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INDUSTRIES AND INTERINDUSTRY COMPLEXES

Development of the Electric Vehicles Market in Russia as a Necessary Condition for Benefiting from the Global Trend towards Transport Electrification

V. V. Semikashev[a, *], A. Yu. Kolpakov[a], A. A. Yakovlev[b], and J.-K. Rostovski[a]

[a] *Institute of Economic Forecasting, Russian Academy of Sciences, Moscow, Russia*

[b] *Market Research Agency Ipsos, Moscow, Russia*

**e-mail: vv_semikashev@mail.ru*

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Abstract—Growing market of electric vehicles (EV) is one of the stable trends in the modern world economy. The development of EV market in Russia is a feasible direction of economic policy, as it is a way to interest international auto concerns in developing of their business in our country, which will reduce the costs of using the results of global scientific and technological progress and create an opportunity for domestic companies to integrate into the technological chain creating added value. The phased development of the electric car market should include three successive stages: 1) subsidizing pioneering use, when demand is provided by specialized support measures; 2) transition to mass use, when all elements of the market (demand, supply, and state support measures) are shifted towards the mass distribution of electric vehicles; 3) free market and reaping benefits from transport electrification. The most critical is the successful completion of the first stage, which requires the construction of a minimum sufficient charging infrastructure in large cities and key highways of the country as well as bringing annual sales to 40000 new electric vehicles.

Keywords: electric vehicle, automotive market, transport, technologies, scientific and technological progress, investment, Paris Agreement

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Assessing the feasibility of certain economic policy measures usually involves calculating the rate of return, gross value added, intersectoral effects, and other similar concepts in terms of the balance between income and expenses. At the same time, it is undeniable that there are many processes that improve the quality of life for people and businesses, even though their economic efficiency is in the zone of uncertainty [1]. This statement holds for the import of many goods, from household appliances and energy-efficient lamps to cars and engineering products. The incoming imported goods make it possible not only to use the results of global Research and development (R&D) [2–3] but in some cases, with proper industrial and foreign trade policies, it gradually leads to the launch of joint ventures (with the participation of domestic and foreign partners) where modern technologies are localized and new jobs are created [4–6]. Thus, as a result of the localization program for the production (assembly) of foreign cars in Russia, 80% of all foreign cars sold here are assembled in Russia.[1]

Clearly, it would be impractical and improper to use this approach systematically [7]. However, in those areas where Russian manufacturers are significantly behind in terms of the level of available technologies and are not able to effectively compete with foreign counterparts, controlled attraction of imported products to the domestic market can be considered as an adequate measure.

However, a necessary condition for attracting foreign manufacturers is the presence of a developed domestic market for their goods, including understandable prospects for demand and the absence of institutional barriers, which ensures ease of entry. Otherwise, the Russian market will not be of interest to foreign suppliers, and this will significantly complicate the access of the domestic population and business to their products, and hence to the results of the global scientific and technological progress.

It appears feasible for Russia to develop the emerging electric vehicle market even though the expanding use of EV is often stereotypically associated with a decrease in demand for hydrocarbon fuels, which are one of the main products of the national economy, and also despite the fact that this market will be largely based on imported models, especially at the initial stages. Creating barriers to the entry of EVs into everyday Russian life is not capable of preventing global

[1] https://www.autostat.ru/news/43746/.

Table 1. Fleet and sales of electric vehicles in the world, thousand units

Indicator	2010	2015	2018	2019	2020	Share of electric vehicles in 2020, %
Sales						
Europe	4	192	400	597	1299	10
China	1	207	1083	1063	1161	6
USA	1	114	364	329	296	2
Japan	2	26	50	40	29	1
Other countries		9	118	95	201	2
World	8	548	2014	2124	2987	4
Fleet						
Europe	7	380	1239	1738	3160	0.9
China	2	293	2289	3349	4509	1.8
USA	4	404	1123	1450	1778	0.9
Japan	2	127	257	297	326	0.5
Other countries	2	42	185	289	423	0.1
World	17	1245	5094	7123	10 196	0.9

Sources. IEA, OICA, ACEA, national statistical agencies.

automakers from stopping the production of traditional cars with an internal combustion engine (ICE). If this is the case, this will happen without the decisive participation of Russia but its result will definitely be the death of the electric vehicle industry still unborn as part of the national economy.

In August 2021, the Government of Russia approved the Concept for the development of the production and use of electric road transport in Russia until 2030.[2] We hope that the authors' view on providing staged development of the EV market in Russia presented below will be a useful addition to the existing discussion on this topic and to the development of the concept of automotive electric transport in the future.

