

# RUSSIA / EURASIA

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## Venture Capital Opportunities in Russian Petroleum Technologies

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This excerpt of a report by Innovative Ventures, Inc. (IVI) summarizes the results of the company's investment activities to identify and finance petroleum technologies (upstream & downstream) and renewables for venture capital (VC) investment in Russian small & medium size enterprises (SMEs) and institutes. It is presented here to share the company's understanding of market characteristics and technology opportunities. It is intended to provide learning curve lessons for:

1. International corporations and financial investors that seek gamechanging technologies from CIS countries and strategies to develop and access the market; and
2. Russian technology developers, managers/entrepreneurs of Russian SMEs and institutes that want to conduct business with international corporations and VC investors.

The full report, including descriptions of technologies, is available on request from IVI or can be downloaded from its web site, [www.IVipe.com](http://www.IVipe.com).

### Objectives & Technology Focus

IVI makes seed and early stage VC investments with our corporate partners and co-investors. IVI's goal was to identify Russian petroleum technologies for commercialization through:

1. A license/sale of intellectual property (IP); or
2. Investment of VC into an existing SME or the creation/financing of a new company to commercialize the technology to market.

Technologies sought fell into three categories:

1. Downstream solutions;

2. Upstream solutions; and
3. Renewable energy solutions.

### Russian Technology and Venture Capital

Russia is a well-known developer of world-class technology. Multinationals are investing in, and incorporating Russian technology into their products, e.g., Intel, Siemens, Motorola, Microsoft, Boeing, IBM, United Technologies, Cadence and Sun. A few global VC technology investors capitalized Russian technology with the startups' corporate headquarters in Europe/USA and the development team in Russia. They have done so to harness the technical and cost advantages of Russian developers with the ease of doing business in Europe or the USA.

In spite of these successes, there is a lack of VC activity in the seed and early stage Russian technology segment for many reasons, e.g., lack of information on deal flow, actual and emerging seed & early stage VC opportunities, and how to channel the skills of Russian talent into R&D to create future deal flow and investment opportunities. Many financial and strategic investors are preoccupied with making investments in the USA, Europe, India, Israel and China with little interest to spend the time, resources and money to search-out hidden opportunities in Russia.

IVI releases market information to inform multinational corporations and co-investors to the potential that exists in Russia and with Russian technology, to demonstrate that seed and early stage deals exist, and that this potential can be accessed and developed for financial gain. It provides details on market characteristics, technologies, VC investment opportunities and developers of technical solutions; such detailed information on the petroleum industry did not exist prior to this IVI report.

### Why Care About Russia & Russian Technology?

Three reasons why:

1. To reduce cost and increase sales through new business models
2. To localize product content and reduce market bar-

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The table presents technologies sought for VC investment.

Artificial lift & advanced drilling	Enhanced oil recovery	Non-seismic exploration	Hydrocarbon processing
Novel well construction, smart fields & wells	Solutions to E&P conditions unique to Russia, (e.g., Artic cold, on & off-shore)	Exploration flow assurance	Automated remote field operations
Earth modeling	Off-shore	Renewables	Surface facilities

riers for operating in Russia

3. To develop the market and create new revenues

**The Russian Petroleum Technology Sector**

**Background**

From May 2004-September 2004 IVI sourced deal flow from SMEs and institutes in Russia with some opportunities received from Kazakhstan, Ukraine and Belarus and E. Europe (Figure 1).

**Deal Flow & Investment Opportunities in the Petroleum Technology Sector**

Strategic potential exists in Russia as demonstrated by the quantity and quality of technology deal flow opportunities. IVI evaluated almost ninety (90) technologies and SMEs in upstream, downstream & renewables with technologies receive from fifty-six (56) sources; thirty-two (32) from enterprises, twenty-one (21) from institutes (& innovation centers affiliated with institutes) with three (3) from individuals. Some institutes and SMEs submitted multiple technologies for investment.

