



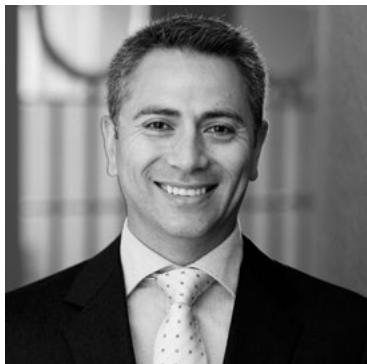
MILESTONES

TWENTY EIGHTEEN

Methanol Industry
In focus

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A MESSAGE FROM OUR CHAIRMAN

An Exciting Year Ahead

By – **Ben Iosefa**, Chairman of the Board, Methanol Institute

(Vice President, Global Market Development & Stakeholder Relations, Methanex Corporation)

As the global trade association for the methanol industry, the Methanol Institute (MI) represents the world's leading methanol producers, distributors and technology companies. MI's mission includes:

- Building product awareness and ensuring the safe handling of methanol and its derivatives across the supply chain;
- Promoting the growth of the methanol industry by furthering methanol as an essential chemical commodity and an emerging source of clean and renewable energy; and
- Influencing global regulatory and public policy initiatives that impact the methanol industry.

MI accomplished a great deal across a wide range of activities in 2017 – including:

- **All Ahead Full for Methanol Marine Fuels;** MI worked with Lloyd's Register on creating guidelines for Safe Bunkering & Handling of Methanol as a Marine Fuel; engaged with the International Bunker Industry Association's (IBIA) IMO Correspondence Group for low-flash point fuels (IGF code); worked with the Dangerous Goods Advisory Council and INTERTANKO to ensure equitable treatment of methanol as a marine fuel under International Maritime Organization (IMO) regulations. MI also continued our engagement in methanol marine pilot projects all over the world, including Summeth Martec II (Finland/Sweden), MethaShip (Germany), with MI member Billion Miles (Singapore) and GreenPilot (Sweden).
- **Cars, Trucks and Buses Running on Methanol;** ASTM this year announced a new specification for High Octane Number Test Fuel that specifically prohibited any fuels containing methanol. MI sprung into action and participated in an ASTM Task Force working to ensure that a new ballot, which removed the methanol prohibition, has been proposed. MI also supported New Zealand's

new fuel regulations increasing the country's limit for methanol in petrol from one to three percent by volume, continued our engagement with the Government of India who are looking to launch a number of methanol related projects, and remained engaged in a number of fuel blending initiatives in China, including the Ministry of Industry and Information Technology's (MIIT) Methanol Vehicle Pilot Project.

- **Methanol Safe Handling;** Working closely with industry leaders, technology partners and customers, MI released the fourth edition of our longstanding *Methanol Safe Handling Manual* to address both common and technical questions related to methanol handling, storage and transport. The deep collaboration of MI and our member companies in producing this vital resource for educational and training purposes highlights our continuing commitment to safety.
- **Washington Methanol Policy Forum;** In June, MI, along with our partner organizations the Institute for the Analysis of Global Security (IAGS) and the United States Energy Security Council (USESC) held our 3rd Washington Methanol Policy Forum. The Forum, held at the National Press Club, brought together over 100 methanol industry leaders, along with important global and national public policy makers
- **As the Voice of the Methanol Industry;** Last year, MI staff presented at over 60 industry conferences and met with hundreds of government officials and policymakers around the world. We continue to publish our weekly *Methanol Matters* newsletter, *Safety Snapshot* and other newsletters, and to grow our reach through our websites, Twitter, Facebook, LinkedIn, YouTube and other social media and digital avenues.

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CONNECT WITH US



In this year's edition of *Milestones*, you will learn more about some of these initiatives. Articles focus on exciting developments in the world of marine methanol; the successful Methanol Vehicle Pilot Project in China; recent advances in low-carbon and renewable methanol; methanol boilers; our newly revised *Methanol Safe Handling Manual*, and more.

As a Board member since 2013 and now entering my third year as Chairman of the Board, I am excited for the work that lies ahead in 2018. This year MI will continue to lead the way in the emergence of methanol as a global transportation fuel; work to identify and open new markets and opportunities for methanol around the world; release a new *Methanol Safe Handling Video*; continue to promote our industry's interests before legislators and regulators across the globe; to expand our reach via our social media and web platforms; and many other important initiatives. MI will also seek to expand our funding levels in 2018/2019, to best take advantage of the vast array of program activities available to advance

methanol as an energy resource, and to ensure that our industry and trade association remain on a level footing with our competitors.

With 40 member companies representing the world's principal methanol producers and distributors, as well as the technology leaders that support the industry, MI is truly a global organization. Our members are headquartered in more than a dozen countries (Australia, Canada, China, Germany, Italy, Japan, Kazakhstan, Malaysia, Netherlands, Oman, Qatar, Russia, Saudi Arabia, Singapore, Trinidad, Turkmenistan, United Kingdom, and United States), and do business in every corner of the world.

The organization and members of the Methanol Institute are making significant contributions to the advancement of the global methanol industry. Together we are looking forward to an exciting 2018, and the Methanol Institute is well positioned to achieve continued growth and success for our industry.



CHINA INDUSTRIAL BOILER STANDARDS

As the Chinese government continues to demolish coal-fired boilers and cook stoves in a quest to reduce air pollution, methanol's use as a clean and affordable fuel is gaining more and more popularity in China. A new report on "Methanol New Applications in China: Boilers and Cook Stoves" jointly produced by MI and the Center for Global New Energy Strategy Studies (CGNESS) of Peking University is finished and available on MI's website at www.methanol.org.

On the standards side, some breakthroughs are evolving in the Boiler Burner Standard from the China Special Equipment Inspection & Research Center Burner Test Lab who have re-classified the boiler burners into gaseous and liquid forms in the proposed "Specification for Liquid Fuels and Gaseous Fuels Burners of Boilers" National Standard, the draft of which is under review. Alcohol based fuel boilers are officially listed in the standard with requirements on design, installation and use.

Additionally, there are ongoing efforts within China to create industrial standards for the easier and safer use of methanol as a boiler fuel. In early 2017, the China Association of Alcohol and Ether Fuels and Automobiles (CAAEEFA) held an inaugural conference on drafting standards on methanol as a boiler fuel.

Later in 2017, the China Petroleum and Chemistry Industry Federation (CPCIF) approved a plan on drafting two Group Standards, "Methanol Based Fuel for Boilers" and "Technical Guidelines for Storage & Liquid Supply Facilities of Methanol Based Fuel for Boilers" originally proposed by CAAEEFA. Over 12 companies involved in the methanol boiler and fuel sector, including MI member **Methanex Corporation**, have committed to participate in the work and contribute various resources including funds, burners, testing equipment and human resources.



