Global Fuel Economy Initiative in Ukraine

Global Fuel Economy Initiative

Core partners

UN environment

iea International Energy Agency

International Transport Forum

icct THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

FIA Foundation for the Automobile and Society

ITS UCDAVIS INSTITUTE OF TRANSPORTATION STUDIES

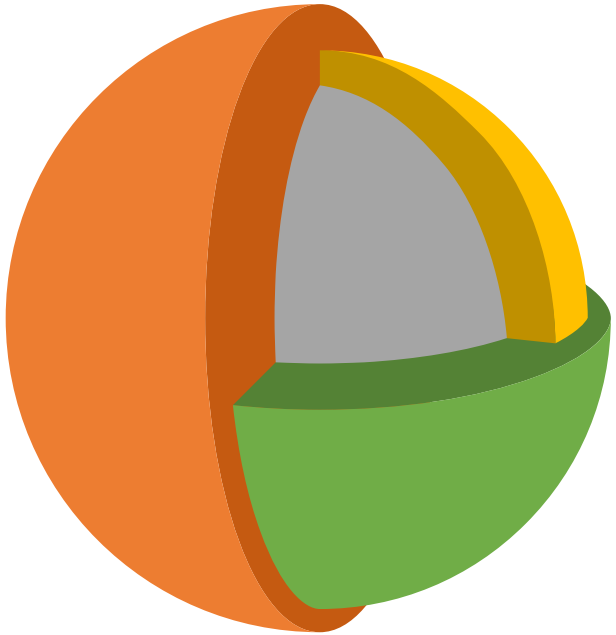
Supported

gef GLOBAL ENVIRONMENT FACILITY

GFEI is important for Ukraine

Strong dependence on imported fuel products

Reducing oil and fuel consumption will increase energy security of the country



Climate change

Slows down negative climate change trends by reducing carbon emissions (CO_2)

Sustainability

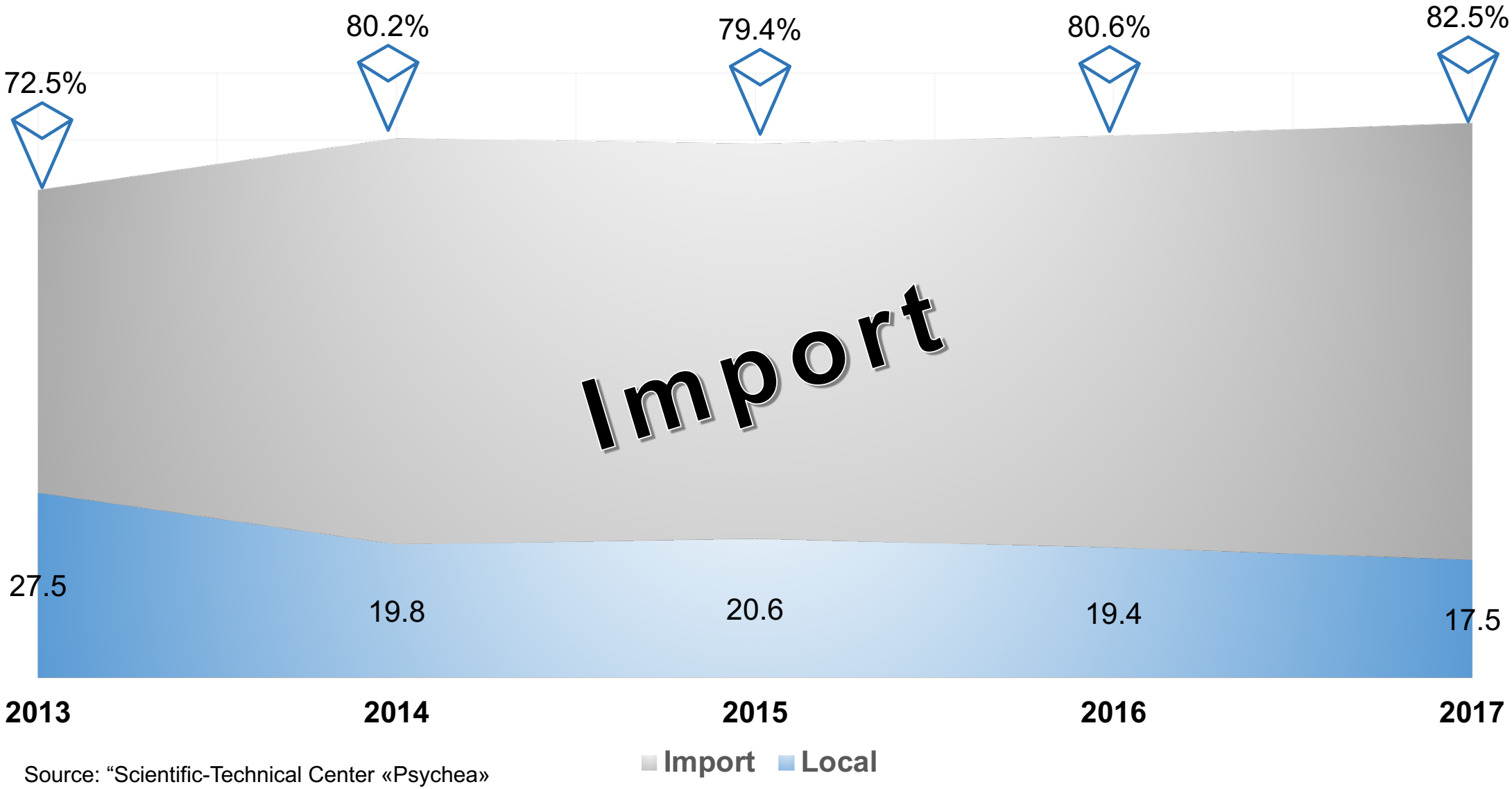
Contributes to the sustainable development of the country's economy

Air quality

Improving the air quality and reducing the negative impact on the health of the population

GFEI

Strong dependence on imported fuel products



Source: “Scientific-Technical Center «Psychea»

In general about vehicle fleet in Ukraine

9.2 millions

Total number of registered vehicles in Ukraine.

6.9 millions

Total number of registered LDV in Ukraine.

In general about vehicle fleet in Ukraine

18.8

202

Average age

The average passenger vehicle age in 2015 was 18.8 years.

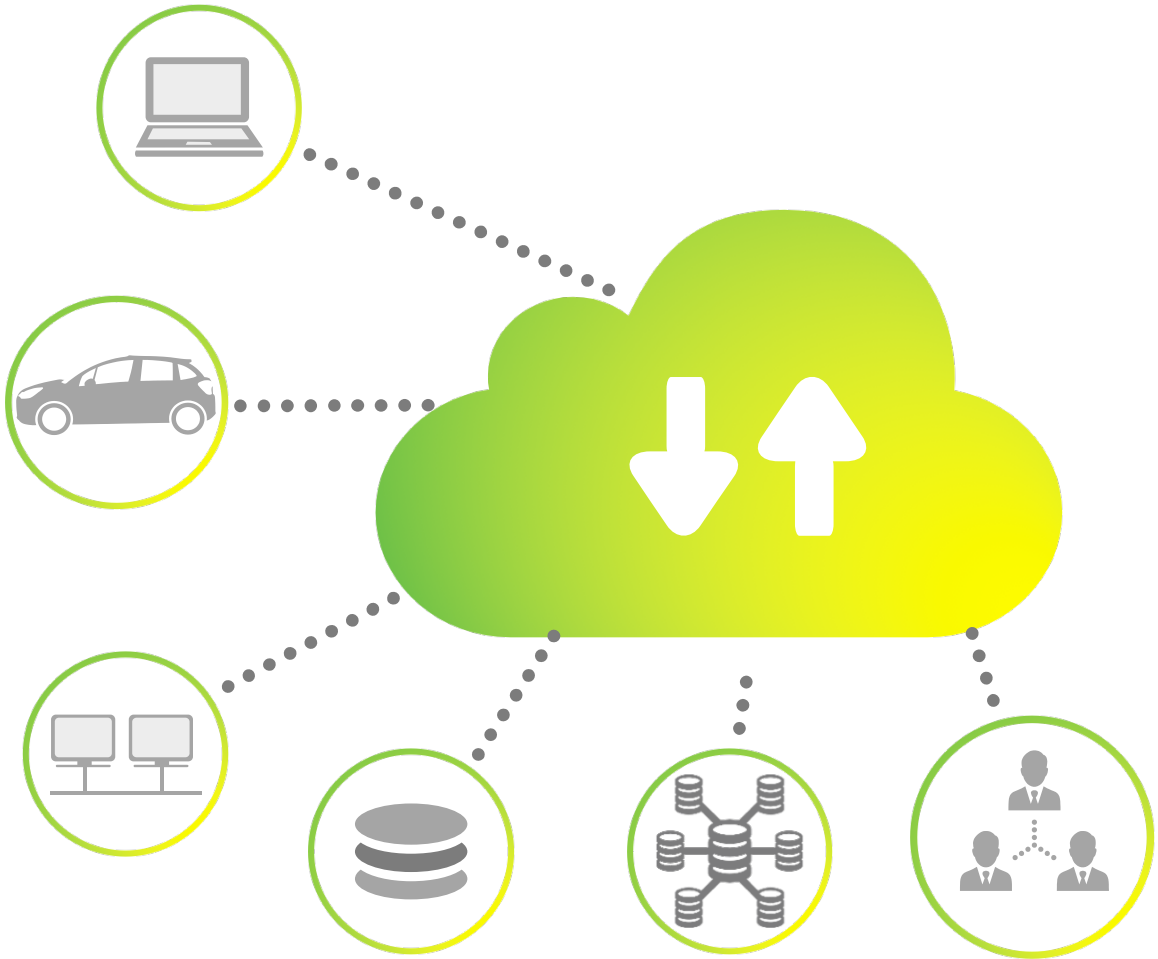
The level of motorization

The level of motorization in Ukraine in 2016 amounted to 202 vehicles per 1,000 inhabitants.

Mission of the project

Promoting Improved Automotive Fuel Economy in Ukraine

Initial objectives



1. Research

- Data gathering
- Baseline development
- Analysis

2. Capacity building

- Identification of key stakeholders
- Identification of potential barriers to introducing FE policies
- Awareness rising & communications

