Using Electric Cars as Taxis

Department of Transport and Road Infrastructure
Development of Moscow

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Moscow Transport

Taxi

Electric Transport

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DEVELOPMENT OF ELECTRIC CARS

There is a rapid growth of demand for electric cars in developed countries.

A strong demand for the electric cars is conditioned by their high ecological performance and smaller operating costs.

The electric cars are used as taxis in some countries of Europe and Asia.

Development of electric taxis can be accelerated if the car and electric energy prices are further reduced.

In order to reduce costs for electric cars, government assistance in regulating the market and developing infrastructure is necessary:

- the Government of the Russian Federation stimulates the growth of the demand for electric cars through a complex of regulatory initiatives.
- the Government of Moscow develops a network of electric recharge stations according to a plan, provides a free on-street parking and PR support.

THERE IS A RAPID GROWTH OF DEMAND FOR ELECTRIC CARS IN EUROPEAN COUNTRIES.

Main Trends of Electric Cars Market

Growth of consumer interest in “green technologies”: hybrid and electric engines.

Reduction of the electric cars price by cutting the price of their batteries.

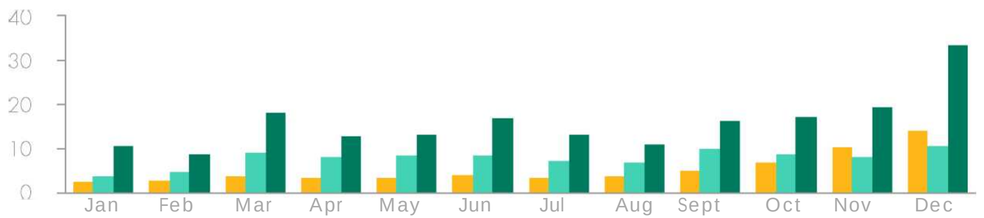
Increase in charge rate and maximum driving distance with one battery charge through new types of batteries.

Active development of electric recharge stations infrastructure, including “domestic”.

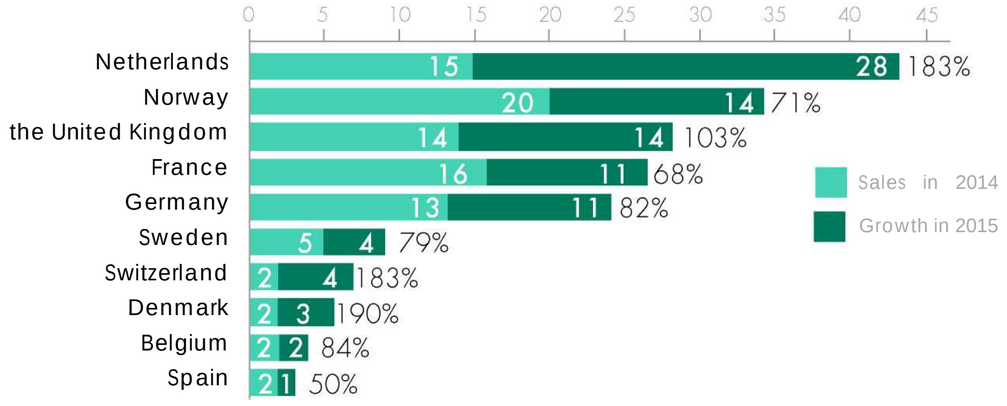
Activation of the government assistance in developing ERS [1] networks and electric mobiles, including tax incentives, road preferences, subsidies for R&D and electric cars manufacture.

Sales of electric cars in Europe amounted to approximately 200,000 vehicles in 2015.

