
7TH MULTINATIONAL ENERGY AND VALUE CONFERENCE
MAY 23-25 2019 OSTİM Ankara Turkey
OSTİM TECHNICAL UNIVERSITY ANKARA
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OSTIM Technical University, Ankara, Turkey
Center for Energy and Value Issues (CEVI), Amsterdam, Netherlands
Energy Markets Research and Application Center of Hacettepe University, Ankara, Turkey
Ostim teknopark
OSTİM ENERJİK
www.ostimteknik.edu.tr - www.centerforenergyandvalue.org
energycongress@ostimteknik.edu.tr - kba@hacettepe.edu.tr
yilmazyildiz@hacettepe.edu.tr

THE LETTER OF CONFERENCE CHAIRS

Dear Colleagues,

It is our great pleasure to welcome you to the 7th Multinational Energy and Value Conference of CEVI. Thank you so much for being in Ankara, we hope you will enjoy both the conference and the city. This conference is organized in collaboration with Ostim Technical University 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.

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 *Energy Projects and Economics, Financing of Energy Projects, Energy Efficiency and The Role of SMEs in Energy Equipment Production*. The second day is devoted to presentations of 36 academic papers on energy issues under the themes of *Electricity Markets, Energy Economics, Energy Politics, Environment, Renewable Energy, Energy Efficiency, Oil &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 Orhan Aydın (the President of OSTIM Foundation), Prof. Dr. Murat Yülek (the Rector of Ostim Technical University) and Prof. Dr. Haluk Özen (the Rector of Hacettepe University) for their considerable support. We are also grateful to Hakan Ünsal, Dr. Tamer Saraçyakupoğlu and Dr. Doğan Karadoğan from Ostim Technical University, Yaşar Çelik and Pınar Yalman Akcengiz from OSTIM Renewable Energy and Environmental Technologies Cluster and OSTIM Technopark for their efforts to host and organize the conference.

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. We are grateful to Prof. Dr. André Dorsman and Prof. Dr. Wim Westerman form CEVI and Johannes Platje form ISINI group for assisting us to set up the international network. We particularly thank to Dr. Kazım Barış Atıcı for their intense efforts in organizing the web site, submissions, all communications, and paper works.

Conference Chairs

Prof. Dr. Murat Yülek

Prof. Dr. Mehmet Baha Karan

Prof. Dr. Aydın Ulucan

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PARALLEL SESSION I
(09:30-11:00)

ISINI SPECIAL SESSION (Chair: Mehmet Baha Karan)

Ignorance management – critical elements of an Early Warning System (EWS) for unexpected events threatening company viability (ID: 33)

Joost Platje
WSB University in Wroclaw, Poland

Black Swans, also called unknown unknowns, or unimagined unexpected events, can threaten the viability and functioning of an organization when significant vulnerabiities and fragilities exist (Taleb, 2012). A company should identify the fragilities, and deal with them, as this is one way to deal with Black Swans. However, a probably more important issue is ignorance of threats than could be known, i.e., unknown knowns (Amoyette et al., 2014). In this context, the paper discusses the basis elements of a so-called Early Warning System (EWS), which enables an organization to react and being prepared "unknown unknowns", which rather may turn out to be "unknown knowns", as there are often some weak signals available, or information is available among stakeholders within or outside the organization. The EWS can function as a kind of "smoke detector". An EWS should include a cognitive-behavioural managerial element, as formal models may miss weak signals (Bertoncel et al., 2018). "Early warning systems serve as a key management tool for anticipating potential disasters or other negative events (Trzeciak and Rivers, 2003)." (quote from Bertoncel et al., 2018, 407). They help to identify, screen and appraise warning signs, and respond to them (Bertoncel et al., 2018, 412). An EWS is needed as people tend to be unable "to acknowledge black swans [because they] tend to focus on things already known to us, and therefore fail to consider those for which we lack knowledge (Anyotte et al., 2014, 1)."

Based on explorative case studies of small companies and literature study, determinants and elements of an EWS will be discussed. First of all, there is lack of awareness of vulnerability and fragility issues Mandelbrot and Hudson, 2008; Taleb, 2012), functional stupidity (Alvesson and Spicer, 2010), lack of general trust (Raiser, 1997, 1999) and adherence to technocentric paradigm (Gladwin et al., 1995) reducing the capacity to create an EWS. Functional stupidity can be defined as „an absence of reflexivity, a refusal to use intellectual capacities in other than myopic ways, and avoidance of justifications (Alvesson and Spicer, 2012, 1188)." It consists of reflexivity (the ability and willingness to discuss and question existing knowledge, rules, norms of behavior, etc. (Alvesson and Sköldberg, 2009)), justification (reasons and explanations for decisions are provided (see Boltanski and Thévenot, 2006)), and substantive reasoning (this lacks when focus is on narrow or short-term aims, and broad perspectives are not considered).

The worldview considered for research is the techno-centric paradigm. This concerns the belief that technology and economic growth can solve all different types of problems (Gladwin et al., 1995). When believing all problems can be solved by engineering and use of more resources, this is likely to lead to neglect of events that can cause significant, irreversible damage to the company or region.

A high level of general trust (trust in people in general) facilitates the cooperation with people with new ideas. It makes the organization more adaptively efficient (Raiser, 1997, 1999). Trust between stakeholders within the company is important, as it may reduce barriers to flow of information crucial from the point of view of EWS. General trust may support the openness to weak signals from outside the company. Furthermore, when there is a lack of general trust as well as a lack of trust in suppliers, customers and people working in the company, this may create difficulties in finding cooperative solutions requiring quick reaction in case of unexpected events.

Other issues important for the development and functioning of an EWS which will be discussed are: creation of scenarios (Posner, 2010; Taleb, 2012; Bertoncel et al., 2018), involvement of outsiders (Posner, 2010),

whistleblowers (Harford, 2011), the use of different theoretical models (Feyerabend, 2010), the ability to learn as quick as possible in situations of extreme volatility (Posner, 2010, 22-23), awareness of volatility and inclusion in risk management (Mandelbrot and Hudson, 2008), procedures for accountability (Posner, 2010), use of system analysis (Sterman, 2000; Posner, 2010), awareness of strength and limitations of the human mind (Beck, 2017), teamwork, intuition (Patton, 2003; Bertoncel et al., 2018), learn from "near mistakes, misses or failures" (CCPS, 2012; Amyotte et al., 2014), the creation of testable hypotheses (Posner, 2010).

Added value of geothermal energy development (ID: 36)

Johan van Ophem
Wageningen University, The Netherlands

Wim Heijman
Wageningen University, The Netherlands

Katarzyna Kurek
Wageningen University, The Netherlands

Among the renewable energy resources geothermal is specific to a local production and consumption. Next to the heat and energy production, geothermal resources reveal wide function in tourism and health sector, agriculture and industry due to the water composition and environmental footprint evidence in the long-term use. Moreover, geothermal energy presents with opportunities for rural and suburban areas linking sustainable development goals with expansion of new local economy sectors. Therefore, we assume that local exploitation of geothermal resources delivers an added value other than energy generation. The aim of this research is to fill in the gap in the literature and establish an empirical link between the use of the geothermal renewable and measures of local development. The assumed added value of the geothermal can be analysed as direct, indirect and induced effects on a municipality of exploitation. This research attempts to provide a methodology that measures the induced effects related to the socioeconomic development. Notwithstanding the relatively marginal importance national authorities have given geothermal resources to date, Poland was chosen as the main object of the research because of its particularly high geothermal potential and private sector experience in bringing up geothermal enterprises.
The theoretical conceptualization underpinning this studies is reflected in endogenous growth theories as well as in approach to local development. Our model is to demonstrate the statistical relation between exploited geothermal energy and parameters of local development assuming a change in the socioeconomic structure. This study aims to present methods to quantify geothermal added value by assessing a local development. Exercised on the Polish municipality cases this model is to be possible to apply to any geothermal municipality in the world and its results to motivate further local authorities into geothermal installations investments.