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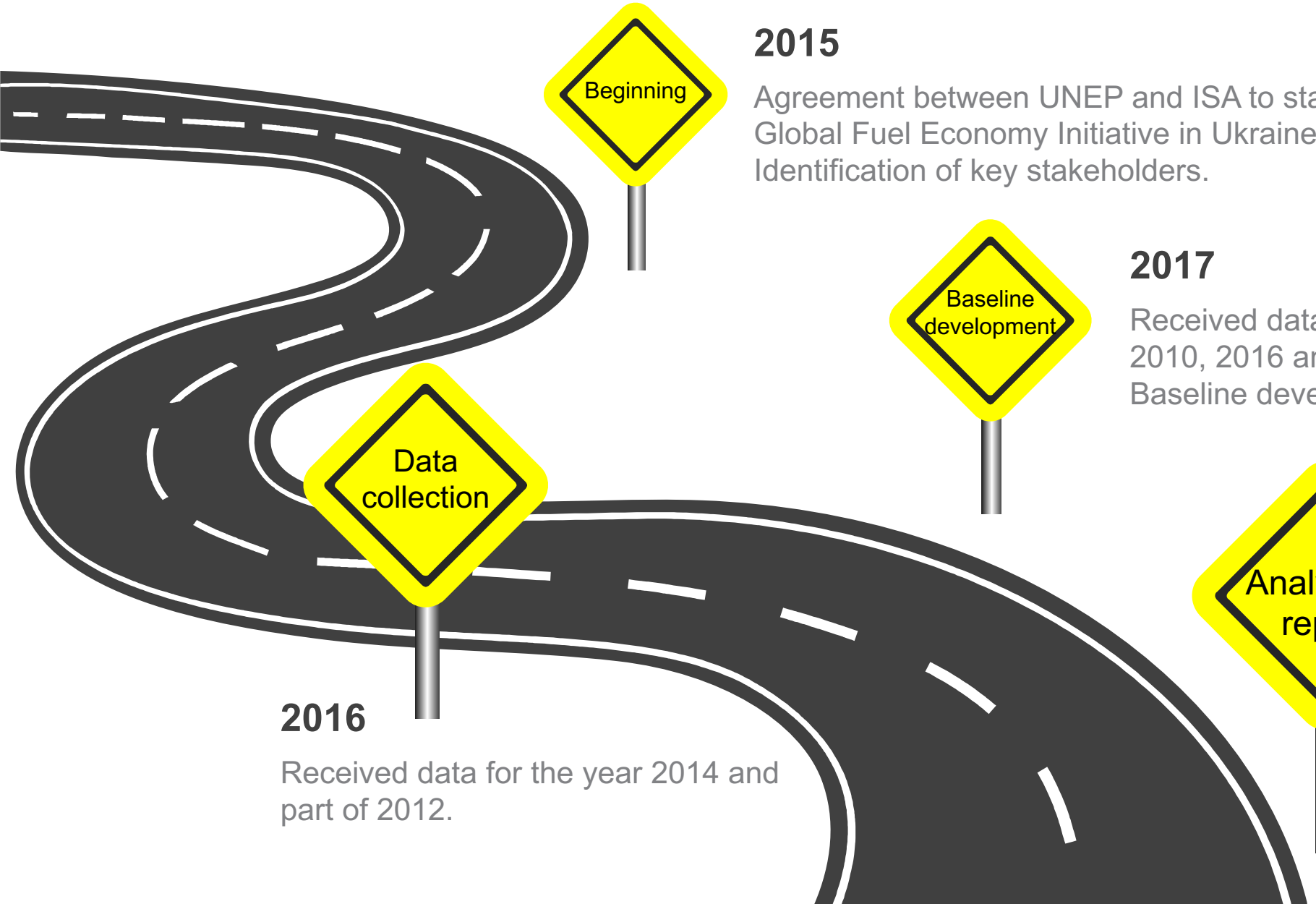
Project activity on a national level



2015

Agreement between UNEP and ISA to start implementation of the Global Fuel Economy Initiative in Ukraine.
Identification of key stakeholders.

2016

Received data for the year 2014 and part of 2012.

2017

Received data for the years 2005, 2008, 2010, 2016 and rest of 2012.
Baseline development.

2018

Baseline analysis.
Report and recommendations.

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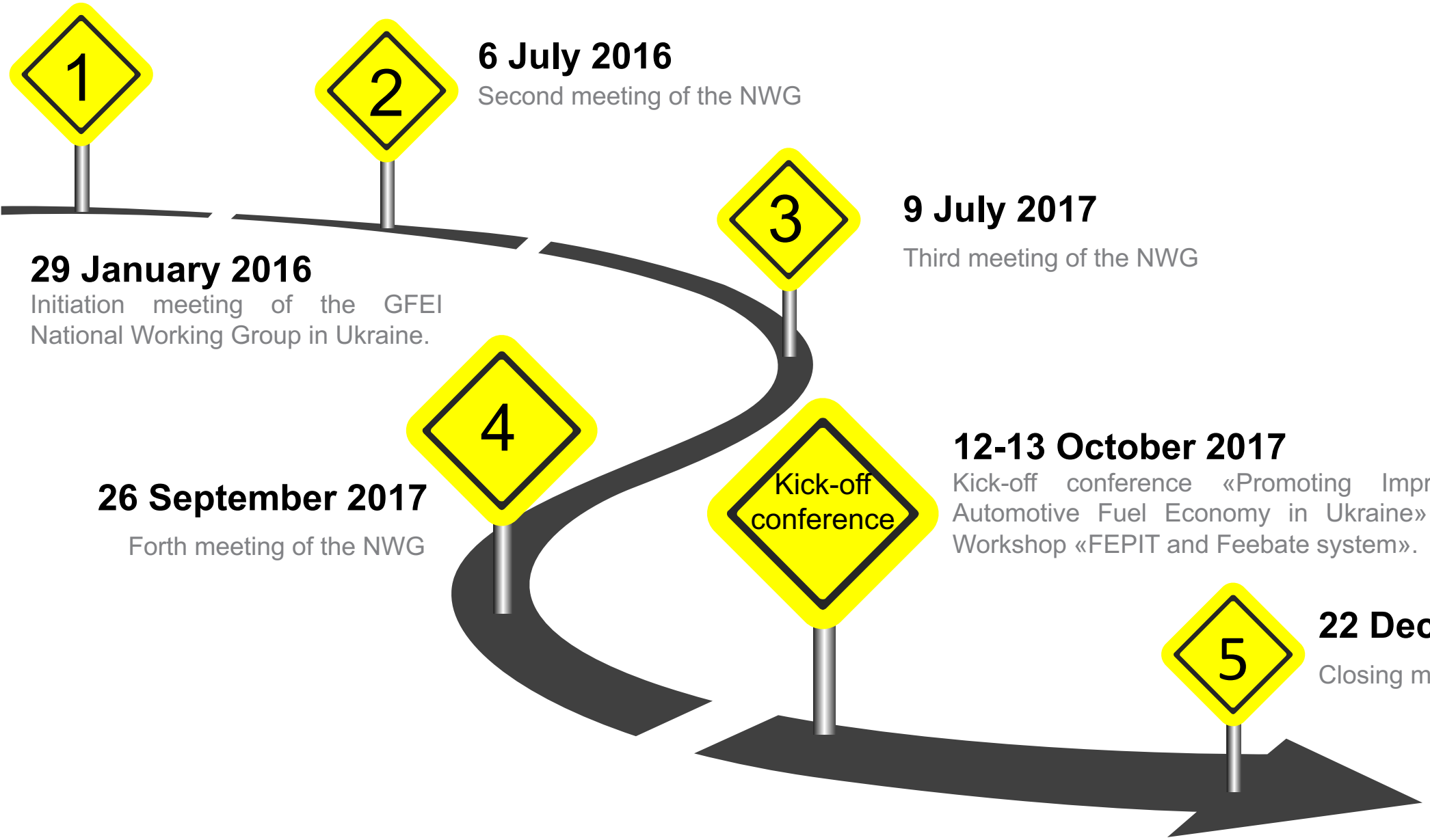
National Working Group

Members of NWG

- Ministry of Infrastructure of Ukraine
- Ministry of ecology and natural resources of Ukraine
- Ministry of energy and coal industry of Ukraine
- Ministry of interior of Ukraine (Main Service Center)
- State Agency on Energy Efficiency and Energy Saving of Ukraine
- Ministry of health of Ukraine
- State Service of Ukraine for food safety and consumer protection
- Sectoral state enterprises
- Academia
- Non-governmental organizations
- Associations of auto market operators

GFEI

Project activity on a national level



29 January 2016
Initiation meeting of the GFEI National Working Group in Ukraine.

6 July 2016
Second meeting of the NWG

9 July 2017
Third meeting of the NWG

12-13 October 2017
Kick-off conference «Promoting Improved Automotive Fuel Economy in Ukraine» and Workshop «FEPIT and Feebate system».

26 September 2017
Forth meeting of the NWG

22 December 2017
Closing meeting of the NWG

National baseline development

Stage 1. Data gathering

Source of information
Ministry of Interior of Ukraine

2005, 2008, 2010, JAN-AUG 2012

Department of Information Technologies

SEP-DEC 2012, 2014, 2016

Main Service Center
AIS “National database “Automobile”

National baseline development

Baseline - minimum data requirement

Number of newly registered vehicles by:

1. Vehicle make (e.g. Toyota)
2. Vehicle model (e.g. Corolla)
3. Model production year - important for used imports (e.g. 2007)
4. Engine displacement (e.g. 1,800 ccm or 1.8 l)
5. Engine power (e.g. 80 kW or 107 HP)
6. Fuel type (e.g. gasoline, diesel, LPG, CNG, electricity)

Rated fuel economy (Lge/100km) or specific carbon emissions (gCO_2 per km) and the respective test cycle basis (NEDC, CAFE (FTP), JC08)

Baseline data – “nice to have”

1. Transmission type (automatic/manual, number of gears)
2. Axle configuration (i.e. number of driven wheels, 4x2, 4x4)
3. Vehicle weight OR Vehicle footprint (wheelbase X track width)
4. Vehicle price

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National baseline development

Acquiring input data

May 2016
- First data received for the year 2014 and part of 2012

January 2017
- Received data for the year 2016

April 2017
- Received data for the years 2005, 2008, 2010 and rest of 2012

The fuel economy baseline should only include vehicles (new cars and used imported cars) which are registered for the first time in a given year in the respective country.

Total number of first registrations ~ 1.6 million cars

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National baseline development

Stage 2. Cleaning data, structuring and verification of national data based on GFEI methodology

	A	B	C	D	E	F	G	H	I	J	K	L
1			Результати пошуку ТЗ									
2												
3		Дата реєстрації з: 01.01.2014 по: 31.12.2014		Група операцій: РЕЄСТРАЦІЯ ТЗ								
4		Тип ТЗ (за конструкцією): ЛЕГКОВИЙ		Мова вводу (власник): Українська								
5		Обмеження: Ні										
6	№ З/П	Дата реєстрації	Операція	Марка та модель ТЗ	Тип ТЗ за конс	Номер кузова	Номер шасі	V двигуна	Вид палива	Рік випуску	Маса без навант. (кг	Повна маса (кг)
22	16	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	HYUNDAI SANTA FE	ЛЕГКОВИЙ			2359	БЕНЗИН	2013	1895	2550
23	17	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	GEELY EMGRAND	ЛЕГКОВИЙ			1498	БЕНЗИН	2013	1000	1500
24	18	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	GEELY EMGRAND	ЛЕГКОВИЙ			1792	БЕНЗИН	2013	1355	1690
25	19	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	ЗАЗ SENS	ЛЕГКОВИЙ			1299	БЕНЗИН	2013	1070	1400
26	20	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	GEELY CK	ЛЕГКОВИЙ			1498	БЕНЗИН	2013	1050	1460
27	21	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	CHERY TIGGO	ЛЕГКОВИЙ			1845	БЕНЗИН	2013	1465	1765
28	22	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	ЗАЗ TA 69WO	ЛЕГКОВИЙ			1399	БЕНЗИН	2013	1194	1595
29	23	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	KIA SPORTAGE	ЛЕГКОВИЙ			1685	ДИЗЕЛЬНЕ ПАЛИ	2013	1455	1940
30	24	03.01.2014	30 - ПЕРВИННА РЕЄСТРАЦІЯ ТЗ ДЛЯ ІНДИ	HYUNDAI ACCENT	ЛЕГКОВИЙ			1396	БЕНЗИН	2013	1165	1565

Verification and cleaning of data

Many data mistakes on the vehicle's parameters. Most common are:

Wrong/absent name of the vehicle's model	Wrong/absent data on engine displacement	Wrong fuel type indicated	Wrong/absent of vehicle's weight

