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Rail: Getting On Track for Decarbonization

Federal Railroad Administration Offices of Railroad Safety, and Research, Data and Innovation hosted an international workshop on rail decarbonization from May 15 – 18, 2023 in Denver, CO.

This workshop convened in-person discussions between US and international rail and clean energy experts on rail decarbonization technologies and strategies. Presentations covered topics related to advanced energy storage and rail propulsion systems, hydrogen fuel, bioenergy technologies, and more. Discussions also focused on safety of clean energy technologies, operating best practices for improving efficiency, as well as the reduction of Greenhouse Gas Emissions (GHGs) from freight and passenger rail systems in the US and globally.

FRA's Associate Administrator for Railroad Safety and Chief Safety Officer Karl Alexy kicked off the workshop with welcome and introductory remarks during the plenary session. Subsequent plenary session speakers were from FRA's Environmental Program Office, US Department Of Energy, US Environmental Protection Agency, and California Air Resources Board. Technical sessions, followed the plenary session, covering presentations from international speakers representing: Australia, Canada, Germany, Great Britain, Europe's Rail Joint Undertaking, Japan, International Union of Railways (UIC). US speakers were from Amtrak, American Public Transportation Association (APTA), Association of American Railroads (AAR), BNSF Railway, California Department of Transportation (Caltrans), CNGMotive, CPKC, CSX, DB E.C.O. Group, HDR, Inc., Mott MacDonald, National Renewable Energy Laboratory (NREL), Progress Rail, Southwest Research Institute, San Bernardino County Transportation Authority, Stadler, US Navy.

The workshop resulted in a number of research ideas, collaborations and networking among both public entities and industrial partners.

Expand All Collapse All

Workshop Presentations

Welcome and Kick-Off

Federal Railroad Administration Climate and Sustainability Program Overview

Marlys Osterhues
Federal Railroad Administration

View Presentation

Marlys Osterhues is the Director of the Office of Environmental Program Management. As the Office Director, Marlys is responsible for the development and implementation of policies, programs, and technical assistance to promote effective transportation and environmental decision making on projects using principles and processes that satisfy FRA responsibilities under the National Environmental Policy Act of 1969 (NEPA) and other relevant Federal statutes. She provides leadership and oversight of a large multidisciplinary staff of environmental protection specialists within three divisions including: Environmental Policy, Environmental Project Review, and Cultural Resources.

Marlys oversees FRA's complex portfolio of environmental reviews. She is responsible for ensuring that environmental policy and compliance obligations are satisfied in the planning and implementation of intercity passenger and freight rail programs. Marlys serves as FRA's principal advocate for the improvement of transportation and environmental decision making through application of NEPA principles and the NEPA process. She oversees coordination of FRA climate, resilience and energy policy.

Prior to joining FRA, Marlys worked in FHWA's Office of Project Development and Environmental Review for 15 years. Marlys served as a Mitigation Team Leader from 2010-2016 where she was responsible for the development of FHWA policies and program support related to natural and cultural resource protection and consideration of ecological impacts in the transportation decision-making process. Marlys oversaw program, research and interagency coordination activities related to water quality, historic preservation, stormwater, wetlands, wildlife, endangered species, and vegetation management.

She graduated from the University of California at Santa Barbara with a degree in Environmental Studies.

Department of Energy's Goals for Transportation Decarbonization

Siddiq Khan
US Department of Energy

View Presentation

Dr. Siddiq Khan is a Technology Development Manager at U.S. Department of Energy's Vehicle Technologies Office. He manages DOE's U.S. DRIVE partnership, SuperTruck projects as well as numerous research projects on engine, emissions, and vehicle technologies. He is also leading Department's decarbonization efforts on rail.

Previously Siddiq worked at Asian Development Bank (ADB) as Vehicle Emissions Control Specialist and as a Senior Transportation Researcher at American Council for an Energy-Efficient Economy (ACEEE).

As a volunteer Siddiq contributes to conferences and committee work of the Transportation Research Board (TRB) and the Society of Automotive Engineers (SAE).
Siddiq earned a Master of Science and a Ph.D. in Mechanical Engineering from West Virginia University, Morgantown, WV, USA.

