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THE ENERGY DIMENSION IN RUSSIAN GLOBAL STRATEGY

RUSSIAN OIL FUTURES

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Scope and Goals of the Study

The focus of this study is a forward-looking evaluation of the domestic and potential emerging international strategies of leading Russian oil companies. The companies included in the research include most of the major producers:

- Yukos,
- Sibneft,
- Lukoil,
- Tatneft,
- Surgutneftegas, and
- TNK

Also, production from probable Sakhalin Island joint ventures is included here.

Some companies, such as Rosneft, are excluded from this study due to insufficient comparable data necessary to construct the corporate upstream model.

The study:

- Includes issues related to the resources controlled by these companies,
- Develops forecasts of the likely future of oil production by company and evaluates future export potential,
- Estimates projected future financial performance under alternative price scenarios using several key metrics, and
- Incorporates financial and operational constraints on the corporate decision-making of these companies.

Reflecting the broad scope of issues that require attention and the fact that the study is forward-looking in its primary goals, numerous analytic assumptions are required and the resulting analysis is necessarily conditional on the outcomes of many uncertain and often conflicting factors discussed later in this paper.

Methods

Due to the scope of issues that must be addressed in this study, modern economics, alone, is inadequate to the task. This pure form of the science has a clear propensity to give short shrift to the political and institutional factors that are both the legacy of Russia's past and a compelling constraint on its future. At the same time, political science, alone, cannot properly incorporate the cold economic facts that will stress and shape the world in which the institutional legacy must ultimately function.

As a result, this study will occasionally apply elements of the more ancient but more balanced predecessor of these two disciplines—a form of the science in which the author was first trained—political economy.

The quantitative results generated in this study utilize Capital Strategies, a proprietary dynamic simulation and forecast model developed by John S. Herold, Inc. (Herold).

Capital Strategies is an analytical tool that draws from a wide range of databases collected and maintained by Herold. It is specifically designed to integrate operational and financial decision making to generate a simultaneous evaluation of what is simultaneously operationally possible, what is financially viable, and what is compatible with the corporate goals and peer group norms of the companies under study.

Operational possibilities are evaluated in the context of their projected impact on key financial indicators including debt to total capital, the return on capital employed (ROCE), and the capital requirements ratio (CRR) which compares projected capital investment outlays to capital from operations available for investment.

In addition, the future effect of alternative financial strategies (dividend policy, share repurchases, and acquisitions and divestitures) can be tested. However, this paper will generally restrict itself to inferences and speculation concerning likely emerging trends and possibilities rather than fully explore all the possible combinations and their longer-term ramifications.

Summary of Key Results of the Study

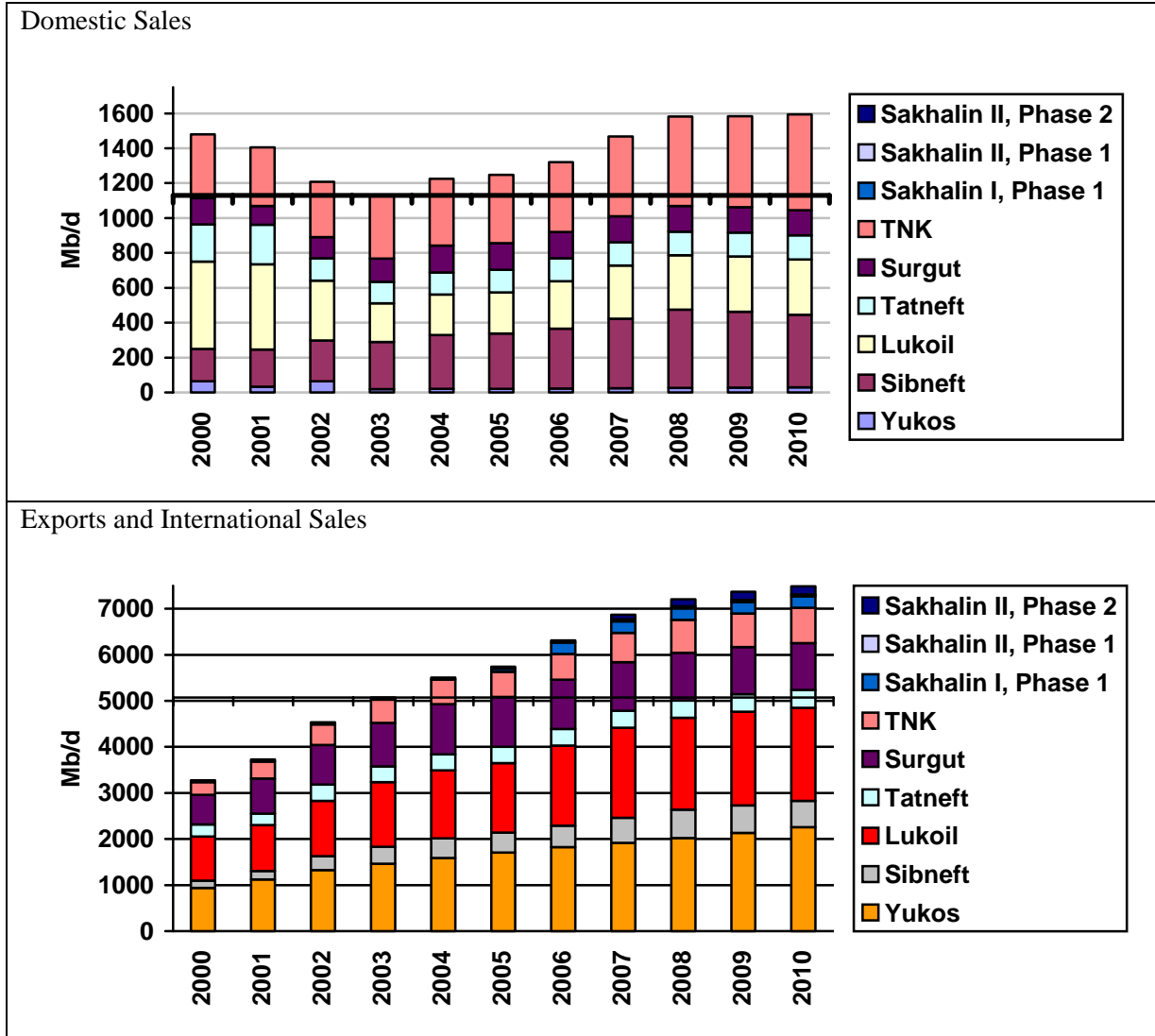
Russian oil production has increased rapidly since 1999 and, in addition, exports as a share of this rising volume have increased substantially. For nearly all of the companies included in this study, production growth and cost control have been de facto key elements of corporate strategy. The focus on volumes is equally evident in the appeal to comparisons of total reserves and production with those of the large international global companies as an indicator of relevant peer groupings repeated by nearly every company in this sample.

- Russian oil production is likely to increase substantially by 2010 relative to 2003 levels (assuming that the indicated additional transport infrastructure is installed).
- The capacity of Russian companies to grow will vary substantially, with Tatneft and Surgut likely to be struggling to sustain rather than increase output.
- While continued growth is likely, the production gains are likely to be more modest than in the recent past until after 2005 and possibly later.
 - Figure 1 shows projected oil production by the sample companies through 2010 with a breakout between domestic sales volumes and exports. The horizontal axis intersects the vertical axis in each chart at the 2003 value to highlight the net additional output that is projected to occur.
 - Exports are expected to grow by 2 million barrels per day by 2008 relative to 2003.
 - A likely scenario is that this growth will be augmented by perhaps as much as 400 mb/d due to further diversion of oil production from the domestic Russian market to exports.
 - Sakhalin projects are a measurable but relatively minor part of the production growth.
- The potential incremental contribution of Russian supplies to the world oil markets relative to 2003 levels hinges on two conditions, one is short-term in nature, the other is a long-term solution:
 - Sustained high international benchmark prices and relatively low Russian domestic prices create a continuing short-term pressure to divert output from domestic to international markets.

- In the short-term, these price differentials will likely justify continuing export growth through multiple higher cost alternatives.
- That is, despite a very sharply rising short-term marginal cost of transportation, the Russian companies will seek to increase overall production as well as divert supplies from the domestic market to the international sector so long as international benchmark price levels for oil are robust.
- A more sustainable (and ultimately more profitable for both the companies and for the Russian government) long-term opportunity hinges upon the successful removal of at least two of three key transport bottlenecks that continue to drive Russian oil economics.
 - One of these bottlenecks—a pipeline outlet to the Asia/Pacific market from Eastern Siberia—is a very long-term and uncertain prospect that is not factored into the analysis of this study.
 - The two most likely and most necessary near to medium-term bottleneck solutions required to generate the production growth projected in this study are:
 - A Barents Sea outlet for crude to be delivered to ocean-going transport (the Murmansk proposal or one like it) and
 - Pipelines from the Black Sea to the Mediterranean that will bypass the Bosphorus bottleneck to tanker trade.
- The results in Figure 1 and the conclusions of this study implicitly assume that both of these medium-term solutions are successfully achieved within the next 2 to 3 years. Longer-term, the Russian industry will face a re-emerging infrastructure-based constraint on further growth unless these solutions are expanded.
- The prospect that the Russian companies will soon expand efforts to grow internationally (a prospect that the results of this paper suggest will have a high probability) is not likely to prevent continued growth of Russian oil production.
- The results of this study suggest that, despite projected growth in Russian supplies to the world markets, this growth is unlikely to be sufficient to undercut current high world prices in the near to medium-term.

- This conclusion is essential to the longer-term opportunities and challenges facing the Russian oil industry.
- Specifically, the Russian oil companies are major beneficiaries of the current cash flow effects of high oil prices—these cash flows facilitate expanded capital programs even in the event of probably rising costs as the character of Russian investment shifts.
- In addition, the high price environment may stimulate current pressures to find transport solutions that would otherwise be delayed or judged marginal.
- A potential challenge that will flow from continued high international oil prices is discussed later.

Figure 1: Oil Production Forecasts, Mb/d

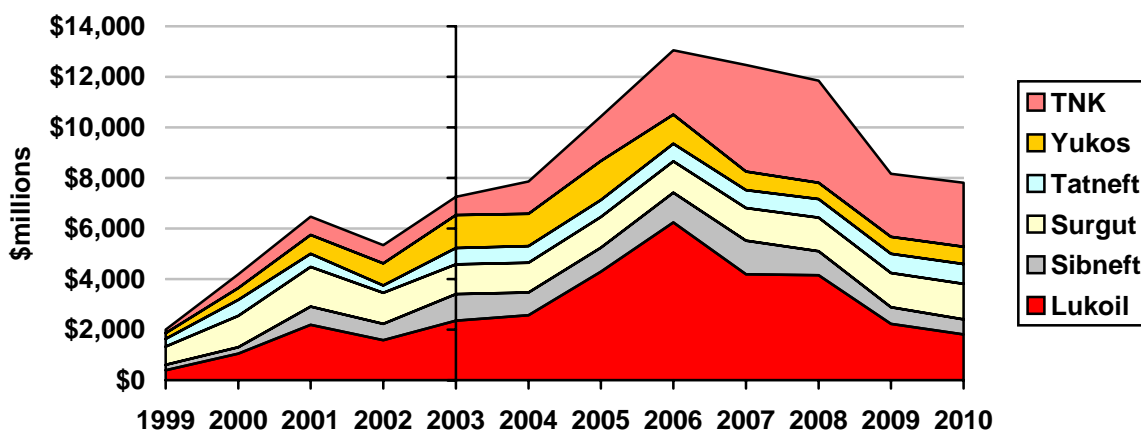


Note: These results assume that the Russian share of oil sales remains constant after 2004. A continued diversion of output from the Russian market is more likely. The magnitude of the diversion hinges on the emerging realization of proposed new transport projects. However, the results in Figure 1 suggest that as much as another 400 mb/d may likely be diverted internationally without reducing overall Russian supplies.

Future production growth will require substantially higher levels of capital spending over the forecast period than has been typical in the past.

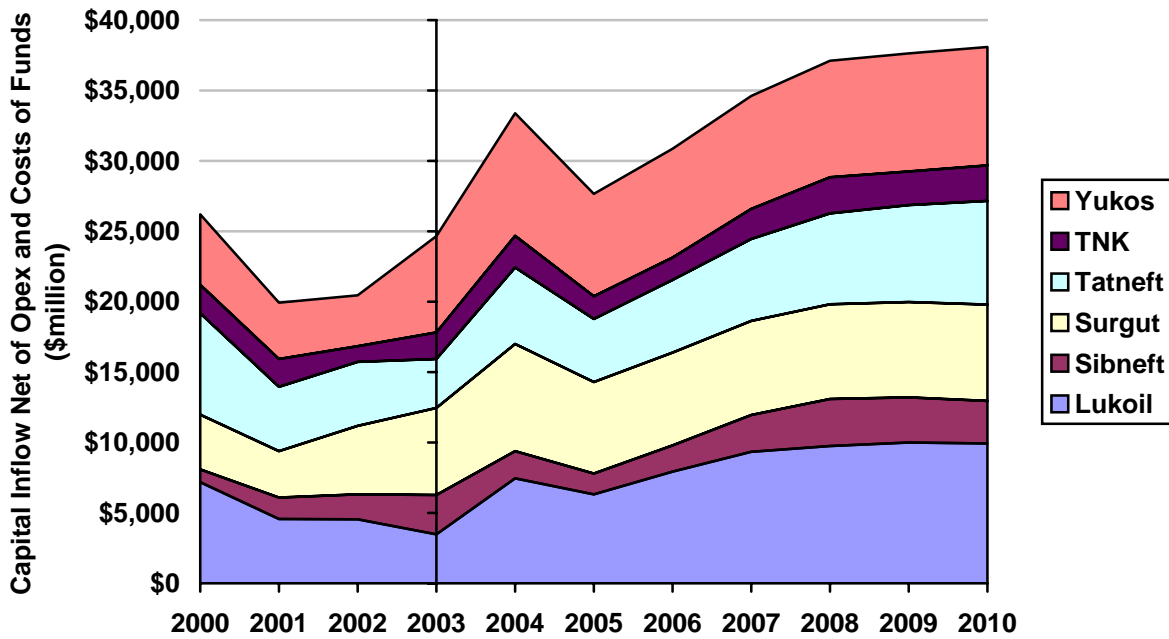
- While most of this growth in capital spending reflects identifiable projects and ongoing operations, a portion is also due to likely cost escalation.
- The forecast results for the group of companies in this study are shown in Figure 2 where it is anticipated that spending will double by 2006 relative to estimated 2003 levels.
- The results in Figure 2 do not include infrastructure capital spending that is likely to be required to realize projected volumes such as the Murmansk pipeline proposal. However, infrastructure capital spending is included in the company capital models to reflect the effects of the resulting calls on capital.

Figure 2: Historic and Projected Upstream Capital Spending (\$ millions)



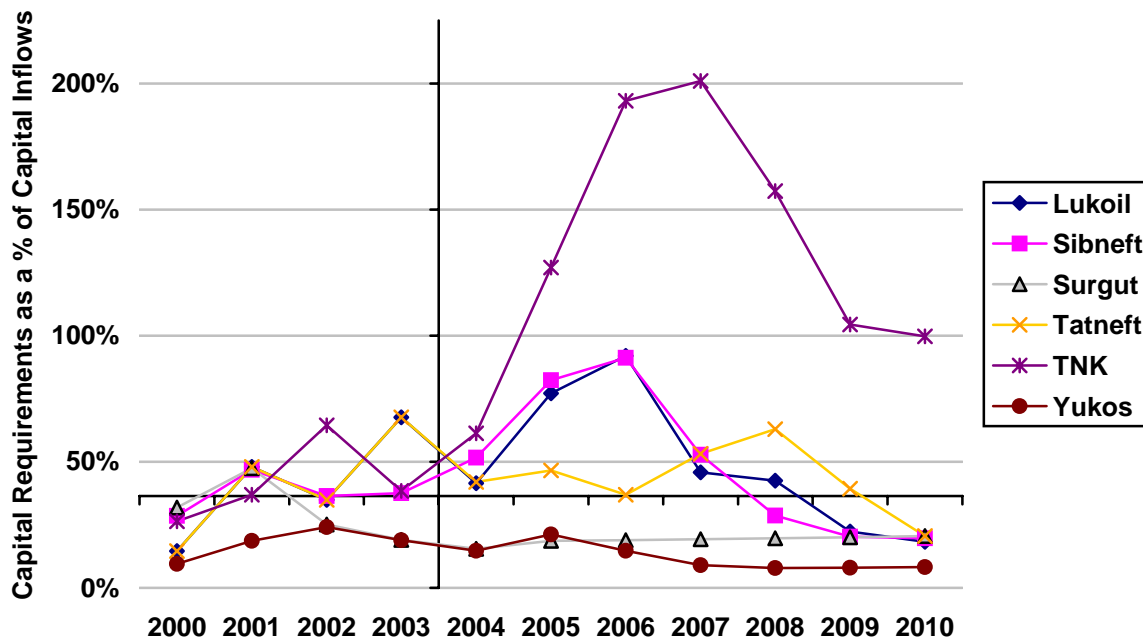
- Despite the projected rapid escalation in capital spending requirements, forecast results suggest that funding of these capital requirements can (with three exceptions) be achieved through projected rapidly growing internally generated funds. For the three companies that are exceptions, the capital spending programs will require increased leverage. Figure 3 shows base case forecasted capital inflows for the Russian companies followed in this study.

Figure 3: Estimated Capital Inflow from Upstream Operations, Base Case International Oil Prices with No Convergence in Russian Market



- Figure 4 shows base case forecasts of the capital requirements ratio (CRR). The CRR measures capital spending as a percent of capital inflows shown in Figure 3.
 - While historic values of the CRR tend to display some volatility on a year-to-year basis, the variation for most companies is typically around a relatively stable median value that is indicative of apparent acceptable levels of capital investment relative to capital inflows available for investment.
 - If capital requirements push the CRR above this median or target value, companies are assumed to look for external funding.

Figure 4: Base Case Projected Capital Requirements Ratios



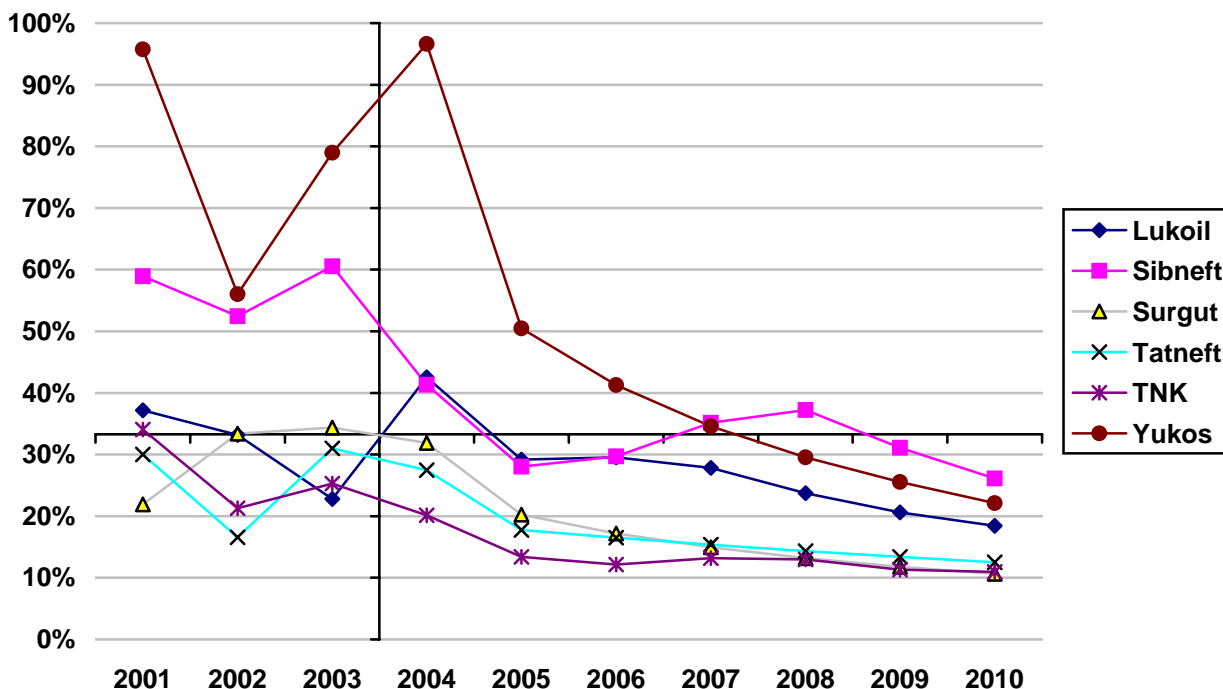
Note: The horizontal axis intersects at the median CRR for all companies over the period from 2000 through 2003.

- There are considerable differences between the companies in terms of their ability to fund the capital investment program from internally generated capital inflows—contrast TNK, Sibneft and Lukoil for example, with Yukos.
 - Prior to 2004, these differences were relatively modest when compared to projected circumstances.
 - For several leading companies (TNK, Sibneft and Lukoil), capital demands are projected to rise dramatically compared to capital inflows and to historic relative values.
 - A clear rationale for certain behaviors emerges from Figure 4. On the one hand, Yukos’ pressure to open up major new investment opportunities such as oil exports from East Siberia to the Pacific market may reflect the large “surplus” of capital inflows relative to capital investment requirements. On the other hand, TNK’s apparent decision to ally with BP seems like a reasonable response to the projected explosion in capital investment demands relative to capital inflows after 2004.

- After 2006, Sibneft and Lukoil also display a substantial decline in the capital requirements ratio, signaling an emerging need for additional investment opportunities.
- Despite the generally positive results of the analysis, looking forward, the research results clearly indicate that the Russian oil companies face an emerging investment challenge. The nature of the challenge is illustrated in the combined results of Figures 4 and 5.
 - This challenge is not unique to the Russian companies. In fact, it is shared by most of their peers and competitors outside Russia.
 - The specific challenge is that current international oil price realizations will:
 - Trigger substantially more profitable results and significantly higher capital inflows available for re-investment in the near to medium-term, but
 - Erode profitability in the long-term if the companies do not either find sufficient future capital investment opportunities to absorb the rapidly accumulating capital or divest themselves of the excess capital through other means.
 - Figure 5 shows projected comparative base case rates of return on capital employed for each of the companies included in the study. The progressive erosion in this measure of profitability is a direct result of rapid accumulation of under-utilized capital.
 - It is essential to recognize that the results of Figure 5 pose a substantial dilemma for the Russian oil companies as they weigh alternative investment strategies.
 - Specifically, as the Russian companies weigh the prospects for increased investment internationally, the domestic returns constitute a benchmark against which international alternatives must be compared. That is, any international program that cannot offer rates of return on capital invested that are comparable to Russian investments will only accelerate the declines shown in Figure 5.
 - The results suggest an almost uniform pattern of decline in profitability for all companies as under-utilized capital accumulates.
 - However, projected ROCE continues to be relatively high by industry standards over most of the forecast period and certainly is high relative to

prospective near to medium-term returns that can be expected from a grass roots based international program.