National baseline development

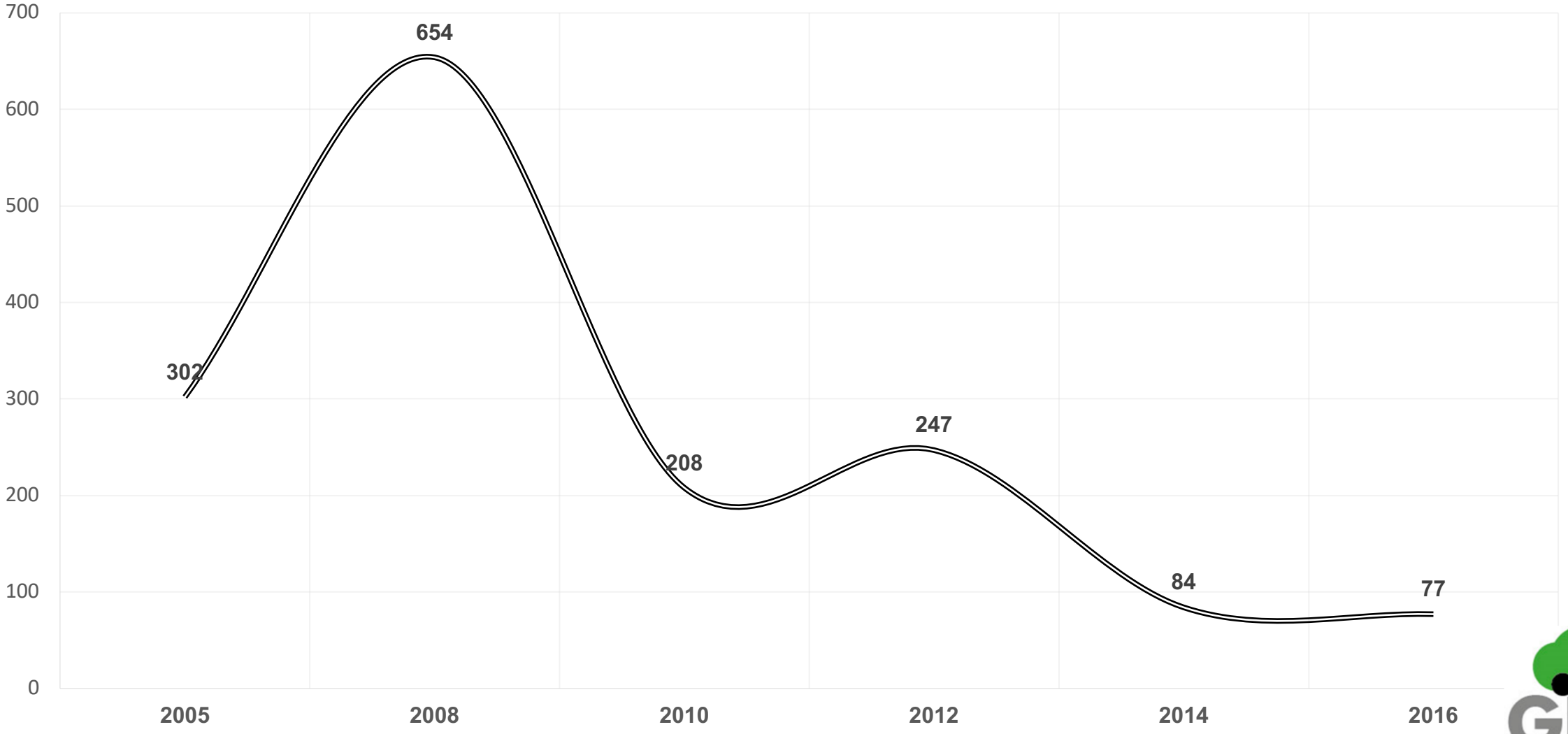
Problematic issues:

- Registration data is missing the following vehicle information:
  - ✓ engine power,
  - ✓ transmission type,
  - ✓ axle configuration,
  - ✓ production place,
  - ✓ condition of vehicle (new or used car), etc.

- Original registration data is in an inaccurate condition as to various necessary parameters (double/triple vehicle checks, an example by VIN code).

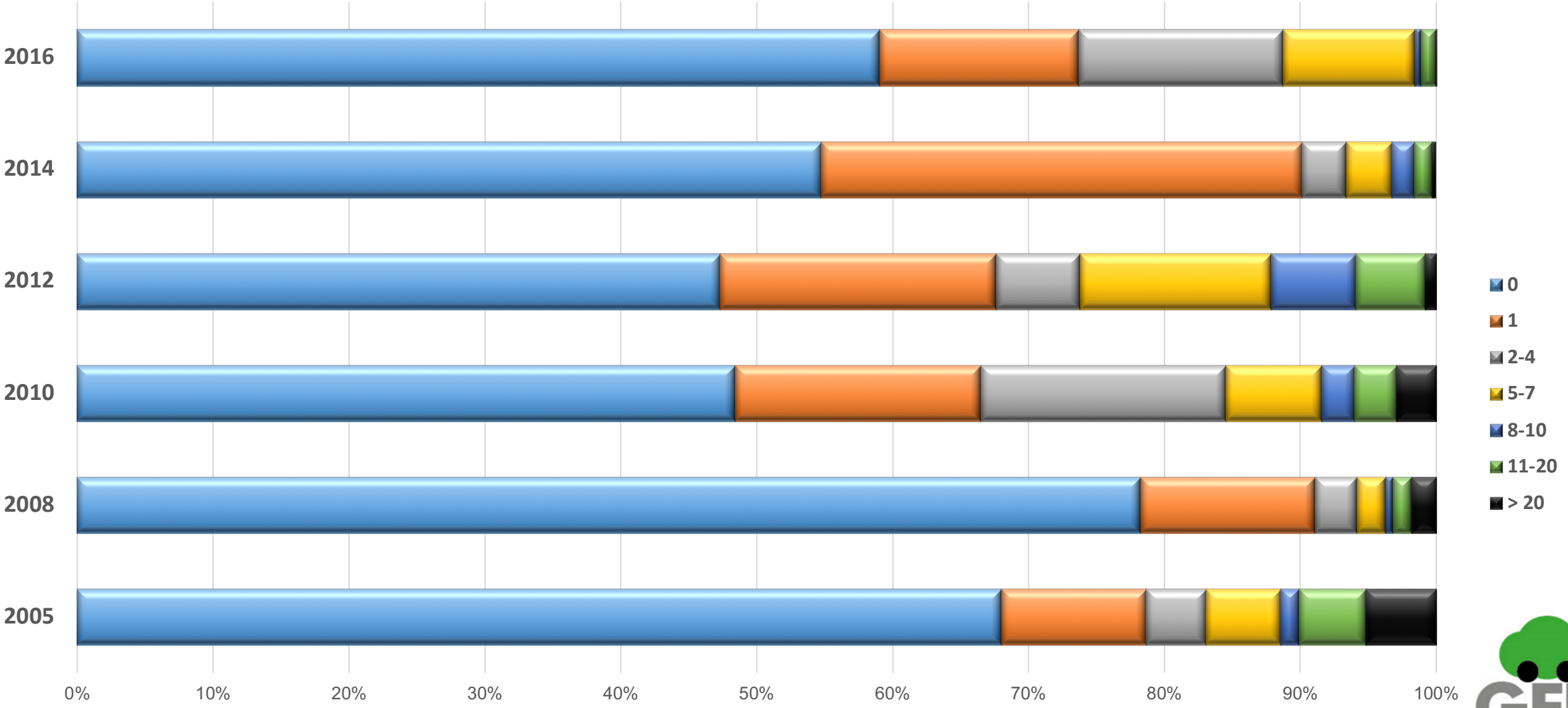
Ukraine GFEI baseline

Ukraine first registrations of LDVs in Ukraine (thousands)



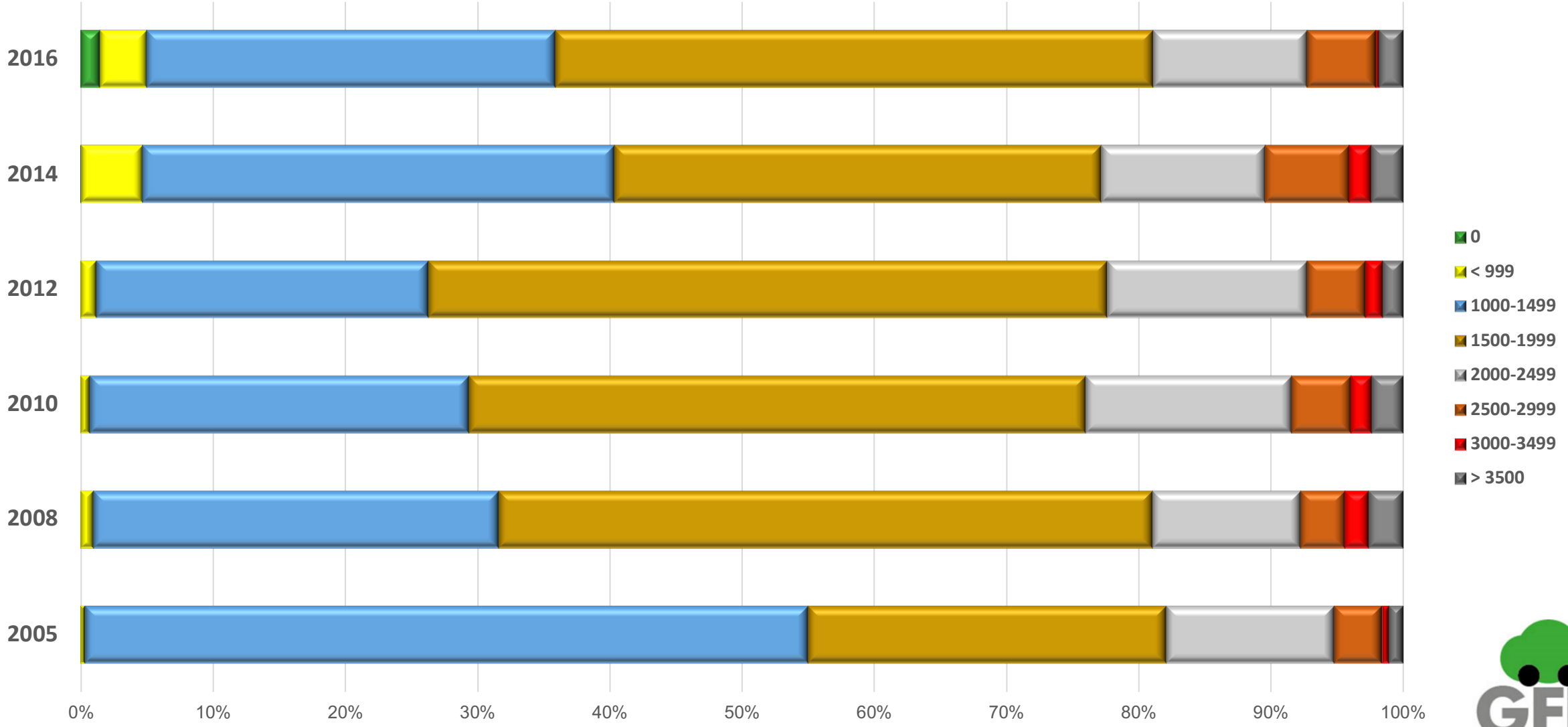
Ukraine GFEI baseline

Ukraine vehicle age on the date of registration, (years)



