



D&D RFI Summary

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Demonstration and Deployment

D&D RFI Summary Agenda

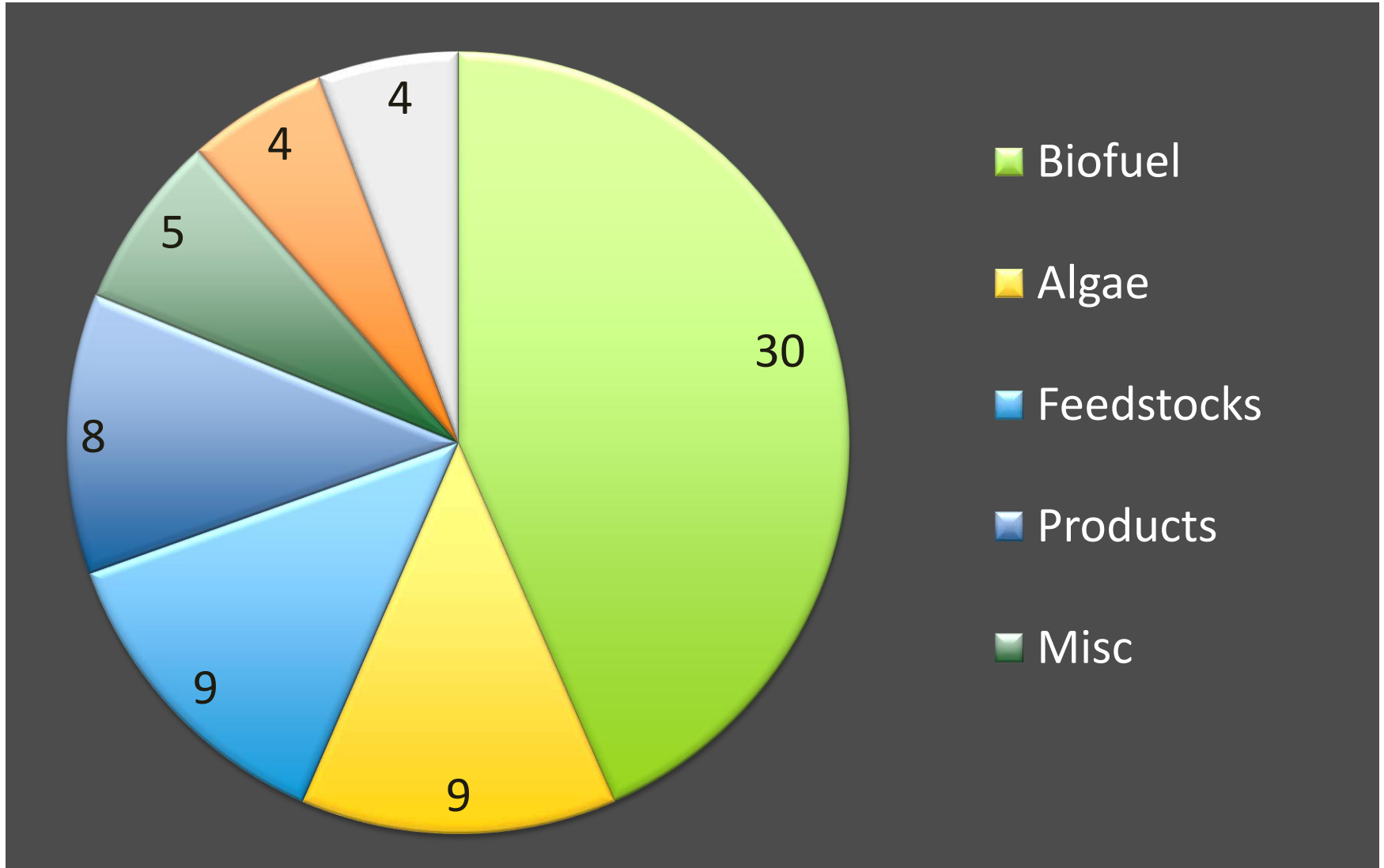
- **RFI Overview**
- **Areas of Interest**
 - Conversion Method
 - End Product
 - Feedstock
- **Facility Related**
 - Existing and Proposed Scale
 - Performance
- **Benefits and Impact**