US Environmental Protection Agency's Goals for Decarbonization

KC Becker
US Environmental Protection Agency

View Presentation

KC Becker is EPA's Regional Administrator for Region 8 which encompasses Colorado, Utah, Wyoming, Montana, North Dakota, and South Dakota. President Biden appointed her to lead Region 8 in November 2021. Prior to that, she served in the Colorado House of Representatives for 4 terms before being term-limited in January, 2021. She served as Speaker of the House for 1 term and as House Majority for 1 term. Prior to serving in the Colorado legislature, she served 4 years on Boulder, Colorado's city council. She worked for several years as an attorney-advisor in the Solicitor's Office at the US Department of the Interior. She graduated with a degree in Government from the College of William and Mary. She earned her JD from Lewis and Clark Law School with a certificate in environmental law, where she served on Law Review. She earned an MS in Real Estate Development from the University of Denver's Daniels College of Business.
While in the legislature, KC Becker led landmark legislation to reform Colorado's oil and gas sector, create a first-in-the-nation Office of Just Transition, and pass nationally-leading legislation requiring the state to put forward a plan to meet carbon reduction goals. She lives in Boulder, Colorado with her husband and two sons.

Protecting Public Health through Rail Decarbonization

Ajay Mangat
California Air Resources Board

View Presentation

Ajay Mangat has been with the California Air Resources Board (CARB), since 2007 and has served in various capacities within the agency. He currently supervises the Freight Systems Section which developed the In-Use Locomotive Regulation that was recently approved by the CARB Board in April of 2023. Prior to focusing on locomotive emissions, he developed and implemented the $1 Billon Goods Movement Emission Reduction Program and served as a liaison to each of the major air districts in California. Mr. Mangat has an Applied Science and Engineering degree from UC Davis.

Rail Decarbonization Strategies from Around the World, Part 1

Pathways to Decarbonizing the Rail Sector: A Canadian Perspective

Jim Lothrop
Transport Canada

View Presentation

Jim Lothrop is an experienced leader in the Canadian federal government with over twenty-five years of experience in public administration. He is currently the Director General of the Innovation Centre at Transport Canada where he provides executive leadership over a multi-million dollar/multi-modal research and development program to position Transport Canada as a leader in transportation innovation, including work on next generation technologies to reduce emissions from the transportation system.

Mr. Lothrop graduated from University of Ottawa with a degree in Civil Engineering and is licensed to practice as a Professional Engineer in the Province of Ontario. He lives in Ottawa, Ontario, is married and the proud father of two children.

Decarb Down Under – An Australian Update

Robert Moffat
Australasian Center for Rail Innovation

View Presentation

Robert Moffat has more than 30 years of experience in engineering and strategic planning across diverse industries, geographies and cultures.

His extensive management and leadership skills have been deployed across the full life cycle of the transport sector from concept, funding, construction, day of operations, maintenance through to cessation.

Living in Australia since 1999, he is currently CEO and Executive Director of the Australasian Centre for Rail Innovation, a vice-chair of the International Railway Research Board and was recently appointed to be Executive Director National Transport Research Organization - Rail. Rob is a board member of Infrastructure Australia, Fellow of Engineers Australia and holds a Bachelor of Electronic & Electrical Engineering with Honours from the University of Edinburgh in Scotland.

UIC – Mission and Goals for Decarbonization of Rail Transportation

Lucie Anderton
International Union of Railways - UIC

View Presentation

As Head of Sustainability at the International Union of Railways (UIC), Lucie leads the Environmental technical topics as well as global advocacy for rail as a climate solution. UIC is the global association of railway organizations. On secondment from Network Rail, the UK Rail Infrastructure manger, Lucie has 18 years of experience in sustainability policy and environmental management in the rail industry and major infrastructure projects.

