Opportunities Arising from Market Imbalances

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PLG Consulting
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Experience // Expertise // Excellence

Today's Presenter

ERIC JOHNSON, Senior Consultant

- For over 20 years, senior executive Eric Johnson has been analyzing, developing and managing rail-based transportation services for bulk and liquid commodities, including fertilizers. Eric's experience in supply chain and project management includes developing and managing a $200M portfolio of import/export business for CSX Transportation. In that capacity, his history with rail, barge and terminal shipping of chemicals have helped him recognize and correct supply/demand imbalances throughout his clients' transportation value chain.
- Eric began his career managing the global supply chain and logistics for two major fertilizer shippers, followed by operational leadership roles at Pakhoed Dry Bulk Terminals (Kinder Morgan). He has worked extensively in rail, barge, vessel, and truck transportation of various bulk commodities.
- Eric taught for 3 years at the University of Rhode Island for the MBA in Strategic Innovation program.

EXPERIENCE

- Market Manager, CSX Transportation
- Director of Customer Service, Pakhoed (Kinder Morgan)

EXPERTISE

- International Logistics Procurement
- Business Strategy
- Market Analysis
- Due Diligence
- Bulk Commodities
- Rail Transportation
- Marine Transport

About PLG

PLG TEAM

- Real-world, industry veterans
- Over 50 logistics and supply chain strategists, operations experts, analysts and project managers
- Delivering value to over 200 clients since 2001

CORE EXPERTISE

- Surface transportation and logistics
  - Rail
  - Truck
  - Marine
  - Pipeline
  - Terminals & Warehousing
- Renewables
- Chemicals
- Oil and gas
- Bulk commodities
- Manufacturing
- Mining and minerals

SERVICES INCLUDE

- Assessment and optimization
- Due diligence
- Operations
- Logistics procurement
- Marketing analysis
- Engineering
- Business strategy
- Site selection
- Technology
- Supply chain design

Representative Clients / / Partial List

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Today's Presentation

Today we will explore how regional freight markets react in times of dynamic change & how Shippers can mitigate risk and optimize their asset utilizations

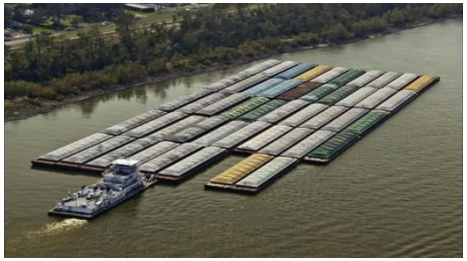
1. Regional supply and demand imbalances create opportunities
2. Supply and demand imbalances drive transportation, infrastructure, and strategy
3. Stakeholder strategy drives long-term Supplier/End-user decisions
4. Four real-world examples including:

   - **Two Perspectives on Precision Scheduled Railroading (PSR)**
   - **Nitrogen Solutions – Regional supply and demand imbalances**
   - **New Orleans District Fertilizer Imports – Supply imbalances drive use of river transportation & assets**
   - **Peak Diesel Exhaust Fluid (DEF) Demand is Approaching**

