

The Triple Transition of Energia

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Executive summary

The Russian defense and aerospace enterprise Energia has successfully made a triple conversion: from defense production to civilian production, from the planning system to the market system, and from state ownership to private, broad employee ownership. While Energia has not escaped the general problems in this difficult period, and the specific problem of the collapse of defense orders, the ways it has dealt with these problems with relative success may be informative.

Our analysis suggests that Energia's success rests on a number of interlocking factors. These include (1) a gradual transition beginning in 1988 from the traditional command and control system to decentralization that nurtured management skills and entrepreneurship in shop managers, and developed an internal culture which accepted change; (2) a relatively radical restructuring of the enterprise that gives broad range to entrepreneurial endeavors of individual units but shelters such entrepreneurship within a company-wide ("consortium") planning system; (3) broad-based ownership and incentives for employees that reward initiative, including unit success; and (4) General Director Vladimir N. Popov's careful planning for the transition and style of leadership by which encourages far-reaching autonomy among subordinates.

Success in the current Russian context is relative. Energia's expansion into new civilian markets has been powered in part by an aggressive use of barter. Although Energia remains the prime Russian electrical system contractor on the space station, the production of windshield wiper motors, small water pumps, and the like often reflects a technological step back from the more sophisticated defense and aerospace production of the past. Employment has fallen from 12,000 in 1993, when defense orders still played a major role, to 5200 in 1999 with an additional 4500 on "alternative employment contracts" which give maintain an employment relation through recall and other rights.

Energia's current consortium structure provides leadership, vision, and economies of scale which benefit the units within the consortium. This structure has sheltered and encouraged

experimentation by the units that they could not have undertaken as stand-alone operations. The consortium structure also preserves Energia's capacity as a defense supplier for the future.

Introduction

Voronezh is a medium-sized industrial city at the juncture of the Voronezh and the Don Rivers about half way between Moscow and Volgograd. In economic terms, it is typical of what has happened to industrial Russia. Much of the local economy in Voronezh has simply stopped. Voronezh had been a particular center for defense, aerospace, and electronics production. The collapse of defense contracts in 1994-95 brought the first to a halt. Production for the aviation industry is virtually at a standstill. The electronics industry is running, but at a low level. The Dutch multinational Phillips bought the Voronezh TV tube production plant and shut it down. This wiped out TV production in Voronezh and took out much of the electronics industry which had been oriented to supplying the television industry. The Voronezh Electromechanical plant has succeeded by converting to supplying the oil and gas industry. Many of the plants still working are up to a year in arrears or are paying employees in barter.

In this generally depressed economic environment, one standout success has been Energia, a former defense and aerospace enterprise. It has successfully made a triple conversion: from defense production to civilian production, from the planning system to the market system, and from state ownership to private, broad employee ownership. Energia has not escaped the general problems in this difficult period, nor has it escaped the collapse of defense orders. It has, however, dealt with these problems with relative success, and its experience may be informative.

The combination of defense conversion and privatization/marketization has been very problematic for most Russian firms in the defense sector. Energia is unusual in its success. Our analysis suggests that this success rests on a number of factors including (1) a gradual transition beginning in 1988 from the traditional command and control system to decentralization that nurtured management skills and entrepreneurship in shop managers, (2) a relatively radical restructuring of the enterprise that gives broad range to entrepreneurial endeavors of individual units but shelters such entrepreneurship within a company-wide planning system, (3) broad-based ownership and incentives for employees that reward initiative, including unit success, and (4) General Director Vladimir N. Popov's careful planning for the transition and style of leadership by which encourages far-reaching autonomy among subordinates.

One caveat: while we had good access to Energia's civilian

production, including visiting a number of production units and interviewing both workers and managers as well as having extended discussions with top managers, as befits a Russian defense company, Energia does not permit access to its defense and space production areas and is reticent about revealing too much hard data about the company in general, including financial information. Consequently, in this case study we cannot provide historical financial information for Energia's transition, except in terms of percentage changes.

