





AAF Evaluation Framework – Road Map for AAF Supply Chain Integration



- AAF evaluation considers timing of demand, supply and policy measures.

- Investments in infrastructure align with market conditions necessary to support various volumes of AAF.

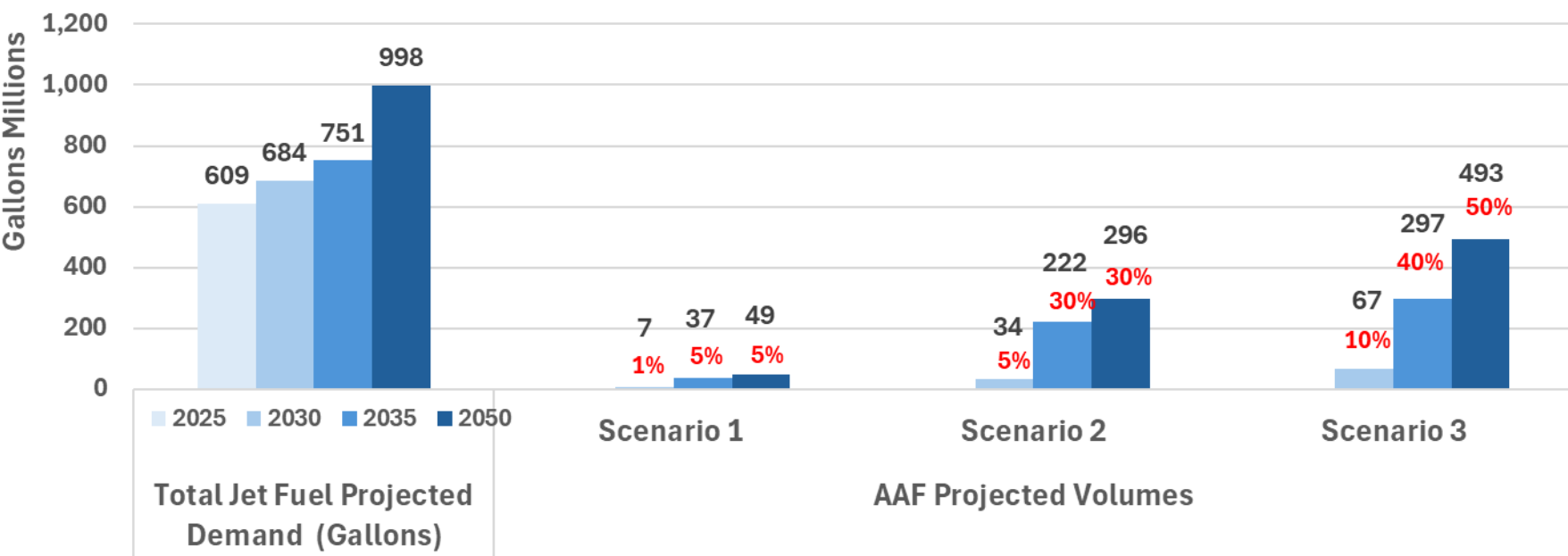
- Strategies are developed to be dynamic and consider advancement or delays in anticipated volumes.

- Analysis provides actionable recommendations for investments in AAF infrastructure.

- Infrastructure investments are technology agnostic and evaluated based on lifecycle costs and market readiness.



KY Study – AAF Forecasted Volumes

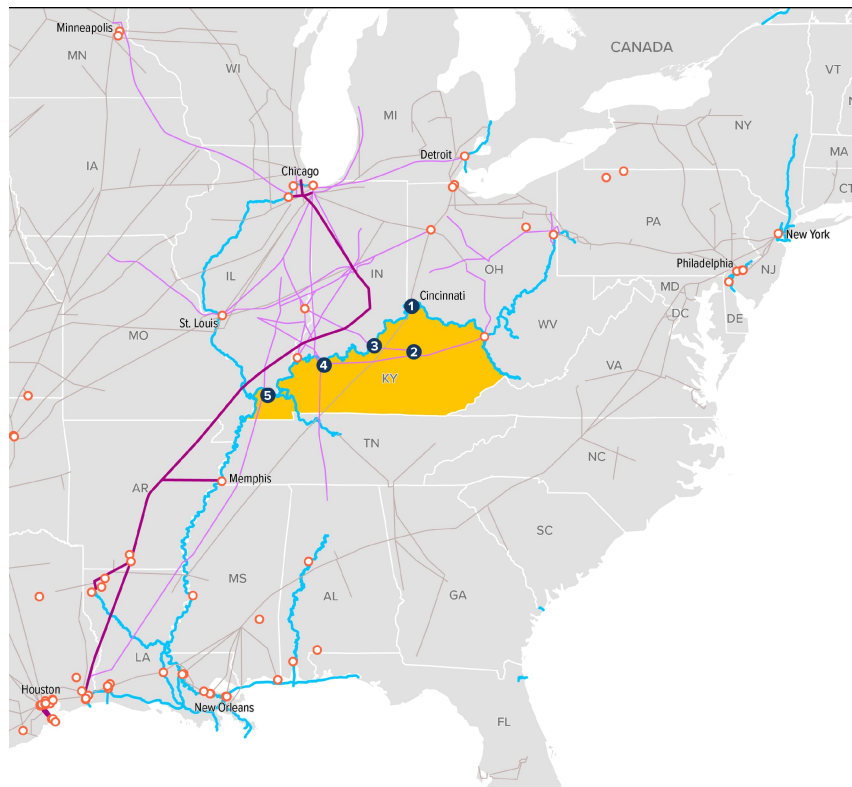


1 bushel of soy = 1.5 gallons AAF
1 bushel of corn = 2.7 gallons AAF
1 gallon of used cooking oil = 0.95 gallons of AAF



