

23rd World Energy Congress

9-13 October 2016
Istanbul, Turkey

PROGRAMME

PROGRAMME OVERVIEW

Under the theme Embracing New Frontiers, the programme of the 23rd World Energy Congress leads delegates through the most live and critical issues facing the energy industry. The format of the four-day programme is designed and developed to address the critical energy frontiers facing the global energy sector today. The World Energy Council identifies these frontiers as

Technology frontiers	Governance frontiers	Market dynamics frontiers	Resilience frontiers
Global scenarios and regional crossroads	Trilemma frontiers	Business models frontiers	Finance frontiers

	Monday, 10 October 2016	Tuesday, 11 October 2016	Wednesday, 12 October 2016	Thursday, 13 October 2016
	Vision and Scenarios for the Future	Identifying the Business Opportunities: Resources and Technologies	The Energy Trilemma: Policy Solutions to Secure Prosperity	Africa: Securing a Sustainable Energy Future
OPENING	SCENE SETTING	SCENE SETTING	SCENE SETTING	SCENE SETTING
	KEYNOTE SPEECHES (09:00 - 09:45)	KEYNOTE SPEECHES (09:00 - 09:50)	KEYNOTE SPEECHES (09:00 - 09:30)	EMPOWERING AFRICA: REALISING THE POTENTIAL (09.00 – 10.15)
	SCENARIOS 2060: THE GRAND TRANSITION (09.45 – 11.15)	INNOVATIVE BUSINESS MODELS: THE NEW FRONTIER (10.00 – 11.15)	CLIMATE OF INNOVATION: HARD TECHNOLOGY CHOICES AND INNOVATION PRIORITIES (09:30 - 11:00)	DISRUPTIVE BUSINESS MODELS: RESHAPING RURAL OPPORTUNITIES (10.15 – 11.30)
	NETWORKING BREAK			NETWORKING BREAK
PANEL SESSION	GLOBAL RENEWABLES UPDATE: THE REALITY OF SCALING UP (11:45 - 13:00)	GLOBAL DYNAMICS OF NATURAL GAS AND LNG MARKETS (11:45 - 13:00)	SUSTAINABILITY OF EUROPEAN GAS MARKETS (11:45 - 13:00)	AFRICA RENEWABLES UPDATE: THE REALITY OF SCALING UP (11:45 - 13:00)
	CHINA'S ENERGY OUTLOOK TO 2060 (11:45 - 13:00)	CYBER THREAT: ARE WE AT RISK OF THE LIGHTS GOING OUT? (11:45 - 13:00)	ENERGY-WATER-FOOD NEXUS (11:45 - 13:00)	DEVELOPMENT FINANCE TO BALANCE THE ENERGY TRILEMMA (11:45 - 13:00)
	DECARBONISING THE FUTURE: THE ROLE OF CCS (11:45 - 13:00)	RENEWABLE ENERGY SYSTEMS: LEARNING FROM LARGE-SCALE INTEGRATION (11:45 - 13:00)	CLIMATE CHANGE NEGOTIATIONS: KEEPING UP THE MOMENTUM (11:45 - 13:00)	TALENT AND CAPACITY BUILDING: SHOWCASING SUCCESS (11:45 - 13:00)
	SMART GRIDS UPDATE: ENGAGING WITH THE PROSUMER (11:45 - 13:00)	HYDROCARBON FRONTIERS: WHAT IS THE NEXT GAME CHANGER? (11:45 - 13:00)	AIMING AT ACHIEVING AND SUSTAINING A BALANCED TRIPLE 'A' (11:45 - 13:00)	
	TOMORROW'S NUCLEAR & TODAY'S REALITIES (11:45 - 13:00)	FINANCING THE GRAND ENERGY TRANSITION (11:45 - 13:00)	TO INVEST OR TO DIVEST: TODAY'S FRONTIERS OF PUBLIC FINANCING (11:45 - 13:00)	
	ASIA REGIONAL CROSSROADS: RESILIENCE AND REGIONAL INTEGRATION (11:45 - 13:00)	REGIONAL CROSSROADS: THE MIDDLE EAST POWER AND TRANSFORMATION (11:45 - 13:00)	REGIONAL CROSSROADS: LATIN AMERICA AND THE CARIBBEAN ENERGY IN TRANSITION (11:45 - 13:00)	
	ENERGY STORAGE AND THE FUTURE OF TRANSPORT (11:45 - 13:00)	THE ROAD TO RESILIENCE: MANAGING AND MITIGATING EXTREME WEATHER RISKS (11:45 - 13:00)	GLOBAL ENERGY GOVERNANCE FRONTIER: THE CHALLENGE TO DELIVER ON CRITICAL OBJECTIVES (11:45 - 13:00)	
	LUNCH BREAK			
PANEL SESSION	PRESIDENTIAL SPECIAL ADDRESSES (13:30 - 15:30)	ENERGY SECTOR REFORM: CHALLENGES AND OPPORTUNITIES (14:15 - 15:30)	THE IMPERATIVE OF TRADE: ACCELERATING THE INNOVATION TRANSFER (14:15 - 15:30)	DRIVING THE VISION FOR REGIONAL INTEGRATION (14:15 - 15:30)
		THE ROLE OF GAS IN THE LOW CARBON TRANSITION (14:15 - 15:30)	NEXT GENERATION BIOFUELS: RESCALING AMBITION (14:15 - 15:30)	
		ENERGY EFFICIENCY: ACCELERATING PROGRESS (14:15 - 15:30)	EUROPEAN ELECTRICITY MARKET HARMONISATION AND THE ROLE OF MARKET DESIGN (14:15 - 15:30)	
		THE ROLE OF MULTIPURPOSE HYDROPOWER IN A WATER-STRESSED WORLD (14:15 - 15:30)	ENABLING THE ENERGY TRANSITION: BENCHMARKING 125 COUNTRIES (14:15 - 15:30)	
		REGIONAL CROSSROADS CENTRAL ASIA: BRINGING CASPIAN BASIN GAS TO WORLD MARKETS (14:15 - 15:30)		
		TECHNOLOGY INNOVATION FRONTIERS (14:15 - 15:30)		
	URBAN INNOVATION: EMPOWERING TRANSFORMATION (14:15 - 15:30)			
	NETWORKING BREAK			NEW ENERGY REALITIES (15.30 – 16.30)
CLOSING	KEYNOTE SPEECHES (15.45 – 16.15)	THE COMMODITY PRICE STORM: SIGNAL OF A NEW NORMAL? (16.00 – 17.30)	MINISTERIAL DIALOGUE: TRANSITION A COUNTRY IN A DECADE (16.00 – 17.30)	
	PRESIDENTIAL SPECIAL ADDRESSES: REACTIONS FROM ENERGY LEADERS (16:15 - 17:30)			

COMMUNITY ROUNDTABLES (BY INVITATION ONLY)

GLOBAL GAS ROUNDTABLE 11.30 – 13.00 Co-hosted by GGC and the Council. By invitation only to gas sector CEOs and select guests	CEO ROUNDTABLE 11.45 – 15.30 By invitation only to the World Energy Council Patron & Global Partner CEOs and select guests	TRILEMMA MINISTERIAL ROUNDTABLE 11.45 – 15.30 By invitation only to Ministers, World Energy Council Patron CEOs and select guests	AFRICA ENERGY LEADERS' ROUNDTABLE 11.45 – 14.00 By invitation only to the Africa's energy leaders and key experts.
		GLOBAL ELECTRICITY INITIATIVE ROUNDTABLE 11.45 – 15.30 Co-hosted by WBCSD and the World Energy Council. By invitation only to power sector CEOs and select guests	