Figure 5: Base Case Return on Capital Employed

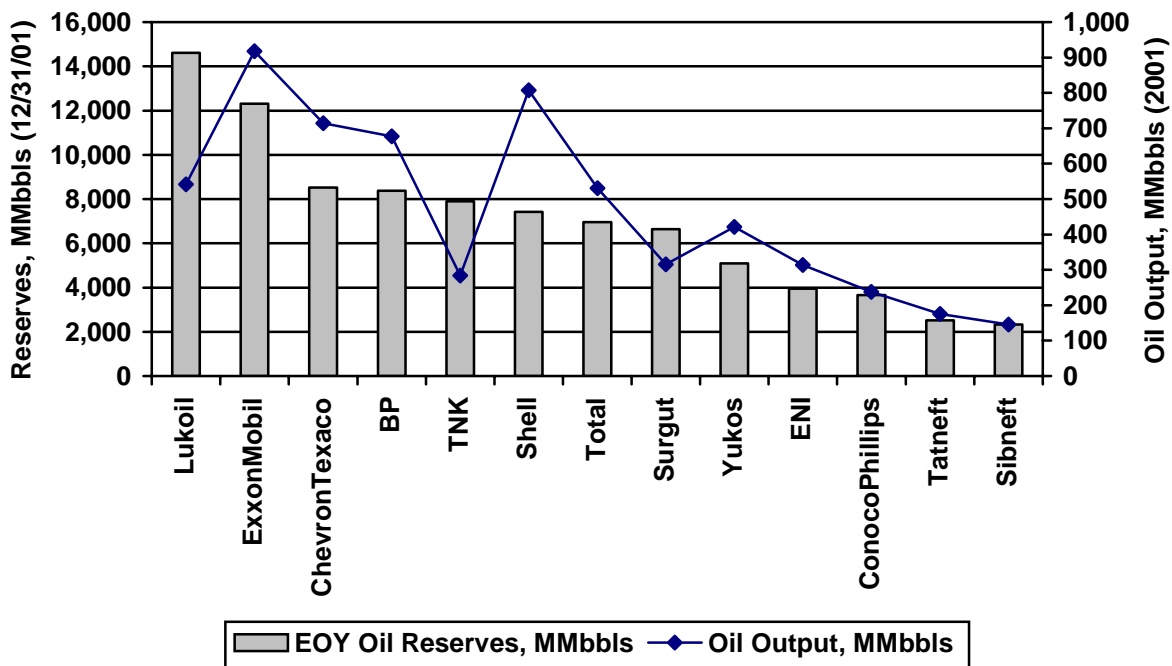


Note: The horizontal axis intersects at the median ROCE over the period from 2001 through 2003.

- The investment challenge illustrated in the results shown thus far is likely to manifest itself in Russian oil company behavior in any or all of three related but apparently dissimilar ways.
 - Growing pressure to increase re-investment rates within Russia as a means to absorb capital, with a potentially adverse effect on costs both due to demand-pull inflationary pressure in the oil-related industries and a shift of capital spending to more costly forms of production enhancement,
 - Capital distributions to shareholders will rise, or
 - More substantive moves than we have seen thus far will be made towards building international E&P operations.

- The pressure to move more aggressively into the international arena is not rooted solely in these economic results.
 - The Russian oil companies can and do boast regularly that, in terms of reserves or production volumes, they are the peers of many of the leading international oil companies.
 - The choice of these metrics for comparisons are suggestive of an underlying institutional pressure both within the Russian oil companies and within the Russian policy sector to demonstrate that the Russian companies are the equals of the “best” in the international oil industry outside Russia.
 - A typical example of such a comparison is shown in Figure 6, which shows worldwide oil reserves and production for a group of companies in 2001. The choice of the year is to maximize the number of companies that reported on a generally comparable basis.

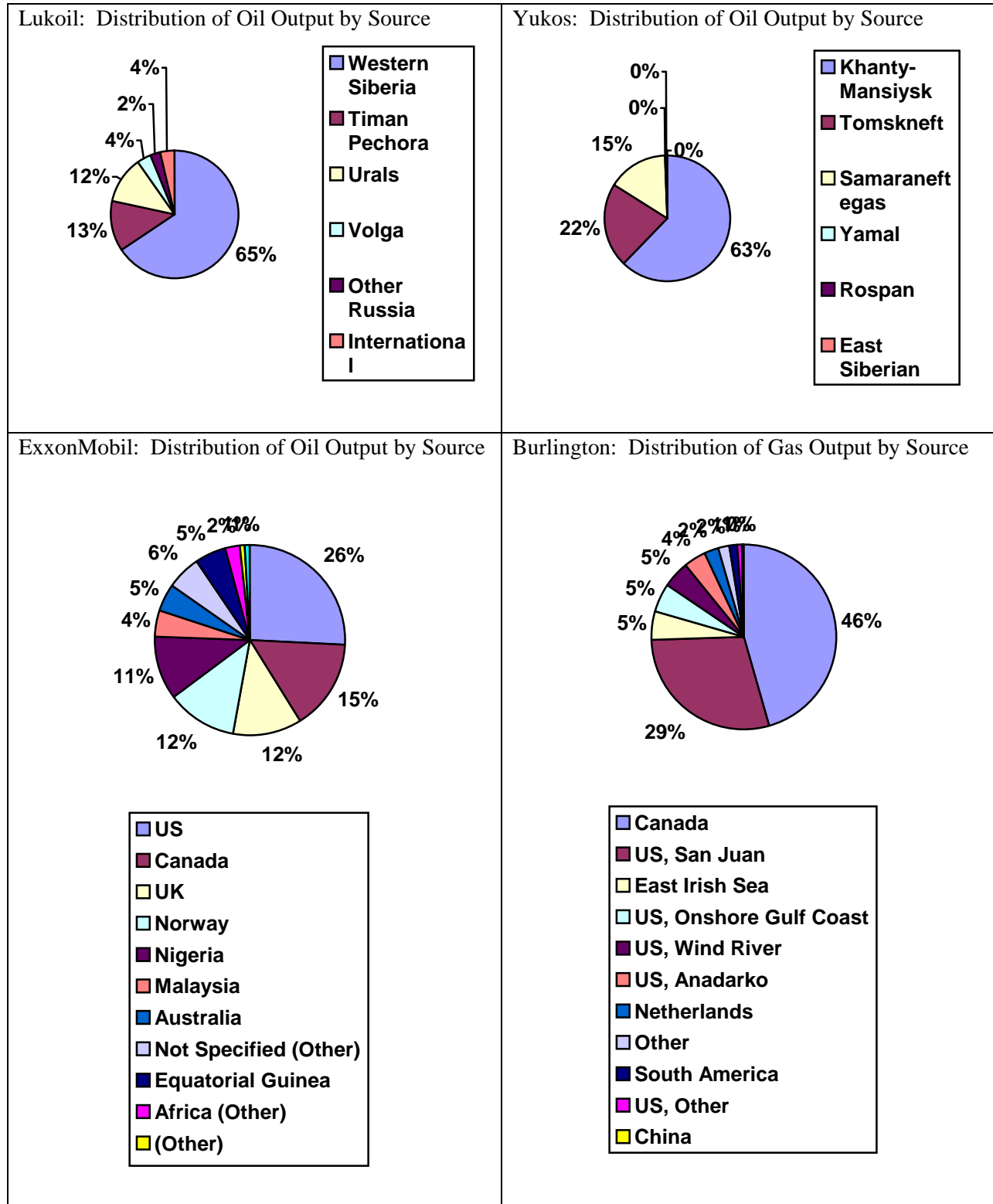
Figure 6: 2001 Reserves and Production of Oil



- The deficiency of the comparison in Figure 6 is rooted in the fact that it is only two-dimensional. This becomes evident when the Russian companies are compared to their non-Russian counterparts on the basis of the depth or diversity of their asset base.

- Figure 7 looks at two leading Russian companies and compares them to non-Russian cases. Note:
 - The high level concentration of Russian company output by region (nearly 2/3rds of output in a single region in both the Lukoil and Yukos case)—a result that is further reinforced by the field concentration within regions.
 - In this, the Russian companies are much more like Burlington Resources than ExxonMobil.
- In such comparisons, the Russian companies' peers are more typically like the medium to large U.S. independent producers or national oil companies that are concentrated in their asset base and lack a substantive international component.
- The potential for perceived invidious distinctions between the Russian companies and the rest of the world oil industry, the drive to match the preferred peer group, and a growing sense that they must “catch up” with other national oil companies (from China, Malaysia, and India, for example) are all powerful drivers that reinforce the economic factors likely to lead some portion of the Russian oil industry into an international diversification effort.

Figure 7: Comparisons on the Basis of the Diversity of the Production Base



- The outlook for conventional investment opportunities for non-Russian companies is likely to rapidly deteriorate as the result of a combination of factors.
 - Capital inflows of Russian companies are likely to increase substantially over time.
 - These gains will be particularly substantial if Russian oil prices convergence occurs, i.e., if Russian oil prices rise to international equivalence.
 - As a result, the perceived need for non-Russian capital will rapidly disappear and, in fact, such capital is likely to be increasingly perceived by the Russian companies and the Russian government as unwanted and unnecessary competition.
 - Also, the current strategic agendas of the Russian oil companies and the few non-Russian companies of consequence in the country are already placing very substantial stress on the Russian institutional framework and the transport grid. Non-Russian participation in an era of already high Russian company capital inflows will only compound these stresses.
 - The results of this study suggest that if non-Russian companies are to succeed in the emerging Russian oil future one potentially constructive approach is to craft a win-win solution.
 - While the specifics of this win-win solution will vary with each company, this study suggests that such a solution is not likely to be based on capital, technology or management efficiencies.
 - More likely, the essential ingredient is for the non-Russian company to simultaneously offer a solution to the Russian company investment dilemma and appeal to the Russian search for parity with the large international companies.
 - The just announced ConocoPhillips buy-in to a minority interest in Lukoil includes several features that are suggestive of this approach. However, insofar as can be determined from early announcements, the scope of the agreement falls short of what is being suggested by this study.
- Russian oil price convergence with international price benchmarks can alleviate the downward pressure on profitability for a time and will radically improve Russian company capital inflows. The effort to achieve convergence is an unambiguous factor in

Russian company strategy (specifically, the nearly uniform programs to reduce Russian sales of crude and to divert incremental supplies away from traditional eastern European transport routes).

- Oil price convergence, while clearly desirable from the companies' perspective, is not costless from the Russian policy-makers' perspective any more than the efficiency drives championed by companies like Yukos are seen as being unmitigated blessings. Convergence will inevitably have adverse economic ramifications within Russia and these economic ramifications will, in turn, be likely to have political implications.
- Institutional rigidities within Russia could become (and are potentially likely to become) binding constraints on output growth. Two leading elements of institutional rigidities include:
 - The continuing role of Transneft as a quasi-monopoly in the transport sector and
 - The failure to develop a stable oil and gas licensing and fiscal system.
- Transneft's natural desire to protect its position as the focal point for transport solutions has the undesirable side effect of encouraging competing and redundant proposals for transport projects that confuse and delay progress.
 - The logic of Transneft's current position and its role in future pipeline projects as a non-integrated quasi monopoly is a uniquely Russian result rooted in the legacy of industrial organization under the prior economic regime. The validity of the Transneft logic is contradicted by the historic experience of the oil and gas industry. In this experience, very early on, forms of vertical integration became necessary and profitable solutions to infrastructure problems that would otherwise have left resources stranded or under-utilized. The Transneft logic continues to be contradicted in most major recent plays around the world. Parallel physical and economic circumstances but different (and more functional) organizational solutions are evident in the Caspian, the North American frontier plays – the Gulf of Mexico, Alaska and the Mackenzie Delta, Europe in the growth era of the North Sea, or Africa today.
 - The world oil and gas industry is, again, entering an era where infrastructure is a critical element to success.
 - This is evident in the growing international gas business and the consequent needs for LNG and LNG transport infrastructure.

- It is also clear in several frontier oil and gas plays where development viability requires commitment to sometimes-costly pipeline transport infrastructure.
 - While companies participating in these infrastructure projects are sometimes committed to these projects as their primary business, it is to be expected that the economics of an integrated project development approach will often be essential to progress.
 - Transneft cannot achieve this integrated economic approach, and efforts to force solutions into the existing institutional structure are likely to become barriers to success.
- The adverse effects of the second key institutional rigidity in the Russian system are already indirectly apparent in the many battles with Yukos, disputes over companies' performance in meeting contractual requirements, and the reversal of production sharing contracts.
 - Under the scenarios that are outlined in this paper, the Russian fiscal system is unlikely to be stable in the current price environment or in the emerging financial world confronting the Russian oil companies.
 - Specifically, despite the oil price-linked royalty system under the Unified Production Tax and the Crude Oil Export tax, government take lacks the mechanisms that are likely to satisfy the government's demands for revenues and its sense of "fairness" in its share.
 - The result is a future volatile and unpredictable investment environment.
 - Some variation on the "Special Petroleum Tax" seems likely in the near future as the government struggles to capture an acceptable portion of the run-up in oil values.

The next section of this study discusses some of the key factors at work in the Russian oil industry. This is a necessary segue into the results of the model forecasts and further reinforces some of the points made in the preceding summary of conclusions.

Facts and Circumstances: The Russian Context

Initial Observations

The character of the Russian oil companies has rapidly evolved. The nature of this evolution has been similar to patterns experienced elsewhere over the industry's history. Specifically, while the Russian companies have always been relatively large, they tended to be concentrated in specific plays and sometimes only in a few dominant fields.

During the period of transition that now seems to be coming to an end, acquisitions have been a key tool for growth and diversification (although the bulk of this acquisition driven diversification program has been focused within different Russian oil plays).

Facts and Circumstances in the Russian Oil Industry

In any evaluation of the likely future, it is essential to begin with the facts and circumstances of the present. Four key components of these facts and circumstances are (1) persistent uncertainties confronting potential investors, (2) the market structure of Russia's oil industry, (3) the long-standing historic role of barriers to export and their ramifications for opportunities and (4) the institutional legacy of Transneft's near monopoly of the oil transport infrastructure.

Each oil and gas play has undeniably unique features. Russia is no exception. However, it is a grave and all too often repeated error of analysis to believe that the future of Russian oil will be uniquely different than prior experience in the industry elsewhere in the world.

Uncertainty Sources

The future course of the oil industry in Russia hinges on the outcomes of a number of key uncertainties. The nature and scope of many of these uncertainties is rooted in the facts and circumstances of the industry today. Current facts and circumstances are, in turn, significantly determined by the industry's history and the legacy this has created.

Critical sources of uncertainty include:

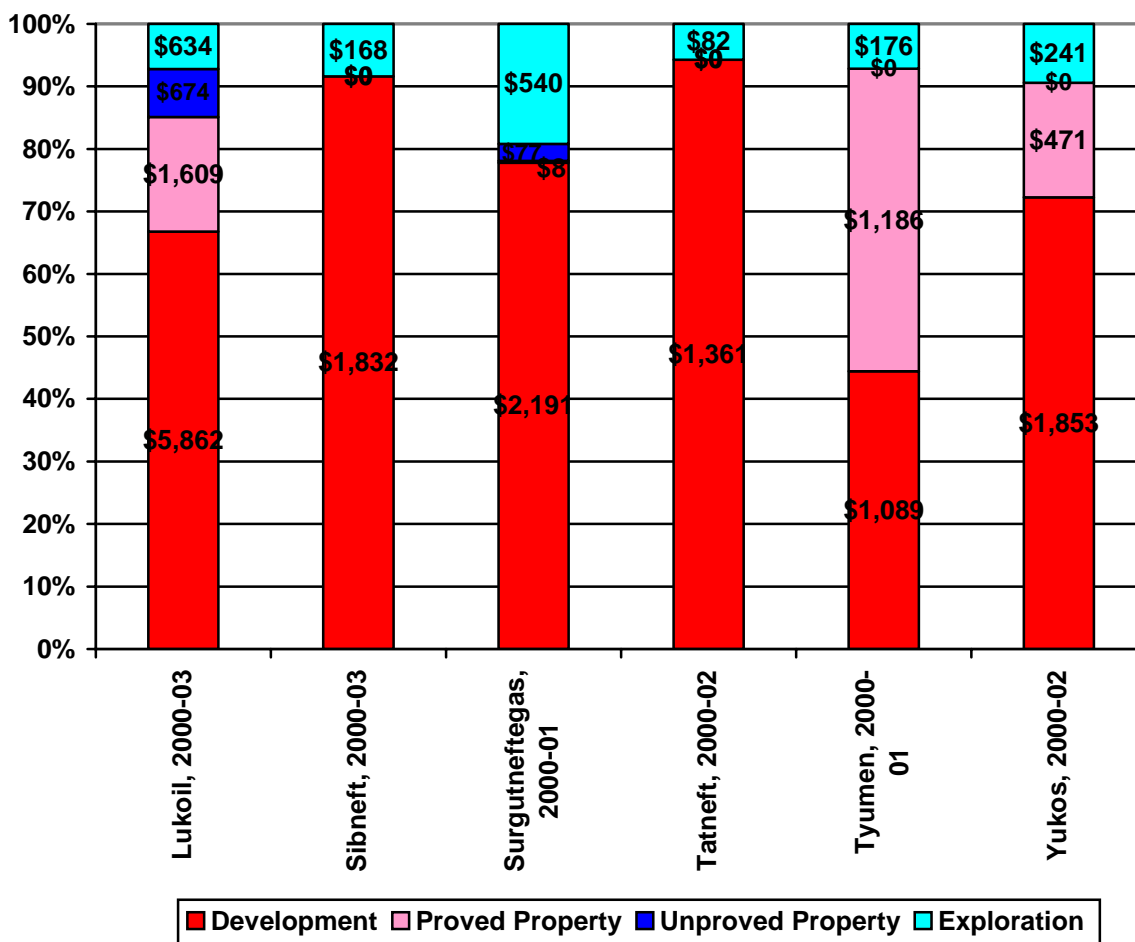
- The aggregate or macroeconomic impact of competing decisions arrived at by the leading oil companies in Russia—each pursuing their own strategic goals—including impact on world and Russian domestic oil prices and effects of growth strategies on Russian F&D costs.
- To date, the growth in Russian oil production has typically been achieved through one of two key processes:
 - Intensive drilling (often of relatively low production rate wells) or, in other words, a multiplication of the extraction effort applied to existing reserves, or
 - Rationalization of existing wells and the application of workovers and new higher yield wells or, in other words, efficiency gains in the extraction effort applied to existing reserves

While very substantial payoffs in production and profitability can be and have been achieved through the application of these two approaches in Russia, there is an inevitable process of diminishing returns. These diminishing returns will affect future performance in the Russian oil industry just as has happened in many other petroleum provinces around the world.

What has not occurred up to this point is a growing industry capital commitment to exploration for new reserves commensurate with the growth that has been experienced in output. The focus, instead, has been on development programs and acquisitions of proved properties—a result consistent with the previously undiversified asset base of most companies and the initial transitional period of the industry.

As shown in Figures 8 and 9, exploration for new reserves has been a relatively modest portion of the capital programs of most companies.

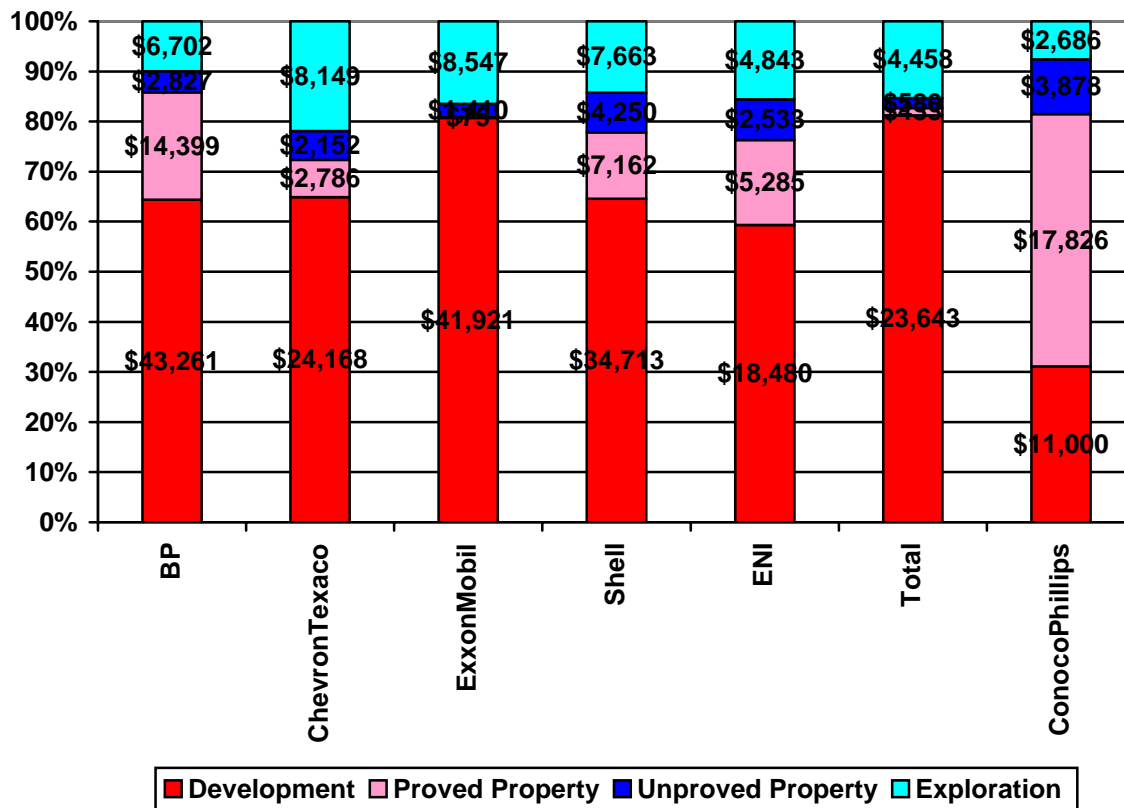
Figure 8: Allocation of Costs Incurred in Upstream Investments by Large Russian Companies



Source: John S. Herold, Inc. financial database. Note: Data coverage is limited to 2000 and 2001 due to limitations on reporting of some companies.

With only one exception (Surgutneftegas), exploration’s share of the total budget is typically 10% or less—often substantially below 10%. The contrast with large international oil company capital spending allocations is seen by comparing the Russian results with Figure 1b where it can be seen that between 10% and 20% of the capital budgets of these companies is typically devoted to exploration and another 3% to 10% is allocated to unproved property acquisition costs.

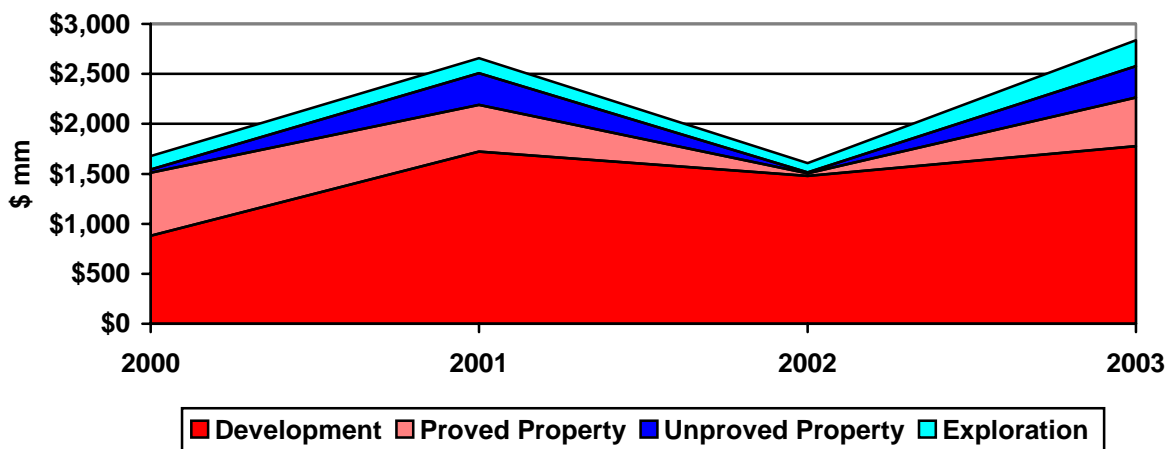
Figure 9: Allocation of Costs Incurred in Upstream Investments by Large Global Oil Companies, 1998-2003



Source: John S. Herold, Inc. financial database.

