



ESF North America 2023

ENERGY & SUSTAINABILITY FORUM

Decarbonizing the Downstream Industry

31 May - 2 June | San Francisco, California

POST EVENT REPORT

ORGANISED BY EURO PETROLEUM CONSULTANTS

 europetro.com/esfnorthamerica



Euro Petroleum Consultants

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INTRODUCTION

Our inaugural ESF North America took place last June in Houston just ahead of the passing of the groundbreaking Inflation Reduction Act and its \$370+ billion investment into decarbonization and clean energy solutions. Catalyzing trillions of dollars' worth of project growth and production in the US over the next decade, where better to hold the next edition of ESF North America than California, the state leading the US' energy transition.

Taking place from the 31st May – 2nd June 2023 at the Hyatt Regency SOMA in San Francisco, we once again gathered the leaders from North America's refining and chemicals industries to help advance and accelerate the development of a decarbonized and sustainable energy future in which the oil and gas downstream industry continues to play a leading role.

Across three days of interactive panels and seminars, insightful presentations and a variety of networking formats, attendees discussed the incentives, investment, collaboration and technologies required to help drive forward profitable decarbonization of the industry.

DAY ONE

Day one kicked off with a focus on “Decarbonization: from pathways to delivery”. Over the last twelve months especially, but since Russia's invasion of Ukraine and the COVID-19 pandemic, we have had an environment where the price of energy and the subsequent slowing global economy has taken centre stage. Despite these headwinds, the 2030 timeline to deliver on the commitments is not slowing and the industry must continue to invest in the projects that provide returns.


The announcements and the ambitions matter!



We had a stellar lineup of keynotes across a variety of formats: **Catherine Reheis-Boyd**, President & CEO, **Western States Petroleum Association** and **Leon de Bruyn**, President & CEO, **Lummus Technology** kicked off the conference with keynote speeches, handing over to **Casey Merriman**, Head, Competitive Intelligence Service, Editorial Director, Western Hemisphere, **Energy Intelligence** for a keynote fireside chat with **Andy Walz**, President, Americas Products, **Chevron**. The plenary concluded with a panel '**Opportunities and Obstacles on the Road to Net Zero**' joined by **Michael Cohen**, Chief US Economist & Head of Oil & Refining, **bp**, **Jennifer Haley**, CEO, **Kern Energy**, **Emma Lewis**, SVP USGC Chemicals and Products, **Shell**, **Jolie Rhinehart**, General Manager, San Francisco Refinery, **Phillips 66** and moderated by **Ed Crooks**, Vice-Chair, Americas, **Wood Mackenzie**.

[Read the takeaways from Catherine, and Andy's sessions, and the panel below](#) 

The conference then split to dig deeper into two hot topics, "Hydrogen & CCUS", and "Sustainable Fuels, Feedstocks and Catalysts". Stream A saw presentations from **Topsoe**, **Wood**, **Cozairo**, **Casale** & **Technip Energies**, **BD Energy Systems**, **Honeywell UOP**, **Pall Corporation** and **Axens** ahead of a panel '**The Missing Links of Hydrogen & CCS - Completing the Value Chains**' joined by **Matt Reeves**, New Products and Strategy Integration Manager, **ExxonMobil Low Carbon Solutions**, **Bob Schlatter**, EVP Capital Project Delivery, **World Energy** and **Katie Zimmerman**, Decarbonization Director, Americas, **Wood**.

[Read the key takeaways from the panel below.](#) 

Stream B saw presentations from **BASF**, **Ketjen**, **W. R. Grace**, **OMV**, **ExxonMobil Catalysts and Licensing**, **Honeywell UOP** and **Chevron Lummus Global**, as well as a panel, "**Fuelling the Revolution**" joined by **Dan Kim**, Chief Strategy & Sustainability Officer, **NEXT Renewable Fuels**, **Melinda Palmer**, Vice President of Regulatory and Public Affairs, **Kern Energy**, **Carrie Song**, Vice President Renewable Road Transportation Americas, **Neste** and moderated by **Thomas Baker**, Managing Director & Partner, **Boston Consulting Group**.

[Read the key takeaways from the panel below.](#) 

DAY TWO

Day two of the conference picked up where day one's plenary left off and continued the discussions on decarbonization pathways and delivery. Second day and a second keynote fireside chat this time between **Chris Cooper**, President, **Neste US** and **Daniel Bolgren**, Principal, **Deloitte Consulting LLP**, followed by presentations from **NexantECA**, and **GreenStar BCS**.

The plenary concluded with our technology keynote panel, "**Technologies that Move the Needle**" which focused on what can be achieved today with the multiple technologies already in the pipeline and finding a balance between finding those near-term efficiencies and the low-hanging fruit whilst trying to pick up the top of the tree in pursuit of the next generation. Read the key takeaways from the panel below which was joined by **Dan Carter**, President, Decarbonisation, **Wood**, **Leon de Bruyn**, President & CEO, **Lummus Technology**, **Bryan Glover**, President & CEO, **Honeywell UOP**, **Jean-Luc Nocca**, Executive Vice President Commercial, **Axens** and **Shigeyoshi Uehara**, CEO, **KBC** and moderated by our Vice President, **Stefan Chapman**.

[Read the key takeaways from the panel below.](#) 

The focused of the conference moved to “Energy and Operational Efficiency”. In today's turbulent environment industry leaders must focus on decarbonizing where possible and building clear plans for abatement. Today's high energy price presents a good opportunity to reinforce the role that energy efficiency plays in driving the longer-term energy transition. **KBC, Alfa Laval, Lummus Technology, Emerson & Aspentech, Genesis, Daily Thermetrics, Sulzer** and **Becht** presented what is achievable for the industry in the short term through the delivery of energy and operational efficiency to minimize carbon footprint and operating costs.

We couldn't conclude the conference without discussing the IRA and so three days of excellent content, discussions, and networking were wrapped up with a final panel discussion, **“Building on Incentives: Harnessing Inflation Reduction Act Tax Credits for Decarbonization”**. Discussing how the refining and chemicals industries can navigate decarbonization incentive programs we welcomed **Thomas Baker**, Managing Director & Partner, **Boston Consulting Group**, **Deanne Barrow**, Senior Associate, **Norton Rose Fulbright**, **Rebecca Jones**, Senior Project Manager, **Wood**, **David Smith**, Partner, Manatt, **Phelps & Phillips** and **Nick Macilveen**, Managing Director, **Embarcatec**.

[Read the key takeaways from the panel below.](#) 

SEMINARS

ESF North America 2023 began with two pre-conference seminars hosted by **Wood & Honeywell UOP**.



Wood opened the seminar day to discuss

"Pathways to Commercializing Energy Transition: Balancing the Challenges and Investing in the Opportunities"

Providing secure, sustainable, and affordable energy has become even more urgent, and a team of Wood experts helped the downstream industry respond to these challenges in their seminar and answer questions including, where does it invest, what innovations are on the horizon, and which solutions will provide business longevity and sustainability?



Joe Aina
Business Development Director at EPC

It was great meeting you [Debbi](#) and having the opportunity to listen to Woods experts discuss new opportunities for longterm sustainable solutions. Looking forward to discussing more over the next few days.



Honeywell UOP's afternoon seminar focused on "Driving Your Sustainability Revolution through Continuous Innovation and Strategic Partnerships"

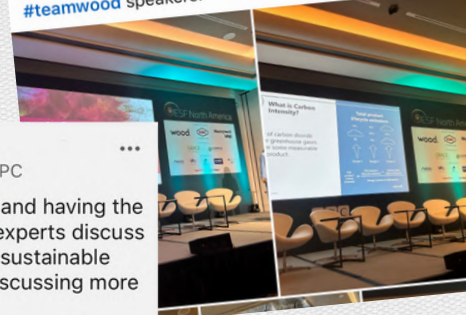
Delegates attending had the opportunity to discover the latest emission management and reduction technologies that are essential for the net-zero future, and how they can be integrated into operations today. Industry experts discussed the latest technology innovations, strategic partnerships, and policy impacts in achieving sustainability goals.

Delegates then enjoyed a networking drinks reception kindly hosted by Honeywell UOP.



Debbi Limond · 1st
Sales Marketing & Enablement Lead at Wood
2mo · Edited · 🌐

We are off to a strong start at [#ESFNorthAmerica](#) with the [Wood](#) pre-conference seminar. Hosted by [Katherine Zimmerman](#) and [Daniel Carter](#), the seminar titled 'Pathways to commercializing energy transition: Balancing the challenges and investing in the opportunities' discussed which solutions will provide business longevity and [#sustainability](#) for the [#downstream](#) industry. Thanks to [Euro Petroleum Consultants](#) for delivering a great event and congratulations to [John Young](#) from [OMV](#) and all our [#teamwood](#) speakers.





EXHIBITOR SPOTLIGHT & HAPPY HOUR

Day One of the conference concluded with a series of more casual presentations taking place in the exhibition and networking area alongside a well-deserved drink.

We heard about sustainable procurement of precious metals from **Sabin Metal**, sustainable energy project delivery and challenges from **Koch Modular Process Systems**, and **Eichleay**, efficiency and reliability solutions from **IGS**, and a company introduction from **NextEra Energy Resources** on how they are leveraging its best-in-class renewables portfolio to lead the green hydrogen transition in North America.

