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INTERNATIONAL ASSOCIATION for ENERGY ECONOMICS

IAEE Energy Forum

First Quarter 2011 International Association for Energy Economics

President's Message

As we enter 2011, I am more confident that the worst may be behind us. After a deep and long-lasting recession, the global economy is slowly gaining strength. World growth forecasts for 2011 are being revised higher, despite Europe's debt problems.

During the recession, energy demand declined in the developed countries, while continuing to expand in the developing countries, especially in China, India and the Middle East. Looking ahead, demand growth is forecast to come from these same countries. Given that developing countries will set the pace, the paucity of data from these regions is a major hindrance to analyzing energy markets and making credible forecasts. As a researcher, I know firsthand that our analysis is worthless without good data. While the need is especially acute from developing areas, we need reliable data and transparency in markets and pricing everywhere. The IAEE has members in 102 nations. I hope that we can work together to increase transparency and publicly available data in our countries.

I am extremely pleased to be coming in as president at a very exciting time for the IAEE. Last year, under Einar Hope's leadership, we began work on a new IAEE journal. Economics of Energy and Environmental Policy (EEEP) fits perfectly with our mission of blending the expertise and interests of economists in business, government and academia, concerned with energy and related issues. EEEP will publish policy analysis of relevant energy and environmental topics based on solid research. EEEP will be slightly different than our flagship publication, the Energy Journal, because it will be written for a broader audience, and should appeal even to non-energy economists and non-economists. Articles will be shorter, without equations, but still refereed. As its name implies, EEEP will also be specifically concerned with environmental issues and policy. We will publish submission guidelines shortly. I urge everyone to consider submitting their policy-related articles to our new journal. Making this journal a success will be my number one priority this year.

Student members are this organization's future. We currently have student chapters in 10 nations -- Germany, Switzerland, Greece, Austria, France, Italy, the U.S., Brazil, Nigeria and the U.K. -- a total of 644 student members, 23 percent more than last year. Student chapters in Norway and Saudi Arabia are in development. In 2010, we disbursed $52,600 to students through Best Paper awards, travel support for conferences, and student programs at IAEE meetings. This year we will continue to make IAEE conferences more accessible and productive for students and to increase student funding.

A third priority is expanding the number of affiliates. A new development is formation of a regional affiliate structure which will encompass not one, but several countries. The South America affiliate has been in the works for several months and should be in place for the meeting in Buenos Aires in April. Argentina, Brazil, Chile, Columbia, Peru and Uruguay are in this group. We are also forming a Russian affiliate. I am thrilled about these developments and look forward to the activities of our new affiliates.

I want to thank outgoing president Einar Hope for his leadership and enthusiastic efforts this past year, especially with EEEP. With his quiet but steady manner, he has made incredible progress toward achieving the objectives in our 2009-2012 strategic plan. I have learned a lot from him. I would also like to thank outgoing council members for their service and dedication.

We have an exciting 2011 ahead. We start the year with the ASSA meeting in Denver. Our efforts on putting together exceptional sessions paid off handsomely. We greatly in-

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Editor: David L. Williams

PRESIDENT'S MESSAGE *(continued from page 1)*

creased attendance, and now have two IAEE sessions at the ASSA meetings – one joint with AEA. The 3rd ELAEE meeting, "Energy, Climate Change and Sustainable Development: The Challenges for Latin America" will be held in Buenos Aires on April 18-19, followed by the 4th NAEE/IAEE conference, "Green Energy and Energy Security: Assessing the Options for Africa in a Global Energy Market" in Abuja, Nigeria, April 25-26. The IAEE 34th Annual Conference, "Institutions, Efficiency and Evolving Energy Technologies" will be held in Stockholm on June 19-23. Capping off the year will be the USAEE 30th Annual Conference, "Redefining the Energy Economy: Changing Roles of Industry, Government and Research" in Washington, D.C. on October 9-12. I hope to see you at many of our conferences.

Best wishes for a happy, healthy and productive 2011 to all!

Mine Yűcel

Jean Tirole (2nd from right) after receiving his IAEE Outstanding Contributions to the Profession award. With him are past presidents Andre Plourde and Andrea Bollino and current president Mine Yűcel.

IAEE Email Policy

At the Rio Council meeting the IAEE Council discussed the use of IAEE's email facilities and agreed to the following policy:

> The IAEE will only send emails to its members on matters pertaining to IAEE business or that of IAEE Affiliates (e.g., Affiliate directly sponsored events). No emails will be sent on behalf of third parties (persons or organizations, including universities). IAEE does not release its email address list.

IAEE Mission Statement

The International Association for Energy Economics is an independent, non-profit, global membership organisation for business, government, academic and other professionals concerned with energy and related issues in the international community. We advance the knowledge, understanding and application of economics across all aspects of energy and foster communication amongst energy concerned professionals.

We facilitate:

- Worldwide information flow and exchange of ideas on energy issues
- High quality research
- Development and education of students and energy professionals

We accomplish this through:

- Providing leading edge publications and electronic media
- Organizing international and regional conferences
- Building networks of energy concerned professionals

Editor's Note

This concludes our *Energy Forum* series carrying articles on energy in Russia and the former Soviet Union. We lead off with an article by past president, long time member and Russia observer, Len Coburn. He provides a brief overview of Russian energy in the last ten years and suggests what we might expect in 2011. Details on some of the points he makes can be found in subsequent articles.

Hi-chun Park notes that progressive household energy tariffs are measures to encourage energy conservation and to supply low-income households with low-priced energy while approaching to cost-reflective prices in countries with low average energy prices.

Laura Solanko comments that Russia is dependent on the smooth functioning of the global raw materials and financial markets with the Federal budget largely based on export tax revenues. Further, the domestic financial system does not meet the investment needs of large Russian corporations. The future challenge is how to manage this dependency and to secure energy exports given only slowly increasing domestic production volumes. A key ingredient in any successful strategy has to include increasing the efficiency of domestic energy use in Russia.

Catherine Locatelli and Sylvain Rossiaud discuss the emerging organizational and institutional framework for regulating access to Russia's hydrocarbon resources. They note that two factors characterize the changes now taking place: (1) state -controlled companies appear as the key players in the new arrangements and (2) conditions for access to the countries hydrocarbons has been toughened.

Tarjei Kristiansen reports that the Russian power market has evolved from a state monopoly to a transitional market on the path to full liberalization. Price levels are relatively low compared with Europe, but buyers must also pay for available capacity such that the effective price is higher. In the future, power (energy) and capacity will be traded on commodity exchanges.

Belarus is second to the Ukraine in importance as a transit country supplying Russian oil and natural gas to the European Union. Alexander Zaborovskiy discusses the role of Belarus in ensuring the reliable transit of natural gas to the EU subject to the following factors: its economic policy goals of greater energy security and energy efficiency; Russia's forecast production and consumption; and the development of gas-transport facilities in the region. He concludes that Belarus will be able to become a secure "energy bridge" between Russia and the EU.

Aleksandr Rakintsev discusses Russian oil field auctions, noting that in recent years there have been more than 200 auctions organized annually by the Russian government. Analyzing a data sample from sixty of these auctions and using a multiple regression model he reports on the factors most influencing auction results.

Oleg Eismont raises the issue, and then analyszes the possibility, that the Russian-European natural gas market could develop into a monopolistic-monopsonic situation.

Courtney Doggart notes that Russia has an extremely strong presence in all aspects of Georgia's electricity sector. She details this presence and then explores the causes and potential consequences of the situation one of which is to hinder needed investment from sources other than Russia. She makes some recommendations that would benefit Georgia in the long run.

DLW

Get Your IAEE Logo Merchandise!

Want to show you are a member of IAEE? IAEE has several merchandise items that carry our logo. You'll find polo shirts and button down no-iron shirts for both men and women featuring the IAEE logo. The logo is also available on a baseball style cap, bumper sticker, ties, computer mouse pad, window cling and key chain. Visit http://www.iaee.org/en/inside/merch.aspx and view our new online store!

34th IAEE International Conference

Stockholm June19-23, 2011

CALL FOR PAPERS

Institutions, Efficiency and Evolving Energy Technologies

Stockholm School of Economics

VATTENFALL

Energimyndigheten

Energimarknads inspektionen

Söderenergi

Research Institute of Industrial Economics

preem

WELCOME TO STOCKHOLM

The world is facing a strong need for a major transformation of the global energy supply system. One obvious reason for this is the threat of climate change caused by carbon dioxide emissions. Another is the continuing concern for the impact on the environment and human health caused by the use of conventional energy sources. A third factor is the concern for the geopolitical aspects of energy supply. At the same time there is a continuing need for a safe supply of energy, in suitable forms, at a reasonable cost.

The 34th IAEE International Conference with the theme Institutions, Efficiency and Evolving Technologies will be held at the Stockholm School of Economics in the very center of Stockholm, Sweden. The conference will bring together a wide spectrum of energy economists, policy makers, and professionals from all parts of the energy sector and representatives of governments and other public institutions. The aim is to address and thoroughly elucidate key issues related to the challenges outlined above.

On behalf of the organizing committee I wish you all a very warm welcome to Stockholm and an exciting conference.

Lars Bergman
General Conference Chair

CONFERENCE TOPICS

As usual at IAEE conferences all the major fields of energy economics and policy will be addressed. In addition there will be a special focus on the following topics, in plenary sessions and in a number of specialized concurrent sessions:

- The organization of energy related innovation and technological development
- Evolving technologies and energy use in the transport sector
- The political economy of energy markets
- Energy security
- The design, integration and regulation of energy markets
- Energy demand and energy efficiency

ABSTRACT SUBMISSION DEADLINE: JAN 17, 2011

Abstracts must be submitted electronically, by January 17, as word documents at the conference website:

www.hhs.se/iaee-2011

Abstracts, of a maximum two pages in length, should comprise: Presentation of research topic, brief overview of related research, methods, results and conclusions. The lead author must provide complete contact details, i.e. mailing address, e-mail address and phone number. At least one author for each accepted paper must pay the registration fee and attend the conference. Authors will be notified by March 1 of their paper's status. Authors whose abstracts are accepted will have to submit their full-length papers (up to 12 pages) by April 18.

The papers will then be made available at the conference website are welcome, the abstract selection process will seek to ensure as broad participation as possible. If multiple submissions are accepted, then a different co-author will be required to pay the speaker registration fee and present the paper.

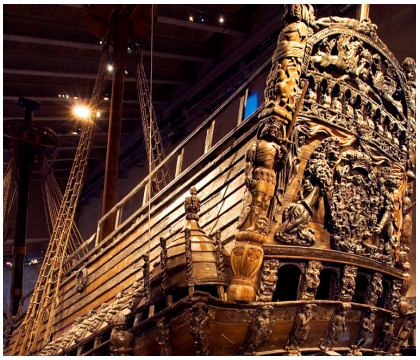
CONFERENCE VENUE

The conference will be held at the Stockholm School of Economics in the center of Stockholm (street address Sveavägen 65). The school´s main building has recently been entirely renovated and is now well suited for international conferences such as the 2011 IAEE International Conference.

The Gala Dinner and Awards Ceremony on June 20th will be held at the Wasa museum, Sweden' most visited museum, while the reception on June 21st will be at the Stockholm City Hall where the Nobel banquet is held on December 10th every year.

The climate in Stockholm in June is usually pleasant, with temperatures ranging between 20 and 25 C. However, it might be much warmer, or cool and rainy. Evenings are very light, with sunset after 10 p.m.





IAEE STUDENT PROGRAM

As part of the IAEE International Conference Student Program, the IAEE offers the IAEE Student Paper Award and IAEE International Conference Student Scholarships. Detailed information about these options for students is available at: www.hhs.se/iaee-2011

CANCELLATION/REFUND POLICY

A refund (less € 100 administration fee) is available until May 19. After that date no refunds will be given, but a delegate from the same institution, or a co-author of an accepted abstract, may be substituted.

REGISTRATION

Registration is online at www.hhs.se/iaee-2011. The registration fees, in €, are the following:

	Before Apr 18	Apr18-May18	After May18
Speakers/Chairs	500	550	600
IAEE members	650	700	750
Non-Members	800	850	900
Students	300	350	400
Accompanying persons	300	350	400

ORGANIZATION COMMITTEE

The General Conference Chair is Lars Bergman, President and Professor at the Stockholm School of Economics and Chairman of the Swedish Association for Energy Economics. Dr Thomas Tangerås, Research Institute of Industrial Economics, is responsible for the organization of concurrent sessions. The other members of the Organization Committee are:

- Lennart Billfalk, Senior Advisor, Vattenfall AB
- Olle Eklund, Managing Director, Europtima AB
- Kjell Jansson, CEO, Swedenergy AB
- Tomas Kåberger, Director General of the National Swedish Energy Administration
- Michael Löw, President and CEO, Preem AB
- Mats Nilsson, Economist, Vattenfall AB
- David Williams, Executive Director, IAEE

PROGRAM COMMITTEE

The Program Committee is responsible for the selection of abstracts and for the program of the conference. The members of the program committee are:

- Eirik Amundsen, University of Copenhagen
- Georg Erdmann, TU Berlin
- Natalia Fabra, Universidad Carlos III de Madrid
- Nils-Henrik von der Fehr, University of Oslo
- Sven-Olof Fridolfsson, Research Institute of Industrial Economics, Stockholm
- Jean-Michel Glachant, European University Institute, Florence
- Richard Green, University of Birmingham
- Reinhard Haas, Technical University of Vienna
- Pär Holmberg, Research Institute of Industrial Economics, Stockholm
- Einar Hope, Norwegian School of Economics and Business Administration, Bergen
- Christian von Hirschhausen, University of Dresden
- Lennart Hjalmarsson, University of Gothenburg
- Wumi Iledare, LSU Center for Energy Studies
- Akinbolaji Iwayemi, University of Ibadan
- Hoesung Lee, Keimyung University
- Chloé Le Coq, Stockholm Institute of Transition Economics
- Matti Liski, University of Helsinki
- Gunnar Lundberg, Vattenfall AB
- Kenichi Matsui, Institute of Energy Studies
- Juan-Pablo Montero, Pontificia Universidad Cátolica de Chile
- Karsten Neuhoff, University of Cambridge
- Mine Yucel, Federal Reserve Bank of Dallas

TRANSPORTATION

Stockholm´s international airport, Arlanda, is located 35 km north of the city.

By Arlanda Express, a fast train, the trip to the Central Station in the center of Stockholm takes 20 minutes and costs around 20 € (single ticket). The Airport Bus, also to the Central Station, takes around 45 minutes and costs around 10 €, while a taxi would take 35 minutes (depending on traffic) and cost around 40 €.

DATE	PROGRAM	TIME
Sun, June 19	IAEE Council Meeting (by invitation)	09:00-12:00
	Council lunch	12:00-13:00
	Secretariat & Registration	13:00-19:00
	IAEE Council Meeting	13:00-17:00
	Welcome reception, Stockholm School of Economics	18:30-20:00
	Council Dinner (by invitation)	20:00-23:00
Mon, June 20	Secretariat & Registration	08:00-18:00
	IAEE Affiliate Leaders Meeting	08:00-09:00
	Student Breakfast Meeting	08:00-09:00
	Opening Ceremony	09:00-09:15
	Presidential Address	09:15-09:45
	Keynote lecture	09:45-10:30
	Coffee Break	10:30-11:00
	Plenary session	11:00-12:30
	Lunch	12:30-14:00
	Concurrent sessions	14:00-15:30
	Coffee Break	15:30-16:00
	Concurrent sessions	16:00-17:30
	Gala Dinner and Awards Ceremony, Wasa Museum	19:00-22:00
Tue, June 21	Secretariat	08:00-18:00
	European Affiliate Leaders Meeting	08:00-09:00
	EJ Editors Board Meeting	08:00-09:00
	2012 Perth Planning Meeting	08:00-09:00
	Dual Plenary Sessions	09:00-10:30
	Coffee Break	10:30-11:00
	Concurrent Sessions	11:00-12:30
	Lunch	12:30-14:00
	Dual Plenary Sessions	14:00-15:30
	Coffee Break	15:30-16:00
	Concurrent Sessions	16:00-17:30
	Reception at the Stockholm City Hall and Boat Trip	18:30-22:00
Wed, June 22	Secretariat	08:00-18:00
	2013 Daegu Planning Meeting	08:00-09:00
	Asian Affiliate Leaders Meeting	08:00-09:00
	Concurrent Sessions	09:00-10:30
	Coffee Break	10:30-11:00
	Concurrent Sessions	11:00-12:30
	Lunch	12:30-14:00
	Closing Plenary Session	14:00-15:00
Thu, June 23	Technical Tour 1: Södertälje CHP	09:00-12:00
	Technical Tour 2: Arena City, Solna	09:00-12:00
	Technical Tour 3: Forsmark	09:00-18:00

TECHNICAL TOURS

1.**The combined heat and power plant in Södertälje**
This is a half-day tour to Södertälje around 35 km south of Stockholm. The plant was commissioned in 2009 and is the biggest heat and power process based on bio-fuels in the Nordic countries. It supplies heat to the interconnected district heating systems in the southern parts of the Stockholm area. The host of the tour is Söderenergi AB, the owner of the plant.

2.The Arena City in Solna
This is a half-day tour to the new Arena City in Solna, around 5 km north of Stockholm.The Arena City complex will contain Sweden's new national soccer arena, hotels, restaurants and stores, and it will use the best available technologies for energy conservation. At the time of the conference the complex will be half complete. The tour is hosted by the owners of the Arena City.

3.The Forsmark village
This is a full-day tour to Forsmark, a village around 150 km north of Stockholm dating back to the beginning of the seventeenth century. Forsmark village was originally a community built around ironworks, in a style that was typical for its time and with several counterparts in the area. Today the village is more like a museum, and Forsmark is currently best known for the nuclear power plant located just outside the village. In addition to tours of Forsmark village and the nuclear power plant, the plans for a final repository for used nuclear fuel will be demonstrated. The tour is hosted by Vattenfall.

CONFERENCE OVERVIEW

As we recover from the global recession and the disastrous Macondo deep water oil spill, concerns are once again mounting about energy supply, and especially the environmental and carbon implications of continued heavy reliance upon fossil fuels. Will increasing energy demands once again drive up energy prices? How should governments and firms react in terms of developing or facilitating new supplies and efficiencies? How should resources and alternative energy sources be developed, regulated, financed, traded? The clash of interests resounds starkly here in Washington, at the U.S. government's door, amid new legislation, evolving energy technologies, and continuing price uncertainties. Energy analysts, economists, financiers, developers, regulators, and students—each must revisit some basic assumptions about their roles, methodologies, research and planning focus, and the information they are using.

This conference will bring together in Washington key players in the North American energy sector to address these questions and many others in plenary and concurrent sessions. Those interested in organizing sessions should propose a topic and possible speakers to Wumi Iledare, Concurrent Session Chair (wumi@lsu.edu). This conference will also provide networking opportunities through workshops, public outreach and student recruitment.