Thanks to the contributions of MI, Methanex Corporation and other Chinese stakeholders, we expect three standards to be officially released and go into effect in 2018. MI and CAAEEFA estimate the total number of methanol boilers in use across China today to be over 1000 units, consuming over 2 million metric tons of methanol in 2017.

METHANOL FUELED VESSELS

- 7 dual-fuel vessels delivered to Waterfront Shipping, trading internationally
- 1 ROPAX carrier, the Stena Germanica, fully converted to methanol, Sweden



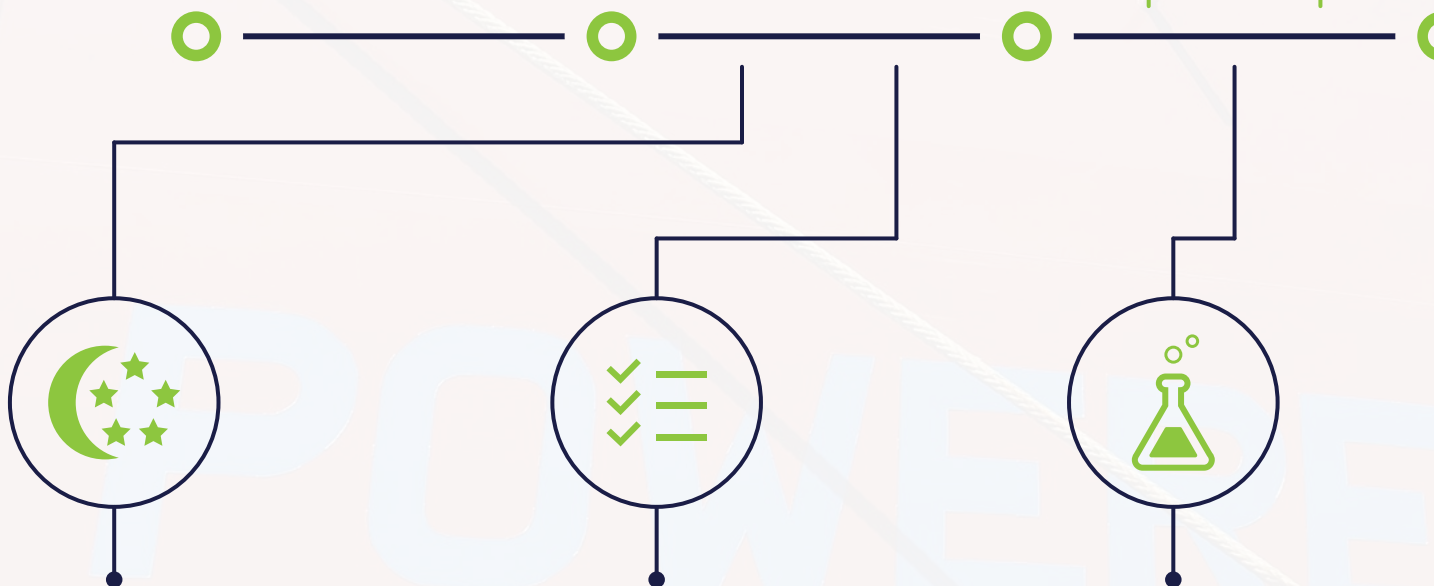
STENA GERMANNICA

- ROPAX carrier
- 4 x 6MW Sulzer engines
- Swedish Maritime Administration & EC
- Completed one year with all four, main propulsion units running on methanol
- Sweden



GREENPILOT

- High Speed rescue, 500kW
- Swedish Maritime Administration
- MI
- Fuel Injection Technologies
- Converted 6-cylinder methanol engines
- Sea Trials completed
- Sweden



SINGAPORE 2020 MARINE FORUM

- High level alternative fuels forum sponsored by:
 - Lloyd's Register
 - IBIA
 - MI

SCANDINAOS BUNKERING WORKSHOP

- China Classification Society
- Lloyd's Register endorsed
- MI endorsed

CCS METHANOL GUIDELINES

- China Classification Society
- Lloyd's Register endorsed
- MI endorsed

SUMMETH PROJECT

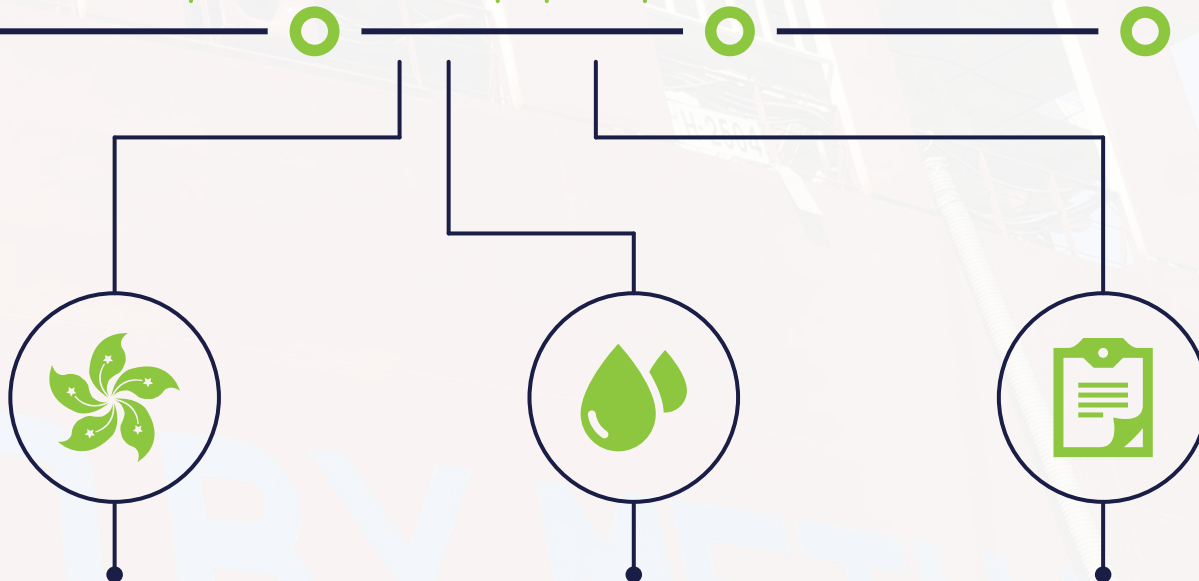
- Marine engine conversion from ethanol to methanol
- Completed Dec 2017
- Lloyd's Register
- Conversion by VTT University, Finland
- Testing by Lund University, Sweden

