UKRAINE'S OIL AND GAS SECTOR – AN EMERGING OPPORTUNITY

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ECONOMIC AND POLITICAL BACKGROUND

Ukraine continues to make progress towards fiscal and monetary stability and this has produced significant economic growth in recent years. This has been fueled primarily by growing industrial and agricultural output— exported both eastwards to Russia and westwards to Europe. Ukraine's unique geographic position, linking East and West while also holding critical warm water ports on the Black Sea, has made Ukraine a trade link of growing importance between the former Soviet Union and Europe. The economy expanded in 2001 as real GDP rose by 9% and industrial output grew by over 14%. This was followed by economic growth of roughly 5% in 2002 to $39.8 billion, marking the country's third consecutive year of economic growth following an eight-year post-Soviet recession.

In 2003, GDP growth is expected to be around 6% with a corresponding growth of the economy to around $43.3 billion. During this time, inflation has been controlled and is likely to settle at 6.1% for 2003 as a whole. Predictions for 2004 suggest an inflation rate of 8.9%. The growing economic stability has resulted in higher levels of foreign investment with FDI likely to reach $1 billion in 2003. While this is still very low when compared with Ukraine's eastern European neighbours it does mark a significant rise relative to 2002 (ca $600 million) and 2001 (ca $750 million).

Ukraine has undertaken efforts to synchronize its trade policies with its neighbors and trade partners in both directions. The country has been engaged in a partnership agreement with the European Union (EU) since 1998, and the two sides are currently considering a draft action plan which Ukraine hopes will pave the way for eventual integration with the EU. Meanwhile, in September 2003, Ukraine joined Russia, Belarus and Kazakhstan in creating a "single economic

area" designed to coordinate the countries' trade regulations and reduce tariffs. While some observers have criticized this dual-track economic strategy as contradictory, Kyiv insists that the newly formed post-Soviet economic bloc will compliment its EU integration strategy and thereby serve the national interest. The observers are not so confident and there is a real risk that the new Soviet-style alignment may interfere significantly with Ukraine's aspirations to join the WTO and later the European Union itself.

President Kuchma, during his second term in office, pledged to reduce the number of government agencies, streamline the regulatory process, create a legal environment to encourage entrepreneurs, and enact a comprehensive tax overhaul. However changes in the politically sensitive areas of structural reform and land privatization are still lagging. Pressure on the President particularly from the US due to a range of perceived irregularities during 2000 - 2002 has abated somewhat since Ukraine expressed support for US efforts in Iraq. Ukrainian forces are currently active in Iraq, initially during the hostilities phase to provide bio-defense support, and latterly for peace-keeping purposes. The country's next presidential elections are scheduled for October 2004, during which President Kuchma may be ineligible for re-election under the current Ukrainian constitution. A recent ruling by Ukraine's Constitutional Court has suggested the opposite although Mr Kuchma continues to insist publicly that he will not run again.

The looming election, considered by many to be Ukraine's most critical since the country gained independence is causing a serious distraction to all areas of the administration, especially Government, Parliament and the President's Administration. In Parliament, the pro-government coalition is continuing to strengthen its position as a result of the widening gaps between the opposition forces. The Ukrainian opposition may well have lost its best chance to put forward a single candidate for the election as it now seems certain that the leader of the Communist faction, Mr Symonenko, will run for the Presidency and will not step aside in favour of Mr Yuschenko. If he establishes active dialogue, Mr Yuschenko can still win support for his nomination from the other two major opposition figures, Mr Moroz and Ms Tymoshenko; if this does not happen, probably all four opposition leaders will stand for the election, which will reduce Mr Yuschenko' s chances of victory.

The intentions of the pro-government forces to field a single candidate have solidified, although it is no longer clear that their candidate will be the current Prime Minister Yanukovych who some commentators consider may be finding the task of managing a country to be seriously more difficult than running the Donetsk region. However, even though the pro-government coalition has the possibility to adopt decisions independently on most national policy issues (except for reforming the political order and changing the constitution), it cannot take full advantage of this because it lacks the ability to develop and implement effective policy. This reduces considerably the chances of the pro-government coalition's candidate winning the election, even though until the election the coalition will be the most powerful player in Ukrainian politics.

