

Meeting Abstracts

Wind Catcher in Office Building in Amman as a Model?

By Rula Sa'ad Al Asir

The paper revisits the concept of cooling method by means of a Wind Catcher; passively utilizing the renewable energy of wind to cool spaces using the office building in Amman as a model. The aim of the paper is to study the possibility of using the traditional wind catcher in an office building in the conditions of Amman, and to develop and assess a method to define the architectural parameters of a wind catcher, i.e. shaft width, length, height, windows pattern...etc to achieve the pre-set conditions in the occupied spaces.

Numerical methods are developed and the hypothesis is examined by the Thermal Simulation (TAS) computer program. The results show possibilities of applying a traditional style PDEC tower to an office building in Amman, Jordan with water introduced to the system. A six meter high evaporative column model with L-shape ventilation regime managed to drop the external temperature in the hottest summer day to 27.7°C -on average- in a four storey building of 2500 m² total area. Half a cubic meter of water is and 0.03 kW/m² of energy is needed to achieve the downdraught for dehumidification on the hottest day to bring the humidity into the human comfort zone.

Jordan's Oil Shale Development: Policy & Strategy

By Hazem M. Al Ramini

Upon the Government of Jordan's (GoJ) eagerness to encourage investors and to bring to production as quickly, technically and as economically feasible as possible its indigenous energy sources; Potential international and local Oil Shale investors and developers were attracted. The potential investors will be offered terms and conditions that are very competitive.

The GoJ had adopted a Two-Phase Strategy to develop its oil shale resources. The implementation of Phase 1 and Phase 2 is ongoing. The GoJ is in a position to implement its strategy through encouraging involvement in Oil Shale in Jordan by developing competition for access to its resources.

The tangible fruits for this strategy were the conclusion of an Oil Shale Concession Agreement "OSCA" for the deeply seated oil shale resources with the Jordan Oil Shale Company (JOSCo), fully owned by Shell

Exploration & Production and two Surface Retorting Concession Agreements (SRCA's): one with Jordan Oil Shale Energy (JOSE) to develop the Oil Shale Resources within the Attrat Um Al-Ghudran area and one with Kerak International Oil *p*sc (KIO) the Blocks A & C of the Al-Lajjun area as the Concession Block.

Jordan is currently licensing large areas of land with little known presence of oil shale resources and expects to award one million tons of mine-able resource once the extent of resources are determined and when interests and capabilities of companies are verified. Jordan had signed several Memoranda of Understandings, several companies have shown strong interest in Jordan's oil shale resources.

The Eight-Power Link

By Khalid Al Walidi

The paper highlights the ambitious project of electric grids networking, its objectives, achievements and the most important obstacles. The briefing highlights other projects aiming to link the Arab and Mediterranean regions. Additionally, the author intends to analyse future plans for the project and prospects of integration.

The Jordanian Energy Position

By Ahmed Al Azzam

The high rates of economic growth necessary to deliver improved living standards to a growing population demands significant increases in energy supply. At the same time, the high cost of providing this supply can imply the transfer of large sums of money to the energy sector, transfers which could impose limitations upon the same economic growth. The development process entails either the growing exploitation of latent domestic energy resources or the sourcing of requirements from the international energy markets. For small, low-income and low-ranking HDI economies without proven fossil fuel reserves the scenario is particularly bleak. One such economy is Jordan, a heavily-indebted Middle Eastern country with a population of around 6.5 million and a HDI ranking of 84. In focusing on Jordan this paper hopes to precipitate discussions on the energy-development dilemma faced by similar energy deficient nations in the world.

Jordan's presently known exploitable energy resources consist of limited quantities of crude oil, natural gas. Over the longer term with higher oil prices and improvement in technology its large oil shale deposits could prove to be a significant factor in meeting local energy demand. The potential of the country's renewable energy sources including geothermal, biomass, solar and wind energy is being investigated and is expected to make massive contribution to electricity generation as their technology is improving significantly over time.

For example the theoretical potential for solar and wind energy in Jordan is enormous, it is estimated to be around 1650GW and 320 GW respectively. The levelized cost per KWh generated electricity was calculated for wind, PV, and CSP to be 49-56fils, 119-140Fils and 133-161Fils respectively.

