CONFERENCE PROGRAM AND ABSTRACTS OF THE PAPERS

THE LETTER OF CONFERENCE CHAIRS

Dear Colleagues,

It is our great pleasure to welcome you to the 6th Multinational Energy and Value Conference of CEVI. Thank you so much for being in Güzelyurt, we hope you will enjoy both the conference and the city. This conference is organized in collaboration with Middle East Technical University, N. Cyprus and Hacettepe University. We believe that the international academic cooperation between two Turkish universities and CEVI in the energy area, will further develop and reach to a higher ground throughout this conference.

We expect that the conference will be very beneficial for the energy sector in the current situation under the influence of Syrian war, energy security issues, Russia's Turkish stream project and transmission of East Mediterranean natural gas to European markets. The importance of international contacts and cooperation concerning energy finance has been steadily growing in the new energy scene where more secure, sustainable and competitive energy markets are needed.

The conference is organized in separate sessions in accord with the main objective of the ongoing CEVI conferences, aiming to create knowledge accumulation on energy and value issues for academic scholars and practitioners. The first day of the conference is the practitioner's day, in which current issues of energy markets will be discussed. The themes are *Trends in Renewable Energy Investments*, *Financing of Energy Projects*, *Regulatory Trends in the Energy Industry* and *Pipeline Projects & Political Risk*. Second day is devoted to presentations of 25 academic papers on energy issues under the themes of *Energy Markets*, *Energy Economics*, *Geopolitics*, *Natural Gas Markets* and *Energy & Finance*. We hope that there will be a great interest to all sessions of this conference and the knowledge accumulated will contribute much to the energy industry, small and medium enterprises, and academicians.

We, on behalf of the conference organizing committee, would like to thank particularly to Prof. Dr. Nazife Baykal (the Rector of METU, N.Cyprus) and Prof. Dr. Haluk Özen (the Rector of Hacettepe University) for their considerable support. Besides, we are grateful to our conference sponsor İşbank for their contributions. It is our pleasure to host Ersin Özince (Chairman - Board of Directors) as a Keynote Speaker. Our thanks are also due to the Energy Regulatory Board of Turkey and the Association of Natural Gas Distributors for their support.

This conference is realized through a team work. In addition to the Organizing Committee members we have benefited from the experiences of the co-chairs and members of the program committee. Prof. Andre Dorsman and Prof. Wim Westerman assisted us to set up the international network. We particularly thank to Mustafa Kaya, Dr. Yılmaz Yıldız and Dr. Kazım Barış Atıcı for their intense efforts in organizing the web site, submissions, all communications, and paper works.

Conference Chairs

Rafet Akgünay

Mehmet Baha Karan

CONFERENCE COMMITTEE

PROGRAM CHAIRS

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Mehmet Baha Karan – Hacettepe University, Turkey

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6th MULTINATIONAL ENERGY AND VALUE CONFERENCE
CONFERENCE PROGRAM - 18.05.2017

08:45--09:30	Registration
09:30--10:00	**Opening Speeches** Dr. Rafet Akgünay (Conference Chair) Prof. Dr. Haluk Özen (Rector - Hacettepe University)
10:00--10:30	**Keynote Speech** Ersin Özince (Chairman - Board of Directors - İş Bank)
10:30--10:45	**Coffee Break**
10:45--12:00	**Trends in Renewable Energy Investments** **Chair:** Prof. Dr. Andre B. Dorsman Peter Holm (Director - New Wave) Ali Kantur (President - İşbir Holding) Gerben van Staaten (International CEO - Walas)
12:00--13:30	**Lunch Break**
13:30--14:30	**Financing of Energy Projects** **Chair:** Prof. Dr. Mehmet Baha Karan Kayahan Karadaş (İş Bank) Wietze Lise (Mercados EMI, Ankara)
14:30--16:00	**Regulatory Trends in the Energy Industry** **Chair:** Dr. Rafet Akgünay Fazıl Şenel (Board Member EMRA (EPDK)) Yaşar Arslan (President - GAZBİR) Dr. Serkan Abbasoğlu (International Cyprus University) Dr. Murat Fahrioğlu (METU, N.Cyprus)
16:00--16:30	**Coffee Break**
16:30--18:00	**Pipeline Projects and Political Risk** **Chair:** Prof. Dr. Volkan Ş. Ediger Dr. Hayriye Kahveci-Ozgur (METU - N.Cyprus) John Roberts (Energy Security Specialist) Prof. Dr. John Simpson (CEVI)
18:00--19:30	**Welcome Reception**

