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Securing the Future
INDUSTRIALIZATION: THE TREND FOR DEVELOPING MARKETS?
Panel Discussion

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Moderator:

Alexei Pivovarov, Anchor, NTV Broadcasting Company_

Panelists:

Anatoly Artamonov, Governor of the Kaluga Region

Klaus Kleinfeld, Chairman, Chief Executive Officer, Alcoa Inc.

Orit Gadiesh, Chairman of the Board, Bain & Company

Richard Koo, Chief Economist, Nomura Research Institute Ltd.

Patrick Kron, Chairman, Chief Executive Officer, Alstom

Denis Manturov, Minister of Industry and Trade of the Russian Federation

Front row participants:

Vladimir Gruzdev, Governor of the Tula Region

Dmitry Konov, Chairman of the Management Board, Chief Executive Officer,
SIBUR LLC

Vitaly Nesis, Member of the Board of Directors, Chief Executive Officer, Polymetal

Giuseppe Orsi, Chief Executive Officer, Finmeccanica

Roman Trotsenko, President, United Shipbuilding Corporation

A. Pivovarov:

Our panel is called Industrialization: the Trend for Developing Markets? Its main theme is the new trend of industrialization. Yesterday, I was preparing for this panel and thinking about what to say in the introduction and then the answer came to me. All flights leaving Moscow for Pulkovo Airport were delayed by about 2–3 hours yesterday because of protocol measures. On my flight here, I met some people who had spent almost half the day at Domodedovo and were quite drunk. They told me all about their business, which entailed selling air conditioners and ventilation systems. They told me that, at the moment, the market leader, relatively speaking, is Panasonic, but they personally only use Daikin air conditioners, even though they are not considered as good as Panasonic ones. They explained to me that Daikin air conditioners are assembled in Japan, whereas Panasonic and other companies moved their production facilities to China a long time ago. This example is probably not the most relevant, as it has more to do with consumer attitudes about the sourcing of production. However, it shows the degree to which countries that did not outsource their production can benefit, even in a consumer industry such as that for air conditioners.

Today we are going to discuss matters that are much more global. First, I would like to turn to Ms. Orit Gadiesh. Please, describe the new industrialization trend in a few words. What does this mean in terms of industrial-scale production and large industrial companies? Furthermore, what is Russia's role in this trend?

O. Gadiesh:

Thank you. Let me start by talking for just a couple of minutes about what steps I think Russia needs to take in order to actually arrive at some of the things that President Putin was talking about, and which you talked about. I think the overall answer is that Russia should act decisively and in a very focused way, starting with where Russia actually has the heft of any kind of competitive advantage, and by that I mean adjacencies to hydrocarbon's core business, and also rapid steps to create a pipeline of world-class technical and engineering graduates; in other words, soft

infrastructure, not just hard infrastructure. I am not a prophet of planned economies, but I think that Russia needs to decide where to allocate its resources in order to deliver rapid progress, which is what this thing is all about.

Let me give you one statistic. We have recently studied rapidly growing economies in the last century, or really in the last 45 years, and we found that only four major countries doubled their GDP per capita in less than 15 years when they were starting at over USD 10,000 per capita: Germany in the 1960s, Japan in the 1970s, South Korea in the 1990s, and in the last decade, Malaysia. They all had two things in common. One was that hard investment in the country's fixed capital cost stock comprised more than 25% of their GDP during that growth period, not in just one year. That is hard infrastructure; I am not talking about investments in non-productive assets such as land purchases or mineral reserves, forests or financial services. This really is hard infrastructure. Number two, the manufacturing sector contributed over 25% of GDP over a sustained period of time, again, not just one point in time. Again, I am not talking about the industrial sector, which includes natural resources; I am talking about value-added manufacturing, which has a multiplier effect because manufacturing workers earn more, and they create related service industries which create more jobs. Manufacturing actually drives 90% of incremental innovation. I am not talking about breakthrough innovation.

When you look at Russia, it falls short, actually, on all those counts. Only recently did President Putin lay out the challenge for Russia to double its GDP per capita, which is currently about USD 17,000. That is very aggressive, given the history of what people are able to do, especially since, going back to the two points I made, fixed private sector investment as a percentage of GDP has been below 20% since 1995. As President Putin mentioned, it jumped in 2011, but that is one year. When you look at South Korea and Japan, for example, the investment rates stabilized at around 30% after they started their growth rate. China today is at 40%, so Russia really has a long way to go.

Number two, at the same time, value-added manufacturing in Russia has sort of hovered in the 17% range over the past decade, compared with the 25%

benchmark that I mentioned earlier. I really believe, and I know others really believe, that Russia cannot afford to grow in unfocused, sort of random industries just because they sound right; people drop industries, high technology or construction or whatever. There is only a limited set of assets. Or, you cannot basically just grow on its oil revenues, especially with declining reserves and the volatility, and we know the difference today, for example, between the price that Russia needs to break even on its deficit and what it gets.

What it can do, I think, and has to do, is to develop at least adjacencies that are close to the oil and gas core, as an example. Why do I say that? Russia represents one of the largest oil service market-places in the world, and has done for quite a long time. There is a long history of exploration and production. Yet it has not established an internationally active oilfield service company of any scale. That is not the case in other oil-producing nations, where oilfield service suppliers and equipment makers are becoming real conduits for capital, technology, and know-how.