Keywords: geothermal energy resources; local development; Analytical Hierarchy Process; Principal Component Analysis; ANOVA analysis.

The effect of industrial and international diversification on firm performance in the Western European energy industry (ID: 13)

Marijin Achtereekte
University of Groningen, The Netherlands

Adri de Ripper
University of Uppsala, Sweden

Wim Westerman
University of Groningen, The Netherlands

This study examines different business strategies on financial performance for firms in the Western European energy sector. A grouping is made between conventional and renewable energy firms, as well as firms in Great Britain and the rest of Western Europe. Renewable energy firms have a higher return on assets than conventional energy firms. Further, we document a negative relation between firm performance and business strategies. Our findings highlight the importance of short-term and long-term considerations related to customer demands, the energy mix, oil prices, the European Union and the "Brexit" outcome.
Keywords: international diversification, industrial diversification, financial performance, conventional energy firms, renewable energy firms, Western Europe.

PARALLEL SESSION I
(11:15-12:15)

ISINI SPECIAL SESSION (Chair: André Dorsman)

Development and regulation of local energy firms in Tanzania: Industry and Local Economic Development (ID: 23)

Benedict Kuhenga Mahona
Institute of Finance Management, Tanzania

Bartjan. J. W Pennink
University of Groningen, The Netherlands

Bernard Mnzava
Institute of Finance Management, Tanzania

Jesse Dümmer
University of Groningen, The Netherlands

In regards to many contradictory findings on natural resources' benefits or costs, this article offers a business economy theoretical literature and empirical evidence concerning the significant sequential involvement of actors and different levels in regard to the Local economic Development Model. This study emphasizes on the importance of including the level of actors at local, regional, national and international levels when developing scenario's in order to overcome the natural resource curse. Evidently from the study, the natural gas sector can significantly contribute to country's sustainable economic growth and development when all players are well-coordinated and engaged. This is due to the fact that the sector strengthens the revenue and expenditure of the actors which in return leads to sustainable economic growth and development. Tanzania, as a newly producer and forecasted exporter of Natural gas has not followed a linear, sequential approach to the management of this resource but would be required to deal with problems as they arise and follow the revenue, legal and investment frameworks that are tailored to country's needs and expectation. The management of these expectations will appropriately help to inform the behavior of all stakeholders for decades to come. This study shade light to the future concentration of researchers where field works can be done in order to search for different aspects on how the different levels can be involved in the industry for the countries future prosperity.

Drivers of women entrepreneurs in tourism in Tanzania: capital, goal setting and business growth (ID: 8)

Irene Mkini Lugalla
University of Groningen, The Netherlands

Jan Jacobs
University of Groningen, The Netherlands

Wim Westerman
University of Groningen, The Netherlands

Tourism in Tanzania is one of the most important sectors in terms of its contribution to the nation's GDP, employment and investment. Women entrepreneurs play a substantial role in the tourism sector in Tanzania. To find out what drives them, we study the women's socio-economic background (mother education, role models and family support), (cultural, social capital and economic) capital, goal setting (perceptions and aspirations) and the business growth of their firms. Using a survey questionnaire, we assemble data on 120 small tourism firms. The research findings provide ample evidence that the capital of the women entrepreneurs drives their goal setting and ultimately their firm's business growth. Therefore, when strengthening the capital of the women entrepreneurs in tourism, professional organisations and government policies can become more beneficial to the Tanzanian society.

Keywords: women entrepreneurs, Tanzania, survey questionnaire

PARALLEL SESSION I
(13:30-15:30)

ELECTRICITY MARKETS (Chair: Wim Westerman)

Long-Run Dynamics of European Electricity Prices With Non-Normal Error Distributions (ID: 18)

Fatma Özgü Serttaş
Yıldırım Beyazıt University, Turkey

Long-term dynamics and trends of important electricity prices in Europe, together with the European natural gas and oil prices are analysed in this study. We capture the high volatility of the high frequency data points by looking at the error distributions' tail behaviors that affect the price returns in all mentioned markets. The analysis of tail behaviors of all price markets show evidence for common tail heaviness behaviors that are not compatible with the Gaussian normal distribution's tail behaviors. Instead, other distributions such as t-distribution and stable distribution have used to model the error terms. Long-term dynamics and causality analyses are performed to reflect the existence of common trends and movements within Europe, which suggests for the possibility of making common policy decisions regarding these three markets in general. Also these policy analyses are extended to capture the long-term effects of the renewable energy transition in Europe.

Keywords: European electricity prices, Natural gas prices, Oil prices, Long-run trends, Co-movements, Renewable Energy.

Switching Behavior of Large Scale Electricity Consumers and Competitiveness in Turkish Market (ID: 28)

Mürşide Erdoğan
Middle East Technical University, Turkey

Selin Metin Camgöz
Hacettepe University, Turkey

Hakan Berument
Bilkent University, Turkey

Mehmet Baha Karan
Hacettepe University, Turkey

This research mainly focuses on switching behavior of electricity consumers as a proxy of competitiveness in Turkish electricity market. While doing this, it analyzes reasoning of switching decision giving reference to economic, behavioral and demographic factors as well as market conditions. Secondly, effectiveness of the regulations and policies on procurement of electricity will be evaluated to understand obstacles for competitiveness in the market. The target group of the study is large scale consumers whose consumption is annually more than 10.000.000kWh since regulated tariff for them is a cost based with 10% markup. That is, this selection gives us chance to detect consumer decision on switching since suppliers can give certainly profitable offers for these customers. In an economic perspective, cost-benefit analysis of switching behavior will be included as a determinant in the study. Moreover, there are additional factors such as satisfaction, quality of service, trust, market

popularity and risk perception of switching classified as behavioral factors. Lastly, market conditions are included in order to understand dimensions considering availability of suppliers, quality of provided promotions and information flow among suppliers, consumers and regulators. Hereby we will analyze the relation between above mentioned determinants and customer switching decisions as well as give some policy recommendations.