KY Study – Overview of Conventional Jet

- KY in general, is largely disconnected from major Gulf Coast Refining Centers
- Supply tends to come from KY and Ohio Refineries
- Delivery through small diameter pipeline, barge, and tanker truck



Regional Map
Refineries, Pipelines and Waterways

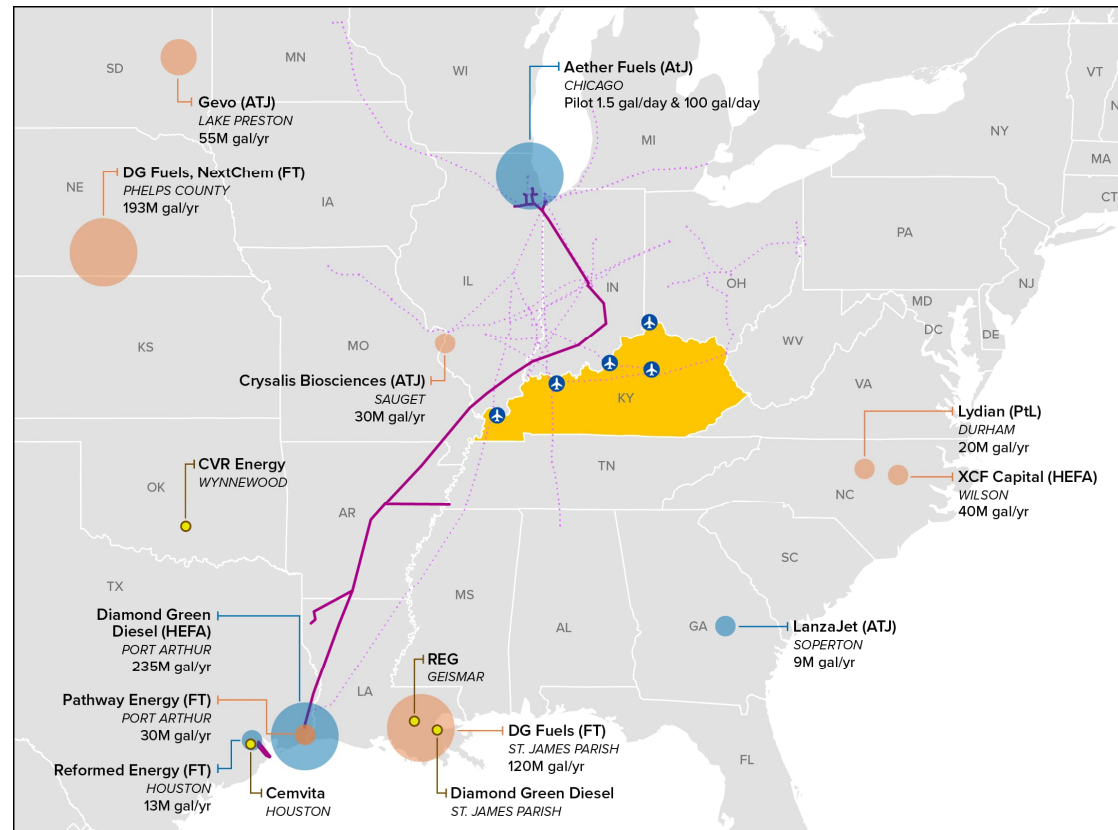
- LEGEND**
- Primary Airport
 - Refinery
 - Other Product Pipeline
 - Primary Waterway
- Petroleum Product Pipelines**
- Jet Fuel Pipeline
 - Non-Jet Fuel Pipeline
- Primary Airports**
1. Cincinnati/Northern Kentucky International Airport
 2. Blue Grass Airport
 3. Louisville Muhammad Ali International Airport
 4. Owensboro/Daviess County Regional Airport
 5. Barkley Regional Airport





Current Regional Review of AAF Production

- Existing and planned AAF incentives in several states.
- High supply costs for planned production locations to CVG.



