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**THE ENTREPRENEURS' LAB:PRESENTATION 'YO-PHILOSOPHY'
Building Russia's Creative Capital**

**JUNE 18, 2011 — 09:00–10:00, Pavilion 8, Conference Hall 8.2 Innovation
Hall**

St. Petersburg, Russia

2011

Panelist:

Andrei Biryukov, General Manager, YO-AUTO Ltd

A. Karachinsky:

Good morning. It seems that after yesterday's party at the house of one of the Yo-mobile stockholders, not everyone could make it here. It was an intense party.

People didn't have the Yo-strength.

This is an Entrepreneurs' Laboratory. Our guest today is Andrei Biryukov, the founder and thinker behind Yo-mobile, the person who came up with it and promoted it.

Two words about what we are doing here. We are trying to change the format of SPIEF a bit. We are trying to showcase people who are truly building the country's future. There are many Western companies, many great non-Russian entrepreneurs here. We are attempting to change that format, to showcase the people who are building the future, who are inventing it. Our task is to talk to Andrei and see how he is planning to build that future.

I have spoken with Andrei. He is a very interesting person. He has a very interesting history: 20 years in business. Yesterday, in this same place, we had Mikhail Pogosyan, who is creating a unique business with the government, which is difficult in its own way. Andrei is making a business all by himself. His education is close to my heart: I am a programmer, and his specialty is microelectronics. You can easily guess what his hobby is: it is cars, and motorcycles, and everything else that travels, moves, and operates. When he took apart an engine for the first time, he was seven years old.

A. Biryukov:

And then I put it back together.

A. Karachinsky:

It's interesting to listen to a bit of the history of how Andrei has tried to do business, it would be interesting to ask, but we do not have very much time.

Initially, in his business, he tried to use old things that already existed. He tried to rebuild a factory that produced excavators, but that did not pan out. And then he tried to think up something completely new and different. He will be talking about that today. It is interesting that they went through a few successful projects. They created a factory that produced trucks. They made a sports truck, and they won the European Championships in that truck in 2000–2001. They invested USD 50 million in the factory; the factory is still functioning and making trucks. When I stand near them and listen to their conversations, I feel a huge technological potential, a flurry of inventions. As I understand it, the Yo-mobile was an idea about how to combine all those inventions into a certain product. Andrei, you said during discussion yesterday that integration is the main thing. Could you start your talk by telling us about how you see the company of the future? What is it like? Do we have to do everything ourselves?

A. Biryukov:

The key in a new production business is engineering. We have to do as much engineering as possible, by our own efforts, to create a new product. Its later commercialization is an issue for which we have to then borrow from various manufacturers, use the best existing technologies, and not be afraid to outsource design documentation development for part production. Why? In order to speed up the process of new product launch by at least two times, or sometimes more. In order to remove or reduce financial risks, so that the project is more successful. You have to make use of the technological experience of your partners, who already have it. That is, you cannot do it all on your own. You have to take the key position that will put that very product on the market, a product that can be competitive.

A. Karachinsky:

So you believe that you have to integrate, but produce everything independently.
Do I understand you correctly?

A. Biryukov:

No, no, not at all. You cannot produce everything independently.

A. Karachinsky:

Excellent. Let's start with the Yo-mobile, because that is of interest to everyone. Can you talk about how it was thought up? How is it that you risked throwing down a challenge to the world automotive industry? Because I believe that you have done so.

A. Biryukov:

The process of creating the Yo-mobile was not started yesterday or a year ago. Naturally, an understanding of where the world is going formed over the course of the past ten years. When we dived into our own manufacturing, it became very important to recognize that we did not have a chance if we were going to create a classic product. We cannot make a car better than Mercedes; we cannot make a better classic engine; we cannot create better classic technology, better metal works, or anything like that. And the realization of what we could not do led us to think about what is going to happen tomorrow.

That is a key position, which, I believe, needs to be held. You do not need to look at what someone else has already done and try to recreate it. You will not have a chance; there will be no added value. In the end, at most we end up purchasing yesterday's technologies.