A good example is Norway. Despite declining oil production, Norway's oilfield service companies, which include PGS, Subsea 7, Seadrill, and Aker Solutions, are now globally competitive and generate significant national wealth. Brazil is another example. The Brazilian Government insists that oil and gas operators buy most of the equipment they need from domestic manufacturers. It may not be cost-effective or competitive yet, but this helps Brazil develop a domestic manufacturing industry that stays in Brazil and then becomes scale.

With regards to investment, every developing country needs to create a hard infrastructure. That is clear. It needs to provide an economic framework for growth to attract investors. That is mentioned in every conversation, and it is mentioned in all the speeches. I think equally important, and in some ways even more important, is soft infrastructure. Here I would put first and foremost education and vocational training. Russia was once really renowned for its science. Russia now ranks 38th and 39th in mathematics and science. This is in a recent OECD report, compared with Finland, its tiny neighbour, which is ranked sixth and second. I would say that

education is the basis of any country's economic destiny, and it should be closely linked to industrial policy. When it is, it actually does wonders. China has been very thoughtful in that way, and it now leads the world in OECD scores. It is literally at the top; Russia is 38th and 39th. Germany has the best technical schools in the world, and it is the economy that really leads Europe.

So, since we do not have much time, let me just say that hard and soft investments really will pay off as the world's economy grows, but Russia needs to craft its industrial policy, decide where it is going to put its relatively limited resources now, and it needs to invest consistently starting now. That is a start.

A. Pivovarov:

Thank you so much for that fascinating opening speech and those very important words.

I would like to turn to Denis Manturov, the individual now responsible for industrial policy in Russia.

Mr. Manturov, first of all, it would be interesting to hear your comments on what Ms. Gadiesh said in her speech.

Secondly, I would like to know your overall assessment of Russian industrial policy. Does such a policy actually exist? What short and long-term goals are we setting for ourselves at the moment?

D. Manturov:

Thank you, Alexei. Good afternoon colleagues, ladies and gentlemen!

The topic of industrialization, which has been raised at this panel discussion today, is very topical, especially for our country. In his speech today, our President drew our attention to the fact that about 50% or more of our economy still depends on raw materials and oil and gas. Therefore, industrialization is vital, especially in manufacturing, so that we can firstly steer away from resource dependence and, secondly, create new jobs. The figure that we heard today is 25 million jobs by 2020. This is a serious claim and it will all depend on how general economic trends

unfold and on the situation in the financial markets, especially internationally. We depend on global economic trends, especially with export-oriented products that are subject to serious competition, which can only be beaten by improving the quality of our products. Since we missed several stages of industrial development and industrial adjustments, we not only need to catch up, but also to invest in and develop our high-tech sector, and this is an area where we do have certain advantages.

We have great human resource potential, which makes it possible for us to talk of reaching new heights with respect to making modern products that are not only in demand in foreign markets, but also lead to constant growth in domestic consumption. We can use one specific example and that is the automobile industry. It supplies the population with 280 vehicles per 1,000 people. In the US, this figure is three times higher. We must be prepared for the challenges related to consumer demand, which is projected to triple by 2025. Saturation is projected to occur by approximately 2025–2030.

I would divide our industrial sectors into three categories. The first category consists of companies and sectors that are generally referred to as global players. Above all, this includes the chemical and metallurgy industries, which today are more successful and in a fairly healthy state. These industries should focus both on increasing exports abroad and expanding production to meet domestic demand.

The second sector or category consists of manufacturers that are primarily focused on the domestic market: transport engineering, power plant engineering, pharmaceuticals, and other industries and fields. These industries need to develop new products and invest in modernization to meet the needs of the foreign markets that they should target and into which they should expand, in conjunction with meeting the needs of the domestic market.

The third category consists of industries that depend on the state for orders. This includes the shipbuilding, aviation, and electronics industries. The situation here is quite satisfactory owing to the ever-growing number of state orders. In the last few years, the emphasis has mainly been placed on corporate matters. Roman

Trotsenko, President of the United Shipbuilding Corporation, is here with us today. The hard work he has done for the company over three years has mainly been focused on creating a comprehensive system to enable the company to increase sales and create new products. This primarily means supporting the modernization of companies to keep them at the required level. The state will pay close attention and provide support, including financial, to the shipbuilding and aviation industries. We need to deal with the issue of entry into so-called global commodity chains. We have positive examples from almost all industries. The pharmaceutical industry is actively entering the international market by forming joint ventures and developing products together with the international leaders of Big Pharma. The aviation and aircraft construction industries are attracting foreign manufacturers. We have built the modern Sukhoi Superjet 100, in which foreign investment is greater than 50%, or even 60%, of the total. We are involved in the assembly of the well-known Agusta AW139 helicopter in conjunction with Finmeccanica, and are working to integrate with international companies. I think that we will continue to develop this further. Issues related to import substitution are also on the agenda. We not only assemble products, but will also localize products developed and manufactured abroad at our own manufacturing companies.

A. Pivovarov:

Thank you, Mr. Manturov. The issue of cost reduction is clearly on the agenda, as we are constantly hearing about it.

D. Manturov:

Reducing costs is an important issue. First of all, we face the ambitious task of raising labour productivity in some sectors by a factor of 2.6 by 2020. On average, we need to increase labour productivity by a factor of 1.8–2 in the manufacturing industries.