6th MULTINATIONAL ENERGY AND VALUE CONFERENCE
CONFERENCE PROGRAM - 19.05.2017

	ISINI SPECIAL SESSION (Chair: M.B. Karan)				ENERGY ECONOMICS (Chair: V.Ş. Ediger)			
	ID	**Title**	**Authors**	**Discussant**	**ID**	**Title**	**Authors**	**Discussant**
09:30 -- 11:00	**22**	What drives working capital levels?	A.B. Dorsman, W. Westerman	R. Lubberink	**3**	How Does Turkey's Macroeconomy Response to the World Oil Prices Shock	A. Kapusuzoğlu, N. B. Ceylan	G. Büyükkara
	21	Exposed Industries in the EU ETS: Modelling Company Decisions on Output and Capacity	A. Nentjes, E. Woerdman	J. van Ophem	**20**	The impact of innovation in green energy on operating and market performances in the U.S.	Ö. Arslan-Ayaydın, J. Thewissen, W. Torsin	B.W. Pennink
	25	Responsible Governance of Innovation in an Industrial Context	R. Lubberink, V. Blok, J. van Ophem, S.W.F. Omta	W. Westerman	**4**	How to overcome the natural resource curse in Tanzania	V. Bekkers, B.W. Pennink	J. Thewissen
11:00--11:15	**COFFEE BREAK**				**COFFEE BREAK**			
	GEOPOLITICS (Chair: A.B. Dorsman)				**ENERGY MARKETS (Chair: W. Westerman)**			
	ID	**Title**	**Authors**	**Discussant**	**ID**	**Title**	**Authors**	**Discussant**
11:15--12:15	**9**	Geostrategic Challenges in the Oil and Gas Sectors	V.Ş. Ediger, İ. Berk	J. Roberts	**14**	Grouping OECD Countries Based on Energy Related Variables Using K-Means and Fuzzy Clustering	A. Hızıroğlu, A. Kapusuzoğlu, E. Cankal	M. Hasanov
	19	Geostrategic Importance of East Mediterranean Gas Reserves	J. Roberts	İ. Berk	**8**	Analysing the Relationship among Oil Prices and Basic Petrochemical Feedstocks	E. Hasanov, M. Hasanov	A. Araç
12:15--13:30	**LUNCH BREAK**				**LUNCH BREAK**			
	ENERGY MARKETS (Chair: R. Akgünay)				**NATURAL GAS MARKETS (Chair: W. Lise)**			
	ID	**Title**	**Authors**	**Discussant**	**ID**	**Title**	**Authors**	**Discussant**
13:30--15:30	**12**	System Dynamics Simulation to Explore Impact of Low European Electricity Prices on Swiss Generation Capacity Investments	R. Verhoog, P.V. Baal, M. Finger	A.B.Dorsman	**26**	A Cost Analysis of the Pipeline Routes from Caucasus and Central Asia Region to Europe	S. Başçı	M.B. Karan
	1	The evolution of electricity price on the German day-ahead market before and after the energy switch	A. Khoshrou, E. J. Pauwels, A. B. Dorsman	R. Verhoog	**5**	Effectiveness of Regulation: An Investigation of the Turkish Natural Gas Distribution Market	O. Yardımcı, M.B. Karan	S. Başçı
	24	Turkish Electricity Reform & Privatization of Electricity Distribution Sector	A. Sarısu, Y. Yalova, G. Topuz, Ö. Atay	G. Büyükkara	**18**	Ranking of Natural Gas Transmission Projects at the Southeastern Corridor: a Multi-Criteria Approach on the Countries of the Region	A. Ulucan, A. Özden, M.B.Karan	O.Yardımcı
	11	Volatility Spillovers between Energy and Stock Markets in G-7 Countries: A VAR-BEKK-GARCH Analysis	G. Büyükkara, H. Temiz	A. Sarısu	**2**	The Long Run Relationship between Natural Gas Prices and Oil Prices	A. Araç, M.B. Karan	F. Çınar
15:30--16:00	**COFFEE BREAK**				**COFFEE BREAK**			
	GEOPOLITICS (Chair: J. Thewissen)				**ENERGY & FINANCE (Chair: J. Simpson)**			
	ID	**Title**	**Authors**	**Discussant**	**ID**	**Title**	**Authors**	**Discussant**
16:00--17:30	**7**	Energy securıty in Natural Gas in Europe: Analysis of Needed infrastructure and Hurdles for implementation	W. Lise, J.D. Joode	V. Özdemir	**23**	The relationship between foreign direct investment and carbon dioxide emissions across a panel of countries	E. Telatar, N. Yaşar	S. Selçuk-Kestel
	27	Geostrategy of EU and Energy Union	A.B. Dorsman, P. Polak	W. Lise	**28**	Flexibility Modelling of Natural Gas Contracts with Respect to Equilibrium Prices:Istanbul Case	C.F. Yazıcı, S. Selçuk-Kestel, E. Kalaycı	N. Yaşar
	10	Geostrategic Importance of Energy Transit and a New Transit Regime under International Energy Charter?	V. Özdemir	A. B. Dorsman				
19:30	**GALA DINNER & CLOSING REMARKS (Prof. Dr. Nazife Baykal - Rector of METU N.Cyprus)**							

TABLE OF CONTENTS

SESSION I
(09:00-11:00)

ISINI SPECIAL SESSION (Chair: Mehmet Baha Karan)

What drives working capital levels? (ID: 22)

André B. Dorsman
VU University Amsterdam, The Netherlands

Wim Westerman
University of Groningen, The Netherlands

This study examines factors that influence the level of working capital. This can be measured by the length of the cash conversion cycle (CCC), the period it takes for investments in inventory to generate cash. The CCC is influenced by contingencies: cultures and habits, rules and regulations, information systems, economic conditions, markets and operations, as well as general factors: asset size, sales growth, solvency and liquidity. The article furthermore discusses several specific drivers of working capital, which are related to the accounts payables, inventory and accounts receivables cycles. While the created framework calls for country- and business-wise adaptations, it can yet inspire corporate managers and academic researchers, such as shown by an example case drawn from real world experiences. Another case reveals however, that the corporate philosophy cannot be neglected as a driver of working capital levels.

