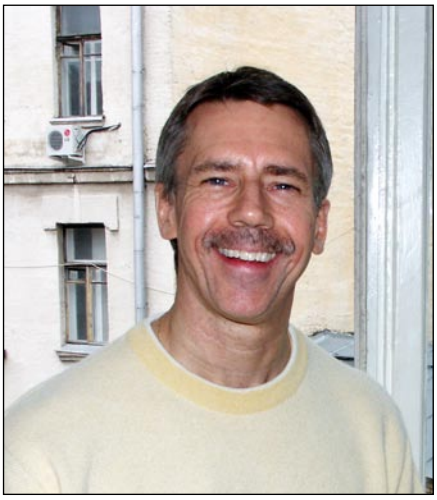


# SCALING UP INNOVATION: THE GOFORWARD PLAN TO PROSPERITY

By Thomas A. Nastas

**Innovation, small and medium enterprises** (SMEs), entrepreneurship and venture capital (VC) are ingredients in the creation of knowledge based economies; witness the success of Silicon Valley in large economies like the US and replicated in France, Germany, Japan, the UK, and elsewhere. Small country economies like Israel, Ireland and Singapore, with little domestic demand for technology, developed unique approaches of exporting knowledge creation with excellent outcomes.

Developing country SMEs in partnership with government planners and foreign investors are working to create technology capacity and ensure their future in a knowledge-based world. Much energy is directed at replicating the strategies that made SMEs in Israel, Ireland, Korea, Singapore and Taiwan so successful—the development of disruptive technologies for global markets with government and donor monies supporting technology creation and VC initiatives to finance innovation.

Are these the best strategies with the greatest chances of success? Do alternatives exist, to build from a base of technical needs for the local market instead, to move developing country SMEs up the path of knowledge creation incrementally with greater numbers of enterprises succeeding domestically, and help position a few for entry into world markets? If yes, how can developing country governments support such a strategy to generate new wealth and prosperity?

In this article I present a six point GoForward plan for government planners on how to scale up innovation and attract the resources necessary to achieve innovation growth. I draw upon my experiences in transacting seed and early stage VC investments in technology for the oil/gas, IT, biotech and medical industries from Central & East Europe (CEE) and the Commonwealth of Independent States (the CIS, countries of the former Soviet Union). These countries have many similarities with others in Africa, Asia/Pacific and Latin America where learning curve lessons presented are transferable, especially those with economies dominated by natural resources.

## The allure of global technology markets

Emerging market and developing country governments see the business and financial successes of SMEs solving global needs and encourage their enterprises to attack world markets with public works initiatives to support this strategy. Actions of the Russian Government (RG) illustrate the commitments that governments execute to jump into the global technology, commercialization and VC game. The RG is spending billions of petrodollars for the creation of new technology in IT, biotech, nanotechnology, medical and the like. It is investing state money for infrastructure projects like technoparks, incubators and the launch of a 500 million dollar fund-of-funds modelled after Israeli's Yozma fund-of-funds scheme, all with the intention of taking a seat at the table of global technology development. Global powerhouses in multiple industries—Intel, Siemens, Motorola, Microsoft, Boeing, IBM, United Technologies, Cadence and Sun—established Russian R&D centers and selectively incorporated Russian technology into their products. A few US VC funds invested in Russian innovation.

Yet with all this capital and horsepower invested and to-be-invested, something is amiss in Russia. A critical mass of seed and early stage SME investment opportunities do not exist in Russia for domestic or foreign VCs. This is not due to a lack of money as the economy is awash with capital and investors looking for opportunities. And Russia has advantages not enjoyed by other developing countries: Soviet scientific accomplishments, leading universities and world class researchers. Leveraging this foundation into a knowledge-based economy that competes with the best from the East and the West is a real challenge.

## Few GameChanging technologies

Over the last seven years, Innovative Ventures Inc. and other VC investors evaluated hundreds of Russian and CIS technology deals in IT, telecoms, biotech and medical to name a few; yet collectively we have invested in only twelve. Specifically, over the past three years, we've looked at oil exploration and production (E&P) technologies for investment. Our findings provide a microcosm and a reflection of what is happening in the market and why so few VC investments in technology have been transacted in Russia.

Only 2 percent of the E&P innovations we evaluated (Figure 1) have the performance characteristics that one might classify as GameChanging: disruptive technology with superior performance

or high cost reduction features. Such GameChanging benefits are required to catch the attention of global customers and investors, and compete against well entrenched competitors.

Even though the technologies we evaluated had interesting features, they are not ready for customers or venture capital. They are R&D stage concepts and require money and time for testing and development, to get them market ready, customer ready and advanced enough for VC investment.

Our findings disprove the notion that Russian institutes and SMEs have great technologies, but investors are blind to the potential. The truth is that institutes & SMEs have great ideas, but customers buy products not concepts, and investors invest in deals, not conceptual stage ideas.