All this could change following recent rulings by the Constitutional Court which appear to allow Parliament to make radical changes to Ukraine's Constitution and to introduce a Presidential-Parliamentary democracy. Under the proposed new system, Parliament in 2006 would elect/appoint the President and not the people by popular vote. In this case the President would have significantly reduced powers compared with the present system and the key political figure would become the Prime Minister. A Parliamentary majority of 300 is required for such changes to be passed. Currently the pro-Government majority can only achieve this with the support of the Communist Faction.

Regardless of any constitutional changes, presidential elections are still planned for October 2004. Although the political situation in Ukraine remains turbulent, there is a real possibility that a reformist President will be elected and this may herald sweeping changes throughout the country, subject of course to Parliament's actions during the months prior to October. With any changes will come greater business opportunities, and those companies currently active in Ukraine will be in prime positions to capitalize on opportunities as they arise.

ENERGY

Ukraine's energy sector is one of the most critical components of the country's economy. The sector has been plagued by a lack of domestic energy sources, increasing foreign debt, outdated and inefficient equipment, lack of funds, fuel shortages, barter deals, and non-payment by consumers. However in recent years Ukraine has pressed ahead with energy reforms, increasing cash collection rates and the promotion of privatization efforts. Barter transactions have been virtually eliminated and agreement has been reached with Russia concerning Ukraine's sizeable gas debts.

In turn, the oil and gas industry is now beginning to stabilize after years of decline. According to Ukraine's 'National Program for Oil & Gas to 2010', developments are planned in the following key areas: increased geophysical research and exploration drilling, increased development drilling, and stabilization and gradual increase of oil, gas and condensate production.

All of these areas provide significant opportunities for foreign investment, with particular regard to exploration/production and the supply of advanced technologies, products and services to facilitate increased production (eg horizontal drilling, reservoir management, work-over services, completion services). Pipeline products and services will also be of interest to the operators of Ukraine's huge oil and gas pipeline networks.

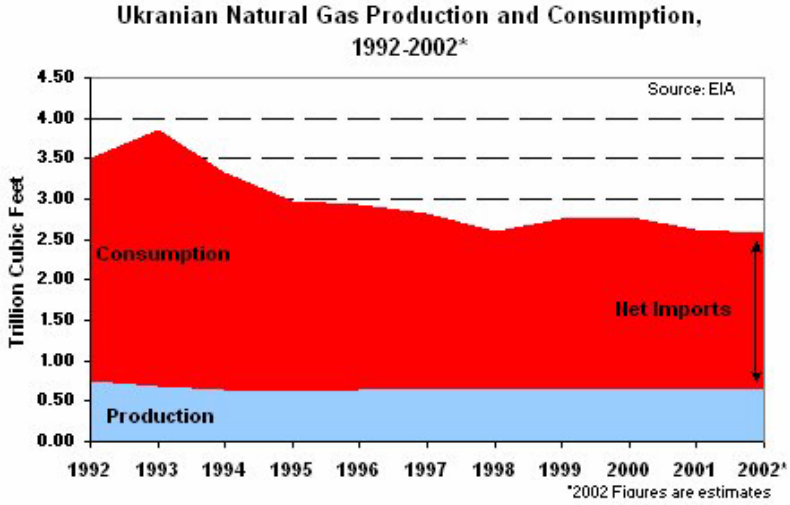
Ukraine is blessed with a wealth of natural resources, substantial domestic production potential, and one of the largest oil and gas pipeline infrastructures in the world. Due to its strategic location between oil and gas suppliers in Russia, Central Asia and the Caspian Basin and consumers in Europe, Ukraine is also a key transport country. Clearly, Ukraine has the foundation to ensure its own energy security and integrate politically and economically with Europe.

NATURAL GAS

Natural gas still plays a major role in Ukraine's fuel-energy balance, representing more than 40% of the primary energy consumption. Ukraine has 39.6 trillion cubic feet (tcf), equivalent to 1109 billion cubic m (bcm), of natural gas reserves, from which roughly 0.64 tcf (18 bcm) was produced in 2001 and a similar amount in 2002. In 2001, the country consumed 2.6 tcf (73 bcm) of natural gas and 2.5 tcf (70 bcm) in 2002. In spite of a 4.1% GDP growth, gas consumption decreased by 1.2% compared with 2001. The domestic production of natural gas was 18.8 bcm (0.4 bcm above the 2001 level), ensuring only 27% of the country demand for natural gas and thus leaving a shortfall of around 73%. One onshore oil & gas field and one offshore gas field in the Sea of Azov were put into operation during 2002.

