

Clean Energy: New DOE Office Should Take Steps to Improve Performance Management and Workforce Planning

GAO-25-106748 (Accessible Version)

Q&A Report to Congressional Committees

November 14, 2024

Why This Matters

In December 2021, the Department of Energy (DOE) established a new office—the Office of Clean Energy Demonstrations (OCED)—to manage a historic amount of appropriated funding for clean energy demonstration projects. Such clean energy projects in areas including carbon capture, hydrogen, and advanced nuclear are intended to help lower the investment risk of new technologies and allow for additional large-scale private investment and the commercialization of such technologies.

The DOE Office of Inspector General and GAO have previously reported on risks related to DOE's management of demonstration projects including related to the agency's selection of projects and to human capital issues such as insufficient federal staffing and heavy workloads for project oversight officials.

The Infrastructure Investment and Jobs Act (IIJA) includes a provision for us to review this new office (Pub. L. No. 117-58, § 41201(f)(2), 135 Stat. 429, 1131 (2021)). Specifically, this report examines OCED's establishment and its program development and proposal review process for issuing awards for projects.

Key Takeaways

- As of October 2024, OCED issued at least one funding opportunity announcement calling for project proposals for all of its eight portfolio areas. OCED has also selected some projects for negotiation and finalized some awards in most of its portfolios. In doing so, OCED has been responsive to some of our relevant prior recommendations such as by providing time to negotiate final award agreements.
- OCED's activities generally follow six leading practices that our prior work has shown can be effective in enhancing and sustaining federal agency coordination, such as bridging organizational cultures, including relevant participants, and leveraging resources and information. OCED's activities partially aligned with the two remaining practices—defining common outcomes and ensuring accountability.
- To provide greater assurance that its activities are aligned with meeting its goals, we recommend that OCED define goals for all OCED activities, collect performance information to measure progress toward goals, and use that information to assess results and make decisions.
- With 250 employees as of August 2024, OCED identified that it needs to fill 101 positions to be fully staffed. To provide greater assurance that OCED will have an adequate and capable workforce to meet its mission and goals, we

recommend that OCED monitor and evaluate progress toward human capital goals and develop a strategic workforce plan.

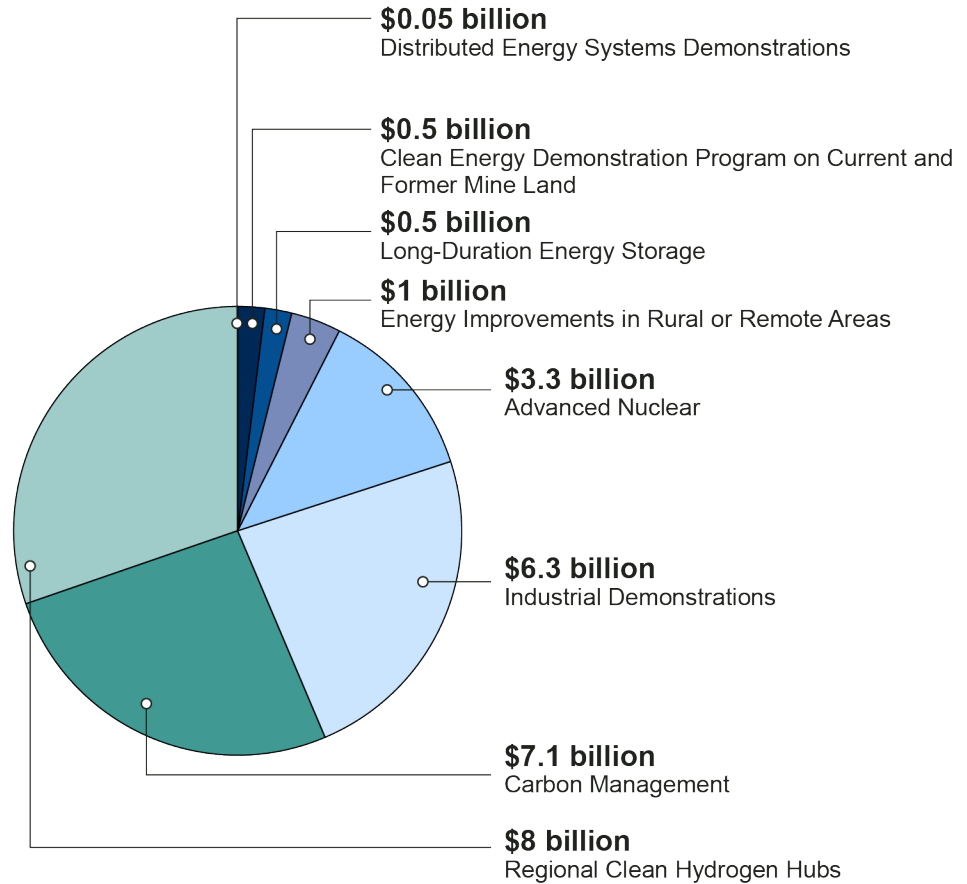
What is OCED's role within DOE?

