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The Rusnano Corporation and internationalisation of Russia's nanotech industry

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PROLOGUE

Over the past two years, Russia's political leadership has openly voiced the need for Russia to embrace what is considered to be the next global powerhouse industry, nanotechnology. As a part of the country's modernisation spree, Russia's President Dmitry Medvedev has personally stressed the need to advance in the field of nanotechnology in order to overcome the economic crisis and to ensure the country's shifting away from its current dependency on natural resource-based industries.

In a conference speech in early October 2009, Medvedev stated the following: *"The economic crisis is a great impetus for an economic renewal. But the main challenge is to avoid the well-known scenario where oil prices are on the rise and the economy is improving and, again, just like in previous years, no one needs nanotechnology because we can relax and make ends without innovations. We therefore must make nanotechnology one of the main sectors of the economy."*

Few can deny Russia's prospective chances to make it among the leaders in the $ 250-billion global nanotechnology market, projected to grow as much as tenfold in the course of the upcoming 5 to 10 years. Russia possesses a rather competitive scientific base for advancements in nanotechnology, as well as a large domestic market and, seemingly – a strong state support for developing the field. Despite the massive $ 4-billion budget earmarked for the nanotechnology funding program until 2015, however, the real advancements do need a more defined set of goals and improved identification of the practical steps needed to be taken in order to reach the status of a nanotechnology superpower.

It lays on the responsibility of the state-owned corporation Rusnano, a nanotechnology coordinative and funding vehicle, to implement most of the practical steps on Russia's way towards a world-class nanotechnology giant. The corporation receives a lion's share of the government's nanotechnology program funding, to be re-directed to new nanotechnology ventures deemed as viable after a multi-stage evaluation process.

It is the purpose of this paper, to lay out operating and funding principles of Rusnano, with a view on its funding of ventures involving foreign companies. In addition, we take a look at the international operations and investments of the Rusnano corporation. Through this descriptive analysis, attempts are made to map the international scope of Russia's recent activities in the

nanotechnology field as well as to lay out the potential the Russia's nanotechnology field holds for foreign cooperation.

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Peeter Vahtra

A SNAPSHOT ON RUSNANO'S ACTIVITIES

Rusnano's role as a vehicle in development of Russia's nanotechnology was initially defined by the President's initiative "Strategy of the nanoindustry development" of April 2007 and by the subsequent federal law "On the Russian Corporation of Nanotechnologies" of July 2007. The Rusnano's business strategy of 2008, states that the corporation is the *"key coordinator of innovation policies designed to commercialize promising research and development projects in the field of nanotechnology"*.

As such, the Rusnano corporation forms an essential part of the Russian national nano-initiatives (Table 1).

Table 1 Russia's federal nanotechnology initiatives

Initiative	**Budget, *$***
Russian Corporation of Nanotechnologies	*5 bln*
Specialized Federal R&D program financing in a field of nanotechnology (2008-2011)	4 bln
Federal Program "Nanoindustry Infrastructure Development in Russian Federation for a Period of 2008-2010"	1 bln
Total	**10 bln**

Source: Rusnano 2010.

In providing the state policy in the field of nanotechnologies, Rusnano seeks to commecialise nanoindustry projects and innovations primarily in the fields of

- manufacturing of nanoproducts (budgeted spending of RUB 92 bln between 2008-2015)
- infrastructure programs, scientific forecasting and road maps, standardisation, certification and safety in nanoindustry (RUB 23 bln)
- education and popularisation in nanoindustry (RUB 15 bln).

In allocating nanotechnology investments, the primary instrument of the corporation's operations, a broad selection criterion is employed in order to address the scientific and technical feasibility of a project as well as its commercial viability. Rusnano's investments are focused at financing the early commercialization stage where the mobilization of private investments is generally limited due to high initial risks as well as market and technological uncertainties.

The key conditions and principles of Rusnano's participation in commercalisation of proposed projects are laid out below.