Efforts Towards Decarbonization in Japan

Takamasa Kadono
Ministry of Infrastructure, Transport & Tourism

View Presentation

Takamasa Kadono has contributed in railways, urban development and other relevant infrastructure/transport policy fields as a government official at the Ministry of Land, Infrastructure, Transport and Tourism since April 2012. He was appointed to her current post as Director for International Cooperation Policy Coordination, International Policy and Project Division, Railway Bureau on 5 November, 2021.

US DOE Vehicles Technology Office – Approach to Advancing Clean Energy Technologies for Rail

Siddiq Khan
US Department of Energy

View Presentation

Dr. Siddiq Khan is a Technology Development Manager at U.S. Department of Energy's Vehicle Technologies Office. He manages DOE's U.S. DRIVE partnership, SuperTruck projects as well as numerous research projects on engine, emissions, and vehicle technologies. He is also leading Department's decarbonization efforts on rail.

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As a volunteer Siddiq contributes to conferences and committee work of the Transportation Research Board (TRB) and the Society of Automotive Engineers (SAE).
Siddiq earned a Master of Science and a Ph.D. in Mechanical Engineering from West Virginia University, Morgantown, WV, USA.

Safety Testing of Lithium-Ion Batteries for Military Applications

Julie Simmons
US Navy, Naval Surface Warfare Center

View Presentation

Battery Testing Example Videos: One | Two | Three | Four

Ms. Julie A. Simmons is a senior lithium battery safety technology expert at the Naval Surface Warfare Center (NSWC), Carderock Division. She received her B.S. from the University of Maryland at College Park in Materials Engineering in 1990. She has worked for the Navy on high-energy batteries for her entire career since starting at NSWC in January of 1991. Julie started out with the Battery Technology Group as a materials research engineer focused on testing lithium batteries to determine their performance and safety characteristics. Over the years, as her knowledge and experience of lithium battery safety testing grew, the job evolved into her current role as trusted Technical Agent for the Naval Sea Systems Command (NAVSEA), conducting safety evaluations and providing recommendations for certification of lithium batteries used in systems deployed from all United States Navy and Marine Corps platforms and shore-based facilities. In addition to her role as NAVSEA Technical Agent, within the Battery Integration and Certification Branch, Julie is also the Technical Area Leader (TAL) of the Lithium Battery Certification Team at NSWC Carderock.

Progress Rail Decarbonization Solutions

Wendy Schugar-Martin
Passenger Rail

View Presentation

As Director, Regulatory & Grants, Wendy is enabling Progress Rail customers to accelerate the adoption and implementation of sustainable solutions. Joining the Progress Rail team in late 2021, she brought with her over two decades of sustainability and environmental expertise. She specifically worked to bring alternative fuels to the on-highway transportation sector by developing and implementing comprehensive business plans and is poised to share those experiences as Progress Rail endeavors to meet the needs of its customers and their sustainability goals.

Get on-Board! – Moving North American Rail Industry Towards Decarbonization, Part I

Overview of Low- and Zero-emission Technology Options for Railway Motive Power

Andreas Hoffrichter
DB E.C.O. North America

View Presentation

Dr. Andreas Hoffrichter is a Principal with DB E.C.O. North America, leading the Center for Net-Zero Transformation. Together with his team, he is supporting railways and transit agencies with strategy development and corresponding implementation to achieve net-zero emissions. Andreas' expertise is in low- and zero-emission technologies for railway motive power, including partial electrification, hybrids, battery-power, and hydrogen options. Prior to joining DB E.C.O. NA, Andreas was the Burkhardt Professor in Railway Management and the Executive Director of the Center for Railway Research and Education at Michigan State University. He holds a Ph.D. in hydrogen-powered railway vehicles, and his work in this field led to the development of the first practical railway vehicle with such a power train in the UK.

California, Net-zero Rail by 2035

Momoko Tamaoki
California Department of Transportation

View Presentation

Momoko Tamaoki is the Assistant Division Chief at California Department of Transportation, Division of Rail and Mass Transportation.