OCED is responsible for managing clean energy demonstration projects and supporting other DOE offices that are managing their own demonstration projects. Overall, the office seeks to provide oversight excellence to the project management of demonstration projects, according to OCED documents. These demonstration projects are generally independent private sector led projects, which OCED supports through grant or financial assistance awards from its appropriations. Specifically, DOE was appropriated about \$27 billion from fiscal year 2022 through fiscal year 2026 from the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act to fund clean energy projects in areas such as carbon capture, hydrogen, and advanced nuclear.¹

OCED publishes solicitations calling for proposals—often called funding opportunity announcements. These solicitations include detailed information on the awards, including who is eligible to apply, what proposal components are required, how to submit a proposal, and the evaluation criteria for selecting awards. OCED evaluates proposals and provides demonstration project funding to successful award recipients based on negotiated award terms and conditions, scopes of work, and other required documents.

As of October 2024, OCED had eight portfolio areas comprising 17 programs related to a variety of technologies.² Regional Clean Hydrogen Hubs (\$8 billion), Carbon Management (\$7.1 billion), and Industrial Demonstrations (\$6.3 billion) are the highest funded OCED portfolio areas (see fig. 1). Projects awarded in the Regional Clean Hydrogen Hubs and Industrial Demonstrations portfolios aim to reduce carbon emissions in various ways, including from steel, cement, aluminum, and chemical production. Projects awarded in the Carbon Management portfolio aim to help accelerate the demonstration and deployment of carbon capture technologies.

Figure 1: Appropriated Funding for the Department of Energy’s Office of Clean Energy Demonstrations by Portfolio Area, as of October 2024



Source: Department of Energy data. | GAO-25-106748

Accessible Data for Figure 1: Appropriated Funding for the Department of Energy’s Office of Clean Energy Demonstrations by Portfolio Area, as of October 2024

- \$50 million - Distributed Energy Systems Demonstrations
- \$500 million - Clean Energy Demonstration Program on Current and Former Mine Land
- \$505 million - Long-Duration Energy Storage
- \$1 billion - Energy Improvements in Rural or Remote Areas
- \$3.3 billion - Advanced Nuclear
- \$6.3 billion - Industrial Demonstrations
- \$7 billion - Carbon Management
- \$8 billion - Regional Clean Hydrogen Hubs

Source: Department of Energy data. | GAO-25-106748

Note: This figure covers projects managed by the Office of Clean Energy Demonstrations, and appropriations for these come from a variety of sources, including the Infrastructure Investment and Jobs Act and the Inflation Reduction Act. These funds were appropriated from fiscal year 2022 through 2026.

OCED works with other DOE program offices that have technical expertise with the technologies represented in OCED’s portfolio, including DOE’s Offices of Nuclear Energy, Fossil Energy and Carbon Management (FECM), and Energy Efficiency & Renewable Energy. Historically, some of these program offices managed their own demonstration projects. For example, FECM previously managed carbon capture and storage projects that are similar to those currently in OCED’s Carbon Management portfolio. Additionally, the Advanced Nuclear portfolio area consists of a new program initiated by OCED and two ongoing projects that were previously managed by the Office of Nuclear Energy.

Most of OCED's appropriations are designated to fund demonstration projects through awards to project recipients, while approximately 5 percent is indicated for OCED's administrative costs for most of OCED's portfolios.³ When establishing its office, OCED was given its own procurement authority and legal counsel within DOE's Office of the General Counsel for its programs to ensure it had the capability to award and manage projects on its own, according to DOE documents and OCED officials.

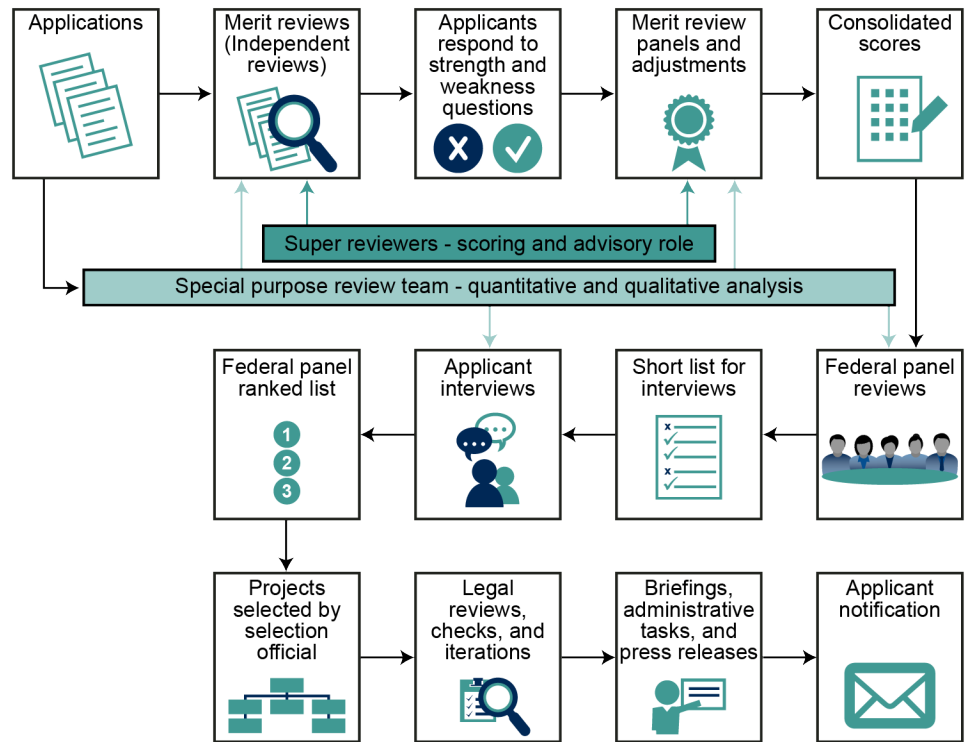
What is OCED's program development and proposal review process?

