

July 29, 2013



## Russia's Skolkovo Innovation Center



### METHODOLOGICAL NOTE

This *inFocus* is the first in a series of four papers publishing Seth Elan's<sup>1</sup> work with the Federal Research Division of the Library of Congress under an Interagency Agreement with U.S. EUCOM discussing *Policy Implications of the Russian Skolkovo Innovation Center*, and funded by the Cultural Knowledge Consortium. This research was conducted in Russian and English and focused on articles, news broadcasts, and commercial and government websites. As the source work was completed in October of 2012, be cognizant that additional developments could now be relevant.

### ABSTRACT OF THE SERIES

This study assesses the implications of the Russian Skolkovo Innovation Center for U.S. policymakers. Located on the outskirts of Moscow, Skolkovo represents the Russian Federation's effort to duplicate the success of Silicon Valley in California. The report discusses how, by facilitating technology transfer to Russia from the United States, Europe, and Asia, Skolkovo is designed to help Russia modernize its economy in five key areas: information technology, biomedicine, energy, satellite and space technology, and nuclear technology. The report provides detailed plans for technology transfer (including the strategy of enlisting support from scientists in the Russian diaspora), cites potential military applications of technology development at Skolkovo, and assesses prospects for the center's success in view of a wide range of challenges that must be met. Finally, the report identifies opportunities and risks posed by the center for U.S. policymakers.

- The first paper in the series reviews Skolkovo, the study's key findings, and U.S. policy implications;
- The second paper explores the industries being impacted by Skolkovo;
- The third paper covers the global interactions involving Skolkovo, and;
- The final paper in the series considers challenges and the future of Skolkovo.

---

## Part 1: Summary, Key Findings, and Policy Implications

### EXECUTIVE SUMMARY

- The Skolkovo Innovation Center is a federally-subsidized Russian research, education, and incubation hub marketed as becoming the core of a Russian "Silicon Valley."
- Corruption, construction delays, and fluctuating public sentiment and investor support continue to reduce Skolkovo's effectiveness.
- Ten key findings in this paper aggregate the issues which will be covered in later parts of this series on Skolkovo (pg. 4-5).
- U.S. policymakers must weigh the benefits of technological engagement with Russia against the risks of scientific knowledge transfer, especially for the modernization of its military.

