

The *Bosphorus* Energy Club

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*Navigating through new transformation and
turmoil in energy, investment and geopolitics*

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Special Session of Prime Ministers and Ministers

Building bridges and forging partnerships in energy

The Bosphorus Energy Club is an exclusive membership-only gathering of senior leaders and executives in energy, investment and geopolitics. It serves as a Track-II energy diplomacy channel as well as a discreet but powerful summit of the top decision-makers for regional issues and projects in Eurasia, the MENA, the Gulf, and Southeast Europe.

Executive Chair

: Mehmet Ögütçü, Executive Chairman, Global Resources Partnership, UK

Advisory Board Chairman

: Michael Ancram, House of Lords, UK







Summary

By Mehmet Ögütçü Chairman¹

Main messages

- ✓ The era of hydrocarbons is not over. We like it or not; they will still account for 70 percent of our energy mix by 2050, despite significant breakthroughs in renewables and efficiency. Many new players come in the energy market promising additional and cheaper resources, and changing the rules of the conventional game.
- ✓ There is a growing tension between public policy and private money. The under-investment that we observe now due to lower prices and risks will become chronic and the global output of energy resources will inevitably lead to supply deficit and new unpredictable price spikes, eventually hitting both producers and consumers.
- ✓ Even if there was an agreement today by everybody to 'phase hydrocarbons out' it would easily take the better part of two generations to get everything running on alternative sources, never mind the plastics, fertilizers, pesticides, pharmaceuticals and just about everything else that modern society uses them for.
- ✓ Oil companies face a challenge: if they truly believe that a shortage is coming they need to continue investing (IEA says investment fell 24% in 2015 and 25% in 2016) or at the very least, protect core investing functions for the future, including exploration spending.
- ✓ OPEC faces a challenge as, for the first time in its history, two low-cost, large-reserve base members signal their intention to increase production. Iran and Iraq will force Saudi Arabia to consider new approaches. Saudi Arabia will certainly not cut its own production to see Tehran and Baghdad increasing their own.
- ✓ Gas is believed to gradually replace coal, which is a source of distress for some producers. The world is facing a proliferation of LNG supplies that are already impacting on gas markets and competing with pipeline gas. Some of the largest and most significant consuming nations are contemplating reform or unbundling, which could mean some take or pay contracts become stranded and an increasing oil price is likely to reinforce the price arbitrage between long-term and spot pricing.
- ✓ We still have massive and cheap resources of coal. Given the reality of climate change, any talk of coal must be clean coal, an approach which enables the utilization of the most abundant domestic energy resource so that at least the impact on the climate is minimized. Clean coal has a number of variations, but all of them involve stripping the CO₂ out of the coal, either before or after it is burned and then capturing it.
- ✓ Further investments should be made in renewables, but lower oil, gas and coal prices and increased efficiency might slow this down. It is still easy to shift back to old mentalities, yet whomever adapts to the new needs of the energy economy will remain competitive in the market.

¹Thanks are due to Sila Uysal, one of the 100 Young Leaders in Energy of the Club, who helped with her notes from the roundtable discussion.

- ✓ Renewable power is replacing or has the potential to replace fossil fuel generation in some countries. Smart grids are delivering the potential for greater interactivity with customers. And the scope for even more transformative technological breakthroughs is being taken more and more seriously all the time.
- ✓ A breakthrough in the cost and practicality of battery storage technology could be a quantum leap enabler, opening up the possibility of off-grid customer self-sufficiency when used in combination with 'own generation'. 'Power to gas' is also a potential transformative technology. All bring opportunities for power companies but many also have the effect of eating away at a utility company's traditional revenues and undermining the traditional utility business model.
- ✓ Pipeline politics are fascinating, but it is the smaller stuff that is really crucial: reverse flows, interconnection, LNG terminals in the right places. Cables vs pipelines are gaining added importance.
- ✓ Unfortunately, economic and financial crisis had relegated environmental concerns to second place because of the false choice so often presented between economic growth and environmental action, with the latter treated as a luxury which could be postponed to better times. Yet, climate change has emerged as an undisputed reality that must be factored in every business and government decisions.
- ✓ A world without nuclear energy is considered to be a tough one because without nuclear energy we would have burned millions more tons of coal and billions more barrels of oil. This would have brought about climate change of such proportions that what we have today would have seemed negligible.
- ✓ In emerging economies like Turkey where energy demand growth is strong, nuclear energy will continue to be popular with governments. Yet, there is need for a strong, independent regulatory body to assure the public and secure nuclear energy development.
- ✓ Cyber threats to critical energy infrastructure requires a much deeper, hybrid approach bringing together governments and different institutions including G-7/G-20.
- ✓ The European Union is in full swing to complete all legislative acts before the end of 2016. A single European energy market will allow Europe to increase its security of supply by allowing energy to flow freely across borders, therefore offsetting any oversupply on one side of a border with any supply deficit on the other.



- ✓ The EU is more confident that it has developed sufficient alternative supply. Russia knows it would be shooting itself in the foot to disrupt supplies. Even a “mad man in the Kremlin”, who decided to attack EU energy markets despite the costs to his own country, was a less dangerous prospect than he would have been seven years ago.



- ✓ Russian perceptions of energy security are different than those of the EU and primarily about predictability and stability of energy prices because they heavily rely on hydrocarbon revenues. Wielding great power influence particularly in its own spheres of influence is another objective. Russia does not want to be vulnerable to Ukraine transit problems, so will accelerate development of alternative routes including Nordstream-2 and Turkish Stream.
- ✓ With Europe increasingly becoming the dumping ground for the world’s surplus LNG, 2016 should see a continuation of the oversupply situation in European gas markets. Those who invested in gas storage or gas-fired power have all burned their fingers, if not their entire arm. There is no real penetration of US LNG into the EU yet. But the possibility of such imports if necessary helps energy security.
- ✓ EU Neighbourhood Policy was supposed to generate a “ring of friends”; instead, we got a ring of fire.
- ✓ Nord Stream 2 may very well get resurrected, but for now, the new Russian gas pipeline into Germany is one of a string of failed projects designed to get more of Gazprom’s gas into Europe. The politics are challenging (EU/Ukraine, Germany/Poland) perhaps too challenging for it ever to be built. That currently leaves for Russia just two pipelines left: Power of Siberia and the Turkish Stream.
- ✓ One leg Turkish Stream is fine but a two-string Turkish Stream, viewed as a political project, could go against Turkey’s interests, as Gazprom’s ability to flood the Turkish market would increase the risk premium associated with investments in alternative supplies (ranging from the Eastern Mediterranean to Iran, Northern Iraq, the Caspian and new FSRU platforms). It might also delay the long awaited liberalisation of the gas market. The second leg can go ahead only if the EU is willing and needs to receive additional gas.
- ✓ Turkey needs to clarify whether its long-term ambition is, as often stated, to become a regional gas hub or a simple transit country. A hub is a competitive market place where gas from multiple sources is stored and traded at spot prices. Any version of Turkish Stream larger than one string would likely put such an ambition in danger by dis-incentivising investments in Turkish storage, LNG, alternative pipelines and demand reduction.



- ✓ Iran's strong re-entry into the world energy markets may not be as fast as we have been led to believe. Political risks, uncertainties and some sanctions are still in place, but the country offers immense potential for energy investment if financiers can possibly be persuaded. Iran and Turkey are bound to work together in this geography either more collaboration or more competition with each other.
- ✓ When Mosul and Raqqa are re-taken and Aleppo is settled, the reconstruction and re-governance phase will be long and arduous. No one is saying that there will be easy choices ahead for the governing authorities in Baghdad and Damascus. The aftermath of the Mosul operation in particular will have serious implications for the new configuration in Iraq, with KRG's security and claims to Kerkuk and parts of Mosul possibly creating continued disputes. Turkey will not be able to stay away from the war going on at its immediate proximity.
- ✓ Accessing Kurdish gas may arguably be less urgent for Turkey today than it appeared a year ago, with political turmoil; the threat to a new gas pipeline posed by the PKK; the slowing Turkish economy; and lower international oil and gas prices which ease the burden of expensive energy imports. KRG faces competition from not only the Turkish Stream but also Azerbaijan, Iran, Qatari LNG, and possibly Israel's Leviathan following the recent Turkish-Israeli détente. However, bear in mind that there is a special relationship between Ankara and Erbil which is beyond pure commercial considerations that could make the gas deal possible, with Turkey's support.
- ✓ International energy governance is in flux. Is it worth giving a push to the IEA's efforts to secure a greater global role without damaging its current value for members? How can we achieve synergies and avoid duplication with IEA, IEF, Energy Charter, OPEC, IRENA?

- ✓ None of us have reached where we are today merely through our own personal endeavours. This way or another we have benefitted from our seniors, sometimes through a couple of wise words, sometimes by way of introduction to potential employer, patient coaching, and mentoring. As we enter a new critical

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era of game-changing developments in world energy millennial young people have to be given the opportunity to progressively grow, mature, build their leadership capacities, develop right attitudes to people and job, and reinforce emotional intelligence. The Club members will support YLE initiative to continue.

Overview

1. The Bosphorus Energy Club, teaming this year with the 23rd World Energy Congress (WEC), brought together 120 major energy leaders in Istanbul on 11 October 2016 including ministers, ambassadors, business executives, lawyers, Think-Tanks and experts from Turkey, the US, the UK, France, Germany, Greece, Romania,

Bulgaria, Azerbaijan, Kazakhstan, Israel, China, Russia, Ukraine, Saudi Arabia, Iran, Qatar, Morocco, Nigeria, South Africa and Australia.

2. The roundtable, moderated by the Club's chairman Mehmet Ögütçü, provided an opportunity to hear from major players the investment decisions, risks, current state of geopolitics, their impact on the energy sector as well as on anticipated changes in the near future. The speakers have not shied away from communicating with a view to guiding business and government leaders in taking the necessary decisions and policy actions going forward in the new world of energy.

3. Among more than 20 speakers who provided privileged insights to the select audience at the meeting were:

- European Commission Vice-President **Maroš Šefčovič**,
- 13th Marquess of Lothian, Lord **Michael Ancram**,
- OECD Nuclear Energy Agency Director-General **William D. Magwood**,
- Former Qatari Minister of Economy and Trade **Mohamed Al Thani**,
- Glencore and Genel Energy Chairman **Tony Hayward**,



- Chevron Vice-President **Ian Macdonald**,
- PwC Global Energy and Utilities Partner **Norbert Schwieters**,
- Bilgin Energy CEO **Tolga Bilgin**
- Former Iranian National Oil Company Director-General **Mahmood Khaghani**,
- Former Minister of Energy, Romania, **Razvan Nicolescu**,
- Bayegan's Deputy Chairman **Ruya Bayegan**,
- Former International Petroleum Exchange Director **Chris Cook**,
- Former Bulgarian Minister of Environment **Julian Popov**
- Gunvor's Head of Natural Gas **Robert Alpen**
- Columbia University's **Tatiana Mitrova**,
- METhinks' **John Roberts**.

4. The Club has also once more shown its strong support in promoting young leaders and provided a platform to two chosen members, Emre Dogru and Sila Bozok, representing its Young Leaders in Energy programme and other 10 leaders to take part in the roundtable.
5. Chatham House Rule allowed for the discussion of some “taboo” issues in a discreet manner at a private dinner debate, hosted by PwC, at Shangri-La Bosphorus Hotel. A summary of this meeting will not be provided given the confidential nature of the discussions held.
6. The event photos, the list of speakers, discussants, participants and publicly available documents can be accessed via www.bosphorusenergyclub.org

Key highlights in detail

7. Megatrends and disruptions are having profound implications for the strategies and future role of companies all along the power utility value. Five global megatrends - technological breakthroughs; climate change and resource scarcity; demographic and social change; a shift in global economic power and rapid urbanisation - are impacting the sector. Their effect is made all the greater by a number of simultaneous disruptions, involving customer behaviour, competition, the production service model, distribution channels, government policy and regulation.

8. The energy industry faces uncertainties of daunting magnitude on many levels: the pace of climate change policy, the growth of renewables, the apparent demise of coal, falling energy prices, the role of natural gas in the energy mix, and the likely impact of energy efficiency on demand growth. It is possible that we will see forces leading to a faster transition.

9. But, history tells us that it takes a long time for new energies to gain market share. It took more than 40 years for oil's share to rise from 1% to 10%. Gas, even after 50 years, still didn't provide 10%. We have renewable energy – meaning wind, solar and biomass – growing more quickly than any fuel in history. It still struggles to reach 10% of the world's energy supply by 2035.

History tells us that it takes a long time for new energies to gain market share

Fossil fuels will be with us for long time to come

10. There was unanimity of opinion at the panel with President Putin when he remarked a day earlier at the World Energy Congress summit that “amid a more than twofold drop in oil prices, many said that the era of hydrocarbons is nearing its end, that a complete shift to alternative energy sources is necessary. I think that there is no real basis for making such far-reaching conclusions, at least for now”.

11. Yet, the World Energy Council did not agree with this assertion, warning that much of the world's fossil fuel reserves have to stay in the ground to limit global warming. That message was lost on most of the speakers in Istanbul, however. Backed by the presence of the Presidents of major oil and gas states – Russia, Venezuela and Azerbaijan – the executives of companies like BP, Saudi Aramco, Total and Gazprom spoke mostly of their plans to invest in new oil and gas production. Mohammad Barkindo, the new Secretary General of oil cartel OPEC, went a step further and said oil should be the “fuel of choice”. He demanded that “the Paris Agreement” should not lead to the “discrimination” of oil.

12. Recent events have heightened awareness of energy security in both Europe and Turkey. There is also a danger of people lumping all fossil fuels together. Not all fossil fuels were made equal. Until there is an economically viable solution to large-scale storage of renewable power, we will need a balancing fuel to solve the intermittency problem. So, a gradual crowding out of coal and a switch to a combination of natural gas and renewable energy in the power sector is a key part of the transition that we need to see.

13. Even if there was an agreement by everybody to ‘phase them out’ it would easily take the better part of two generations to get everything running on alternative sources, never mind the plastics, fertilizers, pesticides, pharmaceuticals and just about everything else in ‘modern society’ uses them for.

14. There is no need to panic about the future of hydrocarbons for the coming decades; even with the world's current sizable population, the improving standard of living in developing countries and the minimal contribution from renewable energy. The current dilemma is due to a political battle coupled with an economic slowdown in critical markets such as China that is leading to oversupply. The oil and gas industry is not (yet) on its knees, rather it is at a crossroads that will determine if the industry can flourish for just the next few decades or well into the end of this century. Through collaboration, cost savings, technological advances it will be possible to improve hydrocarbon recovery and to increase the yield levels to help extend the future beyond a few decades to most of the next century.

15. Capex spending in oil in gas this year is likely to be around a third lower than in 2014. That has been partially offset by falls in costs but even so real investment has shrunk and that is likely to squeeze supply growth. Falling investment in exploration has led to the lowest increase in oil reserves in 70 years. Large-scale investment withdrawals from projects which are now viewed as unprofitable have been observed.

16. It will take some time for the oil industry to recover. For the second time in less than six weeks, Saudi Aramco has cut the price of its oil shipments to Asia. This is a transparent attempt to gain additional market share in advance of any cap on production. But it also depresses the very rise in crude prices that all oil producers are looking for. A Saudi cut in prices to Asia has one objective – to take market share from Russia in what is becoming the main oil market battleground moving forward.

