

GPAE Annual Conference Is on the Horizon

The Marriott Hotel, The Hague, The Netherlands
4th – 6th June 2025

3 days. Endless Ideas.
Registration is open!



Get Ready

A conference and networking event organised by GPAE for the European Gas Processing Industry.

One of the strengths of GPAE is the large number of people who have been active members of our organisation and the industry for many years – several of whom will be presenting.

Our conference kicks off on Wednesday 4th June with a Workshop in the afternoon. The Technical Conference starts on Thursday 5th June.

We also have separate, dedicated training sessions for our Young Professionals on Wednesday 4th June. This one-day event is FREE for members' Young Professionals to attend.

Why attend?

Our Annual Conference brings together business and technical leaders from a range of gas processing organisations.

- 1 **Learn** Immerse yourself in three days of technical talks and presentations
- 2 **Explore** Discover innovations from GPAE partners in one space
- 3 **Connect** Take time to network with other attendees
- 4 **Have Fun** The week wouldn't be complete without our Conference Dinner. Additional activities include our Welcome and Exhibitor Reception

What's On?

YP Training Day

We have a Young Professional Training Day on Wednesday 4th June.

FREE to members' Young Professionals.

Workshop

A high-quality afternoon Workshop on 4th June.

Workshop Theme: Purification of Gas for Cryogenic Processes

Keynote Address

Don't miss the Keynote address.

Panel Discussion

90 minutes, bringing participants' fascinating debate and big picture outlooks from some of the big names in the gas processing industry.

Panel Theme: Roadmap or Roadblock? CO₂ and Hydrogen pipelines.

Technical Conference

Hear from selected speakers during the event.

Themes include:

- CO₂ Infrastructure
- Green Hydrogen / Green Ammonia
- CO₂ Capture
- Traditional Gas Industry

Exhibition

We have limited exhibition space.

An opportunity to promote your organisation and exhibit your wares.

Welcome Reception

Join us late afternoon/early evening in the Marriott Hotel for drinks, canapés, and networking.

Conference Dinner

A Conference dinner will take place on 5th June, giving you more opportunity to network with your fellow delegates.

Hotel

GPAE have secured a limited number of discounted rooms at The Hague Marriott Hotel.



Agenda Overview

What's happening and where?
Start perusing the agenda overview and begin to map out your GPAE experience.

All times are listed in Central European Time, the event's time zone.
Please note: agenda items and times are subject to change.

Wednesday 4TH June

Sessions		Meals & Networking
12pm		Welcome & Refreshments
1pm	Workshop	
2pm		
3pm		
4pm		
5pm		Welcome Reception
6pm		
7pm		

Thursday 5th June

Sessions		Meals & Networking
8am		Welcome & Refreshments
9am	Keynote Speech	
10am	Panel Discussion	
11am		
12pm		Lunch
1pm	Technical Conference	
2pm		
3pm		
4pm		Exhibitor Reception
5pm		
6pm		
7pm		Conference Dinner
8pm		
9pm		
10pm		
11pm		

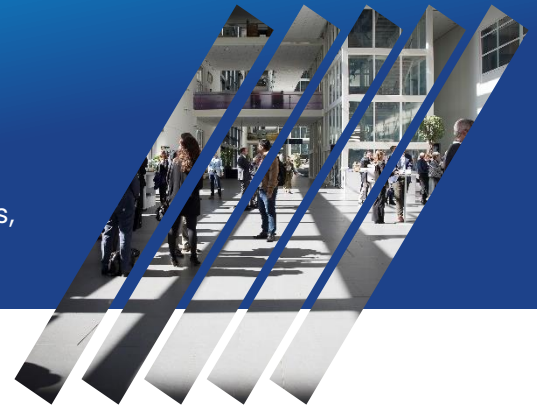
Friday 6th June

	Sessions	Meals & Networking
8am		Welcome & Refreshments
9am	Technical Conference	
10am		
11am		
12pm		
1pm		Lunch
2pm	Technical Conference	
3pm		
4pm		

**** on Friday, the Conference is scheduled to finish at 4:00pm ****

Sponsors & Exhibitor Opportunities

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Interested in sponsoring or exhibiting? Join a select group of sponsors,
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Sponsorship

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Our conference provides a direct marketing channel to commercial and technical leaders from the whole gas processing value chain. You can meet and engage with member companies, all in one place.

The Benefits of Sponsoring

- 1 Networking**
Make valuable connections as you interact with GPA Europe loyalists and key industry leaders
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Improve your exposure and visibility as you position your organisation as an essential GPA Europe partner
- 3 Advertising opportunities**
Purchase from a range of advertising options in print and digital

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John M. Campbell

Exhibitor
 **SulfaTrap**
Taking Sulfur Out of the Equation

Focused Programme

Learn more about the unique programming
GPAE Annual Conference has to offer.



We are delighted to present our 3-day programme to you.

** Please note this programme is subject to change. Information is being added/updated on a continuous basis, so please check back regularly. **

Workshop

Wednesday 4th June

Workshop Theme

The Workshop Theme at this year's conference is: **Purification of Gas for Cryogenic Processes**

Note: the workshop must be booked in conjunction with one of our conference passes.

Target Participants

This is a technical session. The session is intended for people in technical or business development roles who are courageous and confident enough to participate and contribute.

The numbers will be capped at 40 participants so if you are interested then don't delay - register asap.

The workshop is aimed at experienced industry professionals (5+ years in industry).

Workshop Certificate

A Gas Processors Association Europe certificate will be issued to all attendees.

Workshop Speakers & Abstracts

Designing and commissioning Activated Carbon Filters for Purification of Gas Scrubber Liquids

Speaker: Marcel Scholten, Norit Activated Carbon

Several processes are known for the removal of acidic gases such as H₂S and CO₂ from neutral industrial gases, most of which are based on absorption of the acidic gases by alkaline liquids. Such as Organic-alkanolamines (MEA, DEA etc.). During repeated recirculation of the absorbent, organic impurities accumulate in the absorbent. The organic impurities are usually degradation products having a corrosive nature. After prolonged use, the absorbent becomes corrosive to an extent, proportional to its age, and in addition becomes less effective for absorption of acid gases. Further, accumulation of higher hydrocarbons may give foaming problems in time.

