



CITY OF WARSAW





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Structure of daily passengers trips

by METRO:
550.000
p/day



by local railway
companies: SKM,
WKD, KM: 165.000
p/day



by car:
3.200.000



by bus:
1.500.000 p/day



by TRAM:
653.000 p/day



always with us



95 lat
niezwykłej
przygody

1920-2015

MZA today



MZA Warsaw Ltd. - the biggest polish PTO,

with abt. 1300 buses and

more than 3500 drivers,

makes yearly more than 85'000'000 vkm



always with us



Rolling stock - facts and figures

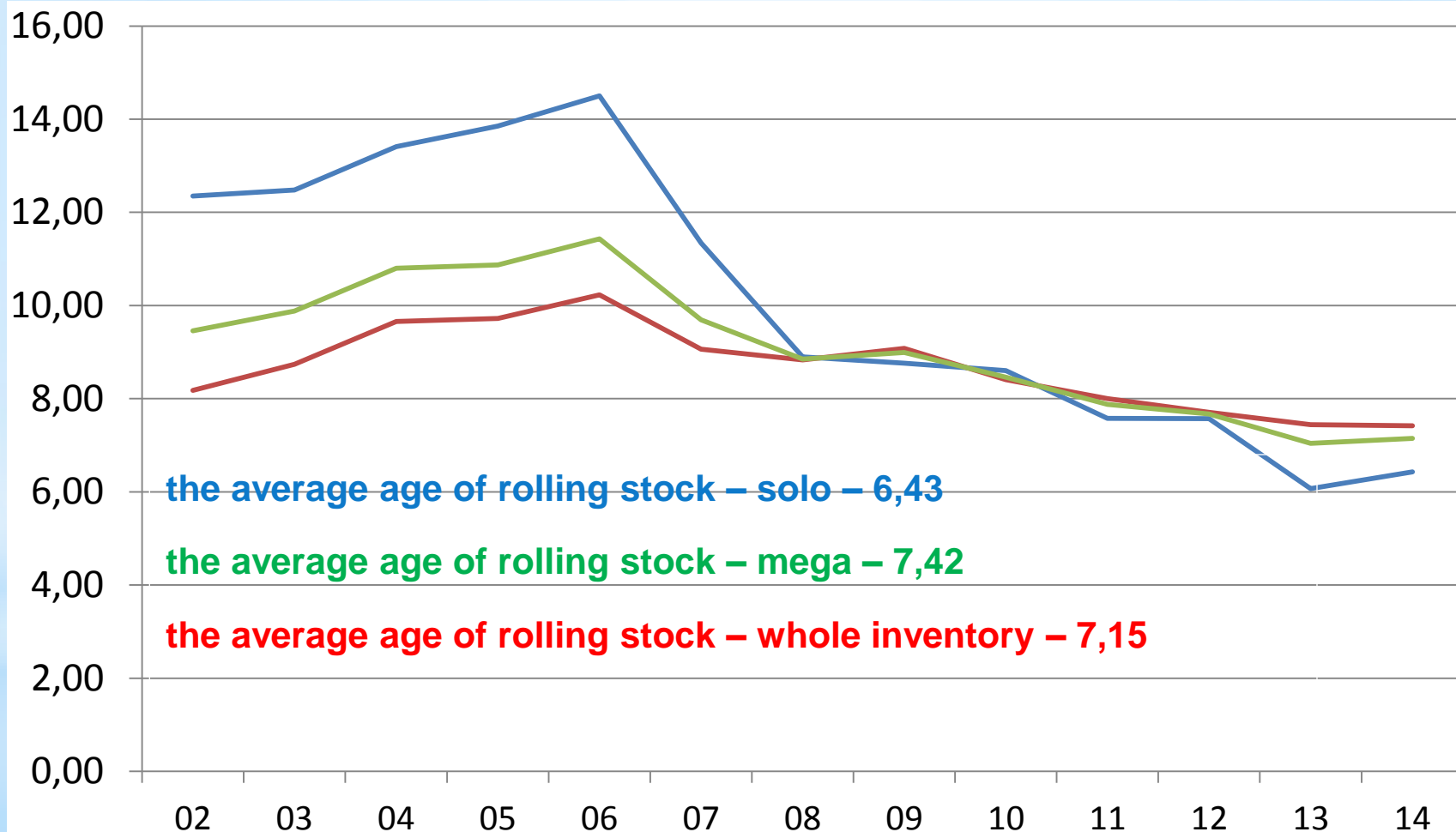


Purchases of new buses

Prediction 2015 - 2024

Rolling stock by type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
BUS - DIESIEL	80	60	50	85	80	95	95	95	95	130
BUS - HYBRID	-	-	-	20	10	10	10	10	10	-
BUS – LNG / CNG)	-	-	-	-	15	-	-	-	-	-
BUS - ELECTRIC	10	10	10	15	15	15	15	15	15	-
BUS – HYBRID / CNG	38 ⁽¹⁾	-	-							
TOTAL:	90	70	60	120	120	120	120	120	120	130

Bus structure – by age [years]