Volume and specificity of the market for electric vehicles in the world and in Russia. In 2020, global sales of new EVs (all-electric and plug-in hybrids) grew by 41%, despite an overall 14% decline in car sales due to the COVID-19 pandemic. Around three million EVs have been sold worldwide, accounting for more than 4% of all passenger vehicle sales (Table 1).

The leaders in EV sales are Europe (1.3 million units) and China (1.2 million units) where EVs already account for 10% and 6% of the market, respectively. In some European countries, the share of EVs in total sales is already a tangible double-digit value (in Germany 14%, in the Netherlands 25%, in Sweden 32%), and in Norway (75%) it even exceeds the share of traditional cars with internal combustion engine (ICE). According to operational estimates, in the first half of 2021, global EV sales continued their growth, increasing by 170% compared to the same period last year.

Table 2 shows sales of the most popular electric car models in Europe. The highest demand is concentrated in the mass segment with prices in the range of €30000—€35000 where the Renault Zoe, Hyundai Kona EV, Volkswagen ID.3, and e-Golf were in the lead in 2020; these four models account for about 18% of all EV sales in Europe. Overall, sales are growing in the mass and midrange EV segments with prices below €45000. The premium segment accounts for less than 10% of total sales over the past decade, and in 2020, the most expensive models accounted for only 4% of the market.

The dynamic growth of the EV market is due to three main driving forces, which interact and multiply each other's influence: 1) government policies aimed at tightening emissions requirements while subsidizing the transition to EVs, including the development of charging infrastructure; 2) automakers that are already investing heavily in the development of electrified vehicles in order to avoid losing their share of a promising market; 3) consumers who are becoming more demanding in terms of environmental friendliness and tank-to-wheel efficiency, and many of them are ready to transfer to EVs.

In reality, the currently accumulated EV fleet is still small amounting to only about 1%. However, the confidence of the authors and many experts in its further growth is largely due to the actions of key automakers, declaring ambitious plans and goals for the electrification of their model ranges. Thus, out of the 20 leading global automakers, which accounted for about 90% of all sales in 2020, 18 announced plans to expand their

[2] http://static.government.ru/media/files/bW9wGZ2rDs3BkeZHf7ZsaxnlbJzQbJJt.pdf.

Table 2. Sales of popular EV models in Europe, thousand units*

Indicator	Minimum price, thousand euros	Sales, 2015	Sales, 2020	Total sales, 2010–2020
Renault Zoe	31.9	18.7	100.8	279.4
Nissan Leaf	30.0	15.5	30.9	185.8
Mitsubishi Outlander P-HEV	31.6	31.2	26.7	185.8
Tesla Model 3	40.0		85.7	180.7
BMW i3	42.6	12.0	23.1	138.1
Volkswagen e-Golf	31.9	11.1	33.7	117.3
Tesla Model S	87.0	15.5	5.6	86.3
Hyundai Kona EV	34.9		47.8	74.0
BMW 330e iPerformance	44.6		26.2	64.0
Volkswagen Passat GTE	44.8	4.9	26.4	63.4
Renault Kangoo Z.E.	38.8	4.2	9.9	57.6
Volkswagen ID.3	31.9		56.1	56.1
Audi e-tron	41.9	1.1	26.5	44.9
Kia eNiro	35.3		31.0	41.2
Tesla Model X	96.0		6.3	40.9
Jaguar I-Pace	77.3		13.9	32.9
Peugeot e208	30.5		31.3	31.3
Mercedes-Benz A250e	36.9		29.4	29.4
Share of models with a price, %:				
below 35000 euros		67.0	54.0	54.0
in the range of 35000–45000 euros		19.0	42.0	36.0
above 45000 euros		14.0	4.0	9.0

* Car prices are given for the German market for the cheapest configuration.

Sources. Transport & Environment (https://www.transportenvironment.org/), Electric Vehicle Database (https://ev-database.org/).

offer and quickly (in the period up to 2030) increase the production of passenger EVs.[3]

The described trends suggest that the automotive market is entering a new qualitative stage. EVs are moving into the category of a mass product, and the market is gradually restructuring in the direction of strengthening their role. These changes are underpinned by supply and regulation factors. It is quite possible that automakers will begin to phase out the production of traditional cars with internal combustion engines, and governments of countries, regions, and municipalities will restrict their use. As a result, such cars will simply be unavailable to residents of many countries.