Keywords: Retail competition, Electricity, Switching, Procurement of Electricity, Developing markets

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Hydro Inflow Forecasting and Virtual Power Plant Pricing in the Turkish Electricity Market (ID: 30)

Sezer Çabuk
EnerjiSA, Turkey

A. Sevtap Kestel
Middle East Technical University, Turkey

Erkan Kalaycı
EWE, Turkey

Hydro inflow forecasting with most accurate quantitative models is a very crucial subject for effective hydro optimization, virtual power plant pricing, volume risk management and weather derivatives pricing in the Turkish electricity market. Predicting increase or decrease in hydro inflow, seasonal characteristics of hydrological years such as wet, dry or normal, allow the decision-makers to economically use water for optimal periods, quantify of volume risk and determine effective portfolio management strategies. In this study, we focus on defining and pricing a hydroelectricity power plant as a Virtual Power Plant (VPP). For pricing of this non-standard option, we work on inflow and price scenarios and optimization model with the possible real world constraints. For the hydro inflow forecasting that will be used in optimization model, we apply Seasonal Autoregressive Integrated Moving Average model with Exogenous Variable (SARIMAX), whereas lagged indexed precipitation data, having the highest correlation with historical inflow data, is included as exogenous variable. In addition
to point forecast of hydro inflow, we generate various inflow scenarios by using the distribution of model fit residuals as a stochastic processes for defined VPP. Moreover, we work on hydro optimization problem where objective function is maximizing the expected value of generation by tracing to generated inflow and price scenarios. Price scenarios are simulated by using the hourly shape of historical Day Ahead Market (DAM) prices. As a result, we could analyze the optimization outputs according to different price and inflow levels. For defined VPP, Volume at Risk measure is pressed to explain the meaning of risky volume for the valuation of VPP.

Keywords: Hydro Inflow Forecasting, Hydro Optimization, Virtual Power Plant Pricing, Energy and Commodity Market, Valuation and Decision in Electricity Market, Volume at Risk

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The converge of Electricity prices for European Union countries (ID: 21)

M. Erdinç Telatar
Okan University, Turkey

Nermin Yaşar
Çankaya University, Turkey

The goal of achieving a single European market for electricity market has been one of the main issue since the Single European Act of 1988. The purpose of this study is to examine whether the aim of unified electricity market has been created in terms of the converge of electricity prices or not. Two tests of convergence are applied, β-converge and -convergence tests using electricity price data for 12 European Union states. This paper uses not only the linear methods but also nonlinear tests too. The results suggest that convergence did not occur for most of the considered countries.

PARALLEL SESSION I
(16:00-17:30)

ENERGY & FINANCE (Chair: Johannes Platje)

Stock price crash risk of alternative energy firms: The role of national culture and environmental performance (ID: 27)

Yılmaz Yıldız
Hacettepe University, Turkey

Mehmet Baha Karan
Hacettepe University, Turkey

This study investigates the impact of national culture and country-level environmental performance on the stock price crash risk of the alternative energy firms. Although prior studies reveal the impact of macroeconomic and societal factors on firm performance of energy firms, the role of firm- and country-specific factors on the stock price crash risk of alternative energy firms is yet to be investigated. Employing a sample of 484 alternative energy firms across 40 countries, we find that individualism and indulgence dimensions of national culture increase the stock price crash risk of alternative energy firms. Furthermore, our findings suggest a negative relationship between long-term orientation and crash risk. Moreover, we find robust evidence of a non-linear relationship between environmental performance of the country and the stock price crash risk. Our results are robust to alternative measures of stock price crash risk and different methods of estimations. Overall, the findings of this paper contribute to the energy economics literature by providing additional evidence on the role of societal and environmental factors on the extreme stock price movements and the firm value.

Modelling Credit Default through a collateral risk management system in a central settlement bank (ID: 31)

Ezgi Avcı
Turkish Standart Institute, Turkey

Necla İ. Küçükçolak
Takasbank, Turkey

Onur Enginar
Hacettepe University, Turkey

With the technological advances in the last decade, there has been a massive increase in information on customer transactions, which has attracted significant research interest in understanding real-life payment behaviour. However, most of the empirical work has focused on credit card and mortgage payment behaviour. Less well-known but equally important area is payment behaviour in post-trade operations of online auctions. In this paper, we examine payment behaviour of professional bidders in a B2B auction. Using an extensive and unique data set from one of the Europe's pillar Settlement Banks, we find a stable taxonomy of customer payment behaviour and identify five distinctive behaviour, which we relate to bidders' risk scores. Then we demonstrate that bidders' risk profiles can be explained by their size, type and diversity. We also analyse the impact of exchange rate shock, a natural experiment happened in August 2018, on bidders' payment behaviour. Our results provide useful implications for enhancing efficiency of collateral management systems in Settlement Banks.
Keywords: Behavioural analytics, risk management, collateral management system

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Volatility Spillovers between Energy Markets and Stock Markets in G-7 Countries: A VAR-DCC-GARCH Model (ID: 2)

Göknur Büyükkara
Hacettepe University, Turkey

Onur Enginar
Hacettepe University, Turkey

Hüseyin Temiz
Bozok University, Turkey

The decline in oil prices is remarkable from a peak of $115 per barrel in June 2014 to under $35 at the end of February 2016 due to OPEC's decision to maintain oversupply in November 2014 despite declining demand for crude oil and increasing shale capacity of US in addition to Iran's nuclear facility. We question whether the pattern of oil prices that changes mostly according to OPEC oversupply contributes to stock market volatility or not in G-7 countries. By applying the vector autoregressive (VAR) model in a multivariate generalized autoregressive (GARCH) setting with dynamic conditional correlation (DCC) option of Engle (2002), we observe that from the beginning of 2014 oversupply period, volatility spillovers appear and dynamic correlations between oil and stock prices start to increase while in the midst of 2016 the correlations start to decreased after rebalancing. Price decreases seem advantageous in US, Europe and Japan which is accepted as large oil consumers by increasing volatility spillovers between 2014 and early 2016. After 2016 rebalancing act, oil market does not seem to be valuable for the stock market since oil prices start to increase slightly thereafter and volatility spillovers become decreased.

Keywords: Volatility Spillover, VAR-GARCH-DCC, OPEC Oversupply, Stock Market, Oil Market

PARALLEL SESSION II
(09:30-11:00)

ENERGY & FINANCE (Chair: André Dorsman)

Responsibility and Financial Performance in the Finance Industry (ID: 7)

Halit Gönenç
University of Groningen, The Netherlands

Bert Scholtens
University of Saint Andrews, UK

We study the relationship between financial performance and corporate social responsibility in the finance industry. We rely on a diverse international sample for the period 2002-2015 and use a wide range of financial performance measures next to various specific indicators for corporate governance, environmental, and social performance. By using simultaneous equation system estimations to address the causality between financial performance and responsibility, we find that the Tier-1 capital adequacy ratio is significantly and positively associated with responsibility indicators. As such, stronger institutions appear to be able to act in a more responsible manner and responsibility signals financial institution's health. We establish that the global financial crisis did have a profound impact on the finance-responsibility nexus. Furthermore, such changes are different between countries with high and low income, civil and common law, single and multiple supervision authorities, and central bank and non-central bank supervision.

Keywords: Corporate Social Responsibility, Finance Industry, Financial Crisis, Financial Performance

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The Effects of Electricity Price Changes on Prices of Other Goods and Services – Evidence from Turkey (ID: 9)

Ahmet Tevfik Gedikkaya
Bilkent University, Turkey

Serdar Varlik
Hitit University, Turkey

M. Hakan Berument
Bilkent University, Turkey

This paper employs a Factor Augmented Vector Autoregressive model to assess the effects of electricity price innovations on prices of other goods and services. Using monthly series from Turkish Domestic Producer Price Index (D-PPI) and Harmonized Index of Consumer Prices (HICP) components, the results of the analyses on the former components suggest that Machinery & Equipment (not elsewhere classified); Electrical Equipment; Rubber & Plastic Products increase the most while Tobacco Products; Crude Petroleum & Natural Gas; Water Supply, Sewerage, Waste Management & Remediation Services increase the least. The results from the analyses on HICP components suggest that Housing, Water, Electricity, Gas & Other Fuels; Furnishings, Household Equipment & Maintenance; Restaurants & Hotels increase the most, while Communications; Alcoholic Beverages, Tobacco & Narcotics; Education increase the least.