Regional Map AAF Facilities

LEGEND

- Primary Airport
- Potential AAF Facilities

Petroleum Product Pipelines

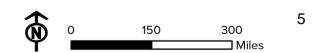
- Jet Fuel Pipeline
- Non-Jet Fuel Pipeline

AAF Production Facilities

- Currently Operating
- Future

AAF Production Volumes

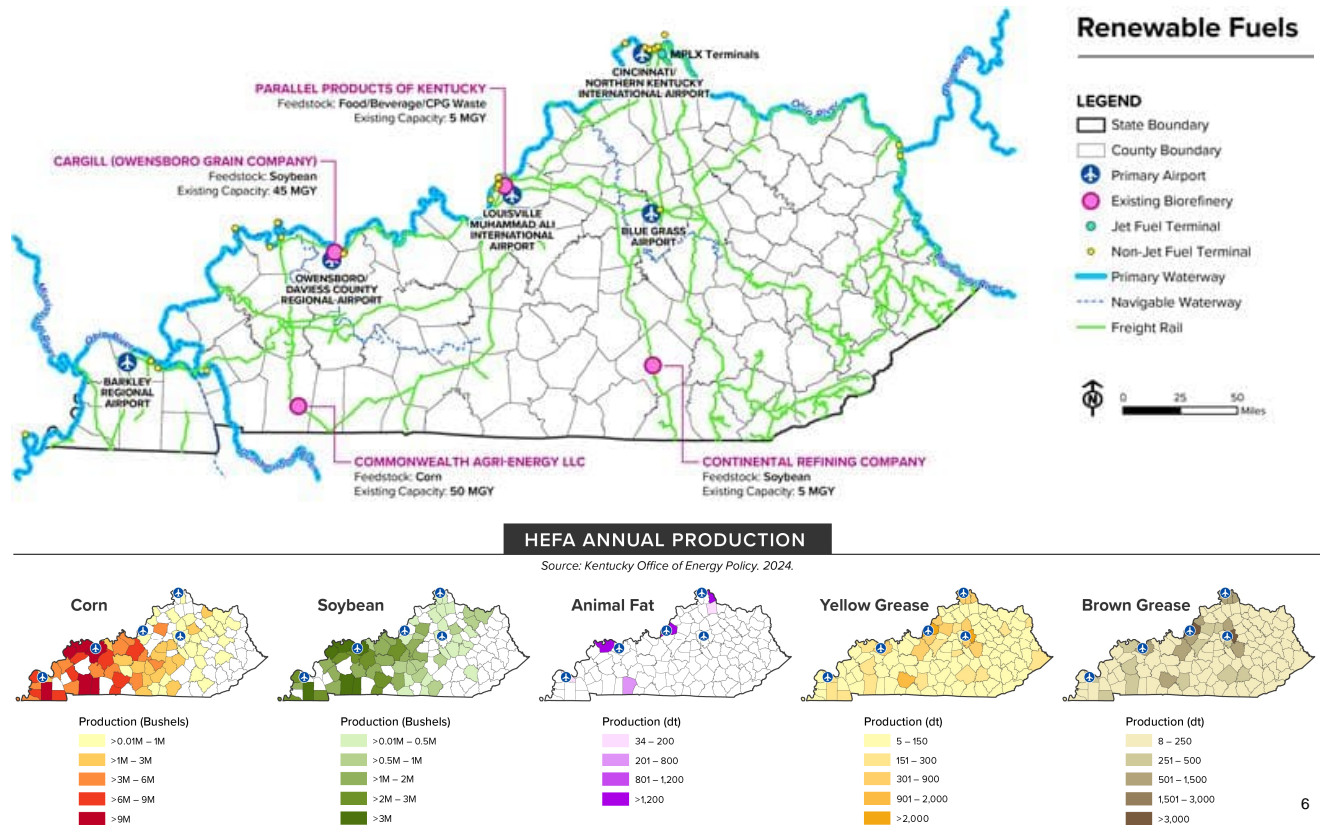
- Less than 50M gal/yr
- 50M to 100M gal/yr
- More than 100M gal/yr