A. Pivovarov:

Sitting next to you is Klaus Kleinfeld. I would like to turn to Klaus now.

You seem like the right person to discuss reducing costs with the help of a specific example. In Russia, we are used to the concept that a large multinational company is essentially less effective than a smaller company, partly because of the constantly increasing costs. We know that Alcoa also faces this problem. Nevertheless, you managed to reduce the cost price of aluminium by 30% per tonne over the past few years. How did you do it?

K. Kleinfeld:

Well, it is a lot of different things that you have to do, and you really want to activate every employee so that you get full employee engagement. It is not just one thing; it is a whole host of actions. We are currently working on a total of around 8,800 actions worldwide to get productivity up. So, if you look just for one thing, you will find you are looking for the wrong thing. There are big actions in there, where you are trying to reduce power costs. There are small actions, where you basically just make sure that a valve that is not operating correctly starts operating correctly. You need to get your team engaged and get people understanding that it starts with the small things, it starts with your working environment. You want your employees to be attentive. They know the machinery best, so they know when it is working well. They know when there is an oil spill and when to stop the oil leak. If you have a workforce like that which we have seen here when we have bought and invested heavily in Russia, when you have a workforce that is not used to taking care of the equipment, then the equipment starts to rot very, very quickly. That is a real problem.

But that is also leading me to the question of the panel: what are the trends in industrialization? In my view, there are really three fundamental things. I do not think that they are going to change that fast. The first thing is, in today's world, where information flows so quickly around the world, the only sustainable competitive advantage that companies really have is the people that they have and the way those people work together. I would say that Russia, in general, has it in its DNA to

have a very, very good technical education. Mrs. Gadiesh has shown that in the last year it has deteriorated. But I would say that from my own experience, the foundation is good, and it is understood that there is a lot of brilliant talent. There is also a lot of brilliant talent that has left Russia and shown their brilliance outside of the country, and I think one of the points is to make sure that those people have the same environment here, which brings me to my second point. So my first point is that the only sustainable competitive advantage is people and the way they work together.

The second thing that you have to look at is to make sure that you enforce, foster, and allow entrepreneurship. People want to do well; I have rarely seen people coming into the factory with the intention of doing badly. Obviously, when they can participate in it and when there is something good in it for them, they are going to be more creative. That is what it is all about. That is the great story of America; that is the American dream, and I think it can well be part of the Russian dream also: to basically ensure that the entrepreneurship that exists, in almost every human, can come out. For that, you need privatization, and I think that is why I was very happy to hear President Putin today re-emphasize that he fully stands behind privatization. The privatization plan is going to fully go forward, so that is a very, very good thing. For that, you also need technology. I would say it is rather a hygiene factor. You cannot afford to not have technology. Unfortunately, we have seen that, after the Soviet Union declined, many industries have lost their oomph. The Soviet Union played a large role in many industries, basically on a global scale, where technology now has fallen behind. We need to make sure, and Russia needs to make sure, that the technology inflow comes quickly. That is when foreign direct investment comes into the game in my view, where you can bring investment in, like we have seen here with Alcoa coming in. I think we have done very, very well for the Russian aluminium manufacturing industry, bringing it up to a real competitive level on a global scale. What we do here, and we are qualified by all the major aerospace companies, is that we export from Russia into the world. The same thing is true for packaging. The facilities that we have here, although they are housed in old

buildings, the equipment and the way we operate here is absolutely first-class, not different from anywhere on this planet. So that is my second thing: let us make sure the fundamentals are correct.

Let me add one more thing to the fundamentals. You also have to make sure in the fundamentals that the rule of law is uncompromised, absolutely uncompromised. I really liked the target that was set by the President. You can use whatever measurement you want; I firmly believe that what does not get measured does not get done. He used the World Bank index to say we have got to bring the ease of doing business substantially up from where it is today, where Russia is one of the lowest countries, up to rather one of the higher countries, where I believe Russia belongs.

Another big point of the fundamentals is the energy price. I think, theoretically, you have a competitive advantage there. Unfortunately, it is not coming out. When you look at the energy costs, the energy prices here, they have increased in a way that has really compromised businesses that are energy-intensive. This for me is the foundation.

And last but not least, and then I will close this, is it is great if you have single companies that are standing out, but it is even greater if you can do clusters. That was your point, I think. The idea of the cluster is a great idea, and it existed in the Soviet days. There are some clusters, like energy clusters, the oil and gas industry, which is very, very good. But there are also some other potential clusters which could come out, and some of those were just mentioned by the Minister of Industry. I would recommend not going too broad. Rather, if you want to mention some clusters, go for the clusters where we can really make it here. I think automotive has a really, really good chance. The automotive market in Russia is the second largest market in Europe after Germany. I tell you there is probably no automotive company that is not knocking on your doors and wanting to invest here. This is great; this is absolutely fantastic. I think also, on the high-tech side, there are some really, really innovative high-tech firms. I was extremely happy to see Yandex having such a fabulous start and fabulous floatation. So that is the trend I would see, and I think

that, listening to the President this morning making this commitment, making it here today, we are so close to something that most people have waited 18 years for: becoming a member of the WTO. I think this is pretty cool.

A. Pivovarov:

Thank you very much, and thank you for your advice indeed.