Four technologies are short-listed for R&D financing and two short-listed for venture capital investment (Figure 2). As expected in evaluating investment opportunities, we rejected most due to poor definition of the technology, lack of information on its value and test data substantiating its performance, etc.

Russian gamechanging technical solutions with global value and international application include:

1. Distributed temperature / pressure system
2. Disc crystallizer
3. Enhanced oil recovery, two-stage combustion technology
4. Low frequency seismic-acoustics
5. Novel well testing
6. Ceramic vitrification of the borehole

Summary descriptions of these and other technologies are in the appendix to the full report, available upon request from IVI.

Approximately eighteen technologies still wait evaluation/decision and the final number of technologies selected and *actually receiving* investment depends on the outcomes of our due diligence and face-to-face meetings between all parties and the success/failure of negotiations

and contract discussions.

IVI thinks this is a terrific response from the market, but especially so given that these results were achieved in just five months of active deal sourcing from start-up. This number of technology proposals from both SMEs and institutes demonstrates the depth and breath of intellectual capital that exists in Russia and its ability to innovate.

These technologies were created under less-than-ideal development and commercialization circumstances; little money for proper R&D, the difficulty in finding potential customers to conduct testing in actual field conditions and performed to international standards / practices. The ability of the Russian innovation system to achieve these results under these circumstances demonstrates its ability in creating technology of strategic importance.

**The Russian Technology Sector is Caught between Two Worlds**

The Russian technology system is in a split stage of development, with some developers making the transition to serve industry with innovative products while others face extinction.

While technology creation (Figure 3) is in the early stages of development, e.g., R&D (51 percent), 46 percent of technology is in the later stages of development / commercialization and more of a match to corporate venture capitalists and financial investors like IVI.

This split stage of development reflects the Russian oil industry’s rapid growth the last few years as institutes and enterprises respond to market needs by creating new technologies (in R&D) while those in mature stages of development (ready for mfging, customer delivery) are older solutions developed under a (different) Russian E&P strategy (vs. international practices), before strong foreign attention / investment in Russia / CIS, and when oil prices were lower. In and of themselves, these ‘older’ and mature technologies offer zero value-added, and is the reason that such a high number were rejected (Figure 2).

This dually of activity, i.e., obsolete vs. innovative technologies, exists in other sectors and is understandable: many institutes and SMEs were 100 percent focused on the Soviet defense sector, while others concentrated on closed Soviet markets; such isolation shut them off from leading edge technology developments in G7 countries

and others. Denied the opportunity to learn and leverage from the technology experiences of global players and others' successes, Russian R&D, application development, engineering and quality assurance lagged vs. the best from the West and the Far East. This situation is slowly improving as more SMEs integrate themselves into world markets, conclude supplier contracts with international companies, institutes compete for R&D contracts against West and Far Eastern universities, etc.

IVI's two short-listed VC deals from SMEs are in the prototype & testing phase and reflect developers' response to the business and financial potential from the growth in the petroleum industry these past few years. Russians' ability to bring technologies to advanced stages of development also has value since it gives investors the confidence that Russians can commercialize; exactly what IVI and our corporate venture partners need to make investments, to generate strategic and financial return.

### **Transforming Russian Potential into Commercial Solutions & Investment Opportunities**

As expected with the majority of innovation in the R&D/prototype stage, Russian developers require financing to complete R&D and prototype development (**Figure 4**). 'Commercialization assistance' is a catch-all need of developers for business development, marketing/sales and financing to bring innovation to market. As Russian talent is directed to international needs and testing standards, technology in R&D will emerge as candidates for VC; it is encouraging that a large percentage of R&D comes from SMEs, not just institutes since it's quicker to market by investing equity into an existing SME vs. create a new company from institute technology.

### **IP Status of Russian Technology: Facts Contrary to Conventional Wisdom**

Many believe that Russian technology is obsolete and outdated vs. international competition, yet the exact opposite exists. Russia continues to create innovation and innovative technologies as 55 percent of opportunities evaluated are patented in Russia and/or international countries (**Figure 5**).

