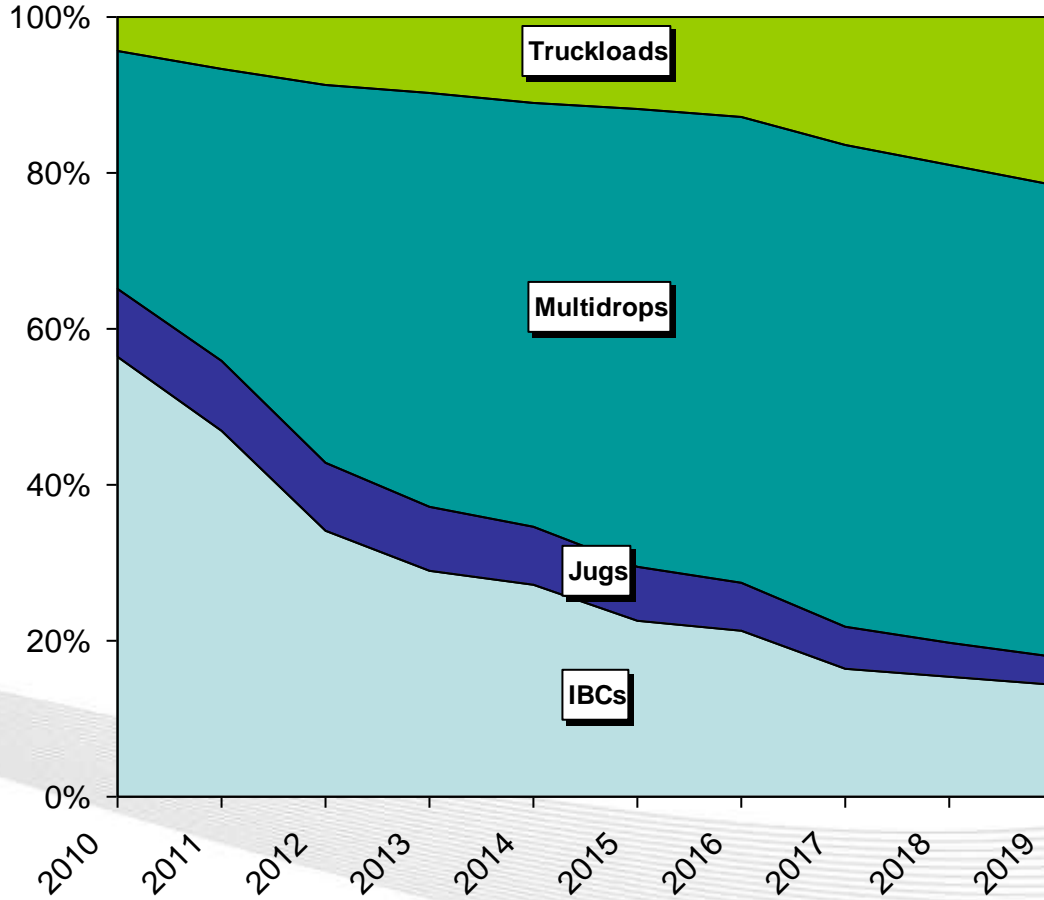


# Distribution System Update for DEF

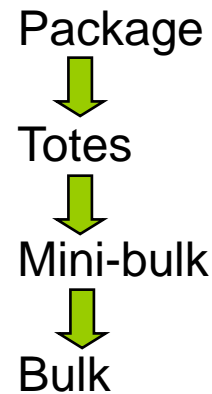


Douglas S. Haugh

# Now that we are past introduction of product the big question is how fast demand will grow for bulk vs package distribution.



Will be an evolution based on demand growth over time.