HOSTED BY

NCAC
U.S. Association for Energy Economics
National Capital Area Chapter

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CAEE

AMEE

Conventional and Unconventional Gas and Oil Supplies

- Exploration and Drilling Cost Concerns
- Changing World Oil Supply/Demand Balance
- Protection of Offshore Resources Versus Oil Supplies

Markets and Drivers of Renewable Energy

- Government's Promotional Role
- Integration of Solar and Wind Generation In Power Dispatch
- Capital Markets – Financing Renewables

Energy Efficiency – Defining and Meeting Realistic Goals

- Building Controls and Cost Allocation
- Update on FNMA Rules
- Tightening Standards
- The Minimal Energy Society – Danish Model
- Sudden Acceleration of U.S. Automobile Efficiency Standards

Economic Analysis Methods and Assumptions

- Energy Data Sources
- EIA Reliability Amid Shale Gas Data Difficulties
- IEA Relevance After China Fiasco
- Private Surveys

Rising Role of Government

- Issues in Energy Regulation and Uncertainties
- Energy Trading under Dodd-Frank
- Exchange Trading Efficiencies
- Over-the-Counter Creativity

Changing Geography of Energy Demand

- Atlantic Energy
- Russian Oil and Gas Investment
- Unconventional Energy Revolution – North America, Europe, China

Offshore in Crisis

- Drilling Expansion vs. Constriction
- Rising U.S. Oil Importation
- Macondo = Canadian Oil Sands Bonanza?

Global Warming Legislation Languishing

Natural Gas – Bridge Fuel to More Natural Gas?

- Shale Gas Revolution and Water Issues
- LNG Trade
- Global Gas Contracts vs. Spot Market Trading
- Role of Gas in Meeting RPS or CO_2 Emission Standards

Global Petroleum Security and Pricing

- OPEC Policies in a Changing World
- Increased U.S. Oil Importation After Macondo
- Oil Supply Crisis Looming?
- Strategic Oil Storage Policies

Electricity

- Coal Power Plant Trade-Offs
- Wind and Solar Market Penetration Issues
- Natural Gas and Wind Generation – Competition or Integration?
- Market Efficiency and Design
- Electricity pricing, fuel pricing and policy

Energy Capital Investment and Allocation

- Wind
- Solar
- Nuclear
- Infrastructure

Global Economic Meltdown and Energy Demand

- Energy Demand Expansion in New Industrial Asia and South America
- China's Energy Policy

Energy Infrastructure

- Capital Investment Requirements
- Costs of Capital
- Pipeline and Transmission Line Financing, Regulatory and Right-of-Way Issues

Energy Technology and Innovation

- Supply Expansion
- Cost Reduction
- Demand and Efficiency

Issues in Moving Beyond Petroleum in Vehicles

- Jumping the Gun with Short-Range Electric Cars
- Who Will Kill the Electric Car This Time?
- Ethanol and Biodiesel

Energy and Wealth Distribution

Energy and Water Issues

30TH USAEE/IAEE NORTH AMERICAN CONFERENCE

CALL FOR PAPERS

We are pleased to announce the Call for Papers for the 30th USAEE/IAEE North American Conference to be held October 9-12, 2011 at the Capital Hilton Hotel, Washington, DC, USA. The deadline for receipt of abstracts is May 16, 2011.

Paper abstracts, giving a concise overview of the topic to be covered and the method of analysis, should be one to two pages. Abstracts should include the following brief sections: (1) overview, (2) methods, (3) results, (4) conclusions, and (5) references. Please visit www.usaee.org/usaee2011/ to download a sample abstract template. NOTE: All abstracts must conform to the format structure outlined in sample abstract template. At least one author of an accepted paper must pay the registration fees and attend the conference to present the paper. The corresponding author submitting the abstract must provide complete contact details—mailing address, phone, fax, e-mail, etc. Authors will be notified by July 7, 2011 of their paper status. Authors whose abstracts are accepted will have until September 1, 2011, to submit their full papers for publication in the conference proceedings. While multiple submissions by individuals or groups of authors are welcome, the abstract selection process will seek to ensure as broad participation as possible: each speaker is to present only one paper in the conference. No author should submit more than one abstract as its single author. If multiple submissions are accepted, then a different co-author will be required to pay the reduced registration fee and present each paper. Otherwise, authors will be contacted and asked to drop one or more paper(s) for presentation.

Abstracts should be submitted online by visiting www.usaee.org/USAEE2011/submissions.aspx Abstracts submitted by email will not be processed. Please use the online abstract submission form.

STUDENTS

Students may submit an abstract for the concurrent sessions. The deadline for abstracts is May 16, 2011. Also, students may submit a paper for consideration in the Dennis J. O'Brien USAEE/IAEE Best Student Paper Award Competition (cash prizes plus waiver of conference registration fees). The paper submission has different requirements and a different deadline. The deadline for submitting a paper for the Student Paper Awards is July 6, 2011. Visit www.usaee.org/usaee2011/paperawards.html for full details. Students may also inquire about our scholarships covering conference registration fees. Visit www.usaee.org/usaee2011/students.html for full details.

TRAVEL DOCUMENTS

All international delegates to the 30th USAEE/IAEE North American Conference are urged to contact their respective consulate, embassy or travel agent regarding the necessity of obtaining a visa for entry into the U.S. If you need a letter of invitation to attend the conference, contact USAEE with an email request to usaee@usaee.org. The Conference strongly suggests that you allow plenty of time for processing these documents.

The 3rd IAEE Asian Conference
20-22 February 2012
Kyoto, Japan

"Growing Energy Demand, Energy Security and the Environment in Asia"

First Announcement and Call for Papers
The 3rd IAEE Asian Conference

Growing Energy Demand, Energy Security and the Environment in Asia

February 20-22, 2012

Dear Energy Professionals

We are pleased to announce that the 3rd IAEE Asian Conference, entitled " Growing Energy Demand, Energy Security and the Environment in Asia ", will be held in Kyoto, Japan on February 20-22, 2012.

Energy demand growth in the coming decades is expected to be mostly in the non-OECD countries, specifically the developing countries in Asia. This demand growth will have significant impacts on energy security and the environment not only in Asia but worldwide The conference will focus on these issues, however, in the spirit of the IAEE, contributions from all fields of energy economics and policy are invited. The Conference welcomes participants not only from Asia, but also from other parts of the world.

Topics in plenary, dual plenary and concurrent sessions will include :

* Long Term Energy Outlook in Asia
* Geopolitics of Climate Change Policy in Asia
* Oil Market in Asia
* Coal Market in Asia
* Demand and Supply of Renewable Energy in Asia
* Energy Conservation and Efficiency in Asia
* Unconventional Fossil Fuels in Asia
* Energy and the Economy
* Geopolitics of Energy in Asia
* Growing Energy Demand and Environment in Asia
* Gas Market in Asia
* Electricity Market in Asia
* New Dimension of the Nuclear Power Plant Development in Asia.
* Evolving Technologies and Energy Use in the Transportation Sector in Asia
* Energy Modeling
* Energy Investment and Finance

Submission of Abstracts

Abstracts up to 2 pages covering Overview, Methods, Expected Results and References should be submitted via e-mail to the Program Committee Chair,

Prof. Kenichi Matsui : matsui@edmc.ieej.or.jp. by September 20, 2011

Authors who are interested in organizing special sessions are encouraged to propose their topics and possible speakers.

Venue

The conference venue is the Kyoto University Clock Tower Centennial Hall. Kyoto is the old capital of Japan and full of historical spots. People in Kyoto live with four seasons punctuated with small and large traditional fests which are held almost in every week in a temple or shrine somewhere in the city. We are confident that you will find something traditional adding to the intellectual stimulus from the Conference during your stay in Kyoto. Relatively few tourists are there in February and connoisseurs say Kyoto is best in winter.

Hotel

We assigned “El Inn Kyoto” as the main Hotel for the Conference. This hotel locates in a very convenient place, just in front of and about 5 minutes walking distance from the JR (Japan Railway) Kyoto Station. This hotel locates also in the one to two minutes walking distance of the Kyoto Terminal of the Airport Limousine Bus from the Kansai Airport. This hotel is not a deluxe one but clean and comfortable and the room charge is very modest. We will reserve your room in this Hotel. Naturally those who wish to stay in a deluxe hotel, please do so but in this case we recommend you to make the hotel reservation well in advance of the conference.

On behalf of the organizing committee I would like to invite you to Kyoto and the 3rd IAEE Asian conference.

General Conference Chair
Masakazu Toyoda
Chairman and CEO, The Institute of Energy Economics, Japan

Some Key Dates:

Abstracts submission deadline: September 20, 2011
Notification of accepted abstracts: October 20, 2011
Deadline for submission of full-length
(up to 12 pages) papers: December 20,2011
Early bird registration: Until December 20, 2011

Contact Information

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Russian Energy: Past, Present, Future

By Leonard L. Coburn*

Entering the first year of the second decade of the 21st century is a good time to assess Russia's energy past, present and future. The past years are characterized by the ascendancy of Vladimir Putin in Russian politics. His Presidency started on January 1, 2000 and lasted eight years, when he moved to the post of Prime Minister. Russia's fortunes changed dramatically during Putin's tenure as Russia's economy stabilized and grew significantly, reflecting the rapid rise of the oil and gas markets on which so much of Russia's economy is based. The global economic crisis starting in the latter part of 2008 and extending through 2009 had a disproportionate impact on Russia, as its economy faltered reflecting again its over-dependence on energy markets. The following is brief overview of the last ten years (first decade of 21st century) with a brief look into what we can expect in 2011.

Russian oil production showed tremendous growth early in the decade and then reached a plateau as it neared 10 million barrels per day. At the beginning of the decade, Russian oil production averaged 6.9 million barrels per day for 2001 (the first year of the new century and decade). By the beginning of 2010, Russian oil production crossed the 10 million barrels per day threshold. Growth was quite uneven, with annual average production surging in the early years between 500,000 and 700,000 barrels per day (2001-2004), and then tapering off to annual average increases of 200,000 barrels per day (2004-2007). This high growth was due to the significant increase in oil prices, (world oil prices increased from an annual average of about $26.00 per barrel in 2001 to a high of an annual average of $100 in 2008, declining in 2009 to an annual average of $62.00 in 2009, to the current oil price of about $90.00 per barrel), the application of modern Western technology to Russia's aging West Siberia oil fields, and the devaluation of the ruble lowering production costs. Russia's economy surged during this period as high taxes on oil production and exports contributed significant revenues for Russia's expanding budgets. In 2004, a new oil export tax was imposed. Marginal tax rates on oil exports exceeded 90 percent, adding to the burgeoning funds in the oil trust fund and allowing Russia to use these tax funds for its growing annual budgets. With oil reaching a peak of $147 per barrel in July 2008, future prospects seemed rosy. The precipitous decline in oil prices in December 2008 to about $35 per barrel in conjunction with the world economic crisis that started in September 2008 led to a shift in Russian oil production. The impact of lower oil prices and the high Russian oil export duty led to a decline in oil production starting in September 2008, lasting six months through February 2009. By March 2009, Russian oil production increased year on year and has continued to increase to the present.

As increases in Russian oil production slowed and reversed in 2008, Russia enacted tax incentives to encourage new production in high cost producing areas, especially in the Northern provinces and in East Siberia. New production from Sakhalin Island came on line in 2007-2008 masking the decline in Russia's old West Siberian oil fields. The combination of new incentives, Sakhalin production and a small number of new fields in East Siberia led to the marginal increases in Russian oil production during the remainder of 2009 to the present. As of September 2010, Russian oil production increased almost 41 percent since 2001.

Russian gas production did not fare as well since it grew by only 0.5 percent from 2001 to 2009 (last year available). Since Gazprom accounts for about 85 percent of Russian gas production, the industry's fortunes are tied strongly to Gazprom. Growth in gas production and exports to Europe, Russia's primary market, grew consistently from January 2001 until 2007. In 2007, a warmer winter in both Russia and Europe led to a decline in consumption and production. Russian production rebounded in 2008, although Gazprom's production hardly increased in 2008. Russian gas production in 2009 declined precipitously from 2008 (from 24.4 Tcf to 20.6 Tcf) because of the two week disruption in gas supplies to Europe due to the Russian-Ukrainian gas dispute in January 2009 (80% of European gas supplies transit Ukraine) and the sharp decline in European gas demand stemming from the economic crisis. Gazprom has been stretching production at its existing gas fields and has postponed investments in new gas fields in Yamal (Bovanenko) and offshore (Shtokman). As an interim strategy Gazprom buys large volumes of gas from Central Asia (66 billion cubic meters in 2008).

Russia's dominance in Central Asia is dwindling as Azerbaijan, Kazakhstan and especially Turkmenistan sought alternatives to Russia for selling their natural gas. In December 2009, Turkmenistan opened its gas pipeline to China. The opening of the pipeline was a wake up call for Russia. At the end of December 2009, Russian President Dmitry Medvedev was in the capital of Turkmenistan, Ashkabad,

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seeking to improve relations with Turkmen President Gurbanguly Berdymukhammedov. At the same time, Gazprom indicated that it had smoothed over its gas pipeline dispute with Turkmenistan stemming from an April explosion that halted all Turkmen gas exports to Russia. Gazprom's Alexander Medvedev said that it will resume purchases of Turkmen gas next year (meaning 2010). Gazprom also agreed to expand the Prikaspiiski pipeline running along the Caspian to Russia and to build the east-west pipeline linking eastern Turkmen gas fields to the Prikaspiiski pipeline route. The fear of losing Turkmenistan's natural gas market to China and possible western routes spurred Gazprom and Russia to renew its energy relationship with Turkmenistan. The open question is whether Russia's effort is too little, too late.

Russia is proposing to build new pipelines (oil and gas) to enhance its export opportunities or to bypass recalcitrant partners. The proposed Nord Stream natural gas pipeline to carry gas from Russia to Germany under the Baltic Sea is under construction. On the other hand, the South Stream pipeline that would carry gas across the Black Sea to Bulgaria and then into Central Europe still appears mired in problems including its astronomical cost and does not appear to be any closer to reality.

Russia is proceeding with its oil pipeline across East Siberia to the terminal at Kozmino, near the port city of Nakhodka, near Vladisvostok in Russia's Far East. The first phase of the East Siberian Pacific Ocean (ESPO), 1700 miles long, is complete from the existing West Siberian pipeline system connecting at Taishet in the Irkutsk region and extending to Skovorodino, 45 miles from the Chinese border. Transneft, Russia's oil pipeline monopoly, completed a pipeline connection to its border with China in order to connect with China's oil pipeline system.The Chinese have finished their part of pipeline construction. The pipeline will carry up to 300,000 barrels per day supplementing rail shipments of oil to China. This oil pipeline connection is part of the deal worked out earlier in 2009 between Russia and China in which China loaned Russia $25 billion for future oil deliveries. The remaining 1300 mile section of the ESPO pipeline is under construction and expected to be completed by 2012. Total cost of the pipeline is about $22 billion. Until the pipeline is completed to Kozmino, Russian oil will move by rail from Skovorodino to Kozmino, with Rosneft, TNK-BP and others planning to use this new port for oil exports to Far East customers.

The start of a new year almost invariably brings another energy crisis between Russia, Europe and its transit countries. In January 2006 and January 2009 Russia created crises in natural gas markets when it halted gas deliveries to Ukraine. Ukraine's natural gas pipelines, built during the Soviet era when it was part of the USSR, carry 80 percent of Russia's natural gas exports to Europe. Russian gas accounts for about 25-30 percent of European Union gas consumption and about 35 percent of its natural gas imports. Some European countries depend on Russia for most of its gas supply. A disruption in gas transit from Ukraine has serious repercussions throughout the EU and Europe. A gas disruption was averted in 2010 as Russia and Ukraine agreed on terms of a new gas agreement including market pricing. Serious economic problems exist in Ukraine due to the world economic crisis; it remains on IMF life support to prop up its economy. On January 17, 2010, Ukraine held a presidential election with Viktor Yanukovich emerging as the winner. Yanukovich is much closer to Russia and his policies have tilted Ukraine much more in the direction of Russia. As a result, the tension between Russia and Ukraine under the past presidency of Ukraine's reformer (Viktor Yuschenko) is gone. Russia and Ukraine are less likely to create problems in the gas sphere as in past years.

If a crisis was averted in Ukraine, Belarus rears up to present problems. On January 1, 2010, Russia cut off oil shipments through the Druzhba pipeline (Druzhba means "Friendship") that transits Belarus and provides about 10% of Europe's oil supplies. This stoppage is reminiscent of a similar dispute in January 2007, when Russia stopped similar oil shipments. Oil flows to Europe (primarily Germany and Poland) continued despite the January 1, 2010, stoppage, while supplies to refineries in Belarus were directly affected. The dispute involves crude oil exported to Belarus refiners that pay about one third of Russia's export tax rate due to the customs union and other agreements between Russia and Belarus. Surplus products refined in Belarus are sold in Europe at a lower price than Russian refiners to Russia's continuing annoyance. Russia wanted to raise tariffs for the Belarusian refiners after the tariff agreements expired on December 31, 2009 so that Belarus refiners would pay the same export tax rate as all others. The new tax could cost Belarus as much as $5 billon annually, more than 10% of its gross domestic product. On Monday, January 4, 2010, Russia resumed all oil shipments when Belarus threatened to cut off electricity to Russia's Kaliningrad region, a small Russian enclave sandwiched between Poland and Lithuania and adjacent to Belarus, where it gets its electricity. Negotiations between Russia and Belarus are ongoing. For the European Union, the stoppage came as an unexpected and unwelcome New Year surprise, despite the EU and Russia putting an early warning mechanism into place last year to avoid these kind of surprises.

For the future, Russian energy will continue to be an important part of Russia's domestic economy until it finds a way to diversify away from oil and gas. Russia is pulling out of its economic crisis assisted by higher oil prices. Oil production has stabilized and is increasing slowly surpassing the 10 million barrel per day level in late 2009 and headed for 10.2 to 10.5 million barrels per day by the end of 2010 due to increasing production from East Siberian oil fields. Natural gas prices are likely to increase in 2010 since natural gas contracts with European buyers are linked to oil prices with a six to nine month lag. If oil prices stay in the $80 to $90 range (or higher), expect European prices for Russian natural gas to rebound. Russia is keeping a careful eye on developments in Central Asia, its economic backyard, and is working to offset gains made by China and the EU. Russia is slowly moving forward with its bypass natural gas pipelines, with Nord Stream now under construction and expected to open this year. In oil, it is moving rapidly forward on its pipeline to the Far East which can give Russia another outlet for its oil, lessening its reliance on western oil markets. It also is working to complete oil pipeline bypasses to Belarus, eliminating another thorn in its energy picture.

As of January 2011, Russia's energy future is looking more stable. In oil, after almost a decade of rapid growth, its oil production is reaching a plateau of about 10-11 million barrels per day. Its future depends upon its ability to provide sufficient incentives for development to occur in East Siberia and its Arctic offshore. For the present, its policies appear to be working. In natural gas, Gazprom continues to delay investments in new production, seeking to buy gas from other countries or from other domestic producers. How long it can continue to play this game is an open question. Its delays are worrisome to its long term stability and to its ability to meet its long term export commitments.

