



U.S. DEPARTMENT OF
ENERGY

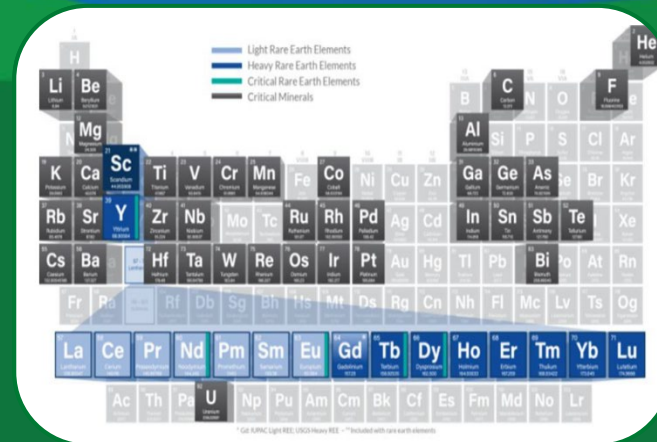
Fossil Energy and
Carbon Management

Carbon Conversion: IJA initiatives and grants

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SEC. 40302. Carbon Utilization Program

Directs the Secretary to establish a program for **eligible entities** (State; a unit of local government; or a public utility or agency) to submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary determines to be appropriate. An eligible entity shall use a grant received to **procure and use commercial or industrial products** that

- (i) use or are derived from *anthropogenic carbon oxides*; and
- (ii) demonstrate significant net reductions in *lifecycle greenhouse gas emissions compared to incumbent technologies, processes, and products*.

Critical Points

- “(1) \$41,000,000 for fiscal year 2022;
- “(2) \$65,250,000 for fiscal year 2023;
- “(3) \$66,562,500 for fiscal year 2024;
- “(4) \$67,940,625 for fiscal year 2025; and
- “(5) \$69,387,656 for fiscal year 2026.”.

- DOE total funding for *demonstration* Procurement Grant program is flexible
- Procurements grants will go to eligible entities
 - State government
 - Local government
 - Public utilities
- Net reduction in life cycle GHG emissions

FECM/NETL CO2U LCA Toolkit

- Initially created the toolkit for Carbon Utilization/Conversion Program research projects
- LCA guidance, open source LCA software (openLCA), NETL data, and results reporting tools
- This is a living document with overall version improvements and addendums to adapt the methodology for new use cases

 <p>CO2U LCA GUIDANCE DOCUMENT FOR THE U.S. DOE OFFICE OF FECM, VERSION 2.0</p> <p>Analysis requirements and instructions for using the supporting data and tools</p>	 <p>NETL CO2U LCA DOCUMENTATION SPREADSHEET</p> <p>Excel file that can be used to document data when not using openLCA</p>	 <p>TRAINING RESOURCES</p> <p>Provided to funding recipients to aid in modeling an LCA</p>
 <p>NETL CO2U OPENLCA LCI DATABASE VERSION 2</p> <p>openLCA database that includes NETL unit process data and an example CO2U LCA</p>		<p>45Q ADDENDUM AND TOOLS</p> <p>Information pertaining to the use of this toolkit in performing life cycle analyses in support of the 26 CFR § 1.45Q tax credit, including an addendum to the Guidance Document.</p>
 <p>OPENLCA CONTRIBUTION TOOL</p> <p>Excel template that translates openLCA results into required charts</p>	 <p>NETL CO2U LCA REPORT TEMPLATE</p> <p>Word report template for summarizing data and results</p>	<p>NETL ADDITIONAL DOWNLOADS</p> <p> Download Full Toolkit</p> <p> Patches, Archives, and Version History</p>

Toolkit available at netl.doe.gov/LCA/CO2U

Preliminary LCA Process for Procurement Grant Program



Product manufacturer completes LCA for eligible product(s) in accordance with **consistent** guidelines and submits for review



DOE reviews manufacturer LCA:

- **Conformance** with guidelines
- Minimum of 10% improvement over business-as-usual