Historically, Russia has met this demand, partially through natural gas offered as payment in-kind for transiting its gas on to Europe, and partially through annual sales contracts. In the past

few years, the missing volume of gas was imported from Turkmenistan (37%) and Russia (36%). In May 2001, Ukraine and Turkmenistan signed an agreement calling for Turkmenistan to supply Ukraine with 8.8 tcf (246 bcm) of natural gas between 2002 and 2006, and the agreement is expected to be extended through 2015.



The central region of Ukraine known as the Dnipro-Donets Basin holds a significant proportion of the remaining on-shore gas reserves with somewhat smaller amounts in western Ukraine's Carpathian Region. Off-shore, according to Chornomornaftohaz, a division of Naftohaz Ukrainy, as many as 13 gas and condensate and dry gas deposits with a combined 2.6 Tcf (73 bcm) of predicted reserves are known on the continental shelf of the Black and Azov Seas.

Increasing Ukraine's own production of natural gas is a central element of the government's energy strategy. To deliver this strategy Ukraine needs both money and advanced technologies and this provides major opportunities for foreign investors.

Transit Gas to Europe

Ukraine's real significance to world energy markets is as an intermediary connecting Russia, the world's largest natural gas producer, with growing European markets. In 2002, approximately 4 tcf (112 bcm) of Russian and Turkmen natural gas transited Ukraine en route to European markets. This represented roughly 24% of OECD Europe's natural gas consumption, and 38% of imports.

Accordingly, Ukraine's natural gas infrastructure is of growing importance both to European consumers and Russian producers. In June 2002, heads of state from Ukraine, Russia, and Germany agreed to begin developing an international consortium to manage and upgrade Ukraine's natural gas distribution infrastructure. In October 2002, Ukrainian and Russian state-owned oil and gas concerns, Gazprom, and Naftogaz Ukrainiy, signed preliminary agreements, and in January 2003, the new company was registered in Kyiv, with each company holding 50%.

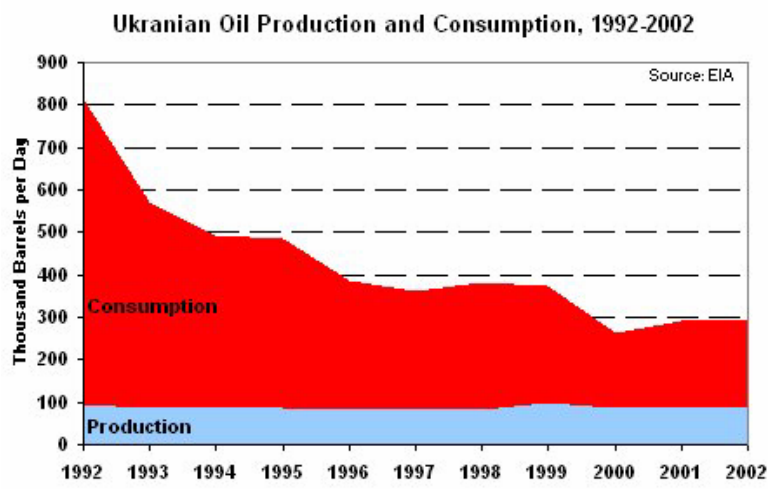
The partners are still considering several proposals for the structure and membership of the consortium. Germany's Ruhrgas has been present at the consortium's negotiations, but its role is as of yet undecided. Several other parties have shown interest in the consortium, including Gaz de France and the European Bank for Reconstruction and Development (EBRD). Ukraine has

also suggested that Caspian Sea region producers Turkmenistan, Kazakhstan, and Azerbaijan be invited to participate.

In August 2003, the consortium agreed to its first infrastructure development project, the construction of a new 930-mile natural gas pipeline between eastern and western Ukraine with a capacity of roughly 1 tcf (28 bcm) per year. As conceived by the partners, the pipeline would allow Russian natural gas exports to Europe through Ukraine to increase by roughly 25%. The consortium is currently conducting feasibility studies and expects that once commenced, construction will take approximately two years.