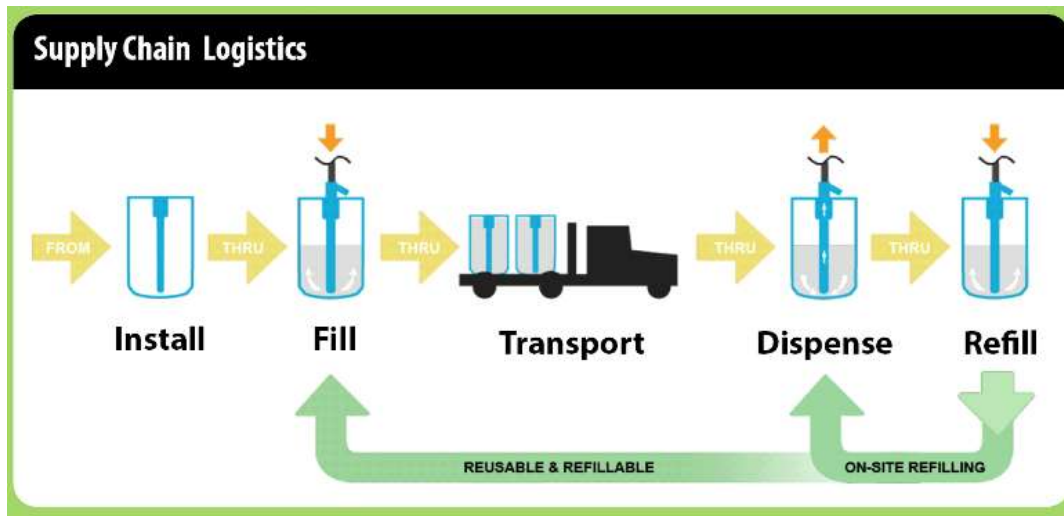
# Underground Storage with Multi-Lane dispensing becoming more common



# Off road - It's closer than you think

- When should PEI members expect sales to non-road customers to begin in earnest, and how should they develop their storage and dispensing strategy? - **NOW**
  - We (and others) are already supplying volumes of test products to OEM's, Rail Road operators, Marine fleets, and other large off road sectors.
  - Collaboration with each sector on size of onboard storage tanks for DEF, expected treat rates, and expected roll out of new engines is key at this point.
  - We must know range and refill expectations in order to optimize supply, storage, distribution, and dispensing.
  - If you are and OEM in this room please tell us as early as you can!

# Quality Control through to End –User is a primary design requirement of the distribution system



**Closed, Sealed & Secured.**

**FILL → TRANSPORT → DISPENSE**

- Experience in Europe over past 5 years shows most contamination occurs on the truck shop floor from improperly sealed dispensing systems.
- Our Air1 closed dispensing system assures quality to the point of use.

# Applying Lessons Learned

- What lessons from the roll-out of the on-highway DEF infrastructure can be learned and applied to off road markets?
- Difference is customer storage and dispensing.