OCED's program development and proposal review process has three main steps that culminate in OCED issuing awards to project recipients.⁴ First, the office is to design a program by defining the types of projects it hopes to support and by detailing the parameters of awards and the selection process, such as the criteria by which OCED will evaluate proposals and time frames. These details are published in funding opportunity announcements.

According to OCED officials and documentation, in designing its programs, OCED reviewed legislative requirements, collaborated with other relevant DOE offices to determine the goals and scope of its programs, and used the expertise of both OCED and DOE officials to publish program details in funding opportunity announcements. In some cases, OCED obtained input on program design through public requests for information in advance of publishing the final funding opportunity announcement. Additionally, in many cases, OCED required potential applicants to submit a concept paper before submitting a full application, which allowed applicants to receive OCED feedback before expending the considerable resources necessary for a full proposal, according to OCED officials.

The second step is OCED's proposal review process where OCED is to review full proposals submitted by applicants and select projects for award negotiations (see fig. 2). OCED initially adopted practices for this step that were developed and used by other DOE offices. As OCED increased its staff and capacity, the office developed its own practices. Specifically, OCED used an expanded number of merit reviewers and conducted in-depth preselection interviews with applicants, according to OCED officials.

Figure 2: Department of Energy’s Office of Clean Energy Demonstrations Proposal Review Process



Sources: GAO analysis of Department of Energy documents; GAO (icons). | GAO-25-106748

Accessible Data for Figure 2: Department of Energy’s Office of Clean Energy Demonstrations Proposal Review Process

- Applications
- Merit reviews (Independent reviews)
- Applicants respond to strengths and weaknesses
- Merit review panels and adjustments
- Consolidated scores

- Super reviewers - scoring and advisory role
- Special purpose review team - quantitative and qualitative analysis

- Federal panel ranked list
- Applicant interviews
- Short list for interviews
- Federal panel reviews
- Selection official selects projects
- Legal reviews, checks, and iterations
- Briefings, admin prep, and press releases
- Applicants notified

Sources: GAO analysis of Department of Energy documents; GAO (icons). | GAO-25-106748

Note: In many cases, the Office of Clean Energy Demonstrations required potential applicants to submit a concept paper before submitting a full application.

Third, for selected projects, OCED and the selectee negotiate the details of the award agreement, and OCED issues the award.⁵ During this step, OCED and the selectee conduct additional due diligence and negotiate terms before finalizing all the terms in the cooperative agreement. With an issued award, funding is obligated, and payments to reimburse authorized expenses may begin.

Across these three steps, we found that OCED was responsive to some practices related to program design, proposal review, and award negotiations that we recommended in our prior reports. Specifically:

Program design. In a 2021 report, we recommended that DOE improve its project selection and negotiation processes for carbon capture and storage demonstrations, including by adopting a down-selection process—whereby DOE would select certain projects for initial funding and further review, and then select a subset of those projects for full funding.⁶ We had found that DOE fully committed to some projects at their initial selection, which increased its risk of funding unsuccessful projects.

OCED adopted a process similar to down-selection for its Regional Direct Air Capture Hubs program, which seeks to demonstrate the processing, transport, and storage of carbon dioxide captured from the atmosphere. In this program, OCED made funding available to support projects from early phase feasibility studies through detailed design and permitting. Upon completion of this process, OCED stated it would provide up to \$500 million for up to two projects to complete the procurement, construction, and operation phases.

OCED did not adopt a down-selection process for its other programs. Rather, OCED sought to reduce the risk of funding unsuccessful projects by building in go/no-go decision points into its awards. Specifically, for its demonstration programs, awardees must meet established project milestones before they are able to advance to subsequent phases, according to OCED documents.

This go/no-go decision point structure is similar to how DOE structured the carbon capture and storage awards we reviewed in our 2021 report. However, OCED officials said that their approach to the go/no-go decisions will be more rigorous and include outside independent review. We are continuing to monitor the extent to which OCED's approach to these decision points is more effective than we found it to be in our 2021 report.

Proposal review. In a 2024 report, we recommended that DOE's FECM ensure that it adheres to guidance and only select projects that are deemed to be technically acceptable.⁷ We had found that FECM had selected a project for award even though its technical score did not meet the office's established threshold. (FECM had previously managed carbon capture and storage projects that are similar to those currently in OCED's Carbon Management portfolio.) For OCED, we reviewed the awards issued through July 2024 and found that OCED selected projects that met the technically acceptable criteria.

Award negotiations. In our 2021 report, we reported that DOE used expedited time frames to negotiate some projects—fewer than 3 months as opposed to up to a year—based on DOE's desire to begin spending funds quickly.⁸ We found that these actions reduced DOE's ability to identify and mitigate technical and financial risks. We recommended that future carbon capture and storage demonstrations allow adequate time for negotiations prior to entering cooperative agreements. For the awards as of October 2024 for the Regional Clean Hydrogen Hubs and carbon capture projects, the time from project selection to award was from about 7 months to 13 months, according to OCED's selection and award announcements. The four OCED selectees we spoke with found that the extended negotiation time frame created some challenges with their budgeting and planning. However, OCED has been responsive to selectees' concerns and has provided updates throughout the negotiation process, including time frames for finalizing awards, according to the selectees.