The Renewable Energy Contribution to the Sustainability and Security of Energy Supplies

By Salah Azzam

The Kingdom of Jordan is a semi-deserted country, almost land-locked and the only access to sea is the Red Sea, where the harbor of Aqaba is located, 350 km south of Amman. Jordan has little indigenous energy sources, almost the 97% of its energy is imported. In 2009, expenditure on energy imports reached approximately 13% of GDP. The levels of energy and electricity consumption will probably double in 15 years, and the electricity consumption is predicted to grow at an annual rate of 6%. Most of the energy resources consumed in Jordan are imported through Aqaba. Jordan is one of the developing countries that spends dramatically on imported fuel.

Jordan has also set targets regarding its policy for RES. These targets are established in the Strategy of Energy Sector, according to this 7% of the energy generation capacity should come from RES until 2015, while this share will become 10% by 2020. This is translated to investments of 530-660 MW of wind capacity and 300-600MW of solar capacity for electricity generation by 2020. In addition to planned wind and solar investments, the government is looking to generate 30-50MW of biomass energy within the next decade to meet the Strategy's goals. Moreover, the Strategy calls for Jordan to meet 29% of its energy needs from natural gas, 14% from oil shale and 6% from nuclear energy by 2020.

In recent years, Jordan has been undergoing a transformation process, based on a major restructuring of the country's economy, where development of local energy resources; natural gas, oil shale, solar, wind, biogas and hydro power will penetrate the energy mix.

The Role of Natural gas in Achieving the Security of Supply for Jordan

By Marwan Al Bakajin

The Government of Jordan (GoJ) has updated its energy strategy for 2007 – 2020. One of the crucial elements of this strategy is to diversify the sources of natural gas by having new sources of supply. The Strategy aims to move towards 80% of generation capacity of power plants being supplied by natural gas as a primary fuel, as well as to supply gas to industrial users and to residential and commercial sectors.

The Energy Charter Declaration.

By Patrice Dreiski

A key development in Jordan's energy sector has been the construction of the Arab Gas Pipeline (AGP). AGP enters Jordan from Egypt at Aqaba, and runs 420 km to the northern part of Jordan till the Jordanian Syrian border. AGP is 36" diameter, with an ultimate capacity of 10 bcm/yr. At present Jordan has the right to receive around (2.6) bcm/yr from Egypt via AGP under the signed contract which has been already allocated to electric power plants. Prior to this, Jordan's supply of gas was from the Risha Field only, which is currently under exploration by BP Company. The Risha Field supplied power plants with (0.19) bcm in 2010.

Due to the rapid growth in demand for natural gas in all sectors and the instability of gas supply from Egypt, especially since the beginning of 2011, GoJ (represented by the Ministry of Energy and Mineral Resources - MEMR) has started investigating the feasibility of importing natural gas in LNG form through constructing an LNG terminal at Aqaba port, this would help Jordan in diversifying its sources of gas supply. The project will mainly aim at providing gas to Jordanian users with the possibility of supplying gas to users beyond Jordan through the AGP.

Geopolitics of the Middle East and the logic of China's energy strategy

By May M. Chen

When China became a net oil import country since 1993, the question of how to ensure the security of energy supply has been a core issue for China's diplomacy. Given the fact that 50% of its oil is imported from the Middle East, the latter plays an essential role on China's economic growth. However, as any changes of geopolitics and upheavals in the region could lead to instability of energy supply, and in consideration of its limited influence in the face of America's competitive presence in the region, China has adjusted its Middle East policy and energy strategy accordingly towards a direction which tried to bring in various powers in the region in pursuit of a balanced policy that suits the status of its national strength.

The contradictions between the West and the Islamic world, tensions among regional countries as well as terror attacks have long constituted the threats to the regional stability. Nevertheless, the twist-and-turns of the Israel-Palestine Peace Route and the constant conflict scenario between the two, the contradiction between the U.S. and Iran that gives rise to the regional anti-U.S. sentiment, the WMD proliferation that fuels the escalation of possible conflicts among hostile nations, as well as the contradiction between the distribution of interests and the social demands in post-Jasmine Revolution period, have all added up to a even more unpredictable security situation in the Middle East.

International Energy Cooperation is necessary more than ever. The Energy Charter remains a political actuality and valid as a legal framework. New challenges in the energy sector are being recognized, new prospects to consolidate the constituency and to enhance co-operation with outreach partners.

The paper will discuss new challenges in the energy sector and methods to strengthen rule-of-law on energy issues. In addition, the presentation will highlight:

- Reducing risk for energy investments and trade
- Promoting energy efficiency
- Discuss policies, strategies and instruments
- Promote international energy trade through WTO-based guidelines
- Facilitates cross-border grid-bound energy flows using infrastructure
- Protects existing investments and endeavours the creation of a favourable investment climate for new investments.