Keywords: Electricity Prices; Inflation Pass-Through; FAVAR

The grid: from a technical to a finance issue: Who bears the financial risk? (ID: 17)

André Dorsman
VU University Amsterdam, The Netherlands

Kees van Montfort
Nyenrode Business Universiteit & University of Applied Sciences Amsterdam, The Netherlands

In the nineties of the last century the electricity markets were liberalized. The government no longer fixed the price, but the market. With the liberalization the market risk was introduced. In the twentieth century the focus of the electricity market was on the technical side. The security of supply was the main issue. In this century, where the market fixes the price, the focus switches from technique to finance. The market structure however is still based on the 20th century situation and is denying the financial risks that were introduced by the market. This paper deals with the financial risks.

In the literature there is much written about the financial risks in abstract markets, like stocks and bonds. Future contracts containing a buy or a sell of an underlying value against a fixed price, creates a price risk for both parties. The buyer will win on the contract when the future price will be higher than the fixed (contract) price. The profit for the buyer is the loss for the seller of the contract. In case the future price will be lower than the contract price the opposite is true. The buyer is in that case the loser and the seller the winner. In other words, financial contracts include price risk.

Electricity is not an abstract good, but a commodity like oil, gas or potatoes. Like potatoes the realized supply can deviate from the expected supply. The weather conditions influence the harvest of potatoes and also the supply of wind and solar energy. Commodities have not only a price risk, but also a quantity risk.

In this paper we discuss the price and quantity risk of the electricity market. We show that the Transmission System Operator (TSO) operates like a clearinghouse in the abstract markets and discuss the consequences of that position.

PARALLEL SESSION II
(11:15-12:15)

OIL & GAS MARKETS (Chair: Johan van Ophem)

Risk Management Activities for Oil and Gas Producers and the Impact on Firm Value (ID: 3)

Eren Yıldız Savaş
Yıldırım Beyazıt University, Turkey

Ayhan Kapusuzoğlu
Yıldırım Beyazıt University, Turkey

This study questions the hedging activities of oil and natural gas firms if it is successful for reducing financial risks. The performance of companies is proxied by Tobin's Q and panel regression models are built to estimate the coefficients for firm value and derivative use. The speculative use of derivatives is eliminated in models by the regulations under IFRS and GAAP. 76 companies from IHS Markit Database are deployed in the model. Based on the availability of disclosures, data period is covering 2007 to 2016. Data includes Global, European, Russian, Asian, Canadian and Other Integrated Companies as well as South & Central International Oil Companies, Large North American Exploration and Production (E&P) Companies, Canadian E&Ps and Trusts, Outside North America E&Ps. The results give critical information regarding asymmetric information and signalling effect. Since the coefficient of derivatives use is negative, it shows the critical meaning of disclosures on the financial healthiness. If companies are publishing high level of hedging activities, it might be a warning for investors to avoid investing at that company.

Keywords: Risk management, energy, firm value

A Game-Changer in Eurasia: The Altai Gas Pipeline (ID: 12)

Elif Güney
Kadir Has University, Turkey

The bilateral energy relations remain their influence on the agenda of the developing countries considering the high energy needs. It is accordingly not unexpected that the pipeline politics and diplomacy in the energy system is still at a peak, with more pipeline project proposals being put on the table and the various actors proceeding respectively, giving their support to some of them or struggling others. Herein, Russia and China are proper cases to assess bilateral energy proceedings. The energy-related rapprochement between Russia and China have become apparent in the past decade. For this specific reason the following study has been focused on main parameters behind the phenomenon on Altai gas pipeline: The first one is related to the volumes of gas that the Altai pipeline would supply and the second one is about the negotiations over pricing terms, and lastly, there is a route-related issue. Therefore, from the Russian perspective, the political advantages of the deal, regarding demonstrating further diversification from Europe, a robust link with China and the chance to promote a new infrastructure base in the Altai region, give more compensation for a possible low commercial return. When it comes to the Chinese perspective, the increasing gas demand, an enthusiasm for creating more competition with Central Asian gas and the opportunity to negotiate with Russia from a position of extraordinary bargaining strength means that the Altai deal is also likely to become meaningful. There would be concerns over the necessity for more Russian gas, with the likelihood that total supply could consider for as much as one-third of total Chinese imports by 2030. Overall, although the scope for disappointment always remains in any negotiations, the potential for a deal on exports via the Altai pipeline appears to have significant commercial and political logic. However, if a final agreement is signed,

substantial problems related to environmental outcomes will remain. In this way, it can be argued that the proposed Altai will be a geopolitical game-changer at the international level if it will be implemented.

Keywords: Altai gas pipeline, China, energy deal, pipeline diplomacy, pipeline politics, and Russia.

PARALLEL SESSION II
(13:30-15:30)

RENEWABLE ENERGY (Chair: C. Coşkun Küçüközmen)

Auction for wind energy in developing economies: A financial analysis of Turkey's new YEKA support scheme (ID: 5)

Selahattin Murat Şirin
Middle East Technical University, Turkey

Abdolrahman Khoshrou
Centrum Wiskunde & Informatica, The Netherlands

Many countries have opted-in renewable energy auctions to support renewable energy technologies while incorporating market dynamics in price-setting. In this respect, successful auctions manage to balance trade-offs between restrictions and flexibilities, and they ensure a process that is compatible with both the electricity market dynamics and country-specific characteristics. As experiences of other countries have shown, there is no "silver-bullet auction" to solve all problems encountered in the process, and decision-makers have to evaluate the interactions between renewable energy targets, policy-goals and market dynamics thoroughly. Turkey has initiated a new support scheme – YEKA - which aims to increase the diffusion of renewable energy technologies and develop domestic competence in these technologies. The low prices were hailed as a great success of the scheme; however, a number of issues are causing concerns about the success of this scheme, and policy-makers should focus on macroeconomic risks, improve innovation system and reduce policy uncertainties to achieve desired outcomes from the YEKA scheme.

Keywords: wind; financial analysis; auction; Turkey

Tapping the Potential: Turkey and Renewable Energy Sources (ID: 11)

Wietze Lise
AF Mercados EMI, Turkey

Banu Bayramoğlu-Lise
Bilkent University, Turkey

One of the biggest challenges facing the modern world is competition and conflict over the sharing of energy resources within the international system. Security challenges among the nations have emerged as a result of the unequally distributed fossil fuel resources around the world. Tapping the renewable energy source (RES) potential is becoming critically significant in the face of depletion of conventional energy sources and their negative impact on the environment. Therefore, as a geopolitically important actor, Turkey has set some RES targets for 2023 and tries to achieve these targets with supportive regulations and legislation to raise its standards to European Union levels. Firstly, this chapter presents the RES potential and the current level of RES development in Turkey. Furthermore, it also discusses various impediments against the rapid progress of RES investments and reaching the RES targets in Turkey. Overall, we conclude that Turkey has a remarkable economic RES potential, which is largely untapped. Therefore, in the current situation, it seems that the 2023 targets can be reached only if hard and consistent work and policies are continued in Turkey.