Supply – The same



Distribution – Similar

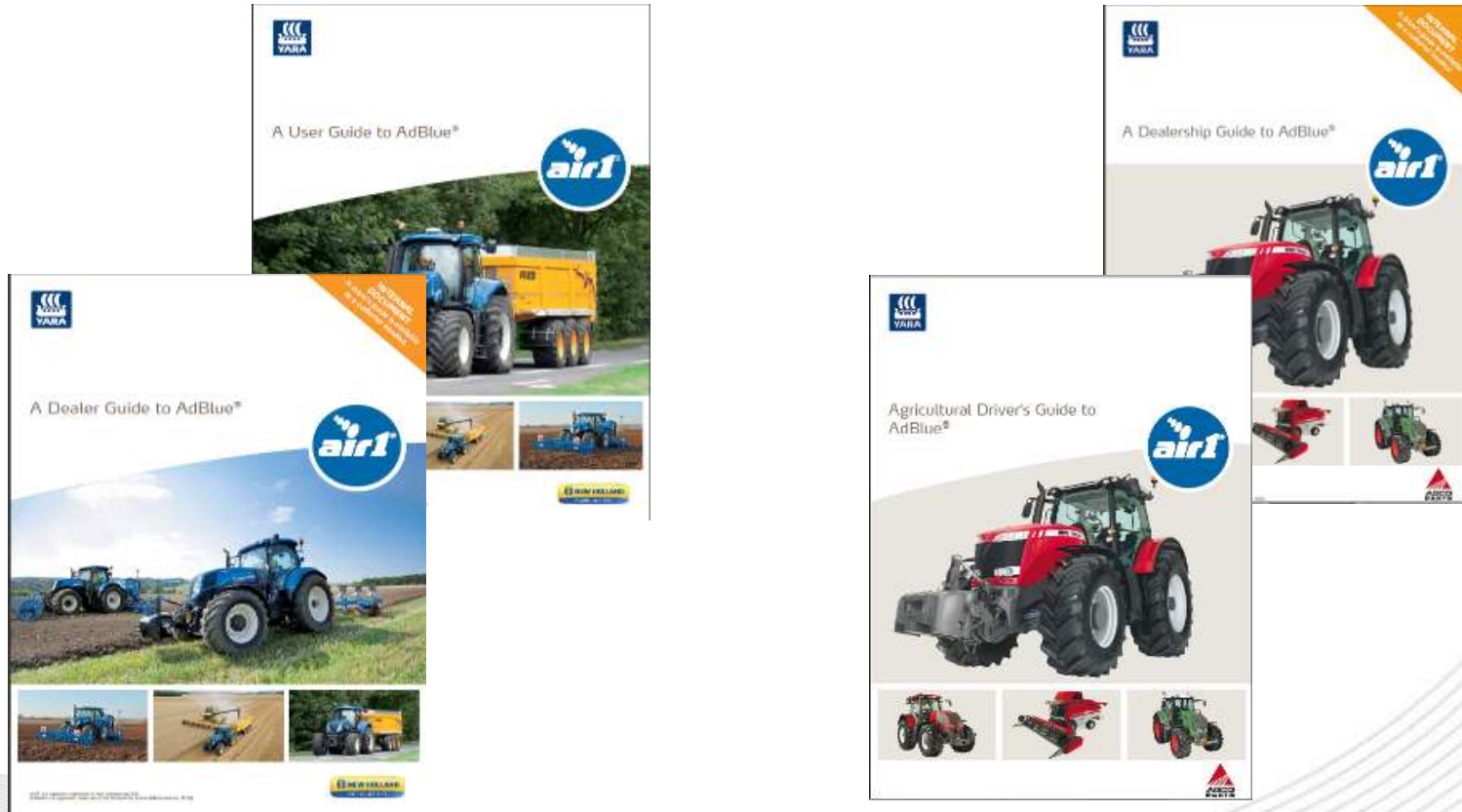


Customer Storage & Dispensing

# Dedicated delivery vehicles ensure quality and scalable distribution capacity.



# Ag OEM's have launched SCR and will be educating dealers



- Suppliers and Distributors will be focused on customer engagement and education throughout this year with some small amounts of early adopter demand.

# Some distribution will be different than On-Road

- Many sectors such as Construction will require on site service vehicles be outfitted for direct delivery of DEF
- Combination trucks capable of delivering fuel and DEF directly to equipment on job sites will be required.



Photos courtesy of Warren Oil Company, Chicago, IL.

# Servicing construction and off road accounts will require new solutions

- These trailers have been traditionally used to haul fuels and service related tools to the jobsite to keep equipment up and running.
- The DEF reservoirs are available in 990 and 750 gallon fuel trailers in 100 or 60 gallon tanks respectively.

**100 Gallon DEF System**



100 gallon tank mounted between the front toolbox and diesel fuel tank DEF-Ready pumping system housed in the front toolbox.  
Non-corrosive stainless steel tank and pumping system designed specifically for DEF.

**60 Gallon DEF System**



60 gallon tank mounted above the front toolbox and diesel fuel tank DEF-Ready pumping system housed in the front toolbox.  
Non-corrosive stainless steel tank and pumping system designed specifically for DEF.