The fossil fuels' share in the energy mix will stay significantly high in the 20 years to come

17. Russia has already responded by ramping up its own production well beyond sustainable levels while likewise cutting prices. OPEC member Iraq too

entered the battle by pledging to increase its own production in response to the Saudi and Russian moves. In short, Riyadh has initiated another round of a price war that every producer will lose – a price war that is counterproductive to the deal that the Saudis themselves both brokered and announced in Algiers. But if it works, it could lock in a larger part of the highly lucrative Asian oil market for Saudi Arabia.

18. Despite the Paris Agreement to take effect in November 2016, the fossil fuels' share in the energy mix will stay significantly high in the 20 years to come. 82 percent of today's energy supply are fossil fuels; this share will be around 75 percent in 2040, thus still clearly above 70 percent in 2050.

19. The discussion's starting point was the fundamentals of supply and demand. There was a significant degree of consensus on the supply side. The increasing ability to access large quantities of shale gas and tight oil, together with continuing discovery of new fields around the world, should ensure that we had enough natural gas for many decades to come, perhaps even several hundred years, and enough oil for the foreseeable future..

20. The demand side was less obvious in some ways. It was clear that primary energy demand would rise steadily for the foreseeable future in the big emerging economies, led by China and India, as well as by high population growth and continuing urbanisation. High economic growth and rapidly expanding middle classes would push up energy needs – and we might well be underestimating the scale of this, as exemplified by the current extraordinary growth in the Chinese car market. But it was difficult to be sure how far attempts to control demand elsewhere would succeed and how far efforts in China to reduce energy intensity might also make a real difference.





21. How easily could balance between supply and demand be achieved? Predictions in this area, as in many others, had a very poor track record. Past price forecasts had proved wrong on a particularly spectacular scale, and humility had to be the order of the day. Most participants thought that over time supply and demand could achieve a reasonable balance but it would be a bumpy process. Oil prices in particular were likely to rise further, albeit with blips and plenty of volatility, given the increasingly difficult and costly conditions for extraction of the supplies of 'unconventional' oil needed, for example from oil sands, very deep waters, and politically unstable source countries.

22. There could well be a much smaller 'supply' cushion in the future than in the past, when Saudi production had been the key variable, which could also increase short-term volatility. The OPEC might well also try to use their market muscle and increasingly dominant position in the market to keep prices up, as they had in the past.

Primary energy demand would rise steadily for the foreseeable future in the big emerging economies, led by China and India

23. One big challenge was how to get oil and natural gas from where they were extracted to where they were needed. Would the private or public sectors be willing to make the necessary huge investments in transport infrastructure, and would permissions/licenses to put in this infrastructure be forthcoming from the necessary authorities, given geopolitical sensitivities in some areas and domestic environmentally-based opposition in others

24. To allow the world to meet the energy demands in the future it will require a combination of renewable energy, biomass, nuclear and hydrocarbons. New technology in offshore wind, solar energy, and tidal energy will not be sufficient alone to replace fossil fuels. However, harnessed together will provide a sufficient quantity to meet the planet's thirst. This clearly shows that the demand will continue to increase over the next few decades until it finds a plateau near the middle of the century, however, this will be highly dependent on the world's population beyond this point.

No “Golden Age” for Natural Gas?

25. The IEA’s earlier prediction on a golden age was premature. Natural gas accounts for roughly a quarter of global energy demand, of which 9.8% is supplied as LNG. Although LNG supply has grown faster than any other supply source – averaging 6% per annum from 2000 to 2014 – its market share growth has stalled since 2010 as growth in domestic production has accelerated. However, a major expansion of LNG supply through 2020 positions LNG to further expand its share.

26. Almost all speakers agreed that there is more going on now in the world of gas than at any time in history. Who knew there was so much gas in the world! With all the shale gas in North America creating a new export source, new discoveries in the Eastern Mediterranean, and vast resources poised for development in East Africa, not to mention accelerating LNG exports from Australia, gas buyers are spoilt for choice and has become the “king”. What seems certain is that all this competing gas will have an impact on price.

To allow the world to meet the energy demand in the future it will require a combination of renewable energy, biomass, nuclear and hydrocarbons

27. The apparent abundance of supplies should mean that prices would fall over time, particularly in the markets where it was produced. This was already happening, eg in the US and Canada, where gas was now just over \$3 per MBTU, compared with \$6 only a few years ago – and compared to much higher prices in much of Asia, for example Japan.

28. More pipelines and construction of further LNG facilities should help to reduce the price disparities over time. Nevertheless, there were uncertainties around the gas market too. Estimates of the amounts of recoverable gas in shale gas fields differed wildly in some cases. The most commonly used extraction technique, so-called ‘fracking’, was controversial in some countries, particularly in Europe, because of concerns about ground-water pollution and seismic effects. Pipelines remained highly sensitive in some key areas. Water shortages could at some stage become a limiting factor for gas extraction.



More pipelines and construction of further LNG facilities should help to reduce the price disparities over time

29. No doubt, Russia was caught off-guard by the sudden emergence of the US as a potential major LNG exporter. But Putin has since made it a priority to hasten the development of Russia's LNG sector². Russia's proposed export plants also lie close to North Asia. Cargoes can be shipped to Japan in less than 24 hours from Sakhalin, making the economics and flexibility of supply appealing. As a result, Russia could carve out much of the lucrative Asian market - the biggest in the

world. Even with just getting Yamal to market, Russia has a big task, as new supplies from US and Australian projects should really start to ramp-up around 2018.

30. Deterioration of the relations between the West and Russia could still stymie Gazprom's major export project, although the partners are moving ahead with development. The South Stream pipeline, which would carry Russian gas across the Black Sea to southern and central Europe, is strategically important for Gazprom. The new route would avoid transit through Ukraine, ensuring supplies to the company's prized European market would not be affected by further friction between Kiev and Moscow.

31. In 2017, Turkey's 30-year supply contract will expire with Russia. It was noted that the two countries had thus far a mutual understanding of this, obviating the need for arbitration, that negotiations were always settled bilaterally and amicably, and that both sides wanted gas trade to continue on the basis of mutual benefit.

32. The startup of several new projects in Australia and Indonesia drove higher supply, ramping up significantly enough to offset outages in Yemen, Egypt and Angola. Although the Pacific Basin remains the largest source of demand, growth was driven by Europe and the Middle East; both regions saw new countries become importers in 2015. A golden age for LNG might arrive if the demand similarly expands to other regions.



33. With supplies growing, some Asian nations like Japan are contracted to buy more than they can consume, leaving surpluses to be sold. That's lured major traders into the LNG market in recent years, including Vitol Group, Trafigura Group, Koch Industries Inc., Gunvor Group Ltd. and Noble Group. The annual capacity of liquefaction plants, where gas is chilled and compressed for shipping, grew to 415 billion cubic meters in 2015 and will expand to 595 billion by 2021. By 2020, five terminals will be operating on the U.S. Gulf Coast and in Maryland. Global export capacity will surge 45 percent and the U.S.'s share will jump to 14 percent from nothing.

34. While U.S. supply is still relatively small, it's having an impact because the American contracts are flexible. Australian and other foreign processors conclude long-term agreements to send gas to specific countries such as Japan and China. Asian buyers have contracted for more than half of the U.S. supply, but they have the freedom to ship the fuel to anywhere in the world, encouraging spot trading.

35. We can expect four things to feature in the next few years:

- First, a process of price discovery will gather momentum, such that wholesale prices will be bound on the upper and lower side by some kind of short-term and long-term marginal cost, most likely trending towards cash cost of production in the shorter term.

- Second, led by flexible LNG supplies, there could be an accelerating migration towards pricing terms which are based on gas-on-gas competition rather than following oil.
- As this process gets underway, hubs are likely to emerge, which will have to be supported with exchange-traded contracts to help build momentum and enough dependability that lenders and others will have the confidence to finance projects based on hub pricing.



- Finally, if the UK and Europe are anything to judge by, change can come much more rapidly than anyone expects, and those who fail to adapt can get into serious trouble as a result.

Investments after all determine what will really happen in the energy sector

36. There was also a mention of Turkey in the new LNG market context.

Turkey has two LNG terminals - Aliaga which is fully operational to gasify 16.5 million cubic meters (mcm) of LNG per day, and the Marmara Ereğlisi to the west of Istanbul where three tanks can gasify 22.5 mcm a day at full capacity, but the terminal is currently only processing 18 mcm a day. A new FSRU is being constructed by Kolin Energy.

37. EgeGaz's first import of LNG from the U.S. (135,000 cubic meters by the Knutsen LNG tanker) is significant for accelerating Turkey's aim of becoming a natural gas trading hub, as well as competition between LNG exporting countries. It will force LNG prices to continue to fall. However, it is unlikely that the U.S. can compete with Russian gas in Turkey for economic reasons.

A major shift in investment towards low-carbon power generation

38. Investments after all determine what will really happen in the energy sector. There is little appetite for investment in today's world. Overall, \$1.8 trillion was spent on energy last year, spanning everything from hydrocarbon extraction to energy efficiency to power supply. Oil and gas still represent the largest single category of global energy investment, accounting for over 45% of the total. Investment in the electricity sector rose to a record \$690 billion, or over 37% of the total, despite a marked slowdown in demand growth, driven primarily by the expansion of renewables and networks.

39. The reductions in upstream spending were behind the fact that this total was 8 percent lower than the 2014 figure. It was also, partially at least, behind the drop in energy supply investment, which was last year at its lowest since 2010. China "retook" the number one position from the US as top investor: whereas US investment in oil and gas production fell sharply, Chinese investment in the electricity sector rose to a "record level". China increased its investment both in renewable energy and in nuclear power.

40. In non-OECD countries, investment in conventional generation remains strong, with over 75 GW of coal-fired power plants having starting operation in 2015 in "developing Asia" – "as much as all renewable capacity additions in the region combined. A "shift" may be underway – it is not going fast enough. Investment in upstream operations in the oil and gas industry shrank by a quarter in 2015 and is expected to continue shrinking this year by another 24 percent. Next year could see a continuation of the trend, which will represent the longest investment decline period in the history of the industry.

41. One speaker pointed out that most of the decline in upstream investment – a decline of over \$300 billion – was a result of lowered costs. This could suggest quickly improving efficiency of exploration and production, but it is far more likely that the lower costs are a direct result of rigorous cost-cutting by E&Ps across the board to weather the effects of the oil price rout. In absolute terms, investment in upstream oil and gas totaled \$583 billion in 2015, representing the biggest single portion of investment in energy.

To encourage high level of investment, participants urged governments to create stable business environment

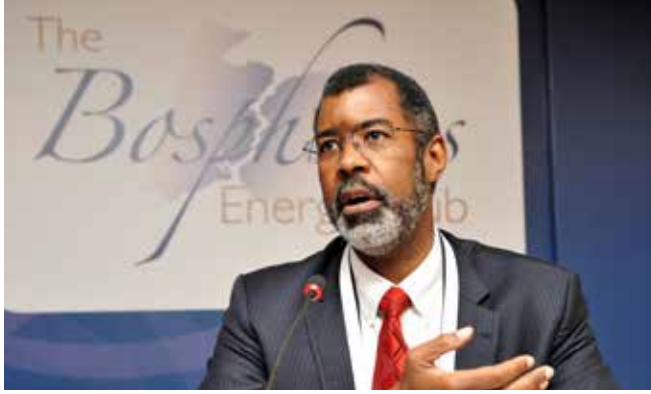
42. Geographically, Russia and the Middle East were the most resilient producing regions, with state-owned companies such as Aramco and Rosneft accounting for 44 percent of the global total in energy investment last year. 2015 upstream investments in North America were down over 50 percent from 2014, at \$138 billion. Overall, however, North America accounted for the most investments in energy last year.

43. Last year, investments in renewables totaled \$313 billion. The share of investments in renewables in the overall mix was 17 percent in 2015, up by just one percentage point from the 16 percent it accounted for in 2014. Still, wind and solar power has become noticeably cheaper, which has made it possible to expand generating capacity with lower investments. In the period between 2011 and 2015, renewable power capacity was boosted by 40 percent and power production from renewable sources jumped by a third, thanks to cheaper materials and installations, and adoption in countries “with better resources”.

44. To encourage high level of investment, participants urged governments to create stable business environments, including policy frameworks which helped companies take on and manage risk, incentivized efficiency and innovation, and eased key infrastructure decisions. Greater transparency and reduction/eradication of corruption would be valuable steps in many countries. Institutional investors such as pension funds should be encouraged to invest in the development of new technologies and vital infrastructure. Serious concerns about the shortage of skilled personnel in the industry also needed to be tackled, as previous generations of engineers retired, with not enough young engineers yet coming through. It was vital to rebuild academic programmes in petroleum engineering, geology and related disciplines.

45. It was indicated that Turkey can only reach its target of producing 30 percent of its energy capacity through installed renewable sources by 2023 by revising its existing investment and licensing model. There must be a problem with these models as the country has reached just 4,700 MW in its wind power capacity and 500 MW in its solar power capacity. These figures are already around 40,000 MW for each in Germany, despite the fact that the two countries started to focus on renewable energy at around the same time. There is another problem with Turkey’s renewable energy policy: Hydroelectric power plants constitute a dangerously high portion of installed renewable power. These kinds of power plants have almost the same regulatory and environmental problems that are the case with coal-fired power plants.





Nuclear Energy “Renaissance” coming back

46. During the discussions on nuclear energy it was stressed that, although often neglected in presence of topics around hydrocarbons and renewable energy sources, nuclear has gained added importance particularly in emerging economies. A world without nuclear energy is considered to be a tough one because without nuclear we would have burned millions more tons of coal and billions more barrels of oil. This would have brought about climate change of such proportions that what we have today would have seemed negligible.

47. Nuclear energy and uranium, which feeds it, are controversial enough even without any actual accident happening. Radioactivity is dangerous. Nobody is arguing against it. What many opponents of uranium forget to mention, however, are the benefits of nuclear energy and the fact that the statistical probability of serious accidents is pretty low. They focus on the “What if?” and neglect the other side of the coin.

48. One discussant underlined the positive side of nuclear energy which he said deserves more attention than it is currently getting. Uranium-fueled power is obscenely greener than fossil fuels. It’s also cheaper and, perhaps surprisingly for many, it is actually lower in carbon emissions than solar and biomass. This means that the construction of a nuclear plant, including materials used and the work itself plus the operation of the plant over its lifecycle, produces fewer greenhouse gases than the construction and operation of a solar farm.

Although often neglected in presence of topics around hydrocarbons and renewable energy sources, nuclear has gained added importance particularly in emerging economies

49. What’s perhaps more important is that nuclear energy is much more easily scalable than other low or zero-carbon energy sources. And that isn’t just some claim from the nuclear industry – that’s something climate scientists and environmentalists are saying.

50. Countries are building new nuclear plants and upgrading existing ones. Forget about Germany and its plans to go nuclear-free – plans that will cost it tens of billions. None other than Sweden--the poster child of renewable energy, the country that vowed to become the first fossil-free state in the world--is not only choosing to maintain its nuclear fleet; but it is updating them. China is building 20 new reactors, South Korea is working on four; and even Japan is restarting some of the capacity shut down after the Fukushima disaster and building new reactors.

51. Nuclear energy may be green, but it is also more dangerous than, say, wind energy. Again, nobody in nuclear power is contesting that. What they are doing instead is working on new, safer reactors. Private investors such as Bill Gates, D. E. Shaw, and Chinese billionaire Li Kashing have been pouring money in research – and uranium mining – for years now. The nuclear reactors of tomorrow will not only be safer than the ones we already have – which are themselves safer than many believe – they will be much more efficient.

