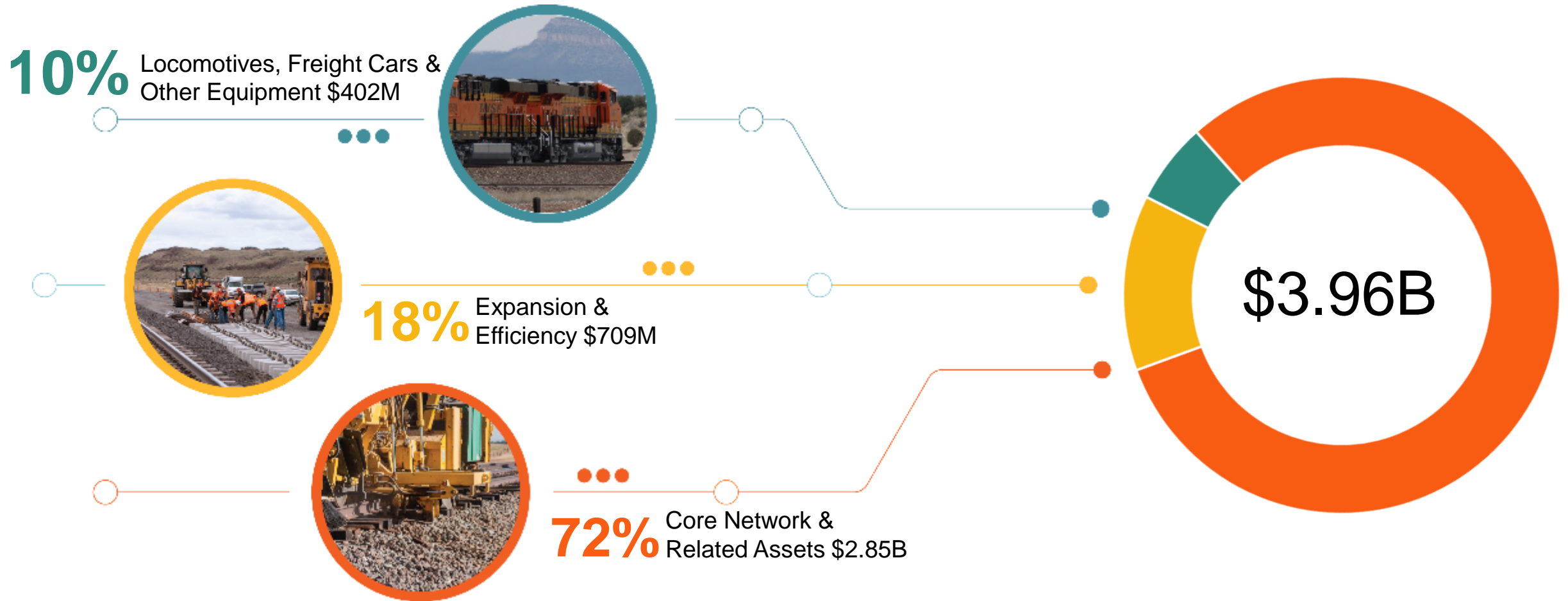




ORANGE IS THE NEW GREEN
SUSTAINABLE FREIGHT TRANSPORTATION FOR YOUR SUPPLY CHAIN

Pacific Northwest Association of Rail Shippers
John Lovenburg, VP Environment & Sustainability

2023 Capital Investments \$3.96B



BNSF Economic Development

Logistics Parks



Logistics Centers



Certified Sites



Transload



INVEST • DEVELOP • PARTNER • PROMOTE

Climate Change Drivers for Rail

- Climate disruption
- Growth – rail as low carbon solution for customers (one-third carbon)
- Innovation – zero emissions tech with improved efficiency
- Supply chain requirement for customers with net zero carbon targets (next slide)