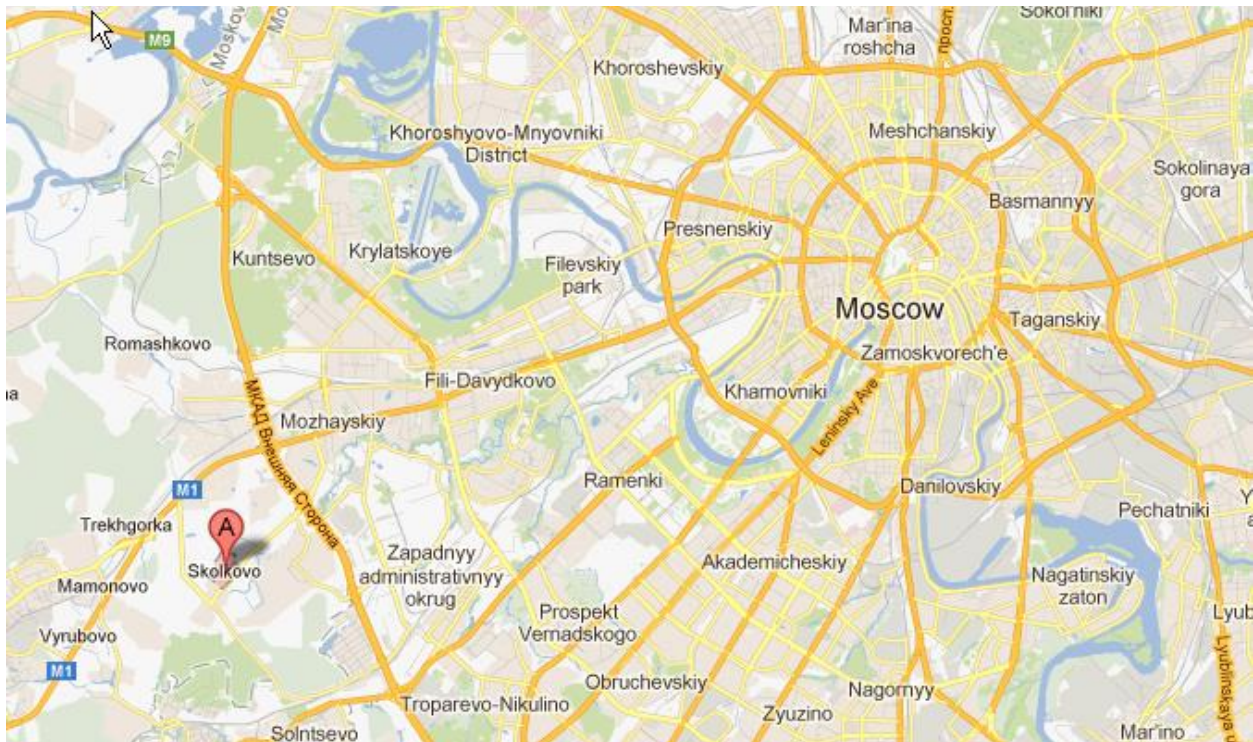
//Begin Excerpt//

Date of Information: October 24, 2012

## INTRODUCTION

The Russian innovation center managed by the Skolkovo Foundation is designed to link fundamental scientific research and applied research, and to serve as a model for the integration of teaching, research, economic development, and technical training in the basic and applied sciences.<sup>2</sup> **The nearly 1,000-acre Skolkovo Innovation Center represents Russia's effort to duplicate the success of Silicon Valley.** Located in southwestern Moscow (see figure 1), the center encompasses a technology park, a city laboratory, and several universities—Skolkovo Institute of Science and Technology, the nondegree Skolkovo Open University, and Skolkovo Business School. **The city laboratory is expected to house 21,000 people and to accommodate an equal number of commuters.**<sup>3</sup>

**The most important function of the center is to promote technology transfer from around the world, thereby stimulating innovation and entrepreneurship in Russia.** The Skolkovo Foundation hopes that, ultimately, the new center will help modernize Russia's economy, transforming it from an economy based on natural resources to one based on innovation and scientific development. According to Skolkovo's Web site, 493 companies had joined the project as of April 2012.<sup>4</sup> The *Economist* magazine reports that **the Skolkovo Foundation aspires to house as many as 40 corporate research and development (R&D) centers and 1,000 start-ups.**<sup>5</sup> Russian law governing Skolkovo requires participating entities to be legal entities incorporated under the laws of the Russian Federation, but excludes branches and joint ventures in the form of association.<sup>6</sup>

Figure 1 - Map of Skolkovo<sup>7</sup>

The Skolkovo Institute of Science and Technology, known as SKTech (pronounced “ess-kay tek”), plans to enroll 1,800 graduate students. SKTech has assigned an initial class of 21 students to one year of study abroad, which began in August 2012.<sup>8</sup> **The Massachusetts Institute of Technology (MIT) has entered**

into a three-year agreement with the Skolkovo Foundation to develop the new graduate university.<sup>9</sup> See figure 2 for a graphical depiction of the overall structure and principal goals of the Skolkovo Innovation Center.