SABIN
Metal Corporation



Koch Modular
PROCESS SYSTEMS



Eichleay



IGS







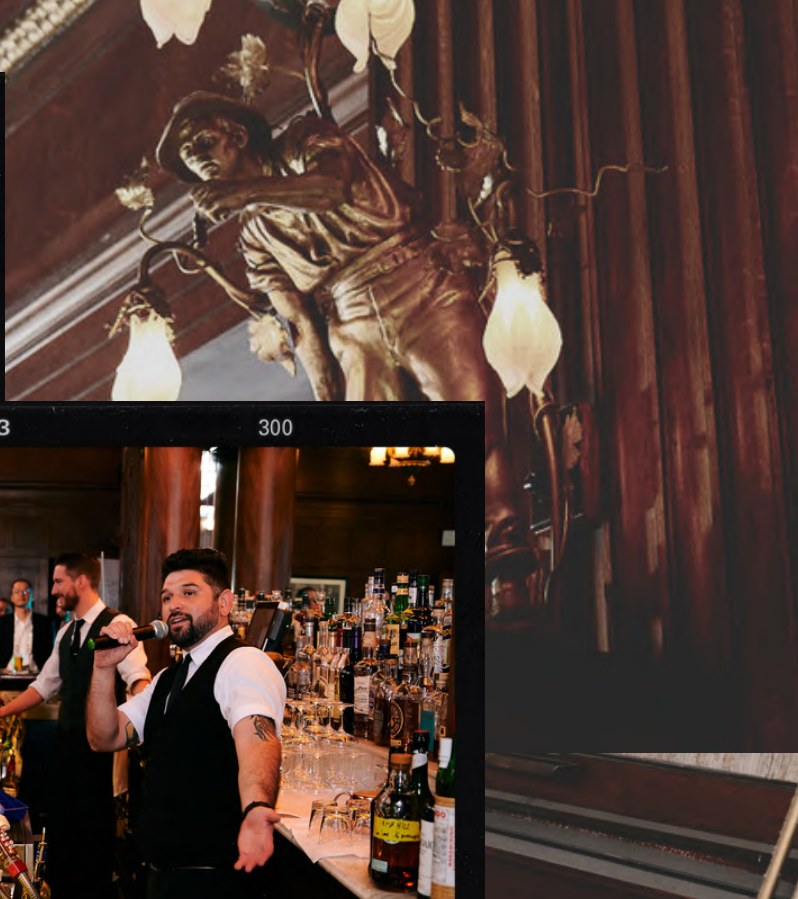
A Yokogawa Company

NETWORKING MIXER

We know that a successful conference isn't just about the content in the classroom, it's the connections and collaborations that matter, never more so than for this net zero transition and that's why we put a big emphasis on networking!

To conclude the first day of the conference, KBC hosted networking drinks and nibbles in a historic San Francisco landmark and one of the city's oldest bars! Opened in 1908, and rich in history, The House of Shields was President Warren G. Harding's favourite spot, before becoming a speakeasy during the Prohibition era!





3

DAYS

2

SEMINARS

16

HOURS OF CONTENT

10+

HOURS OF NETWORKING

56

SPEAKERS & PANELLISTS

280

REGISTERED DELEGATES

123

PRE-ARRANGED MEETINGS

ESF North America

ORGANISED BY:
EPC
Euro Petroleum Consultants

Platinum Sponsors:

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A Yokogawa Company
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- GreenStar
- NexantECA
- SULZER
- TOPSO

ESF
NORTH
AMERICA
IN NUMBERS

WHAT THEY SAY ABOUT IT

SEE IT, HEAR IT, READ IT!

 **VIEW THE VIDEO ON YOUTUBE**



Insightful and inspiring.

**Vice President, Sustainability and Strategic Insights
SOLOMON ASSOCIATES**

*ESF North America 2023 was world-class, the best event we've attended this year!
Your effort in setting up the meetings was greatly appreciated and
an excellent feature of the EPC events.*

**Chief Commercial Officer
GREEN STAR BCS**

*Thank you for the kind invitation for me and Neste to join the ESF North America 2023.
The conference agenda was packed full of gems!!
Congratulations to you and your team for great planning.*

**Vice President Renewable Road Transportation Americas
NESTE**

*Thank you to you and your team for a very nice event!
The content and the attendance were excellent
with one of the best one-on-one meeting coordination I've experienced.*

**Chief Strategy & Sustainability Officer
NXT Clean Fuels**

*This is not the first time our company has participated.
I found this conference to excel in the speakers and the networking.*

**VP Chemical Industry
EMERSON**

*Bringing the major refiners, technology providers, and future bio-refiners
into the same room creates the environment for a frank exchange of ideas about
what can be achieved in decarbonization. Excellent conference.*

**Principal Consultant North America
SHV ENERGY**

*The event was well-organized and provided a unique platform to connect
with industry leaders, experts, and like-minded individuals passionate
about sustainable practices. The networking opportunities were invaluable,
allowing me to establish meaningful connections and exchange ideas with professionals.
I highly recommend this event to anyone seeking to stay at the forefront of
energy and sustainability advancements and contribute to a more sustainable world.*

**Business Development Director
EICHLEAY**

*ESF North America 2023 was one of the best events I have attended
with really valuable conversations. It means a lot to connect in person
with fellow operators and vendors who are very relevant to my industry*

**Vice President Technical Services
BAKERSFIELD RENEWABLE FUELS**

#ESFNORTHAMERICA IN THE MEDIA

Carrie Song · 2nd
 Vice President Renewable Road Transportation Americas, Neste | Bri...
 2mo · 🌐

Great to share the stage today with thought leaders and #renewable enthusiasts at #ESFNorthAmerica, and enjoyed the discussion on the critical role renewable fuels play in fueling the energy transition. I never get tired of talking about Neste's climate commitment and how we 'walk the talk' by significantly ramping up renewable diesel production and helping heavy duty sectors—not only road transportation, but marine, manufacturing, power generation—reduce #greenhouse gas emissions effectively. Bottom line: the competition is between us and the GHG emissions, not between different solutions. Only by leveraging 'all of the above' solutions and encouraging collaboration across the entire energy ecosystem, can we reach a carbon-neutral future! Huge thanks to the other panelists, our moderator, and ESF event team for such a great session.

Thomas Baker Dan Kim Kay Mitchell Melinda Palmer



Cathy Reheis-Boyd
 President - Western States Petroleum Associa...
 What a great forum and networking opportunity!

Duncan Mitchell
 Decarbonization | Operations | Consulting | Str...
 Excellent conference. Great conversations and networking. Impeccably organized and run. Thanks to all.

Leon de Bruyn · Following
 Chief Executive Officer at Lummus Technology
 2mo · 🌐
 Great dialogues and a lot learned at #ESFNorthAmerica! Euro Petroleum Consultants

Consensus: time is NOW to implement technology that already exists and reduces #emissions while improving #profits.

BASF Refinery Solutions
 18,524 followers
 2mo · 🌐
 We always have a great time at #ESFNorthAmerica as this is the perfect opportunity to share our sustainable solutions with the industry. Proud of Mark Schmalfeld, who spoke about how we enable decarbonization at this year's ESF in San Francisco. Thanks to Euro Petroleum Consultants for the great event.



KBC A Yokogawa Company
 58,157 followers
 1w · 🌐
 At the recent Energy & Sustainability Forum conference, our experts discussed how refineries and petrochemical plants can transition to a low-carbon future. Read their insights <https://ow.ly/9Tof50PeU35>
 #Refinery #Petrochemical #Decarbonization #NetZero #BringingDecarbonizationToLife



You and 56 others
 4 comments · 1 repos
David Smith, LL.M. · 2nd
 Partner at Manatt, Phelps & Phillips, LLP
 2mo · 🌐

Most appreciative of the invitation and opportunity to join these professionals in sharing strategic thoughts on the Inflation Reduction Act's decarbonization incentives. What is your company's climate compliance and sustainability strategy?



You and 207 others
 4 comments · 3

Aspen Technology
 155,932 followers
 2mo · 🌐
 Last week, Emerson's Don Fregelette and AspenTech's Gerardo Muñoz took the stage at #ESFNorthAmerica in San Francisco to discuss digital solutions for plastics circularity.

Thank you for having us, Euro Petroleum Consultants.
 #EnergyEfficiency #Decarbonization #Sustainability
 Emerson's Automation Technologies & Solutions

Euro Petroleum Consultants
 15,817 followers
 2mo · Edited · 🌐

Green Star BCS
 845 followers
 2mo · 🌐

We were very pleased to have Scott Hughey and Eric M. Wei attend the #ESFNorthAmerica Energy & Sustainability Forum in San Francisco. Eric facilitated a great session with technology providers and operators to discuss new developments and technologies in the context of sustainable fuels, feedstocks, and circular products. The following day, Eric presented Green Star BCS's approach to collaborating with clients to develop and deliver a Decarbonization Masterplan Roadmap. He explained our methodologies, toolsets, and framework for planning for an uncertain future.

If you're interested in knowing more about this subject don't hesitate to contact us at info@greenstarbcs.com

#greenstarbcs #decarbonization #hydrogen #renewablefuels #masterplanning

Deanne Barrow · 2nd
 Energy & Infrastructure Lawyer at Norton Rose Fulbright
 2mo · Edited · 🌐

I had a great time talking about my favorite topic, the Inflation Reduction Act, at #esfnorthamerica! 😊 Thank you to Euro Petroleum Consultants for having me!



You and 106 others
 6 comments

Kay Mitchell · 1st
 Senior Event Director · Content Creator · Driving Decarbonisation in the Oil & Gas Downstream Industr...
 2mo · 🌐
 The #ESFNorthAmerica team has arrived and we can't wait to see you all tomorrow for Wood and Honeywell UOP seminars and welcome drinks tomorrow!
 #californiadreaming #sustainability #dreamteam



Christina Waller Author
 VP of Sales and Business Development a...
 Always a great time with the EPC crew!! Thank you all for being such gracious hosts and helping make the conference insightful, successful and fun.