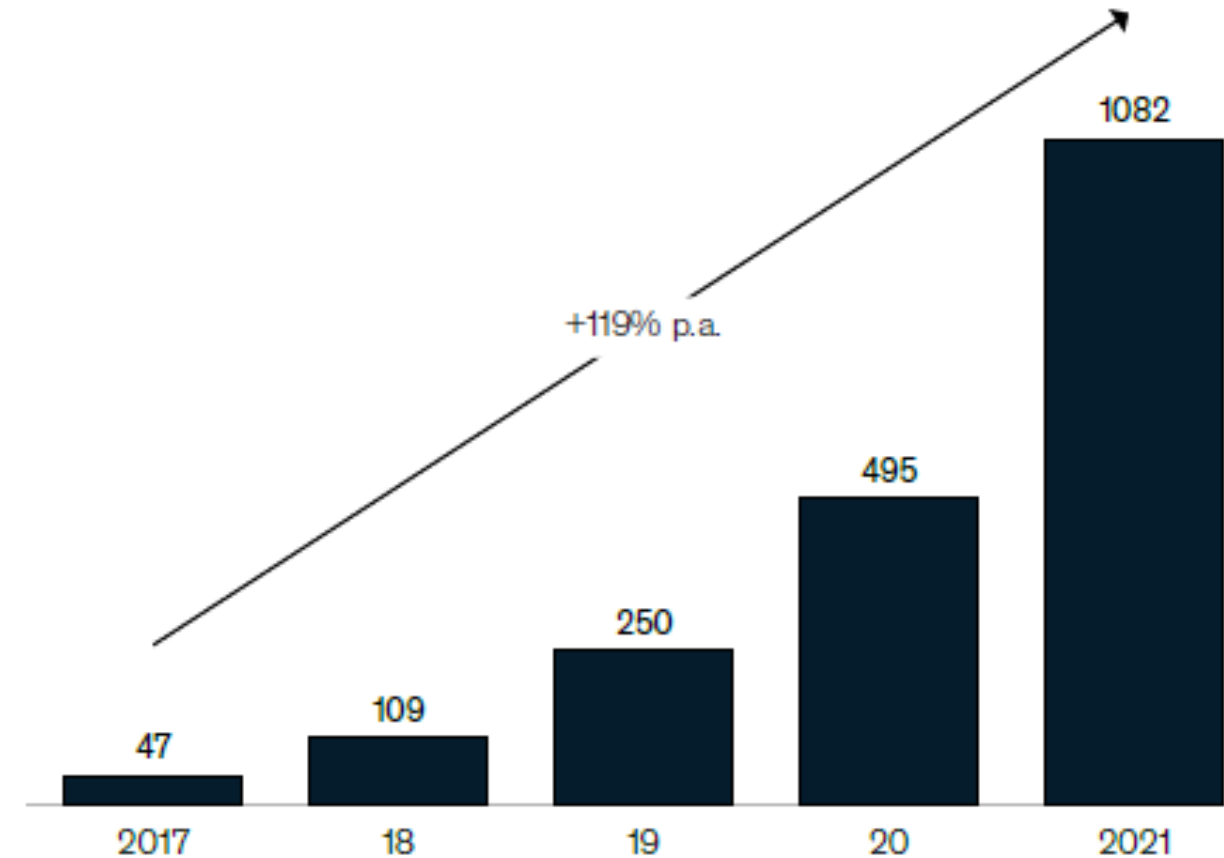


Dixie Fire in California

Customer Demand for Lower Carbon Freight Transportation Increasing

- 96% of companies with approved science-based targets have targets covering scope 3 emissions

More companies set science-based targets for Scope 3²
of cumulative companies with approved targets



BNSF Sustainable Freight Leadership



1 Sustainable Development and Communities

“Optimal siting to responsibly avoid impact to sensitive receptors and/or minimize permitting effort”

2 Sustainable Operations Program

“Drive regulatory compliance and risk reduction through Sustainable Ops solutions”



3 Advanced Energy Innovation

“Efficient use of energy innovation and technology to reduce Total Cost of Ownership”

4 Sustainable Customer Solutions

“Provide sustainable transportation solutions that meet the needs of our customers’ supply chains and enables them to grow in core and emerging sustainable business markets”

Sustainable Development & Permitting

Vision

Avoid/minimize overall environmental impact and reduce Total Cost of Ownership

- **Siting & Communities**
Avoid impacts; promote compatible land uses
- **Design**
Sustainable design to minimize impact, reduce permitting timelines
- **Construction**
Incorporate sustainable construction practices
- **Operations**
Position sites for long-term sustainable operations

Constraints & Siting Analysis



Sustainable Operations Program

Objective:

Identify and implement *collaborative* and *sustainable solutions* that protect the environment, support stakeholder needs, and provide operational benefit to BNSF

SOP PROCESS:

- Assess operational areas within facilities
- Capture best management practices and opportunities
- Evaluate for implementation
- Implement at local and/or system level

PROJECT EXAMPLE:

- Replace oil filter crusher, with compactor (All-in-one process)
- Reduces oil spillage/clean-up, haul-off frequency, and labor



Rail Industry Innovation to Reduce Carbon

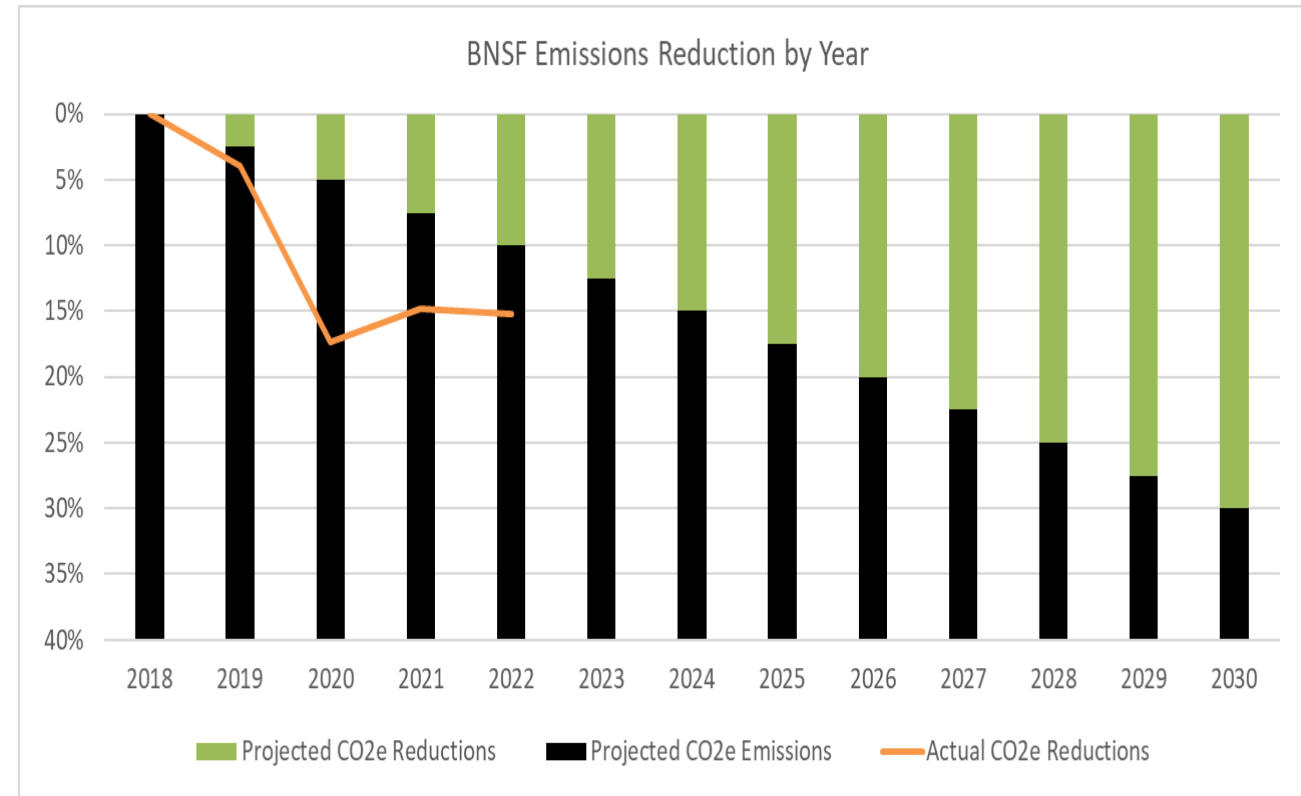
- **Association of American Railroads Formed Technical Subcommittees**
 - Decarbonization
 - Renewable Diesel
 - Charging
- **Collaboration to Accelerate Technology Prove-Out**
 - Higher Renewable and Biodiesel Blends with locomotive manufacturers
 - Battery-electric and hydrogen locomotives
 - Intermodal hub electrification



Battery-electric yard trucks
at intermodal facility

Path to 30% Carbon Reduction

- **Headwinds – up to 10%**
 - Business mix shift hurts fuel efficiency – less coal, more CP
 - Growth from '18
- **Opportunities – need up to 40%**
 - Fuel efficiency
 - Renewable fuels
 - Battery-electric regional & switcher locomotives



Fuel Efficiency

Initiatives:

- Replace Older Locomotives
- Operational Practices
 - Horsepower per ton
 - Speed limits
- Energy Management Software
 - Locomotive energy management
 - Idle reduction
- Aerodynamics
 - Locomotives, cars, train make-up

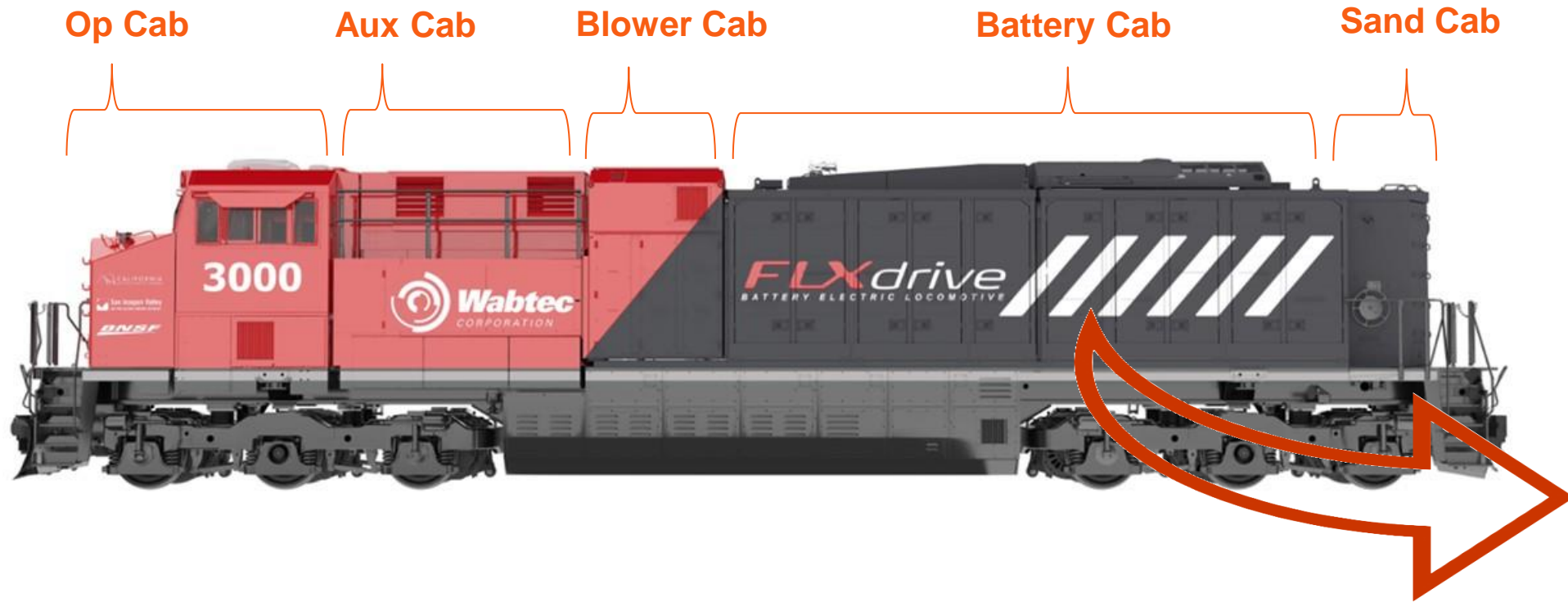


Renewable Diesel

- Advancing pilots to enable higher percentage blends
- Policy change/advocacy required for cost-competitive supply
 - State Low Carbon Fuel Standards
 - Multi-year process: legislation, rule-making, establish markets, establish supply chains
- Availability of cost-competitive renewable fuels

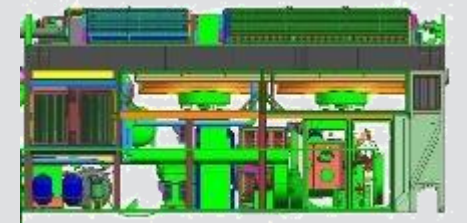


What is a Battery Electric Locomotive?



Eliminated

- Engine
- Alternator
- Cooling System



Battery-Electric Locomotive Efficiency “Secrets”

- **Battery-Electric System Twice as Efficient as Diesel-Electric**
 - Use half the energy do the same work
- **Plus:**
 - “Free energy” from regenerative braking
 - Less energy used during idling



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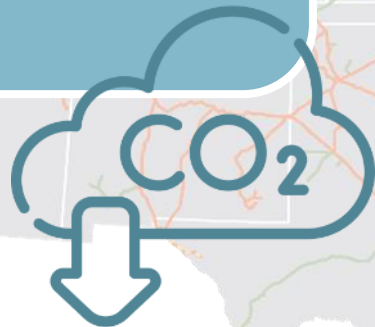
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Green Corridor Vision

Partner and deploy zero or near-zero technologies to achieve a lower greenhouse gas emission *door-to-door* service product

BCOs are increasingly setting emissions targets to include their supply chain



1.