Keywords: working capital management, cash conversion cycle, drivers

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Exposed Industries in the EU ETS: Modelling Company Decisions on Output and Capacity (ID: 21)

Andries Nentjes
University of Groningen, The Netherlands

Edwin Woerdman
University of Groningen, The Netherlands

The European Union Emissions Trading Scheme (EU ETS) was originally conceived as a cap-and-trade scheme, but has been revised to incorporate elements from performance standard rate trading where output is higher. Although a phased transition is planned towards auctioning, allowances will still be handed out for free to energy-intensive industries exposed to international competition. Since 2013 the initial distribution of free allowances is based on benchmarks and production capacity. The PCO rules, which require a minimum use of capacity as an extra criterion for receiving free allowances have added to complexity. We examine how in an international oligopolistic market for the output of fuel intensive industry the change-over in rules will impact upon capacity and output of EU industry. Conclusion: the effects are consistent with an EU climate policy that has shifted away from giving highest weight to economic efficiency in the reduction of climate gases towards giving priority to keeping up output of exposed fossil fuel intensive industry and containment of carbon leakage.

Keywords: European Union Emissions Trading Scheme (EU ETS), exposed sector, cap-and-trade, credit trading, carbon leakage, Cournot oligopoly.

Responsible Governance of Innovation in an Industrial Context (ID: 25)

R. Lubberink
Wageningen University, The Netherlands

V. Blok
Wageningen University, The Netherlands

J.A.C. van Ophem
Wageningen University, The Netherlands

S.W.F. Omta
Wageningen University, The Netherlands

This paper aims to contribute to the ongoing conceptual debate on responsible innovation, and provides innovation practices and processes that can help to implement responsible innovation in the business context. Based on a systematic literature review of 72 empirical scholarly articles, it was possible to identify, analyse and synthesise empirical findings reported in studies on social, sustainable and responsible innovation practices in the business context. The synthesis of the included articles resulted in a refined framework for responsible innovation in the business context. This framework includes an overview of innovation practices and processes that can enhance the dimensions of responsible innovation: anticipation, reflexivity, inclusion, deliberation, responsiveness and knowledge management. Additionally, knowledge gaps are identified and a research agenda for responsible innovation is proposed. This review can therefore serve as a next step in the theoretical and practical development of responsible innovation in general, and in the business context in particular.

ENERGY ECONOMICS (Chair: Volkan Ş. Ediger)

How Does Turkey's Macroeconomy Response to the World Oil Prices Shock (ID: 3)

Ayhan Kapusuzoğlu
Yıldırım Beyazıt University, Turkey

Nildağ Başak Ceylan
Yıldırım Beyazıt University, Turkey

The purpose of this study is to examine the relative impact of Brent to WTI prices on the macroeconomic variables such as industrial production, and inflation rate, overnight interest rate, real exchange rate, and stock exchange for Turkey. The effects are investigated using monthly data for the period 2006:07-2015:12. A structural vector autoregressive (SVAR) model is employed for the analysis. Impulse response functions are obtained to assess the relative impact of oil price shock to macroeconomic variables. According to the empirical findings, it is found that BO increases stock return, real exchange rate, domestic interest rate, industrial production, foreign interest rate relative to WTI. For inflation, WTI decreases domestic interest rates contemporaneously and for the first three periods. BO decreases inflation rate more than WTI. A one standard deviation shock given to WTI oil price increases stock returns and inflation rate contemporaneously but decreases at periods 3 and 4. On the other hand, WTI oil price decreases industrial production and foreign interest rate.

Keywords: Oil Prices, Stock Market

The impact of innovation in green energy on operating and market performances in the U.S. (ID:20)

Özgür Arslan-Ayaydın
University of Illinois at Chicago, USA

James Thewissen
Katholieke Universteit Leuven, Belgium

Wouter Torsin
Katholieke Universteit Leuven, Belgium

This chapter investigates the impact of corporate innovation in green energy on operating and market performances. Given that the U.S. government annually invests 0.7 billion in green energy R&D, does corporate research in green energy actually pay off? We answer this question by using a sample of about 130,000 patents granted by 206 U.S. firms, ranging from a period between 1975 - 2006. We find evidence that the patent value is positively and significantly associated with firm performance in a long-term window. Our results, however, also show that when the patents are green, the effect on operating performance is negative. We additionally provide evidence suggesting that the cumulative abnormal returns in a long-term window around the announcement date of the patent are positively associated with the value of the patent. Besides, this effect is negative when innovations concern green energy. This indicates that investors attach less value to innovation in green energy, thus discouraging firms to pursue socially beneficial innovations, and giving an argument to policymakers to subsidize green energy innovations to compensate for reduced market value.

How to avoid the natural resource curse in Tanzania (ID: 4)

Vera Bekkers
University of Groningen, The Netherlands

Bartjan W. Pennink
University of Groningen, The Netherlands

This research aimed to uncover factors that can help developing countries with significant amounts of natural resources in avoiding the so-called 'natural resource curse'. Previous studies show mixed results; some countries show a surge in economic growth, whereas others end up with conflicts and environmental degradation, i.e. the natural resource curse. Posing local economic development and innovation as sources of national economic growth (the antithesis of the natural resource curse), this case study involved semi-structured interviews with various local stakeholders on the topic of recent natural gas findings in Tanzania. From the analysis of the interview data, a number of factors were uncovered that may lead to positive outcomes of resource exploitation and to chances to incorporate the interests of local communities. These factors include (1) *the government,* (2) *knowledge and education,* (3) *local participation,* (4) *revenues,* (5) *transparency,* (6) *legal issues, and* (7) *finance and capital*. Then, three scenarios were developed that give deeper insight into possible futures for the natural resource exploitation, using the previously identified factors. Lastly, a multi-criteria analysis (MCA) showed that the importance ranking of these factors is stable across a measure of needed change and a measure of uncertainty in the future. These seven factors then, can be seen as crucial for a successful exploitation *and* for creating opportunities for the local actor. Combining the qualitative scenario descriptions with a more quantitative MCA approach strengthens the results of this research.