Keywords: renewable energy; Turkey; targets; green technologies; power sector.

Turkey's National Energy Policies to Decrease the Dependency on Energy Imports: Renewable Energy as an Alternative to Coal (ID: 19)

Gözde Nur Karagöz
Kadir Has University, Turkey

Volkan Ş. Ediger
Kadir Has University, Turkey

According to the data from the Energy Ministry of Turkey, the country imported 75% of its total primary energy demand in 2017. Import dependency of hydrocarbon sources is even worse than this, reaching 93.9% in oil and 99.3% in natural gas. Oil was imported mainly from Iraq, Iran, and Russia while the natural gas from Russia, Iran, and Azerbaijan. On the other hand, import dependency is the least in coal, consisting 61.9% of consumption. Turkey produces lignite domestically and imports bituminous coal mainly from Columbia, Russia, and Australia. This overall situation is not only threating the energy security of the country but also harms the economy and environment. For this, Turkey has tried to decrease its import dependency by increasing use of its existing potential of coal and renewables.

The increasing use of coal has been supported in various official documents. In Article 407 of the Ninth Development Plan, 2007-2013, it was aimed to maximize the share of domestic and renewable energy resources in production. In the Tenth Development Plan, 2014-2018, it was noted in many articles that the local fossil resources should be exploited in the highest possible rate in energy production. Among the objectives of the Ministry of Energy and Natural Resources 2015-2019 Strategy Plan, the use of domestic coal resources keeps a prominent place. Among the goals of the Plan, Goal 2,4 and 10 include targets and strategies for the use of domestic energy resources, including coal. In the plan, the most efficient use of domestic coal resources has been identified as one of the main objectives and electricity generation from domestic coal is targeted to reach 60 billion kWh /year in 2019. On the other hand, in the Electricity Market and Security of Supply Strategy Paper prepared by the Ministry targeted to use more lignite for electricity generation by 2023. However, the paper also encourages to use imported coal for the security of supply reasons. Finally, the recently declared policy of "domestic and national energy" includes the incentives for using coals.

However, Turkey's renewable energy potential is more significant than the domestic lignite. Besides, despite the incentives given for domestic coal, coal imports are continuously increasing since 1981. In 2017, domestic sources met only 2.9% of 24.7 million tons-of-oil equivalent of hard coal consumption. Amount paid for coal imports was $ 749 million in 2002, and this amount increased to $ 2,049 million in 2017.

The increasing coal imports show the failure of the targets to increase domestic coal usage. To obtain supply security, it may be considered as diversifying the energy sources however this situation also increases dependency on other countries. Besides, with the increasing coal consumption, CO2 emissions also keep increasing. Turkey's coal consumption and carbon dioxide emissions graphs increase accordingly. Therefore, the best policy to decrease the import dependency of Turkey appears to give more importance on renewable energies as an alternative to coals during the present energy transition period.

Switching to renewable-based decentralized energy for sustainable development of Turkey (ID: 20)

Burak Şuşoğlu
Kadir Has University, Turkey

Volkan Ş. Ediger
Kadir Has University, Turkey

Turkey is one of the major developing countries with a constantly rising primary energy demand of which the long-term average annual rate of increase is around 5%. In order to secure the supply to meet its demand, the country is persistently looking for new ways to produce domestic energy. This is specifically true for electricity generation which mostly runs on fossil fuels. The electricity generated in 2017 is from natural gas (37.2%), coal (32.8%), hydro (19.6%), renewables (10.1%), and oil (0.4%). The total contribution of fossil fuels in electricity generation is roughly 70%, but only 38.1% of coal, 5.9% of oil, and 0.7% of natural gas are produced domestically and the rest is imported. This is a major issue for the Turkish economy since energy imports have the biggest share in total imports with 16%. In addition to the economic side, these resources emit carbon dioxide and other greenhouse gases, which cause global climate change and other environmental problems. The electricity from fossil fuels is mostly generated in centralized power plants, which are not very efficient in electricity transmission and distribution. In 2017, 1,9% in transmission and 10,2% in distribution were lost.

Decentralized systems could be an alternative to centralized power plants since it promotes local and clean renewable energy with a more efficient supply. For decentralized systems, an amount as little as these limits to be beneficial for the country and reduce import dependency, it requires extensive engagement of prosumers, people who produce and consume their own energy.

According to the report of European Parliament of 2010, decentralized generation (DG) described as microgeneration with capacities lower than certain MW of electricity for different types of renewables; solar PV less than 3 MW, small hydro less than 1 MW, wind less than 6 MW, geothermal less than 3 MW and biogas plants less than 10 MW. In Turkey, the percentages of power plants in total within these limits are 86% for solar, 7% for hydro, 15% for wind, 4% for geothermal, and 87% for biogas. Solar is one of the most important energy sources that people could easily engage in. Even though the solar PV within limits are at 86%, the total solar installed capacity is quite low. Installed capacity of unlicensed PV is 5% of total installed capacity, however the actual generation is lower than 1%. There are over 9 million rooftops on which solar PV panels could still be installed.

Although Turkey is aiming at increasing renewables, decentralization is not a part of the related policies and strategies and its deployment often faces different barriers. There have been regulations and incentives to ease the application of renewables, but their applicability is still challenging. Another issue for Turkey is the lack of technical capabilities like the interconnection problem of a DG, lack of technical human resources in this sector etc. Social acceptability is also an issue since people still prefer natural gas over renewable resources, mostly because of high costs of renewables. However, in spite of all these factors, renewable-based decentralized energy systems (RDES) are important options in order for Turkey to overcome the issue of import dependency and climate change mitigation.

PARALLEL SESSION II
(16:00-17:30)

ENERGY ECONOMICS (Chair: Wietze Lise)

Blockchain as a technology backbone for an open energy market (ID: 24)

James Thewissen
Katholieke Universteit Leuven, Belgium

Özgür Arslan-Ayaydın
University of Illinois at Chicago, USA

Prabal Shrestha
Katholieke Universteit Leuven, Belgium

This chapter looks into the evolving use of the blockchain technology in the clean and renewable energy sector. The underlying technology behind the bank-less digital currency, Bitcoin, has attracted the attention of entrepreneurs, policymakers and academics alike, due to its potential to facilitate transactions and coordination without a central authority. Bitcoin's capacity to support smart contracts potentially opens the door for its application to numerous settings, and one of the more prominent ones being the clean energy sector. The chapter provides insights on how this novel technology that offers disintermediation, transparency and flexibility is providing new ways of interaction to tackle challenges of communication, coordination and efficiency in this sector. Along with providing a brief overview of the blockchain technology, we discuss some of the prominent clean energy applications of the technology currently being introduced, namely, micro energy exchange grids, cap-and-trade and electrical vehicle charging networks. This chapter also includes empirical evidence on Initial Coin Offerings (ICOs) launched by projects focusing on various aspects of development of renewable energy sector. From this dataset, we identify six prominent themes of services, namely, clean cryptocurrency mining, energy exchange, project financing, investment intermediation, network building and hosting incentive programs. Lastly, we find that collectively these clean energy related ICOs raise greater amount of money and are more likely to successfully issue their tokens in a cryptocurrency exchange, indicating its favorability among crypto investors.