Becht
16,009 followers
2mo · 🌐

Becht proudly participated in the **Euro Petroleum Consultants** -ESF North America Conference last week. **Katie T.** presented "Conversion to a Green Refinery Configuration: Assessing Options, Risks, and Viability." Lots of great conversations and information shared. [#esfnorthamerica](#) [#conference2023](#) [#petroleum](#) [#refinery](#)



Rebecca Jones PMP · 2nd
Senior Project Manager at Wood.
formerly Amec Foster Wheeler
2mo · Edited · 🌐

I so enjoyed participating in the 2023 North America Energy and Sustainability Forum. [#esfnorthamerica](#) was wonderful meeting with my fellow panelists **Nic Macilveen Deanne Barrow David Smith, Thomas Baker**. I also enjoyed spending time with other Woc decarbonation and sustainability experts. **Katherir Zimmerman Wood Nishadi Davis, PE #sustainabi #energy**

+ Follo **Danielle Gore** · 1st
Climate Sustainability Specialist at Chevron Phillips
Chemical Company
2mo · 🌐

Great discussions on the decarbonisation of downstream and chemicals with a focus on hydrogen and carbon capture at [#ESFNorthAmerica](#). It's invigorating to be part of this continued energy transition. I'm always amazed at the innovation of Reduction Act has shaped these conversations here in San Francisco and how it differs from those I have had in Europe on the same topics. Policy can certainly shift the abatement curve, but I'm also hopeful that we will stay focused on the real problem - climate change. We need to remain focused on innovation to solve this global issue and not lock ourselves into solutions.

Euro Petroleum Consultants
15,817 followers
2mo · Edited · 🌐

Brittney Drake · 2nd
Business Development Director
2mo · 🌐

A Round of Applause for our own **Divya Jonnavittula!**
Her expertise and professionalism left a lasting impression on those in attendance, showcasing her in-depth knowledge and passion for green hydrogen and ammonia.

Thank you to **Euro Petroleum Consultants'** for organizing this successful event and creating a space to make meaningful connections, exchange of ideas, and discuss transformative opportunities.

Already looking forward to participating again next year!

[#Eichley](#) [#ESFNorthAmerica](#) [#PetroleumIndustry](#) [#Networking](#) [#KnowledgeSharing](#) [#ProfessionalDevelopment](#)



Kejet Corporation
2,234 followers
1mo · 🌐

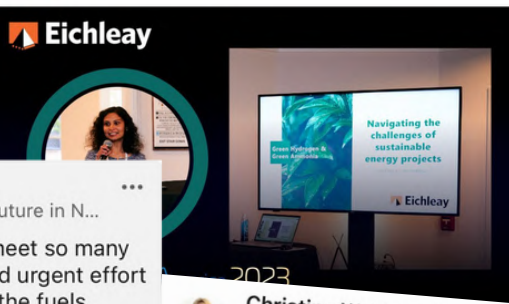
We were so grateful for the opportunity to be a part of [#ESFNorthAmerica](#). We had the chance to engage with other industry experts, exchanging ideas, knowledge, and innovative solutions. The energy and enthusiasm were truly inspiring. From renewable energy sources to sustainability initiatives, we were immersed in a wealth of knowledge and left with a renewed motivation to continue to contribute to the growth and progress of the refinery and petrochemicals industries.

Energy Intelligence
Chevron: Renewable Gasoline Offers Solution Alongside EVs
Copyright © 2023 Energy Intelligence Group
Fri, Jun 2, 2023

Author
Casey Merriman, San Francisco
Editor
Chris Raine



Simon Doughty
Renewable fuels have an inevitable future in N...
Excellent conference. Good to meet so many experts engaged in a sincere and urgent effort to lower the carbon footprint of the fuels industry. Glad to be here on behalf of SHV Energy, talking about pathways to renewable LPG and the importance of propane in the off-grid consumer market. [#forgottenfuel](#).



Christina Waller · 1st
VP of Sales and Business Development at BD Energy Systems, LLC
2mo · 🌐

Wrapping up an incredible experience at [#ESFNorthAmerica](#)! What an amazing conference filled with insightful sessions, informative fireside chats and enjoyable networking opportunities. Kudos to the organizers for putting together such a fantastic, fun event!
Steve Lancaster Anelya Akylbekova



Andrea Carruyo (She/Her) · Following
Marketing and Communications Manager at Lummus Technology Supporting the Chevron Lummus Global...
2mo · Edited · 🌐

Sharing a few snapshots from [#ESFNorthAmerica](#) in San Francisco last week.

Leaders, innovators, and forward-thinkers came together to discuss the challenges, technologies and pathways that will propel our industry to new heights to meet sustainability goals. 🌍🌱

A big thank you to everyone who visited the [#ChevronLummusGlobal](#) and ART photo booth. We hope you enjoyed capturing memories!

Debbi
Sales Marketing & Engneering
2mo · 🌐

Day 2 [#ESFNorthAmerica](#): **Daniel Carter**, President of Decarbonisation at Wood w [#technology](#) panel. Joined **Lummus Technology, Axr Company**, the panel disc the needle' in the journe assets.
Euro Petroleum Consi #energytransition #s

Laura McManus · 1st
Conference Director | Energy & Sustainability | Downstream Decarbonisation | Key Account Manager...
2mo · 🌐

Busy morning in San Francisco at [#esfnorthamerica](#)! Great to welcome so many from our industry joining the decarbonization conversation!



Lara Heberle (She/Her) · 1st
R&D | Global Carbon Capture Technology Lead | Pall Corporation | Danaher
2mo · 🌐

Pall Corporation at [#ESF](#) [#esfnorthamerica](#) with **Lara Heberle, James Colvin, and Julien Plumail**.



JME
34 followers
2mo · 🌐

It was great to be out in San Francisco last week for the second edition of **Euro Petroleum Consultants** Energy & Sustainability Forum North America. Working throughout the 3 day event capturing photos and video content as well as working with our sister company **EpicBooth** who provided a sponsored photo booth.



[You and 37 others](#) reposted
[75 others](#) reposted
1 comment

[#ESFNorthAmerica](#) [#ESFNorthAmerica](#) [#Photography](#) [#NorthAmerica](#) [#USA](#) [#SanFrancisco](#) [#VideoContent](#) [#Videographer](#) [#EventPhotography](#) [#WeAreJME](#)



Melinda Palmer · 2nd
Vice President - Regulatory & Public Affairs
2mo · Edited ·

+ Follow



Jennifer Haley · Following
President & CEO, and Board Director at Kern Energy
2mo ·

Speaking at **Euro Petroleum Consultants' #ESFNorthAmerica Energy & Sustainability Summit** on their keynote panel was a pleasure. Insights from my co-panelists – **Emma Lewis (she / her)**, **Jolie Rhinehart**, and **Michael Cohen** – and other innovative leaders at the Summit were an encouraging reminder of our collective alignment to decarbonize and implement pragmatic solutions to reach our climate goals.

At **Kern Energy CA**, we're proud of our work to anticipate and embrace the future of transportation fuels. In 2009, Kern Energy pioneered into the world of renewable diesel by looking at the challenge of the RFS as an opportunity. Our collective impact will be greatest when we work together against challenge, instead of treating each other as the challenge. This is how we will achieve our goals and leave things better than we found them for the next generation.

Sulzer Chemtech
15,390 followers
2mo ·

Impressions from ESF North America with our expert Matthew Clingerman participating in a panel as well as presenting on "REDUCE Carbon Emissions, REUSE Proven Technology, and REPURPOSE Existing Assets - Minor Changes for Major Results." More information here: <https://lnkd.in/g/jfjw6TX>

SFNorthAmerica #Sustainability #CarbonEmissions #reuseTechnology #purposeAssets #Innovation #GreenFuture #opportunities #technology



John Young · 2nd
CEO at Strategic Growth Services
2mo · Edited ·

It's a pleasure to be back in the US to introduce OMV's innovative ReOil technology for post consumer plastic recycling at the **#esfnorthamerica** event in San Francisco. Thanks to **Wood** for an excellent seminar; **Euro Petroleum Consultants** for such a well organised event and **Andreas Lechleitner** for his expert technical knowledge.



DroneXperts
1,205 followers
2mo ·

Retour du salon à San Francisco sur l'énergie et la durabilité à San Francisco, **Euro Petroleum Consultants**

Le 31 mai dernier, DroneXperts eut l'opportunité de participer en tant qu'exposant au Energy and Sustainability Forum. Il s'agit de l'un des principaux événements nord-américains axés sur la décarbonation de l'industrie.

En voici ce que **Guillaume Blackburn-Lewis**, notre expert en solution environnementale en retire :

« ESFNorthAmerica a été une très belle expérience pour nous. Ce fut notre premier salon aux États-Unis et nous avons apprécié l'engagement envers nos solutions. C'est toujours plaisant de discuter avec des acteurs concernés par leurs émissions et ouverts d'esprit à l'intégration de nouvelles technologies dans leurs opérations.

La Californie est une région précurseur en matière d'environnement et on le remarque très rapidement avec les discussions que nous avons eues. La température ainsi que l'architecture de San Francisco ont aussi grandement ajouté à l'expérience. »

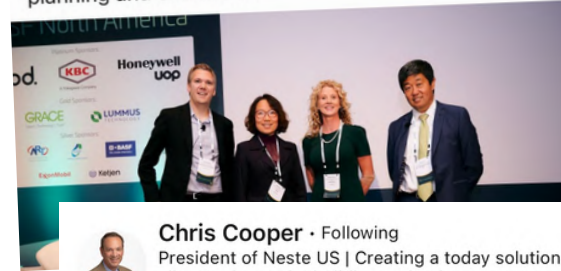
#ESFNorthAmerica #sampling #Measuring



Sharing the stage with **Carrie Song** and **Dan Kim** at **Euro Petroleum Consultants' #ESFNorthAmerica Energy & Sustainability Forum** made for an enjoyable afternoon conversation highlighting how additive solutions across industries are transforming transportation fuels.