1. Rusnano exits the project as soon as private partner is able to support business independently. The corporation does not attempt to maximize the value of its share.
2. Financing from the corporation is available regardless of the applying companies' country of origin, with the sole requirement that at least part of the manufacturing takes place in Russia. Foreign ownership can be up to 100%.
3. The minimum total volume of funding by Rusnano is $ 10 mln. For the projects with budgets below $ 10 mln, financing is carried out by the means of venture and seed funds.
4. Rusnano finances up to 90 % of the required scope of project financing. With this equity capital share of Rusnano shall be less than 50 % minus 1 share in the venture.
5. Provision of funds in the form of loans with favorable terms (below inflation rates), purchasing of bonds and convertible debentures, granting of guarantees on credits and other obligations as well as leasing.
6. Financing schedule is up to 10 years.
7. Provision of financing as grants for research purposes in order to foster product competitiveness.
8. Provision of financing to conduct ongoing training for project teams (Rusnano 2010; Ivanov 2009).

In sum, Rusnano provides funding for domestic and foreign ventures alike, with no official restriction to even a full foreign ownership, given that a (substantial) part of the manufacturing takes place in Russia. Funding up to 90 % of the project financing, Rusnano retains a minority ownership in the venture, with an objective of exiting as soon as the project is considered viable to survive independently.

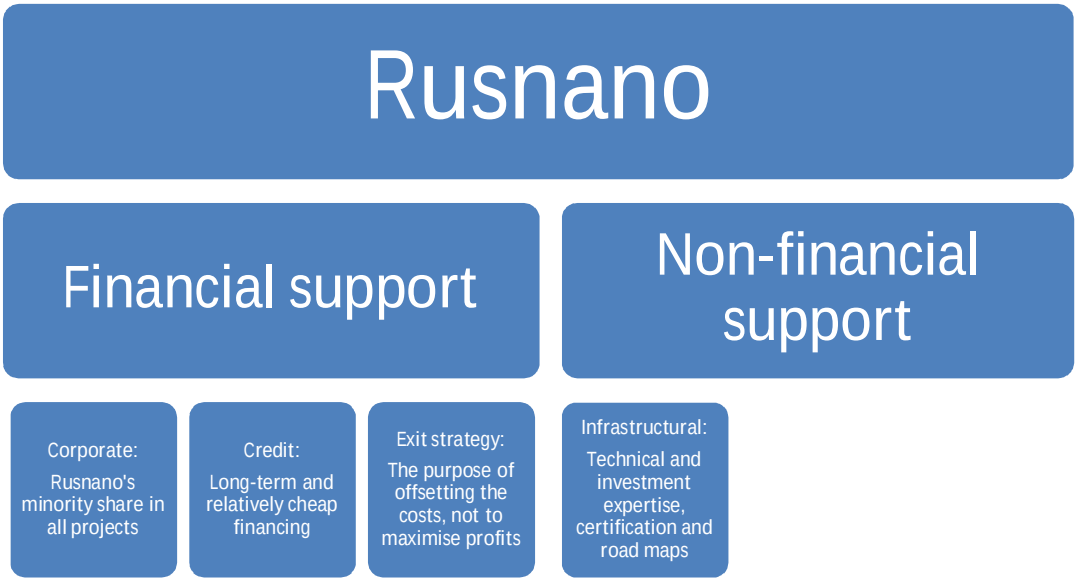
In addition to financial support, Rusnano provides the following types of non-financial support for selected ventures:

- Administrative support (for instance, proclaimed shielding from red tape procedures and corruption, product market promotion)

- Foresight-based product roadmaps
- Development of databases on research projects, technological, product and market databases
- Assistance of project arrangements in special economic zones
- Participation improvement of legislation supporting innovative business
- Certification, standardisation, and metrological support
- Nanotechnology popularization

Figure 1 below provides a summary of the measures of Rusnano's participation presented above.

Figure 1 Summary of Rusnano's project participation measures



Source: Rusnano 2010.