In many systems, the gas treater liquid is purified with Granular Activated Carbon (GAC) or Extruded Activated Carbon (EAC) to remove the organic impurities to such an extent that the absorption system runs well.

The presentation will delve into how Norit's technical support can enhance gas scrubber system performance by assisting with the selection of optimal GAC or EAC types, providing technical input for filter design, supporting commissioning engineers during system setup, and offering detailed spent carbon sample analysis.

Hydrocarbon Dewpoint; the Gap Between Theory and Reality

Speaker: Paul Stockwell, Process Vision Ltd

For decades, hydrocarbon dewpoint has served as the industry's standard for determining gas "dryness" in natural gas transmission and distribution. However, recent findings are suggesting that relying solely on hydrocarbon dewpoint is not enough to ensure dry gas. Widely variable results across dewpoint measurement methods highlight a significant accuracy gap that leads to undetected liquids in pipelines. This variability introduces risks to operations, making a case for advanced tools to provide a more comprehensive approach to gas quality.

Traditional hydrocarbon dewpoint is a key factor in gas sales contracts, determining if natural gas supplies meet the "dry gas" criteria essential for safe transmission. Even small volumes of liquids—mist or stratified flows of hydrocarbons—can cause increased risks, increased costs and operational challenges and downstream. When these go undetected, they can lead to equipment damage, costly disruptions, and inefficient operations. Unfortunately, variations in dewpoint measurement and calculation methods can create uncertainty about the true condition of gas in the pipeline, with the error for a single gas mixture sometimes spanning up to 186°F (103.6°C). This inconsistency is a growing concern for gas suppliers and end-users alike.

This paper will show examples of errors observed in the field and introduce a solution on how to bridge this reliability gap and how the introduction of advanced visual monitoring technologies can improve efficiency and performance of both gas processors and gas transportation.

Real-time visualisation of gas flows inside high-pressure pipelines allows operators to detect actual liquid presence directly. Unlike hydrocarbon dewpoint calculations, which provides only inferred data about liquid formation based on pressure and temperature calculations. This live video feed enables operators to spot liquid mist, stratified flows, and small volumes of natural gas liquids (NGLs) that traditional measurements fail to report.

The implications of this approach are transformative. With real-time visual data, operators can swiftly identify and address liquid contamination issues, improving pipeline integrity, optimising system maintenance, and protecting against costly disruptions. This paper advocates for a new approach into standard gas quality protocols, where advanced visual monitoring is incorporated as a complementary tool to hydrocarbon dewpoint, ensuring that gas quality measurements are both accurate and reliable.

CO₂ Ethane Separation Using Cellulose Triacetate Based Hollow Fiber Membranes for Cryogenic Plants

Speaker: Dr. Hans Kumar, SLB

CO₂ removal using amine units is a common pre-treatment requirement upstream of Cryogenic NGL recovery plants. Typically, the maximum allowable CO₂ in the Cryo unit feed is dictated by the CO₂ specifications in the residue gas (export gas) from the Cryo plant and by the CO₂ specs in the export NGL. If these specifications do not dictate the CO₂ limit in the feed, CO₂ freezing in the demethanizer column will determine the maximum allowable feed gas CO₂ content. Factors such as operating pressure of the demethanizer column, the amount of heavier hydrocarbons in the gas (GPM of C₂+), and the extent of ethane recovery in the cryo plant, further impact the CO₂ freezing in the column.

Changes in the reservoir production behaviour in an existing operating Cryo plant such as increased CO₂ content in the feed can often become bottlenecks for the cryo plants, especially when higher ethane recoveries are desired. One obvious solution to handle the increased CO₂ in the feed gas scenario is to add extra amine treatment capacity in the gas pretreatment section to remove the excess CO₂. However, this option requires significant capital investment.

Because of the similar volatility of CO₂ and ethane, majority of CO₂ tend to stay with the ethane product. This paper will discuss an alternative debottlenecking scenario where the overhead from the deethanizer column can be processed in a hollow-fiber Cellulose Triacetate (CTA) membrane unit to reduce the CO₂ content in the export ethane product. Alternatively, if a separate distillation column is used for the separation of CO₂ and ethane, membranes can be used to break the ethane-CO₂ azeotrope for higher CO₂ recovery. CTA hollow fiber membranes have been extensively used in the oil and gas industry for separating CO₂ from natural gas, but not much work has been done for separating CO₂ from ethane. Test results for the ethane CO₂ separation will be presented. The larger molecular size of ethane compared to methane provides much higher selectivities for CO₂-C₂ separation compared to CO₂-C₁ separation. High ethane selectivities of membranes results in high ethane recoveries. Implementing a membrane unit to handle the increased CO₂ content in the feed gas offers attractive option for operators. This presentation will discuss a case study demonstrating the advantages of a membrane-based Cryogenic unit for separating CO₂ from ethane.

LNG pre-treatment - Heavy Hydrocarbon Removal from Lean Natural Gas

Speaker: Dr. Tobias Eckardt, BASF

Aromatic compounds, such as benzene, toluene, ethylbenzene, and xylene (BTEX), have relatively high frost points in methane, leading to early freezing in the cold section of an LNG plant. Traditionally, these hydrocarbons have been removed in a Scrub Column or in a NGL Recovery unit with a turbo-expander process. Increasingly, LNG plants, especially in North America, are fed by natural gas from the pipeline grid. NGL's have been extracted from this gas, resulting in a lean gas with a tail of heavy hydrocarbons in trace concentrations.

Liquefied natural gas (LNG) is produced by cooling natural gas to negative 160°C. Prior to cooling to these low temperatures, impurities must be removed from the gas to ensure proper performance of the downstream liquefaction process. A standard pre-treatment line-up consists of an acid gas removal unit (AGRU), a molecular sieve dehydration unit to remove water to <0.1ppm, and a mercury removal unit. It wasn't until the first baseload LNG plants in the United States processing lean gas started up in the mid-2010s and began to experience freezing in the cryogenic heat exchangers that this typical pre-treatment approach was questioned. Meanwhile, the industry has acknowledged and started to address the freezing problem, which reduces LNG throughput throughout the region.