OIL

Ukraine has 395 million barrels of proven oil reserves, the majority of which are located in the eastern Dnieper-Donetsk basin. Although Ukraine has made efforts at exploration, particularly in its sector of the Sea of Azov, oil production has remained relatively flat since independence.



Consumption, on the other hand, has fallen dramatically, from 813,000 barrels per day (bbl/d) in 1992 to 296,000 bbl/d in 2002. Despite this decline in consumption, Ukraine remains highly dependent on imported oil, most of which comes from Russia with lesser amounts coming from Kazakhstan. In 2002, net oil imports totaled roughly 212,000 bbl/d, representing 70% of consumption.

Oil Transit

Ukraine's geographic location makes it an ideal corridor for oil and natural gas to transit from Russia and the Caspian Sea region to European markets. Most of the oil transited via Ukraine is Russian oil, and is sent through the 1.2-million-bbl/d Druzhba pipeline, the southern fork of which runs through Ukraine.

In July 2003, the Ukrainian government approved a new agreement with Russia calling for the transit of Russian oil through Ukraine to increase by 60%, to 1.6 million bbl/d, for 15 years. However, the Russian side, in a surprise negotiating tactic, has refused to sign the agreement, owing to a dispute over Ukraine's newest oil pipeline, Odessa-Brody

The Odessa-Brody Pipeline System

Ukraine also hopes to become a transit center for oil from the Caspian Sea region, which is expected to increase significantly over the decade. The leading potential conduit for this oil in Ukraine is the Odessa-Brody pipeline, which was completed in 2001 and extends from Ukraine's Black Sea port of Odessa northward to the city of Brody (see map). The pipeline was initially intended to load Caspian Sea oil from the newly completed Black Sea marine terminal, Pivdenniy (or Yuzhniy), and carry it northward through the Ukrainian system and on to Europe with an initial capacity of roughly 300,000 bbl/d. However, for roughly two years the pipeline has been mostly dormant. Russia has suggested that the pipeline be used in reverse, to move oil from Russia southwards to tankers in the Black Sea and shipped onwards to world markets. Since January 2003, the last 32-mile leg of the pipeline has been used (in reverse) by Russian oil companies for these purposes.

Faced with the possibility of losing direct access to Caspian Sea region oil, European governments have voiced their opposition to the reversal project in newspaper articles and public statements. Leading Caspian Sea region producer, Kazakhstan, has also taken counter-measures. In July 2003, for instance, the country agreed to construct a 32-mile pipeline parallel to the segment currently being used in reverse to transit Russian oil. However, in late September 2003, the Ukrainian government announced that in 2004, the pipeline will be used in its originally intended north-south direction in to carry 180,000 bbl/d of Caspian sea region crude to Europe. It is, however, unknown if the deal will extend beyond one year.

Whether the Odessa-Brody pipeline will be permanently and entirely reversed, per the Russian proposal, remains unknown at the present time, as the Ukrainians have been noncommittal. On August 19, 2003, the Ukrainian government opened a tender for independent investigation of the possibility of reversing the pipeline. Some analysts have suggested that the pipeline be reversed temporarily, to allow Russian oil to flow through the pipeline in the meantime until major Caspian Sea region projects come online

Refining/Downstream

Ukraine has six crude oil refineries, with a combined throughput capacity of approximately 1 million bbl/d. However, with domestic demand at just over 30% of the country's refining capacity, Ukraine's refineries are operating significantly below capacity. Until recently, Ukraine's refineries did not even receive enough crude oil supplies to supply the country's domestic petroleum product demand. Ukraine has begun to achieve better results in securing sufficient

crude oil supplies for its refineries by offering oil exporters in Russia and Kazakhstan a stake in the country's refineries.

In March 1999, Russia's Lukoil paid $7.2 million for a 51.9% stake in Ukraine's 78,000-bbl/d Odessa refinery, the country's fourth largest in terms of refining volumes. Since its original purchase, Lukoil has increased its stake in the refinery to 94% by purchasing additional shares on the secondary market. Lukoil has invested over $2 million in reconstructing the Odessa refinery.

Russia's Tyumen Oil, through its subsidiary TNK-Ukraina, acquired 67% of the 320,000-bbl/d Lisichansk (LiNOS) refinery in July 2000, then increased its stake to 78% in October 2000. The company is carrying out an investment program to modernize the plant over the next five years and to boost its design capacity. In June 2001, TNK-Ukraina signed an agreement with a German bank to expand an existing $50 million credit for the refinery, with the additional financing planned to be used to fund a stable supply of crude oil to LiNOS and eventually increase production. In recent years, the refinery's output has been limited by shortages of crude oil.