Energy Infrastructure Security and Pipeline Protection in Turkey*

By Arzu Celalifer Ekinci

Around % 35 of the world's oil and 75 % of its natural gas are being transported through pipelines. This fact has highlighted the security of energy infrastructures both in respect with the security of supply and protection of pipelines. This issue is particularly important for Eurasia and the Middle East in general and in particular for transit countries, such as Turkey, where the security of energy infrastructures is at stake daily. Since Turkey aims to become a regional hub and an energy corridor, security of energy infrastructures is considered as a vital issue for Turkey. Both as a country who meets its energy demand through pipelines and as a transit country that carries the energy supplies to other countries, the protection of pipelines is an important subject which needs to be addressed carefully. This brief intends to demonstrate the importance of critical energy infrastructure security, the kinds of threats that those facilities may face and Turkey's approach on pipeline protection.

The Nile Basin Crisis - Is It Water or Energy or Both

By Dia El Din El Quosy

Following decades of friendly relationship between Nile Basin countries, the last two years witnessed less harmonic decisions taken by different camps. Upstream countries claim that water is a natural resource falling

their lands, giving them the right to use as much of it as they wish. Egypt and Sudan, being at the tail end of the system, flag their historical right in the quantity they have been using the last fifty years since the Nile Basin agreement was signed in 1959, with no objection from others upstream countries. In a steep sloping country like Ethiopia, heavy rain causes severe soil erosion problems. However, almost all eight countries (Congo, Rwanda, Burundi, Tanzania, Kenya, Uganda, Eritria and Ethiopia) have no sources of fossil fuel or natural gas explored on their territories.

Egypt and Sudan have some oil reserves and Egypt has surplus of natural gas where it is being exported to other countries. This paper is meant to discuss the crisis between upstream and downstream countries in the Nile basin which can be solved according to many observers by allowing the generation of hydropower in the upstream or the swap of energy and water between both riparian parties.

Waves of EI Targeting? Initial Impressions from the Energy Infrastructure Attack Database (EIAD)

By Jennifer Giroux

Drawing from initial impressions from the data gathering process for the Energy Infrastructure Attack Database (EIAD), a project carried out by the Center for Security Studies and Paul Scherrer Institute in Switzerland, this presentation will examine global trends in attacks aimed at energy infrastructure (EI). Of note, in the last decade EI attacks have taken on new spatial and temporal characteristics - creating a wave-like phenomenon of global EI targeting activity. In addition to discussing this observed trend and the characteristics of attacks, the presentation will also touch upon emerging risks to energy system - particularly in the cyber domain.

Energy Security – Statistics and Challenges

By Mazen Khalifa

The last decade had seen a number of radical changes which reflected in global energy demand. The sharp fluctuations in the prices of energy, long-term negative effects of power misuse on the environment and climate has prompted many scientists and researchers to look for new and realistic solutions to the crisis. In Jordan, energy is a very difficult challenge because of the lack of domestic commercial energy sources. To sustain economic growth and social development, the priority is to have a sustainable energy production. In light of this fact, and in light of the economic and social development, which aims to improve the quality of life for Jordanian citizens, the demand for energy is expected to increase to about 3% per year in general and about 6% per year in electrical consumption in particular.

Alternatives for supplying crude oil and oil products

By Kholoud Mahasneh

All crude oil and 25% of Petroleum Products consumed in the Kingdom of Jordan are currently imported at international market prices.

One of the objectives of the Energy Master Plan, which was prepared in 2004 and updated in 2007, was to review all alternatives for supplying crude oil and oil products. We investigate the feasibility of these options, including:

- a rehabilitated Tapline from Saudi Arabia
- A new pipeline from Iraq
- Road tanker from Iraq
- Accessing international markets through Aqaba, then conveyed by road (or) a railway system (or) a via a new pipeline

The analysis suggests the following:

- The existing crude transport method by road is relatively expensive, environmentally damaging and undesirable in the long-term
- Pipeline from Saudi or Iraq is the cheapest alternative long-term option, but is high risk
- Aqaba - Zarqa railway could bring wide benefits to Jordan's energy and non-energy sectors.

Security of petroleum supply can be achieved by proceeding in downstream oil sector restructuring program, opening the market for competition by establishing logistic and marketing companies as well as liquefied petroleum gas, which will pave the way for import from the world markets to meet the local market needs. In addition, the possibility exist for exploiting any local discoveries of crude oil or producing crude oil other resources.