The evolution of one company's (Lukoil) upstream capital budget is shown in Figure 10 where it can be seen that exploration spending, while rising in recent years, has consistently been a minor part of the program.

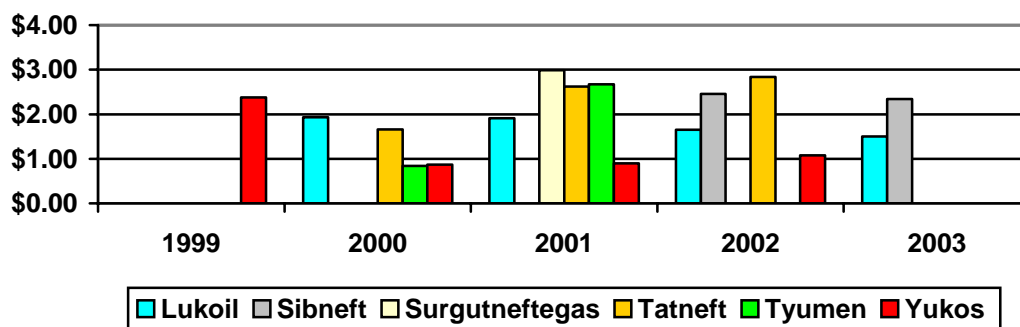
Figure 10: Costs Incurred by Lukoil, 2000 through 2003



Source: John S. Herold, Inc. financial database.

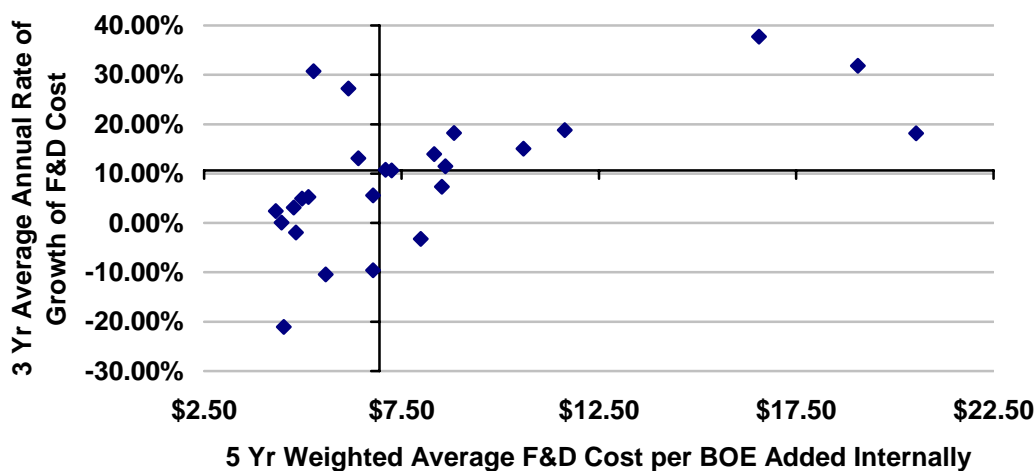
- Macroeconomic trends in the efficiency of the Russian oil industry with respect to reserve generation may emerge as a key factor. A significant driver that is likely to accelerate the emergence of competitive increases in costs is the effect of shared production growth strategies among nearly all of the major companies.
- An essential indicator of the cost effectiveness of an oil and gas company's investment program is finding and development costs incurred per barrel of oil equivalent reserves added through internal operations (\$F&D/boe)—excluding the effects of acquisitions. Figure 11 shows the estimated 3-year rolling average F&D costs incurred per boe added internally for Russian companies. As a group, the Russian companies have reported very low unit F&D costs despite rapidly rising production rates. This performance reflects, at least in part, the character of the Russian industry's capital program. Specifically, the low cost of reserve additions reflects the relatively modest role of higher risk exploration in the program. In addition, a substantial portion of the capital budget has been devoted to re-development of existing reserves or improvements in the existing stock of producing wells.

Figure 11: 3-Year Rolling Average of F&D Costs Incurred per BOE Added Internally, Selected Russian Companies



- Figure 12 shows the 5-year rolling average of worldwide F&D costs incurred per boe added internally in 2003 for a selection of international oil and gas companies. The figure also shows the compound average annual rate of growth in this indicator from 2000 through 2003. Rolling averages are used to smooth out year-to-year volatility. The axes cross at the sample medians for each variable.

Figure 12: F&D Costs Incurred per BOE Added Internally in 2003 and Long-Term Growth Rates



Source: John S. Herold, Inc. databases

- The data in Figure 12 suggest a general level of F&D costs that is substantially higher than recent historic results in Russia. The sample also shows a median average annual rate of escalation of costs in excess of 10%. Only six of 25 companies in the sample were able to reduce costs or hold them constant over the period since 2000.

- Over time, it may be expected that Russian costs per boe added will also tend to rise. When this begins and how fast it proceeds is speculative at this time. Driving forces behind this likely cost escalation will include market-driven inflation, diminishing returns of current production-based investments, and a shifting composition of capital spending in favor of exploration. The Murphy, Marathon, Hess and Anadarko experiences are suggestive of a case pattern that may well emerge in the Russian industry as opportunities for low cost production growth are drawn down, and the Russian companies must turn to higher risk and higher cost strategies.
- In addition to Russian company decisions and their broader ramifications, the future of Russian oil will also depend on the macroeconomic impact of competing decisions of oil companies in key related producing areas of the world—most particularly the Caspian—including impact on world oil prices and competing demands on export outlets.
- Public policy decisions inject substantial uncertainties. The continuing problems of Yukos, international oil companies doing business in Russia, and recent events in Kazakhstan are examples of specific risks. The uncertainties include decisions both within Russia and in the key countries that are essential to the Russian oil industry by virtue of either their control over export outlets or their potential importance as consumers of Russian oil.
- Infrastructure is a critical factor in defining what is both possible and probable. Timing, volumes, and location of the evolution of required oil transport infrastructure essential to enabling export volume growth is an essential driver of uncertainty.

Market Structure

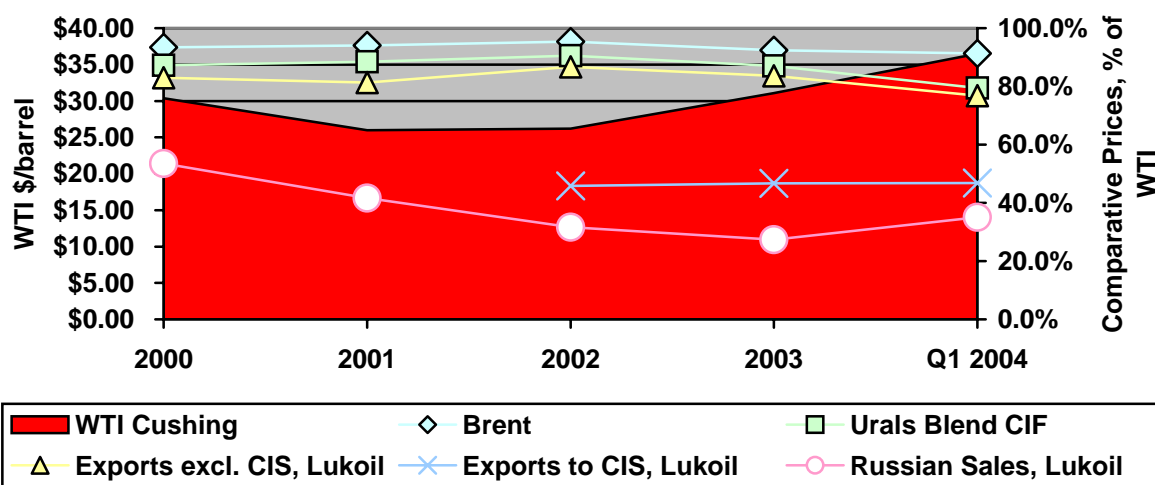
- At present, three market outlets exist for Russian crude: the domestic market, exports to CIS countries, and exports to non-CIS countries.
- The legacy pipeline grid results in a high level of concentration of non-CIS exports in specific western markets.
- With the exception of Sakhalin production, all Russian exports flow west (there is no substantive outlet for Russian crude to Pacific markets).

The three Russian markets differ in a number of ways but two points of difference are particularly relevant. First, the markets differ in terms of the degree to which changes in realized prices are linked to the international market price benchmarks. Second, the absolute price level that Russian crude can command is very different in each of the markets.

Figure 13 shows the WTI spot crude price as a benchmark for the world market from 2000 through the first quarter of 2004. The figure also shows a cross-section of other prices relevant to the valuation of Russian production as a percent of the WTI price. Two of these other prices (Brent and Urals blend) are direct market benchmarks. The remaining prices are average realized prices on crude sold into the three markets for Russian crude identified above and as reported by Lukoil.

The substantial discounts on prices of crude sold into the CIS or the Russian market is clear from Figure 2. These discounts have persisted over an extended period of time. The root causes of these large discounts and their persistence are of fundamental importance to understanding the long-term strategies of many of the key players in the Russian oil industry, the interaction with public policy goals within Russia, and possible implications.

Figure 13: Russian Crude Markets and Pricing Effects



Note: Data on Lukoil prices realized in sales to the CIS countries are not available prior to 2002.

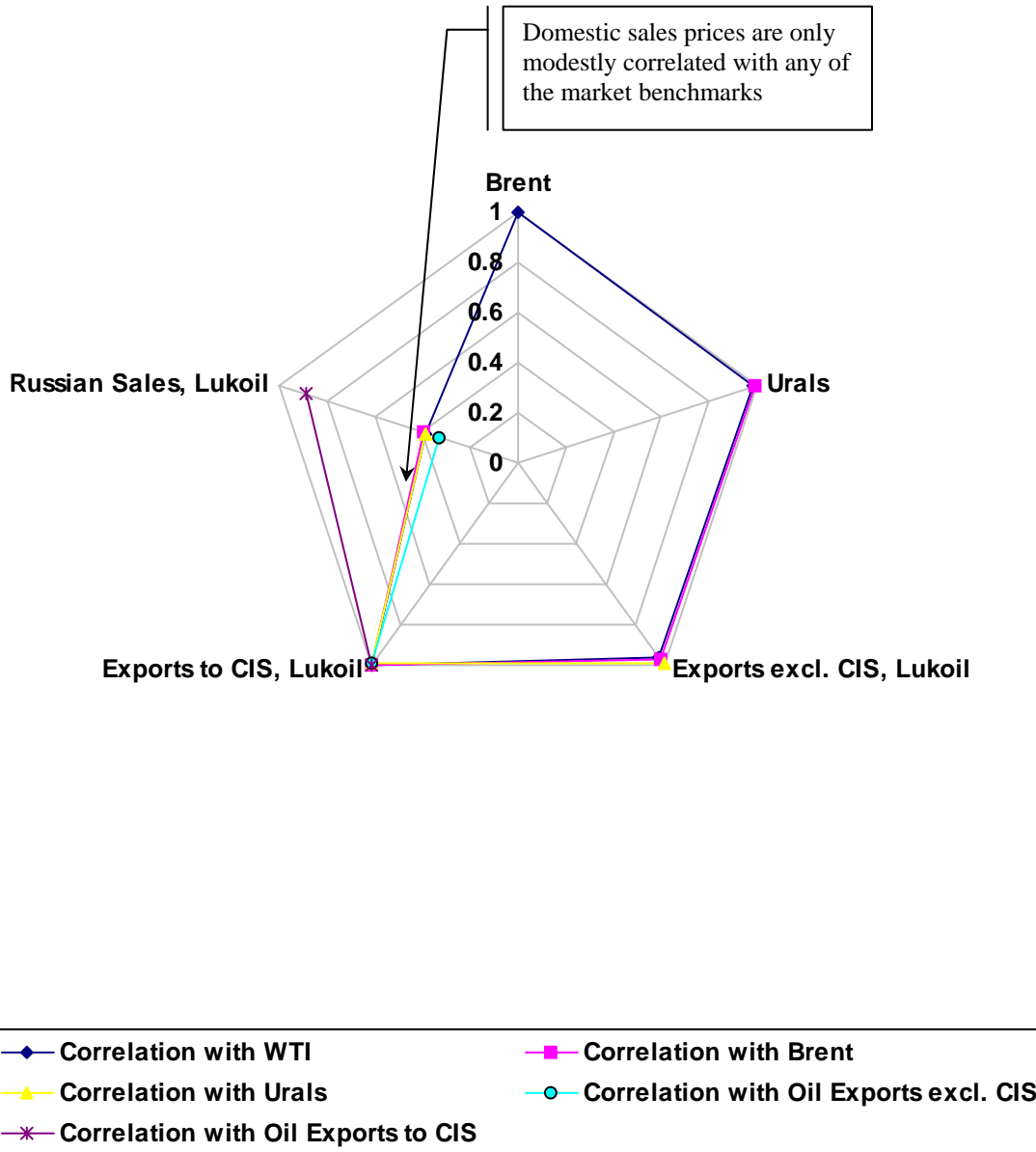
Figure 14 shows correlation estimates for each of these oil prices. The results illustrate a number of important additional characteristics of pricing in the Russian industry:

- Changes in all of the key market benchmarks (WTI, Brent and Urals) are, not surprisingly, very highly correlated.
- Moreover, Lukoil's average reported price received for exports both to the CIS and the non-CIS markets are also highly correlated with the market benchmarks.
- While CIS exports are discounted in level relative to market benchmarks, the correlation estimates show that they nevertheless tend to track changes in the market benchmarks.
- However, domestic Russian oil realizations are much more weakly correlated with the market benchmarks but show a strong correlation with exports to the CIS countries.

The behavior of the domestic Russian market, as illustrated in Figures 13 and 14 is reminiscent of a market subject to price controls. Specifically, the price within Russia is substantially discounted relative to arm's length alternatives and market signals, as reflected in external, uncontrolled market prices, seem to only imperfectly influence the domestic price.

While economic theory is unambiguous as to the potentially adverse effects of such a situation if it persists over an extended period of time, political economy just as clearly suggests that an unplanned or unduly rapid resolution of this dichotomous pricing situation may conflict with public policy imperatives in Russia in the near to medium-term.

Figure 14: Correlations of Market Benchmarks and Realized Prices on Crude Oil Sales as Reported by Lukoil



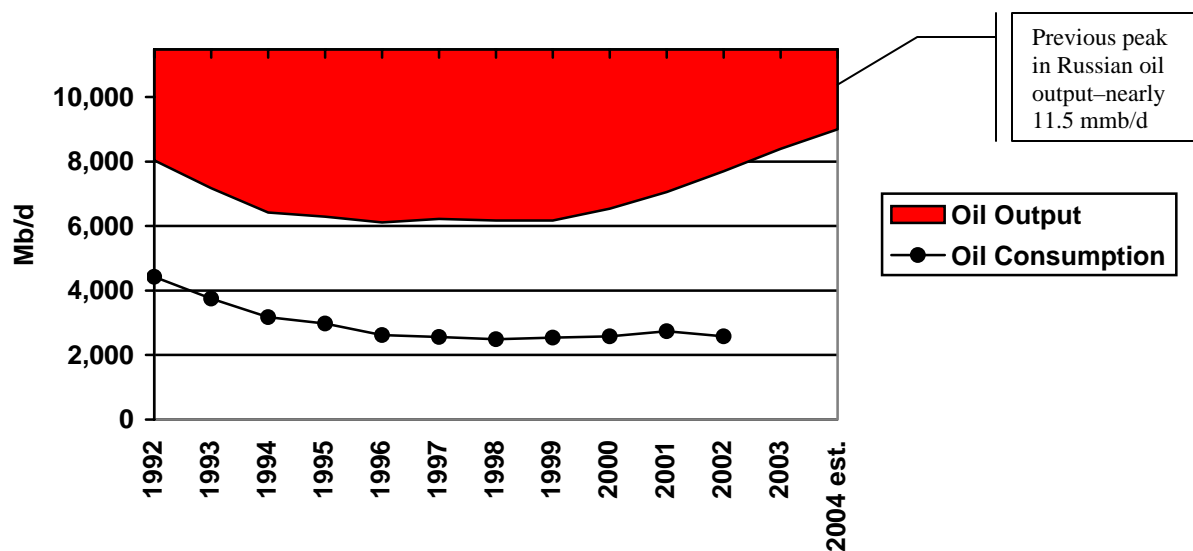
An important policy implication of the current discounts on oil sold into the Russian market should not be overlooked: a substantial economic subsidy to the non-energy portion of the Russian economy. As producers, en masse, struggle to reduce sales of crude into the Russian market, one may expect this subsidy to erode over time, i.e. Russian domestic oil prices will converge toward an adjusted parity with market benchmarks. The government's attitude towards this long-term erosion remains to be seen.

Barriers to Export

While Russian oil price behavior is reminiscent of price controls, the source of the breakdown of economic communication between Russian and world oil prices is rooted in a different type of barrier to economic efficiency: infrastructure constraints in the form of pipeline export capacity, concentration of export outlets to relatively narrow markets defined by the available pipeline capacity flows, and sharply rising marginal costs of transport as additional output is forced to rail shipment when pipeline capacity is exhausted.

This barrier, combined with surplus oil production capacity relative to Russian domestic oil consumption (as shown in Figure 15) results in the pricing characteristics mentioned above.

Figure 15: Estimated Russian Oil Production and Consumption

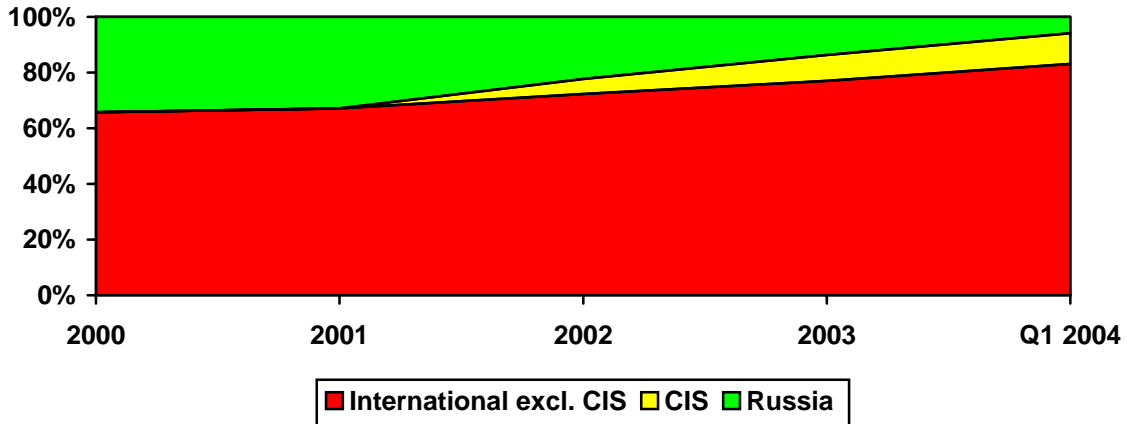


Another parallel between the Russian facts and circumstances at this time and those of a market subject to price controls is the resulting impact on corporate strategies. A widely shared strategic goal in the Russian oil industry in recent years is the search for export capacity and the goal of increasing the relative role of oil exports in the total production mix of the company.

The operation of this shared strategic goal at Lukoil is illustrated in the changing composition of its oil sales since 2000 as shown in Figure 16. International crude oil sales, including sales to the CIS, have climbed from roughly 65% in 2000 to more than 90% by the first quarter of 2004. This growth in the role of international sales has been achieved by a combination of growing

worldwide oil output (rising at an average annual rate of 6.7% from 2000 through 2003) and declining oil output sold in Russia (declining at a 21.5% average annual rate from 2000 through 2003).

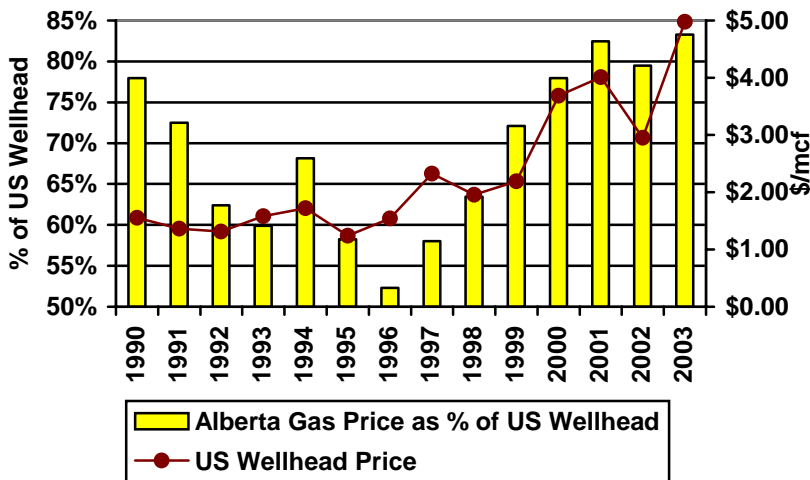
Figure 16: The Composition of Lukoil Crude Oil Sales by Major Market Opportunity



**Convergence at Work: A Recent Example
Canadian Gas to the U.S.: A Historical Parallel to the Russian Transport Dilemma**

Insight into the character of the Russian problem and the potential future evolution of the business is offered by the experience in the Canadian gas industry prior to and after the construction of major export pipelines to the U.S. market. In the late 1980's and into the early to mid-1990's Alberta gas production capacity greatly exceeded demand in markets available with existing pipeline infrastructure. Following construction of several major pipelines into the U.S. market, exports from Alberta more than doubled in two stages.

Canadian Gas Pricing and Integration with the U.S. Market



The push to expand crude oil exports from Russia, coming at the same time that Caspian production and shipment through the Black Sea and the Bosphorus is up substantially, is creating new bottlenecks in the export infrastructure. The difficulties in expanding tanker trade from the Black Sea through the Bosphorus and into the Mediterranean is one result.

By some reports, growing Caspian production shipped through the Transneft network is also pressuring Russian export opportunities through this route. Problems in the Bosphorus directly affect the export capacity of oil production from the Caspian—including the Caspian Pipeline Consortium shipments of crude to Novorossisysk on the Black Sea. Competing proposals to build pipeline bypasses of the problem through Turkey or through Bulgaria and Greece have emerged.

Comparative pipeline proposals are summarized in Table 1. Letter designations associated with the proposals are a key for use with the map on the following page.

Industrial Organization and Institutional Dominance

Quasi-Monopoly on Oil Transport Infrastructure

The institutional legacy of Transneft's dominance of the oil pipeline grid in Russia contributes to an ongoing potential for disputes over choices between alternative transport solutions and decisions concerning ownership and control.

While Transneft's role as a near monopoly of the pipeline grid is not unique in the world, it stands in stark contrast to circumstances in key developed countries such as the U.S., Canada and Australia as well as many leading third world countries in the Caspian, West Africa, Latin America and the Pacific.