It was the difficulty in promoting a classic product that made us think about what will happen tomorrow. And an in-depth analysis of today's situation in the world led us to the idea that the world is going to change very quickly. And since it is going to change, we need to try to be at the forefront of that process—or at least

not lagging behind it—to be at least in the first ten. Then we started looking more deeply into what the key trend in business will be, in production, and what needs to be changed so that in the end the economy becomes more efficient than it is today.

It is a curious thing: over the last 100 years, we have been constantly producing inefficiencies, beginning with the automobile, fuel production, and the fuel infrastructure, and ending with even greater inefficiency in the energy infrastructure. And the realization that that inefficiency has sold well over many decades, on the whole, answers the question of what needs to be done.

A. Karachinsky:

And you did it with the Yo-mobile? How is the Yo-mobile different from everything else?

A. Biryukov:

In effect, the Yo-mobile differs from the 'classics' in each of five key sections. In this situation, we are laying down a challenge not to Mercedes or AvtoVAZ—not to any of the manufacturers. We are challenging the classic automobile. When we talk about the key component of our product, we mean the electric drive with on-board power generation. This is not a hybrid in the sense we are used to talking about.

I would like to emphasize that the on-board power generation system produces electricity without a mechanical connection to the wheels. You could say that an electric drive linked to the wheels is something that it has in common with electric cars. But unlike those cars, there is no huge lithium-ion battery or massive infrastructure for generating electricity. A charging outlet would seem to be a very simple infrastructure. But it also is a very expensive one, and by and large it rules out the possibility of classic electric cars competing with classic cars. With our product, electricity is produced by an on-board power plant, and this design

allows for the same advantages that an electric car has: that is, energy recuperation when braking. But in our variation, we use not an expensive, heavy lithium-ion battery, but a supercondenser that charges very quickly.

A. Karachinsky:

Are there similar things elsewhere?

A. Biryukov:

It is interesting that Russia is currently the leader in the production of supercondensers and those technologies. It turned out that during the Soviet era, thanks to space-related research, we got a huge backlog of inventions in this area. It was just a question of when it would be more widely applied around the economy. The automobile is the key consumer for that.

A. Karachinsky:

So there is nothing similar in the world? No one has done anything like it?

A. Biryukov:

With that design, nobody.

A. Karachinsky:

Plus, we have fantastic potential in regards to batteries, right?

A. Biryukov:

I think they will simply be unnecessary; that's another issue...

A. Karachinsky:

So we already have a competitive advantage. What are we doing? We came up with something new and are preparing to use a competitive advantage left over from the country's past!

A. Biryukov:

Yes, and the appearance of a new battery, and of a new on-board energy source, will drastically affect the large-scale energy market, by and large. The current inefficiency of energy on the larger scale is obvious, and the situation that occurred in Japan clearly confirms that.

A. Karachinsky:

I have already spoken with you several times, and I have constantly had the feeling that in addition to cars, your head is full of some unique solutions in the energy field that you want to try out on automobiles. Do you? Is that true?

A. Biryukov:

There have always been two parallel engineering businesses: energy engineering and automotive engineering. So when you understand both fields, it would be stupid not to look at those business areas and think about how to combine them and find a common solution. I am absolutely convinced that it is the electric-drive car that will lead to the creation of a new source of energy, which will then be transformed in society into a type of local energy that eliminates the infrastructural inefficiency we see today. The saddest thing is that the investments in maintaining this infrastructure are so huge that facilitating its stable operation will be very difficult; there may simply not be enough money.

A. Karachinsky:

What are you talking about? What infrastructure? Are you talking about petrol stations?

A. Biryukov:

Power lines, transformer stations, wiring—about all that.

A. Karachinsky:

So you mean the energy infrastructure. I see.

A. Biryukov:

That is why the Yo-mobile and this philosophy are forming the key impetus for a new source of energy.

A. Karachinsky:

Your own local source of energy.

A. Biryukov:

Our Yo-mobile concept car already has an on-board power plant today, which has an outlet, but it is the other way around: you can connect your house to the electricity you have produced. You will be autonomous. You can use that energy source for emergency services; you can use it for various other purposes. Again, I would like to emphasize that the key thing is that on board, there is both a producer and a consumer of electricity.