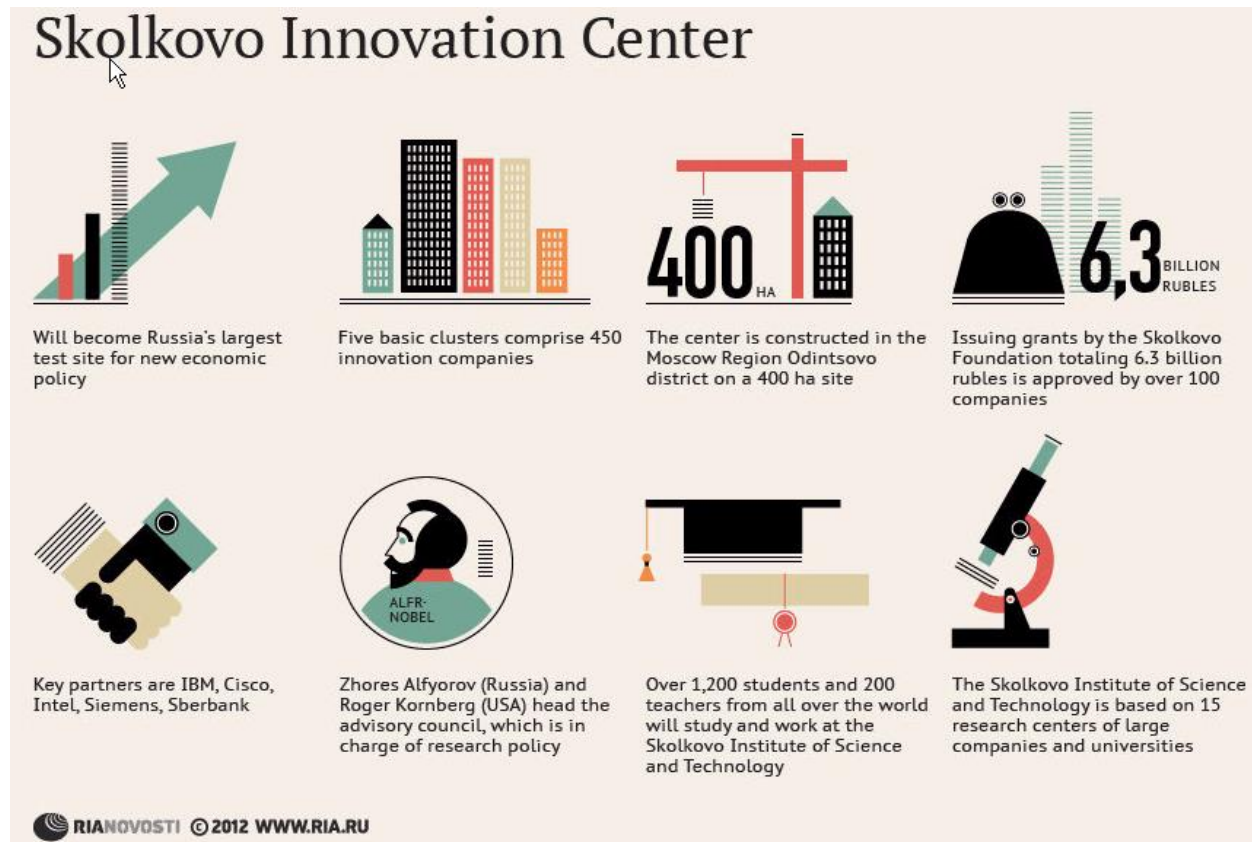


Figure 2 - Infographic of Skolkovo Innovation Center<sup>10</sup>

In September 2012, at the request of the Russian government, the political party United Russia was drafting legislation requiring state enterprises to set aside a percentage of their revenue for SKTech. The percentage each enterprise sets aside depends on the profitability of its industrial sector. For example, Russia might reasonably expect enterprises in the energy sector to contribute as much as 5 percent to SKTech, whereas such a tax would be onerous for enterprises in less profitable sectors. An article in *Izvestiya* compared these contributions to the endowments of American universities like Harvard and Yale. However, despite the earlier promises of Rosneft and other enterprises to contribute 1 percent of their revenue to SKTech, the only enterprise that had actually done so as of September 2012 was JSC Russian Railways. Furthermore, Gazprom announced plans to set up its own technology center, devoted to natural gas research.<sup>11</sup>

The nonprofit Skolkovo Foundation, which the Russian government established in May 2010 with an initial grant of US\$5 billion, is responsible for coordinating the entire Skolkovo project.<sup>12</sup> Viktor F. Vekselberg has served as president of the foundation since its inception.<sup>13</sup> Vekselberg chairs the Renova Group, which invests in and manages companies in the sectors of energy (oil and gas), metallurgy, nanotechnology, and telecommunications.<sup>14</sup> A Scientific Advisory Council, chaired by Nobel Prize winners Roger D. Kornberg, biochemistry professor at Stanford University School of Medicine, and Zhores I. Alferov, physicist at the Ioffe Physical-Technical Institute of the Russian Academy of Sciences in St. Petersburg, advises the Skolkovo Foundation.<sup>15</sup>



**Although the Skolkovo Innovation Center has begun operation, it remains a work in progress.** The physical complex is still under construction, and the Skolkovo Foundation is still recruiting staff, students, and partner companies. According to Skolkovo Foundation Vice President Seda Pumpyanskaya, the Foundation expects that the complex will be only one-third complete when it hosts the G8 Summit in 2014. Pumpyanskaya indicated that “the project will have three stages, with the commissioning deadlines in 2014, 2017, and 2020,” and will eventually have about 30,000 employees.<sup>16</sup> Figure 3 shows the ambitious architectural plan for the entire facility. However, there are many reports indicating that the center will likely continue to miss its targets for construction, foreign investment, the pace of grant transfers, and combating corruption.<sup>17,18,19,20,21,22,23,24,25,26,27,28</sup>