What is the status of OCED's programs?

As of October 2024, OCED issued at least one funding opportunity announcement calling for proposals for all 17 programs in OCED’s portfolios. OCED has selected some projects for award negotiation in each of its portfolios and finalized awards for some projects in every portfolio but one. OCED officials told us they plan to finalize awards for all the projects selected for negotiations across their portfolio by the end of calendar year 2024, and some of these projects are expected to be implemented into the next decade. See table 1 for a summary of the status of OCED’s portfolio, and appendix 1 for additional details.

Table 1: Status of Department of Energy’s Office of Clean Energy Demonstrations Portfolio Areas, as of October 2024

Portfolio area	Appropriation (Dollars in billions)	Number of programs in portfolio area	Status: Funding opportunity announced	Status: Projects selected	Status: Projects awarded
Regional Clean Hydrogen Hubs	\$8	2	all programs	all programs	at least one program
Carbon Management	7.1	4	at least one program	at least one program	at least one program
Industrial Demonstrations	6.3	1	all programs	all programs	at least one program
Advanced Nuclear	3.3	2	all programs	at least one program	at least one program
Energy Improvements in Rural or Remote Areas	1	3	all programs	at least one program	at least one program
Long-Duration Energy Storage	0.5	3	all programs	at least one program	at least one program
Clean Energy Demonstration Program on Current and Former Mine Land	0.5	1	all programs	all programs	at least one program
Distributed Energy Systems Demonstrations	0.05	1	all programs	all programs	no programs

Legend:

- = All programs within the portfolio area
- ◐ = At least one program within the portfolio area
- = No programs within the portfolio area

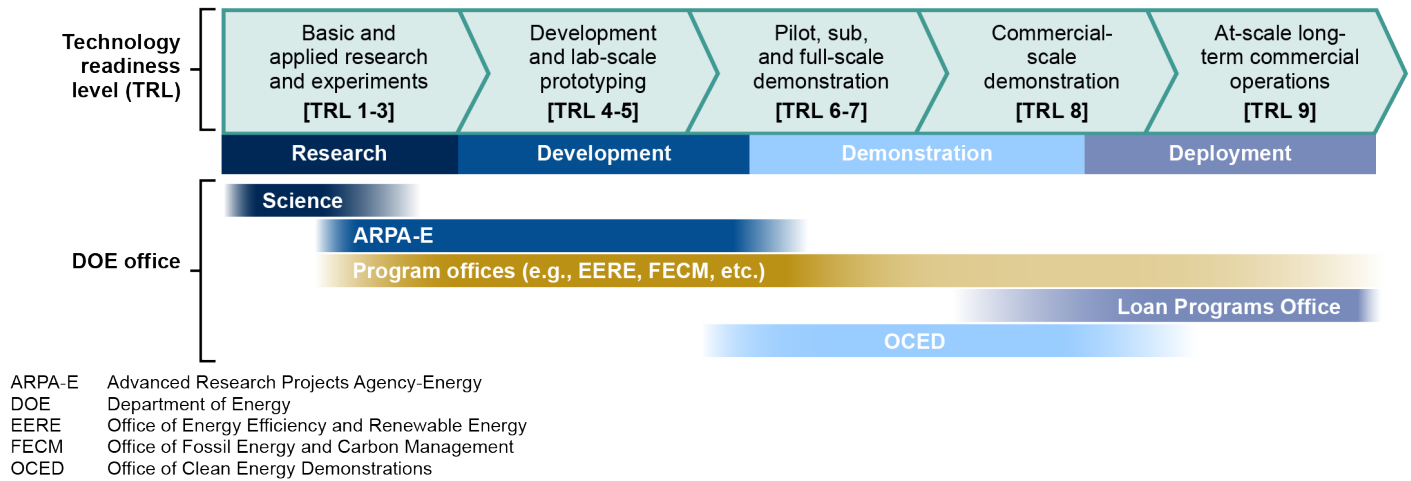
Source: GAO analysis of Department of Energy documentation. | GAO-25-106748

Note: This table covers projects managed by the Office of Clean Energy Demonstrations, and appropriations for these come from a variety of sources including the Infrastructure Investment and Jobs Act, the Inflation Reduction Act, and other appropriations.

How did DOE determine which demonstration projects OCED would manage?

DOE relied on legislative direction and department discretion to determine which demonstration programs OCED would manage. In part, DOE also used a technology readiness level scale to categorize projects as research, development, demonstration, or deployment and the offices that will generally work on those projects. As shown in figure 3, OCED was established to manage projects that are near the demonstration technology readiness level. Prior to the creation of OCED, demonstration projects were primarily managed by DOE’s program offices, which also manage projects ranging from research and development to deployment.