Natural gas discoveries in the Eastern Mediterranean – Implications for Regional Energy Security

By Gal Luft

Recent geopolitical developments in the Middle East present both threats and opportunities to regional and global energy security. Among the game changers causing a great deal of nervousness in energy markets are

the regime change in Egypt, the elevated threats to critical energy infrastructure and the escalating tensions in the Gulf. At the same time natural gas discoveries in the eastern Mediterranean and a variety of ambitious pipeline projects have the potential of strengthening regional energy security cooperation. In the coming years regional players will be forced to adopt new energy security strategies to address their interests as both reliable producers as well as rapidly growing energy consumers.

Middle East Oil Supplies – Economic, Security and Political Implications

By Robin Mills

Middle East oil supplies, crucial to the world economy, are not threatened by a lack of resources in the ground. Though technical challenges are increasing, Middle East oil reserves remain substantial, and there is considerable scope for improved and enhanced recovery, new exploration and unconventional resources. The physical security threat to MENA oil supplies, though not negligible, is often overstated and largely confined to specific states, e.g. Iraq, Libya, and Yemen. Recent political turmoil in the Middle East has had only a minor impact on the main Gulf producers, while the Iranian threat to the Strait of Hormuz is containable. However, political and market factors play a large role in determining Middle East oil supplies and hence the state of global markets. With non-OPEC supplies growing only slowly since 2004, in the face of rapidly-growing Asian demand, a number of major OPEC countries- Iran, Iraq, Nigeria, Libya and Venezuela- have been unable, for various reasons, to increase production substantially or even to maintain it. Iran's presidency of OPEC has gained headlines, but its ability to influence oil markets is weak due to its own declining output. This has left Saudi Arabia supported by Abu Dhabi and Kuwait, as the sole holder of significant spare capacity and hence the arbiter of production levels and prices. Iraq, with its ambitious production expansion plans, presents a potential challenge to this Saudi hegemony over the next few years, though formidable logistical, security and political challenges remain.

Crime of Piracy in the Light of International Law

By Dr. Aiman Salama

Crimes of piracy and armed robbery against ships and vessels off the coast of Somalia and the Gulf of Aden, raised concern and attention of the international community. These crimes represents a threat to international peace and security in general, and a threat to human security by the State of Somalia, which has collapsed and broken apart since 1991. The acts of piracy and armed robbery against ships and vessels off the "coast of Somalia in the Gulf of Aden" pose a major threat along with great calamities, it is impossible to wait and not act on this issue. We need to deal with piracy as an international crime. It is important to study this legal issue

because of its direct impact on recent international efforts to combat armed violence off the Somali coast, as well as recent decisions of the Security Council to combat this phenomenon.

An Impending Oil Crunch by 2015: Impact on the Global Economy & Energy Security

By Mamdouh G Salameh

An analysis of the global oil market fundamentals indicates that a severe oil crunch could be in the offing probably by 2015 or thereabouts. By 2012, the global oil production surplus capacity could entirely disappear if the global economy continues to grow and by 2015 the shortfall in oil output could reach nearly 10 million barrels a day (mbd) causing a severe oil crunch and pushing the oil price to levels matching if not exceeding the price levels reached in July 2008, namely \$147/barrel. While it is difficult to predict precisely what economic, political and strategic effects such a shortfall might produce, it would surely, at best, lead to periods of harsh economic adjustments in the global economy and, at worst, to conflict and even war should one of the major oil-consuming nations choose to intervene forcefully. The war on Iraq was a foretaste of what's to come. That war was instrumental in precipitating the recent global banking crisis and the recession from which the global economy is still suffering.

The Salient Implications of Geo-strategic Policies on Stabilizing the Oil Market in the MENA (Middle East and North Africa) Region

By Dr. Ahmad Shikara

Oil as a Geo-strategic and Geo-economic commodity has and will continue (at least for the next 50-70 years or even more) to play a prominent role in shaping Energy Security strategies and policies. OPEC itself will continue (despite internal pressures) to play a salient role in devising relatively sound policies that defend oil producers' interests without discounting the mounting external pressures emanating largely from the consumers' camp and which are increasingly coming from East Asia (China and India, etc). Oil geo-strategic and economic policies will continue to be determined by various players, elements, factors and events covering multivariate areas, i.e. security, politics, economic, and social. Entering into the vital role, new technologies are increasingly playing a role in creating innovative projects particularly with regards to the question of renewable non-fossil energy options. However, the implications of Geo-strategies on the degree of stabilizing the oil market has increasingly started to gain even more attention and interest by multivariate parties.