Ukrtatnafta is a joint venture between Ukraine's Kremenchuk refinery (43%) and several Russia's entities including Tatneft producer, Tatnefteprom and others who own another 57% of the joint venture. The Kremenchuk/Ukrtatnafta refinery enjoyed cash and crude injections from Russian partner Tatneft that helped to pay off debts. Ukrtatnafta purchases itself about 80% of all crude it processes. Having reliable financial backing, Ukrtatnafta is expanding its wholesale presence by aggressive marketing. Ukrtatnafta is developing its own retail network and has a number of modern gas filling stations in Kremenchuk, Poltava and Kyiv.

Finally, Kazakhstan's state oil company, Kazakhoil (now Kazmunaigaz) purchased 60% of the Kherson oil refinery in November 2001. In May 2002, however, Kazmunaigaz announced plans to sell its stake in the Kherson refinery, owing to difficulties in meeting its commitments to ensure 36,000 bbl/d of oil annually to the refinery and to invest $250 million to modernize the plant. Russia's Rosneft has signed a preliminary agreement with Kazmunaigaz to purchase the 60% stake in the Kherson refinery.

GENERAL INVESTMENT CONSIDERATIONS

Legal and Fiscal Issues

The Ukrainian government continues to work hard to improve the legal and fiscal framework to provide the long-term clarity, stability and consistency needed to sustain the significant level of foreign investment required by the country. It is unrealistic to expect an overhaul of the entire legal and fiscal regime overnight, but there are significant steps which are now being taken. In addition to radical reforms of the taxation system currently being introduced, one of the most important improvements has been the adoption of production sharing legislation. This form of legislation, which is an effective and speedy method of jump-starting the energy sector, has been successfully adopted in many other countries around the world and is a proven means of reducing the perceived risks of investing in an otherwise rapidly evolving fiscal and legal environment. Ukraine has enacted a production sharing law together with the essential enabling legislation necessary for the production sharing law to operate effectively. These essential pieces of legislation are currently being revised and updated to meet the requirements of today's investors. This key development in Ukraine's legislative framework will be welcomed by all potential investors in Ukraine's natural resources and energy sectors.

Advanced Technology

In addition to the creation of the right business environment, access to the best available technology is needed to unlock Ukraine's full natural resources potential. Huge advances in exploration and production technology have been made by the industry over the last twenty years, enabling the identification and commercial exploitation of increasingly more complex reserves. Unfortunately, many of these advances have not generally been available in Ukraine, primarily due to severe shortages of funding. On the other hand, Ukrainian technologists are highly innovative in making the best use of tools when they are available.

3D Seismic

One of the major advances in exploration technology has been the development of three-dimensional seismic technology and - equally important - the associated processing and interpretation techniques. This technology has significantly improved understanding of the geology of prospective areas and has enabled the identification and exploitation of hitherto unrecognized structures. For example, barely twelve years ago the accepted wisdom in the industry was that both the UK North Sea and the US Gulf of Mexico were highly mature basins, with relatively limited remaining potential. However, in both these regions the development and application of three-dimensional seismic technology has enabled the imaging and identification of new geological structures with enormous hydrocarbon potential. The net effect has been resurgence in both exploration and development activities in areas previously considered more or less fully explored.

This has some interesting implications for Ukraine which appears to have large areas with closely analogous geology to that of the UK North Sea and the US Gulf of Mexico. The application of three-dimensional seismic technology could offer the possibility of identifying and exploiting significant new reserves in Ukraine, whose potential was previously unrecognized.

Drilling

In the drilling area, there are a variety of technologies which could materially increase Ukraine's oil and gas production and improve overall recovery rates. These include, for example, drilling deviated, high angle and horizontal wells, to access reserves more efficiently, and applying multi-lateral well completions, to enable simultaneous production from several different horizons. Advanced drilling technology such as this will allow gas production to be accelerated while reducing the total number of wells. This in turn will reduce the overall capital costs and thus make it economic to exploit even smaller and technically more challenging reserves.