Kern Energy CA is leading California's transportation fuel evolution while being stewards of people and planet. Our pragmatic approach to improving upon our existing operation while innovating toward next-generation renewable fuels is how we reliably provide the clean gasoline and diesel our community needs today and into tomorrow. At Kern Energy, we value teamwork, partnerships, and collaboration - firmly believing we are greater than the sum of our parts. Together is how we will succeed in fueling a clean energy future.

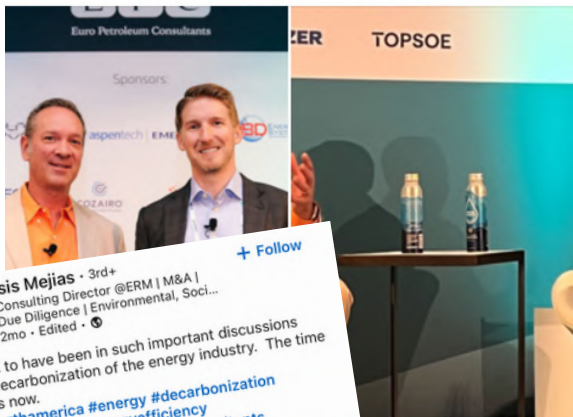
Thank you, **Thomas Baker**, for the wonderful job moderating and **Kay Mitchell** for your team's wonderful planning and execution.



Chris Cooper · Following
President of Neste US | Creating a today solution for climate change by building a circular economy
2mo ·

Enjoyed sharing Neste's origin story and lessons learned on our journey to become a renewables product powerhouse, at ESF North America 2023, which took place in San Francisco last week. Thanks to Euro Petroleum Consultants (EPC) for inviting me, **Daniel Bolgren** for moderating, and all the participants who share Neste's vision of creating a healthier planet for our children.

#Neste | #sustainability | #renewable fuel



Isis Mejias · 3rd+
Consulting Director @ERM | M&A | Due Diligence | Environmental, Soci...
2mo · Edited ·

Grateful to have been in such important discussions about decarbonization of the energy industry. The time to act is now.
#esfnorthamerica #energy #decarbonization #hydrogen #SAF #energyefficiency #sustainability Euro Petroleum Consultants

ART Hydroprocessing
1,752 followers
2mo ·

ART leverages its deep expertise to innovate renewable and clean fuel solutions to ensure we're an integral part of the industry's sustainability journey. Last week, we participated in the North American Energy and Sustainability Forum in San Francisco. The annual event is an incubator for renewable and sustainable fuel and energy solutions.



Cozaïro
288 followers
2mo ·

Yesterday at **#ESFNorthAmerica** our CEO, **Tim Matthews** joined a terrific panel representing **#cleanhydrogen** engineering and technology leaders (**Henrik Rasmussen** of **Topsoe**, **Stephen McColl** of **Wood**, **Ermanno Filippi** of **CASALE** and **Vinay Khurana** of **Technip Energies**) to discuss the role of **#bluehydrogen** in decarbonizing the downstream and petrochemical sectors. Tim highlighted the most common gap in the Blue H2 value chain - **#storage** - and Cozaïro's successful approach to closing that gap as a developer of **#CCS** | Blue H2 projects. Reach out if you'd like to learn more about how we can help get your CCS project moving.



Nick Macilveen · 1st
Renewable Energy Development / SAF - Sustainable Fuels | Fintech Innovation/Payments | Personal Data...
2mo ·

Just a few days ago we were discussing the transformative role the **#InflationReductionAct** incentives, government grants and loan programs will play in the **#decarbonization** of hard-to-abate energy and transportation sectors at **#ESFNorthAmerica** by catalyzing private investment in the United States.

Thank you to **Deanne Barrow**, **Rebecca Smith**, **Thomas Baker** and **David Smith, LL.M.** for your expert insights. We covered the **#IRA**, Dept of Energy grants, new EPA regulations, **#CleanHydrogen** and tax credit equity / IRA credit monetization. We are looking forward to seeing the imminent rules from the **#Treasury** that will govern tax credit monetization.

Special thanks to **Kay Mitchell** and the entire team at **Euro Petroleum Consultants** for bringing together members of the ecosystem that will help set our course for a **#netzero** future.



Debbi Limond · 1st
Sales Marketing & Enablement Lead at Wood
2mo · Edited ·

Day 1 **#ESFNorthAmerica**: **Katherine Zimmerman**, Decarbonization Director at **Wood** moderated the panel titled 'The missing links of hydrogen & CCS - Completing the value chains'. Joined by **ExxonMobil** and **World Energy, LLC**, the panel discussed topics such as how to mature the value chains for the **#hydrogen** and CCS markets and how we can find a balance between driving localized plant-level solutions and federal-level policies.

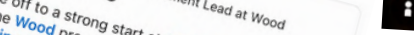
Euro Petroleum Consultants
#sustainability #energy

Rebecca Jones PMP · 2nd
Senior Project Manager at Wood.
Formerly Amec Foster Wheeler
2mo · Edited ·

It was exciting to be a presenter at the **#esfnorthamerica** pre-conference seminar hosted by **Wood** and to participate in the conference's final panel. I appreciated EPC's organization and planning to host this wonderful forum and its thought provoking presentations and panels on energy **#sustainability**.

Debbi Limond · 1st
Sales Marketing & Enablement Lead at Wood
2mo · Edited ·

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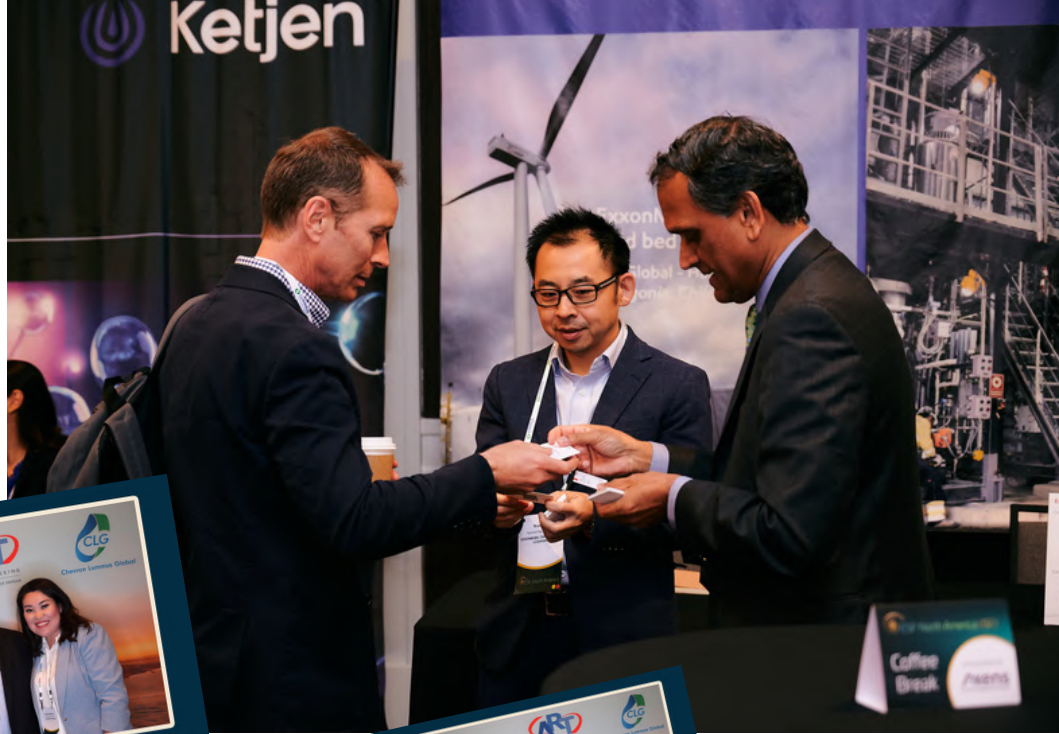


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Catherine Reheis-Boyd
President & CEO
**Western States
Petroleum Association**



Andy Walz
President, Americas
Products
Chevron



Chris Cooper
President
Neste US



Leon de Bruyn
President & CEO
**Lummus
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Emma Lewis
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Carrie Song
Vice President Renewable
Road Transportation Americas
Neste US



Bryan Glover
President & CEO
Honeywell UOP



Michael Cohen
Chief US Economist &
Head of Oil & Refining
bp



Jolie Rhinehart
General Manager,
San Francisco Refinery
Phillips 66



Jennifer Haley
CEO
Kern Energy

E
A



Shigeyoshi Uehara
CEO
KBC
A Yokogawa Company



Melinda Palmer
Vice President of
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Dan Carter
President,
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Wood



Dan Kim
Chief Strategy &
Sustainability Officer
NEXT Renewable Fuels



Ed Crooks
Vice-Chair, Americas
Wood Mackenzie

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Casey Merriman
Head, Competitive Intelligence
Service, Editorial Director,
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Energy Intelligence



Bob Schlatter
EVP Capital
Project Delivery
World Energy



Jean-Luc Nocca
Executive Vice
President Commerical
Axens



Matt Reeves
New Products & Strategy
Integration Manager
ExxonMobil



**Henrik Wolthers
Rasmussen**
Managing Director
The Americas
Topsoe

CATHERINE REHEIS-BOYD

PRESIDENT & CEO
**WESTERN STATES
PETROLEUM ASSOCIATION**

- As an industry one of our main focuses today is ensuring we collaboratively create a sustainable energy future that works for everyone. That means facing some serious energy realities, and realizing the need to tap into the brightest minds of our industry to deliver solutions to help ensure no one gets left behind as we continue to transition to even cleaner and more efficient energy solutions.
- California's energy and fuel consumption and needs are constantly growing but policy in the state, and many of the Western states is driving mandates that are severely limiting or shutting down oil and gas production entirely, and mandating electrification and renewable energy timelines that we are not nearly ready for.
- The disconnect between policymakers, energy experts, and everyday consumers has never been wider and more apparent. Policymakers are largely ignoring science, industry experts and real data that shows the current path we are on will leave California and the nation with a highly unstable and inadequate fuel and power supplies. This will affect people lives, people's pocketbooks and the economy at large.
- For decades to come California will need large amounts of petroleum, yet rather than support local jobs and produce in state where environmental and safety standards are the best in the world, our policymakers are banning in-state production in favor of more expensive and emissions-heavy imports.