The freezing of coldboxes in US LNG plants is due to traces of heavy hydrocarbons (HHCs) in otherwise lean natural gas, which are not removed prior to the cold section of the plant. Depending on the design of the plant, HHC freezing can occur as far upstream as the gas/gas heat exchanger upstream of the turboexpander. However, it is more common for the freezing to occur in the cryogenic heat exchanger of the plant. US LNG plants have addressed the HHC freezing problem by reducing throughput or completely shutting down the trains to warm up the coldbox to derime. This process leads to flaring of natural gas and excess energy consumption due to warming and cooling of the coldbox.

It has been shown that for an existing plant and for new LNG development projects adsorptive removal of heavy hydrocarbons and water in a TSA system is a viable option to prevent HHC freezing. Especially as a drop-in solution, implementing adsorptive HHC removal in the pre-treatment section is a powerful approach to debottleneck LNG plant without or with minimal CAPEX spending.

The interactive Workshop will address technology fundamentals as well as limitations and advantages of different approaches to address HHC freezeout. Operational data from existing plants will be discussed.

Panel Discussion

Thursday 5th June

This year's panel theme is: **“Roadmap or Roadblock: CO2 and Hydrogen Pipelines”**.

A 90-minute session, bringing participants' fascinating debate and big picture outlooks from some of the big names in the Gas Processing Industry, covering topics such as pipeline material specifications and operating conditions, gas compositional limits and learnings from recent projects.

Panel Moderator:

1. Stuart Penson, Gulf Energy Information

Meet our Panellists

1. Dr. Manohara Gudiyor Veerabhadrapa, Senior Scientist, NPL Management Ltd
2. Peter van Elferen, Project Manager, Gasunie
3. Thomas Fontfreyde, Delivery Manager, Genesis Energies
4. Thomas de Cazenove, Senior Engineer CO2 Abatement Deployment – SME CO2 Processing and Liquefaction, Shell

Technical Conference Sessions

There will be technical paper presentations on the following themes:

- CO2 Infrastructure
- Green Hydrogen / Green Ammonia
- CO2 Capture
- Traditional Gas Industry

Thursday 5th June

CO2 Conditioning - Design Challenges

Speakers: Myrian Schenk - Baker Hughes (BH), and Tobias Eckardt - BASF

Authors: Myrian Schenk (BH), A. Cruz (BH), C. Weingaertner (BH) H. Albaroudi (BH) and Tobias Eckardt (BASF), P. Greene (BASF), H.N. Cao (BASF)

Carbon capture and sequestration (CCS) is a technology that is ready to be implemented to reduce the impact of greenhouse emissions and to reduce global warming. Carbon dioxide is captured at the point source then transported and mostly stored permanently in geological formations, preventing its release to the atmosphere. More than six billion tonnes of CO₂ will have to be transported from the CO₂ sources to storage sites by 2050 to meet the requirements of the International Energy Agency (the 2-degree scenario), requiring large investments also in transportation infrastructure.

Injecting CO₂ downhole is not a new process requiring new technology. The oil and gas industry has been doing this since the 1960s, when high-pressure CO₂ was used for enhanced oil recovery.

Independent of the technology used for the capture, the CO₂ needs to be conditioned before it can be transported and injected into selected reservoirs. Steps of purification and compression are always needed, and different impurities will be present depending on the CO₂ source. In general transport can be done in liquid (example shipping) or dense phase (example pipelines).

Even though first projects have been commissioned there are no industry-wide agreed specifications for the treated CO₂. Allowed contaminant concentrations will affect design considerations and employed technologies. In fact, the purification effort will vary from project to project.

We know for certain, that the impurities will change the thermodynamic/physical behaviour of the CO₂ and some impurities will need to be removed or dealt with in transport/injection.

In this work we show the impact of removing impurities during purification versus dealing with them in the transportation. We will use a “backwards approach” (i.e. starting from the today required specifications- which are various) to identify which contaminants are difficult to remove. A trade-off and determining an acceptable level of accuracy is required to minimise costs- a qualitative analysis will be presented.

Process Design Considerations In Defining The Refrigeration Techniques For CO2 Handling Facilities

Speaker: Paolo Cari - Saipem SpA

Authors: Paolo Cari and Alessandro Mari - Saipem SpA

As the global natural gas industry accelerates its efforts towards decarbonization, the requirement for carbon capture, utilization and storage (CCUS) facilities is becoming essential. Either as additional to any industrial plant or as stand-alone (i.e. hubs), the CCUS facilities are meant to provide the most effective way to collect, treat, store and utilize or dispose the CO₂-rich streams.

The final utilization and destination market for any CO₂ product stream is the driver to select the proper treatment process, affecting and governing the different design choices and concepts. Among the several contributing factors, whether the CO₂ streams should follow the sequestration path (i.e. geological storage) or different industrial utilizations (i.e. e-fuels), the transportation method is key to define the required CCUS facilities, as it governs the required physical state of the CO₂ product; liquid CO₂ (LOC₂) or supercritical CO₂ (SCO₂) are the most efficient means, due to liquid-like physical properties which favour the transportation via pipelines, ship or trucks.

Consequently, since the CO₂ handling facilities should be designed to achieve the required physical state of the product, they often include refrigeration facilities, which may imply different fluids or process schemes. These facilities are similar to those normally applied to the Oil & Gas industry, even if the peculiarities of the CO₂ may allow some variations – on the theme, opening up to interesting, efficient and fit-for-purpose solutions.

Starting from case studies developed by SAIPEM experience gained in executing several CCUS projects as EPC Contractor, this paper presents a thorough analysis of the process design considerations used in evaluating and defining the refrigeration techniques in CO₂ handling facilities, with some specific focus on refrigerant fluid selection (HC vs. NH₃ vs. CO₂) and process scheme (external refrigeration vs. auto-refrigeration).

Carbon Capture: An Integrated Solution

Speaker: Leorelis Vasquez – Worley Comprimio

Authors: Leorelis Vasquez and Nathan Smith – Worley Comprimio

Through a life cycle cost of evaluation of various technology routes and comparing the strongest route with novel and mature technology, Worley will demonstrate that there is no ‘silver Carbon Capture bullet’ residing in the near future and that other project cost reduction measures and economic stimulus will be necessary to accelerate carbon capture deployment.

The paper will assist with gaining a better understanding of carbon capture cost components, the relative contribution of CAPEX and lifecycle OPEX in that total cost, and what portion is shaped by discrete ISBL technology choices. The paper will show how technology can be systematically evaluated against completed classes and how costs can be projected vs. time as a function of pre and post commercialized learning curves.

