ESF Europe

ENERGY & SUSTAINABILITY FORUM

Decarbonising the Downstream Industry

ADVISORY MEETING REPORT

HELD ON 26 SEPTEMBER 2023

HOSTED BY EURO PETROLEUM CONSULTANTS

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ESF EUROPE ADVISORY

Ahead of the next edition of ESF Europe, we gathered our 2024 advisors to discuss and debate the challenges and opportunities driving the decarbonisation of the downstream industry, and importantly shape the discussions for next year in Madrid!

Here are the highlights and key takeaways from the 90 minute discussion.

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DECARBONISING ASSETS

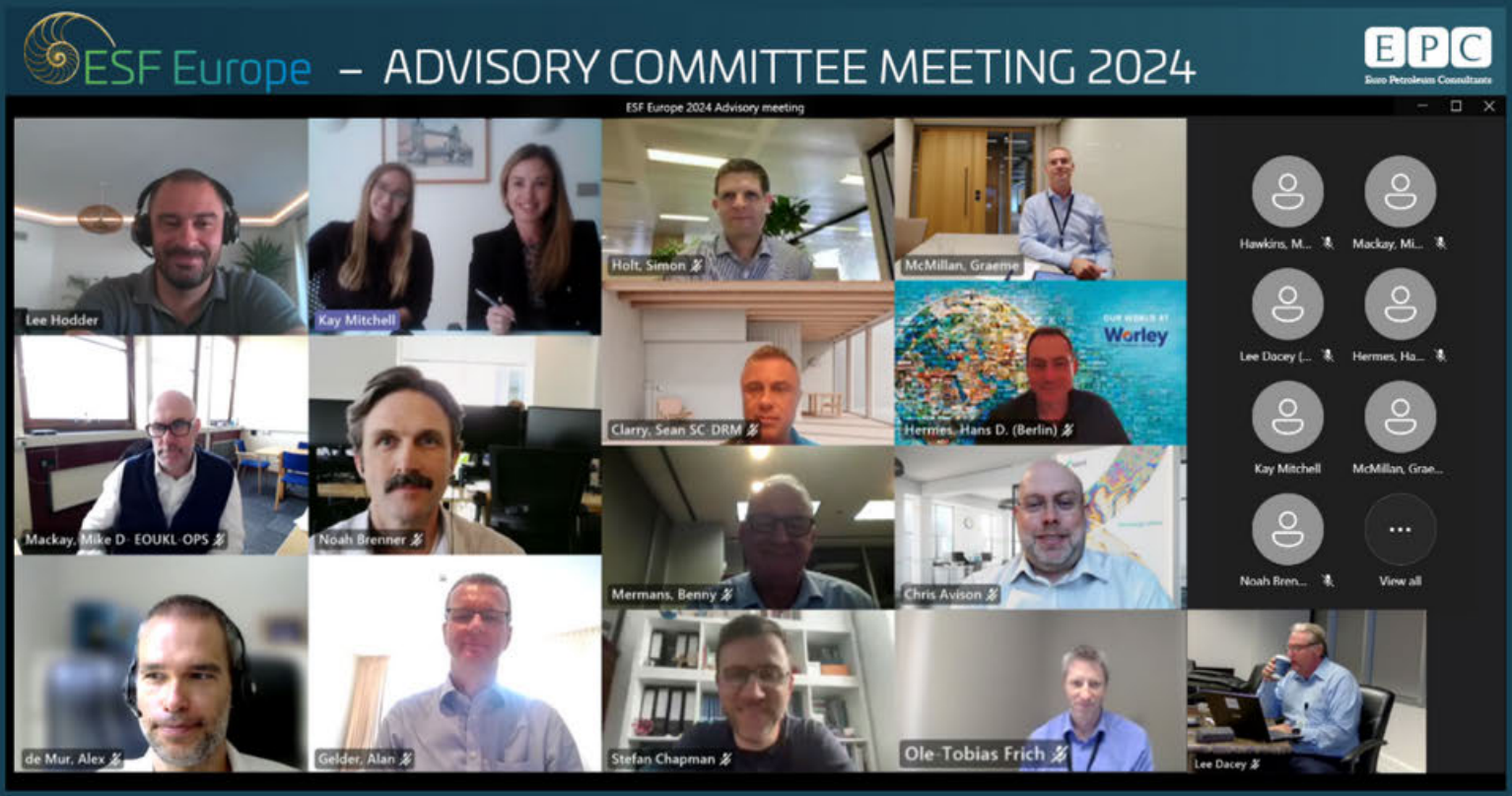
DELIVERING TANGIBLE ACTIONS

- **Maintaining momentum and project risks** - The first wave of decarbonisation commitments and projects, primarily driven by large companies and government-backed has been established. As we move forward there is a risk of losing momentum due to the imbalance between demand and supply. Only 20% of forecasted demand is covered by projects, and only 10% of those projects have reached FID.
- **Investing in infrastructure** - Future developments and momentum could be hindered by a lack of infrastructure, particularly in supply chains and downstream applications calling for further government intervention and investment.
- **Local solutions and local relevance** - Despite the global nature of decarbonisation, local solutions based on local resources are critical. For example, green hydrogen makes sense in Portugal where there is access to relatively cost-effective green molecules and captive demand. Strategies and technologies need to be aligned with what is relevant and competitive locally.
