

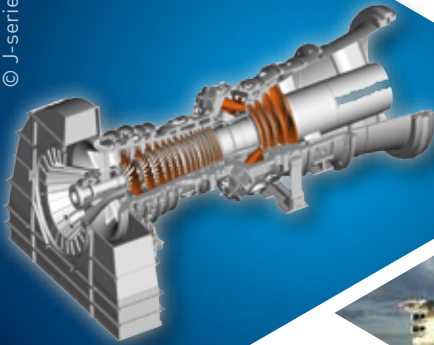
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THE FUTURE OF GAS TURBINE TECHNOLOGY

8th International Gas Turbine Conference

12-13 October 2016 | Brussels | Belgium



IGTC
International
Gas Turbine Conference



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Welcome

**THE FUTURE OF
GAS TURBINE
TECHNOLOGY**

8th International Gas Turbine Conference
12-13 October 2016 | Brussels | Belgium



THE FUTURE OF GAS TURBINE TECHNOLOGY

Dear IGTC-16 Participant,

On behalf of the Board of ETN and the IGTC-16 Conference Advisory Board, I am very pleased to welcome you to the 8th biennial International Gas Turbine Conference in Brussels. During those two days, you will have the chance to attend top level discussions and debates regarding the future of the gas turbine technology, with the participation of users from both power generation and oil and gas industry, gas turbine specialists from the whole value chain and policy-makers from the European Commission, the International Energy Agency or the US Department of Energy.

During this IGTC, four keynote sessions will present outlooks for the gas turbine industry from a policy, market and technology perspective. They will outline the political and commercial expectations of the future in the context of the Paris Agreement coming into force, and will give the floor

to high-level speakers from European, US and international institutions, senior-level industry representatives and experts from the gas turbine research community.

The International Gas Turbine Conference will also offer technical sessions with a focus on solutions to the challenges that operators face today and on promising research for future gas turbine development needs:

- Gas Turbine in Distributed Generation
- Innovative Low Carbon Cycle
- Optimising Oil and Gas Operations
- Optimising Combined Cycle Operations

Another series of technical sessions will present more specific technology developments to tackle user community's requirements and on-going R&D projects for the development of the next generation of gas turbine technology:

- Combustion and Fuel Flexibility
- Maintenance and Repairs
- Flexible Operation
- Materials

I would like to address a warm thank you to all the speakers as well as to our generous sponsors, who have greatly contributed to the success of this conference.

Lastly, I wish to all of you a fruitful conference, which I hope help you to garner an ever clearer view of the future and will inspire new ideas for innovation and cooperation!

Sincerely Yours,

A handwritten signature in blue ink, appearing to read 'Christer Björkqvist', written over a light blue background.

Christer Björkqvist
Managing Director

Keynote Speakers



Christer Björkqvist is the Managing Director and co-founder of the International association ETN that brings together all stakeholders around stationary Gas Turbine Technology development and operation. For the past 17 years he has been working with the gas turbine industry and research community and gained a wide experience in gas turbine technology, project management and energy policy. He has been involved and coordinated several EU- and industry-funded projects. Prior to the foundation of ETN in 2005, Christer Björkqvist was the General Manager of the association of European Manufacturers of Gas Turbines for a period of 5 years.



Nikolaas Baecklemans joined Esso Benelux in 1991 as Corporate Lawyer based in The Netherlands. Subsequently, he took on assignments with increasing responsibilities in the law department, business functions and public & government affairs. He was based in Belgium, The Netherlands, Germany, Libya and Qatar. In October 2014, he was appointed Vice-President for EU Affairs.

Mr. Baeckelmans holds a master degree in Law from the Leuven University, and a master degree in European History & Law from the Strasbourg University.



Bernard Quoix, Head of Rotating Machinery Department of TOTAL E&P since 2003 and recently nominated Senior Fellow of TOTAL Group, started his career in 1979 within TOTAL Operations.

From 1986 to 1989, he worked for Turbomeca Industrial Division and then joined Renault Car Manufacturer before working for Elf Aquitaine and eventually TOTAL, involved in all aspects of turbomachines for new oil and gas

field development, commissioning and start-up, and Operations. In 2005, 2009, and 2014, he was elected member of the distinguished Turbomachinery Advisory Committee in Houston. In 2010, he was elected President of the Board of ETN.