RFI Overview

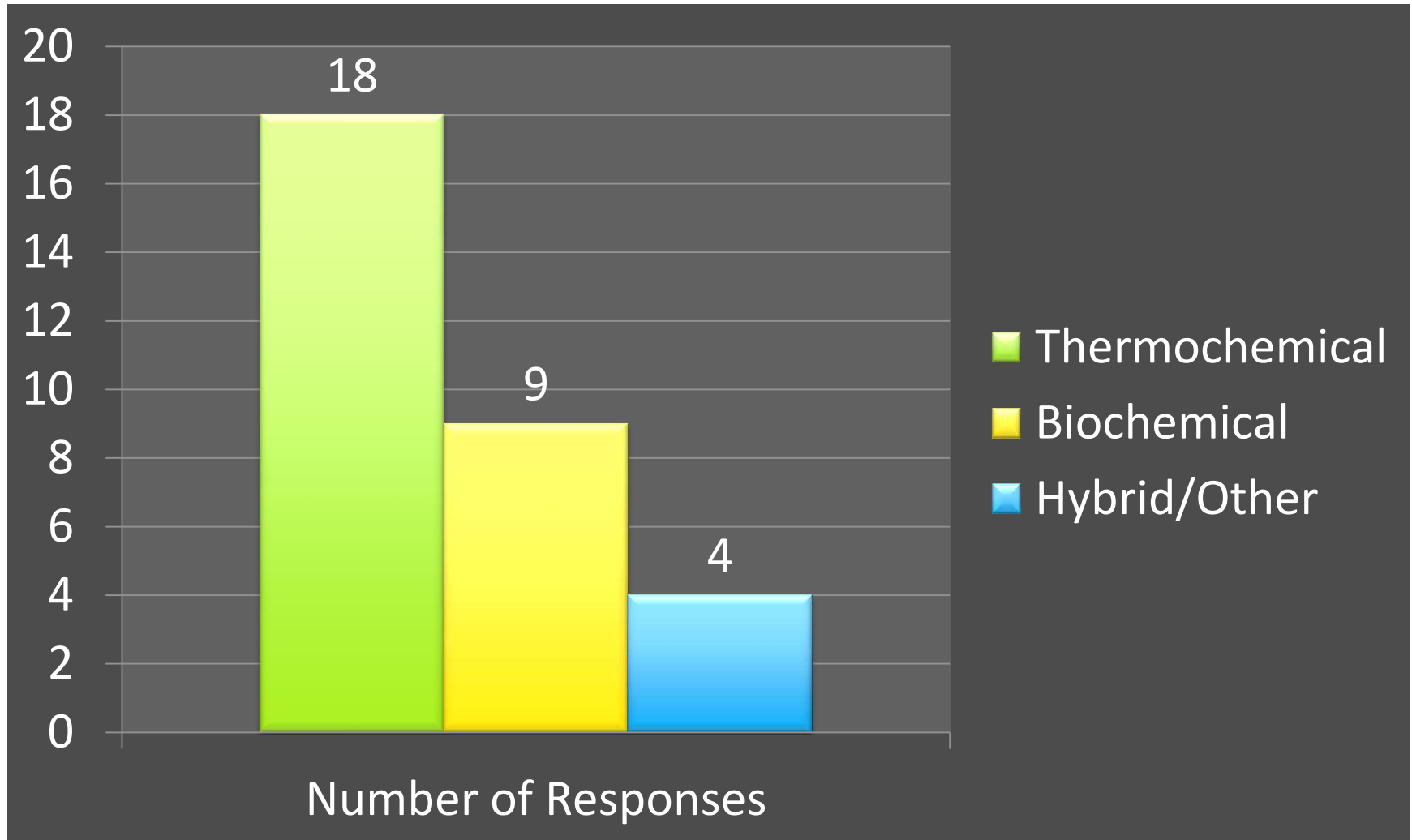
- Request for Information (RFI): [Demonstration and Deployment Strategies DE-FOA-0001013](#) released on 10/30/2013
 - Focused on Technology Readiness Level (TRL) 6 and up
- Each responses went into 1 of 9 Areas of Interest, spanning biofuel, bioproducts, algae, terrestrial feedstocks, and market barriers
- We asked 12 broad questions spanning feedstock, conversion, sustainability, and potential US manufacturing benefits