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Towards Cost-reflective Energy Pricing in Ukraine

By Hi-chun Park*

Introduction

Ukraine has been in an energy crisis at least since the gas supply disruption from Russia in January 2006. The actual energy crisis has been triggered mostly by low energy prices which have implications both on energy supply and energy demand. Most Ukrainian energy providers have been unable to finance even their replacement investments as their revenues from sales did not cover all their costs. Their equipment is no longer energy efficient. Delayed payments of gas import bills by Naftogaz, the state gas corporation, have been one of the major reasons for the Russian gas supply disruption. At the same time energy consumers have not had enough incentive to save energy. Low energy prices have resulted in excessive energy consumption which in turn has aggravated the energy crisis.

Prices of gas, electricity and district heating for households are especially low, which has been made possible by subsidization and cross-subsidization from industrial consumers to households. This low energy price policy can no longer be pursued as Ukraine has to pay international market prices for gas imports from 2010. It has to equalize prices for imported gas and domestic production by the end of 2011 to fulfill one of the IMF's stand-by loan commitments. The price of gas from domestic production has been kept artificially low, at less than half of the price paid for foreign supplies.

The importance of cost-reflective energy prices has been well recognized in Ukraine. The Energy Strategy of Ukraine for the Period till 2030 (2006) calls for Ukrainian energy prices to gradually approach prices of liberalized EU markets over the 2008-2011 period. This paper first reviews the Ukrainian energy scene. It then analyzes Ukrainian energy pricing policy and finally discusses an option to improve this policy in Ukraine. This paper ends with conclusions and policy recommendations.

Ukrainian Energy Scene

Ukraine has not only coal but also oil and natural gas as its resources. However, Ukraine's energy production is not sufficient for its domestic consumption. Ukraine's economy is highly dependent on gas, a great deal of which has to be imported from Central Asia and Russia, solely through Russian gas pipelines. The oil and gas import dependencies of Ukraine were 73.5% and 74.8%, respectively, in 2007. This was high. Ukraine has maintained the low energy price policy that originated in the Soviet era. The Soviet Union, being rich in energy resources, and a socialist state provided industry and households with energy on a need basis. This tradition continued in Ukraine for a long time after independence from the Soviet Union in 1991. Energy security has become a big concern since the Russian gas supply disruption in January 2006.

Energy Pricing Policy

Energy prices in Ukraine are lower than in OECD countries. Most energy prices only cover operating costs and do not reflect the long-term costs of energy supply. There are no specific energy taxes in Ukraine except the value added tax (VAT) of 20%. As energy is somewhat regarded as a basic social service, its prices for households have been kept very low (Copsey and Shapovalova, 2009). Electricity and gas tariffs are regulated by the National Electricity Regulation Commission of Ukraine (NERC). District heating tariffs are subject to the local authorities' approval according to the Law on Heat Supply. Only prices of petroleum products are determined in the market.

Electricity tariffs

In Ukraine electricity consumers are divided into two groups, i.e., regulated tariff consumers and non-regulated tariff consumers. Regulated tariff consumers include households, settlements (lighting, group consumers) and other consumers (industrial and commercial companies, etc.). Non-regulated tariff consumers are big companies with special permits.

There was a big increase in household electricity tariffs from 15.5 kopecks/kWh in March 1999 to 24.4 kopecks/kWh in September 2006. Since then these tariffs have remained unchanged at 24.4 kopecks/kWh. According to the NERC, the 2006 electricity tariffs covered only 60% of the production costs (Tsarenko, 2007a). The NERC wanted to introduce a progressive electricity tariff system starting in April 2007. According to it, the first 125 kWh per month of electricity consumption would be charged at the prevailing rate, and anything above that would cost 60% more (Tsarenko, 2007a). However, this system could not be introduced.

Other consumers are divided into two groups. The first group covers consumers connected to a 0.4-10 kV network, the second group includes consumers connected to a 35-110 kV network. These consumers pay substantially higher electricity tariffs than households. Table 1 indicates that there is substantial cross-subsidization from other consumers (small and medium sized companies) to households and big companies.

Natural gas tariffs

Household gas tariffs depend on the yearly consumption with meters installed on consumer's side. There are four progressive tariff steps, i.e., consumption

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Tariff period	House-Holds	First Group	Second Group	Big Companies
Jan 2008 – Dec 2008	24.4 (4.6)	39.8 (7.6)	53.4 (10.2)	24.8 (4.8)
Jan 2009 – Sept 2009	24.4 (3.2)	52.3 (6.8)	70.2 (9.1)	27.5 (3.5)

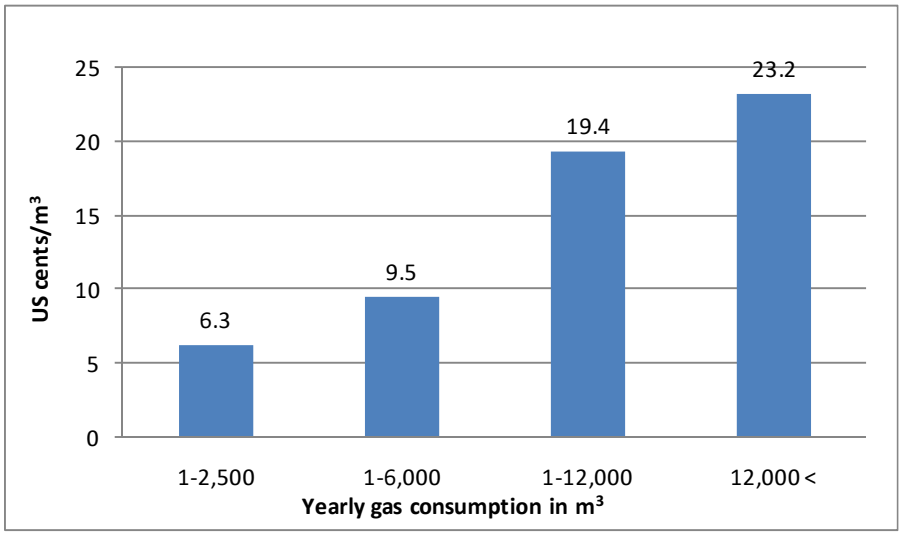
Sources: NERC; State Company "Energorynok" (ARENA-ECO, 2009).
Notes: First group (0.4-10 kV); second group (35-110 kV); big companies (92 with special permits).

Table 1: Electricity Tariffs for Households and Industrial Consumers, kopecks (US cents)/ kWh

up to 2500 m³ (20.1 Giga calories), 6000 m³ (48.3 Gcal), 12,000 m³ (96.6 Gcal) and over 12,000 m³ per year (Figure 1). Households consuming up to 2500 m³ gas per year pay 6.3 US cents per m³ since December 2008. Households consuming more than 2500 m³ but less than 6000 m³ per year pay for the whole consumption at 9.5 cents per m³. For instance, a household having used 2400 m³ gas until the end of November and consuming 200 m³ gas in December will have to pay until November 6.3 cents per m³ but in December USD 19 (0.095 * 200) plus USD 76.80 [(0.095 – 0.063) * 2400].

These tariffs have to be improved. First, the tariff level is too low. Household gas tariffs have to be raised at least by a factor of two. Second, the Ukrainian tariffs require some refinement. Considering per household yearly gas consumption in the Netherlands with 1432 m³ (12.1 Gcal) in 2006 (Weiss et al., 2009) and in Korea with about 11 Gcal in 2007 (Park and Kim, 2008), the range of Ukrainian tariff steps or the intervals between tariff steps are too large and the tariff steps of up to 6000 m³, 12,000 m³ and over 12,000 m³ are too high. According to ARENA-ECO, a majority of Ukrainian households consumed less than 6000 m³ gas and 39% of households consumed less than 2500 m³ gas in 2009.

Industrial consumers paid 20.3 and 22.2 cents per m³ in September 2008 and January 2009, respectively. They paid substantially more than households consuming less than 6000 m³ per year. The weighted average gas tariff with VAT for district heating was 11.6 cents/m³ in 2008. The gas tariffs for households and district heating are low because they have been supplied with gas extracted in Ukraine. Its production cost was much lower than the imported gas price (Tsarenko, 2007b).



Source: NERC (ARENA-ECO, 2009).

Figure 1: Natural Gas Tariffs for Households with Gas Meters, valid from December 2008.

Districting heat tariffs

As can be seen in Table 2 the average district heating tariff for households per Gcal was USD 38.76 in 2008, which was substantially lower than that for commercial consumers paying USD 87.24. This tariff difference is doubtless the result of cross-subsidization from commercial to residential consumers.

Relative energy prices

The Ukrainian household gas prices of 0.69 cents/kWh (yearly consumption up to 2500 m³) and 1.03 cents/kWh (yearly consumption up to 6000 m³) in 2008 were only one seventh and one fourth, respectively, of the German price of 4.8 cents/kWh. Ukrainian household gas prices are not only very low in absolute terms compared to OECD countries but also very low in comparison to district heating and electricity. Table 3 shows relative household prices of gas, district heating and electricity in Germany, Korea and Ukraine. Ukrainian household energy prices are lower than those of Germany and Korea. Assuming a generation efficiency of 35 to 40%, electricity has to cost two to three times the price for gas and district heating. The price ratios of gas to electricity in Ukraine were 1 to 4.5 (yearly gas consumption up to 6000 m³) and 1 to 6.7 (yearly gas consumption up to 2500 m³) in 2008.

While the price ratio of gas to district heating in 2008 were about 100 to 110 in Germany and Korea, such a ratio in Ukraine was 100 to more than 310. District heating costs almost as much as electricity in Ukraine. It is not at all economic.

Ukrainian household gas prices are also low in comparison to those for industrial consumers. According to Table 4, in 2007 Ukrainian industrial consumers paid USD 378.1 per ton of oil equivalent (toe) of natural gas, while households paid only USD 84.5 per toe (22% of the industrial tariff) and USD 126.7 per toe (34% of the industrial tariff). These price ratios of industrial consumers to households are quite different from that of the OECD average of USD 428.9 (100) to 690.8 (161) per toe. Ukrainian house-

holds would have to pay 4.7 times (161/34) or 7.3 times (161/22) the price they pay for gas today, if the OECD price ratio applied.

Improvement of Energy Pricing Policy

As discussed Ukrainian household gas, district heating and electricity prices are very low and distorted. A substantial increase in these prices is required to remove this price distortion. A solution which does not too adversely affect living conditions of low-income households, while adjusting low energy prices to cost-reflective price levels, is the introduction of a progressive tariff system. Such a system can enable a country with relatively low average prices to encourage energy conservation and to supply low-income households with low-priced energy. This is necessary as poverty has increased in the transition from the Soviet system to a market economy. Non-payment of energy bills has been relatively high in Ukraine (Tsarenko, 2007a).

An example of such a system is the Korean household electricity tariff system which has a very steep progression in 6 steps, going from the first step of monthly consumption up to 100 kWh (5.5 US cents/kWh) to the last step of monthly consumption of over 500 kWh (64.4 cents/kWh) per household (Figure 2). Households using over 500 kWh per month have to pay 11.7 times the tariff for those using up to 100 kWh per month. As the (average) household electricity tariff in Korea was one of the lowest among the OECD countries at 10.2 cents/kWh in 2007, (OECD average: 14.3 cents/kWh; Japan: 17.6 cents/kWh), one could expect a relatively high per capita household electricity consumption in Korea. However, due to the steep progression, Korean households, in 2007, consumed only 1118 kWh per capita against 2278 kWh per capita in Japan. Korean households generally do not use electricity for cooking and heating because of the progression.

	Net costs	Approved tariffs	Net costs	Approved tariffs
	2008		2009	
Residential consumers	239.88	204.00	282.48	286.44
	(45.60)	(38.76)	(36.60)	(37.08)
Commercial consumers	319.68	459.36	508.92	684.48
	(60.72)	(87.24)	(65.88)	(88.56)

Source: Ministry of Housing and Communal Services of Ukraine (ARENA-ECO, 2009).

Table 2: Average Estimated District Heat Tariffs with VAT, UAH (USD)/ Gcal

	Gas	Heat	Electricity	Gas	Heat	Electricity
	US cents/ kWh			Gas price = 100		
Germany	4.8	5.3	14.6	100	110	304
Korea	3.8	4.2	8.2	100	111	216
Ukraine	0.69 1)	3.25	4.6	100	473	671
	1.03 2)			100	314	445

Sources: BMWT, Entwicklung von Energiepreisen und Preisindizes, 2009; KEEI, Yearbook of Energy Statistics 2009; Tables 1 & 2; Figure 1.
Notes: 1) and 2) Yearly gas consumption up to 2500 m3 and 6000 m3, respectively.

Table 3: Relative Household Energy Prices in Ukraine and Other Countries, 2008

			Industry	Household	Industry	Household
					Industry = 100	
Electricity	Ukraine	2007	8.9	4.6	100	52
(US cents/kWh)	OECD	2007	11.0	15.0	100	136
Natural gas	Ukraine	2007	378.1	84.5 1)	100	22
(USD/toe)				126.7 2)	100	34
	OECD	2007	428.9	690.8	100	161
District heat	Ukraine	2008	87.2	38.8	100	44
(USD/Gcal)		2009	88.6	37.1	100	42

Sources: IEA, Energy Prices and Taxes, 2009 Third Quarter; Tables 1 & 2; Figure 1.
Notes: 1) and 2) Yearly gas consumption up to 2500 m3 and 6000 m3, respectively.

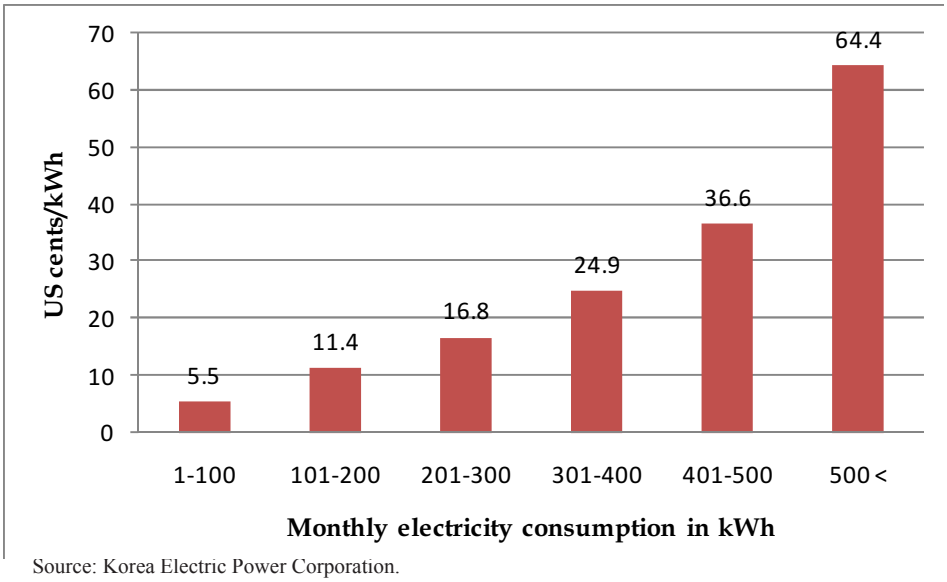
Table 4: Relative Energy Prices for Households and Industry in Ukraine and OECD Countries

Conclusions and Policy Recommendations

Conclusions

The energy crisis in Ukraine has been triggered mostly by low energy prices. Electricity, gas and district heating are sold at below production costs. Distorted are not only relations among gas, district heating and electricity prices for households but also the ratio of household to industrial energy prices. Household energy prices in Ukraine are substantially lower than those for industrial consumers. To approach cost-reflective energy prices, which is the price policy aim in Ukraine, household energy prices have to be raised by at least a factor two. Ukrainian households would have to pay 4.7 to 7.3 times the price they pay for gas today, if OECD price ratios applied.

A solution which does not too adversely affect living conditions of low-income households while adjusting low energy prices to cost-reflective price levels, is the introduction of a progressive tariff system. Such a system can enable a country with relatively low average prices to encourage energy conservation and to supply low-income households with low-priced energy. This is especially necessary as poverty has increased in the transition from the Soviet system to a market economy since the independence from the Soviet Union in 1991.



Source: Korea Electric Power Corporation.

Figure 2: Monthly Household Electricity Tariffs in Korea, Valid Since January 2007

Policy Recommendations

All subsidies and cross-subsidies between different economic sectors should be removed as soon as possible. At the moment the cross-subsidies from industrial/commercial consumers to households are very large. Prices for imported gas and domestic production have to be equalized as requested by the IMF's stand-by loan agreement. The price ratios of industrial consumers to households in OECD countries should be considered while readjusting Ukrainian energy prices to cost-reflective price levels. Furthermore, the ratio between different energy resources used by households should be also taken into consideration.

A progressive household tariff system for electricity and district heating should be introduced to alleviate the effects of price increases on low-income households while adjusting low energy prices to cost-reflective price levels. And the existing progressive gas tariffs should be also revised to make them more effective. Progressive tariff systems could have the following tariff structures:

- Household electricity tariffs in 5 progressive steps: e.g., monthly consumption up to 100 kWh, 200 kWh, 300 kWh, 400 kWh and over 400 kWh per household;
- Household district heating tariffs in 5 progressive steps: e.g., monthly consumption up to 0.5 Gcal, 1.0 Gcal, 1.5 Gcal, 2.0 Gcal and over 2.0 Gcal per household;
- Household natural gas tariffs in 5 progressive steps: e.g. ,monthly consumption up to 50 m^3, 100 m^3, 150 m^3, 200 m^3 and over 200 m^3 per household.

Such progressive tariff systems will enable Ukraine to reduce household energy consumption while maintaining relatively low average household electricity, gas and district heating prices. Thus, Ukraine would not need to raise average energy prices too much.

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Why Energy Efficiency is Vitally Important for Russia

By Laura Solanko*

Introduction

The severity of the global financial crisis in Russia underlined the dependency of the Russian economy on the smooth functioning of global markets for raw materials and on the global financial markets. Despite the desire to stress sovereignty and stability in Russian economic parlance, the federal budget is largely based on export tax revenues. On the other hand, the domestic financial system does not meet the investment needs of large Russian corporations. Therefore, the world's largest producer of oil and natural gas is inherently open and dependent on the global economy. The future challenge is how to manage this dependency and to secure energy exports given only slowly increasing domestic production volumes. A key ingredient in any successful strategy has to include increasing the efficiency of domestic energy use in Russia.

Energy-dependent Economy

Much of the world's most important hydrocarbon resources are concentrated in a fairly small area stretching from the Middle East and Caspian region to Russian Siberia. Russia alone accounts for a quarter of the world's natural gas reserves while the next largest resource owners (Iran, Qatar and Saudi Arabia) together account for almost a third of the world reserves. Consequently, the world's largest natural gas producer country, Russia, alone accounts for 20% of the world's natural gas production. Global oil reserves are slightly less concentrated geographically but nevertheless three countries (Saudi Arabia, Iran and Iraq) account for 40% of total proven reserves. Russia's oil reserves are estimated at 80 billion barrels or slightly less than 10% of global reserves. Currently Russia - on a par with Saudi Arabia - is the world's largest crude oil producer. This means that Russia's crude oil reserves are likely to be depleted long before Saudi Arabia's.

As opposed to many other major oil and gas producers such as Qatar, Norway and Saudi Arabia, Russia is a large country, with a population of 142 million and a high level of domestic energy consumption. In per capita terms, Russia's hydrocarbon reserves are not huge. Proven crude oil reserves are the case in point; Russia's oil reserves per capita are only 1% of the corresponding figure for Saudi Arabia. (See Table 1) Therefore, Russia cannot live on energy resources alone.