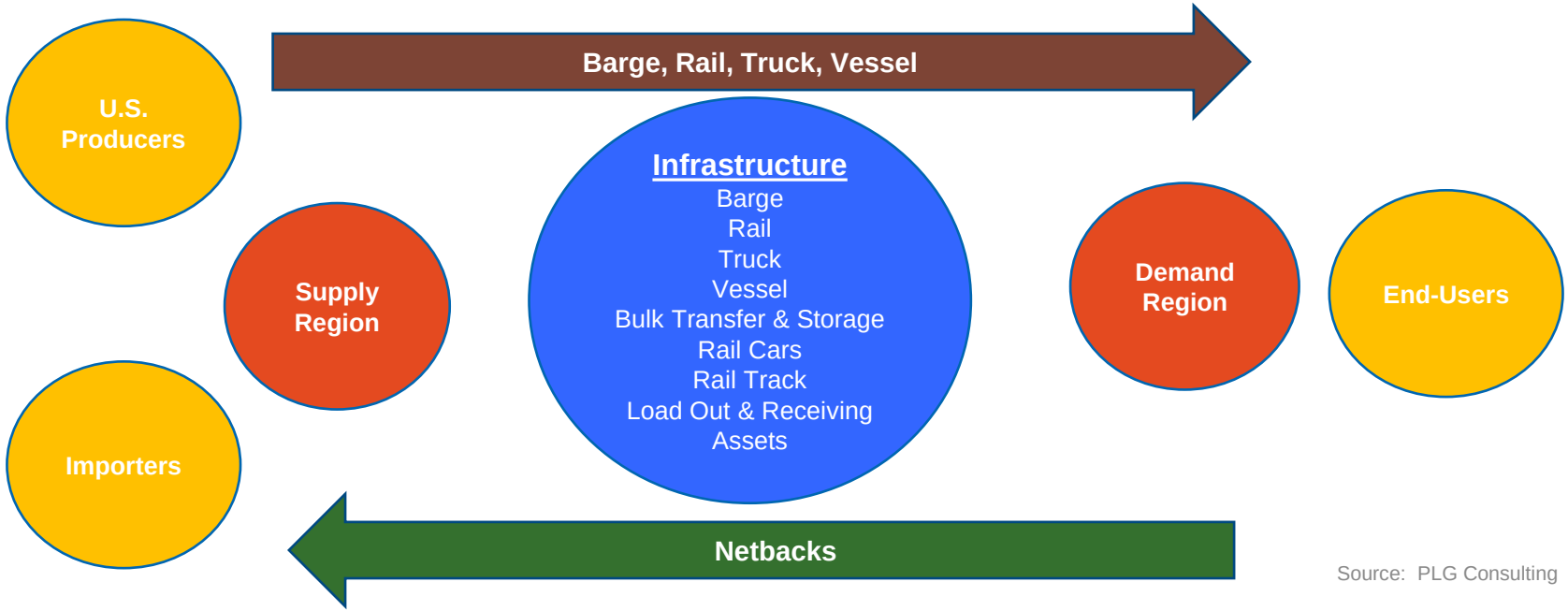
Regional Supply & Demand Imbalances Create Opportunities

Market Fundamentals

- Transportation networks and infrastructure are critical to address the needs of market imbalances
- Producers, Suppliers, End Users are key players in the development of transportation and infrastructure decisions
- Infrastructure assets provide a competitive advantage and leverage for Producers/Suppliers/Buyers
- Netbacks to the origin and the lowest cost transportation value chain are key drivers of transportation and infrastructure decisions and development
- The competitive market may drive the stakeholders - Buyers/Distributers/End-users and Producers/Suppliers to partner on infrastructure
- Strategic initiatives by stakeholders impact the infrastructure, transportation, long-term strategy and/or the sourcing of buyers/end-users



Supply & Demand Imbalances Drive Transportation, Infrastructure & Strategy



Source: PLG Consulting

Demand & supply region flows develop around the least cost value chain transportation and distribution infrastructure

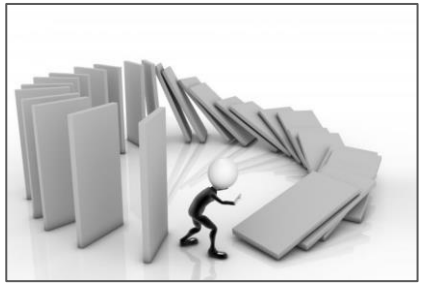
Stakeholder Strategy Drives Long-term Supplier/End-User Decisions

Two perspectives on Precision Scheduled Railroading (PSR)

PSR - A railroad perspective

- Focus on moving cars
- Consistent, predictable, reliable service
- Make rail accessible to more customers
- Increase asset utilization
- Balanced network

Improved Financials through Operational Improvements



PSR - A layman's perspective

- Reduction/discontinuance of unscheduled unit train service
- Elimination of price spreads between unit trains and single car shipments
- Implementation of zone pricing driven by administrative efficiencies
- Fewer human resources for customers (i.e., Operational, Commercial, Administrative)
- Demurrage policy changes - *increased costs of doing business by rail*

Unintended consequences

- No long-term incentive for the customer to invest in rail infrastructure
- Strategic decisions of buying and selling shift focus to the use of the river and import terminals
- Loss of relationship