A central deficiency in Russia is the institutionally mandated decoupling of the strategic and economic roles of infrastructure and upstream assets. To be more specific, in those areas of the world where this decoupling is not present, the strategic priority attributed to infrastructure by investors is directly linked to the reality that such infrastructure is a necessary precondition for realizing upstream value. In the process, the economics of infrastructure and upstream investments are mutually determined, not independently. One may note, for example, the joint evaluation of the upstream, liquefaction, transport and, in some cases, the regasification capital projects that is typically required to bring an LNG project to fruition in Qatar, Indonesia, or Australia. Or consider, as another example, the mutual interests of the owners of the Caspian Pipeline Consortium (CPC) and the owners of the upstream assets transported through the CPC. Or, finally, consider the role that infrastructure has often played in company cash flows and earnings long after the original upstream asset's production has begun to decline but the infrastructure continues to process third party volumes.

Similarly, the risks of the infrastructure and upstream portions of the project are typically shared by the same investors rather than by disparate groups. As such, the risked evaluation of the overall economics can differ under a decoupled versus a coupled case.

Of course, in principle, a blend of the tariff (or pricing) mechanism and throughput guarantees from the upstream companies should equate the economics even if the infrastructure and upstream portions are decoupled. However, this apparently basic principle of economics often fails precisely because it ignores the institutional rigidities that emerge in practice. Not the least of these institutional rigidities arises when the infrastructure company has other, competing strategic goals or needs or when the planned new infrastructure is perceived as a source of competition with pre-existing infrastructure.

This breakdown between theory and practice is precisely one of the key problems in Russia as oil pipeline capacity to preferred markets lags behind potential oil production capacity. The same nature of problem has arisen in the natural gas sector for somewhat similar reasons.

Table 1: Potential Export Options

Target Market	Supply Source	Route	Proponents	Volume Mb/d	Cost \$mm	Comments
Asia	East Siberia	Angarsk to Nakhodka (Primorsk region) (F)		1,600	\$6,000 (DOE); \$15,400 (Transneft)	4,188 km pipeline from Taishet to Perevoznaya Bay near Nakhodka. The line would pass through 7 Russian federations: Irkutsk, Tchita, Amur, Buryatiya, Khabarovsk and Primorsk
Asia	East Siberia	Angarsk to Vanino (Khabarovsk region)	Governor of Khabarovsk region; Rosneft			3,288 km alternative to the Nakhodka plan. Vanino is located in the Khabarovsk region (Nakhodka is located in the Primorsk region). This route would pass near Rosneft's Komsomolsk refinery; also, Vanino is nearer to Sakhalin.
China	E. Siberia	Angarsk to Daqing (China) (G)	Yukos	600	\$2,500 (DOE) \$1,700	1,500 mile pipeline
Western Europe and U.S.	West Siberia, Timan Pechora	Western Siberia to Ukhta to Murmansk (3,600 km) or Western Siberia to Usa to Murmansk via the White Sea (2,500 km) (B)	Lukoil, Yukos, Sibneft, TNK	1,600	\$3,400 to \$4,500 depending on the route	Possible 2007 startup. Lukoil and Yukos will fund 2/3 rds of cost and hold 40 mm tonnes of capacity. 10 mm tonnes to be supplied by Sibneft and TNK each. Capacity to start at 60 to 80 mm tonnes per year with expansion possible up to 120 mm tonnes per year. Murmansk is a deepwater, ice-free port
U.S.	West Siberia	Surgut to Indiga	Transneft	1,100	\$6,000	1,700 km pipeline to ship crude to the Barents Sea port of Indiga. To implement requires guarantees from U.S. refineries that they will take Russian sour crude and determination that super-tankers will be able to discharge their cargo on eastern U.S. coast.
Mediterranean	West Siberia	Kirikoy (Black Sea Turkish port) to Ibrikbaba (Saras Bay on the Aegean) (D)	Transneft; Anadolu	1,200	\$900	193 km pipeline. Possible tariff of \$1/bbl. \$7.47/tonne during credit payback dropping to \$3.04/tonne after credit payback. Two year construction period anticipated.
Mediterranean	West Siberia	Bourgas (Bulgarian port on Black Sea) to Alexandroupolis (Greek port on Aegean Sea) (E)	Russian Deputy Foreign Minister	700	\$620	279 km pipeline. Goal: to reduce adverse effects of bottlenecks in the Bosphorus. 280 km pipeline from Bourgas to Alexandroupolis. Tariff to match the cost of shipping via the traditional Bosphorus route to the Mediterranean. Less than 3 year construction period.
Europe	West Siberia	Black Sea port of Tuapse through the Odessa-Brody pipeline	Ukraine			Russian Minister of Industry and Energy opposes the proposal: destabilize the existing market for Russian and Kazakh crude in Europe; tariff would be \$13/tonne more than the cost through the existing Druzhba pipeline
Asia	Eastern Siberia	Vankorskoye field to the Arctic port at Dikson	Rosneft	600	\$1,000 to \$2,000	800 km pipeline that could start by 2008. The \$2,000mm cost estimate includes cost of building ice-class tankers to carry the crude. An alternative is a 500 km pipeline to link to Transneft pipelines.
Western Europe	Timan Pechora, W. Siberia, Urals, Kazakh	Baltic Pipeline System Phases I and II; Usa to Primorsk (C)	Transneft	240 12/01; expansion to 840 complete 2/04; possible expansion to 1,200 by 2005		Phase 1 commissioned on 12/2001. Phase 2 adds 264 km of additional pipelines and will accommodate 90,000 cm tankers. Outlet to the sea from the port of Primorsk (near St. Petersburg)
W. Europe, U.S.		Druzhba-Aria Pipeline Integration Russia to Beylorussia to Ukraine to Croatia, Hungary and Slovakia through the port of Omishal in Croatia	Transneft; Yukos	100 to 200 to 300 in 3 phases		In Phase 1 reversal of the flow of the Croatia portion of the Adria pipeline from the Sisak pumping station to the port of Omishal Omishal is a deepwater port that can handle supertankers with up to 2.5 mmbbls capacity. Means to bypass the Bosphorus bottleneck Russian oil will flow from the Southern Druzhba pipeline. Yukos owns 49% of the Slovakian segment of the Druzhba (Transpetrol)
W. Europe	Kazakh, Russian	Odessa (Black Sea) to Brody (near Poland) to Gdansk port (A)		180 with potential to 800	\$650	667 km pipeline could connect Black Sea output to the Ukrainian leg of the Druzhba pipeline; In July 2004 the Ukraine announced it would use the line to ship Russian crude to the Black Sea rather than Caspian crude to Europe. 300 mile extension from Brody to Plotsk in Poland for \$500 mm
Mediterranean	Caspian: Azeri project	Baku to Tbilisi (Georgia) to port of Ceyhan (Turkey)	ACG consortium	1,000	\$3,000	1,760 km pipeline to bypass the Bosphorus and serve as an export line to the Mediterranean port of Ceyhan in Turkey. Planned startup in 2005
Mediterranean	Caspian: Tengiz	Tengiz to Novorossisyk port on Black Sea	Tengiz owners	1,400	\$2,600	935-mile pipeline from Tengiz to the Black Sea Port of Novorossisyk. Went on-line in 2001



Model Results and Forecasts

Model Premises and Forecasts for the Leading Russian Companies

Key shared premises underlying the model results presented in this paper include:

- Oil and gas price realizations by each company.
- Cost drivers:
 - Efficiency of the capital program over time—trends in finding and development expenditures required adding a barrel of oil equivalent reserves.
 - Likely future direction of transportation costs in Russia.
- The proportion of company production that is exported.

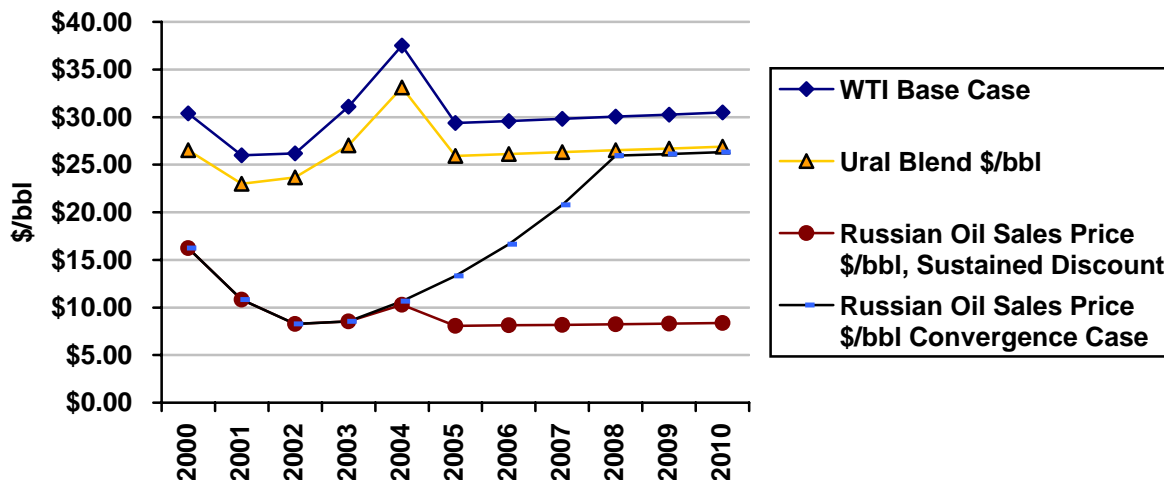
Base case and scenario alternatives for key driving factors are summarized below:

Oil and Gas Price Realizations: The two key issues are (1) the long-term level of international benchmark crude prices (WTI, Brent, Urals Blend) and (2) the degree to which Russian domestic crude oil prices converge to a market benchmark parity.

The importance of the international benchmark prices to our results is obvious. However, convergence or lack of convergence is important to varying degrees to results for each of the Russian companies. The incentive to export increasing shares of gross oil output is a direct result of the ongoing discounted price of crude sold within the Russian market.

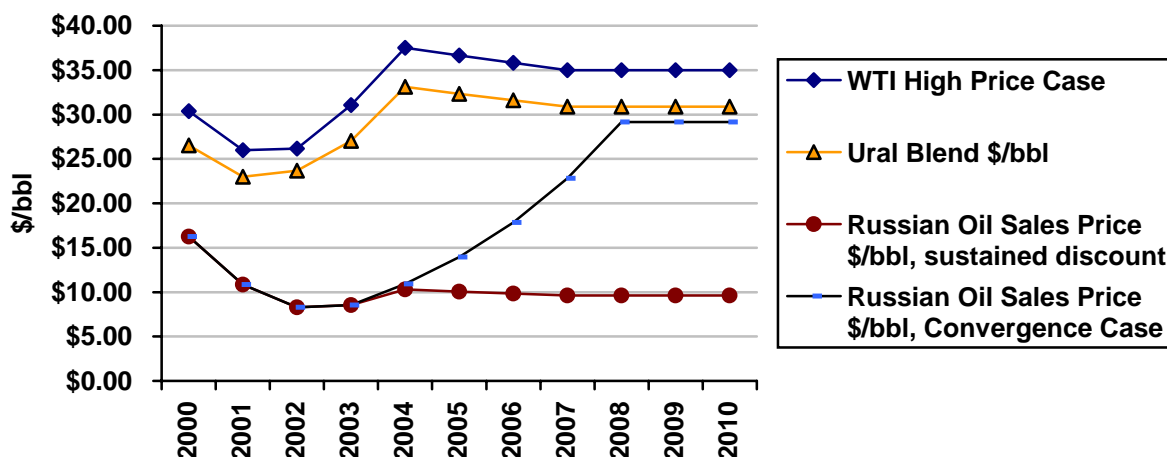
Over time a plausible scenario is that convergence will be the emergent tendency (as was true in the Canadian experience) since the incentive to divert oil output to export markets will remain in place until the domestic price approaches the international price net of export taxes and additional transport costs. This incentive will persist until the residual of production after exports of oil just equals Russian domestic consumption needs at the convergence price. What is not clear is whether Russian policy makers are prepared to accept the resulting domestic price that may be required for this process to be completed.

The **Base Case** oil price premises using Lukoil historic data as an example (without and with assumed convergence by Russian domestic crude prices) are shown below.



In this case it is assumed that current oil benchmark prices are an aberration and drop from recent highs to \$30 per barrel in 2005 with negligible change afterwards. The Ural blend and domestic Russian prices move more or less parallel but at discounted levels. In the convergence alternative, Russian domestic oil prices rise continuously through 2008 to a level equivalent to the international benchmark adjusted for the export tax.

The **High Case** oil price premises (without and with assumed convergence by Russian domestic crude prices) are shown below. In this case, recent prices represent a new norm with the WTI benchmark dropping slightly to a new plateau of \$35/bbl.



Finally, in the low price case, the WTI benchmark is assumed to decline gradually to a level of \$25/bbl—roughly consistent with prior norms.

Costs: F&D costs are assumed to escalate at a relatively modest 3% per annum over the forecast period. The resulting values late in the forecast are still substantially below international norms. Lifting costs are assumed to remain constant at recent historic averages.

Taxes: The Unified Production tax and the oil export duty are calculated using the formulaic link to realized oil prices as described in the company reports.

The analysis that follows for each company will focus on projections of several key indicators through 2010:

- Oil production and the composition of oil sales (domestic sales and exports),
- Capital inflows net of operating costs, productions and export taxes, and the costs of funding (interest expense and dividends)
- Funding of capital programs as a percentage of projected net capital inflows assuming historic levels of this ratio are sustained
- Capital structure as indicated by the evolution of the projected debt to total capital ratio
- Profitability as measured used the projected rate of return on total capital employed in the upstream segment.

Company Results

Lukoil

Strategic Goals

The company's strategy builds from two key goals that are generally shared by most of its peers in the Russian oil industry:

- Sustained production growth—in excess of 4% per annum through 2010—with a substantial majority of oil production to be exported
- Constraining oil and gas lifting costs to between \$2 and \$2.50 per barrel produced after adjusting for inflation and fluctuations in the exchange rate of U.S.\$/RR.
- Asset management targeted at high-grading the production portfolio and, in particular, reducing the role of marginal wells in the production base.

Outside these shared areas of intent, the company hopes to:

- Account for 25% of Russia's total oil production by 2010.
- Maintain a relatively modest return on capital employed (ROCE) of between 17% and 20%
- Rely on major new producing areas outside its historic large position in Western Siberia, including the Northern Caspian, Yamal, and Timan Pechora.
- Increase the role of international operations to 15% of total production by 2010
- Increase the role of natural gas with a specific goal of becoming Russia's second largest producer of gas

Results and Assessment

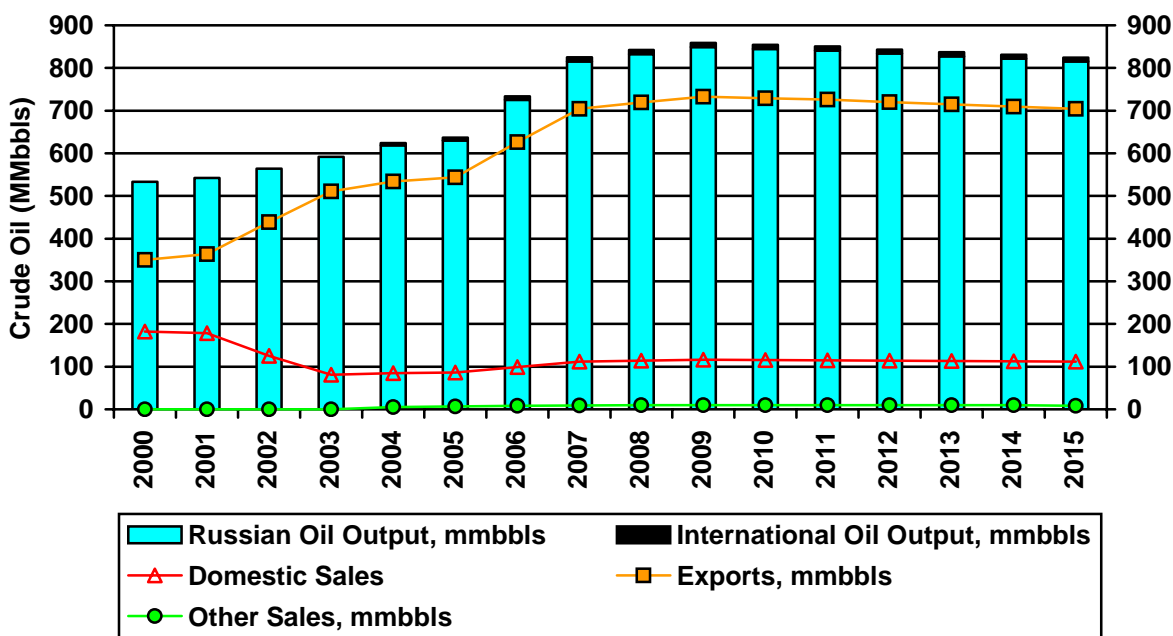
Lukoil's output is projected to rise substantially in 2006 and 2007 with a continued, much slower rate of growth through 2009. Most of the production gains in Russia are projected to enter the world market.

Capital inflows net of operating costs, production and export taxes and costs of funding will remain relatively flat in the low price case but will increase in both the base case and the high

price case. Convergence offers significant potential benefits to the company, raising capital inflows in each price scenario substantially. In particular, the low price case with convergence generates equivalent results to the base price case without convergence.

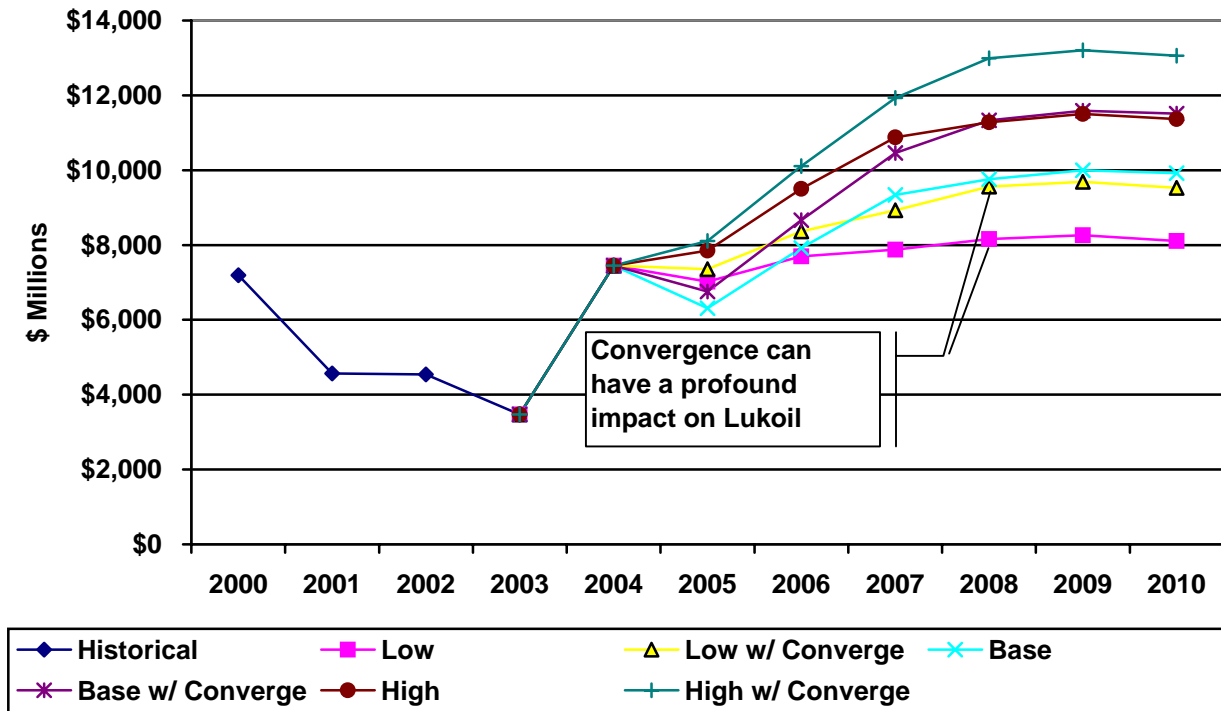
In all but the low price/no convergence case Lukoil is likely to experience significant growth in capital available for reinvestment. While this is significant because it suggests substantial gains in capacity to expand investments, there is an equally important effect evident in the remaining summary graphics. Specifically, current known and projected capital investment plans are insufficient to absorb this capital inflow.

Figure 17: Lukoil Oil Production and Sales Mix, Mmbbls



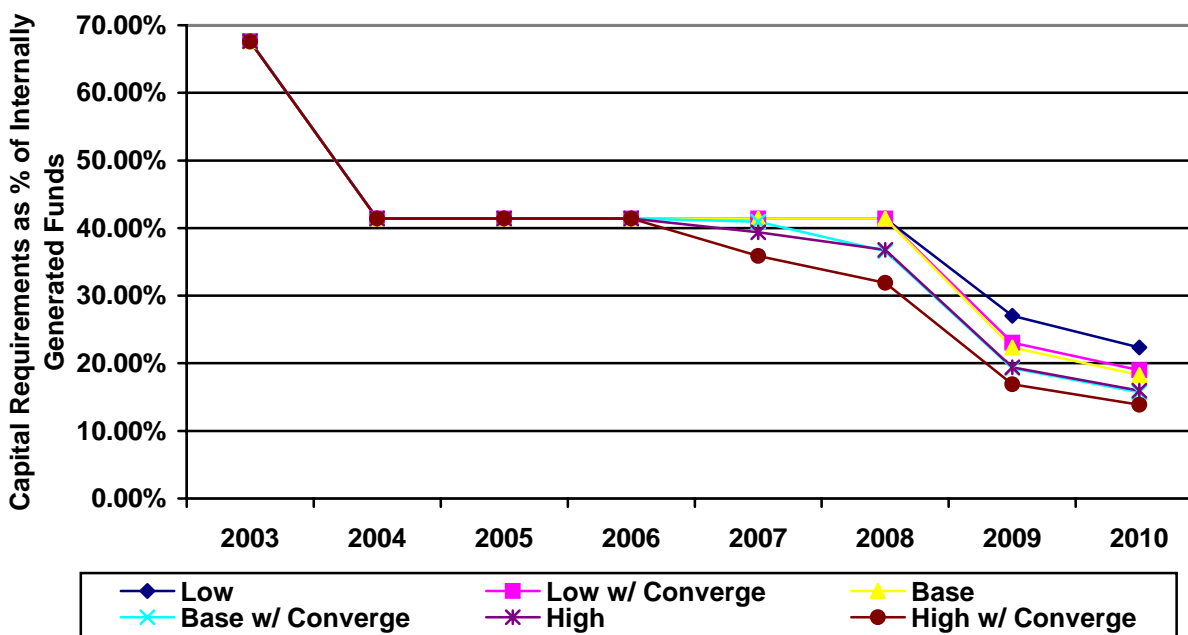
Note: Russian development projects are assumed to be conducted under the tax system rather than a production sharing contract. The export share of Russian oil output is assumed to remain constant after 2003 for purposes of the sales mix estimates.

Figure 18: Lukoil Projected Revenues Net of Operating Expenses and Finance



The capital requirements ratio (CRR) measures projected capital investment as a percentage of expected capital inflows—it is essentially an indicator of the capital re-investment rate. All model runs assume that the historic median CRR is indicative of the targeted rate. If capital investment requirements push the CRR above this targeted value, the model assumes the excess is funded externally.