#### **Future Outlook**

Real and undeveloped potential exists in Russia and the CIS. Exploiting opportunities requires proactive strategies and investment for the long-term.

### **Conduct R&D to Build the Deal Pipeline**

R&D projects are the prelude to generating future VC transactions based on new technical solutions and approaches. R&D contracting with institutes and selected enterprises with the skill sets to work on defined problems of customers and users is one strategy to build investment opportunities.

Although their technologies were not shortlisted for

investment, several institutes work in innovative areas of upstream and downstream technologies, e.g., the Department of Radiation Monitoring, Ural State Technical University; the Faculty of Information Technologies, Novosibirsk State University; the Institute of Petroleum Chemistry, and the Institute of Oil & Gas Solutions.

Russian institutes and SMEs need direction on emerging trends, where the industry is headed, customer direction and feedback at the early stages of technology development. A clear understanding of problems and potential solutions directs developers' R&D efforts to the needs for new technology and products. Such direction to needs is a strategy to 'jump-start' developers' attention to the financial opportunities in the petroleum sector. Commercialization of new technology starts with R&D and product development projects to demonstrate 'proof of concept' and the value of novel ideas.

Targeting SMEs and institutes for upstream, downstream and renewable technologies is straightforward since three clusters of innovation (**Figure 6**) exist; Moscow/Moscow region, Tomsk, Novosibirsk and Nizhny Novgorod in software, enhanced oil recovery (EOR), earth modeling and sensors as examples of E&P technologies. A secondary cluster is the Urals (cities of Yekaterinburg, Ufa, and Kazan) with technical development in crystals and crystallography for sensor applications, EOR and chemical processes for improving oil recovery in old fields.

### **Drive Innovation into the Market: Link Enabling Technologies with Platform Solutions**

Russian institutes and companies operate in innovation spheres that match the petroleum industry's strategic priorities (**Figure 7**).

Some of these technologies are stand-alone opportunities, while others require Western technology and skills as enablers and/or complementors to speed market introduction and customer adoption. Numerous foreign platform technologies can use Russian enabling or complementing technologies to maximize value creation and many of these technologies already exist in joint venture and portfolio companies of Western oil companies and their service suppliers. Rather than finance duplicate technologies and/or these skills, opportunities exist to mix and match imported technology/skills to make Russian and foreign technology more robust for commercial applications.

### **Speed Commercialization: Mix & Match CIS & Foreign Technology Together**

Russian developers are especially strong in specific technology targets of multinational petroleum companies and international service suppliers (**Figure 8**).

Mixing and matching Russian technology with complementary technology/skills from investors' portfo-

lio makes their technology more robust to leverage investments into new revenues, maximizing value creation and eliminates much of the Russian risk factor. It's IVI's strategy to invest in, and link Russian managers with Western companies and build management expertise in Russian entrepreneurs as the prelude for the successful ones to 'graduate' and raise venture capital. As an example, risk, cost and time-to-market is less by integrating the Russian distributed pressure/temperature system with the technology one of our corporate partner's investee companies to create the total solution. Linking these two companies speeds commercialization since the foreign SME has the international sales, distribution and service networks for global marketing.

### **Upgrade CIS Technology w/Western Solutions for Russian Sales; then Attack Global Markets**

Moscow (& CIS) offices of international oil companies seek technology solutions for Russia specific applications (e.g., cold water ocean environments, arctic conditions, gas reserves in deepwater basins, pack ice, etc.) or price sensitive segments unique to the Russian market.

A number of Russian technologies were developed for Russian buyers where the prices are significantly lower vs. Western solutions, yet their performance is just a notch below world class, e.g., a gas separation technology from a Krasnodar company and a plastic sphere (cold weather) technology from a Vladimir company. Opportunities exist to upgrade Russian technologies to Western standards to expand their use on the Russian market and later commercialize them to global customers, increasing value for international petroleum companies and the supply chain.

Such home grown Russian technologies help multinational companies 'localize' its supply content, substitute imports with domestic purchasing to reduce cost **and** comply with Russian Government requirements for doing business in Russia; increase the number of supply chain contracts with Russian technology and Russian suppliers.