In that role, she is responsible for:

- Intercity Rail Operations and Fleet Management
- Planning and Capital Projects Delivery
- Oversight on state and federal funding programs, grants, and contract/financial Management

She is a dynamic State government transportation professional with 17 years of increasingly responsible experience pertaining to rail and mass transportation. Insightful strategist with keen negotiating, analytical, problem-solving and team building skills. She has been leading initiatives and projects to transition Caltrans Intercity Rail to zero emissions.

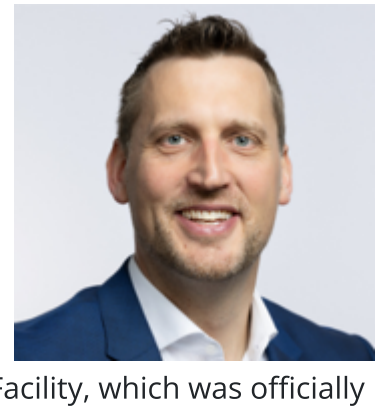
BNSF Railway Decarbonization Technology Implementation Strategy

Mike Swaney
BNSF Railway

View Presentation

Mike Swaney is the Director of Advanced Energy Innovation at BNSF Railway. He is responsible for the identification, evaluation, and adoption of zero and near-zero emissions technologies at BNSF. Mike joined BNSF in 2006 and has led multiple software and hardware technology deployment programs across various Operating departments. Mike holds a BBA in finance from Texas A&M University and an MBA from Southern Methodist University. Mike is married with three sons and lives outside Fort Worth, Texas.

Hydrogen and Battery: How Stadler's Alternative Propulsion Products Make US Rail More Sustainable



Martin Ritter
Stadler US Inc.

View Presentation

Stadler Example Video

Martin Ritter is the President and CEO of Stadler US Inc. Since accepting the role and relocating to Salt Lake City in May of 2016, Martin has been relentless in the systematic growth and development of this US operation. Painstaking detail has been dedicated to the development and launch of a new 250,000 sq. ft. US Manufacturing Facility, which was officially opened in May of 2019. Some of Martin's greatest successes to date have been the completion of the TEXRail project, the first project fully

assembled at the US location and winning the contract to supply METRO trains for MARTA, the largest US contract thus far. Prior to his current executive leadership role, Martin served Stadler Rail Management as a Strategic Special Assistant to former Stadler Rail Group CEO and President of the Board of Directors Peter Spuhler, where he was responsible for developing business solutions and leading several strategic projects. It was in this role Martin uncovered the strategic opportunities relating to the development of a new manufacturing site in the US. In every assignment, Martin has proven that he can develop and implement plans to accelerate market expansion, attract and hire top talent, dramatically increase business partnerships, and strengthen brand positioning. It has been no surprise that Martin has made such a profound and immediate impact on the business units he leads. Mr. Ritter will proudly point toward his military experience as being the cornerstone of his leadership development, which resulted in being promoted to the rank of Captain and serving as Commanding Officer of the First Company of the 20th Grenadier Battalion. In addition to his service, Mr. Ritter is a lifelong learner who holds a Master Degree in Accounting and Finance, as well as Bachelor Degree in Business from the University of St. Gallen in Switzerland.

Global Trek Towards Decarbonization

Lessons Learned and Best Practices from 4+ Years of Safe Operation of iLint Hydrogen Fueled Train in Germany

Christoph Grimm
Eisenbahnen und Verkehrsbetriebe Elbe-Weser GmbH, German

View Presentation

Christoph Grimm has been working in the railroad industry for more than 25 years, gaining extensive experience on both the agency as well as the train operator side of the business. Before joining evb as Chief Executive Officer in 2020, he held several senior operational and strategic management positions, both domestically and internationally, developing businesses, markets and opportunities in countries ranging from the UK and Sweden to Canada and the USA. Previous employers include Keolis SA, DB Netz AG (Infrastructure), DB Regio AG and Bayerische Eisenbahngesellschaft (BEG, Public Transport Authority of the Federal Free State of Bavaria). He holds a degree in economic geography with a focus on urbanism and transport planning as well as additional qualifications in transit planning, marketing and communications.

