

1. Center for Climate and Energy Solutions (C2ES). (2014). Federal Vehicles Standards. Available at: http://www.c2es.org/federal/executive/vehicle-standards. Accessed: September 10th, 2014.

2. Central Agency for Public Mobilization and Statistics (2015). Central Agency for Public Mobilization and Statistics (CAPMAS), Arabic Republic of Egypt. Online database. Retrieved from: http://www.capmas.gov.eg

3. Federal Ministry for Economic Cooperation and Development [GIZ] (2014), International Fuel Prices, 2012/2013, 8th edition. Available at: http://www.giz.de/expertise/downloads/giz2014-en-international-fuel-prices-2013.pdf

4. Global Fuel Economy Initiative (2014): Developing a baseline. Available at: http://www.unep.org/transport/gfei/autotool/nextsteps/developing_a_baseline.asp. Accessed: August 19th, 2014 30.

5. Global Fuel Economy Initiative (2013): Global Fuel Economy Initiative: Plan of Action 2012-2015. Retrieved from:http://www.globalfueleconomy.org/Documents/Publications/workplan.pdf

6. Industrie und Handelskammer (2011): Tunisia: An attractive destination for Automotive Industry. Industrie und Handelskammer (IHK) Nürnberg für Mittelfranken. Retrieved from: https://www.ihk-nuernberg.de/de/media/PDF/veranstaltungs-pdfs/International/tunisia-as-automotive-industry.pdf

7. International Monetary Fund (2008). Chapter 4: Climate Change and the Global Fuel Economy, *World Economic Outlook 2008.* Retrieved from: http://www.imf.org/external/pubs/ft/weo/2008/01/pdf/c4.pdf

8. Ministère de l'Equipementet de l'Environnement (2013a): National Report on the State of Environment for years 2012-2013 (in Arabic). Retrieved from: http://www.environnement.gov.tn/fileadmin/medias/pdfs/etat_env/rnee_2012_ar.pdf

9. Ministère de l'Equipement et de l'Environnement (2013) : National Report on the State of Environment for years 2012-2013 (in Arabic). Retrieved from: http://www.environnement.gov.tn/fileadmin/medias/pdfs/etat_env/rnee_2012_ar.pdf

10. The globaleconomy.com (2014). Tunisia Gasoline Consumption. Available at: http://www.theglobaleconomy.com/Tunisia/gasoline_consumption/. Accessed: September 25th, 2014.

11. The International Organization of Motor Vehicle Manufacturers (OICA). Total in Use 2012. Available at: http://www.oica.net/category/about-us/. Accessed: September 4th, 2014.

12. The Organization for Economic Cooperation and Development (OECD) (2007). African Economic Outlook: Tunisia. Available at: http://www.oecd.org/dev/emea/africaneconomicoutlook2007.htm. Accessed: September 17th, 2014.

13. The World Bank (2014): *Country and Lending Groups,* available at: http://data.worldbank.org/about/country-and-lending-groups#Lower_middle_income, accessed: December 16, 2014.

14. United States of America. Government Accountability office (2008). *Vehicle Fuel Economy.* New York: Novinka books.

15. United Stated Commercial Service (2014): *Doing Business in Tunisia: 2014 Country Commercial Guide for U.S. Companies*. Retrieved from: http://photos.state.gov/libraries/tunisia/231771/PDFs/2014%20ccg.pdf

16. World Bank dataBank (2014): *World Development Indicators*, 2013 data, retrieved from: http://databank.worldbank.org , accessed: December 16 , 2014.

17. World Bank (2012): *The Real Costs of Fossil Fuel Subsidies.* Retrieved from: http://www.worldbank.org/en/news/feature/2012/05/09/real-costs-fossil-fuel-subsidies

18. World Bank (2014): Country and Lending Groups. Retreived from: http://data.worldbank.org/about/country-and-lending-groups

19. Trape, P., Chauvin, M., Salah, H. (2014): African Economic Outlook: Tunisia 2014. Retrieved from: http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2014/PDF/CN_Long_EN/Tunisie_EN.pdf

ANNEX-1: GFEI DEFINITION OF LDVS

Vehicle Segment	Examples
A: Mini / Micro / Small town car **Smallest cars, with a length between 2.50m to 3.60m.**	Citroën C1 Fiat Panda Smart Fortwo
B: Small compact **Slightly more powerful than the Minis; still primarily for urban use; length between 3.60m and 4.05m**	Mitsubishi Colt Opel Corsa Suzuki Swift
C: Compact **Length between 4.05m – 4.50m**	Mazda 3 SubaruImpreza Volvo S40
D: Family cars **Designed for longer distance; fits 5- 6 people; length is 4.50m to 4.80m**	BMW 3 series Chrysler Sebring Lexus IS
Light vans **Size is similar to D, but interior volume is maximized to accommodate larger families**	Chevrolet Uplander Ford Galaxy Volkswagen Sharan
Big / Full size cars **Have generous leg room; can comfortably transport 5 - 6 people; generally have V8 engines and are 5m or longer in length**	Cadillac DTS Jaguar XJ Mercedes-Benz E Class
SUV / All terrain **The original cars were utility cross-country vehicles with integral transmissions like the Jeep**	Dodge Durango Jeep Grand Cherokee Nissan Patrol Toyota Land Cruiser

ANNEX-2: SAMPLE LDV DATA

Make	Model	Fuel Type	Engine size (liter)	Total sales	Fuel economy (l/100km)	Co2 emissions (g/Km)
Renault	Symbol	Gasoline	1.2	4774	5.8	135
VW	Polo	Gasoline	1	3273	3.99	108
Kia	Rio	Gasoline	1.2	2636	4.13	114
Ford	Fiesta	Gasoline	1.2	2326	5.8	139
Fiat	Punto	Gasoline	1.2	1906	5.7	136
Peugeot	206	Gasoline	1.4	1869	6	139
VW	Golf	Gasoline	1.2	1213	4.61	129
Chevrolet	Aveo	Gasoline	1.2	1183	3.92	111
Citroen	C3	Gasoline	1.6	1161	6.1	145
Seat	Ibiza	Gasoline	1.2	1122	5.5	125
Peugeot	207	Gasoline	1.4	834	6.3	145
Renault	Symbol	Diesel	1.5	777	4.4	115
Peugeot	Partner	Diesel	1.6	656	6.19	175
Citroen	C4	Diesel	1.6	636	4.5	120
Citroen	Berlingo	Diesel	1.9	389	5.7	181
Peugeot	Bipper	Diesel	1.3	356	4.5	119
Citroen	C4	Gasoline	1.6	328	6.4	153
Dacia	Logan	Gasoline	1.4	320	6.8	157
Peugeot	508	Gasoline	1.6	308	7.1	164
Chevrolet	cruze	Gasoline	1.6	301	6.5	153
Kia	Picanto	Gasoline	1	266	5.9	139
Renault	Fluence	Gasoline	1.6	261	6.5	149
Audi	A4	Gasoline	1.8	256	5.8	139
Fiat	Linea	Gasoline	1.4	218	6.3	156.1
BMW	1 Series	Gasoline	1.6	194	6.3	150
Mazda	3	Gasoline	1.6	193	6.4	147