I would like to explore other specific examples of how industrial policy works. Richard, tell us about the example of Japan and other Asian countries. What is their policy now and how are the goals and tasks determined?

R. Koo:

Thank you very much for inviting me to this panel. I understand that there is quite a bit of concern to re-industrialize Russia, especially to move away from the dependence on energy prices. Just from the overall viewpoint, having energy or natural resources is sometimes not a benefit but a curse for manufacturers, because too often the best people, the best money, and even exchange rates are frequently moved by the natural resources sector. If the price of natural resources goes up, manufacturing people suffer because typically exchange rates also go up with it. Today, Canada and Australia are suffering very badly because the exchange rates are so high. There are three car manufacturers in Australia; all of them are screaming for help. Canada used to have a very weak exchange rate against the US dollar, and there are a lot of auto manufacturers in Canada, now they are suffering as well. This is because Canada has natural resources, because Australia has natural resources. Having natural resources is a kind of curse, and if it is completely market determined, it would be very difficult to develop manufacturing in this country. The government will have to take very strong, determined action to develop manufacturing, because if you just leave it to the market forces, I do not think that it will happen.

Now, how did Asia manage to industrialize, especially in the catch-up phase? The Minister mentioned catching up; well, Asia had to do a lot of catching up. Actually,

Asia has a lot of different models, and I would like to mention each of them. First, Japan and South Korea. They actually used quite a bit of protectionism at the beginning. In Japan in the 1960s, if you wanted to buy American or German cars, they cost four times more in Japan than in the United States or in Germany. That is how much they protected the industry until around the 1970s. And in Korea, if you went to Korea five years ago, you would hardly see any foreign cars; it was entirely Korean cars. But during that period they developed industry, and now in Korea you can see some foreign cars. In Japan, foreign cars are now very common. But they did use that protectionism for substantial period of time.

That requires two things: that someone will actually allow you to put protectionism in place, and that you have a very disciplined bureaucracy. No corruption. Japanese bureaucracy was known for very little corruption, and I think that is how Japan actually succeeded.

But today, Russia is joining the WTO, and the WTO says no protection. Of course, you can do a lot within certain limits, but not like the way Japan or South Korea practised it 20–30 years ago. Corruption, which President Putin mentioned quite a bit, will have to be eradicated to get industrial policy moving. That is the headwind I think Russia will face if it wants to follow the Japanese or South Korean model.

The second model is using foreign direct investment, and that has already been mentioned. That got many Southeast Asian economies and China moving very quickly. But for that to work, you have to have one of the lowest labour costs in the industry, because this is kind of a race to the bottom. If you have the lowest costs all manufacturers come to you, but if you are kind of a mid-range economy, it is difficult to attract people to manufacture things, because they can always go somewhere else that may be cheaper.

Russia is kind of in the middle. It has about the same wages as Malaysia, but of course there are a lot of cheaper workers around: Bangladesh, India, Vietnam, and most recently Myanmar. Because it has just opened up, all the manufacturers around the world are trying to enter Myanmar because it is so cheap. So Russia would be competing against that and that may be a little difficult. You do have one

advantage, which was already mentioned earlier, and that is that you do have a substantially large market: 140 million people is not a small market. That is one advantage that other Asian countries, except China, do not enjoy. Maybe you can capitalize on that.

The third model that I would like to mention is Taiwan's model. Taiwan was on nobody's economic map of the world until 1985. It was just a tiny little island in the Pacific Ocean. Just 10 years later, in 1995, Taiwan became the most important producer of computer equipment in the world. How did Taiwan manage to do that in just 10 years, from 1985–1995? I go back to the point mentioned earlier about engineering talent. I do not know how many of you are aware of Taiwan's history, but when Taiwan was occupied by the nationalist Chinese government, the Chiang Kai-Shek government, it preferred to use its own people, the so-called mainland Chinese. The local Taiwanese could not get very good jobs inside the government in Taiwan, or in other major industries that were controlled by the government. So the best people actually left Taiwan to start working in the United States, Silicon Valley and so forth. Then around 1985, finally the martial law was removed, people were allowed to do whatever they wanted, and someone came up with a brilliant idea: Taiwan has got so many engineers in Silicon Valley in the United States, why do we not bring them back? So they came up with a programme to bring those engineers back.

The first time they tried it they got some back. But they did not stay in Taiwan, and the reason was the following: you can always get the husbands back. Husbands, when you tell them enough about working for the mother country, they come back. But it is very difficult to get the wives and children back, because if the wives and children are working in Western Europe or Los Angeles, San Francisco, all those nice things, they do not want to come back.

So then they came up with the solution. They actually built Los Angeles inside Taipei. It is a city called Hsinchu: in Taiwanese, it means 'new bamboo', so if you cannot pronounce it just remember 'new bamboo'. There is a science park there, and inside the science park you actually have the city of Los Angeles: rolling lawns,

nice houses, swimming pools. Swimming pools may not be very practical in St. Petersburg. When they put that in, mostly importantly, they built English-speaking schools inside the compound so that the children could continue their education in English. Then, the whole family came back, and once they started settling in Taiwan the electronics industry skyrocketed.