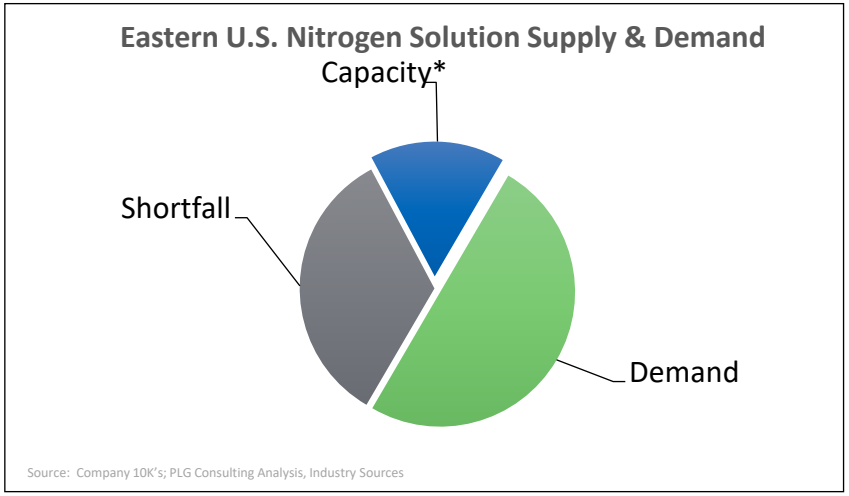
Nitrogen Solutions – Regional Supply & Demand Imbalance

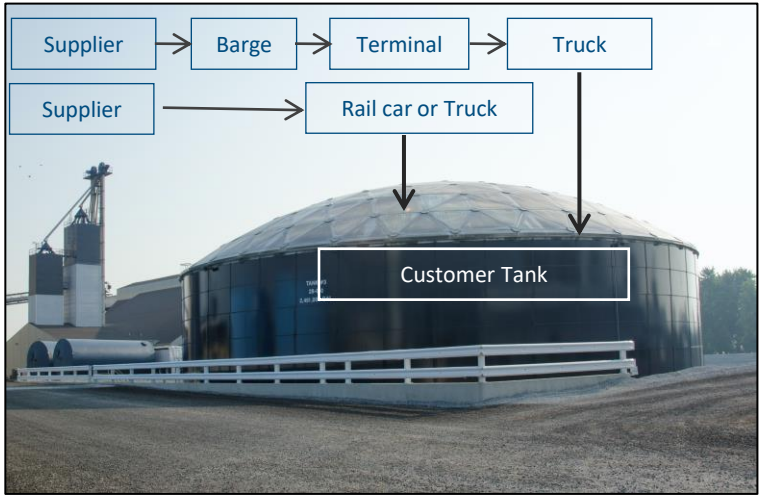
Nitrogen Solutions

- U.S. production primarily located west of the Mississippi River
- Eastern U.S. Corn Belt market is dependent on barge and rail transportation and their supporting infrastructure assets
- Stakeholder changes and transportation value chains have shifted to favor river assets

Over the past 20 years, rail served inland storage infrastructure has more than doubled