Returning to Figure 1, 52 percent of the technologies were rejected due to poor descriptions of what value the idea create, inconclusive performance data, and competitive benchmarking. Many of these ideas appear interesting and worth a second look if only reliable performance data was available. Rejection was not due to issues of IP, lack of business plans, management, or capital markets.

Good test data is essential to prove performance benefits. Once an SME decides to compete in tech markets, it positions itself against global competitors, many with deep access to customers and a customer-oriented mindset that provides buyers with the information they require to make purchase decisions.

Even with good performance data, attacking international markets requires disruptive technologies to capture the attention of global buyers and investors. However, GameChanging technologies are few and far between, even from technology powerhouses located in small and big country economies.

If the chances of creating disruptive solutions are so slim, what can a country, its scientists, universities and SMEs do to get into the technology and commercialization business? Given potential but no immediate GameChanging technologies in oil E&P, IT, biotech, etc., what can Russia, with lots of money and talent, but only ideas, do to re-build its place in the knowledge world? What actions can countries take when they lack the technical base that Russia, Kazakhstan and others have to move up the innovation value-chain? Let's return to Russia to see what an alternative strategy might be and its learning curve lessons for others.

## Overlooked opportunities in the domestic sector

While few Russian innovations have GameChanging qualities for international buyers, others (Figure 2) have value in domestic E&P. These ideas and products are low cost solutions that give customers (both Russian and international oil companies) almost world class performance, but with lower prices to Western competitors. Such low cost technologies attract price sensitive users that seek cost/price competitive solutions.

What makes this set of opportunities interesting is that they represent an alternative to pursuing a GameChanging strategy. Instead of trying to outperform competitors on all fronts, one can build a locally competitive SME technology sector for domestic use. Once this base is established, new resources can be invested to grow internationally competitive enterprises.

Given higher probabilities of growing a locally competitive technology sector, a GoForward strategy exists to build technology platforms in and around strategic assets vs. diversifying resources away from natural advantages. And if overlooked potential exists in tech for the hydrocarbon business, do overlooked sectors exist in other industries to 'jump-start' more tech creation and deployment?

## The GoForward plan in technology and knowledge creation

### *Action Item #1: Target Domestic Users first*

SMEs and governments cite the low absorption rate of domestic users as the reason to pursue a GameChanging innovation strategy for world markets. Yet every country has industries that are knowledge based; some are clusters while others exist from natural advantages.

The automobile industry is a tech business with excellent growth in the CEE and the CIS as Ford, General Motors, Toyota, VW, Peugeot and others ramp up production in Russia and Slovakia to meet regional demand. These auto multinationals need to build the domestic auto component supply chain to a Western equivalent to meet their business plans just as Shell, Chevron and other oil companies need more and better oil field service suppliers in the CIS. And both industries seek solutions to localize more purchasing and satisfy local content regulations.

Yet Russia's forward plans to build knowledge based sectors include the usual list of candidates (e.g., IT, bio &

Figure 1

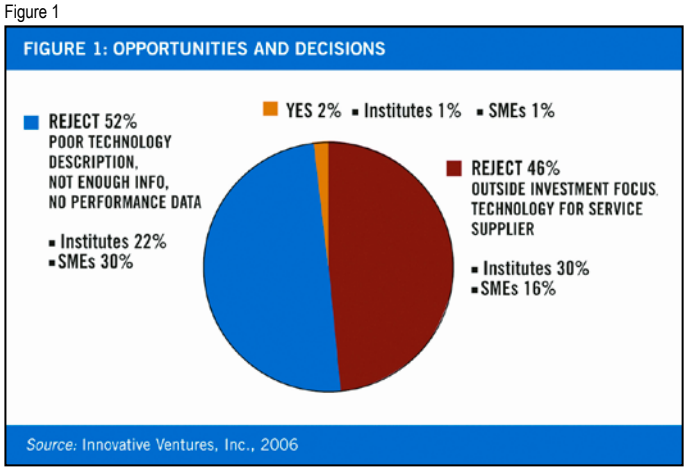
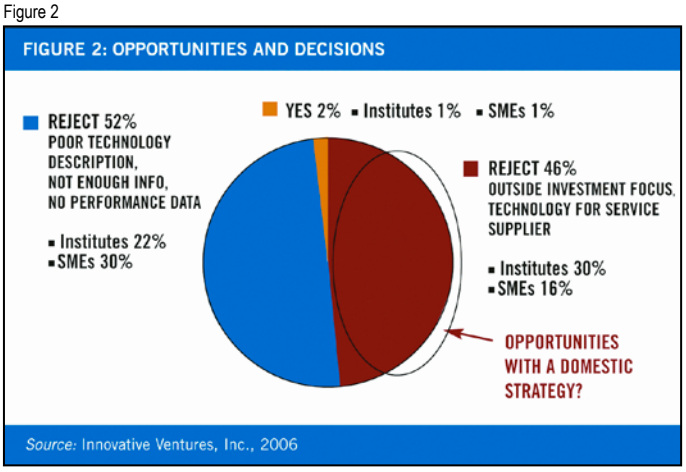



Figure 2



nanotech, etc.) but not auto components, oil field services and mineral extraction/processing; sectors with immediate payoffs to catalyze a chain reaction in domestic tech absorption.