Areas of Interest

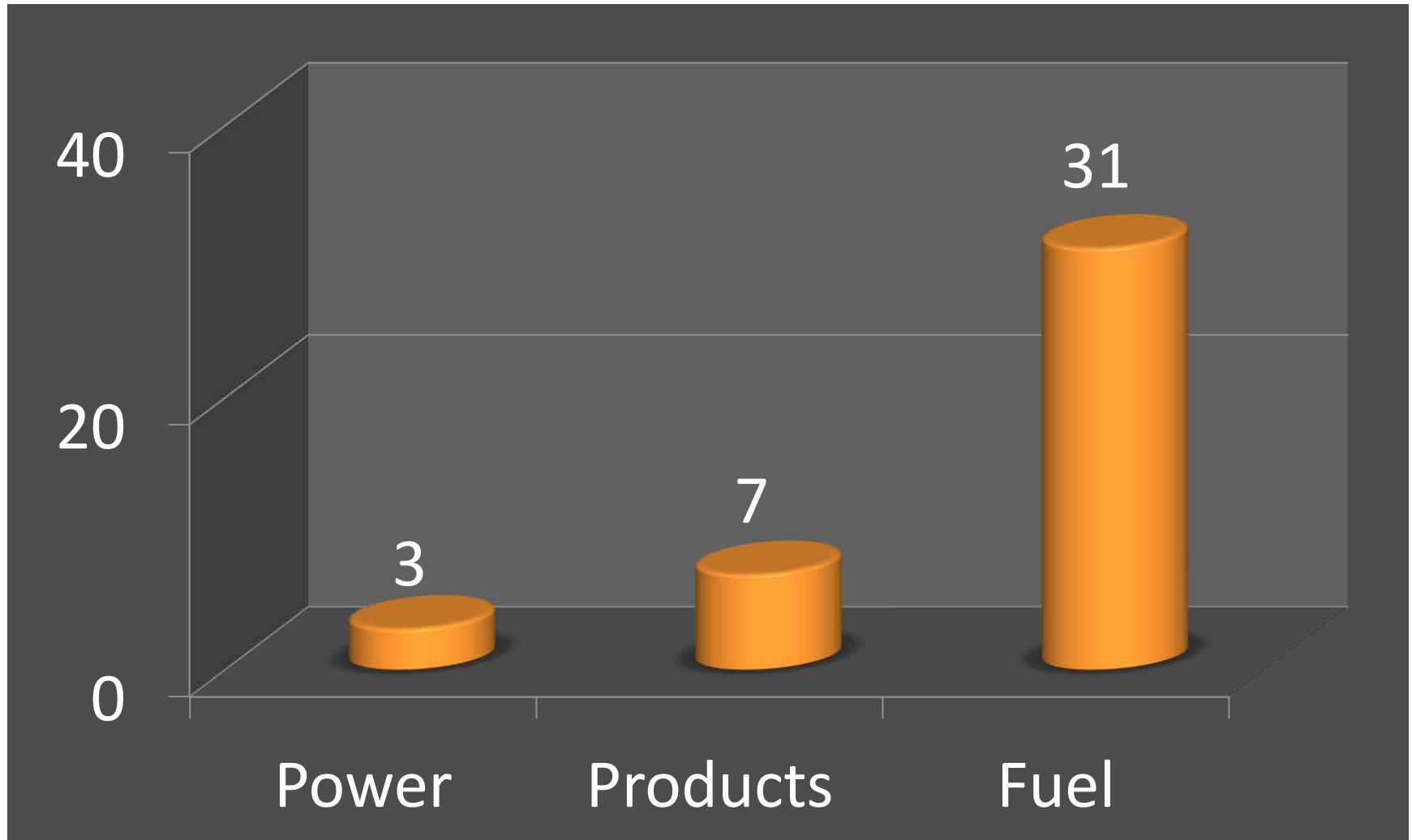
Response Breakdown by Number of Responses