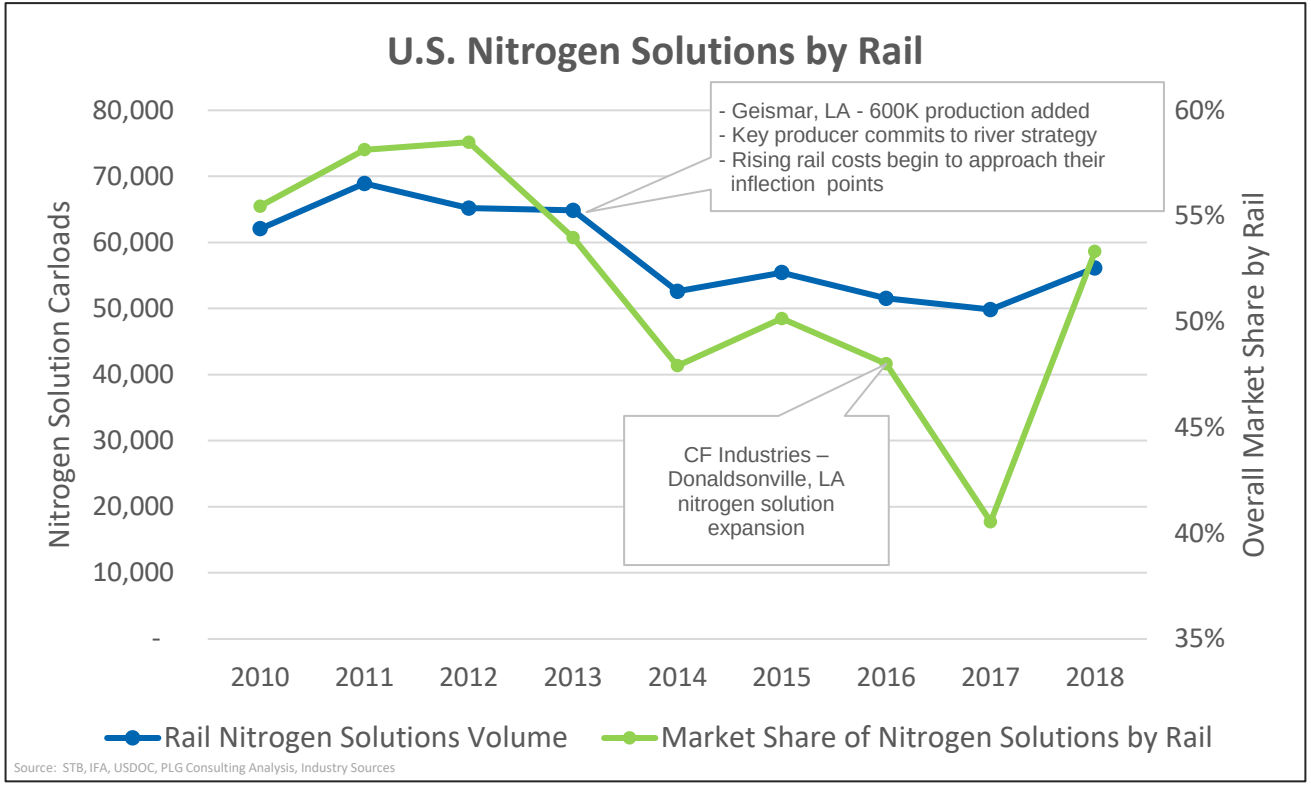
- There are approximately 90 customer-owned inland nitrogen solution storage tanks with rail access in the eastern Corn Belt
- There are 18 customer-owned unit train-capable facilities with nitrogen solution storage
- Customer-owned tanks provide buyers leverage





Market imbalances and stakeholder decisions are met with infrastructure development