Keywords: natural resource curse, local economic development, innovation in developing countries.

SESSION II
(11:15-12:15)

GEOPOLITICS (Chair: Andre B. Dorsman)

Geostrategic Challenges in the Oil and Gas Sectors (ID: 9)

Volkan Ş. Ediger
Kadir Has University, Turkey

İstemi Berk
Dokuz Eylül University, Turkey

This chapter identifies the major geostrategic challenges that have emerged during the last two decades and assesses their implications for the global oil and gas sectors. The historical development of oil prices shows that there have been two major periods of volatility, 1973-1986 and 1998-present, each of which was preceded by two relatively stable periods. The two oil price shocks of the 1970s that were triggered by geopolitical events had long-term effects on global politics and economics. Major oil and gas producers faced the challenges of declining consumption on the demand side, as consumers turned to alternative energies, energy efficiency improved, and non-Organization of Petroleum Exporting Countries (OPEC) oil supplies increased. The crisis in the 2000s, on the other hand, had similar but more intense consequences, deeply altering the structure of oil and gas markets. We identify two major challenges facing the oil and gas industry: energy substitution and resource scarcity. While the substitution of coal and renewables threatens to reduce oil and gas demand, resource scarcity is expected to promote the development of unconventional hydrocarbon resources such as shale oil and gas and heavy oil. Unlike in the 1970s, oil consumption did not decline when oil prices peaked in the 2000s. Moreover, the recent fall in oil and gas prices created a fiscal challenge for conventional producers, such as OPEC countries, and non-OPEC countries like Russia and Mexico, whose governmental budgets depend on export revenues. These fiscal challenges are expected to increase competition between national oil companies (NOCs) and international oil companies (IOCs), necessitating structural change in the governance of the industry. The NOCs are expected to continue dominating the industry and due to the increasing intervention of the corresponding governments, the next decades could experience a rise in state capitalism not only in major oil and gas producing countries but also in the global energy business.

Keywords: Oil and gas sectors; geostrategic challenges; structural changes; NOCs and IOCs; state capitalism

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Geostrategic Importance of East Mediterranean Gas Reserves (ID: 19)

John Roberts
Energy Security Specialist

East Mediterranean gas is clearly capable of playing a significant role in regional gas supply but its importance in a broader, essentially European, context remains limited so long as market prices in Europe remain low and subject to prospective or actual competition between Russian pipeline gas and US liquefied natural gas. Moreover, even in a regional context there are a significant number of problems that have the potential to postpone or even prevent full field development in key East Med gasfields. These include the issue of whether Israeli gas can find export outlets in Egypt and Turkey as well as local opposition to planned supplies to Jordan and the Palestinian Authority.

This paper will address the issue by focusing on elements specifically relating to the production of gas for export. It will address the issue of whether export-oriented gas production in the Eastern Mediterranean will be pursued on a multilateral basis or primarily through bilateral arrangements.
It will specifically address some core issues. These include:

- Prospective supplies from Israel to Egypt, where there are problems concerning both the commercial arrangements for such sales, which could be used as feedstock for revived Egyptian LNG exports, and the willingness – or reluctance – of the Israeli authorities to rely on a partner which has so recently proved unable to ensure contracted deliveries in the opposite direction. It will directly address the question of whether Egypt needs gas supplies from its neighbours to justify the resumption of exports or even whether it is interested in such exports in the first place.
- The issue of Israeli pipeline deliveries to Turkey and the core question of how the necessary infrastructure pipeline to connect Israel's offshore fields to the Turkish market would cope with the issue of transit through the exclusive economic zone of the Republic of Cyprus or across Cyprus itself. It will also address the issue of Israeli gas sales to Jordan and the Palestinian Authority.
- Gas issues concerning Cyprus itself, including the impact on gas development of ongoing negotiations between the Greek and Turkish communities in Cyprus. In particular, it will seek to address the question of the extent to which the development of the country's relatively small volume of already proven reserves can take place in a currently febrile environment and whether the discovery of further reserves might on the one hand prove necessary to ensure overall development and yet, on the other, might serve as a catalyst either for the conclusion of a successful agreement between Greek and Turkish Cypriots or for the termination of such talks.

It will conclude with an analysis of the attitude of Turkey to regional developments, notably in Cyprus, and the issue of Turkey's role as a potential transit state for the transport of gas from the Eastern Mediterranean to wider European markets.

ENERGY MARKETS (Chair: Wim Westerman)

Grouping OECD Countries Based on Energy Related Variables Using K-Means and Fuzzy Clustering (ID: 14)

Abdulkadir Hızıroğlu
Social Sciences University of Ankara, Turkey

Ayhan Kapusuzoğlu
Yıldırım Beyazıt University, Turkey

Erhan Cankal
Yıldırım Beyazıt University, Turkey

The main purpose of this study is to examine the relationships between energy consumption, CO_2 emission and economic growth for 28 OECD countries and to form clusters based on the findings. The study is carried out under the 1990-2010 period, considering the annual data, the average annual values for each country are calculated and the countries are grouped by taking into account the main energy variables. This study examined OECD countries into three groups to form more specific clustering, rendering to test the hypotheses in current empirical studies, and examining the relationships of the interacted variables for within and inter cluster countries.