Monthly dynamics of electric cars sales, thousand pieces ■



Growth of electric cars sales by countries, thousand pieces and %



Note: 1 electric recharge stations

Sources: public data, EVVolumes.com

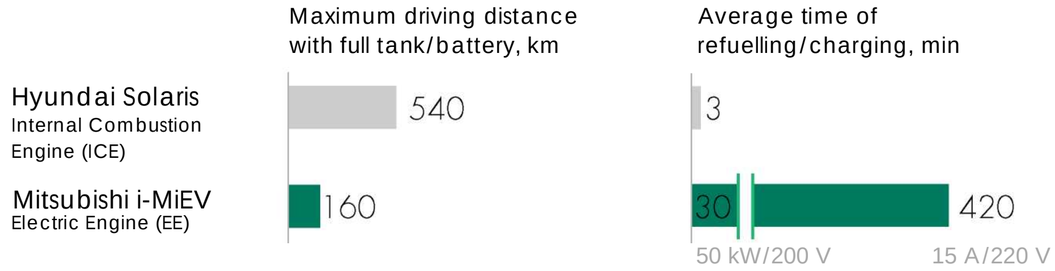
STRONG DEMAND FOR ELECTRIC CARS IS CONDITIONED BY THEIR HIGH ECOLOGICAL PERFORMANCE AND SMALLER OPERATING COSTS

Advantages of Electric Cars

- High level of energy conversion efficiency (up to 95 %) as compared to ICE (22–42 %)
- Low level of environmental damage
- Smaller noise level
- Lower price of “fuel”
- Lower price of technical maintenance and high reliability of main parts

Disadvantages of Electric Cars

- Smaller maximum driving distance
- Reduction of driving distance during cold time
- Long full-charge time



Today, the disadvantages of the electric car are balanced out by the developed infrastructure, and the advantages positively influence ecology and expenses of population.

Sources: public data

ELECTRIC CARS ARE USED AS TAXIS IN SOME COUNTRIES OF EUROPE AND ASIA

the United Kingdom and Europe[1]

- Geely, Chinese automotive manufacturer and owner of London Taxi Company, invested USD 390 mln to London Cab TX5.
- Geely plans to increase a number of legendary London Cab TX5 in some European capitals: Barcelona, Oslo, Amsterdam, Berlin, Prague

Russia[2]

- In 2012, batch manufacturing of Lada Ellada electric car was launched.
  The car is used as a taxi in a resort town Kislovodsk, Stavropol Krai.
- This is the first Russian project connected with the use of the electric car for the purposes of passenger transportation.
- In 2015, Yandex.Taxi purchased 2 Tesla electric cars for Moscow.

China[3]

- Nowadays, >4,000 electric taxis operate in Taiyuan, an administrative centre of the Northern Chinese province of Shanxi.

  In the short run, it is planned to replace all gas-operated vehicles with electric cars.

the United Arab Emirates[4]

- Careem Company announced that it signed an agreement with NEXT Future Transportation Inc. Under this agreement, the Company plans to enlarge its car fleet in Middle East and in Northern Africa by adding self-driving electric taxis for private use.

Note

1 — http://www.forbes.com/sites/tychodefeijter/2016/08/17/geely-to-replace-londons-iconic-black-cab-with-a-hybrid/#4a87520943d5;
2 — http://avtomobili-vaz.kaketoustroeno.ru/m_el-lada.htm;
3 — http://vamoisej.livejournal.com/992217.html;
4 — http://arafnews.ru/news/bespilotnye-modulnye-elektro-taksi-stanut-realnostju-v-oae-uzhe-k-2030-godu.html

SPECIAL MODEL OF COST-EFFECTIVE, ENVIRONMENTALLY FRIENDLY AND COMPETITIVE ELECTRIC TAXI IS DEVELOPED AND PRESENTED IN GERMANY

Germany[1]

- A car model CITY eTAXI ready for commercial launch and dedicated to passenger transportation under the city conditions is presented with financial support from the Federal Ministry of Economic Affairs and Energy of Germany and within the Adaptive City Mobility (ACM) 2 project.

- Within the ACM, a simple four-wheel vehicle with electric drive is developed. It can be used not only for carsharing services or as a city taxi but also to fulfil logistics or tourist functions.