People

When considering technology, it is too easy to be blinded by the specialized equipment, the computing power, and the advanced materials, and to forget the know-how and experience of people. It is important that western resource companies planning to invest in Ukraine are prepared to share the best technology and know-how with Ukrainian specialists to ensure that technical solutions are found that are appropriate to local needs and which will create the maximum value added to any joint activities. In Ukraine, where there is already a highly skilled

and experienced technical resource, sharing technology and know-how will undoubtedly produce major benefits to any exploration and production project.

CURRENT PARTICIPATION IN UKRAINE'S OIL & GAS SECTOR

Up to 250 enterprises of various types of ownership operate in the oil and gas sector: in exploration, production, refining or pipelines. The largest companies are subsidiaries of state-owned holding company Naftogaz Ukrainy. Naftogaz controls the domestic natural gas and crude oil extraction industry and over 60% of the gas trading market. With subsidiary companies Ukrnafta and Chornomornaftohaz, Naftogaz produces 97% of domestic natural gas. Ukrnafta is the largest oil producer in Ukraine (94% of domestic oil production).

Companies from the following countries currently operate in Ukraine (upstream and downstream): Russia: RAO Gazprom, TNK/BP, Lukoil, SlavNeft, TatNeft, Alliance Group; Kazakhstan: Kazakhoil (Kherson refinery), USA: Mobil, Shell, USENCO, Carpatsky Petroleum Corporation /JV UkrKarpat Oil; US-Russia: Itera International Energy Company, Itera-Ukraine; US-German: JV Eurogas; Canada: Kroes Energy, Momentum Energy, Epic Energy; UK: JKX/Poltava Petroleum Company JV, CanArgo Energy; Europa Oil & Gas Ltd; Poland: Polish Oil &Gas Company; Greece-Cyprus: JV Plast; and others.

CONCLUDING REMARKS

Amongst oil industry specialists working in Ukraine there is a widespread belief that, in spite of the challenges, the benefits both for investors and for the country from successful oil and gas exploration/production projects are potentially very substantial. Currently a great deal of work is being done in Ukraine by many dedicated individuals in government and in state organisations to maintain and extend the improvements in the legal, fiscal and business regimes. Such effort is now being rewarded by a steadily improving climate for upstream investment. As a result the future for Ukraine's oil and gas sector is now brighter than at any time previously.

UKRAINE - COUNTRY SUMMARY

GENERAL

President: Leonid Kuchma (since July 19, 1994)
Prime Minister: Viktor Yanukovych (since November 21, 2002)
Independence: December 1, 1991 (from Soviet Union); National holiday: Independence Day, August 24, 1991
Population (7/01E): 48.7 million
Location: Eastern Europe, bordering the Black Sea between Poland and Russia
Size: 233,090 square miles, slightly smaller than Texas
Major Cities: Kyiv (capital), Kharkiv, Donetsk, Dnipropetrovsk, Odesa, L'viv
Languages: Ukrainian (official), Russian, Romanian, Polish, Hungarian
Ethnic Groups: Ukrainian 73%, Russian 22%, Jewish 1%, other 4%
Religions: Ukrainian Orthodox - Moscow Patriarchate, Ukrainian Orthodox - Kyiv Patriarchate, Ukrainian Autocephalous Orthodox, Ukrainian Catholic (Uniate), Protestant, Jewish

ENERGY

First Deputy Prime Minister (for Fuel and Energy Complex): Andriy Kluyev
Minister of Fuel & Energy: Serhiy Yermilov
President, Naftohaz Ukrainy (National Oil and Gas Company): Yuri Boiko
Proven Oil Reserves (1/1/03E): 395 million barrels
Oil Production (2002E): 84,400 barrels per day (bbl/d)
Oil Consumption (2002E): 296,000 bbl/d
Net Oil Imports (2002E): 211,600 bbl/d
Crude Refining Capacity (1/1/03E): 1 million bbl/d
Natural Gas Reserves (1/1/03E): 39.6 trillion cubic feet (Tcf)/1109 billion cu m (bcm)
Natural Gas Production (2001E): 0.64 Tcf (18 bcm)
Natural Gas Consumption (2001E): 2.62 Tcf (73 bcm)
Net Natural Gas Imports (2001E): 1.98 Tcf (55 bcm)
Coal Reserves (2001E) : 37.6 billion short tons
Coal Production (2001E): 90.6 million short tons (Mmst)
Coal Consumption (2001E): 93.7 Mmst
Electricity Generation Capacity (2001E): 54 gigawatts (GW)
Electricity Production (2001E): 165 billion kilowatt hours (Bkwh)
Electricity Consumption (2001E): 152 Bkwh

