ESF North America

ENERGY & SUSTAINABILITY FORUM

A Sustainable & Secure Downstream Industry

Houston, TX I 20–22 May 2025

POST EVENT REPORT

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EPC

Table of Contents

Click to head straight to the page you need!

Introduction

From May 20-22, 2025, ESF North America returned to Houston for two and a half days of engaging discussions, insightful presentations, and valuable networking to support a secure and sustainable energy future in which the refining and chemicals industries continue to play a leading role.


Crystaphase
Goes great with gnarly renewables
Our filtration technologies are top-shelf, because renewable diesel applications deserve better than the house pour. Cheers to premium performance. That's the
ExxonMobil
LEF Technology
Driven to reduce emissions


Leading Beyond Chemistry
Henrik Rasmussen
TOPSOE


OMV ReOil®
Sebastian Wiesner
OMV

Day 1

The conference opened with the theme 'America in Transition'. This year, U.S. energy priorities have shifted toward ensuring secure access to affordable domestic fossil-fuel-based energy, even as global momentum for decarbonization remains strong. For the refining and chemicals sectors, this creates a dual challenge to deliver stable and affordable fuels and products in the near term, while continuing to invest in and deploy low-carbon solutions to stay competitive in a net-zero future. Against this backdrop, our keynote panelists discussed the balance between immediate domestic priorities and longer-term global decarbonization commitments.

Setting the scene, we welcomed David Brown, Director, Energy Transition Practice, Wood Mackenzie to deliver the market keynote titled 'Hitting the Brakes - How the Energy Transition Could Decelerate in the US'. David presented a strategic perspective on the energy transition, along with an integrated view of various energy transition scenarios across each segment, commodity, technology, and market. In Wood Mackenzie's delayed transition scenario, US oil demand peaks around 2035, EV adoption is 53% lower compared to their base case in 2030 and bioenergy demand in road and industrial sectors is 10% higher than in the 2030 base case as electrification slows.

Katie Zimmerman, Decarbonization Director, Wood, our Platinum Sponsor, delivered the technology keynote titled 'The Role of Refining and Chemicals in Critical Materials'. Today, the U.S. has about 50 critical minerals according to the Department of the Interior. The country is 100% import reliant on 12 and 50% import reliant on another 29. China holds the dominant position in minerals processing. Critical minerals are key for magnets, energy storage, cell phones, defence and as such, governments want material security AND energy security. Against this backdrop, Katie presented applying core skills from refining and chemicals to minerals and strategies to capitalize on the opportunity of the "new oil".

The keynote plenary concluded with our panel, 'America in Transition' bringing together industry leaders from Dow, Neste US, Par Pacific, Chevron Renewable Energy Group, Marathon Petroleum and Green Star BCS to share perspectives on partnerships, ROI and internal decision making on capital allocation, supply/demand dynamics and competitiveness of RD/SAF vs biodiesel, as well as how to deal with regulatory uncertainty, and maintain energy transition momentum with challenging headwinds.

READ THE FULL TAKEAWAYS FROM THE KEYNOTE PANEL HERE.

Following the plenary session, the focus shifted to ‘Hydrogen & CCUS’, bringing together insights from Topsoe, Honeywell UOP, and HSB Solomon Associates. The session examined the evolving role of hydrogen, ammonia, and carbon capture, utilization, and storage technologies in enabling North America’s lower-carbon future.

Next up was ‘Catalysts & Recycling Technologies’, featuring experts from Evonik, Moxba Group, OMV and KBC (A Yokogawa Company), showcasing the latest innovations and technologies accelerating circularity and plastic recycling at scale, enhancing efficiency, process performance and achieving sustainability goals.

The day concluded with a panel discussion, ‘Decarbonizing The Chemicals Industry’. As a hard-to-abate sector known for high levels of greenhouse gas emissions, the industry needs a pathway to credible and significant emissions reductions via flexible allocation principles to support all companies across the value chain and enable value-chain investments.

READ THE FULL TAKEAWAYS FROM THE KEYNOTE PANEL HERE.

Day 2

Delegates reconvened for Day Two of the conference with a keynote 'The "Yes, and" Approach to the Energy Transition' from Amanda Hickman, Vice President, ESS Research and Sustainability, Honeywell Energy & Sustainability Solutions.

In her presentation, Amanda highlighted Honeywell's legacy of over 100 years of global technology invention and innovation, showcasing the company's portfolio of technologies and solutions designed to advance efficiency across an evolving augmented energy mix, in support of a sustainable and reliable energy future.

Next on the agenda was our Day Two keynote panel: 'Balancing on a Net-Zero & Tariff Tightrope - Getting Across the FID Line' featuring expert insights from Wood, Montana Renewables, Worley, Infinium and Green Star BCS.
The panel examined predictions and expectations for current and future low-carbon investments, the ramifications of tariffs for project costs and supply chains and the financial viability in the absence of subsidies and incentives.

READ THE FULL TAKEAWAYS FROM THE KEYNOTE PANEL HERE.

The focus shifted to 'Industrial Decarbonization & Operational Excellence' with presentations from KBC (A Yokogawa Company), Nalco Water, an Ecolab Company, Schneider Electric, Braskem and The Catalyst Group who presented cutting-edge strategies and digital technologies to improve process efficiency, reduce emissions, and optimize assets and operations across the value chain.

The final theme of the event, 'Energy Efficiency, Asset and Process Optimization', featured presentations from Honeywell UOP, Alfa Laval, Crystaphase, and Tubacex, who showcased advanced technologies and equipment to optimize processes, support long-term sustainability and competitiveness, and lead the charge to lower carbon emissions.

ESF North America 2025 concluded with a dynamic final panel, 'The Hard to Abate, let's Collaborate! – The World's Apollo 13 Moment'. Great aspects of mankind were reflected in the Tom Hanks movie when everyone came together to figure out how to get those astronauts home, so why can't we do the same? No single plant, refinery, or company can solve this alone. Significant opportunities lie in open dialogues and collaboration. Against this backdrop, the University of Houston, Amazon Web Services, ALLY Energy, OMV and Microsoft discussed championing collaboration, building partnerships and leveraging synergies with a common focus of reducing collective carbon emissions.