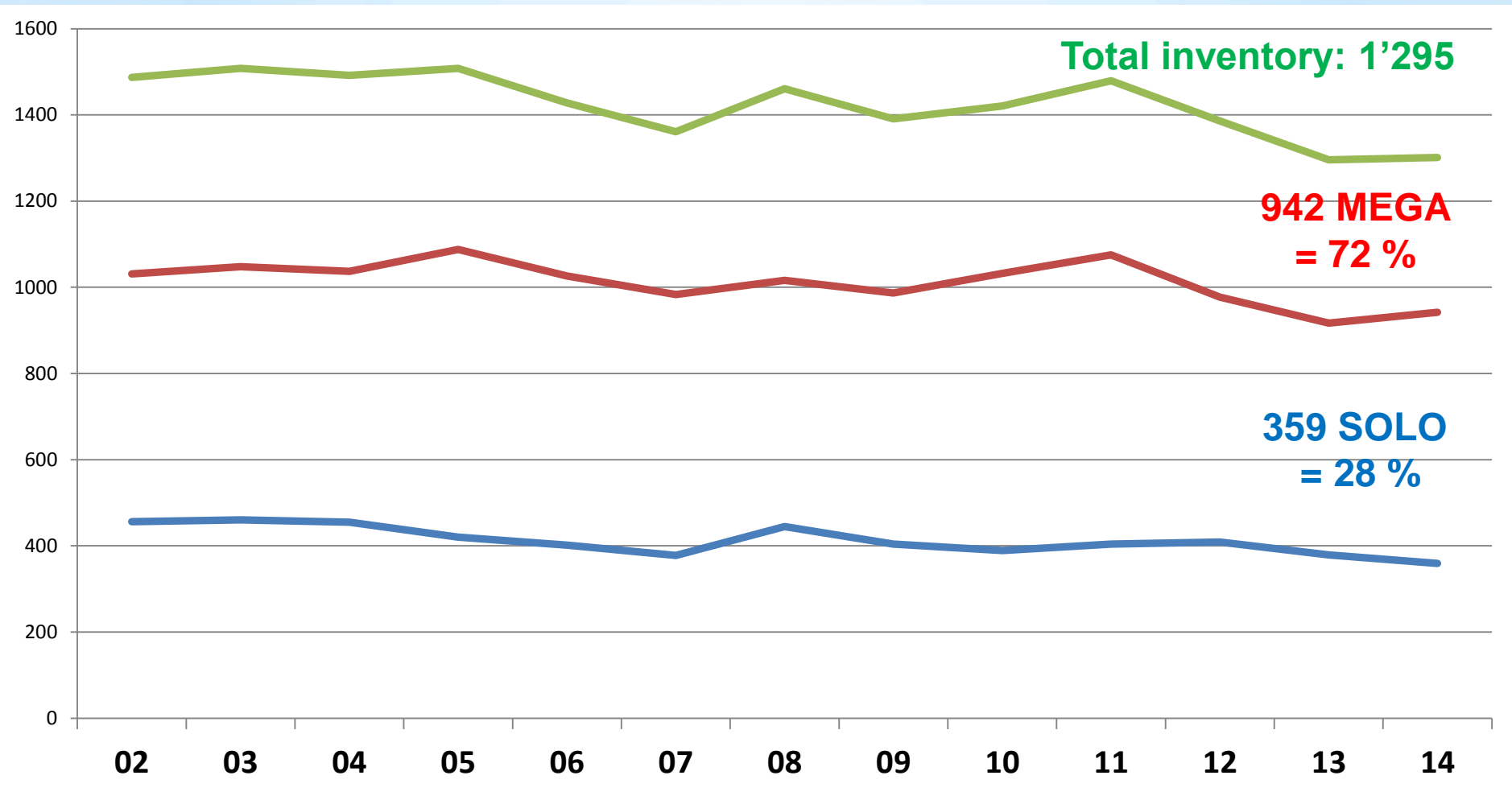


the average age of rolling stock – solo – 6,43