Oil: Proven Reserves at end 2007	Thousand million barrels	Share of world total	Reserves/ curent Production	Population mils.	Reserves per capita
Saudi Arabia	264,2	21,0%	66,5	4,5	58,7
Iran	138,2	10,9%	86,9	72	1,9
Iraq	115,0	9,1%	47,5	29	4,0
Kuwait	101,5	8,1%	99,6	2,7	37,6
Venezuela	99,4	7,9%	38,7	27	3,7
United Arab Emirates	97,8	7,8%	89,7	4,8	20,4
Russian Federation	*80,4*	*6,3%*	*21,8*	*142*	*0,6*
Libya	43,7	3,5%	64,6	6,3	6,9
Kazakhstan	39,8	3,2%	70,0	15,4	2,6

Table 1
Source: BP World Statistical Review 2009, CIA World Factbook

Russia exports around 70% of its crude oil and 30% of its natural gas production. These two items, combined with oil products, comprise 70% of the value of Russia's exports. Moreover, the rest of Russia's export goods are generally energy-intensive, low-value-added products of the metals, petrochemical and forestry industries. The share of machinery in Russia's exports is less than 6%.

Since the export price of natural gas depends on the world market price of crude oil, the total value of Russia's exports fluctuates widely, in line with fluctuations in the international prices of raw materials. The main driver of the 45% decline in the value of exports in the first half of 2009 was clearly the drop in oil prices. In volume terms, Russia's oil exports increased modestly, and gas exports were cut by "only" 30% compared to the first half of 2008.

Not only is Russia's external balance dependent on oil and gas exports; the country's budget balance is also critically dependent on proceeds from fees from natural resources extraction and from export taxes on crude oil. According to the Russian Ministry of Finance, almost 50% of federal government revenues derive from the energy sectors (mainly oil and gas). This indicates that at least a quarter of the enlarged government (federal, regional and local budgets plus major extra-budgetary funds) revenues are dependent on proceeds from the energy sector.

Russia taxes heavily crude oil exports, the tax rate depending on the export price. Therefore increases (decreases) in export prices are almost immediately

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See footnotes at end of text.

translated into increases (decreases) in federal budget revenues. This is why a federal budget surplus of 4% of GDP in 2008 could turn into a deficit of 6% this year. Russian oil companies have long claimed that the effective marginal tax rate on oil exports is 90%, which discourages new investments even when the oil price is high.

Any list of large Russian companies includes energy companies and state-owned banks. The largest enterprises are oil and gas giants, which are large by any measure even by global standards. Fortune magazine places Gazprom (22nd) and Lukoil (65th) in its top-100 companies worldwide in the 2009 rankings.[1] An alternative ranking by Forbes includes Gazprom (43rd), Lukoil 8114th) and Rossneft (192nd) in the global top-200.[2] Oil and gas companies and their subsidiaries are therefore unquestionably the major companies in Russia. Only 19 oil and gas companies made their way into the Expert rating of the top-400 companies in Russia in 2008. Those 19 companies accounted for 33% of the total sales of the 400 rated companies.[3] The remaining 381 companies accounted for only two thirds of total sales.

Additionally, these energy majors are often the main customers (and owners) of many service companies, especially in transportation, banking and construction. Therefore, it is not surprising that the energy sector as a whole (including electricity and district heating) comprises a large part of the domestic economy. The draft government Energy Strategy 2030 states that the energy sector currently accounts for a third of Russia's GDP. The figure should not be an over-estimate, as the country's largest company, Gazprom, claims to produce alone some 10% of Russia's GDP.

Inefficient Energy Use

By global standards, Russia trails far behind almost everyone else in energy efficiency. Russia is the world's third largest energy consumer after the U.S. and China. As the structural change towards services has proceeded in Russia both energy consumption per unit of GDP and the absolute levels of CO_2 emissions have declined slightly over the last 15 years. But Russia is still nowhere close to the average levels of industrialized countries. In relation to the size of the economy, as measured by GDP, Russia currently consumes 2.5 times more energy than China and a whopping nine times more than the U.S.

Russia's energy efficiency has increased significantly during the last ten years. In 2000-2007 GDP increased by seven percent while energy consumption grew only by two percent annually. Annual improvement of energy efficiency by five percentage points or more is targeted by the Russian government. And it is surely impressive by any international comparison, but Russia's progress is mostly due to the rapid growth in GDP – not due to efficiency-enhancing investments.

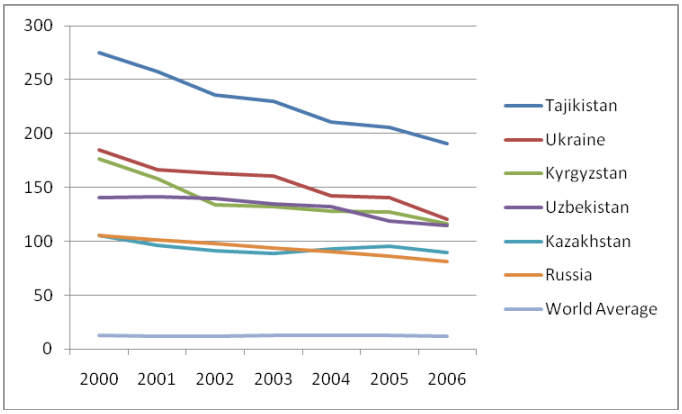

Figure 1: World's Six Most Energy Intensive Economies and World Average . Primary Energy Consumption (Btu) per GDP, 2000-2006.

Source: EIA at http://www.eia.doe.gov/emeu/international/energyconsumption.html

Note: GDP is measured using market exchange rates in thousands of (2000) US dollars.

Some of the high energy intensity in Russia's economy is probably dictated by a harsh climate and long distances, but most of it is a legacy from the Soviet economic structure, tilted towards heavy, energy-intensive industries. According to recent government estimates, 45% of Russia's relative energy inefficiency is due to the inherited industrial structure, 35% to outdated technology, and only 20% to other factors, including climate.[4] If true, this would imply two things. First, Russia can go a long way to improve energy efficiency simply by adopting new technologies already in use elsewhere. And second, if Russia really wishes to approach Western European levels of energy efficiency, large-scale modernization of the Soviet industrial base is needed. That would mean closing down several large plants, with grave implications for local employment and public services. Energy is still considered a social public good in Russia.

The scale of inefficiency in energy use is indeed huge. A recent study (IFC, 2007) estimates that Russia could save up to 300 Mtoe or 45 percent of its total primary energy consumption by switching to more efficient technologies already commercially available elsewhere in the world. This would equal 15 % of total primary energy consumption in the EU-27.[5] The largest potential for energy savings in Russia are found in residential buildings as well as in industry and transportation, where current energy consumption could be cut by 40%-50%. Also power generation and heat distribution suffer from low energy efficiency; primary energy use could be reduced by 30% and 20 %, respectively (IFC, 2007). Russian power plants typically have average electric efficiency of about 28%

,i.e., 10 percentage points less than in modern Western European plants. Moreover, Russian power plans are equipped with only very basic emission control systems with no control systems for nitrogen or sulphur oxides. (ÅF-Consult, 2009.)

A major obstacle to more rapid improvement in energy efficiency is domestic energy pricing. Domestic prices on gas and electricity need to be increased. In Russia, the price of gas is not determined by the market. Instead the Federal Tariff Service sets fixed wholesale prices at which Gazprom must sell most of its gas. [6] The tariff for households is significantly lower than the price charged to industrial users. Both prices are, however, considerably lower than export prices. In October 2006, the government approved a plan – since already adjusted - to gradually increase the domestic price of gas so that by the end-2011 the domestic price for industrial users would equal the export price (less export tax and transportation costs). Currently the price difference is remarkable. At the end of 2007, the domestic tariffs should have been raised almost three-fold to attain net-back parity with export prices (Solanko and Sutela, 2009). This would be a very major adjustment burden to the Russian economy, accustomed to very low-priced energy. As long as consumer prices for natural gas and electricity continue to be regulated, incentives for energy efficient investments are weak.

Increasing Energy Efficiency is Vitally Important to Secure Energy Exports

Russia's economy is in many ways unavoidably dependent on energy production and energy exports. This dependence on global energy prices renders the Russian economy vulnerable to external shocks, as witnessed again during the global financial crisis of 2008/2009. Moreover, dependence on export earnings from a few raw materials is often seen to lead to the "resource curse", an equilibrium where the domestic economic institutions (e.g., rule of law, education, courts) remain in a poor condition, which leads to slow economic growth and wide income disparities. This scenario would clearly contradict all attempts to create a "modernized", innovations-based Russian economy – an idea most recently promoted by President Medvedev in his state of the nation speech in November 2009.

Russian policy-makers have a clear vision of the need to reduce Russia's energy dependency. Both the government's medium-term economic policy plan and the Energy Strategy of the Russian Federation till 2030 point to a diminishing role for the energy sector. The Energy Strategy document, often criticized for being overly optimistic and vague on details, strives for an economy in which the energy sector's role is less than 20% of GDP by 2030.[7] This vision has yet to result in concrete action plans and forceful implementation, which have been in short supply in post-Soviet Russia.

Even in the best of the cases, reducing energy dependency is a long-term goal. It would imply that the non-energy sectors of the economy should grow at faster rates than the energy sector. Increasing global energy prices are likely to make this target extremely difficult to attain. Therefore, at least in the medium term, the Russian economy is likely to remain just as energy-dependent as it is now. Perhaps paradoxically, this means that maintaining energy export capabilities will be a top priority in Russia's economic policy-making.

During the last ten to fifteen years Russian oil and gas industries have relied on the massive investments made in these sectors during the last Soviet decades. With fading production levels at the supergiant fields this is no longer possible. Especially in the gas sector, it is not the sufficiency of resources that would hinder growth in production. They exist in great quantities. The challenge is in deficiency of investment. In the past fifteen years, the Russian gas monopoly Gazprom has made very little new investments in production and transportation. The next generation of Russian gas fields are located further north in the Arctic Sea and in the Yamal peninsula, in extreme physical conditions. In 2006, Gazprom finally decided to start developing the fields on the Yamal Peninsula beginning with the Bovanenkov field. Many experts have warned that Gazprom's plans to commission the giant Yamal field by 2015 are almost impossible to materialize. The challenges are technical, logistical, and project management-related, and none of them is alleviated by the tightness of credit markets following the 2008/2009 financial crisis. Constructing a completely new production site and infrastructure takes years at best. Just building the transportation infrastructure on the marshy peninsula presents a major challenge. [8]

Even the optimistic forecasts of the Energy Strategy 2030 do not see large increases in production volumes in oil and gas over the next 20 years. Therefore, future growth has to be found elsewhere. Securing future export volumes requires curbing growth in domestic energy consumption together with securing the current volumes of energy imports. This is why improving energy efficiency will become increasingly important for Russia.

As stressed above, the potential is clearly huge and, encouragingly, the Energy Strategy 2030 seriously discusses these issues. A new law on energy efficiency was adopted in November 2009, hope-

fully increasing awareness of energy efficiency in the country. Further, continuing price liberalization in wholesale electricity markets and in industrial use of natural gas will slowly force domestic consumers to optimize their energy use. For higher prices to have real influence on end-user behavior, however, both households and corporations need to have hard budget constraints. This will imply a major cultural change. Even though there have been some cases where industrial consumers have been cut off power supply, at the end-2009 cutting off private consumers for unsettled bills was still illegal. Further, energy consumption must be metered properly which sets remarkable technical requirements in especially residential housing. A typical Russian block of houses does not have meters for power, heat or natural gas by apartment. Higher prices alone are not, therefore, enough to enhance energy efficiency. Without adequate institutional and technical environment, dramatic increases in energy prices could simply lead to serious social problems, possibly reflected in increased non-payments.

But much remains to be done. In industries, importing the already existing technologies and know-how from other countries would be the fastest way to achieve real results. Russian industry has been slow in realizing its energy efficiency potential primarily due to shear ignorance and lack of awareness among senior management (IFC, 2007). A significant hindrance is also lack of long-term funding to finance energy efficiency improvements. IFC estimates that on average, energy efficiency investments would pay back in just four years. But only a third of corporate bank loans in Russia have maturity over one year.

From the Russian perspective, the other important element in securing export capabilities is the securing of sufficient and reliable transport capacity. Besides the standard maintenance and repair, this includes the building of new oil and gas pipelines as well as new export harbors, in order to reduce dependence on sometimes unreliable transit countries. This explains why projects like the gas pipelines Nord Stream and South Stream, and the oil pipelines BPS-2 or TCP-2 are seen as vitally important by the Russian government.

Seen in this light, Nord Stream (planned to run from Russia through the Baltic Sea bed to Germany) is neither simply targeted against Ukraine or the Baltics nor meant to provide the Russian Baltic Fleet a missing *reason d'etre*. It can be seen as an unavoidable investment for securing uninterrupted deliveries of natural gas to Russia's major export markets. Deliveries to the EU-27 countries plus Turkey account for two-thirds of Gazprom's total sales revenue. Deliveries to all CIS countries account for only a third of Gazprom's revenues, even though, in volume terms, two-thirds of its sales go to those markets.

Conclusions

Due to its dependence on energy resources Russia is, and will continue to be, dependent on the gyrations of the global economy. During the last ten years the Russian governments have managed the windfall revenues of constantly increasing export prices very prudently, storing large shares of them in sovereign extra-budgetary funds. These funds, did indeed provide a warmly welcomed cushion that insulated public expenditure from the dramatic decline in revenues in 2009. But even the large stabilization funds and extremely low public debt cannot insulate the Russian economy from being an energy-dependent economy vulnerable to a global shock.

High energy dependency is readily acknowledged among the Russian policy-makers. The government's Energy Strategy strives for an economy in which the energy sector's role is less than 20% of GDP and energy efficiency is much improved by 2030. Even in the best of the cases, reducing energy dependency is a long-term goal. The current crisis underlined the fact that even a country that manages one of the world's largest hydrocarbon resources needs global financial markets. This is especially true considering that huge new investments are needed to keep up the current production levels in the future as well as to finance the shorter term investments needed to increase energy efficiency.

Meanwhile, securing sufficient volumes of energy exports is of utmost importance for public finances, external balance and economic growth in Russia. As oil and natural gas production is not projected to increase rapidly in the future, growth in domestic energy consumption can be only very modest. This calls for major improvement in energy efficiency. Russia can, technically, save 45 percent of its primary energy consumption of the 2007 level. To ensure continued economic growth, some of that potential has to be realized fast.

(See footnotes on page 26)

Russia's Gas and Oil Policy: the Emerging Organizational and Institutional Framework for Regulating Access to Hydrocarbon Resources

By Catherine Locatelli and Sylvain Rossiaud*

This article examines recent changes in the institutional and organizational arrangements defined by Russia's federal authorities to provide a framework for access to the country's hydrocarbon resources. In the case of oil resources, the dilemma that appears to govern the current changes concerns the necessity for the state to create an institutional framework that will stimulate exploration of new oil fields while at the same time ensuring that revenues from this oil boost state coffers. In the case of gas, the question of the modalities of access to the country's resources cannot be separated from Gazprom's strategy of downstream integration in the gas chain in the EU countries. "Reciprocity" in the exchange of assets now seems to be the prism of Russia's gas policy. While the country's oil and gas policies differ with respect to certain specific details and issues, we present a combined analysis of the Russian model for hydrocarbon access. In the first part of our paper we look at how the model has changed, identifying the main points regarding access to hydrocarbon resources. In the second part of the paper we discuss the contradictions of the Russian model in relation to the standards and rules promoted by the EU in the Energy Charter treaty. This logically opens the debate on alternatives ways to the Charter of managing the energy interdependence between Russia and the EU.

Changes in the Russian Hydrocarbon Model

The reorganization of the hydrocarbon sector that has been underway since the start of the 2000s is aimed at defining a new organizational model. This model must comply with and take into account the main characteristics of an oil and gas policy designed explicitly to ensure economic growth and reconstruction (Heinrich, 2008). Two factors in particular characterize the changes now taking place in comparison with the model of the 1990s, described by Aslund as a "liberal model" (Aslund 2006). First, state-controlled companies appear as the key players in the new institutional arrangements for the hydrocarbon industry. Rosneft, GazpromNeft, Tatneft and Slavneft (50%) in 2008 accounted for 39.7% of Russia's oil production (see Table 1). Gazprom, with 83% of gas output, holds a monopoly over transmission and exports.

Second, the increasing share of state-owned companies in oil production has been accompanied by tougher conditions for access to the country's hydrocarbon resources, or at the very least by tight control over access to resources by the authorities. These tougher conditions for access firstly affected the regions. The various amendments to the subsoil law put an end to the principle of joint allocation by state and regions of exploration and development licences, with the state taking full control (LeBoeuf, Lamb, Greene, MacRae, 2005)[1]. Foreign investors were also affected. First, a list of strategic fields was established. These fields are not subject to the principle of tendering required by law (gas law of 2006)[2]; instead the state reserves the right to select the companies to be granted exploration and development licences. Second, the law on foreign investment in strategic companies, adopted in May 2008, limits private foreign investment in a Russian hydrocarbon company to 10%, and to 5% in the case of investment by a foreign state-owned company. Any investment beyond these thresholds requires special authorization by a commission headed by the prime minister[3]. And third, under amendments to the Subsoil Law passed in 2008, licences to develop the (major) deposits in offshore fields will go exclusively to state companies (currently Rosneft and Gazprom).

	2003	2008
Private companies, %	72.6	43.9
State companies, %	4.8	39.7
Regional companies and others, %	22.6 (1)	17.4 (1)
Total output	8.4 mbd	9.82 mbd

Note: (1) Output from regional companies, that is to say companies in which the regions have majority holdings, could possibly be included in state company output, but we feel that these companies differ sufficiently from state-controlled firms for them to be treated as a separate category.
Sources: Rossiaud, S., Locatelli, C. (2009). The obstacles in the way of stabilizing the Russian oil model. *Post-Communist Economies*, vol. 21, n°4, pp. 425-438; Hanson, P. (2009). Russian energy policy and the global crisis. *Energy Economist*, n° 336, October, pp. 5-7.

Table 1: Output of Russian Oil Companies According to Ownership Type

Where do Foreign Investors Stand?

Russia subscribes to the principle of the new "oil nationalism" (Stevens, 2008). Conditions for access to hydrocarbon resources are in fact becoming increasingly restrictive for international investors. However, the Russian territory

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See footnotes at end of text.

is not completely closed. The way we see it, this tightening of control over access to foreign investors is not simply due to the fact that they are "foreign". This movement is taking place in the broader context of the federal authorities' response to the problems encountered by the liberal model. Two problems have been particularly acute: first, the lack of investment in Russia's frontier areas, which has damaged the country's capacity to renew its resources (Kryukov & Moe, 2007), and second, the difficulties encountered by the state in securing oil revenues (Vygon, 2009). The point of the changes currently taking place would seem to be to create a stable legal and fiscal framework, and in particular one that is seen as credible by investors, in order to encourage greater investment in the exploration of Russia's frontier areas. In fact, the transposition of the standards and rules from developed market economies that characterized the first transition phase did not lead to such stabilization. From this point of view, it might be considered that the 2008 law on the strategic sectors clarifies and stabilizes the legal framework for foreign investors (OECD, 2008). It might, therefore, be possible that the presence of state companies in oil contracts will add credibility to the contractual commitments entered into with international oil companies. From the point of view of the State, the involvement of state companies might help reduce information asymmetry and ensure that a fair share of oil revenues is secured. Thus the only viable way for international oil companies to invest in Russian hydrocarbons would seem to be through partnerships with the big state-controlled companies (OECD, 2008), at least where development of major fields is concerned.