I would like to give just a couple of figures. A million cars consume a minimum of 50 gigawatts of installed capacity. I think a lot of people understand just what that is. In Russia in 2010, one gigawatt went online. In the Soviet Union, up to 14 gigawatts per year went online. That is another answer to the question of whether there is a future for electric cars.

A. Karachinsky:

May I interrupt you for a second? I know you have a video clip. Do we show it now, or do we talk a little more? You're the most important thing. We want to know more about you.

A. Biryukov:

Let's talk, I think, and then we will show the clip at the end.

In order to create a Yo-mobile, you needed to make Yo-brains, and to change your attitude accordingly, to an extent, about what you are doing, without being afraid to step on the toes of today's technological and technical standard-bearers.

A. Karachinsky:

Andrei, are you afraid that you will build all this up, and we will end up with a Yo-country?

A. Biryukov:

Excellent.

A. Karachinsky:

It is good to be in a country with a lot of electricity.

A. Biryukov:

At least. Makes everything Yo-kay.

A. Karachinsky:

Right. There were a few more things I wanted to yo over. We have all seen a Yo-mobile and even sat in one, though we have not ridden in it. How do you imagine this business project? What will happen? And how ready are you to begin production?

A. Biryukov:

I would like to return to the third issue: what is new? We have ventured to change the body technology completely. Today's body technology is very cumbersome, energy-intensive, and, what is currently extremely important, it is expensive to invest in. In our concept for the body, we use almost 100% composite materials, and the composite used is created from an inexpensive raw material: polypropylene. Polypropylene is practically the first processing stage of natural gas in its raw form. So we can say that our car is made out of natural gas, and consumes it too. And from the beginning, we have given the car a dual-fuel natural gas/petrol system—avoiding the catch-22 of a lack of infrastructure and a lack of consumers to stimulate it.

What are the advantages of composite materials? We get the chance to reduce the number of parts for the manufacturing of the body by at least five to seven times. The composite is easier to mould, so we can provide the strength characteristics at a significantly lower weight. Again, we are addressing the problem of 100% utilization down the line. Today, in classic cars, of course, these elements are used. Mercedes, Audi, and BMW all use separate elements. One company makes a seat support frame from this material; another makes a rear bumper out of it; and another makes the rear roof or wings out of it. But why? Because there is something to lose in this situation. They have made a colossal investment in this technology.

We need to choose new technology, and after analysing what is happening on the market, we simply came to the clear understanding that our future tomorrow is composites, not metal. Today we have concluded all the computer modelling, computer crash-tests, and outsourced the work to Magna. We decided not to take a risk and outsource a part of the engineering to a famous brand, simply to avoid falling flat on our face and to make a high-quality end product on time. And we have received absolute confirmation of the fact that this technology works, that this body is in compliance with all safety requirements, and that it is

economically viable. We have already reached the phase of creating the end product—that is, class A design documentation—so that we can then order the fittings.

A. Karachinsky:

How has the composite proven itself from a safety point of view?

A. Biryukov:

We have facilitated safety on the level of the very highest requirements, while decreasing the car's weight by 37%.

A. Karachinsky:

Great. What else is new?

A. Biryukov:

I talked briefly about the dual-fuel system, but I would like to devote special attention to the promise of natural methane gas. We have long been accustomed to today's fuel situation, which we see at filling stations, and we do not even ask ourselves the question: why are there so many different kinds of fuel? Why are there so many vehicles with different engines? The answer is obvious. Classic fuel production is inefficient. From the get-go, it is made so that we get many types of fuel, including fuel oil residue, including tar, including other wastes.

When we extract natural gas from a well, we get a 100% ready-to-use fuel. The questions remain of how to transport and store it, using liquefaction or compression technology, but the market will answer those questions quickly. We get a 100% ready-to-use fuel. It follows that we do not need a complex, varied infrastructure. We don't need different types of motors. Most importantly, hardly doing anything, we get atmospheric emissions no worse than Euro 4 or Euro 5 even in existing classic motors.

A. Karachinsky:

Can they be decreased further?