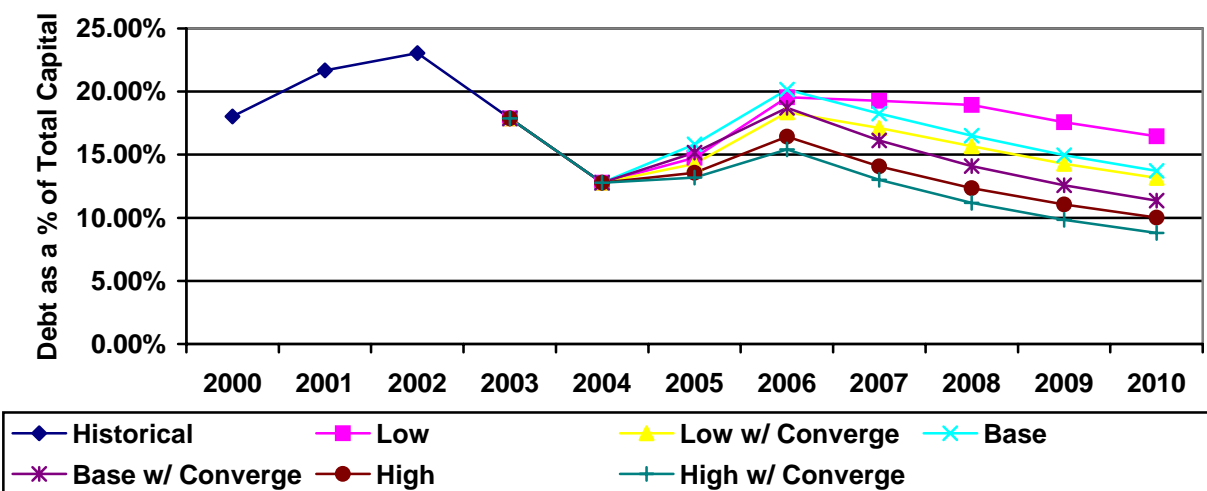
Figure 19: Lukoil Funding from Internal Cash Flows at the Median



Beginning in 2007 or 2008, capital investment requirements begin to fall below historic levels relative to capital inflows. This result is indicative of an emerging need for additional capital outlets.

Lukoil’s external funding requirements in the near to medium-term are sensitive to the oil price outcome that is realized. However, at no point in the forecast does external financing require an increase in the debt to total capital ratio above 20% -- a level very consistent with historic norms for the company.

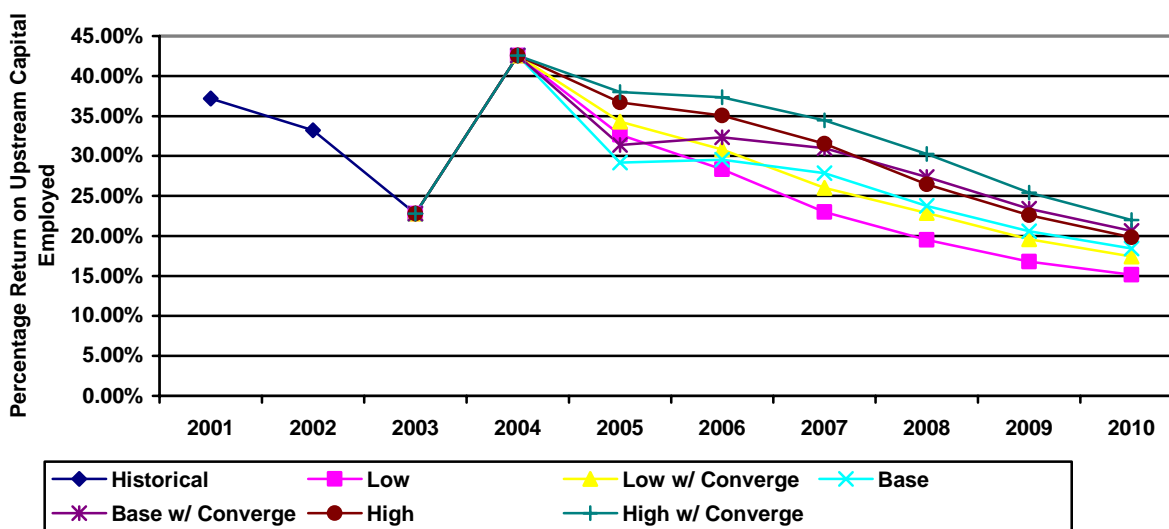
Figure 20: Lukoil Debt as a Percent of Total Capital



One of Lukoil’s goals is to maintain a return on capital employed (ROCE) of between 17% and 20%. The model results suggest that this goal is attainable in all but the low price case without convergence. However, ROCE is projected to steadily decline throughout the forecast period except for brief plateaus in the convergence scenarios.

This erosion reflects a projected rapid buildup in total capital. It also signals a probable emerging pressure on the company to secure substantial additional investment outlets in the near to medium-term.

Figure 21: Lukoil Return on Upstream Capital Employed



Sibneft

Strategic Goals

The company’s strategic goals and objectives are:

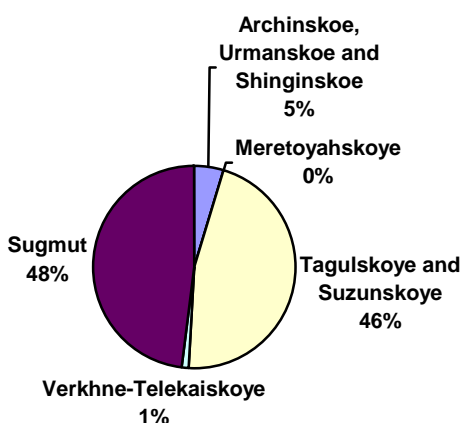
- A continued geographic focus in Russia and the CIS, based on an expectation that it can earn higher rates of return on capital used domestically than it can on international operations
- Achieving rapid, sustainable growth in output.
- Generate industry-leading rates of return on equity.

The company has stated its belief that it can achieve these goals through the efficient use of existing assets and acquisitions. The recent increase in its interest from 20% to 100% in Archinskoe and Shinginskoe—operating in the Tomsk region—illustrates the role of acquisitions. The acquired companies hold interests in 3 fields with estimated recoverable reserves of 20 million tonnes and are expected to achieve production rates of 59 Mb/d by approximately 2007.

Results and Assessment

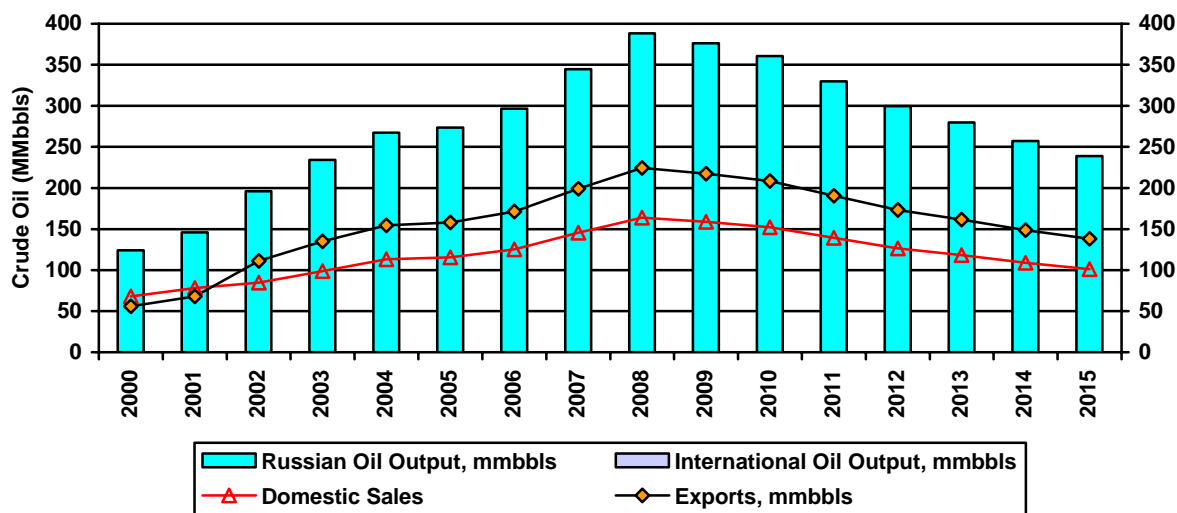
Sibneft oil production is projected to rise substantially in 2004, flatten out in 2005 and then increase very substantially through 2008 when it peaks at approximately 1 million barrels per day. Key sources of production from identifiable projects are illustrated below:

Figure 22: Sibneft Source of New Project Output by Identified Field



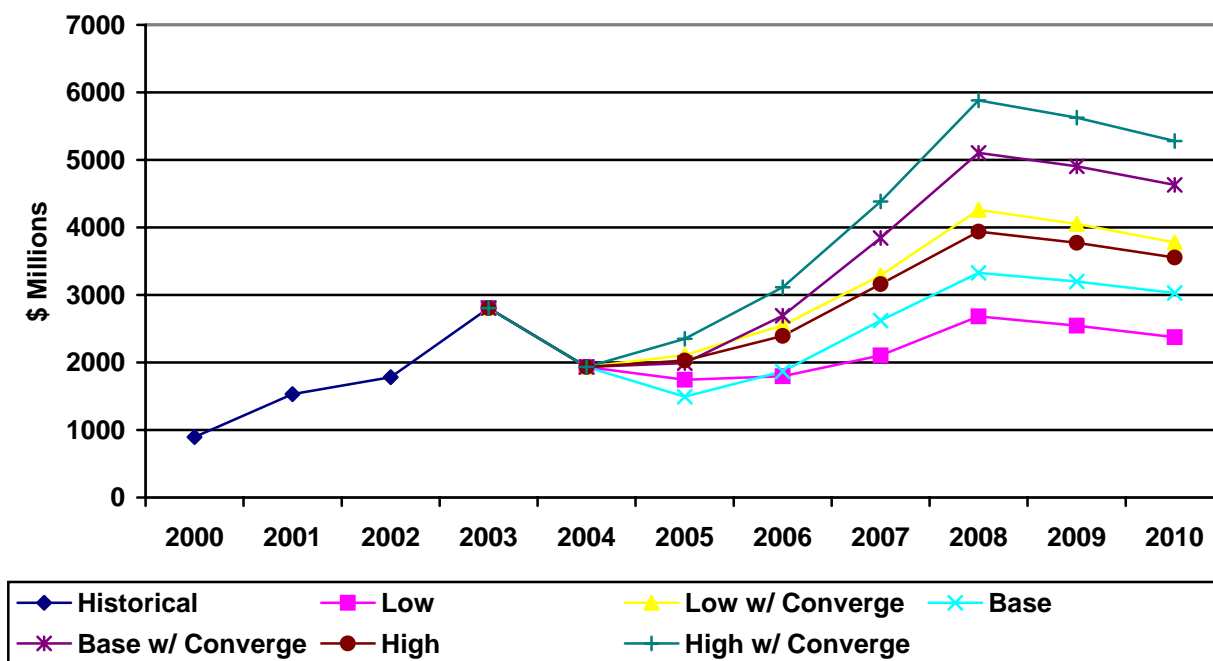
Sibneft’s portfolio of new oil development projects is clearly dominated by only two fields.

Figure 23: Sibneft Oil Production and Sales Mix, Mmbbls



The central long-term problem for Sibneft is sustaining the production gains that are likely to occur through 2008. Historic rates of reserve additions are inadequate to this task.

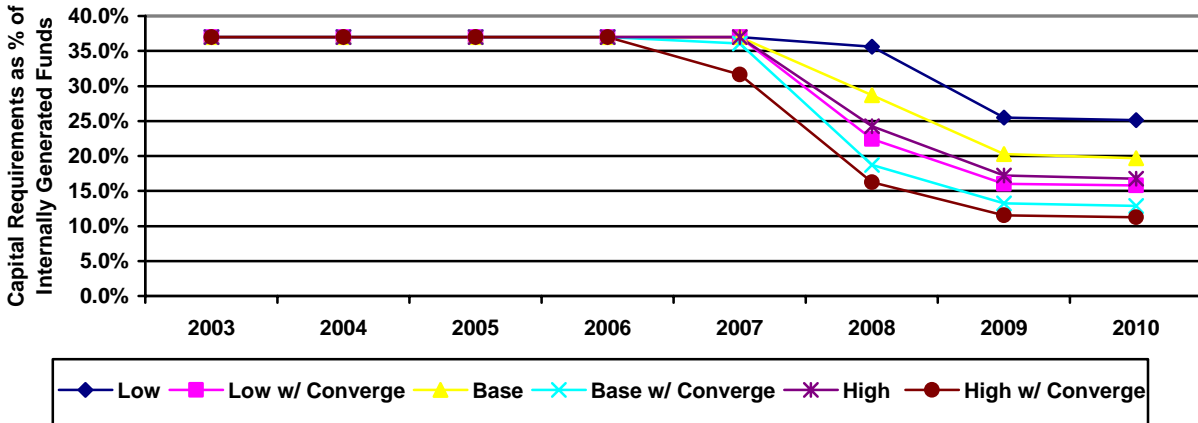
Figure 24: Sibneft Projected Revenues Net of Operating Expenses and Finance



Capital inflows available for re-investment escalate rapidly with production growth in all but the low and base cases without convergence. The very substantial positive effects of convergence

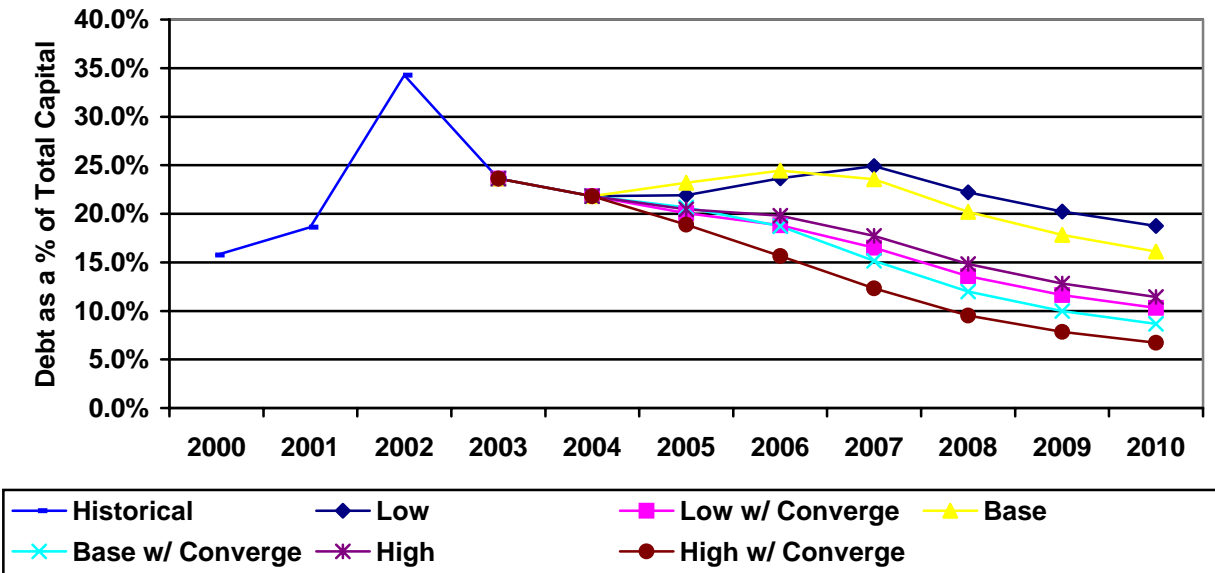
are evident and derive from the continuing high percentage of crude output that is sold in the Russian market. Absent convergence, Sibneft has a particularly large incentive to pursue means to divert substantial additional volumes to the international markets.

Figure 25: Sibneft Funding from Internal Cash Flows at the Median



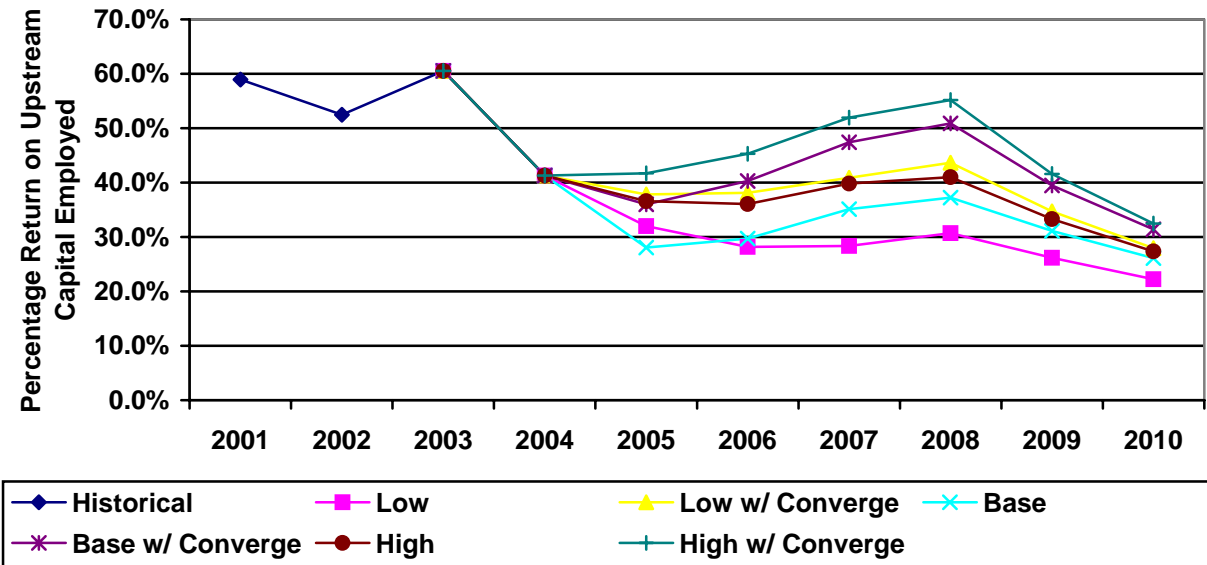
The buildup in production is reflected in an equally dramatic buildup in capital requiring some outlet.

Figure 26: Sibneft Debt as a Percent of Total Capital



Leverage, as measured by the debt to total capital ratio, rapidly falls in all but two cases to extremely low levels after 2006.

Figure 27: Sibneft Return on Upstream Capital Employed



Strong and relatively sustained profitability is indicated until late in the forecast period.

Surgut

Strategic Goals

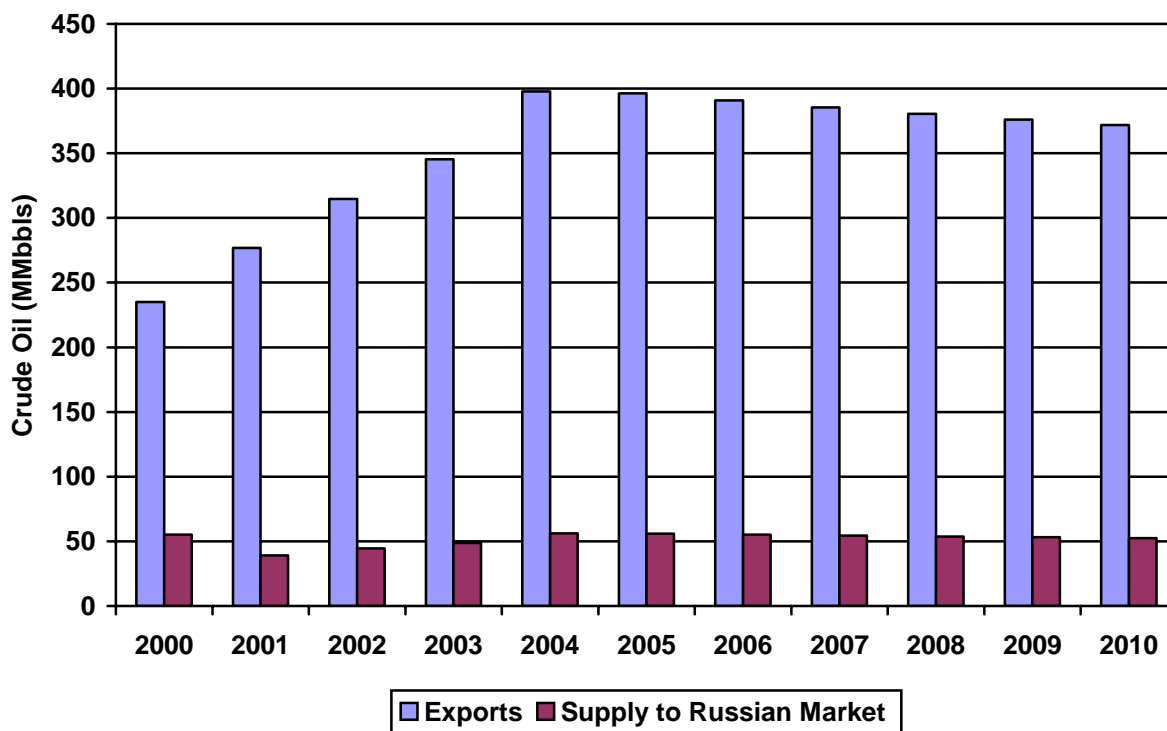
The company's strategic goals and objectives are:

- Production growth combined with improved operating efficiency.
- Continued use of both drilling and acquisitions to achieve growth.
- Increase the role of natural gas and improve profitability including gas processing and gas-fired power generation at key fields.

Results and Assessment

Surgut oil production has increased steadily from 2000 through 2003. The forecast indicates a continued increase in 2004 followed by a sustained plateau in overall oil output.

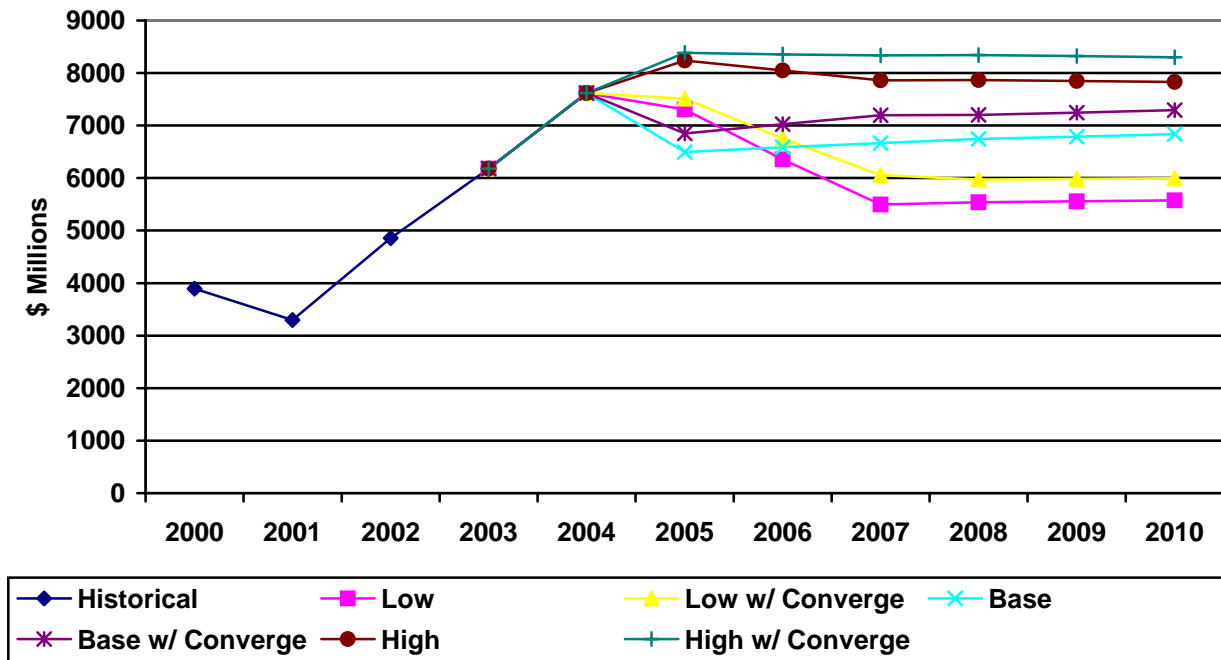
Figure 28: Surgut Oil Production and Sales Mix, Mmbbls



There is some reason to believe that the production forecast will be somewhat low due to difficulties in anticipating the degree to which internal efficiency gains can be achieved and the lack of data on new projects.