Stakeholders Infrastructure & Strategic Decisions Impact Transportation Assets



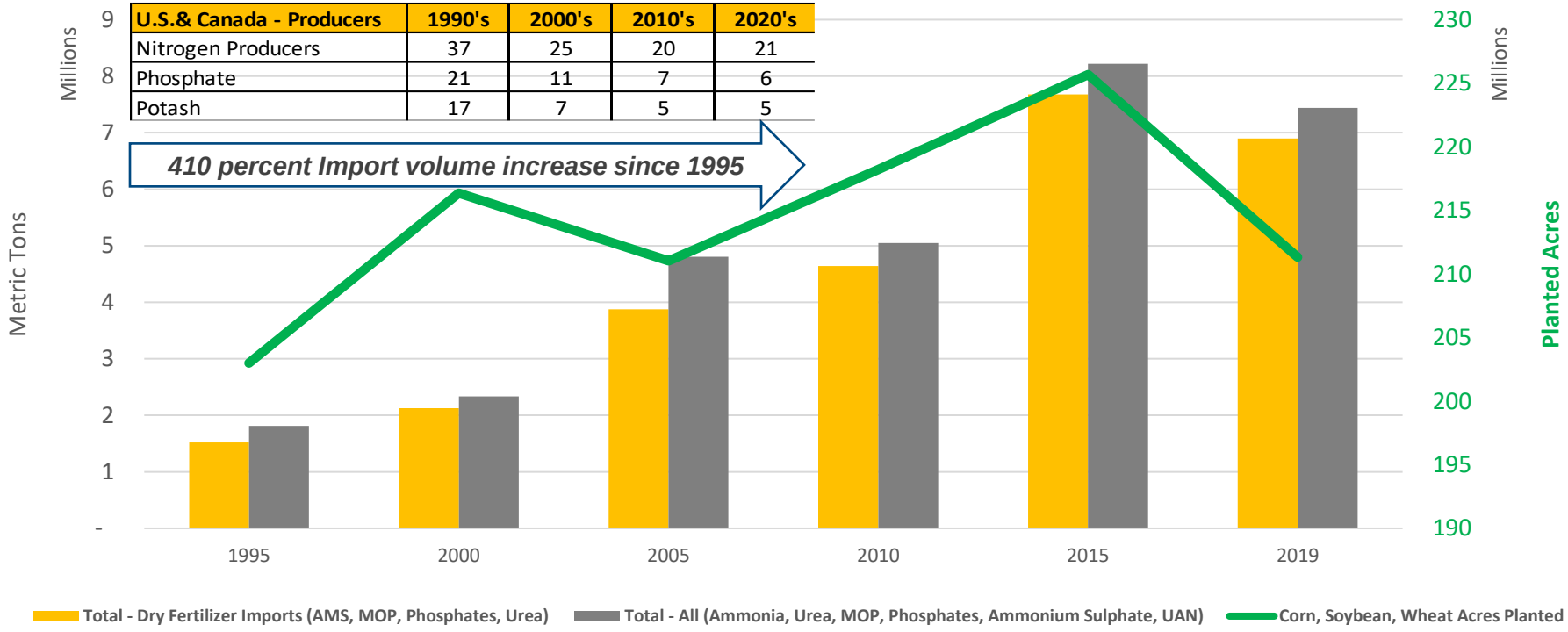
- Carloads decline ~15,000
- Rail market share declines by 14.5%
- Import rail declines by more than 20+%
- 1,250+ tank cars idled
- Key producer implements asset utilization strategy
- PSR implemented by eastern Class 1 rail carrier
- River storage commands a premium

Anticipating the impact of market developments is critical to seizing opportunities and mitigating risks

Supply Imbalances Drive Use of River Transportation & Assets

New Orleans District Fertilizer Imports

U.S.& Canada - Producers	1990's	2000's	2010's	2020's
Nitrogen Producers	37	25	20	21
Phosphate	21	11	7	6
Potash	17	7	5	5



Source: USDOC,USDA, Industry Sources

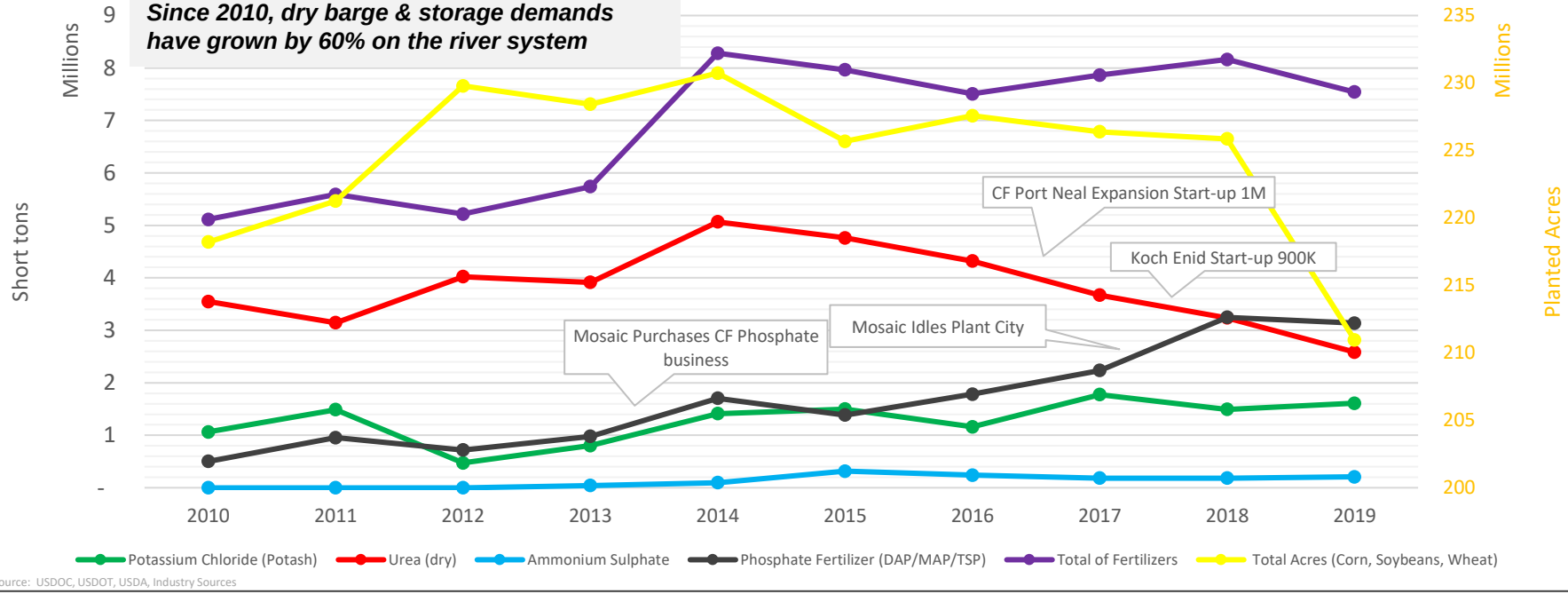
Continued offshore demand growth mitigates buyer's risk and creates infrastructure opportunities