Figure 3: Roles of Department of Energy (DOE) Offices Across Technology Readiness Levels



Source: GAO summary of information from Department of Energy. | GAO-25-106748

Accessible Data for Accessible Data for Figure 3: Roles of Department of Energy (DOE) Offices Across Technology Readiness Levels

Technology readiness level (TRL):

- Basic and applied research and experiments [TRL 1-3]
- Development and lab-scale prototyping [TRL 4-5]
- Pilot, sub, and full-scale demonstration [TRL 6-7]
- Commercial-scale demonstration [TRL 8]
- At-scale long-term commercial operations [TRL 9]
- Research
- Development
- Demonstration
- Deployment

DOE office:

- Science
- ARPA-E
- Program Offices (e.g., FECM, EERE, etc.)
- Loan Programs Office
- OCED
- ARPA-E: Advanced Research Projects Agency-Energy
- DOE: Department of Energy
- EERE: Office of Energy Efficiency and Renewable Energy
- FECM: Office of Fossil Energy and Carbon Management
- OCED: Office of Clean Energy Demonstrations

Source: GAO summary of information from Department of Energy. | GAO-25-106748

Currently, according to DOE officials, research and development projects continue to be managed by DOE’s program offices. They told us OCED generally manages demonstration projects; however, there have been exceptions including the following:

- OCED entered into an agreement with DOE’s Grid Deployment Office for that office to manage a demonstration program using funding originally appropriated to OCED, citing increased efficiency in use of department resources.

- Other DOE offices such as the Office of Energy Efficiency and Renewable Energy and FECM manage several ongoing pilot-scale demonstration projects appropriated to those offices, according to DOE officials.

How has OCED coordinated with other relevant DOE offices?

OCED's activities coordinating with other DOE offices generally followed six of eight leading practices which our prior work has shown can be effective in enhancing and sustaining federal agency coordination, and OCED partially followed the remaining two practices (see table 2).⁹

Table 2: Department of Energy’s Office of Clean Energy Demonstrations (OCED) Coordination Activities as Compared with Leading Practices for Effective Coordination

Leading practice	Alignment between OCED activities and leading practice
Defining common outcomes	partially aligns
Ensuring accountability	partially aligns
Bridging organizational cultures	generally aligns
Identifying and sustaining leadership	generally aligns
Clarifying roles and responsibilities	generally aligns
Including relevant participants	generally aligns
Leveraging resources and information	generally aligns
Developing and updating written guidance and agreements	generally aligns

Legend:

● = Generally aligns with leading practice

◐ = Partially aligns with leading practice

Source: GAO analysis of Department of Energy documentation. | GAO-25-106748

Defining common outcomes

OCED’s activities partially align with the leading coordination practice to define common outcomes. OCED clearly defined short-term outcomes related to its coordination with other DOE offices. For example, OCED signed memorandums of understanding with other DOE offices that include purpose and scope of work sections describing intended outcomes of the offices’ coordination. However, OCED did not clearly define long-term outcomes or identify crosscutting challenges and opportunities to create buy-in from relevant stakeholders on how to address such challenges. In our prior work on leading practices for federal agency coordination, we reported that collaborative efforts benefit from defining common goals and outcomes.¹⁰ We stated that, to coordinate efforts effectively, participants should develop a mutual understanding of the crosscutting challenge or opportunity to create buy-in from all parties.

Ensuring accountability

OCED’s activities partially align with this leading practice. OCED’s memorandums of understanding describe plans for officials to annually assess progress toward goals and revise the scope of the agreements. Additionally, OCED officials told us they discuss progress toward goals in regular meetings with other DOE offices with which they coordinate. However, OCED has not established coordination-related performance standards—that is, standards that reflect the level of performance expected—against which its performance can be evaluated.

Bridging organizational cultures

OCED’s activities generally align with this practice, which calls for coordinating entities to establish compatible policies and procedures and agree on common terminology and definitions. OCED primarily coordinates with other offices within DOE, which share similar terminology, procedures, and crossover staff. Further, OCED and multiple offices with which it coordinates report to the same Undersecretary.

Identifying and sustaining leadership

OCED’s activities generally align with leading practices for identifying and sustaining leadership. OCED has established clear leadership roles for its coordination activities with other DOE offices through its memorandums of understanding and other agency documents. For example, OCED’s

memorandums of understanding with other DOE offices identify how critical leadership roles will be staffed, and agency documents detail which office is responsible for each specific activity.

Clarifying roles and responsibilities

OCED's activities generally align with leading practices for clarifying roles and responsibilities. For example, OCED's memorandums of understanding detail which office will staff key roles, including the Project Manager and Project Technology Lead. The memorandums also describe the types of activities—such as financial assistance, legal, and environmental policy—for which each office will be responsible.

Including relevant participants

OCED's activities generally align with leading practices for including relevant participants. For example, OCED sourced and relied on staff from program offices and subject matter experts to help with review of the large number of proposals received in response to the funding opportunity announcements in its portfolio.

Leveraging resources and information

OCED's activities generally align with leading practices for leveraging resources and information. OCED leverages several agency-wide coordination initiatives such as Joint Strategy Teams, which are typically organized by technology group and contribute to DOE's efforts to implement the department's top priorities. OCED also leverages DOE resources through informal methods of communication, including ad hoc check-ins, discussions with transferred staff about previous experiences and expertise, and communication with DOE senior leadership about lessons learned.

Developing and updating written guidance and agreements

OCED's activities generally align with leading practices for developing and updating written guidance and agreements. OCED's memorandums of understanding outline how the relevant offices will coordinate with OCED on funding opportunity announcements—including about the number of staff, their core functions, and how OCED will pay for services. OCED's memorandums also detail plans for assessing and updating the agreements as needed on an annual basis.