**METHASHIP**

- Cruise & ROPAX design
- Completed Dec 2017
- Lloyd's Register
- Meyer Werft
- HELM
- Flensberger Schiffbau-Gesellschaft
- Germany

**BILLION MILES**

- 4-cylinder methanol auxiliary engine
- Main propulsion unit in 2018
- Sea Trials begin
- Singapore

**HONG KONG SHIP OWNERS ASSOCIATION TECHNICAL FORUM**

- MAN
- WIN G&D
- Fuel Injection Technologies
- Lloyd's Register

IMO REVISIONS TO CARRIAGE REQUIREMENTS FOR METHANOL

- INTERTANKO
- DGAC
- Support: Liberia, Marshall Island, Panama, USA

IGF CODE TASK FORCE

- MI members
- 3rd party stakeholders
- Adoption, if required



CHINA METHANOL VEHICLE PILOT PROGRAM SUCCESSFUL

Having begun back in 2012, the Chinese Ministry of Industry and Information Technology (MIIT)'s Methanol Vehicle Pilot has been run in 10 cities in 5 different regions (Shanxi, Shaanxi, Shanghai, Gansu and Guizhou).

The Methanol Vehicle Pilot has included more than 4,000 vehicles in total including cars, buses and trucks and has reached a milestone with all the pilots having been well reviewed and accepted by an expert group commissioned jointly by MIIT, the National Development and Reform Commission (NDRC) and the Ministry of Science and technology (MOST), proving that the vehicles powered by methanol are clean, economical and reliable.



proved the adaptability, reliability, safety and low environmental impact (pollutants within national standards and limits) and fuel economy, paving the way for the future promotion.

**THE METHANOL VEHICLE PILOT
HAS INCLUDED MORE THAN 4,000
VEHICLES IN TOTAL INCLUDING
CARS, BUSES AND TRUCKS**



At a seminar held in December 2017 in Beijing to review the program, experts concluded that the pilot successfully promoted the technology and quality of methanol vehicles, and that the accumulated data

In 2018, we expect a further policy from the central government of China, to guide the commercialization of methanol vehicles in China, which is underscored by investments in plant and equipment totaling 8 billion RMB (1.26 billion USD) by Geely alone.

Some Highlights from the Program Include:

- In Shanxi Province alone Pilot Program vehicles travelled 21.4 million kilometers (12.84 million miles) over three years
- 100 buses participated in Changzhi City's Pilot and met all their proposed objectives
- The biggest single pilot in Gui Yang City has 3,300 Geely M100 cars





GLOBAL METHANOL FUEL BLENDING DEVELOPMENTS

2107 saw significant global methanol fuel blending developments in New Zealand, Denmark, Italy and beyond.

In August, New Zealand's Ministry of Business, Innovation and Employment announced the adoption of new fuel regulations increasing the country's limit for methanol in petrol from one to three percent by volume. The three percent methanol blending allowance was supported by comments from both MI and member company **Methanex**. The new regulations took effect on October 2, and included an RVP waiver and pump labeling requirements.

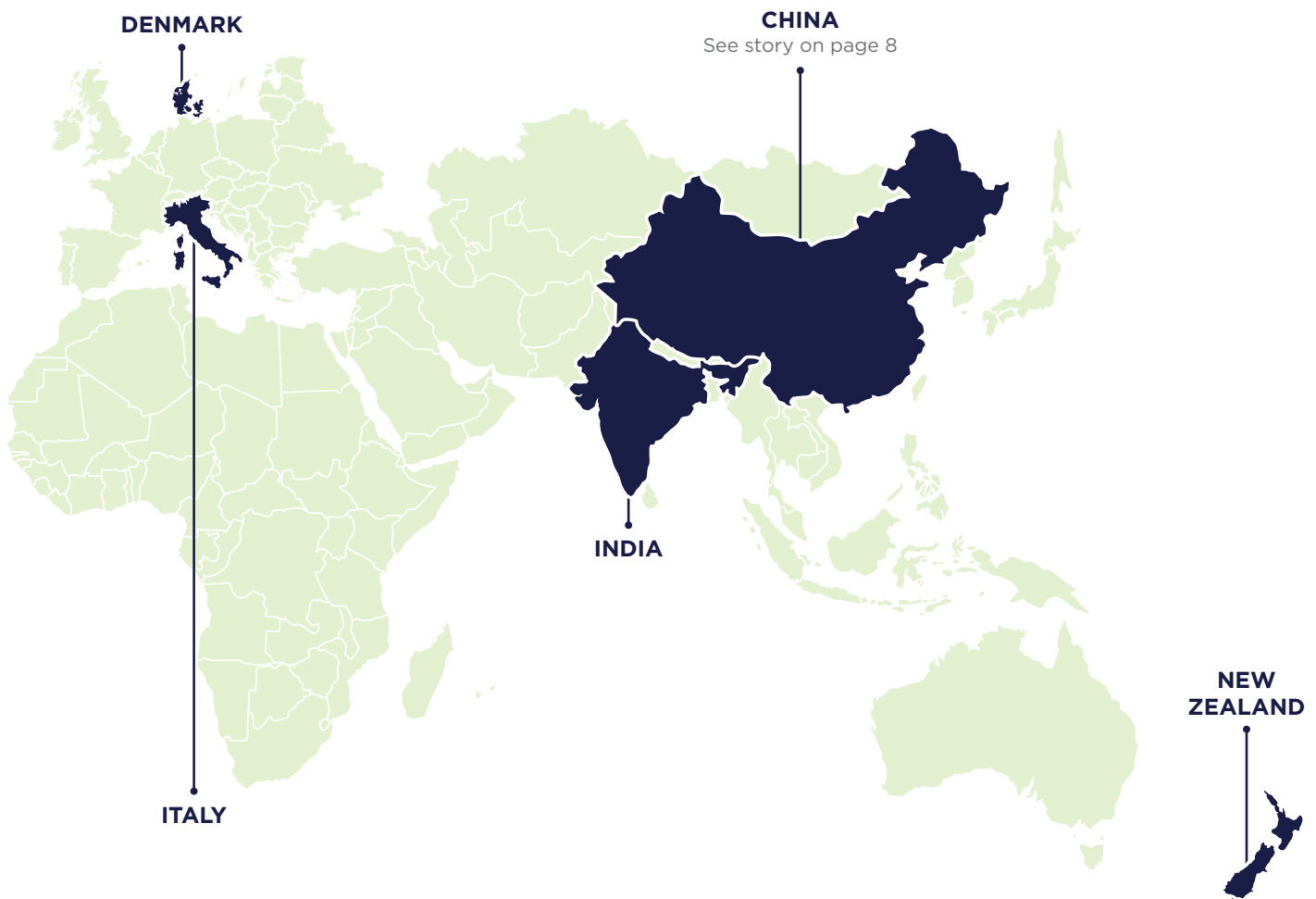
As noted by New Zealand's Energy and Resources Minister Judith Collins, "The changes carry multiple benefits for consumers and for our environment, and increasing the methanol blend limit - could potentially

allow more flexibility in fuel mixes, a reduction in harmful emissions and increased diversity and enhanced security of local supply."