Tomi Motoi joined the International Energy Agency (IEA) in November 2015. She works in the Economics and Investment Office and is an author of the IEA's annual World Energy Investment report, where she focuses on electricity supply analysis. Previously, Tomi negotiated contracts for the sale of wind turbines for General Electric's renewable energy business, where she worked on projects in emerging markets such as Pakistan. Before

joining GE, Tomi spent eight years in the US Navy and studied for her MBA at London Business School.



Tudor Constantinescu is Principal Adviser to the Director General for Energy in the European Commission since 2011. He coordinates activities related to steering the use of Structural Funds for energy priorities and initiatives related to Hydrogen and storage in the energy system. He worked as founding Executive Director BPI Europe and was the President of the Romanian Agency for Energy Conservation. For 11 years, he worked for the

Energy Charter Secretariat in Brussels. Tudor Constantinescu holds a master degree in energy engineering from the UPB and a master degree in applied economics from the Institute of Advanced Studies.



Junior Isles is the founder and Editor-in-Chief of The Energy Industry Times – a specialist monthly newspaper that is distributed internationally with 40 per cent of its readership in Europe. He has been a journalist in the power sector since 1989, having previously been editor of Modern Power Systems and Power Engineering International magazines, and is a well-known commentator on the industry. Junior also often appears

at both public and private conferences as an accomplished moderator and speaker, and over the years has become a trusted colleague of key players in the industry.



Pedro Lopez Estebaran has started his career at Enel Viesgo as Operation & Maintenance Engineer. He then moved to E.On in 2009, where he has been since then, holding the positions of Responsible of the Technical Area in Generation, Head Fleet Management Centre Spain and Plant Manager at Ostiglia Power Plant. In 2015, he was appointed Director of Operational Support and took over his current position of Director of Operations CCGT in August 2015.



Andy Williams previously worked at Ethos Energy Group, CUK Ltd and of Fusion Services Ltd, where he held various technical and operational roles focusing on the technical support of aero and industrial gas turbine components, overseeing the engineering activities of the whole portfolio and as Sales director. Andy has a BSc in Metallurgy and Materials Science from the University College Cardiff and he has been an ETN Board member since 2006.



Dr Abbott has over 40 years of experience in the fields of combustion and acoustics. For the last 20 years he has specialised in gas turbine combustion including research, development and design roles for a major manufacturer (ALSTOM) and development, troubleshooting and operational support roles for a major utility gas turbine operator (E.ON, now Uniper). He has a particular interest in the impact of fuel composition and quality on all aspects of gas turbine operation

particularly, combustion dynamics, emissions, integrity and operability. Dr Abbott is now semi-retired, but maintains an active interest in all aspects of gas turbine combustion. He holds a degree in Chemical Engineering & Fuel Technology and a Doctorate in Combustion Acoustics from Sheffield University.



Shaun West has worked for over 18 years in the aftermarket for GE Energy Services (Italy), Sulzer Rotating Equipment Services (Switzerland) and RWE (UK) before moving to into his academic role in Luzern. In each of the roles pricing has always been an important aspect, from estimating value creation, to M&A transactions and service contracts. Today in his academic role his is bring together his industrial experience with academic rigor to

investigate and disseminate key issues associated with product-services systems primarily in an industrial setting.



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DAY 1 – WEDNESDAY 12 OCTOBER 2016

Morning Programme

07:15	Registration will take place in the lobby of Hotel Le Plaza
08:15	Welcome note: Key points from the 2014 Conference and Introduction to IGTC-16 Christer Björkqvist , Managing Director, ETN Bernard Quoiq , ETN President/ Head of Rotating Machinery Department, Total
08:30	INTERNATIONAL ENERGY POLICY AND MARKET OUTLOOK TOWARDS 2030 OPPORTUNITIES FOR THE GAS TURBINE SECTOR Chair: Christer Björkqvist , Managing Director, ETN Speakers: <ul style="list-style-type: none">• GLOBAL ENERGY TRENDS AND THE ROLE OF GAS IN CURRENT ENERGY AND CLIMATE POLICY FRAMEWORK Tomï Motoi, International Energy Agency• THE DESIGN OF A SUSTAINABLE EU ENERGY UNION TO ENABLE A COMPETITIVE LOW-CARBON ENERGY SECTOR BY 2030 Tudor Constantinescu, Principal Advisor, DG Energy, European Commission• EXXONMOBIL GLOBAL ENERGY OUTLOOK TOWARDS 2040 Nikolaas Baeckelmans, Vice President European Union Affairs, ExxonMobil
	PANEL DISCUSSION Panel Discussion with the above speakers will take place after the presentations. Moderator: Junior Isles , Editor-in-chief, The Energy Industry Times
10:20	Coffee break