- The purpose of the the project launched in 2015 is creation of a cost-effective, environmentally friendly and competitive electric car that will embrace new technologies of battery replacement and ICT for electric mobility.

- Testing of an innovative taxi on the roads of Munich is planned in 2017.

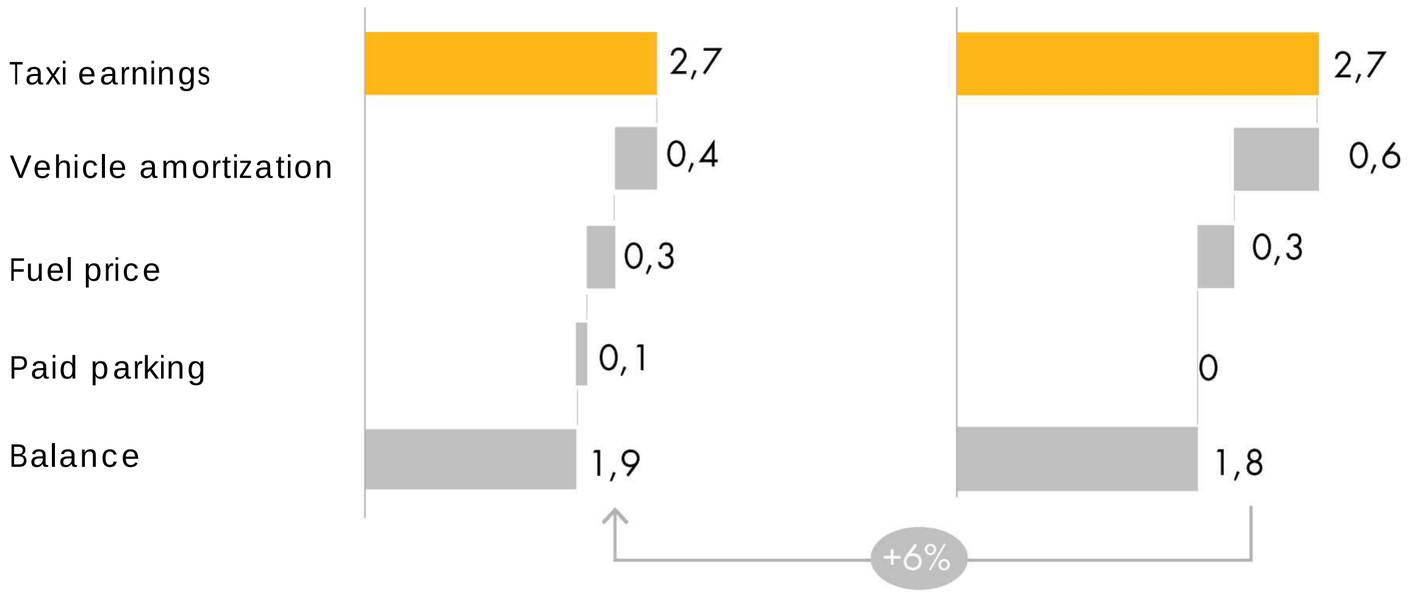
Notes: 1 — http://ecotechnica.com.ua/transport/1191-city-etaxi-legkoe-gorodskoe-elektrotaksi-predstavleno-v-germanii.html

DEVELOPMENT OF ELECTRIC TAXIS CAN BE ACCELERATED WITH THE CAR AND ELECTRIC ENERGY PRICES FURTHER REDUCED

Comparing economic efficiency of taxis with ICE and EE within distance of 100,000 km,
million rubles

Hyundai Solaris
Internal Combustion Engine (ICE)

Mitsubishi i-MiEV
Electric Engine (EE)



Comments to calculations

Models and prices of official dealers are compared [1]:

- Hyundai Solaris 1.4/4AT — from RUB 699,400
- Mitsubishi i-MiEV — from RUB 999,000