Production Opportunities in KY

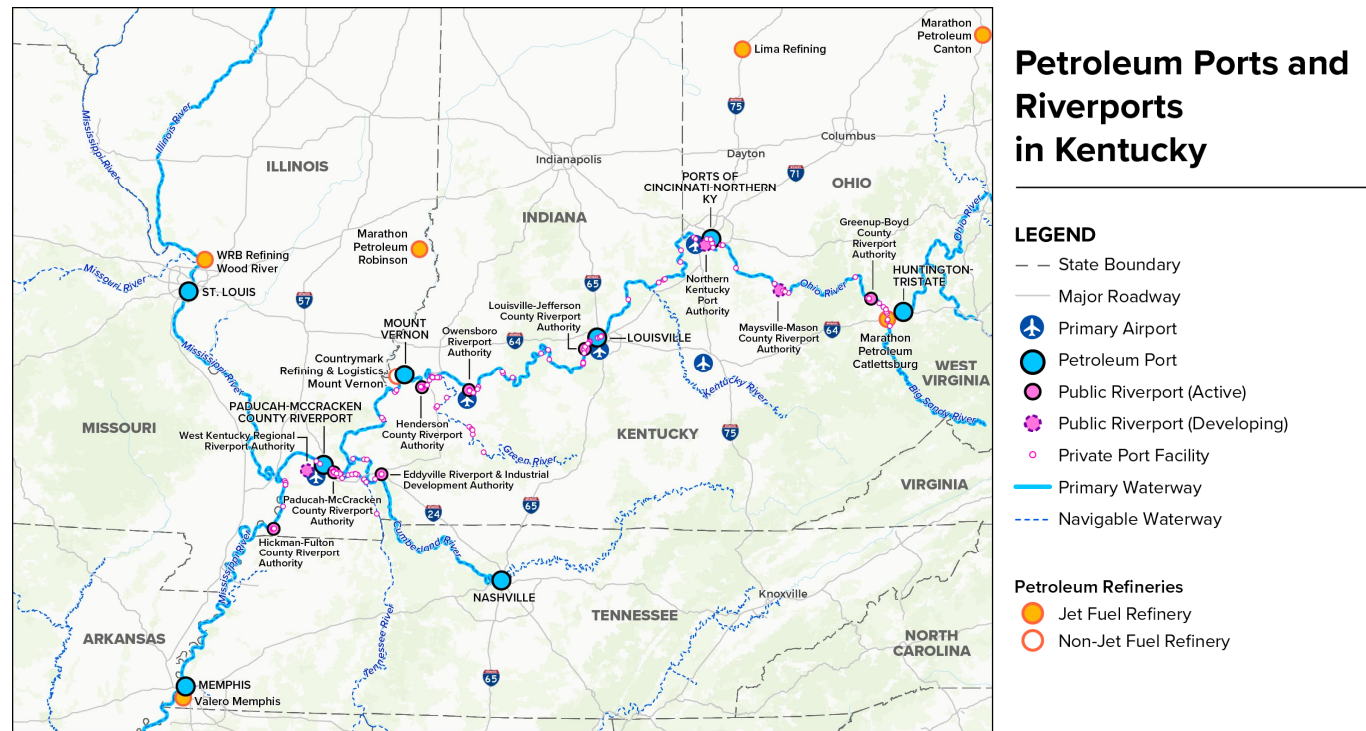
- Aligning production with feedstock and demand.
- Feedstocks available in the KY market
- Integration with conventional jet for blending.
- Access to pipelines or terminals supplying existing airports.





Key Factors for Consideration in KY – Waterborne

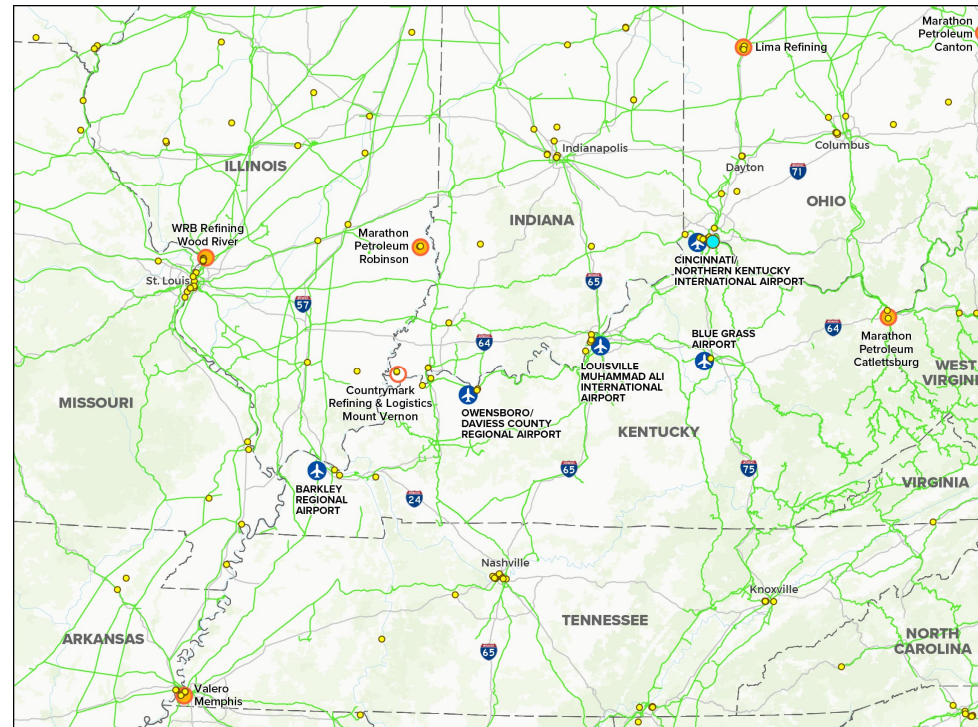
- Current supply chain for conventional jet
- Availability of AAF in KY
- Blending locations with existing jet
- Alternative blending locations
- Environmental considerations
- State Incentives





Key Factors for Consideration in KY – Rail

- Current supply chain for conventional jet
- Availability of AAF in KY
- Blending locations with existing jet
- Alternative blending locations
- Environmental considerations
- State Incentives