### **Capital is a Partial Solution: Provide Western Systems Skills to Russian Counterparties**

Provide institutes and enterprises with proper customer direction and financing in the simple blocking and tackling activities of technology development like end-user guidance to focus design & development to performance, cost and price requirements & comprehensive testing to international standards. IVI expects that many technologies rejected (42%, **Figure 2**) because of poor technology description, lack of test data and information, have a 2<sup>nd</sup> life as viable opportunities with proper guidance from corporate partners.

Deal flow exists now, and deal flow can be developed with financing + western systems delivery & management execution in:

1. Project management & implementation skills
2. Testing & technical service/support
3. Business development, marketing & sales

### **Patience is a Virtue**

Time and patience is needed to develop the business relationship. The Russian culture is relationship driven with confidence and trust created through 'face time' vs. the western way of working with a free flow of information (e.g., info submitted without a non-disclosure agreement, NDA). IVI never signs NDA at an early stage of due diligence; IVI rejected some technologies due to Russian demand for an NDA prior to releasing information needed to make a decision.

### **Conclusion**

The intent of presenting this summary of the IVI report is to show that sufficient depth and breadth exists in the Russian/CIS innovation system to create technologies and products for commercialization through a transfer of IP, the venture capital (or joint venture) investment into an existing company or the creation of a new enterprise (to implement the technology). A 2<sup>nd</sup> objective is to demonstrate that new supply-chain links between Russian/CIS enterprises and multinational petroleum companies and their service suppliers is possible so they can better satisfy local content regulations between themselves and host governments. □