INTERNATIONAL ENERGY POLICY AND MARKET OUTLOOK TOWARDS 2030 OPPORTUNITIES FOR THE GAS TURBINE SECTOR

According to the International Energy Agency's World Energy Investment report released last month (September), global gas-fired power generation investment declined by nearly 40% to 31\$ billion in 2015. Of the 46 GW added globally during the same period, the Middle East, China and the USA accounted almost half of gas fired power investment. In Europe, however, overcapacity, renewables expansion and low wholesale prices continue to undermine fossil fuelled generation, especially gas. The panel discussion will debate what the future holds for gas-fired generation globally and whether European is ever likely to come out this slump.

Key questions to be addressed will include:

- Will greater gas export from the US lower gas prices in Europe and how will that change the economics for gas plant?
- As the price of renewable generation continues to fall, will this further squeeze out gas or will it present opportunities for gas to complement the variability of wind and solar?
- Where do the opportunities lie for gas turbines – in the industrial sector or grid-connected generation?
- What can OEMs do to make gas turbines more attractive for plant operators?
- What government or EU policies are needed to secure the future of gas fired generation?

Presentations will be followed by a panel discussion with the speakers.

10:50 **DEVELOPMENT NEEDS FOR UTILITIES AND OIL & GAS OPERATORS FOR THEIR CURRENT AND FUTURE GAS TURBINE FLEETS**

Chair:

Andy Williams, Director Special Coating Processes, Chromalloy

Speakers:

- PRESENTATION FROM THE POWER GENERATION SECTOR
Pedro Lopez Estebanz, CCGT Fleet Director, Uniper
- THE CHALLENGES FOR GAS TURBINE OPERATORS OF CHANGING FUEL COMPOSITIONS AND THE AVAILABILITY OF ALTERNATIVE FUELS
David Abbott, Independent GT Combustion Specialist
- CREATING AND MEASURING VALUE: ALTERNATIVE OPERATIONS AND MAINTENANCE BUSINESS MODELS
Shaun West, Lecturer Service and Product Innovation, Lucerne School of Engineering and Architecture

PANEL DISCUSSION

Panel Discussion with the above speakers will take place after the presentations.

Moderator:

Andy Williams, Director Special Coating Processes, Chromalloy

12:45 Lunch

DEVELOPMENT NEEDS FOR UTILITIES AND OIL & GAS OPERATORS FOR THEIR CURRENT AND FUTURE GAS TURBINE FLEETS

It is in the interest of the whole gas turbine user community to enhance the developments that can deliver a more flexible and environmentally technology with reliable and low cost operation. However, the needs for such developments vary quite substantially between power generation and oil & gas operations in the same extent that it does between continents in terms of market. On top of that, the operational environment of the gas turbines also has a big impact on the requirements and demands of the technology. The most important technical requirements and expectations from users in different markets and sectors and for different types of operation will be highlighted. This session will also explore both the operators and the OEM perspective in order to optimal operation & maintenance models for the future. The impact of quicker market changes and new technical developments like big data and additive manufacturing and its effect on operation and maintenance business models will also be highlighted and debated in this session.

Presentations will be followed by a panel discussion with the speakers.



