

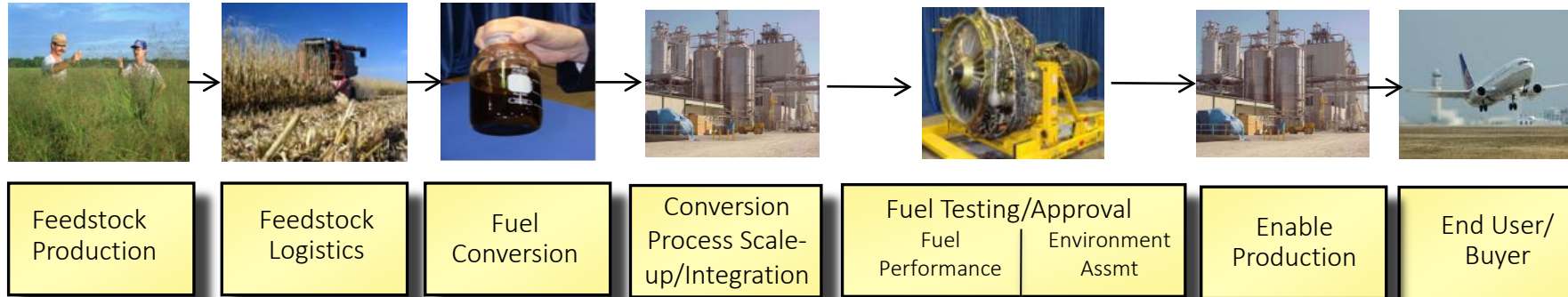
AMR

May 2024

Washington, DC

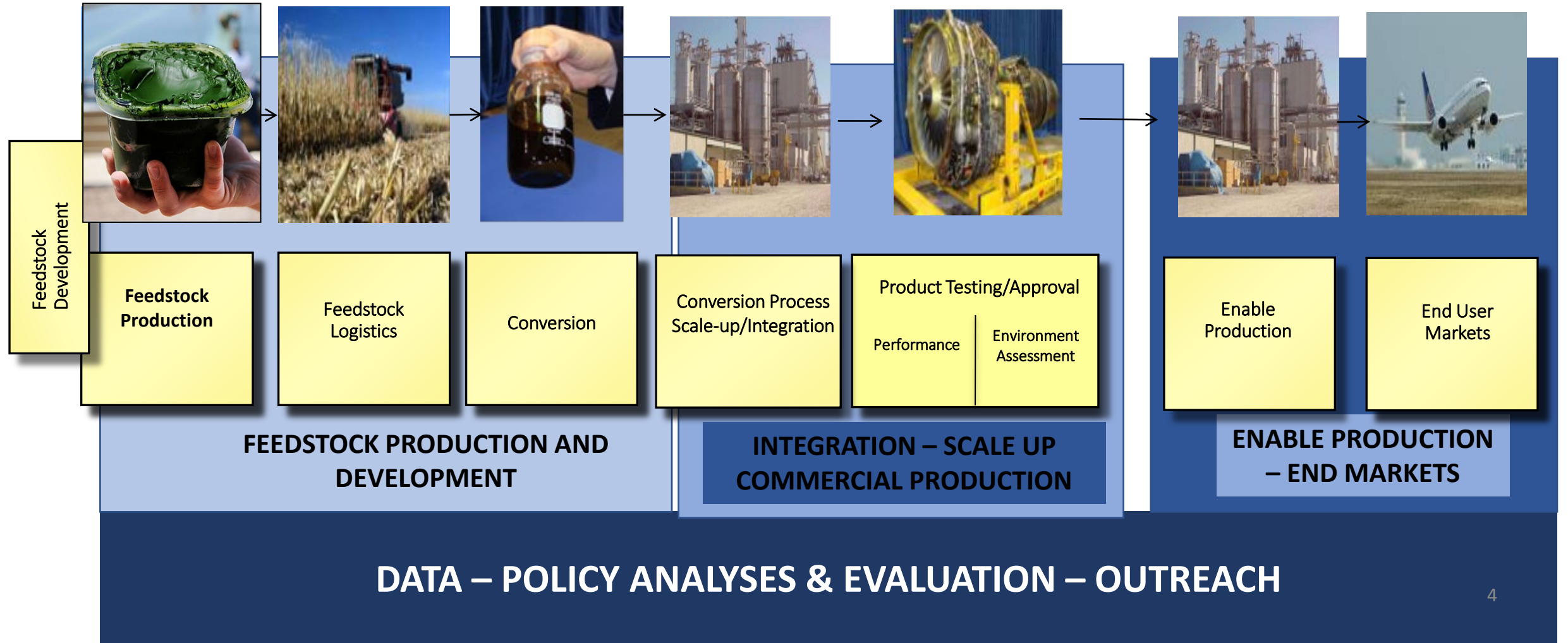
- Executive Order
- Bipartisan Infrastructure Law
- IRA Inflation Reduction Act
- SAF Grand Challenge
- Hydrogen Grand Challenge
- CI and GHG reduction
- On & Offshore wind to H₂
- Energy efficiency including process improvements