Figure 1

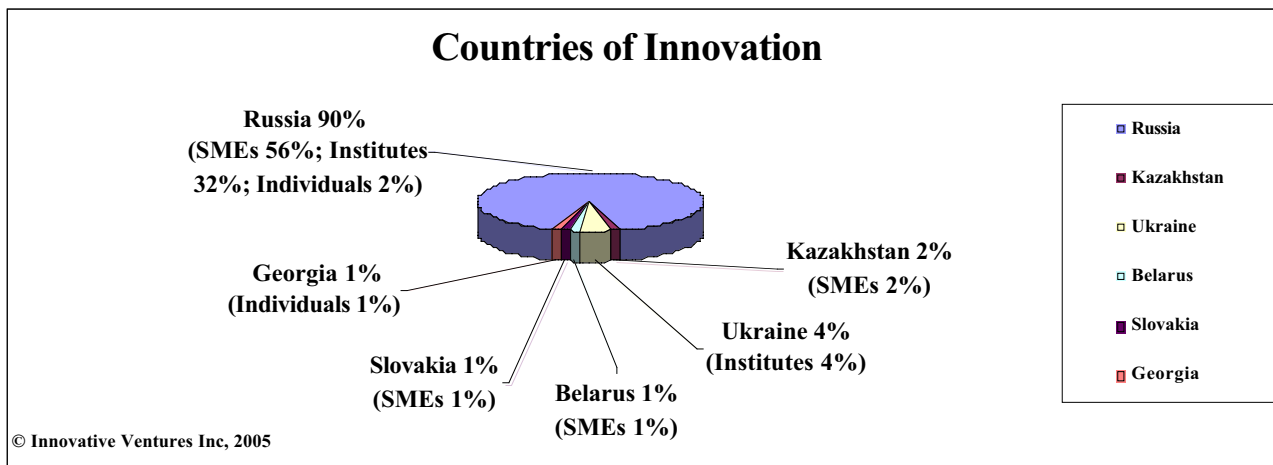


Figure 2

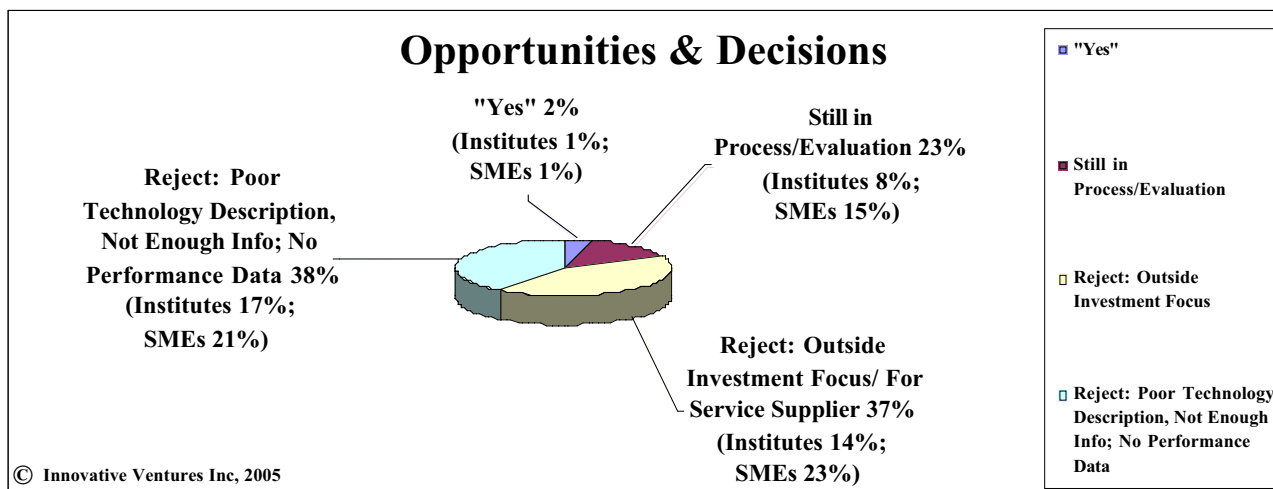


Figure 3