From defense to civilian production

Energia was established in 1945 to repair electric motors. In 1949 it began building electric motors as well. Its production was geared to supply Soviet defense needs for specialized electric motors, many miniaturized to fit unique military applications. Entering aerospace production in the 1970s, Energia was also responsible for the power supply systems for a number of Russia's key space projects, including the Mars and Venus probes, the Energia heavy-lift booster, and the Mir space station. Its large, 2000 person scientific research establishment constituted a unique resource; however, prior to 1985 it was separated from the industrial side of the firm, which was, as General Director Vladimir N. Popov notes, both "typical of the planned economy" and "our greatest weakness." In 1985-86, Energia was reorganized as the "Scientific-Industrial Concern Energia," which integrated its scientific research and its industrial production within a single organization. At the beginning of the Gorbachev era, Energia was among the Soviet Union's premier defense industry firms. "There practically wasn't a Soviet weapons system that didn't use Energia motors," one manager reflected fondly in November 1998.

In 1987 defense and aerospace hardware made up close to 95 percent of Energia's production. By 1993, defense orders constituted only 15 percent of production. The dramatic change came with the collapse of defense orders between 1991 and 1993, as defense and aerospace plummeted from more than 90 percent of Energia's production to less than 15 percent. Since then, defense production has swung between 8 and 23 percent of its baseline 1986 levels (see Figure 1). In July 1998 the company had no active Russian defense contracts in production, although it was continuing to fill foreign orders from Finland, China, India, and the Arab states. In common with other Russian defense firms, Energia has mothballed the portions of its defense production capacity that it has not been able to convert to civilian use, and it expects to win Russian defense replacement part orders, when the contracts are let again.

Energia continues to build electrical system components for the Russian space program. Its largest single production unit, "Cosmos," which employs 600, is building the electric system for the new space station. But even Cosmos also makes a variety of civilian

products, including voltage regulators for German customers, and, like many other Energia units, runs its own retail shop which sells heaters and fans.

Energia sought to replace its defense production with civilian business. By Russian defense industry standards, it has been highly successful in doing so. It has diversified into producing parts for the auto industry, for medical equipment, and for refrigerators and other appliances. It builds a variety of small electric motors for those end users. It has developed a line of pumps for agriculture and industry, voltage regulators and battery chargers for industrial and household use, welding equipment for small workshops, windmills for generating electricity, electrical heating systems for raising poultry, and fans and appliances for households and restaurants. In the fall 1998, 95% of its production was for civilian use.

Energia's conversion from defense to civilian production was a three-stage process.

(1) Under Gorbachev, Energia was required to build some products for civilian use. In this period, it did two things: (a) supplied part of its existing electric motor production to appliance manufacturers for washing machines and refrigerators and (b) designed its own consumer products including hair driers and electric mixers for sale. This civilian production was entirely secondary to its primary defense and aerospace mission. Energia's total volume of production grew 85 percent between 1986 and 1991 (Figure 1).

 Figure 1 goes about here

(2) In the immediate post-Gorbachev period between 1991 and 1993, Energia dealt with the collapse of defense orders by supplying its existing electric motors to many producers of civilian capital and consumer goods: motors for oil pumps, water pumps, electrical windows, and windshield wipers for cars and trucks, motors for tape recorders, motors for sewing machines, etc. During this period, Energia was supplying national firms with a national market. Despite the collapse of its defense orderbook, Energia's figures show that its volume of production grew almost another 50 percent between 1991 and 1993, peaking at 282% of 1986 production in 1993.

(3) In the economic collapse since 1994, a number of Russian firms which Energia supplied with motors ceased production. Russian tape recorders production was wiped out by foreign competition, while the Podolsk Sewing Machine Company, another major Energia customer, was

purchased and largely shut by Singer. Energia's civilian and total production fell by 15% and 7%, respectively, between 1993 and 1995. Since then, Energia has developed new products for the auto and truck industry as well as continuing to supply the remaining Russian appliance producers, and has increasingly developed its own consumer products -- including coffee grinders, meat grinders, and dicers -- and small-scale capital equipment which it builds around its existing electrical motors and which it markets to end users. These include small submersible pumps, heating systems, and feed milling machines for agriculture; industrial pumps, fans, welding equipment, and heating systems for small-scale industry; and a variety of small machines, such as milk shake mixers, for restaurants. Many of these products are sold primarily in the regional market.

In addition, Energia has redeployed some of its assets to serve the local market in Voronezh. One of Energia's early initiatives was to begin to open retail shops to sell consumer goods. These include shoes, clothes, and an upscale cosmetic shop selling, among other items, French perfume. A number of Energia units opened their own retail shops -- by 1998 there were fifteen Energia-owned stores -- selling both their own and others' goods. These retail stores provide a significant portion of Energia's cash. Some Energia units have leased space to service shops, and some have undertaken food production, including the personnel department setting up sun flower oil production, and kitchen personnel opening a bakery. Furthermore, some of Energia's social service activities, such as its large sports complex, have moved toward break-even on a fee for service basis. While production declined roughly 10 percent from 1993 to 1995 (to 262% of 1986), it rose above the 1993 level again by 1997.

