



Update of Russian Semiconductor and PV Market with the latest News

April 1, 2010

It is reported by the Kremlin press service that Dmitry Medvedev gave instructions following the meeting of the President' Commission for Modernization and Technological Development of the Russian economy, which was held on March 23.

In particular, Vladimir Putin and Vladislav Surkov (the First deputy of the Head of the Russia's President Administration) requested to submit proposals on regulations for the establishment and operation of geographically isolated complex of innovative technologies "Silicon Valley" in Skolkovo before May 1.

A clearly-written legal framework will contribute to "the commercialization of the innovation center, including the area of taxation, customs and tariff regulations, as well as administrative procedures (including migration)."

As reported previously, the Center for the development and commercialization of new technologies will be created in the suburban Skolkovo.

According to the president, in fact it will be a new city, where on the basis of such a center the following five high-tech areas will be developed: energy, IT, telecommunications, biomedical technologies and nuclear technologies.

It is assumed that starting from the spring of 2010 the biggest private companies will develop their innovative products in their clusters and then the most promising pre-selected products will be moved to the "valley". The process of the valley settle down will start at the year end.

In support of projects and for the "valley" design the sum of about 4 billion rubles (100M Euro) is allocated from the total sum of 10 billion rubles which is reserved in the budget-2010 for the modernization projects. It is assumed that the infrastructure of the new complex will accommodate 30-40 thousand people and will include everything needed for the development of scientific ideas and turning them into business: from housing and comfortable environment to business incubators and services, ready to take on marketing strategies new products and technologies.

Viktor Vekselberg (executive director of TNK-BP's) has been appointed as Coordinator of the project which is already called the national "Silicon Valley". As to the work on the selection and funding the necessary equipment and technologies for the Valley, this will be responsibility of Rusnano.



January 21, 2010

Russian poised to restore industrial strengths

Russian government continues working on making the country attractive for local and foreign investments, while creating attractive investment climate, reducing administrative barriers, further developing private/state partnership and financial infrastructure, as well as reducing bureaucratic barriers for business.

“There are some lessons we learn from the crisis, and one of them is understanding of the necessity to invest in efficiency, in infrastructure, in big, medium and small size investment projects.” – said Vladimir Putin in his speech at International Economic Forum. He also added that even in the crisis time the long term goals which were set up for the development of the country stay fixed. This includes the economy diversification, breakaway from raw materials dependence and switch to innovative way for the country development. We badly need modern transport and energy infrastructure, new projects in high technologies area and in telecommunications. We cannot afford to postpone investment process”.

For the first time in the latest period of it's history Russia's leadership set up a nation's goal of the country modernization in all social, industrial, economic and political areas with the following key strategic directions (from President Medvedev speech addressed to the Nation on Nov.12, 2009:

- Technical modernization of the entire industry. *As the President said, “it is a matter of Russia's survival in the contemporary World”*
- Development of space technologies and telecommunication;
- Deploying the high-end computers' potential;
- Setting up powerful modern technology center for R&D in Russia following the example of Silicon Valley and other similar centers in other countries;
- Creation of permanently working processes to support the attraction of the most competent Russian and foreign scientists, as well as entrepreneurs experienced in commercialization of innovations;
- Focusing the country' foreign policy on pragmatism attracting capital, new technologies, advanced concepts and much more to Russia.



Rusnano, being a vehicle through whom government is investing in high tech industries, continue funding semiconductor and PV projects.

Rusnano was set up in 2007 and by now they approved 62 projects.

On September 19 Rusnano announced their development strategy up to year 2015. By that time the State Corporation should become independent from the state budget by means of investing in new projects for the account of selling their shares in old projects. "After that the corporation can go different ways including the way of privatization" – said Anatoly Chubais.

Some analysts believe that following the above way Rusnano can reach \$30B-\$40B capitalization level by 2015.

Semiconductors, solar energy, optoelectronics and composite materials are among the current priorities of Rusnano.

Project updates

- **Nanotechnology Centers—Opportunities for Profitable Private Investment:**
<http://www.rusnano.com/Post.aspx/Show/24075>

Semiconductor Projects:

- **Sitronics/Mikron**
200 mm project (0.18um CMOS EEPROM). All equipment installed, production launched.