52. So it’s the Athabasca Basin that will be ground zero in the nuclear energy rebound. Some even call the Athabasca Basin the “Persian Gulf of uranium”. It not only contains some of the highest-grade uranium in the world, it is also home to two of the top seven deposits in terms of metal content. The basin has a well-developed power, transport and processing infrastructure, too, which makes it all the more attractive for miners and mining investors.

53. Athabasca will be one of the places to watch in the coming years as the uranium market swings from a glut into a deficit. The glut was caused by the sharp drop in demand following the Fukushima events in 2011. Now the pendulum is moving back, with a deficit in the making as uranium miners curbed exploration and production due to falling prices.

54. France exports more electricity than any other country on the planet, according to World Nuclear Association. That is largely a result of how cheap nuclear power is to produce, resulting in more than €3 billion a year in export revenues, and the best domestic tariff regimen on the continent. The nuclear sector also provides another active export market. Reactor technology along with processed fuel and related services provide opportunities for exports to broader markets. Third, about 17% of all French electricity comes from recycled nuclear fuel.



Some have claimed that Hinkley Point C will end up being the most expensive physical object ever built

55. Not everything on the French nuclear front is positive, however. Despite being a contributor to any initiative (like the Paris Climate Agreement) intended to lower the carbon footprint, public support for nuclear power is declining. Some of this results from increasing fears of accidents, even though the French have a spotless record here. Most criticism comes for the high costs of maintaining the nuclear infrastructure, and the heavy bills coming due for refurbishing aging nuclear power plants. Similar concerns are slowing down the adoption of nuclear power elsewhere (apart from Asia).

56. The UK has recently committed to a nuclear renaissance, but by commissioning French and Chinese companies to build the first UK nuclear power station in a generation, the Hinkley Point C deal has come in for almost universal condemnation. This project will prove to be a public relations disaster for the Conservative Party, and every future Westminster government. Prime Minister Theresa May clearly buckled under economic pressure from China and has backed nuclear power as the panacea to combat the electricity crunch that the country faces. Her questionable decision means the UK is committed to a long-term very expensive project that comes with national security and many other concerns.

57. If ongoing experience in France and Finland is anything to go by, and with apparently few financial penalties in place for late delivery, there are serious doubts that the project can be completed in the revised timescale and on budget. The costs of the project are enormous. Some have claimed that Hinkley Point C will end up being the most expensive physical object ever built. The project requires £100 billion, with the construction costs alone being in the region of £18-£25 billion.

58. Then there are the subsidies that will amount to a conservative £1 billion plus per year, for at least 35 years. The deal penned is inflation linked at more than twice the cost of current wholesale electricity prices. The plant will then operate for a further 30 years. It has a potential life span of around 65 years and it will continue to be a drain on public finances even after the initial contract has expired.

59. Then try to add into the calculus the unstated decommissioning and radioactive waste management costs, and it soon becomes apparent these super-burdensome costs and risks are incalculable. If Sellafield in Cumbria, England, is used as a baseline, such costs are too much. Indeed, loads of money amounting to tens of billions of pounds have already been spent, trying to make safe the UK's nuclear legacy. Based on the available evidence one can only conclude that cheap and clean nuclear power is a myth.

60. Turkey is preparing to host three nuclear power plants in the coming years. This will bring considerable energy security to the country. However, William Magwood insisted on the importance of domestic expertise in the domain. This covers being able to run a power plant without being bound to external agents. In this respect, Magwood recommended Turkey to start forming and training young professionals to take over important responsibilities when the nuclear power plants start to operate.

Given the reality of climate change, any talk of coal must be clean coal, an approach which enables the utilization of our most abundant domestic energy resource so that at least the impact on the climate is minimized

61. As to the controversial issue of nuclear waste, Magwood said that it is not as big of a problem as it seems. Processing nuclear waste is manageable and quite straightforward. As long as regulators and operators are serious in the performance of their duties, nuclear energy is also a quite safe energy source. The Fukushima disaster



stemmed from a regulatory issue, which proves that no risks can be taken when it comes to safety, be it in technical or regulatory decisions. The OECD deals closely with these questions to ensure the promotion of nuclear energy in the safest possible way.

Coal is no perfect energy source, but...

62. It is abundant and cheap. Each and every fuel has its own advantages and compromises. Coal contaminates everything it comes in contact with and creates problems at every step of its life cycle: from unhealthy and unsafe underground mines, to the environmental catastrophe of mountaintop removal, to the problems associated with handling the enormous piles of ash that are produced every day. But by far, the biggest problem is the enormous amount of carbon dioxide emitted.



63. The people who still support coal basically have one argument: that it's a necessary evil, being the only source of energy within reach that is sufficiently abundant to keep up with our enormous and ever-growing appetite for energy. Considering that coal accounts for 40 percent of all electric generation (down from 45 percent), that's a lot of energy to replace. Of course, with falling natural gas prices, that is clearly picking up a lot of the slack. Meanwhile, renewables will increase its share. If that's not bad enough, coal powers 70 percent of China's electric grid, which is growing far faster than anyone else and shows no sign of slowing down.



64. Given the reality of climate change, any talk of coal must be clean coal, an approach which enables the utilization of our most abundant domestic energy resource so that at least the impact on the climate is minimized. Clean coal has a number of variations, but all of them involve stripping the CO₂ out of the coal, either before or after it is burned and then capturing it. It is then either utilized for industrial purposes or for enhanced oil recovery, or else it is pressurized into a liquid form where it can be injected underground where it supposedly will stay indefinitely in a process called carbon sequestration.

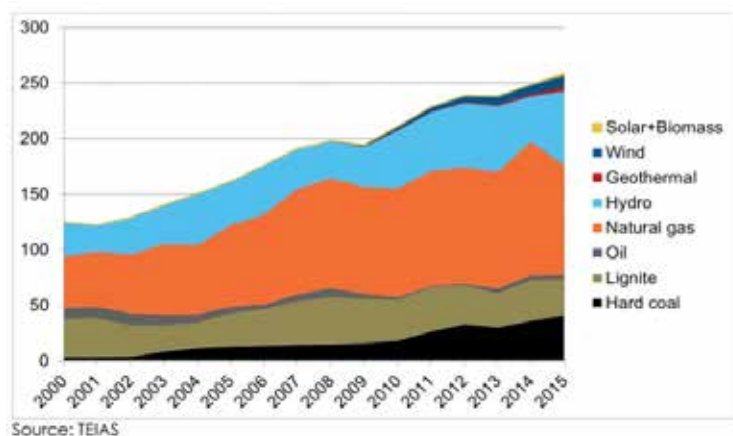
65. The true costs of coal are not included in what is paid today. Coal would not be competitive if environmental costs were included. When the costs of mitigating these impacts are factored in, it will not be competitive against renewables. However, we might still need to use it in some localities to meet our ever-growing demand. But with natural gas coming in just as cheap, and with the same level of GHG as Clean Coal, it's not at all clear that these investments are justified.

66. In case of Turkey's recent push for coal to meet its energy demand through to 2030, there was some dissenting views. It is a strategy endorsed by President Erdogan, concerned about Moscow's grip over his country's energy security and import energy bill. Preparations for a new fleet of coal-fired power plants are "in the works" as the country aims to add 50 gigawatts of capacity by 2030. Some investors felt that they burned fingers as the government imposed unforeseen levy on imported coal, which was not in the package when they decided to invest.



67. According to government data, natural gas tops primary energy demand at 35%, followed by coal (28,5%), oil (27%), hydro (7%), and other renewables (2,5%). While wind, hydropower and solar will play a role in the shift from gas, coal looks set to dominate, with an estimated 80 plants in various stages of planning. The lignite-fueled buildout being pursued by the government would cost at least \$1.1 billion and perhaps as much as \$2 billion in annual public subsidies and that it would increase electricity prices by 19 percent to 29 percent.

President Erdogan, concerned about Moscow's grip over his country's energy security and import energy bill. Preparations for a new fleet of coal-fired power plants are "in the works" as the country aims to add 50 gigawatts of capacity by 2030



Turkey's power generation mix as of 2015



68. It was argued that renewables are a better bet for sustained investment. High levels of sun, vast areas of land available for wind power allied to already significant hydro capacity should make Turkey ripe for clean energy development. In reality there's little in the way of green thinking. The paltry 0.3GW of installed solar capacity in Turkey pales in comparison, for example, to Spain's 7GW and Germany's 40GW. Wind energy targets for 2030 have been cut to 16GW while the government only sees solar capacity doubling in the next 15 years. These targets do not reflect the potential of a country with a photovoltaic system performance 50% higher than in Germany.

69. Although Turkey says it has investors from Japan, Saudi Arabia and Qatar lined up to help pay for the plants, globally money for coal is drying up. The OECD Export Credit Group, World Bank and European Bank for Reconstruction and Development) are among bodies representing major donors who are tightening criteria for coal finance.

70. Turkey has promised to decrease its CO2 emissions by around 20 percent by 2030, in line with the Paris Climate Deal. But Turkey's emissions grew more than 100 percent between 1990 and 2013. An even greater increase is expected unless dramatic changes are made in the energy sector, as well as in the construction sector.

71. In Turkey, around 85 percent of the coal used in power plants is imported, as Turkey's own coal reserves are not enough for power generation. Search is underway for the latest technology to generate power from coal reserves with lower calories. At this point, it may be useful to make a cost analysis, for example by comparing the costs of such technologies with the costs of greener renewable energy technologies.

In Turkey, around 85 percent of the coal used in power plants is imported, as Turkey's own coal reserves are not enough for power generation



Tackling energy and environmental concerns together

72. So many people, when talking about the Paris Agreement, almost exclusively focus on the supply side. Energy efficiency needs to play at least as big a role, if not a bigger role, in responding to the challenges. Global GDP is expected to more than double over the next 20 years, while energy demand increases by only 30%. The difference between those two things is improving energy efficiency or declining energy intensity. That is critical in underpinning the shift expected in the rate of growth of carbon emissions. The energy intensity of GDP will decline much more rapidly than we've ever seen before.

73. Participants recognized the need to bring energy and environmental policies together, in an integrated approach. We had to reduce fossil fuel use, including hydrocarbons, for the sake of a planet seriously threatened by climate change, not because fossil fuels were running out or could become too expensive, or were bad for energy security. The Stone Age had not come to an end because stones had run out but because better alternatives had been found. The same should be true of the 'Oil Age'.

74. We did not have to get all available supplies out of the ground if cleaner and more sustainable alternatives were available. The oil companies knew this as well as anyone. However, reducing dependence on hydrocarbons would inevitably be a long haul, and the public had to be persuaded of the real need for such a move.

75. Unfortunately, economic and financial crisis had relegated environmental concerns to second place because of the false choice so often presented between economic growth and environmental action, with the latter treated as a luxury which could be postponed to better times. We came back to this dilemma repeatedly, including in our closing discussions.

European Energy Union: Full Steam Ahead?

76. European legislators are getting increasingly nervous about the chaotic state EU energy policy is in. An attempt by the European Commission to solve the mounting problems at one stroke, with a huge "winter package" of regulations, communications and reports, expected on 7 December, will be make or break for the EU "Energy Union"

77. The champion of the Energy Union Šefčovič was with us at the Club meeting and declared that 2016 will be "a year of delivery". "If we want a cost-effective transition to a low-carbon economy, we have to create an internal energy market where European rules apply". He provided plenty of examples of what progress means, across all five dimensions of the Energy Union. They include: signing off on the first energy projects for funding from the Juncker Plan, completion of an underground power line between France and Spain that doubles their interconnection capacity to 2.8GW, proposals to revise the famous A to G energy label for white goods, and the launch of a new Strategic Energy Technology Plan to coordinate European energy R&D.

A single European energy market will allow Europe to increase its security of supply by allowing energy to flow freely across borders

78. He added that “for us in Europe, the notion of integrating our energy infrastructures and policies is coded in the DNA of the European Union. The European Coal and Steel Community of the 1950s is what triggered the entire European integration project - it was the result of bold leaders who understood that by tying our energy resources together so that we are less likely and less capable of turning arms against each other”.

79. A single European energy market will allow Europe to increase its security of supply by allowing energy to flow freely across borders, therefore offsetting any oversupply on one side of a border with any supply deficit on the other. It would create a far more competitive market across the EU allowing consumers to choose their suppliers from across borders.

80. It would allow Brussels to better negotiate with its external partners, given that the EU spends some €260 billion euros every year on its energy imports. That used to be €400 billion until recently (when oil prices were high) but the EU is still the largest energy importers in the world. And it would also help achieve climate targets much more efficiently by setting common targets and negotiating more effectively with its global partners.

81. When asked about Nordstream-2, the answer was: “we will only support infrastructure projects that are in line with the EU Energy Security Strategy. If built, Nord Stream 3 and 4 would not give access to a new source of supply and would further increase transmission capacity from Russia to the EU, while even now this is only used at 50%. These pipelines will have to comply fully with EU law.”

82. Several speakers noted that Europe’s gas reserves and demand were on the decline. Natural gas prices declined as the result of an oversupply made worse by the falling cost of coal, rising use of renewables, better energy efficiency and the warm weather. Now, amid a drop in Asian demand, Europe is becoming a more likely target destination for natural gas as the U.S. has shipped its tankers of liquefied fuel from the shale boom, Australia expands its exports, forcing Middle Eastern suppliers to seek new customers, and Russia fights to maintain market share. Gazprom plans to keep gas supplies to Europe at about 156 billion to 160 billion cubic meters a year in 2016-18.

Energiewend in the German market

83. Germany was identified as an example with an astonishing pace for increasing the amounts of electricity generated by renewable sources. Germany’s decision in 2011 to abandon nuclear power meant replacing 22% of the country’s electricity supplies by the end of 2022. With nine reactors since retired, that figure has dropped to 14%. Five of the remaining eight plants with a combined net capacity of 6.7 GW are located in southern Germany. New centralized gas power stations could replace some of that generation. The remainder must be superseded by local combined heat-and-power plants, reduced demand, imported electricity, and renewable energy technologies.

84. Indeed, the country passed the 30% marker in 2014, and plans to reach 40-50% renewables countrywide by 2025 and as much as 80% by 2050. While the United States produces far more renewable energy than Germany does in terms of overall quantity, it has so far only managed to get renewables to about 13-14% of total generating capacity, mostly big hydro.





Germany's federal government has made the decision to transform its energy market through Energiewende, literally translated as "energy turnaround"

85. Germany's federal government has made the decision to transform its energy market through Energiewende, literally translated as "energy turnaround" aimed at shifting Germany to an energy portfolio dominated by renewable sources, energy efficiency and sustainable development.

86. While Energiewende has a strong policy connection and is led by Chancellor Merkel herself and her administration, the desire to phase-out nuclear power completely and restructure the energy sector is now shared by at least 85% of the German population. Indeed, German customers have endured a variety of cost increases, including a Renewable Energy Surcharge increase from 0.9 cents per kilowatt hour in 2000 to 6.17 cents per kilowatt hour in 2015 to support the infrastructure transformation. The majority of the country remains solidly supportive of the technological shift that is taking place.

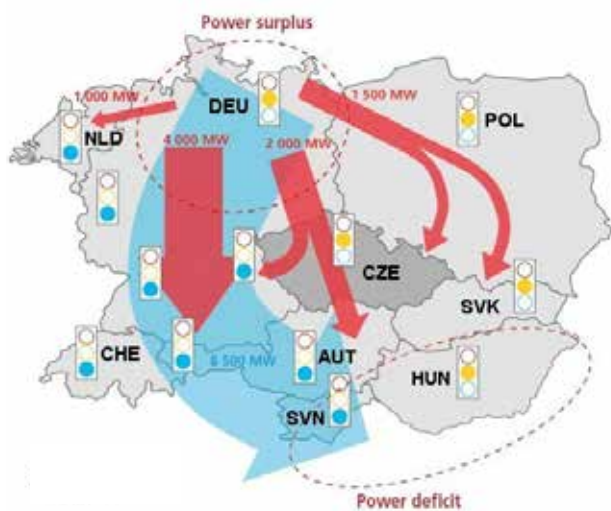
87. In many jurisdictions, renewable power is replacing or has the potential to replace fossil fuel generation. Smart grids are delivering the potential for greater interactivity with customers. And the scope for even more transformative technological breakthroughs is being taken more and more seriously all the time.