Despite the development of various forms of alternative production, its growing retail sector, and transferring employees to marketing, employment at Energia has contracted from 15,000 in Soviet times to 12,000 in 1993 and to about 10,000 in 1998 and 1999, including 4,500 on "alternative employment contracts" in the last two years. These "alternative employment contracts" provide recall rights and permit laid off employees to continue to be shareholders in Energia and to continue to receive dividends; they maintain the company's relationship with laid off employees. Energia's figures indicate that employment in 1998 was is down to 46 percent of the 1986 base.

During the 1986-98 period, there has been a near-tripling of the volume of production as civilian production has replaced defense production. Labor productivity is up 700 percent per man-hour since 1986 (Figure 1).

Energia has dramatically outperformed Soviet and Russian benchmarks for industrial production generally and the machine building industry (to which Energia belongs) in particular despite the collapse of its

defense production (Figure 2). Between 1990 and 1997, Energia's total production has grown from 151 (1986 = 100) to 287 while Russian industrial production has declined from 96 (1986 =100) to 45 and machine building industry production has fallen from 97 to 31.

 Figure 2 goes about here

Energia's biggest problem in the conversion process has been that it has had to fund the costs internally without any government support, and lost quite a lot of money doing that. Further, the government has required that defense production capacity be mothballed at the company's expenses, and the military has been far in arrears in paying for its orders.

From centralized to decentralized decisions

Perhaps Energia's most outstanding resource in the transition process has been small scale entrepreneurship aided by its highly trained research and development staff. To mobilize this, Popov undertook a radical restructuring of the enterprise, splitting it into numerous semi-autonomous enterprises (rather similar to American profit centers) in 1993-94. These were organized around existing production capacity and functions within Energia as well as new product ideas. Energia itself is a holding company (or "consortium") which provides a variety of centralized services to the units and which handles strategic planning.

Initially, during what Popov calls "the romantic period" of economic reform "when everyone wanted to work independently and get rich," employees proposed establishing 137 separate units. Energia adopted a fairly extreme form of decentralization initially encompassing 20 scientific-industrial complexes, 9 firms, 3 territorial production amalgamations, and 134 self-sufficient enterprises. "When we got to the concrete stage, about 50 didn't do the paperwork, so they were never formed as units. Many were laboratories. The formal leaders in labs are often not suitable for taking on additional obligations of practical work as independent enterprises, such as personnel, finance, and marketing, though they are good at the scientific side. On the other hand, the process brought forward new leaders who were previously workers and who have learned sales and marketing."

The units established had very substantial independence within the Energia consortium. Popov sought managers for them with some entrepreneurial spirit. In selecting managers for them a background in cooperatives was a plus.

Of the 90 units initially set up, ten have been liquidated because of losses and about twenty stopped their

activities because the state stopped paying for their work or stopped paying for social programs, such as housing, kindergartens, clubs, and pioneer camps, previously run by the company.

Today 60 units remain, employing between 10 and 600 each; average employment is less than 100. Of these, fifty are in Voronezh and ten lie elsewhere. Each keeps its own books, does its own research, develops its own products, pays its own bonuses based on unit performance, and does its own sales and marketing for consumer goods. Exchanges between the units take place on the basis of both negotiated transfer pricing and contract. These quasi-independent enterprises employ 9,900, including about 4,500 on alternative employment contracts. A number of the units are built around producing and marketing a particular class of motors. Others focus on providing services (construction, repair, electricity and gas) both to other Energia units and to outside customers.

Relations between the holding company Energia and the individual enterprises are laid down by Energia's company constitution.

As of July 1998, about half the units were current in paying employees; the other half were 1-3 months in arrears. Payment depends on the success of the individual enterprise, and payments are made in goods as well as cash.

Energia's central administration (the "consortium"), which employs 100, provides a variety of central services to the production enterprises. The consortium handles financial operations, business strategy, quality control, and exports, and it provides planning and coordination across units. The individual units develop their own business plans which are submitted to the consortium for approval. The central administration has sanctions for units which do not meet performance goals. The central administration also plays a special role with regard to space and defense products, which are developed and marketed with central support from the top management.