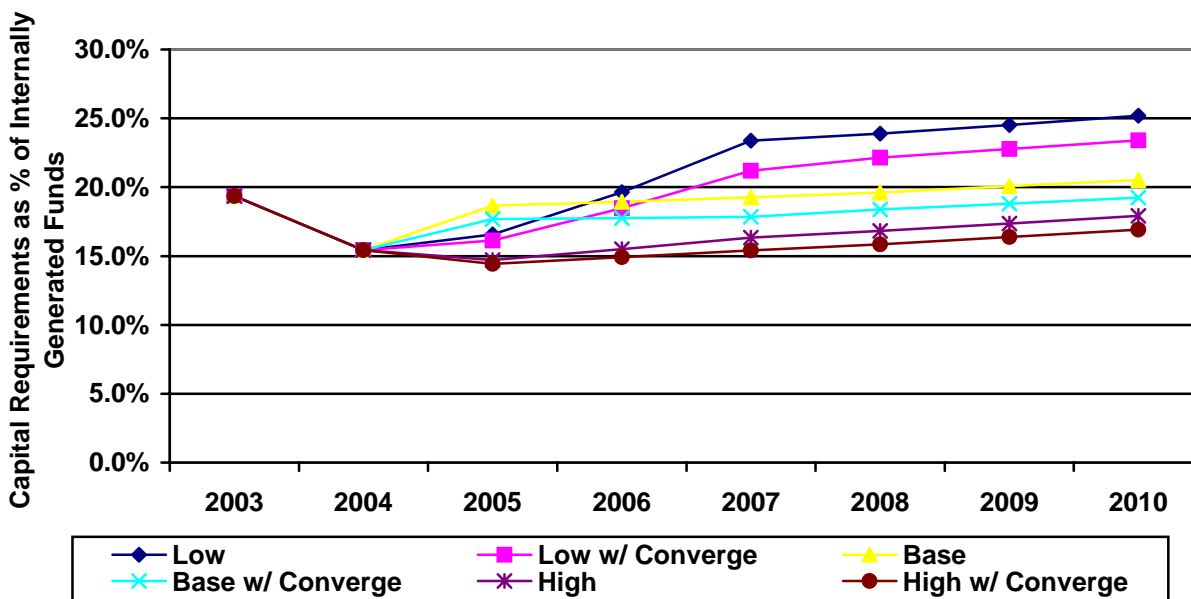
The plateau in output results in generally a parallel plateau in capital inflows after 2005. However, downside potential is considerable in all but the high price cases as costs slowly rise over time.

Figure 29: Surgut Projected Revenues Net of Operating Expenses and Finance



Calls on capital inflows remain relatively stable or up depending on the oil price outcome. However, re-investment rates as measured by this indicator are unusually low by comparison to those of Surgut’s peers.

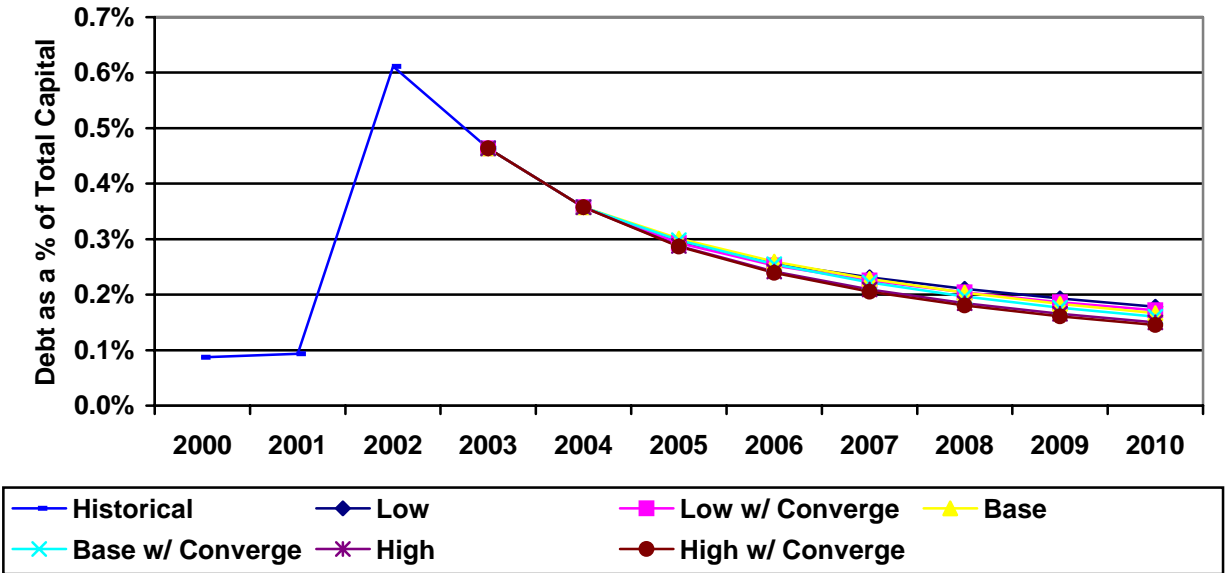
Figure 30: Surgut Funding from Internal Cash Flows at the Median



This apparent shortage of investment opportunities relative to capital inflows is a key reason for the projected stagnation of output.

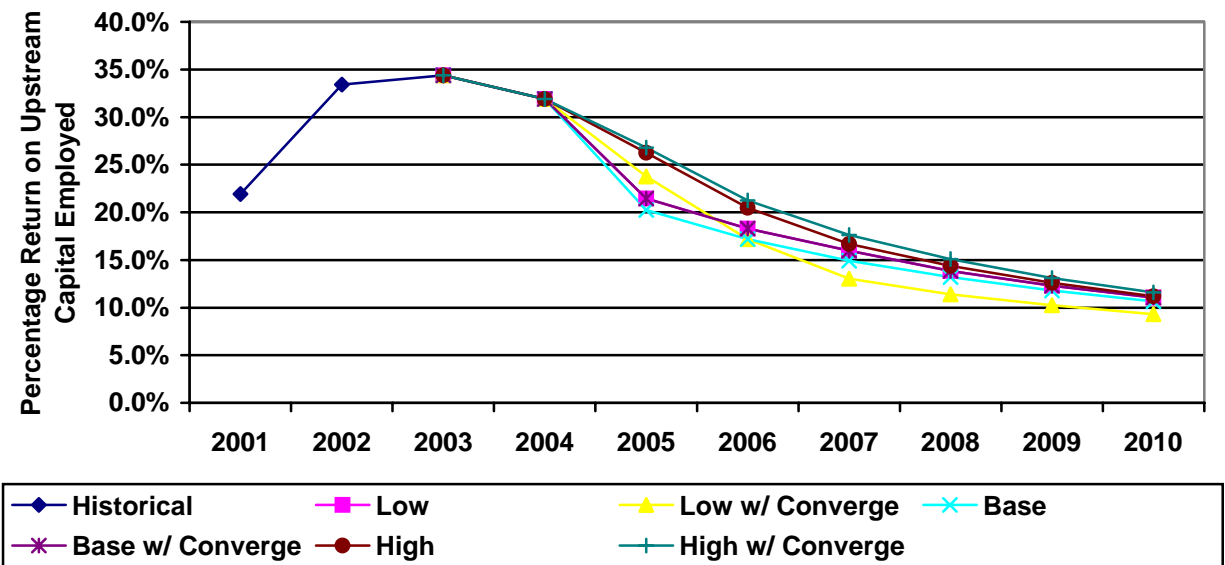
The company has a negligible level of leverage.

Figure 31: Surgut Debt as a Percent of Total Capital



The model results project persistent and rapid deterioration in the company's ROCE.

Figure 32: Surgut Return on Upstream Capital Employed



Tatneft

Strategic Goals

The company's strategic goals and objectives are:

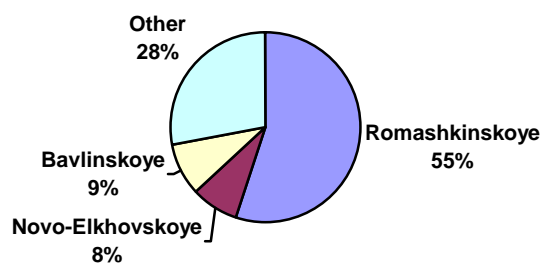
- Stabilization and optimization of production levels at existing fields
- Expand oil reserves and production outside Tartarstan.
- Cut production costs through improved work organization and oil recovery techniques
- Strengthen the existing reserve base through investment programs and maintain an industry leading level of profitability
- Establish Tatneft as a vertically integrated company.

Results and Assessment

Tatneft oil production has been flat throughout the period from 2000. While some growth is projected after 2004, the company continues to stand out as one of very few Russian companies that are unlikely to significantly increase output. In this respect, Tatneft most resembles any of a number of large oil producers whose assets are concentrated in mature fields.

In addition, Tatneft's production base is dominated by one key field (Romashkinskoye), which contributed 55% of total oil output in 2002.

Figure 33: Tatneft Oil Output by Major Fields, 2002



Reflecting the maturity of its asset base and the dominant role of Romanshkinskoye, Tatneft’s strategic problems are more like those of a mature U.S. producer than like that of most of the other Russian oil companies.

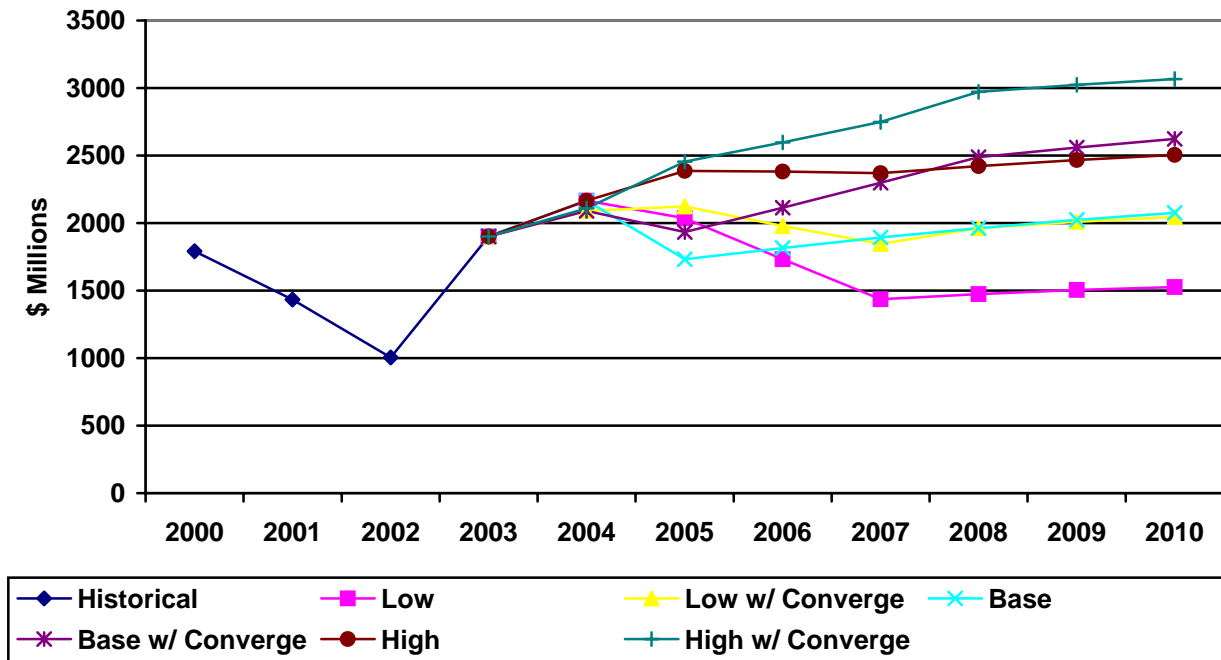
In 2002 the company shifted a substantial portion of its oil sales from domestic to export markets.

Figure 34: Tatneft Oil Production and Sales Mix, Mmbbls



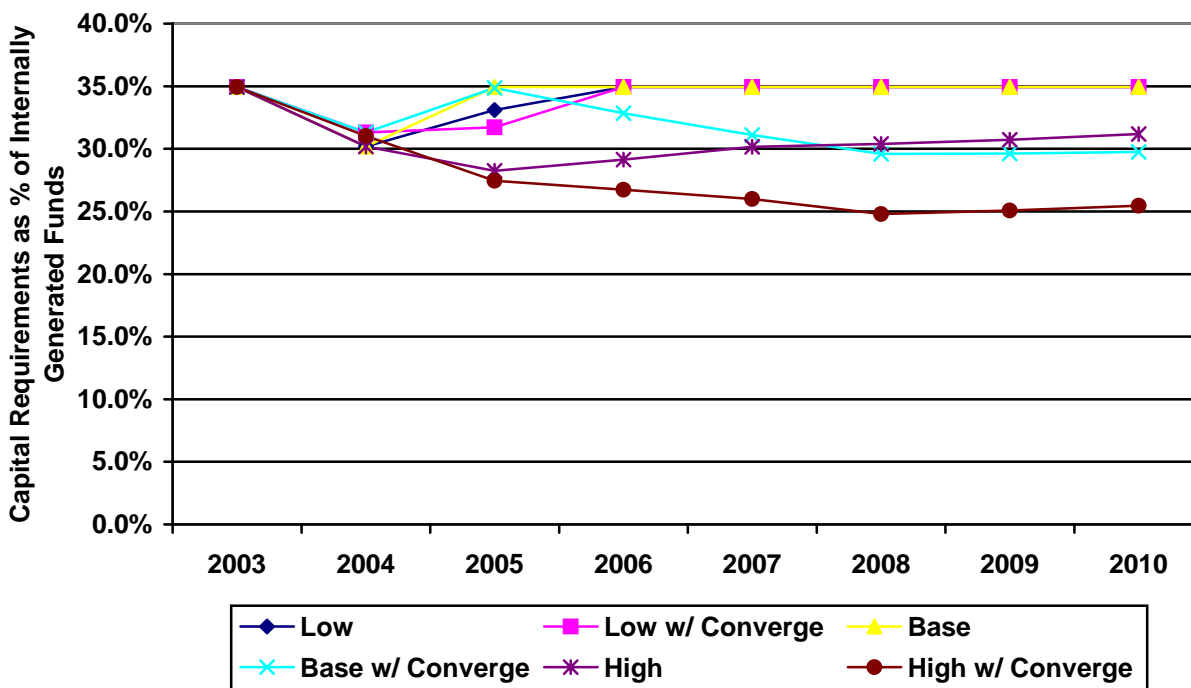
Future capital inflows are flat or down in nearly every price outlook except the high case with convergence.

Figure 35: Tatneft Projected Revenues Net of Operating Expenses and Finance



The company's capital investment requirements range from 25% to 35% of projected capital inflows.

Figure 36: Tatneft Funding from Internal Cash Flows at the Median



Among the Russian companies, Tatneft's leverage has historically been relatively high. Recent reductions in leverage are projected to continue throughout most of the forecast period.

Figure 37: Tatneft Debt as a Percent of Total Capital

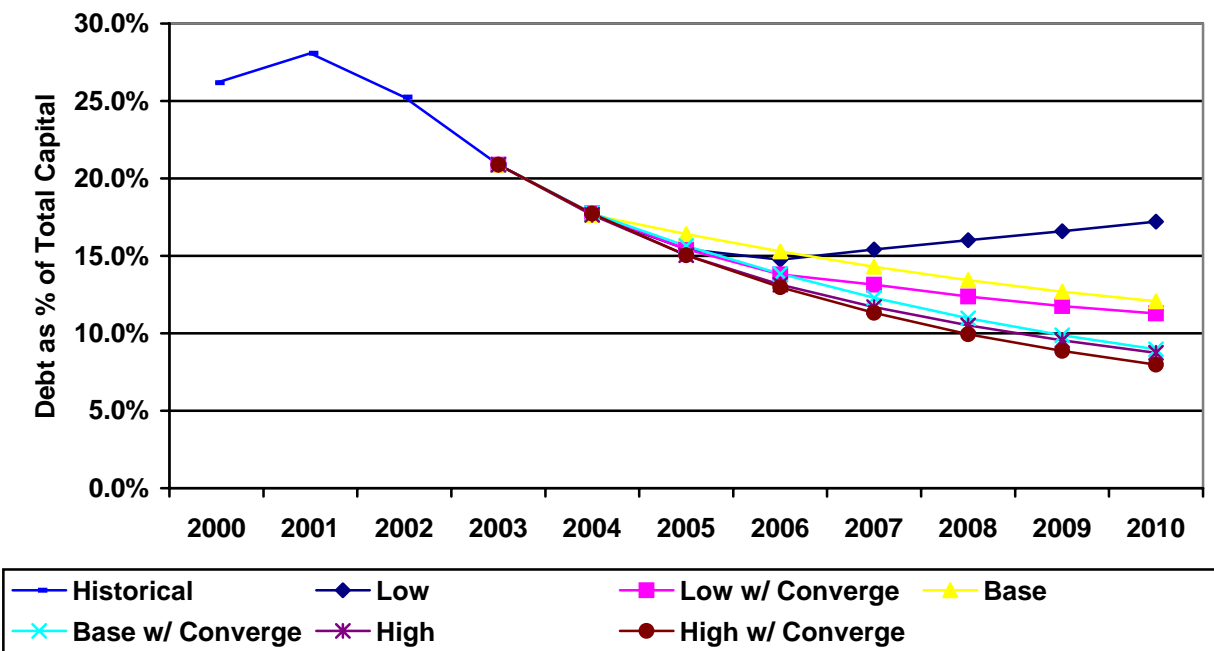
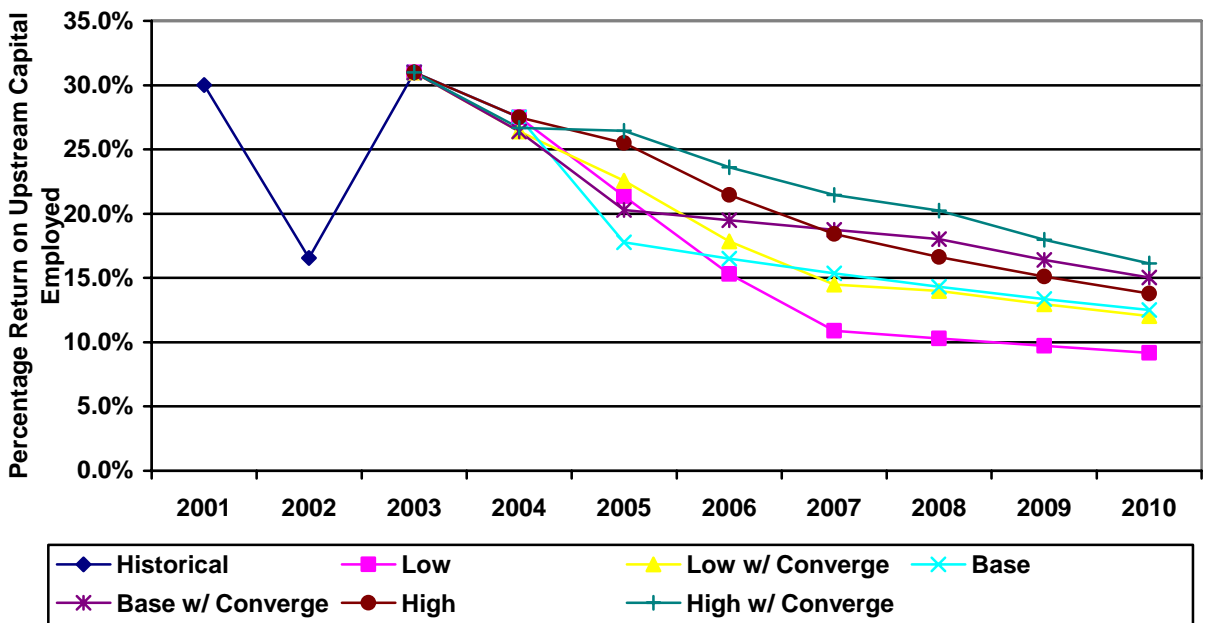


Figure 38: Tatneft Return on Upstream Capital Employed



TNK

Strategic Goals

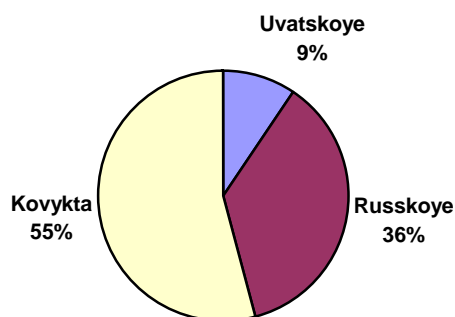
The company's strategic goals and objectives are:

- Become a world-class Russian company
- Aggressive production growth while replacing 75% or more of production.
- Achieve growth internally through high technology applications to existing fields and monetization of natural gas reserves
- Acquire assets when the combination yields synergies such as in shared infrastructure
- Maximize export options in the midstream and downstream segments including potential gas exports to Asia.
- High-grade the asset portfolio through divestitures of under-performing or non-core assets.

Results and Assessment

TNK's oil production is projected to continue growing throughout the forecast period, driven by both an assumption that recent strong historical reserve additions will continue and by the contribution selected very large development projects. Production contributions from these major projects in millions of barrels of oil equivalent through 2030 are shown below.

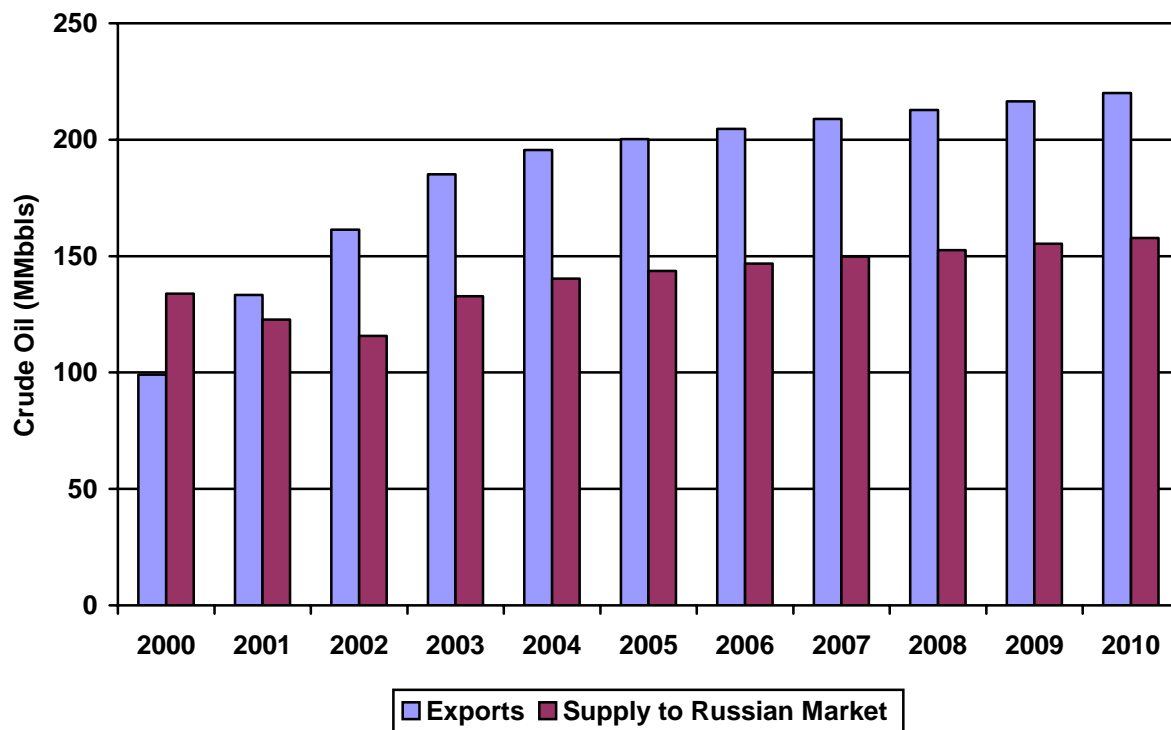
Figure 39: TNK Source of New Project Output by Identified Field



Note: Kovykta output is natural gas and has been converted to oil equivalency for purposes of comparison.