In Denmark, Danish methanol fuel cell manufacturer SerEnergy launched a commercial reformed methanol fuel cell (RMFC) vehicle with a driving range of up to 800km on a tank of methanol.

The engineers and mechanics at SerEnergy's mobility development centre, located in Aalborg, Denmark, have developed a RMFC vehicle based on the Nissan e-NV200 electric van platform, a vehicle that is being sold in large numbers worldwide.

The van is equipped with an urban range extender which enables up to 800km before the vehicle needs refueling - up from the battery only range of 200km -, and is therefore ideal for an urban driving pattern covering many kilometres, such as taxis, delivery vans and other commercial vehicles. It has been three years since SerEnergy started the development of a fuel cell solution for the mobility segment, with a first-generation RMFC-vehicle based on a Fiat 500 platform.





In November, at the Palazzo Chigi in Rome, in the presence of the Italian Prime Minister, Paolo Gentiloni, the chief executive of Eni (parent company of MI member **Ecofuel**), Claudio Descalzi, and the chief executive of Fiat Chrysler Automobiles (FCA), Sergio Marchionne, signed a Memorandum of Understanding for the joint development of research projects and technological applications aimed at reducing CO₂ emissions from road transport vehicles. The two companies, renewing their strategic commitment to a low-carbon future and in line with the National Energy Strategy, combined their respective expertise, experiences and technological know-how in order to significantly reduce the sector's level of CO₂ emissions.



Eni has developed a new type of petrol containing alternative fuels (15% methanol and 5% bioethanol) which produces lower emissions and is currently being jointly tested with FCA. This new fuel is being used by five Fiat 500 vehicles from the Enjoy fleet, Eni's car sharing service that was created in partnership with FCA, in an extensive road test.

With regard to the use of methanol, use of the new petrol (15% methanol, 5% bio-ethanol) can ensure, well to wheel, a more than 4% reduction in CO₂ emissions.

In India, the National Institution for Transforming India (NITI Aayog) has been forcefully calling for India to adopt methanol fuel blends. In December, the Government of India published a Gazette notice establishing approval requirements for emissions from M15 (15% methanol and 85% petrol) and M100 (100% methanol) light-duty vehicles and MD95 (95% methanol and 5% diesel) heavy-duty vehicles. Complying vehicles would be required to display a clearly visible sticker.



The Automotive Research Association of India is currently undertaking emissions testing and there is a desire to have the first methanol pump open in a matter of months. MI will continue to work closely with all relevant stakeholders in India to bring the benefits of methanol fuel blending to the Indian consumer.





RENEWABLE METHANOL DEVELOPMENTS

While the late Nobel Prize winner Dr. George Olah's vision of a Methanol Economy has not yet come to pass, there have recently been many technical advances and now countries are waking up to the potential for a meaningful supply of low-carbon and renewable methanol to meet transportation fuel mandates and to pursue green chemistry.

MI member company **Enerkem** is at the forefront of the renewable methanol revolution and is involved in several joint ventures that promise to advance the use of renewable methanol worldwide.

In addition to Enerkem's existing 10 million gallon municipal solid waste (MSW)-to-methanol-to-ethanol plant in Edmonton, Alberta, in late 2016 it was announced that a partnership comprised of AkzoNobel, Air Liquide, Enerkem and the Port of Rotterdam is looking to build the first waste-to-chemicals facility of its kind in Europe to provide a sustainable alternative solution for non-recyclable wastes, converting waste plastics and other mixed wastes into new raw materials. The project is supported by the Dutch Ministry of Economic Affairs & Climate Policy, the City of Rotterdam, the province of Zuid-Holland and InnovationQuarter, the regional development agency.

The new chemical plant will use Enerkem's proprietary technology to convert residual waste into methanol for

use in the chemical industry and for the transportation sector. These chemicals are currently produced almost entirely from fossil fuels. The planned facility will therefore provide a sustainable alternative by producing a renewable chemical and will represent a significant step toward a sustainable and circular approach. The partners recently signed a project development agreement which covers €9 million of initial investments in the project, including detailed engineering, set-up of a dedicated joint venture, and the permitting process. The consortium is aiming to make a final investment decision for the €200 million project later in 2018.

THE PARTNERS RECENTLY SIGNED A PROJECT DEVELOPMENT AGREEMENT WHICH COVERS €9 MILLION OF INITIAL INVESTMENTS IN THE PROJECT

Additionally, Enerkem has signed an agreement with Sinobioway Group worth over Canadian \$125 million in the form of equity investment in Enerkem Inc., future licenses, equipment manufacturing and sales, as well as for the creation of a major joint venture that will lead the construction of over 100 Enerkem state-of-the-art facilities in China by 2035. The announcement was made in the presence of the Premier of Quebec, Philippe Couillard, during a China trade mission earlier this year.





Another MI member company leading the way in renewable methanol is **Carbon Recycling International (CRI)**, which operates the world's only industrial scale renewable methanol facility using carbon dioxide (CO_2) and hydrogen as a feedstock. The CO_2 is sourced from a geothermal power plant, and the hydrogen is generated in a process of electrolysis. In 2015 CRI expanded the plant from a capacity of 1.3 million liters per year to more than 5 million liters a year with the capacity to recycle about 5600 tons of CO_2 per annum.

According to an independent audit by SGS Germany based on the industry-standard EU ISCC Plus certification scheme, the production and use of renewable methanol from the plant as automotive fuel releases 90% less CO_2 than the use of a comparable amount of energy from fossil fuels.

Carbon Recycling has commenced market deployment of its technology and intend to start design and construction of commercial scale plants in 2018. The first projects outside of Iceland will be

implemented in Europe or China, which has a robust methanol (M15 blend) transportation fuel market and has set the ambitious goal of reducing CO_2 emission per unit of GDP by 40% before 2020. The Chinese government has also vowed to increase the share of non-fossil fuel usage by 15% over the same time period. CRI in collaboration with Geely Holdings and Zixin Industrial have formed a Shanghai-based joint venture company under the name CRI Ji Xin, which will handle all sales and marketing in China.