A. Biryukov:

Yes. I can say that with a small amount of effort, this problem can be solved for 20–40 years ahead, up until, say Euro 20. For Russia, that is a key trend. Up to 1990, Russia was the leader in the number of natural gas–engined vehicles. Today we are in eleventh place, after Armenia. Pakistan leads with 5.3 million automobiles. And do you know why? Because of desperation. They did not have oil refineries, so they took the simplest path: they gasified their transportation. Given, not in the most effective way possible, but they addressed the problem. Then there were Argentina and Israel. Among the advanced countries, I would look at South Korea today, which has practically made natural gas in city transportation into dogma.

A. Karachinsky:

That could be good for Gazprom too, because we know that natural gas use is falling. Maybe they will have a new source. Are they ready, generally, to work on this infrastructure?

A. Biryukov:

You know, it is a good thing now that Gazprom Gazenergoset has been created. We have also signed an agreement with them, and that company's purpose is to create infrastructure. Our agreement allows them to fulfil their plans, understanding that we are beginning to create automobiles that use natural gas fuel.

A. Karachinsky:

All right, let's talk a little about the company's future. How do you see it unfolding? What will production be like? What are your plans for the number of cars you want to sell in ten years? Now that is interesting. This is business, after all.

The key question for the development of the Yo-business, of course, is not automobile production. The key area will be engineering in very broad segments. When we decided to create the Yo-mobile, it was conditioned on just one thing: we needed a centrepiece, a hallmark that would draw attention and show that we are making a stab at very serious things. Because car manufacturing is taken as something that's incredible, right? But all the key inventions are inside the car, inside that centrepiece. It is the innovations and inventions, or gathering inventions that have taken centuries to take shape, that will be the key trend in our company's development. We are already talking about big energy today, because it will have a big demand for the energy source that we can obtain.

A. Karachinsky:

Are you talking about the company called Yo-Auto or the one called Yarovit?

A. Biryukov:

Not really. Now we are talking about Yo-Holding, which has Yo-Engineering, Yo-Auto—where the cars will be made—and Yo-Market, which owns this brand and will use the brand in various products. We are currently conducting negotiations with many manufacturers of such items as telephones. So you will have Yo-Phone, Yo-Book, and anything else we might think up. The idea is to add 'Yo' to products that represent innovation, that will be around tomorrow.

It is very important to launch production, and we will definitely launch it. The deadlines that have been declared are very tight, and with a lot of our Western partners, we have really had to hold their nose to the grindstone. Because their classic schedule for the creation of a car is four years. Literally yesterday, I came

back from Austria, from negotiations with Magna, where we finally confirmed our deadlines for putting the car on the market. The ribbon-cutting ceremony is at the end of 2012, and mass production will start during Q1 2013. In 2013, we plan to produce the first 20,000-25,000 cars.

A. Karachinsky:

Great. Can I go back a bit? I've been wanting to ask a question this whole time, but I didn't want to interrupt you. You say that engineering is a key thing for the company in the future. What about the people? What about the engineers?

A. Biryukov:

In addition to gas, Russia also has a huge number of talented people. I would say there are more of them than there is of gas.

A. Karachinsky:

And natural gas will run out, but people make themselves. This is very important.

A. Biryukov:

And in just about any circumstances, yes. In the difficult times in the 1930s, our excellent engineers created what we still use today. And there was a huge number of those people during the thaw in Brezhnev's day. That potential must be used. It is important to believe that these people exist, and the main task of business is to help them commercialize their inventions, of which there is a huge number. That is Yo-Auto's key role. We are not inventors; we are collectors. Our goal was not to create our own engineering service, add a great number of developers to it, and create something. We have begun to bring in, from all over the country, those people and inventions that will be integrated today in the automobile, and those which will establish a fundamentally new direction or new products for our future Yo-mobile and for other segments. And—I am probably

disclosing a commercial secret here—that is our key value. I recommend that absolutely all businessmen think about the fact that building housing and real estate is simple, but supporting inventors is both responsible and, most importantly, very promising.

A. Karachinsky:

Andrei, we do not have much time left; that is why I am trying to figure out about the future of engineering. Do you think something needs to be done so that we have enough engineers, so that you can be successful? Or is everything all right?