ETN
Global

DAY 1 – WEDNESDAY 12 OCTOBER 2016

Afternoon Programme

GAS TURBINES IN DISTRIBUTED GENERATION

Room:

Chair: **Pierre Dechamps**, European Commission

14:00

Improving the Flexibility and Efficiency of Gas Turbine-based Distributed Power Plant

Michael Welch, Siemens

Steady-State Experimental Characterization of a flexible Humidified micro Gas Turbine

Svend Bram, BURN joint research group

Challenges in the Development of Micro Gas Turbines for Concentrated Solar Power Systems

Abdulnaser Sayma & Jafar Azaili, City University London

OPTIMISING OIL AND GAS OPERATIONS

Room:

Chair: **Olaf Brekke**, Statoil

Optimisation of gas turbine driven compressor trains by online monitoring

Holger Berghaus, MAN Diesel & Turbo

Improving Reliability and Production in Shell Oil & Gas Facilities

Gert Hoefakker, Shell

On Line Condition Based Maintenance

Antonino Graziano, GE Oil & Gas

15:30

Coffee break

INNOVATIVE LOW CARBON CYCLES

Room:

Chair: **Mohsen Assadi**, University of Stavanger

16:00

Selective Exhaust Gas Recycling for Carbon Capture Applications: Combustion and Operability Measurements

Richard Marsh, University of Cardiff

Turbomachinery-based engine: Concurrent production of power, cooling and desalinated water

Giovanni Cerri, Roma Tre University

Experimental exhaust gas recirculation and selective exhaust gas recirculation on a micro-gas turbine for enhanced CO₂ capture performance

Karen N. Finney, University of Sheffield

OPTIMISING COMBINED CYCLE OPERATIONS

Room:

Chair: **Charles Davis**, ENGIE

Start-up time reduction for Combined Cycle Power Plants

Pascal Decoussemaeker, GE Power

Increasing competitiveness of CCGT plants in a dynamic market: An owner's approach

Artur Ulbrich, Uniper

A diagnostic & corrective action system based on deep learning and natural language processing

Thomas Hubauer & Giuseppe Fabio Ceschini, Siemens AG

18:15

Reception and Gala Dinner

MTU, our sponsor for the cocktail and **MHPS**, our sponsor for the Gala dinner are happy to welcome you to the **Colonial Palace in Tervuren**. Please meet at 18:15 in the lobby of Le Plaza Hotel.

For more information please see page 9.



We are happy to invite you to a cocktail reception, sponsored by **MTU**, and a Gala dinner, sponsored by **MHPS** in the prestigious Colonial Palace in Tervuren.

Please, **meet in the lobby of Le Plaza Hotel at 18.15**. There will be a return transfer by bus to the venue of the Gala dinner. Your badge will be necessary for the entrance. (Expected return to Le Plaza Hotel: 23:00).

Dinner

HOW TO LEAD IN A WORLD OF UNPREDICTABILITY



Filip Muyliaert is a presentation coach and a sought-after professional keynote speaker who has addressed audiences from around the world, in all five continents. Apart from motivational speeches, his highly-rated presentations cover topics like "inspiring leadership", "the business use of artificial intelligence" and "communication". He captivates audiences by mixing a thought provoking and dynamic presentation style with solid business content.

More info: www.filipmuyliaert.be



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DAY 2 – THURSDAY 13 OCTOBER 2016

Keynote Speakers



Uwe Kaltwasser started his professional career in the Aerospace Industry as a project engineer at Vickers Systems in Germany. In 1999 he joined MTU Maintenance in Ludwigsfelde, focusing on aeroderivative gas turbines, holding positions as Head of Sales and Customer Support. Since 2014, Uwe holds a position at Siemens, currently as Head of Market Support, covering the technical as well as the marketing aspects of the Siemens gas turbine portfolio up to 66MW for the use in any application (power generation/distributed generation, oil & Gas etc.). Uwe holds an engineering degree in aerospace engineering from the University of Applied Science Munich.



Franco Rosatelli is leading the Company engineering activities related to localisation in Russia of advanced turbomachinery for Oil & Gas and Power generation applications. Before joining REP Holding Company, Franco worked for 35 years in Ansaldo Group holding several positions in R&D, Project Management and Engineering both for nuclear and fossil power plants. From 2008 to October 2015 Franco has been Chief Technical Officer at Ansaldo Energia S.p.A. Franco Rosatelli has been also Vice-President and Board member of European Association of Gas and Steam Turbine Manufacturers (EUTurbines), member of the Advisory Boards of PowerGen Europe and PowerGen Russia Conferences and member of the Italian Committee of WEC (World Energy Council).