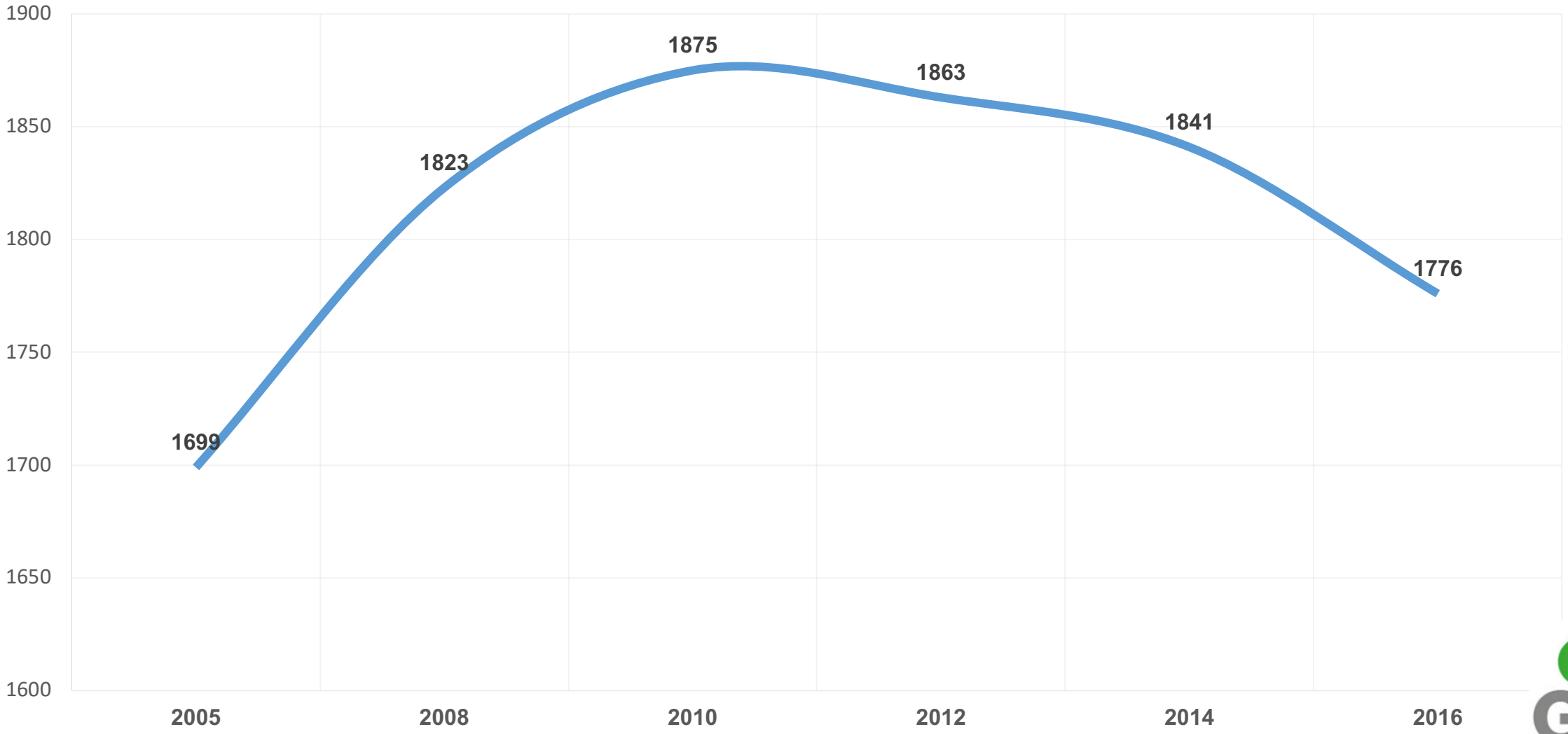
Ukraine GFEI baseline

Ukraine engine size distribution in %, (cc)



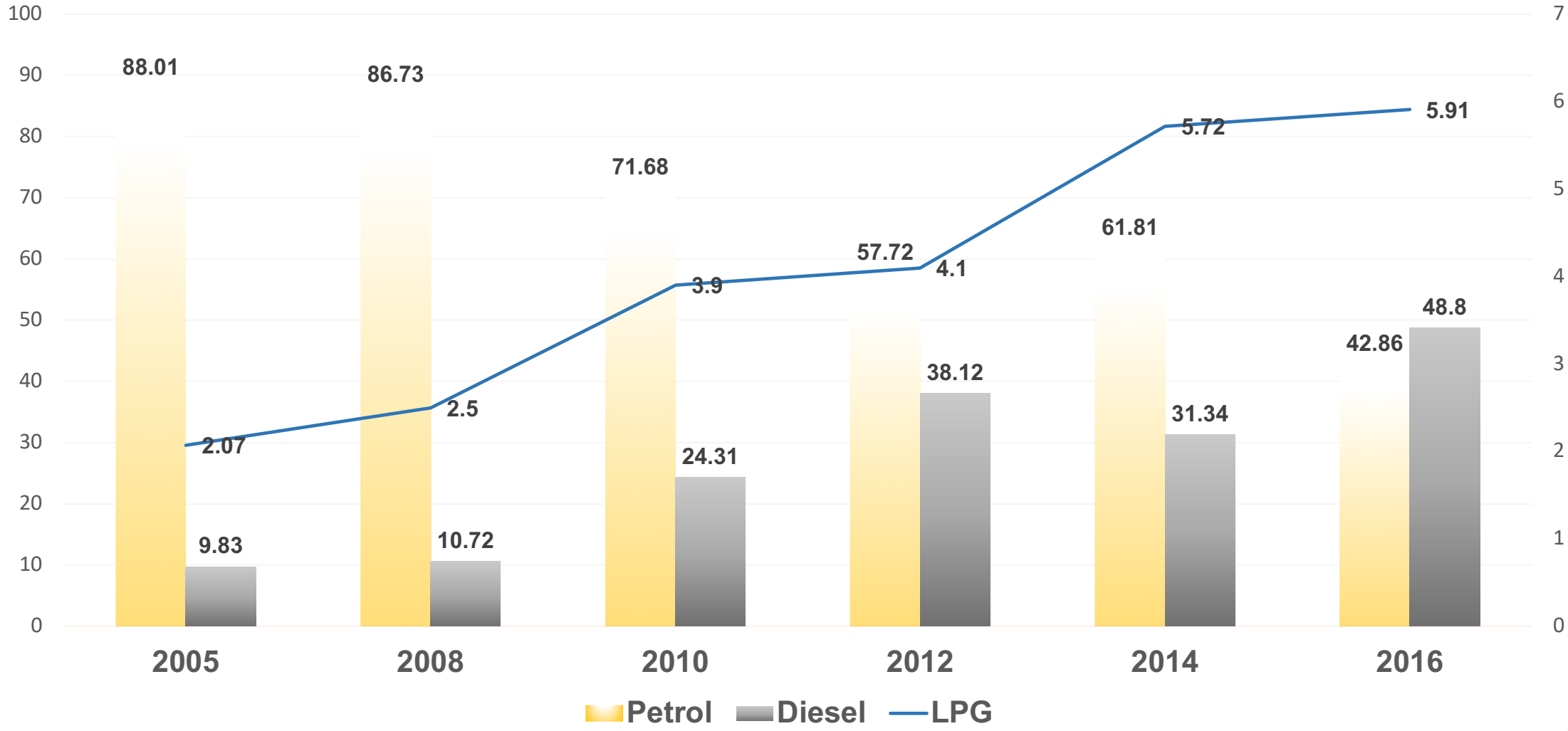
Ukraine GFEI baseline

Ukraine average engine size for the first registrations (cc)



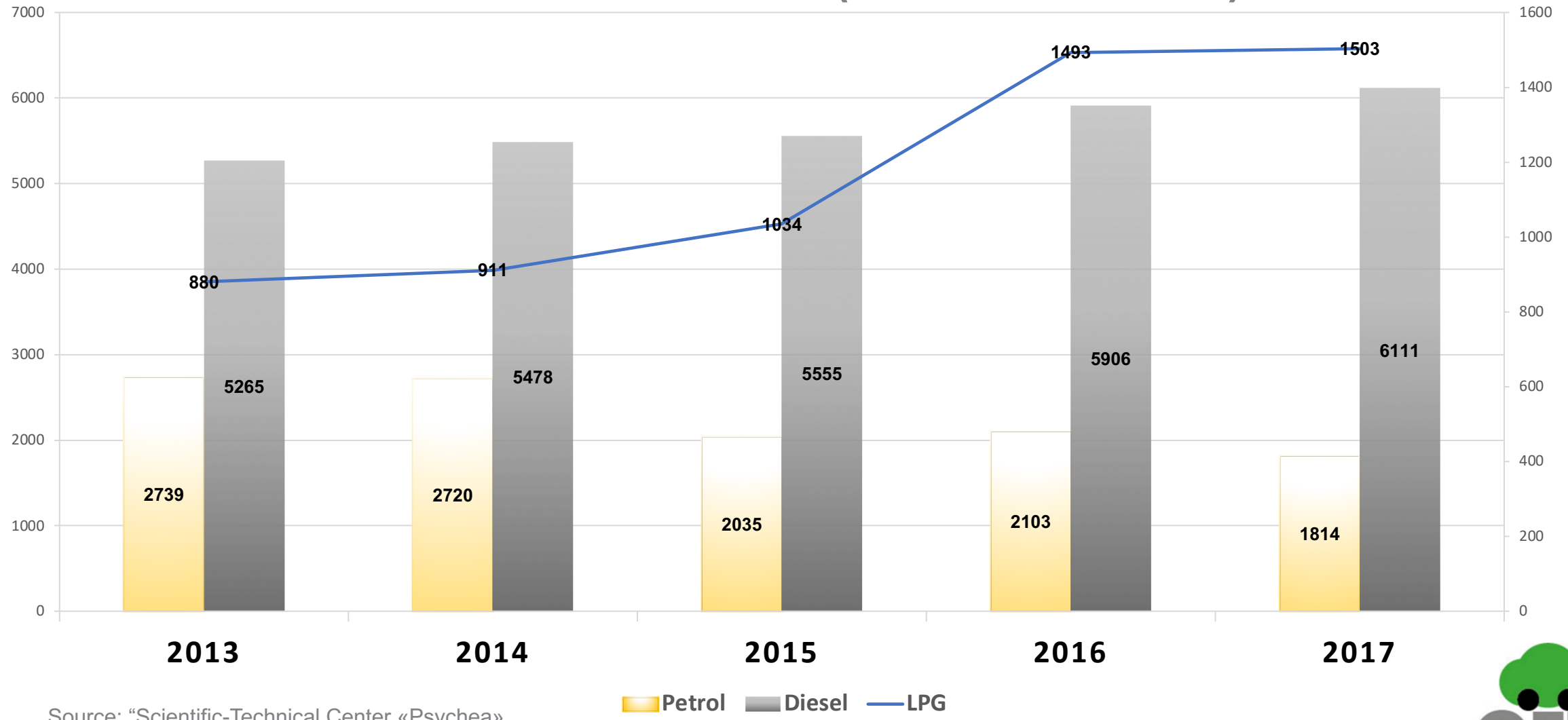
Ukraine GFEI baseline

Diversification of LDV fleet by fuel type (in % of market share)