88. A breakthrough in the cost and practicality of battery storage technology could be a quantum leap enabler, opening up the possibility of off-grid customer self-sufficiency when used in combination with 'own generation'. 'Power to gas' is also a potential transformative technology. All bring opportunities for incumbent power companies but many also have the effect of eating away at a utility company's traditional revenues and undermining the traditional utility business model. Other technologies, notably the combination of the internet, mobile devices, data analytics and cloud computing with smart grids and smart metering, present opportunities for utility companies to get closer to the customer, play an enhanced 'energy partner' role and exploit data opportunities.

89. Energy efficiency has also risen up the policy and customer agenda. Together, renewable technologies, energy saving and a different customer outlook are leading to a transformation of the electricity environment. They are causing the value chain to shift, away from large conventional power plants towards local power generation, and a greater focus on distributed energy and demand management.

90. Such transformation is also very relevant to developing countries, many of which face the triple challenge of being unable to meet existing demand for electricity while also facing huge demand growth and the need to extend access to those who don't have electricity. The need for good demand management is already very familiar in countries such as South Africa where managed outages and demand restrictions are commonplace. Technological advances will enhance this response as well as present the opportunity for expansion of power in ways that may leapfrog the traditional grid evolution route.

91. The price of new technologies is falling equally rapidly. Shrinking battery and solar costs will make the combination of electric vehicles, solar panels and stationary batteries for excess power a compelling proposition in many markets within the next ten years. The combination of an electric vehicle + solar + battery should have a payback of 7–11 years, depending on the country-specific economics. After that, the electricity generated is truly 'free electricity' for the remainder of the lifetime of the equipment.



Falling costs have the potential to introduce a new challenge to the power utility business model

92. Falling costs have the potential to introduce a new challenge to the power utility business model. If they translate into actual falls in the price of electricity itself, the industry will have to move away from the default assumption of ever-rising prices, on which many of its deals and investment are based. Overall, transparent and long term contracts, together with fair prices, would bring the necessary competition to create a more predictable energy market. This would benefit to both the buyers and the sellers of the energy market, in line with the win-win principle.

UK's post-Brexit energy transformation

93. Brexit will have serious consequences for the UK and the EU plus their partners across the globe including on energy and climate change. Increasing interconnectivity with continental Europe will necessarily require co-operation with the EU internal energy market in any Brexit scenario. Because the UK Government has been at the forefront of efforts to liberalise and develop cross-border energy markets, this policy direction is likely to endure.

94. If the UK were permitted to participate in the Energy Union following Brexit, it would - irrespective of the Brexit model - need to negotiate an appropriate partnership with the EU, and adopt - and comply with - the relevant European legislation. The difference, however, would be that the UK is unlikely to have a say in the formulation and interpretation of the rules, unless the UK manages to negotiate to remain part of the institutions which co-ordinate EU energy regulation.

95. Brexit, in whatever form, is unlikely to change the UK's climate change goals; these are established at a national level under the Climate Change Act 2008. But, there will nevertheless be important issues to settle. For example, at an international level the UK's emissions reduction commitment would need to be disentangled from the EU target under the United Nations Framework Convention on Climate Change and the recent Paris agreement. If Brexit used the EEA + EFTA model, then, like Norway, Lichtenstein and Iceland, UK industry would be able to participate in the EU cap and trade scheme.

96. Following Brexit (other than using the EEA + EFTA model), the UK would be released from its renewable energy targets under the EU Renewable Energy Directive and from EU state aid restrictions, potentially giving the government more freedom both in the design and phasing out of renewable energy support regimes. The availability of funding from EU institutions may impact the deployment of capital intensive projects such as offshore wind. However, given that the UK would still be bound by national and international decarbonisation obligations, renewable and low carbon energy development would continue to form part of UK Government climate change policy.

97. There are a number of EU initiatives to promote investment in energy infrastructure which represent an important source of funding for UK projects. For example, total European Investment Bank investments in the UK economy came to EUR 7 billion in 2014 (energy projects accounted for 50 per cent of this). The impact on proposed EU funded projects will depend on the timing of the changes to investment criteria and the project's nature, including if it furthers EU policy.



98. Turkey is seen as one of the potential energy partners for the post-Brexit UK. Such a partnership could lead to substantial business deals. The investments and exports between the two countries being already high, significant energy deals and related business projects are likely to be on the table for the post-Brexit era.

99. China and India also are building huge amounts of solar and wind power, but a lot of this capacity is wasted as it cannot be integrated into the grid. In China the problems stem mostly from rigid planning processes and compensation systems. In India, the stumbling block is state-owned distribution operators that have an incentive not to increase access to electricity. In both countries, reforms are contemplated but will be difficult to achieve

100. Installed wind capacity in China reached 129 GW at the end of 2015, up 23 percent over six months earlier and now the highest in the world. Solar PV generation capacity has also grown quickly, reaching 43 GW in December 2015, up from 28 GW a year earlier. India's totals are smaller, but its growth is also strong with wind increasing from ~13 GW to ~25 GW and solar from 0.04 GW to ~5 GW between 2010 and 2015. India's target for 2022 is 100 GW of solar and 60 GW of wind. China is aiming for 150 GW of solar and 200 GW of wind by 2020.

Following Brexit (other than using the EEA + EFTA model), the UK would be released from its renewable energy targets under the EU Renewable Energy Directive and from EU state aid restrictions

101. However, despite this surging investment in renewables, both countries face major difficulties in integrating these new resources into the grid. Wind energy curtailment in China averaged 15 percent in 2015, with rates surpassing 30 percent in regions rich in wind resources. Detailed estimates of curtailment in India are more difficult to come by, but wind generators in Tamil Nadu, the state with the highest share of wind energy, have complained to regulators about curtailment despite the regulatory provision of mandatory dispatch.

102. Coal-fired generators in China are resistant to any reform perceived as threatening allocated operating hours. Around the world, every country seeking to boost renewable energy is facing the challenge of finding ways to increase system flexibility. However, China and India are struggling with some particularly deeply entrenched rigidities and inefficiencies – including their approaches to system operations.

103. Although these two countries are very different, some common threads run through their power sectors. In both countries, even when grid conditions and weather would allow use of additional renewable energy—typically at near-zero marginal cost—relatively expensive and polluting coal-fired power plants are often operated instead. Meanwhile, within each country's fleet of coal-fired power plants, grid operators often dispatch relatively inefficient power plants over more efficient counterparts.

104. In short, the ‘merit order’ ranking of available resources according to marginal cost is largely absent in both countries. Unclear rules and compensation for ancillary services also hamper flexibility in both countries. The upshot is that system operators in both countries are missing opportunities to take advantage of available renewable resources to reduce system costs and emissions.



The Turkish Stream: How will its second leg work?

105. Turkey is destined to play a crucial role in the European energy map as consumer, transit, trader, investor and security provider. Russia has figured prominently in the recent energy partnership deals, after a hiatus in relations following the downing by Turkish F-16s of a Russian SU-24. The World Energy Congress, within which the Club roundtable took place, witnessed the signing of a historic Turkish Stream intergovernmental agreement in the presence of Presidents Putin and Erdogan, with details and price discount yet to be disclosed.

Around the world, every country seeking to boost renewable energy is facing the challenge of finding ways to increase system flexibility

106. This has become one of the most hotly debated subjects. The normalisation of Turkish-Russian relations coincided with mounting scepticism about the parallel 55 bcm expansion of the Nord Stream pipeline – the other pipeline which allowed Russia to significantly reduce its reliance on the Ukrainian transit corridor to Europe. Poland’s anti-trust agency recently shot down a joint venture proposal to build Nord Stream 2, arguing that Gazprom’s west European partners, including Shell Oil, already had a big presence in Poland and the pipeline would increase Gazprom’s pricing power.

107. Nord Stream 2 may very well get resurrected, but for now, the new Russian gas pipeline into Germany is one of a string of failed projects designed to get more of Gazprom’s gas into Europe. That currently leaves for Russia just two pipelines left: Power of Siberia and the Turkish Stream. The Power of Siberia is a China deal. It was signed almost immediately after the West imposed sanctions on Russian banks and oil and gas companies in a government effort to show it still had friendly neighbors wanting to do business. Margins are tight on this one. China is financing most of it.

108. China and Turkey lines are important, but the market — for now — sees Europe as of paramount concern for Gazprom. Russia’s negotiating position on the Siberia line was very weak and China neatly exploited that. Add the fact that Russia is dependent on China for credit, and the Power of Siberia does not look as good. Turkish Stream, meanwhile, looks the most promising. Outside of that, it seems that Russia has nothing new to offer Europe in terms of delivery routes.

109. If line one replaces the existing Trans-Balkan pipeline, Gazprom will have to build a second line if it wants to tap into Turkish growth in gas demand. But getting any surplus gas from the second 15.75 bcm capacity line to southeastern Europe is not clear cut. Yet, Turkey has always wanted to be an energy hub and not just Russia’s appendix in the south. This is why we see them in talks with Azerbaijan, Iran, Iraqi Kurdistan and Israel.



110. Clearly, a two-string Turkish Stream would go against Turkey's interests, as Gazprom's ability to flood the Turkish market would increase the risk premium associated with investments in alternative supplies (ranging from the Eastern Mediterranean, to Iran, Northern Iraq, and the Caspian). This would happen at a time when Azerbaijan's Socar is negotiating with international financial institutions to raise finance for the Southern Gas Corridor – a flagship diversification initiative for the EU.

Regional hub or transit country?

111. Turkey needs to clarify whether its long-term ambition is to become a regional gas hub or a simple transit country. A hub is a competitive market place where gas from multiple sources is stored and traded at spot prices. Any version of Turkish Stream larger than one string would put such an ambition in danger by dis-incentivising investments in Turkish storage, LNG, alternative pipelines and demand reduction. Two strings of Turkish Stream would make it more likely that Turkey would become a transit country. It would benefit from transit fees, but not necessarily increase its geopolitical relevance to Europe, which would only see Turkey as another corridor for the same old Russian gas.

Clearly, a two-string Turkish Stream would go against Turkey's interests, as Gazprom's ability to flood the Turkish market would increase the risk premium associated with investments in alternative supplies

112. Turkey realises that the current reconciliation is purely tactical, and that it is not in Turkey's interest to further expand the Russian grip on Turkey's gas market (already, more than 50% of Turkish gas imports) driving attention away from much needed investments in Turkey's gas market resilience. Moscow needs Turkish Stream much more than Ankara because Russia has no alternative to Turkey if it wants to recover the \$12 bn cost borne so far in adapting its domestic transit capacity to South or Turkish Stream and maintain its market share. This puts Turkey in a strong negotiating position.

113. Within this framework, it is crucial that Europe does not compromise its gas cooperation with Turkey. Arbitraging between gas from Russia, Turkey, and LNG is in the long-term interest of the EU, as it will enhance energy security in South East Europe and help prevent axes between Moscow and Ankara against the EU's interests. Turkish Stream may go against these interests.

114. EU-Turkey relations, not at its best for a while, have become further strained after the failed coup, but gas cooperation is still possible given that by increasing its reliance on Russia, Turkey might lose geostrategic significance to the EU. The EU should therefore provide clear signals such as speeding up the Southern Gas Corridor, and proposing to jointly further the engagement with other regional suppliers, notably Turkmenistan, Iran, Iraq and Israel.

115. However, one should not forget that Turkish Stream is not only a commercial energy project; it is part and parcel of a bigger package deal between Ankara and Moscow involving security issues, Syrian debacle, Akkuyu nuclear power plant, tourism, agricultural exports and construction drive and cannot be treated in isolation from other strategic components. It remains to be seen how the current scenarios would play out given the fragile nature of relations between two countries which lack institutional structures compared to problematic and more stable relationship with the EU.





Kurdish region, the future of Mosul and energy implications

116. Iraq's Kurdish region (KRG) is in the middle of the changing dynamic of the war in Syria. So far the KRG has managed to balance all interests including Washington, Moscow, Ankara, Tehran and Baghdad. However, once ISIL is defeated, the equilibrium could change and it is far from clear how the jigsaw pieces will fall into place. Oil companies in Kurdistan have invested heavily in the past decade and are now producing. Payments have been regular in the past eight months but the KRG still owes significant amounts of receivables to these companies. KRG internal politics is also an important factor in oil company payments. The main political parties keep drifting apart and the risk of going back to rival, competing administrations is increasing the longer the dispute over suspending parliament goes on.

117. Moreover, control of Kirkuk fields is essential for the KRG to maintain oil production at the level of the past year. There is little chance the KRG will lose control at this stage as the area is completely under its control administratively and militarily since 2014, when ISIL attacked. However, the oil company operating the fields is under Baghdad's control, and it was protected by an Iraqi military presence, which retreated under ISIL pressure.

118. While there is confidence that the new U.S.-supported coalition can defeat ISIL, there are concerns that each faction holds contesting views about what comes after. It is becoming apparent, for example, that a number of elements have well-vested interests in partitioning the province into a series of six to eight ethnic or sectarian cantons with independent rights and autonomy from Haider al-Abadi's government in Baghdad.

Payments have been regular in the past eight months but the KRG still owes significant amounts of receivables to these companies. KRG internal politics is also an important factor in oil company payments

119. While power-sharing in Mosul before ISIL took over in 2014 was far from perfect, it did represent forms of power-sharing which accommodated and balanced minority interests. The 2013 governorate elections returned a coalition of parties from the Kurdish KDP and PUK, Atheel al-Nujaifi's tribal, Sunni-dominated

al-Hadba coalition, and other tribal, Shabak, Yazidi, Chaldean, and nationalist parties, reflecting the possibilities of representation without territorial carve-ups.

120. Unless canton proposals are put to all Iraq's citizens through referenda, the implications and risks in terms of the territorial integrity of the rest of the country could be disastrous. Furthermore, the creation of such cantons is unlikely to result from a consultative approach, and will therefore potentially result in more problems than it solves, especially if the cantons' internal governance and legal structures prove incompatible with Iraq's constitution.

121. The fighting against ISIL and the influx of refugees into KRG worsened the existing budget crisis, and made it even more urgent for Erbil to secure a reliable route for oil exports and payments. The World Bank estimated the overall cost of the influx of refugees and internally displaced people at \$1.4 bn. KRG has used the cost of the fighting against ISIL and of the refugee influx as justifications for the lack of payments to the IOCs.





122. However, control of the Kirkuk area fields also considerably increased the immediate oil production available, with Avanah and Bai Hassan output freeing up oil from Khurmala for export. Kirkuk capacity will decline without substantial investment and technical assistance, which BP had formerly been providing by agreement with the Ministry of Oil in Baghdad.

KRG could have a substantial surplus of gas for export – some 12 bcm by 2018 rising to 21 bcm by 2020

123. Gas production in KRG stands at around 3–4 bcm annually, and is currently entirely for domestic use; the Khor Mor field supplies power plants at Bazian and Erbil, while the Summail field, which was supplying the Dohuk power plant, has run into production problems. The addition of Kirkuk to the KRG's control adds about 2.5 bcm annually, which could increase if more currently flared gas is captured. However, most of this gas is required for local power generation. Miran and Bina Bawi could produce about 11 bcm between them, with 5 bcm from an expansion of Khor Mor and 6 bcm from Chemchemal (depending on a resolution of the MNR's dispute with Dana Gas). Flared gas from Khurmala could add another 2 bcm.