In this respect, the framework defined to develop the Shtokman gas field could serve as a model not only for gas reserves but also for oil field development. This framework in fact adopted a new approach that differs from the classic framework of production sharing agreements. Development of the Shtokman deposit is to be led by a consortium named SDC (Shtokman Development Company), formed by Gazprom (51%), Total (25%) and Statoil (24%). While the term "Shtokman model" is not used, the agreement signed in 2007, nevertheless, reflects certain specific features. It does not call into question Gazprom's export monopoly. Gas produced by the consortium will be sold to Gazprom at prices calculated on the basis of gas prices in Russia. The different members of the consortium will, however, be guaranteed a profit on export sales[4]. Finally, it is Gazprom alone that owns the gas resources on Russian territory. The question remains entirely open as to whether the foreign partners will be able to book some of the reserves in proportion to their financial commitment; according to the consortium partners this question has been subject to contradictory statements[5].

Energy Charter versus "Assets for Assets": Two Contradictory Approaches

Russia's hydrocarbon policy is today based essentially on bilateral international relations. This has strong implications for Russia's integration in the hydrocarbon markets, whether in terms of its relations with its main customers (more specifically for natural gas) or in terms of giving international investors access to its territory. This approach has had a considerable impact on its relations with the EU.

The bilateral approach developed by Russia contrasts sharply with the multilateralism that the EU intends to promote essentially through the Energy Charter treaty. The EU's ambition is in fact to establish a single regulatory space (standards, rules, etc.) with its suppliers (Belyi, 2009; European Council, 2006). This could be a prelude to integration of the EU and Russian energy markets (Haghighi, 2007). In this approach, extending the Rule of Law is seen as a mechanism for dealing with the issue of energy security and one that would lead to the creation of a single energy market (Correljé, Van der Linde, 2006). This approach has led to a certain rationale which today conflicts with the principal characteristics of Russia's oil and gas policy[6]. Two aspects are particularly problematic and are at the heart of relations between the EU and Russia.

Access to Hydrocarbon Resources

The aim of the Energy Charter is to ensure that international oil companies can obtain access to the hydrocarbon resources of the producing countries through a multilateral investment framework. This goal does not undermine the principle of state sovereignty over natural resources but such sovereignty must not conflict with the obligations laid down in the principal frameworks for international investment (Haghighi, 2007). Thus, the Energy Charter sets forth rules intended to protect international investment and ensure non-discriminatory conditions for foreign investors (taking up certain WTO clauses).

The Russian government's preferred strategy of exchanging assets with consumer countries conflicts with the rationale of the Energy Charter. Russia seems to be increasingly intent on making access to its hydrocarbon resources conditional on its being granted access to assets in the downstream sector of the importing countries. Thus, the notion of reciprocity (Belyi, 2009) and the bilateral relations that it requires are at the heart of Russia's hydrocarbons strategy. It is also being confirmed as a key element in

Russia's relations with the EU.

The agreement concluded between Gazprom and BASF in 2009 reflects this intention since it concerns the entire gas chain (see. Box 1). But, this agreement could pose problems for de-integration of the gas industry operators (and for ownership unbundling) promoted by the EU gas directives and the 2008 Energy-Climate package. Similarly, in June 2009, Total bought a 49% stake in a Novatek-owned unit in charge of developing a gas field in Yamal province. In exchange, the French company sold a large stake in a Dutch refinery to the Russian oil company Lukoil.

Box 1: Gazprom-BASF agreement of 2009

This agreement covers exploration and production activities (in Russia), and transmission and distribution activities (in Germany and certain European countries). Under the contract Wintershall (a subsidiary of BASF) receives a stake of 25% less one share in the Russian company Severneftegazprom which is developing the Yuzhno-Russkoye gas field[7]. In exchange, Gazprom is to increase its holding in Wingas from 35 to 50% less one share. Furthermore, the agreement also provides for the creation of a 50/50 joint venture between Gazprom and BASF, known as Wingas Europe, to market the gas in Europe.

The Question of Transit

The second stumbling block concerns transit (A. Konoplyanik, T. Wälde, 2006). In the Energy Charter transit protocol it is implicitly assumed that gas suppliers will provide third party access (TPA) to the gas pipeline networks. What Europe wants in particular is to see Gazprom open up its pipelines to outside suppliers. This would make it possible for gas from Central Asia (Kazakhstan, Turkmenistan) to be delivered to Europe and would enable the number of suppliers serving the European market to be increased. As things stand today, this is in total contradiction with Russian government policy. The state has reinforced Gazprom's monopoly over gas production and export with the purpose of preventing greater competition in the gas market in Europe.

One of the key challenges of the reorganization of the Russian hydrocarbon sector is to define economic incentives that will stimulate new investment strategies. One question remains unanswered for the moment: Will this new institutional framework, characterized by tighter state control, be seen as sufficiently reassuring and stabilized to promote long-term investment or will it be a major factor of uncertainty for economic actors, in particular foreign investors and private national companies?

Footnotes

[1] The regions still have a presence on the boards that decide on licence allocation, but their role is now only advisory.

[2] It is on the basis of this principle that Gazprom was given the licence to develop the Chayandinskoye natural gas field, which is listed as a strategic reserve. The reserves of this field in the Sakha (Yakutia) Republic in eastern Siberia are estimated at 1260 bcm "Gazprom given licence to drill".- FSU Energy, Petroleum Argus, Vol XIII, 15, 18 April 2008.

[3] "Russia: Duma passes law limiting foreign investment in strategic enterprises".- BOFIT Weekly, 13. 28.03.2008

[4] "US demand doubts threaten development".- Argus FSU Energy, 26 February 2010.

[5] "Statoil fits the bill for Shtokman".- Petroleum Intelligence Weekly, 5 November 2007.

[6] Remember that Russia signed but did not ratify the Energy Charter treaty. Furthermore, in October 2009 D. Medvedev announced that Russia was withdrawing consent to provisional application of the Charter. Note also that a recent decision from an arbitration hearing in the Yukos affair seems to suggest that Russia will remain legally bound by the provisions of the Charter, under the terms of this provisional application, as far as all investments made before October 2009 are concerned. Clearly there are doubts surrounding the enforcement of this ruling in Russia (Riley, 2009)

[7] Wintershall is also involved in the development of a gas field near Urengoy in Eastern Siberia as part of a joint venture with Gazprom Achimgaz.

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Why Energy Efficiency is Vitally Important for Russia *(continued from page 22)*

Footnotes

[1] http://money.cnn.com/magazines/fortune/global500/2009/

[2] http://www.forbes.com/lists/2007/18/biz_07forbes2000_The-Global-2000-Russia_10Rank.html

[3] Expert-400 rating in the Russian weekly Expert Magazine no. 38(675) 2009.

[4] Speech by Vice-Premier Igor Setchin, as documented in Energetitseskaja Politika 4/2009.

[5] EU energy and transport in figures. Statistical pocketbook 2009. EU Commission, 2009.

[6] From the end of 2006 limited volumes of gas have been sold at deregulated prices at gas exchange auctions. The prices on the exchange have been ca 35% higher than the regulated tariffs for industrial users (Mezhregiongaz, 2008).

[7] Strategy approved by the Russian government at 13.11.2009, http://www.energystrategy.ru/

[8] A possible point of comparison is Zapolyarnoye, the latest large gas field taken into production. The field reached full production capacity only in 2005, over ten years after the project was launched.

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The Russian Power Market

ByTarjei Kristiansen*

Introduction

The Russian power market remains in a restructuring phase whereby former state-owned vertically integrated monopolies have been unbundled and are partly privatized. However, the network companies, system operator, and nuclear and hydropower plants are still state-owned and the government also have stakes in several territorial and wholesale generation companies through the state-controlled utility, Gazprom.

The restructuring is occurring in the two price zones which consume most of the power generated. The Europe-Urals zone includes six hubs and the Siberian zone includes two (Figure 1). In addition there is an isolated area and non-price zones (regulated market). Locational marginal pricing (LMP) is used in a day-ahead auction with aggregated bids that are arranged via a complex mathematical model for approximately 3,000 locations in the European zone and 6,000 locations in the Siberian zone. Several time zones are incorporated, a result of the country's vast geographical area diversity.

The two price zones exhibit different geographical characteristics and have different fuel mixes. The European zone has a high share of thermal power plants while the Siberian zone is home to most hydroelectric generation. Around half of the electricity trades now at unregulated prices, but they are set to increase to 90% by 2011, with the exception of household consumption. The unregulated electricity prices are relatively low compared to European levels (around 21€ and 15€ per MWh), but wholesale consumers (buyers) must pay for availability in the form of capacity payments (Abdurafikov, 2009). Otherwise, investments in new generation capacity may be unprofitable, because it may be impossible to recover the capital costs. With increasing price risks, a power exchange is currently being established so market players can hedge risk. Additionally, the government plans to support renewable generation and ancillary services and curb emissions.

The Wholesale Electricity Market

Wholesale electricity trade is complemented with ex ante capacity trade which is traded separately, yet all market players can act both as sellers and buyers. LMP is utilized to determine prices and quantities for wholesale trading. The locations are the supply points or groups of points where generation connects to the grid.

Figure 1: The Wholesale Market (Abdurafikov, 2009).

The LMPs differentiate electricity by location by considering production costs, transmission congestion and transmission losses. Investors in generation and transmission are thus incentivized by market signals. The market operator (ATS) employs a complex mathematical model of the power system to calculate LMPs and the planned hourly generation and consumption. All bilateral contracts including regulated are settled against the LMPs. Market players are required to notify the system operator (SO) about maximum consumption, minimum and maximum generation (including self-consumption), planned exports and imports and other necessary data. Generators also notify the SO about their start and stop costs as well as maximum bid prices in the day-ahead and balancing markets. Based on the submitted information the SO performs a unit-commitment (power plant scheduling) calculation which is subsequently forwarded to ATS for the day-ahead market clearing. The day before physical delivery the market players can submit price bids for hourly or block contracts to ATS. The bids must cover the available capacity of the generators so as to prevent withholding of capacity. The day-ahead zone prices (aggregated LMPs) exhibit cyclical fluctuations and high volatility caused by demand and supply shocks. The large geographical distances and time zone differences present some challenges in terms of hub or index prices since peak or offpeak prices will differ depending on the time zone. This is solved by defining these hours by local time and then averaging the LMPs.

Electricity is traded both at regulated and market prices. In isolated regions where there is lack of competition, regulated prices are used in regulated contracts. Uncontracted volumes are left for the day-ahead market, balancing and

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bilateral contracts.

Trading of regulated contracts requires a volume calculation by the Federal Tariff Service (FTS) and the ATS whereby companies' tariffs are set by cost plus profits divided by volume. The regulator issues forecasts of electricity consumption and generation capacities for generators and forecasts of monthly total and peak consumption. These forecasts (called FTS balances) are being used in the transition phase to a competitive market such that the regulated volumes are gradually being reduced, excluding household consumption. As a result, minimum and maximum regulated volumes are established. The maximum regulated volume comprises current year's volumes allocated to households. The volume is further profiled by using 60 typical load periods within the year. Finally, the market operator determines the counterparties to regulated contracts and volume traded. The matching process considers technical (instantaneous power balances) and cost constraints. The regulated price is set so that the average price of regulated contracts does not exceed the electricity tariff set by the FTS for the relevant region.

Since 2008, generators' tariffs are calculated by using the preceding year's tariff indexed by a public formula depending on forecasted inflation, fuel prices, water taxes for hydropower plants, etc., including deviations of actual values from forecast (ex post).

As an outcome of the matching process, buyers hold a portfolio of regulated contracts. They are allowed to reduce their regulated volumes of electricity and (or) capacity within the minimum and maximum volumes.

As of July 1 through December 31, 2009, 50% of electricity from the FTS balance and consumption volumes for 2007 have been sold at non-regulated prices. By 2011, all electricity will be sold at non-regulated prices, again with the exception of electricity sold to households (at regulated tariffs until 2014) (see Figure 2).

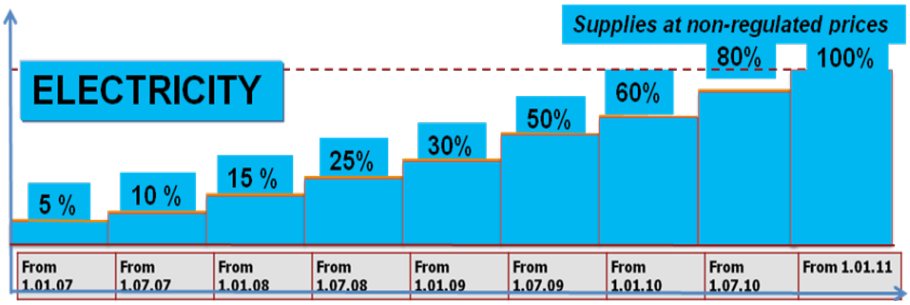

Figure 2: Gradual Opening of Russia's Electricity Market

The Russian Wholesale Capacity Market

A capacity market is employed as a mechanism to secure reliability of supply in the medium and long term (Abdurafikov, 2009). Available generation capacity should be able to meet peak demand. However, since peak demand may vary considerably on an annual basis due to electricity consumption cycles, some capacity will be reserved during lower demand periods. As a compensation for the costs incurred during these periods, the owners receive a capacity payment. Buyers of wholesale electricity are obliged to contract peak-hour availability (i.e., total peak load plus a reserve margin). The Russian capacity market is divided into 28 free transfer zones. In these zones annual long term auctions (4 years ahead) are conducted. Before these are fully implemented, however, the capacity market still follows the transitional market model described below.

Transitional market model

Before a liberalized capacity market was implemented, capacity was traded at regulated tariffs set by the regulator. The capacity payment was for fixed cost per installed MW capacity. From mid-2008 only available capacity was remunerated. On average, capacity payments account for roughly 60% of the generators' revenues as energy prices are insufficient to cover total generation costs including capital costs.

The SO determines the available capacity in every price zone. At the end of each year generators submit bids to the yearly capacity auctions. In advance the SO announces volumes, expected electricity consumption and capacity, planned reserve coefficients including a list of free electricity transfer zones and flow limits between them. The generator can submit bids for capacity which are limited to values as set by the regulator. Capacity is divided into new and old type where the price for the old capacity is set by the regulator and the price for new capacity is subject to a market council's approval. Information regarding any commissioning or decommissioning during the period is specified as well as technical parameters. Capacity is remunerated as pay as bid. The SO certifies the generator's volumes and parameters, including non-certified volumes to be purchased by the generators and delivered. The generator has supply obligations, and must keep capacity available by ensuring that technical standards set by the SO are fulfilled. In case of failure the capacity payments are reduced pro-rata and the failing generator

compensates the other generators within the price zone.

Capacity can also be traded freely on the market as bilateral contracts, based on the auction's results for capacity delivered under "agreement of capacity provisioning. The three types of base and peak contracts are:

- Bilateral contracts for non-regulated volumes
- Contracts traded on commodity exchanges
- Contracts for new capacity

Since 2009, the capacity not sold by regulated and non-regulated contracts is offered on commodity exchanges bundled with electricity. Capacity as specified in bilateral contracts between non-regulated electricity transfer zones is constrained to the transmission capacity (capacity quota) between zones. Capacity not specified by regulated and bilateral contracts is shared among generators pro-rata according to their certified capacities. Any generator exceeding its capacity limit is charged a penalty equal to the difference between the auction price and the generator's price bid. The capacity quota may be traded among the generators. If a generator buys more capacity than allowed, the surplus can be sold in auctions. Buyers of capacity in the annual auctions pay for certified volumes equalling actual consumption times a reserve coefficient for the price zone. The volumes are partly covered by regulated contracts with older hydro and nuclear power plants while the remaining may be purchased as non-regulated bilateral contracts and in auctions. New capacity is traded on the market as capacity delivered under agreements of capacity provisioning. Newly developed generation capacity as part of the investment programmes may delay commissioning by 1 year without paying charges. After that non-commissioned capacity is not remunerated and is also charged a 30% fee of the auction price.

Long term capacity auctions

After the transitional phase, long term capacity auctions will be held in the free electricity transfer zones where certain generation technologies will be prioritized to achieve a fuel mix as laid out in the national energy strategy. In the new model there will be competition between generators for capacity payment to reduce costs and excess capacity, as well as give price signals for investments. Moreover, in the transition model the aggregate electricity and capacity costs may be overstated since the marginal electricity revenue does not reduce the capacity cost. Nuclear and hydro power plants are price takers and will not be compensated if their profits from the day-ahead market are sufficient to cover their fixed costs. Bilateral contracts will be concluded in advance of the auctions where volumes are price taking. Auctions for generation capacity are conducted for old and new capacity. Prices are capped by operation costs and operation costs plus return on investment, respectively. Capacity payments are guaranteed at the bid price for one year for old capacity and for a non-defined period (five to ten years) for new capacity. New capacity is treated as price taking and adjusted annually by inflation. Controllable load consumers will also participate in the capacity market. These consumers must qualify for a volume and technical certification. Prices are capped and demand curves are defined by reserve coefficients. Large-scale industry may undertake self-planning for four years at a constant value. If actual consumption deviates from planned, the consumers buy or sell capacity in the market. Volumes from bilateral contracts are limited for each buyer, to eliminate arbitrage and ensure fairness among consumers. A capacity buyer's volume will, therefore, be from bilateral contracts for old and new capacity and from auctions.

To incentivize generators to develop peak load capacity, the national strategy suggests that generators should be remunerated with both energy and capacity prices. This peak load capacity will be capped in the day-ahead market by the energy price submitted in the auction, while generated electricity sold under bilateral contracts will trade freely on the day-ahead market. This suggested mechanism encourages trading under bilateral contracts, because auction trading would be more expensive for buyers, and generators could receive extra profits in the day-ahead market. If this new model is rejected, the model with inflation adjusted returns should incentivize investors sufficiently. When capacity shortfalls occur, the SO organizes tenders with starting price equalling twice the expansion costs for short construction time capacity. If no one participates in the tenders the government will invest in generation or transmission capacity.

Commodity (power) Exchange

From late 2007 trade of non-regulated bilateral agreements for the purchase of physically delivered power (SDD) has been conducted on the Arena stock exchange. From 2008 Arena has facilitated trade of simultaneous physically delivered power and capacity (SDEM). The spot price index by ATS is used as a settlement price for the contracts. The SDDs weekly and monthly agreements are settled against the

hub indices for the first and second pricing zones. The SDEMs are traded in a fixed capacity amount and freely chosen power volume within a month depending on the shape of the supply. Financially settled SDEMS are also available from generation companies.

The current share of capacity and power traded at Arena is about 34% of the total free tradable volume. With increasing market opening, the volume is expected to increase also.