Keywords: Energy Consumption, CO_2 Emission, Economic Growth, Fuzzy Clustering

Analysing the Relationship among Oil Prices and Basic Petrochemical Feedstocks (ID: 8)

Elkhan Hasanov
SOCAR Capital, Azerbaijan

Mübariz Hasanov
Okan University, Turkey

In this paper we analyse the relationship among crude oil prices and prices of basic petrochemical feedstocks. In particular, we estimate dynamic effects of Brent oil prices on naphtha, benzene, ethylene and propylene. Using the monthly data over the period 2000:M1-2015:M2, we first analyse cointegration properties among these variables using bounds testing approach. Then we estimate error correction models to assess long- and short-run effects of oil price changes on prices of these petrochemical feedstocks. We find that naphtha prices move one for one with oil prices in the long run. Prices of other feedstocks react less than unity in the long run. We also find that only prices of benzene and naphtha react more than unity in the short run whereas prices of propylene and ethylene react less than unity to changes in oil prices. This study feels a major gap in the empirical literature. Although the dynamic interactions among oil prices and fuels as well as other macroeconomic and financial variables have been widely investigated in the literature, the relationships between oil and petrochemicals prices have not been investigated yet. Thus, our study feels the gap in the literature. Second, the results of this study have nice and clear policy implications. In particular, we find that prices of basic petrochemicals do not move one for one with oil prices. This finding implies that oil price fluctuations are not fully transmitted to prices of petrochemical products, which are one of the important intermediate goods for many industries. Therefore, this result explains why oil price changes have only limited effects on economy. Furthermore, this result also implies that petrochemical goods can be used as a hedging instrument by oil companies and oil exporting countries against oil price falls.
Keywords: Oil prices, petrochemicals' prices, cointegration, Granger-causality

SESSION III
(13:30-15:30)

ENERGY MARKETS (Chair: Rafet Akgünay)

System Dynamics Simulation to Explore Impact of Low European Electricity Prices on Swiss Generation Capacity Investments (ID: 12)

Reinier Verhoog
École Polytechnique Fédérale de Lausanne, Switzerland

Paul van Baal
École Polytechnique Fédérale de Lausanne, Switzerland

Matthias Finger
École Polytechnique Fédérale de Lausanne, Switzerland

European electricity markets are coping with low energy prices as a result of overinvestments in generation capacity and the financial crisis of 2008. In this chapter we explore the implications of low electricity prices in the Swiss electricity market, which is facing the additional challenge of phasing out nuclear power plants and market liberalization. System Dynamics is utilized to model and simulate the long-term impact on investments in new generation capacity, security of supply and future electricity prices. Monte Carlo simulation results indicate that the current low electricity prices are likely to persist for another decade. The most likely response to the low prices is an underinvestment in generation capacity, with the risk of an energy crisis and price spikes as it coincides with the decommissioning of nuclear power plants. Furthermore, results indicate the presence of investment cycles of around ten to fifteen years. Finally, on the long-term we observe a shift towards renewable energy sources and natural gas fired power plants, resulting in more volatile electricity prices. These findings are similar to earlier studies of the liberalized German and Belgian electricity markets, which are also facing the challenges of a nuclear phase-out under depressed European prices.

Keywords: electricity market, electricity prices, system dynamics, simulation, Switzerland, investment cycles

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The evolution of electricity price on the German day-ahead market before and after the energy switch (ID: 1)

Abdolrahman Khoshrou
Centrum Wiskunde & Informatica (CWI), The Netherlands

Eric Pauwels
Centrum Wiskunde & Informatica (CWI), The Netherlands

André B. Dorsman
VU University Amsterdam, The Netherlands

In Europe, Germany is taking the lead in the switch from fossil and nuclear energy to renewables. This creates new challenges as wind and solar energy are fundamentally intermittent and to some degree, unpredictable. It is therefore of considerable interest to investigate what effect these changes have on the overall trend and volatility of the electricity price. While market coupling promises to reduce price volatility, dependence on renewable energy sources (RES) might have the opposite effect. To elucidate

the combined impact of these two developments, we investigate the evolution of the electricity price on the German day-ahead market over the course of the last 11 years (2006-2016). Our main observations are that price volatility has decreased rather than increased. Furthermore, excess wind production during off-peak hours correlates well with the occurrence of negative prices. Finally, daily price profiles show a gradual shift in peak-prices away from the day-light hours, and this shift is more pronounced during the summer than in winter. This points to a growing influence of solar production on prices.