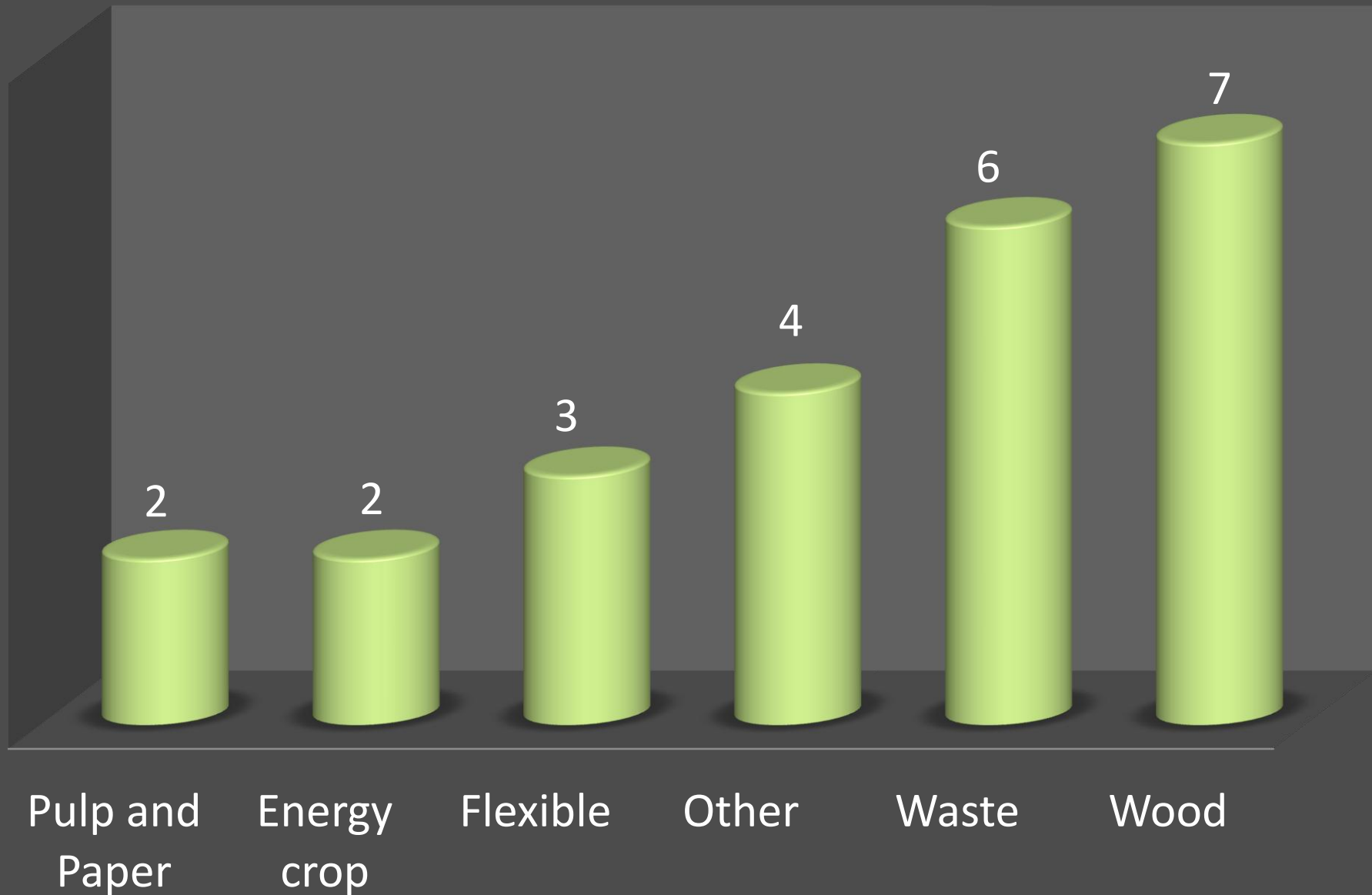
Conversion to Fuel Pathways Discussed in Responses



