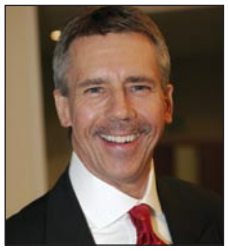
RUSSIA, OIL, TECHNOLOGY & VENTURE CAPITAL: THE GOFORWARD PLAN



The Soviets created many technologies widely used in the petroleum industry, but much innovative capacity was lost with the demise of the USSR. In this Part I of two articles, venture capitalist Thomas D. Nastas, President, Innovative Ventures Inc. (IVI) writes on the status of the Russian technology sector to renew its leadership position for the industry. In Part II for the next edition of the Review, Mr Nastas presents the GoForward strategy for corporate investors like international oil companies to incorporate Russian innovation in their products and services

Innovators in Technology

For decades, Soviet scientists and Russian developers pioneered new technology for the petroleum industry. In 1917, Russian scientist Armis developed the first electrical submergible pump. In the '50s, 43 horizontal wells were drilled in the Soviet Union, one of the most ambitious drilling efforts for the untested and nascent technology.

Building on the work of US scientist Yuren, Alexander Grigoryan put theory into practice by branching the borehole and in doing so he became known as the father of multilateral technology. In 1953, the Soviets drilled a main bore in the Bashkiria field (Bashkortostan today) with nine laterals (with a horizontal reach of 136 meters). Although the field was one and a half times more costly versus other wells, it penetrated the pay thickness five and a half times better and generated 17 times more oil per day. Over the next 20 plus years, the Soviets drilled 110 multilateral wells with Grigoryan himself drilling over 30 wells .

These are just a few of the contributions of Soviet science to the industry, other Russian technologies widely used include in-situ combustion and VSP (vertical seismic prospecting), invented in 1957 by Soviet geophysicist Evsei Galperin, Soviet Institute of Earth Physics. His first VSP profiles demonstrated its usefulness to show the structure of seismic wave fields including shear waves and polarisation effects. After almost 50 years of improvements by Western developers (led by Bob Hardage, Phillips Petroleum), VSP is firmly planted in the toolkits of geophysicists around the world.

As the West looks to Russia and the CIS for hydrocarbons and economic opportunity, new technologies are needed to efficiently find, extract and bring hydrocarbons to market; Siberia, the Russia Far North, Sakhalin and Shtokman pose unique challenges for energy majors and service suppliers. Western oil multinationals operating in the CIS and Russian oil companies themselves employ international services suppliers and their technologies, some which are Russian in origin but never exploited by the Russians to their commercial potential.

With continued growth and development in the market, is the time right for technology users and investors to look to Russia and former Soviet states like Ukraine and Belarus as developers of technology to solve Russia and CIS specific E&P problems in deep water, cold weather and large geographies? Are any of these technologies suitable for global use, to create game changing solutions or improve technology cost/performance thereby opening price sensitive segments and filling economic vacuums and market gaps? Do opportunities exist to mix and match foreign and Russian technology to build the supply chain and better localise product content? If yes, what are the ways to access opportunities, structure transactions and manage projects to conclusion?

These questions are certainly on the mind of forward thinking business planners as they look at the larger strategy of Russia and CIS countries as contributors of E&P technology to develop huge fields like Shtokman for example. Specifically where should the industry add Russian and CIS technology content to solutions from other centers of excellence like the US, the UK, France and Norway? And what can international E&P companies do to help Russian developers capture more economic value from their innovations than in the past?

The GoForward Plan in Russian & CIS Technology

A bigger business development picture is emerging for the entire supply chain to generate new value with and from Russian technologies and those from selected CIS countries:

1. Expand the commercialisation of almost world class Russian technology with super price/value combinations for sale in the CIS and selectively upgrade some for global sales.
2. Mix and match foreign and Russian technology to more quickly localise and build the 2nd and 3rd tier supplier segment and lower technology cost as a percentage of the solution, e.g., well cost. While first-tier suppliers like Halliburton successfully introduced the first wave of technology to the CIS, the environment continues to evolve and considerable needs exist to replace (old) technology assets and add value in multiple segments of the supply chain.
3. Create solutions that do not now exist through game changing R&D with global value to build new models that open new markets, increase revenues and lower cost.

The background

Russia is a well-known developer of world-class technology. Multinationals in multiple industries are investing in, and incorporating Russian technology into their products, for examplel, Intel, Siemens, Motorola, Microsoft, Boeing, IBM, United Technologies, Cadence and Sun.