124. We were told that KRG could have a substantial surplus of gas for export – some 12 bcm by 2018 rising to 21 bcm by 2020. This would require a fast pace of gas development, supported by gas sales agreements with Turkey (or other markets). The November 2013 agreement signed with Turkey included 4 bcm of Kurdish gas exports by 2017, 10 bcm by 2020, and a possible increase to 20 bcm by 2025. This gas would mostly come from the Bina Bawi and Miran fields, operated by Genel Energy. By the early 2020s, exports could reach 20 bcm per year if necessary investments can be made in a timely manner.

125. Turkey currently receives about 28 bcm of gas from Russia, 3.5 bcm from Azerbaijan, 9.5 bcm from Iran, and the remainder of almost 50 bcm of consumption from LNG imports and some minor domestic production. Depending on the competitiveness of pricing versus alternative suppliers, and the flexibility of Turkish infrastructure and contractual commitments, Turkey could take 10 bcm of Kurdish gas from the early 2020s, increasing to 20 bcm by the mid-2020s – partly representing new demand and partly displacing LNG and Iranian (or Russian) gas.

126. Accessing Kurdish gas may be less urgent for Turkey today than it appeared a year ago, with political turmoil; the threat to a new gas pipeline posed by the PKK; the slowing Turkish economy; and lower international oil and gas prices which ease the burden of expensive energy imports. An alternative for KRG would be to export gas to federal Iraq. Based on its geographic proximity, especially to the southern part of KRG, and its high-priced gas import deal with Iran, federal Iraq could potentially be a more lucrative market. It would also create some mutual dependency and hence an incentive to maintain reasonable relations. However, insecurity in Diyala and mistrust between Erbil and Baghdad would make it a challenging deal to conclude. Alternatively, KRG could step up its domestic power generation and export electricity to federal Iraq (which suffers from severe shortages) and/or Turkey.

127. Exports of around 1 million bpd of oil and 10 bcm of gas by the early 2020s, rising to 20 bcm per year by the mid-2020s, are plausible given the discovered resource base and current stage of development. If achieved, this would probably be accompanied and facilitated by a significant consolidation of the current operator base under a number of larger companies. This would go along with the development of associated domestic refineries, pipelines, and gas-fired power plants.



128. Relations with Turkey will only gain in salience for an increasingly autonomous KRI. Full development of the region's oil depends on export routes, and of its gas on the Turkish market. Turkish engineering and construction firms, lenders, and investors are also critical to KRG economy. But the deepening complexity of the Syrian conflict, the further involvement of Russia, the Turkish confrontation with the PKK and Syrian Kurds, the heightened role for Western countries in fighting ISIS, all shape this relationship in complicated and unpredictable ways.

Iran in the global energy market

129. Iran's energy wealth and geo-strategic location – a bridge between East and West – allow it to export energy resources to European and Asian energy markets. However, due to various internal and international political, economic, and security constellations, Iran could not successfully exercise its energy potential internationally. Two main blocking factors – the Iranian oil contract regime which is not attractive to the International Oil Companies and international sanctions - are being presently redefined.

130. There was a strong interest in new opportunities opened in Iran with the partial lifting of sanctions and the preparation of a new more competitive oil contract framework, allowing Iran to re-emerge on the global energy stage in a new atmosphere. With supposedly the fourth-biggest proven reserves of crude oil estimated at 157.8 billion barrels and the second largest proven reserves of natural gas estimated at 1201 trillion cubic feet Iran has certainly the potential to grow into a major market in the world. Iran's economy with an estimated gross domestic product of \$417 bn is the third biggest in the Middle East after Saudi Arabia and the UAE.

131. Oil accounts for 60% of Iran's budget revenues despite Iran's efforts at diversification, Moreover, Iran needs a price at around \$130/barrel to balance its budget which is a very distant possibility under current circumstances. Iran's oil industry – hampered by years of mismanagement, war and sanctions – is not in a good condition. The country has not been able to make its OPEC quota of 4.00 million barrels a day since 2000. Plans to raise output are well behind schedule; and long-term plans for expanding production capacity may have to be scaled back as well because of insufficient reserves.

Iran's energy wealth and geo-strategic location – a bridge between East and West – allow it to export energy resources to European and Asian energy markets

132. A major stumbling block in Iran's attempts to raise capacity is the reservoir management practices that were used to achieve the record levels of the 1970s. During the 1970s, the re-injection of gas into oil reservoirs was greatly increased. In less than 10 years, crude oil production rose from under 2 mbd to 6 mbd. The excesses of the 1970s and the neglect of the 1980s and 1990s have left Iran with pressure problems and water encroachment in several of its oilfields. Billions of barrels of reserves have probably been lost as a result despite attempts to step up rates of gas injection in recent years.





Iran's oil industry – hampered by years of mismanagement, war and sanctions – is not in a good condition

133. US companies are still excluded from Iran under the terms of the Iran Libya Sanctions Act of 1996. The shortcomings of the present buy-back contracts were highlighted and their competitiveness in comparison with the oil contracts offered in Iraq and Iraqi Kurdistan Region was assessed. The potential new terms of the Iranian Petroleum Contracts were outlined and compared to the buy-back contracts. It appears that many companies have found Iran's upstream terms not so favourable for the time being and levels of political risk still considerable.

134. Against this background, it is perhaps not so surprising that Tehran wants to further develop nuclear energy to replace the crude oil and natural gas currently being used to generate electricity, thus allowing more oil and gas to be exported. Without nuclear power, Iran could be relegated to the ranks of small exporters as early as 2020 with catastrophic implications for its economy and also the price of oil.

135. Re-opening Iran's energy sector will offer many new opportunities for the IOCs. The speed with which Iran will regain and increase its previous oil production and export levels will depend on the investment flow, the state of the industry and its management. Tehran is expected to become gasoline and basic petrochemical products key exporter in the short term. Therefore, it was argued that Iran has potential to develop in three main energy branches: oil, gas, and refinery and petrochemicals. Successfully exercising its potential, Iran could become a leading energy "superpower". One Iranian speaker argued that either competition or collaboration must exist between Iran and Turkey for security and a sustainable, predictable and viable energy market in the region.

A breakthrough in South Caucasus's frozen conflicts?

136. There were assertions that the security of the Southern Gas Corridor, still in the making, hinges on what happens in Georgia and Azeri-Armenian conflict.

137. Russia seems to have shifted its policy on Armenia before the attempted coup in Turkey in July 2016. Last April, Azerbaijani and Armenian forces clashed in Nagorno-Karabakh in one of the most violent incidents since the implementation of the 1994 Bishkek Protocol and its provisional cease-fire. The clashes left 200 dead on both sides and the prospect for a graver escalation to follow, if no progress on peace talks was made.

138. Russia negotiated a cease-fire in Nagorno-Karabakh, and then developed a diplomatic campaign that aimed for a long-term settlement of the conflict. Russia was expected to present a peace plan, which may include the restoration of Baku's control over some of the occupied territories (outside Nagorno-Karabakh) that were taken over by the Armenians, as well as security guarantees for the unrecognized republic of Nagorno-Karabakh.

139. Putin met with the presidents of Azerbaijan, Armenia and Turkey to discuss a deal on Nagorno-Karabakh, but no apparent understanding came through. However, Russia is still pushing for a resolution on Nagorno-Karabakh, as that gives both Turkey and Azerbaijan something to appreciate. Russia is doing this because it is concerned about what it sees as a U.S. containment strategy in Europe from the Baltic Sea to the Black Sea and possibly reaching Azerbaijan. Moscow has been closely following U.S. relations with Poland and Romania and has grown concerned, as the U.S. builds up military capabilities in both countries.

140. For Russia, the Black Sea is militarily and commercially strategic. Russia has watched Turkey work with Poland and Romania on defense-related projects and it definitely didn't want to see Turkey joining a U.S.-sponsored alliance in the Black Sea. Russia needed to be less hostile to the Turks to avoid them aligning with the Americans. The talks on Nagorno-Karabakh and the good will gestures are a way for Moscow to build trust with Ankara.

141. A potential settlement imposed on Armenia could strengthen Turkey's position in the Caucasus. In return, Russia seeks gains to the rear of what it perceives to be the American containment line in Europe and expects Turkey to pull away from Poland and Romania. Russia giving up part of its position in the Caucasus could trigger Turkey to give in as well in the Black Sea. This is a smart maneuver to lay the groundwork for a positive long-term relationship, but it is unlikely to come to fruition.

142. The Black Sea embeds the geopolitical tension between Russia and Turkey. While Turkey cannot allow Russia to dominate the Bosphorus, Russia can't allow Turkey to be the single power in the Black Sea. For a settlement on Nagorno-Karabakh and for Turkey's decreasing involvement in the U.S. alliance to be the beginning of bilateral cooperation between Russia and Turkey, the two countries need to continue working together to establish influence in the Balkans, Central Asia and Syria.

143. Free of many sanctions, Iran is becoming an active player in the South Caucasus, taking steps towards greater involvement in the region. Russia is not objecting, and even appears to be supporting these initiatives. Armenia announced last March that Iran will build a gas distribution network in southern Armenia. Gazprom, which currently controls that country's gas distribution system, has not opposed this plan. Iran is also involved in another initiative with Russia, Armenia and Georgia.

144. The four countries have agreed to build the North-South Energy Corridor, linking them to a unified electric grid. These recent initiatives are just the first to take off. Iran and Russia have been deepening their economic ties with all South Caucasus countries, securing reliable transit corridors while keeping other foreign competitors out of the picture.

Any hope for the East Med gas?

145. Positive thinking leads us to believe that the massive natural gas reserves in Israel, Egypt, Lebanon and Cyprus could have a transformative effect over decades, delivering stability, incentivising peace and creating the jobs that young people across the eastern Mediterranean so desperately need.



Russia has watched Turkey work with Poland and Romania on defense-related projects and it definitely didn't want to see Turkey joining a U.S.-sponsored alliance in the Black Sea





There are currently many actors on the stage driving and affecting energy and geopolitics in the eastern Mediterranean including Israel, Egypt, Cyprus, Turkey, Greece, Lebanon, the US and the EU

146. However, it may not happen soon in a region with so many complicated problems. Migrants are streaming through the region in an attempt to reach the safer and more prosperous countries further west. The perilous situation of the Greek economy, the febrile political atmosphere in several Western Balkan countries, escalating violence in Syria and the evolving Turkey-Russia-Israel relationships continue to cast a shadow over the region's security, not least its energy security.

It would be a mistake to allow these crises to overshadow the vast potential for regional cooperation and economic integration in energy. Through a combination of vision, energy and courage in eastern Mediterranean, energy can, for perhaps the first time, become a motivator and catalyst for cooperation and security.

147. There are currently many actors on the stage driving and affecting energy and geopolitics in the eastern Mediterranean including Israel, Egypt, Cyprus, Turkey, Greece, Lebanon, the US and the EU. Israeli Energy Minister Yuval Steinitz met his Turkish counterpart Berat Albayrak in Istanbul on 13 October 2016 and both sides agreed to open discussions on building a gas pipeline to pump Israeli gas to Europe. While Israel was also building regional energy cooperation links with Jordan, Egypt, Cyprus and Greece “the Turkish option is very important”, Israeli Minister said. Israel is searching for energy partners to develop its Leviathan natural gas field in a bid to make it economically feasible.

148. The most coherent commercial logic points in one direction, which is to combine the gas resources of Israel, Cyprus and Egypt, at least initially, to process them jointly and to involve Turkey as both customer and conveyor, but development in such a manner faces considerable geopolitical obstacles, notably concerning transit in Cypriot waters or on Cyprus itself.

149. The pipeline project to carry Israeli gas to Turkey has to go through the exclusive economic zone of Cyprus. The Cyprus problem cannot be resolved without also solving the exclusive economic zone issue and unless that issue is settled, the pipeline project cannot be realised.

150. For a realistic gas pipeline from Israel to Turkey the first condition is the economic feasibility of the project. In order to develop the Leviathan field a final investment decision needs to be taken and then financing should be secured, which means a purchase and sales agreement should be signed.

151. Headaches come in many fronts and in different intensities – technical, commercial, political and geopolitical. Zigzag policies and a lack of gas export infrastructure in Cyprus and Israel have delayed the development of several discovered fields to date, which in turn has prevented possible exports. Even if the final investment decisions are made today, gas from the Leviathan and Aphrodite fields may not be able to compete with Russian pipeline gas in Europe. Iraqi Kurdish, Iranian and Azeri gas as well as LNG supplies are competitive vis-à-vis eastern Mediterranean gas at the moment.

152. Geopolitical headaches turn out to be intense and frequent. Energy cooperation played a key role in the emergence of two tripartite alliances: Greece-Cyprus-Egypt and Greece-Cyprus-Israel. In the meantime, Egypt-Israel relations have improved. High-level political and technical meetings have reinforced these tripartite summits, bringing the most senior Greek and Cypriot officials together with counterparts from Israel and Egypt. Eventually it would not be too surprising if a quartet is formed.



China's "One Belt, One Road" Silk Road Initiative

153. Since 2013, the 'One Belt, One Road' (OBOR) initiative has become the center-piece of China's economic diplomacy. The essence of OBOR is to promote regional and cross-continental connectivity between China and Eurasia. Connectivity covers five major areas of interest: policy coordination, infrastructure construction (including railways and highways), unimpeded trade, financial integration and people-to-people ties. Among these, infrastructure construction is the dominant feature of the New Silk Road.

154. "One belt, one road" is seen as the biggest infrastructure development project ever. It was asserted that it would certainly shift the weight between energy producers, transit countries, transporters, traders and consumers around the world. Chinese neomercantilism endorses global trade and its institutions while also pursuing a government-led globalisation strategy to accumulate capital and wealth for the nation. China's strategy clearly preferences state-owned enterprises and is focused on establishing free trade areas — similar to the China-ASEAN Free Trade Area which came into effect in 2010 — with Central Asia and South Asia.

For a realistic gas pipeline from Israel to Turkey the first condition is the economic feasibility of the project.

155. The China-Pakistan Economic Corridor (CPEC) project is one of these initiatives. CPEC is a combination of transport and energy projects and includes the development of a major deep-sea port offering direct access to the Indian Ocean and beyond. Total costs for the projects currently under construction amount to \$46 billion. Should all the planned projects be implemented, the combined value of the projects would be equal to all foreign direct investment in Pakistan since 1970, and would be equivalent to 17 per cent of its 2015 GDP.

156. There was frequent reference to the state of China's national oil companies such as Sinopec, CNPC and CNOOC, which have incurred phenomenal debts – higher than the country's total GDP. So far they have been bailed out by the government, but this just shifts the problem one level up, to China Inc. as a whole. The discussion focused on how China's national oil companies got into this fix and why the world should hold its breath about their future.

157. In the short term, China's OBOR initiative will likely only deliver modest results despite immense investments. It is still hard to predict whether China's OBOR projects will be effective over the medium-to-long term as this depends on the responsiveness of both governments to challenges, as well as the external environment. Still, OBOR marks the beginning of a new economic diplomacy for China as it shifts towards being an active driver of the regional and global economy. It is expected that OBOR initiative will dispose \$90 to 100 billion a year for investment.