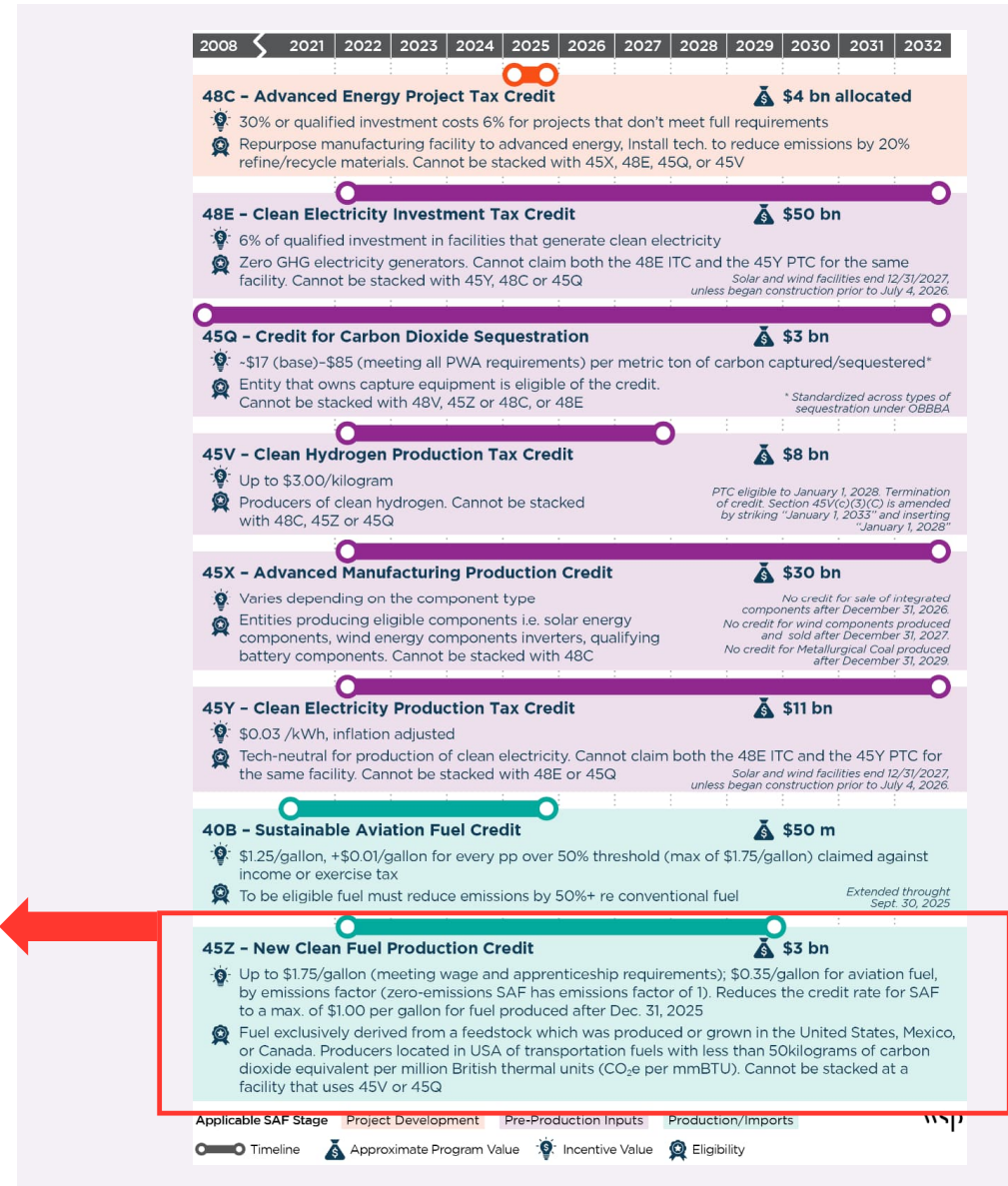


Rail Network



Policy and Incentives

- **\$4 billion in federal funding** to support research, development, and production including AAF-specific production
- **Renewable Fuel Standard** as the primary federal program supporting AAF
- **IRA 45Z Bipartisan** clean fuel credit \$1.00 per gallon in addition to RFS – expires 12/2029

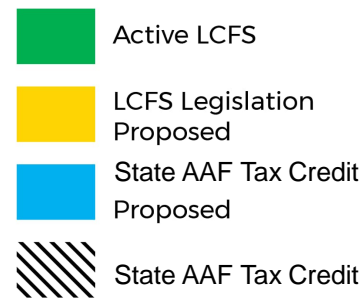




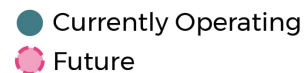
Policy and Incentives - State

- Originally West coast states with a focus on emissions reduction
- Increasingly Midwest and Southern states interested in agricultural use and resiliency