In effect, the consortium organization acts as a large-scale business incubator, permitting a degree of unit initiative and experimentation that is substantially greater than individual units could afford to risk if they were stand-alone operations. Operating as rough equivalents of profit centers, individual units gain substantially from the consortium's economies of scale. This is not least true in the case of the ubiquitous barter operations which have fueled Energia's production growth in a declining economy. The consortium structure can clear barter transactions that would be completely impractical for the units, were they stand-alone companies.

Energia's restructuring was less painful than it otherwise would have been because it continued a process already underway. Energia's point of departure was the traditional "state production amalgamation" with the usual hierarchical managerial structure. It

moved to the status of a "Scientific and Industrial Enterprise" with some divisional autonomy (as scientific-industrial complexes") in 1986 in an effort to achieve greater integration of science and production and more flexibility in management. In 1988, employees leased Energia's assets from the state and established a commercial bank to service the company and the "scientific-industrial complexes" got the right to open their own bank accounts.

It was difficult to ascertain during our short visits how important this more gradual and longer term transition was to Energia's success. We believe, however, on the basis of interviews with unit managers that the lease period was significant in creating a cultural and psychological basis for subsequent reform among both employees and managers.

While employee base pay reflects skills and experience and is set without regard to the individual enterprises, incentives for employees are aligned with the success of their individual enterprise within the holding company. Whether an enterprise's employees are paid on time depends on its sales success. About half the enterprises are able to stay current with their wages and about half are said to be one to three months in arrears. Bonuses are paid monthly, when enterprise success permits; they are paid by the individual enterprise and vary sharply between enterprises. Dividends, however, are paid to employee shareholders by the holding company.

From state to employee ownership

Energia was among the pioneers of privatization. The work collective leased the enterprise's assets with a right to purchase in 1988. Popov (1993, p. 3) says that Energia was the first defense enterprise to be leased. It was then purchased by the work collective under the terms of the lease agreement and was collectively owned in 1989-90. It was subsequently converted into a joint stock company, and remains today a closely held ("closed") company. Its stock is 100% owned by employees and Energia pensioners. The majority of employees own stock, and the largest stockholder -- General Director Popov -- owns less than 1% of the company stock.

Today the individual enterprises which make up Energia are typically 80% owned by the Energia holding company ("the consortium") and 20% by the employees who work in the individual subsidiary enterprise. The holding company is 100 percent owned by the employees of the subsidiary enterprises and by Energia former employees and pensioners. Energia's stock continues to pay a dividend.

Pay is based on skill level and enterprise performance. In November 1998, base pay varied between 140 and 1600 rubles per month. Bonuses

are paid monthly at the enterprise level and vary with the success of the enterprise in terms of meeting its production plan and meeting or beating sales targets. Bonuses have typically added about 35 percent on top of wages, but the most successful units, like Cosmos, regularly pay bonuses of 60-70 percent. Dividends are paid by the holding company.

This system of ownership and organization is believed to be excellent from the point of view of connecting ownership and production, but it actually increases Energia's tax burden. Both the individual enterprises and the holding company are taxable. Energia has sought legislation to consolidate its tax burden, but the legislation has not been passed by the Duma.

Leadership

To a substantial extent Russian enterprises' success or failure during economic reform has reflected the capabilities and personalities of their leaders. One of the most striking aspects of Energia's story is General Director Popov's approach to defense conversion, privatization, and the market. Initially appointed General Director in 1984 to reorganize the company as a "scientific-industrial concern," Popov has been reelected repeatedly. He negotiated the employee leasing of the firm's assets in 1988, and led its subsequent privatization, adaptation to the market system, and on-going reorganization. He is blunt in approach and straightforward in speech. Popov is not a "new Russian." When Energia's employees are paid in barter, so is Popov; one month he had to take his salary partly in butter.

Popov is both a practical manager and an empirical social scientist. [\[1\]](#) He wrote Energia's reorganization and restructuring plan initially as his doctoral dissertation. Popov was eclectic and empirical in his orientation, drawing on the Japanese model of teamwork, quality and concern for employees; the Swedish combination of economic efficiency and employee participation; American ESOP ownership experience; and Russian ideas of collective property. He even drew on the Chinese experience with economic reform, commenting favorably on it.