158. Turkey is situated in the heart of this initiative. Both Ankara and Beijing would benefit from closer partnership in boosting infrastructure investments across this new economic corridor. The Bosphorus Energy Club members have asked to pursue further work on OBOR and explore joint activities with China's government and business organisations in this domain.

Can we move faster, absent a new crisis?

159. Many participants tended towards pessimism on the prospects for significant progress in the near future in bridging the gulf between the parallel universes of efforts to meet growing energy demand at a reasonable cost, and the imperative to keep global warming to 2°C. Little was likely to happen until there was another major crisis, eg natural disasters on a much bigger scale, as predicted by climate change scientists, or some new combination of energy shortages/massive price rises.

160. There are some encouraging dynamics. BlackRock, the world's largest private investment fund, has announced that it will include climate change as an important factor in how it assigns risks to its investment portfolio. This decision has huge implications for the energy sector. BlackRock is not an average investment fund. With \$4.9 trillion in assets, it is the biggest private investment fund in the world. Naturally, what it says, and more important, what it does, matters.

We had to show the right determination to move towards the integrated and balanced policies which could alone address global energy needs in a sustainable way

161. Others argued strongly that we could not afford to wait for a crisis, since the issues became more difficult and the solutions more expensive all the time. We had to show the right determination to move towards the integrated and balanced policies which could alone address global energy needs in a sustainable way. Some key words that came up again and again include:

- Leadership: this seemed to be in short supply in both public and private sectors. If a genuine debate was to be started about the options and the public engaged, leaders had to step up and set out the facts objectively.
- Transparency: without some generally agreed facts and data, and more common vocabulary, progress and public engagement were extremely difficult.
- Trust: the public had lost faith in the pronouncements and views of governments, companies and experts alike. Restoring this was critical, which was where transparency came in.
- Long-term thinking: these were complex issues. The time-scales of the solutions, measured in decades, sat ill with 'quarterly capitalism' and even shorter political deadlines and media pressures. We had to find ways of reconciling these.
- Vision: current narratives, on both energy and the environment, tended to focus too much on the problems. People had to be inspired, and persuaded that there were worthwhile and achievable aims out there, to which they could make an effective contribution through their own actions.
- Responsibility: everyone had to step up to the plate in their own sphere, including ordinary citizens. Leaving it to others was not good enough.



Supporting young leaders in energy

162. Young Leaders in Energy (YLE) programme was born at the Club's Annual Summit in December 2014, with much effort and dedication of our corporate members who believe in and support investing in young people, irrespective of where they come from. Since then, the YLE initiative has progressed with tangible results to date. They will take it over from us so that the flag is to move to them in a smooth way learning and acquiring necessary skills as we go along.

163. None of us have reached where we are today merely through our own personal endeavours. This way or another we have benefitted from our seniors, sometimes through a couple of wise words, sometimes by way of introduction to a potential employer, patient coaching or mentoring. And we all know from the experience that leaders are growing neither in a vacuum nor on a tree.

164. As we enter a new critical era of game-changing developments in world energy young people have to be given the opportunity to progressively grow, mature, build their leadership capacities, develop right attitudes to people and job, and reinforce emotional intelligence.

young people have to be given the opportunity



165. It is not only older leaders grooming the next generational leaders but also how today's young leaders must effectively lead older generations. We need to prepare talented twenty-somethings for leadership roles today for the energy world of tomorrow. If we don't teach them how to equip and manage themselves, is it reasonable to expect them to lead us towards a challenging future? Engaging and empowering young people is the only way to create a sustainable world.

166. There was a call to continue supporting YLE programme and bringing fresh blood from those under 35 years old, already professional or post-graduate with a strong interest in energy, investment and geopolitics.



Agenda

Moderator: Mehmet Ögütçü, Chairman, The Bosphorus Energy Club

09:00-09:30 Registration and Networking

Host's remarks: Murat Mercan, Chairman, WEC Turkey National Committee

09:30-11:15 Keynote Speakers

- **Maroš Šefčovič**, Vice-President in charge of Energy Union, “The External Dimensions of the European Energy Union Strategy: The Road Map”
- **Tony Hayward**, Chairman, Genel Energy plc, “What is the future for hydrocarbons in the next 10 years?”
- **Michael Ancram**, 13th Marquess of Lothian, House of Lords, (Chairman, Global Strategy Forum), “UK: Brexit, Energy Security Priorities and Policy Moves”
- **Sila Bozok and Emre Dogru**, representing Bosphorus Energy Club's Top 100 Energy Leaders, “What Do Young Leaders in Energy Want?”

11:15-11:45 Coffee Break

11:45-13:35 Current Global Energy Dynamics for Decision-Makers

- **Ian MacDonald**, Vice-President, Europe, Eurasia & Middle East, Chevron
- **Mohamed A. Althani**, former Minister of Trade and Economy, Qatar, “A “golden age” for LNG in the era of resource abundance?”
- **Tatiana Mitrova**, Center on Global Energy Policy, Columbia University, “How will Russia adopt its strategies?”
- **John Roberts**, Energy Security Specialist, METhinks, “What Future for Gas?”
- **Haydar Çolakoğlu**, Chairman, Ege Gaz, “A new gas and renewables equation and changing investment flows”
- **William D. Magwood**, Director-General, OECD Nuclear Energy Agency

13:35-14:30 Lunch

14:30-15:30 Transforming Major Regions of the World Energy

- **Razvan Nicolescu**, Former Minister of Energy, Romania
- **David Merkel**, Managing Director, Summit International Advisors (former Director, US National Security Council in the White House), “How to put the US-Turkish relations on a positive agenda track in the post-coup attempt and -US elections era?”
- **Dimitar Bechev**, Harvard University, “New dynamics in Russia and Southeast Europe”
- **Tolga Bilgin**, CEO, Bilgin Energy Investment Holding, “What risks and upside for renewable energy in the future?”
- **Julian Popov**, former Minister of Environment, Bulgaria, and senior fellow, European Climate Foundation, Brussels, “Oil and Gas Pipelines vs. Power Transmission Grids: Overcapacity for Energy Infrastructure?”
- **Mahmood Khaghani**, former Director-General, National Iranian Oil Company, “Caspian energy market in Transition: Pushing the boundaries towards energy as a service”

15:30-16:00 Coffee Break

16:00-16:45 New Opportunities in a Distressed World Energy Market?

- **Chris Cook**, former Director, International Petroleum Exchange, “Iran: Pipelines vs Cable?”

- **Richard Mallinson**, Energy Aspects, “China’s Belt and Road Initiative: What Energy Benefits Can We Expect?”
- **Kirill Zenin**, Partner, White & Case, “What’s up in Central Asia?”
- **Ruya Bayegan**, Deputy Chairman, Bayegan & **Robert Alpen**, Head of Natural Gas, Gunvor, “Opportunities and difficulties in energy trading”
- **Sanford Henry**, Special Projects, Global Resource Partnership, UK, “How will new trading arrangements change energy flows?”

16:45-17:00 Key Messages for Business and Government Leaders

19:30-22:30 Private Dinner Discussion (Only by invitation)

Venue: Shangri-La Bosphorus Hotel - Ballroom, Sinanpaşa Mah. Hayrettin İskelesi Sok. No.1, Beşiktaş, Istanbul-Turkey with Club members and special guests, featuring in an off-the-record discussion, hosted by PwC

Questions for Discussion

- What has changed in the world energy over the past year, what new developments are anticipated next year: how will they affect our members and countries in the region?
- The signing of an inter-government agreement on the Turkish Stream with Russia: what new opportunities and challenges it might create for both countries and competing gas projects?
- What is the update on the Iraqi Kurdish, eastern Mediterranean and Iranian gas? Will TANAP and TAP projects proceed as expected?
- Turkey’s rapprochement with Russia, Iran and Israel as well as Syrian intervention: how will they affect the foreign policy, security, energy and investment equation?
- Any realistic hope for European Energy Union? In what ways, EU’s energy vision coincides with those of Turkey, Eurasia and Southeast Europe?
- Will Africa be able to unleash a new wave of investment flows in the energy sector?
- China’s “One Belt and One Road” initiative: what is the real scope and how the region’s energy infrastructure can benefit from it?
- How can we explain the significantly reduced investment in fossil fuels in the global energy system while there is a marked increase in renewable energy and technology? Do we expect a similar trend in Turkey?
- How will governments and businesses act in view of the excessive regulatory barriers, debt repayment risks, political and security challenges and new technological breakthroughs?
- Will there be further improvements in promoting nuclear energy?
- Some recommendations for the government and business leaders

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Mehmet Ögütçü, Chairman, The Bosphorus Energy Club

An internationally recognized authority on geopolitics, energy diplomacy, and investment, Mehmet has built significant knowledge and experience in the fields of energy, natural resources, investment and geopolitical risks with particular geographic focus on Europe, Turkey, Central Asia, Russia, Africa, the Middle East and China.

Based in London, Paris, and Istanbul, his professional career over the past 30 years has included high-level government, business, and public diplomacy engagements.

Currently, Mehmet chairs Global Resources Partnership, UK, sits on the boards of Genel Energy plc and Sisecam Group, serves as Special Envoy of The Energy Charter for MENA Region, and as Executive Chair of The Bosphorus Energy Club, an exclusive gathering of the senior executives and leaders in finance, energy and politics across the world. An effective convener and doer, he often provides strategic advice to large international groups on political risk mitigation, fund-raising, business growth and M&A deals in emerging markets.

A former diplomat, having served in Ankara, Beijing, Brussels, and Paris, Mehmet worked as an advisor to the late Turkish Prime Minister, Turgut Özal, as a senior staffer at the International Energy Agency, executing the Asia-Pacific and Latin America operations, and at the OECD in Paris managing investment programmes for MENA and Emerging Asia, Africa, and Central Asia (1994-2005). Until 2011, Mehmet was Director for BG Group, one of the world's largest natural gas and petroleum multinationals, managing high-level government engagements in support of the company's global assets and new business development. He was an independent board member of Yasar Holding Group (major food and beverage conglomerate), and chairman of International Advisory Board for Invensys plc, a FTSE 100 technology company.

Mehmet is a graduate of Turkey's "Mulkiye", London School of Economics (MSc) and College d'Europe (MA), Bruges. He is an occasional lecturer at London School of Economics' Enterprise Executive Programme, Harvard University, Dundee University, University of Reading and Peking University's School of Government since 2005. He writes and lectures extensively around the world on political dispute settlement, energy investment and geopolitical matters. Mehmet is fluent in Turkish, English, French and Chinese mandarin (conversational).



Murat Mercan, Chairman, WEC Turkey National Committee

Murat is a founding member and deputy chairman of the Justice and Development Party (AKP) of Turkey. Born in 1959, he attended Bosphorus University in Istanbul and graduated with Bachelor's and Master's degrees in industrial engineering. He then went on to receive a PhD from the University of Florida, USA in 1992. Following his studies, Mr. Mercan became an assistant professor at Cleveland State University, USA, and an associate professor at Bilkent University, Turkey, where he lectured as part of the Faculty of Business Administration. A parliamentary deputy from Eskisehir, Mr. Mercan has served as Chairman of the Turkish Delegation to the Parliamentary Assembly of the Council of Europe (PACE) and the European Interparliamentary Defence and Security Assembly (IESDA), and as Vice-president of the Parliamentary Assembly of the Council of Europe. From 2007 until 2011, Mr. Mercan was Chairman of the Committee for Foreign Affairs of the Turkish Grand National Assembly. He has also served as Deputy Minister of Energy and Natural Resources.



Maros Sefcovic, Vice-President in charge of Energy Union

Maros (born in 1966) is a Slovak career diplomat and since 1 November 2014 Vice President for Energy Union of the European Commission. In this capacity he leads the Commission's Energy Union Project Team which comprises 14 commissioners.

From 2010–2014 he was Vice President of the European Commission in charge of Inter-Institutional Relations and Administration. From 2009 to 2010, he was European Commissioner for Education, Training, Culture, and Youth. From 2004 to 2009, he was the Permanent Representative of the Slovak Republic to the European Union. A diplomat by profession, he served from 1992 to 2004 in Zimbabwe and Canada and as Ambassador to Israel.

He graduated from the University of Economy in Bratislava and the Moscow State Institute for Foreign Relations. He holds a Doctor of Law degree and a PhD in European law from the Comenius University Faculty of Law, Bratislava. He also studied at Stanford University in the USA.



Tony Hayward, Chairman, Genel Energy plc.

Tony studied geology at Aston University in Birmingham and completed a PhD at Edinburgh University. He holds honorary doctorates from the University of Edinburgh, Aston University, the University of Birmingham, and Aberdeen's Robert Gordon University.

Tony was Group Chief Executive of BP from 2007 to 2010, having joined BP in 1982 as a rig geologist in the North Sea. Following a series of technical and commercial roles in Europe, Asia, and South America, he returned to London in 1997 as a member of the Upstream Executive Committee. He became Group Treasurer in 2000 and Chief Executive for BP's upstream activities and a member of the Main Board of BP in 2003.

In June 2011 Tony founded Vallares plc, a \$2.2bn acquisition company listed on the London Stock Exchange. He became Chief Executive of Genel Energy plc in November 2011 following the merger of Vallares plc and Genel Energy International, the largest oil producer in the Kurdistan Region of Iraq. In August 2015 Tony was appointed Chairman of Genel Energy.

Tony is Chairman of Glencore, a partner in AEA Investors, and Chairman of CompactGTL. He is a Fellow of the Royal Society of Edinburgh, a visiting professor in the School of GeoSciences at the University of Edinburgh, a member of the International Advisory Board of Birmingham University, and chairs the Aston University Development Board. In addition, he is a member of the British Museum Chairman's Advisory Board and a member of the Development Advisory Board of the Royal Academy of Engineering.



Michael Ancram, 13th Marquess of Lothian, House of Lords, (Chairman, Global Strategy Forum)

Michael is a Scottish QC, having practised largely at the criminal bar between 1970 and 1979. He was first elected to Parliament in 1974. He served for three years on the first Energy Select Committee, and for one year on the Public Accounts Committee.

Michael's ministerial career includes four years as the Scottish Office Minister For Housing, Local Government, the Environment, and Law and Order, and four years as the political minister in Northern Ireland responsible for the initial political engagements with the IRA and the beginnings of the peace process which led eventually to the Good Friday Agreement. Subsequently, Michael served as Chairman of the Conservative Party for three years. He then became Shadow Foreign Secretary, and Deputy Leader of both the Conservative Party and the HM Opposition. For the last four years he has been the Chairman of Le Cercle, an International Affairs Forum.

He has authored numerous pamphlets including *Farewell to Drift*, *A New Foreign Policy for a Network World*. Michael Lothian has degrees from Oxford and Edinburgh Universities.



Sila Bozok, representing Bosphorus Energy Club's Top 100 Energy Leaders

Sila is a part of the Young Leaders in Energy (YLE) Programme of the Bosphorus Energy Club, since its foundation. She currently works as a Business Analyst at Shell Turkey. Sila is also the First Prize Winner of the 23rd World Energy Congress' (WEC) Paper Competition. She holds a BA in International Relations from Galatasaray University, where she ranked second. She won the Jean Monnet Scholarship received her MSc in International Political Economy from London School of Economics. She had previous experiences at EnerjiSA, UNDP, the Assembly of European Regions, and the Foreign Economic Relations Board (DEIK). She is native in Turkish, fluent in English and French.