FULL PROGRAMME

	Monday, 10 October 2016	Tuesday, 11 October 2016	Wednesday, 12 October 2016	Thursday, 13 October 2016
	Vision and Scenarios for the Future	Identifying the Business Opportunities: Resources and Technologies	The Energy Trilemma: Policy Solutions to Secure Prosperity	Africa: Securing a Sustainable Energy Future
OPENING	SCENE SETTING KEYNOTE SPEECHES (09:00 - 09:45) Keynote speech from Marie-Jose Nadeau, Chair, World Energy Council, Canada Keynote speech from Khalid Al-Falih, Minister of Energy, Industry and Mineral Resources, Kingdom of Saudi Arabia Discussion Leaders <ul style="list-style-type: none"> Khalid Al-Falih, Minister of Energy, Industry and Mineral Resources, Kingdom of Saudi Arabia, Saudi Arabia Marie-Jose Nadeau, Chair, World Energy Council, Canada Moderator <ul style="list-style-type: none"> John Deferios, Anchor & Global Emerging Markets Editor, CNN, UAE 	SCENE SETTING KEYNOTE SPEECHES (09:00 - 09:50) Keynote speech from Bob Dudley, Group Chief Executive, BP, UK Keynote speech from Amin H. Nasser, President & CEO, Saudi Aramco, Saudi Arabia Discussion Leaders <ul style="list-style-type: none"> Bob Dudley, Group Chief Executive, BP, UK Amin H. Nasser, President & CEO, Saudi Aramco, Saudi Arabia Moderator <ul style="list-style-type: none"> John Deferios, Anchor & Global Emerging Markets Editor, CNN, UAE 	SCENE SETTING KEYNOTE SPEECHES (09:00 - 09:30) Special address video by Ban Ki Moon , Secretary-General, United Nations, USA	SCENE SETTING EMPOWERING AFRICA: REALISING THE POTENTIAL (09:00 - 10:15) While Africa is blessed with a vast and diverse wealth of energy resources, from vast oil and gas reserves to great potential for renewable energy sources, including solar and large hydropower projects, the continents' energy wealth is unevenly distributed and mostly underdeveloped. Africa is still the least electrified continent - 2 out of 3 Africans lack access to electricity. To empower Africa access to reliable, clean and affordable energy is critical. Advancing regional integration through priority interconnection projects must be part of the way forward for the continent to realise its untapped potential. Among the most encouraging recent developments are number of innovative bottom-up off-grid solutions supported by mobile banking solutions. Questions <ol style="list-style-type: none"> What are the priority back-bone projects on a 21st century energy roadmap for Africa? What is the role of mobile financing and micro leasing for empowerment of rural Africa? What are key barriers to finance and deliver energy infrastructure on a national and regional level, and how can they be overcome? Discussion Leaders <ul style="list-style-type: none"> Simon D'ujanga, State Secretary for Energy, Government of Uganda, Uganda Thulani Gcabashe, Chairman, Standard Bank, South Africa Elham Mahmood Ahmed Ibrahim, Commissioner for Energy & Infrastructure, African Union, Ethiopia Andrew N. Kamau, Principal Secretary of Petroleum, Government of Kenya, Kenya Moderator <ul style="list-style-type: none"> Bonang Mohale, Vice Chair for Africa, World Energy Council; Chairman & Country General Manager, Shell Commercial Pty, South Africa
	SCENARIOS 2060: THE GRAND TRANSITION (09:45 - 11:15) In order to explore the Grand Transition, the World Energy Council has built three energy scenarios - Modern Jazz, Unfinished Symphony and Hard Rock - which comprehensively develop possible paths toward 2060. Modern Jazz is a world driven by markets, strong innovation and rapid deployment of new technologies; Unfinished Symphony is a world of strong states direction, with energy policy priorities focused on security and climate change; and Hard Rock is a fragmented world with a weak economy and strong nationalism. Questions <ol style="list-style-type: none"> What are the major challenges that the world and its energy sector will face on the pathways to 2060? Which will be the most critical innovation areas? What does the future energy industry look like? Who wins and who loses? Discussion Leaders <ul style="list-style-type: none"> Fatih Birol, Executive Director, IEA, France Steve Bolze, President & CEO, GE Power, USA Ged Davis, Executive Chair, World Energy Scenarios, World Energy Council; President & CEO, Forescene SA, UK Yağiz Eyüboğlu, President, Energy Group, Koç Holding, Turkey Regine Günther, Climate and Energy Practice Leader, WWF, Germany Isabelle Kocher, Chief Executive Officer, ENGIE, France Willi Meixner, CEO, Power and Gas, Siemens, Germany Moderator <ul style="list-style-type: none"> John Deferios, Anchor & Global Emerging Markets Editor, CNN, UAE 	INNOVATIVE BUSINESS MODELS: THE NEW FRONTIER (10:00 - 11:15) The rise of new technologies in smart energy and the impact of customer behavioural changes are transforming the power sector, challenging conventional centralised thinking and business models. It heralds a new world of energy management, looking at how decentralised energy systems can accommodate multiple sources closer to the consumer, foster the optimal use of renewables, integrate storage and incentivise demand to follow supply, and increase energy efficiency. The prospect of a more distributed utilities network offers promise on many levels, but it is likely that we are only seeing the beginnings of these changes. Questions <ol style="list-style-type: none"> What are examples of the new models shaping this electricity revolution? What are key barriers and enabling conditions for such examples to scale up? Can old and new electricity models co-exist and if so, what will be the role of established utilities in a utilities 2.0 world? What will be challenges and solutions to maintain critical back-bone infrastructure such as Transmission and Distribution? Background Reading World Energy Issues Monitor 2016 Discussion Leaders <ul style="list-style-type: none"> Michael Bell, President, CEO and Member of the Board of Directors, Silver Spring Networks, USA Richard Lancaster, Chief Executive Officer, CLP Holdings, Hong Kong SAR Jean-Bernard Levy, Chairman and CEO, Electricité de France (EDF), France Johannes Teyssen, Chairman and CEO, E.ON, Germany Moderator <ul style="list-style-type: none"> John Deferios, Anchor & Global Emerging Markets Editor, CNN, UAE 	CLIMATE OF INNOVATION: HARD TECHNOLOGY CHOICES AND INNOVATION PRIORITIES (10:00 - 11:15) The World Energy Council's scenarios illustrate that technology innovation has to be a critical part of the solution to move towards a clean energy future. Without breakthrough innovation in areas such as CCS or electric storage, and continued innovation in energy efficiency, renewables, clean transport and system resilience, the objectives set at COP21 or by the UN sustainable development goal nr. 7 will be difficult if not impossible to achieve. Twenty of the world's largest economies have recognised this on the side-lines of the Paris COP21 meeting and committed to double their clean energy research and development investment over the next five years. Equally impressive commitments have been made by industry leaders forming the Breakthrough Coalition. The necessity for companies and governments to be part of the innovation frontier is a powerful imperative and also a significant opportunity that will define tomorrow's winners and losers. Questions <ol style="list-style-type: none"> Which are the critical innovation areas to be considered a priority for RD&D? In which areas can partnerships beat the innovation power of markets? What are the best examples for successful innovation partnerships? Discussion Leaders <ul style="list-style-type: none"> Suhail Mohamed Al Mazrouei, Minister of Energy, Government of UAE, UAE Rainer Baake, State Secretary, Federal Ministry for Economic Affairs and Energy, Germany Tufan Erginbilgic, Chief Executive, Downstream, BP, UK Taehee Woo, Vice Minister of Energy and Trade, Ministry of Trade, Industry, and Energy, Government of Korea, South Korea Moderator <ul style="list-style-type: none"> Richard Black, Director, Energy & Climate Intelligence Unit, UK 	DISRUPTIVE BUSINESS MODELS: REDEFINING RURAL OPPORTUNITIES (10:15 - 11:30) The rise of innovative and disruptive business models for off-grid power solutions is reshaping rural development in Africa. By combining state of the art renewable technology with high-efficiency appliances, latest battery technology, and innovative mobile payment systems that have emerged from the mobile phone revolution, entrepreneurs are delivering household solutions that increase rural electrification rates and scale up renewables in Africa. These innovative business models are challenging the conventional wisdom of energy infrastructure development in Africa and are fueling debates on off-grid versus on-grid solutions as well as small-scale versus large-scale projects. Questions <ol style="list-style-type: none"> What are the opportunities and challenges for developing off-grid solutions in Africa? How can these new business models accelerate their reach by accessing additional commercial financing? What are enabling policies to further accelerate the momentum of off-grid electrification? Discussion Leaders <ul style="list-style-type: none"> Simon Bransfield-Garth, Chief Executive Officer, Azuri Technologies, United Kingdom Thomas Duvreau, Head of Business Development, Mobisol, Germany Steve Harley, President - DHL Energy Sector, DHL, South Africa Mugo Kibati, Group CEO; Chairman, Pan Africa Insurance; M-KOPA Solar; Lake Turkana Wind Power, Kenya Benon Mutambi, CEO, Electricity Regulatory Authority Uganda, Uganda Moderator <ul style="list-style-type: none"> Angeli Hoekstra, Partner, Energy & Technology, PricewaterhouseCoopers (PwC), South Africa
NETWORKING BREAK				
PANEL SESSIONS	GLOBAL RENEWABLES UPDATE: THE REALITY OF SCALING UP (11:45 - 13:00) The spectacular growth of the solar industry has exceeded expectations of most analysts over the past years and in the meantime the world invests more in renewables than in conventional energies. Renewables are not only a solution to mitigate environmental impacts, but in an increasing number of cases they have become the most cost effective way to generate and deliver electricity. In many rural contexts in Africa and parts of Asia renewables are meanwhile providing an engine for local development and poverty reduction. Countries / States such as Germany, China, Ethiopia or California, have managed to diversify their economies, create jobs and substitute greenhouse gas intensive electricity generation. Questions <ol style="list-style-type: none"> Will the renewables growth continue and if so, where will be the growth centres? What are the success stories and critical success factors? 	GLOBAL DYNAMICS OF NATURAL GAS AND LNG MARKETS (11:45 - 13:00) As global energy demand rises and with the pressure to transition towards a lower CO ₂ energy supply, the market for natural gas and liquefied natural gas (LNG) continues to expand. According to a World Energy Council study, unconventional have now become a global phenomenon with transformative character for the LNG markets: supply diversity and increased competition have led to much greater market depth. Growing supplies of unconventional gas, led by US shale gas and Australian coal bed methane (CBM) are emerging on the global market as LNG and are transforming the market with dramatic price developments in Asia and beyond. With first LNG deliveries from the US to Asia the impact of the unconventional revolution is no longer limited to regional markets. Questions <ol style="list-style-type: none"> What are the latest key international dynamics on unconventional gas? How will additional LNG supplies from Australia and the US, possibly Africa, impact LNG prices? Is the linkage of LNG to oil prices a chapter of the past? 	SUSTAINABILITY OF EUROPEAN GAS MARKETS (11:45 - 13:00) While globally natural gas is the only fossil fuel with substantial growth prospects, the European outlook is flat and shaped by new realities. Future demand opportunities will be driven by chemicals feedstock and heavy duty transport; meanwhile, the role in electricity will shift from volume to system service; new infrastructure valuation may come from storage opportunities in pipelines capacity or the greening of gas through power-to-gas; competition has already and will further increase as a result of underused LNG import capacity and new pipeline projects. Meanwhile, the high volatility of commodity prices has put huge pressure on the gas industry, and recent pipeline geopolitics have seen a renaissance. Questions <ol style="list-style-type: none"> What are critical policy and investment priorities to ensure natural gas can fulfil its role as a bridging fuel in Europe? Are current gas market signals strong enough to refinance and maintain the existing European natural gas infrastructure? What are the most promising outlook trends in European gas markets? 	AFRICA RENEWABLES UPDATE: THE REALITY OF SCALING UP (11:45 - 13:00) Renewables are not only a solution to mitigate environmental impacts, but in an increasing number of cases they have become the most cost effective way to generate and deliver electricity. In many rural contexts in Africa, renewables are meanwhile providing an engine for local development and poverty reduction. Meanwhile, independent power producers enable attracting foreign investments and deliver projects with increasing ambition. Questions <ol style="list-style-type: none"> What are the success stories and critical success factors? What are the barriers preventing the development of renewable energy, and how can these be overcome? Are renewables and distributed energy the key to rural development? Discussion Leaders <ul style="list-style-type: none"> Bruno Benasson, CEO Africa, ENGIE, France David Humphrey, Standard Bank, Head of Power & Infrastructure, South Africa