Market Imbalance & Asset Use Via the River System

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Est. Dry Storage Requirement (@ 2.5 turns)	2,045,836	2,235,993	2,086,342	2,295,661	3,312,839	3,185,830	3,002,500	3,145,348	3,265,134	3,016,428
Equivalent dry barges (@ 1,500 tons)	**3,410**	**3,727**	**3,477**	**3,826**	**5,521**	**5,310**	**5,004**	**5,242**	**5,442**	**5,027**
Equivalent rail cars (@ 100 tons)	**51,146**	**55,900**	**52,159**	**57,392**	**82,821**	**79,646**	**75,063**	**78,634**	**81,628**	**75,411**

Fertilizer Commodity Imports to New Orleans Port District (USDOC) in short tons

Since 2010, dry barge & storage demands have grown by 60% on the river system



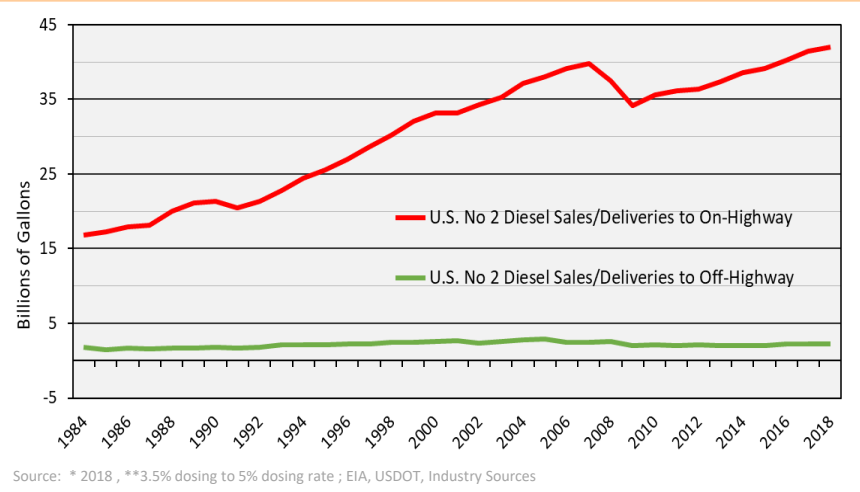
Source: USDOC, USDOT, USDA, Industry Sources

"Agricultural Goods Movement" by water forecasted to grow by more than 49% by 2045

Peak Diesel Exhaust Fluid (DEF) Demand is Approaching

SCR equipped trucks account for more than 50% of the "Over-the-Road" trucks today

- Diesel fuel consumption is just over 44B gallons*
- Full DEF consumption will be approximately 1.5 to 2.2 billion gallons**
- Equivalent to ~2.3M to ~3.3M tons of dry urea**