Keywords: blockchain, energy, renewable

Causality between Economic Policy Uncertainty and Energy Consumption and Carbon Emissions (ID: 34)

Burak Pirgaip
İzmir University of Economics, Turkey

Burcu Dincergok
Atılım University, Turkey

We investigate the causal relationship between economic policy uncertainty (EPU) and energy consumption and carbon emissions in developed (U.S., Japan, Germany, Canada, U.K.) and developing (India, China, Russian Federation, South Korea, Brazil) countries. We employ a bootstrap panel Granger causality test developed by Kónya (2006). By using monthly data spanning from 2002.12 to 2018.12, we provide strong evidence that EPU Granger cause both energy consumption and carbon emissions. Such causality exists in the opposite direction for certain cases as well.

Keywords: Economic policy uncertainty, energy consumption, carbon emissions, Panel Granger causality.

Interdependence of Bitcoin and Financial Markets: A Copula-Garch Approach (ID: 4)

C. Coşkun Küçüközmen
İzmir University of Economics, Turkey

Ayşe Metin Karakaş
Bitlis Eren University, Turkey

Binali Selman Eren
Bitlis Eren University, Turkey

Mustafa Salim Erek
Bitlis Eren University, Turkey

This paper aims to examine the relationship between Bitcoin and preeminent financial indicators using Copula-GARCH method. In the study, we use closing prices of Bitcoin and US 10-Year Bond Yield, Gold Spot US Dollar, US Dollar Index, S&P 500, FTSE 100 and NIKKEI 225. The results show weak dependence between Bitcoin and preeminent financial indicators. These findings indicate the necessity of more detailed studies for a more comprehensive understanding the nature of Bitcoin, particularly for investors and potential users.

Keywords: Bitcoin; Copula-GARCH; Financial Markets.

PARALLEL SESSION III
(09:30-11:00)

ENERGY EFFICIENCY (Chair: Aydın Ulucan)

Efficiency Analysis of Turkish and European Countries' Electricity Generation Sectors via 'DEA by Sequential Exclusion of Alternatives' Method (ID: 32)

Yetkin Çınar
Ankara University, Turkey

As the electricity demand rapidly increase in many countries, efficiency in electricity generation sector becomes one of the main objectives of energy policies. In this study, the efficiencies of electricity generation sectors of Turkey and EU member countries are evaluated by Data Envelopment Analysis (DEA) model. Since homogeneity is a crucial assumption in efficiency evaluation by DEA especially in intercountry comparisons; first, the environmental factors which causes the heterogeneity in the sample are discussed and their effects on efficiency scores are estimated by different statistical methods. Then, a novel approach which is called as 'DEA by Sequential Exclusion of Alternatives' is used application. It is concluded that the method proposed by Aleskerov & Petrushchenko (2013) can effectively take into account heterogeneity in its application algorithm and worth using for raising the reliability of efficiency evaluations.

Keywords: Efficiency, DEA by Sequential Elimination of Alternatives, Heterogeneity, Electricity Generation Sectors

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Innovation and New Technologies in Utility Regulation (ID: 15)

Okan Yardımcı
Energy Market Regulatory Authority, Turkey

High electricity and natural gas bills can be seen as the major problem in the Turkish energy market by citizens. However, researches on electricity and natural gas network services are very limited. Studies on innovation and development of new technologies are almost negligible. High costs of network services increased the importance of this research proposal. The aim of the study is to introduce the regulatory practices that will lead to improvements in the dynamic efficiencies of the regulated utilities, and to accelerate the implementation of innovations and new technologies that will reduce tariffs. The paper has the potential to provide original contribution in the area.

The paper is expected to respond to two basic questions. It is planned to examine the R&D budget approve mechanisms and other regulations of the regulatory authorities in some of the countries; in order to find an answer to the first question: What are the successful implementations to ensure dynamic efficiencies of regulated utilities?

The second question is; what are the application areas of new technologies in the network industries. In order to answer the second question, network planning, utilisation of the network, smart grid, smart metering, demand side response, flexibility, self-generation, energy storage, e-mobility, EV charging, digitalization and blockchain will be examined in a detail.

Keywords: Regulation, natural gas, electricity, network industries, natural monopol, innovation, R&D, technology, dynamic efficiency, digitilization, blockchain, smart grid, EVs, electricity storage

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Measuring the Effects of Energy Efficiency Policies: Evidence from Turkish Manufacturing Industry (ID: 16)

Pinar Engin
United Nations Development Programme, Turkey

Kazim Baris Atici
Hacettepe University, Turkey

Aydin Ulucan
Hacettepe University, Turkey

This chapter aims to provide insight on the energy efficiency concept, which is getting progressively important with improving awareness on environmental issues, increasing energy demand and costs of energy. Within the scope of energy efficiency, a contemporary approach is the Energy Management System (EnMS) that represents continuous and systematic efforts for energy improvements. After discussing the basics of the both concepts, we conduct an empirical analysis in Turkish manufacturing industry firms that apply EnMS principles and carried out energy efficiency increasing activities between 2015 and 2017. In the empirical analysis, make use of data collected in the scope of a recent project implemented by the Ministry of Energy and Natural Resources in cooperation with the United Nations Development Programme (UNDP) and United Nations Industrial Development Organization (UNIDO), with funding from the Global Environment Facility (GEF). The data includes information about a number of small/medium/large scale manufacturing firms that have been carrying out energy efficiency activities at different sizes. We approach to the data from two perspectives and provide two types of evaluations: firm-based evaluations and activity-based evaluations. Our modeling scheme includes both energy related (capacity, energy savings, emission savings and financial indicators (cost, financial savings) to observe the performance of applied projects and applying firms. The aim of the empirical part includes providing evidence from a micro-level analysis on how EnMS policies can be efficient in-line with identifying the prominent energy efficiency activities and determining the most efficient sub-sectors. We employ a well-known relative efficiency measurement methodology, Data Envelopment Analysis and present results at sub-sectoral level and identify the efficient sectors. The efficient projects are identified and discussed relying on their size. The evaluations on projects are also supported with a simulation model to observe the level of robustness in efficiency scores. All evaluations also consider two different subsets of the firms as ISO certification holders and small and medium-sized enterprises (SMEs). We derive conclusions on EnMS applications at firm, sub-sector and activity level.

Keywords: Energy Efficiency; Energy Management System; Performance Measurement; Data Envelopment Analysis; Simulation

PARALLEL SESSION III
(11:15-12:15)

ENERGY EFFICIENCY (Chair: Aydın Ulucan)

The Rebound Effects of Energy Efficiency Improvement Projects in Turkish Industry Sector (ID: 14)

Songül Tekeli
Energy Market Regulatory Authority, Turkey

Ayşen Sivrikaya
Hacettepe University, Turkey

Turkey targets reducing energy intensity at both sectoral and macro levels by increasing efficiency in production side of the economy. To reach this goal, Turkish government has been financing the efficiency improvement projects (EIPs) in industry sector and more than 13 million Turkish Liras (TL) has been paid for the completed 139 EIPs since 2009. In order to analyze whether the planned energy savings from EIPs increase or decrease after implementation compared to pre-implementation situation, we measure the size of rebound effect for the two energy types such as electricity and heat within the eleven sub-sectors in Turkish industry. The novelty of this study is twofold. One is that we measure the production-side rebound effect while second is that we use firm-based data to do it. We utilize the completed 139 energy improvement projects, financed by the government between 2009 and 2017. The results of this study reveal that the rebound effects range from a very high negative backfire effects to a very small partial rebound effects. The rebound effects are found negative in 74 out of 139 EIPs. Specifically, negative backfire effect is observed in 14 EIPs and prebound effect is observed in 60 EIPs. However, backfire effect is not observed for all completed EIPs meaning that both electricity and heat rebound effects never totally offset the potential energy savings. The results of this study have a very clear policy implication for policymakers to prioritize the EIPs and their sub-sectors related to energy saving potentials. In particular, the results suggest that in case the allocation of government funds is distributed according to energy savings potentials of the sub-sectors, energy efficiency gains from the EIPs can be increased.