Once approved, manufacturer and product are added to an approved list of vendors

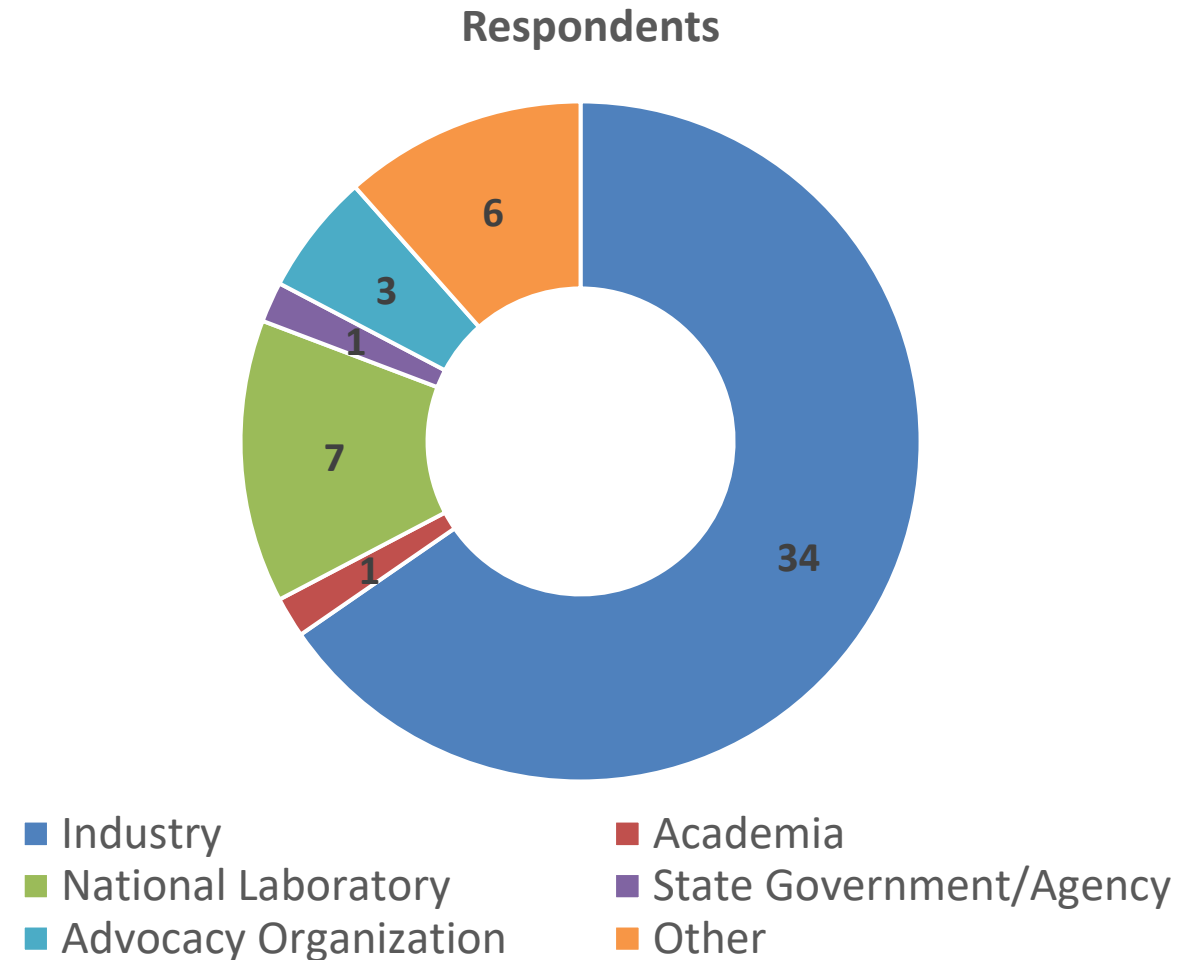


Eligible entities engage approved suppliers and establish a purchase agreement

RFI Technical Area #6 - Deployment and Demonstration Opportunities for Carbon Reduction and Removal Technologies

Response overview (52 total respondents)

- Industry (34)
- Academia (1)
- National Laboratory (7)
- State Government/Agency (1)
- Advocacy Organization (3)
- Other (6)
 - Includes non-profits, consultant, foundation, initiative, institutes



RFI Technical Area #6 Overall Summary

Funding, business models, and market considerations

- The current market offers a non-attractive business case due to high-cost premiums compared to fossil-derived materials.
- Several respondents expressed uncertainty on if or when 45Q applied to CO₂ conversion and this results in investment hesitation. Updated 45Q credit and/or other funding and incentives must be implemented to promote and, in some cases, sustain the commercialization of CO₂ conversion technologies/products.

Engagement and Existing Government Procurement Mechanisms

- Respondents most often specified that DOE should engage stakeholders at the state level, but responses varied from the Federal level all the way down to customers. The most common response is to engage commercially motivated stakeholders (i.e., industries) as well as government groups and agencies at all levels.

Product Codes, Standards and Certifications

- There is no current standard practice to measure, quantify, or report the carbon footprint of a product or technology. There is no verification that a product utilizes CO₂. There is no sufficiently detailed, standard method to perform life-cycle-analysis for CO₂ conversion.
- These issues must be remedied in order to allow for technology/product developers to obtain/qualify for some “low-carbon” certification (and possible subsequent incentive) and to encourage consumers to purchase such certified products. This will promote commercialization.

Technology

- Responses covered a wide variety of CO₂ conversion products and pathways.
- The discussed CO₂ utilization technologies spanned a range of maturity levels, but most technologies are at a lower TRL.
- Respondents commonly expressed the need for both standards and certifications as well as funding, incentives, and policy to support scale-up and commercialization efforts.
- The respondents claimed that CO₂ conversion would reduce CO₂ emissions. Details were scant for the market scale/emissions reduction potential of individual technologies and products, but several reports were cited that indicated that the CO₂ conversion market would see expansive growth and use up to several gigatons of CO₂ per year.
- Major commercialization is expected to commence in the early to mid 2030's.
- Economic support to Underserved Communities, due to CO₂ conversion commercialization, would be provided due to the creation of new jobs ranging from construction, to product manufacture, to product value chains.

Additional References

- <https://usea.org/event/virtual-carbon-management-applicant-education-workshop>
- LCA Toolkit available at netl.doe.gov/LCA/CO2U



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Questions?



Legend:

- Light Rare Earth Elements
- Heavy Rare Earth Elements
- Critical Rare Earth Elements
- Critical Minerals

H																	He
Li	Be											B	C	N	O	F	Ne
Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	Og
		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
		Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

* Ga, K, Mn, Li, REE, U, Os, H, He, REE. ** Included with rare earth elements.