Where single technology hubs are less obvious, other SME development approaches are possible, e.g., in logistics, where multiple technologies intersect. For instance, Latvia sits on the Baltic Sea with new technologies required in IT, warehousing and transportation to grow a nascent logistics platform into a regional distribution powerhouse.

***Action Item #2: Provide 'Mini Grants' to Document Business Opportunities***

Once domestic industry tech hubs and opportunities are identified, fund a 'mini-grant' program to define the business opportunity for proposed technologies. The mini-grant is not intended to fund an entire business plan, but a 3-4 page document of the potential of the proposed technology. Typical mini-grants might be in the size of $3,000-$10,000.

***Action Item #3: Capitalize a 'Proof of Concept' Fund***

Commercialization of new technology starts with R&D and product development monies to demonstrate 'proof of concept' and the value of novel ideas. Early stage SMEs frequently lack the money to initiate 'proof of concept' testing. Yet they are only able to approach customers when they clearly present technology strengths and weaknesses, conducted to a comprehensive analysis under different user conditions. Then, monies can be invested to enhance the technology. A Proof of Concept Fund finances the costs of testing a technology and benchmarking it to competition and alternatives.

To invest capital wisely, mandate that developers and companies benchmark the technology early and often. Most technologies have specific applications where they perform best and create the most value-added, and the developer needs to know the range of user conditions, performance and cost characteristics to create and capture the value that the technology provides. This can only be accomplished by testing the technology at regular intervals, and comparing performance results to what buyers have from competitors, whether they are domestic or international companies.

***Action Item #4: Inventory SME/ Institute Technologies and Publish as a Database***

Provide an Organizational Service (OS) that gives customers and investors the information needed to consider technology from your country:

1. SMEs/institutes organized by technology, product and market segment, with full contact information
2. Benefits of their technology, cost and performance
3. Performance and cost benchmarked against domestic and international competitors with data generated to international testing standards
4. Stage of development, i.e., R&D, product development, alpha/beta testing, etc.
5. Product development plan with timetable and milestone inflection points, line item budgets
6. Patents issued or filed, by country, date and number, and competing technologies similar in form or function

Publish this information as a database hosted on the Internet and searchable by keywords like technology or market.

***Action Item #5: Offer Targeted Business Development Support***

Too often innovations developed in academia remain on the shelf since scientists lack the knowledge to make the business case for the technology, the energy and drive to move them into the market; many scientists and (some) businesses lack the skills to make the transition from development to commercialization and growth.

Create a business development office with an outreach community which actively works with the OS to 'scout' for opportunities in the SME community and academia, identify and develop interesting projects for financing by the 'mini-grant' and Proof of Concept programs, and help sell innovations from academia/SMEs to customers.

***Action Item #6: Establish an IP Facility to Protect Your Country's Intellectual Assets***

The IP Facility pays legal and other costs of filing domestic or international patents with costs reimbursed through revenues generated from product sales. Such repayments replenish the Facility so it becomes a revolving instrument with a one-time investment.

Scientists and businessmen are rightfully proud when they create new innovations, and they frequently announce their solutions to others prematurely and inadvertently, before protecting IP. One responsibility of the business development office is to identify IP early in the development cycle and work with legal council to protect the technology. Another responsibility of the business developers is to educate and sensitize scientists and SME management to the issues in IP protection.

## Concluding remarks

New Zealand is a fitting success story for my conclusion. While it is not a developing country, it is a small and geographically remote country and its success in transitioning from low tech to high tech is illustrative of how a domestic focus created a technology SME industry.

In the mid 1990s, New Zealand government planners invested capital to create more flavourful and different varieties of wine, cows and lamb with more meat and less fat. Their focus was on new solutions for domestic needs in agriculture and animal husbandry, not global applications in IT, nanotechnology, biotech, etc., areas where New Zealand had little comparative advantage. Five years later, government initiatives yielded results and VC investors began investing in New Zealand SMEs to commercialize their innovations.

Fast forward to 2006 and New Zealand meat and wine are found in Australia, Europe, Japan, Russia and the US. New Zealand SMEs sell tech products and services to Australian, European and US wine producers and animal growers, truly a win-win for all. Build the deal flow first, and then customers and investors will come.

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