Earnings from 1 taxi

- Trip distance ~15 km; trip time ~30 min; trips per day ~10 trips; working days per year ~250 days.
- Average economy class tariff (according to taxi aggregators) [2] ~RUB 400. (RUB 99–149 for serving a taxi; RUB 8–9 per km; RUB 8–15 per min)

Expenses during life of vehicle

- Amortization is calculated pro rata the ICE/battery resource consumed within distance of 100,000 km (guaranteed ICE resource [3] amounts to 180,000 km; guaranteed battery resource [4] amounts to 160,000 km).
- Average "fuel" price in Moscow [5]: RUB 36 per 1 l of AI-92 or RUB 8 per 1 kWh
- Fuel (battery) consumption per 100 km [6]: 7 litres of AI-92 or 33 kWh
- Expenses for paid parking are calculated on the following assumption: tariff ~RUB 60, parking per day ~2.5 hours
- Other expenses are not taken into account, since they are equitable for the compared models (maintenance, insurance, credit interests, etc.)

Sources:
public data, Strategy Partners Group 7 review

Notes:
1 Rolf, Major Auto;
2 Yandex.Taxi, GetTaxi, Uber, VC.Ru, Roem.Ru, Ubervoditel.ru;
3 SolarisAvto.com, AutoFlit.ru;
4 FAQ Mitsubishi Cars;
5 Benzin-Price.Ru, Tesla-Automobile.Ru;
6 Hyundai and Mitsubishi data