<p>3. What are the barriers preventing the development of renewable energy, and how can these be overcome?</p> <p>4. What does it take to deliver the required transmission, storage and back-up capacities?</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Adnan Z. Amin, Director General, IRENA, UAE • Abid Malik, Managing Director, Acwa Power Turkey, ACWA Power, Turkey • Albert Mugo, Managing Director and CEO, Kenya Electricity Generating Company Ltd., Kenya • Jérôme Péresse, President & CEO, GE Renewable Energy, USA • Frank Quante, Managing Director, EWE Turkey, EWE AG, Turkey <p>Moderator</p> <ul style="list-style-type: none"> • Philippe Joubert, Executive Chair, Global Electricity Initiative, World Energy Council, France 	<p>4. What does it take to ensure effective price discovery in Asia and possibly other regions?</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Roger Bounds, Vice President, Global Gas, Royal Dutch Shell PLC, Singapore • David Hobbs, Head of Research, King Abdullah Petroleum Studies and Research Center (KAPSARC), Saudi Arabia • Amine Mazouzi, Chief Executive Officer, Sonatrach, Algeria • Shigeru Muraki, Executive Advisor, Tokyo Gas, Japan • Andrew Walker, Vice President, Strategy, Cheniere Marketing, UK <p>Moderator</p> <ul style="list-style-type: none"> • Muqit Ashraf, Managing Director & Global Head of Energy Practice, Accenture Strategy, USA 	<p>Discussion Leaders</p> <ul style="list-style-type: none"> • Didier Holleaux, Executive Vice President, Strategy, Technology, Projects and Solutions, ENGIE, France • Gertjan Lankhorst, Chief Executive Officer, GasTerra, Netherlands • Klaus Schäfer, Chief Executive Officer, Uniper, Germany <p>Moderator</p> <ul style="list-style-type: none"> • Bernhard Hartmann, Partner, Head of Energy for MENA, Oliver Wyman, UAE 	<ul style="list-style-type: none"> • Christina Ulardic, Head of Market Development Africa, Swiss Re Corporate Solutions, Switzerland* • Albert Mugo, Managing Director & CEO, Kenya Electricity Generating Company, Kenya • Samuel Undenge, Minister of Energy and Power Development, Zimbabwe <p>Moderator</p> <ul style="list-style-type: none"> • Izael Da Silva, Deputy Vice Chancellor, Strathmore University, Kenya
<p>CHINA'S ENERGY OUTLOOK TO 2060 (11:45 - 13:00)</p> <p>China has grown rapidly for more than three decades by following a strategy of high investment, strong export orientation and energy-intensive manufacturing. While China became the world's second largest economy with the largest number of rapidly expanding mega cities and the key engine for global growth, it also heightened problems of structural inequalities, intensified congestion, water stress, air pollution and CO₂ emissions. China now has entered a new phase of economic development - 'Xin chang tai' (Chinese New Normal) to focus on restructuring for more qualitative growth through reform and openness and through striving for more balance between very different economic realities in the East, West and Middle China.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What will China's energy landscape in 2060 look like? Is there a change or a refocus of China's energy ambitions? 2. What are the key drivers and critical uncertainties to determine China's future energy mix? 3. What role can China be expected to play in global energy governance in the coming decades to help achieve its trade and resources objectives? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Kang Yanbing, Director, Energy Sustainability Center, Energy Research Institute (ERI) - NDRCC, China • Leslie Maasdorp, Vice President and Chief Financial Officer, New Development Bank, China • Jianyu Zhang, Managing Director, China Program, Environmental Defense Fund (EDF), China <p>Moderator</p> <ul style="list-style-type: none"> • Xiansheng Sun, Secretary General, International Energy Forum (IEF), Saudi Arabia 	<p>CYBER THREAT: ARE WE AT RISK OF THE LIGHTS GOING OUT? (11:45 - 13:00)</p> <p>The increasing interconnection and digitisation of the energy sector, ranging from smart grids, or digital oil fields smart devices and the growing Internet of Things, along with the sector's critical role in the functioning of a modern economy, makes the energy sector a highly attractive target for cyber-attacks geared to disrupt operations. As experienced in the Ukraine at the end of 2015, an attack on a system used to operate the power grid can impact the power supply of an entire country. Attacks on energy systems could lead to physical damage, with significant impacts on local communities and the economy. As highlighted in a new World Energy Council report, the energy sector must adopt measures to prevent, prepare for and respond to cyber events. Greater resilience to cyber risk is critical to current and future energy security. There is a lot at stake, and new risks have become the focal point of boardroom and cabinet discussions.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. How can cyber risks be assessed and mitigated, taking into account the changing nature of the energy industry and energy infrastructure? 2. How can governments and private sector collaborate to improve the energy sector's response to cyber threats? 3. What are learnings from other sectors and best practices in coordinating cyber security measures across supply chains and borders? <p>Background reading</p> <p>The road to resilience: Managing cyber risks report</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Michael Bell, President, CEO and Member of the Board of Directors, Silver Spring Networks, USA • Andrew George, Chairman, Energy Practice, Marsh, UK • Dean Oskvig, Vice Chair for North America, World Energy Council; President & CEO, B&V Energy - retired; Black & Veatch Corporation, USA <p>Moderator</p> <ul style="list-style-type: none"> • Sean Cleary, Founder and Executive Vice Chair, Future World Foundation, South Africa 	<p>ENERGY-WATER-FOOD NEXUS (11:45 - 13:00)</p> <p>98% of electricity supply directly depends on access to water. A recent World Energy Council report on resilience highlights that water stress and competition for water resources are increasing and expose energy systems to new vulnerability. Technology choice, coordinated regional water planning, internal water pricing, and innovative insurance models are among the solutions implemented to adapt to a more water constrained future.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. Which regions are most affected by the nexus challenge and what are some of the visible consequences? 2. What are the technologies and innovative solutions that help manage the nexus? 3. What are required policies to support the management of the nexus? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Matar Al Neyadi, Undersecretary of Energy, Government of UAE, UAE • Guillermo Bravo Mancheño, Senior Vice President, Abengoa, Spain • Jason Drew, Chief Executive Officer, AgriProtein, South Africa • Maria Neira, Director Public Health, Environmental and Social Determinants, World Health Organization, Switzerland <p>Moderators:</p> <ul style="list-style-type: none"> • Brian Statham, Chair of the Studies Committee, World Energy Council; Chairman, South African National Energy Association, South Africa 	<p>DEVELOPMENT FINANCE TO BALANCE THE ENERGY TRILEMMA (11:45 - 13:00)</p> <p>In the move towards developing more sustainable infrastructure for Africa, attracting the required capital remains a challenge. The ongoing energy transition is shifting private funds to clean energies, but traditional development banks and public funds are still needed to lead as early market shapers, take some risks and attract private capital. Public funds are often insufficient to address the current investment gap to deliver sustainable energy systems as envisaged by the energy trilemma and more private funds have to be mobilised. Due to the limitations of commercial investors, alternative institutional investors, pension funds and public-private partnerships play a role in unlocking finance for sustainable infrastructure.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What measures can be adopted to de-risk clean infrastructure investments? 2. What are success stories for public private partnerships in clean infrastructure investments? 3. What is the potential role and future contribution of institutional investors in inclusive, green development finance for Africa? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Suleiman Jasir Al-Herbish, Director-General, OFID, Austria • Abir Burgul, Senior Underwriter, Multilateral Investment Guarantee Agency (MIGA), USA • Mansoor Hamayun, Co-Founder and CEO, Bboxx, UK • Mugo Kibati, Group CEO, Pan Africa Insurance; Chairman, M-KOPA Solar & Lake Turkana Wind Power, Kenya • Mansur Muhtar, Vice President, Islamic Development Bank, Nigeria • Mustapha Baba Shehuri, Minister of State for Power, Works and Housing, Government of Nigeria, Nigeria <p>Moderator</p> <ul style="list-style-type: none"> • Joan MacNaughton, Executive Chair, World Energy Trilemma, World Energy Council, UK
<p>DECARBONISING THE FUTURE: THE ROLE OF CCS (11:45 - 13:00)</p> <p>Carbon capture and storage (CCS) technology will need to play a substantial role in mitigating global emissions alongside the scaling up of renewables and the delivery of energy efficiency. There are 22 large scale CCS projects currently in operation or under construction around the world, with the capacity to capture up to 40 million tonnes of CO₂ per year. These projects cover a range of industries, including gas processing, power generation, fertiliser, steel, hydrogen or chemical-production. While optimism about CCS was strong in the early 2000s, deployment has been slower than anticipated. Yet, recent innovation stories such as mineralization in relationship with basalt rock fuel hope for a fresh start.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the main drivers and barriers relevant to boosting CCS capacity in the coming decades? 2. What are key innovation stories? 3. What policies and mechanisms are needed to deliver CCS at the scale? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Christian Friis Bach, Executive Secretary, UNECE, Switzerland • Amit Kumar, Dean (Distance & Short Term Education), The Energy and Resources Institute (TERI), India • John Scott, Global Risk Officer, Zurich Global Corporate, UK • Hildigunnur Thorsteinnsson, Senior Vice President, Reykjavik Energy, Iceland <p>Moderator</p> <ul style="list-style-type: none"> • Hans-Wilhelm Schiffer, Executive Chair, World Energy Resources, World Energy Council, Germany 	<p>RENEWABLE ENERGY SYSTEMS: LEARNING FROM LARGE-SCALE INTEGRATION (11:45 - 13:00)</p> <p>Renewable energy sources, including hydropower, now account for around 30% of the total global installed power generating capacity, and 23% of total global electricity production. Renewables have undoubtedly become big business, reaching a record US\$286 billion investment in new renewables capacity in 2015. However, the increasing share of intermittent renewables still presents a number of challenges. Generally, an energy system that lacks effective market signals to deliver back-up capacity or storage to effectively integrate the increasing share of intermittent renewables and a lack of transmission planning has repeatedly led to regional bottlenecks or to the idling of new renewable capacity.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the key learnings from large-scale integration, and what are success stories to large scale renewables integration? 2. What are market designs that have successfully incentivised back-up and storage capacity? 3. What are the lessons learnt to ensure adequate regional planning and transmission capacities? <p>Background Reading</p> <p>Variable renewable energy sources integration in electricity systems 2016 - How to get it right</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Ziya Altunyalidiz, Committee Chairman for the Industry, Trade and Energy Committee, in the 26. Term, Turkish Grand National Assembly, Turkey • Georges Antoun, Chief Commercial Officer, First Solar, Inc., USA • Claudio Facchin, President & Global Head of Power Grids, ABB Group, Switzerland • Carlo Pignoloni, Head of Europe and North Africa Area, Enel Green Power, Italy • Boris Schucht, CEO, 50Hertz Transmission GmbH, Germany <p>Moderator</p> <ul style="list-style-type: none"> • Matteo Codazzi, Chief Executive Officer, CESI, Italy 	<p>CLIMATE CHANGE NEGOTIATIONS: KEEPING UP THE MOMENTUM (11:45 - 13:00)</p> <p>195 countries came together in December 2015 for the historic Paris Agreement to commit to a universal climate change deal. Ambitious in scope and vision, the Agreement will enter into force in 2020, requiring submitted INDCs (Intended Nationally Determined Contributions) to reduce emissions. The process is to be supported by a re-evaluation of progress every 5 years, and assurance that developing countries most immediately affected by the effects of climate change will be helped with adaptation strategies and aid. Now that Paris is over and implementation has started, how will countries keep up the momentum?</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What do we expect from COP22 in Marrakesh? 2. With Paris, we are only at one third of the 2°C objective – how do we close the ambition gap? 3. What are the imperatives to ensure effective tracking of the INDCs – how do we close the tracking gap? 4. What are the key challenges related to monitoring and tracking climate finance effectively – how do we close the financing gap? 5. What are the challenges faced by developing countries and how will these be addressed collectively? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Yukiya Amano, Director General, IAEA, Austria • Ottmar Edenhofer, Deputy Director & Chief Economist, Potsdam Institute for Climate Impact Research (PIK), Germany • Ricardo Melendez-Ortiz, Chief Executive Officer, International Centre for Trade and Sustainable Development (ICTSD), Switzerland <p>Moderator</p> <ul style="list-style-type: none"> • William D'haeseleer, Chair, Belgium Member Committee, World Energy Council; Director, University of Leuven Energy Institute, Belgium 	<p>TALENT AND CAPACITY BUILDING: SHOWCASING SUCCESS (11:45 - 13:00)</p> <p>Across Africa, skilled entrepreneurs are solving some of the continent's most pressing energy challenges of energy access, climate change and resilience. The mobile revolution has spurred new opportunities for emerging markets and at the same time renewables have become more cost-competitive. However, many challenges remain to be solved and it will take strong pioneers to develop suitable business models and overcome skills, capital, supply chain and infrastructure gaps. This session will showcase some of Africa's entrepreneurial success stories and explore successful policy environments and educational systems.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are examples of success and what lessons can be drawn? 2. How can local skills constraints be overcome? 3. What is the role of public and private partnerships in developing Africa's talent base? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Sanjit 'Bunker' Roy, Founder, Barefoot College, India • Ahmed Badr, Executive Director, Regional Center for Renewable Energy and Energy Efficiency (RCREEE), Egypt • Paul Smith Lomas, Chief Executive, Practical Action, UK • Cristina Morales, Regional Manager Latin America and the Caribbean, World Energy Council, Colombia • Andreas Spiess, Chief Executive Officer, SolarKiosk, Germany <p>Moderator</p> <ul style="list-style-type: none"> • Mervin Azeta, Future Energy Leader, World Energy Council; Completions Engineer, Schlumberger, Nigeria