For the last two years, a fleet of six methanol powered Geely cars have been undergoing rigorous real-world testing in Iceland. The fleet of Geely Auto's Emgrand M100, the world's first mass produced methanol light vehicle, has been operated by CRI and its affiliates. The cars have logged over 150,000 kilometers. Study participants reported virtually no difference in driving experience compared to regular gasoline or diesel fueled cars.

The Emgrand M100 is a methanol variant of the best-selling domestic sedan in China, the Emgrand 7

with average sales of over 20,000 units per month. Geely Auto has been a long term pioneer of methanol vehicles in the Chinese market and has worked closely with Carbon Recycling International to make the road test a reality. The methanol variant of the Emgrand 7 features a 1.8L engine which can run on both methanol and gasoline. The version used in the fleet test has a 50 liter methanol tank as well as a 10 liter gasoline tank. The methanol powered car starts with fuel from the gasoline tank and automatically switches to methanol once a preset temperature has been reached in the engine. The switch from gasoline to methanol is completely seamless. A two-tank design was used to avoid any problems during cold starts.

IN 2015 CRI EXPANDED THE PLANT FROM A CAPACITY OF 1.3 MILLION LITERS PER YEAR TO MORE THAN 5 MILLION LITERS A YEAR WITH THE CAPACITY TO RECYCLE ABOUT 5600 TONS OF CO₂ PER ANNUM.

Additional renewable methanol developments include the Silva Green Fuels joint venture between Sweden's Södra and Norway's Statkraft, which will use Steeper Energy technology to produce drop-in advanced biofuels in Norway.

Additionally, Södra plans to invest more than \$12.5 million in the production of biomethanol, a sustainable

fuel from forest raw material. The project commenced in autumn 2017 and is scheduled to be ready for operation by spring 2019. The aim is to produce 5,000 tonnes of biomethanol per year at the new facility to be situated at Södra's pulp mill at Mönsterås. The long-term aim is to further increase production for passenger, truck and ship transport.

California's Byogy Renewables also has a technology for upgrading methanol into renewable jet fuel or gasoline, and in Germany the MS innogy is now taking passengers for a green tour on the beautiful Lake Baldeneysee. The MS innogy, the first vessel in Germany to be powered by methanol fuel cells, is a project by innogy, a leading distributor of green energy in Germany and the City of Essen. The methanol fuel cell system powering the vessel is developed and manufactured by the Danish fuel cell manufacture SerEnergy.

The MS innogy is a part of innogy's "greenfuel" project where they demonstrate the entire value chain of environmentally friendly methanol, from a green production of methanol using CO₂ from the surrounding air, green electricity and water, to the use of methanol as fuel in the excursion vessel and in cars.

It is an exciting time for renewable methanol, and it is expected that these technologies will continue to grow rapidly throughout 2018 and beyond.





WASHINGTON METHANOL POLICY FORUM

The Methanol Institute (MI), along with our partners the Institute for the Analysis of Global Security (IAGS), and the U.S. Energy Security Council (USESC), welcomed well over 100 attendees to our 2017 Washington Methanol Policy Forum at the National Press Club in Downtown Washington, DC. The June 2017 event built on previous successful Washington Methanol Policy Forums held in 2012 and 2014, and featured the inaugural presentation of the George A. Olah Memorial Lifetime Achievement Award by Dr. Olah's colleague University of Southern California Professor Surya Prakash to Paul Wuebben of Carbon Recycling International.

THE JUNE 2017 EVENT FEATURED THE INAUGURAL PRESENTATION OF THE GEORGE A. OLAH MEMORIAL LIFETIME ACHIEVEMENT AWARD

The Washington Methanol Policy Forum brought together industry leaders, energy policy experts, congressional and executive branch officials, academics and the media to share information about methanol's global penetration of the transportation fuel market and its implications for the U.S. economy. Experts from around the world provided the most up-to-date information on global methanol fuel blending initiatives.

Additionally, there was a keynote speech by WEI Anli, Deputy Secretary General, China Internal Combustion

Engine Industry Association (CICEIA)/Ministry of Industry and Information Technology (MIIT), and a special luncheon discussion with members of the USESC. USESC attendees included: Robert "Bud" McFarlane, former U.S. National Security Advisor; R. James Woolsey, former Director of Central Intelligence; John Hofmeister, former President, Shell Oil Company; C. Boyden Gray, former White House Counsel and Ambassador to the United Nations; J. Bennett Johnston, former U.S. Senator from Louisiana.

MI CEO Gregory Dolan noted the increasing



enthusiasm shown for methanol's use as an energy resource, particularly in vehicle and vessel fuel blending, saying "I'm pleased such a distinguished group of industry and policy experts chose to come together to make this forum such a success and help chart the path forward for methanol's inclusion in the U.S. fuel pool."

At a reception following the event, attendees heard from special guest Representative Eliot Engel of New York, who earlier in the day introduced the Open Fuel Standard Act in the U.S. House of Representatives, and spoke of the importance of broadening and diversifying the U.S. fuel pool to include methanol and other alternatives to gasoline.

MI would also like to extend a very special thank you to event sponsors Consolidated Energy Limited (CEL), Southern Chemical Corporation (SCC), OCI N.V., Methanex, Mitsui & Co. and SABIC, without whom the forum would not have been possible.

Video of the Forum in its entirety may be viewed on MI's YouTube Page at [YouTube.com/user/MethanolInstitute](https://www.youtube.com/user/MethanolInstitute)





IN MEMORIAM: GEORGE OLAH

Nobel Prize winning chemist George Olah passed away at his home in Beverly Hills, California on March 8th, 2017. He was 89 years old.

Olah had a profound influence on the world of hydrocarbon chemistry and his discoveries had great application to everyday life: He helped pave the way for less-polluting gasoline, more-effective oil refining and several modern drugs.

At the University of Southern California (USC), he was Distinguished Professor of Chemistry, Chemical Engineering and Materials Science, Donald P. and Katherine B. Loker Chair in Organic Chemistry and founding director of the Loker Hydrocarbon Research Institute in the USC Dornsife College of Letters, Arts and Sciences.

Olah's research also led to the development of a new kind of fuel cell, called the direct liquid methanol fuel cell, a highly efficient source of electricity. He developed new methods to convert existing natural gas (methane) directly and efficiently to methanol. However, the true methanol economy, Olah argued, will do without fossil fuels like natural gas, oil and coal, instead producing methanol by the reaction of hydrogen with carbon dioxide collected from exhaust gases from power plants and various industrial emissions.