- **Strategic scaling** - Project scale needs to be aligned with anticipated local market trajectories and demand. Maintaining optionality in investments allows for adjustments and reapplications of technologies based on emerging demands or market opportunities.

FOSTERING INDUSTRIAL CLUSTERING AND INTEGRATION

- **From theory to practice** - How do we go from something that's on paper to something that is realistic and implementable with the risks and capex appropriately proportioned amongst all the various stakeholders?

- **"Chicken and Egg"** - Government involvement is key in providing the infrastructure necessary to first seed a project and then for secondary and tertiary emitters to be integrated. Ensuring government and project developers are aligned when often years away from FID creates a "chicken and egg" situation.



FUNDING AND POLICY SUPPORT MECHANISMS

- **Building on incentives** - Whilst the US' groundbreaking Inflation Reduction Act (IRA) has surged project investment and interest there are still implementation challenges and questions to overcome about how to maximize available credits.

- **Fungible financing** - The IRA is strongly incentivizing the carbon capture industry because it can sell tax credits as well as get paid directly by the IRS. However, there are strings attached, namely the upfront project costs and some limitations.

- **Carrot and stick** - While the IRA provides a significant stimulus for supply, the demand side is lagging, contrary to Europe where there is greater demand stimulus. Balanced and timely government intervention is needed to stimulate both the supply push and demand pull.