Supply Chain – Agency Effort Summary



	Feedstock Production	Feedstock Logistics	Fuel Conversion	Conversion Process Scale-up/Integration	Fuel Performance	Environment Assmt	Enable Production	End User/Buyer
USDA	✓	✓	✓	✓	---	---	✓	---
DOC	✓	---	✓	✓	✓	✓	---	✓
DOE	✓	✓	✓	✓	---	✓	✓	---
DOD	---	---	---	---	✓	✓	---	✓
EPA	---	---	---	---	---	✓	✓	---
FAA	---	✓	---	✓	✓	✓	---	✓
NASA	---	---	---	---	✓	✓	---	---
NSF	✓	✓	✓	---	---	---	---	---

USDA BIOECONOMY SUPPLY CHAIN



Renewable Energy System/Energy Efficiency Improvement Grants and Loans Guarantees Specific Technology Categories

- **Biomass, digesters**
- **Biomass, bioenergy**
- **Geothermal, electric**
- **Geothermal, direct use**
- **Hydrogen**
- **Hydrokinetic**
- **HTL**
- **Solar, small**
- **Solar, large**
- **Wind, small**
- **Energy Efficiency Improvements**
- **Ocean, wave, tidal**
- **Wind, large**

Inflation Reduction Act

- REAP, PACE, New ERA
- 45Q - CO₂
- 45V - H₂
- 45Z - Clean Fuels

Rural Business Cooperative Service – Energy Programs

- 1. Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (9003)**
- 2. Rural Energy for America Program (REAP 9007)**
- 3. Biorefinery Program Advanced Biofuels (9005)**
- 4. BioPreferred (9002)**
- 5. BRDI (9008)**
- 6. BCAP (9011)**
- 7. Business and Industry Guaranteed Loan Program (B&I)**
- 8. Rural Economic Development Loan and Grant Program (REDLG)**
- 9. Intermediary Relending Program (IRP)**
- 10. Rural Business Development Grant (RBDG)**
- 11. Value-Added Producer Grant Program (VAPG)**
- 12. CIG grants**

Risk Mitigation

- Risk: Technical and Financial
- SCALE – bench, pilot, IDU, first commercial, replications
- Construction
- Monitor- definitions, pay, substantial, mechanical, commissioning, start up, steady state, guarantees, warranties, liquidated damages

Hot Trends

- Green Hydrogen
- Sustainable Aviation Fuels
- Renewable Natural Gas – Anaerobic Digesters /
Landfill
- Fertilizers
- Hybrids

Hygenuity

- Hygenuity AZ LLC is in planning to build a bulk green hydrogen production plant on the Cocopah Indian Reservation in Arizona to supply commercial clients in Los Angeles and San Diego. The 60 MW plant will be connected to the Arizona Public Service Co and purchase qualified clean renewable energy to produce 14 million kg of green hydrogen annually. SAF, Renewable Diesel, and Hybrid projects will be using the green hydrogen as critical ingredients to produce their respective biofuels. Carbon abatement, lowering the Carbon Intensity scores, and monetizing the tax credits that are available are additional attributes to the project.
- Using renewable energy, water (H₂O) is transformed into hydrogen and oxygen by an electrolyzer. The green hydrogen can be used as a fuel (liquid or gaseous), a carrier, or as a power source for fuel cells and storage.

Talus Renewables

- Talus Renewables' first to market, zero carbon produces renewable hydrogen and ammonia the essential macro plant nutrient for food production and our primary responsibility at USDA. The system is operated using only water, air, and renewable energy from a solar array. The renewable hydrogen is then used to produce ammonia that is used as an organic fertilizer. The system is modular in design and capable of producing 10 tonnes per day of ammonia. The first generation of the system was demonstrated in a campaign in East Africa. The Phase 2 application is in process at USDA. The first series of commercial facilities will be located in Iowa, New Mexico, Indiana, and Nebraska. The second series are planned for Spain, North and South Dakota.
- The system is operated using only water, air, and renewable energy from a solar array. The water will require treatment to de-mineralize (reverse osmosis, de-ionization, softener) for the electrolyzer to produce the hydrogen (H₂). The H₂, N₂, and a catalyst are synthesized to produce ammonia (NH₃) fertilizer. The ammonia produced will be available in anhydrous and aqueous form for the agriculture community.

Talus Renewable film

A few videos:

- 55 second installation video

<https://youtu.be/HHOhHZjVs64?si=cZ-9TqsEjMj4TvK8>

- 25 second version if better

https://youtu.be/1jFgDwAWSCM?si=I8SD_WwKrerAE4bh

- 2 min video with African subsistence farmer that's a part of our new smallholder trials we just kicked off

<https://youtu.be/vTTILEONtaE?si=>

Thank you

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