By fully defining common outcomes and ensuring accountability for its coordination efforts with other DOE offices, OCED could further strengthen its coordination efforts and ensure it is able to leverage the expertise of the various DOE program offices.

To what extent has OCED's performance management followed leading practices?

OCED's performance management activities, such as the development of the 2023 Multi-Year Program Plan and fiscal year 2024 goals, partially align with two of three leading practices for performance management and do not align with the third leading practice (see table 3). Our prior work has defined performance management as a three-step process by which organizations define goals, collect performance information to measure progress, and use that information to assess results and inform decisions.¹¹ Taken as a whole, performance management activities help an organization define what it is trying to achieve, determine how well it is performing, and identify what it could do to improve results.¹² The practices can also help mitigate and address long-standing

challenges of federal agencies—including ensuring performance information is useful and used—to help agencies further improve results.

Table 3: Department of Energy’s Office of Clean Energy Demonstrations (OCED) Performance Management Activities as Compared with Leading Practices for Performance Management

Leading practice	Alignment between OCED activities and leading practice
Define goals	partially aligns
Collect performance information to measure progress	partially aligns
Use performance information to assess results and inform decisions	does not align

Legend:

● = Partially aligns with leading practice

○ = Does not align with leading practice

Source: GAO analysis of Department of Energy documentation. | GAO-25-106748

Define goals

OCED’s activities partially align with the following key actions our prior work identified for defining goals:¹³

- **Goals cover long-term outcomes.** OCED discusses its mission and some long-term goals of lowering the risks associated with clean energy technologies and partnering with the private sector in its Program Plan. Additionally, OCED described expected outcomes for some of its programs, such as for each phase of its Hydrogen Hubs program. However, as discussed above, OCED has not fully defined long-term common outcomes for its coordination efforts.
- **Goals cover near-term measurable results.** OCED established some near-term goals with measurable results related to the timing of issuing funding opportunity announcements, proposal reviews, and awarding financial agreements. For example, OCED established fiscal year 2024 goals, which include finalizing the initial phases of award agreements by the end of fiscal year 2024. However, not all OCED’s long-term goals have associated near-term measurable goals. For example, OCED’s Program Plan describes the long-term goal of lowering the risks of clean energy technologies but does not include near-term measurable goals associated with this. Such near-term measurable goals could help guide OCED’s program efforts over time toward achieving its long-term goals.
- **Goals cover all activities.** OCED’s goals do not cover all its activities. For example, OCED has developed additional programs within its portfolios since it developed the Program Plan, but neither the Program Plan nor the fiscal year 2024 goals mention these efforts.
- **Goals are aligned across organizational levels.** OCED has described goals among some of its divisions and programs in its Program Plan. For example, its Project Management Division has a goal to collect data consistently across projects. However, OCED’s fiscal year 2024 goals do not always align with the goals that are defined in the Program Plan.

OCED officials told us they wrote the Program Plan to explain OCED’s role and vision; thus, it was less goal oriented. Additionally, when writing the Program Plan, officials said they had not finalized the details of funding opportunity announcements, some of which include additional goals and performance measures.

Collect performance information to measure progress

OCED's activities partially align with the second leading practice of collecting performance information to measure progress. OCED officials told us they are collecting performance information at the program level, but they are not collecting such information to measure progress against portfolio- or office-level goals. Additionally, OCED cannot fully collect performance information to measure progress without first establishing goals across all of its activities.

Use performance information to assess results and inform decisions

OCED's activities do not align with the last leading practice, because OCED has not demonstrated it has used performance information to assess results and inform decision-making. For example, OCED did not provide evidence of implementing performance reviews, which are meetings or processes in which senior leadership and responsible parties review relevant performance information and other evidence to assess progress toward goals.

OCED officials stated that they plan to publish reports in the future, such as a State of the Portfolio annual report, to show how OCED's portfolio of projects is contributing to overall goals. Such reports may provide information that could be useful to assess results and inform decisions. OCED officials told us they have been focused on near-term activities such as developing and issuing funding opportunity announcements, and so have not completed some long-term planning. Until OCED fully establishes its long-term goals and associated near-term goals, and collects the related information, such annual reports could not encompass all aspects of the program.

OCED's efforts also have not fully aligned with two leading practices for coordination that are closely related to performance management—defining common outcomes and ensuring accountability, as discussed earlier. Fully implementing leading performance management practices would better position OCED to determine its overall progress and produce annual reports that fully reflect program results. In doing so, defining goals for all its activities would include defining common outcomes for its coordination activities. Similarly, collecting and using performance information to assess progress would include ensuring accountability for its coordination efforts.

How has OCED planned for its workforce needs?

OCED has taken some actions to define its workforce needs but has not followed all leading practices for workforce planning.

Strategic workforce planning includes aligning human capital needs with mission and programmatic goals.¹⁴ We have previously identified leading practices for effective workforce planning.¹⁵ OCED's workforce planning activities generally align with the first, partially align with the second, and do not align with the third of these leading practices (see table 4).