In addition, Worley will discuss options for amine based carbon capture solutions on how the selection of gas pre-treatment and solvent reclaiming can be essential in finding the optimal solution for whole life cycle value evaluation.

Selection of Compression System(s) for Green Hydrogen Facilities

Speaker: Asif Ali – Bechtel

Authors: Asif Ali, Esme Elman, and Dr. Andrew Till – Bechtel

Bechtel has developed a design template for modular electrolysis plants, scalable to GW capacities, to produce green hydrogen with downstream compression to storage pressures. With relatively lower volumetric energy density and its unique physical characteristics, hydrogen presents a variety of challenges to efficient compression.

The paper focuses on presenting the decision-making process when selecting an efficient combination of technologies to achieve the necessary compression solution. The effect of the key factors providing the basis of the selection, such as process parameters, compressor types, electrolyser types, scalability, efficiency and power consumption, integration of interstage cooling, sparing and maintenance requirements, turndown and flexibility, integration of compression train(s) with downstream processes, technology readiness level, supply chain constraints, compression building design and integration with plant facilities etc has been discussed.

A survey of commercially available compression technologies for this specific application with the design sufficiently developed to support the decision-making process has been presented. Due to unprecedented combination of flowrates and pressures ratios, no single compression technology can provide the solution – it is a hybrid approach comprising a combination of compression technologies that is required.

Modeling Equilibria and Fluid Properties of Hydrogen Mixtures for a Sustainable Energy Economy

Speaker: Dr. Behnam Salimi – KBC Process Technology

Authors: Behnam Salimi, António J. Queimada, Xiaohong Zhang, Nuno Pedrosa, and Richard Szczepanski – KBC Process Technology

The transition to a hydrogen-based economy is key to achieving a low-carbon energy future, as highlighted by the European Union and United Kingdom governments. Hydrogen, the universe's most abundant element, offers a clean alternative to fossil fuels for transportation and chemical industries, producing only water when used. It also serves as a means to store surplus renewable energy. However, challenges such as energy-intensive production, high-pressure storage, and specialized transport infrastructure hinder its widespread adoption. Addressing safety concerns, including hydrogen's explosiveness, is crucial for deployment in densely populated areas.

This work examines the capabilities of existing thermodynamic and transport property models in Multiflash® to predict the physical behaviour of hydrogen-rich mixtures, particularly for integration into existing energy systems. We focus on key properties such as density, viscosity, heat capacity, and phase behaviour, including hydrogen solubility in brines and the formation of gas hydrates. Standard cubic equations of state (EoS) and high-accuracy models like GERG are evaluated, with suggested improvements to enhance predictive accuracy. Additionally, we assess the compatibility of hydrogen-natural gas mixtures for current energy infrastructure, providing insights into safe and efficient transport and storage solutions. This analysis supports the development of robust models for the hydrogen economy.

The Factors Affecting the Design of Hydrogen Plants Based on PEM and Alkaline Electrolysers

Speaker & Author: Dr. Andrew Till – Bechtel

Bechtel has developed modular designs for green hydrogen plants, scalable to GW capacities, based on PEM, Pressurised and Atmospheric Alkaline Electrolysers. These modular designs include all electrical systems, electrolysers, compression, and gas conditioning.

The PEM, Pressurised and Atmospheric Alkaline Electrolysers have their pros and cons. This paper presents some of the key design considerations for hydrogen plants based on PEM, Pressurised and Atmospheric Alkaline Electrolysers, such as safety (in operation and construction), plant design and layout, building size, utility requirements and equipment count.

It also investigates the removal and replacement of electrolyser stacks, areas that to date are often neglected. Alkaline electrolyser stacks typically exceed 2m in diameter and 6m in length and can weigh up to 60 tonnes. A 1-GW plant can have as many as 200 stacks, which, at the end of their life, must be removed and replaced. Bechtel analyses the operational safety, access and layout, along with the different methods of mechanical handling for the safe and efficient lifting, moving and replacement of these alkaline electrolyser stacks. This includes cranes, forklift trucks, hydraulic lifting, crawler and rail systems. These themes need to be addressed at an early stage of the project design, when layout and buildings are still in draft.

Friday 6th June

Resolution on Free Water Carryover in C3+ NGL Product at NGL Producing Facilities

Speaker: Taib Abang – Saudi Aramco

Authors: Ali M Al-Abbas and Taib B Abang – Saudi Aramco

Saudi Aramco own and operate the different hydrocarbon networks with the involvement of multiple business lines. One of those networks is the Natural Gas Liquid (NGL) products. These products, C2+ & C3+ NGL are being transferred mainly from Gas processing Plants and Gas Oil separation Plants to NGL facilities to supply petrochemical and refineries with Natural Gas Liquid components.

One of the major contaminants in NGL streams is free water. Efficient removal of free water in C3+ NGL is crucial to mitigate water accumulation inside the pipeline and ensuring stable operations for downstream NGL fractionation plant, especially depropanizer column. There are various factors that could result in high water carryover in NGL stream from design and operations perspective.

The paper presents a successful case study focusing on the control strategy of water removal in the condensate feed drums. Four key operating parameters for effective gravity separation by feed drums include optimum water interface level, level control in auto mode, fixed & mid-range level set point and water valve opening within operable limits. The paper details the methodology, challenges encountered, and key performance indicators that demonstrate the effectiveness of this innovative approach in achieving operational success and product quality compliance.

Enhancing Acid Gas Separation with Durable PIM-1 Membranes in Hybrid Systems

Speaker: Dr. Faiz Almansour – Saudi Aramco

Authors: Dr. Faiz Almansour and Ahmed Ameen – Saudi Aramco

The treatment of sour gas streams needs innovative methods to efficiently separate hydrogen sulfide (H₂S) and carbon dioxide (CO₂) while minimizing hydrocarbon losses and reducing energy consumption. This work explores the integration of Polymers of Intrinsic Microporosity (PIM-1) based membranes with amine sweetening in a hybrid system designed for sustainable acid gas separation. Known for their high permeability and selectivity, PIM-1 membranes offer a robust solution for acid gas removal while addressing the challenges of hydrocarbon recovery and operational efficiency.