Eventually, Olah proposed, it will be possible to separate atmospheric carbon dioxide and convert it to methanol, enabling mankind to liberate itself from dependence on fossil fuels. Olah co-authored the book *Beyond Oil and Gas: The Methanol Economy* with fellow USC professor, and holder of the George A. and Judith A. Olah Nobel Laureate Chair in Hydrocarbon Chemistry, Dr. G. K. Surya Prakash, and USC professor Dr. Alain Goeppert.

MI member **Carbon Recycling International (CRI)** named its George Olah Renewable Methanol Plant in Svartsengi, Iceland in honor of the Nobel Prize Laureate. In 2013, Professors Olah and Prakash received the first \$1 million Israeli Prime Minister's Prize for Innovation in Alternative Fuels for Transportation for their work on the Methanol Economy.

To honor the work of Dr. Olah, MI last year created two awards; the George A. Olah Memorial Lifetime Achievement Award which was presented at June's Washington Methanol Policy Forum to Paul Wuebben of CRI, and in November at the China Methanol Vehicle Forum to He Guangyuan, former Minister of the Chinese Ministry of Machinery. The second award, the George Olah Memorial Outstanding Contribution Award, was presented at the China Methanol Vehicle Forum to Li Shufu, Chairman of the Geely Group for Geely's work to introduce M100 cars, trucks and buses to China's market.



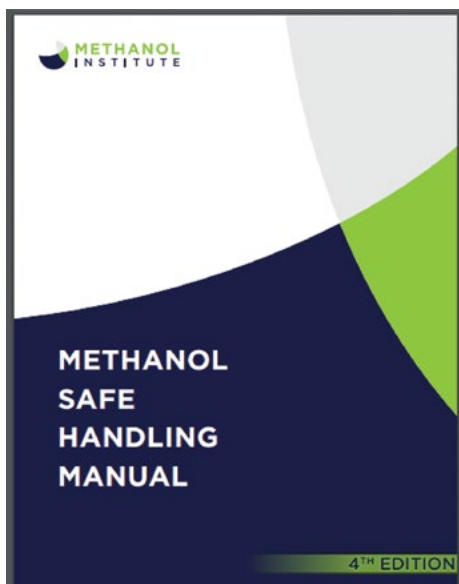
MI RELEASES 4TH EDITION OF METHANOL SAFE HANDLING MANUAL



In April 2017, MI, working closely with industry leaders, technology partners and customers enhanced our longstanding *Methanol Safe Handling Manual* to address both common and technical questions related to methanol handling, storage and transport. The deep collaboration of MI and our member companies in producing this vital resource for educational and training purposes highlights our continuing commitment to safety.

The manual has been thoroughly revised to be more user friendly and adaptable. The updated manual features a new section on process safety, with detailed explanation about key elements of Process Safety Management (PSM) which are in-line with the best industrial practices specific to methanol. The manual also includes a new chapter on fire safety which takes into account current best practices. In addition to the revised 263-page manual, MI has created a standalone module focusing specifically on health and safety, for users looking to directly access this critical information.

The updated *Methanol Safe Handling Manual* and *Health and Safety Module* are available to the general public at no cost on MI's website. An updated Methanol Safe Handling Video will be released in 2018 as well and will also be available at no cost on MI's website at www.methanol.org



MI MEMBER COMPANIES

- Atlantic Methanol Production Companies (AMPCO)
- Azelis
- Billion Miles
- BP Chemicals
- Carbon Recycling International (CRI)
- Clariant
- Coogee Chemicals Pty.
- Ecofuel
- Enkern
- FITech
- Fuel Freedom Foundation
- G2X Energy
- Haldor Topsoe
- HELM AG
- IGP Methanol
- International-Matex Tank Terminals (IMTT)
- Johnson Matthey
- Lebzi Halal
- J.S.C. Metafrax
- Methanex Corporation
- Methanol Holdings Trinidad Limited (MHTL)
- Mitsubishi Gas Chemical (MGC)
- Mitsubishi International Corporation
- Mitsui & Co., Ltd.
- Mitsui OSK
- Qatar Chemical & Petrochemical Marketing & Distribution Co (Muntajat) Q.J.S.C.
- Nakhodka Fertilizer Plant
- NW Innovation Works
- OCI N.V.
- Oman Methanol Company (OMC)
- PETRONAS Chemical Group (PCG)
- Qatar Fuel Additives Company Limited (QAFAC)
- SABIC Asia Pacific
- Salalah Methanol Company (SMC)
- Sipchem
- Solvadis Group
- Southern Chemical Corporation (SCC)
- Tricon Energy, Inc.
- United Chemical Company (UCC)
- Vitusa Products, Inc.



METHANOL INDUSTRY US JOB CREATION

According to a 2017 analysis MI commissioned from ADI Analytics, the U.S. methanol industry will create over 5,000 new permanent high-paying jobs, and 19,000 temporary construction jobs by 2020.

The ongoing growth of the methanol industry continues to demonstrate its position as one of the world's most vibrant and innovative industries. Shale gas supplies have led to several new methanol plant announcements, which will enable the U.S. to shift from being a net importer of methanol to a net exporter in the near future.

As the ADI analysis details, **a typical 1.5 million metric tons per annum methanol plant in the U.S. drives capital spending of \$1.1 billion, and an economic ripple effect worth an additional \$1.5 billion.**

Speaking on the release of the analysis, MI CEO Gregory Dolan noted “This is an exciting time for the U.S. domestic methanol industry. As the U.S. transitions to becoming a net methanol exporter, more Americans will be hired in high-paying jobs in the industry, and the economic benefits of this growth will be felt in many communities across the nation.”

Uday Turaga, Founder & CEO of ADI Analytics noted that “North America is oversupplied in natural gas thanks to shale, and methanol is a great way to monetize that resource. Methanol also has a wide range of applications, from a chemical feedstock to a transportation fuel, and can enable the U.S. to leverage its shale gas resource to expand trade, jobs, tax revenue, and other economic and employment benefits.” Mr. Turaga presented the results of the study at MI’s Washington Methanol Policy Forum in June 2017. The full analysis is available on MI’s website at www.methanol.org.

ECONOMIC IMPACT OF A TYPICAL U.S. METHANOL PLANT



MI SOCIAL MEDIA PLATFORMS

For the latest on MI activities, industry news, videos and more, please connect with MI through our many social media outlets.