READ THE FULL TAKEAWAYS FROM THE KEYNOTE PANEL HERE.

Pre-Conference Seminar

HOSTED BY wood.

ESF North America 2025 began with a seminar hosted by **Wood**.

Wood's experts delivered a series of presentations under the theme: 'Navigating Uncertainty in a Dynamic Global Market'. Amidst shifting political and regulatory landscapes, the downstream industry faces the challenge of maximizing energy production while minimizing emissions. Experts explored innovative strategies and adaptive measures that industry leaders can implement today to navigate these uncertainties and stay ahead in a rapidly evolving environment, ensuring both operational excellence and sustainable performance.


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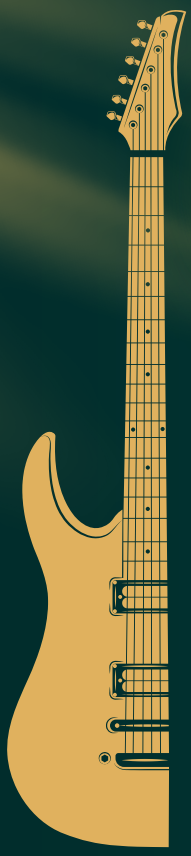
Networking Evening



THE RUSTIC

Day one concluded with **KBC (A Yokogawa Company)** hosting delegates at The Rustic, for an evening of local Texan food, drinks, and live music from country artist Heather Tayleen, creating the perfect atmosphere for networking.

SPONSORED BY KBC
A Yokogawa Company


THE
USTIC


HEATHER
Rayleen

#ESFNorthAmerica in the Media

OMV
238,083 followers
1mo •

Designed by refiners, for refiners

Yesterday, John Young, Head of Technology Licensing, took to the stage at ESF North America in Houston, USA to share our journey in pioneering #innovation.

In his presentation, "OMV of the Future: Pioneering Innovation Strategy – Successful Start-up of the ReOil® Plant", John showcased how our proprietary ReOil® chemical #recycling technology is transforming end-of-life plastics into circular feedstock. A key highlight: the recent successful start-up of the ReOil® plant, which marks a major milestone on our path toward a #circulareconomy.

ReOil is a scalable, efficient, and ISCC PLUS-certified solution that enables refiners and polymer producers to seamlessly integrate circular feedstock into their operations.

Anil Nair • 3rd+
Energy Transition Leader | Business Development | Project Mana...
1mo • Edited •
+ Follow

Great day of listening to leaders in the energy sustainability arena at #ESFNorthAmerica today and catching up with some old friends!

#LanzaJet #SAF

ReGen III (TSXV:GIII)
791 followers
1mo •

That's a wrap! #ESFNorthAmerica was a fantastic opportunity to mee sustainability champions, technical experts, and key decision makers downstream energy sector! A big thank you to our host, Euro Petrole Consultants, and to those we connected with. We look forward to fol soon!

ReGen III (TSXV:GIII) conference takeaways:
✅ "To Transform, We Innovate; To Innovate, We Collaborate" -- Partr critical on the path to net zero!
✅ Decarbonization in the downstream energy sector is underway ar technologies are being rapidly adopted
✅ Projects with unique value propositions are well positioned in the decarbonize
✅ Circularity is front and centre

TSXV: #GIII | OTCQB: #ISRJF | FSE: #PN4

#Decarbonization #Sustainability #BaseOils #CleanTech #Innovatio #CircularEconomy #Downstream

Shell Chemicals
16,370 followers
1mo • Edited •
+ Follow

"The solution has to be credible, scalable and affordable to enable meaningful industrial decarbonisation," Marla Kline explained to more than 200 attendees today at ESF North America in Houston.

The panel discussed how Carbon Assured (SCS 115) enables an umbrella of solutions, backed by an independent accounting standard, for the industry to decarbonise. Moderated by the Rocky Mountain Institute's Joe Fallurin the panelists included P&G's Erik Roberts and SCS Global Services' Scott Coye-Huhn and generated a lively discussion in which the audience drove the themes to credible accounting methodology, carbon capture and storage depth, to the impact on the consumer market.

The overarching outcome was the solution must be applicable across the value chain to enable decarbonisation across the complex petrochem value chain.

#chemicals #PoweringProgress #ESFNorthAmerica

Marla Kline • 2nd
General Manager, Global Commercial Chemicals and President ...
1mo • Edited •
+ Follow

What an incredible day at ESF North America in Houston! It was an honor to join the panel discussion on Decarbonizing the Chemicals Industry, alongside Erik Roberts from P&G, Scott Coye-Huhn from SCS Global Services, and our moderator Joseph Fallurin from the Rocky Mountain Institute.

During the session, I shared how Carbon Assured (SCS 115) provides an umbrella of scalable, credible, and affordable solutions, backed by an independent accounting standard, to help the industry decarbonize. The lively discussion ranged from the importance of robust accounting methodologies to the depth of carbon capture and storage, and even the impact on consumer markets.

One key takeaway? For decarbonization to succeed, solutions must be applicable across the entire value chain of our complex petrochemical industry.

A huge thank you to the organizers of ESF North America for creating a platform where industry leaders can exchange ideas, showcase innovations, and build partnerships. Together, we can power progress and drive the sustainable energy future we all envision.

If you attended the session or have thoughts on industrial decarbonization, I'd love to hear from you! Let's continue the conversation and work together to make a meaningful impact.

#Decarbonization #ChemicalsIndustry #EnergyTransition #PoweringProgress #Sustainability #ESFNorthAmerica #Collaboration #Innovation

SIAD Americas LLC
1,144 followers
1mo •
+ Follow

SIAD Americas LLC was proud to participate in the ESF North America Energy & Sustainability Forum, where we connected with industry leaders committed to advancing sustainable energy solutions.

The forum provided an excellent platform to showcase our industrial gas equipment and technology, highlighting their critical role in decarbonization and the broader energy transition. We engaged in meaningful conversations about how our unique set of offerings contribute to a more sustainable future.