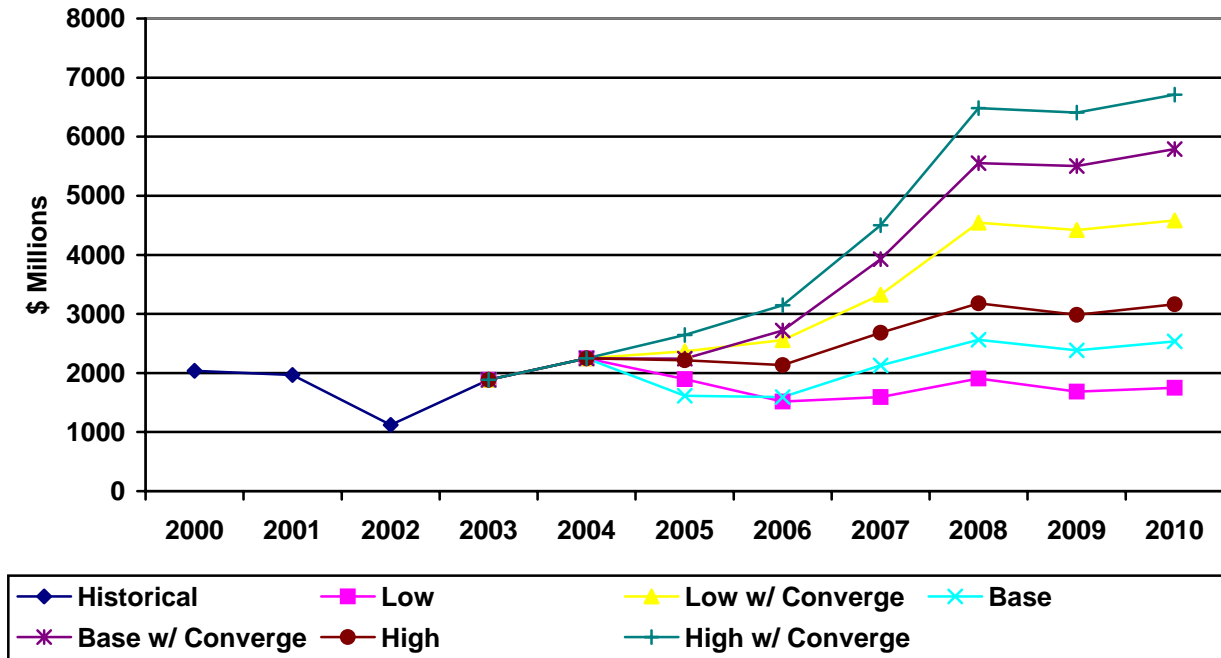
Recent reports that the Kovykta license may be rescinded will clearly have a significant impact on the company's results in the very long-term.

Figure 40: TNK Oil Production and Sales Mix, Mmbbls



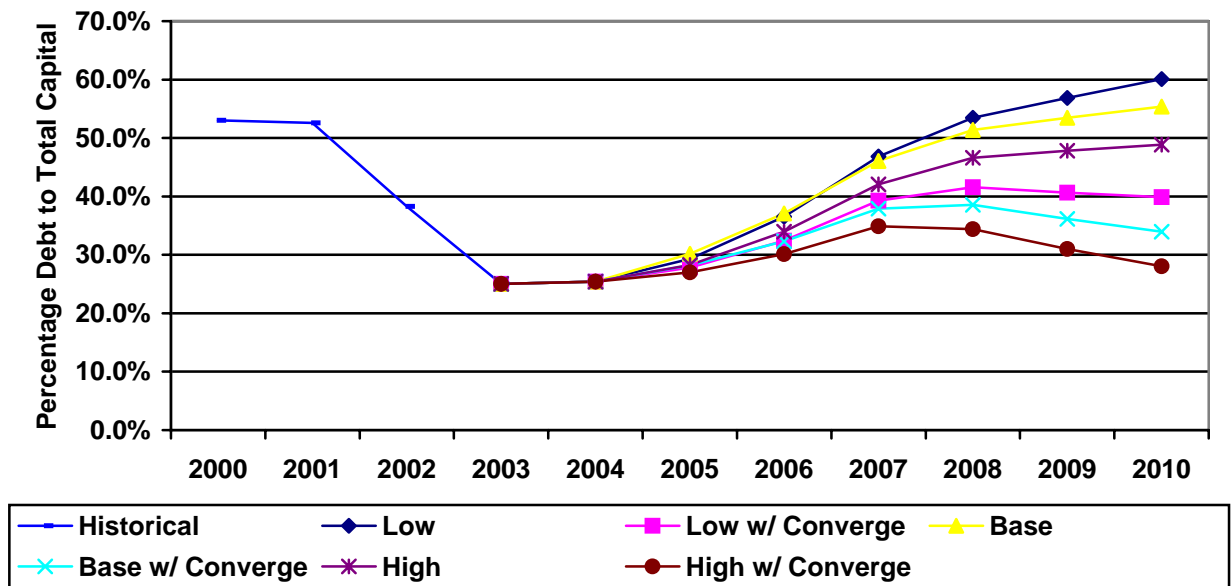
Note: The data shown here includes the effects of own crude processed in TNK refineries.

Figure 41: TNK Projected Revenues Net of Operating Expenses and Finance



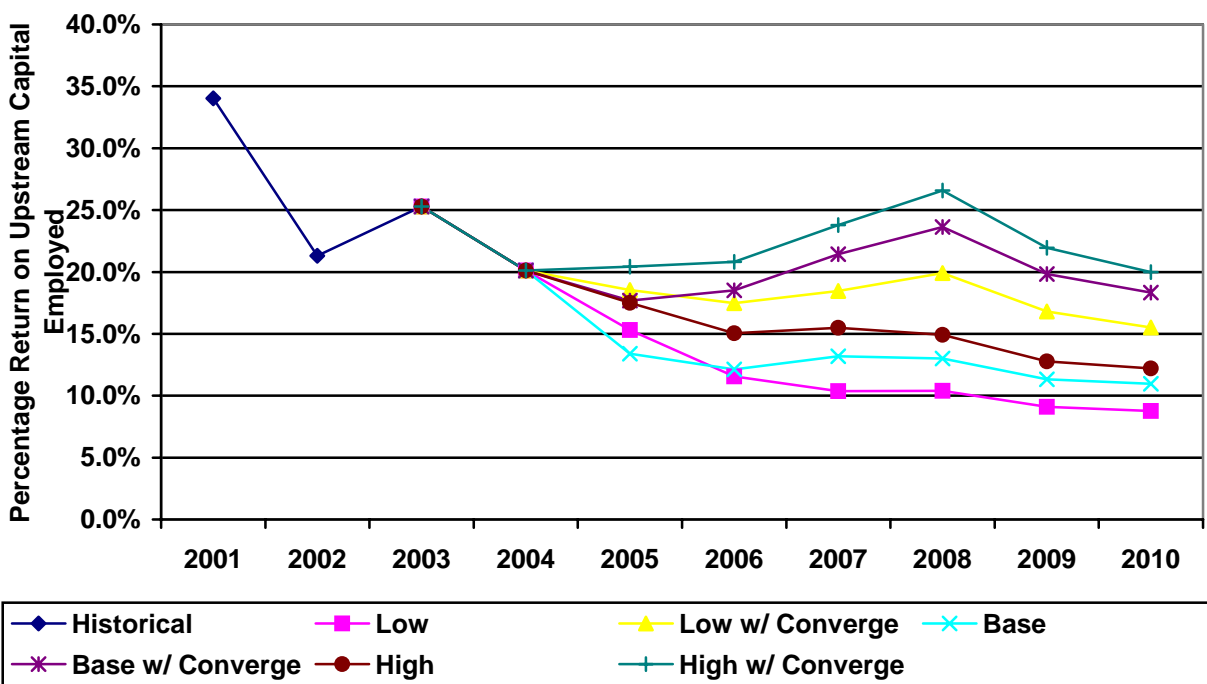
Convergence of Russian oil prices to international norms will have a substantial positive effect on TNK's capital inflows.

Figure 42: TNK Debt as a Percent of Total Capital



While TNK’s debt load has dropped very substantially since 2001, the forecast indicates that debt as a percent of total capital will increase rapidly in the years ahead. This “threat” of rising debt loads is likely to have been a major factor in the alliance with BP.

Figure 43: TNK Return on Upstream Capital Employed



Return on capital employed is projected to decline in all non-convergence cases to levels that are generally below both historic performance and low relative to many of the other Russian companies. In part this is due to the fact that the companies major new projects are not projected to be significant factors in overall output until late in the forecast period.

Yukos

While the continuing turmoil surrounding Yukos leaves its survival uncertain, the analysis in this paper assumes that the company continues as an independent entity.

Strategic Goals

The company’s strategic goals and objectives are:

- Sustained production growth.
- Growth through more cost effective technology applications: “Drill less produce more” through fracturing, re-working existing wells, horizontal drilling.
- Reducing costs of operation.
- Strategic focus on development of oil export markets including participation in infrastructure projects (Murmansk pipeline and pipeline to Asian markets).

Results and Assessment

Yukos’ oil production has increased rapidly since 2000. Output is projected to continue growing after a bit of a pause in the near-term. Growth is the result of recent strong historical reserve additions and future growth will be derived from the contribution two very large development projects. Production contributions from these major projects in millions of barrels of oil equivalent through 2030 are shown below.

Figure 44: Yukos Source of New Project Output by Identified Field

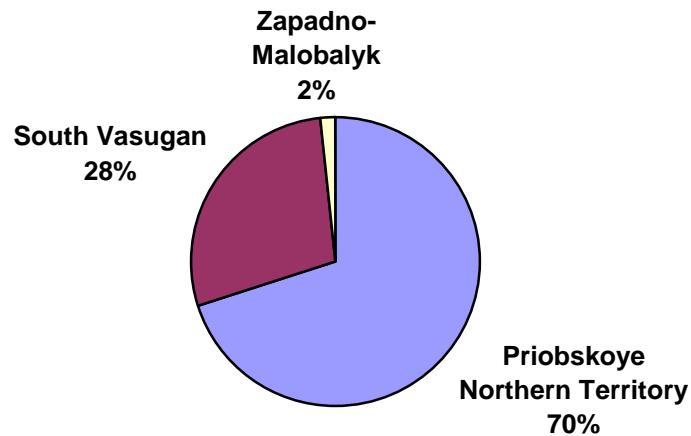


Figure 45: Yukos Oil Production and Sales Mix, Mmbbls

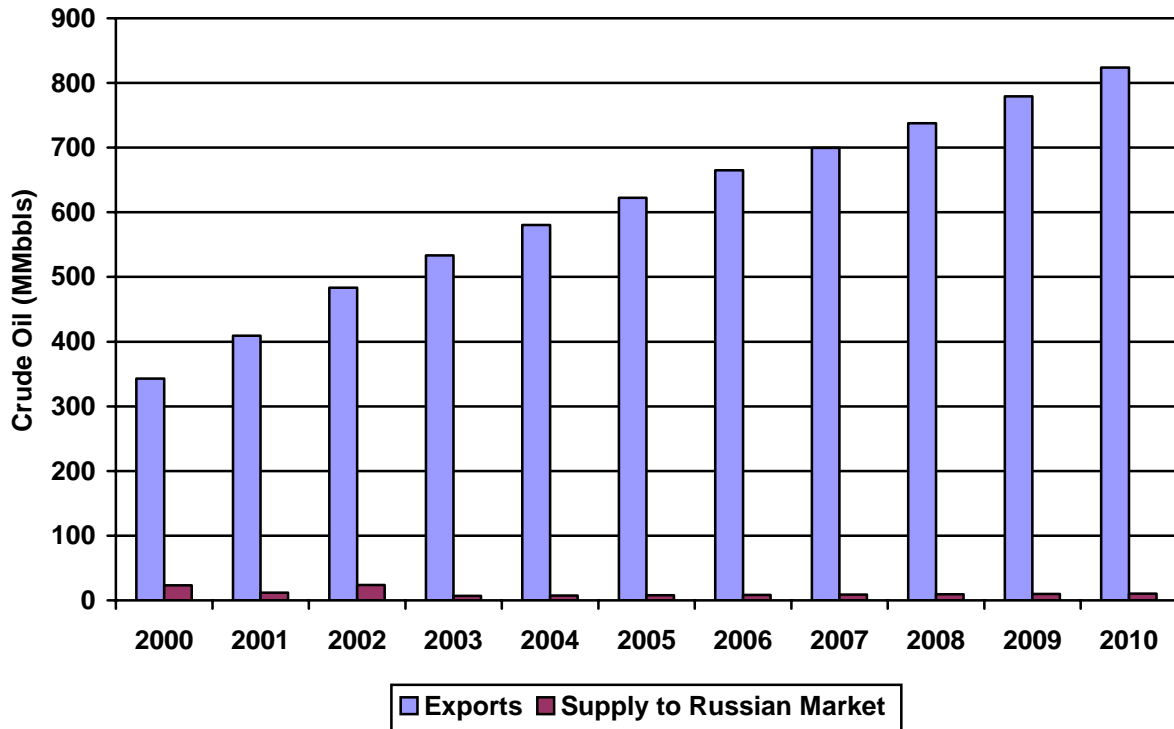


Figure 46: Yukos Projected Revenues Net of Operating Expenses and Finance

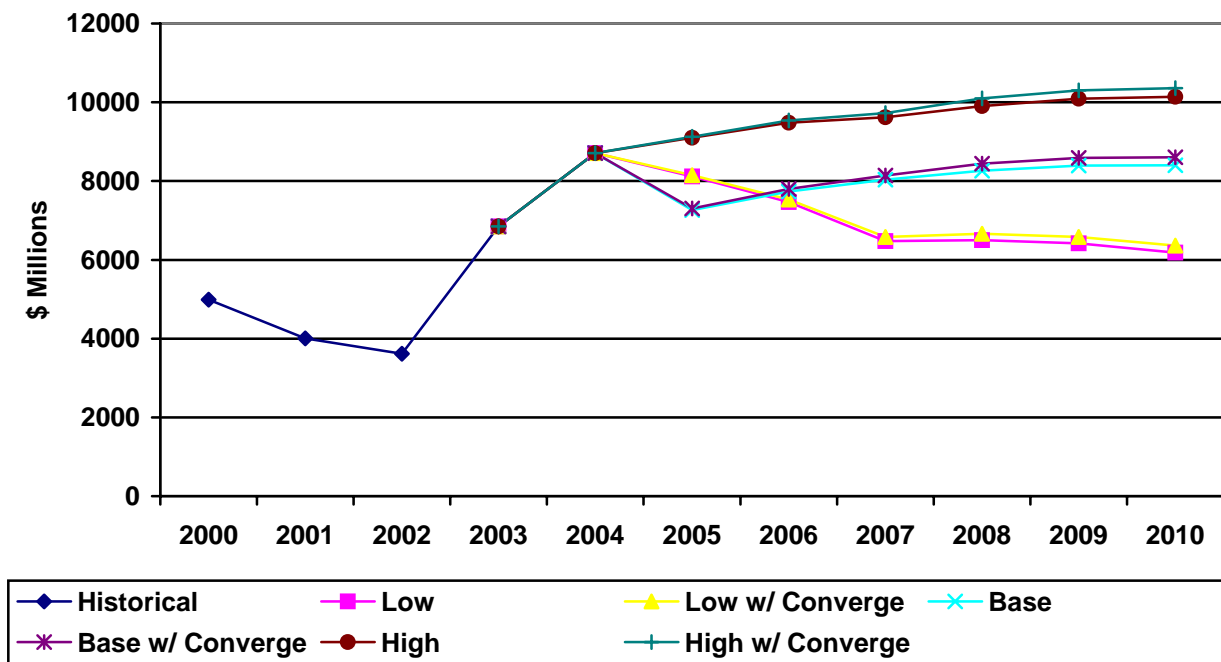


Figure 47: Yukos Funding from Internal Cash Flows at the Median

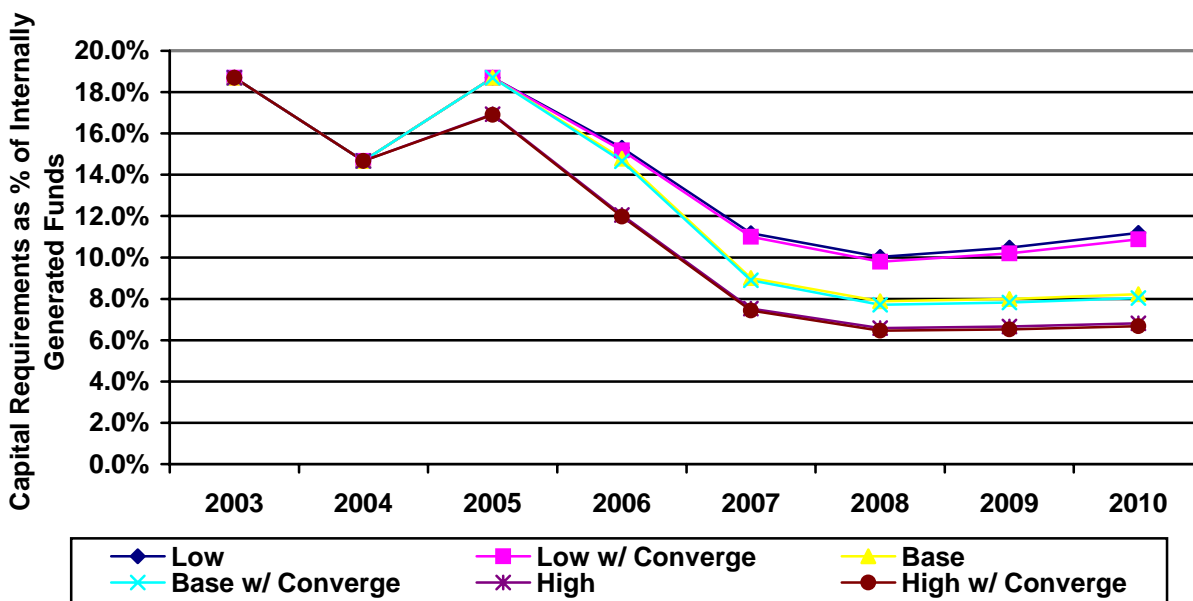


Figure 48: Yukos Debt as a Percent of Total Capital

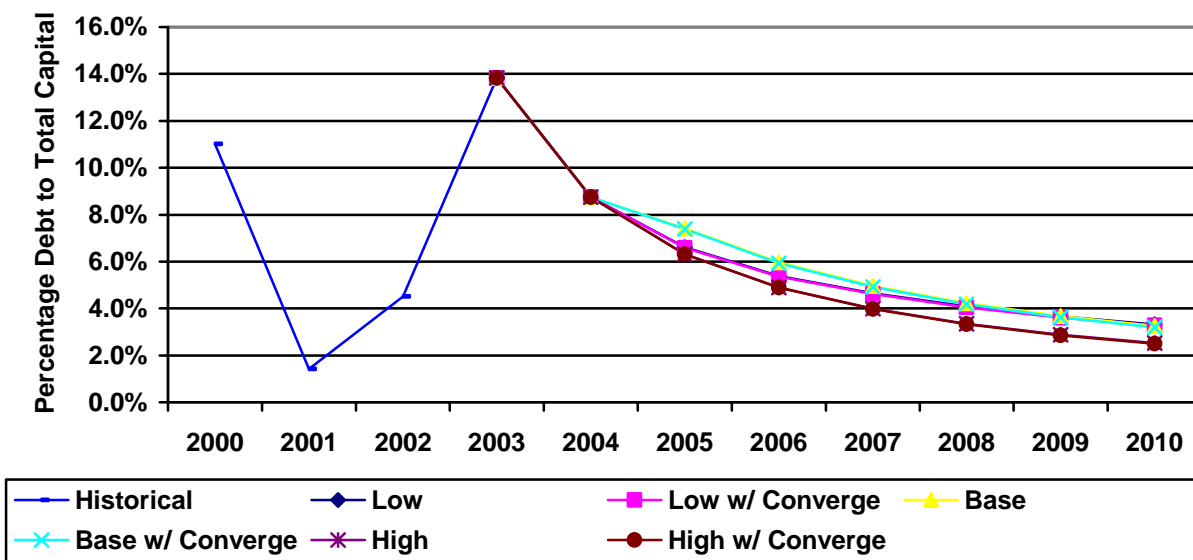
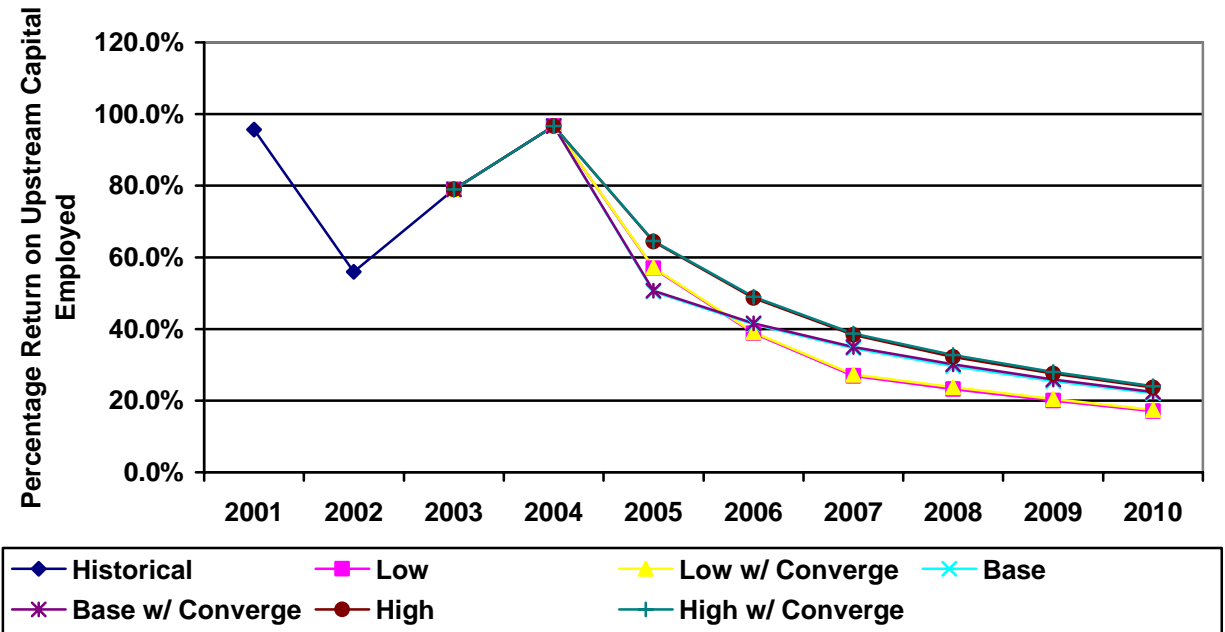