Facebook: www.facebook.com/Methanol-Institute



YouTube: www.youtube.com/user/MethanolInstitute



LinkedIn: www.linkedin.com/company/methanol-institute



CEO Gregory Dolan's Twitter: <https://twitter.com/gdolan1>



Twitter: @methanoltoday - www.twitter.com/methanoltoday



CEO Gregory Dolan's LinkedIn: <https://www.linkedin.com/in/gregory-dolan-57b1194/>



UNESCO AWARDS KOREAN STUDENTS FOR METHANOL PROJECT

by Jaeyoung Kwak, Korea University

A team of students from Korea University (KU) met with Methanol Institute (MI) and Methanex Korea staff last March. The third-year students competed in an LG Innovation competition that sought to identify world-class technologies and how those could be used in Korea.

The students felt methanol could transform Korea, while addressing concerns over growing environmental pollution in the country.

Alongside of this, the Korea University team also participated in the UNESCO Climate Change Youth Frontier Initiative (UNESCO Frontier). The competition is organized by the Korea National Commission for UNESCO and the Korea Energy Agency. Teams are tasked with proposing to relevant industries and government agencies innovative and realistic new business ideas that relate to energy and climate change.

The KU students formed the *Methanology* team, whose goal was to create policy proposals for the technical development and promotion of a methanol ship. UNESCO Frontier judges awarded the students Second Prize for their efforts.

Jaeyoung Kwak, one of the students from the *Methanology* team, noted, "Air pollution is one of the most severe environmental global issues. The remarkable thing is that air pollution from shipping has been rapidly increasing over the past 10 years.

This is an honest reflection of the current state that technical improvements and political regulations on ship emissions are lagging behind those for vehicle emissions on land."

In Busan, one of the biggest port cities in Korea, the problem of air pollution caused by ship emissions has been reported several times, and public concern has begun to grow in recent years. As a solution to this problem, the *Methanology* team proposed a methanol ships using eco-friendly fuel – methanol – as an efficient and sustainable marine fuel.

Methanology gathered the specific information on

EAST ASIAN COUNTRIES AND INDUSTRIES HAVE BEGUN TO RECOGNIZE THE SERIOUSNESS OF AIR POLLUTION AND HAVE BEGUN TO FOCUS ON LOW-EMISSION MARINE FUELS.

advanced cases from other countries to show the Korean government the advantages and possibilities of methanol ships. MI and Joanne Ellis, manager of The Sustainable Marine Methanol (SUMMETH) project which is sponsored by the Swedish Maritime Administration, provided the results of research about technical feasibility and environmental benefits of methanol ships, as compared to those using heavy fuel oil (HFO) or marine gas oil (MGO). MI and Methanex Korea also provided information on the diverse R&D projects and the growth of the global market for methanol fuels. Additionally, Incheon Port Authority (IPA), which is running a pilot project running a ship on alternative fuels, shared its know-how on its ship's operations and the need for legal and policy amendments.



KOREA NATIONAL
COMMISSION FOR UNESCO

From its collected data, Team *Methanology* prepared a policy proposal for technology development and expansion of methanol ships and submitted it to the Korean Ministry of Oceans and Fisheries (MoF) and to the Yeosu-Gwangyang Port Authority. This proposal particularly focuses on the delivery of practical and professional information for the introduction of methanol ships, including economic and technical aspects, proper location and government support. It also generated substantial interest from the shipping industry in the viability of methanol as a marine fuel and several interested parties (ISSAC E&C, SEAWARD Ship Management Co, Ltd) and a Korean television station, considered making a documentary on the marine environment and methanol-powered ships.



Methanology also submitted articles on *Oh My News*, an Internet daily newspaper, to inform the public about the environmental benefits of methanol as a marine fuel. *Oh My News* published the article on October 10. The Korean National Commission for UNESCO appreciated the students' activities, and published the UNESCO Frontier Comprehensive Report dealing with their overall accomplishments.

As shown by the results of the *Methanology* study, East Asian countries and industries have begun to recognize the seriousness of air pollution and have begun to focus on low-emission marine fuels. These changes will bring with them opportunity for the methanol industry, offering the possibility of methanol's application as a fuel. This will be a completely new chance to broaden the market for methanol moving forward.

MI STANDING MEMBER COMMITTEES

LEGISLATIVE/REGULATORY AFFAIRS

Directs all international public policy advocacies.

- MI's Legislative & Regulatory Committee is focused on interactions with governments around the globe to ensure that the development of public policy utilize the best available scientific evidence and do not unduly hinder the growth of the methanol industry.
- As the chemical industry globally comes under increasing regulatory scrutiny, the Committee is charged with ensuring that the methanol industry meets every challenge head on.
- The Committee addresses regulatory challenges for developing applications in energy and fuel in addition to proactively monitoring traditional products such as formaldehyde and MTBE.

PRODUCT STEWARDSHIP

Responsible for methanol health & safety activities.

- MI's Product Stewardship Committee (PSC) is responsible for overseeing efforts to promote health and safety activities throughout the global supply chain.
- The Committee oversees the continuous improvement and distribution of MI's critical *Methanol Safe Handling Manual* and related documents, ensuring best practice and safety information is transferred to producers, distributors and consumers.
- The PSC also is responsible for addressing issues related to methanol health and safety that arise around the globe, including oversight of the Bootleg Alcohol Prevention Subcommittee (BAPS).

MARKET DEVELOPMENT

Facilitating the development of methanol applications in a number of emerging markets.

- From fostering emerging technology companies to promoting the use of methanol as a vital energy solution, the MDC is focused on augmenting methanol markets around the globe.
- The Committee oversees issues related to the use of commercialization of methanol fueled industrial boilers & cook stoves, methanol-to-olefins (MTO), renewable methanol, small-scale methanol technology (SSMT), methanol fuel cells, methanol-to-power and wastewater treatment.

GLOBAL FUEL BLENDING

Encourages the growth of methanol fuel blending worldwide.

- Aggregate all relevant technical & emissions data on methanol fuel blending (low, mid, & high level).
- Identify research needs & fund appropriate testing programs that fill information gaps and share with all relevant stakeholders.
- Support & lobby for public policy directives that encourage the use of methanol as a global transport fuel, and defend and support methanol inclusion in fuel regulations worldwide.

MARINE FUEL

Encourages the growth of methanol fuel blending worldwide.

- The Marine Fuels Committee is focused on expanding methanol as a marine fuel by:
 - Developing and advocating for supporting legislation which allows for the safe and efficient use of methanol as a marine fuel.
 - Proving conversion, new build and infrastructure economics.
 - Addressing supply & demand issues.
 - Advocating and promoting environmental benefits.
 - Providing best practices and safe handling.