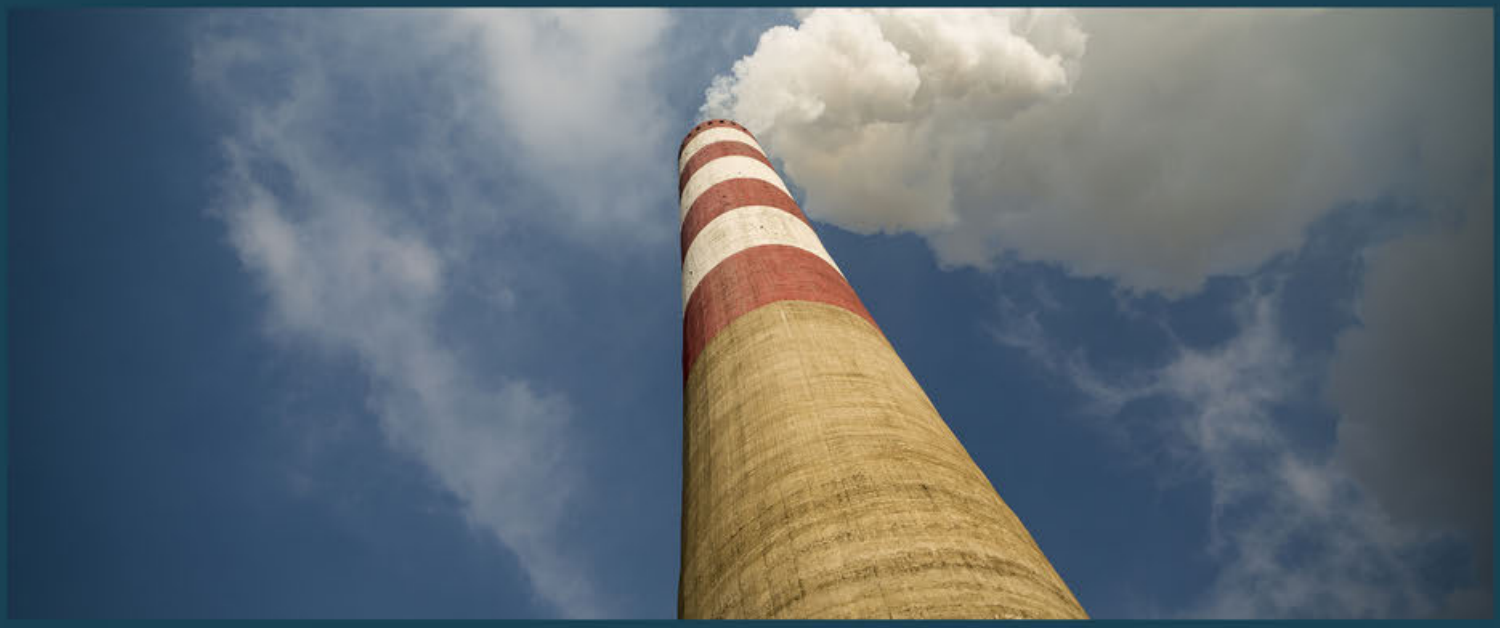
- **Cash kick starters vs. technology agnostic** - European instruments like the Industrial Emissions Directive (IED) and the EU Emissions Trading System (EU ETS) provide a more perfectionist technology-agnostic system to the IRA's clear cash pledge technology kickstarters. What elements of the IRA can be adopted to accelerate decarbonisation in Europe?

- **The CBAM "Stick"** – Help or harm to Europe's refining and chemicals sectors? Although initially not covered, the phase-out of the allowances will come eventually which will impact global trade flows. European producers who have export positions outside of the EU are set to be disadvantaged, while for those without export positions, it could be looked at as an opportunity to protect the market from imports that might otherwise have cost advantages due to scale and feedstock, for example, those coming from the Middle East. One of the main challenges is if we have the tools, systems, and robust reporting in place to look at the carbon intensity of individual products to underpin a mechanism like this?

CIRCULARITY PATHWAYS

- **The move to a full circular model** - According to the recent report ReShaping Plastics, circularity could bring down the carbon intensity of plastics by 65% by 2050, however a lot of regulatory hurdles don't facilitate this and several barriers to a circular system for plastics exist.
- **Putting circularity at the forefront** - Circularity principles and carbon source considerations need to be integrated in the early planning stages. Cross-sector collaborations for technology and project design should be promoted to encourage circularity.
- **Challenges and roadblocks to large-scale investment in chemical and mechanical recycling** - feedstock, affordability, demand constraints, mass balancing are some of the hurdles limiting the investment and scale-up of advanced recycling. Chemical recycling is not accepted as an environmentally sound management practice and the exclusion of mass balance as an accounting principle is restricting progress. Commitments from brand owners to use recycled content are often voluntary and sometimes retracted, making industry plastic reduction targets inconsistent.
- **Maximising mechanical recycling** - the target is for 90% of plastic waste to be steered towards mechanical recycling but this requires plastics that can be recycled in the first place. Product design plays a major role in maximizing mechanical recycling.
- **Cross-industry collaboration across the value chains** - The full potential of circularity requires integration across various stages of the value chain, from upstream waste management to downstream chemical processing. How can we step away from being competitors and instead for example leverage each other's waste streams and technologies? This is crucial to devise localised, sustainable solutions for plastic circularity.