We extend our gratitude to the event organizers, partners, and all who visited our booth. The connections made and discussions begun at ESF will continue to drive our collaborative efforts toward a cleaner energy landscape.

#SIADAmericas #EnergyTransition #Sustainability #IndustrialGases #ESFNorthAmerica #Decarbonization #CleanEnergy

Nicholas Namphengsone • 2nd
Energy Transition Leader driving sustainable growth in energy
1mo •
+ Follow

While all my colleagues were enjoying the Emerson Exch connecting with industry leaders at #ESFNorthAmerica h the World.
While the future is full of challenges and uncertainty, it w passion, innovation, and collaboration coming from the driving real progress toward a more sustainable and resil Excited to see more FOAK projects gain momentum, like Roadrunner reaching FID. The path to low-carbon fuels a technologies is becoming clearer—and the downstream

Infinium
17,024 followers
1mo • Edited •
+ Follow

This morning, our Chief Commercial Officer, Ayesha Choudhury, joined a verhouse keynote panel at Euro Petroleum Consultants ESF North America iference on "Balancing on a Net-Zero & Tariff Tightrope – Getting Across the FID ."

panel couldn't come at a better time—we just announced earlier this week that F Project Roadrunner is under construction! This is a major milestone on the ustry's path to scaling eFuels.

FNorthAmerica #eSAF #SAF #eFUELS

Green Star BCS
2,361 followers
Visit website
1mo •

Just wrapped up an energizing few days at the ESF NAM Conference. It was a privilege for our team to participate, sharing perspectives and engaging in thoughtful dialogue with industry leaders.

We were fortunate to moderate two important topics.

Jerry Price led "America in Transition - Agility in times of ambiguity" with Billy Bardin (Dow), Peter Zonneveld (Neste), Jon Goldsmith (Par Pacific Holdings, Inc.), Neville Fernandes (Chevron), and Yoga Anand (Marathon Petroleum Corporation).

Scott Hughey led "Balancing on a Net-Zero & Tariff Tightrope - Getting Across the FID Line" with Ayesha Choudhury (Infinium), Katherine Zimmerman (Wood), Daniel Carlson (Montana Renewables, LLC), and Adam Green (Worley).

A big thank you to Euro Petroleum Consultants and everyone who made the event so impactful.

Please follow Green Star BCS to continue the conversations!

Debalina Sengupta • 2nd
Chief Operating Officer, Energy Transition Institute | Assistant Vi...
1mo •
+ Follow

It was a very nice discussion to moderate today! Thanks to the organizers and sponsors for bringing this crucial topic in discussion!

Debbi Limond • 1st
Sales Marketing & Enablement Lead at Wood
1mo • Edited •

A brilliant start to #ESFNorthAmerica with Wood's pre-conference seminar, 'Navigating uncertainty in a dynamic global market'

Host Katherine Zimmerman was joined by Nishadi Davis, PE, Jacqui Allen, MBA, PMP, David Zummo, P.E., PMP, Scott Commons and Richard Spires to discuss how the downstream industry faces the challenge of maximizing energy production while minimizing emissions amidst shifting political and regulatory landscapes.

Thank you to our audience for the excellent questions and to Euro Petroleum Consultants for making the event a massive success.

#decarbonization #NorthAmerica #Energy #Downstream

Yasmine McColl, MBA, BSChE • 2nd
Senior Executive | Thought Leader | Commercial Business Stra...
1mo • Edited •
Connect

At #ESFNorthAmerica, I shared how #technology innovations in #automation, #software, and #electrification are transforming the landscape. By integrating power and process systems, these technologies help:

- Reduce design risks
- Improve cost accuracy
- Optimize engineering economics
- Accelerate project delivery

Learn more: http://spr.ly/6044NNLNo

Euro Petroleum Consultants Schneider Electric

Montana Renewables, LLC
3,319 followers
1mo •

Our own Daniel Carlson sat on a keynote panel at the ESF North Americ and Sustainability Forum in Houston this week. It's always great to have discussion with industry peers. #syntheticaviationfuel #renewablediesel #CalumetProud #DomesticEnergy #EnergyIndependence

SINAI Technologies
10,386 followers
1mo •
+ Foll

ESF North America starts today!

We're live in Houston, Texas - joining global leaders, innovators, and chang to shape the future of energy and sustainability across North America.

Come connect with us and explore how cutting-edge technologies and bo collaboration are driving climate action forward.

See you at #ESFNorthAmerica!

#SINAI #ClimateLeadership #EnergyTransition #Sustainability #CleanTec #ESF2025

KBC A Yokogawa Company
60,449 followers
1mo •

Thank you Euro Petroleum Consultants for a great event last week in Houston, and to our KBC A Yokogawa Company team who attended, presented, and hosted at this event.

If you would like to find out more about how we're #BringingDecarbonizationToLife, then visit www.kbc.global and get in touch!

#KBC #Decarbonization #ESFNorthAmerica #Downstream #EnergyTransition

Bobby Davis • 2nd
Unlocking climate solutions commercially | Deal Maker | Leader
1mo •

Clear call to action from Shell Chemicals, P&G, and SCS. What d to win in the #EnergyTransition?

Peter Zonneveld • 2nd
President, Neste US
1mo •

It was a great pleasure to join other industry leaders in the keynote pa #ESFNorthAmerica in Houston. Today, the renewable energy industry needs to agile as the regulatory landscape keeps evolving – how can producers keep the momentum and continue to provide cleaner, more sustainable, and renewable products amid all the uncertainties, was the focus of today's discussion. For Nes means:

Strengthening raw materials sourcing and refining capabilities: Having production and sourcing capabilities in the US gives us the advantage to better serve customers here.

Keep innovating: Neste is currently sourcing small volumes of novel vegetab oils produced in our own pilot projects and in regenerative agriculture projects value chain partners. In the longer term, we are targeting to increase the availab of novel vegetable oils in Neste's raw material pool.

Have confidence in our products and our customers: We have been develop renewable products for more than two decades and we know clearly that our solutions are needed by our customers to reduce emissions.

Huge thanks to our moderator Jerry Price and the other panelists Yoga Anand, Jon Goldsmith, Neville Fernandes Bill Bardin!