ECONOMICS

Minister of Economy: tba
Minister of Finance: Mykola Azarov
Currency: Hryvnia
Market Exchange Rate (1 Jan 2004): US $1=5.35 hryvnia
Nominal Gross Domestic Product (GDP) (2002E): $39.8 billion; **(2003F):** $43.3 billion
Real GDP Growth Rate (2002E):4.8%; **(2003E):** 8% **(2004F)**: 4.6%
Inflation Rate (Change in Consumer Prices year-on-year, 2002): 0.8%; **(2003E):** 6.1%

(2004F): 8.9%
Official Unemployment Rate (2002E): 3.6%; **(2003E):** 4.0%
Current Account Surpluss (2002E): $3.17 billion; **(2003E):** $2.85 billion
Major Trading Partners: Russia, EU, U.S., Turkey
Merchandise Exports (2002E): $18.8 billion; **(2003E):** $19.8 billion
Merchandise Imports (2002E): $18.1 billion; **(2003E):** $19.0 billion
Merchandise Trade Surpluss (2002E): $700 million; **(2003E):** $800 million
Major Exports: ferrous and nonferrous metals, fuel and petroleum products, machinery and transport equipment, food products
Major Imports: energy, machinery and parts, transportation equipment, chemicals
External Debt (12/02E): $10.2 billion

ENVIRONMENT

Minister of Ecology and Natural Resources: Serhiy Polyakov
Total Energy Consumption (2001E): 6.08 quadrillion Btu* (1.5% of world total energy consumption)
Energy-Related Carbon Emissions (2001E): 96.58 million metric tons of carbon (1.5% of world total carbon emissions)
Per Capita Energy Consumption (2001E): 123.7 million Btu (vs. U.S. value of 341.8 million Btu)
Per Capita Carbon Emissions (2001E): 2.0 metric tons of carbon (vs. U.S. value of 5.5 metric tons of carbon)
Energy Intensity (2001E): 31,001 Btu/$1995 (vs U.S. value of 10,918 Btu/$1995)CHECK**
Carbon Intensity (2000E): 3.13 metric tons of carbon/thousand $1995 (vs U.S. value of 0.17 metric tons/thousand $1995)**
Fuel Share of Energy Consumption (2001E): Natural Gas (45%), Coal (30%), Nuclear (13%), Oil (10%)
Fuel Share of Carbon Emissions (2001E): Coal (48%), Natural Gas (41%), Oil (11%)
Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified May 13th, 1997). Signatory to the Kyoto Protocol (signed March 15th, 1999, not yet ratified)
Major Environmental Issues: Inadequate supplies of potable water; air and water pollution; deforestation; radiation contamination in the northeast from 1986 accident at Chornobyl Nuclear Power Plant.
Major International Environmental Agreements: A party to Conventions on Air Pollution, Air Pollution-Nitrogen Oxides, Air Pollution-Sulphur 85, Antarctic Treaty, Biodiversity, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Wetlands. *Has signed, but not ratified*: Air Pollution-Persistent Organic Pollutants, Air Pollution-Sulphur 94, Air Pollution-Volatile Organic Compounds, Antarctic-Environmental Protocol.
* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar and wind electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

Sources for this report include: Energy Information Administration, CIA World Factbook, U.S. Department of Commerce's Business Information Service for the Newly Independent States (BISNIS), Economist Intelligence Unit ViewsWire, U.S. Embassy in Ukraine, Canadian Embassy in Ukraine, Oil and Gas Journal, Petroleum Economist, PlanEcon, The Deane Group (Ukraine).

*** Biographical Note**

Dr Jim Bown has extensive experience in the international oil and gas industry having worked for more than 25 years with British Petroleum (BP). He moved to Kyiv in April 1997 to establish the company's upstream representation in Ukraine. Previously he had spent four years with BP's exploration and production activities in Baku, Azerbaijan. Jim Bown retired from BP in April 2000 and is currently engaged in his own energy industry consultancy business based in Ukraine.

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