H2 & UTILISATION OF CO2



- **Is CO2 valorisation a realistic goal?** The viability of CO2 valorisation in producing e-fuels is under scrutiny, considering the energy intensity of the process. Are conflicts emerging between the automotive industry's shift towards electrification and the fuel industry's endeavour to develop potential solutions using CO2? While startups in the US are exploring CO2 as a feedstock, doubts linger about whether such carbon utilisation aligns with long-term decarbonisation goals. Investments in processes that valorise CO2, whether from biogenic sources, direct air capture, or point source emissions, need rigorous scrutiny from both technological and policy perspectives.

- **Hydrogen production and trade dynamics** - Europe is anticipated to experience a shortfall in hydrogen production versus demand, necessitating imports and the establishment of trade flows from low-cost hydrogen-producing regions. The evolving demands and applications of green hydrogen, along with varied pricing structures are shaping a complex and uncertain medium-long-term business case that requires a degree of "leap of faith" and flexibility in investments and partnerships. Refiners should utilize captive demand to support and de-risk initial investments.

FUELING THE FUTURE

- **The revision of RED** - The impacts of RED III revisions and redefinitions will largely be localised. There is still a lot of debate that will impact how it is translated and played out locally by governments.

- **Chasing feedstocks** - The variability, availability, and traceability of feedstocks all remain challenges in these sought-after commodities. Securing supply requires creativity in sourcing through partnerships and JVs. Regulatory demands like the Corporate Sustainability Reporting Directive (CSRD) are driving demands for greater transparency and traceability.

- **Driving adoption of certain pathways and feedstock** - Government incentives have been shifting industries towards certain pathways and feedstocks, sometimes saturating them which necessitates a shift of incentive to drive innovation and adoption elsewhere. Feedstock processing is becoming more complex, with evolving mandates and incentives needed to stimulate innovation

- **Balancing short-term capex with long-term flexibility** - Many of today's existing refining assets advantage from distribution and marketing channels, and technology similarities. As we move to second-generation advanced biofuels, the more different to crude oil these feedstocks become and the larger the investments needed to get compatible with the existing asset base.

- **Regulatory impacts and future advanced biofuels developments** - Current regulations and those under discussion, especially those affecting co-processing and utilisation of existing facilities, are crucial in defining how existing assets can be leveraged or adapted for emerging market demands and technology pathways.

THE PEOPLE'S TRANSITION

- **Resourcing legacy and green assets** - We need to strike a balance to resource and maintain our legacy assets which are in fact paying for the new, shiny attractive "green" assets at least in the shorter term. Besides shortages in feedstock, the biggest shortage, and an even bigger risk, is not having enough expertise!
- **The boots on the ground to build the transition** - Attracting and retaining expertise and talent continues to be a challenge for the industry. Engaging with educational institutions and showcasing the central role that chemical engineering plays in the energy transition is key to ensuring its future.
- **Handling hydrogen** - Hydrogen is an explosive gas which can be handled, but a transition of this size and scale in new markets runs the risk of potentially thousands of people handling hydrogen without the necessary skills, experience and training. As our workforces expand into unfamiliar terrains comprehensive training is required.

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19–21 February 2024

Madrid, Spain

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EPC Euro Petroleum Consultants

CALL FOR PAPER

Join our Esteemed Speaker Panel

Taking a technology-neutral approach, ESF Europe supports the downstream industry to reduce its carbon intensity and emissions, quickly and profitably. Across three days, we will present and explore all the decarbonisation technologies and strategies on the table including:

- Sustainable fuels, chemicals and circularity
- Low carbon hydrogen, green ammonia and methanol
- CCUS
- Energy efficiency and asset optimization, including digitisation
- Waste water use and management
- The energy trilemma - secure, affordable, and sustainable
- Industrial integration and clusters

Submit Your Abstract

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