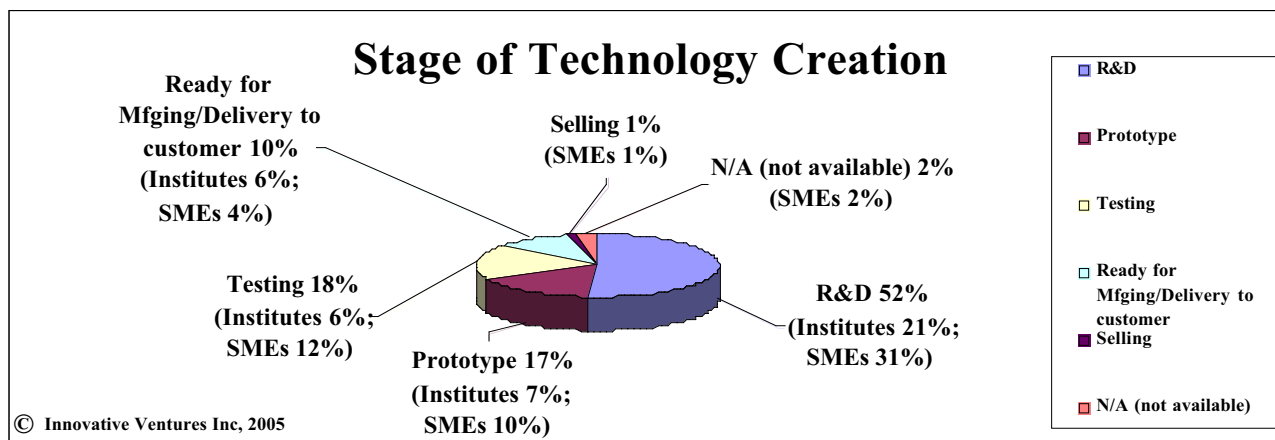


Figure 4

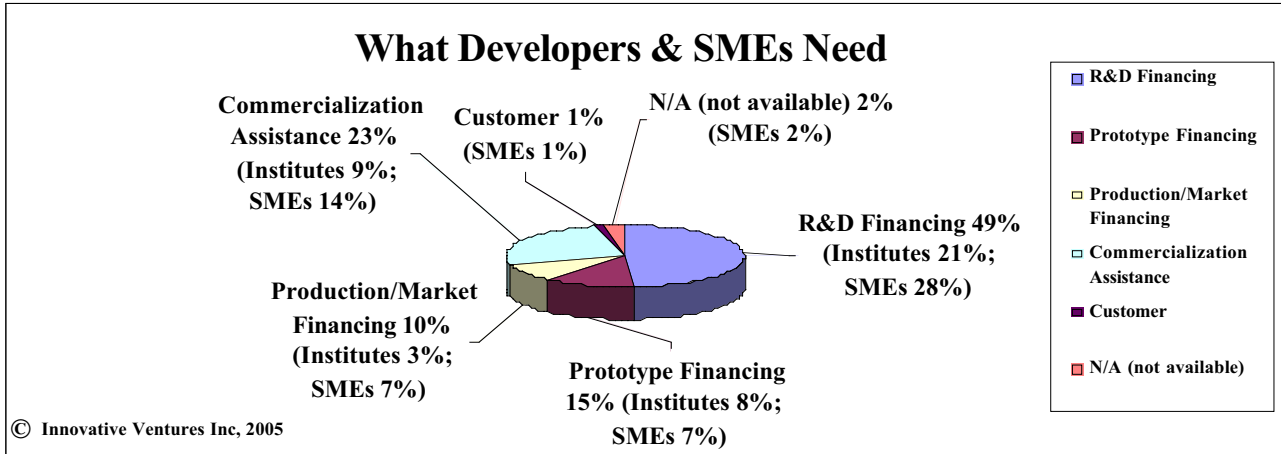


Figure 5

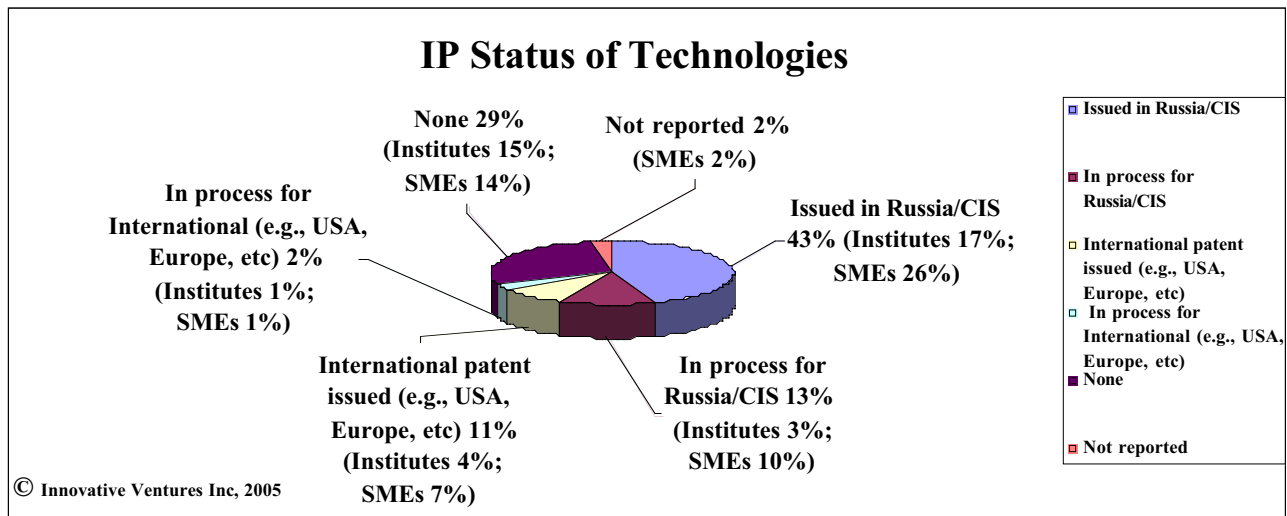