A few global venture capital (VC) technology investors capitalised Russian technology with the start-ups' 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. Schlumberger is especially active in the CIS, with a Moscow based R&D center, a regional unit in Novosibirsk, and over $10m dollars invested to capitalise on the scientific talents of Russians. In the spring of 2005, Baker Hughes opened a R&D office in Novosibirsk too. In 2004 and 2005, Shell Oil Moscow organised technology fairs to showcase their technologies and those of Russian institutes.

In spite of these successes, there is a lack of information on how to channel the skills

of Russian talent into R&D and technology commercialisation to create new companies, investment and revenue opportunities. In this article, I summarise the experiences of IVI in the Russian technology sector. Short and long-term trends are discussed so multinational oil companies and their suppliers can benefit from promising developments coming to the market.

Corporate and financial investors with a global search for technology, internal incubation groups and corporate venture capitalists can benefit as well as knowledge presented is useful for those in aerospace, computer, IT, communications, microelectronics, chemicals, materials, medical and biotechnology since these are strengths of the CIS science system. Game changing technology investment opportunities in the petroleum industry are an indicator that potential exists in other technology spheres.

Current status: Russian petroleum technology sector

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 120 plus technologies in upstream, downstream & renewables with business plans and technical descriptions from small and medium size enterprises (SMEs) and institutes in Russia, Kazakhstan, Ukraine, Belarus and Slovakia. Value-added technologies are stratified into two classes, with Russian developers innovating in two directions:

a) Highly differentiated solutions with a step change in performance and value creation.
b) Almost world class products developed under a Soviet E&P policy; scientists and product innovators took a different approach versus Western practices, and these solutions have super price to value benefits with the opportunity to expand their commercialisation in the CIS and selectively upgrade some with foreign technology for global sales.

Examples of technologies in these two categories and source of innovation (SME or institute) include:

- Distributed temperature/pressure system monitoring of the wellbore (24/7) - SME
- Disc crystallizer for de-oiling & dewaxing processes - SME
- Enhanced oil recovery, two-stage combustion technology - Institute
- Low frequency seismic-acoustics - Institute
- Novel well testing - Institute
- Ceramic vitrification of the borehole - Institute
- Hemispherical resonator gyroscope - SME
- 3D +VSP - SME
- Gas separation and recovery - SME
- Deep separation of binary gas-liquid flow - SME
- Sphere insulation plastic for extreme cold, deep water and off-shore - SME
- Geophysical data interpretation (inverse problems) software - Institute

2. The Russian technology sector is caught between two worlds.

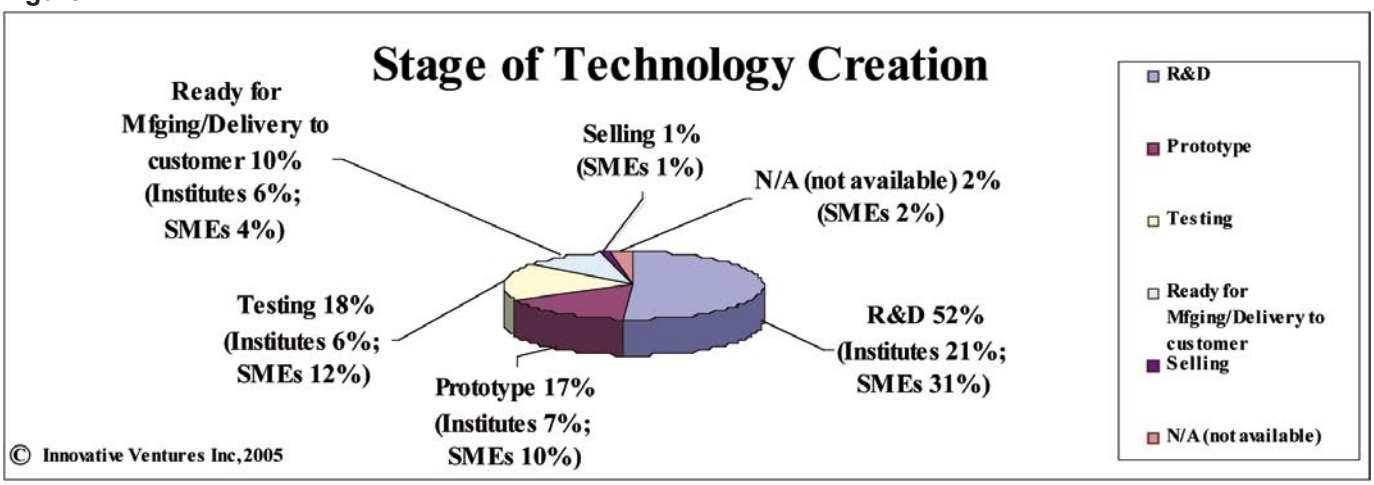
Some developers are making the transition to serve industry with innovative products while others face extinction. While technology creation (Figure 1) is in the early stages of development, e.g., R&D (52%), 46% of technology is in the later stages of development/commercialisation and more of a match to strategic investors, corporate venture capitalists and financial investors. (Figure 1)