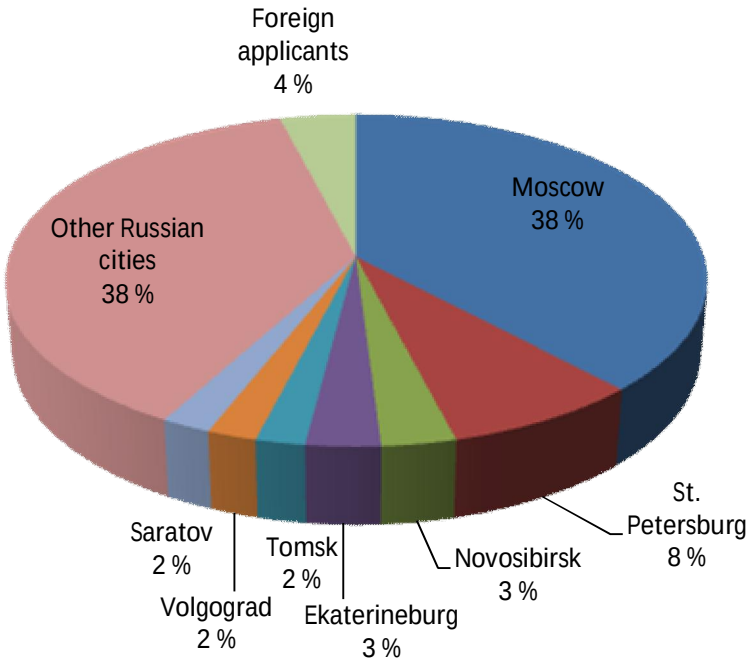
The beginning of 2010 has marked major steps by Rusnano, to achieve stronger foothold on both domestic and international nanotech industry. The corporation has gone out to seek for notable external funding for its future expansion and new projects, including the plans to sell the equivalent of $ 1.7 billion in state-guaranteed bonds starting from Q3 2010 (BusinessWeek 2010).

Altogether Rusnano plans to raise debt of about $ 6 billion to help expand Russia's nanotechnology industry to reach nearly $ 30 billion in annual revenues by 2015. The above funds would complement the $ 4.4 billion the corporation has received from the government three years ago to co-finance innovation projects. During the upcoming years, Russia is due to spend $ 10–11 billion to develop its nanotechnology industry. With this amount Russia most probably holds the world's biggest state fund dedicated to developing nanotechnology.

During 2010 Rusnano will be likely to convert to a joint-stock company after receiving permission from the presidential administration, which is expected during the first half of 2010. In support of this view, Arkady Dvorkovich, President Medvedev's top economic adviser, stated already in November 2009 that three state corporations -- Rusnano, Russian Technologies, and Vneshekonombank (VEB), the state development bank -- could be transformed into state-controlled joint-stock companies already in 2010.

By March 2010, Rusnano has invested in 76 projects after evaluating some 1500 applications. Despite the non-limitations for foreign companies to apply for funding from Rusnano, from the projects applied for thus far, merely 4 % have been of international origin. The Moscow region has been the key source of applications, with St. Petersburg tailing long behind (Figure 2 below).

Figure 2 Geographical breakdown of funding applications to Rusnano, 2008–2009.



Source: Ivanov 2009.

By March 2010, altogether 54 foreign applications to Rusnano had been made. The US and Israeli companies had been the most active to apply, with 15 applications each, traced by Armenia with 5 applications. By the beginning of 2010, no foreign applicants had been granted funding yet as the evaluation processes were still ongoing.

Challenges related to Rusnano's operations

The first two years of operation have shown that despite the growing numbers of projects invested in, major bumps remain on Rusnano's path to world-class nanotech giant. Kaartemo (2009) identifies the too wide a set of rules on where they can and can't invest, as a number one problem. This does not encourage the effective allocation of resources. In particular, the limitations of the official rules to Rusnano's international investments are pointed out. As the following chapter will present, there are, however, a number of international openings, which, if proved successful, may notably increase Rusnano's international reach. As for several other major Russian companies, the financial crisis might have produced interesting global opportunities to Rusnano seeking for investment targets and partners abroad. Secondly, the

scientific community seems not to trust Rusnano, as they are working differently from what the researchers have used to. This allegedly makes Rusnano's work in Russia very challenging. Thirdly, Rusnano's work and the operation of the whole Russian nanotechnology cluster has been criticised as being too far away from market demand and the solutions to be more targeted to the state-run defence sector than to private consumers and businesses. Although some of the most valuable innovations have their basis in defence sector, such as internet and GPS devices, it is a long and complicated path to economic diversification (Kaartemo 2009).