Innovative Research Projects focused on Decarbonization

Elton Toma
National Research Council Canada

View Presentation

Elton Toma has been with the National Research Council Canada (NRC) for 20 years, where he leads a team of researchers conducting rail and road vehicle testing and simulation. He has led or been active in NRC studies related to freight and passenger rail operations concerning derailment causes, in-train forces, marshalling of freight cars, curving behavior, and vibration and noise. He is currently leading a team conducting a risk assessment of hydrogen fuel cell locomotives for freight use. He was a member of the 2016 National Academy of Science (NAS) committee on the review of DOT testing of Electronically Controlled Pneumatic (ECP) brakes, and is currently a member of the NAS Committee on the Impact of Trains Longer Than 7,500 Feet. He has a Ph.D. in Mechanical Engineering from Queen's University at Kingston (Ontario, Canada) and is a licensed professional engineer in the province of Ontario.

Europe's Rail Joint Undertaking Decarbonization Plan

Ian Hodkinson
Technical Turkey Transit System, Alstrom

View Presentation

Ian holds a Bachelor of Mechanical Engineering from McGill University and has nearly 20 years of varied experience in the rail industry with Alstom Transportation. Over the past few years, he has held various important roles within complex systems engineering projects, as well as in numerous public-private partnerships. As Marketing Director of Transit Systems for the Americas at Alstom, Ian is involved in business development opportunities and turnkey contracts of all kinds, whether light rail, hybrid, hydrogen and battery propulsion systems or high speed.

Welcome and Kick-Off - Day 2

Deutsche Bahn's Global Decarbonization Strategies

Dr. Tobias Fischer
Deutsche Bahn AG, Germany

View Presentation

Dr Tobias Fischer has held various positions and functions at Deutsche Bahn AG for over 20 years. Since moving to the technical area in July 2017, he has been pursuing the goal of testing new, innovative vehicle components and concepts together with the railway industry. The essential basis for this is the specially created advanced TrainLab, a unique test train with which the technical department of Deutsche Bahn evaluates new technologies. One of his main topics are the decarbonization goals of Deutsche Bahn. It is particularly important to him that locomotives and multiple units can run without fossil diesel, which is why he investigated the use of alternative fuels with the advanced TrainLab and successfully implemented alternative fuels at Deutsche Bahn.

Rail Decarbonization -It's a Journey!

Jennifer Elevique
Department for Transport, UK

View Presentation

Jennifer Elevique is the Deputy Director within the UK's Department for Transport (DfT). Her portfolio covers Rail environment policy including decarbonization, sustainability, air pollution, noise pollution, and biodiversity. She is also the Programme Director for the East Coast Digital Programme (£3.45bn whole life cost) which seeks to replace conventional signalling with digital signalling and then promulgate this through a 'long term deployment' portfolio across the UK Rail Network; She is also the government lead on Project Reach , a Network Rail project exploring opportunities to collaborate with the private sector to improve telecommunications on the Railway; and also covers policy for depots and stabling.

She joined DfT's Rail group in December 2020, previously being Head of Finance Business Partners for the DfT's Roads, Devolution and Motoring Group managing its £3.5Bn annual budget and providing financial advice to the policy teams for national and local roads, motoring, transforming cities, mobility, & cycling and walking. She brings a multi-disciplinary approach to her portfolio.

The Current Status of the Development of Carbon-neutral & Energy-conserving Rolling Stock for Railway Systems in Japan

Dr. Hitoshi Hasegawa
Railways Technical Research Institute, Japan

View Presentation

Hitoshi Hasegawa is Deputy General Director of the Research and Development Promotion Division at the Railway Technical Research Institute (RTRI), of the Japan Railways (JR) Group. He is an expert in electrical machines, energy storage and sustainable energy systems. Dr. Hasegawa has over 30 years of work experience at RTRI, including previous positions as the Director and Head of the Vehicle Control Technology Division, and Senior Chief Researcher and Head of the Hydrogen and Sustainable Energy Laboratory. He holds Bachelor's, Master's and Doctor's degrees in electrical engineering from Waseda University.