Background Paper

An Impending Oil Crunch by 2015: Impact on the Global Economy & Energy Security

By

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Introduction

Eleven years into the 21st century, and the world remains heavily dependent on the fuel that powered the last 100 years: crude oil

Concern about the depletion of conventional global oil reserves seems to have intensified for several reasons, including technological improvements in geological data gathering and analysis, the increasingly sparse reserves discovered by new drilling, question marks over the real size of global proven reserves and concerns that much of the world's conventional oil especially in the Middle East, is coming from old and over-exploited mega-fields that are becoming less productive. There is no risk that we are running out of oil but chances of being able to match the projected growth in demand over the medium term with a rise in production is being seriously questioned.

The pressure on the oil price will continue unabated in coming years because of the growing global demand for oil and the dwindling global proven oil reserves.

Conventional oil production peaked in 2006. My own research, however, indicates that the peak may have already been reached in 2004 if we factor in what I describe as "OPEC's inflated proven oil reserves". My research indicates that OPEC's proven oil reserves are overstated by some 300 billion barrels (bb). 1

Nine of the top oil producers in the world have already peaked: USA peaked in 1971, Canada 1973, Iran 1974, Indonesia 1977, Russia in 1987, UK 1999, Norway 2001, Mexico 2002 and Saudi Arabia 2005 (see Table 1). The only one among the top producers that has clear capability to increase production is Iraq once stability is restored to the country.

Background Paper

Energy Security: the Middle East and the Gulf Countries: perspectives.

By Patrice Dreiski
Energy Charter Secretariat - Brussels

Background :

Energy is one of the hottest topics in contemporary politics. The extreme importance of energy for modern life is undeniable. Energy maintains our standard of living and is the basis of economic performance. Currently, we take it for granted that energy is available whenever we want it. Demand for energy will continue to increase as long as the global economy grows and average living standards rise. The most reliable predictions indicate that by 2050, the world's population will have nearly doubled from its present level, rising from around six billion to roughly ten billion people. This will certainly result in increasing import dependence, higher prices, and uncertainty of energy supply.

In recent years, we have witnessed a resurgence of interest in energy security that goes well beyond the stability and predictability of prices, commercial arrangements, and infrastructure projects. Energy security is now recognized as an integral part of the concept of security. In this respect, the topic is at the top of the political agenda of many international and national organisations as it does underpin not only their economic growth, but also their ability to alleviate poverty, improve social welfare, and secure their political independence. This has occurred in parallel with the emergence of a number of new threats and challenges that bring in numerous factors to be taken into account when shaping national and multilateral strategies.

For the next twenty years, fossil fuels will continue to dominate global energy use, accounting for some 85 per cent of the increase of world primary demand. Oil will remain the most widely used fuel, even though its percentage share will fall marginally. Demand for natural gas will grow in the immediate future. Interregional supply is expanding strongly all over the world, particularly with the development of liquefied natural gas (LNG). This development will strengthen the role of transit countries while creating a particular role for maritime hub countries.

Governments are facing new challenges regarding their energy policies. Things have changed since the first energy crisis. We can no longer be certain that the existing national energy policies will provide secure access to energy resources, accommodate increasing demand for energy and growing energy dependence, and protect against energy depletion.

Current economic and environmental conditions oblige us to look for regional and even global solutions to long-term energy security challenges based on renewable, efficient, and ecologically sound technologies. To achieve this goal, more energy dialogue and more interregional and inter-institutional co-operation are needed, and more joint activities and multilateral energy policies must be developed.

Energy Security is well beyond the domestic borders, energy security means the security of supply for the consumers, the security of delivery for the producers as well as the security of the transit, for both. Energy security is a ground for international cooperation; it does provide stability and peace. While today energy security principles rely, for majority, on fossil resource, energy security should include the emergence of renewable energy resources, solar and wind, in particular for the Middle East and North Africa regions.

Energy security is an evolving situation: evolving resources, evolving energy roads, alternative roads, it is the opposite of a frozen situation.

It is necessary to consider the water/energy nexus, particularly important in this region and Central Asia. The Helsinki Convention on the cross-border cooperation for water management should be promoted as an efficient tool for prevention water/energy conflicts. Importance of the regional organisations to develop regional- and wishfully –integrated policy, meaning stability, positive and monitored interdependence.

Energy security is and will remain at the top of the global political agenda, and the capacity to develop concerted policies aiming at strengthening energy security will rely on co-operation between relevant international organizations.