Keywords: Energy efficiency improvement; Rebound effect; Prebound effect; Negative Backfire Effect.

Multiple Criteria Decision Approaches for Different Types of Energy Production: An Application to OECD (ID: 29)

Cem Menten
Hacettepe University, Turkey

Bülent Çekiç
Hacettepe University, Turkey

In today's world which industrial developments turn into economic development, energy plays a fundamental role in terms of both economic and basic humanitarian activities. Being a strategic product that shapes the world economy and policy, countries have entered into the competition with each other for energy resources. The purpose of this study is to rank the member countries of the Organization for Economic Cooperation and Development (OECD) based on different types of country level energy production such as oil, gas, electricity and renewables with utilizing Multiple Criteria Decision Analysis (MCDA) approaches. Within the scope of the analysis, different types of energy production and OECD countries are considered as criteria and alternatives, respectively.

Keywords: Energy Production, OECD, Multiple Criteria Decision Analysis

PARALLEL SESSION III
(13:30-15:30)

ENERGY POLITICS & SECURITY (Chair: Necmiddin Bağdadioğlu)

The impact of US sanctions in Iran (ID: 22)

Karen Kokabisaghi
Centrum voor Wiskunde & Informatica, The Netherlands

André Dorsman
VU University Amsterdam, The Netherlands

Eric Pauwels
Centrum voor Wiskunde & Informatica, The Netherlands

Over the years, economic sanctions have often been applied as policy tool for resolving international disputes. One of the important subset of economic sanctions is energy sanction imposed on developing and single product economies. Since 2006, economic and energy sanctions against Iran were tightened by the US and its allies that led to an economic recession in Iran. Firstly, Iran's oil export was hit by the sanctions. Secondly, country's financial system was restricted; Iran faced difficulties in transferring money necessary for international trade that led to an increase in foreign investment risk in energy industry. Iran's government tried to reduce economic vulnerability against energy sanctions with economic resilience and changing some regulations and policies in energy section. One strategy was to change target market for oil export; it is expected to compensate oil export by changing markets from Europe to China and India. The aim of this paper is to investigate the efficiency of new strategies to soften oil sanction's effect on Iran's economy. Due to a lack of data we can only give a descriptive analysis.

Keywords: International energy sanction, Economic Sanction, Iran

Proliferation and the Logic of the Nuclear Market (ID: 6)

Eliza Gheorghe
Bilkent University, Turkey

Why haven't more countries acquired nuclear weapons? Why are there only nine nuclear weapons states today, not 25 or more? This article answers that question by focusing on an important pathway to the bomb: the nuclear market. I argue that proliferation is a function of the competition among suppliers in that market. In the absence of a supplier cartel that can regulate transfers, the more suppliers there will be, the more intense their competition will be as they vie for market share. This commercial rivalry makes it easier for nuclear technology to spread, because buyers can play suppliers off against each other. The ensuing transfers help countries either acquire nuclear weapons or become hedgers. The great powers seek to thwart proliferation by limiting what suppliers can sell and putting safeguards on potentially dangerous nuclear technologies. Their success depends on two key structural factors: the global distribution of power and the intensity of the security rivalry among the great powers. Stemming proliferation is more likely in unipolarity, and less likely in multipolarity, with bipolarity falling in between. Furthermore, the more intense the rivalry among the great powers in bipolarity and multipolarity, the less effective they will be at curbing the spread of nuclear weapons. The world appears to be moving from unipolarity to multipolarity with potential for intense security rivalry among the great powers (the United States, Russia, and China), which does not portend well for checking proliferation.

Attitudes of SMEs towards the Elements of Eco-Efficiency: The Turkish Case (ID: 10)

Sıdıka Başçı
Yıldırım Beyazıt University, Turkey

Derya Fındık
Yıldırım Beyazıt University, Turkey

Kıvılcım Metin Özcan
Ankara Social Sciences University, Turkey

Fatih Cemil Özbuğday
Yıldırım Beyazıt University, Turkey

Eco-efficiency is achieved by creating more value with less environmental impact. Thus, eco-efficiency serves environmentally sustainable economic growth or green growth. Since the Small and Medium Sized Enterprises (SMEs) are responsible for most of the production in the industrial output, their adoption of and awareness about elements of eco-efficiency is crucial for green growth. In this study, we investigate the attitudes of the Turkish SMEs for three items of eco-efficiency: (i) increasing resource efficiency investments, (ii) producing more environmentally compatible "green" products or services, and (iii) consuming energy generated from renewable sources. To this end, we utilize data on the Turkish SMEs from the 2017 wave of the Flash Eurobarometer, Small and Medium Sized Enterprises, Resource Efficiency and Green Markets (GESIS) dataset. Our analysis of 299 SMEs from Turkey reveals that many firms indicate administrative and legal procedures as barriers to resource efficiency investments. The findings also demonstrate that most of the SMEs rely on their financial resources to become more resource-efficient. However, they are still in need of external support such as new technologies, grants, subsidies or consultancy. One interesting observation is that actions towards resource efficiency have not created desired cost reductions concerning production. Only 9 percent of the firms declared that their costs decreased significantly.

The results on the attitudes of Turkish SMEs towards on-site energy generation from renewables demonstrate that the Turkish SMEs do not put much emphasis on achieving eco-efficiency through energy from renewables. The findings also reveal that the majority of the firms are reluctant to produce green products or services. One reason for this finding could be a lack of incentives. A vast majority of the SMEs believe that the presence of financial incentives for future projects would help them develop new green products or services.

These findings imply that there is a distance between the Turkish SMEs and the elements of eco-efficiency. As SMEs construct a sizeable portion of the output in the economy, these findings show that the contribution of SMEs to environmentally sustainable economic growth will be lacking in the coming years unless further actions are taken, and supports are given by the Turkish government.

Keywords: Eco-efficiency, Renewable Energy, Energy Efficiency, Small and Medium Sized Enterprises, Turkish Case

Aspects of Hydrocarbon Insecurity in the Eastern Mediterranean: Maritime Claims, Access, and Quest for Energy Resources (ID: 1)

S. Süha Çubukçuoğlu
Koç University, Turkey

Salih Saner
Middle East Technical University, Turkey

Issues related to maritime claims, access, and the quest for energy resources have always been considered as significant aspects of sea power, strategy and security. The Eastern Mediterranean at the turn of the 21st century is not an exception to that, particularly in the light of recent hydrocarbon discoveries in the region. This paper seeks to examine the mounting instability in the Eastern Mediterranean particularly with regards to rising energy geopolitics. By addressing a range of political, social, military, and economic insecurity issues related to off-shore hydrocarbons, this research highlights possible emergent threats, challenges, opportunities, and responsibilities for related actors. The paper conceptually views "hydrocarbon insecurity" within the broader context of the term "security" itself. Intrinsically, the assessment recognizes the essential maritime component in international relations and analyses issues that illustrate how factors in the possession, supply, and distribution of energy resources may impact the outlook of conflict and cooperation in the region. It is argued that the intensive political engagement should be advanced among conflicting parties to build confidence and resolve fundamental differences over competing claims of maritime delimitation. This can reduce risks and vulnerabilities associated with the endeavor of accessing, exploring, and exploiting energy resources in the region. The paper ultimately seeks to discuss the instruments through which hydrocarbon security challenges can be addressed such as advancement of regional security order and of multilateral maritime security governance in the region, particularly in reference to the role of regional alliances.