Infrastructure & Resiliency – The Missing Link!

Drivers, Facility Considerations, and Economics of the Zero Emission Transition in Rail

Will Kirby
HDR

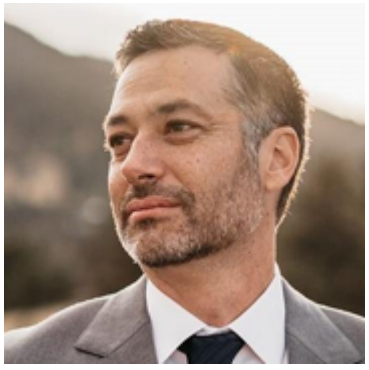
View Presentation

Will is a Transportation Sustainability Leader with significant experience on client sustainability and clean energy projects for a diverse set of client types. Will is committed to bringing sustainable approaches to each project and strives to make great things possible for his clients on their sustainability journeys. As a Transportation Sustainability Leader, Will leads projects or tasks for public and private clients in decarbonization, electrification, sustainability planning, climate action plans, resiliency planning and more. His background as a Project Manager in renewable energy and power transmission has given him experience in managing teams, scheduling, budgeting and cost management, risk management, leading pursuits, contract and scope development and client coordination.

Advanced Locomotive Technology and Rail Infrastructure Optimization System

Jason Lustbader
National Renewable Energy Laboratory

View Presentation



ason Lustbader is the manager for the Advanced Vehicles and Charging Infrastructure group at the National Renewable Energy Laboratory's Center for Integrated Mobility Science. He is the principal investigator for the the Advanced Locomotive Technology and Rail Infrastructure Optimization System (ALTRIOS), which seeks to accelerate rail decarbonization through the development of an opensource modeling framework. His group works with industry and fleet partners to evaluate the performance and support the development of advanced medium- and heavy-duty vehicle technologies and associated high power charging infrastructure with the goal of decarbonizing all modes of transportation. The team works closely with industry partners to apply vehicle data, advanced analytics, and simulation to identify and overcome technical barriers and inform the development of commercial vehicle technologies that improve efficiency and performance.

Multi-Decadal Decarbonization Pathways for U.S. Freight Rail

Lynn Harris
Deutsche Bahn E.C.O North America Inc.

View Presentation

Mr. Lynn Harris graduated from North Carolina State University in 1999 with a BS in Nuclear Engineering, and since November 2020 has been employed by DB E.C.O. North America Inc. as a Senior Consultant in the Center for Net-Zero Emissions group. Prior to joining DB he was employed by McDowell Engineers & Associates for ten years as an embedded consultant to the North Carolina DOT Rail Division. His previous employment has included time with GE, Applied Materials, and multiple startup companies. Mr. Harris has extensive experience in implementation of green technology for the railroad industry, locomotive and railcar rebuilds, and positive train control implementation.

Maintenance Facility Retrofit to Accommodate the SBCTA Zero-Emissions Multiple Unit

Nick Laverick
Mott Mcdonald

View Presentation

Originally from Australia, Nick is a Chartered Professional Engineer and Principal Project Manager with Mott MacDonald based in Seattle, Washington. Nick has been in the rolling stock business for over 18 years with experience both on the car builder and the owner-side of the industry. From hands-on vehicle manufacturing, fabrication and maintenance, through leading engineering and design teams in rail vehicle procurements. Nick is currently supporting SBCTA as the Vehicle Technical Lead for their Zero Emission Multiple Unit (ZEMU) Project. A key aspect of his role is to aid integration of the hydrogen-hybrid ZEMU vehicle into SBCTA's existing maintenance facility.