TO REDUCE COSTS FOR ELECTRIC CARS, GOVERNMENT ASSISTANCE IN REGULATING MARKET AND DEVELOPING INFRASTRUCTURE IS NECESSARY

● National level ● Regional level

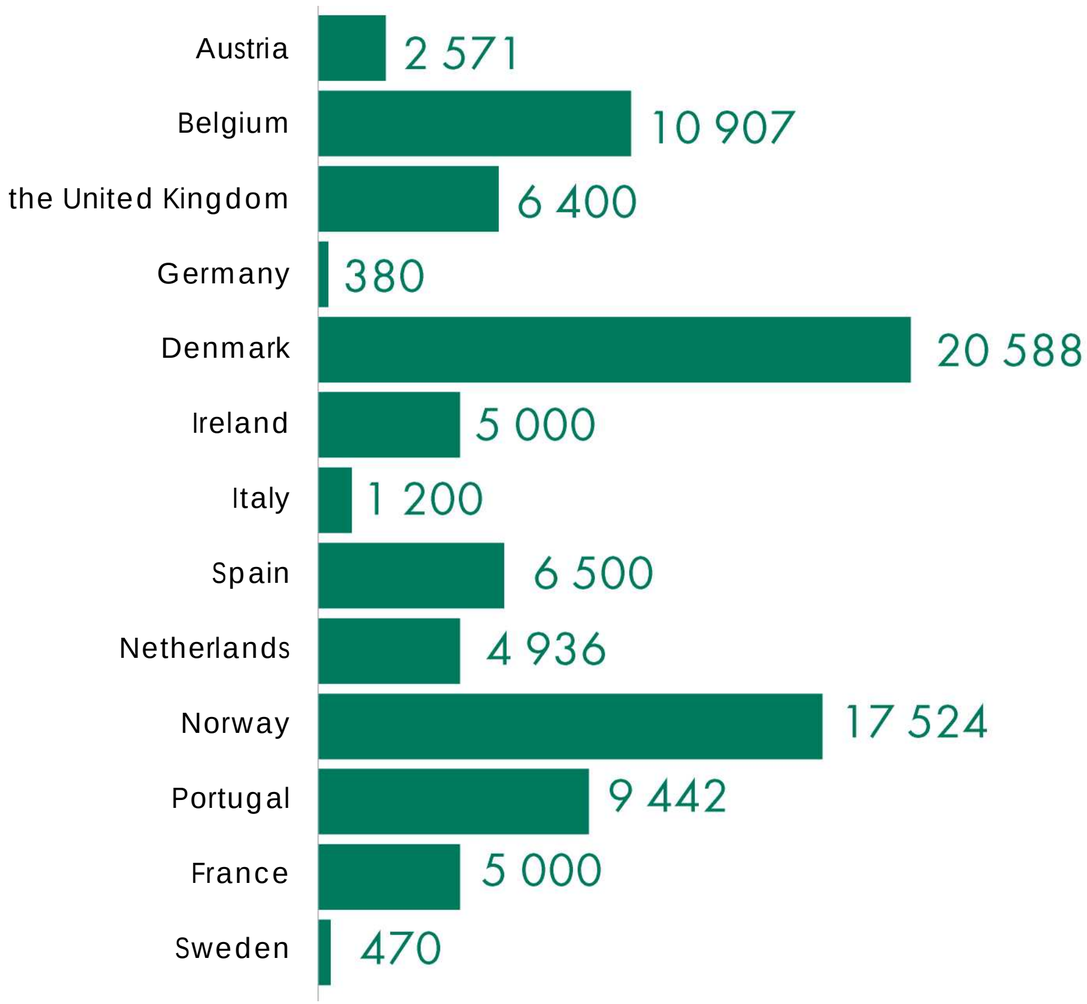
	Examples of government assistance instruments	Russia	China	the USA	Norway	Canada	South Korea	Japan
REGULATION	Tax preferences: Reduction or abolition of customs duties	●	●	●	●			●
	Tax preferences: Reduction or abolition of transport tax	●	●	●	●		●	●
	Tax preferences: Income tax reduction for buyers of electric cars			●				
	Tax preferences: Electric cars licensing/registration cost reduction		●	●	●			
	Road preferences: Free parking	●	●	●	●	●		
	Road preferences: Access to dedicated lanes			●	●	●		
INFRASTRUCTURE	Manufacture of electric cars: State subsidies for R&D			●				●
	Manufacture of electric cars: National scientific programs		●	●		●	●	●
	Manufacture of electric cars: State subsidies for manufacture		●					
	Purchase of electric cars: State credits for purchase			●		●		
	Purchase of electric cars: Compensation for a part of costs associated with purchase		●	●		●	●	●
	Purchase of electric cars: Government procurement	●		●				
	Electric recharge stations: Government assistance in establishing domestic charging infrastructure (co-financing, credits)			●		●		●
	Electric recharge stations: Government assistance in construction of commercial electric recharge stations	●	●		●	●	●	

Notes:
1— lenta.ru
2 — vm.ru

Sources: public data, Strategy Partners Group 7 review

GOVERNMENT SUPPORT IN EUROPEAN COUNTRIES

A total amount of benefits for one electric car taking into account all reduced payments, €



Main support measures:

- Abolition of registration fee
- Abolition of road or transport tax
- Preferences in relation to import duty
- Preferences in relation to VAT
- Preferences in relation to income tax
- Free parking/dedicated parking space
- Free entrance to the centre

GOVERNMENT OF RUSSIA STIMULATES GROWTH OF DEMAND FOR ELECTRIC CARS THROUGH COMPLEX OF REGULATORY INITIATIVES.

1

ALL-RUSSIAN PROGRAM FOR DEVELOPMENT OF CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES (approved by Order of PJSC Russian Grids No. 412 of 17.07.2013)

2

Complex plan of action aimed at supporting manufacture and use of green vehicles (Order of A.D. Dvorkovich, Deputy Prime Minister of the Russian Federation No. AD-P9-3076 of 28.04.2014).

3

On 27 August 2015, D.A. Medvedev, Prime Minister of the Russian Federation, signed Decree of the Government of the Russian Federation No. 890, thus, making it possible to equip gas stations with charging columns for electric cars.