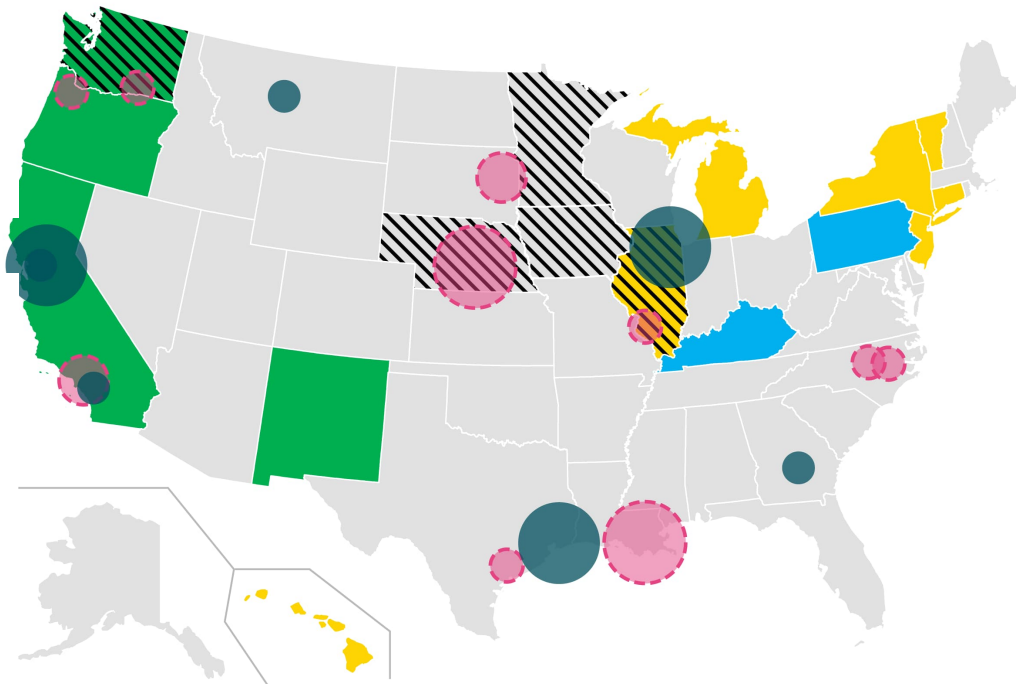
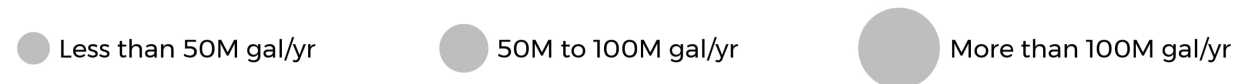
State-Level Policy and Incentives