As for Russia, its EV market is in its infancy. Sales in 2020 were only 687 vehicles, and the total number of registered EVs is about 11 000 units, with a total passenger car fleet of 46 million units. Approximately 60% of the entire electric fleet is concentrated in the Far East and Siberia, the remaining 40% in the European part of the country (Moscow and St. Petersburg). More than 80% of all Russian EVs are represented by one model, the Nissan Leaf, and these are mainly used cars imported from Japan.

According to E. Rogers' theory of diffusion of innovations, for the transition of a new technology to mass consumption, it is important to ensure demand at the level of 2.5% of the total market volume; the first consumers act as "innovators." With a positive experience of using the new technology by innovators, another 13% of consumers will be ready to test it, who can be conditionally called "early adopters" [9].

In our opinion, at the current stage, it is advisable to focus the state's stimulating efforts on achieving the abovementioned share of EVs in new car sales in Russia at the level of 2.5%, i.e., sales of about 40 000 new EVs per year. If such a volume can be achieved within the next four to five years, Russia will be among the 20–25 largest EV country markets in the world, which will open up the potential for the development of dealerships and service centers, and then local production

[3] J.-K. Rostovskii, Analysis of investment plans for the production of electric vehicles by the world's largest automakers. IBI Bulletin no. 31, 2020. A Reuters analysis of 29 global automakers found that they are investing at least $300 billion in electric vehicles. https://inlnk.ru/meLRp.

of both new domestic EVs (for example, KAMAZ) and localized foreign automakers.

Staged development of the market for electric vehicles in Russia. An analysis of world practice shows that the development of EV markets in various countries has a fairly typical logic involving the following three stages: 1) subsidizing paradigm: share of EV sales in new cars is up to 2–3%[4], EVs are expensive, consumer subsidies are required; 2) paradigm of transfer to mass segment: EV sales skyrocket to tens of percent[5], EVs successfully compete with traditional cars with regard to their price, consumer subsidies become an additional factor; 3) free market paradigm and benefiting from transport electrification. The third stage has not yet been implemented anywhere in the world and is of a future-oriented character. However, the experience of the first two stages gained by a number of countries can provide cumulative understanding of algorithms underlying ongoing processes and the most effective tools that the state can use to support them.

With this in mind, we also propose to introduce the phased development of the electric vehicle market in Russia in three stages.

Stage 1: Paradigm of Subsidizing EVs (2021–2025).

After 2025, cost parity between ICE and EV vehicles will be achieved (see, for example, [10]). By this point, a minimum base of EVs and charging infrastructure must be in place to avoid being an unattractive market in the new phase of the global EV market development. Otherwise, if domestic demand is not created, Russia will remain among the lagging countries where old ICE cars from Europe and Asia will be brought, which will further slow down the development of this direction.

Therefore, the main goal of the first stage is to create the prerequisites for the mass development of electric vehicles, namely: creating the minimum necessary charging network, as well as the emergence of the first "user experiences" of owning EVs in sufficient quantities for further popularization.

World experience shows that the introduction of EVs starts from the upper price segments since it is here that the barriers to the spread of electric vehicles are the least pronounced: the drive range per charge is higher than that of cheaper EVs in the mass segment, the price elasticity of demand in this segment is less significant; and, in addition, more affluent premium EV owners often have the ability to install individual chargers (for example, in a country house, a separate garage, or a business center). This will also happen in Russia.

The premium car market in Moscow and St. Petersburg (leading Russian regions in terms of the share of premium and near-premium segments of 15% and 13%, respectively[6]) is estimated at the level of 53000 cars per year. Even assuming that at least 20–25% of this amount will switch to EVs (i.e., 10000–15000, this is not only personal, but also corporate cars, the fleet of which is being updated), this will not be sufficient to reach the level of 2.5%.

It is necessary to use such additional solutions that would simultaneously minimize the weaknesses of electric transport and, at the same time, would provide a "heap" effect. It appears that close attention here should be paid to such areas of car use that are characterized by high mileage and the presence of base sites, i.e., taxis, delivery services, and possibly car sharing. Efforts to electrify these areas:

— Will be cost-effective, since the high initial cost of the EV will be spread over the total distance driven [11], and therefore the unit cost of the trip will be orders of magnitude lower compared to personal EV. Certainly, the fare for the taxi with the code name "Electro" will be slightly higher than the comparable fare for a car with an ICE, but such a taxi can attract many interested users who are hesitant to switch to personal EVs because of their objective inconvenience but are willing to pay more for one-time electrified trips. The same solution will extend the user experience to representatives of the mass segment:

— Will make it possible to organize mass gas stations at their base sites (in taxi companies, car-sharing rental/delivery areas, at staff parking lots).