Throughout Energia's restructuring, Popov has sought to achieve an optimal combination of independence for subunits within Energia in which "decentralization replaces vertical relations with horizontal ones within the conditions of entrepreneurial networks, centralization of strategic functions, complete legal independence of units, and optimal forms of ownership and systems of exchange within the company." This remains a moving target.

Popov is sufficiently relaxed in his decentralized management structure that the weekly meeting for the sixty enterprise directors was conducted in his absence in July 1998 while he answered his American guest's questions.

Popov is conversant with a good bit of recent Western management literature, and one Energia manager, Viktor G. Lutchenko, was delegated to work with the Western strategic management literature and to share it. Popov's next major initiative is "to move to more participative management. To implement participatory management you need a stable financial situation, a structure inside the company which supports it, because the law doesn't, and enthusiastic people. We now have the elements in place: we're a closed company, have ownership by the work collective, have our incentives in place, have a decentralized structure which works, and have solved the main economic questions. Now we have to activate all the members of the collective."

Decentralization in action

Nikolai Vassilievich, who started as a production worker at Energia a quarter of a century ago, is now the director of MOST, an enterprise employing 198 within the Energia holding company. Prior to the holding company structure, MOST was one of Energia's machining operations, and it previously machined parts for space and defense. Now it produces some 500 different products, some of which it assembles itself; its production in 1998 was 5-7 percent space and defense.

"At the same time we became independent," said Nikolai Vassilievich, "we lost the majority of our state orders. We had 250 employees and no work. We had to find new products to keep them employed. Our unit started to look at every opportunity. We brought together the work collective with the marketing group to develop new products."

Major products include automotive parts (especially thermostats) and small pumps and small feed mills for farmers. Its pumps and feed mills are sold primarily in the Voronezh region, where MOST supplies 38 small shops which sell its products on consignment. Roughly 30 percent of its production is sold to customers either directly, through other Energia units or through the Energia trading house; the other 70 percent are sold to other Energia units.

Many of these new products are designed for small scale farming. MOST's feed "mill" is designed for the needs of the family with a dozen chickens, a couple of pigs, and a milk cow. "No one produced what these people needed," said Nikolai Vassilievich, who comes from the countryside. "My parents couldn't find what they needed." Similarly the pumps MOST builds are designed for shallow family wells (25 meters or less), but MOST is redesigning its pumps (which it has

patented) for depths of 50 and 70 meters.

About 25 percent of sales are in cash, and the remainder is barter. Sixteen of MOST's employees work in sales/marketing and purchasing, with barter linking the two functions. MOST focuses its barter sales on customers which can exchange food or clothing, which MOST can then convert into cash. It arranges its own barter chains, except when chains involve taxes; then MOST turns the chain over to the holding company.

MOST is organized as a limited partnership. It is 2 percent directly owned by employees, who contributed that share in cash, and 98 percent owned by Energia.

Nikolai Vassilievich was production manager in the machine shop that became MOST prior to decentralization. "How has your job changed?" we asked him in November 1998. "It's an absolutely different style of work," was his answer. "Previously I was responsible for two things: the volume of production and the quality of production. Now I have to take responsibility for sales, paying salaries and bonuses, new product development, bookkeeping and finance, as well as production and quality."

"Decentralization provided us the flexibility to deal with changing conditions. Practically all companies which didn't have stopped production. If we had stopped production, we would never have restarted. Our independence has its limitations and its disadvantages, but we have survived." Moreover, MOST has survived without firing any employees. Of the original 250, 38 have retired, 20 have taken other jobs voluntarily, and Nikolai Vassilievich is now looking to hire additional employees; he will match his skill needs with those on "alternative employment contracts."

Plan to Market: From "Crisis of Payments" to Barter

It was one thing to convert defense production to civilian needs and to decentralize authority and decision making; collecting receivables from its new customers was an entirely different issue. By 1993, some of them couldn't pay as their markets collapsed. Others didn't pay because they couldn't collect their receivables either. Energia found itself in the grips of the "nonpayment crisis."

The consequence for Energia was its own "nonpayment crisis." As its defense conversion proceeded from 7% to 96% between 1991 and 1993, its collection of receivables and its tax payments and social security contributions collapsed to 46% and 59% of its obligations (see Figure 3). Tax and social security payments continued to decline over the next three years to 16% and 13% of obligations respectively in 1996. Only with the development of generalized, full

scale barter in 1996 was the non-payment situation eased. Energia resumed tax and social security payments at higher levels in 1997 and 1998... but largely in barter.