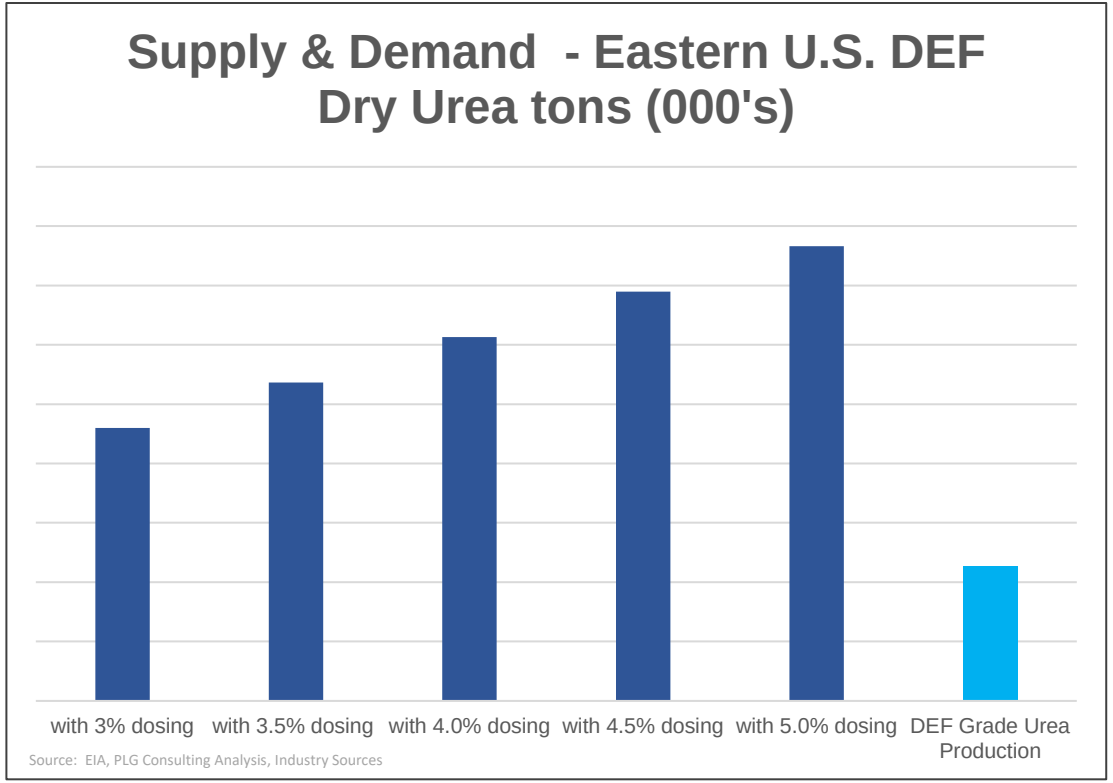


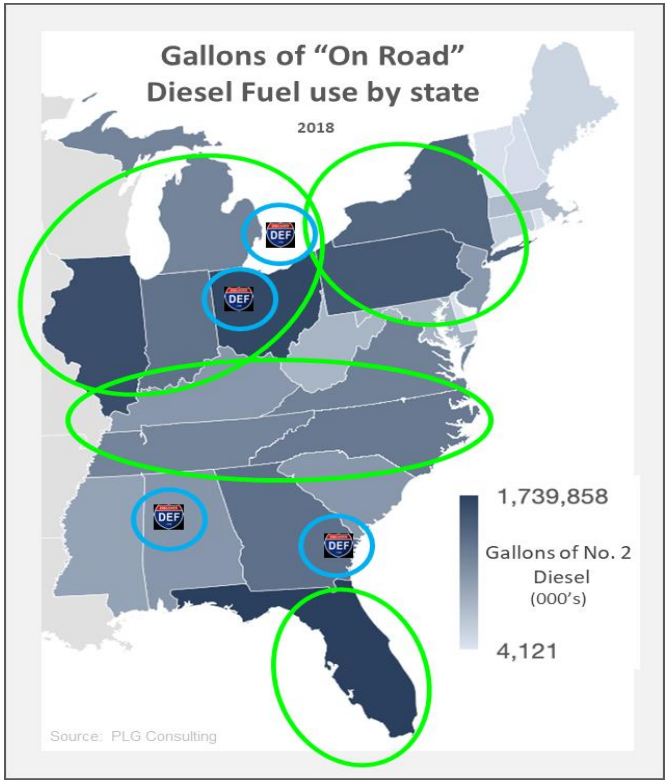
Source: * 2018 , **3.5% dosing to 5% dosing rate ; EIA, USDOT, Industry Sources

- 50% of "On Road" diesel fuel is consumed east of the Mississippi river

Trucking of "Goods" forecasted to grow by more than 30% over the next 25 years

DEF Supply Gap in the Eastern U.S.