Figure 6

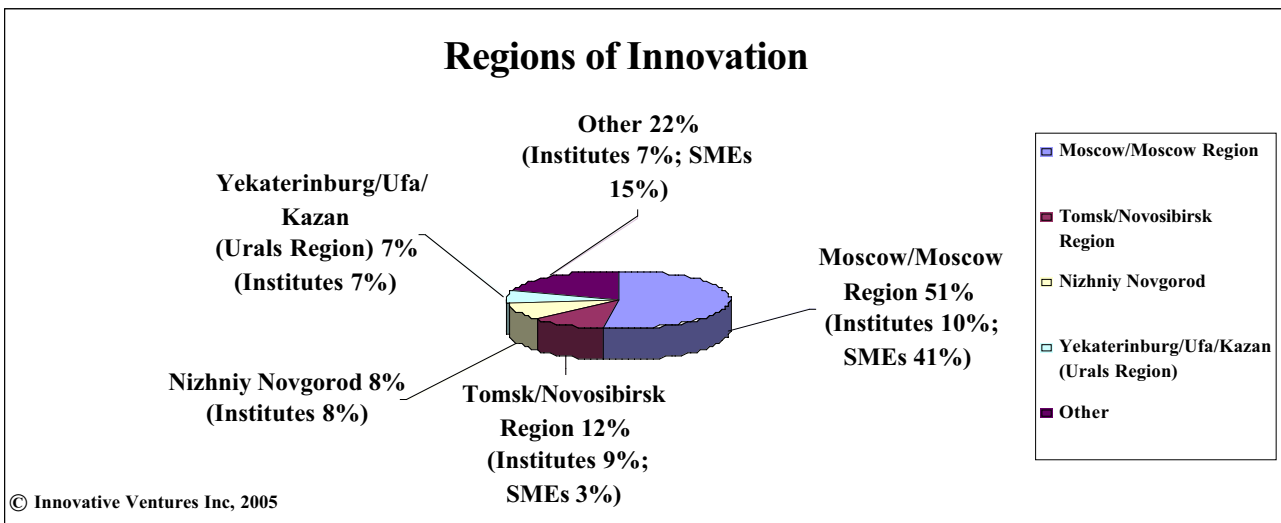


Figure 7

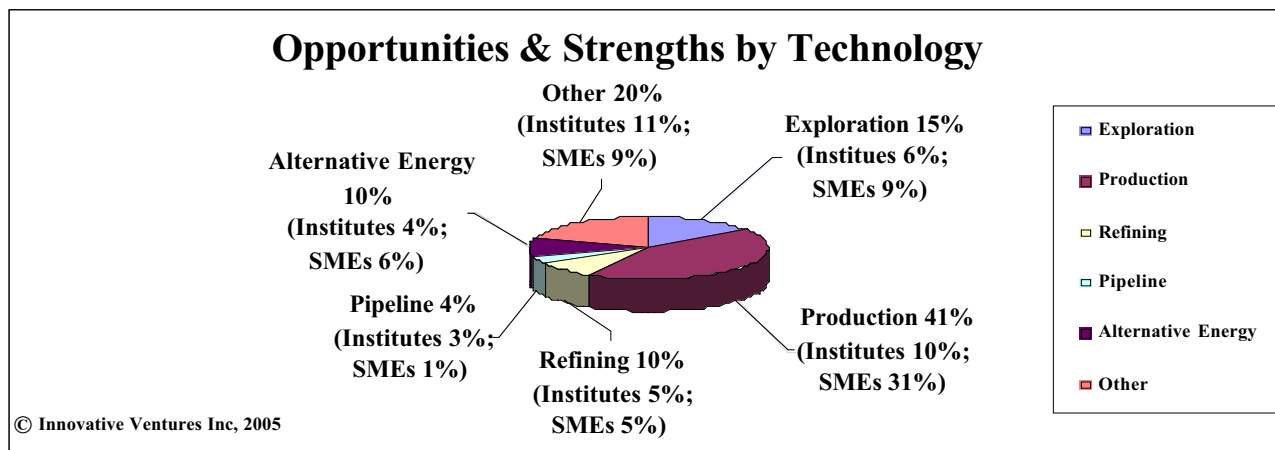


Figure 8