 Figure 3 goes about here

"We, too, have the barter illness," complained Popov in July 1998. Seventy percent of Energia's 1998 sales were in barter, up from less than 50 percent in 1996 and 30-40 percent before that. Barter has stabilized production, but it has also inflated inventory and, because of its higher costs, "helped drive profitability to the dogs," says Aleksander Stepanovich, vice president for marketing, sales, and purchasing. The combination of sales and purchasing functions reflects the impact of barter on Energia's business practices.

Ideally Energia's barter operations seek to exchange parts directly for finished products. The unit that builds windshield wiper motors, for instance, takes Ladas in barter. "'Everybody sell' is our motto," commented Popov. In fact, we had three different people independently try to sell us one of the two Ladas remaining from the last shipment of eight, parked next to the windshield wiper motor shop. "We need to make room for the next shipment," explained one wiper motor supervisor apologetically after his sales pitch to us.

Where Energia's barter began as direct exchange of Energia's products for those of its barter partners, by 1998 about half of Energia's barter was through barter "chains" in which Energia's motors were bartered to a company which built them into its product which it bartered to a third party which then bartered its production to a fourth party which shipped its product back to Energia; such chains sometimes have as many as a dozen companies involved. Direct barter is done by individual units, but the central holding company administration supports barter chains.

The 30 percent of Energia's production sold for cash is primarily made up of the contracts on Alpha space station project, refrigerators, and Energia's retail shops; the first two provide about half its cash receipts and the last, the other half.

Barter appears to create problems for Energia's otherwise well functioning decentralized structure. Popov estimates that 6 percent of Energia employees are involved in making the barter system work. Decentralization may limit Energia's capacity to barter optimally, although at least one enterprise (Katerina Alexandrovna's supply unit

which employs 18) seems to have created a new business in handling purchasing, barter and supply for some of the other Energia enterprises.

Energia pays its local taxes in barter, including its social welfare taxes for pension and unemployment compensation. It runs a shop carrying food staples (pasta, milk products, sausage, potatoes, etc.) which its own and other pensioners in the central Lenin district of Voronezh receive food in lieu of cash; Energia barter for the food provided. A similar shop in the same district, also run by Energia, provides consumer goods which the unemployed can pick up in lieu of unemployment compensation to sell. Some are Energia's own production (coffee grinders, mixers, etc), while others are provided through Energia's barter or by other companies, also paying social welfare taxes in barter. While this system is less than perfect -- who wants to take their unemployment compensation in coffee grinders or hair dryers which you then have to barter or sell?? -- it seems to beat the arrearage in payment of pensions and unemployment compensation in other districts in Voronezh.

Evaluating Energia's experience

Energia is a relative success in the Russian defense industry. It has made a virtually complete conversion from defense to civilian production, and has increased its volume of production substantially. But it has not been easy.

While Energia did well in the initial period of privatization, it was hard hit by the collapse of defense orders in 1991-93. It received no subsidy for its defense conversion, and had to fund this effort internally. A number of units converting from defense to civilian production continue to lose money; the new product lines are profitable. Since 1993 employment has been cut from 12,000 to 10,000; of the latter 5200 are on active employment and 4500 on "alternative employment contracts."

The average wage at Energia in July 1998 was 590 rubles/month, about twice that of the 250 rubles a month in the very depressed electronics industry in Voronezh but only a fraction of the 1500 to 2000 rubles/month in the food industry. Wages are supplemented by bonuses and dividends, but employees from the shop to the General Director's office often draw part of it in barter. One payday Popov went home with 18 kilos of butter.

Energia has continued its social programs. It is continuing to build employee housing, but it requires an employee investment in the apartments. In downtown areas, Energia apartment blocks uniformly have had the bottom floor rented out to shops and service businesses. The social infrastructure of medical care, day care and

kindergartens, and programs for pensioners is still operating, though day care and kindergartens have been turned over to the city; the transfer of its housing to the city has been largely completed. It maintains a big sports program including a championship women's soccer team, but it has shifted much of costs of the sports facility to fees to outside groups.