I understand that there are a lot of talented Russian engineers working outside Russia. If you can bring them back, especially if they are in the top echelons of industries overseas, they know what the market wants. They know what technology is available; they know what kinds of machines are available, so that they can start the industry in Russia very quickly. I understand that you already have a programme like that. It is called Skolkovo, if I understand it correctly. There are 500 companies already in it. Those are all a very good start, but if you really want them to stay, if you really want them to put their roots in Russia, then you need to make sure that their wives and children are also happy coming home. Without that, this could be very transitional. Some people might come back and after a few years they leave. Then, we really cannot get a solid base started in this country.

Lastly, I just want to mention that manufacturing is done at the level of manufacturers not assemblers. Assemblers are just assembling things, and anyone can do that. But manufacturing is done usually by small companies, small and medium-sized companies who specialize in a certain thing, and they produce something that no one else can because they are so specialized. You have to have hundreds of these things to really have a strong manufacturing base. In Japan, we had that. In Taiwan, there are so many small and medium-sized companies producing very key components for computer manufacturing that no one else can compete with them. So for the Minister and for the government people, having a large assembly line looks good on television; they are good for the political show. But for the actual manufacturing, you have to develop small and medium-sized companies who actually produce things, not just assemble things. Thank you.

A. Pivovarov:

Thank you. Thank you, indeed.

I would like to turn to Roman Trotsenko.

Stories about the Asian experience are always impressive and, in my opinion, are even a bit demoralizing. All we can do is conclude that we have a different mentality.

In what niches can Russia be competitive in your business, in the field which you have been working in for the last three years? How can we succeed in the short term, given what we have said on this panel about international cooperation and the new trend of industrialization? How can we avoid concluding that we have a problem with our mentality, and that is why we cannot develop like Asia?

R. Trotsenko:

I will answer your question at the end of my speech because it logically follows from a number of premises.

It is difficult to say when it all began. Perhaps it was in December 2005, when the Financial Times and Goldman Sachs named Thomas Friedman's *The World Is Flat* the book of the year. This was a milestone in the recognition of globalization trends, and a directive to all countries and companies that they should transfer their manufacturing businesses abroad, build their production facilities there, reduce costs, and work within a narrow specialization. It was believed that long commodity chains could be broken up into country specializations. Remember, Friedman predicted that some countries would specialize in web design, some in production and others in agriculture. Each one would thus have its own area of specialization. This is a good idea, but, unfortunately, it is about as feasible as the notion that all illnesses can be cured with aspirin. Aspirin is an effective medicine, but not for all illnesses.

I think that the global crisis we are experiencing had its roots in this incorrect assumption, or even delusion. We began to see the following trend: companies would relocate their production facilities abroad and, as a result, jobs started to disappear in sectors considered to be unpromising by the countries themselves, for

example, in the industrial sector. Young people in Germany did not want to become welders and likewise, in Italy, they did not want to become furniture makers. These industries gradually began moving to Southeast Asia and China.

Thirdly, the consequence of transferring production facilities abroad was that these offshore plants started generating their own competition. If we ask who the main rival of Italian furniture companies is today, we see that the answer is Chinese companies. Who is the main rival of the German shipyards? Currently it is companies from China and Southeast Asia. If we look at corporate strategies, for example, from 2002, when Friedman's ideas were at their height, we see the ideas of globalization, offshore production, and moving production facilities abroad.

My fourth point is this: in essence, this trend was economic suicide because companies and countries gradually began to lose their competitive advantage and started gaining more competitors abroad.

My fifth point is the following. Creating a product – not its assembly, which, as we talked about earlier, can be done by anyone, - but actually creating a product, which involves interrelated economic, social, and technological inputs is the most valuable thing today, as the product must be competitive. The goal of the national economy and national industrial policy of any country should be to support domestic producers in creating unique, competitive products by providing them with all the competitive advantages of the national economy, including the right mentality, which you were asking about earlier. Mentality is a special characteristic and it can be a competitive advantage in relation to certain types of activities and products.

In recent years, we have witnessed a consistent stance from the Ministry of Industry and Trade of Russia, which has set itself the goal of supporting domestic companies, motivating them, and pressuring them to create new products. The product is competing with other products and, ultimately, the consumer wants a good price-to-quality ratio. This is particularly difficult to achieve when creating upmarket products with a long life cycle, such as ships, aeroplanes, and helicopters. The idea that they can be created by one company, without state support, is an illusion. There are exceptions, so to speak, that only prove this rule.

The long term goal is not simply to create a product, but to create a self-sustaining system that could reproduce the development of a new product with each new cycle, say, every 10 years. This means mastering global technologies, creating an entirely new education system and a new way of training personnel. It also involves making changes to national tax and customs regulations that facilitate the creation of new products. As a result, new technologies began to appear simultaneously around the world, which, instead of building long assembly line-based production facilities, allow us to produce custom-made products that can be easily changed and modified. Nowadays, the Boeing production facility is not just a conveyor belt, but a customized work environment. For modern manufacturers, labour costs are not the most important thing. The key is quality. If a factory costs EUR 5 million, then it does not make sense to save money on employees who might utilize the equipment incorrectly.

As a result, countries that were the first to stop producing goods, however trendy it was, and decided that the trend of the future was precisely a focus on simply creating virtual images of products, were surprised to discover that products actually needed to be made and that the production facilities they transferred abroad became their own competitors. It is now being recognized that the notion that globalization will lead to the death of industry or industrialization, which will no longer be needed in developed countries, was erroneous. We can see how in different countries, traces of 'industrialization 2.0' are gradually sprouting up. In the US today, ten urea production plants are being designed and constructed at the same time. In the past, we would never have believed that this would happen in the US in the 21st century because the chemical industry was considered so unpopular. Industrialization, new industrialization or 'industrialization 2.0' is the way forward, not only for the developing world, but also for developed countries.