Commercial 90-nm IC production to be set up in Russia at Mikron:

<http://www.rusnano.com/Post.aspx/Show/18622>

Currently works on upgrade up to 90 nm are going on. Agreement with RusNano on Joint Venture set up is signed. In accordance with the Agreement RusNano invested in the JV 6,5B rubles (150M Euro). License agreement with STM is signed. Production launch (test wafers) is planned for Q4 2010 / Q1 2011.



■ **Angstrom-T:**

130nm, 15,000 WSM project project of Angstrom-T with 815M Euro loan from Vnesheconombank (VEB) is in progress, though with some delays in the building of production site. The delays caused some difficulties in making timely payments for credit to VEB, and in August, 2009 VEB who by funding the project became the Angstrom-T control share holder decided to take the project control in their hands and became the management company for Angstrom. Currently they are working on Angstrom -T project restructuring aimed at the increase in technology level up to 90 nm.

■ **Basic Angstrom:**

Purchase of production line for smart power devices manufacturing (200 mm, .35 mkm) was postponed in connection with the company owner change, but the above project, having very good market worldwide, is still in force being supported by the state.

■ **NIIS:**

Equipment is supplied and being installed, technology transfer process is finished, facility utilities are being upgraded with site acceptance planned for Q2, 2010. The project (150 mm; 0,35 mkm) is aimed at the production of high reliability ICs for special applications (automotive, industrial, etc.).

■ **Optical Network components project, St. Petersburg**

RUSNANO's Supervisory Council has approved the corporation's participation in a project that would found a high-tech enterprise for manufacturing gallium-arsenide substrates, chips, and optical components based on vertically emitting lasers: <http://www.rusnano.com/Post.aspx/Show/18674>

■ **Integral, Belarus**

Completed and successfully running 0,35 um production line while having some issues with production at 0,25 um technology level. The government of Belarus is planning to have Integral split in parts shortly and then make those parts privatized.

■ **LED project in Urals**

With participation of RusNano, ONEXIM Group and the Ural Optical and Mechanical Plant will manufacture a new generation of LED: <http://www.rusnano.com/Section.aspx/Show/18017?Page=2>

The project is aimed at creating a highly technological industrial production of a new generation lighting systems based on gallium nitride semiconductor chips. The final product will be LED chips, LED lamps and lighting systems, the brightness of which is comparable with the best world analogues. The record low amount of defects in semiconductor layers allows the



devices to work without losing effectiveness with high-density currents, enabling good brightness to price ratio for LED chips. Investment: Total — €76.7M, RUSNANO — €40.6M

■ **Project of MICRAN**

Currently under consideration by RusNano for funding. Includes:

- 1) set up of an integrated complex for development and production of solid state gallium arsenide based heterostructures;
- 2) on the basis of the above development, manufacture of microwave devices.

■ **SRISA**

Working on existing pilot line modernization to 130 nm technology level. Funding provided by the state.

■ **MIET University in Zelenograd, the owner of Photomask Center**

Together with Vistec Electron Beam GmbH have entered into a joined electron-beam lithography photomask manufacturing project recently kicked-off in Russia which is aimed at providing both semiconductor industry as well as research institutes in Russia with advanced photomasks for a wide range of applications: <http://www.nanowerk.com/news/newsid=14002.php>

■ **Istok:**

Project on microwave device manufacturing (1,500 wafers per month , 150 mm 0.35 mkm). Equipment installation is close to the completion.

■ **Pulsar:**

Project on microwave device manufacturing (1,500 wafers per month , 150 mm 0.35 mkm). Clean room construction is being completed.

Photovoltaic projects:

■ **NITOL–TCS, Polysilicon and Monosilane.**



This project was the first PV project approved by RusNano and with RusNano participation in the project. It is aimed at constructing Russia's first large-scale complex producing polycrystalline silicon and monosilane in Siberia. The detailed information can be found on RusNano website: <http://www.rusnano.com/Post.aspx/Show/18022>