Dr Robert Romanosky has been with the U.S. Department of Energy, National Energy Technology Laboratory since 1978. He worked as Technology Manager for Power Systems Advanced Crosscutting Research. Dr Romanosky was also the Deputy Director, Office of Coal and Power R&D at the National Energy Technology. Recently, he has been assigned as the Acting Crosscutting Technology Manager in the Office of Strategic Planning. Dr Robert Romanosky

holds a M.S. and a Ph.D. from West Virginia University in analytical chemistry/instrumentation.



Nigel Blackaby is based in PennWell's UK office where he has held editorial and management positions since joining this international energy media company in 2001. As the director for international power industry conferences, he chairs Advisory Board's for POWER-GEN Europe, POWER-GEN Asia, POWER-GEN Africa and POWER-GEN Middle East conferences. Nigel continues as Associate Editor for Power Engineering International magazine covering

the global power industry from electricity generation through to transmission and distribution.



Marcelo Accorsi Miranda is a Senior Consultant on Energy and Turbomachinery with 38 years of experience in oil and gas industry. He provides solutions to face the challenges during the transitional phase from the oil & gas era to the low carbon society. Since 2007, Mr. Miranda has served as Active Member of the prestigious Turbomachinery Symposium Advisory Committee, sponsored by the Texas A&M University. Mr. Miranda holds a B.S. degree (Mechanical

Engineering) from Universidade Federal do Rio de Janeiro and a M.S. degree (Industrial Engineering) from Universidade Federal Fluminense.



Tom Scarinci is Senior Vice President for Aeroderivative Gas Turbines in Siemens Canada. He is also Head of Global Customer Solutions for the Distributed Power Generation and responsible for the long-term Technology Partnership recently established between Siemens AG and Rolls-Royce Plc. Before joining Siemens, Tom worked for 20 years with Rolls-Royce and briefly held senior program management roles at Pratt & Whitney Canada

in 2008-2009. Tom graduated from McGill University in 1992. He was awarded the 2004 ASME Gas Turbine Award and the 2004 John P. Davis Award by the International Gas Turbine Institute for his contributions to Low Emissions Combustion Technology.

THE FUTURE OF GAS TURBINE TECHNOLOGY

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Mr. Miyama started his career at Mitsubishi Heavy Industries in April 1981. During his career, he successively became the Deputy Head of Takasago Machinery Works, Senior Vice President of Mitsubishi Power Systems Americas, Chief Engineer for Power Systems of Mitsubishi Heavy Industries and the Head of Gas Turbine Products Headquarters, Power Systems Division, Energy & Environment, Head of Takasago Machinery Works. In 2014,

Mr Miyama was appointed Senior Vice President at the Head of Gas Turbine Products Headquarters, Regional Representative for Takasago, Mitsubishi Hitachi Power Systems and Head of Takasago Machinery Works of Mitsubishi Heavy Industries. He then became Executive Vice President, Mitsubishi Hitachi Power Systems and Executive Vice President, Head of Turbine Products Headquarters.



Mike Leary joined GE Aviation and held various gas turbine design engineering positions primarily on helicopter and fighter engine programs. He previously was engineering manager for advanced helicopter engine programs with partners in Italy before joining the large commercial engine program. In 2007, after 25 years in aviation, he moved to GE Power and Water in Greenville where he has

held various management positions in systems engineering. He is currently the manager of Gas Turbine Engineering. Michael holds a B.S. degree in mechanical engineering from the Northeastern University in Boston.



Dr. Florjancic. After subsequent work as a Senior Field Engineer at Sulzer in Portland, Dr Florjancic joined 1993 ABB Power Generation Ltd, which became Alstom Power and lately part of Ansaldo Energia to work in various managerial roles in the area of Gas Turbine R&D. In 2004, Dr. Florjancic became Engineering Responsible for the fleet of newer Alstom IGTs and returned to new equipment development in 2010 to work as Director of R&D Execution for gas turbines.

As of today he is designated to become CTO at Ansaldo Energia. Dr Florjancic holds a degree in Mechanical Engineering and a Ph.D. for a combined experimental and theoretical research thesis from the Federal Institute of Technology in Zurich.