Emre Dogru, representing Bosphorus Energy Club's Top 100 Energy Leaders

Emre Doğru is managing partner at StratejiCo., a strategic advisory firm based in Istanbul, Turkey. Mr. Doğru previously worked in several international organizations and multinational companies specializing in research & analysis, political advisory, energy security and strategic forecasting, and served as the U.S. Representative of TUSIAD (Turkish Industry & Business Association) in 2012. He was as an intern at NATO and United Nations Development Programme. Mr. Doğru is a graduate of Ankara University, Faculty of Political Science and currently PhD candidate at Koc University, where his research focuses on nonmarket strategies of corporations, business-government relations and energy & defense sectors.



Ian R. MacDonald, Vice President, Europe, Eurasia & Middle East, Chevron

Based in London, Ian is responsible for business development, new ventures, and transportation strategy for Europe, Eurasia, and the Middle East. In addition to advancing new opportunities, Ian directly manages new business in Eastern Europe and the Kurdistan region of Iraq. Previously, he served as President of Chevron Neftegaz in Moscow, the General Director of the Caspian Pipeline Consortium (CPC) in Russia and Kazakhstan, and Logistics Manager at Tengizchevroil in Kazakhstan.

Ian has also held management roles in Europe, the United States, and Nigeria. He is a vice chair of the International Oil and Gas Producers Association and serves on the governing bodies of CPC and Tengizchevroil.

Ian holds a B.A. in political theory and institutions from the University of Liverpool. A native of Scotland, Ian joined Chevron in 1981.



Mohamed A. Althani, former Minister of Economy and Trade, Qatar

Mohamed Ahmed is a former minister of economy and trade in Qatar.

He spent over seventeen years working in the oil and gas industry, mainly with Qatar Petroleum, RasGas, and QatarGas. His main activities now are related to consulting, energy research, and the GCC political economy, regarding which he is a visiting fellow at the Oxford Centre for Islamic studies.

He is a board member of the London Business School Global Advisory Board and a visiting board member of the Fuqua School of Business at Duke University. He holds a B.A.A. in industrial management and supervision from Central Michigan University, a Global MBA from Duke University, and has completed the senior executive programme at the London Business School. Sheikh Mohamed has authored two books, *The Arab Spring and The Gulf States: Time to Embrace Change*, and *Jassim, the Leader and Founder of Qatar*.



Tatiana Mitrova, Center on Global Energy Policy, Columbia University

Tatiana is a research scholar at the Center on Global Energy Policy. She has twenty years of experience in the Russian and global energy markets, including in production, transportation, demand, energy policy, pricing, and market restructuring. She formerly served as Head of the Oil and Gas Department at the Energy Research Institute of the Russian Academy of Sciences (ERI RAS). From 2011-2012 she was Head of Global Energy at the SKOLOKOV Energy Centre, responsible for analysis of the global energy market and the Russian Federation's energy export and import policy. From 2006-2011 she was Head of the Center for International Energy Markets Studies at ERI RAS.

Dr. Mitrova is a graduate of Moscow State University's Economics Department. She is a visiting professor at the Institut d'Etudes Politiques de Paris (Sciences Po). She has authored more than 120 publications in scientific and business journals and four books.



Norbert Schwieters, Partner, Global EU&M and CIPS, PwC

Norbert has led PwC's Global Consumer and Industrial Products and Services group since 2012 and is the Global Energy, Utilities, and Mining Leader for PwC's worldwide operations. He also is the leader of the Energy industry team in Germany. He has more than 27 years of experience with PwC, half of that time focused solely on the power and utilities industry. Norbert has worked for a variety of clients in the sector and has been involved in providing professional services relating to general industry and operational issues.

Norbert's experience includes serving as the Global Relationship Partner for RWE AG, Essen, and E.ON SE, Düsseldorf. He is the PwC representative for the World Energy Council, the Energy Council of Wirtschaftsrat Deutschland, and the Deutsches Nationales Komitee des Weltenergieerates (DNK).

In addition to his work with PwC, Norbert is holding a seminar on financial accounting in the masters course for economics at the Ruhr-Universität Bochum, Germany.

Norbert holds a degree in economics and received a doctorate in economics in 1989. He is qualified as a German Tax Advisor and as a German Certified Public Accountant. Norbert is married, has two children, and is based in Düsseldorf/Germany.



John Roberts, Energy Security Specialist, METhinks

John is a senior fellow at Atlantic Council's Dinu Patriciu Eurasia Center and Global Energy Center. He is also a senior partner with Methinks Ltd, a consultancy specializing in the interrelationship between energy, economic development, and politics. He has a particular expertise in the development of energy in the Caucasus and Central Asia and in the pipelines connecting or intended to connect the Caspian to China, Russia, India, and Europe.

Roberts is one of Europe's leading energy security specialists. He served as managing editor at Platts for twelve years and previously with Financial Times Energy, focusing on the development of energy and on the impact of energy on development. In assessing global energy security issues, he has regularly toured the Gulf and the Caspian, as well as visited the Alaskan North Slope, the Athabasca Tar Sands, China, Norway, and Venezuela. He has also testified to UK parliamentary committees on Turkish, Russian, Caspian, and Mideast energy security issues. He is currently researching shale gas development in China and hydrocarbons development in the Eastern Mediterranean and Northern Iraq.

His books include *Caspian Pipelines* (1996), *Visions & Mirages: The Middle East in a New Era* (1995), and *Beyrouth: L'Été '82* (Beirut, Summer of '82) (1983). His latest book, *Pipeline Politics: The Caspian and Global Energy Security*, was published in 2014 by the Royal Institute of International Affairs in the United Kingdom and by the Brookings Institution in the United States.



Haydar Çolakoğlu, Chairman, Ege Gaz

Haydar has a BA in Economics from Princeton University and he is also Vice-Chairman of Çolakoğlu Metalurji and board member at TEB Holding, the holding company of Türk Ekonomi Bankası (TEB).



William D. Magwood, Director-General, OECD Nuclear Energy Agency

William is the Director-General of the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD) since 1 September 2014. He has extensive experience in both the regulatory and developmental aspects of nuclear energy, including at the international level. From 2010 to 2014, he served as one of the five Commissioners appointed by the US President and confirmed by the US Senate to the US Nuclear Regulatory Commission (NRC). While a commissioner, he advocated the importance of nuclear regulatory independence and the necessity of maintaining strong, credible and technically sound nuclear regulation in the United States and all countries that use nuclear power.

Prior to his appointment at the NRC, from 2005 to 2010 he provided independent strategic and policy advice to US and international clients on energy, environmental and technology policy issues. During this time, he also sat on various advisory groups and provided technical and policy advice to members of the US Congress on nuclear research, education and climate change policy. From 1998 to 2005, Mr. Magwood was Director of Nuclear Energy at the US Department of Energy (DOE). During his tenure, he launched several important initiatives including the US Nuclear Power 2010 programme and the Generation IV International Forum (GIF). He was also actively involved in the work of the NEA, serving as a Steering Committee bureau member from 1999 to 2003, and as Chair in 2004 and early 2005. Prior to his experience at the DOE, Mr. Magwood managed electric utility research and nuclear policy programmes at the Edison Electric Institute in Washington, DC, and was earlier a scientist at Westinghouse Electric Corporation in Pittsburgh, Pennsylvania.

He, a US national, holds Bachelor's degrees in Physics and English from Carnegie Mellon University and a Master of Fine Arts from the University of Pittsburgh.



Razvan Nicolescu, former Minister of Energy, Romania

Razvan has been the Minister Delegate of Energy of Romania since March 2014. Since March 2010, he has also been the President of the Board of Administrators of the European Agency for the Cooperation of Energy Regulators. In 2008, he was appointed Director for Public and Regulatory Affairs with OMV Petrom. Between 2006 – 2008 he was Romania's Energy Attache at the European Union.

He holds a BA degree in Energy Engineering from the Polytechnic University in Bucharest and the Universit  degli studi di Trento (Italy). In 2009 he graduated the EMBA programme of the Solvay Business School in Brussels (Belgium).



David Merkel, Managing Director, Summit International Advisors (former Director, US National Security Council in the White House)

David holds degrees in Economics and International Relations and is a member of the Council on Foreign Relations, the International Institute for Strategic Studies (London) and the Swedish Institute of International Affairs. He is also a Senior Fellow at Johns Hopkins Center for Transatlantic Relations, at the Azerbaijan Diplomatic Academy and a Visiting Faculty Member in the Geopolitics of Energy.

David has served as Deputy Assistant Secretary of State for European and Eurasian Affairs at the U.S. Department of State, Director for European and Eurasian Affairs at the National Security Council in the White House, Director for South and Central Asian Affairs at the National Security Council, Deputy Assistant Secretary for International Affairs at the U.S. Treasury Department; International Counselor to the Chairman of the U.S. Securities and Exchange Commission and Senior Professional Staff on the Senate Foreign Relations Committee.

He is currently a member of the Board of Trustees of Nazarbayev University in Astana, the Josef Korbel School of International Studies Social Science Foundation at Denver American University School of International Studies Dean's Council.



Dimitar Bechev, Center for European Studies, Harvard University

Dimitar is Director of the Sofia-based European Policy Institute and Visiting Scholar at the Center for European Studies, Harvard University. His previous positions include Senior Visiting Fellow at the European Institute, London School of Economics, Research Fellow at European Studies Centre, University of Oxford, Senior Policy Fellow and Director of Sofia Office at the European Council on Foreign Relations (ECFR), and visiting professor at Hitotsubashi University, Tokyo. He has published widely on EU external policies and the foreign policy and domestic affairs of Turkey and the Balkans, Russia's influence in Southeast Europe. His new book, coming out with Yale University Press in 2017, is entitled *Rival Power: Russia in Southeast Europe*. He is a regular contributor to *Oxford Analytica*, *Al Jazeera*, *Foreign Policy* and *openDemocracy*. His quotes have appeared in *The Economist*, *Financial Times* and the *Wall Street Journals*, amongst other quality media outlets. He holds a D.Phil. in Politics and International Relations from the University of Oxford.



Tolga Bilgin, CEO, Bilgin Energy Investment Holding

Tolga has been managing Bilgin Energy Investment Holding since 2000, one of Turkey's largest and pioneering companies in the renewable energy sector with an installed capacity of 900 MW. Bilgin Energy is the first private investor in Wind Energy Power Plants and also the first owner and trader of carbon emission certificate in Turkey. He played a major role developing, financing and executing the wind and hydro power plant projects in Bilgin Energy. He received his B.A. from Bilkent University in 1997. Tolga is also serving as President, Wind Power and Hydropower Plants Businessmen's Association (RESSIAD) since 2006.



Julian Popov, former Minister of Environment, Bulgaria, and senior fellow, European Climate Foundation, Brussels

Julian leads the South East Europe Grid Initiative which catalyses high level energy policy cooperation among countries in wider South East Europe, including Turkey and the Western Balkans. He is the founding CEO and a current board member of the New Bulgarian University, former Chairman and current board member of the Bulgarian School of Politics, co-founder of the Tunisian School of Politics, and a board member of the Balkan Forum.

Julian is member of the Advisory Board of GridTech, a member of the Advisory Board of the BETTER Project, a founding member of the Governing Board of Sofia Platform, a member of the Steering Committee of Grantmakers East Forum, and Honorary Treasurer and Director of the UK charity Friends of Bulgaria. He is the author of two books and writes regularly on current affairs and energy policy.



Mahmood Khaghani, former Director-General, National Iranian Oil Company

Mahmood, now retired, had more than 33 years of service in senior international positions in Iran's petroleum industry. He held the position of the Director for Energy, Minerals and Environment at the Secretariat of the Economic Cooperation Organization (ECO) during 1996-2000. He is a graduate in energy engineering at Britain's Surrey University and is a Petroleum- development Strategy advisor (International). Mr Khaghani has participated and presented papers in many international conferences and seminars.



Chris Cook, former Director International Petroleum Exchange

Following an early career in the UK Department of Trade & Industry, Chris was a market regulator at the Association of Futures Brokers & Dealers, and then at the International Petroleum Exchange (latterly as a Director). At the IPE, he developed successful new trading mechanisms such as Exchange of Futures for Swaps; Volatility Trades; and Settlement Trades. Between 1998-2000, he founded and developed NewClear, a generic transaction confirmation concept, still widely used in global markets. Chris now works mainly in Scotland, with Nordic Enterprise Trust, to develop new partnership-based enterprise models, and related financial products and services. His work at ISRS is focused on a new generation of networked markets – which will, in Chris's view, necessarily be dis-intermediated, open, decentralised and, therefore, resilient.



Richard Mallinson, Energy Aspects

Richard leads analysis of geopolitics, international affairs and energy policy. The Middle East and North Africa region is his primary focus. Richard is a senior policy professional with more than six years experience working with central government functions in both the UK and Australasia. He has a deep understanding and track record of impact in all aspects of policy-making. He has written articles for a range of publications including MEES and the Oxford Energy Forum and regularly comments on geopolitical events affecting the energy markets. Richard holds a BA in Politics and International Studies from the University of Warwick and is a member of the Royal Institute of International Affairs (Chatham House)



Kirill Zenin, Partner, White & Case

Kirill is an attorney admitted to the practice of law in England and Wales, the State of New York and the Russian Federation. He represents clients in a broad range of corporate, commercial and finance-related transactions, with a particular emphasis on mergers and acquisitions, capital markets and other strategic transactions in the natural resources sector in Africa, Russia and Central Asia. He is recognised by Chambers Global as a leading lawyer within the field of 'Energy & Natural Resources, Kazakhstan' (2014 edition). Kirill holds a Jurist Diploma With Highest Distinction from the Moscow State Lomonosov University and a Master of Laws Degree from Harvard Law School.



Rüya Bayegan, Board Member, Bayegan Group

After graduation from University in Newbury College in Boston in 1992, Ruya moved back to Turkey and started working in her father's textile factories.

Starting from the lowest ranks gradually moved up to productions supervisors. Due to increasing business volume, she left her father's company and joined Bayegan Group in 2002, as sourcing coordinator since then. She was voted as one of the 50 most powerful people in a survey done by Refining & Petrochemicals magazine in December 2010.



Robert Alpen, Head of Natural Gas, Gunvor

Robert has worked for 17 years in the energy space. Robert started with Semptra Energy Trading in the US as a power trader before switching to Europe, and natural gas, rising to VP of European Natural Gas. In 2009, Robert lead the construction of Gunvor's diversification into Natural Gas trading, shipping, storage, and supply. Today, Gunvor's Natural Gas business represents over 20% of the turnover for the firm and has become the largest foreign supplier of gas to both Italy and Spain. Gunvor's LNG desk continues to grow with both long term supply arrangements starting in the near future as well as a robust spot trading business that traded more than 50 cargos this year. Robert's specialty lies in the intersection of the local delivery of physical commodities and their links to financial markets around the world. Robert holds a BS in Economics from Virginia Tech University.



Sanford Henry, Special Project, Global Resource Partnership, UK

Sanford is Founder and Managing Director of Asset Solutions. He advises corporate clients and family offices on strategic investments, transatlantic trade, asset based lending, acquisitions, due diligence and fund management. He is a partner of Global Resources Partnership, Strategic Thinker, Bosphorus Group, Senior Advisor to Dr.Schwarz-Schilling & Partners and MEC Consult (Middle East). He is member of The Pilgrims, Fellow at British American Business, member of the Conservative & Republican parties and American Citizens Abroad.

He has worked in over forty countries for international companies in senior positions: Edmond de Rothschild, Russia Partners (Siguler Guff), Polish Privatization Fund (Lazard), Polish and Hungarian-American Enterprise Funds (U.S. Government), Lazard Medical Ventures(Lazard), U.S. Leasing International, Inc (Vice President: Europe, Africa, Middle East & Asia), Holiday Inn, Groupe L'Express, Ford Motor Company and a journalist: WGBH & WHLS. He has been a member of Financial Conduct Authority, Securities Institute and Board Director of over twenty companies.