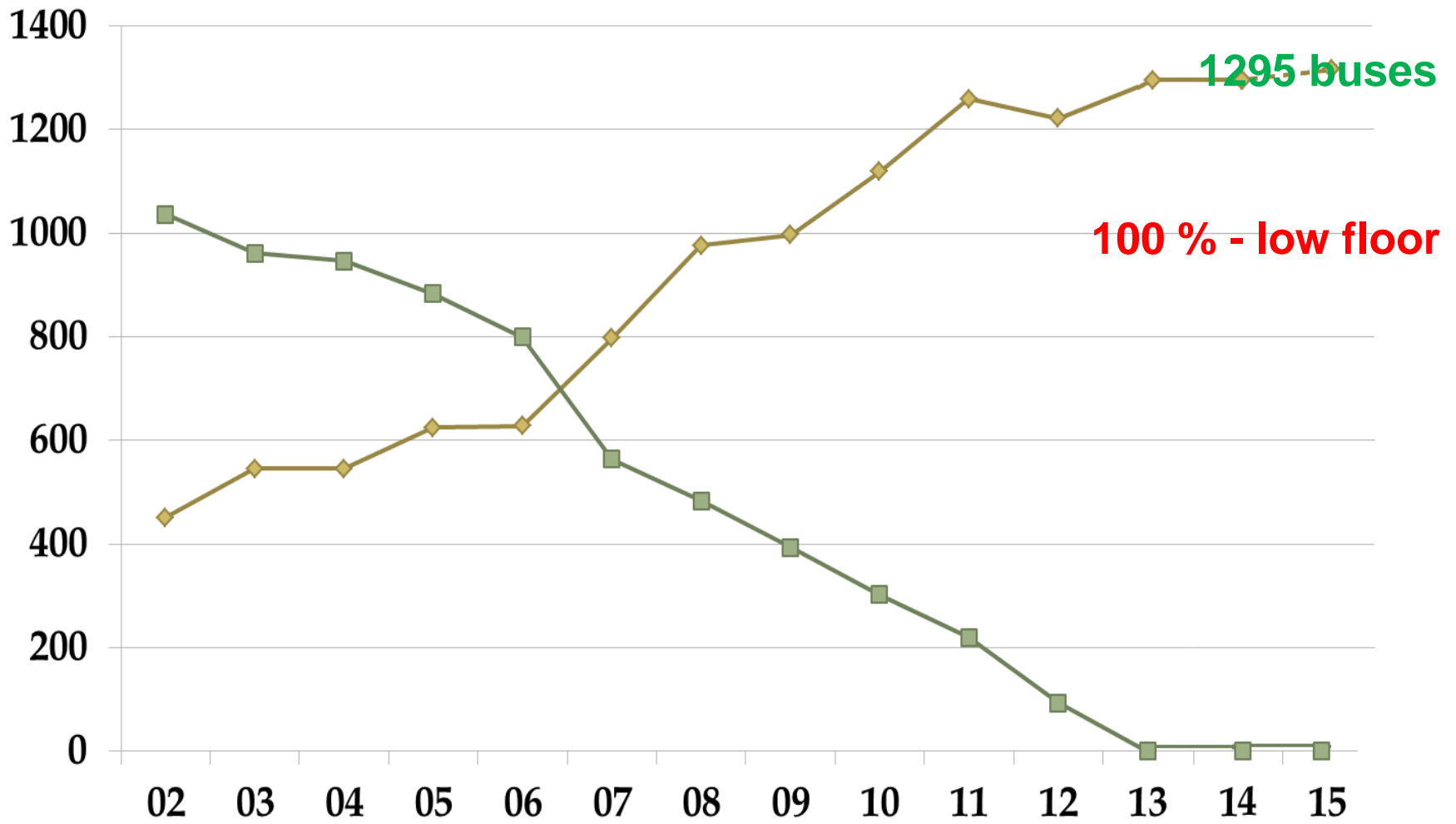
the average age of rolling stock – mega – 7,42