AAF Production Facility



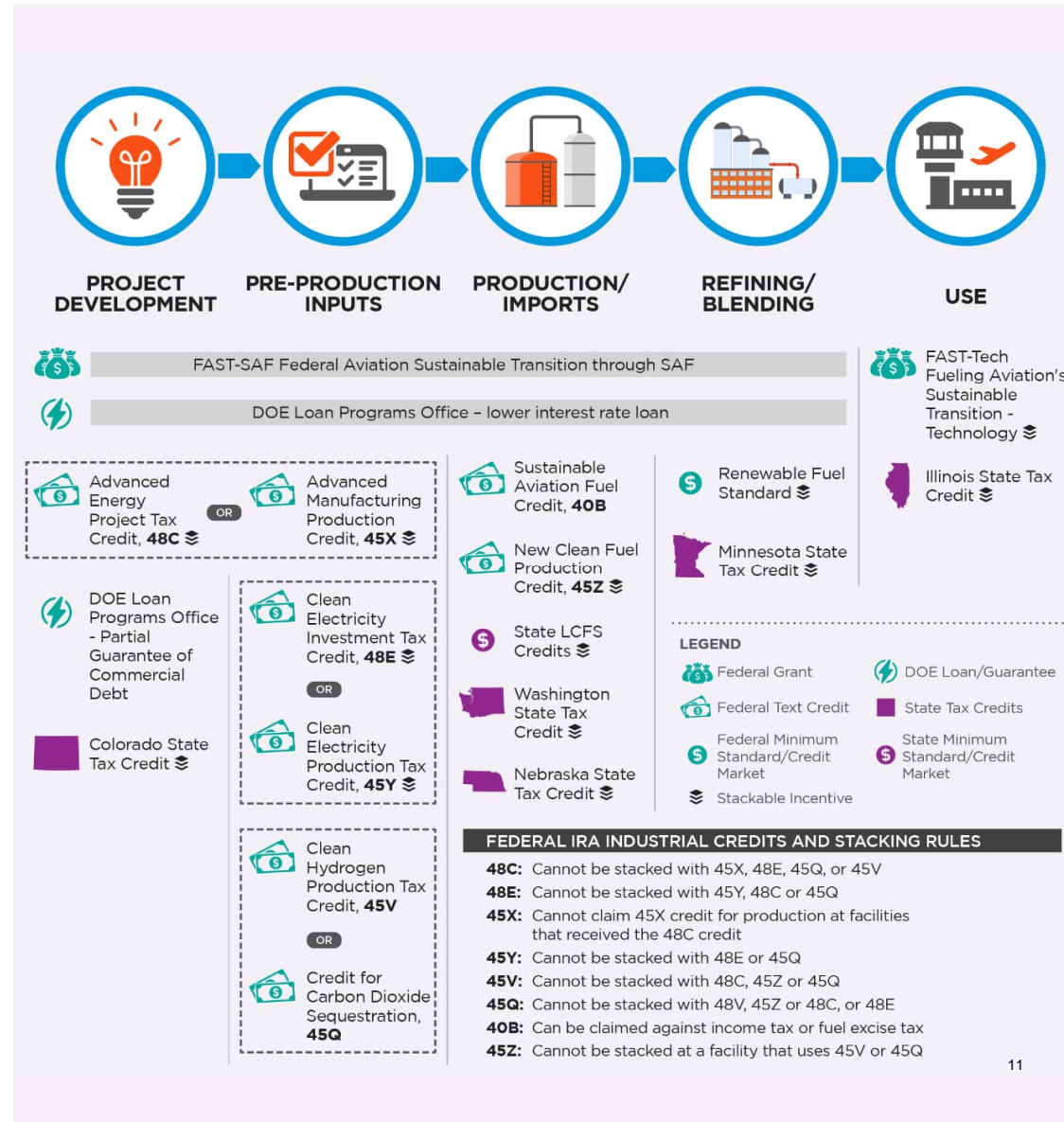
AAF Production Volumes





Policy and Incentives

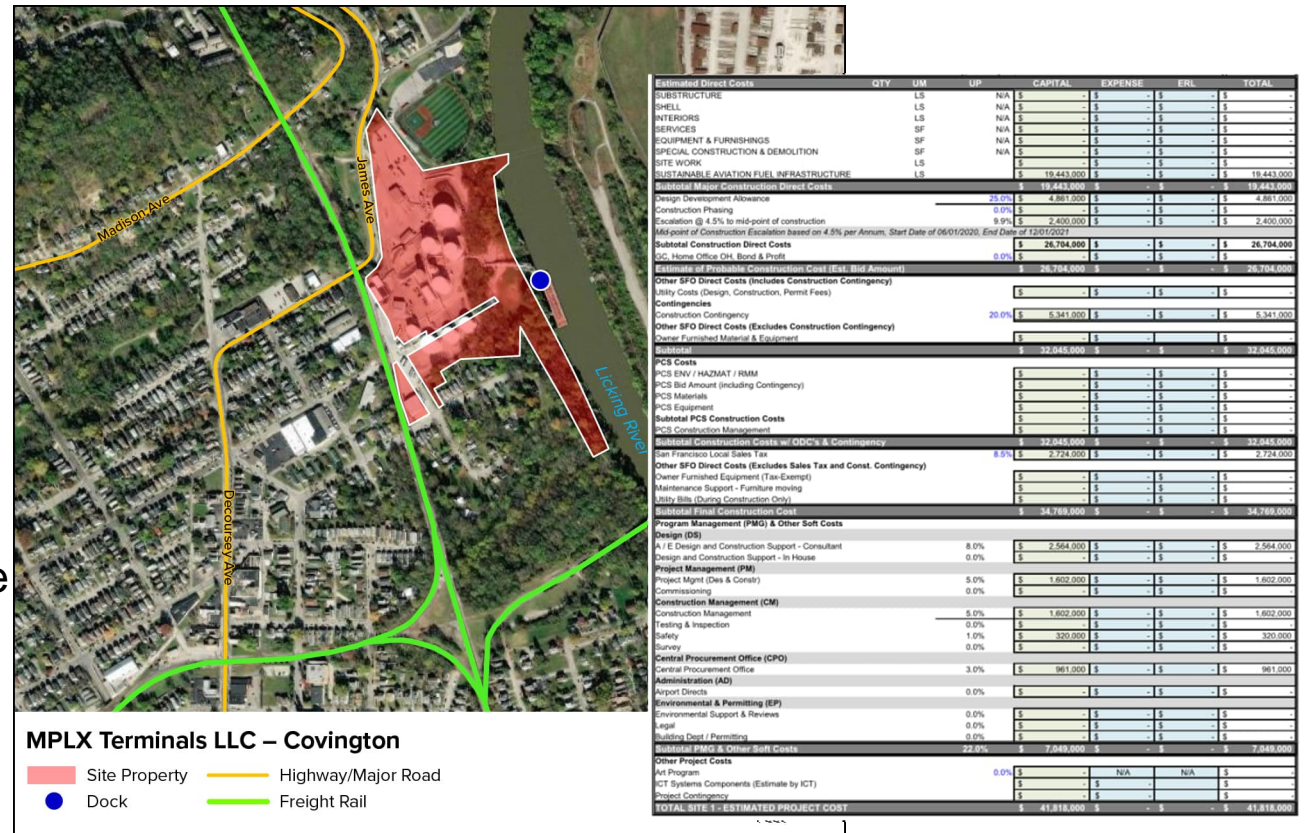
- States are using a combination of production and blending incentives
- Generally, “stackable” on federal incentives
- KY HB 775 –
 - ✓ Includes commitment to further research and development to build **alternative fuels policy**