Balancing and Ancillary Services Markets

Planned and actual generation and consumption differs in real-time and the deviations are handled in the balancing market. Large industrial consumers and generators participate here. Hydro and pump-storage plants are price takers. Based on the submitted bids the SO runs its mathematical model and calculates minimum balancing prices for 3 hours ahead and in real time. The upward balancing price is calculated as the maximum of the day-ahead market price and the minimum balancing price, while the downward balancing price is the minimum of these two.

Ancillary services (major frequency and voltage) provide reliability and stability of the power systems. These services incur costs for the providers and must be remunerated. The ancillary services market was launched in 2009.

Bilateral Contracts and Hedging

Bilateral contracts allow participants to carry out long-term planning, lock in electricity prices, hedge the risks of performing obligations under regulated contracts and determine the terms and procedure of payments for electricity. Bilateral contracts can be concluded between market players located in a single price zone. The counterparties agree upon contract price and schedule of delivery (hourly volumes), and report to ATS which then calculates the delivery costs as reflected in LMP difference (costs of transmission losses and congestion). In addition to the injection and withdrawal locations, the parties specify an arbitrary reference location (location of delivery). If the reference location does not match the seller's or buyer's location, both of them will be exposed to LMP risk. Thus, a better solution is to settle the contracts against a liquid hub (weighted LMP) price. The LMPs have similar prices that do not deviate more than a specified value from the hub price. Four hubs are located within price zone 1 and two are within price zone 2.

Retail Electricity Prices

Suppliers in the retail market are energy supply companies, suppliers of last resort SLR) and generation companies. Each SLR operates in its assigned operation area. The SLR concludes a contract with each customer in line with the contract form approved by the government. It also sells volumes purchased from regulated and non-regulated contracts to retail customers under tariff and under non-regulated prices to other classes of retail customers. Households only buy from the SLR at regulated prices.

Electricity and capacity may be sold separately or combined. Retail electricity prices reflect energy and capacity components (non-regulated and regulated) as well as network tariffs, and SO and ancillary services tariffs including sales mark-ups. The mark-ups are determined by regional regulators and set by a cost plus principle. In general the regulated markups are around 1–3 €/MWh (Abdurafikov, 2009).

The levels of regulated regional prices are generally harmonized with the indicative prices set by the federal regulator and used in regulated contracts. As of 2008 prices (as determined by bilateral contracts, day-ahead and balancing markets) are modified by adjusting consumption downward by irregular variations. The most expensive generator volumes are compensated pay as bid while the lower demand results in lower clearing prices. Beginning in 2009 clearing prices are determined as the maximum of irregular consumption variations and exports from a price zone.

The energy component of electricity prices reflects the variable cost including the fuel cost of the marginal plant. In most cases coal and gas plants are price setting, backed up by hydro and nuclear plants which have substantially lower marginal costs.

The fuel markets in Russia are generally uncompetitive and dominated by vertically integrated companies.

From 2011 regional wholesale gas price for non-household customers are net backed such that the price in certain region equals a regional coefficient times the price in a (virtual) gas production location. This equates to average export price net of the costs for delivery (transportation, storage and sales), including customs fees and export duties. The export price is calculated as the average export price in the preceding base period which depends on long-term gas supply contracts indexed to oil with a time lag.

(continued on page 34)

Belarusian Energy Strategy Today: Improving Energy Efficiency, Reducing Energy Dependence and Insuring Gas Transit to the EU

By Alexander M. Zaborovskiy*

Belarus has been a key player in the oil sector since the days of the former Soviet Union: the pipeline system "Druzhba" ("Friendship") through Belarus was and still is a major export channel for Russian oil that ensures up to 40% of the export supplies. In 2008 Russia exported 243 Mio tonnes of oil (out of 473.2 Mio tonnes produced), of which 85.1 Mio tonnes were transported via Druzhba. Druzhba will remain the main continental corridor until the second phase of the Baltic pipeline system becomes operational, the capacity of which should be 50 Mio tonnes annually.

In the gas sector, the monopolist JSC Gazprom is completely dependent on the Ukraine for exporting natural gas. The total transit capacity of the Ukrainian system is estimated at 170 bcm per year (Poltavets, 2004). To reduce dependency, the Yamal–Europe pipeline was proposed for Belarus. The project consists of two branches, each with a capacity at 33 bcm annually. The first branch went into operation in September 1999. If the Yamal-Europe pipeline is completed, and accounting for the capacities of the "Beltransgaz" system, the total volume of gas transmitted via Belarus could reach 96 bcm annually. Obviously, this won't allow eliminating Ukrainian pipelines from transit entirely, but, it will give JSC Gazprom room to manuver in its negotiations with Ukrainian authorities regarding the terms of transit. In order to construct the Yamal-Europe pipeline Belarus provided most-favoured treatment for JSC Gazprom, including exemption from fees for the allotment of land and streamlined decision-making regarding construction.

The development of cooperation between Belarus and Russia in the gas sector took place during the rapid political and economic integration of the states, when three treaties were signed in a relatively short period: on the Commonwealth of Russia and Belarus (1996), on the Union between Belarus and Russia (1997), and on the Creation of a Union State of Russia and Belarus (1999). The treaties provide for a number of basic agreements, i.e., the creation of a customs union; a common energy market; a common market; and common pricing for energy resources. According to the Russian-Belarusian agreement on equal conditions for economic agents of the Union State of Russia and Belarus (the Treaty of 1999), prices for natural gas exported from Russia to Belarus could be no higher than those in the Smolensk Region (Russia) bordering Belarus. It allowed Belarus to purchase Russian gas at prices considerably lower than contract prices for Russian gas exported to the EU. As a result, the share of Russian gas in the country's Total Primary Energy Supply (TPES) increased from 36.7% to 61% during 1992-2005 (IEA, 2009). See Figure 1.

The lower prices, compared with competitors from Central and East Europe, ensured profits for Belarus's gas-intensive petrochemical plants which include the manufacturers of chemical fibers and the producers of nitrogen fertilizers. Under previous Soviet centralized planning, such plants were located in the territory of Belarus.

Another significant contributor to the run-up in demand was Chernobyl's radioactive contamination which made the use of firewood unsafe in Belarus's southern districts. The accelerated, capital-intensive gasification of these districts resulted in increased consumption of natural gas by households.

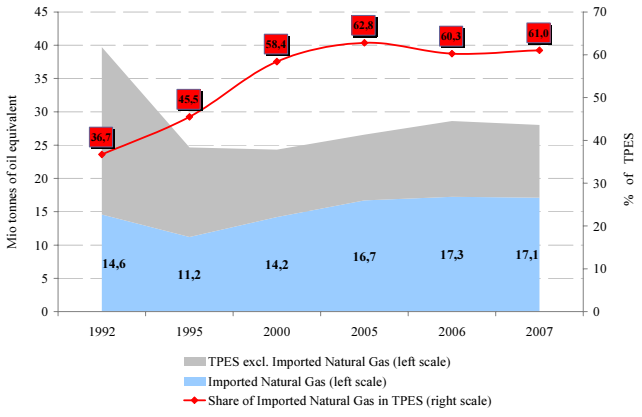

Figure 1: Share of natural gas import in TPES of Belarus

For many years, growing dependence on natural gas provided by a single supplier did not concern the Belarusian authorities who instead treated Russia as a strategic partner in the energy sphere. As stipulated in the Treaty on the Creation of a Union State of Russia and Belarus (1999), relations between the two are based on the concept of collective energy security. The treaty suggested that a single energy balance of Belarus and Russia should be worked out, a scenario that did not encourage Belarus to develop its own independent energy security strategy. The planned construction of the Yamal-Europe pipeline also played a

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role in guaranteeing reliability of supply.

Thus Belarus was unprepared for Russia's revision of the bilateral agreements in 2004, in particular, the additional conditions related to the cost and terms for the transfer of the Belarusian pipeline to the ownership of JSC Gazprom (the conditions were associated with the price of gas for Belarus set by Russia). Belarus's refusal to accept the conditions led to the temporary suspension of gas supplies in that same year, but as a result of the following negotiations in 2005-2006 the former gas prices were restored. At the start of 2007 the Russian Federation unilaterally withdrew from the new agreement and JSC Gazprom then announced plans to raise gas prices for Belarus to the European level. Russia's unilateral withdrawal from the principles of a common market and its contradictory positions on oil and gas transit through Belarus in 2004, 2006, 2007 and 2009 resulted in considerable changes to both Russia's strategy for the development of oil and gas export infrastructure and Belarus's energy strategy.

Difficult negotiations in December 2006 led to the sale of 50% of JSC Beltransgas shares to JSC Gazprom at 2.5 Bio USD and the formation of a long-term pricing mechanism for natural gas supplied to Belarus similar to the one used in take-or-pay contracts for the EU. The shares were transferred to JSC Gazprom in equal portions of 12.5% and the payments were 625 Mio USD annually in 2007-2010. This four-year period also brought reductions in the price of natural gas which were calculated by a formula set and pegged to a basket of oil products. In March 2010 JSC Gazprom transferred the last tranche and became a 50% owner of JSC Beltransgas. This strategy has allowed JSC Gazprom greater influence over the terms of future gas transport to Belarus and transit capacities delivering natural gas to the EU – the latter with a total volume of 60 bcm per year including the capacity of the Yamal-Europe's first branch (as mentioned above, the second branch is yet to be constructed).

The reality that bilateral relations in the energy sphere had worsened caused the Belarusian government to revise its strategy for domestic energy sector development. In 2005-2007, three normative documents that cover 2006-2010 and up to 2020 were approved: the State Program for the Belarusian Energy System Modernization, the Concept of the Energy Security of the Republic of Belarus and the Directive N 3, "Economy and Thrift − the Main Factors of Economic Security of the State". They call for diversifying supply, improving efficiency and increasing use of domestic resources. Considering the limited potential of local energy resources (according to optimistic forecasts, their share in total fuel consumption can amount to 25% in 2012 compared with 17% in 2005), the construction of a nuclear plant and a coal plant in Belarus appear to be reasonable. The planned reduction of GDP energy intensity is 31% in 2010, 50% in 2015 and 60% in 2020.

Notably, the progress in energy efficiency achieved by Belarus during the period of its independence is impressive and experts consider it the best of the CIS countries (ECS, 2007). Prior to independence, its economy was one of the most energy wasteful in the world: energy intensity (TPES/GDP PPP) in 1990 was 0,78 toe per thousand 2000 USD (IEA, 2009). During 1990-2007 the energy intensity of the Belarusian GDP decreased by 2.3 times to 0,34 toe per thousand 2000 USD, while GDP in 2007 is 1.5 times greater than in 1990. Yet, the achieved energy consumption level is 2 times higher than the average for the OECD countries and 1.7 times higher than the world average (see Figure 2). The comparatively low energy efficiency of the Belarusian economy and a high degree of energy dependence indicate that the price of energy resources and the terms of supply are critical to national economic security.

The key issues in Directive N 3 and the Strategy of Energy Security of Belarus are greater security of supply, reduced dependence on imports, in particular, from Russia, and exploitation of all possible advantages of Belarus's geopolitical situation as an energy transit country connecting Russia and the EU. These key issues take on greater significance when considering Russia's treatment of the Ukraine in 2005-2006 and 2008-2009. Russia limited supplies of natural gas to the Ukrainian gas transportation system which in turn caused considerable havoc for EU gas supplies.

Thus, during the past five-year-period, energy disputes each year in the post-Soviet region did not encourage trust between the partners and produced understandable concern within the EU.

Still another factor has contributed to the present regional destabilization – the absence of universally recognized supranational rules for regulating natural gas transit. The Energy Charter Treaty has never acquired the status of a document that sets universally recognized rules for interstate trade in energy. Therefore, disruptions of natural gas and oil supplies to the EU have occurred, even though the Energy Charter Treaty contains preventative measures.

Russia has developed its own concept of minimizing transit risks in supplying energy resources to the EU by excluding transit countries from the supply chain. The reasons are the following: lack of an effective interstate legal environment to acknowledge the interests of the countries producing, transporting and consuming energy resources along the Russia-EU axis; contradictions in the issues of economic

integration of Russia and Belarus; and little effectiveness of the Russian-Ukrainian interaction in the energy sphere. Russia has proposed several new projects: construction of the Northern European Gas Pipeline (NEGP, 55 bcm per year, 27.5 bcm per year in a first phase) beneath the Baltic Sea which bypasses the transit states, and a second phase of the Baltic pipeline system for the purpose of transporting oil through the port of Primorsk. These projects are more costly for Russia than the construction of the second phase of the Yamal-Europe pipeline through Belarus and the maximal use of Druzhba. Moreover, the entire infrastructure for the second phase of the Yamal-Europe is already available. The additional costs to be paid by operating companies to construct the Northern European Gas Pipeline and the second phase of the Baltic pipeline system can be considered the true price of ineffectiveness of the Energy Charter Treaty. The last two projects are the South Stream pipeline (30 bcm per year) and a Caspian gas pipeline (20 bcm per year).

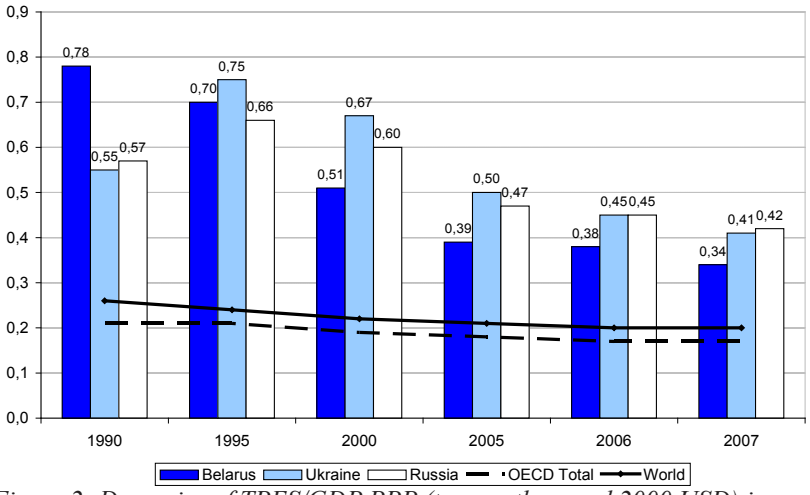

Figure 2: Dynamics of TPES/GDP PPP (toe per thousand 2000 USD) in Belarus, Ukraine and Russia in comparison with OECD and world average

Undoubtedly, the European market will remain a high priority for Russia in the future, yet the EU desires to minimize the risks caused by energy dependence on Russia. The reappraisal of factors influencing global supply and demand is forcing Russia to enter new markets and to develop the appropriate infrastructure. For example, the Energy Strategy of Russia for the period up to 2030 cites diversification of export markets and routes, which include increasing the share of the Asian-Pacific region to 11-12% by 2015, 16-17% by 2020 and 19-20% by 2030.

Table 1 shows the predicted natural gas production and domestic consumption according to the Energy Strategy of Russia to 2030. The data given in italics are calculated on the basis of the strategy's target parameters.

In 2008 the total export of natural gas from Russia was 195 bcm, including 37.0 bcm to the CIS countries (Belarus accounted for 21.1 bcm). Thus, the export of the Russian natural gas to the EU countries and Turkey was 158 bcm. Pipeline facilities providing only 50% of Russian natural gas exports are controlled by JSC Gazprom, and the other 50% are supplied only through the Ukrainian gas pipeline system. The realization of the projects already announced by JSC Gazprom will bring the total transit capacities under its control to 162 bcm per year, which is 71% of net surplus of production over domestic consumption of Russian natural gas in 2015 and about 54% in 2030.

The following conclusions can be made:

- The surplus of natural gas production over consumption will not be considerable before 2020. Moreover, for 2015-2020 it is predicted that the growth of gas production will stand at 107.8% and the growth of consumption at 103.8%. If the demand during this period is higher, then available export resources of natural gas in Russia will not exceed 250 bcm annually. As a result, planned growth rates for the export of Russian natural gas cannot be achieved without a corresponding increase in natural gas imports from Middle Asia.
- JSC Gazprom control over the Belarusian gas pipeline system considerably strengthened the position of the Russian monopolist during negotiations with Ukraine. This ensures supply of Rus-

	2008 (actual)	2015	2020	2030
		--------(forecast)------		
Natural gas production, bcm	664	745	803	940
Natural gas consumption, bcm	457	519	539	641
Net excess (prod. – cons.), bcm*	*207*	*226*	*264*	*299*
*Capacity of natural gas supply routes from Russia to EU and Turkey**, bcm/y*				
Under control of JSC Gazprom	***77,0***		***162,0***	
- NEGP	0,0		55,0	
- Beltransgas	61,0		61,0	
- Blue stream	16,0		16,0	
- South stream	0,0		30,0	
Through Ukraine (JSC "Naftogaz")	***170,0***		***170,0***	
Total to EU and Turkey	**247,0**		**332,0**	

*import from Middle Asia is not considered
**existing and announced projects

Table 1: Russian Natural gas production, consumption and net excess to 2030 according to the Energy Strategy of Russia

sian natural gas to the EU by 2015 at 160 bcm per year practically without the participation of the Ukraine (JSC Naftogaz).

- The second phase of the Yamal-Europe pipeline can be put into operation at a relatively low cost and at the same time will increase the volume of gas pipeline capacities controlled by JSC Gazprom to 190 bcm per year. In general, Belarus is a reliable transit country that, subject to further development of its pipeline system, can become a secure "energy bridge" between Russia and the EU.
- The necessity of participation by JSC Naftogaz in gas transportation to the EU is evident if one is to account for the corresponding volume of Russian export at more than 160 bcm per year while the second phase of the Yamal–Europe pipeline is not yet developed. Acting within the framework of this strategy, Russian officials have suggested that the assets of JSC Gazprom and JSC Naftogaz could be merged. Considering the Ukraine's present-day political situation, such a scenario appears realistic.
- Belarus must reduce its energy dependence and increase its energy efficiency. Achieving the world average level of energy efficiency requires economic restructuring, increasing the role of the services sector and implementing effective economic incentives in energy policy (Zaborovskiy, 2008).

To improve reliability and to develop mutually beneficial cooperation requires a common interstate legal base. The Energy Charter Treaty should be expanded to address the interests of producers, customers and transit states as well as protecting foreign investments in the region's energy sector.

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The Russian Power Market *(continued from page 30)*

The gas prices are expected to increase to ensure equal profitably of domestic and foreign markets by 2011. According to the tariff regulation strategy, the regulated domestic gas price will increase by 27.7 per cent this year (Abdurafikov , 2009) which again will feed into the price of electricity. Power plants fuelled by coal are located close to the mines. Because coal producers compete with gas producers and need to recover their extensive reconstruction costs, they tend to set prices similarly to gas.

Fuel oil accounts for 2-4% of the thermal generation and trades at market prices.

Conclusion

The Russian power market has evolved from a state monopoly to a transitional market on the path to full liberalization. This entails a development toward unregulated (competitive) prices in the two major price zones: European and Siberian. Price levels are relatively low compared to Europe, but buyers must also pay for available capacity such that the effective price is higher.

The market has some similarities with the LMP markets in the U.S. and is expected to develop in that direction. Furthermore, as a part of market liberalization, power (energy) and capacity will be traded on commodity exchanges to facilitate hedging and trade among market participants. Due to the geographical and time zone diversities, pricing and risk management will continue to present Russia with challenges.