the average age of rolling stock – whole inventory – 7,15

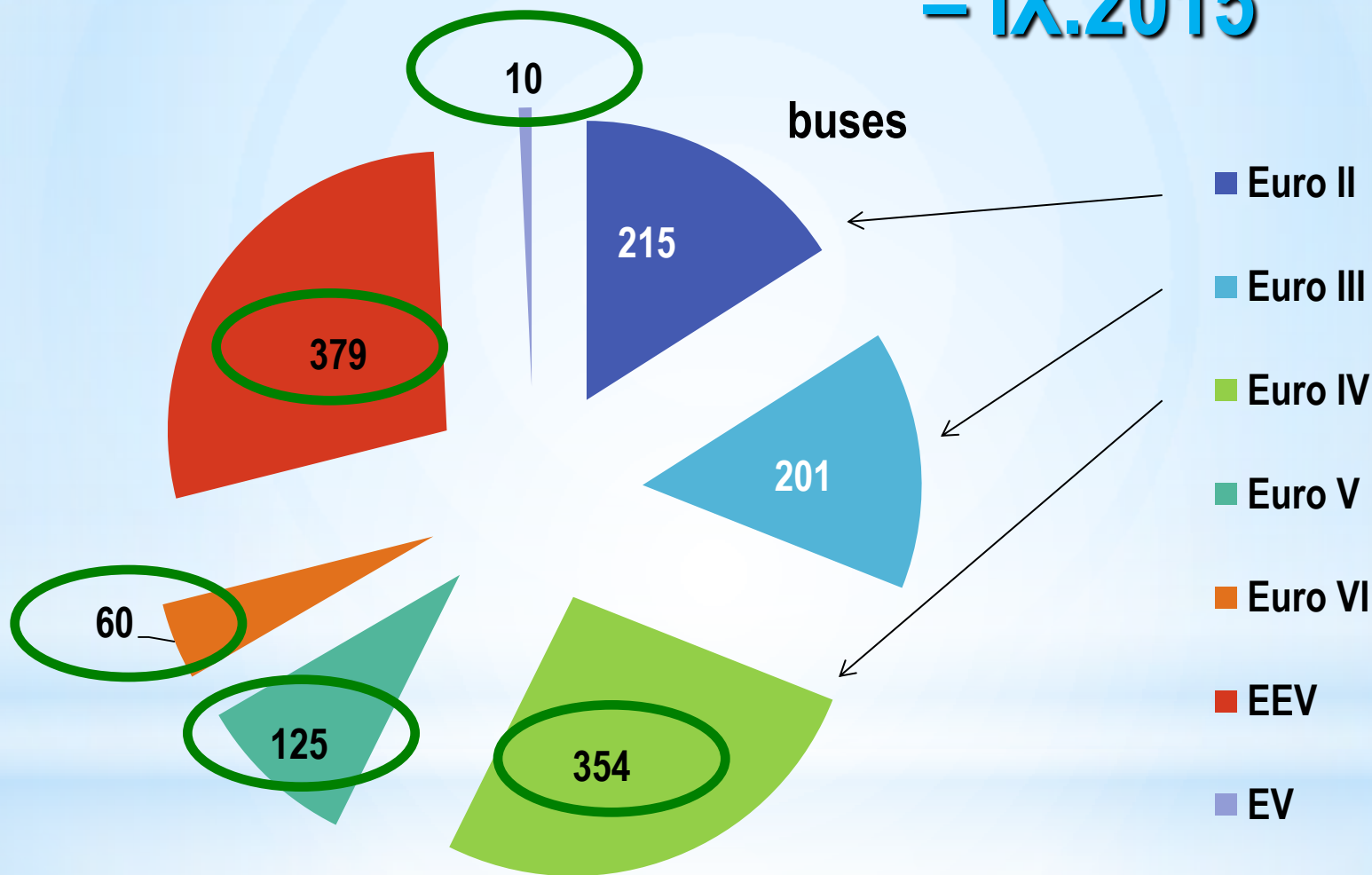
Bus structure – by inventory



Bus structure – by floor



Bus structure – by engine Euro standards – IX.2015



Near 70 % meet Euro IV or higher standards

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MZA Warszawa – selected planned activities within the infrastructure:

The construction of ultra-modern, multi-level bus depot „Redutowa” with parking places for about 300 buses, including 100 articulated and 100 electric.

Next to a modern technological equipment, to be used innovative energy sources such as heat pumps or photovoltaic cells.



MZA Warszawa – selected planned activities within the infrastructure:

Installation in depots
photovoltaic cells as an
alternative energy source



Replacing lighting of bus
parking sites on the lanterns
with LED lamps

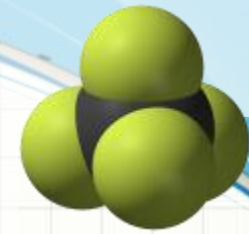


SOLBUS SOLCITY 18 LNG bus – „Ostrobramska” Depot



**MZA since February 2015, operates 35 low-floor,
articulated Solbus Solcity 18LNG buses**

ECOLOGICAL ASPECTS OF LNG



CO₂ EMISSION of MZA articulated buses - Emission comparison of ON vs. LNG



Emission of CO ₂ g/km	Fuel
1'452	Diesel
1'377	LNG

CO₂ emission of LNG is **5,2%** lower

SOLARIS U12E electric bus – „Woronicza” Depot

MZA since July 2015, operates 10 low-floor, fully electric buses Solaris U12E