"Standing Up" the Standards

APTA Whitepaper on Battery-Electric and Hydrogen Passenger Rail Equipment

Jackson Xue & Marcin Taraszkiewicz PE
WSP

View Presentation

Jackson currently serves as Vice President and Senior Technical Principal in Rail Vehicles Engineering at WSP with a focus on high-speed trainsets, alternative propulsion passenger rail vehicles (hydrogen and battery), and inspections. He graduated in 2007 with a Bachelors of Engineering in Mechanical Engineering from Cooper Union, and has been with WSP for 16 years. His experience in rail vehicle engineering includes investigating and developing vehicle system requirements and specifications, managing system interfaces, performing vehicle condition assessments, and supporting vehicle procurement efforts. Jackson is currently leading an APTA working group tasked with the development of an APTA Whitepaper on Battery-Electric and Hydrogen Passenger Rail Equipment Requirements. He is also a member of the ASME Rail Transit Vehicle Committee and is involved in the FRA Passenger Safety Working Group through APTA, contributing to the development of new Tier III high-speed rail regulations and Tier IA alternative compliance regulations.

Marcin has 30 years of professional experience in transit engineering, project management, design, testing, commissioning, integration, operation, and maintenance. His extensive portfolio of projects includes new car procurement and overhaul of light rail, heavy rail, and commuter rail cars with major clients both in North America and abroad. Marcin is HDR's Rail and Transit Vehicle Technology Lead and specializes in the assessment and implementation of zero-emissions technologies for rail transportation. He has a bachelor's degree in Aerospace Engineering from the University of Michigan, an MBA from DePaul university, and is registered as a Professional Engineer in Maryland, New York, and Virginia. He is also a graduate of the Leadership APTA program.

AAR Activities - Alternative Fuel Standards Development & Locomotive Battery Charging Infrastructure

Michael Fore
Association of American Railroad

View Presentation

Michael Fore has over 30 years' experience with the AAR. Mike started in the Policy & Economics Department and transferred to Railinc when the organization moved to the current headquarters in Cary, NC. Mike rejoined the AAR in the Safety & Operations Department where he currently manages the Locomotive Committee as well as performing the collateral duties of inspection results notification for repair facilities and receiving the corrective action responses for the Mechanical Inspection Department (MID).

Canada Advancing the use of Hydrogen & Electrification in the Rail Industry Through Standardization

Iris Monner
CSA Group

View Presentation

Iris Monner is a Project Manager at CSA Group and has a background in Mechanical Engineering. She works in the Transportation sector managing new and existing binational, and international standards development work focused on hydrogen and electrification.

Optimizing Current Technologies and Operations for More Efficient Rail

The Impact of Trainline Air Leakage on Engine Efficiency and Decarbonization

Chris Stoos
Southwest Region Institute

View Presentation

Issues in Real-world Effectiveness of Automatic Engine Start Stop and Other Idle Reduction Technologies

Abby Swaine
US Environmental Protection Agency

View Presentation

Abby works for the US EPA's New England office on voluntary and regulatory programs to maximize the emissions efficiency and minimize the public health impacts of freight movement. On the voluntary side, Abby promotes EPA's SmartWay partnership for shippers and carriers (including rail), and brings the tools and resources of EPA's Ports Initiative (which covers railyards and on/near-dock rail) to the Region. Abby chairs an internal EPA Rail Interest Group to help Regions and HQ offices learn about locomotive and freight rail technologies and operations, including from experts at FRA. On the regulatory side, Abby fields complaints about locomotive idling (often with advice from FRA field staff), promotes compliance with EPA engine rules for locomotives, and discourages tampering with emissions controls on trucks.

CSX Decarbonization Strategy and Experience with Trip Optimizer

Corey Davis & Rebbeca Hensley
CSX

View Presentation

Director of Fuel Strategy and Utilization at CSX Transportation where he oversees locomotive fuel conservation and emission reduction programs to help CSX achieve fuel and carbon reduction goals. He has over 27 years of experience at CSX Transportation holding various positions in Operations, Training, and regulatory compliance roles. **Corey** began his career with CSX as a Conductor in Atlanta, GA in 1995 and then became a Locomotive Engineer in 1998; this field experience has given Corey a comprehensive perspective of railroad operations. His current role is responsible for implementing solutions to reduce locomotive emissions and improve fuel efficiency such as Trip Optimizer Zero to Zero, friction management, and alternative fuels. He holds a degree in Transportation Technology from Mountwest Technical College and currently lives in Jacksonville, FL.