KEYNOTE INSIGHTS FROM

- EVs are exciting and can be a great option but a forced switch to all-electric transport has endless issues from the electrical grid preparedness, to lack of charging infrastructure, to cost and beyond. The policy is flawed and the environmental analysis only looked at tailpipe emissions and not the entire supply chain and battery life cycle. EVs are a good option for some but for others an unfair financial burden.
- California's 10 active refineries are running at near capacity, and prices are rising due to the state's diminishing production and refining capacity, which will only get worse. Policies lacking a firm understanding of market and energy realities are hurting Californians; raising fuel prices, killing jobs, and having unintended environmental consequences through more and more imported petroleum.
- There is so much innovation across so many different technologies happening.
 - ✓ Let's lean into that and explore all options to get us to a sustainable energy future that works for everyone.
 - ✓ Let's push for fact and reality-based policies that help meet environmental goals while also protecting jobs, energy security and consumer choice.
 - ✓ Let's continue to advocate for communities, workers, and the environment – we don't have to choose one over the other.
 - ✓ And let's listen to the amazing experts in all areas of energy to help drive real solutions, and to help us navigate the intricate energy realities that are too often ignored in today's rhetoric.

ANDY WALZ

PRESIDENT,
AMERICAS PRODUCTS
CHEVRON

Refiners globally are challenged to make the lower carbon energy future a reality. Chevron believes achieving a lower carbon future that serves all people requires ambitious innovations and pragmatic solutions that deliver measurable results. But what does that mean for transportation fuels and products? Sit down with Andy Walz, president of Chevron Americas Products, to better understand how the company is delivering lower carbon solutions today in its products and operations

Andy Walz, President, Americas Products, Chevron
in Conversation with

Casey Merriman

Head, Competitive Intelligence Service,
Editorial Director, Western Hemisphere

Energy Intelligence

- Chevron believes that the demand for the products that we have today is going to continue to grow. It's forecasted that by 2040 we will have 9 billion people on the planet who need access to reliable, affordable, and ever-cleaner energy. Chevron is working hard to find that energy, to get it to markets, and get it to the customers that want it and that need it to live the lives that we all enjoy. We believe that is essential and we also believe that that energy needs to be lower carbon.



KEYNOTE FIRESIDE CHAT

- To decarbonize transportation, we need all kinds of solutions. The electric vehicle may have zero emission at the tailpipe but it has lifecycle emissions. Lower-carbon gasoline is a really good option that you can put in vehicles that are on the road today and is on par with an electric vehicle on an emissions basis. It's not an alternative to EVs, it's an AND solution.
- We have got to do a better job of educating policymakers. We need to work together to come up with solid solutions and avoid punitive regulation that ultimately won't be good for consumers.
- We are looking at all options with our manufacturing facilities and what we could make, and what's a capital-efficient way to make it.
- There is a bright future in hydrogen. We are starting to get some capability today working with Toyota on their light-duty hydrogen car and building stations. It's a long game in the hard-to-abate heavy-duty transportation sector but we're learning and bringing in partnerships.
- "Crude to customer" is the value chain on which our traditional business has been built. It allows us to have somewhat control over that value chain. We can supply ourselves. The margin doesn't always accrue in the same spot, so you can expose yourself to the full value chain. That's how we thought about our traditional business and that's how we're thinking about the new emerging businesses that we're getting involved in.
- Whether it's biodiesel or sustainable aviation fuels, we want to be a producer. We want to be able to move it around, get it to the right place and we want to sell it to our customers and be competitive in those new value chains.



OPPORTUNITIES & OBSTACLES ON THE ROAD TO NET-ZERO



Over the last twelve months especially, but since Russia's invasion of Ukraine and the COVID 19 pandemic, we have had an environment where the price of energy and the subsequent slowing global economy has taken centre stage. Despite these headwinds, for many, the 2030 timeline to deliver on the commitments is not slowing. Granted looking from 2030 to 2050, and at the bigger substantial asset changes, there are still open questions as to what the energy environment will look like. For example, the supply of renewable energy or capacity of carbon capture, and although these questions may impact the timelines of the broader implementation, they won't impact 2030 roadmaps.

The reality is, most companies have announced their ambitions for 2030, 2050 or somewhere in between, and in order to achieve those ambitions, we must continue to head down that path regardless of the environment that we are in today. Of course, that does not mean going down that path with blinders on. You are always going to have to have some type of value proposition, which we would expect to change and continue to change by region, but nonetheless, we must continue to invest in the projects that provide returns, whether that's cost savings or commercial value.

The announcements and ambitions matter.

- Secure, affordable, and low carbon - the energy trilemma hurdles in our pathways
- Differentiating between short-term affordability and medium-long-term decarbonization delivery
- The policies to pursue a truly all-of-the-above approach – what role has the recent Inflation Reduction Act (IRA) played in changing the conversation and levelling the playing field?
- Bringing finance to the forefront to play a much more active role and drive the levels and speed of change needed
- Public perception - how do we help the public understand that we still need to explore and recover fossil fuels (responsibly) to achieve Net Zero goals?

KEYNOTE PRODUCER PANEL

Moderator:

Ed Crooks, Vice-Chair, Americas, **Wood Mackenzie**

Panelists:

Michael Cohen, Chief US Economist & Head of Oil & Refining, **bp**

Jennifer Haley, CEO, **Kern Energy**

Emma Lewis, SVP USGC Chemicals and Products, **Shell**

Jolie Rhinehart, General Manager, San Francisco Refinery, **Phillips 66**

TAKEAWAYS

- **If, how, why** - the question is no longer IF we should be decarbonizing its HOW we do it. When it comes to WHY, we are trying to reverse the man-made impacts of climate change and ultimately continue to operate, producing better products, providing energy, improving communities and lives.
- **The next iteration** - the constant evolution of energy is built into the DNA of our industry. This is the next iteration in which we are being pushed to go more quickly, but we have certainly had and faced big challenges before.
- **Big picture focused** - there is so much fixated on carbon emissions that we are forgetting about methane and local air pollutants. Oxygenation, MTBE, and lead are all examples where we created more problems for ourselves. We have to be cautious, big picture focused and ensure we are not creating other problems in this journey.
- and and and ... we need to provide the range of options and products that our customers need and are asking for. It's not just EVs, renewable diesel, blue or green products its and and and
- **Profitable decarbonization** - that is the reality, not decarbonization for the sake of decarbonization. For many, there are shareholders to answer to which creates tension between short-term profitability versus long-term decarbonization. Furthermore, what is the rate and pace that consumers will move at? Do you wait for the consumer to move or do you create the market? The reality is we need to continue to make traditional fossil fuel products as we pursue our journey to profitably decarbonize. However, having sustainable and lower-carbon products will help to get more out of the products that are made today.
- **Demand disconnect** - we need to ensure we don't get disconnected from demand. It has to be a part of the conversation in making sure that we are meeting demand now, not just planning for what we want to do in the future.
- **The energy trilemma** - secure, affordable, and sustainable. We must address all three and balance competing pressures from shareholders, stakeholders, customers, and policymakers. Public education is critical here.

KEYNOTE PRODUCER PANEL

- **Capital allocation** - investors are challenging what is the right amount of capital allocation for our future energy system. The diversity of this industry is emblematic of the fact that we need all hands-on deck and we need all the solutions on the table.
- **There is no perfect** – there is a lack of knowledge about full lifecycle emissions, especially for EVs that use cobalt mined in the Congo by slaves. Reducing emissions, and reducing carbon intensity requires industry, government, community collaboration and actual compromise!
- **“The best way to predict the future is to create it” Peter Drucker** - we need to harness the magic of our industry, of our existing talent and infrastructure and become collaborators toward achieving our goals. We need to come together to drown out the rhetoric. It's really easy to find fault with an approach but it's a lot harder to find a better way to do it.
- **Affordable solutions are really important** – It's very hard to talk about decarbonization without talking about social and environmental justice. Affordability is key and we have to be able to do this in a way where everybody can access low-carbon products. Taking biochemicals as an example, the reality is they are really unaffordable for a vast number of consumers however blue products are a way to provide affordable low-carbon solutions today and it shouldn't be an argument for one or the other.
- **Divest to invest** – both Shell and bp on the panel have divested refineries globally to have a smaller portfolio in which they can continue to invest. They are taking on different forms and becoming integrated energy hubs, in advanced locations that can provide optionality in terms of the feedstocks, capture carbon, provide a source or sink for hydrogen and produce different types of low carbon and circular products.
- **Optionality versus cost** – with secure feedstock supply a continued challenge, optionality provides the flexibility to be able to run a slate of feedstocks, however typically that comes with higher capital cost.
- **Perspectives on scope 3** – are they someone else's 1 & 2? Where does the responsibility lie in helping partners to reduce those emissions, and to what extent are they/should they be managed?
- **We are on an unsustainable path** - a new momentum scenario points to between 2.5-4 degrees Celsius of warming by the end of the century. Is not sustainable and something has to change. There's a big gap between the policy imperative that exists today in certain geographies, and the goal that we have in mind. We have to look at land use, at the agriculture sector, at direct air capture. There needs to be more investment in some of these technologies that are not yet at a commercial scale.