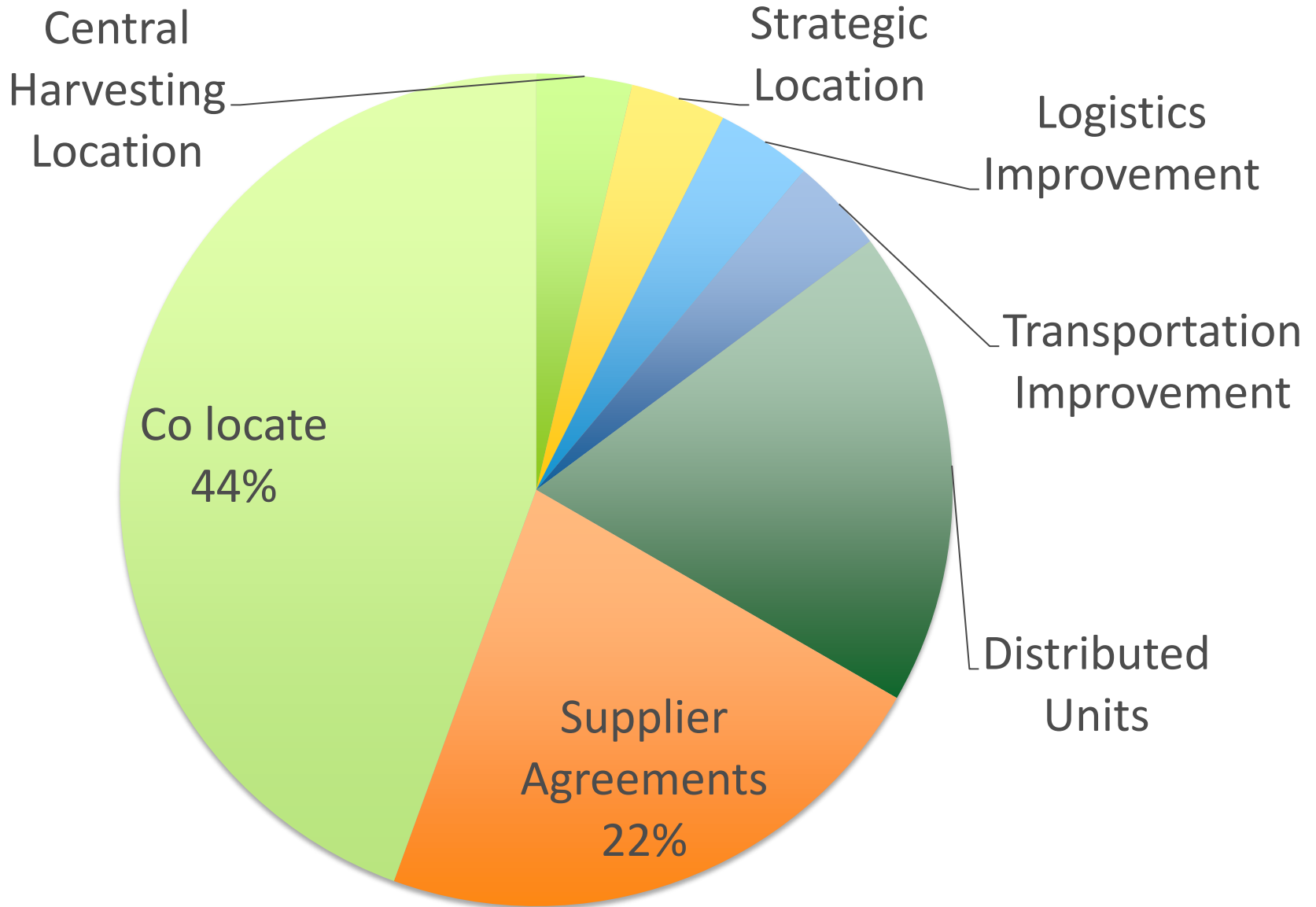
What Product will you Produce?