PANEL SESSIONS	<p>SMART GRIDS UPDATE: ENGAGING WITH THE PROSUMER (11:45 - 13:00)</p> <p>The vision for smart grids is to enable integration and better coordination of intermittent renewables, decentralized storage opportunities and automated demand response and thereby minimize the need for expensive peak capacity. With the development of the internet of things (IoT), the possibilities seem opened yet, the business case for smart grids has not been obvious for utilities. Meanwhile, cyber risks add a further dimension where smart grids may provide solutions and add to the business case.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What is a visionary storytelling of future smart grids with IoT? 2. What are critical uncertainties and challenges? 3. What are the desirable partnership and regulatory models for the future of energy delivery? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Leonhard Birnbaum, Vice Chair for Europe, World Energy Council; Member of the Board of Management, E.ON, Germany • Marc-Andre Forget, Chief Executive Officer, Ossiaco, Canada • Julian Hardy, Chief Executive Officer, Eseye, UK • Georg Kopetz, Member of the Executive Board, TTECH, Austria • Hando Sutter, Chairman of the Management Board, Eesti Energia, Estonia <p>Moderator</p> <ul style="list-style-type: none"> • Jeroen Van Hoof, Chair, Netherlands Member Committee, World Energy Council; Industry Leader, Energy, Utilities & Mining, PriceWaterhouseCoopers (PWC), Netherlands 	<p>HYDROCARBON FRONTIERS: WHAT IS THE NEXT GAME CHANGER? (11:45 - 13:00)</p> <p>Large amounts of new energy supplies will potentially come from non-traditional technologies and regions. Over the past decade enormous developments have taken place with focus on shale oil & gas and tight oil or ultra-deep-water and many more projects are underway. Meanwhile, there are other sources that have massive potential. A World Energy Council survey estimates that at least 4.8 trillion barrels of oil shale is available (based on 40 countries), which is three times as high as the consumed 1.3 trillion barrels of oil so far. Further out methane hydrates may be referred to as the largest unknown in terms of resource potential. Meanwhile, in a low price environment many promising explorations have slowed or halted, including in East-Africa or the Arctic.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the next hydrocarbon frontiers? 2. How much is <i>not</i> going to be used if proven reserves are 2.8 times greater than the carbon budget? Is the next frontier even relevant? 3. Given a context with more active investors, who will drive progress in developing the next game changer in hydrocarbons? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Noureddine Boutarfa, Minister of Energy, Government of Algeria, Algeria • Jorge Camargo, Chair of the Executive Committee, Brazilian Petroleum, Gas and Biofuels Institute, Brazil • Bonang Mohale, Vice Chair for Africa, World Energy Council; Chairman & Country General Manager, Shell Commercial Pty, South Africa • Ibrahim Muhanna, Advisor to the Minister of Energy, Saudi Arabia <p>Moderator</p> <ul style="list-style-type: none"> • Nuri Demirdöven, Managing Director, Energy, Accenture Strategy, USA 	<p>AIMING AT ACHIEVING & SUSTAINING A BALANCED TRIPLE 'A' (11:45 - 13:00)</p> <p>Energy policy has become a critical pillar of economic, industrial and foreign policy in most countries. The World Energy Council awards a meanwhile widely respected triple 'A' ranking to countries that have demonstrated the ability to deliver sustainable energy policies balancing the three dimensions of the Energy Trilemma: energy security, social equity, and environmental impact mitigation. When a country has a predictable and transparent energy policy framework and a long-term approach to energy resource planning, it achieves better results in the World Energy Council's Energy Sustainability Index.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. How can countries balance the need for rapid transition with the requirement to deliver robust triple A conditions? 2. What is the key to the Triple A, and what are the necessary institutional and political framework conditions? 3. What are the biggest challenges for governments to achieve sustainable energy systems? Where are the quick wins? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Aldo Flores Quiroga, Deputy Secretary of Energy for Hydrocarbons, Secretaría de Energía, Mexico • Christine Kung-wai Loh, Undersecretary for Environment, Hong Kong SAR • Ando Leppiman, Deputy Secretary General, Government of Estonia, Estonia <p>Moderator</p> <ul style="list-style-type: none"> • Philip Lowe, Vice Chair, World Energy Trilemma, World Energy Council, UK
	<p>TOMORROW'S NUCLEAR & TODAY'S REALITIES (11:45 - 13:00)</p> <p>The development of nuclear power today is concentrated in a relatively small group of countries. China, India, Korea and Russia account for 40 of the 65 reactors under construction at the end of 2015. The Fukushima accident and growing public opposition in some regions, the increasing cost of nuclear as a result of a toughening security standards, the difficult economic situation of many incumbents of the nuclear industry, and the decreasing costs of natural gas and renewables has split countries in these where governments put nuclear power firmly on the agenda and these where nuclear is seen as too difficult an option. Meanwhile, technological development continues in areas such as Fast Neutron Reactors (generation IV reactors), High Temperature Reactors and Small Modular Reactors and R&D efforts maintain the ultimate vision of fusion power.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the risks and challenges associated with nuclear operation and development? 2. What are the key drivers defining the future of nuclear power? Will future drivers for nuclear differ from past drivers? 3. What are the future nuclear technology trends? Will small nukes realize their promise to lower entry barriers and bring down costs through "commoditisation"? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Jeff Benjamin, Senior Vice President, New Plants & Major Projects, Westinghouse Electric Company, USA • Kirill Komarov, First Deputy CEO for Corporate Development and International Business, Rosatom, Russia • William D. Magwood, Director-General, Nuclear Energy Agency (NEA), France • Naohiro Masuda, Chief Decommissioning Officer, TEPCO, Japan • Qin Sun, Chairman, China National Nuclear Corporation, China • Agneta Rising, Director General, World Nuclear Association, UK • Lauri Virkkunen, President & CEO, Pohjolan Voima Oy; Chair, Finland Member Committee, World Energy Council, Finland • Wang Binghua, Chairman, State Power Investment Corporation, China <p>Moderator</p> <ul style="list-style-type: none"> • Gareth Wynn, Senior Managing Director, FTI Consulting, UK 	<p>FINANCING THE GRAND ENERGY TRANSITION (11:45 - 13:00)</p> <p>Governments across the world are setting ambitions and shaping strategies to respond to climate change and decarbonise their economies. The energy industry needs to invest about half the world's current GDP spread over the next 20 years, in order to maintain and transform existing systems as well as to meet growing energy demand and climate objectives. Traditional investors will struggle to meet the investment requirements and it will require unprecedented collaboration between public and private sector actors to strike a new balance between market and regulation and deliver the capital required.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What keeps investors of long-term infrastructure projects most awake at night? 2. Are necessary incentives in place to deliver investments in tomorrow's clean, secure and affordable energy infrastructure? 3. What must be the next deliverable of the global climate negotiations to ensure keeping the world below 2°C warming? 4. What are examples and best practices to manage investment uncertainty and political risk? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Mohammed Saeed Al Tayer, Managing Director & CEO, Dubai Electricity and Water Authority (DEWA), UAE • Tayfun Bayazit, Chairman, Marsh & McLennan Companies, Turkey • Hakima El Haité, Minister of Environment, Kingdom of Morocco, Morocco • Christopher Knowles, Head of Climate Finance, European Investment Bank (EIB), Luxembourg • Yongping Zhai, Technical Advisor (Energy), Asian Development Bank (ADB), Philippines <p>Moderator</p> <ul style="list-style-type: none"> • Joan MacNaughton, Executive Chair, World Energy Trilemma, World Energy Council, UK 	<p>TO INVEST OR TO DIVEST: TODAY'S FRONTIERS OF PUBLIC FINANCING (11:45 - 13:00)</p> <p>Over a trillion dollars in investment needs per year in energy is increasingly under pressure to deliver on carbon neutral solutions. Commitments from 197 countries at COP21 to a low carbon future have added further pressure on the agenda. In response, an increasing number of development banks, sovereign wealth funds and institutional investors have started black-listing high-CO₂ solutions in their investment portfolio and pressured fossil fuel companies to disclose carbon management and risk mitigation strategies.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. Is the future of funding for coal and other carbon-based resources in danger and is there a risk of "stranded resources"? 2. What are the risks to moving funds away from carbon based energy resources? 3. What are the most attractive investment alternatives? 4. What are the governments' responsibilities toward carbon-based industries and people employed by those industries during the transition period? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Andi Aranitasi, Head of Power and Energy, ERBD, Turkey • Tom Delay, Chief Executive, Carbon Trust, UK • Linden Edgell, Global Sustainability Program Director, ERM, UK • Leslie Maasdorp, Vice President and Chief Financial Officer, New Development Bank, China <p>Moderator</p> <ul style="list-style-type: none"> • Jeroen Van der Veer, Chairman, Supervisory Board, ING Group; Executive Chair, Financing Resilient Energy Infrastructure, World Energy Council, Netherlands
	<p>ASIA REGIONAL CROSSROADS: RESILIENCE AND REGIONAL INTEGRATION (11:45 - 13:00)</p> <p>Between 2040 and 2050, Asia will surpass North America and Europe combined in terms of global electricity generation. Regional integration in Asia has a huge potential as such integration can link clean energy resources centers to high-density demand centers or establish natural gas hubs that empower Asian consumers through more transparent price discovery. Southeast Asia is the most active and dynamic sub-region in Asia in terms of regional integration, but East Asia is still in its early stage. Regional energy integration in Asia can play a key role to secure reliable, affordable and sustainable energy. Furthermore, regional integration could ensure increased energy system resilience as the Asia region is very vulnerable to energy-water-food nexus and extreme weather events.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are key objectives that can be achieved by regional integration projects in Asia? 2. Which are priority regional integration projects that best support these objectives? 3. What are the key barriers to regional integration? 	<p>REGIONAL CROSSROADS: THE MIDDLE EAST POWER TRANSFORMATION (11:45 - 13:00)</p> <p>The Middle East power sector is in a state of flux. Most of the region's electricity and water desalination systems were designed on the principle of plentiful supplies of cheap oil and gas. With rapid growth of domestic consumption export opportunities are compromised and lack of diversification is seen as a draw-back. To address this new reality most countries in the Middle East now embrace renewable or nuclear energy alternatives, promote energy efficiency and embark on reducing subsidies. The GCC Interconnection Authority has developed regional integration projects as part of a vision where increased cross-border trade in electricity will provide enhanced system stability, greater energy security and economic prosperity for participating countries.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. The GCC grid is now fully interconnected: what are the missing steps towards a fully effective regional power pool? Is there potential for power trade beyond the GCC? 2. Are gas-rich rich countries in the region likely to see power exports as a way of creating a new market for their gas? 3. Will LNG imports form the backbone for the region's power sector? 	<p>REGIONAL CROSSROADS: LATIN AMERICA AND THE CARIBBEAN ENERGY IN TRANSITION (11:45 - 13:00)</p> <p>Latin America has abundant resources ranging from hydro, biofuels and other renewables, and unconventional oil & gas. Commodity price volatility and the strongest El Niño in history have just shown how fragile economies are against phenomena that affect their energy systems. The policy focus now shifts to the diversification of the energy mix, low carbon solutions and system resilience. Regional integration is a critical enabler and in a number of countries there is a renaissance regional integration agenda.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the main challenges to the energy sector across Latin America and the Caribbean? 2. What must be policy priorities to most effectively address these challenges and which of these require regional collaboration? 3. How are energy efficiency & renewable energy developments advancing in the region? 4. What are the regional integration priorities that will help enhance prosperity for the entire region? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Esteban Albornoz Vintimilla, Minister of Electricity and Renewable Energy, Ecuador