#neste #renewables #renewablefuels #energytransition

Katherine Zimmerman • 2nd
Decarbonization Director, Americas at Wood
1mo • Edited •
Connect

#ESFNorthAmerica is off to a great start! I had a wonderful time kicking off the conference with my #teamwood colleagues and an excellent room full of people for a conversation on navigating uncertainty in a dynamic global market.

Join us tomorrow where Wood will be giving the keynote on "The Role of Refining and Chemicals in Critical Materials" and Eamonn Collins will be moderating the Hydrogen & CCUS section.

Thanks again to my amazing panelists, Nishadi Davis, PE, Jacqui Allen, MBA, PMP, David Zummo, P.E., PMP, Scott Commons, and Richard Spires.

Jose Escandon • 2nd
Technology Manager, Naphtha and LOHC at Honeywell UOP
1mo •
+ Follow

#ESFNorthAmerica is underway! It was great to present alongside many of our industry experts in Hydrogen about how we can continue advancing the technology landscape and deliver viable, low-cost, and safe alternatives to transport hydrogen with our Honeywell LOHC Solution. Glad to see all of the thoughtful questions in the panel and interest in #LOHC.

Solomon Associates
8,128 followers
1mo •

Thank you Euro Petroleum Consultants for having us at #ESFNorthAmerica!

Video Highlights

VIEW IT ON YOUTUBE
HTTPS://YOUTU.BE/IBDTGIYOYC4

VIEW THE FULL PHOTO GALLERY
ESF NORTH AMERICA 2025 | HOUSTON, USA | FLICKR

ESF North America
In Numbers

3
Days

1
Pre- Conference Seminars

2
Networking Mixers

40
Speakers and panellists

180
Registered Delegates

86
Pre-arranged 1-to-1 Meetings

18
Sponsors & Exhibitors

4
Panel Discussions

19
Presentations

Sponsors & Exhibitors

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wood.

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Honeywell
UOP

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Leading Beyond Chemistry

GreenStar BCS
Beyond Carbon Solutions

MOXBA GROUP

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OMV

SOLOMON

TCG
The Catalyst Group™
Vision > Intelligence > Impact

TOPSOE

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TUBACEX GROUP

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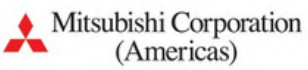
Participating Companies

ADVARIO

ATOE

EATON

GP100 ENERGY ADVISORS



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OMV wood


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An Ecolab Company
MINIMIZE WATER
OPTIMIZE COST
REAL CHANGE starts today


SIAD


SOLOMON
Net Zero

Testimonials

A huge thank you to the organizers of ESF North America for creating a platform where industry leaders can exchange ideas, showcase innovations, and build partnerships. Together, we can power progress and drive the sustainable energy future we all envision.

Marla Kline,
General Manager, Global Commercial Chemicals
and President of SCLP
SHELL

I truly enjoy getting the opportunity to talk with vendors and other owners. Thank you so much for such a great event.

Vice President General Manager
Bakersfield Renewable Fuels

ESF North America offers great opportunities to collaborate with others looking to solve the same complex problems in innovative ways.

Decarbonization Director
Wood

It has been the best conference I have attended in the last two years. There was good balance of strategic and tactical issues that were discussed. I saw an excellent blend of technology companies, operators and the topics discussed were very timely and current

VP Oil Markets & Refining Analytics
Turner, Mason & Company

ESF North America 2025 truly met and exceeded all expectations. This was my first ESF event and while I expected it to be heaving on sustainability discussions, I was pleasantly surprised by the in-depth discussions and presentations on real world applications and opportunities. I believe that the discussions that happen at ESF NA are vital to the sustainability future of North America

Lead Reliability Engineer

DELEK

The ESF North America summit was outstanding. Thank you EPC!

Director Business Development

Honeywell UOP

It was a great event, meeting and exceeding our expectations. Well organized, great collaborative EPC-staff, friendly helpful, wonderful!!

VP Sales & Marketing

Moxba Group

Attending ESF NA 2025 was an incredibly valuable experience. The forum brought together a dynamic mix of industry leaders, innovators and sustainability experts, all focused on accelerating the energy transition. The sessions on hydrogen infrastructure, decarbonizing the chemicals sector and circular economy practices were especially insightful—offering both strategic vision and practical pathways forward. Wood did a remarkable job curating relevant topics and fostering meaningful dialogue. I left the event inspired, better informed and more connected to a network of professionals driving real change in energy and sustainability

Team Leader, HSE

Adnoc Onshore


wood.


KBC
A Yokogawa Company
Trusted technology, expertise and
experience to help you navigate your
path to net zero emissions


ALFA LAVAL
Rethink
your refinery.


MOXBA GROUP
CATALYST

KEYNOTE PANEL TAKEAWAYS
America in Transition

This year, U.S. energy priorities have shifted toward ensuring secure access to affordable domestic fossil-fuel-based energy, even as global momentum for decarbonization remains strong.

For the refining and chemicals sectors, this creates a dual challenge to deliver a stable and affordable fuel supply in the near term, while continuing to invest in and deploy low-carbon solutions to stay competitive in a net-zero future. Against this backdrop, our keynote panellists discussed the balance between immediate domestic priorities and longer-term global decarbonization commitments.

Jerry Price
Managing Director - Americas
GREEN STAR BCS
MODERATOR

Jon Goldsmith
Senior VP, Renewables
PAR PACIFIC HOLDINGS

Billy Bardin
Global Climate Transition Director
DOW

Peter Zonneveld
President US
NESTE

Neville Fernandes
VP, Corporate Affairs & Development
CHEVRON RENEWABLE ENERGY GROUP

Yoga Anand
Sr. Director, Renewables & Low Carbon Management
MARATHON PETROLEUM CORPORATION

- **No one-size-fits-all approach to the energy transition –** The energy transition is not linear; it's complex and multidimensional. Dow is exploring a wide range of opportunities across its assets, customers, and markets to decarbonize its products and services. This approach enables partners further down the value chain to reduce their Scope 3 emissions. Today, Dow is one of the largest consumers of renewable energy in the industry, with over 1,000 GW-hours of renewable power under contract. The company is also actively pursuing projects focused on decarbonized hydrogen as a fuel source, as well as nuclear energy, with a project currently underway in Texas. As the United States advances toward domestic manufacturing, energy resilience, and "energy dominance," the development of technologies such as advanced small modular reactors (SMRs) becomes critically important.