Turkish Electricity Reform & Privatization of Electricity Distribution Sector (ID: 24)

Ayhan Sarısu
Anka Technology University, Turkey

Yüksel Yalova
İstanbul Aydın University, Turkey

Gökmen Topuz
İstanbul Technical University, Turkey

Özlem Atay
Ankara University, Turkey

After the liberalization policies, which started in early 2000s in Turkey, performance of electricity sector has been evaluated. Electricity market liberalization reforms basically changed the market structure. This market change directly affected the behaviors of market agents and performance of the sector. In this study, the recent developments in the Turkish electricity distribution sector and the privatization practices have been discussed in the context of private sector visibility of public services and the related processes, applied policies, technical studies and reports. Changes in the Turkish electricity sector were provided within the framework of the periods. The development of the sector is explained from the perspective of Turkey. The study presents the historical background of the privatization of Turkish electricity distribution market. The reflections of privatization in the electricity distribution sector are discussed. Then, electricity market performance based on the data ensured by the primary figures in the sector are evaluated in terms of indicators such as prices, investment, capacity utilization rates, costs and profitability. In the past years, important improvements were achieved in the direction of liberalization of the sector. But key indicators of the success for the reform and liberalization indicate that performance of the electricity sector is relatively not strong. In this regard, capacity utilization ratios are not increased the cost of electricity generation and price of electricity is not decreased. Moreover, the institutional financial situation in sector seemed not stable. Especially, the investment, which constitutes the important goal of the reform, is not successful over the years. The electricity distribution sector's poor performance implies some problems for implementation of the reform and privatization in Turkey. As a conclusion, solution suggestions to the problems encountered in the privatization of the electricity distribution sector has been developed.

Keywords: Performance and efficiency of the Turkish electricity market, Turkish electricity reform, performance indicators, privatization of the electricity distribution sector in Turkey.

Volatility Spillovers between Energy and Stock Markets in G-7 Countries: A VAR-BEKK-GARCH Analysis (ID: 11)

Göknur Büyükkara
Hacettepe University, Turkey

Hüseyin Temiz
Hacettepe University, Turkey

Understanding time varying volatility and the volatility transmission mechanisms between energy prices and stock markets is essential for researchers, academicians, investors and policy makers. In fact, all investors would want to know how the risk and value of their portfolios are affected by important fluctuations in oil prices especially in recent years. In this study we analyze the volatility transmission between oil prices and stock markets of G-7 countries in a multivariate GARCH framework setting. Two reasons motivate this study: First, there is a common trend between oil and stock market prices. Second the articles that search the volatility transmission between major developed financial markets and global crude oil market within a multivariate setting are limited. We employ a VAR-BEKK-GARCH analysis that employs BEKK representation of GARCH in a VAR framework. Using the daily data over the recent period of 2014-2015, we mainly find evidence of significant return and volatility spillovers between oil and stock markets in G-7 countries by VAR-BEKK-GARCH method. Our results figures out that spillover effects are stronger for all countries and the transmission of volatility is apparent from both oil markets to stock markets and stock markets to oil markets in all 7 countries.

Keywords: Volatility, Spillover effect, VAR-BEKK-GARCH, Oil market

NATURAL GAS MARKETS (Chair: Wietze Lise)

A Cost Analysis of the Pipeline Routes from Caucasus and Central Asia Region to Europe (ID: 26)

Sıdıka Başçı
Yıldırım Bayezit University, Turkey

This paper aims to give some policy suggestions about the natural gas pipeline routes from Caucasus and Central Asia region to Europe after making a cost analysis. Although there are lots of studies on pipeline routes for the region mentioned, most of them are political and related to the international relation discipline. The economic aspects are not studied very much. However, in fact, large-scale projects should be designed by using the most effective ways in order to decrease the cost of the project. Since natural gas pipelines are also large-scale projects and moreover they are static infrastructures for natural gas transfers where it is very hard to make changes once they are build, decisions about the routes of the pipelines need very careful analysis. If a failure occurs, the financial and environmental costs can be enormous, even in some cases it can cause the shutdown of the project. Transfer of natural gas from Caucasus and Central Asia Region to Europe is an important issue for European Countries because most of the European Countries are energy dependent. The Ukraine – Russia natural gas crises which accured at the beginning of 2009 is a real example of the problem. There are two approaches to determine the routes of least-cost. One of them is Geographic Information System (GIS) and the other one is Optimization Approach. This paper using these approaches, tries to make an analysis of determination of the efficient pipeline routes from Caucasus and Central Asia region to Europe. This determination can be a suggestion of routes obtained in a more technical way, independent of the politics but still giving some policy suggestions.

Effectiveness of Regulation: An Investigation of the Turkish Natural Gas Distribution Market (ID: 5)

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The Turkish Natural Gas Market Law, being enacted under the influence of the structural reforms going on in Europe, was aimed at a liberal market model. In this context, it was planned to create competitive markets or produce the results of a competitive environment by regulations in the natural monopoly activities.

The main objective of the law put forward is that of ensuring the supply of natural gas at high quality and low prices to consumers in an environmentally sound manner under competitive conditions, which requires effective regulation especially considering natural monopoly activities. The results obtained from the regulation of these activities that require high investment costs on the part of the companies, are one of the important tools for testing the success of the regulatory authority developed under this law.

In this study the effectiveness of regulation was investigated via examination of the various implementations and the efficiency, productivity and service quality analysis of the distribution companies. While touching upon the main elements of the intended market model, the results were taken into account mainly with regard to the effectiveness of regulation rather than in drawing conclusions with respect to economic paradigms, like market failure.

The important regulations with regard to the natural gas distribution sector were analyzed within the scope of the difference between the various planned and recognized situations. Thus it was understood that some of the regulations did not produce effective results. Particularly the comparison between private and public companies concerning their performance and R&D expenditures revealed the alienation experienced from the expected benefits of liberalization. The regulations to encourage sector development and cost reduction through R&Ds have not been properly implemented. The obtained results are considered as partially regulatory failure.