Compared with demand for fuel

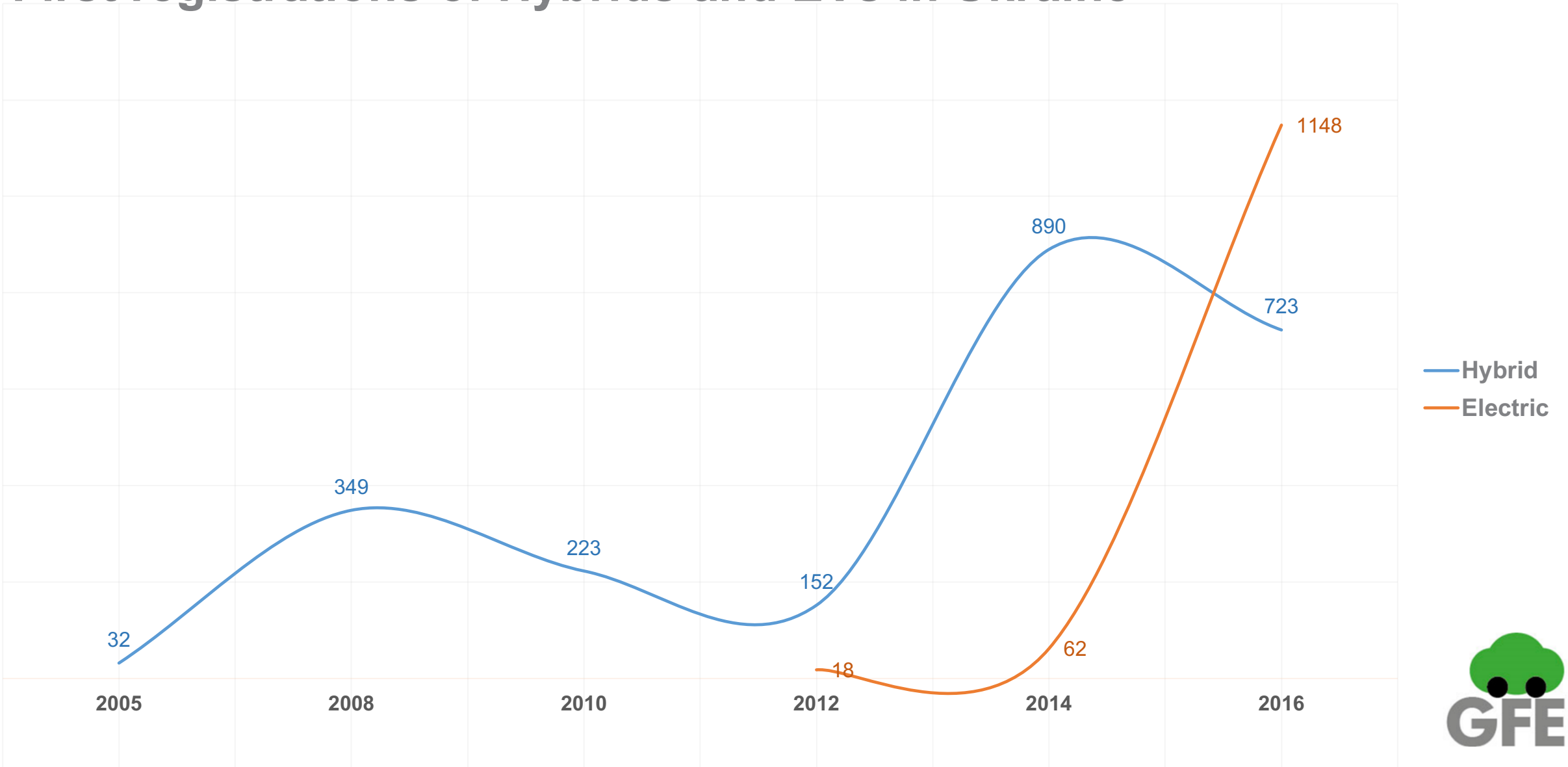
Structure of fuel market in Ukraine (thousands tons)



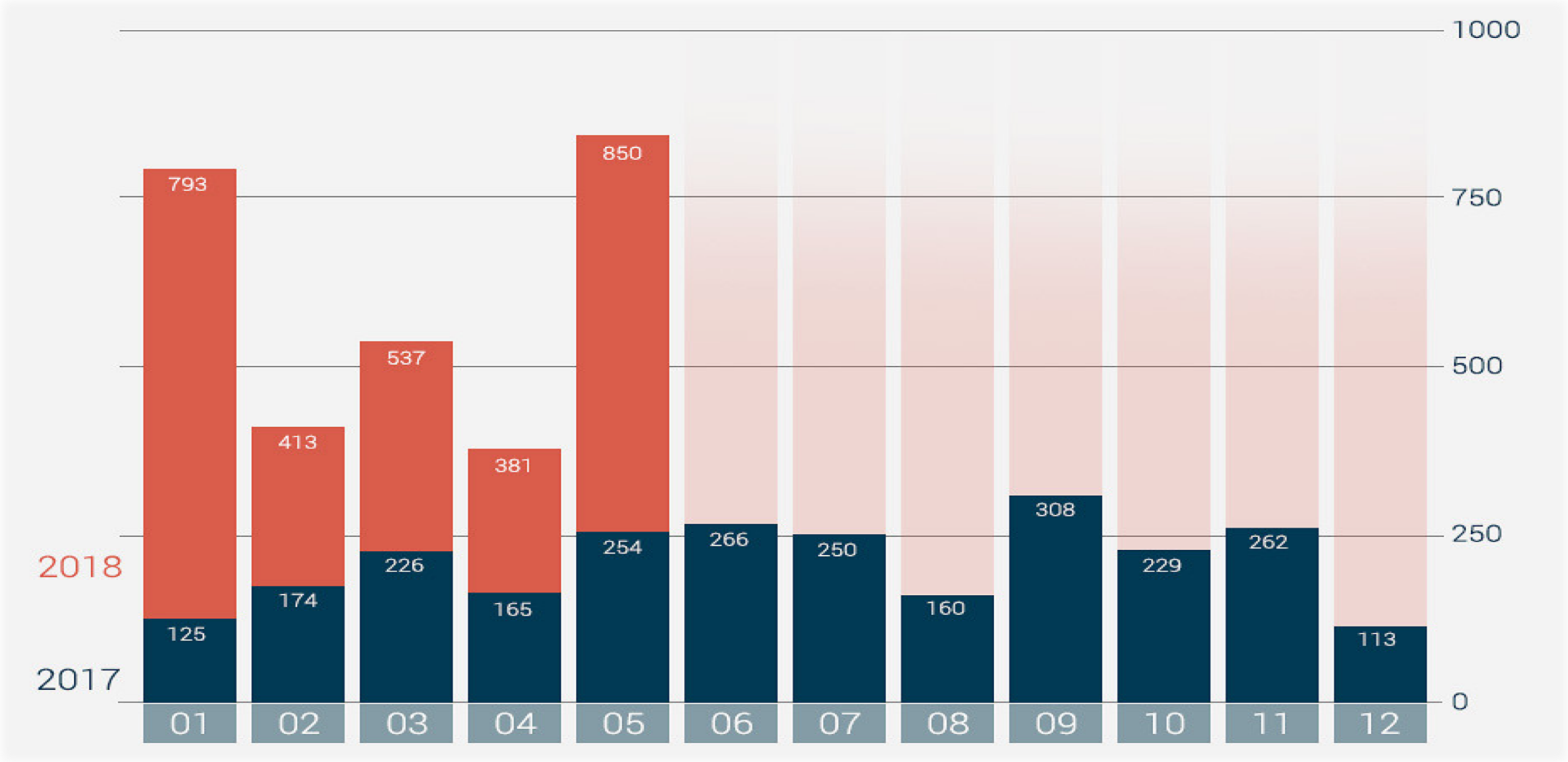
Source: “Scientific-Technical Center «Psychea»

Ukraine GFEI baseline

First registrations of Hybrids and EVs in Ukraine



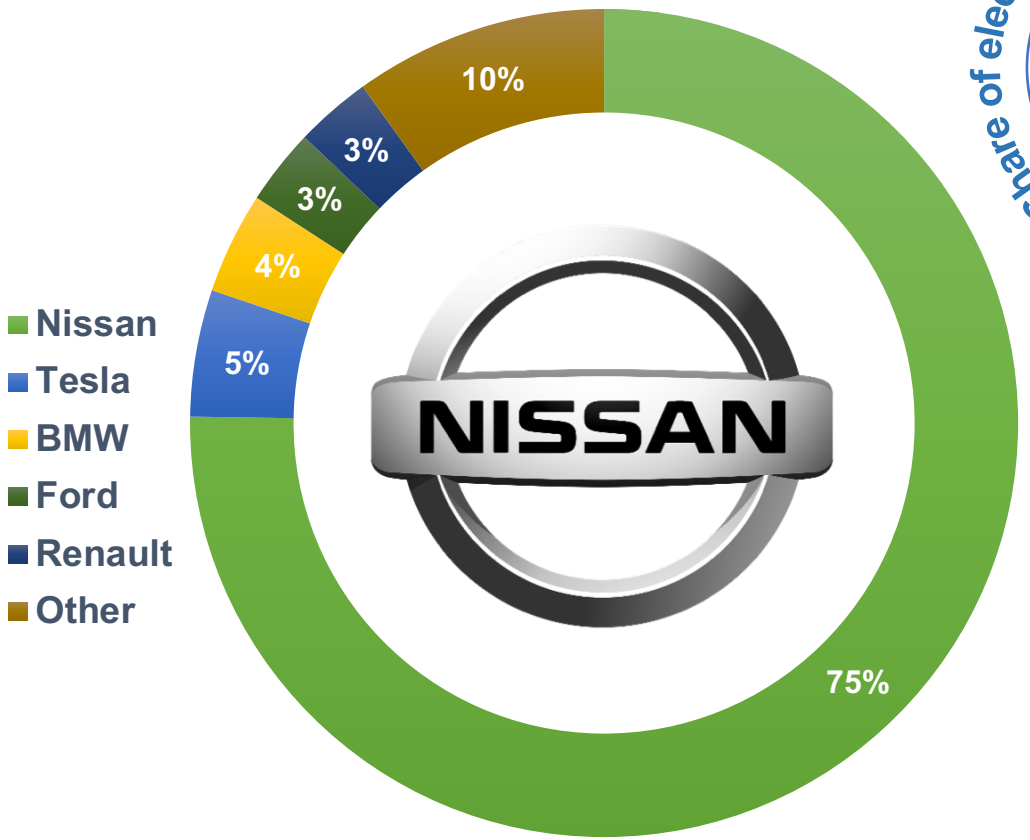
Number of EVs imported in Ukraine (2017-2018)



Most popular EV in Ukraine

Total number of registered EV in Ukraine – 7439 (01.05.2018)

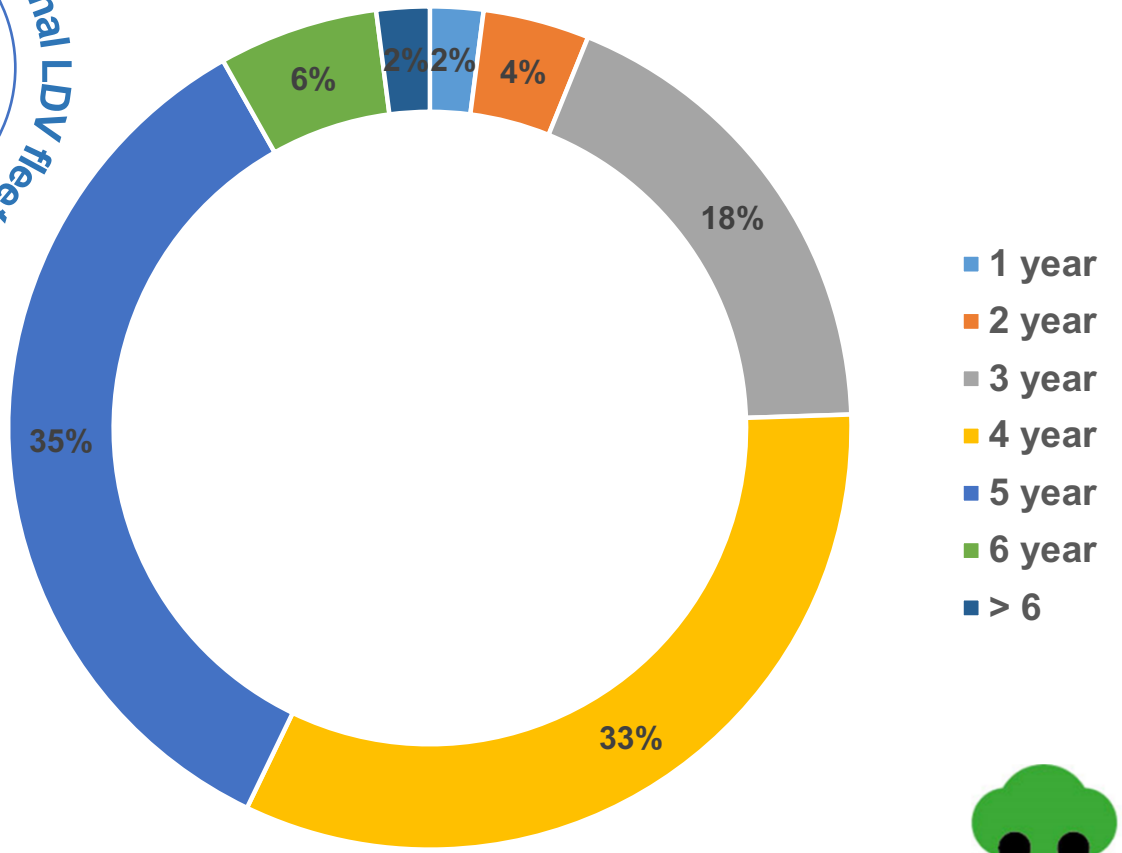
Brand



Share of electric vehicles in the national LDV fleet

0.1%

Age



Source: MSC

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National baseline development