OUR 2018 MEMBERS

 the power of agility		 METHANOL HOLDINGS (TERMINAL) LTD			
	 Mitsubishi Gas Chemical America, Inc	 MITSUI & CO.		 Emas Methanol Company LLC	 PETRONAS
	 شركة سابك للميثانول في ج.م. (المنطقة الحرة) Sahab Methanol Company LLC (SFC)	 GX G2XENERGY	 JM Johnson Matthey Inspiring science, enhancing life	 سبكيم Sipchem	 eni ecofuel
 Mitsubishi International Corporation			 METAFRAX		
 CARBON RECYCLING INTERNATIONAL	 MOL Mitsui O.S.K. Lines			 United Chemical Company	 INTERNATIONAL METHANOL TANK TERMINALS
 SCC SOUTHERN CHEMICAL CORPORATION		 VITUSA PRODUCTS™ INCORPORATED	 Double Green Bridge	 azelis	 NAKHODKA FERTILIZER PLANT
		 HALDOR TOPSOE	 CoogeeEnergy	 CLARIANT	 solvadis
 FUEL FREEDOM FOUNDATION CHEAPER, CLEANER, AMERICAN-MADE					

MEMBERSHIP TIERS

"WHERE YOU FIT IN"

TIER	TIER	TIER	TIER	TIER
01	02	03	04	RA
Major Methanol Producers	Methanol Producers	Associate Members	Affiliate Members (non-producers)	Reciprocal Members

ANNUAL DUES

\$200,000

CRITERIA

Major producers of methanol (over 1.5 MMT per year).

BENEFITS

- Appoint two voting representatives to the Board of Directors
- Membership on the MI Executive Committee
- Ability to serve as Board Officer, including Chairman & Vice Chairman
- Ability to Chair Standing Committee(s)

ANNUAL DUES

\$100,000

CRITERIA

Organizations which are producers of methanol or are otherwise interested in promoting the interests of the methanol industry

BENEFITS

- Appoint one voting representative to the Board of Directors
- May be invited to participate in Executive Committee meetings (non-voting)
- Ability to serve as Board Secretary or Treasurer
- Ability to Chair Standing Committee(s)

ANNUAL DUES

\$50,000

CRITERIA

Minimum level of membership for methanol producers. Also includes non-producers and sellers of methanol who are interested in promoting the interests of the methanol industry.

BENEFITS

- May participate in Board of Directors meetings (non-voting)
- Ability to Chair Standing Committee(s)

ANNUAL DUES

\$15,000

CRITERIA

Organizations that are interested in promoting the interests of the methanol industry.

BENEFITS

- Ability to participate in Standing Committee(s)

ANNUAL DUES

N/A

CRITERIA

Allied trade associations and other non-profit organizations who are interested in promoting the interests of the methanol industry.

BENEFITS

- Cross-listing in membership directories and websites
- Sharing of newsletters and informational resources
- Joint legislative/regulatory activities
- Co-sponsored research initiatives

2018 METHANOL INSTITUTE CALENDAR OF EVENTS

FEBRUARY, 2018

February 8TH - February 9TH

IMPCA Mississippi Conference America

📍 New Orleans, LA, USA

🌐 www.impca.eu/IMPCA/

February 13TH

ADI Analytics: 2018 North America Natural Gas and NGL Forum

📍 Houston, Texas

🌐 <https://adi-analytics.com/2017/07/14/2017-north-america-natural-gas-and-ngl-forum/>

February 19TH - February 21ST

ME-TECH 2018: Middle East Technology Forum

📍 Dubai, UAE

🌐 <https://europetro.com/event/me-tech2018/0>

February 26TH - February 1ST

CRU: Nitrogen + Syngas 2018

📍 Gothenburg, Sweden

🌐 <https://events.crugroup.com/nitrogenandsyngas/home>

MARCH, 2018

March 12TH - March 14TH

CT Maritime Association: Shipping 2018

📍 Stamford, Connecticut, USA

🌐 <http://www.cmashipping2018.com/>

March 14TH - March 16TH

APM 2018: Asia Pacific Marine

📍 Singapore

🌐 <https://www.apmaritime.com/>

March 19TH - March 23RD

WPC 2018: 33rd Annual World Petrochemical Conference

📍 Houston, Texas

🌐 <https://wpc.ihsmarkit.com/registration/>

March 20TH

MAN/MI Marine Workshop

📍 Copenhagen, Denmark

🌐 www.methanol.org

March 23RD

MI Board Meeting

📍 Houston, Texas

✉ garmstrong@methanol.org

March 25TH - March 27TH

AFPM: 2018 International Petrochemical Conference

📍 San Antonio, Texas

🌐 <https://www2.afpm.org/forms/meeting/Microsite/IPC18>

APRIL, 2018

April 11TH - April 13TH

Sea Japan 2018

📍 Tokyo, Japan

🌐 <http://www.seajapan.ne.jp/en/>

April 12TH - April 13TH

CIS Petrochemicals

📍 Moscow, Russia

🌐 <https://www.globuc.com/cispetrochemicals/>

April 15TH - April 17TH

11th International Symposium on Fuels and Lubricants

📍 New Delhi, India

🌐 <http://isflindia.in/>

MAY, 2018

May 9TH - May 10TH

APIC 2018: Asia Petrochemical Industry Conference

📍 Kuala Lumpur, Malaysia

🌐 <http://apic2018.org.my/>

May 10TH - May 12TH

CNFIA: China Methanol Industry Conference

📍 Hangzhou, China

May 16TH - May 17TH

CAAEEFA: China Alcohol and Ether Fuel and Automobile Annual Conference

📍 Hangzhou, China

JUNE, 2018

June 14TH

MI Board Meeting

📍 Como, Italy

✉ garmstrong@methanol.org

June 14TH - June 15TH

IMPCA European Mini-Conference

📍 Como, Italy

🌐 www.impca.eu/IMPCA/IMPCA/Future-Conferences

SEPTEMBER, 2018

September 11TH - September 13TH

Argus Methanol Forum

📍 Houston, TX, USA

🌐 <http://www.argusmedia.com/events/argus-events/americas/>

OCTOBER, 2018

October 5TH - October 6TH

36th IHS World Methanol Conference

📍 Vienna, Austria

🌐 www.ihs.com/events/index.html

October 29TH - November 2ND

Singapore International Energy Week 2018

📍 Singapore

🌐 <https://www.siew.sg/>

NOVEMBER, 2018

November 6TH - November 8TH

IMPCA Asian Methanol Conference

📍 Singapore

🌐 <http://www.impca.eu/IMPCA>

November 10TH

MI Board Meeting

📍 Muscat, Oman

✉ sg@methanol.org

November TBD

13th Annual GPCA Forum

📍 Dubai, UAE

🌐 <http://www.gpcaforum.net/>



WWW.METHANOL.ORG
WWW.METHANOLFUELS.ORG