<p>4. How could the regional integration promote more resilient energy system Asia?</p> <p>Background Reading The series of Financing Resilient Energy Infrastructure reports and video</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Areepong Bhoocha-Oom, Permanent Secretary, Government of Thailand • Kazutomo Irie, General Manager, Asia Pacific Energy Research Center (APEREC), Japan • Christine Kung-wai Loh, Undersecretary for Environment, Hong Kong SAR • Yongping Zhai, Technical Advisor (Energy), Asian Development Bank (ADB), Philippines <p>Moderator</p> <ul style="list-style-type: none"> • Shigeru Muraki, Executive Adviser, Tokyo Gas Company Ltd., Japan 	<p>4. Is the linkage between electricity generation and water desalination preventing the development of alternative energy sources?</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Bader Al Lamki, Director, Masdar, Clean Energy, UAE • Saleh Alawaji, Deputy Minister for Electricity, Saudi Arabia • Ahmed Ali Al-Ebrahim, Chief Executive Officer, GGC Interconnection Authority, Saudi Arabia • Ibrahim Saif, Minister of Energy and Mineral Resources, Jordan <p>Moderator</p> <ul style="list-style-type: none"> • Adnan Shihab-Eldin, Director General, Kuwait Foundation for the Advancement of Sciences (KFAS), Kuwait 	<ul style="list-style-type: none"> • Laura Bull, Head of Studies, Regional Manager, Latin America, International Centre for Hydropower, Norway • Laura Estrella, Expert and Adviser on Renewable Energies at the National Directorate of Energy, Government of Uruguay, Uruguay • Marcelo Tokman Ramos, Chief Executive Officer, ENAP, Chile <p>Moderator</p> <ul style="list-style-type: none"> • Claudia Cronenbold, Chair, Bolivia Member Committee, World Energy Council; President, Bolivian Chamber of Hydrocarbons and Energy (CBHE), Bolivia 	
<p>ENERGY STORAGE AND THE FUTURE OF TRANSPORT (11:45 - 13:00)</p> <p>Energy storage solutions are seen as critical innovation area at the heart of the energy transition as they enable deeper renewables integration, roll out of off-grid solutions and enable e-mobility. Transport is one of the world's highest growing sectors, with the number of light-duty vehicle fleets expected to grow 2.5 to 2.7 times over next 45 years. Currently transport is mostly fuelled by oil, but the fuel frontier is shifting to electric and hybrid vehicles and other innovations such as self-driving vehicles which further affect the behavioural and efficiency aspects around transport.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. Are innovation progress and learning curves of the energy storage in line with expectations? 2. Is there need for a further coordination and collaboration to push innovation through initiatives such as mission innovation or the breakthrough coalition? 3. Can we expect a similar success trajectory for electric cars as we have seen for solar PV cells? 4. What are the most successful policy examples for urban clean transport? <p>Background Reading E-mobility: Closing the emissions gap</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Christina Bu, Secretary General, Norwegian EV Association, Norway • Paul Gardner, Global Segment Lead, Energy Storage, DNV GL, UK • Dolf Gielen, Director, IRENA Innovation and Technology Centre, Germany • Peter Littlewood, Director, Professor, Argonne National Laboratory, USA • Marie-Jose Nadeau, Chair, World Energy Council, Canada • Francois Vuille, Chairman, Softcar; Director Development, Energy Center, EPFL, Switzerland • Alexander Wokaun, Department Head Energy and Environment, Paul Scherrer Institute (PSI), Switzerland • Steven Young, Regional President of Turkey and the Middle East, Bosch, Turkey <p>Moderator</p> <ul style="list-style-type: none"> • Alan Thomson, Director, Global Leader Energy Systems, ARUP, UK 	<p>THE ROAD TO RESILIENCE: MANAGING AND MITIGATING EXTREME WEATHER RISKS (11:45 - 13:00)</p> <p>The energy industry is going through extraordinary change and has to become resilient against a number of new and growing risks: The World Energy Council considers the following three resilience areas as priority: 1) the increasing competition for water and a tightening energy, water and food nexus, 2) the increasing frequency of and exposure to extreme weather events, and 3) the increasing digitization and interconnection with exposure to cyber risks. This session will explore infrastructure solutions, financing and policy solutions that are needed to prepare for the 'new normal' and ensure increased energy system resilience.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the most significant new risks faced by the energy industry? 2. How are these new risks impacting on the design, operation of, and investment in, the energy system? 3. How can new long-lived energy investments best be de-risked and thus attract necessary capital? <p>Background Reading The road to resilience - managing and financing extreme weather risk</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Claudia Cronenbold, Chair, Bolivia Member Committee, World Energy Council; President, Bolivian Chamber of Hydrocarbons and Energy (CBHE), Bolivia • José da Costa Carvalho Neto, Former President and CEO, Eletrobras, Brazil • Juerg Trueb, Managing Director, Head Environmental and Commodity Markets, Swiss Re Corporate Solutions, Switzerland <p>Moderator</p> <ul style="list-style-type: none"> • Eric Noel, Vice President, North America, Oxford Analytica, USA 	<p>GLOBAL ENERGY GOVERNANCE FRONTIER: THE CHALLENGE TO DELIVER ON CRITICAL OBJECTIVES (11:45 - 13:00)</p> <p>The main elements of the present international energy governance framework have their roots in the international institutional framework established after World War II and modified with the advent of OPEC in the early 1960s and the IEA in the early 1970s. However, influence shifts in supply and demand centers, in technology and policy priorities, and in related geopolitics have challenged the status quo and have led to an unprecedented fragmentation with a multitude of multilateral energy governance platforms and processes. Key objectives that require internationally coordinated efforts include:</p> <ul style="list-style-type: none"> • The efficient resource sharing through regional integration of infrastructure; • Universal access through promotion of adequate policies, skills development, innovative business models and financing schemes; • Mitigation of CO₂ emissions through an international climate framework agreement and burden sharing; • Sun-setting of distorting fossil fuel subsidies that discourage energy efficiency; • Sharing of green technologies and solutions through elimination of tariff and non-tariff barriers; • Revision and regional alignment of outdated market design in electricity and natural gas; • A coordinated RD&D in system critical components with a focus on electric storage and carbon capture / utilisation and storage (CCUS). <p>Questions</p> <ol style="list-style-type: none"> 1. What are the fundamental energy related common prosperity priorities that can only be achieved through international cooperation? 2. With these objectives in mind, what are the challenges of the existing institutions' reform? Will they be successful or are new approaches needed? 3. What are the potential roles for countries such as China or India? 4. How does the private sector fit into the institutional reform process, and what does an effective government and private sector partnership look like? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Sean Cleary, Founder, Future World Foundation, South Africa • Han Wenke, Director General, Energy Research Institute (ERI) – NDRC, China • Prince Michael of Liechtenstein, Founder and Chairman, Geopolitical Intelligence Services AG, Liechtenstein • Richard L. Morningstar, Founding Director and Chairman, Global Energy Center, Atlantic Council, USA <p>Moderator</p> <ul style="list-style-type: none"> • Gerald Davis, Executive Chair, World Energy Scenarios, World Energy Council; President & CEO, Forescene S.A., UK 	
LUNCH BREAK			
<p>PRESIDENTIAL SPECIAL ADDRESSES (13:30 - 15:30)</p> <p>Special addresses from the Presidents of Turkey, Russia, Venezuela and Azerbaijan</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Younghoon David Kim, Co-Chair, World Energy Council; Chairman & CEO, Daesung Group, South Korea • Hasan Murat Mercan, Chair, World Energy Congress 2016 Organising Committee, Turkey • Berat Albayrak, Minister of Energy and Natural Resources, Government of Turkey, Turkey • Binali Yıldırım, Prime Minister, Government of Turkey, Turkey • Nicolás Maduro, President, Government of Venezuela, Venezuela • Ilham Aliyev, President, Government of Azerbaijan, Azerbaijan • Vladimir Putin, President, Government of Russia, Russia • Recep Tayyip Erdoğan, President, Government of Turkey, Turkey 	<p>ENERGY EFFICIENCY: ACCELERATING PROGRESS (14:15 - 15:30)</p> <p>According to the World Energy Council's Issues Monitor, energy efficiency is among the top action priorities for energy leaders globally. The G20, the clean energy ministerial, or the UN sustainable development goal nr. 7, all point to the critical contribution of energy efficiency for achieving a low carbon economy. Yet, real progress is far behind the objective of 2.6% annual energy intensity improvement. It will require substantial additional efforts to further develop and deploy energy efficient technologies, urban design solutions and matching individual behaviours. Main barriers to overcome include fossil fuel subsidies, lack of international standards e.g. in shipping or aviation, and difficulties in aligning diverging owner, user and regulatory interests.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are key success stories in energy efficiency and lessons learned? 2. Has the Paris Agreement added momentum for increasing energy efficiency? 3. What efforts are needed in the developing world to achieve greater energy efficiency? Are the solutions different to those needed in the developed world? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Didier Bosseboeuf, Coordinator of International Studies, ADEME, France • Thorsten Herdan, Director General, Federal Ministry of Economic Affairs and Energy, Germany • Brian Motherway, Head of Energy Efficiency, IEA, France • Bonhtha Prasada Rao, Chief Executive Officer, BHEL, India • Levent Taşkın, President of Turkey, Middle East and Africa Region, Danfoss A/S, Turkey <p>Moderator</p> <ul style="list-style-type: none"> • Pierre El Khoury, General Director & President of the Board, Lebanese Center for Energy Conservation, Lebanon 	<p>EUROPEAN ELECTRICITY MARKET HARMONISATION AND THE ROLE OF MARKET DESIGNS (14:15 - 15:30)</p> <p>Today electricity generated from renewables is one of the most important sources of power, supporting the grand transition towards a low carbon economy. However, its zero marginal cost, the vanishing entry barriers for new players, the increasing decentralisation and digitalisation are challenging and transforming the electricity market at an unprecedented speed. New solutions and services ranging from automated demand response over grid storage solutions or power to gas to internet of things challenge the classic market frameworks and utility business models. The electricity market requires a reboot to adapt to this new reality.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the key ingredients for a successful electricity market 2.0? 2. With increasing interconnection and co-dependency of critical infrastructure, what linked markets are affected? 3. Should national or regional institutions lead the re-design process? 4. What are key solutions for no deregulated monopolistic market structures to cope with challenges arising from the rapid transition? <p>Discussion Leaders:</p> <ul style="list-style-type: none"> • Patrick Graichen, Executive Director, Agora Energiewende, Germany • Dalius Misiūnas, Chairman of the Board and Chief Executive Officer, Lietuvos Energija, Lithuania • Fintan Sliye, Chief Executive, EirGrid, Ireland (Republic of) <p>Moderator:</p> <ul style="list-style-type: none"> • Norbert Schwieters, Global Energy, Utilities and Mining Leader, PwC, Germany 	<p>DRIVING THE VISION FOR REGIONAL INTEGRATION (11:45 - 13:00)</p> <p>Africa is blessed with a vast and diverse wealth of energy resources, from deep oil and gas reserves to great potential for renewable energy sources, including solar and large hydropower projects. However, the region's energy wealth is unevenly distributed and the lack of regional integration has led to enormous untapped potential. Similarly, opportunities for the storage of oil, gas and electricity are unevenly split. Many energy challenges have their most effective solutions in collaboration that goes beyond the borders of individual countries. This makes international collaboration and regional integration in terms of infrastructure and markets critical as it will lead to Trilemma benefits and increased competitiveness for the entire region.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the priority energy infrastructure and institutional projects across Africa with regards to regional integration? 2. What are the key benefits of these projects for the region and how can these be illustrated with success stories? 3. What are key barriers and enabling conditions for these projects and how can the region's governments and key stakeholders work together to enhance the Trilemma ranking for the entire region? 4. How can we as a group best use World Energy Council's platform to support the ongoing regional integration efforts? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Morlaye Bangoura, Commissioner, Energy and Mines, ECOWAS, Nigeria • Elham Mahmood Ahmed Ibrahim, Commissioner, Energy and Infrastructure, African Union, Ethiopia • Reuel Khoza, Chairman, Globeleq, South Africa • Taylor Ruggles, Regional Energy Counselor for Africa, Department of State, USA