Table 4: Department of Energy’s Office of Clean Energy Demonstrations (OCED) Workforce Planning Activities as Compared with Leading Practices for Effective Workforce Planning

Leading practice	Alignment between OCED activities and leading practice
Determine needed skills and develop strategies to address gaps	generally aligns
Monitor and evaluate progress toward human capital goals	partially aligns
Develop a strategic workforce plan	does not align

Legend:

- = Generally aligns with leading practice
- ◐ = Partially aligns with leading practice
- = Does not align with leading practice

Source: GAO analysis of Department of Energy documentation. | GAO-25-106748

Determine needed skills and develop strategies to address gaps

OCED’s actions generally align with the first leading practice. OCED officials said they reviewed staffing requirements for each OCED division and office. Additionally, OCED has developed a training and development program that the office will launch in fiscal year 2025, which includes a competency assessment. The training and development program aims to ensure OCED employees have the competencies and technical training needed for specific roles. Moreover, OCED worked with an outside talent acquisition firm to target and select senior positions to fill, according to OCED officials.

Monitor and evaluate progress toward human capital goals

OCED’s actions partially align with the second leading practice. OCED has maintained a current and detailed organization chart that includes all its offices and positions as well as information on the staff hired to date. However, OCED has not developed near-term human capital goals or performance measures to be able to evaluate the effectiveness of its efforts. For example, OCED has identified its long-term staffing needs, but without near-term goals—such as for which positions are needed in the next quarter in order to finalize ongoing award negotiations—it is not possible to know whether OCED currently has the staff to meet current needs.

Develop a strategic workforce plan

OCED’s actions do not align with the third leading practice. OCED has not developed a strategic workforce plan to coordinate strategies and align them with agency goals.

According to OCED officials, they have focused on the near-term activities of recruiting staff and using limited staff to advance OCED’s mission. Initially, OCED focused on publishing funding opportunity announcements. After publishing the funding opportunities, OCED shifted to reviewing proposals, identifying selectees, and negotiating awards. OCED officials said their priority most recently has been working to finalize the awards for their portfolio of demonstration projects. OCED officials told us they expect to shift focus to managing the awarded projects in the near future.

Thus, some workforce and strategic planning policies and documents that OCED officials recognize are needed have not been formalized or implemented due to workforce capacity limitations. OCED officials told us that as a new office within DOE, OCED had to quickly establish its workforce to meet its immediate needs. Specifically, OCED’s workforce grew from 64 onboarded employees at the end of fiscal year 2022 to 250 onboarded employees as of August 2024.

To be fully staffed the office estimates it needs 351 onboarded employees, according to OCED's most recent organization chart. That leaves 101 more positions to be filled, a process that requires time and prioritization. OCED officials told us that they underestimated some of their staffing needs for this year, as the award negotiations have been more complex than anticipated. Officials told us they recently signed a new memorandum of understanding with DOE's Office of the General Counsel to secure more legal assistance to address the unexpected number of issues raised by selectees.

Our prior work has highlighted the importance of workforce planning efforts. For example, in 2014 we reported that staff vacancies in key positions contributed to the DOE Loan Programs Office inconsistently following its monitoring and reporting policies, which prevented it from being able to reasonably ensure it was effectively managing risks associated with program funds.¹⁶ Consistent with prior GAO findings, strategic workforce planning enables an organization to be agile, resilient, and responsive to current and future trends.¹⁷ Similarly, prior DOE Inspector General findings demonstrate the need for sufficient staff to ensure key federal oversight functions are performed and the government is adequately protected.¹⁸ Developing human capital goals and formalizing a workforce plan would provide greater assurance that OCED has the staff to support its mission and programmatic goals.

Conclusions

In December 2021, DOE established a new office to manage a historic amount of new funding for large and potentially risky clean energy demonstration projects. As we and others previously reported, DOE was challenged in managing such projects in the past.

Recognizing this past, DOE aims for this new office to provide oversight excellence in managing demonstration projects. OCED has ramped up to 250 staff on board as of August 2024. We found that OCED has so far been responsive to some of our prior relevant recommendations in how it designed programs and selected and awarded projects.

However, we also found that OCED's activities do not fully align with leading practices for coordination, performance management, and workforce planning. OCED officials told us that the immediate demands of standing up the new office and workforce capacity limitations have meant the office has not formalized aspects of its planning processes.

OCED could better ensure its activities are working as intended and take actions when they are not if it more clearly establishes goals and performance measures, including for how it coordinates with other DOE offices. Clear goals and performance measures would enable DOE and Congress to fully evaluate OCED's work and make adjustments to efficiently use taxpayer funds. Similarly, implementing leading practices for workforce planning would help OCED manage its hiring efforts strategically and ensure it has the workforce in place to meet its needs.

Recommendations for Executive Action

We are making the following two recommendations to DOE:

The Director of OCED should take steps to fully implement leading practices related to performance management. These practices include defining goals and outcomes for all OCED activities; collecting performance information to measure progress toward goals; and using that information to assess results, make decisions, and ensure accountability. (Recommendation 1)

The Director of OCED should take steps to fully implement leading practices for effective workforce planning by developing a strategic workforce plan and processes to monitor and evaluate progress toward OCED's human capital goals. (Recommendation 2)

Agency Comments

We provided a draft of this report to the Department of Energy for review and comment. In its comments, reproduced in appendix II, DOE concurred with our recommendations. DOE also provided technical comments, which we incorporated as appropriate.