This split stage of development reflects the Russian oil industry's rapid growth the last few years as institutes and SMEs respond to market needs by creating new technologies (in R&D) while those in mature stages of development (ready for merging, 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 little value-added when compared to the best from the West.

This dually of activity, i.e., obsolete vs. innovative technologies, exists in other sectors and is understandable: Many institutes and SMEs were 100% focused on the Soviet defence 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. innovation from the West and the Far East. This situation is slowly improving as more Russian SMEs integrate themselves into supply networks, conclude supplier contracts with international service companies, CIS institutes compete for R&D contracts against Western and Far Eastern universities, etc.

3. Transforming Russian potential into commercial solutions & investment opportunities

Figure1



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 2). 'Commercialisation 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's encouraging that a large % 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.
(Figure 2)

4. **Transparency, business practices & the Russian risk factor**
Russians can be difficult to work with at times, and yes a few have attempted to sell IP to multiple parties when the buyer thinks exclusivity is offered. But such occurrences are the minority and newspapers rarely report positive or upbeat news. Multinationals developing IP and using IP in their Russian operations include Intel, Microsoft, Cadence, Motorola, Siemens, Sun, IBM, United Technologies, etc., in addition to oil majors with billions committed like Shell, Chevron, Conoco, BP and service suppliers like Schlumberger. Boeing itself has over $2.5b invested in the country. Private equity investors operate in the region as well with over US$1 billion of capital committed from international institutional investors, and they would not have invested if Russia were a path to loss.

The Russian technology market is fairly transparent with SME managers and scientists willingly open with information and receptive to industrial partners and equity co-investors versus cash flow businesses that operate as the personal fiefdoms of the general director and his/her senior staff. From time-to-time IVI did not receive requested information, and this is due to their lack of experience in dealing with foreign strategic investors, Western business protocols and attitudes that are a carryover from Soviet times. The inability of the Russian counterparty to provide information requested is frequently mislabelled as lack of transparency, and this is simply not true.

Russians are a proud people and are not forthright when performance data is not generated to international standards and protocols. Russian managers, developers and scientists are embarrassed when tests are not benchmarked to competitive alternatives and established procedures used in the West, when they are unable to clearly present its strengths and weaknesses due to a lack of comprehensive analyses under different field conditions.

Russian oil majors themselves contribute to this situation. When a Russian oil company conducts an assessment, results are deemed confidential and withheld; hence the innovator can't demonstrate value-added to others. Consequently Russian developers have little recourse but to test their technology informally and under less than ideal situations; this puts them at a disadvantage when approaching international users accustomed to comprehensive data generated under transparent test conditions.

Russian E&P companies block innovation and erect barriers in other ways too; a production versus an exploration focus, a lack in the basics of technology development through execution, and their stick-to-it-ness with the tried and true even when service suppliers offer (more effective, but more expensive) third and fourth generation solutions. A contributor to this single mindedness is the difference in labour rates of Russian versus Western staff that make less costly, but less effective technologies still used in Russian and CIS E&P.

The GoForward Plan for international corporations & technology investors

Real and undeveloped potential exists in Russia and the CIS. Exploiting opportunities requires proactive strategies and investment for the long-term. In the next issue of the Russian Investment Review, I'll discuss the 10 point plan in detail, but let me give you snapshoot at what these strategies include:

1. Conduct R&D to Build the Deal Pipeline
2. Drive Innovation into the Market: Link Enabling Technologies with Platform Solutions
3. Speed Commercialisation: Mix & Match CIS & Foreign Technology Together
4. Target Russian Value Clusters as Satisfiers of Strategic Priorities & Unmet Needs
5. Upgrade CIS Technology w/Western Solutions for Russian Sales; then Attack Global Markets
6. Link Global Technology Activities to the Supply Chain Needs of Your Russian Operations
7. Invest Locally & Internationally
8. Capital is a Partial Solution: Provide Western Systems Skills to Russian Counterparties
9. The Virtue of Patience
10. How VC Can Help Implement Your Go-

Figure2