			<ul style="list-style-type: none"> • Mutaz Musa Abdullah Salim, Minister of Electricity and Water Resources, Government of Sudan, Sudan • Samuel Undenge, Minister of Energy and Power Development, Government of Zimbabwe, Zimbabwe <p>Moderator</p> <ul style="list-style-type: none"> • Shamal Sivasanker, Leader, Infrastructure & Power Africa, Deloitte, South Africa
	<p>THE ROLE OF MULTIPURPOSE HYDROPOWER IN A WATER-STRESSED WORLD (14:15 - 15:30)</p> <p>Hydropower provides over 16% of global electricity production and the sector has the potential to double its capacity to 2,000GW by 2050. Emerging markets are increasingly recognising the benefits that multipurpose hydropower can bring in a water-stressed world; in addition to delivering clean low-cost electricity and enhancing energy security, hydropower can provide water services, encourage regional cooperation and be a pillar of economic development. However, increasing competition for water usage, a higher frequency of droughts and flooding over the past decades, as well as the potential effects of new developments on local environments and communities are challenges that have to be carefully managed.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. How can the sector best manage the increasing competition for water? 2. What are good examples on how the sector can manage more regular droughts and extreme weather events? 3. Is regional integration a critical condition to further support the development of hydropower projects? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Albert Cordeiro Geber de Melo, Director General, Electrical Energy Research Center (Cepel), Brazil • Simone Rossi, Group Senior Vice President, International Division, Electricité de France (EDF), France • Richard M. Taylor, Chief Executive Officer, International Hydropower Association, UK • Ernst Zeller, Regional Director EMEA, Global Head Marketing and Sales, Hydropower and Renewable Energy, Pöyry PLC, Austria <p>Moderator</p> <ul style="list-style-type: none"> • William D'haeseleer, Chair, Belgium Member Committee, World Energy Council; Director, University of Leuven Energy Institute, Belgium 	<p>THE IMPERATIVE OF TRADE: ACCELERATING THE INNOVATION TRANSFER (14:15 - 15:30)</p> <p>About three quarters of the estimated productivity potential comes from catching up, only one quarter from pushing the frontier. Trilemma objectives including mitigation of greenhouse gases and lowering pollution through good technologies, enhancing energy security through smart technology solutions or delivering innovative energy solutions to rural households depend on effective technology sharing and reduction of tariff and non-tariff trade barriers. International trade agreements, such as the APEC agreement (Asia-Pacific Economic Cooperation), serve as leading examples in a period marked by international disputes over energy subsidies and other protectionist measures. Other regional economic and trade platforms, such as ECOWAS (Economic Community of West African States), have the ambition to achieve the same. As environmental goods represent a trade market of approximately US\$1 Trillion annually, a recent World Energy Council study shows that reducing barriers to trade and investment can be a powerful economic force, supporting cost effectiveness and efficient decarbonisation of the energy sector and helping countries to successfully address their energy trilemma.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. How can countries tackle tariffs and nontariff measures (NTMs) to accelerate the transfer of low-carbon technologies across borders? 2. How can the APEC agreement be replicated on a regional or global level? 3. Are local content requirements aligned with a Trilemma agenda that depends on effective deployment of best technologies? <p>Background Reading</p> <p>Latest World Energy Perspective report on the rules of trade and investment 2016</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Morlaye Bangoura, Commissioner, Energy and Mines, ECOWAS, Nigeria • Guillermo Bravo Mancheño, Senior Vice President, Abengoa, Spain • Ricardo Melendez-Ortiz, Chief Executive Officer, International Centre for Trade and Sustainable Development (ICTSD), Switzerland • David Shark, Deputy Director-General, World Trade Organisation, Switzerland <p>Moderator</p> <ul style="list-style-type: none"> • Timothy Richards, Executive Chair, Rules of Trade, World Energy Council, USA 	
	<p>THE ROLE OF GAS IN THE LOW CARBON TRANSITION (14:15 - 15:30)</p> <p>Gas could play an important role as a 'bridging fuel' to a low-carbon economy. Substitution of coal fired by gas fired power plants supports climate change mitigation efforts by reducing emission by half. Natural gas has also been envisioned as a perfect complement facilitating the increase of intermittent renewable energy sources as it can provide necessary back-up, transport and storage capacities, at least in areas with an existing well-developed gas infrastructure. Natural gas also has grown as a fuel for transport particularly in North America as a result of cheap unconventional. Finally, power-to-gas may even be a way to enable "green gas" in the future. However, the role of gas not only changes but greatly varies across the world and the future maintenance and refinancing of existing infrastructure or even build up is facing substantial uncertainties.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. Is natural gas holding its promise as a 'bridging fuel' to a low-carbon economy? 2. Do existing market frameworks enable the shifting role of natural gas and its contribution to low-carbon economy? 3. Are the developments in gas fuelled transport and power-to-gas sign-posts towards a hydrogen economy? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • René Bautz, Chief Executive Officer, Gaznat; Chairman, Global Gas Centre, Switzerland • Marc Benayoun, Chief Executive Officer, Edison SpA, Italy • Claudia Cronenbold, President, Bolivian Chamber of Hydrocarbons and Energy; Chair, Bolivia Member Committee, World Energy Council, Bolivia • Bob Dastmalchi, Business Development Director, Chevron Corporation, United States of America • Bjorn Hamso, Senior Manager, Global Gas Flaring Reduction Partnership, World Bank, USA • Maros Šefcovič, Vice-President for Energy Union, European Commission, Belgium • Chandima Weerakkody, Minister of Petroleum Resources Development, Government of Sri Lanka, Sri Lanka <p>Moderator</p> <ul style="list-style-type: none"> • Jean-Marie Dauger, Chair, Communications & Strategy Committee, World Energy Council, France 	<p>ENABLING THE ENERGY TRANSITION: BENCHMARKING 125 COUNTRIES (14:15 - 15:30)</p> <p>The World Energy Council's Energy Trilemma Index comparatively ranks 125 countries in terms of the likelihood that they can provide a secure, affordable and environmentally sustainable energy system. The Council refers to the challenge of balancing the trade-offs between the three goals as the Energy Trilemma. Index results show that policy choices and a regime to support a robust energy sector are critical to lasting energy trilemma performance, regardless of a country's resources or geographic location and that policies and investments needed to balance the trilemma will take time and be disruptive.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the key factors to balancing the energy trilemma? 2. Do priorities shift between the developed and developing world? 3. Why is benchmarking a useful exercise, and how can the learnings be applied in other countries? 4. How can the public and private sector work together on research, innovations, and development to drive progress on the energy trilemma? 5. In a context of increasing urbanisation with empowered cities, will tomorrow's cities need a Trilemma benchmarking? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Matthias Finger, Director, Institute of Technology and Public Policy (ITPP), EPFL, Switzerland • Steven Griffiths, Executive Director, Masdar Institute, UAE • Kang Yanbing, Director, Energy Sustainability Centre, Energy Research Institute (ERI), NDRC China • Amit Kumar, Dean (Distance & Short Term Education), TERI, India <p>Moderator</p> <ul style="list-style-type: none"> • Philip Lowe, Vice Chair, World Energy Trilemma, World Energy Council, Belgium 	