Energia's successful conversion rests on a combination of organizational restructuring and economic initiatives:

(1) Energia's radical decentralization of authority to 60 more or less independent production units has encouraged entrepreneurship, increased market relations, and new product development. In effect, Popov has converted the entire firm into a large scale incubator for new products. He bemoans the fact that the immense scientific and technical capacity that the firm has in vastly underutilized, but that is a cost of conversion. Engineers who once designed high capacity miniaturized motors for specialized defense applications are now redesigning these motors to power windshield wipers for Ladas and submersible pumps for small scale farming. At the same time, the Energia holding company (the "consortium") itself handles a number of central functions for the units, providing economies of scale, and does strategic planning.

(2) Energia units have successfully marketed existing products -- electric motors originally designed for defense and aerospace -- to civilian appliance and auto producers which continue to sell their production nationally. Energia's high quality products and aggressive marketing have combined to make it a major supplier to auto, truck, and appliance manufacturers, and it has diversified its markets, so that it is not dependent on a single firm or sector.

(3) Energia units have designed and assembled new products built around Energia's core electric motor production. Instead of being sold to other manufacturers, Energia's products are sold directly to end users, whether they be consumers or small agricultural and industrial producers. Many of these products are sold regionally.

(4) An aggressive use of barter has enabled Energia to maintain and expand core production.

(5) Energia's units have created peripheral businesses in the local market, and some service units like repair teams and electricity and gas supply now sell services locally. Energia's retail stores, food production, and leasing storefront property to other retailers and service businesses have filled local business niches. The company has developing alternative income sources to continue many basic social welfare activities (housing, medical care, support for pensioners, and sports activities) while passing others, including services for children (nursery schools, kindergartens) to the city. Further, Energia's retail sales provide a welcome source of cash to meet

wages.

Energia clearly has not met all its employee owners' hopes nor management's plans, but it has certainly outperformed the Russian defense industry norm, its civilian sector norm, and the Russian industrial norm overall.

There are some lessons from Energia's experience which deserve summary:

(1) Discussions with individual managers suggest that Energia's early reform efforts under Gorbachev and gradual transition to an employee-owned, market driven, civilian producer played a major role in winning widespread acceptance of change among even those who initially were opposed to Popov's efforts. Proponents of "shock therapy" to the contrary, genuine, successful change takes time.

(2) Popov's leadership and restraint -- unlike many general directors who have sought to acquire controlling interests in their enterprises, General Director Popov is said to own less than 1 percent of Energia's stock -- have played a major role as well. He has successfully implemented an organizational vision that combined his intellectual constructs with Energia's empirical reality.

(3) Energia has "Russified" many high performance workplace practices. We are struck by the degree to which Energia has adapted Western "high performance" techniques to Russian circumstances. Management strategies include decentralizing decision making to what are, in effect, profit centers; using ownership and bonuses as incentives; encouraging the learning of new ideas and skills; integrating research, production and sales; incubating new business ideas; and emphasizing quality. These "transformation strategies" seem to work well at the level of the individual business unit.

(4) Energia's consortium structure provides leadership, vision, and economies of scale which benefit the units within the consortium; furthermore the consortium structure has provided shelter and support for experimentation by the units that they would not otherwise have dared to undertake if they were stand-alone operations. Had the company been broken up, the units would not have been as successful on the average as they have been. Further, the consortium structure preserves Energia's capacity as a defense supplier for the future.

Energia's empirical experience should be informative for policy makers in government and in international organizations and for managers in other firms alike.

Sources

This case study is based primarily on visits to Energia including

interviews with General Director Vladimir N. Popov and a number of Energia enterprise managers on July 17, 1998, and November 10-12, 1998. The data in figures 1-3 were provided by Energia in November 1998. Our special thanks to General Director Vladimir N. Popov for his hospitality and time.

This study also draws on a presentation "A/O Naychno-Proizvodstvennii Kontsern 'Energiya'" made by Popov to a seminar sponsored by Russia's Economic Reform Foundation "Opit razvitiya form aktsionernoi sobstvennosti rabotnikov" in July 1993, and on Mikhail Glukhovsky, "Conversion Voronezh-Style," *Delovie Lyudi*, May 1993, pp. 20-21.

For more information on the utility of high performance management and workplace practices in Russia and for case studies of Russian enterprise reform, see John Logue, Sergei Plekhanov, and John Simmons, *Transforming Russian Enterprises* (Westport, CT: Greenwood Press, 1995).

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[\[1\]](#)—Energia publishes two scholarly journals for the Academy of the Science and Practice of Management of Production, and Popov is a professor at the Academy. Popov has published a hundred or so articles.