- **The lifeblood of industrial transformation –** Steam remains the heart of the process industries, and decarbonizing steam production is therefore the lifeblood of industrial transformation. Securing reliable, firm sources of low-carbon steam is essential to ensuring both sustainability and operational continuity.

- **Preparing for deeper troughs and higher peaks –** Today, we are spending a significant amount of time just trying to keep up with the latest developments, hour by hour, day by day, week by week. As an industry already characterized by volatility on the conventional side, the transition space, which relies heavily on strong and consistent regulatory support, is even more vulnerable to uncertainty. Since the start of the year, we've witnessed significant shifts in the economics of renewable diesel and biodiesel. A considerable amount of bio-based capacity has gone offline, as well as idling in the renewable diesel space. Furthermore, conventional capacity reductions, particularly on the West Coast, further disrupted the overall supply-demand balance. In this landscape, flexibility is crucial for reacting and adapting to deeper troughs and higher peaks.

- **What's that marginal barrel?** As we adapt to evolving and often unpredictable regulatory policies, feedstock flexibility has become crucial for optimizing supply chains and maximizing the highest possible margins. Success in this environment demands a value chain perspective that considers feedstock sourcing, characteristics, processing specifications, unit constraints, and, critically, regulatory compliance. Ultimately, the aim is achieving that marginal barrel, and today that's changing on a week-to-week basis as we await final and confirmatory guidance on federal, state, and local policies

- **Customer demand for decarbonized products remains robust –** Despite a complex political environment, including the slowing of incentives, evolving policies, and shifting dynamics, Dow continues to see strong demand and a robust pipeline of customers seeking decarbonized products to meet their Scope 3 emissions reduction goals voluntarily. Today, there is a limited supply of these products, presenting an opportunity to monetize decarbonized products amid the supply-demand disconnect.

- **Decarbonization across the value chain –** Dow is implementing approaches that enable the selection of decarbonized options across its product portfolio and supply chain. This includes the ability to choose low-carbon feedstocks, intermediates, and finished goods, and integrate them into a cohesive, geographically agnostic, and carbon-accountable supply chain. By tracing and assigning decarbonization attributes to specific product flows, Dow not only supports its customers' sustainability goals but also monetizes the decarbonization value embedded in its products.

- **Balancing energy abundance, cost, and voluntary market growth –** Today's energy landscape is increasingly focused on abundance and affordability. In this context, voluntary carbon markets will play a critical role in driving the adoption of low-carbon products. However, the key challenge is maintaining cost sensitivity, especially for the end consumers operating outside of mandated markets. Their long-term engagement will depend on the perceived and actual value of carbon reduction and other environmental benefits.

- **The power of policy –** While voluntary markets can help augment demand, policy remains the primary driver of growth for low-carbon alternatives. We've seen this firsthand in California through the Low Carbon Fuel Standard (LCFS). Today, it is harder to find a barrel of petroleum diesel in California than it is to find renewable diesel or biodiesel, which account for approximately 70% of the diesel market in the state.

- **A less rosy RVO revert?** While an equilibrium needs to be established with the set 2 RVO to ensure it aligns with supply, there is no guarantee this will happen. Instead, the possibility is a revert to a more conservative, existing RVO, one that may not be as optimistic, and faces a potential dislocation between supply, demand, and regulatory benefits.

- **RD vs. SAF trade-offs –** A clear trade-off is emerging between renewable diesel (RD) and sustainable aviation fuel (SAF). RD has reached a greater level of market maturity, especially on the West Coast, where established programs and incentives have helped drive adoption and penetration. The SAF market is still evolving, both in terms of the policy landscape and, perhaps more importantly, the level of support from end customers.

- **SAF tailwinds** – With technology risks significantly reduced, supportive policy developments emerging in certain states – including incentive programs and tax credits – and strong logistical and feedstock synergies with renewable diesel, the tailwinds for SAF are increasingly positive.

- **Customer commitment is key –** despite the positive tailwinds, for SAF to scale meaningfully and proliferate in the market with domestic supply, airlines must play a more active role in committing to offtake agreements and helping producers and manufacturers justify the capital-intensive investments required for SAF production and facility conversions.

- **Line of sight** – whatever the investment, companies need a clear and confident line of sight of their return. In the absence of long-term regulatory certainty or clear policy guidelines to underpin those returns, capital won't flow.

- **Critical components in Canada** – Dow's Fort Saskatchewan Path2Zero ethylene cracker expansion project is a prime example of how the right conditions can enable a long-term investment decision. Alberta offers a historically stable policy environment, supported by both provincial and federal governments, along with targeted incentives, as well as abundant raw material supply and existing infrastructure that supports CCS. Once online, the project will deliver instantaneous results, decarbonizing approximately 20% of Dow's global ethylene capacity, demonstrating the scale and impact possible when these critical components align.

- **Foundation for clarity –** Establishing a clear and stable foundation is essential for guiding strategic capital allocation, reinforcing confidence in the underlying economic model, and ensuring that capital deployed aligns with both internal strategic priorities and shareholder expectations. Ultimately, creating shareholder value remains a central tenet of any significant investment decision.

- **A bridge, not a bottleneck –** We must leverage existing energy infrastructure and technologies to capitalize on renewable fuels opportunities, ensuring they serve as a complementary bridge for the transition rather than a bottleneck. Retrofitting existing assets supports capital efficiency and risk mitigation, allowing for a phased transition that scales renewable fuels within the familiar operational footprint as demand matures and policies evolve. Infrastructure will have to support a myriad of inputs in a way that it doesn't today, and be able to compensate and deliver power demand and power on demand when needed.