- **Renova and RusNano founded a company for Russia's largest production of solar batteries:**
 The Supervisory Council of the RusNano has approved the corporation's participation in a project to produce solar modules using thin-film technology. The parties agreed to establish a joint venture to manufacture solar modules based on thin film technology provided by Oerlikon Solar (Switzerland). The detailed information can be found on RusNano website: <http://www.rusnano.com/Post.aspx/Show/18027>
- **KVANT Project.**
 On July 31, 2009 the Supervisory Council of RUSNANO approved a joint venture project with Research-Production Enterprise NPP KVANT for the manufacture of solar batteries for space applications. The project is based on bifacial gallium arsenide solar batteries for satellites and space stations, with battery efficiency increased from 15 to 32% compared to silicon-based batteries: <http://www.rusnano.com/Post.aspx/Show/18696>
- **Solar Wind.**
 Project to Produce Bifacial Sensitive Monocrystalline Solar Modules in Krasnodar was approved by RusNano on December 17, 2009: <http://www.rusnano.com/Post.aspx/Show/24473>
- **Module Solar AG and "Solnechniy Potok" (Solar flux) company project is funded by RusNano.**
 The project is aimed at production of nano-heterostructure photoconverters with the efficiency reaching 37-45%. Solar modules and new generation power plants, equipped with Frenel lenses and sun tracking system will also be produced under the auspices of the project. It will commercialize the outcomes of research conducted in the Ioffe Physical Technical Institute in the field of fundamental scientific and technical principles and technological basis for constructing the main blocks of concentrator solar photovoltaic plants. More info: <http://www.rusnano.com/Post.aspx/Show/24352>
- **KONTI Group** is planning to invest 9B rubles (200M Euro) from their own and borrowed funds in **Mining Chemical Combine (MCC)** located in Krasnoyarsk region which has become one of the first producers of polysilicon in Russia. Though MCC is still state owned enterprise, the privatization



process has finally started. Konti Group will invest in the project while becoming the control share holder: <http://www.cnews.ru/news/top/index.shtml?2009/06/02/349341>

- **Baltic Silicon Valley:** International project "Polysil" which belongs to "Baltic Silicon Valley" company, near St. Petersburg (based on electric energy from Leningrad Atomic Power Station. Aimed at the production of 5000 tons of Poly per year. Supported by the government.

- **Fully integrated 1.2GW solar plant** is to be built in the Omsk region in Western Siberia, Russia at an estimated cost of €1.6 billion (approx US\$2.4 billion), which will include a 10,000MT monosilane/polysilicon plant as well as c-Si solar cell and module production plants. Work on project coordination with local structures continues and while project funding is not approved yet, the customer is actively working with competing technology and equipment suppliers. Some more details: http://www.pv-tech.org/news/a/a_1.2gw_1.6_billion_polysilcon_to_solar_module_plant_planned_for_russia_wit/

- Project for organization of **solar module production with 12MW yield** at the Metal Ceramics Instrumentation Plant in the city of Ryazan makes the plant the largest module producer in Russia. "Spire wins turnkey solar module manufacturing line contract in Russia": http://www.pv-tech.org/news/a/spire_wins_turnkey_solar_module_manufacturing_line_contract_in_russia/

- **"Solar Energy JSC"**
 Equipment for producing solar cells up to 10 MWT/year purchased from GT Solar. Production line is being installed. Was scheduled for launch in December, 2008; postponed due to financial challenges.
 TC and Poly design work are going on with CDI and Hyprosintes as EPCM contractors. 1K tons of polySi should be produced in 2010 and 2,5K tons per year starting in 2011– with one year delay caused by economy downturn. Project funding negotiations with RosNano are underway.

- **"Semiconductor Plant"**, Zaporozhye, Ukraine. The project on TCS and Polysilicon manufacturing with production volume 2,5 tons per year and potential extension is progressing fast. Equipment supply finished and installation currently going on. Project cost 402M Euro. Commissioning and start up in Q2 2011; FSO in Q4 2011; Contract for technology & equipment for TCS and Poly signed with Centrotherm.



- **Podolsky Plant–TCS**, Polysilicon project is under way. Currently producing Si ingots and monosilicon wafers (156x156), pilot production of solar cells (2 mwt/ year) in Orel. Plans to start Poly production in 2011 on the basis of their own technology for PolySi, equipment–from GT Solar, technology for TCS–from SolMic. Work with Rusnano on project funding continues.

- **“Tash-Kumyr Silicon Production” JSC**, Kirgizia. Production of TCS & Poly manufacturing based on old technology and equipment re-started.
Phase 2: Big project for 2,5K tons/year of polySi manufacturing on the basis of modern technologies and equipment. Currently are looking for investor/partner.