FUELLING THE REVOLUTION



- The long runway for liquid fuels – what are the best options available to lower the carbon footprint of the liquid transportation fuel market?
- The low carbon gasoline market – missed opportunities?
- Bringing those next-generation renewable fuels to market – what’s needed in terms of policies, partnerships, and collaboration?
- Lipids are over-saturated - building a portfolio of alternative feedstocks

Moderator:

Thomas Baker, Managing Director & Partner, **Boston Consulting Group**

Panelists:

Dan Kim, Chief Strategy & Sustainability Officer, **NEXT Renewable Fuels**

Melinda Palmer, Vice President of Regulatory and Public Affairs, **Kern Energy**

Carrie Song, Vice President Renewable Road Transportation Americas, **Neste**

TAKEAWAYS

- Promising renewable diesel: Renewable diesel is a highly effective solution for reducing GHG emissions in heavy-duty sectors such as long-haul trucking, agriculture, construction, and marine and its potential impact is often overlooked. A crucial characteristic is that it’s compatible with existing infrastructure and engines, providing reliability similar to fossil diesel whilst delivering up to 75% GHG reductions compared to traditional diesel. It’s readily available today with production set to continue to grow.
- Integration of renewable fuels and hydrogen: The renewable fuels industry has an opportunity to lead the broader low emissions fuel industry by embracing hydrogen as a significant component. Developing economic scalability and commoditization of low emission fuels, including hydrogen, is essential.

PANEL DISCUSSION

- Additive nature of carbon management: Carbon management requires multiple solutions working together. The focus should be on trying, learning, and succeeding, while keeping a range of solutions on the table. Proper certification and standards must be developed to ensure the sustainability of low-emission fuels.
- At the end of the day, there is no competition between solutions. With fuel demand continuing to be robust despite increased rates of vehicle electrification, a suite of solutions are needed and working together in unison. As positive as renewable diesel is, we also need electrification, they both have their place. Industry also needs carbon reductions immediately not just in the future, so whilst innovating towards new renewables, we must also focus on decarbonizing industrial operations at the same time
- Critical capabilities to succeed - policies, partnerships, and collaboration are crucial for advancing sustainable renewable fuels. Impatience should be avoided, and the value of existing talent and infrastructure should be recognized. Policies should foster collaboration rather than create competition. Streamlining project permitting is essential, particularly in areas of overlapping authorities and jurisdictions
- The perks of technology neutrality – The Low Carbon Fuel Standard (LCFS) program in California has demonstrated the effectiveness of renewable fuels, with 39% of diesel consumption coming from renewable sources. This program encourages innovation and collaboration by remaining technology-neutral, allowing different technology solutions to benefit from the program rather than picking a favourite
- Impact beyond California: While renewable fuels have gained traction in California due to incentive programs, pollution is a global issue. The success of renewable fuels in California, driven by programs like LCFS, showcases the importance of inclusive policies that encourage diverse technology solutions working together towards a common goals





THE MISSING LINKS OF HYDROGEN & CCS

COMPLETING THE VALUE CHAINS



- H2 hurdles and enablers – infrastructure, cost, policies, and price, where are we today?
- Maturing the value chains for H2 and CCS markets
- Finding a balance between driving localized plant-level solutions and federal-level policies

Panelists:

Matt Reeves, New Products and Strategy Integration Manager, **ExxonMobil Low Carbon Solutions**

Bob Schlatter, EVP Capital Project Delivery, **World Energy**

Katie Zimmerman, Decarbonization Director, Americas, **Wood**

TAKEAWAYS

- The lack of supply at a significant scale is the key barrier to building and realizing a H2 economy - while OEMs are continuing to develop fuel cell technologies, the demand side is hesitant to make investment commitments in the technologies until there's certainty of supply. Producers are hesitant to commit to large investments unless there's a strong demand signal.
- The inability to scale is also holding the market back - while there are many proposals on innovative production technologies such as electrolyzers, and MSW gasification, the scale isn't insufficient to build confidence for the HDV sector to commit to H2 usage since the quantum change in demand is far larger than a typical electrolyzer project.
- Current carbon capture efforts are focused on CCS, which limits the number of carbon capture opportunities. As such only manufacturing centers that are near sequestration locations can benefit from CCS.
- With the new incentives, when the geography works, you can make the economics work - the IRA has a significant impact in places with high concentrations of CO2, but for other areas, additional support is needed including from customers choosing to buy more expensive lower carbon products.

PANEL DISCUSSION

- California's efforts to jump-start the US' hydrogen economy - hydrogen fuelling infrastructure is key to growing the hydrogen economy and reducing the barrier to entry, although we have seen a lot of projects in California, we need to see more seeding along the Gulf Coast, East Coast and central states.
- Creating and sustaining a market drive and consistency of representation for low-carbon product offerings is key - projects that are dependent on government subsidies need to have confidence that there's security in the policy throughout the project life. In the case of the IRA, most of the policies are created for 10-12 years but after that what happens? We need a market-based draw, a pole in the market, or mandates that makes value associated with having decarbonized products.
- Insets not offsets - there's big difference between offsets and changing behaviour. Offsets allow the continuation of current behaviour; they don't change behaviour and decarbonize activities. Long-term success requires insets and a change of behaviour.
- Trying to pick solutions with targets deviates from the optimum - we need consistent neutral policy which drives decarbonization, led by science and engineering, and lets the market decide what's the most efficient



NESTE FIRESIDE CHAT “BUILDING A SUSTAINABLE ENERGY FUTURE”

CHRIS COOPER

PRESIDENT
NESTE US

in Conversation with

Daniel Bolgren

Principal

Deloitte Consulting LLP

Daniel: Neste has been undergoing a fantastic transformation journey. Could you give a little bit more background on the history and your sustainable journey?

Chris: Neste has a DNA of sustainability and over two decades ago we asked questions about our refining capacity and what else we can run through our refineries that brings value to the environment and to our marketplace. We asked the tough questions back then with refining capacity just in the Finish marketplace and realized that we could produce products such as the Nordic grade gasoline, that we were the first to import into California. We made those changes to the refining capacity in our Porvoo facility. We've subsequently expanded our refineries worldwide, today Rotterdam, Singapore, and our refinery that's just opened up with our joint venture partner in Martinez, California, where we're currently producing renewable diesel. Across this refining platform we have the opportunity to produce “today's fuels”, or fuels that have a place in our market to expedite our transition of decarbonization.



FIRESIDE CHAT

Chris: Those fuels didn't just start yesterday, they started a few days before, actually many years ago and Neste started in a meaningful way to make this transition so that products can be available for all of us. In the hard-to-abate sectors, those sectors that otherwise will have difficulty through their transition, we see a lot of great technology in the work that we see in our day-to-day lives when we make selections of automobiles. An electric car is a great idea. An electric airplane – that's a future idea. Heavy road equipment or machinery – those are future ideas and opportunities. Neste has products today so it's a pretty exciting reality that we're in is that these products are available and they're in production and being distributed today. For those of you who flew into San Francisco or Oakland or San Jose airports today or yesterday, our sustainable aviation fuel is available and you're probably using it on the airline that you're departing with.

Daniel: Fantastic. Diving a little bit deeper, as an early mover, you've got to think about how you build and grow capabilities. You mentioned the Martinez refinery joint venture, and you've made some acquisitions in the used cooking oil space. What is your approach to acquisitions, joint ventures, and how you're trying to scale and build this business?

Chris: We had a lot of good opportunities to really leverage the innovation and the teams have brought the technology to the market quickly. We realized that this future is going to require feedstocks and so we began the effort that was the collection and global aggregation of the waste and residues that we dedicate primarily to our production. Those are the used cooking oils, animal fats, and wastes. As we continue to expand, we'll continue to grow. Here in the US we've acquired several subsidiary companies including Mahoney Environmental, the leader in used cooking oil recycling, and so next time you're out, at one of your favorite restaurants, Neste may be out behind that restaurant every morning collecting their used cooking oil. We created an integration of all of these technologies, access to the raw materials that we use to produce our products, all the way to physically arriving at the restaurant, whether its a hamburger joint or Buffalo Wild Wings, we are actually physically there collecting the used cooking oil and transporting it through infrastructure that we've organized. The infrastructure then gives us the ability and flexibility to move that into appropriate markets for refining where we have our refining complex and then the businesses that we've organized give us the ability to then distribute them to those markets in greatest demand. Today we are expanding throughout the entire state of California, as well as Washington and Oregon, and moving into Canada and other markets as the availability and the expansion of our production allow us to continue to march East.



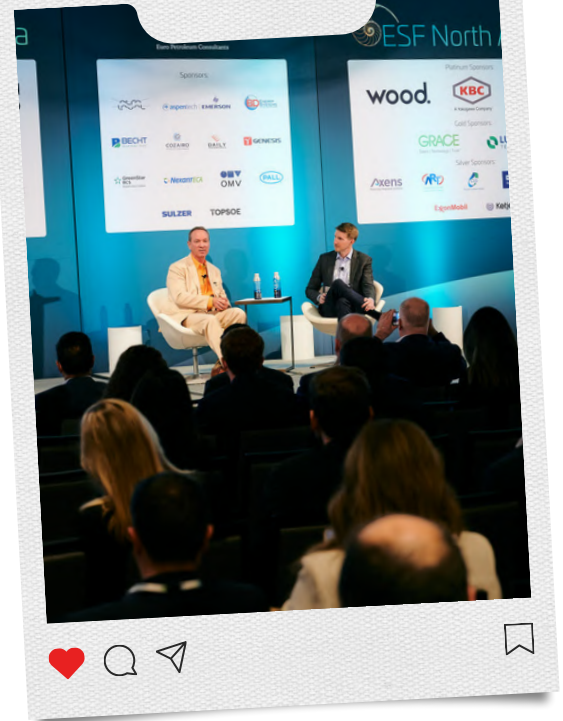
FIRESIDE CHAT

Daniel: Continuing on this theme of pace and scale, in March the UN's Intergovernmental Panel on Climate Change issued its latest report and that report was a really clear warning that we need to do more and we need to do more quicker if we're going to mitigate the impacts of climate change. Alongside that, it was probably a real challenge to the global business community to say that you have to be the drivers of this pace and scale. Could you talk about how Neste is working to address some of the concerns that were in the latest IPCC report?