Infrastructure and transportation opportunities exist to meet forecasted demand

Thank You!

For follow up questions and information, please contact:

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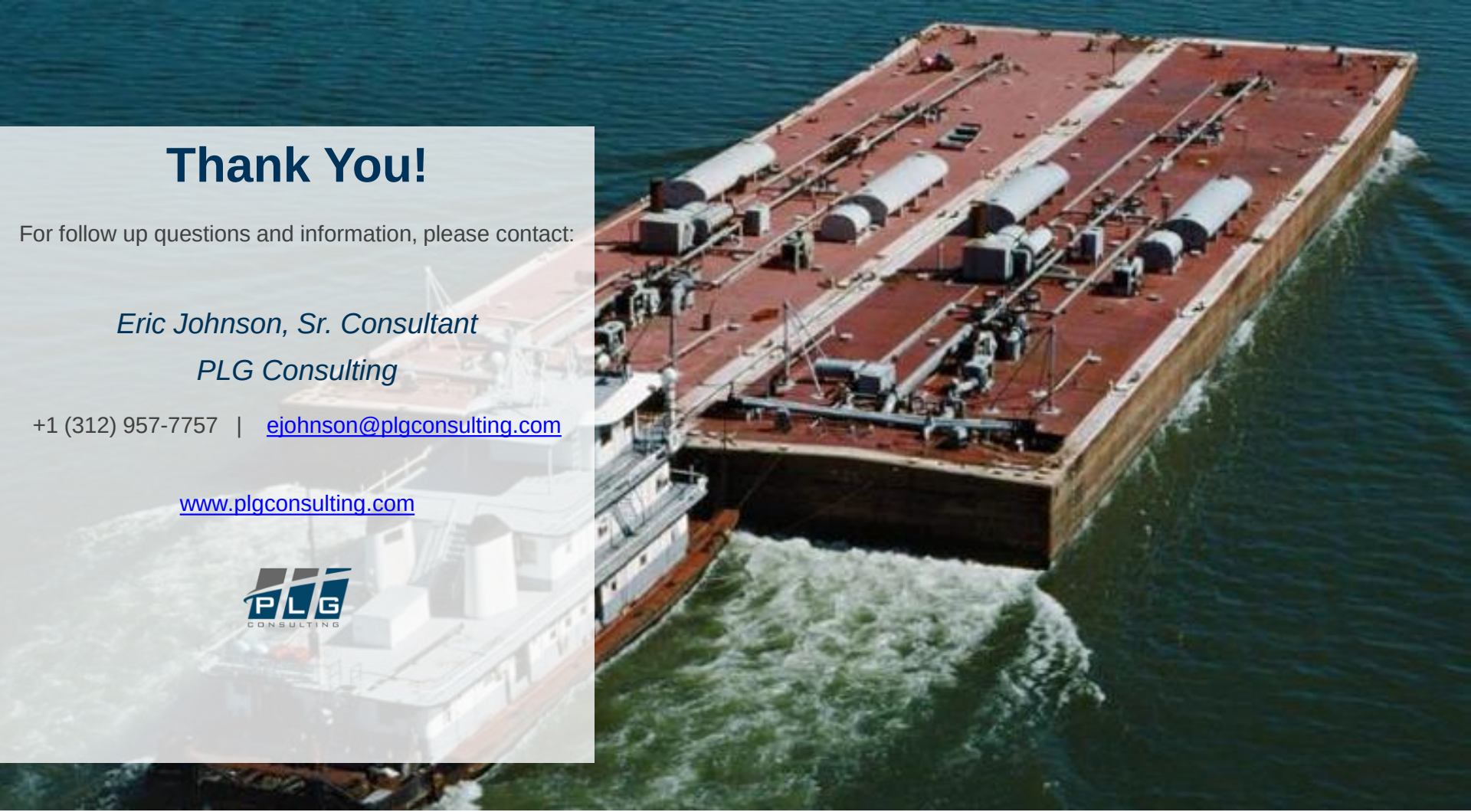
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