A. Pivovarov:

Sorry for interrupting you, Roman. What you are saying now is very interesting and I would listen to you for longer if we had the time.

But I would like to come back to the shipbuilding industry. You said that it is difficult to imagine how a company could create such a complex product as an aeroplane or a ship without state support. But can it be done by one country without the support of companies from other countries? For example, in relation to shipbuilding?

R Trotsenko:

Every company or country has its own specialization, including shipbuilding. We have found Russia's own niche specialization. We realized that trying to enter the market with a conventional fleet, relying on simple tonnage, represented by bulk carriers, tankers, and container ships, makes no sense for us. For us, it makes sense to build smaller ships with a particular tonnage coefficient relative to labour intensity. Our current ratio is over 1.5. These types of ships include ice-class tankers and ice support vessels.

A. Pivovarov:

Is cooperation possible here? For example, could we see the manufacturing of ship hulls in China?

R Trotsenko:

Thank you for your question. Cooperation is required here. The vital thing is who holds the product image and documentation and who invented the product. Secondly, there is the matter of who made the hull. Let me give an example. We have developed international cooperation with regard to ice support vessels. Our companies in Leningrad Region produce the hulls, which are then sent to a company that belongs to the United Shipbuilding Corporation at the Helsinki shipyard, where they are completed. But the most important thing is whose project it is.

A. Pivovarov:

Is the ship still Russian?

R Trotsenko:

The ship and the project are still Russian. Negotiations on the cost of the hull take minutes or hours. Negotiations on the transfer of technology and 3D-models of the vessel take months and are rarely successful. This is the most valuable thing and the biggest secret that a company has.

A. Pivovarov:

That is the most important thing. Thank you for your presentation.

Patrick, may I turn to you, and continue to talk about the measures that the state must take to support its industry and its manufacturers.

Your company Alstom is working in different BRIC countries, not only in Russia. I would like to get your comparative assessment on the competitive advantages Russia has over other BRIC countries, and in what areas Russia lags behind.

P. Kron:

Thank you. Actually, being the sixth panelist to intervene in the debate, a number of things have already been said and it allows me to be briefer. I also want to add that rather than being generic, I will focus, if I may, on our specific experience in what we have been doing in the country and elsewhere, as you mentioned, in our business, which is focused on infrastructure: power generation and transmission, as well as rail transportation. This is our business: 100% focused on infrastructure.

The first point is that I share what Mrs. Gadiesh said on the need for economic development, social welfare, and environmental protection: to have stronger hard and soft infrastructures. When I look at what needs to happen to create these infrastructures, I think that obviously there is a political will, I know, to modernize the infrastructure in the country, but there is also a very fundamental point for businesses which are long-cycle businesses, capital-intensive businesses. They need clear and stable frameworks: clarity and stability are absolutely needed to

ensure investment by all the upstream contributors to the modernization of infrastructure.

If I look at what happened in our case, the driving factors for us to participate in the development of infrastructure in Russia were first, the political will to modernize infrastructure. I mean, create the market: if there is no demand, do not be surprised if the offer will not be there. And secondly, the ability we had to participate in these programmes. There was enough openness to allow us to step in and we have done that, not only by building capacity on our own, but by partnering with Russian companies involved in that sector. They provided a lot of assets that we did not necessarily have: market access, industrial activities, know-how, etc. We had obviously a technology; we have 30,000 engineers worldwide, and we provided the combination which was needed. I confirm that we have been quite impressed by the quality and the ease with which we have been able to collaborate with our Russian colleagues in engineering matters.

Again, when you think of what is going to happen next and what needs to happen next, the first thing is, as I said, the demand: a continuing programme for the modernization of infrastructure. The second thing is the combination of this development of infrastructure with the development of industrial production. When you develop Russian infrastructure, you assume that you will drag with you an industrial sector which will be able, first, for the Russian need, and secondly, for a broader hinterland, to develop trains and systems and sell them.

This is what is happening and I think it is going in the right direction. The comparison with other areas is a little bit difficult. I would say that Russia is a difficult country, but we operate in 100 countries, and to tell you the truth, 100 of the countries are difficult ones. We are probably missing the easy ones, but so far so good.

A. Pivovarov:

Thank you so much.

I think it is unlikely that anyone would argue with the fact that Russia is a difficult country, but Russia is still a varied country. The Russian regions are all different. I even wrote down an example, which everyone is happy to cite when talking about achievements. During the financial crisis, industry in Kaluga Region grew by 40%.

I would like to ask the Governor of Kaluga Region a question. Mr. Artamonov, other than yourself, what does your region have that others do not have? How did you manage to achieve this?

A. Artamonov:

I hope last but not least.

Today we should be aware and be absolutely convinced that industrialization is the destiny of any developing society. This is not only a contemporary challenge, but is in fact an issue that has existed since time immemorial. When analysing the development of society, you see that industrialization has always been pivotal. It sounds paradoxical, but it has been confirmed in practice: the industrialization of society encourages the development of technological systems, information technology, nanotechnology, and so on.