Feedstock Type

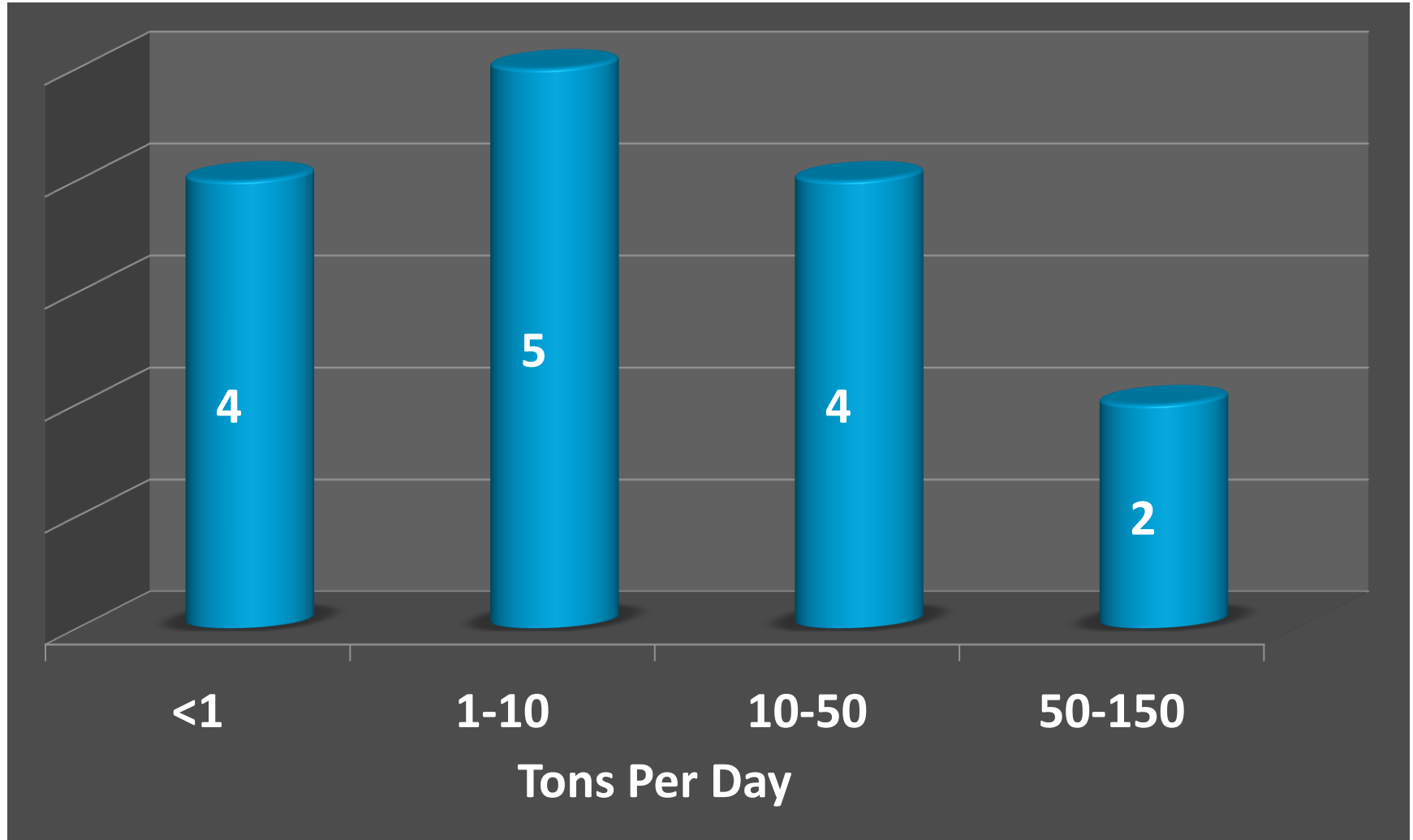


Plan for Feedstock Logistics

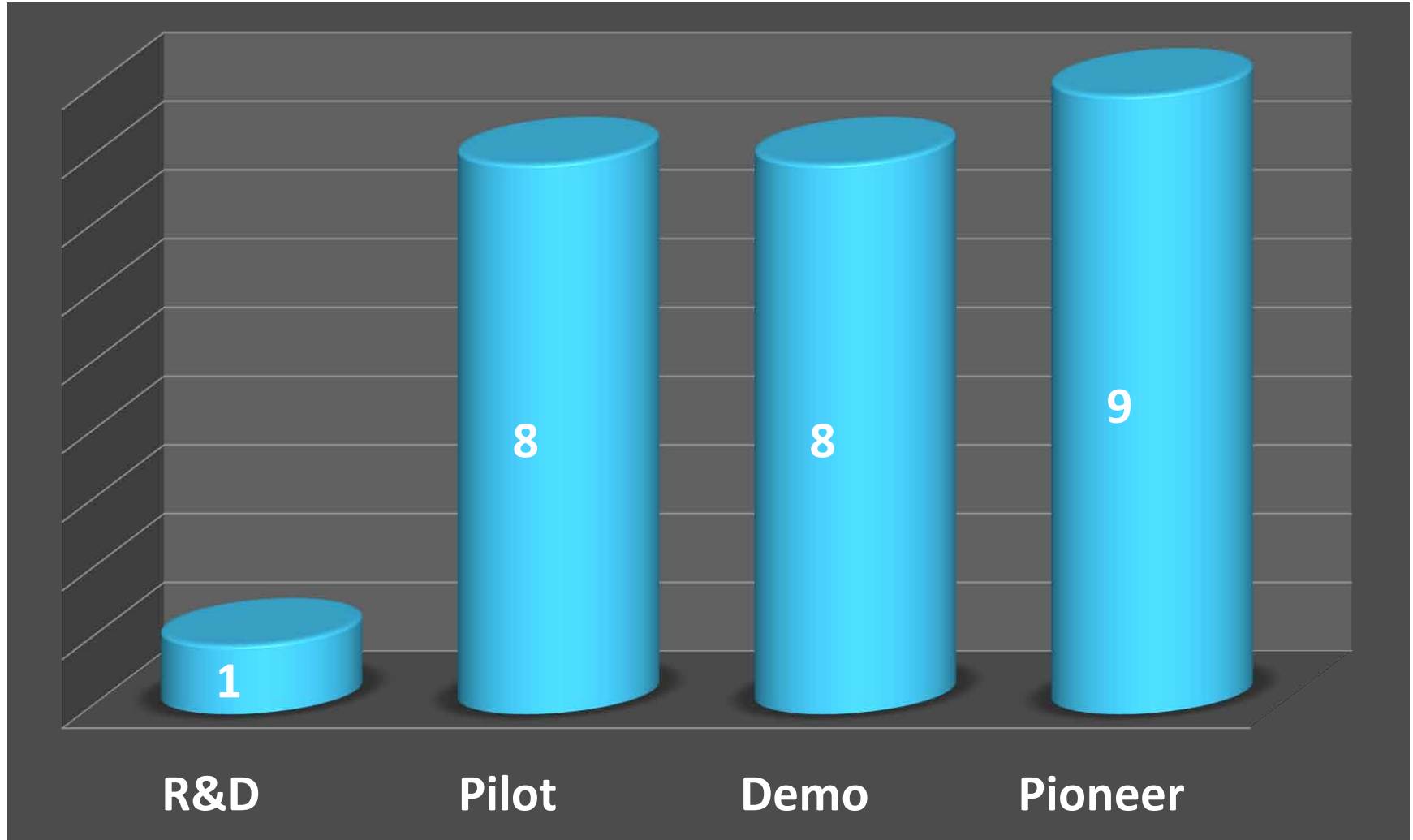