2015	July	August	September
total mileage [km]	34'191	34'934	34'931
Power consumption [kWh]	37'072	41'058	36'013
Average power consumption [kWh/km]	1,084	1,175	1,031



Comparing the ecological effect



EMISSION of CO₂ – MZA buses, 12 m Emission comparison of diesel and electric bus

Route n# 222 – type SORT 1 (V= 13 km/h)

	Diesel bus	Electric bus Solaeris U12E	
Consumption: fuel / power (traction only)	45 dm ³ / 100km	110 kWh / 100 km	110 kWh / 100km
CO ₂ "production"	1194 g/km	0**	979 g/km
CO ₂ w „production” within LCC* (800'000 km and 10 years)	955,2 Mg/LCC*	0**	783,2*** Mg/LCC* reduction to ~18%

* LCC – Live Cycle Cost; ** emission at the operation site; *** emisja of power station

MZA Warsaw - selected activities within the rolling stock:

On the roofs of 15 buses of the Company in the end of 2014 were installed photovoltaic panels:



	Bus model	Power of panels
1	Solbus 12 m	1'200 W
2	Solbus 18 m	1'650 W
3	Solaris 18 m	1'500 W

Positive results (savings of 5%) led the MZA to order (public tender) factory-installed, professional systems, tailored to energy configuration / consumption of buses

MZA Warsaw - selected activities within the rolling stock:

The tender was won by Solaris Bus & Coach offering buses with
roof photovoltaic panels



Thank you for your attention

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