	<p>ENERGY SECTOR REFORM: CHALLENGES AND OPPORTUNITIES (14:15 - 15:30)</p> <p>Access to reliable and clean energy is a pillar of prosperity and development for every economy. In the history of energy sector development and reform the pendulum has swung between more public and more private ownership and there are graveyards of unsuccessful partial sector reforms. Shifting political realities and policy objectives, evolving resources contexts and technology opportunities as well as shifting perception about the benefits and risks of foreign capital in the sector, have given rise to sector reforms in many countries with the objective to ensure its best contribution to national prosperity. Recent sector reforms such as in Mexico, Chile, South Africa or UAE have by tendency opened the energy sector to more foreign investment, providing opportunities for international companies to participate in the development of a nation's oil & gas, power and renewable energy resources, reduced subsidies while aiming at overcoming underinvestment and increasing efficiency incentives. However, reform generally requires substantial political investment to create the conditions necessary to attract investors.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are key objectives and evaluation criteria that must be considered to ensure the reform will be effective? 2. What are successful examples of energy sector reform, and what can we learn from these? 3. Where is the pendulum today with regards to public versus private ownership of energy assets and foreign capital? <p>Discussion Leaders:</p> <ul style="list-style-type: none"> • Mehmet Bostan, President, Privatization Administration of the Republic of Turkey, Turkey • Mehmet Göçmen, President, Sabanci Holding Energy Group, Turkey • Francisco Salazar, Chair, Mexico Member Committee, World Energy Council, Mexico • Aleksandras Spruogis, Vice-Minister of Energy, Government of Lithuania, Lithuania <p>Moderator:</p> <ul style="list-style-type: none"> • David Hobbs, Head of Research, King Abdullah Petroleum Studies and Research Center (KAPSARC), Saudi Arabia 	<p>NEXT GENERATION BIOFUELS: RESCALING AMBITION (14:15 - 15:30)</p> <p>Biofuels have gone through an intense decade with controversy around food in the tank and good versus bad biofuels, excitement around 2nd generation technology, stop & go subsidies, and mandatory fuel mix contributions in the Americas, Europe and parts of Asia. The sector has learnt to cope with different realities around the world. Liquid biofuels for transport have become part of fuel security strategies, climate change mitigation efforts and rural development support schemes. Conventional biofuels (also referred to as first generation biofuels, usually including ethanol from corn, sugarcane etc. and biodiesel from canola, jatropha etc.) have reached a global production volume of more than 100 billion litres annually. To complement the conventional biofuels, recent advances are focused on the next generation of biofuels. Advanced biofuels, generally referred to as second or third generation biofuels are produced from a broad spectrum of predominantly non-edible biomass feedstock.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are latest updates and success stories on 2nd generation biofuels? 2. Where are biofuels thriving most successfully and what are the enabling factors? 3. What is the biofuels outlook in an increasingly carbon constrained and water stressed world? 4. What are showcases of sustainable biofuel? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Zurina Amnan, Group CEO, Bionas, Malaysia • Remigijus Lapinskas, President, World Bioenergy Association, Sweden • Abubakar Sambo, Technical Advisor to the President, Government of Nigeria, Nigeria <p>Moderator</p> <ul style="list-style-type: none"> • Karl Rose, Senior Director, Scenarios and Policies, World Energy Council, Austria 	
	<p>TECHNOLOGY INNOVATION FRONTIERS (14:15 - 15:30)</p> <p>Annual global investment in renewables, mainly wind and solar PV, has overtaken investment in conventional generation capacity. Global wind power generation reached 432 GW in 2015, representing around 7% of installed power generation capacity worldwide. Global installed capacity for solar has seen an exponential growth, with a 50% annual increase on average since 2007 and reaching around 227 GW by the end of 2015. E-storage is also characterised by rapid change, driven by cost reduction as well as increased and shifting needs. However, according to the World Energy Council's Scenarios, the world is not on track to meet the 2°C target nor are we on track to close the gaps on energy access and wider sustainability issues. Important additional mitigation, adaptation and resilience efforts are therefore required to deliver a truly sustainable energy system and technology innovation is a critical part of the solution.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. What are the most dynamic and promising technology innovation frontiers? 2. What are priority areas for innovation focus and which of these are moving below expectations? Why? 3. Does the world need more innovation partnerships and what are the most promising / successful examples? 4. Considering the available time-frames, how can innovative technology be deployed rapidly and at large scale? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Jason Drew, CEO, AgriProtein, South Africa • Thomas Klinger, Director, Max-Planck-Institute for Plasmaphysik, Germany • Georg Kopetz, Board Member, TTTech Computertechnik AG, Austria • Anis Mohamed, Head of Energy (Oil & Gas) & Services for Europe, Infosys, UK • Hans-Wilhelm Schiffer, Executive Chair, World Energy Resources, World Energy Council, Germany <p>Moderator</p> <ul style="list-style-type: none"> • Karel Beckman, Editor in Chief, Energy Post, Belgium 		
	<p>REGIONAL CROSSROADS CENTRAL ASIA: BRINGING CASPIAN BASIN GAS TO WORLD MARKETS (14:15 - 15:30)</p> <p>The Caspian basin has attracted much international attention due to its riches in natural gas. The Southern Gas Corridor, the ambitious undertaking to connect the South Caucasus Pipeline (SCP), the Trans Anatolian Pipeline (TANAP) and the Trans Adriatic Pipeline (TAP), will transport gas over a 3,500 kilometre journey from the Caspian Sea into Europe. This project is one of the most complex gas value chains ever developed as it involves cooperation among multiple key players, including seven governments and 11 companies, and requires massive investment to enhance existing and develop new critical infrastructure. Upon completion, the Southern Gas Corridor could change the energy map of an entire region.</p> <p>Questions</p> <ol style="list-style-type: none"> 1. Is the project on track to deliver gas to Europe as of 2018? 2. What are the key regional benefits beyond profits of the South Corridor project for Central Asia? 3. How important is the supply potential for Europe? 4. What are early lessons from this project and how can the region's governments and key stakeholders work together to further enhance regional integration? <p>Discussion Leaders</p> <ul style="list-style-type: none"> • Saltuk Düzyol, Chief Executive Officer, TANAP, Turkey • Erdal Tanas Karagöl, Energy Researcher, SETA (Foundation for Political, Economic and Social Research), Turkey • Sohbet Karbuz, Director of its Hydrocarbons Division, Mediterranean Observatory for Energy (OME), France 		