Stage 3. Adding fuel economy parameters and CO2 emissions

1	Vehicle make and model	Engine siz	Fuel type	Make year	consumption L/1	CO2 emission g/k	Check FE to CO2
1045	AUDI Q5	1968	Diesel	2014	5,9	158	26,78
1046	AUDI Q5	1984	Petrol	2014	7,5	174	23,20
1047	AUDI Q5	1984	Petrol	2014	7,5	174	23,20
1048	AUDI Q5	1984	Petrol	2014	7,5	174	23,20
1049	AUDI Q5	1984	Petrol	2014	7,5	174	23,20
1050	AUDI Q5	1968	Diesel	2009	5,9	158	26,78
1051	AUDI Q5	1984	Petrol or LPG	2011	8,1	197	24,27
1052	AUDI Q5	1968	Diesel	2011	5,9	158	26,78
1053	AUDI Q5	1984	Petrol	2013	7,5	174	23,20
1054	AUDI Q5	1968	Diesel	2013	5,9	158	26,78
1055	AUDI Q5	1984	Petrol	2013	7,5	174	23,20
1056	AUDI Q5	1968	Diesel	2013	5,9	158	26,78
1057	AUDI Q5	1968	Diesel	2013	5,9	158	26,78
1058	AUDI Q5	1968	Diesel	2013	5,9	158	26,78
1059	AUDI Q5	1968	Diesel	2014	5,9	158	26,78
1060	AUDI Q5	1968	Diesel	2014	5,9	158	26,78
1061	AUDI Q5	1968	Diesel	2014	5,9	158	26,78
1062	AUDI Q5	1968	Diesel	2014	5,9	158	26,78
1063	AUDI Q5	2967	Diesel	2014	6,4	171	26,78

2014pix | Pivot Table

Sources for fuel economy information

Country	Source
Australia	Green Vehicle Guide Factsheets
	http://www.greenvehicleguide.gov.au
Brazil	Programa Brasiliero de Etiquetagem
	http://pbeveicular.petrobras.com.br/TabelaConsumo.aspx
Chile	Comparador de Autos
	http://www.consumovehicular.cl/?q=comparador
China	轻型汽车燃料消耗量通告 通告日期
	http://chinaafc.miit.gov.cn/n2257/n2280/index.html
European Union (EEA)	Monitoring of CO2 emissions from passenger cars – Regulation 443/2009
	http://www.eea.europa.eu/data-and-maps/data/co2-cars-emission-8#tab-european-data
France	Consommation conventionnelles de carburant et émissions de gaz carbonique
	http://www2.ademe.fr/servlet/getDoc?cid=96&m=3&id=52820&p1=00&p2=12&ref=17597
Japan	自動車燃費一覧
	http://www.mlit.go.jp/jidosha/jidosha_fr10_000019.html
Mexico	Indicadores de Eficiencia Energética y Emisiones Vehiculares
	http://www.ecovehiculos.gob.mx/
Singapore	One Motoring Fuel Cost Calculator
	https://vrl.lta.gov.sg/lta/vrl/action/pubfunc?ID=FuelCostCalculator
South Korea	소비자 체감에 부합하는 새로운 연비표시 방법 확정
	http://bpms.kemco.or.kr/transport_2012/main/main.aspx
South Africa	COMPARATIVE PASSENGER CAR FUEL ECONOMY AND CO2 EMISSIONS DATA
	http://www.naamsa.co.za/ecelabels/
Switzerland	Automobil Revue catalogue
	http://katalog.automobilrevue.ch/
UK	Car Fuel Data Booklet
	http://carfueldata.direct.gov.uk/
	To download the data
	http://carfueldata.dft.gov.uk/downloads/
US	DoE / EPA Fuel Economy ratings
	http://www.fueleconomy.gov/
	To download the data
	http://www.fueleconomy.gov/feg/download.shtml

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National baseline development

Stage 4. Calculation of the national average fuel economy

To correctly use rated fuel economy, the different energy densities of gasoline and diesel need to be taken into account. Therefore, volumetric fuel economy values (litres per 100km) of diesel cars need to be normalized to the energy content of gasoline – i.e. they need to be converted to litres of gasoline equivalent per 100km (Lge/100km).

Conversion factors to normalize volumetric fuel economy values to Litres of Gasoline equivalents per 100km for Diesel, CNG and LPG fuel economy adjustment

L/100km to Lge/100km	Diesel	*1.08
Retrofit adjustment	CNG	*1.12
	LPG	*1.15

Factors to convert fuel economy (Lge/100km) to carbon emissions (gCO2/km)

Lge/100km to gCO2/km	Petrol	*23.2
	Diesel	*24.8
	CNG	*18.8
	LPG	*21.1

National baseline development

Stage 4. Calculation of the national average fuel economy

$$FE = \frac{\sum_i^n Reg_i \times FE_i}{\sum_i^n Reg_i}$$

With:

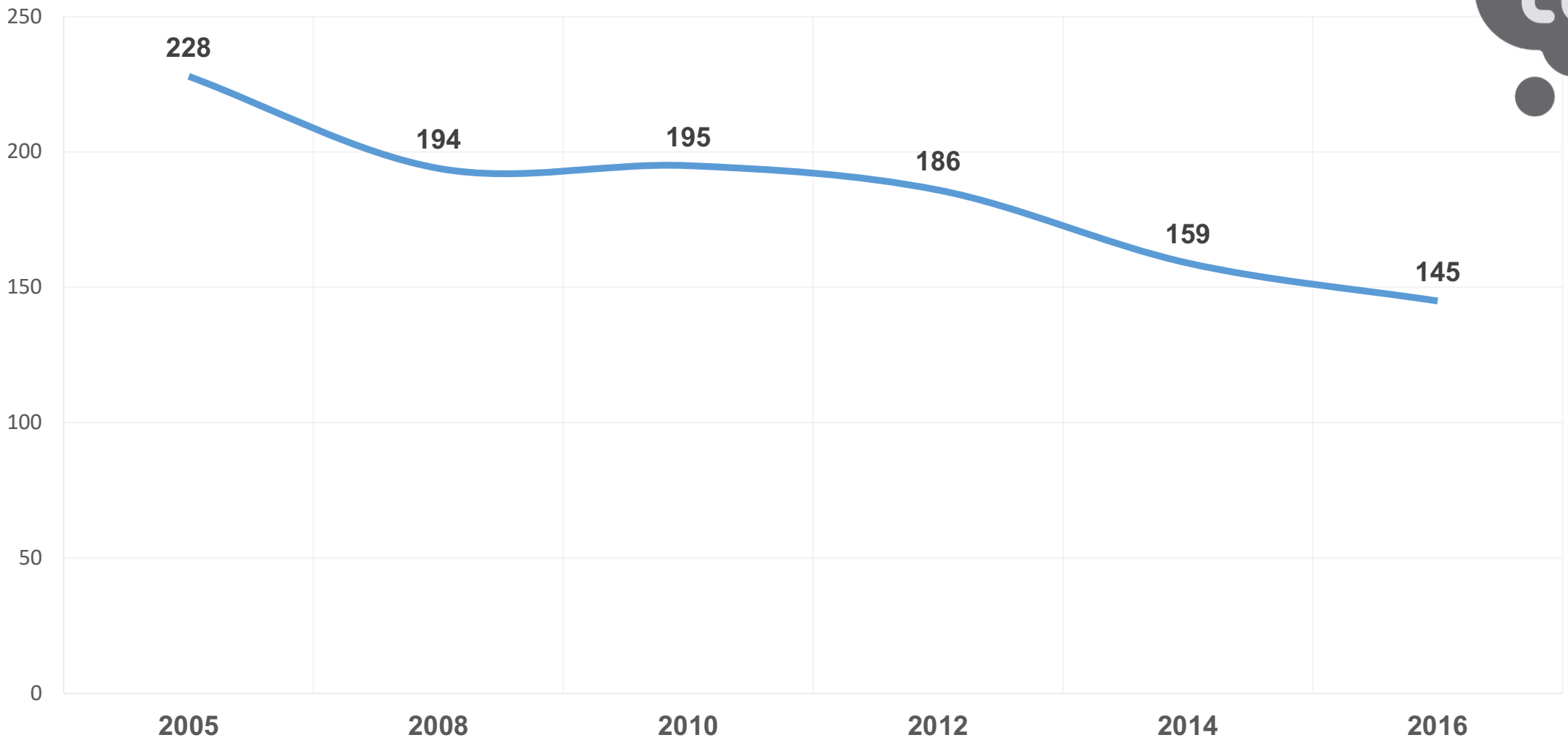
$FE = weighted\ average\ fuel\ economy$

$Reg_i = number\ of\ newly\ registered\ vehicles\ of\ type\ i$

$FE_i = fuel\ economy\ of\ vehicle\ of\ type\ i$

Main findings of baseline analysis

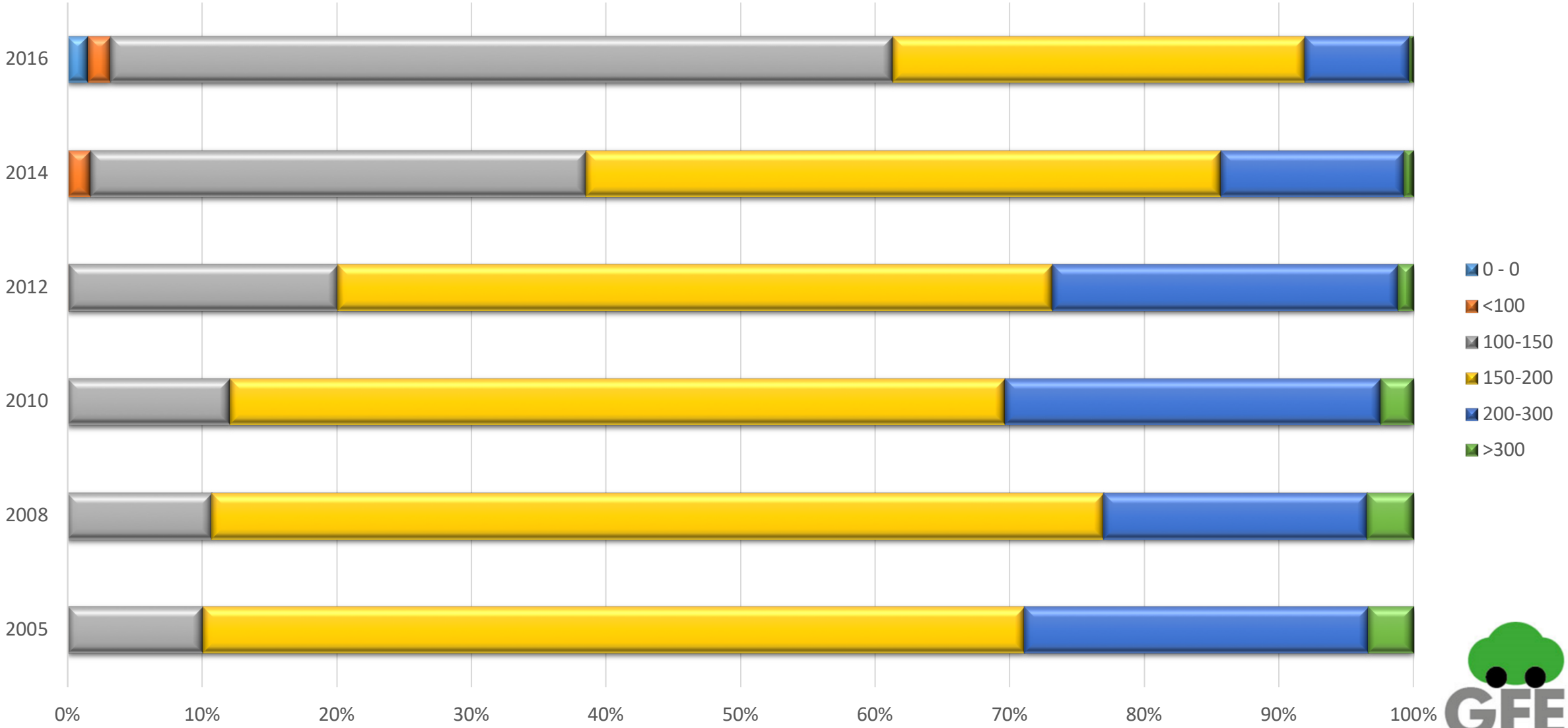
Average emissions of gCO2/km in Ukraine



GFEI

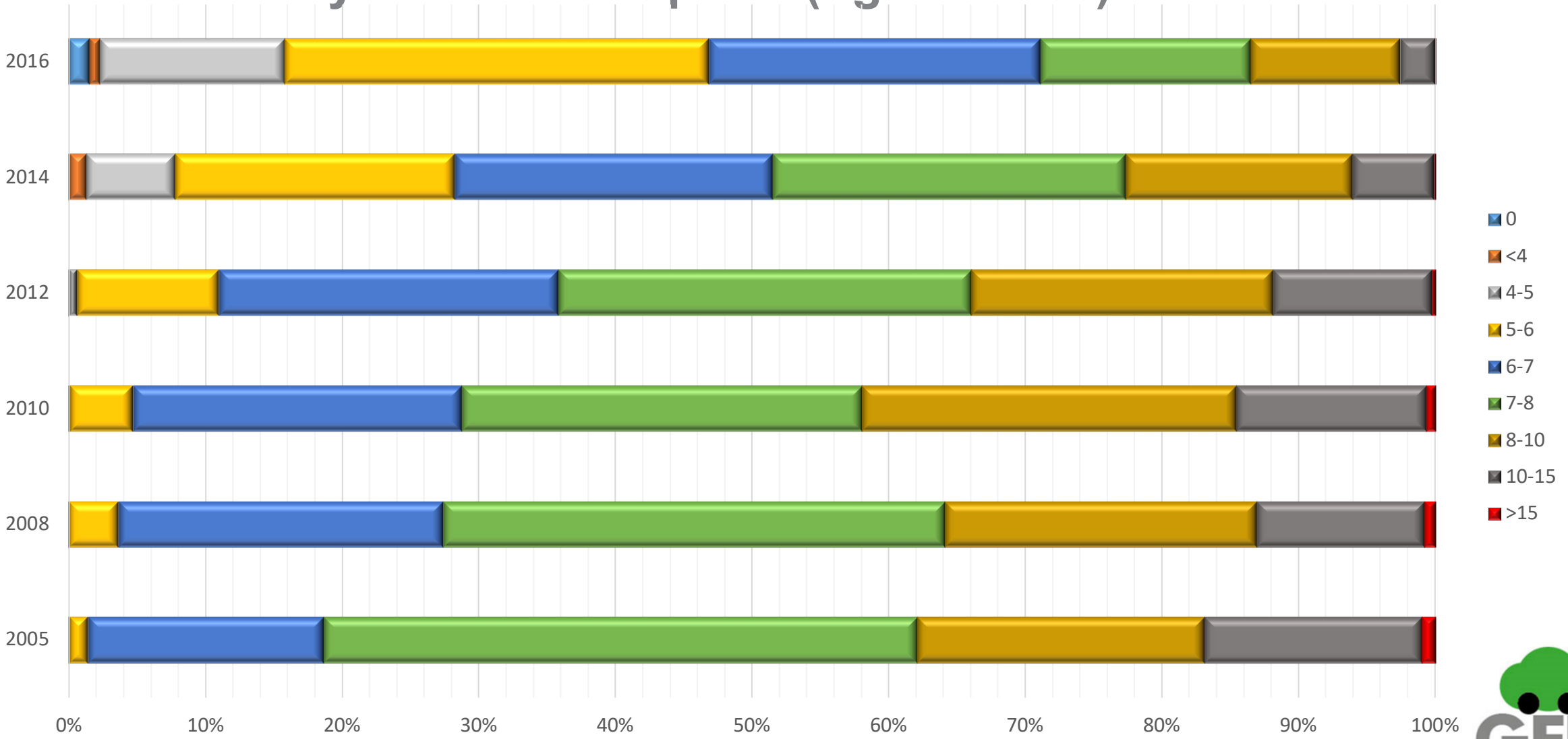
Main findings of Ukraine GFEI baseline

Distribution by CO2 emissions (gCO2/km)



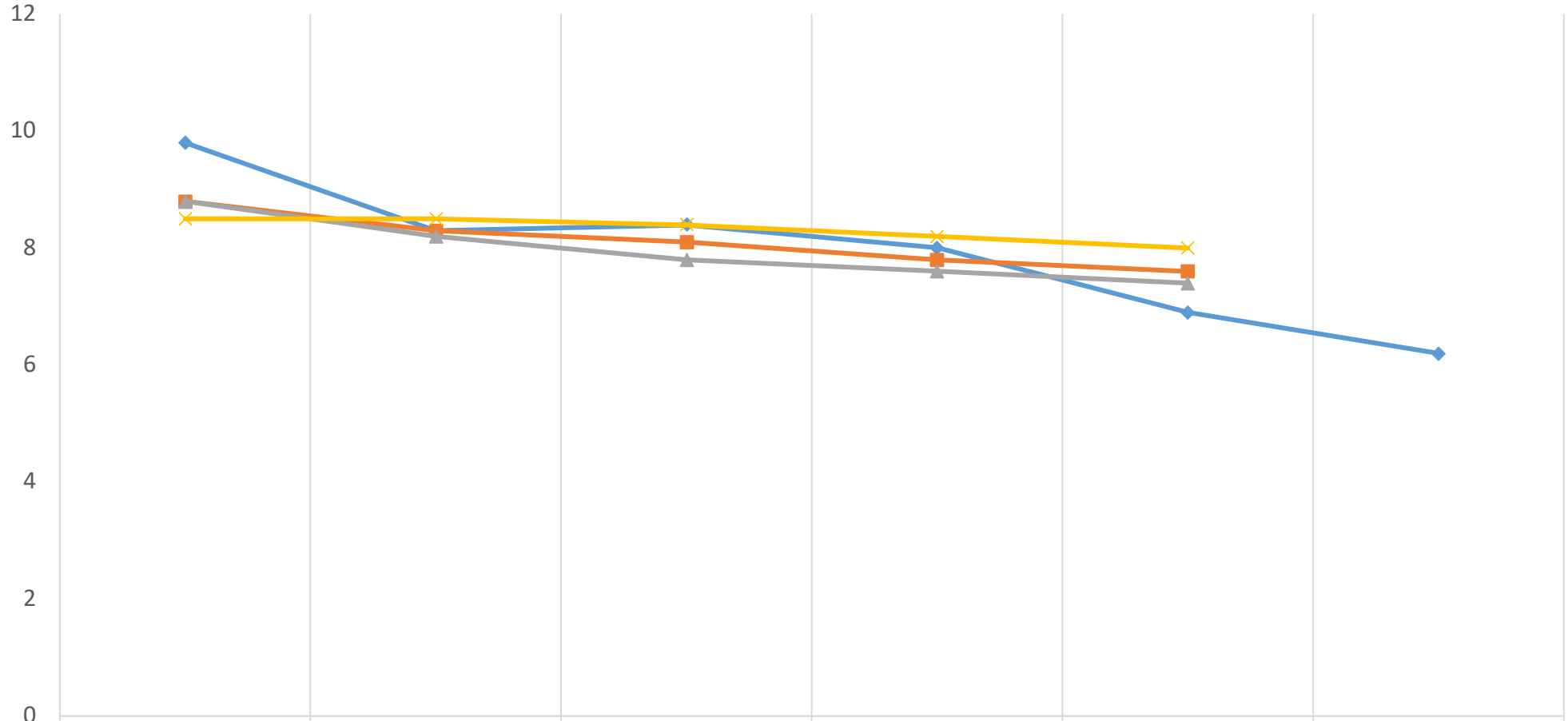
Ukraine GFEI baseline

Distribution by fuel consumption (Lge/100 km)



Ukraine GFEI baseline

Average fuel consumption in Ukraine

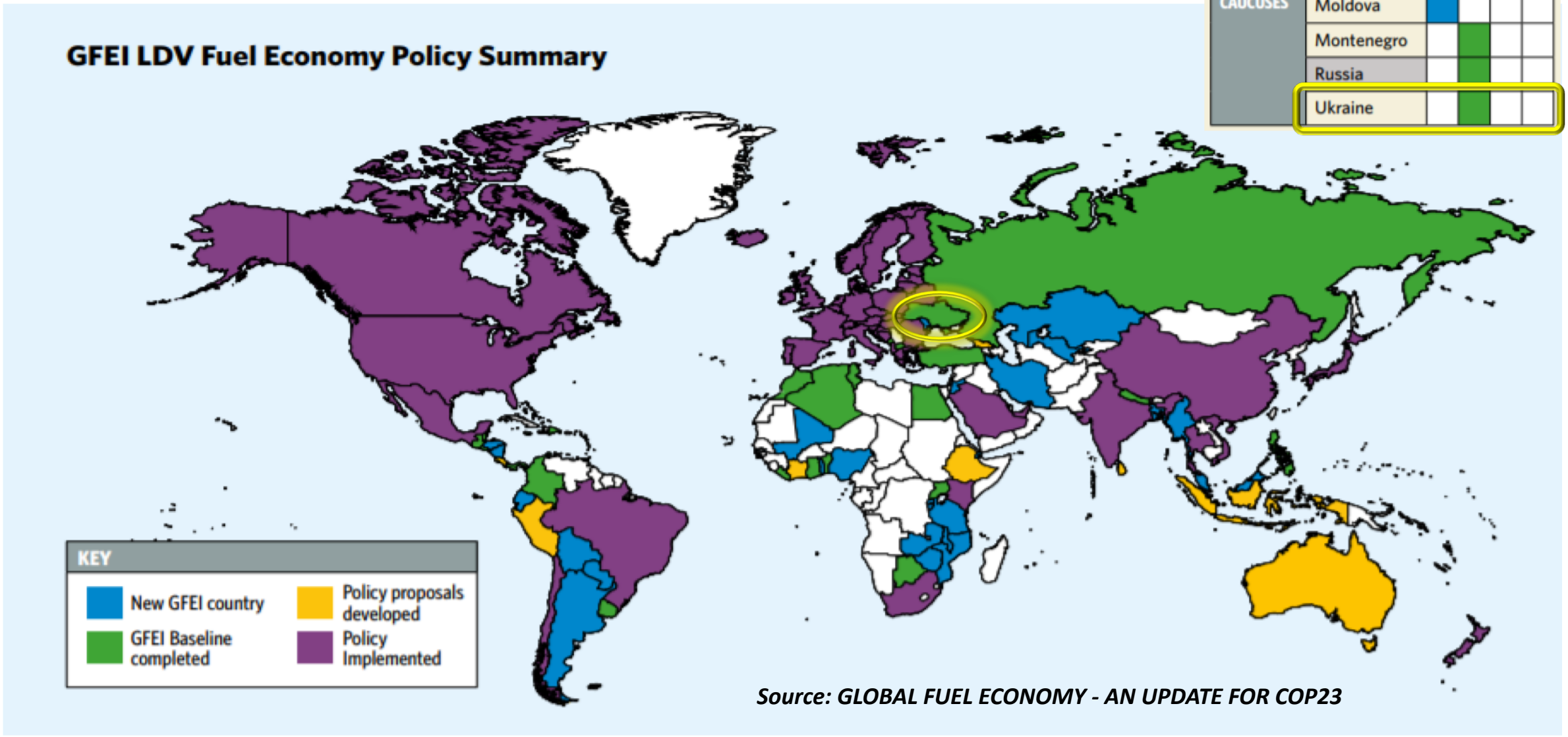


	2005	2008	2010	2012	2014	2016
Ukraine	9.8	8.3	8.4	8	6.9	6.2
Global	8.8	8.3	8.1	7.8	7.6	
OECD and EU	8.8	8.2	7.8	7.6	7.4	
Non-OECD	8.5	8.5	8.4	8.2	8	