Keywords: natural gas, distribution, natural monopoly, effective regulation, regulatory failure

Ranking of Natural Gas Transmission Projects at the Southeastern Corridor: a Multi-Criteria Approach on the Countries of the Region (ID: 18)

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The southern energy corridor of Europe has been the subject of major political developments and investment projects over the last decade. While energy security for the European Union is important, the natural gas projects in this region will not only provide energy security for the countries of the region but also provide significant economic benefits. Especially, the explorations and developments in the gas fields and projects of the region, create an opportunity for Turkey and Israel to invest in alternative of natural gas projects. In this study, it was investigated whether the interests of the two countries overlapped by using a multi-criteria decision making technique, namely ELECTRE. Firstly, the available and potential gas transmission projects for Turkey including LNG are ranked using quantitative and qualitative variables such as investment cost, geopolitics, country risk, trade volume Then this methodology is reemployed to the gas supplier neighbor countries which have options to use Turkish territory with their other alternative gas transmission plans and evaluated the importance of Turkey. Lastly, sensitivity analysis applied using parameters of different scenarios to reflect the uncertainties in the decision-making process. This study has shown that the Israel-Turkey Offshore Pipeline Project is a priority for both countries. Moreover, our work has shown that scenarios that would make the second priority project of the aforementioned countries more important are not realistic. The study confirms the importance of Turkey for the Southern Corridor. The main contribution of the paper is using multi-criteria analysis for different countries with a comparative ability of the results.

Keywords: Southern Corridor, Natural Gas, Pipeline Projects, Multi Criteria Decision Making

The Long Run Relationship between Natural Gas Prices and Oil Prices (ID: 2)

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Although the recent increases in natural gas production have accelerated the establishment of free markets for natural gas trade, the results of the studies investigating whether or not the natural gas prices are determined by free market conditions are mixed in the related literature. In this study, we aim to explore the co-movement of natural gas prices and oil prices in the long run. To this end, we employ the panel cointegration tests introduced by Pedroni (1999) for a panel of natural gas exporting countries, including the US, Canada, Norway, the Netherlands, Russia, Australia and Indonesia. We use monthly data from July 2003 to December 2013. The results of this study show that natural gas and oil prices move together in the long run, which indicates the intensive use of oil-indexed natural gas prices in long-term sales contracts.

Keywords: Natural Gas Exporting Countries, Natural Gas Price, Oil Price, Panel Cointegration

SESSION IV
(16:00-17:30)

GEOPOLITICS (Chair: James Thewissen)

Energy securıty in Natural Gas in Europe: Analysis of Needed infrastructure and Hurdles for implementation (ID: 7)

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The European Commission (EC) has acknowledged for several years the importance of securing in the long run its increasing gas demand from supplies from a limited neighboring countries and regions. This also includes the infrastructure of gas and electricity markets and gas corridors with key suppliers. In addition to the public goal of gas *availability*, the *affordability* and *acceptability* of getting the resource at the end-consumer are also major policy concerns.

This paper focuses on the assessment of the required gas supply infrastructure for connecting the EU markets with its key gas suppliers in Russia, South East Europe, Middle East and North Africa as well as with other LNG sources in the future and their timing. The seasonal swing in consumption and the need for storage to meet this demand variation is also taken into consideration.

In this paper, we assess first the gas infrastructure until 2030. This assessment makes use of the GASTALE model of the European gas market, which can calculate the investments needed for pipelines, LNG transport and storage. In addition, the market prices can be obtained. The tool can also assess the impact of gas supply disruptions on gas prices.

The potential economic and geopolitical barriers that might hamper the implementation of optimal gas corridors are identified and we propose recommendations for EU policy and regulation. We find that both uncertainty regarding future policy and regulation applicable to the investment as well as co-ordination issues surrounding the investment negatively contribute to energy corridor investment issues. A larger role for EU coordination on development of a common gas infrastructure regulatory framework is suggested.

The results of the paper provide useful insights in gas infrastructure requirements connecting the EU gas markets with our key suppliers.

Keywords: Gas demand and supply, gas infrastructure and investments, gas market competition and regulation

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Geostrategy of the EU and Energy Union (ID: 27)

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By 2035, the EU's reliance on imported oil is projected to increase to over 90% (from around 80% today), and its dependency on gas imports is expected to rise to over 80% (from around 60%). Europe's high dependency on foreign energy sources, combined with the recent developments at its Eastern border, has raised the question of the EU (European Union) energy policy response more valid than ever. Main problem is that a position of the EU member countries is not the same. Some of the member countries - especially Baltic states, Finland, Slovakia, Bulgaria and Greece - are highly dependent on importing gas from Russia, while the others import gas from Russia but are protected from disruptions, whether because they have sufficient storage capacity, or they have a very strong, long-lasting, and established commercial and political relationship with Russia (Germany and Italy). Some countries, e.g. Belgium, Sweden, Denmark, Croatia, Spain, do not import gas from Russia directly at all and therefore have no formal contracts with Gazprom. Such a difference between various EU member countries makes it difficult to speak with one voice.

Because most of the Europe's gas from Russia comes via Ukraine, it risks transit disruptions due to Ukraine's situation as well as Russia-related risks.