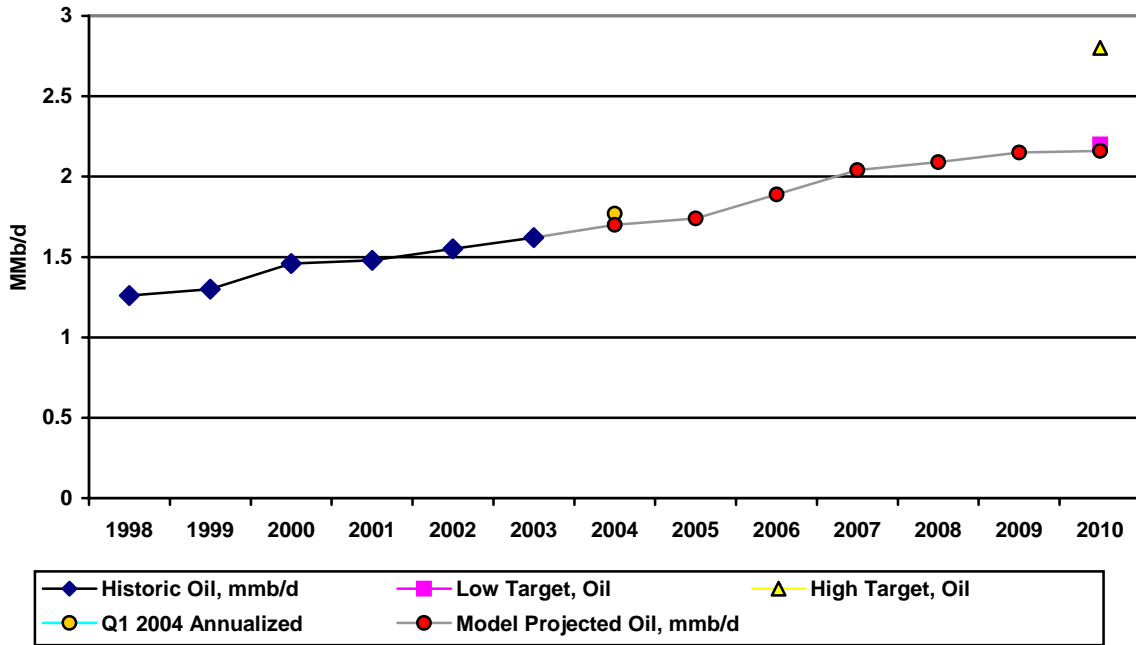
Figure 49: Yukos Return on Upstream Capital Employed



Appendix: Supplemental Illustrations of Results Generated in the Study

Figure 50: Base Case Lukoil Projections

Oil Production, MMb/d



Gas Production, Bcf/d

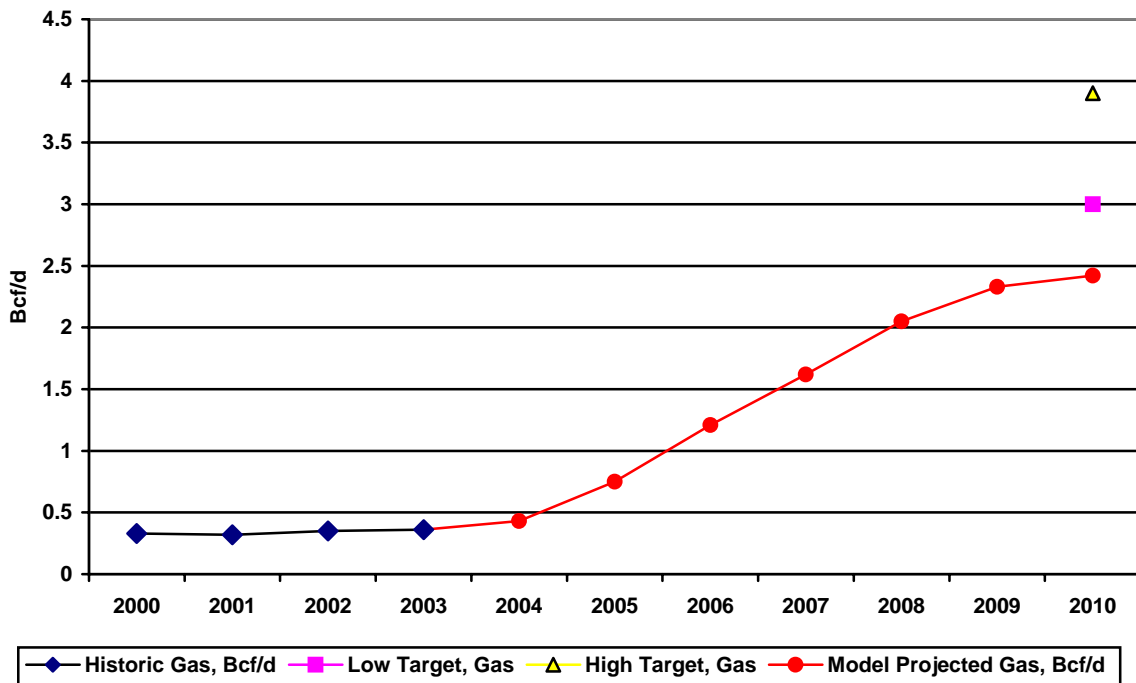


Figure 51: Origins of Lukoil's Estimated Net New Source Oil Output, 2003-2030

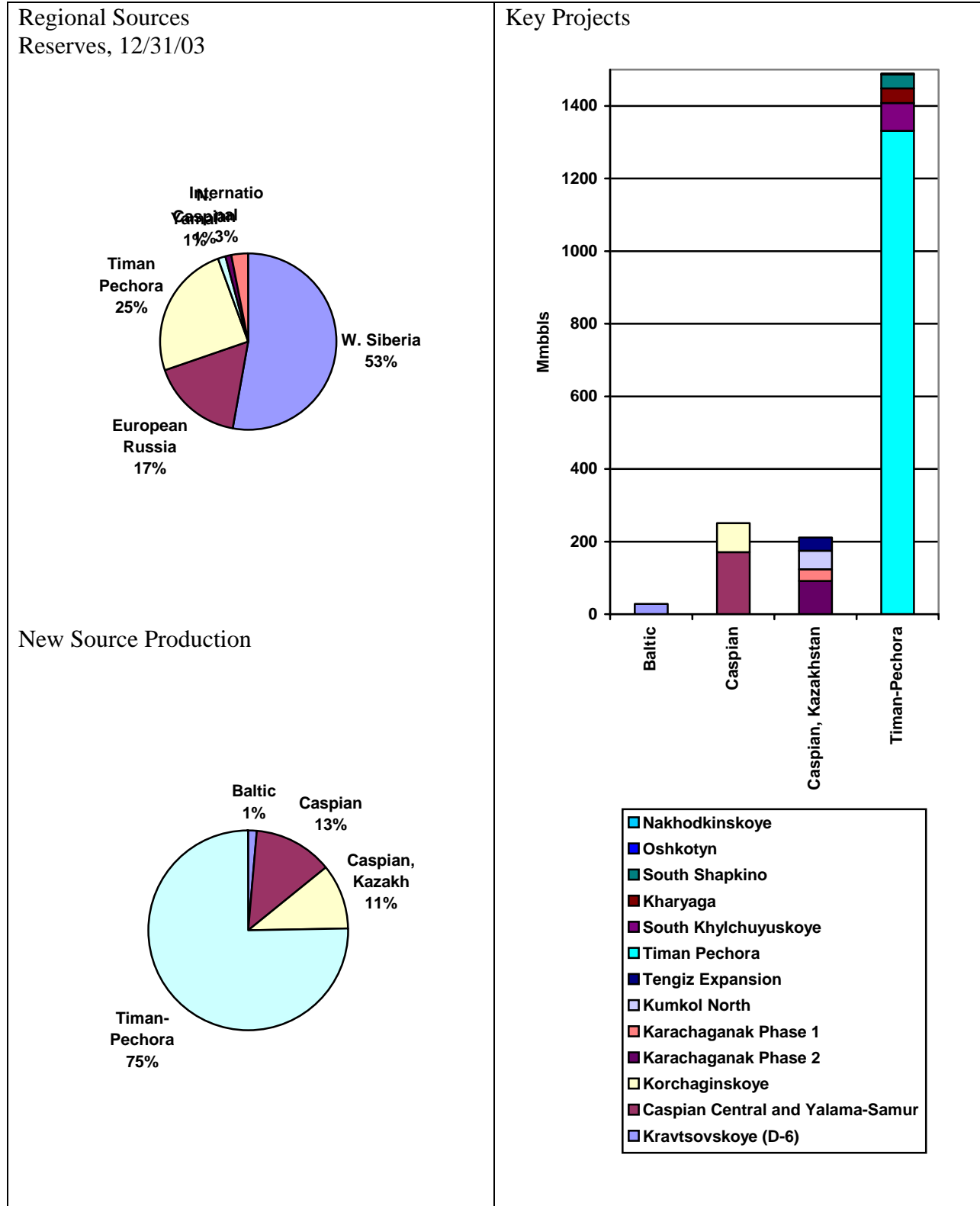


Figure 52: Origins of Lukoil’s Estimated Net New Source Gas Output, 2003-2030

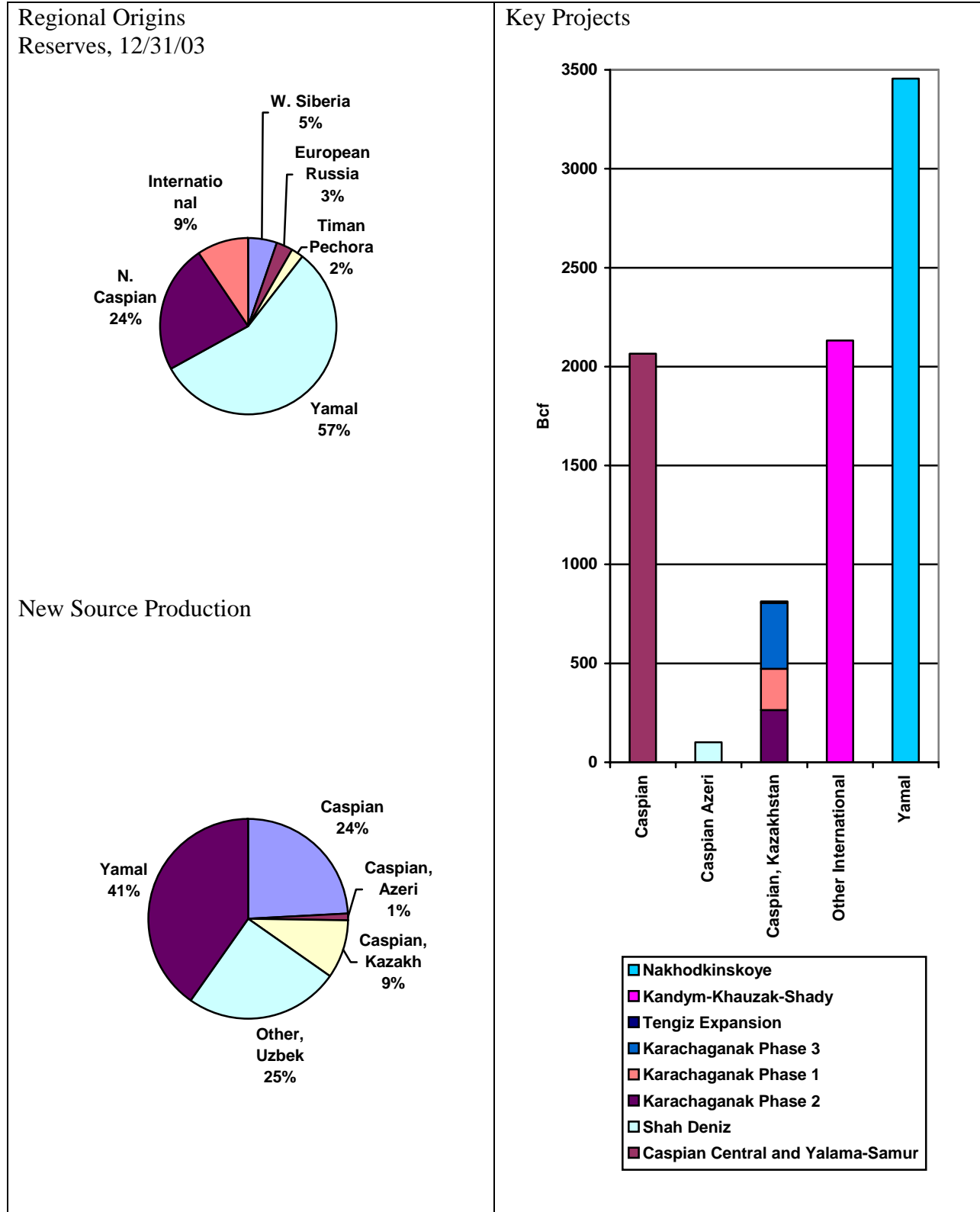
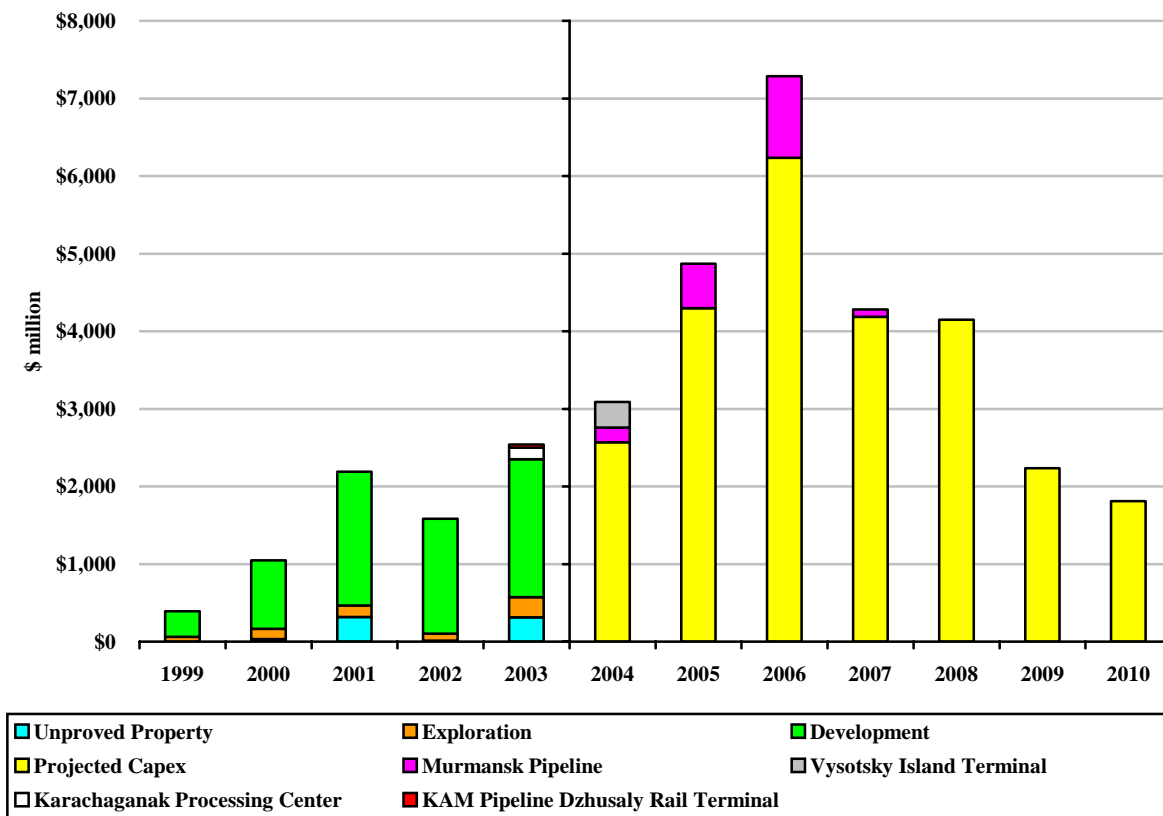


Figure 53: Lukoil’s Historical and Projected Upstream and Related Infrastructure Capital Spending



Historical capital spending shown above to the left of the vertical axis is based on reported costs incurred excluding proved property acquisition costs.

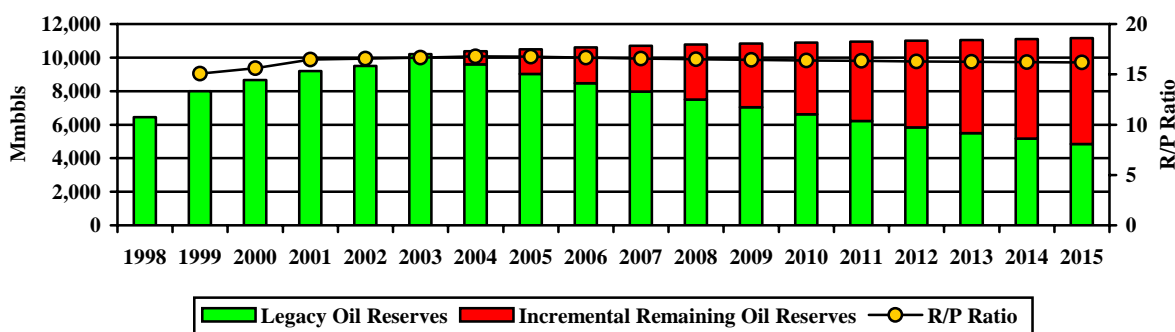
The capital-spending forecast includes spending associated with known oil and gas development projects and an incremental—or ongoing business operations—component that is predicated on the efficiency of adding reserves and the projected average annual rate of reserve additions for ongoing operations. The base case assumes that finding and development costs incurred per boe added internally will escalate at a 3% average annual rate of growth. In addition, the base case assumes that incremental capital spending will be sustained at levels necessary to add, on average 1 billion barrels of oil equivalent per year.

The chart shown below shows projected legacy oil reserves (proved, developed reserves as reported at year end 2003). The results suggest that the base operations of the company will

remain stable throughout the forecast period, assuming the internally generated reserve additions in the future are able to match historic average rates of additions.

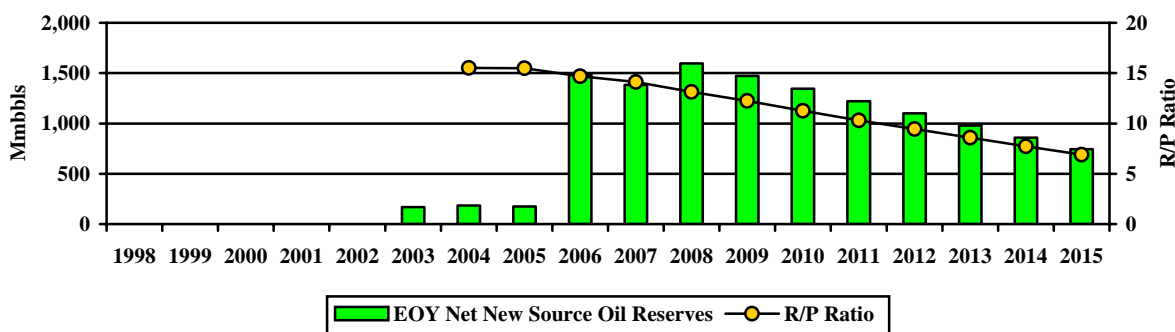
The chart does not include reserves associated with specific, known development projects, which are shown separately in the next chart. Developed new source reserves jump in 2006 due to production startup in Timan Pechora and a much smaller contribution from the Tengiz expansion project. Remaining reserves in this projects and the R/P ratio decline rapidly after 2008.

Figure 54: Lukoil’s Legacy and Incremental Net Oil Reserves and the R/P Ratio



Note: The R/P ratio for any year is based on the average of end of year reserves in the prior year and the current year divided by the current year output.

Figure 55: Lukoil’s New Source Net Oil Reserves and the R/P Ratio



As would be expected, given the projected sustained growth in oil and gas production over the forecast period, capital spending rises very substantially—tripling by 2006 relative to 2003 levels and holding a relatively stable plateau of approximately \$4 billion per year from 2005 through 2008. Infrastructure outlays—particularly the assumed participation in the Murmansk pipeline

export project—are a major factor in the near term. The decline in capital spending after 2008 reflects the completion of several major identified upstream capital projects.

**Figure 56: Lukoil’s Funding of the Capital Program –
Upstream Revenues Net of Operating and Financing Costs**

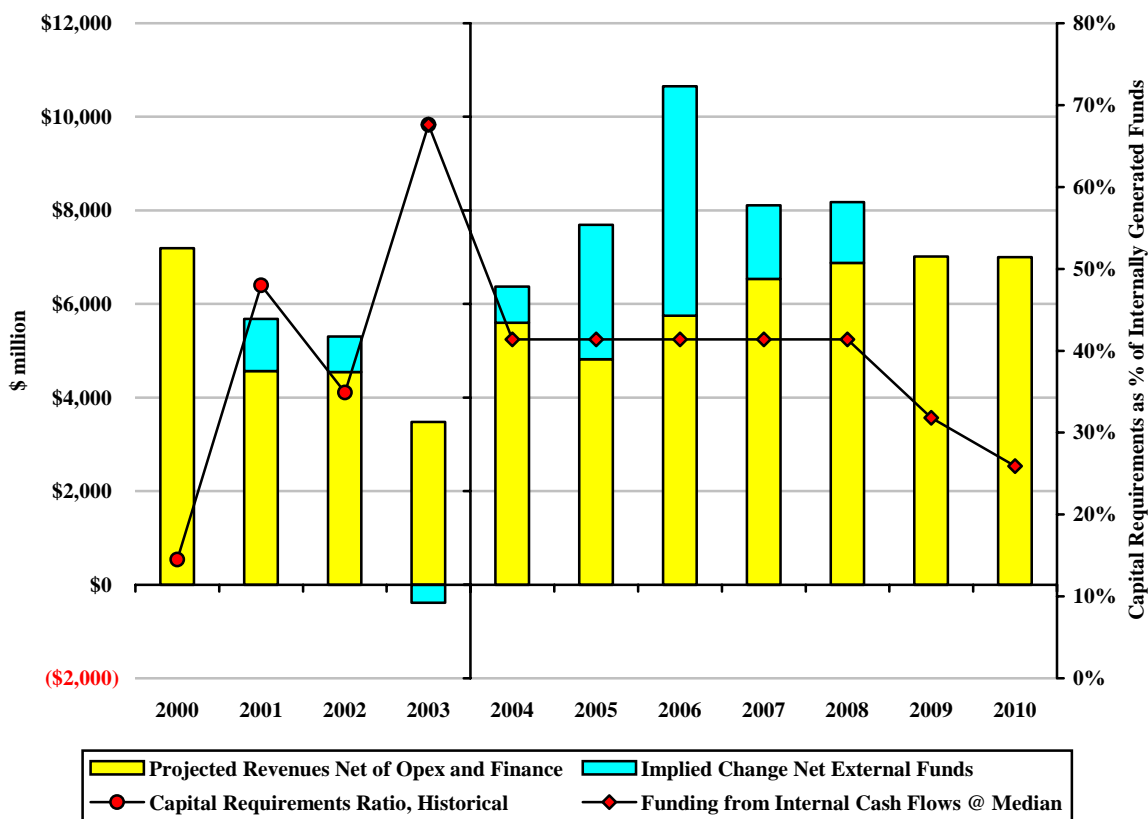


Figure 57: Changes in Lukoil’s Capital Structure and Profitability