Sanford has worked in politics and media in the US and internationally. He is a citizen of both the U.S. and U.K. He completed university undergraduate and graduate studies, including a master's thesis on German politics in the U.S. (Michigan State/Michigan) with graduate study in Switzerland (Lausanne), Germany (Cologne) and Great Britain (London).

As was a Visiting Fellow at the Royal Institute of International Affairs researching transatlantic trade, has mentored and lectured at Regent's University and is now writing a book: "Only Trade Works: A History of Transatlantic Trade"

List of speakers and participants

Members

- **Ahmet Erdem**, Country Chairman, Shell
- **Ahmet Kirman**, CEO, Sisecam
- **Ahmet Eren**, Chairman, Eren Holding,
- **Besim Şişman**, CEO, Turkish Petroleum
- **Burhan Özcan**, General Manager, Botaş Boru Hatları ile Petrol Taşıma A.Ş.
- **Cüneyt Ağca**, General Manager, Opet
- **Ercüment Bayegan**, CEO, Bayegan Group
- **Erhan Erdem**, Business Development Manager, Gunvor Group Ltd.
- **Fatih Mehmet Baltacı**, Chairman, Akfel Holding
- **Gökhan Tezel**, General Manager, Aygaz
- **Grigory Kazakov**, CFO, Akkuyu Nuclear
- **Hakan Ateş**, Faunder President and CEO, DenizBank
- **Haluk Yalçın**, Territory Senior Partner, PwC
- **İbrahim Yelmenoğlu**, General Manager, Tüpraş
- **Kaher Tahar**, CEO, Saudi Crown Holding
- **Kanat Emiroğlu**, CEO, NaturelGaz
- **Lord Howell of Guildford**, Chairman of the Board, WEG (Windsor Energy Group),
- **Martin Thomsen**, CEO, BP Turkey
- **Murat Çolakoğlu**, Partner-Energy, Utilities and Mining Industry Leader, PwC Turkey,
- **Murat Özgül**, CEO, Genel Energy,
- **Osman Saim Dinç**, CEO, Çalık Energy,
- **Ömer Faruk Özgül**, Chairman of the Board, Özgül Holding
- **Patrick Regis**, CEO, Rolls-Royce
- **Selim Kervancı**, General Manager, HSBC
- **Timur A. Kulibayev**, Chairman, Kazenergy
- **Turhan Turhangil**, General Manager of Middle East Region, Schneider Electric
- **Yağız Eyüboğlu**, President, Koç Energy Group
- **Zaur Gahramanov**, CEO, SOCAR
- Carnegie Moscow Center
- **Andrii Sybiha**, Ambassador, Embassy of Ukraine
- **Angeli Hoekstra**, PwC
- **Anthony Gajadharsingh**, Invenys plc
- **Arda Akarsu**, Director, TEB
- **Arda Yalı**, General Manager, ELİN Yenilenebilir Enerji Sistemleri A.Ş.
- **Arif Yüklér**, CEO, Georgia Gas
- **Arne Walther**, former Ambassador, Norway
- **Aslan Uzun**, General Manager, Enerya Gaz Dağıtım A.Ş.
- **Atilla Kılınc**, Bilgi Universty
- **Atilla Ulusu**, Tüpraş
- **Atom Okumuş**, Young Leader, Bosphorus Energy Club
- **Aydan Güler**, Young Leader, Bosphorus Energy Club
- **Balazs Hendrich**, Consul General of Hungary, Istanbul
- **Barbaros H. Binicioğlu**, Political Affairs, Economic and Social Commission for Western Asia, UN, and Middle East Coordinator for Calik Energy
- **Barış Şanlı**, Advisor, Ministry of Energy and Natural Resources, Turkey
- **Barry Weir**, Managing Director, J.P. Morgan
- **Beglan Baimukhanov**, Senior Advisor, Reach Energy Berhad, Khazakhstan
- **Bernd Bievert**, Deputy Head Cabinet, European Commission Vice-President
- **Berris Ekinci**, Director General of Energy Department, Ministry of Foreign Affairs,
- **Binyamin Zomer**, Israel Country Manager, Noble Energy
- **Burak Yitgin**, Young Leader, Bosphorus Energy Club
- **Burak Baştacı**, Business Development Manager of Natural Gas, Enerjisa
- **Burcu Günal**, Director of Industry Analysis, Turkish Petroleum
- **Can Ögütçü**, Energy Charters secretariat, Brussels
- **Cathryn Clüver**, Executive Director, Harvard Kennedy School
- **Chakib Sbiti**, Chief advisor to Schlumberger CEO
- **Chris Bowers**, Director, Chevron-London
- **Chris Marshall**, Office of Director-General, IRENA(International Renewable Energy Agency)
- **Christian Cleutin**, former Director-General Energy, European Commission
- **Christian Schwarck**, Deputy Director, International Association of Oil & Gas Producers, Brussels
- **Christopher Bas**, Founder and Ceo, The Global Compass
- **Christopher Marshall**, Event Management , IRENA - International Renewable Energy Agency
- **Christopher Adams**, Energy Editor, Financial Times
- **Dan Blanculescu**, Senior Advisor Romania, Global Resources Partnership UK
- **Danila Bochkarev**, fellow, EastWest Institute, Brussels
- **David Koranyi**, Director, Eurasian Energy Future Initiative, Atlantic Council
- **Dilek Özlem**, Board Member, TOTAL
- **Dimash Dossanov**, Chair of the Management Board, Kaz Trans Oil JSC
- **Dmytro Kohan**, Consulate General of Ukraine
- **Duygu Ökesli**, Young Leader, Bosphorus Energy Club
- **Duygu Sever**, Young Leader, Bosphorus Energy Club
- **Ece Akın**, Executive Business Assistant to Chairman, Özgül Holding
- **Ege Yazgan**, Istanbul Bilgi University

Participants

- **Aad Groenenboom**, WEC NL Secretary and former PwC Partner
- **Adam Townsend**, Board Member, AKFEL Commodities
- **Adnan Vatansever**, Senior Lecturer, King's Collage Of London Russia Institute, KCL
- **Agah Hınç**, General Manager, AKFEL Energy
- **Ahmet Evin**, Professor, Sabancı University
- **Ahmet Şükrü Susuz**, Partner, Fideltus
- **Akın Ünver**, Department of International Relations, Kadir Has University
- **Ali Aissaoui**, Senior Consultant, Apircorp
- **Ali Arif Aktürk**, General Manager, Naturalgas, Genel Energy plc
- **Alican Kasapoğlu**, Young Leader, Bosphorus Energy Club
- **Ammar Abdulhafedh M.R.H. Maarafi**, Kuwait Embassy
- **Andrei V. Kolesnikov**, Senior Associate and Chair,

- **Elif Yağlı**, General-Manager, Bereket Enerji
- **Elina Teplinsky**, Lawyer, Pillsbury
- **Elliot Gerson**, Executive Vice President, Aspen İnstitute
- **Emin Calbay**, Young Leader, Bosphorus Energy Club
- **Emre Ünlü**, Young Leader, Bosphorus Energy Club
- **Emre Ertürk**, CEO, Ce Enerji
- **Erdem Başçı**, Ambassador, Permanent Delegation of Turkey to the OECD
- **Erik Somelar**, Counsellor, EU Mission in Baku
- **Ersin Merdan**, Young Leader, Bosphorus Energy Club
- **Farzad Moshfeghi**, CEO, Energy Investment Group
- **Filiz Katman**, Chairwomen, EPPAM
- **Flavius Caba-Maria**, President, Middle East Political and Economic Institute
- **Frank Quante**, CEO, EWE Turkey Holding
- **Gal Luft**, Co-Director, United States Energy Security Council
- **Gökçe Dervişoğlu Okandan**, Director, Istanbul Bilgi University
- **Gökçe Büyükçoban**, Tüpraş
- **Gökçe Mete**, Young Leader, Bosphorus Energy Club
- **Gulmira Rzaeva**, Founder CEO, Eurasia Analytica Consulting Company
- **Gülsüm Azeri**, CEO, OMV Petrol Ofisi A.Ş.
- **H.E Ghassan Yousuf A. Alzawawi**, Ambassador, Kuwait Embassy
- **Halil Emecen**, Managing Director, Goldman Sachs
- **Haluk Özgün**, Young Leader, Bosphorus Energy Club
- **Haris Boko**, Adviser, Energy Institute Hrvoje Pozar
- **Hasan Tan**, Event Management , Tüpraş
- **Hossein Iranmanesh**, President, Institute for International Energy Studies and Research Institute for Energy Mamangement and Planning, University of Tehran
- **İlhan Nebioğlu**, Managing Partner, Long Capital Partners Limited
- **Ilulian Fato**, Directory, National Intelligence Academy
- **Jacek Rostowski**, Professor, University of London
- **Jack Caravelli**, former White House National Security Council Director and Deputy Assistant Secretary of Energy, US
- **Jacques Robinson**, CEO, Revelation Energy
- **James Clad**, Senior Adviser, Center for Naval Analyses,US
- **Jan Rostowski**, Professor, University of London
- **Jeroen van Hoof**, Central Cluster Leader Energy, Utilities & Mining EMEA, Netherlands, PwC
- **Joana de Deus Pereira**, Energy Security and Geopolitical Consultant, Brussels,
- **Joanna Pritchett**, Deputy Political and Economic Section Chief, U.S. Consulate General Istanbul
- **John R. Bass**, Ambassador, Embassy of United States of America
- **Jonathan Clarke**, President, Washington Consultancy
- **Judith Slater**, British Consul-General,Istanbul
- **Karani Güleç**, Managing Director, Fina Enerji
- **Kenan Yavuz**, Chairman of the Board, İrfan Plastik ve Kalıp Ltd. Şti
- **Kirill Zenin**, Local Partner, White & Case Kazakhstan LLP
- **Kıvanç Gökrem Üçlertoprağı**, General Maneger, TransPasifik Enerji
- **Kıvanç Zaimler**, CEO, Enerjisa
- **Koen Minne**, Honorary Consul of Turkmenistan in Belgium
- **Kutluhan Olcay**, Corporate Communication Manager, Turkish Petroleum
- **Laura El Katiri**, Senior Analyst, OCP Policy Center, Morocco
- **Levent Zağra**, Tüpraş
- **Lynn Croas**, CEO, Trafalgar Oil And Gas
- **Maksym Vdovychenko**, Consulate General of Ukraine
- **Mansur Mete Göknel**, former CEO, Botaş
- **Marta Dassu**, Director, Aspen İnstitute
- **Mehmet Aktaş**, CEO, Yaşar Holding Group
- **Mehmet Ali Şenel** , Young Leader, Bosphorus Energy Club
- **Mehmet Betil**, Member of the Executive Committee, Borusan Holding
- **Mehmet Çalika**, Chairman, Bosphorus Advisory Group
- **Mehmet Vehbi Bilgin**, Chairman of the Board, Bilgin Energy Investment Holding Group
- **Memet Ali Kaya**, Head of Strategy Development, Turkish Petroleum
- **Mesut Özcan**, President, Diplomatic Academy, Turkish Ministry of Foreign Affairs
- **Mete Gürel**, Managing Partner, Moment Global Investment
- **Mithat Rende**, former Ambassador, Permanent Representative of OECD, Ministry of the Foreign Affairs in Turkey
- **Mohammed Nosseir**, Managing Director, Global Marketing Consultancy
- **Murat Yazıcı**, Managing Partner, Yazıcı Law Firm
- **Mustafa Aydın**, Rector, Kadir Has University
- **Mustafa Mente**, Secretary General, Turkish Exporters Assembly
- **Myungseop LEE**, Economy Counsellor, Embassy of Korea
- **Nicolas W L Maclean**, Chief Executive, MWM (Asia)
- **Niloufar Molavi**, US Energy (& Mining) Leader, Market Managing Partner-Greater Houston, PwC
- **Nusret Cömert**, Board Member, Borusan Mannesmann
- **Obahan Obaoğlu**, Secretary-General, Electrical Manufacturers Association
- **Okan Safran**, Senior Project Economist, Turkish Petroleum
- **Okan Demirkan**, Partner, Kolcuoğlu Demirkan Koçaklı Attorneys at Law
- **Oktay F. Tanrısever**, Associate Dean, Middle East Technical University Faculty of Economic & Administrative Sciences
- **Olcayto Yigit**, General Manager, Vestas
- **Oliver Sheehan**, Heritage Oil
- **Oral Avcı**, Chairman of the Board, Piomak
- **Özgür Kahramanzade**, Tüpraş
- **Pars Kutay**, Head of Government Relations, Genel Energy
- **Paul Sampson**, Middle East and Caspian Correspondent, Energy Intelligence
- **Pavel Felgenhauer**, Defense Analyst, Novaya Gazete, Russia

- **Pierce Riemer**, Director-Generel, WPC
- **Raphael Hadas - Lebel**, Vice-Chairman, Institut Aspen France
- **Reha Denemeç**, Founding Member, AKP and Chef Advisor to the President
- **Remzi Önder Karaduman**, President, Association of Electricity Producers
- **Richard Mallinson**, Geopolitical Analyst, Energy Aspects
- **Rıdvan Aktürk**, Director, Yetaş
- **Sabahattin Günceler**, Board Member, Şişecam
- **Sarp Yeletayşi**, Tüpraş
- **Seda Ertorun**, Commodities Deputy CEO, AKFEL Energy
- **Selim Oktar**, CEO, Strateji CO
- **Sergei Komlev**, Director, Gazprom Export
- **Serikzhan Seitzhanov**, President, South-Oil LLP.
- **Shai Shabati Cohen**, Consul General of Israel, Istanbul,
- **Shira Ben Tzion**, Consulate-General of Israel, İstanbul,
- **Sıla Uysal**, Young Leader, Bosphorus Energy Club
- **Simone Tagliapietra**, Senior Researcher, FEEM, ENI Milan
- **Sinan Demirer**, Koç Energy Group
- **Sohbet Karbuz**, Director, The Mediterranean Energy Observatory (OME)
- **Stephen Jones**, Partner, Global Resources, Communications Advisory, Brussels Turkish Parlemant
- **Taha Özhan**, MP, Chairman, Foreign Affairs Commission
- **Tahir Uysal**, Board Member, Silso Oil Corporation,
- **Tamas Torma**, Counsellor, Hungary,
- **Tamer Turna**, CEO, Yıldırım Energy Holding
- **Tarkan Deniz**, International Business Development Director, Middle East Construction
- **Tatsuo Masuda**, Visiting Professor, Nagoya University of Commerce and Business Graduate School
- **Traian Chebeleu**, Deputy Secretary General, Black Sea Economic Cooperation
- **Tufan Lokmanoglu**, Owner, Peri Enerji
- **Tuğba Gülen**, Energy Consultant, Embassy of Korea
- **Ulrike Von Lonski**, Director of Communications, WPC
- **Umut Kolcuoğlu**, Partner, Kolcuoğlu Demirkan Koçaklı Attorneys at Law
- **Vanessa Raine**, Business Director, Gilan Holding Azerbaijan
- **Vasile Secareş**, Chairman of the Board, Romanian Banking Institute
- **Vasyl Bodnar**, Consul - General, Embassy of Ukraine
- **Vildan Demirkıran**, Young Leader, Bosphorus Energy Club
- **William Rapp**, First Secretary, Embassy of the United States of America
- **Yaşar Arslan**, President, GAZBİR
- **Yunsoo Cho**, Ambassador, Embassy of Korea

Notes











The Club's Organising Team Members

Our Members:



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