Facility Related Responses

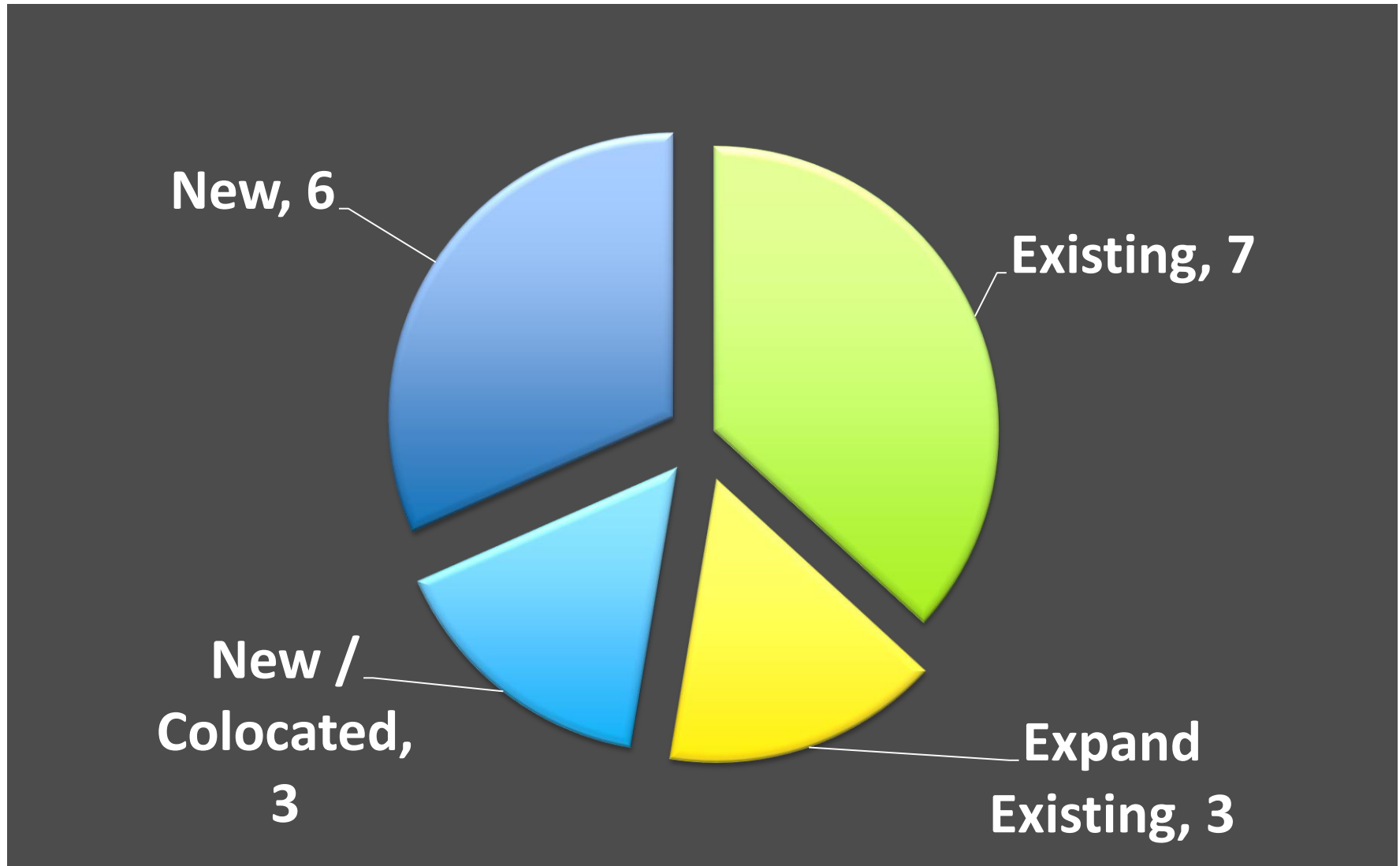
What Scale of Testing Has Been Completed?