Now let us take a look at the challenges faced by Russia and the Russian regions in 1991. We had a militarized industrial sector, which was high-tech for the time, but, all of a sudden, there were no orders because the country did not need so many weapons anymore and the contacts, which open up the foreign markets in which we are active today, had yet to be established. A large number of highly skilled workers and engineers were left outside the company gates and those who were not laid off were not paid for months or received only a small fraction of their wages. What was to be done? We needed to find alternative products to manufacture, we needed to create a new economy, new industrial sectors, and to manufacture goods that society needed. This all went well.

I can give you an example: we have a turbine plant that is well-known not only in our country, but in 50 others who use the products manufactured by this company. This plant was producing turbines for submarines and surface ships. There was no

longer any demand for them. We started to produce power equipment at this plant for the sugar industry, for boilers and so on. This form of production soon reached more than 80% of the aggregate total. Now, when the need to develop the goods for which the plant had been designed reappeared, the pendulum swung the other way. We realized that we would not be able to modernize fully and restructure without attracting investors. When faced with this problem, we found that no one was interested in us and we looked into the reasons for this. We asked our potential investors, especially foreign ones, what was putting them off, why they were not coming to Russia to invest, or to us in Kaluga Region. Four main reasons were given: the high level of bureaucracy; corruption; the underdevelopment of and complexity of connecting to infrastructure; and the high tax burden. We travelled to other countries: to China, the US, and Europe to see how they were coping with these issues. We saw that there was nothing difficult in what they were doing and we decided to do the same in our region. We attempted to do an even better job than they were doing.

A. Pivovarov:

Excuse me for interrupting. Is this possible to achieve across a single region?

A. Artamonov:

This can be achieved at both a regional and national level.

A. Pivovarov:

No, the whole country is another matter. I think Mr. Manturov will agree with me that we all want that. How are you managing to do it across the region? Do you not agree that we have an odd situation? One region can do it, yet the others cannot?

A. Artamonov:

To do this, you simply need to have a sincere love of the land where you live and work, and try to make the development and prosperity of your region your life's goal. Then it can be achieved, no questions asked.

A. Pivovarov:

So you mean that everything depends on the human factor?

A. Artamonov:

Yes, always. You remember history. We were taught that the individual played a minor role in history, but this was not true. Things always depend on the human factor. Successful self-made people are sitting here today. They directly represent this human factor. I do not think that the industrialization that we have undertaken is our biggest achievement, although we have increased our industrial output by a factor of 4.6 in a decade. The most important outcome is the formation of a team of modern managers, who are highly skilled and whose standard of work is correspondingly high.

A. Pivovarov:

Yes, of course. I am just very interested in the situation, hence the question.

You and your team have created a certain kind of system. It is clear that all this happened because of you. To what degree is this system stable? To what degree can it work, regardless of who is in charge? Or will things quickly fall apart if the person in charge is replaced?

A. Artamonov:

Unless you make it your goal to destroy this system, it will run indefinitely. This team is capable of regenerating itself, and this is already happening. We are seconding our team members to other regions, as well as to posts at the federal level. Nevertheless, this has not affected our team. But, of course, you can also ruin everything.

A. Pivovarov:

Thank you.

Yes, Mr. Manturov.

D. Manturov:

Can I summarize the answer? I want to confirm that the system that the Governor has managed to create will indeed continue to function. I also agree about the historical role of the individual because, without it, this system would not have been created. There are both positive and negative aspects to this. Members of the Governor's team are taking up posts in the federal government. The Deputy Governor has already taken up the position of Deputy Chief of Staff of the Russian Government.

A. Pivovarov:

I have the feeling that, in Russia, everything depends on certain individuals.

A. Artamonov:

I want to tell you something we have realized. We hear a lot today about the state's role in economic development, business development, and so on. The less the state helps business, the more beneficial it is for business.

Today, a large number of different state structures - the prosecutor, the police, the FSB, and the investigating authorities - are all intent on helping business, rooting out corruption, and so on and so forth. The risks of corruption are being replicated to such an extent that we are getting bogged down in our own work. We need to stop the police, the FSB, and the prosecutor from concerning themselves with business. We have the Federal Antimonopoly Service and the Federal Tax Service and that is enough. There are agencies that monitor the quality of work of the companies to which they issued a licence. If someone breaks the law, then the tax, antimonopoly, or licensing agencies refer the case to the investigating authorities.

A. Pivovarov:

Mr. Artamonov, I do not want to interrupt you.

The applause attests to the fact that you have made a crucial point. We have quickly run up against the wider national issue.

I would like to give Giuseppe Orsi the chance to speak. It would be interesting to hear how these problems are viewed from the outside. By this I mean the problem that, in Russia, everything depends on certain individuals; that, to make things work, you need to come to an agreement with that individual and it is difficult to interact with the system. Do you have the feeling that everything works like that in Russia?

G. Orsi:

Let us start from one side. I think that another factor in this industrialization is technology. As has been said, technology really is the second key variable of the world economy in future, after free international capital flow. The technology race among countries will be very important. A few years ago, we thought that the emerging countries, the Greeks and others, could not challenge the Western countries and Japan on technology. Those countries were importing more, and using technology rather than producing it. Now, things are changing, because more and more, the developing countries are dedicating a larger part of their GDP to developing technology. They are also now exporting it.