Chris: Neste has set some meaningful goals for ourselves. We have a global strategy of helping our customers reduce their emissions by 20 million tonnes a year by 2030 and we already arrived at 11.1 million tonnes of CO2 reduced in 2022, so we are quick on the pace. We are a purpose-based company. That purpose is to create a healthier planet for our children, and we do that as we align our almost 6000 employees behind that purpose. We are all in the business of fighting climate change and making meaningful commitments. We need to work to deploy technologies and educate others to make meaningful science-based targets and goals, providing them the opportunity to create pathways. Those meaningful goals need to be realistic, but they also need to be specific and specific to your industry – in aviation, an airline has the best opportunity today to reduce its emissions and carbon footprint by utilizing sustainable aviation fuel where available.

Sustainability through an in-sector move is the most meaningful and I hope we can all begin to realize that. Instead of offsetting, in-sector or “in setting” utilizes the products that are available, whether it's carbon sequestration in your production models, or recycling of products and materials through your production methods, which we've deployed in our refineries giving us the ability to recycle the hydrogen in use in our HVO processes. While looking for methods to reduce your carbon, keep that new concept in mind and look within your sector, and within your industry at how you can offset the emissions that you're emitting today, and starting today.

Daniel: Many know Neste for all your great work and portfolio focused on sustainable transportation solutions, but many aren't aware that there's been a lot of great work you're doing as a forerunner in another exciting area: renewable plastics. Could you share a little bit more about what that journey has looked like and the work that you're doing to scale that portion of your portfolio?



FIRESIDE CHAT

Chris: Yeah, very exciting technology. The reality is we're creating synthetic products. We're taking the basics, the elements that we're all familiar with in our refining process formally reliant on fossil fuels, but we're introducing wastes and residues. Those waste and residues still are hydrocarbons once produced or processed through our facilities, and that gives us the ability then to derive valued use products, so whether it's producing renewable diesel, whether it's producing sustainable aviation fuel that I've mentioned previously. We have the ability to continue in our production of renewable or green naphtha and green propane and with those building blocks, we can then introduce them to the petrochemical space and begin to introduce renewable plastics and polymers into the market. The really neat thing about it is not only that we produce these products today and they are available today, but that we have the opportunity to help you all in these transitions to application. An interesting pilot program was working together with McDonald's, who don't know how to make plastic, but they do know how to distribute fast food, and they require containers such as plastic cups. Our team was able to describe what alternatives could be available and then together how they could engage with a petrochemical or the producer of their plastic cup and introduce some of these innovative technologies. The availability of those feedstocks or those polymers gave us the opportunity to produce a plastic cup together with McDonalds. We're looking forward to seeing as that renewable and recyclable plastic cup makes its way and becomes available for all of us to begin to consume and begin to use. It's how we begin to address these questions and what can we do today to begin this transition? Waiting until 2049 is not going to be good enough and the magic technology won't be available to reverse all the damage we continue to do between now and 2050. It really is starting today and asking those questions.

Daniel: You mention McDonalds as an end customer, can you talk a bit more about how you work with end customers and partners, not only to educate them and meet them on their own decarbonization journeys, but I think also to help guide where they're going to need to go in the future.

Chris: That's a great question and I hope this becomes a thought that you've either considered or will consider as a result of today. The idea is we can't do it alone. There isn't just one technology, and Neste isn't the only solution that you all should all consider in this transition. It's the actions that you're taking today. By reaching out, by leveraging conversation, by engaging with those that are with you today, but understanding how that collaboration is going to help us find solutions. McDonalds isn't the consumer of renewable polymers or chemicals. What they actually consume are the products that we eat as consumables but they need companies like Neste to discuss what are the alternatives in their life cycle. What does it take to deliver a hamburger or some French fries or a milkshake? It takes containers and all of them, or most of them are single-use plastic containers. By engaging with McDonalds we were able to engage with LyondellBasell and work together to provide a solution for McDonalds. It wasn't that McDonalds is the ultimate consumer, its that they were the cooperation that we need. They are the help that requires the drive to encourage LyondellBasell to consider what it takes to introduce renewable polymers into their production scheme. By working together, we're able to find these solutions and ask these questions. Some of us play a pushing role and some play a pulling role, and as we work together, we're able to move this along.

FIRESIDE CHAT

Daniel: Being a veteran in the energy industry and being an early mover in the energy transition, what would you share with the audience today in terms of learnings for their own sustainability journeys?

Chris: Starting today, thinking about what we can do, Neste has a mantra – faster, bolder, together, and faster means today. Faster means starting right away by considering your production methodologies, considering the technologies that you have deployed within your own companies, or how you're sharing your technologies around the industry and around your marketplace. As we start today, we'll advance this fight against climate change together and we'll find there are solutions. Neste has demonstrated, again a profitable pathway to sustainability. Bolder, be brave about those goals. Be sure that your company has science-based targets already in place. Be sure you're considering those actions of your scope emissions and how decisions can be made today to make those changes. Consider those thoughts of in-sector reductions you could make or the in-setting versus offsetting. What I think is really critical is that we consider what otherwise could be considered dubious practices of this transition and avoid anything that could be questionable or produce doubt because the naysayers are chasing the opportunities. They are looking for those opportunities that we don't really have a well-thought pathway or result in mind yet. The reality is being bold by considering the hard-to-make decisions and making them. Together - I'll reiterate that all of us need to work together, and that includes our work around technology, the way we consider, the way we do things, when we do them, and how we're doing them. We need to pay close attention to the policy space and we need to work for practical policy that's going to help foster this growth. To help our industry as it continues to grow, policy has always been an important driver. We learned a lesson during COVID, that borders don't prevent pandemics. Climate change also can't be stopped by borders. Individual countries aren't going to be able to save the world.

Chris: All of us working together can make a difference and I think we can do it in a meaningful way, and find that faster, bolder together, and find our way to accomplish some great things. Consider that we need to work through these technologies for solutions, both in the medium and long term. Today's technologies are really amazing.

Daniel: Fantastic. Any final words or comments that you want to leave with the audience as it relates to Neste's sustainability journey and learnings to share?

Chris: I'll give you one little titbit. Whether you heard Neste and thought we made chocolate or maybe even iced tea, Neste is actually a Finnish word, and it means a droplet of water. What we see at Neste is that all of us can come together as we coalesce and become as powerful as an ocean, as a body of water as we work together. We hope you all can consider Neste as you're thinking about your ESG and your ambitions of decarbonization. As we work together, we can accomplish great things. I invite you to join Neste as we consider this fight against climate change, reach out to us as we grow in this market, and see the decarbonization efforts that we are accomplishing together.

TECHNOLOGIES THAT MOVE THE NEEDLE

In the downstream industry, 80%+ of emissions are heat-related, and so ultimately when it comes to it, as an industry we know what the technologies and solutions to meet the 2050 goals are; to electrify assets, carbon capture, and leverage hydrogen. Against this backdrop we gathered technology leaders to discuss:

- What needs to get done this decade to deliver by 2050?
- Perfection is the enemy of progress –what can be achieved today with the multiple technologies already in the pipeline and how do we change the policy perspectives to ensure they aren't overlooked?
- Guiding the right use of technologies to decarbonize and re-imagine our assets
- Finding a balance between finding those near-term efficiencies and the low-hanging fruit whilst trying to pick up the top of the tree in pursuit of the next generation



KEYNOTE TECHNOLOGY PANEL

Moderator:

Stefan Chapman, Vice President, **Euro Petroleum Consultants**

Panelists:

Dan Carter, President, Decarbonisation, **Wood**

Leon de Bruyn, President & CEO, **Lummus Technology**

Bryan Glover, President & CEO, **Honeywell UOP**

Jean-Luc Nocca, Executive Vice President Commercial, **Axens**

Shigeyoshi Uehara, CEO, **KBC**

TAKEAWAYS

- **Starts with good housekeeping** - we often get distracted by the 2050 timeline and the larger and shinier projects that go with that, but there is a lot of work that we can do today in our facilities to enable us to reduce our energy demands, and to reduce our scope 1 emissions, that will have an impact on the bottom line. There are frequent opportunities for low-grade heat recovery that have very short payback terms. For example, excess O₂ in a large fired heater can save you several thousand kilograms of CO₂ emissions a year.
- **Mechanisms to offset or recover investment** - historically in the refining, and petrochemical industries we've seen multiple transitions of liquid fuels, from leaded gasoline to lead-free gasoline, through to low sulphur and very clean burning fuels. All of those created significant challenges and required significant investment but mechanisms were in place that allowed producers to recover those costs. One of the big challenges today is when frameworks do not exist to be able to offset, recover or create opportunities for producers to get value out of the investments that are required. The IRA in the US offers a framework, particularly for CO₂ capture and hydrogen generation. There are mechanisms available to offset investments now which may not last indefinitely but have created an enormous uptake in interest in projects across a range of technologies; renewable fuels, clean hydrogen, carbon capture, and abatement from industrial processes, however ...
- ... we need to do what makes sense, with or without subsidies – there is an opinion that elements of the IRA don't make sense from a scientific and engineering point of view. There is a risk incentivizing a certain direction, and creating a distraction away from what could make more sense. We need to do what makes sense, with or without subsidies.
- **The reuse of catalysts is becoming increasingly important:** recycling, regenerating, cascading to other services, and having catalysts that are more selective and active that can operate in lower temperatures.
- **There has never been a better time to improve your energy efficiency** - equipment will play a big role. For example, high-efficiency heat exchangers can decrease carbon footprints and due to the high cost of energy provides payback too. Furthermore, achieving energy efficiencies from existing configurations in itself can reduce CO₂ emissions by 15 to 20% without a significant commitment of capital.