Rebecca (Becky) Hensley is a Senior Manager Environmental Programs at CSX Transportation, Inc where she coordinates the CAA program and Environmental, Social and Governance (ESG) reporting. She has over 25 years of experience with EHS, sustainability, and regulatory compliance. She specializes in data management solutions and cross-functional team collaboration. Before joining CSX, she worked as a consultant for a variety of transportation, manufacturing, military and government clients. Her career has specialized in environmental permitting and developing customized solutions and tools for air, water and waste compliance.

Get on-Board! – Moving North American Rail Industry Towards Decarbonization, Part II

Introduction of First US Hydrogen Powered Train

Victor Lopez
San Bernardino County Transportation Authority

View Presentation

Victor Lopez is the Director of Transit and Rail Programs for the San Bernardino County Transportation Authority. He is a professional Civil Engineer with more than 18 years of experience in project delivery of major capital projects ranging from planning through project close-out. He has a bachelor's degree in Civil Engineering from Santa Clara University and a master's degree in Civil Engineering from San Jose State University.

Hydrogen Hybrid Switcher Locomotive for Freight Movement in Canada

Matthew Findlay
Canadian Pacific Railroad

View Presentation

Matthew Findlay is Director of Mechanical Systems at Canadian Pacific, with responsibility for CP's Hydrogen Locomotive program.

Matthew started working in design on GE's first high-efficiency H-System steam-cooled gas turbine. In 2004 he joined Union Pacific Railroad's Finance department, working closely with the Mechanical team to introduce low-emissions locomotive technologies to the industry. Since 2012 he has been with CP leading initiatives in costing, capital planning and locomotive reliability.

Matthew holds a Ph.D. in mechanical engineering from UBC, an MBA and degree in aerospace engineering. He is trained as a locomotive engineer and is a former Chair of the AAR Locomotive Committee.

Safety-Centric Design in Hydrogen Tenders for Mainline Freight

Pedro Santos
CNGMotive

View Presentation

Pedro Santos is the co-founder and Chief Technology Officer of CNGmotive. An active serial energy technology entrepreneur, Pedro started his career with mechanical devices by taking apart his first engine and compressor at the age of 6. Pedro completed his last two degrees from the University of Oklahoma with a Master's of Science in Natural Gas Engineering and Management and a Master's in Business Administration including a certificate in Entrepreneurship and Innovation from the Massachusetts Institute of Technology's Sloan School of Management in Cambridge, Massachusetts, where he developed the foundational technology for CNGmotive. He is currently the main inventor and holder of over 30 patents in hydrogen and natural gas technologies within compression, liquefaction, storage, safety, and process innovations. Pedro was a recipient of the Patrick McGovern Entrepreneurship award in 2010 and the inaugural Forbes 30 under 30 recipient in the area of Energy in 2012. Pedro is frequently called upon as a technical expert on complex and cross-cutting technical matters involving emerging energy technologies. He is further known as a subject matter expert in virtual fuel pipelines for heavy duty applications over road, rail, and maritime cases including liquefied and pressurized fluids, having led innovations in the increase of density of transportation and storage of hydrogen and natural gas.

Amtrak Strategy for Net-Zero by 2050

Laura Fotiou
Amtrak

View Presentation

In her role as Sustainability and Climate Resilience Manager, Laura leads the development of Amtrak's Net-zero emissions target and strategy. She started her career at Amtrak 10 years ago in the Environmental, Health, and Safety group where she established and integrated new environmental policies and procedures across operations. In EHS, she quickly found a passion for reducing impacts on the environment and driving sustainability goals. Last year, her passion brought her to Amtrak's Strategy and Planning department to incorporate sustainability and emissions reductions into long range planning and corporate strategy. Laura holds a B.S. in Chemistry from St. Joseph's University and an M.S. in Applied Geosciences from the University of Pennsylvania. In her free time, you can find Laura hiking with her dog and finding any opportunity to travel to Greece to visit family and friends.

Last updated: Thursday, June 29, 2023

U.S. DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

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