A. Biryukov:

Of course, there is the threat of a certain 10- or 15-year breakdown, but in that period of time, talented young people have appeared, and I can confirm that based on my own team. It includes young people aged 23–27 who do a pretty good job of bringing in new technologies. They are prepared to absorb it, and they are ready to learn.

A. Karachinsky:

What would you do, if you had the opportunity to do something now? Or is everything all right as far as the people go?

A. Biryukov:

You know, I would redirect the money from RUSNANO and Skolkovo to 'garage'- or 'kitchen'-based invention. If we gave grants of USD 200,000–300,000 or 1,000,000, believe me, that money would have a huge effect. That would be one hundred percent possible.

A. Karachinsky:

I am supposed to stay neutral, but in my heart, I am simply applauding you. I agree. Let's go back to the topic of production. What will happen in the company in terms of production? Where are you going to manufacture, where are you going to sell?

A. Biryukov:

The first production plant will be in St. Petersburg. On June 8, we put a 'Yo-cornerstone' in at Marino.

A. Karachinsky:

What colour was the 'Yo-cornerstone'?

A. Biryukov:

You know, I am colour-blind.

A. Karachinsky:

That is a politically correct response.

A. Biryukov:

The first plant will be in St. Petersburg, but our production philosophy is also different than what is accepted today in the classic auto industry. We want there to be car assembly plants in every region, with the aim of allowing us to assemble Yo-mobiles at certified service centres. Why? Because the level of personnel training in a service centre is an order of magnitude higher than that of any assembly-line employee at BMW, Mercedes, Audi, or anywhere else. The design concept we created is allowing us to easily implement this.

Of course, we will have to work quite a bit on standards and regulations which, generally speaking, delay a lot of things. For example, the gasification of our transportation. In imagining the key gasification trend, the heaviest burden on us

is from the point of view of regulations that do not let you do anything. If we are saying that we need to undertake something, then a change in the regulations is needed as soon as possible.

After building the first factory, we are already conducting negotiations with our regional partners, who, in the end, will be the main owners of the regional plants. We are not looking for 100% ownership of these companies. The maximum we are counting on is 25%, in order to facilitate quality control, to transfer technology and design documentation there, and to coordinate the sales and distribution system. We were very pleased that when we announced the beginning of preliminary orders, we received nearly 52,000—more exactly, 51,288—in the first twenty-four hours. Even though I am a complete optimist, I was only counting on 7,000 or 8,000.

A. Karachinsky:

How many do you plan to produce from, say, 2013 to 2015?

A. Biryukov:

In 2014, we will have 45,000; in 2015, we will produce 90,000 automobiles.

A. Karachinsky:

If a huge demand arises, what will you do?

A. Biryukov:

We will push on through, although it is very difficult to get around the creation of production processes. In any case, it needs time. Before we release our first products, we are going to hold ourselves back a bit, because it is very important to us to assure ourselves that all of the production processes work correctly. After that, it is a scalable story that will be installed in the regions very quickly. And in principle, I will not hide the fact that our ambition for 2017–2019 is to have

500,000 Yo-brand cars. This does not mean that Yo-Auto will make that quantity. It will simply mean that they will be made through our manufacturing franchise in various regions, including, I believe, outside of Russia.

A. Karachinsky:

When do you plan to show us your first revolutionary projects in the energy field? If you have any secrets, you just say, “No, I am not going to answer that.” That’s the fashion now.

A. Biryukov:

In November, we are planning to conclude tests on one very interesting power plant. If it all works out, we will talk about it then. We are already being accused of giving out too much optimistic technical information. But actually, believe me, we only give out 15–20% of what we are creating.

A. Karachinsky:

All right, we do not have much time left at all. Should we show the clip on Yo-philosophy? Or should we talk some more?

A. Biryukov:

I suggest that we do the following. We can talk for three to five more minutes, because I need to run after that. Then you can show the clip.

From the audience:

May I ask a question?

A. Karachinsky:

Yes, yes, I have one last question, and then we will turn it over to the audience. This is my question. Mikhail Prokhorov is a very significant figure in Russian business, from any standpoint. What is his role in your project?