KEYNOTE TECHNOLOGY PANEL



- **Perfection is the enemy of progress** – our industry has a tremendous asset base and already commercialized technologies. Reducing the carbon footprint and increasing the efficiency of those assets is profitable, not an investment cost. We need to attack the low-hanging fruit first, without trying to be perfect and zero carbon tomorrow. There are big, profitable impacts that can be made now while we take time to plan the more capital-intensive next steps.
- **The fence between refining and petrochemicals** - historically we've seen refining as one business and petrochemicals as another with a fence down the middle. Taking down that fence, and bringing the two together creates an enormous number of opportunities in terms of integrating services, managing hydrogen across the boundary, managing production between chemicals and fuels, and the pretreatment of the feedstock and crude selections to name but a few.
- **SAF is here to stay** – it's the long-term transitional fuel key to the decarbonization of aviation. The challenge is not the technology, but the quantity, quality, and range of feedstocks we can have access to. It's expected that by 2030, a high percentage of the world's consumption of aviation fuel will be SAF.
- **Plastic fantastic** – Plastics are not just a carbon footprint problem; they are a waste problem and a feedstock opportunity, but we need society to change its habits. There are tremendous opportunities in plastics recycling especially in the countries where plastics are collected, aggregated, and sorted to the degree that makes it possible. If we play it right, circular plastics can displace single-use plastics like polyethylene and polypropylene.
- **Every asset, every petrochemical plant and every refinery is different** - we need to match the right opportunities to the right asset base. The options that are available and attractive in North America may be very different to those in Europe, or South East Asia. The important thing is that while technologies are advanced broadly across the front, they are aligned with achieving real reductions in each application. As an asset owner, you don't want one universal solution that fits all, you want to exploit your natural advantage in your decarbonization journey and 2030 represents the timeframe of when that starts to become important.

KEYNOTE TECHNOLOGY PANEL

- **We need to be more proactive and less reactive**, starting with a plan for how to decarbonize our assets, based around certain assumptions. It's easier to take that plan and modify it as policies or the evolution of technology changes than to keep reinventing the wheel.
- **Profit and decarbonization can go hand in hand**, especially in the near term when looking at opportunities in existing assets. Let's implement some of the plans that are already developed. They may not be perfect but present the opportunity to enhance profit and reduce carbon footprint. Longer term, as a society and community we will develop the technologies forward and come up with better, newer solutions as we roll towards 2050.
- **Learning from deployment** - we need to start deploying technologies like carbon capture and hydrogen fuelling on our downstream assets in order to learn from those deployments and increase the pace of adoption.
- **There are two tiers** - the first tier; low-hanging fruit or profitable projects is everything from energy efficiency, further integration with petrochemicals, incremental propylene production, plastics recycling, SAF, and hydrogen management. There is a whole range of projects where the technologies exist and are profitable in parts of the world where the policies or incentives exist. For tier 2, and the next tranche of enhancements and developments that we need to make, the technology is available and viable. Earlier movers are starting to deploy them and to develop projects usually driven by incentives or regulatory requirements. Of course, a new plant built today is dramatically better than the plant that was built 20 years ago, 40 years ago, 60 years ago. Technologies are going to evolve and get better but the projects can be implemented now.



BUILDING ON INCENTIVES: HARNESSING INFLATION REDUCTION ACT TAX CREDITS FOR DECARBONIZATION

Legislation intended to fight climate change and promote the domestic production of clean energy, the Inflation Reduction Act, invests almost \$400 billion in tax incentives aimed at reducing carbon emissions and accelerating the country's energy transition away from fossil fuels. While companies associated with renewable energy will be significant beneficiaries of the act's incentives, companies in the fossil fuel sector also benefit from several new and expanded incentives designed to encourage investment in decarbonization activities. We gather leaders to discuss how the refining and chemicals industries can navigate decarbonization incentive programs:

- Digesting the provisions to help you plan for success
- Capturing carbon, capturing credits - strategies to maximize incentives for your project
- Anticipating how the IRA and Bipartisan Infrastructure will impact decarbonization and clean energy production



CLOSING PANEL DISCUSSION

Moderator:

Nick Macilveen, Managing Director, **Embarcatec**

Panelists:

Thomas Baker, Managing Director & Partner, **Boston Consulting Group**

Deanne Barrow, Senior Associate, **Norton Rose Fulbright**

Rebecca Jones, Senior Project Manager, **Wood**

David Smith, Partner, **Manatt, Phelps & Phillips**

TAKEAWAYS

- **Globally leading in decarbonization projects and technologies** - the Inflation Reduction Act's \$370+ billion investment into decarbonization and clean energy solutions is estimated to catalyse trillions of dollars worth of project growth and production in the US between now and 2032.
- **Increased CCS credits** - The IRA supersized the value of tax credits for carbon capture from \$50 to \$85 for every tonne of CO2 permanently stored and sequestered and from \$30 to \$60 per tonne used for enhanced oil recovery (EOR) or other industrial uses of CO2.
- **Tax equity investors have provided access to subsidies** - Not every company eligible for these credits can use the credits because they might not have the taxable income creating stranded money, and the need for a tax equity investor.
- **Stackable tax credits** - there are multiple revenue streams on the table of stackable credits that can add up to huge benefits across most decarbonization projects, including investment credits and production credits.
- **There are huge opportunities to save money on fuel costs and decarbonize at the same time** - for example, with the green hydrogen production tax credit of \$3 per kilogram, after supply chain and permitting challenges subside, the cost of electrolyzers and renewable electricity will fall and the forecast is green hydrogen production cost of \$3 per kilogram, creating a scenario whereby natural gas can be replaced with a ultra low cost fuel. The IRA will make clean hydrogen a long-term game-changer in the United States.
- **Renewables and decarbonization in general have bipartisan support** - Anything is possible. The risk of 'defunding' the IRA by a future administration to remove the incentives is relatively low. For example, renewables tax credits, the Production Tax Credit (PTC) and Investment Tax Credit (ITC) were extended a few years ago in a Republican-controlled house of Senate and Presidency. The IRA economically benefits many areas of the country, including former energy communities that relied on fossil fuels for their economic vitality.

CLOSING PANEL DISCUSSION

- **The EPA mandates for carbon capture and sequestration will have a significant impact on existing operations in the power sector** - The proposed rule requires either 90% capture of carbon dioxide using CCS by 2035 and/or co-firing with low-GHG hydrogen at a ratio of 30% (by volume) beginning in 2032 and ramping up to co-firing with low-GHG hydrogen at a ratio of 96% (by volume) beginning in 2038. It was very notable last year when the IPCC and others announced that we cannot meet the Paris Agreement without carbon capture.
- **There is a risk that Tax Equity won't be sufficient to monetize all tax credits needed for these types of projects** - \$85 was a number talked about in the industry which might bring it to some parity. The amount you can get out of the IRA differs if you're making productive, profitable use of the carbon somehow, either enhanced oil recovery or some other commercial use of it. Companies are grappling with transferability and whether to sell tax credits or do a traditional tax equity deal.
- **Supply chains, permitting, access to capital, and transmission interconnect are the main barriers to advancing projects and technologies incentivized by the IRA** - despite modest permitting reform, permitting is still taking too long. Whether it's green hydrogen, efuels, or renewables, there is a real recognition of the need for increased green electricity going forward. On a positive, the 10% bonus credit is driving domestic content.
- **The IRA has shifted the boundaries of the clean fuel market globally** - when looking at how the IRA has impacted global markets, taking export costs of clean ammonia as an example, pre-IRA, the US was the least cost-effective market when compared to Canada, South East Asia, Australia, and the Middle East. Today, US producers are the most cost-competitive. The US now produces blue and green hydrogen \$1+ cheaper than any other exporter. We're seeing a copycat consensus globally. Governments looking to incentivize and promote their own domestic production of clean fuels, will likely need to subsidize their domestic production industries to compete with US producers.
- **Transferability, something new in the tax credit space** - The IRA has enabled an enormous new market of selling and buying tax credits through 'transferability' to enable a developer of a carbon capture or a clean hydrogen project to sell their IRA credits to a company with tax appetite. Key takeaways of the process include 1) the cash proceeds from selling the credits are not taxable 2) the value of the credit to the buyer—that is, the difference between a discounted price paid for the credit and the full dollar of tax savings—is not considered taxable income to the credit buyer 3) you can sell your credit from one project to multiple buyers, but the credits can't be resold – the first-time buyer is the ultimate buyer 4) the buyer bears the financial responsibility for a recapture event (excluding upstream ownership changes); the seller can indemnify the buyer and some insurance is available.



CLOSING PANEL DISCUSSION



- **There are a lot more zeros in the grants** - Regulations and incentives are increasingly driving the economics and business decisions. Building the capabilities within teams and companies to respond to these grants and understand the incentives is incredibly important to businesses going forward.
- **A gold mine of opportunities to decarbonize** – we are eight months in and still trying to figure out the requirements and how to navigate the requirements. Structuring the deals takes work, but the incentives can enable project success and make new projects possible.

THANK YOU!

A huge thank you to all of our speakers, sponsors, and attendees who attended and contribute to the success of ESF North America 2023. We will continue the discussions next year...



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See you next year

The ESF Team



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