A major focus of this research is mitigating the aging of PIM-1 membranes, which can affect their long-term stability. Aging challenges were addressed using three strategies: alcohol vapor treatment to enhance structural stability, the incorporation of highly functionalized graphene oxide into mixed matrix membranes to improve durability and blending with Cardo-based polymers to increase robustness. These advancements significantly extend the lifespan and performance of PIM-1 membranes under industrial conditions.

The hybrid system demonstrated efficient acid gas separation with reduced hydrocarbon slippage and lower energy demands. By decreasing the thermal requirements for amine regeneration, the system achieved a notable reduction in CO₂ emissions and overall carbon footprint. These findings underscore the potential of PIM-1 based membranes as a scalable and sustainable solution for sour gas treatment in industrial applications.

Iron Sulphide – Friend or Foe Revisited

Speaker: Michael Sheilan, SGS Amine Experts

Authors: Ben Spooner, P.Eng and Michael Sheilan, Amine Experts Inc.

Twenty years ago, Amine Experts published a seminal paper on H₂S corrosion in amine systems, titled “Iron Sulphide – Friend or Foe”. The paper described the various forms of iron sulphide formed from the reaction between H₂S and steel and how knowledge of these corrosive byproducts can provide a clue as to the formation mechanism, the severity of the potential corrosive environment and the degree to which the corrosion will affect operation of an amine unit.

Amine plants treating gas containing H₂S will have iron sulphides in the system. Are iron sulphides a good or bad thing? When do they help and when do they hinder? They are known for many things: forming protective films but yet promote fouling and are pyrophoric. The original paper attempted to clarify the pros and cons of iron sulphides present in an amine system. This paper will build on another 20 years of experience and knowledge gained through troubleshooting 100’s of amine units around the globe, specifically targeting guidelines on operating low pressure units like Acid Gas Enrichment (AGE) and Tail Gas Treating Units (TGTU), both becoming more prevalent in Middle East gas production.

The Other Sulfides: Organic Sulfur Species in Amine Solvents

Speaker: Kaiyr Tekebayev, SGS Sulphur Experts

Authors: Philip le Grange, Kaiyr Tekebayev, Francis LeBlanc, Michael Sheilan (Amine Experts) and Marcus Adolfsson, Daniel Yarnold, Gilles Thevenet (Preem raff Lysekil)

The Other Sulfides: Organic Sulfur Species in Amine Solvents" examines the behavior of various organic sulfur compounds—specifically carbonyl sulfide (COS), C₁–C₅ mercaptans, methyl ethyl sulfide (MES), dimethyl sulfide (DMS), and dimethyl disulfide (DMDS)—within amine solvent systems. It provides a comprehensive review of the chemistry of these species in amine systems, analyzes operational data from 50 industrial amine solvent absorbers, and presents a case study from a European refinery. The findings suggest that optimizing the removal of organic sulfur species can potentially reduce the size of downstream gas conditioning units in new facilities. In existing systems, such optimization may extend cycle times on molecular sieves and decrease the consumption of caustic, thereby reducing the volume of mercaptide and disulfide waste streams requiring disposal. The study underscores the economic and operational significance of understanding the behavior of organic sulfur species in amine systems, highlighting the necessity for further research and field data to enhance industry knowledge in this area.

Solubility of Light Hydrocarbons in Amine Treating Solutions

Speaker: Dr. Inna Kim, SINTEF.

Authors: Dr. Inna Kim, SINTEF and Mike Hegarty, H2W United LLC.

Earlier research projects funded by GPA Midstream have demonstrated a significant salting-in effect when increasing the molar concentration of the amine in the aqueous solution. GPA Midstream Projects 071 and 141 demonstrated a consistent salting-out effect on the solubility of several model hydrocarbons when loading the aqueous amine with H₂S, CO₂, or a mixture of the two. The reduction in solubility ratio, x/x_0 , (x_0 is the solubility of a given hydrocarbon in the unloaded amine solution) was found to follow a regular pattern for a given solvent and hydrocarbon type over the range of temperatures considered.

GPA Midstream Project 201 has extended solubility measurements for five light paraffin hydrocarbons in seven amine solutions of different strength. VLE measurements were done at 298, 333, 353, and 383 K for unloaded amine solutions with four vapor phase compositions: two systems with single gases (ethane and propane) and two systems with gas mixtures (C₁/C₂/C₃ and C₁/nC₄/nC₅). For the solutions loaded with CO₂, measurements were done for methane, ethane, and propane in five amine solutions at 333K. The system pressure (and partial pressure of hydrocarbons) was selected so that no condensation of hydrocarbons takes place during the measurements (VLE conditions). The system pressure was 0.8 MPa for measurements with propane. All other tests were done at 1.6 MPa.

High-pressure equilibrium cells with two electromagnetic ROLSI® sampler for in-situ analysis of vapour and liquid phase composition were used in this work.

To compare solubility of hydrocarbons measured at different and relatively low partial pressure, Henry's constants were calculated using following correlation: $H=y*P / x$
where y and x are a mole fraction of the hydrocarbon in the vapor and liquid phase, P is the system pressure (bar).

It was demonstrated that solubility of all hydrocarbons (expressed in Henry's constants) increased significantly with amine concentration. For lower concentration solutions, hydrocarbons solubility seems to go through a minimum at temperatures between 333 and 353 K similar to that reported earlier for hydrocarbons solubility in water. For highly concentrated solutions, hydrocarbon solubility tended to be relatively insensitive to temperature. While solubility in water is decreasing from methane to n-butane, solubility in concentrated amine solutions was highest for n-pentane.

Solubility of hydrocarbons was found to decrease linearly with CO₂ loading (or with ionic strength).

DMX™ CO₂ Capture in Dunkirk: Final Outcomes and Key Takeaways

Speaker: Dr. Qiao Zhao – Axens

*Authors: Qiao ZHAO^a, Martin Pfeiffer^a, Vincent Carlier^b, David Albarracin-Zaidiza^b,
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Carbon capture is crucial for achieving the Net Zero Emissions scenario by 2050. Currently, amine scrubbing is considered a suitable technology for sectors with large CO₂ emissions (such as steel manufacturing, cement production, or energy production) due to its robustness, adaptability, and ability to produce a highly concentrated CO₂ stream that is suitable for transportation. Among various industrial CO₂ capture technologies, the DMX™ process developed by IFPEN and commercialized by Axens, has reached a significant milestone with the operation of its industrial demonstrator since September 2022 [1].