Figure 3 - Bird's Eye View of Skolkovo (Artist's Conception)<sup>29</sup>

## KEY FINDINGS

1. The Russian Skolkovo Innovation Center outside Moscow—the Russian Federation’s attempt to approximate if not duplicate the success of California’s Silicon Valley—is a vehicle for worldwide technology transfer to Russia in the areas of information technology, biomedicine, energy, satellite and space technology, and nuclear technology. **These five clusters are critical to the Russian Federation’s program of economic modernization away from reliance on the oil and gas industry.**
2. The Skolkovo Foundation, which manages the project, is tapping into scientific and engineering talent in the far-flung Russian émigré community through relaxed visa requirements and restrictions on foreigners. **This is part of an effort to reverse the brain drain that has weakened Russia’s scientific capabilities in the post-Soviet period.** Skolkovo is also attracting the participation of multinational companies through exceptionally attractive tax incentives.
3. **Besides corporate research, Skolkovo features a graduate university,** known as the Skolkovo Institute of Science and Technology or SKTech (pronounced “ess-kay tek”), which is being

organized with the sponsorship of the Massachusetts Institute of Technology. Eventually, SKTech, which sent an initial class of 21 students for a year of study abroad, hopes to enroll 1,800 graduate students.

4. Although military activities are not an official cluster of activity, ***the Skolkovo Foundation has, in fact, been involved in defense-related activities since December 2011***, when it approved the first weapons-related project—the development of a hypersonic cruise missile engine. The project is a response to the U.S. Department of Defense’s Advanced Hypersonic Weapon, part of the Prompt Global Strike program. Sophisticated physical security, consisting of cameras, thermal imaging, and alarms, also suggests that not all of the center’s efforts are civilian in nature.<sup>30</sup>
5. Although its primary purpose is to attract foreign direct investment, ***Skolkovo is also interested in making selected investments in foreign technology companies***. An example is the Palo Alto–based firm Jelastic, which has created a cloud platform for Java applications. In July 2012, Jelastic announced that it had received US\$1 million in funding from Skolkovo and would establish a secondary office there to develop security features enabling governments and corporations to use the platform.
6. ***Skolkovo is attracting preferential funding, generating resentment in Russia’s 14 older scientific cities***. However, given budgetary constraints and the prospect of cuts in spending for defense and social programs in coming years, ***not everyone is convinced that Skolkovo will actually receive the promised funding***. Indeed, while President Vladimir V. Putin has expressed support for Skolkovo, its establishment under the leadership of his less authoritarian predecessor Dmitry A. Medvedev may make Skolkovo a proxy for the relationship between these two leaders.
7. Skeptics in Russia criticize Skolkovo for its weak links to Russia’s domestic industry and academic institutions, as well as questionable prospects for converting basic research into industrial applications. They point to an excessive focus on construction rather than scientific development.
8. Another challenge is corruption, which is pervasive in Russian business. Although ***Russia is the world’s most corrupt major economy***, according to Transparency International, the government’s twin decisions in 2012 to join the World Trade Organization (WTO) and to sign the Organization for Economic Co-operation and Development (OECD) Anti-Corruption Convention indicate an interest in addressing this obstacle to economic development.
9. Russia’s accession to the WTO in August 2012 is consistent with Skolkovo’s objectives, ***since it further facilitates the opening of the Russian economy to foreign funding and technology***. One downside is that ***Russian industry, including the domestic telecom equipment sector, will be exposed to unprecedented foreign competition***.
10. Time will tell whether Skolkovo will trigger the desired modernization of Russia’s economy or end up as merely a symbolic showcase of a failed transformation.

#### IMPLICATIONS FOR U.S. POLICYMAKERS

One of the implications of Putin’s return to the presidency is that Russia is likely to adopt a more aggressive military posture toward the United States, particularly in regard to the deployment of a

missile defense system in Europe. Certainly, Putin's use of anti-American rhetoric as part of his campaign to regain the presidency, and his refusal to participate in the last G8 summit meeting at Camp David, leave no doubt about where he stands.