— Will significantly enhance the positive environmental effect of transport electrification because the amount of harmful emissions depends on the mileage, which means that the electrification of each taxi car in its usefulness will be comparable to the transition of several households to personal EVs.

According to our estimates, the car market for taxis and car sharing in Moscow, St. Petersburg, and Sochi can be estimated at 40000 per year. If a special norm (or subsidy/stimulus) is introduced for such a business stipulating the transition of 20% of the entire fleet to electric models (with the introduction of specialized support measures), this will increase the total EV market to 20000 a year.

However, in order to achieve sales of 40000 EVs, a significant contribution to the success of the first stage of electrification (at least 20000 EVs per year) must be

[4] In most countries of the world focused on the development of EV, this period takes from two to eight years: World—eight years; China—seven years; USA—eight years, Europe—eight years (Germany—nine years, the Netherlands—three years, Norway—two years). The Netherlands and Norway are leaders in this area, they immediately boosted the development of the EV market.

[5] In European countries, the growth in the share of EV in new sales from 2–5% to more than 20% was: in Norway—five years, in Iceland—four years, in Sweden—five years, in Finland—four years, in Denmark—six years, in Germany—two years, and in the Netherlands—seven years. The long transition in a number of Nordic countries and Norway is associated with their early development, when EVs, in terms of their technical and economic characteristics, were very different from modern EVs.

[6] https://www.autostat.ru/infographics/47882/.

made by personal cars of the nonpremium segment. Since the price elasticity of demand is greater here, EVs should be brought closer to the affordability and convenience of ICE vehicles. For this purpose, it is proposed to subsidize the purchase of such EVs in the range of 500000–1000000 rubles, which brings the cost of acquiring an EV closer to a car with an ICE, and owning an EV becomes more profitable.

The critical factor is the development of charging infrastructure. According to the data from PlugShare service,[7] in Russia at the moment there are about 250 "fast" and about one thousand "slow" charging stations. Chargers are located mainly in Moscow, Siberia (Novosibirsk, Krasnoyarsk, and Irkutsk) and the Far East. The situation with intercity charging stations is deplorable: while you can move between cities along the main routes of the European part of Russia, albeit with difficulty, there is nothing of the kind in other parts of the country. The development of the EV market in Russia requires dramatic change in the situation with the charging infrastructure.

The list of measures aimed at supporting the EV market that can be used by the state at the initial stage is self-evident.

In order to create a minimum viable frame charging infrastructure, the following is proposed: to focus efforts on the largest cities of the country (uniform nodal coverage with gradual compaction) and main highways [12], including those connecting with neighboring states, and to introduce mainly fast charging; provide incentives for connecting to the electricity grid and subsidizing the electricity tariff for owners of charging stations; launch specialized preferential loans; establish standards for the organization of a certain number of charging stations in the surrounding areas and parking lots of new construction projects.

In order to *stimulate consumers*, the following is offered: subsidizing the purchase of EVs through discounts and/or specialized soft loans; zero transport tax on EV in all regions of the Russian Federation; creation of favorable conditions for EV ownership (free parking, the possibility of driving along dedicated lanes for public transport); promotion and informing the population; special EV distribution programs in certain regions and cities; introduction of norms for the share of electrified cars in the field of taxis, car sharing, and delivery services.

In order to *stimulate businesses* (automakers, dealerships, service centers, charging business, other commercial organizations involved in electric mobility), it is necessary to overcome the initial barrier of guaranteeing certain EV sales volumes (including for each individual model). Measures intended to stimulate consumers and create a frame charging infrastructure will largely contribute to the removal of such a barrier. Additionally, the following is proposed: zeroing (extending zero[8]) customs duties on EV imports; partial reimbursement of EV certification costs; specialized preferential loans for the organization of dealership and service centers, private charging infrastructure; developing a set of measures intended to support the production of EVs, their components, and related equipment in Russia.

The total volume of state support at the first stage is estimated at 85–135 billion rubles over four to five years, including: 20 billion rubles on the charging infrastructure [13, 14]; ten billion rubles for business subsidies; 50–100 billion rubles on subsidies to consumers (when subsidizing purchases of 25000 EVs over four years in the amount of 500000 rubles to one million rubles per electric vehicle); five billion rubles is to be allocated for promotion and publicity.

The first EVs will no doubt be imported models. However, at the same time, it is possible (and necessary) to localize the production of charging stations, which are technically and technologically relatively simple equipment.