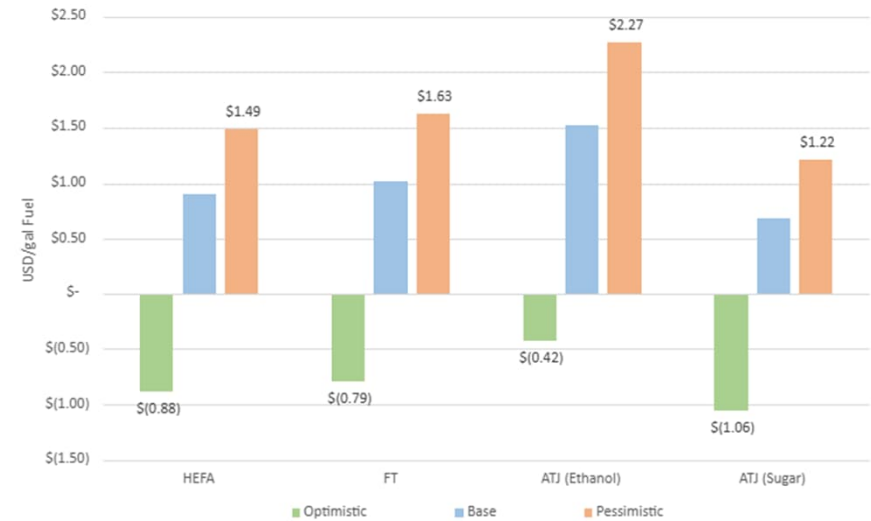
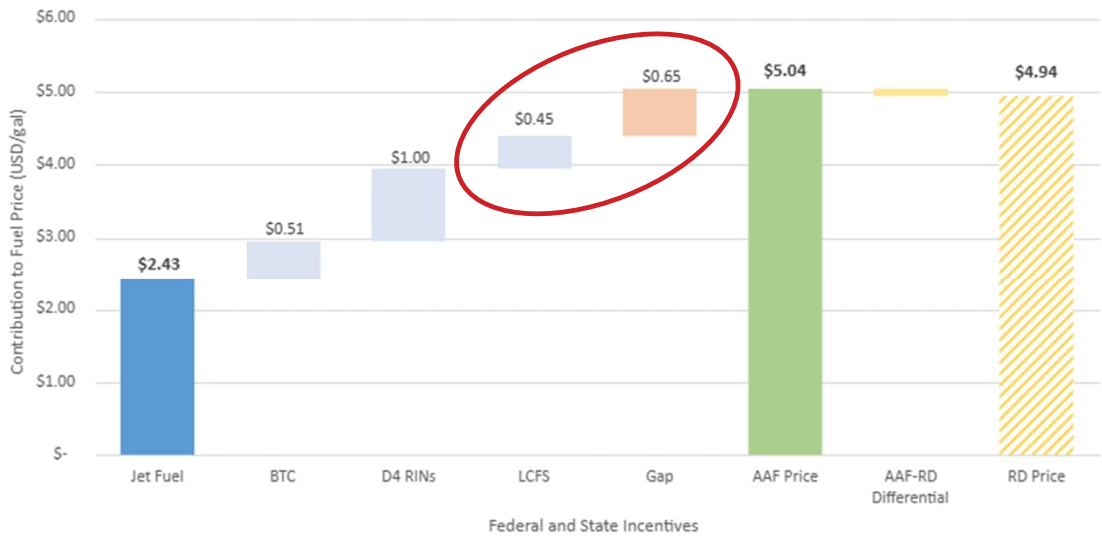
Example CVG Infrastructure and Supply Chain

- Existing jet fuel receipt and storage capacity.
- Waterborne option for AAF delivery.
- Tanks available for AAF storage and blending.
- Existing supply to CVG.
- Asset owner actively involved in AAF production and storage in other regions of the U.S.
- Minimizing investment costs for AAF integration.





Economic Feasibility – Price Differential and Incentives





Economic Feasibility – Production and Distribution Investments

- In 2024 the Biomass-based middle distillate industry produced 5 billion gallons of domestic production, generated \$42.4 billion in economic activity and supported 107,400 jobs and \$6 billion in annual wages (GlobalData)
- Half of the jobs were attributed to fuel production facilities
- Study of Central Appalachia in 2022 using local feedstock for Fisher-Tropsch biorefineries estimated an investment in 3 facilities at a total cost of \$1.6 billion would create an additional economic benefit of \$2.2 billion
- Current KY AAF study is evaluating the impact specific to AAF production.

<i>\$ millions</i>	Direct Investment	Multiplier	Total Impact
AAF Production			
<u>Capital Investment:</u>			
Economic Activity	\$1,590	1.68	\$2,672
Gross Regional Product	\$726	1.76	\$1,278
<i>Employment (jobs)</i>	11,265	1.64	18,429
<u>Annual Operations:</u>			
Economic Activity (excl Salary)	\$199	1.68	\$333
Salary	\$18	1.98	\$36
Annual Economic Activity	\$217	1.70	\$368
Gross Regional Product	\$129	1.61	\$207
Feedstock Supply			
<u>Feedstock to Production:</u>			
Economic Activity (excl Salary)	\$11	1.79	\$20
Salary	\$6	1.76	\$11
Resource and logging operation owners	\$40	1.79	\$71
Annual Economic Activity	\$57	1.78	\$101
Gross Regional Product	\$13	1.55	\$20
<u>Feedstock Transportation</u>			
Economic Activity	\$37	1.85	\$68
Gross Regional Product	\$20	1.83	\$37
Total Impact	\$3,063	1.70	\$5,222

WSP from: University of Tennessee (2022) – The Economics of a Renewable Biofuels/Energy Industry Supply Chain Using the Renewable Energy Economic Analysis Layers Modeling System & IMPLAN



THANK YOU

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