What is a “Drop-in” fuel?

• Not well defined!

• 2 crucial aspects:
  – Meeting overall fuel specifications (ASTM)
  – Blending percentage

• There is developing consensus that it refers to a blendstock that does not require substantial changes in refining or distribution infrastructure.
  – To Dept of Energy (DOE), this means hydrocarbons (gasoline, diesel, and jet fuel blendstocks)

• Applies to both transportation fuels as well as boiler fuels
Ethanol

• All major OEMs (engine manufacturers) warranty E10 (10% ethanol) in vehicles
  – There is no major infrastructure changes, so is E10 “drop-in”?

• Ethanol is not fungible with gasoline
  – Ethanol is hydrophilic, it attracts water
  – Ethanol acts as a solvent and cleans up pipes
  – Ethanol causes stress corrosion cracking in pipelines
  – For ethanol to be pipelined, it must be dedicated, which is major infrastructure cost
  – E85 requires different storage and vehicle infrastructure
Drop-in (cont’d)

• The key to being drop-in is that the overall blended fuel product meets specifications
  – JP5, JP8, Jet-A, Diesel #2, Diesel #6, Reformulated gasoline (RFG), etc.
  – Jet fuel has some of the more rigorous specs, boiler fuel less rigorous
  – Fuels are formulated by mixing several blendstocks to meet performance specs
  – Even when blending two hydrocarbon liquids together, the performance specs can change