This semi-industrial scale demonstrator, located at ArcelorMittal's steel mill, was connected to the blast furnace gas network and had a CO₂ capture capacity of 0.5 tons per hour. It efficiently processed the real industrial gases through a solid collaboration between operators from AXENS, IFPEN, ArcelorMittal, and TotalEnergies. This work presents operational feedback and process results from the demonstrator's operation within the framework of the H2020 funded project called 3D project.

The DMX™ CO₂ capture process is based on chemical absorption by means of an innovative demixing solvent. Since its developments in 2010, this process has shown immense potential for significant energy and investment cost reductions [2–4]. The operation of the industrial demonstrator was designed to validate these potentials.

The operation of the demonstrator started on September 2022 and accounted for more than 4500 h of operation. An experimental plan was carried out around a range of raw gas CO₂ partial pressure (ppCO₂) covering several CO₂ emitters (0.15 and 0.65 bar). The ppCO₂ was varied through treated gas and CO₂ captured recycle lines, as well as a compression package installed in this demonstration. In total, more than 100 parametric tests were performed, with pilot operations concluded in April 2024.

The tests have demonstrated that the CO₂ capture rate consistently exceeded 90% with a CO₂ product purity of over 99.8% on a dry basis. Besides, in the absence of any solvent reclaiming strategy (make-up/bleed, thermal reclaiming...), the accumulation of solvent degradation products was observed limited at 0.5wt% of the total solvent.

The tests have also highlighted that the energy penalty is highly sensitive to factors such as operating conditions, heat recovery efficiency, and heat losses in the regenerator. A low energy penalty was achieved with the demonstrator. These results are promising considering the relatively simple heat recovery scheme and absorber design of this demonstrator. For industrial scale units, reductions of the energy penalty around 20% to 40% can be obtained by the implementation of enhanced heat integration and absorber designs.

In addition, emissions of DMX™ solvent were quantified at less than few ppmv for blast furnace application, given that only a simple water wash system (without recirculation) is used in absorber. With advanced water wash designs in industrial units with much higher efficiency, emissions are expected to be well below 1 ppmv.

To conclude, the Demonstration Plant allowed to provide solid evidence to answer all challenges for the DMX™ industrialisation. These findings validate the DMX™ process potential for industrial CO₂ capture applications, including steel production, lime and cement manufacturing, power generation, waste incineration, and refining.

The outcomes of the experimental campaigns will be presented, highlighting key insights and lessons learned from the start-up and operational of the unit.

The DMX™ technology is currently being commercialized by Axens, a main player along the CCUS value chain, following the successful completion of the demonstrator's operation.

ACKNOWLEDGEMENTS

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Enhancing Post-Combustion CO2 Capture: Flue Gas Contaminant Management in Amine-Based Solvent Systems

Speaker: Alessandro Mari – Saipem

Authors: Alessandro Mari and Paolo Cari – Saipem

In recent decades, there has been a significant increase in focus on environmental emissions, with stricter legislation and improved guidelines for best practices. Public awareness of greenhouse gas emissions has also grown, leading to the development of technologies to decarbonize the fossil energy sector and hard-to-abate industries. Advanced amine-based solvent technologies capture the CO2 from flue gases, but contaminants like NOx and SOx can affect their performance. Controlling these contaminants is crucial for the efficiency of CO2 capture systems. SO3 forms aerosols that lead to solvent losses and increased ambient emissions, while NO2 leads to the formation of heat stable salts. Removing particulate matter from flue gas enhances CO2 scrubbing efficiency. Comprehensive analysis and removal of contaminants are essential for cost-effective and environmentally friendly CO2 capture. This paper examines two case studies with different flue gas compositions, demonstrating how Saipem, as a technology integrator, leverages its extensive experience to meet the needs of clients, technology providers, and stakeholders, formulating cost-effective removal strategies that prioritize environmental sustainability while minimizing OPEX and CAPEX.

CO2 Capture in Brownfields Units: Application in Refining and Power Industry

Speakers: Jerome Bayle & Enrique Gomez Suarez – TotalEnergies

Authors: Beining Wang, Mahdi Yazdanpanah, Luc-Emmanuel Combes-de-Prades, Tuan Le-Quang, Jerome Bayle, Enrique Gomez Suares, and Renaud Cadours – TotalEnergies

Decarbonization of refining, petrochemical and power industry are an important element in achieving net zero objective in the energy industry. To achieve this target, CO2 capture is recognized as an emission reduction tool following energy efficiency and replacement of the sources with renewable energies. A large literature is available on the CO2 capture technologies available on the market and their advantages. However, many questions remain beyond the general focus, such as the CO2 removal efficiency, sometimes presented through the CO2 avoided, and the energy efficiency of these technologies. Indeed, the CO2 product specification driven by the transportation introduces technical challenges for the CO2 capture.

TotalEnergies has conducted several studies to implement CO2 capture in its existing assets such as refineries (e.g. on FCC plants) and CCGT power plants. This paper will present the technical challenges and solutions evaluated to achieve the CO2 product specifications, considering the composition of each flue gas in terms of components such as NOx, SOx, particles, etc. This paper will also consider some challenges imposed by a brownfield project such as the constraints of layout for the integration of CO2 capture solutions in existing units. Finally, waste disposal from the CO2 capture unit or from flue gas pre-treatment will be discussed.

As brownfield projects are specific to each plant, this paper will not present a universal turn-key configuration but aims to share recommendations and outline open questions for the implementation of CO2 capture technologies to existing plants.

Innovative CO₂ Capture Technique for Natural Gas Operations

Speakers: Sebastien Duval – Saudi Aramco and Tim Merkel or Lokhandwala Kaaeid – MTR Inc.

*Authors: Ahmed W. Ameen⁽¹⁾, Feras Hamad⁽¹⁾, Sebastien A. Duval⁽¹⁾, Milind M. Vaidya⁽¹⁾, John O'Connell, Shabbir Ghulam⁽¹⁾, Olatunde Onasanya⁽¹⁾, Lokhandwala Kaaeid⁽²⁾, Richard Baker⁽²⁾ and Tim Merkel⁽²⁾
(1) Saudi Aramco (2) MTR Inc.*

Introduction: A breakthrough process that combines a new category of membranes with amine solvent technologies offers an energy-efficient and economical alternative for CO₂ capture at gas plants. This hybrid approach presents a cost-effective and energy-saving solution compared to traditional absorption-based CO₂ capture methods, reducing greenhouse gas emissions and enhancing CO₂ capture capabilities.