Mark Keith has global responsibility for all after sales support including field service, overhaul, service parts, refurbishment and upgrade, long-term service agreements, and Solar's condition monitoring and equipment analytics group. Additionally, he has regional responsibility for Solar's business in Europe, Africa, and the Middle East. Mark has worked at Solar Turbines for 20 years and has held a broad range of engineering, project management, operations,

sales and leadership positions. Prior to joining Solar, Mark worked for American Airlines for 6 years as both an aircraft and turbine engineer. Mark holds a Bachelor of Science degree in Aerospace Engineering from Texas A&M University and has completed the Caterpillar Executive Leadership program with Stanford University.



Dr. Sven-Hendrik Wiers has a 20 years of experience in the gas turbine and turbo machinery industry. In June 2011, he took on the responsibility for MDT's gas turbine engineering as Vice President Gas Turbines. Wiers previously served the position of Head of Calculation & R&D compressors at MDT in Oberhausen and Berlin. Before that he was Program Manager for Technology Demonstrator Programs at MTU Aero Engines

Munich. He holds a degree in Mechanical Engineering from the Technical University of Karlsruhe, and got his Ph.D. from the Technical University in Stockholm in 2001.



Gary Lock completed his degree in Mechanical Engineering in 1983. After an initial spell in the Oil & Gas Industry he moved into Engineering Consultancy and has been with Frazer-Nash for 30 years. Initially specialising in stress analyst, this progressed into structural design, technical management and more latterly business management. He is currently the Business Manager responsible for Gas and Steam Turbines.

He is a Fellow of the Institution of Mechanical Engineers, a Member of the IDGTE and a board member of the European Turbine Network.



ETN
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DAY 2 – THURSDAY 13 OCTOBER 2016

Morning Programme

08:00 **Networking coffee**

08:30 **Opening and introduction**
Catherine Goy, Vice President ETN, Uniper

08:40 **NATIONAL AND REGIONAL GAS TURBINE
MARKETS: OPPORTUNITIES AND CHALLENGES**

Chair:

Uwe Kaltwasser, Market Intelligence & Sales Excellence,
Siemens AG

Speakers:

- THE US GAS TURBINE MARKET AND CURRENT R&D PROGRAM
Robert R. Romanosky, Deputy Director, Office of Coal & Power R&D, National Energy Technology Laboratory (NETL), United States Department of Energy
 - GAS TURBINE OPPORTUNITIES IN LATIN AMERICA
Marcelo Accorsi Miranda, Senior Consultant, ETM Energy & Turbomachinery
 - GAS TURBINE OPPORTUNITIES IN RUSSIA
Franco Rosatelli, Vice-President for Technological Development, JSC REP Holding
-

PANEL DISCUSSION

Panel Discussion with the above speakers will take place after the presentations.

Moderator:

Nigel Blackaby, Director PennWell Global Power Group

10:40 **Coffee break**

NATIONAL AND REGIONAL GAS TURBINE MARKETS: OPPORTUNITIES AND CHALLENGES

The expansion of the global gas turbine industry is forecast to grow quite substantially in the coming years as a result of an increase in energy demand and a massive amount of natural gas. However, in the aftermath of the abrupt fall of the oil price in the end of 2014 and the unfavourable conditions of the European gas turbine market, affordable operations and project financing has become an increasingly greater challenge in certain regions. The materialisation of future growth opportunities also depends on technology developments while the markets' needs are getting always more diversified. Even though the market outlook looks promising on a global scale, each regional market has its own challenges. This session will highlight market opportunities and challenges from a gas turbine perspective and will inform on R&D programmes in place that aim to widen the opportunities for the gas turbine market.

Presentations will be followed by a panel discussion with the speakers.