**Russia is a strong advocate of a multipolar world**, as evidenced by its support for the Iranian nuclear program. Russia has also backed the Syrian regime led by Bashar al-Assad. Both initiatives stand in direct opposition to American foreign policy goals. In addition, they raise the issue that rogue nations like Iran, Syria, and Venezuela could become the primary customers for any advanced weapons developed as a result of technology transfer at Skolkovo. The hypersonic cruise missile project, although probably intended to restore Russia's own standing as a military superpower, illustrates that Russian weapons development is not a hypothetical threat. **At the same time, one should keep in mind that Russia's "five pillars of modernization" are primarily goals for developing technologies for civilian uses, and that Skolkovo's main focus is on these five areas**—IT, biomedical, energy efficiency and alternative energy, space technologies, and nuclear power.

Apart from their anxieties about the global balance of military strength, analysts are concerned that Russia has shown signs of reverting to an authoritarian state under Putin's leadership. Signs of rising authoritarianism include the arrests and official harassment of a female punk rock band and of pro-democracy advocates like blogger Alexei A. Navalny and former world chess grandmaster Garry K. Kasparov. These disturbing developments raise the question, why should the United States—or multinational corporations based in the United States—reward such behavior by participating in Skolkovo or in any other Russian technology-transfer initiatives?

Skolkovo is an ambitious enterprise, aiming to promote technology transfer generally, by inbound direct investment, and occasionally, through selected acquisitions. As such, **Skolkovo is arguably an overt alternative to clandestine industrial espionage**—with the additional distinction that it can achieve such a transfer on a much larger scale and more efficiently. Implicit in Russia's development of Skolkovo is a critical question—a question that Russia may be asking itself—why bother spying on foreign companies and government laboratories if they will voluntarily hand over all the expertise Russia seeks? Since multinational institutions hire talent worldwide and seek access to foreign markets without regard for national interest, only the U.S. government would be in a position to persuade them to scale back their commitments in Skolkovo if U.S. relations with Russia continue to deteriorate. However, given the global dimensions of Skolkovo's technology transfer program, it is not clear how much leverage U.S. industry has.

Therefore, **the key issue for U.S. policymakers is balancing the benefits of constructive technological engagement with Russia against the risks that Russia could leverage transferred scientific knowledge to modernize and strengthen its military**. To the extent that Skolkovo's aim is to modernize the Russian economy outside the defense sector, the United States has an adequate reason to cooperate in the project. Certainly, a return to the Cold War would be a major step backward. Nevertheless, considering Russia's recent departure from its previous course toward democracy and cooperation with the West, and its current pursuit of external aggression and internal repression, the United States should calibrate its policy to reflect its concerns about Russia's behavior and goals.

*//End Excerpt//*

## STRATEGIC FORESIGHT-DERIVED IMPLICATIONS FOR EUCOM

**Russia recognizes the need to diversify and accelerate non-energy industries.** With up to 30% of Russia's GDP and half of all government revenue derived from hydrocarbons<sup>31</sup>, reliance on energy creates serious challenges over the next several decades as global supplies and consumption patterns change. Investments in technology research programs like Skolkovo are a clear sign that the at least some parts of government are eager to develop solutions which could offset reductions in the energy industry.

**Global competition and technology transfer will increase.** Federally-subsidized entrepreneurs operating in modern and campus-like laboratories will be able to aggressively pursue talent and technology. Riskier investments than those acceptable to traditional privately-funded enterprises will be possible.

**Russia's defense industry will benefit from the government's focus on growth.** The government's operation of Skolkovo and investment positions in companies will likely provide its military awareness of and access to technologies.

## RISKS AND OPPORTUNITIES FOR EUCOM

**Commercial opportunities for Europeans and Americans may increase.** Investment from the Skolkovo Foundation could be enticing for companies even if Russian strings are attached. Additionally, Russian firms not receiving support from Skolkovo may look to move operations outside Russia to reduce the burden of Skolkovo taxes.

**Anti-American rhetoric may be used to justify government subsidies.** The Skolkovo Innovation Center will only directly benefit a small portion of the Russian population and business community, yet its funding will be drawn from all. Putin seems willing to advocate a "multi-polar" world, and current marketing of Skolkovo being Russia's answer to Silicon Valley plays to a "Russia vs. America" narrative as justification for national support of Skolkovo.

**Industrial espionage could be justified through corporate relationships.** The subsidization of work between and within academic institutions, companies, and Skolkovo could be argued to permit the Russian government rights to any influenced technologies. Additionally, corporate relationships could become gateways for covert industrial espionage into parts of larger organizations not directly engaged with Skolkovo.