Body: During the acid gas removal stage, CO₂ is removed along with H₂S and sent to the Claus unit, where H₂S is converted into elemental sulfur. High CO₂ content in the acid gas feed to Claus unit leads to operational challenges in the Claus Unit. It may also cause a significant drop in the reaction furnace temperature, reducing the Claus unit's effectiveness in processing harmful compounds such as ammonia, BTX, and heavy hydrocarbons.

Currently, some gas plants already implement a method that partially removes CO₂ from the Claus unit's acid gas feed using H₂S-selective amines. This process produces two streams: a stream enriched with H₂S for the Claus unit and another stream high purity CO₂ stream suitable for compression and sequestration. However, this absorption process is typically limited to a CO₂ capture to around 70%.

A new type of membrane, which preferentially permeates CO₂ over other gases including H₂S, presents a promising opportunity for use in acid gas streams to enrich the H₂S in the acid gas stream, while simultaneously capturing CO₂. By integrating this membrane with the H₂S-selective amine, the CO₂ capture rate can be increased to over 90%. Since the membrane is not constrained by equilibrium limitations, it can generate a residue stream with more than 90% H₂S, which can be directed to the Claus unit. The CO₂-rich permeate is subsequently treated in an H₂S-selective amine unit to capture CO₂. Hence, this process is referred to as Membrane-Acid Gas Enrichment (MAGE).

This membrane technology was successfully piloted and demonstrated stable performance throughout a field test lasting over 4,500 hours of operation. It is now set to be demonstrated in an oil refinery to further validate its potential.

Conclusion: This innovation has the potential to significantly improve CO₂ capture and H₂S enrichment, leading to more sustainable gas treatment operations. By integrating this specialized membrane with H₂S-selective amines offers a unique solution for enhancing CO₂ capture and increasing the H₂S content in acid gas streams, paving the way for more efficient industrial practices.

Activities

GPAE Annual Conference will offer a variety of ways to meet with your peers. From sponsored get-togethers to meetups and hallway conversations, we will provide the spaces, places and fun to engage and connect.



Official Events

Wednesday 4th June

Welcome Reception

Join us at The Hague Marriott Hotel for drinks and canapés with your fellow delegates.

Thursday 5th June

Exhibitor Reception

Join us to speak with our exhibitors and network with your fellow delegates.

Conference Dinner

The Conference Dinner is on Thursday 5th June.

Accommodation

Take advantage of our discounted room rate at The Hague Marriott Hotel.



The Hague Marriott Hotel, Johan de Wittlaan 30, 2517 JR, The Hague, The Netherlands

GPA Europe have secured a limited number of discounted rooms at The Hague Marriott Hotel.

Located in the International Zone, The Hague Marriott Hotel is ideally positioned for guests to explore Den Haag, with the World Forum within walking distance and the Kunstmuseum, Peace Palace, Scheveningen Beach and Centraal Station all close by.

We can request additional nights at the hotel on your behalf, however, these are not guaranteed until confirmed by the hotel.

Please note that the room rate we have secured for the conference dates cannot be guaranteed for any additional nights booked outside of these dates due to limited availability at the hotel.



Getting there

Plan ahead of your time with us in Italy.



Hotel Address

[The Hague Marriott Hotel](#)

Johan de Wittlaan 30, 2517 JR The Hague, The Netherlands

From Schiphol Airport



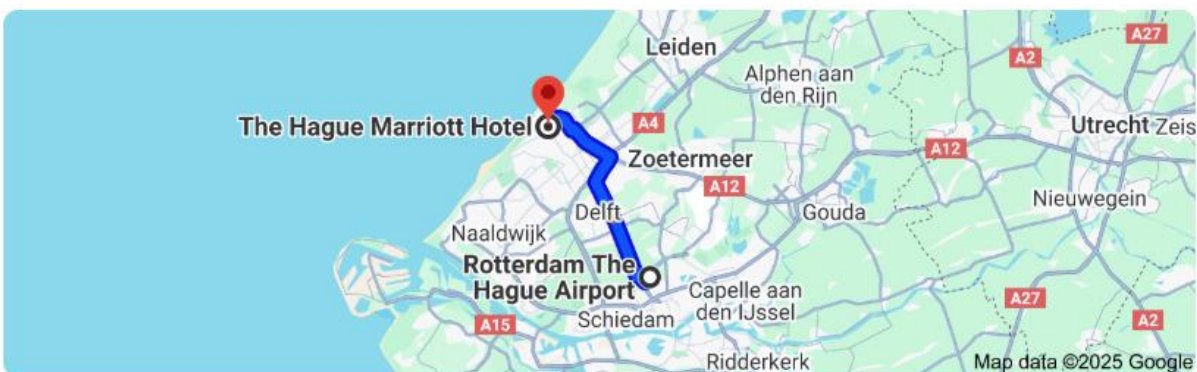
By Car or Taxi:

It is 45km to the hotel and typically takes 55 minutes.

By Train:

It typically takes 60 to 75 minutes by train.

From Rotterdam Airport



By Car or Taxi:

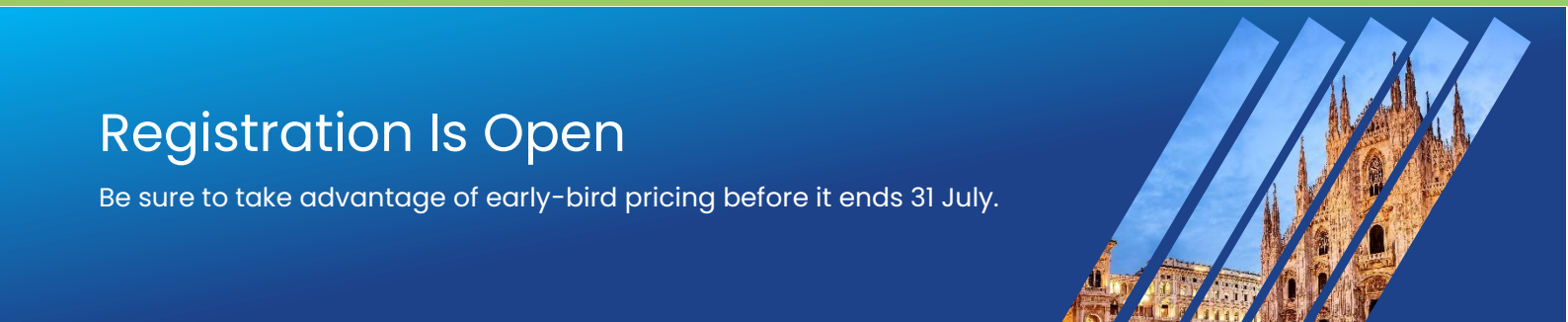
It is 25km to the hotel and typically takes 30 minutes.