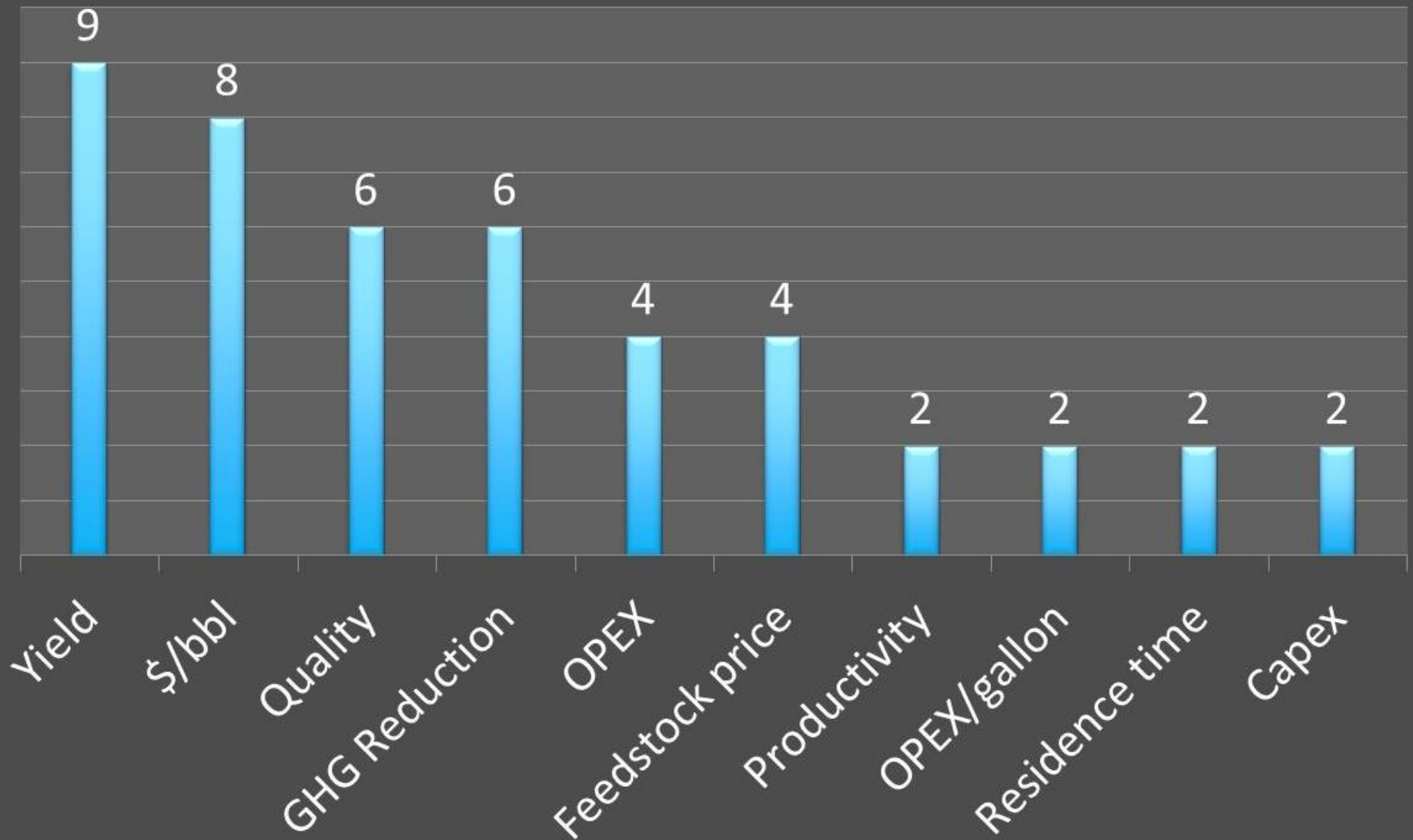
Proposed Next Scale of Testing



Will the Proposed Facility be New or Existing?



Which Metric is Most Important to Measure?



Key Takeaways

Key Takeaways – From these Responses

- Many promising conversion technologies – both biofuel and bioproducts
 - Typically focused on drop-in replacements vs. new functionality
 - Many are “hybrid” conversion methods
- Feedstocks dictate much of the performance
 - Utilize existing supply chains for wood or waste
 - Co-locating models or 3rd party supply agreements most popular option
- Many existing facilities to prove technology at various scales

Benefits, Impact, and the DOE Role

- “Over ten years, it could be expected that ten new 2000 ton/day units would create 20,000 new jobs and produce 560 million gallons per year of drop-in gasoline and diesel fuels from biomass”
- “cost and risk of further scale up severely inhibits the participation of individual private or corporate investors”
- “assistance to support the first few demonstration systems is critical, since private capital has not been willing to take this risk”
- “traditional financing vehicles are not available for innovative energy technology due to externalities associated with the energy industry not being factored into energy costs. As such, there exists a need for government to step in and correct this market failure”

Appendix

Areas of Interest

1. Drop-in, hydrocarbon advanced biofuels in new/expanded facilities
2. Improvements to specific unit operations or processes for advanced biofuel production in existing facilities
3. Bioproducts that will contribute to "replacing the whole barrel"
4. Advanced biopower, excluding combustion systems that generate steam for heat and power
5. Feedstock supply and logistics systems
6. Algae utilization: harvesting, processing, and conversion
7. Early adoption opportunities, such as renewable home heating oil and renewable marine fuel applications
8. Solids handling systems for pressurized reactor interfaces, such as for biomass feeding or ash and char removal
9. Market barriers such as infrastructure needs or fuel compatibility

Questions Asked

1. What is the specific advancement over currently available technology/systems? Please describe how this advancement or improvement can be represented along a known or analogous learning curve and how subsequent improvements will be incorporated into commercial production systems?
2. What metrics do you use to measure the advancement over existing technology/systems? Provide support for why you selected those metrics. DOE is seeking only the types of metrics to compare technologies and is not seeking business sensitive, proprietary or confidential performance results.
3. What scale of testing has already been completed, measured in both feedstock throughput and/or volume or mass of product? How many hours or cycles of testing have been completed? Was the testing in an integrated facility that included all of the key process recycle loops and/or heat integration?
4. What next scale of testing is necessary to advance your technology assuming incremental progression through TRLs 6-8, or integrated pilot, to demonstration, to commercial scale?

Questions Asked Continued

5. What would be the most efficient and advantageous method for testing this advancement? As a new or improved unit operation in an existing testing facility? Testing in a new test facility? Some other method? Please describe the rationale for your response.
6. What is the optimum feedstock throughput for your technology at this scale? Please report feedstock throughput as tonnes/day; if this is not appropriate for your technology, please explain what metrics you use to define feedstock throughput.
7. What are the main technical barriers for the technology and how will these barriers be addressed?
8. What sustainability (economic, environment, and social) criteria are the most important in terms of site selection for a bioenergy facility? More information on sustainability criteria is available in Section 2.4 of BETO's MYPP.

Questions Asked Continued

9. How do you plan to design and operate a biomass feedstock supply system to meet the annual volumetric and quality demands for a commercial bioenergy facility? What are the barriers to integration with a regional supply system to supply multiple bioenergy facilities and how would you overcome these barriers?
10. What financial barriers are you encountering currently and how are you planning to overcome these barriers? If financing is dependent on reducing your technical risk, what metrics are used to determine the risk and how do you measure reduction in risk?
11. Why is it appropriate to use government resources for validation and is government cost share necessary for validation of the technology?
12. What is the enduring benefit to the United States from validating this technology? Please estimate the potential impact of a successful validation, measured in jobs created, return of investment (ROI), or displacement of oil or other fossil fuel.