**Handling of Skolkovo signals Russian government motivations.** Support of the Skolkovo Innovation Center would correlate with Russia's support of diversifying its economy and aligning with international trade policies. Mistreatment of the Center or its sponsors and leadership would suggest conservative nationalistic influence in support traditional energy and power structures.

### GUEST AUTHOR:

Seth Elan, [sela@loc.gov](mailto:sela@loc.gov)







**EUCOM Strategic Foresight**  
(OCONUS) 430-2296/4525  
[william.c.busch.civ@mail.mil](mailto:william.c.busch.civ@mail.mil)



**Cultural Knowledge Consortium**  
<https://www.culturalknowledge.org/>

**Strategic Foresight Method Statement:** Strategic Foresight: 1) synthesizes new knowledge from the aggregate of relevant existing knowledge by placing it within Command context, 2) disseminates finished products throughout the community, ideally creating further dialogue and leading to new topics for research which are tailored to the customer, 3) selects topics via Command-focused (top-down) and environmentally-driven (bottom-up) approaches, 4) scopes its research plans to ensure relevance and to identify hypotheses to be tested, assumptions, and gaps in knowledge, 5) researches scholarly repositories using customized IT tools.

Unless otherwise noted, **the views expressed in this document are those of the author(s)**, as are any factual or analytical errors and/or omissions. They do not necessarily represent the official policy or position of US European Command, the Department of Defense, or the US Government.

EUCOM Strategic Foresight (ESF) edited/excerpted portions of the paper to ensure brevity and structural consistency with other ESF products. ESF provides the implications, risks, and opportunities for EUCOM.

<sup>1</sup> Seth Elan worked as author and researcher, and Malinda Goodrich acted as his Project Manager within the Federal Research Division of the Library of Congress.

<sup>2</sup> Germany, Federal Ministry for Education and Research, "Wissenschaftlicher Brückenschlag: Skolkovo Innovation Center und Berliner Einrichtungen kooperieren" [Scientific Bridgehead: Skolkovo Innovation Center and Berlin Institutions Cooperate], <http://www.kooperation-international.de/detail/info/tu-berlin-berlin-moskau-wissenschaftlicher-brueckenschlagpressekonferenz.html> (accessed July 25, 2012).

<sup>3</sup> Erawatch, "Skolkovo Innovation Centre," [http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country\\_pages/ru/supportmeasure/support\\_0015?tab=template&country=ru](http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/ru/supportmeasure/support_0015?tab=template&country=ru) (accessed August 20, 2012).

<sup>4</sup> Skolkovo Foundation, "Results of Our Work," <http://www.sk.ru/en/Model/AboutFund.aspx> (accessed July 26, 2012).

<sup>5</sup> *Economist*, "Innovation in Russia: Can Russia Create a New Silicon Valley?" July 14, 2012, <http://www.economist.com/node/21558602> (accessed July 18, 2012).

<sup>6</sup> Skolkovo Foundation, "Criteria for legal entities getting Skolkovo status," <http://community.sk.ru/foundation/helpcenter/w/faq/criteria-for-legal-entities-getting-skolkovo-status.aspx> (accessed September 6, 2012).

<sup>7</sup> Google Maps, <https://maps.google.com/maps>

<sup>8</sup> *Economist*, "Innovation in Russia: Can Russia Create a New Silicon Valley?"

<sup>9</sup> *MIT News*, "Skolkovo Foundation and MIT To Collaborate on Developing the Skolkovo Institute of Science and Technology," news release, October 26, 2011, <http://web.mit.edu/newsoffice/2011/skolkovo-agreement-1026.html> (accessed July 18, 2012).

<sup>10</sup> RIA Novosti, "Skolkovo: Russian 'Silicon Valley'," <http://en.rian.ru/infographics/20120427/17061637.html> (accessed July 27, 2012).

<sup>11</sup> Alena Sivkova and Dmitry Runkevich, "Goskompanii otdadut 5% svoikh dokhodov na innovatsii" [State companies to spend 5 percent of revenues on innovation], *Izvestiya* (Moscow), September 5, 2012, <http://izvestia.ru/news/534386> (accessed September 6, 2012).