On 20-21 March 2014, the European Council discussed the issue of EU energy security. It concluded that "efforts to reduce Europe's high gas energy dependency rates should be intensified, especially for the most dependent Member States." Progress made since the 2006 and 2009 energy supply crises in creating a common energy market and implement mechanisms that would ensure the security of supply has been insufficient. The EU remains vulnerable to political pressure due to its high dependency on oil and gas imports. Its room for manoeuvre vis-à-vis Russia is limited, and its efforts in the current crisis have been less effective as a result.

This text proposes a set of measures that address the EU's energy dependency challenges. Its implementation could lead to the creation of a genuine "Energy Union" in Europe. All the measures and instruments should be introduced based on the Treaties with full respect for the current balance of competencies between the EU institutions and Member States and the sovereign right of Member States to determine their own energy mix.

This paper shows the possibilities of the Energy Union/European Union to deal with the oil and gas dependency of non-EU countries and especially the dependency of Russia. The relationship between EU and Russia is a two-side dependency, that is not only economically but also politically driven. In the near future this two-side dependency will not diminish. This paper shows that a strong Energy Union improves the position of the European Union Countries.

Geostrategic Importance of Energy Transit and a New Transit Regime under International Energy Charter? (ID: 10)

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The energy transit, which frequently covers transport and access issues, constitutes one of the critical components of energy supply chain. A robust energy trade can only take place with access to a well-connected and well-managed transmission network. Issues such as feasibility of investments, non-discriminative access to infrastructure and related legal regulations have elevated energy transit security to top of the energy security agenda. With growing interdependence, suppliers and consumers alike have become even more concerned about transit security. Search for a reliable transit of energy goes parallel with the multi-dimensional, evolving and administrative nature of energy security as well as geostrategic calculations of the leading actors. Currently there is not any internationally binding agreement which regulates the energy transit. There has been discussion on an international transit protocol under the Energy Charter Treaty for decades but the process has not resulted in a concrete product. Nevertheless, rather than a global one, a more modest form of transit regime could be applicable for a specific region. In this paper, geostrategic importance of energy transit and possibility of a new regime under International Energy Charter will be discussed with a specific reference to geopolitical and market related developments of Eurasia where such kind of a regional transit community could be achieved.

Keywords: Geopolitics of energy, energy transit, International Energy Charter, Eurasia

ENERGY & FINANCE (Chair: John Simpson)

The relationship between foreign direct investment and carbon dioxide emissions across a panel of countries (ID: 23)

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Çankaya University, Turkey

The relationship between foreign direct investment, growth and energy consumption has been investigated extensively in the economic literature. Recently, focuses of the researchers have been moved towards the use of renewable sources in the process rather than use of non-renewable for example, e.g. fossil fuels. It is well documented that renewable sources have several advantages over fossil type of sources. It is clear that using renewable sources significantly reduce carbon dioxide emissions. Meanwhile, both developing and developed countries are showing great interest in engaging to use clean energy in production process by signing some international protocols. Kyoto Protocol in 1997 is the good example.

Investment in energy is growing and so carbon dioxide emission is also growing. Foreign direct investment is considered one of the most important sources of financing energy projects in both developed and developing countries. More than 1 trillion US dollars have been invested into energy project over the last decade.

This paper investigates the relationship between foreign direct investment inflows (FDI) and pollution emissions from energy use for a panel of countries categorized into four group based on World Bank income categorization (high, upper middle, lower middle and low income). The main motivation of this study comes from the fact that environmental concerns are spreading everywhere in both developed and developing countries. Particularly, changing climate and depleting natural resources are one of major concern all over the world. In general there are two competing schools of thought that explain FDI-environment relationship, namely classical comparative advantage theory and neo-technology trade perspective. Our study not only adds to the literature in terms of a wide panel countries but also adds to the discussions whether the results change depending on countries level of development or not.

Flexibility Modelling of Natural Gas Contracts with Respect to Equilibrium Prices: Istanbul Case (ID: 28)

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This paper aims to develop a novel algorithm based on all contractual and technical real-world constraints for a gas import/wholesale company in the concept of flexibility. The Mixed Integer Linear Program (MILP) is applied to a portfolio of contracts to produce the optimal amount of purchases pipeline natural gas (PNG) agreements, spot natural gas purchases, natural gas storage use levels and

LNG purchases based on a real life case under various commitments such as Monthly Contract Quantity (MCQ), Annual Contract Quantity (ACQ), pipeline capacity, LNG and storage constraints. Multivariate Adaptive Regression Splines (MARS) is applied to the natural gas demand to determine its future movements by incorporating inputs such as heating degree days (HDD), cooling degree days (CDD) and one-period earlier gas supply realizations. The output of the proposed model enables local distribution companies (LDCs) to develop criteria on producing the optimal future natural gas purchases based on different oil scenarios. Along with World Bank (WB) oil forecasts, we suggest a stochastic model (ARIMA) based on historical oil prices. A case study on a local distribution company in ˙Istanbul city is employed to illustrate the long term gas purchase price curves for different Take-or-Pay (ToP) rates which is aimed to guide the LDCs on their willingness to pay for long term natural gas contracts. The main outcome of this article is the determination of the long term price curves for LDCs under demand and supply constraints and an application for the ˙Istanbul natural gas market for the first time in literature.

Keywords: Natural Gas, Consumption Forecast, Multivariate Adaptive Regression Splines (MARS), Mixed Integer Linear Programming (MILP), Optimal Contract Decision, ARIMA, Oil Price.


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