INTERNATIONAL SCOPE OF RUSNANO'S OPERATIONS

One of the key long-term objectives of Rusnano is to assist Russian nanotechnology companies to enter the global market with their technological and intellectual products and to create favorable international conditions for the development of the Russian innovation infrastructure. In addition, Rusnano's strategy involves turning the corporation an integral player in the global nanotechnology development in cooperation with international companies and organisations. As a part of this process of international integration, the aim is both to attract foreign investments for the development of nanoindustry in Russia as well as to find prospective targets for investments and joint ventures abroad. In its internationalisation spree, Rusnano seeks nanotech companies from overseas to commercialise their technologies in Russia as well as looking for opportunities for commercializing technology of Russian origin outside of Russia. In following, the recent international activities of Rusnano are discussed in order to identify the potential for participation for foreign companies in the corporation's activities.

Seeking investment opportunities in Asia

The rapidly growing markets of Asia play the key role in Rusnano's international openings. Representatives of the Russian corporation have repetitiously toured the East-Asian countries in search for investor partners and investment opportunities. In particular, Rusnano is looking for joint investment opportunities with Asian nanotechnology firms. Most recently, the senior Rusnano executives visited Singapore in March 2010 in a search of manufacturing partners. From the recent visit, perhaps the most quoted message was the one put forward by the Rusnano CEO, Anatoly Chubais, when meeting with the Singaporean nanotechnology firms: *"If you have the cutting edge technology then we have the funding for you".*

Similarly, according to the Deputy Director General of Rusnano, Aleksandr Losyukov, Singapore is considered as a key target of interest for the Russian nanotech giant: *"Singapore has managed to create a very successful system and it is very interesting for us to scrutinize this system and that is why we are here. We are necessarily doing something, inviting private co-investing and Singapore is also the financial center of Asia so this is exactly the place to try and find it."*

Searching for business opportunities in the technologically advanced Asian countries seems justified given Rusnano's ambitious sales target of $ 28–30 billion by 2015. Singapore possesses the state-of-the-art R&D infrastructure and skilled labour as well as the ability to attract international experts and promising students for development of nanotechnology solutions. Simultaneously, however, the country largely lacks the manufacturing ability for nano-technology products, where again the Russian counterpart comes in the picture. As a result, the co-operation could have fruitful bearings for both parties involved. The cooperation discussion further included the subject of increased assistance to establish Singaporean firms in Russia, as well as providing access to Rusnano's network of technological partners.

In addition to cooperation prospects in Singapore, Rusnano has found an investor partner from China in early 2010, when the corporation it set up a joint venture with Thunder Sky Group Ltd. The two parties signed an agreement to establish the joint venture lithium-ion technology for the first Russia-based production of high-capacity lithium-ion batteries. The Russian plant to be located in Novosibirsk will produce batteries which will be primarily used in electric buses and minibuses. The batteries will also be used in uninterrupted power supply units in IT, telecommunications and renewable energy. Battery production will begin in 2011. The annual production capacity will reach 400 million ampere-hours by 2012, enough to power 12,000 electric vehicles a year. The guaranteed demand for major part of batteries produced in first four years is ensured by the Thunder Sky contracts with Chinese producers of electric vehicles.

The sales of the project's production are expected to reach $ 450 million in 2015. The total budget of the venture is estimated at $ 466 million. Rusnano will invest $ 72 million in cash in project's equity and provide a loan of $ 189 million. Thunder Sky Group in turn will invest $72 million rubles in cash, technologies and the intellectual property in project's equity and provide a loan of $ 134 million.

Rusnano's advancements in Europe

Besides Rusnano's recent focus on Asia for developing its international cooperation and investment scope, Rusnano is seeking for investment targets and partners also in Europe. As reported in early April 2010, Rusnano and the Russian telecom and oil conglomerate Sistema are eyeing a stake in French electronic components' manufacturer Altis Semiconductor, a 50-50 joint venture between IBM and the German-based company, Infineon. Infineon announced in

December 2009 that it aimed to sell its Altis stake during 2010. Simultaneously, the French press reported late last year that two French businessmen were also searching to raise around 150 million euros of financing to take over Altis. Russia's Sistema, in turn, has on its own front been showing interest in taking over Infineon in 2009. Reports further have it, that the new mayor of Corbeil, Altis's home town, was looking for investors during his trip to Moscow in March 2010.