	<ul style="list-style-type: none"> Omer Kocaman, Deputy Secretary General, Turkic Council, Turkey David Oniani, Senior Advisor, Strategic Planning & Funding, JSC Georgian Oil and Gas Corporation, Georgia Zhecho Stankov, Deputy Minister of Energy, Government of Bulgaria, Bulgaria <p>Moderator</p> <ul style="list-style-type: none"> Tatiana Mitrova, Research Scholar, Center on Global Energy Policy, Columbia University, Russia 			
	<p>URBAN INNOVATION: EMPOWERING TRANSFORMATION (14:15 - 15:30)</p> <p>Over 50% of the global population lives in an urban environment and the UN estimates that this will increase to 66% by 2050. Cities account for over half of global energy consumption and forty percent of greenhouse gas emissions with the largest shares going to road transport, building electricity and heating. Reducing the impact of urbanisation through increasing urban energy efficiency and switching to clean, low carbon resources is critical for cities to continue to thrive as engines of economic growth and prosperity. With high concentrations of people and intense energy, water, food, traffic and waste cycles, cities are also leading the charge in mitigating, adapting to, and creating resiliency against the effects of climate change. There are lessons to be learned and shared for the benefit not only of other cities, but for national governments as well.</p> <p>Questions</p> <ol style="list-style-type: none"> What are main challenges faced by cities and how have these changed over the past decades? What have been the most important innovation areas in confronting these challenges and what can we learn from success and failure stories? Are cities leading the policy revolution regarding climate change and the future of energy? What are the empowerment gaps for city governments to be able to drive change and solve key challenges ahead? <p>Discussion Leaders</p> <ul style="list-style-type: none"> Zurina Amnan, CEO, Bionas, Malaysia Yousef Ahmed Baselaib, Executive Director, Sustainable Real Estate, Masdar, UAE Ian Gardner, Director, Global Energy Leader & UK-MEA Board, ARUP, United Kingdom Samir Ibrahim, CEO, Sunculture, Kenya <p>Moderator</p> <ul style="list-style-type: none"> Karl Rose, Senior Director, Scenarios and Policies, World Energy Council, Austria 			
	NETWORKING BREAK			
CLOSING	<p>KEYNOTE SPEECHES (15:45 - 16:15)</p> <p>Keynote speech from Alexander Medvedev, Deputy Chairman of the Management Committee of Gazprom Keynote speech from Guler Sabanci, Chairman, Sabanci Holding</p> <p>Discussion Leaders:</p> <ul style="list-style-type: none"> Güler Sabanci, Chairman, Sabanci Holding, Turkey Alexander Medvedev, Deputy Chairman of the Management Committee, Gazprom, Russia <p>Moderator:</p> <ul style="list-style-type: none"> John Deferios, Anchor & Global Emerging Markets Editor, CNN, UAE 	<p>THE COMMODITY PRICE STORM: SIGNAL OF A NEW NORMAL? (16:00 - 17:45)</p> <p>The uncertainty and volatility of crude oil and natural gas prices over the past two years has been at unprecedented levels. The overcapacity as a result of slower growth in China and the rest of the world, the strong supply picture with unconventional and additional supply including from Iran, the longer than expected sustained production of unconventional in a low-price environment, and the arbitration effects between oil & natural gas in North America have been key factors defining uncertainty. Last but not least, the outcomes of the Paris climate negotiations point at the possibility of "leaving carbon in the ground" as a response to a limited carbon budget from a climate perspective, which would have significant impact on procuring countries production strategies.</p> <p>Questions</p> <ol style="list-style-type: none"> At what price will US shale/tight oil production resume with full force? What is the response in IOC/NOC capex to the changing and volatile context? What internal CO₂ price scenarios do producers use to make investment decisions with a 10/20 years' time horizon? <p>Background Reading World Energy Issues Monitor 2016</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> Mohammad Barkindo, Secretary General, OPEC, Austria Eulogio Del Pino, Minister of Petroleum, Government of Venezuela, Venezuela Leonid Fedun, Vice President, Lukoil, Russia Alexander Novak, Minister of Energy, Government of Russian Federation, Russia Patrick Pouyanné, Chief Executive Officer, Total, France Lorenzo Simonelli, President & CEO, GE Oil & Gas, UK Maarten Wetselaar, Integrated Gas and New Energies Director, Royal Dutch Shell plc, Netherlands <p>Moderator</p> <ul style="list-style-type: none"> Steve Sedgwick, Anchor, CNBC, UK 	<p>MINISTERIAL DIALOGUE: TRANSITION A COUNTRY IN A DECADE (16:00 - 17:15)</p> <p>Achieving a smooth and quick transition to sustainable, affordable, and low-carbon energy is a crucial objective for the developing and developed countries alike as a foundation for future prosperity and competitiveness. A successful transition will require political and economic collaboration at a scale beyond historical levels and balancing the Energy Trilemma will be of critical importance to ensure political support and stability: embracing new frontiers, striving for innovation while maintaining stable investment frameworks is a conundrum that requires novel approaches to keep the Trilemma balanced and avoid political back-lash or even disruption.</p> <p>Questions</p> <ol style="list-style-type: none"> What are the learnings from previous national energy transitions? What is the right balance of leadership initiative versus robust institutional and political frameworks to ensure a successful and timely transition? What are the biggest challenges for governments to achieve sustainable energy systems and what are the areas that require particular leadership? What is the role of regional integration for countries to enhance their Trilemma ranking? <p>Discussion Leaders</p> <ul style="list-style-type: none"> Suhail Mohamed Al Mazrouei, Minister of Energy, UAE Esteban Albornoz Vintimilla, Minister of Electricity and Renewable Energy, Government of Ecuador, Ecuador François Austin, Global Energy Practice Leader, Oliver Wyman, UK Doris Leuthard, Federal Councillor, Head of the Federal Department of Environment, Transport, Energy and Communications, Switzerland Frank Mastiaux, CEO, EnBW, Germany Ali Ahmad Osmani, Minister of Energy and Water, Government of Afghanistan, Afghanistan Mutaz Musa Abdullah Salim, Minister of Electricity and Water Resources, Government of Sudan, Sudan <p>Moderator</p> <ul style="list-style-type: none"> Joan MacNaughton, Executive Chair, World Energy Trilemma, World Energy Council, UK 	<p>NEW ENERGY REALITIES (15:30 - 16:30)</p> <p>The world is undergoing a Grand Transition driven by a combination of factors including the fast-paced development of new technologies, an unstoppable digital revolution, global environmental challenges and changing growth and demographic patterns. Over the coming years this energy transformation has the potential to change the way in which we produce and consume energy. This will impact operating models and the economic foundation of both nation states and businesses, leading to a rebalancing across sectors and regions with knock-on effects on the wider global economy.</p> <p>This session aims to summarise the key features of the new energy realities that have been discussed during the 23rd World Energy Congress, as well as their critical implications.</p> <p>Questions</p> <ol style="list-style-type: none"> What are the critical implications from new energy realities? What are the key policy, trade, resilience, governance and innovation imperatives? <p>Discussion Leaders:</p> <ul style="list-style-type: none"> Gerald Davis, Executive Chair, World Energy Scenarios, World Energy Council; President & CEO, Forescene S.A., UK Joan MacNaughton, Executive Chair, World Energy Trilemma, World Energy Council, UK Timothy Richards, Executive Chair, Rules of Trade, World Energy Council, USA Hans-Wilhelm Schiffer, Executive Chair, World Energy Resources, World Energy Council, Germany Jeroen Van der Veer, Executive Chair, Financing Resilient Energy Infrastructure, World Energy Council; Chairman Supervisory Board, ING Group, Netherlands <p>Moderators:</p> <ul style="list-style-type: none"> Christoph Frei, Secretary General & CEO, World Energy Council, UK
	<p>PRESIDENTIAL SPECIAL ADDRESSES: REACTIONS FROM ENERGY LEADERS (16:15 - 17:30)</p> <p>Reactions and discussion from the energy community, following the Presidential special addresses.</p> <p>Discussion Leaders</p> <ul style="list-style-type: none"> Rovnag Ibrahim Abdullayev, President, SOCAR, Azerbaijan Mohammad Barkindo, Secretary General, OPEC, Austria <p>Moderator</p> <ul style="list-style-type: none"> John Deferios, Anchor & Global Emerging Markets Editor, CNN, UAE 			