Ocean Transport

Lower carbon vessels

2.

Short-Haul & Long-Haul Intermodal

Battery-electric locomotives and Tier 4 locomotives with renewable diesel

3.

IMF Operation & Logistics Park Integration

Battery-electric equipment and switchers at integrated IMF and logistics park with key BCOs

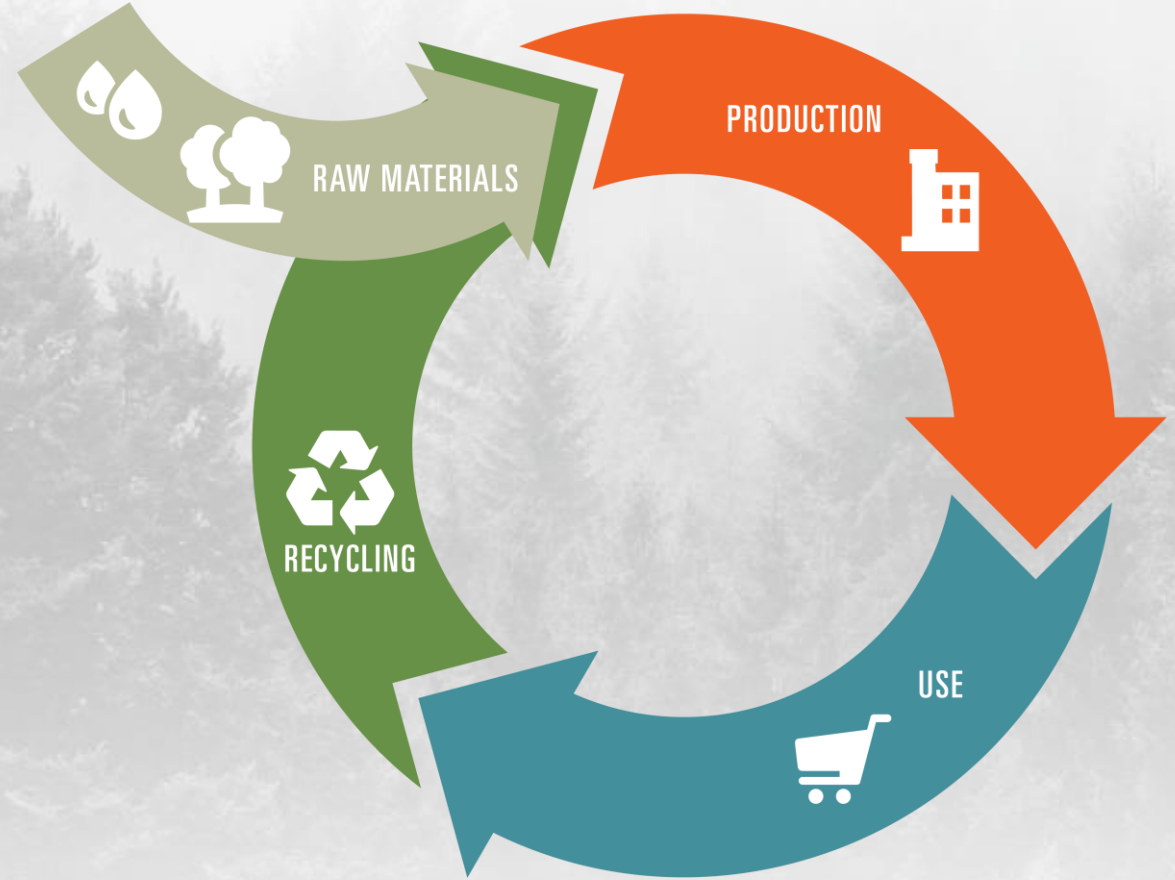
4.

Drayage

Zero/near zero trucks

Rail as a Supply Chain Solution for Sustainable Business Markets

- Emerging Power & Energy Storage
- Plastics: Advanced Recycling
- Low Carbon Cement & Steel
- Renewable Fuels
- Recycled Composites



Discussion