Ukraine vs. Global fuel economy developments

			2005	2008	2010	2012	2014	2015	2016	2030
OECD & EU average	average FE (Lge/100 km)		8.8	8.2	7.8	7.6	7.4	7.3		
	annual improvement rate (% per year)		-2.3%	-2.8%	-1.6%	-1.3%	-0.5%			
			-1.8%							
Non-OECD average	average FE (Lge/100 km)		8.5	8.5	8.4	8.2	8	7.9		
	annual improvement rate (% per year)		-0.1%	-0.3%	-1.4%	-1.2%	-1.6%			
			-0.8%							
Global average	average FE (Lge/100 km)		8.8	8.3	8.1	7.8	7.6	7.6		4.4
	annual improvement rate (% per year)		-1.8%	-1.6%	-1.3%	-1.3%	-1.1%			
			-0.8%							
Ukraine	average FE (Lge/100 km)		9.8	8.3	8.4	8	6.9		6.2	
	annual improvement rate (% per year)		-15.0%	1.2%	-4.5%	-14.5%	-8.8%			
			-3.3%							
GFEI target	required annual improvement rate (% per year)	average FE (Lge/100 km)	-2.80%							
		annual improvement rate (% per year)								-3.7

Ukraine on GFEI`s global map

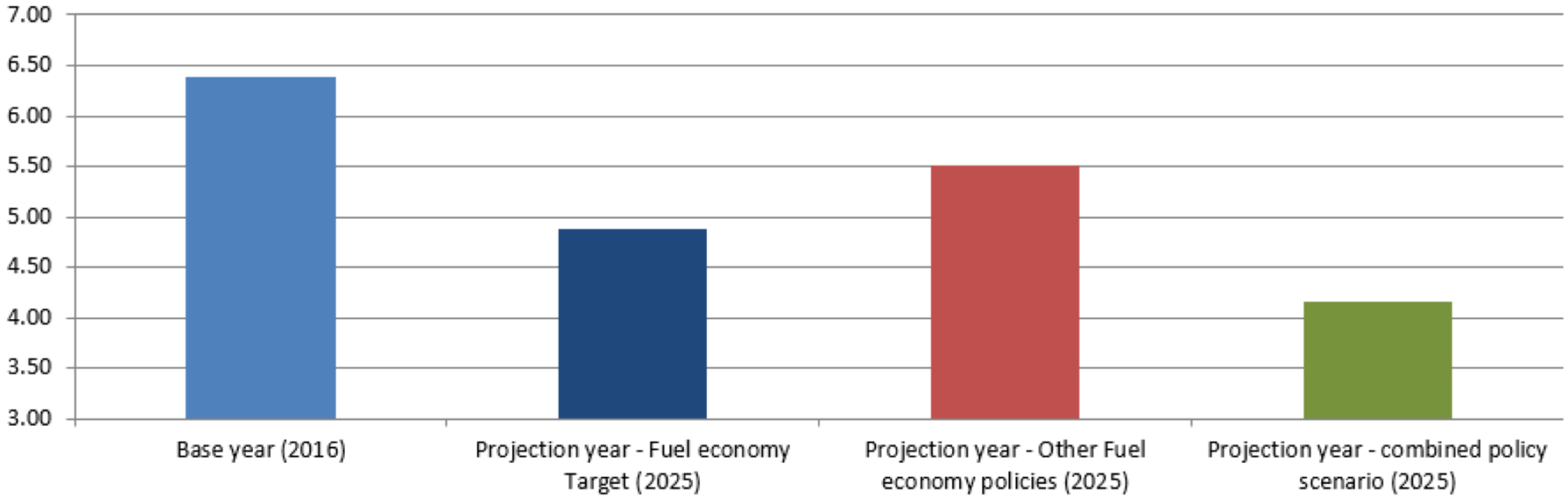


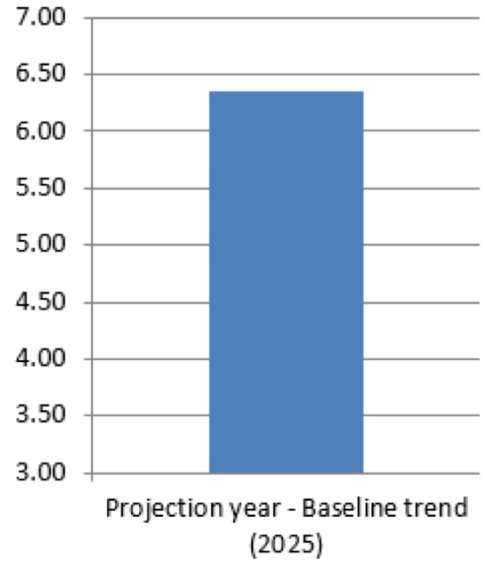
Source: GLOBAL FUEL ECONOMY - AN UPDATE FOR COP23

FEPIt – fuel economy projection modeling

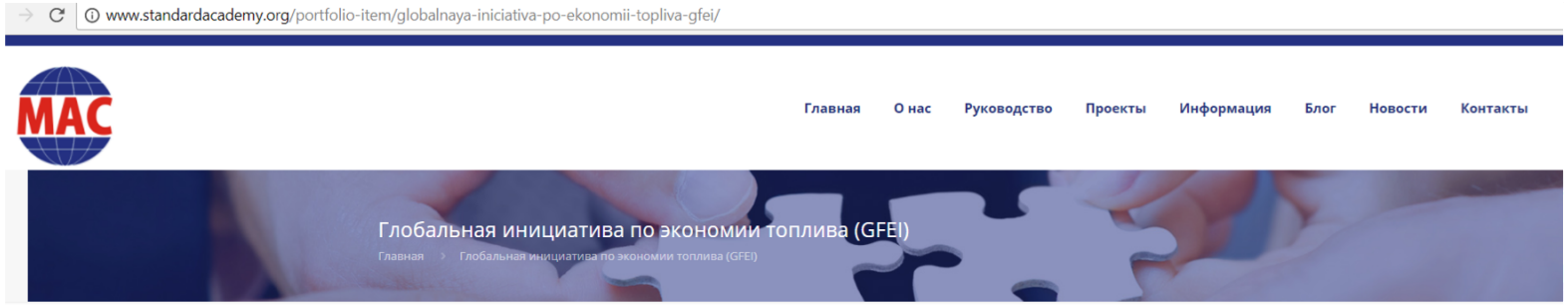
Scenario	Average fuel economy lge/100 km	Var% base year
Base year (2016)	6.38	
Projection year - Fuel economy Target (2025)	4.88	-23.6%
Projection year - Other Fuel economy policies (2025)	5.51	-13.7%
Projection year - combined policy scenario (2025)	4.17	-34.7%
Projection year - Baseline trend (2025)	6.35	-0.5%

Scenario	Average CO2 emissions per km g CO_2/km
Base year (2016)	153.2
Projection year - Fuel economy Target (2025)	117.1
Projection year - Other Fuel economy policies (2025)	132.2
Projection year - combined policy scenario (2025)	100.1
Projection year - Baseline trend (2025)	152.4





Informational support for GFEI in Ukraine



https://www.facebook.com/GFEIUKRAINE

http://www.standardacademy.org

http://www.fueleconomy.in.ua

Information support for GFEI in Ukraine

Identified problem: Many FE sources create perplexity.

http://www.fueleconomy.in.ua

Solution: Standardization - creation of a uniform database.

Vehicle registration	Brand\Model	Release year	Volume of engine, sm3	Fuel type	Fuel consumption	Full weight	Light weight	CO2 Emission	Added
	maserati gran								
2012	MASERATI GRANTURISMO SPORT	0	4691	Petrol	0	0	1955	360	01.04.2017
2012	MASERATI GRANTURISMO S AUTOMATIC	0	4691	Petrol	0	0	2055	358	01.04.2017
2012	MASERATI GRANTURISMO S AUTOMATIC	0	4691	Petrol	0	0	1880	331	01.04.2017
2012	MASERATI GRANTURISMO S AUTOMATIC	0	4691	Petrol	0	0	1955	354	01.04.2017
2012	MASERATI GRANTURISMO S	0	4691	Petrol	0	0	1845	337	01.04.2017
2012	MASERATI GRANTURISMO S	0	4691	Petrol	0	0	1880	385	01.04.2017
2012	MASERATI GRANTURISMO S	0	4691	Petrol	0	0	1955	385	01.04.2017
2012	MASERATI GRANTURISMO MC STRADALE	0	4691	Petrol	0	0	1770	337	01.04.2017
2012	MASERATI GRANTURISMO MC STRADALE	0	4691	Petrol	0	0	1845	337	01.04.2017
	MASERATI								

Potential benefits for GFEI:

- Speed up of national baseline developments for the new members of GFEI
- Uniform database will provide more data accuracy for users
- Flexibility for upgrading the database based on a new FE information

Recommendations for FE Policy development

1) **Informational measures:**
   a) Establishing a unified central vehicle registration database which should contain overall fleet information regarding vehicles' engine power, transmission type, axle configuration, fuel efficiency and CO_2 emission data, including any other informational provision required for vehicle labelling and taxation systems;
   b) Vehicle fuel economy labeling system;
   c) The national informational campaign in support for the fuel and energy efficiency in the transport sector;
   d) Voluntary eco-driving programmes for different categories of existing drivers and obligatory for driving school programs and new drivers.

2) **Fiscal measures to encourage the purchase of more fuel-efficient vehicles:**
   a) Progressive CO_2-based LDV registration tax;
   b) CO_2-based LDV ownership tax (on annual basis);
   c) Fiscal incentives for owners of "zero" emission vehicles.

3) **Technical regulation measures:**
   a) Implementation of the EU Fuel Economy Directive and accompanying measures;
   b) Launching of the fuel quality monitoring system;
   c) Launching of mandatory technical inspection system for LDVs.

GFEI

THANK YOU

Looking forward to fruitful cooperation for a cleaner future

Oleg Tsilvik

INTERNATIONAL STANDARDIZATION ACADEMY
interstandardacademy@gmail.com
www.standardacademy.org