- **Chemical feedstocks –** Today, renewable chemical feedstocks, whether propane, LPG, or renewable naphtha, face significant cost disadvantages compared to fossil-based naphtha. Committing to a higher-cost renewable feedstock is extremely difficult without the support of policy, favourable production economics, and strong commercial offtake agreements, specifically take-or-pay agreements, to justify the front-end capital investment and the complexities of chemical conversion. To truly enable the transition to renewable chemical feedstocks at scale, we need to find ways to make renewable naphtha cost-competitive with fossil-based naphtha, which is a very big lift!

- **Yield enhancement feedstock technologies –** Beyond expanding acreage or introducing new crops, yield-enhancement technologies offer a promising avenue to increase the volume of renewable feedstocks. However, scaling these solutions depends heavily on policy clarity. Once there's greater certainty around long-term policy support for domestic feedstocks, we could see a meaningful push to invest in and adopt yield-enhancement technologies.

- **Vertical, and global positioning –** Beyond novel feedstocks and yield enhancements, ensuring feedstock availability to meet the projected annual production of renewable diesel and SAF of 40-50 million tonnes requires vertical integration and establishing a global footprint. Neste's acquisition of Mahoney Environmental and Agra Trading is a strong example, as it gives Neste control over used cooking oil collection from over 90,000 locations in the U.S. This provides not only cost and access advantages but also traceability, which is becoming increasingly crucial in regulatory frameworks and carbon intensity scoring. While feedstock supply is regional, demand is global. Building a diversified, international sourcing strategy, investing in logistics, aggregation, and local partnerships, will better position companies to scale sustainably and resiliently.

- **Beyond returns –** While price signals and policy frameworks are key contributors to any project investment analysis, particularly in the renewable fuels space, the reality is far more multi-variable. It's easy to get fixated on hurdle rates and returns, but in today's environment of regulatory and market uncertainty, risk management and capital at risk are crucial. This includes stress testing policy and incentivization regimes, considering both best-case and worst-case scenarios. Furthermore, beyond the standalone economics, an investment must be evaluated on its strategic fit within the core business. How can it complement core business lines or offer synergies that can be leveraged?

- **Recalibrating the investment thesis for renewables –** Legacy fossil markets have undergone multiple cycles, primarily driven by supply and demand, with lows, middles, and highs, and investment paced accordingly. Renewables is a novel business line and market, where we are still the data point, defining it as we go. Macro influences structurally dislocate today's supply and demand. How do we enhance margin capture, expand existing footprints, and optimize what we have and build durability for the future?

- **The power of partnerships –** In today's renewables market, partnerships have never been more critical. Beyond 1 + 1 = 3, done right, they can help manage risks – technical, capital, and regulatory – help weather turbulence and cycles in the regulatory markets, and unlock agility and opportunities for growth as the marketplace evolves.

PANEL TAKEAWAYS

Decarbonizing The Chemicals Industry

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With growing urgency to cut emissions, the chemical industry must act now. In the panel discussion "Decarbonizing the Chemicals Industry", leaders from across the value chain explored how the sector can accelerate its transition to net zero. From modular carbon accounting frameworks to scalable technologies like carbon capture and storage (CCS), the discussion highlighted practical strategies, emerging business models, and the importance of collaboration. Progress must be transparent, inclusive, and grounded in both science and usability to drive meaningful change.

- **The chemical sector has a major decarbonization challenge –** As an industry characterized by complex processes and extensive value chains, chemical production generates emissions across upstream suppliers, production facilities, and downstream consumer use. This complexity makes carbon accountability both essential and difficult to implement.

- **Scope 3 emissions dominate the footprint and require full value chain collaboration –** For companies like P&G, the majority of emissions come from upstream suppliers and downstream consumer use (e.g., heating water for laundry). Addressing these issues requires deep engagement across the entire ecosystem – from feedstock producers to end-users.

- **A modular carbon assurance standard offers a new pathway forward –** Developed by SCS Global Services through a transparent, multi-stakeholder process, the standard builds on existing frameworks like ISO 14067 and Together for Sustainability. It includes five modules (A–E), each representing a different lever for evidencing decarbonization in chemical production.

- **Flexibility is key to industry-wide adoption –** The modular design allows companies of all sizes and at different stages of their decarbonization journey to engage meaningfully. It supports a "a-la-carte menu" approach, enabling stakeholders to select modules most relevant to their operations, investment capacity, and geographic constraints.

- **Carbon accounting must be rigorous, but also usable –** While ideal systems are desirable, progress depends on frameworks that are science-based, auditable, and actionable today. Transparency, iteration, and continuous improvement are essential to enable action now and refinement over time.

- **Carbon capture and storage (CCS) is a key chemicals technology –** CCS is a proven, scalable solution for chemical plant emissions reductions. Shell has already abated over 9 million tonnes of CO_2 and is expanding with a new project targeting 300 million tonnes. The standard also allows companies to sell or purchase CCS credits, increasing accessibility.

- **Voluntary action is a strategic advantage –** Operating in a voluntary decarbonization environment allows companies to proactively shape cost-effective, scalable solutions before regulatory mandates are imposed. This flexibility encourages innovation and industry-led progress.

- **Sustainability must deliver performance and value to scale –** Consumers are unwilling to compromise on performance or price. Scalable solutions must provide all three: performance, affordability, and sustainability. Products that reduce emissions without trade-offs, such as P&G's Tide Cold Water, demonstrate how innovation can meet expectations and achieve mass adoption.

- **Carbon intensity is becoming a critical product feature –** The chemical sector may need to evolve toward more service-oriented models, where carbon intensity becomes a product attribute or value-added offering. This shift could unlock new business models and incentives for decarbonization.

- **A unified, credible standard is a catalyst for progress –** A shared framework that integrates technology, commercial agreements, incentives, and consumer communication is essential to unlock investment, reduce uncertainty, and accelerate emissions reductions across the value chain.

- **Transparency builds trust and drives transformation –** As carbon intensity becomes a market differentiator, transparent and auditable claims, potentially in the form of "nutrition label"-style disclosures, can help buyers and consumers make informed decisions and support low-carbon choices.

- **Progress over perfection is the mindset shift needed –** Stakeholders agree that waiting for perfect systems leads to paralysis. Instead, iterative, transparent approaches that evolve with science and market needs are critical to sustaining momentum, enabling innovation, and achieving real-world impact.