By Train:

It typically takes 75 to 90 minutes by train.

Parking at The Hague Marriott Hotel

- EV Charging, fee: 26.00 EUR daily
- Off-site parking, fee: 4.00 EUR hourly, 26.00 EUR daily
- On-site parking, fee: 4.00 EUR hourly, 26.00 EUR daily



Registration Is Open

Be sure to take advantage of early-bird pricing before it ends 31 July.

Conference Passes

Get the full GPAE experience with:

- 3 days of sessions, including the general session, keynote speech, panel discussion and more
- Admittance to evening events: Welcome Reception and Conference Dinner
- Attendee meals
- Workshop
- Exhibition

Single Conference Passes

Single Conference passes, aimed at an individual attending without their partner/spouse.

	GPAE Member	Non-Member
Conference Only Pass (single)	£1,365 / €1,640	£1,565 / €1,880
Two-night Conference Pass (single)	£1,735 / €2,085	£1,935 / €2,325

Double Conference Passes

Double Conference passes, aimed at an individual attending with their partner/spouse. This pass entitles your partner/spouse to attend the Welcome Reception and Conference Dinner.

	GPAE Member	Non-Member
Conference Only Pass (double)	£1,525 / €1,830	£1,725 / €2,070
Two-night Conference Pass (double)	£1,945 / €2,335	£2,145 / €2,575

Discounts Available

Early Bird Discount

Book before 31 March to take advantage of the early-bird discount of **an additional £150 / €180** off the listed member/non-member conference pass price.

Member Discount

GPA Europe Members receive a discount of **£200 / €240** off each Conference Pass price, when compared to Non-Member pricing packages.

Young Professional Discount

GPA Europe is offering Graduate Engineers the opportunity to attend the Technical Conferences at a discount of **£400 / €480** on the fees paid by an accompanying senior engineer. The Graduate Engineer should not have attended a GPA Europe Conference previously and will have less than five years' experience. Contact admin@gpaeurope.com for a discount code.

Retired Member Discount

GPAE is offering Retired Members the opportunity to attend our Conferences at a discount of **£400 / €480**, when compared to Non-Member pricing packages. Contact admin@gpaeurope.com for a discount code.

Frequently Asked Questions

Find the answers to top GPAE Annual Conference 2024 questions.



General

When and where will GPAE Annual Conference 2025 take place?

GPAE Annual Conference will take place at The Hague Marriott Hotel, The Netherlands, from 4th to 6th June 2025.

What is the address of the Conference?

The Hague Marriott Hotel, Johan de Wittlaan 30, 2517 JR The Hague, The Netherlands

What is the common language spoken at the conference?

The official language of the conference is English, and all general sessions will be presented in English.

What is the recommended conference attire?

Business casual or smart business.

Is there an email contact for questions?

Yes, you can send general questions to admin@gpaeurope.com

Registration

What are the registration fees for the event?

You can view our pricing on our [conference page](#)

What payments do you accept for registration?

When registering, you may pay by credit card, bank transfer or PayPal.

Are there any discounts?

Yes, we offer discounts for GPA Europe members, Young Professionals and Retired members. For details email: admin@gpaeurope.com

What is included in the registration fee?

Your registration fee for a full conference pass entitles you to the following:

- Workshop (if selected by you on the registration form)
- Welcome Reception
- General sessions, including the Keynote Address and Panel Discussion
- Exhibition
- Conference Dinner
- Lunch and refreshments
- Accommodation (if selected by you on the registration form)

Is there a deadline for registration?

No, there's no deadline. You can register online through to the first day of the conference. However, there are discounts for early registration.

Event Access

Will I need a badge to get in?

Yes, a conference badge is required for entry into the conference and should be worn at all times. You'll be able to pick up your badge at the registration desk and throughout the duration of the conference.

The registration desk will be located in the lobby of the Plenary Room. The registration desk will be open from 12 noon on Day 1, and 08:30hrs on Day 2 and 3 of the conference.

Do I need a visa to attend the conference?

There are a few countries that require a visa for entry. We recommend checking in advance with your country's local consulate for details, requirements and timelines for issuing visas.

How do I obtain a visa invitation letter?

In order to request a visa letter from GPA Europe, please email the following information to admin@gpaeurope.com:

- Full name on passport
- Date and place of birth
- Gender
- Nationality
- Passport number, place and date of issue, and date of expiration
- State clearly if you are a government official

Visa invitation letters will be submitted for approval for attendees who have requested a letter and have completed registration data for a full conference pass, including payment.

Please note, we can only issue visa letters for fully paid delegates, and you will need to allow sufficient time for your embassy to process and issue your visa.

Hotel

Does GPAE offer hotel accommodation?

Yes, GPAE have a number of discounted rooms reserved at The Hague Marriott Hotel. In order to access this discount, you will need to register and pay through GPAE.

Do I need to contact the hotel to make my room reservation?

No, when you register with us, a hotel reservation will be made for you by GPAE.

Can I extend my stay?

Yes, we can check the availability with the hotel, and ensure you obtain the discounted room rate. Please note, additional room nights are not guaranteed and will be booked only as and when requested.

Sessions and Speakers

Can I preregister for sessions?

There is no need to preregister for sessions, with the exception being the Workshop, which is limited to 40 spaces. The registration form has a check box to denote if you wish to attend the Workshop. We advise registering for the conference at your earliest convenience, to avoid disappointment.

Can I get copies of the material presented at the conference?

Yes, the papers will be made available to all delegates. They will also be available on the GPAE website after the conference.

[Click here to view sessions from past GPAE conferences](#)

Sponsorship

I would like to learn more about 2025 sponsorship opportunities. Who can I contact?

Please email admin@gpaeurope.com.