	COMBUSTION AND FUEL FLEXIBILITY	MAINTENANCE AND REPAIRS	FLEXIBLE OPERATION	MATERIALS
	Room: Chair: Catherine Goy , Uniper	Room: Chair: Markus Kupper , EthosEnergy	Room: Chair: Niko Cornelis , Engie	Room: Chair: John Oakey , Cranfield University
11:10	Gas Power Systems Fuel Capability Paul Glaser , Fuel Systems Integration Leader	Impact of HEPA Air Intake Filtration on Gas Turbines Operating in Middle East Offshore Applications and Fueled with Sour Gas Dominique Orhon , Jeroen van der Kaag , Total & Scott Taylor , AAF	Gas Turbine Flexibility and Life assessment Method David Bosak , Cranfield University	Liquid feedstock plasma spraying as an emerging process for advanced thermal barrier coatings Nicolaie Markocsan , University West
	Gas Fuel Flexibility in Dry Low Emissions Combustion Systems Michael Welch , Siemens	F-technology Gas Turbine Retrofit with EPA Filters (Case Study) Victor Litinetski , Israel Electric Corporation	Advancements in H Class Gas Turbines for Combined Cycle Power Plants for High Efficiency, Enhanced Operational Capability and Broad Fuel Laurent Cornu , GE Power	Gas Turbine Low Conductivity Thermal Barrier Coating Validation and Demonstration John Scheibel , EPRI
	Development of gas turbine combustors for fuel flexibility Tomohiro Asai , MHPS	Experimental investigation results of a hybrid ceramic and actively cooled ball bearing for gas turbines Peter Glöckner , FAG Aerospace	Advances in Using Associated Gases in Solar's DLE Industrial Gas Turbines Luke Cowell , Solar Turbines	Impact of Engine Operation on Gas Turbine Component Durability using Ductility Exhaustion Richard J. Green , Solar Turbines & John Douglas , Frazer-Nash Consultancy
	Panel discussion with the speakers and David Abbott , Independent GT Combustion Specialist	A Novel Approach for Non-Destructive Testing of the Adhesion of Thermal Barrier Coatings Jochen Manara , Bavarian Center for Applied Energy Research (ZAE Bayern)	Data modeling to quantify relationships between changes in maintenance and operating regime on power plant reliability Angelo Nicotra , Sciemus	Additive Manufacturing for Hot Gas Path Parts Julius Schurb , GE Power
13:10	Lunch			

14:15 **PANEL SESSION:**

WHICH GAS TURBINE TECHNOLOGY ADVANCEMENTS DO THE OEMS PREDICT WILL SATISFY THE CURRENT AND FUTURE MARKET?

Chair:

Bernard Quiox, ETN President/Head of Rotating Machinery Department, Total

Five minutes presentation by each panellist.

Panellists:

- **Tom Scarinci**, Vice President, Siemens
- **Akimasa Muyama**, Director, Executive Vice President, Head of Turbine Products HQ, MHPS
- **Michael Leary**, Systems Engineering Manager, GE Power
- **Stefan Florjancic**, Chief Technology Officer for R&D, Ansaldo Energia
- **Mark Keith**, Vice President, Solar Turbines
- **Sven-Hendrik Wiers**, Vice President Gas Turbines, MAN Diesel & Turbo

Panel Discussion and Q&A: with the above speakers.

Moderator: Gary Lock, Business Manager, Frazer-Nash Consultancy

16:00 **Closing remarks**

Bernard Quiox, ETN President/Head of Rotating Machinery Department, Total

16:15 **End of Conference**
Networking Coffee and Drinks

WHICH GAS TURBINE TECHNOLOGY ADVANCEMENTS DO THE OEMs PREDICT WILL SATISFY THE CURRENT AND FUTURE MARKET?

The gas turbine industry has recently gone through a restructuring accumulative consolidation with mergers, strategic alliances and joint ventures in order to ensure a competitive edge in an intensifying global competition for future promising markets.

As the gas turbine user community today is facing very tough market conditions, what are the OEMs offering to help them to overcome the current situation? Altogether as market demands become more and more diversified, gas turbine R&D becomes broader and more complex. What does this mean for technology development and services foreseen by the OEMs?

This session will give OEMs the opportunity to give their interpretation of the future energy scenario and market demands and to share their views on future gas turbine development opportunities. Which R&D topics do they foresee as the key to ensure a wide market share in a future low-carbon economy?

After a short opening statement by each OEM, an extended panel discussion will take place with the OEM representatives including an interactive involvement by the audience.

The 2016 issue of our R&D Recommendation Report is out!

ETN presents the 2016 issue of its biennial Recommendation Report for R&D, which brings up proposals for developments based on interpretations of the user community's recommendations and energy policy targets. Another input of the organisation to the reflexion around the future of this technology!



Download it on ETN website: www.etn-gasturbine.eu



**Join us in a powerful European network
promoting environmentally sound
gas turbine technology with reliable
and low cost operation**

You can apply for membership by completing the membership
online form available on the ETN website www.etn-gasturbine.eu
or by sending an email to info@etn-gasturbine.eu