4

The EEC Council approved an initiative to null 19 % duty imposed on electric cars imported to the countries of the Customs Union within the period from 1 February 2014 to 31 December 2015. Work on extension the period till the end of 2017 is in progress.

5

Creating conditions for incorporation of all types of autonomous electric vehicles on the territory of the Russian Federation.

6

Cooperation agreement between the Government of Moscow, PJSC Russian Grids and PJSC Mosenergo with regard to organization of electric vehicles use in Moscow (August 2014) permitting owners to park their electric cars in a zone of a paid parking for free.

7

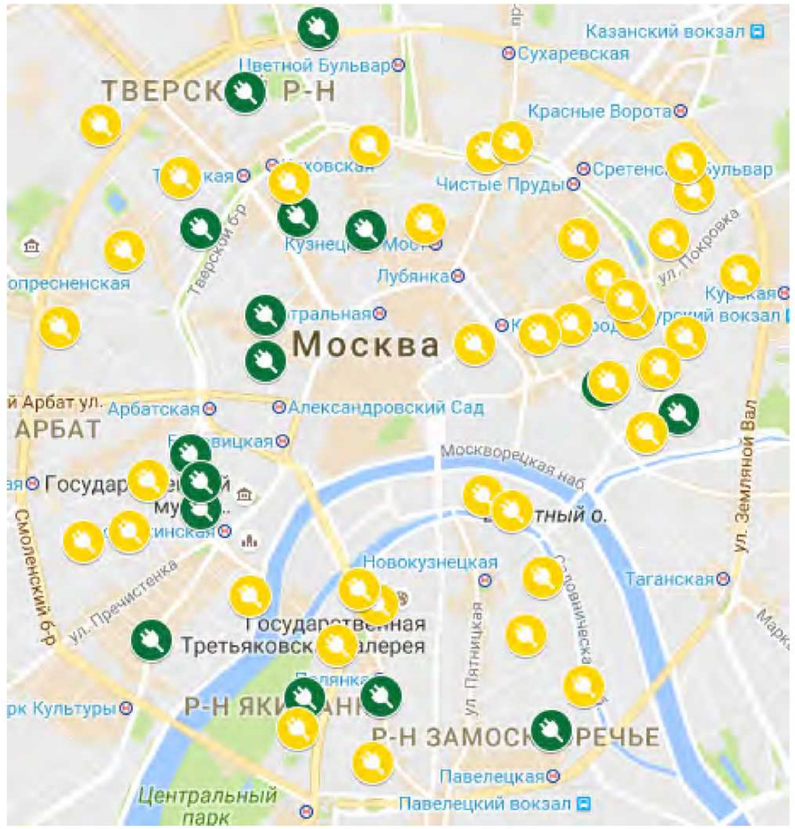
Law of Moscow Region No. 173/2015-OZ (Article 26.19) abolished transport tax for vehicles with electric engines only.

1,000 electric cars are registered in Russia

Sources: public data

GOVERNMENT OF MOSCOW DEVELOPS NETWORK OF ELECTRIC RECHARGE STATIONS ACCORDING TO PLAN, PROVIDES FREE ON-STREET PARKING AND PR SUPPORT

Planned number of ERS in the centre of Moscow amounts to 60 units up to 2017



- operating

- planned

Comments

Electric recharge stations (ERS) are placed according to the allocation scheme approved by the Department of Transport and Road Infrastructure Development.

327 places for ERS are examined and 130 places are approved in Moscow.

Not less than 18 ERS operate in the centre of Moscow, >40 ERS are planned to create.

Owners of the electric cars may park their vehicles at a paid city parking for free.

A sub-brand “Electric Transport” is developed as a part of the brand “Moscow Transport”.

Moscow Transport | Taxi | Electric Transport

Sources: data provided by the Department of Transport and Road Infrastructure Development, PJSC Mosenergo, PJSC Russian Grids