- **"If you're not part of the solution, you're part of the problem" –** Before regulation forces action, industry players must come together to co-develop solutions, share learnings, and invest in scalable technologies. Now is the time to act!

PANEL TAKEAWAYS

Balancing on a Net-Zero & Tariff Tightrope - Getting Across the FID Line

The Inflation Reduction Act (IRA) spurred major investments in renewable fuels, carbon capture, and other low-carbon technologies, driven by expectations of strong returns through tax credits and subsidies. At the same time, Trump-era tariffs have added pressure to project costs and disrupted supply chains. Now, with subsidies and incentives in question, the economics and financial viability of many low-carbon projects face significant headwinds.

Against this backdrop, the panel explored predictions and expectations for current and future low-carbon investments, the impact of tariffs on project costs and supply chains and the financial outlook for projects in the absence of subsidies and incentives

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- **First-of-a-kind project risks** – especially in hard-to-abate sectors, there's no blueprint or precedent, so risk is inevitable. Most projects don't fail for technical reasons; the challenge is commercial. Some risks are outside our control, like tariffs or shifts in government funding, which introduce volatility. The key is controlling what we can and bringing that risk inside acceptable limits.

- **A three-year window of uncertainty –** The Bipartisan Infrastructure Law and the Inflation Reduction Act promised billions in grants, loans, and tax incentives, but accessing those funds hasn't been straightforward, and the qualification process, such as wage requirements, hydrogen credit criteria, and carbon intensity thresholds, has been slow. Without clarity on how to qualify or what values to rely on, companies have been unable to build incentives into their cash flow models confidently and have held off on pressing the FID button.

- **Capital allocation is at the core –** ultimately, where investors choose to put their money and what their risk-reward threshold is. Reaching FID requires sufficient technology de-risking and commercial de-risking. In recent years, neither of those conditions has been in place. In rare instances, it has happened, but in general, it's tough to get there.

- **Spending money to make money –** is a major challenge, especially for first-of-a-kind projects where no one wants to be "serial number one." Investors need clear certainty on returns, whether through loans or tax incentives. Ongoing uncertainty around incentive amounts and potential clawbacks makes it hard to know what they can literally bank on.

- **Has the tariff train left the station?** For those projects already in execution, where contracts are signed and long-lead items have been ordered, essentially, it is what it is. While there are some cost-sharing strategies in place, you must live with whatever tariff applies when the goods arrive. For earlier-stage projects, there are still options. Find suppliers in lower-tariff jurisdictions, adjust your sourcing strategy, or consider sourcing domestically. Another question to ask is whether it makes sense to continue developing the project in the U.S. or if another country, where these risks don't exist, makes more sense. You can't do that once the train has left the station, but for projects still early, it's a different dimension in the risk register.

- **Cost of production –** Regardless of the pathway, how do we lower the cost of production, reduce the premium and become less dependent on government mandates or incentives to bridge the gap? Conventional refining has had a century to optimize. Technology and innovation have driven significant gains over time, allowing units to run at five times their original capacity. We're applying the same mindset to emerging fuels, finding ways to improve selectivity, increase flexibility, boost efficiency, and improve margins. Some things we can't control, and the reality is that it will take time; however, the pathway remains the same.

- **You can't scale talk –** we have to start building to learn what works and what doesn't. To reach FID, we still need enough commercial certainty to know you won't lose money, but the acceptable risk today seems to be that you might not make as much as you'd hoped for.

- **Opportunities that span state lines –** Some states, notably on the West Coast and across Canada, have gone out on their own with cap-and-trade systems and clean fuel standards, often linked for reciprocity and trading, driving investment and a pop-up of project hotspots.

- **Faster than federal – S**ome states are stepping up to grow their own economies and attract investment. Wyoming and Louisiana are good examples, aligning innovation and incentivization with their visions for future growth and economic development. In carbon sequestration, any state pursuing Class VI primacy for permitting is signalling it wants to move quicker than the federal government.

- **Canadian competition –** Canada remains a strong competitor to the U.S., particularly in carbon capture, with easier access to project funding and infrastructure collaborations. The projects may not be $500 million scale, but they will get built, and they will operate.

- **Unsubsidized pathways reaching FID –** A business case for an unsubsidized project plan requires creativity, both commercially and technically. It comes to smart technology selection and smart site selection, considering jurisdictional differences, port access, and feedstock availability. Creativity in that business plan, and when those elements align, is when you'll see an unsubsidized project plan take shape.

PANEL TAKEAWAYS

The Hard to Abate, let's Collaborate! – The World's Apollo 13 Moment

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Collaboration is the new climate currency. From AI-driven innovation to regenerative design, the panel "The Hard to Abate, Let's Collaborate! – The World's Apollo 13 Moment" explored how cross-sector partnerships are essential to solving the toughest decarbonization challenges. With the majority of the audience backing an "all hands on deck" approach, the discussion spotlighted how inclusive collaboration, systems thinking, and responsible technology use can accelerate progress across hard-to-abate sectors.

- **An "all hands on deck" approach is essential for sustainability** – Tackling climate challenges requires broad, inclusive collaboration across sectors and disciplines. From investing in low-carbon technologies to rethinking material use and recycling, the path to net-zero demands shared responsibility and coordinated action at every level. 76% of the audience supported this holistic approach.

Whose hands are needed on the deck?

16%	8%	0%	0%	76%
Companies	Policy/ Governance	Academia	Public	All of the Above

- **Inclusive, adaptive partnerships unlock broader impact –** Effective collaboration must extend beyond industry and government to include local communities, startups, and underserved groups. Engaging diverse stakeholders ensures solutions are grounded in real-world needs and promote climate equity. Strategic partnerships that combine capital, expertise, and technology, such as AWS's Climate Pledge (joined by over 550 companies) and Microsoft's Climate Innovation Fund, are key to scaling innovations like sustainable fuels, green steel, and climate risk modeling.

- **Mutual understanding is key to effective partnerships –** True collaboration depends on shared expectations and balanced relationships. Avoiding hierarchical dynamics and co-defining success criteria fosters trust and innovation. Cross-competitor partnerships, when built on openness and aligned values, can accelerate progress.