Russia was not in the same condition, it was different, as has been mentioned, because during the Soviet era there was a lot of technology development. But mainly, this technology was seated in the laboratory. This technology has not been put into products that could have been exported, and much of it not into products that could be competitive.

I will take the example that Mr. Manturov mentioned before, the helicopter. When we decided that we should create a helicopter company, that was a vision in which we said, let us try to do it in order to be able to have a product that is the latest product, that can be produced competitively, and that can be exported.

Obviously, Russia knows how to build helicopters. They were invented here. But the idea was: how can we produce a helicopter today that can be sold in a worldwide market competitively, allowing the company to make money? This means developing a technology, developing a process, developing manufacturing capability, developing a competitive way to go into the market.

As has been said before, this industry can be developed with government support. R&D on this major product must be developed with government support, but then the production should be self-sustained. As was said before, if Russia wants growth we need to have a competitive manufacturing capability and go into that experiment, into the global market to sell it.

The second point of note, another thing that has already been said: the government needs to invest in infrastructure. Yes, the government needs to invest in modern infrastructure and also in the protection of infrastructures. Today, infrastructures are not just physical things but also social projects. We have to protect that, we have to protect them physically, but we also have to protect them from whatever IT today is subject to intruders. We need to develop cyber protection, and this is another field where the activity and the technology are very basic.

There is a project here of smart cities. The development of better living conditions requires that the city, mainly the mobility of the city, the energy in the city, must be developed according to a single project. The project of smart cities that exists here in Russia is another source of technology to be developed. This is what we are looking for and we are ready to share this technology in order to increase our market. We believe that technology is not a value by itself; it becomes a value when it can be transferred into products, can be sold, and can help the health of the company and also the human being.

A. Pivovarov:

Thank you so much.

On the subject of technology and access to technology, I have a question for Dmitry Konov, Chief Executive Officer of SIBUR. Tell me please, do Russian companies,

particularly in the refining industry, not feel discriminated against by developed countries in terms of access to technology? Is there such a feeling?

D. Konov:

That very much depends on the complexity of the refining.

I represent the petrochemical industry, which turns by-products of oil and gas into products with a variety of complicated names. I think that about half of this hall is made from synthetic petrochemicals.

For products that require minimal processing and less specialization, the main competition is at a global level cost-wise: technology can generally be purchased and the cost of it is a minuscule fraction of the cost of projects as a whole and is quite affordable.

The more specialized we get and the smaller the production output of a product becomes, the more difficult technology becomes to procure, as it is not always available due to the fear of competition. Such technology is therefore kept more private. Nowadays, even these technologies are not universal. This is not the Cold War, nor a period of industrial espionage. In many cases, you can obtain them via a partnership, but the proportion of these technologies in the total cost of the product and the project cost is much higher than for simpler products.

A. Pivovarov:

To what degree is this holding back the development of our industry?

D. Konov:

In some cases this is holding us back, but it certainly is not the decisive factor.

A more crucial factor has not been talked about much by the panel. Many companies and the state as the regulator want to industrialize and build new facilities. Many, but not all, have the financial resources to implement major capital-intensive projects. In reality, very few have the project management skills and capabilities to actually implement them.

The modernization and industrialization of Russian oil refining is a clear example. It is impossible to implement such modernization and industrialization quickly without planning design and engineering resources, and without modernizing the construction industry and the manufacture of equipment.

The ability to implement projects is a topic that I think is very much underappreciated in our general planning, both within companies and at the regulatory level.

A. Pivovarov:

What is this problem related to? A lack of specialists at the required level?

D. Konov:

Each industrial sector must have a certain period of time to develop on its own. We have missed a number of investment cycles in each sector. We do not have the necessary level of skills and, moreover, we lack these skills across the board.

It is good to see that we are focusing our efforts and attempting to bring together resources from different areas, but it is not effective. These examples are more the exception than the rule. We do not have enough specialists, nor adequate skills to support the modernization and industrialization of particular sectors.

This is a problem that will prove a major impediment to the overarching plans of the state and individual companies in the coming years.

A. Pivovarov:

I would like to turn to Vitaly Nesis. Is your business in the same situation? Does it not depend on the nature of the business?

V. Nesis:

Yes, I totally agree with Dmitry that the lack of project management skills is the main impediment to the development of the Russian economy. Furthermore, Mr. Kleinfeld

said that the only competitive advantage in the global economy is people and how they interact with each other. This also applies to investment projects.

A. Pivovarov:

Do you think that primary industry, which includes mining, can become the driver of the new wave of industrialization?

V. Nesis:

Individual people, specific companies, and the country as a whole have competitive advantages. We need to identify what the long-term growth areas are in our country. Doing everything at once, or searching for growth areas on the basis of our wishes rather than objective suppositions is dangerous and will lead to dire consequences. Mr. Trotsenko described the exodus of certain industries from developed countries. I am completely sure that this happened not because of the errors of market players, but rather because of illiterate state policies. States were proactively redistributing investment resources from successful industries into social welfare programmes and other less-developed industries.

I hope our government will not repeat these mistakes and will not develop industries in which Russia will never be competitive, by virtue of its historical characteristics.

A. Pivovarov:

Vitaly, thank you very much. I think that you have brought our discussion to a fitting end.

Thank you to all the panelists, participants, and the audience. Our panel discussion has now come to a close. Thank you.