The government still retains ownership in network companies, regulators, hydro and nuclear generation companies, including several territorial and wholesale generation companies. Many technical regulations and standards could benefit from updating to improve energy conversion and conservation (Abdurafikov, 2009). Existing generation capacity would thus work more efficiently

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Russian Oil Field Auctions

By Aleksandr Rakintsev*

Crude oil plays an increasingly important role in the modern industrial society, justifying our time as the oil age. Of course, other forms of energy can, at a price, replace oil, but its unique performance and historic position of being the main energy source is brought about by our lifestyle. Oil has been supplying the world's growing demand in energy during the past century, and there is a clear expectation of its continuance. Due to industrialization, oil demand has significantly escalated in the past decade, particularly in the emerging economies,. Today oil supplies about 40% of the world's energy demand and covers over 90% of its transportation energy. Since the shift from coal to oil, the world has consumed about 1.000 billion barrels. And another 1.000 billion barrels of proved and probable reserves remain to be recovered (IAGS 2003). It is also expected that oil consumption will rise together with oil recovery volumes.

According to OPEC estimates, by 2020 the world consumption of oil will rise by ca. 20% from 4.031 mtoe to 4.830 mtoe (OPEC 2008). The major task for the key countries/suppliers is to cover continuously growing demand, what in turn means that the oil market players will have to increase recovery capacities.

Today Russia is the second largest oil producer, extracting daily ca. 9.8 mln bbl and the second largest oil exporter with exports of ca. 4.1 million barrels per day. The actual volume of Russian proven oil reserves is confidential data. However, in various sources you will find independent estimates varying from 60.000 up to 200.000 mln bbl, which should be sufficient for the next five decades.

Russia is a large country with a vast territory of more than 17 mln. km2. Nevertheless, it possesses a wide network of oil pipelines and railways, which capacity is constantly increasing, providing oil companies with new supply and distribution opportunities.

The international oil companies are constantly looking for access to potential new resources. Since approximately three quarters of the world's proven oil reserves are in the tight grip of nationalistic governments, Russia could create a great opportunity for the interested oil companies. Despite its non-transparent legal frameworks, Russia does have a competitive oil recovery market structure. The five biggest companies share up to 75% of the oil production market, namely Rosneft, Lukoil, TNK-BP, Surgutneftegaz, and Gazpromneft (Infotek 2006-2008). All of them are joint-stock companies with shares traded worldwide.

In spite of weak legal institutions and the dominance of oligarchs, Russia is one of the largest opportunity markets for international oil companies. These will be welcomed in Russia not due to the absence of its own capacities, but because of a general need for new exploration and recovery technologies, such as secondary and tertiary methods, which shall be brought into the country by the new exploration projects.

In the last two decades oil companies were exploiting reserves that have accumulated in the times of the Soviet Union. The increment of the extractable reserves added was less than production. Also the increased market prices for oil could not change the current situation (Rubanov 2006-1). The forecasting coefficient of oil recovery (the "FCOR") has decreased in Russia since the 1960s. The current estimated rate is 35% (Rubanov 2006-2). The entrance of new companies into the Russian oil market may affect FCOR increasing it to upwards of 50% due to the utilization of the new methods of recovery, namely secondary and tertiary methods. However, the deployment of these methods leads to a significant rise in production costs (Dorochov 2007).

The aim of our research is to investigate Russian oil field auctions empirically. Having collected a data sample from 60 oil field auctions for the period of 2004-2008, we have tried to determine the factors affecting the result of the bidding process taking into account the legislation and the specific geological features of the oil field.

Oil Fields Allocation Procedure in Russia

The main regulatory issues concerning the examination, allocation, exploration and recovery of oil reserves are outlined in the Russian Federal Law on Mineral Resources. According to this document, all mineral resources are the state property; however, any third party may obtain a right to use these resources by obtaining a relevant licence.

There are two ways of oil field allocations. The first one is through a production sharing agreement, but we skip this due to the small number of practical examples. The second way of allocation is the public auction. The winner of the auction will be granted the recovery and exploration right for a specified field. The right will normally be given for 25 years, inclusive of five years for the geological study of the field.

The theory of auctions is one of the most successful modern economic theories. Auctions have become an effective tool of public policy implementation. Huge volumes of goods and services, property, mineral resources and financial

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instruments are sold through auctions and many models are being designed. The United States have been particularly successful in organizing significant numbers of auctions.

The auction is an instrument representing an efficient way of distributing scarce resources, ensuring that the object will be allocated to those, who value it most. If the value of a good is unknown, the auction provides a valuation mechanism, i.e., the good is worth at least as much as the highest bid paid. Moreover, it provides a simple clearing mechanism determining the market price and allows demand and supply meet (Klemperer 2004).

Russian oil field auctions are usually organized in the form of the open English auction. According to Milgrom and Weber (1982), when bidders are risk neutral and uncertain about their value estimates, the English auction leads to higher expected prices, due to the opportunity to observe the behaviour of their competitors in the bidding. Such information weakens the winner's curse since it leads to more aggressive bidding. Auctions are more flexible than a fixed price sale and less time-consuming than price negotiations. In recent years more than 200 auctions have been organized annually by the Russian government for the allocation of fields containing oil and gas reserves (see Table 1).

Year	Number of Auctions
2006	239
2007	208
2008	245

Table 1
Auctions Allocating Oil and Gas Reserves
Source: Federal Subsoil Resources Management Agency

Factors Affecting the Outcomes of the Oil Fields Auctions in Russia

For the purpose of an empirical approach we have gathered data from 60 oil field auctions that took place in different regions of Russia during the period of 2004-2008. We have analyzed several factors, namely: a) geological data, the volumes of extractable resource and its categories (only oil reserves were taken into account and no by-products such as condensate or natural gas), b) pricing information: initial allocation price (reserve price), amount of the participation fee, the auction's step and the final price paid by the winner, c) the number of the auction participants, d) current market crude oil price, and e) Russian legislative parameters affecting the selling price, which are reflected in the oil netto-export price (the market price minus export fee) (see Figure 1).

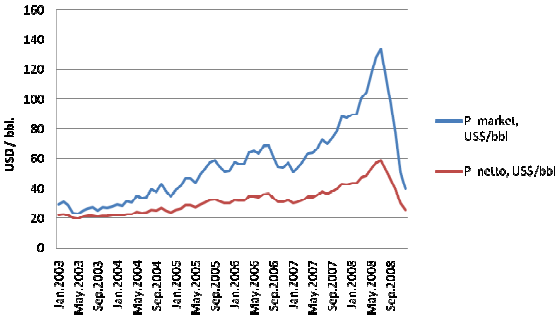

Figure 1
Crude Oil Market Price and Russian Netto-export Price
Source for Crude oil price: Energy Information Administration, Russian Federal Law on Export fees.

Unfortunately due to information constraints we could not take infrastructure parameters into account. The analysis of the influence of such data is subject to further investigation.

We used a multiple regression model to determine the factors affecting the results of the oil fields auctions. This indicated that the final price per barrel of crude oil reserves (to be paid by the winner) is positively influenced by the number of participants and by the initial auctions price per barrel of reserves. We were quite surprised that parameters such as the volume of reserves, the auction's reserve price and the netto-export price did not affect the outcome significantly. Moreover, we have unexpectedly found that the number of participants is negatively correlated to the netto-export price. This is quite intriguing, but could be explained by the increased role of the top domestic oil companies. In the last four years the volume of the crude oil recovered by the five largest oil companies operating in Russia has increased by 10% and their market share has risen from 70% up to 75% (Infotek 2006-2008).

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Perspectives on the Russian-European Natural Gas Market

By Oleg Eismont*

Within recent years, "gas" relations between Russia and Europe have become strained. This is mainly due to concerns about the reliability of Russian gas supplies to Europe (especially after the reduction of gas supplies in January 2006 and completely cutting them for two weeks in January 2009), and to liberalization of European gas market (seen by Russia as a threat to its important role on the European gas market and followed by the publicly declared intentions to redirect Russian gas exports from Europe to Asia). At present, Russia (represented by the Russian gas monopoly Gazprom) supplies natural gas according to long-term "take-or-pay" contracts with particular European countries and companies. However, a number of European countries and political leaders favor a unified European policy in dealing with Russia. As EU Vice President G. Verheugen put it, "The principle of solidarity is a basic principle of the EU, and we will never, never, never violate this. … That means that our partner countries cannot pick and choose. You have to deal with the whole, with all the EU. You cannot separate or single out member states." In this respect, it is worth mentioning that several years ago, under pressure from the EU, Gazprom was forced to abolish the ban on resale of natural gas it supplies to European consumers, which deprived Gazprom of the possibilities to use the policy of price discrimination on the European gas market.

It looks quite realistic that, within the not too distant future, Russia might face a unified Europe in negotiations on gas supplies. In that case, taking into account that Russia is the leading player in the European gas market, its gas being supplied to Europe only by pipelines (which impose rigid ties between supplier and consumer), one could expect formation of a monopolistically-monopsonic Russian-European gas market. Within the last decade, the international gas trade has experienced significant changes, caused by the dramatic expansion of liquefied natural gas (LNG). Though LNG production and delivery costs are higher than the costs of supplying natural gas by pipelines, due to high natural gas prices, LNG is quite competitive relative to natural gas transported by pipelines. LNG now accounts for nearly 30% of world natural gas trade, its share in natural gas consumption in Europe being about 13%. Since LNG can be shipped anywhere and transportation costs only weakly depend on distance, rapidly increasing production of LNG may lead to the formation of a world natural gas market. The share of LNG spot trading on the European natural gas market reached 13% of total LNG supplies in 2008, and this figure is forecast to be about 20% by 2012. Quite often, it is argued that since Gazprom has long-term contracts which are valid until 2020 and even 2030, it should not worry about future supplies of natural gas to Europe. However, existing contracts could be subject to change, long before their expiry. Since European spot prices of natural gas in 2009-2010 got significantly lower than contract prices, Gazprom had to soften conditions of existing contracts by lowering minimum volumes of natural gas consumers were obliged to buy according to "take-or-pay" contracts (e.g., recent agreement between Gazprom and E-on Ruhrgas). What could be the consequences of the above mentioned circumstances for the natural gas trade between Russia and Europe?

Though the problems of Russian-European gas trade have been addressed in a number of papers, perspectives on the formation of monopolistically-monopsonic Russian-European gas market have been ignored. To analyze possible consequences of the monopolistically-monopsonic Russian-European gas market for Europe and Russia within a formal model, the following assumptions have been used. Europe consumes domestically produced natural gas, as well as imported gas from Russia and other countries. It is assumed that European gas producers and producers from countries other than Russia behave competitively on the European market and their supplies are limited. Under these conditions, Gazprom can be considered as a dominant company within a competitive fringe of the European gas market. There is a world natural gas market. Within this setting, the bargaining problem between Russia and Europe on gas supplies is considered. The guaranteed payoffs of both sides in this bargaining problem are as follows: for Russia – profit from selling gas to Europe at prices that are equal to the corresponding marginal cost; for Europe – surplus of European consumers of Russian gas supplied on residual demand market at monopoly price. The bargaining power of each side is assumed to depend on its access to the world natural gas market which, in its turn, depends on Russia's natural gas liquefaction capacities and Europe's LNG re-gasification capacities. The equilibrium state of the Russian-European gas market is obtained from maximization of the corresponding Nash product.

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It has been shown that the bargaining powers of Russia and Europe depend only on the ratio of marginal costs of natural gas liquefaction and LNG re-gasification (adjusted for the ratio of interest rates in Russia and Europe). Based on available statistics, the bargaining powers of both sides, as well as Russia's profit and surplus of European consumers of Russian gas can be estimated. In equilibrium, the bargaining power of Russia is much lower than the European one which is due to very high liquefaction costs, relative to re-gasification costs, and higher interest rates in Russia. The main result is that Russia's equilibrium profit from selling gas to Europe is only 5% higher than its guaranteed profit, while the equilibrium surplus of European consumers of Russian gas is 50% higher than their guaranteed surplus. Thus, the formation of a monopolistically-monopsonic Russian-European gas market, while being beneficial for Europe, is highly unprofitable for Russia. The actual state of affairs for Russia is even worse, since up to now it has no natural gas liquefaction plants that could use gas currently supplied to Europe by pipelines, while there are many re-gasification plants in Europe and their number is constantly increasing. Moreover, existing re-gasification capacities are considerably higher than the current LNG supplies. Taking into account these results, construction of new gas pipelines from Russia to Europe (North Stream and South Stream) could make perspectives of monopolistically-monopsonic Russian-European gas market for Russia more problematic.

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Russian Investments in Georgia's Electricity Sector: Causes and Consequences

By Courtney Doggart*

The aftermath of the August 2008 war between Georgia and Russia created new political and economic realities for both Georgia and Russia. One important ramification, often overlooked, is the December 28, 2008 signing of a Memorandum of Understanding (MOU) between the Russian parastatal company Inter RAO and the Georgian government over the management of the 1300 MW Enguri Hydropower Plant. This MOU effectively gave Inter RAO management over 1300 MW of Georgia's 4700 MW of generation, continuing a trend of a strong Russian presence in all aspects of Georgia's electricity sector, from generation to transmission and distribution.

This article will examine these Russian investments in light of Georgia's energy and economic vulnerabilities and explore potential causes and consequences of this situation. The purpose of the article is to raise questions about the reasons for high Russian investments on both the Russian and Georgian sides, the vulnerability of Georgia's energy system, and the strength of Georgia's institutional framework. The article will propose some thoughts on causes and implications, but in a short space, this larger topic cannot be effectively explored. Rather, the author hopes that this piece will serve as a catalyst for further investigation.

Economic Background

Though the Russian-Georgian political relationship has long been fraught with tension, their economic relationship has featured high flows of trade and foreign direct investment (FDI). Yet, the economic relationship has been largely asymmetric, with only 10% of Georgia's exports going to the Commonwealth of Independent States (CIS) and roughly 50% of Georgia's imports coming directly from Russia.[1] Furthermore, Russia's FDI inflows to Georgia have been primarily in the strategic sectors of energy, telecommunications, and banking. International economic relations impact domestic politics, shaping national interests, with this impact being more acute in countries with asymmetric economic relationships.[2] Asymmetric economic influence can manifest itself in overt coercion or influence and the effects are far more likely to be realized as influence, which is often more valuable politically, particularly during periods of political transition.[3] In short, an asymmetric economic relationship between Russia and Georgia can have political ramifications—and the relationship is particularly lopsided within the electricity sector.

Georgia's Electricity Sector

Russian companies have a presence in each major component of Georgia's electricity sector, from generation to transmission to distribution.

Generation

Georgia has installed capacity of roughly 4700 MW, of which 1300 MW are supplied by the Enguri Hydropower Plant, which is under management by the Russian parastatal company Inter RAO.[4] In addition to being under Inter RAO management but Georgian state ownership, Enguri has a further complicated structure with its dam and reservoir under control of the central Georgian authorities but its turbines and generation equipment located on Abkhazian controlled territory.[6] In addition to managing Enguri's 1300 MW, Inter RAO owns at least an additional 600 MW of thermal generation (Mtkvari power plant) and manages an additional two hydropower plants with a total of 222 MW (Khrami I and II). Taken together, almost half of all of Georgia's installed capacity is owned or managed by Inter RAO, with a key portion of that located within a politically disputed territory. Furthermore, Mtkvari's contribution of roughly 11% of the country's electric consumption is gas fired, which is critical to generation supply diversification in the winter months when hydropower has weak production and Georgia's capacity is constrained.

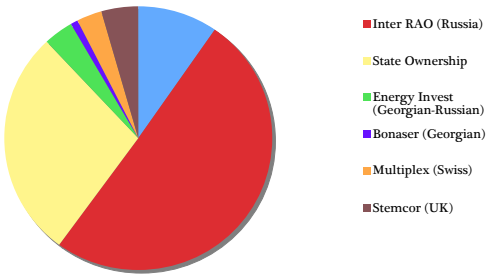

Figure 1: Ownership and Management of Georgian Electric Generation by Company and Country of Ownership

With the management of Enguri's 1300 MW, Inter RAO manages or owns almost half of all Georgia's electric generation. In addition, in 2008 roughly 400 MW of Georgia's 500 MW of imports came from Russia.[5]

Transmission

Two companies currently control electricity transmission in Georgia. The state-owned Georgian State Electrosystem (GSE) operates the 300, 220, and 110 networks and some of the 35 kV lines, which are used for more local distribution. JSC Sakrusenergo, owns the critical 500 kV line running across the country

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See footnotes at end of text.

which is used for exports. Sakrusenergo is 50% owned by Inter RAO and 50% by the Georgian State. Planned transmission lines include a 500 kV line designed for export purposes to Turkey. According to a Memorandum of Understanding signed between the two countries in 2007, this 500 kV line, as well as a 400 kV line and a substation are set to be complete by 2012.

Distribution

Georgian electricity distribution consists of five main companies of which three are owned by Energo-Pro (Czech) for a total of 46.5% of Georgia's distribution. Inter RAO (Russia) owns 75% of Telasi, which accounts for 33.6% of distribution. The final company is the state-owned Abkhazia Energy Company, which makes up the remaining 19.9% of distribution. However, the latter is currently outside of state control.[7]

Furthermore, though the Electricity System Commercial Operator (ESCO) is currently owned by the Georgian state, the government plans to privatize it in the coming years by distributing the shares among the electricity sector licensees, with 30% going to distribution companies, 35% to generation companies and the remaining 35% becoming the property of the dispatch licensee. Under the current ownership structure, Inter RAO will have a large stake.

Inter RAO

Of the Georgian electricity assets owned by Russian companies, Inter RAO, the international division of Russian company behemoth RAO UES, is the biggest investor in Georgia. As of December 2009, Inter RAO was 57.3% owned by Rosatom State Nuclear Energy Corporation and OJSC Energoatom Concern, both state-owned and operated. In addition to heavy Russian state representation in ownership, the state is well represented on Inter RAO's board of directors. The Chairman of the Board of Directors is Igor Sechin, First Deputy Prime Minister and staff member of Russian President Putin for almost two decades, who was singled out in a 2007 *Economist* article about the strong ties between the FSB (successor to the KGB) and the Russian government.[8] In 2009, of the remaining ten board members, two work directly for the government (Minister of Energy and State Property Management), two work for Rosatom, (Inter RAO majority shareholder and state nuclear energy corporation), four work for other state owned enterprises or subsidiaries with an international presence (VTB and its subsidiary Russische Kommerzial Bank AG, Gazprom, Rosneft-Energo, and Transneftprodukt). The final board member represents Inter RAO. Inter RAO cannot be seen as anything other than a state controlled company with the ability to pursue state interests, be they economic, political, or both.

Figure 2: The dam of Enguri Hydropower Plant

Reasons for Russian Investment

Investment patterns such as the ones seen in Georgia occur as a result of both external reasons (such as motivations of investors) as well as internal ones, namely the legal, institutional, and regulatory framework governing investments. An examination of Georgia's investment framework reveals that the country's investment-friendly laws coupled with a strengthened presidency and reduced independence of the electricity regulator have resulted in a lack of transparency in the electricity sector. The resulting framework likely corresponds to Russian investment interests while failing to attract large-scale interests from other investors, either because of lack of opportunity or fear of unhealthy risk.