- **Joint ventures and co-investment are unlocking downstream potential –** The shift toward circular economy models is transforming traditional roles in the downstream industry. Co-investment and shared ownership help distribute risk, unlock economies of scale, and combine complementary expertise. Examples include Microsoft's partnership with LanzaJet on sustainable aviation fuel and OMV's collaboration with waste management firms to produce chemical recycling feedstock.

- **Connecting the dots across the value chain –** Navigating the complexity of the energy transition requires systems thinking and life cycle analysis to identify interdependencies and adapt to shifting demands. AI-powered logistics and real-time data feedback loops improve agility, transparency, and operational efficiency in a rapidly evolving geopolitical and energy landscape.

- **Digital collaboration is accelerating sustainability –** AI is transforming the energy sector, from optimizing operations and reducing emissions to breakthroughs in material science and logistics. Responsible AI use demands robust governance, including data privacy, intellectual property protection, cybersecurity, and ethical design. These are not just technical challenges but organizational imperatives that demand clear policies and proactive leadership.

- **Blended workforces are reshaping how teams operate –** The rise of AI agents and robotics is transforming how decisions are made and work is executed. As humanoid bots and AI writers increasingly participate in meetings and fieldwork, organizations must rethink how human-machine collaboration is structured, managed, and trusted. This shift presents opportunities for speed and efficiency, but also raises cultural and ethical questions about the future of work.

- **Sustainability efforts benefit from cross-sector cooperation –** Beyond carbon reduction, sustainability includes water stewardship, waste management, and biodiversity protection. Innovative technologies such as zero-water cooling systems and regenerative design help optimize resource use. Future strategies must embrace regenerative thinking and create economic incentives for restoring natural systems.

- **The energy transition is not a single-sector challenge –** It is a systems-level transformation that demands collective intelligence, shared responsibility, and bold experimentation. Whether through AI-powered innovation, regenerative design, or inclusive community engagement, the path forward lies in our ability to collaborate across boundaries. The future of sustainability will be shaped not just by technology, but by the strength of the partnerships we build today.

A huge thank you to all of our speakers, sponsors, and attendees who attended and contribute to the success of **ESF North America 2025**. We will continue the discussions next year...

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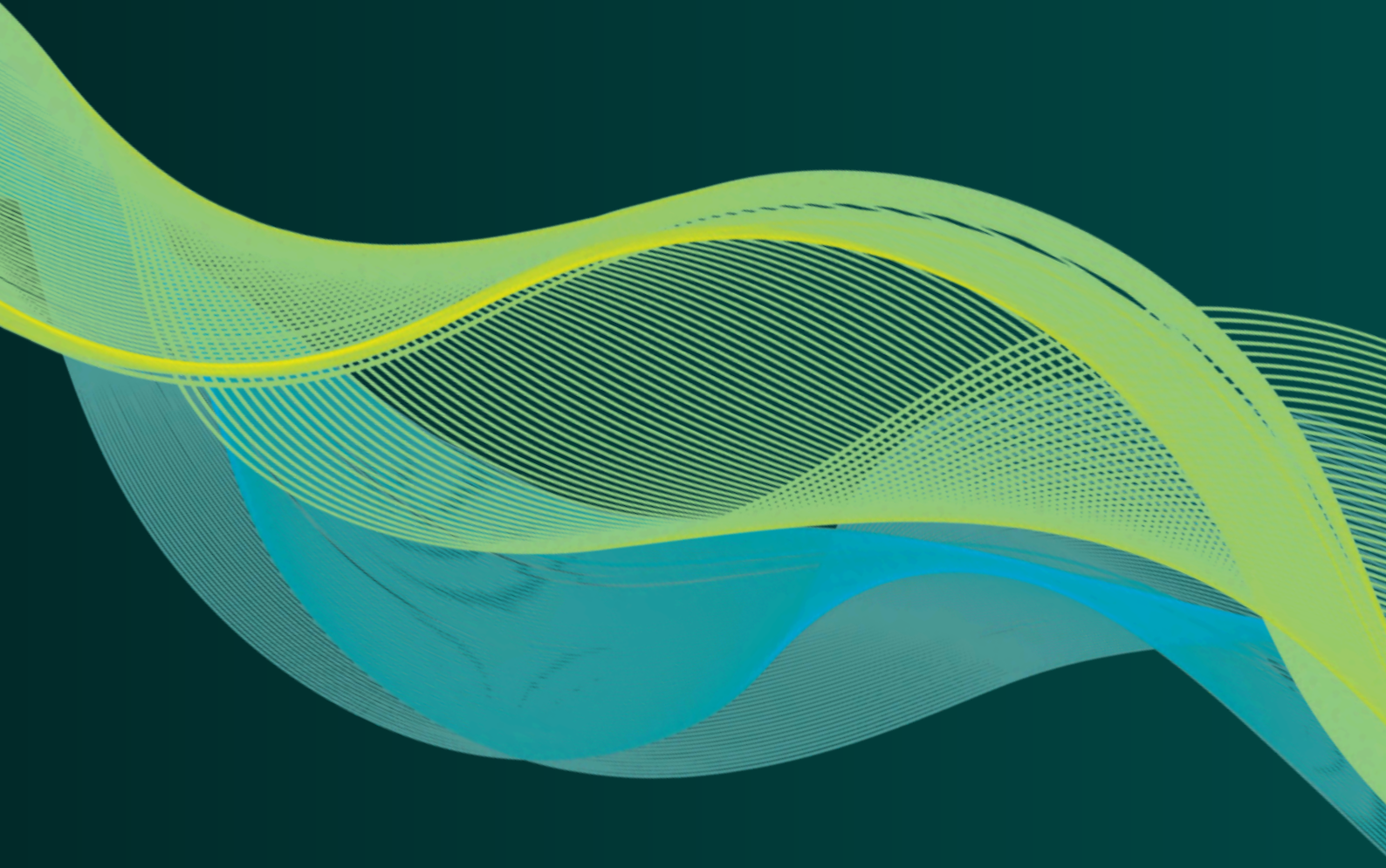

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