Keywords: Mediterranean, Security, Energy, Conflict, Delimitation, Hydrocarbon, EEZ, UNCLOS

PARALLEL SESSION III
(16:00-17:30)

ENVIRONMENT (Chair: Bartjan. J. W Pennink)

Paris Climate Agreement Processes and Their Sustainability in the Global Climate Change Struggle market (ID: 25)

İzzet Arı
Ministry of Development, Turkey

Levent Aydın
Ankara Social Sciences University, Turkey

Within the scope of the United Nations Framework Convention on Climate Change (UNFCCC), international climate change policies, particularly the mitigation of greenhouse gas emissions, are addressed within the scope of combating the global climate change. A new climate agreement was needed due to the fact that the Kyoto Protocol, which quantitatively determines the emission reduction of developed countries and sets down cost-effective mitigation mechanisms, has not been determined the commitment to reduce emission for a sufficient number of countries and the responsibility to fight a fair climate change. In line with these needs, the Paris Agreement was adopted in 2015 as a result of the 21th Conference of Parties to the UNFCCC at the end of the climate negotiations between the years 2011 and 2015. A few months before the adoption of the Paris Agreement, countries began to submit the Intended Nationally Determined Contributions (INDCs) statements on emissions reduction to the UNFCCC secretariat. By December 2015, nearly 160 countries submitted their INDCs for sake of supporting the construction of the Paris Agreement on emissions reduction.

The Paris Agreement, which became one of the main documents of international policies on combating climate change post-2020, came into force on 4th November 2016 and covers the post- 2020 implementation period.. As of 10th April 2019, 185 countries ratified the Agreement. Due to the monitoring of the process of negotiating and bottom-up negotiating method, updated INDCs and progressive and additional emission reduction expected (INDCs 2.0) process in 2020 has gained critical importance. 2020 will be addressed in two separate processes for the countries that will give INDCs.

The year 2020 is the second INDC submission date for those issuing 2020-2025 for the period of INDCs and the date of update for those issuing 2020-2030. In 2025, which is the period after 2020, all countries need to submit new INDCs (INDCs 3.0).

In parallel with these processes, it was decided that the emission reduction contributions of the countries two years before the 2nd and 3rd INDCs submission deadlines (2018 and 2023) will begin to make evaluations in order to reach the ultimate goal of the Paris Agreement. However, in the UNFCCC negotiations, a clear consensus has yet to be reached on methods to ensure that the criteria and transparency that countries will use in assessments based on initial and updated INDCs.

In particular, the sustainability and effectiveness of the Paris Agreement were questioned in the post-2020 period due to the fact that the responsibilities of developed and developing countries were different and INDCs were not submitted in a common format (absolute emissions reduction, relative emissions reduction or intensity based emissions reduction.

In this study, starting from the construction process of the Paris Agreement, a critical evaluation of the system to be established and the processes to be completed will be followed. At the end of the study, recommendations will be made especially for developing countries to carry out the emission reduction process more transparently.

Keywords: Paris Agreement, INDCs, Transparency, Climate Change

System Dynamic Approach to Turkey's Intended National Determined Contributions in Paris Climate Agreement (ID: 26)

Levent Aydın
Ankara Social Sciences University, Turkey

İzzet Arı
Ministry of Development, Turkey

Climate change has become one of the most important problems facing human beings. The reporting of the IPCC is the creation of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, followed by the Kyoto Protocol and the Paris Climate Agreement aim to reduce climate change. In 2015, while adopting the Paris Agreement, the UNFCCC Secretariat requested the Intended Nationally Determined Contributions (INDC) of all countries for emission reduction in line with their national circumstances. Turkey for the first time declared to emission reductions as deviation from business as usual (BaU) scenario by 21%. However, there is no multidimensional analysis of the impact of INDC on economy, climate and energy.

Since it is a multi-dimensional and multi-sector problem to link energy transition with the goals of climate change, the analysis of actions and policies necessary to combat climate change is necessary to address system integrity, feedback and dynamic relations. Furthermore, with the implementation of the system dynamics approach in the mitigation and energy transition needs analysis required by the Paris Agreement, the impacts can be seen in multiple dimensions. Turkey's long-term energy transition compatible with this study Paris Agreement with economic, energy and climate change system dynamics analysis for the achievement of the objectives will be realized. Thus, the relationship between emission reduction on system dynamics of energy use, especially in energy, transportation, industry and housing sectors will be determined. Three main scenarios will be developed within scope of the project. The first, the BaU scenario, according to 2030 targets as 21% of mitigation through transition in energy sources will be analyzed. In the second scenario, in addition to emission reduction achieved in the transition of energy supply sources in the first scenario, it is aimed to reduce the energy intensity by using energy resources efficiently and to reduce the emission. With this aim, effects of both energy efficiency and technology / activity change on primary energy use and the effect of energy demand change on emission reduction will be modeled. In the third and last scenario, it is aimed to use market mechanisms such as carbon tax and / or emission trade in these scenarios by excluding fossil energy sources from new and renewable energy sources or by reducing energy demand by decreasing energy intensity. In other words, it will be investigated that contribution of provision of access to climate finance and ensuring more fair situations in the UNFCCC to Turkey on additional emissions reduction. In the context of this study, national and international data will be acquired and system dynamic approach will be modelled first time at this scale. Thus, policies on climate change will be flexibly analyzed dynamically.

Keywords: Paris Climate Agreement, INDC, System Dynamics, Energy Transition, Renewable Energy, Energy Intensity, Turkey

Importance of Technology in Reducing Emissions from Electricity Generation (ID: 35)

Tuğba Dinçbaş
Ministry of Industry and Technology, Turkey

İlknur Frolet
Ministry of Industry and Technology, Turkey

Climate change is one of the crucial current environmental problems of our day; it does not recognize any boundaries in terms of its emergence and its wide effects. To combat climate change, a large amount of emission reduction is required over the coming years parallel to the Paris Agreement's target. Energy systems, especially electricity generation lie at the heart of climate change and for this reason they are being studied intensely. Production of electricity and heat production is responsible for 22,3% of the global emissions and it constitutes an important problem for the planet.

It is extremely essential to meet the energy demand -which is increasing day by day depending on the growing, diversifying and changing production and consumption patterns- in an environmentally friendly manner. Especially in recent years, very important technological developments especially in renewable energy technologies have taken place and were implemented to generate electric with less environmental pollution.

This paper evaluates these relevant technologies used in the electric generation in terms of their stage in the technology cycle and their effects on climate change. Finally, the paper gives an overview of Turkey applications of these technologies and discusses them.

Keywords: climate change, mitigation, electricity related emissions, renewable energy.


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OSTIM ENERJİK
www.ostimteknik.edu.tr - www.centerforenergyandvalue.org
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