<sup>12</sup> New Cities Foundation, "Skolkovo Foundation Joins the New Cities Foundation," May 16, 2012, <http://www.newcitiesfoundation.org/index.php/2012/05/skolkovo-foundation-joins-the-new-cities-foundation/> (accessed July 26, 2012).

<sup>13</sup> Sergey Borisov, "ROAR: Tycoon Vekselberg to build Russia's 'Silicon Valley'," RT television network, March 24, 2010, <http://rt.com/politics/roar-tycoon-silicon-valley/> (accessed July 26, 2012).

<sup>14</sup> Renova Group, "Renova Group Structure," <http://www.renova.ru/en/structure/company/> (accessed July 26, 2012).

<sup>15</sup> Germany, Federal Ministry for Education and Research, "Wissenschaftlicher Brückenschlag."

<sup>16</sup> NTN World News, "Skolkovo To Be Built by Approximately One/Third by G8 Summit 2014," May 15, 2012, <http://ntnnews.manjunet.com/2012/05/15/skolkovo-to-be-built-by-approximately-onethird-by-g8-summit-2014/> (accessed in July 25, 2012).



- <sup>17</sup> Skolkovo Foundation. “2011 Annual Report.” Moscow, June 20, 2012.  
<http://community.sk.ru/press/b/weblog/archive/2012/06/20/skolkovo-foundation-annual-report-2011.aspx> (accessed July 31, 2012).
- <sup>18</sup> Mokrousov, Irina. “Who is Profiting from Skolkovo.” *Vedomosti*, 2 July 2012.  
[http://www.vedomosti.ru/library/news/2234875/pochem\\_innovacii\\_dlya\\_naroda?full#cut](http://www.vedomosti.ru/library/news/2234875/pochem_innovacii_dlya_naroda?full#cut)
- <sup>19</sup> *Vedomosti*. “Medvedev’s main idea is not being funded.” 26 October 2011.  
[http://www.vedomosti.ru/tech/news/1403098/stop\\_modernizaciya#ixzz1btWO1fR](http://www.vedomosti.ru/tech/news/1403098/stop_modernizaciya#ixzz1btWO1fR)
- <sup>20</sup> *Vedomosti*. “State companies to transfer 1 percent of innovation budgets to Skolkovo.” 23 March 2012.  
<http://www.vedomosti.ru>
- <sup>21</sup> *Gazeta*. “The Road to Skolkovo Cracked.” 28 March 2011. [http://www.gazeta.ru/auto/2011/03/28\\_a\\_3567409.shtml](http://www.gazeta.ru/auto/2011/03/28_a_3567409.shtml)
- <sup>22</sup> *CNews*. “2 million rubles spent on the creation of the Skolkovo website.” 15 April 2011.  
<http://www.cnews.ru/news/line/index.shtml?2011/04/15/436645>
- <sup>23</sup> *Lenta*. “Medvedev Gave Rotenberg Right to Build Roads Around Skolkovo.” 24 May 2012.  
<http://lenta.ru/news/2012/05/24/rotenberg/>
- <sup>24</sup> *RIA Novosti*. “Skolkovo has developed its own procurement system.” 16 May 2012.  
[http://ria.ru/sk\\_analytics/20120516/650602683.html](http://ria.ru/sk_analytics/20120516/650602683.html)
- <sup>25</sup> Ananan, Mikhail. “I don’t believe in Skolkovo.” *Nanonewsnet.ru*, 26 April 2010.  
<http://www.nanonewsnet.ru/blog/nikst/mikhail-ananan-ya-ne-veryu-v-skolkov>
- <sup>26</sup> *Kommersant*. “Skolkovo Replenished Funding.” 8 November 2010. <http://www.kommersant.ru/doc/1534962>
- <sup>27</sup> *Ng*. “Staff failure in Skolkovo.” 18 November 2011. [http://www.ng.ru/politics/2010-11-18/1\\_skolkovo.html](http://www.ng.ru/politics/2010-11-18/1_skolkovo.html)
- <sup>28</sup> Onishchenko, Yevgeny. “Competitive Support for Science as it Happens in Russia.” *Polit.ru*, 11 June 2009.  
<http://polit.ru/article/2009/06/11/onischenko>
- <sup>29</sup> Jean-Marie Duthilleul and Etienne Tricaud, AREP press release, March 2, 2011,  
[http://www.arep.fr/medias/editor/AREP\\_ComPresseAREP\\_Skolkovo\\_VA.pdf](http://www.arep.fr/medias/editor/AREP_ComPresseAREP_Skolkovo_VA.pdf) (accessed July 25, 2012).
- <sup>30</sup> Anna Gorchakova, “Skolkovo prevratyat v rezhimyj gorod” [Skolkovo is being transformed into a regime city], *Izvestiya* (Moscow), November 21, 2011, <http://dlib.eastview.com/browse/doc/26273383> (accessed July 24, 2012).
- <sup>31</sup> National Center for Policy Analysis, “Russia’s Dependence on Energy Consumption,” June 4, 2013.  
[http://www.ncpa.org/sub/dpd/index.php?Article\\_ID=23239](http://www.ncpa.org/sub/dpd/index.php?Article_ID=23239) .