In 2006, Georgia astounded readers of the World Bank's Doing Business Report by jumping 75 places—from 112th to 37th—in the span of one year. This was the biggest jump made by any country since the World Bank started the rankings four years previously, and is indicative of Georgia's pace and determination to create markets favorable to investment.[9] As of March 2010, Georgia is 11th on the list. Changes in licensing, enforcing contracts, and employing workers all helped Georgia to jump to nearly the top of the rankings. Yet, other factors, such as the country's Foreign Direct Investment (FDI) and anti-monopoly laws have also helped create particular factors that tend to encourage foreign investment.

Foreign Direct Investment in Georgia

The abandoning of restrictions on FDI has been cited as reason for the tremendous global growth of the past decades, as countries worldwide abandoned restrictions on foreign investment and reaped the benefits of capital inflow,[10] with Georgia no exception. Georgia's 1996 Law on Investment Activity Promotion and Guarantees provides the basis for foreign investment in the country. With its short foreign company registration turnaround time and limited list of sectors requiring explicit government permission, Georgia's active promotion of FDI inflows has it jumping from 15th to 9th between 2006 and 2007 in an inward FDI performance index measuring the three-year moving average of 141 countries' inward

FDI performance.[11] Georgia is clearly actively promoting inward FDI, and one of the largest contributors to that is Russia. In 2007, stocks of Russian FDI in Georgia amounted to 25% of Georgia's GDP.[12]

What is unusual about the newest phase of Georgia's privatization is that Georgia is privatizing assets that a majority of countries define as strategic and typically retain under state control. These include at least 2/3 of the shares of the Georgian State Electricity Company (GSE), 24% of the Port of Poti, the Georgian Post, and several regional airports.[13] Given that restrictions are typically imposed on strategic sectors and specific countries for security reasons and that countries at war often take control of strategic sectors owned by an enemy for national security reasons, it is notable that Russian companies will likely be main investors, particularly in the electricity sector.[14] Though Russia was roundly criticized by the G7 and NATO for using excessive force during the August 2008 war over Georgia's breakaway enclave of South Ossetia and had, as of mid-December 2008, continued to violate the European Union-brokered cease-fire following the 2008 conflict,[15] Georgia will still likely end up selling some strategic assets or management rights to Russia. This does not mean that there is a direct threat of supply cut-off—there was no interruption to electricity supplies within Georgia aside from expected damage during the 2008 war, for example. Yet, it does mean that Russia will wield influence in Georgia .

Anti-Monopoly Laws

In addition to its unusually open FDI laws, Georgia also has weak anti-monopoly laws. Characteristics of strong competition law include provisions for a well-funded and staffed independent regulatory commission with enforcement capabilities, non-discrimination in law and enforcement, realistic thresholds of merger notification, transparency, a clearly defined review period, an appeals process, and the establishment of channels of communication for enforcement and evidence gathering. Challenges to the implementation of a strong competition law are lobbying by interest groups, weak regulatory systems, and abuse of competition laws in a protectionist manner.

Georgia's experience with competition law has gone through several stages, the most recent being the adoption of the "Law on Free Trade and Competition" in 2005. This law superceded the previous anti-monopoly legislation, which was more in line with U.S. and EU competition laws. The current competition law has come under fire from critics for lacking sufficient clarity and creating a "hazardous legal vacuum."[16] Unlike previous legislation, the new legislation does not address the traditional fields of competition law, such as agreements restricting competition, concerted practices, abusing dominant position in the market, takeovers and mergers, state enterprises and so-called natural monopolies.[17]

In addition, the new Agency for Free Trade and Competition lacks the independent status of the earlier competition regulatory body, The State Antimonopoly Service. Instead, the Agency for Free Trade and Competition is located within the Ministry of Economic Development and has limited investigative powers.[18] President Saakashvili threatened to close the Agency in October of 2007, following rapid price increases, particularly in the foodstuffs sector. The Agency still appears to exist, but as a sub-division of the Ministry of Economic Development, lacking its own website.

Both the FDI and competition laws indicate that Georgia's priority is investment and the shape of that investment is not of paramount importance. Furthermore, the openness to foreign investment and lack of regulatory oversight for monopoly behavior leaves Georgia susceptible to abuse of market power. This scenario of open investment environment with little oversight is one that has been known to deter strategic investors and encourage others. This is a theme that continues in the structure and regulation of the electricity market.

Consequences

It should be acknowledged upfront that Russian investment in Georgia's electricity sector is not inherently bad for Georgia. In fact, it can be argued that without it, the electricity sector in Georgia would not be functioning nearly as well as it is currently, though a comprehensive study on this and the impact of EU/U.S. support would clarify these assertions. However, there is reason to believe that the results of the Georgian-Russian investment relationship have contributed to reinforcing a cycle of corruption, weakened regulatory oversight and loss of strategic investors.

Increased corruption is a danger of foreign investment inflows, and its likelihood is dependent on both the host country's political and economic environment, as well as the transparency of the investor.[19] An ideal political environment includes strong institutions that provide necessary checks on government officials wishing to make illegal profit. Competitive political environments, for example, provide a greater check on public officials, more easily calling them to task for misbehavior and more easily providing alternative candidates. A free press, active civil society, and trustworthy judiciary all contribute to these checks. Georgia's current political climate leaves it ripe for increased corruption, particularly given the lack of transparency in Inter RAO, the leading investor in Georgia's electricity sector.

For example, the June 2008 "Governance Matters" report put out by the World Bank shows that between 2006-2007 Control of Corruption and Voice & Accountability both declined in Georgia, with the latter returning to 2004 levels.[20] In the World Economic Forum's 2008 Global Competitiveness Re-

port, Georgia shows a competitive disadvantage in its judicial independence, favoritism in decisions of government officials, transparency of government policy making, organized crime, ethical behavior of firms, and strength of auditing and reporting. Similarly, Russia's own democracy indicators have continued to worsen in all areas from corruption to independent media. Furthermore, Russia is unwilling to ratify international treaties that would increase transparency in the energy industry, such as the Energy Charter Treaty. Both Georgia and Russia's weak democratic environments taken together indicate that FDI inflows from Russia are likely to continue the cycle of weakening institutions, rather than strengthening them as would happen with strategic investors.

The Georgian National Electricity and Water Regulatory Commission

Indicative of this trend is the case of the Georgian National Electricity and Water Regulatory Commission (GNEWRC). One key component of a functioning competitive electricity market is an independent regulator who oversees the sector, typically distributing licenses and setting tariffs. Though GNEWRC is well-designed, several changes in the past several years have threatened the independence of the regulator or worked to undermine its effectiveness.

In the past several years GNEWRC has been moved from Georgia's capital of Tbilisi to Kutaisi, a city roughly a three hour drive away, has been understaffed from the commissioner level and under-trained at all levels, and has seen key duties moved from its jurisdiction to the Ministry of Energy. Since 2004, GNEWRC has lacked political support and has been undermined, possibly the result of parts of the Georgian government believing that independent regulators are not necessary.[21] The reasons for GNEWRC's destabilization are several, including a strengthening of the Presidency at the expense of checks on central government power. In all likelihood, Russian FDI in the electricity sector does not play a direct role. However, the weakening of GNEWRC is symptomatic of larger policy problems—problems that are fed by investment from non-strategic sources.

As a result, Georgia is able to neither attract strategic investors nor position itself for entrance into Europe's Energy Charter Treaty (ECT), which would require Georgia to maintain a strong, independent regulator. Strategic investors are typically defined as those that have cash and access to debt financing—a characteristic that is most common in investors from the U.S. and Europe.[22] In addition, strategic investors can also be considered those that enhance a country's transparent operating through the adherence to international best business practice standards. Georgia's inability to attract these strategic investors to its electricity sector is most likely due to the returns from investment not being able to outweigh the risk. The result is a reinforcing feedback loop where lack of transparency in the deal-making process attracts Russian investors, which in turn decreases transparency, which in turn increases the risk. Encouraging a competitive environment in the electricity sector requires most market participants to have confidence that their offers will be given a fair and objective review, to be assured that there will not be breaches in confidential information, and that open access to adequate information that would affect the resources they choose to offer would be given.[23]

Georgia has made tremendous gains in encouraging investment, working to streamline and open the process. However, given the deals made behind closed doors and the complaints surrounding several privatizations, it seems unlikely that the Georgian government is able to provide confidence in a fair and objective review process. For investors that require such an open review process, Georgia's lack of ability to provide this is a huge deterrent.

As mentioned before, other investors may see this lack of transparency as an asset. By not providing a transparent investment process in practice, Georgia is weeding out strategic investors from the others, and it is the others that will invest in the sector. As a result, these non-strategic investors could contribute to the further marginalization of regulatory measures as well as to corruption within the country, creating at best the loss of best business practices that could be gained from strategic investors and at worst a cycle of corruption.

Conclusion

Georgia's current energy security is dependent on Russia, from gas imports to fuel the thermal power plants, to the high percentage of ownership and management rights of electricity sector assets. In order to create a situation that allows for necessary investment but takes preventative protection measures Georgia should:

- Strengthen independent regulatory bodies such as GNEWRC and make others, such as the Agency for Free Trade and Competition an independent body.
- Reduce dependence on Russian gas during the critical winter thermal generation period. Bilateral contracts with Azerbaijan and the creation of gas storage can reduce the potential for dangerous price fluctuations.
- Reevaluate FDI laws to protect strategic assets. Removing the tender for the GSE privatization is a helpful first step. However, a formal legislative approach will be more effective than a case-by-case evaluation.

In sum, the Georgian-Russian relationship is one in which politics and economics intersect in a potentially destabilizing fashion, aided by Georgia's domestic policies that create a feedback loop reinforcing this lopsided relationship. However, with an institutional framework that provides the proper safeguards against corruption through independence and transparency, as well as preventative measures that provide a buffer against gas prices, Georgia will be able strengthen its position vis a vis Russia's role in its electricity sector for the future, while allowing the investment necessary for a developing country recovering from war.

Footnotes

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SCENES FROM THE 2010 IAEE NORTH AMERICAN CONFERENCE (OCTOBER 14-16, 2010)


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IAEE's Member-Get-A-Member campaign continues in 2011. IAEE believes you know quite well the value of membership in our organization. Furthermore, membership growth is one of the Association's top strategic initiatives. With your knowledge of our organization's products/services, publications and conferences, we know that you are in the ideal position to help us grow. The process to win rewards for your self is quick and easy!

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Thank you for making IAEE the great organization that it is!

IAEE/Affiliate Master Calendar of Events

(Note: All conferences are presented in English unless otherwise noted)

Date	Event, Event Title and Language	Location	Supporting Organizations(s)	Contact
2011				
February 16-18	8th IEWT at Vienna University of Technology Language: German & English	Vienna University of Technology, Austria	AAEE	Reinhard Haas haas@eeg.tuwien.ac.at
April 18-19	3rd ELAEE Conference *Energy, Climate Change and Sustainable Development: The Challenges for Latin America* Language: Spanish & English	Buenos Aires, Argentina		Gerardo Rabinovich gerardoa@speedy.com.ar
April 25-26	4th Annual NAEE/IAEE International Conference *Green Energy and Energy Security: Assessing the Options for Africa in a Global Energy Market*	Abuja, Nigeria	NAEE	Adeola Adenikinju akiniwayemi@hotmail.com
June 19-23	34th IAEE International Conference *Institutions, Efficiency and Evolving Energy Technologies* http://www.hhs.se/iaee-2011	Stockholm, Sweden	SAEE/IAEE	Lars Bergman lars.bergman@hhs.se
October 9-12	30th USAEE/IAEE North American Conference *Redefining the Energy Economy: Changing Roles of Industry, Government and Research*	Washington, DC	USAEE/NCAC/IAEE	USAEE Headquarters usaee@usaee.org
2012				
February 20-22	3rd IAEE Asian Conference	Kyoto, Japan	IEEJ	Kenichi Matsui kmatsuijr@aol.com
June 24-27,	35th IAEE International Conference *Energy Markets Evolution under Global Carbon Constraints: Assessing Kyoto and Looking Forward*	Perth, Australia	AAEE/IAEE	Ron Ripple r.ripple@curtin.edu.au
September 9-12	12th IAEE European Conference	Venice, Italy	AIEE/IAEE	Edgardo Curcio e.curcio@aiee.it
2013				
June 23-27	36th IAEE International Conference *Realizing the Potential of Energy and Material Efficiency*	Daegu, Korea	KRAEE/IAEE	HoesungLee hoesung@unitel.co.kr

Member Get A Member Campaign Continues Success

Nasser Al-Dossary Wins Complimentary Registration to the IAEE Stockholm International Conference

IAEE's Member Get a Member campaign was a grand success in the fourth quarter. Members had their membership expiration date advanced three months for each new member referred. Nasser Al-Dossary referred the most new members and won a complimentary registration to the coming Stockholm International Conference.

Calendar

16-18 February 2011, 7. Internationale Energiewirtschaftstagung an der TU Wien - Märkte um des Marktes Willen: Bleibt die Technik auf der Strecke at Vienna University of Technology. Contact: Conference Secretariat, Vienna University of Technology, Gusshausstraße 25-29 / E373-2, Vienna, 1040, Austria. Phone: +4315880137303. Fax: +4315880137397 Email: iewt2011@eeg.tuwien.ac.at URL: http://eeg.tuwien.ac.at/iewt2011

27 February, 2011 - March 2, 2011, Nanotech Insight at Cairo, Egypt. Contact: Ms. Neveen Samy, Administration Assistant, SabryCorp Ltd. for Science and Development, Egypt. Phone: +20 2 2414 6493. Fax: +20 2 2415 0992 URL: http://www.nanotechinsight.net/conf/nanoinsight/11/

1-3 March 2011, Energy Indaba at Sandton Convention Centre, South Africa. Contact: Margi Page, Siyenza Management, Johannesburg, Gauteng, Gauteng, South Africa. Phone: 011 463 9184. Fax: 011 463 8432 Email: margi@siyenza.za.com URL: http:www.energyindaba.co.za

7-11 March 2011, International Gas Value Chain Course at The Netherlands. Contact: Rik Cents, Account Manager, Energy Delta Institute, Laan Corpus den Hoorn 300, Groningen, 9728JT, Netherlands. Phone: +31 (0) 50 524 8319. Fax: +31 (0) 50 524 8301 Email: cents@energydelta.nl URL: http://www.energydelta.org/en/mainmenu/executive-education/introduction-programmes/international-gas-value-chain

22-24 March 2011, World Biofuels Markets at Beurs - World Trade Center, Rotterdam. Contact: Claire Poole, Bioenergy Series Manager, Green Power Conferences. Phone: 44-203-355-4227 Email: claire.poole@greenpowerconferences.co.uk URL: www.worldbiofuelsmarkets.com

23-25 March 2011, 10th Offshore Mediterranean Conference at Ravenna, Italy at Ravenna Italy. Contact: Conference Secretariat, OMC, Viale L C Farini 14, Ravenna, 48121, Italy, Conference Secretariat, OMC, Viale L C Farini 14, Italy, Ravenna, 48121, Italy. Phone: 39-0544-219418 Email: conference@omc.it URL: http://www.OMC.IT

23-25 March 2011, 10th Offshore Mediterranean Conference at Ravenna, Italy. Contact: Conference Secretariat, OMC, Viale L C Farini 14, Ravenna, 48121, Italy. Phone: 39-0544-219418 Email: conference@omc.it URL: http://www.omc.i

28-30 March 2011, Energiemarkten at The Netherlands. Contact: Jasper Hofman, Account Manager, Energy Delta Institute, Laan Corpus den Hoorn 300, Groningen, 9728JT, Netherlands. Phone: +31 (0) 50 524 8308. Fax: +31 (0) 50 524 8301 Email: hofman@energydelta.nl URL: http://www.energydelta.org/en/mainmenu/executive-education/introduction-programmes/energiemarkten-2

4-6 April 2011, Master Class Gas Sales & Purchase Strategies in Liquid Markets at The Netherlands. Contact: Nynke Feenstra, Course Manager, Energy Delta Institute, Laan Corpus den Hoorn 300, Groningen, 9728JT, Netherlands. Phone: +31 (0) 50 524 8314. Fax: +31 (0) 50 524 8301 Email: feenstra@energydelta.nl URL: http://www.energydelta.org/en/mainmenu/executive-education/specific-programmes/master-class-gas-sales-purchase-strategies-in-liq

April 4, 2011 - September 14, 2012, Executive Master of Finance & Control of Energy Industry at several locations. Contact: Boryana Velinova - de Haan, Course Manager, Energy Delta Institute, Laan Corpus den Hoorn 300, Groningen, 9728JT, Netherlands. Phone: +31 (0) 50 524 8334. Fax: +31 (0) 50 524 8301 Email: velinova-dehaan@energydelta.nl URL: http://www.energydelta.org/en/mainmenu/executive-education/executive-master-programmes/executive-master-of-finance-control-for-t

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10-13 April 2011, 38th Intl Energy Conference and 32nd Intl Area Conference at Boulder, CO. Contact: Dorothea El Mallakh, Director, ICEED, 850 Willowbrook Rd, Boulder, CO, 80302, USA. Phone: 303-442-4014 Email: iceed@colorado.edu URL: www.iceed.org

13-14 April 2011, European Biomass to Power at Vienna, Austria. Contact: Justyna Korfanty, ACI Europe, 5/13 Great Suffolk Street, London, SE1 0DS, United Kingdom. Phone: 44-20-7981-2503 Email: jkorfanty@acieu.net

25-26 April 2011, 4th Annual NAEE/IAEE Intl Conf: Green Energy and Energy Security - Assessing the Options for Africa in a Global Energy Market at Abuja, Nigeria. Contact: Adeola Adenikinju, Nigeria Email: akiniwayemi@hotmail.com

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19-23 June 2011, 34th IAEE International Conference: Institutions, Efficiency and Evolving Energy Technologies at Stockholm, Sweden. Contact: Lars Bergman Email: lars.bergman@hhs.se URL: www.hhs.se/iaee-2011

June 29, 2011 - July 3, 2011, Western Economic Association International 86th Annual Conference at San Diego, CA. Contact: Meeting Coordinator, WEAI, 18837 Brookhurst St, Ste 304, Fountain Valley, CA, 92708, USA. Phone: 1-714-965-8800. Fax: 1-717-965-8829 Email: info@weai.org URL: www.weai.org

9-12 October 2011, Redefining the Energy Economy: Changing Roles of Industry, Government and Research at Washington, DC. Contact: David Williams, Executive Director, USAEE, 28790 Chagrin Blvd Ste 350, Cleveland, OH, 44122, USA. Phone: 216-464-2785 Email: usaee@usaee.org URL: http://www.usaee.org

10-12 October 2011, Energiemarkten at The Netherlands. Contact: Jasper Hofman, Account Manager, Energy Delta Institute, Laan Corpus den Hoorn 300, Groningen, Netherlands. Phone: +31 (0) 50 524 8308. Fax: +31 (0) 50 524 8301 Email: hofman@energydelta.nl URL: http://www.energydelta.org/en/mainmenu/executive-education/introduction-programmes/energiemarkten-2

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Volume 20, First Quarter, 2011

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