Stage 2: Transition to the Mass Segment (2026–2030)

As a result of the first stage, the first experience of use will be obtained, the range of EVs available on the market will expand due to cheaper models with acceptable characteristics [15], and the minimum required charging infrastructure will appear, which will greatly facilitate the transition of EVs to the mass segment.

At the second stage, the incentive measures should retain their adopted character, however, economic support for consumers should be limited to the mass EV segment (for example, models with a price of up to three million rubles).

It will be necessary to provide mass installation of public chargers in blocks with multi-apartment buildings (these can be slow chargers). Taking into account the complex engineering infrastructure required, this process should be organized by large energy supply companies and administrations of municipal communities.

In order to ensure the conditions for expanding demand for EVs, it is possible to transfer part of government purchases of cars to electric models (where this meets the development goals of the region: for example, as resorts in Sochi, Crimea, and as centers of emissions in large cities). In addition, administrative instruments can be used to restrict the access of cars with an ICE to the central part of large cities, where there is almost no residential development.

Business support also should be fine-tuned to meet the goal of developing the mass segment of the EV market. This can be done by revisiting definitions of

[7] https://www.plugshare.com/.

[8] This issue is being discussed at the time of the article submission to the editor.

Table 3. SWOT analysis of the EV market development in Russia

Strengths	Weaknesses
the interest of global automakers in the presence on the Russian market; reduction in the cost of adopting global R&D results in the field of EV through imports; contribution to the achievement of the goals of the Paris Agreement and the national climate policy through the reduction in greenhouse gas emissions in the transport sector; reducing emissions of harmful substances in cities and improving the quality of the environment; low operating costs of EV	at the first and second stages: EV is more expensive than a similar car with ICE, has a shorter drive range compared to a car with ICE, sparse charging infrastructure and longer charging times compared to refueling a car with ICE; decrease in demand for motor fuels (lost revenues from the budget of Russia and domestic oil and gas companies)
Opportunities	**Threats**
integration into the value chain and localization of a number of production and commercial processes with the creation of new jobs and the involvement of enterprises that already produce components for cars with ICE; investment in charging infrastructure; business diversification incentives for oil and gas companies; mitigating the problem of low utilization of generating capacities in Russia by meeting additional demand for electricity; creation of a domestic industry for the production of charging stations; subsequent entry into foreign markets (primarily in terms of electric chargers)	temporary growth in imports of cars, components, equipment in conditions of high concentration of this market; negative income dynamics in Russia as a demand constraint

Source. Authors' research.

the technical characteristics for the supported products.

The total volume of state support within the framework of the second stage is estimated at 190–240 billion rubles for five years. This includes 40 billion rubles for the charging infrastructure and 150–200 billion rubles for subsidizing purchases. A reduction in the level of subsidies to an average of 300000–400000 rubles can be expected if it is necessary to subsidize up to half of the EVs sold, i.e., 80000–120000 EVs per year. At the same time, subsidies will have a more significant effect: the share of EV in sales of new cars in Russia should grow to 10–15%.

At this stage, depending on the availability of domestic EV models or foreign EV models assembled in the country, the criterion for granting a subsidy may be the level of localization.

Stage 3: Transition to a Free Car Market and Reaping Benefits from the Electrification of Transport (after 2030)

The third stage is associated with the abolition of most subsidies and the transition to a free competitive market paradigm. The role of the state at this stage is primarily regulatory. The next direction is the localization of added value in the EV industry in Russia, including the opening of production facilities for fully domestic electric vehicles. Our country has successful experience in the effective organization of such processes for cars with ICEs [6], so it is possible to reuse the developed instruments. The third direction is the gradual introduction of taxes and fees for EVs as their market share expands.

By the start of this stage, the results of development in the previous decade will be clear. Cost and market estimates will be adjusted. Therefore, it makes no sense to estimate the necessary costs but it is possible to indicate their direction. Subsidizing the purchase of EVs of completely foreign production (without localization) should be canceled. The largest expenditures should be focused on the development of a network of charger stations (if this requires government funding) and support for domestic EV manufacturers and infrastructure for them.

Swot analysis for the market of electric vehicles development in Russia. The development of the EV market is a very controversial process that will have tangible consequences for the socio-economic and technological processes in the country, budget planning, and urban space design. Table 3 presents a SWOT analysis showing various aspects of the potential electrification of the Russian car park.