*Additional Sources:*

- Apollonova, S. A. “Dve ekonomiki—dve strany. i snova o rossiiskom proizvoditele telekom-oborudovaniya” [Two economies—two countries—again about the Russian telecom equipment manufacturer]. *Elektrosvyaz* (Moscow), February 2012.  
<http://www.elsv.ru/files/actual/275.pdf> (accessed August 23, 2012).
- Bidder, Benjamin, and Matthias Schepp. “Stiller Dulder” [Quiet Sufferer]. *der Spiegel* (Hamburg), July 2012, 84–85.  
<http://www.spiegel.de> (accessed July 16, 2012).
- Bogoroditskaya, I. A. “Otrasl’ IKT na voskhodyashchem trende” [The ICT sector trending higher]. *Elektrosvyaz* (Moscow), January 2012. <http://www.elsv.ru/files/actual/269.pdf> (accessed August 23, 2012).
- Chyernich, Alexander, and Lolita Grusdeva. “Russia looking to reverse brain drain of young scientists.” Translation by Worldcrunch. *Time* (original article appeared in *Kommersant*), November 18, 2011.  
<http://www.time.com/time/printout/0,8816,2099861,00.html> (accessed July 20, 2012).
- Economist*. “Innovation in Russia: Can Russia Create a New Silicon Valley?” July 14, 2012.  
<http://www.economist.com/node/21558602> (accessed July 18, 2012).
- Forbes.ru*. “Dmitrij Medvedev sdelał Yuzhoj Koree interesnoe predlozhenie” [Dmitry Medvedev made South Korea an interesting offer]. <http://www.forbes.ru/print/node/59547> (accessed August 6, 2012).
- Johnson, Juliet. “Mission Impossible: Modernization in Russia after the global financial crisis.” PONARS Eurasia Policy Memorandum No. 196, Program on New Approaches to Research and Security in Eurasia (PONARS Eurasia), Institute for European, Russian and Eurasian Studies, Elliott School of International Affairs, George Washington University, Washington, DC, June 2012. <http://www.gwu.edu/~ieresgwu/assets/docs/ponars/pepm196.pdf> (accessed August 29, 2012).

---

Steiner, Eduard. "Russland fürchtet durch WTO-Beitritt die Konkurrenz" [Russia fears competition as a result of WTO membership]. *die Welt* (Hamburg), August 21, 2012. <http://www.welt.de/wirtschaft/article108722788/Russland-fuerchtet-durch-WTO-Beitritt-die-Konkurrenz.html> (accessed August 23, 2012).

The researcher also used newspapers and news services, including BioTOP Berlin-Brandenburg, Bloomberg News, *Interfax*, *Izvestiya*, Marchmont Innovation News, *Moscow Times*, Itar-Tass News Agency, *MIT News*, NTN World News, *Parlamentskaya Gazeta*, *Register* (London), Reuters, RIA Novosti, *Svobodnaya Pressa*, Venture Business News, *Vestnik Svyazi*, *Voyenno-Promyshlenny Kuryer Online*, and the Voice of Russia; television networks such as Rossiya 24 and RT; databases such as Eastview, Open Source Center, and Johnson's Russia List Email Archives; the Web sites of the Skolkovo Foundation and Russian government entities; the Web sites of companies, such as Facility for Antiproton and Ion Research in Europe GmbH, Renova Group, and Schneider Electric, and of universities, such as Imperial College London, Massachusetts Institute of Technology, Purdue University, and the University of Amsterdam; and the Web sites of other organizations, including AREP, Erawatch, New Cities Foundation, PONARS Eurasia, Russkiy Mir Foundation, and the World Trade Organization.