A. Biryukov:

I think that without him, we would not be able to implement the project so ambitiously and within such a short period of time. And in this case, the product, the brand, and Prokhorov, plus the team that is creating all this, are inextricably linked. Each of these parts, in the end, promotes and assists the development of the business. I am grateful to him for the fact that the discussion of whether or not he would participate took just two weeks. After I came to him with a short presentation on what can be done, we had an agreement within two weeks. I think big business should follow that example, because we have a huge number of small and medium-size businesses that have long been in possession of innovations, but they do not have enough political, administrative, or financial resources to advance a project as successfully as we have.

A. Karachinsky:

Andrei, you and I know that he has good instincts, or else he probably would not be #1 or #2, as I remember.

Questions?

From the audience:

Andrei, in the first place, thank you so much for your presence, your philosophy, and your company. We have been waiting for this for a long time, and it is really neat. I have one question. As far as strategic marketing is concerned, brand promotion, how will you translate 'Yo' into English?

A. Biryukov:

Why should we translate it? Let them get used to it.

From the audience:

You want to venture out into the world with a Russian letter? That is super. We have been waiting for a long time for that as well. Thank you!

From the audience:

Andrei, I am Georgiy Efremov, Deputy Chief of the Government of Stavropol Region. I do not have a question; I have a proposal. Let's launch the first 5,000 Yo-mobiles as taxis in Kavmingroup. That is a group of cities that may be the cleanest, ecologically, in Russia (Kislovodsk, Pyatigorsk, Essentuki, Zheleznovodsk, and Mineralnye Vody), and where a million tourists vacation every year. We propose a partnership. The Yo-Group, the Yo-philosophy, has really won us over in Stavropol Region. We have the most ecologically clean region. We have the largest gas reservoir in Europe. Polypropylene production is our cup of tea. We have a regional programme for the implementation of natural gas motor fuel. And, most importantly, we have a strong wish for the most environmentally friendly Russian vehicles currently available to be driving our streets.

A. Biryukov:

You probably did not have an opportunity to propose this twelve hours ago, but we came to an agreement about this with Khloponin yesterday.

G. Efremov:

Great.

A. Biryukov:

He practically came to us and said, “Andrei, you can make us Yo-taxis.” I said, “Yes, that is a very important topic, and we will think about it.” I think that that is precisely an area in which we will be working actively.

A. Karachinsky:

Any more questions?

From the audience:

Mr Biryukov, I wanted to ask: yesterday, Mr Pogosyan sat where you are sitting and talked about the need to create a cooperative network for the creation of a competitive product. You repeated that today. Could you give a bit more detail on those partners and suppliers—maybe the first-tier ones—that are helping you to bring about this technology? You mentioned Magna. Could you elaborate on Magna’s role and about other people who are implementing this with you?

A. Biryukov:

With the engineering, we are also working with EDAG; they are going to make us an assembly conveyer, as their flexible conveyer technology suits us best. As far as the suppliers go...

A. Karachinsky:

You should tell us right now what kind of company that is and where it’s from.

A. Biryukov:

EDAG is the leader in European automobile engineering. I would say that it is, perhaps, the best in the world as far as technology goes.

As regards the components, in the first stage, we will need to build the bodywork technology ourselves, since it does not exist yet. We will do 100% of the production of the chassis-integrated body and the internal and external panels.

As to the supply of various parts, fortunately, today in Russia, manufacturers of good discs, good wheels, good separate components, have appeared. That same Magna is currently actively developing production in St. Petersburg, in Kaluga, in Tatarstan. And the key thing the government should do is to stimulate the influx of car parts producers rather than automobile manufacturers. If you have good car parts, believe me, AvtoVAZ can make good cars. The level of engineering at AvtoVAZ is no worse than that at Mercedes. You just need to know how to use it. And I think that Renault, in coming into the project, is looking first and foremost at the engineers from AvtoVAZ.

A. Karachinsky:

Any more questions? Let's let Andrei go; he has another presentation. Thank you very much. And we will show the clip on the Yo-philosophy.

A. Biryukov:

Please come to Pavilion 3 at 10:00 a.m.; we will talk in more detail there, with our opponents, among others. Thank you.