In addition to the *strengths* mentioned above, two important aspects should be noted. First, the electrification of transport is a way to reduce greenhouse gas emissions in the transport segment, which contributes to ensuring that emissions are reduced to 70% by 2030 from 1990 levels to achieve the goals of the Paris Agreement. Doubtless, the "climatic" efficiency of

the EV is determined by the structure of electricity generation, however, low-carbon sources (hydro- and nuclear energy, natural gas) have a significant share in the Russian electric power industry, as a result of which the carbon footprint of owning an EV is lower compared to a traditional car [16]. Second, the absence of harmful emissions during EV operation (except for small dispersion particles) will improve the ecology of cities and the quality of the environment, which is a positive factor for public health [17].

Weaknesses include the well-known issues of high EV prices and rudimentary charging infrastructure (with the resulting inconvenience) but the staged development plan for the Russian EV market presented above is going to mitigate these significantly.

Another problem consists in the inevitable weakening of demand for motor fuels, which are produced and supplied to the market by domestic oil and gas companies, and a significant share of their price goes to the Russian budget in the form of specialized taxes (excise tax and mineral extraction tax) [18]. Obviously, the spread of EV means lost revenues for the oil and gas business and the country's budget system. At the same time, the transfer of the tax burden to the price of electricity is counterproductive for the development of the EV market, at least in the first two stages of its formation.

There are several threats that should also be mentioned. The dynamics of demand for EVs in Russia may be significantly slowed down in the current unfavorable situation of declining incomes of the population (during 2013–2020, real incomes of the Russian population fell by 10%, and annual sales of new cars, by 42%). Another problem is the inevitable increase in imports of both EVs themselves and components in the first two stages, which worsens the foreign trade balance. At the same time, the market for critical materials for the dissemination of new low-carbon technologies (including EV) is largely concentrated [19], which may create geopolitical and price risks in the future.

At the same time, the development of the EV market creates potential opportunities for the Russian economy.

First of all, this concerns real investment both in the creation of a charging infrastructure, and in implementing integration of domestic business into the global technological value chain. A significant potential for the national economy lies in the organization of localized industries with the creation of new jobs. An important advantage is the presence of similar businesses focused on the assembly of traditional ICE cars, which have been developed over the past decade in Russia as part of efforts to localize the automotive industry. Taking into account that the vast majority of parts and components for EV and ICE vehicles are similar, the scale of possible involvement of existing domestic enterprises is significant.

An additional advantage is the ability to seamlessly meet the increase in demand for electricity by using idle reserves of generating capacities.[9] The assumption that EV distribution will equalize electrical load patterns throughout the day [20] may not be realistic, as the outcome will be determined by how and when the public is going to charge their EVs. But if such an effect is, nevertheless, observed, this would allow optimizing the management of energy systems.

And of course, the development of the EV market will create incentives for the diversification of large companies in the Russian fuel and energy complex, namely, for moving away from oil and gas companies to "energy corporations"; this is in line with the strategies of key industry players and the expectations of market investors.

* * *

The effective development of the electric transport market in Russia should be based on the following principles:

1. It is important to develop electric transport in Russia based on the logic of staged market development. The implementation of government programs when the entire market is developed weakly (as well as the market segment with private demand) is highly likely to be ineffective.

2. The development of the EV market must be implemented in three stages. At the first stage, it is necessary to focus on creating a market, achieving an annual sales volume of at least 2.5% of all new cars, i.e., 40000 EVs a year. At the second stage, EV sales should be increased to 160000–240000 units, which will be 10–15% of all new car sales. The volume of public spending for implementing these two stages is estimated at the level of 250–350 billion rubles in the period up to 2030, with 75–80% of this amount allocated for subsidizing the purchase of new EVs (at the first stage, these will be mainly imported models but at the second, emphasis should be made on domestic or partially localized EVs). At the third stage, it will be possible to stop subsidizing the purchase of EVs (due to achieving cost parity with an ICE car), and focus on supporting domestic manufacturers of EVs and equipment for them, as well as on developing a network of charging stations.

3. In addition to personal vehicles, there are a number of segments whose electrification is simpler from an organizational viewpoint but at the same time it can accelerate the overall development of the EV market in Russia. Those include taxi cars, car sharing, delivery services, and public transport.

4. An important direction of the EVs market development is the organizational and regulatory proposals

[9] G. P. Kutovoi, How should we deal with energy tariffs?! https://inlnk.ru/EL8Np.

listed in the article. Without their adoption, the effects of spending on infrastructure development and sales promotion will be significantly lower.

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Translated by I. Pertsovskaya