Another example of Rusnano's cooperation in the European high-tech industry is found in the 2009 agreement between Rusnano and a major Russian financial-industrial group Renova, to set Russia's largest solar modules manufacturing facility based on the technology provided by a major Swiss company Oerlikon Solar. Total investment in the project is 20.1 billion rubles. Rusnano will contribute 3.7 billion rubles to the equity of the new company. In addition, the corporation will grant to the venture a loan of 9.8 billion rubles. Rusnano will hold a 49 %-share in the equity of the project company. Renova will hold a 51 %-share in its equity and be responsible for development of the business.

Rusnano's cooperation with Finland's TEKES

One of the earliest initiatives for Rusnano's international cooperation was made between Russia and Finland. The two countries started to held roundtable cooperation discussions in 2008 under an international agreement for collaboration in the nanotechnology sphere. Early 2009, Deputy CEO of Russian Corporation of Nanotechnologies Andrey Malyshev and Director Reijo Munther, Materials technology, of TEKES, the Finnish Funding Agency for Technology and Innovation, signed a memorandum on standardisation and regulation in nanotechnology at a recent Russian-Finnish roundtable.

The cooperation memorandum addresses problems in regulating nanotechnology and approaches to developing coordinated positions for presentation to European standardisation and safety agencies. The standards would be applicable to joint Russian-Finnish projects, if undertaken. On Rusnano's proposal, a working group was also formed to take over joint efforts to standardise and regulate Russian-Finnish nanotechnology.

The memorandum signed envisions collaboration between Finland and Russia as the foremost international joint undertaking to regulate nanotechnology.

The cooperation was described by Yuri Tkachuk, Director of the Department of Standardization at Rusnano, as follows: *"Development of joint Russian-Finnish projects for technical regulation and safety assessment in nanotechnology and nanoindustry products is directed toward creating conditions for competitive products from Russian-Finnish projects to enter world markets,"* Tero Elkin, Manager for Development at the Finnish Centre for Metrology and Accreditation and chairman of the roundtable, emphasised that *"future cooperation will be positive for both countries. We must consider global aspects. As proposed by the Russian side, joint Finnish-Russian advances in this sphere could be used in integrating other countries into this model for collaboration."*

On a long path to the US conquest

Rusnano turned its focus on the USA in 2009. During the previous year, the corporation has, first and foremost, sought opportunities to press the US President Barack Obama for tax breaks for Russian nanotechnology as Rusnano develops its plans to create a $ 1-billion venture fund with US companies to invest in Russia.

The CEO of Rusnano, Anatoly Chubais, has publicly pushed for a concrete cooperation proposal concerning nanotechnology and other technological spheres, involving notably preferential treatment in the USA, such as tax breaks, for Russian innovative products. A senior Rusnano official has been quoted as saying*: "If there is political support at the presidential level, it will be easier for us to reach agreements with U.S. banks and funds and promote our innovative projects on the local market".* (Moscow Times 2009) The Rusnano official further quoted Rusnano's interest in building cooperation with US firms in energy efficiency, medicine and other advanced spheres of economy.

A key area of cooperation pushed by Rusnano would be the $ 1-billion fund under which US companies would help finance the development of new technologies in Russia. According to the Rusnano CEO Chubais, the investors would include companies from the US Silicon Valley.

In autumn 2009, the supervisory council of Rusnano approved the corporation's participation in a new Russian venture fund, established in partnership with VTB Group and the US Silicon Valley's Draper Fisher Jurvetson (DFJ). The overall size of the first stage of the project initiated by DFJ and VTB Group is $ 100 million. Of this amount, Rusnano and VTB will commit $ 50 million each to the fund. The fund, DFJ-VTB Aurora, will focus on promising nanotechnology

innovation both in Russia and abroad, as well as on attracting foreign partnerships and investment to support the construction of Russian nanotechnology production facilities. VTB Capital, the investment business of Russia's VTB Group, and DFJ will act as managing partners.

As put by Timothy Draper, a founding partner of DFJ: *"We are very impressed with the extensive amount of innovation and intellectual property currently being developed in Russia. We are looking forward to bringing the experience of DFJ's team in funding and helping along start-ups to work with the VTB Capital and RUSNANO to give more Russian entrepreneurs the opportunity to bring these strong technologies to the global market."* (AltAssets 2009)

DFJ-VTB Aurora is the first international venture project in Russia realised with participation of Rusnano. Cooperation with such giants as VTB Group, the second largest Russian financial institution in Russia, and the leading venture fund DFJ, inevitably sets the benchmark for future venture funds in terms of success potential.

Besides the already operational DFJ-VTB Aurora, Rusnano is due to establish another major international fund together with a US partner. The corporation will set up a $ 1-billion international nanotechnology investment fund. In late 2009, the US-based C Change Investments won a tender to become a Western investment partner for Rusnano's massive international fund.

Rusnano and C Change are expected to invest up to $ 500 million each into the new fund. It will be registered in the U.K. and formed in Q4 2009 – Q2 2011. The fund will be managed by Rusnano Capital. The fund will invest in nanotechnology ventures in Russia including Western technology transfer and development of Russian nanotechnology production.

Launched in November 2008, C Change Investments is based in Cambridge, MA and focuses on investment in and development of clean energy technologies. C Change was co-founded by John Preston, former director of technology development at MIT, and Russell Read, former chief investment officer of the California Public Employees' Retirement System (CalPERS).

As the Rusnano executives have sought to promote further the corporation as a source of internationally acknowledged expertise and a strong scientific base, the US fund managers

have widely recognised Rusnano's chances to become a major global player once it will be able to make its international operations more flexible. The US commentators have repetitiously said that more flexible investment operations would be the key to success in the US markets, as Rusnano would have to compete with major private investors.

Rusnano's cooperation with the CIS countries

Although cooperation with the CIS countries is defined as one of the priority directions of Rusnano, the concrete steps in this direction remain scarce to date. Among the few practical initiatives, Russian-Kazakh technology fund has been established to finance relevant scientific and technological development. The operation of the fund officially released under the assistance and supervision of Presidents of both countries is, however, still in its infancy.

There are further perspectives on Rusnano's cooperation with Belarus and Armenia, together with several technology projects under discussions. The overall tendency of Rusnano's CIS cooperation appears to be that the stress is currently put more on signing numerous framework agreements with several countries and discussing general project plans instead of yet engaging in practical investment or technology development schemes.

CONCLUSIONS AND POLICY CONSIDERATIONS

1) *Rusnano offers significant potential for participation of foreign companies in fast-developing Russian nanotech industry*

   Rusnano's funding principles do not make difference between domestic and foreign applicants, given that at least a part of the production is undertaken in Russia. However, as the practical evidence shows, evaluation times for foreign project applications can be significantly higher than for domestic ones and not a single foreign led-project has been funded yet (as of 4/2010).

2) *The relations between Rusnano and the state administration still remain to be defined*

   Up to date, Rusnano has enjoyed generous financial support from the state as major part of funds earmarked to developing the nanotech industry in Russia is directed through Rusnano. If and when the corporation will be transformed into a joint-stock company (possibly already in 2010), the principles of state funding may be altered. In that case, the corporation would be more vulnerable to market forces and would face fiercer competition especially on international markets. This would require even greater opening up to international cooperation and developing a more flexible operation structure.

3) *Rusnano has grown notably active in establishing foreign partnerships and engaging in overseas funding schemes*

   Since early 2009, Rusnano has pushed for accelerated internationalisation through establishing international funds and planning foreign acquisitions. This is a notable step forward towards internationalization of Russia's nanotech industry and an essential stepping stone on the path of modernising the Russia's economy. Until now, the development of very few of Russia's industries has relied on internationalisation from an early stage onwards; nanotechnology has a potential to be the notable exception and a showcase industry in this respect. This, however, requires a true market-minded approach to development of the sector and a notable transformation away from the existing practices of developing the giant and inflexible state corporations.

4) *Participation of foreign investors in Russian nanotech industry and foreign start-ups in particular should be advanced*

Comprehensive legislation still needs to be introduced in Russia's nanotech industry in order to facilitate entrance of foreign companies and SMEs in particular. Building a competitive nanotech industry and introducing an innovation-led economy in Russia inevitably needs extensive foreign participation and flow of people and know-how. The recently initiated building of Russia's Silicon Valley outside Moscow, for instance, could act as a pilot project also in the sense of providing eased access of foreign companies to Russia by improving legislation and easing the burden of bureaucracy.

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