How GAO Did This Study

To examine OCED's establishment and program development and proposal review process, we reviewed DOE and OCED documents as well as relevant legislation, such as the IIJA. Specifically, we reviewed OCED documentation, including funding opportunity announcement materials, merit review reports, and award announcements, to determine the status of OCED's portfolio of programs. We also reviewed DOE and OCED policies, guidance, and documentation related to OCED's coordination activities, performance goals, and workforce planning.

In addition, we reviewed prior GAO work that made recommendations for DOE to improve its project selection and negotiation process and spoke to OCED officials about their efforts to incorporate the recommendations. Where relevant, we corroborated officials' statements about their efforts by assessing documentation from the review process. For example, we reviewed Merit Review Panel Chairperson Reports for the 10 funding opportunity announcements issued as of the time of GAO's review to determine whether OCED had selected any technically ineligible applicants.

We compared OCED's activities with selected leading practices identified in previous GAO reports related to federal agency coordination,¹⁹ performance management,²⁰ and workforce planning.²¹ For coordination, we assessed OCED's activities against eight leading practices for enhancing and sustaining federal agency coordination. For the performance management leading practices, we referred to our prior work that defines performance management as a three-step process, and we refer to those steps as leading practices. For the workforce planning leading practices, we consolidated five key principles for effective strategic workforce planning from our prior work into the three leading practices presented in this report.

For each analysis we used a three-point scale to determine if OCED's activities generally aligned, partially aligned, or did not align with the leading practices. For those leading practices where OCED provided sufficient evidence and did not have any gaps in documentation, we determined that its activities generally aligned with leading practices. For those leading practices where OCED provided documentation but there were gaps in the evidence compared with the leading practices, we determined that its activities partially aligned with leading practices. For those leading practices where OCED could not provide relevant documentation, we determined that its activities did not align with leading practices.

To describe the status of OCED's programs, we reviewed OCED and DOE documents including funding opportunity announcements, award fact sheets, and DOE funding data as of October 22, 2024. We reviewed available documentation on the reliability of DOE's databases from which the funding data was drawn and

interviewed relevant officials. We determined that the data were sufficiently reliable to describe funds competed, committed, and obligated for the purposes of our report.

To understand OCED's establishment and program development and proposal review process, we interviewed OCED and DOE officials and a nongeneralizable sample of seven applicants. Of those applicants, four were selectees—that is they had submitted proposals for projects that OCED selected for award negotiations. We selected the seven applicants to obtain a range of perspectives based on the requested award amounts and technology type. Because we selected a nongeneralizable sample of applicants, the information gathered is not generalizable to applicants we did not interview.

The IIJA includes a provision for us to review the processes and procedures used by OCED to evaluate proposals and award projects, as well as OCED's oversight of such projects, and to recommend any changes to the processes, procedures, and program structure.²² We did not address OCED's oversight of awarded projects because few awards had been made as of the time of our review. We will be evaluating DOE's oversight of demonstration projects in future work as more projects get awarded.

We conducted this performance audit from March 2023 to November 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

List of Addressees

The Honorable Joe Manchin III
Chairman
The Honorable John Barrasso
Ranking Member
Committee on Energy and Natural Resources
United States Senate

The Honorable Frank D. Lucas
Chairman
The Honorable Zoe Lofgren
Ranking Member
Committee on Science, Space, and Technology
House of Representatives

We are sending copies of this report to the appropriate congressional committees, the Secretary of Energy, and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

GAO Contact Information

For more information, contact: Frank Rusco, Director, Natural Resources and Environment, at (202) 512-3841 or RuscoF@gao.gov

Sarah Kaczmarek, Managing Director, Public Affairs, KaczmarekS@gao.gov, (202) 512-4800

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Appendix I: Status of Office of Clean Energy Demonstrations Programs

This appendix provides additional information on the status of Office of Clean Energy Demonstrations programs by portfolio area.

Table 5: Status of Office of Clean Energy Demonstrations (OCED) Portfolios, as of October 2024

Dollars in millions

Portfolio	Funding: Appropriated	Funding: Competed ^a	Funding: Committed ^b	Funding: Obligated ^c
Advanced Nuclear	\$3,277	\$800 ^d	\$2,302	\$1,095
Carbon Management	7,074	3,809	2,295	186
Clean Energy Demonstration Program on Current and Former Mine Land	500	450	475	16
Distributed Energy Systems Demonstrations	50 ^e	50	49	0
Energy Improvements in Rural or Remote Areas	1,000	765	461	71
Industrial Demonstrations	6,312	6,300	5,928	78
Long-Duration Energy Storage	505	479	315	23
Regional Clean Hydrogen Hubs	8,000	8,000	7,010	119
Total	26,718	20,653	18,834	1,588

Source: GAO analysis of Department of Energy data. | GAO-25-106748

Notes: Values may not sum to totals shown due to rounding. This table does not include the program Upgrading Our Electric Grid and Ensuring Reliability and Resiliency. OCED entered into an agreement with DOE's Grid Deployment Office for that office to manage this program using funding originally appropriated to OCED.

^aAmount identified as available for award in published program funding opportunity announcements.

^bTotal federal cost share amount for the full selected or awarded projects (as identified in selection or award documentation). For awards with multiple phases this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^cRepresents the amount obligated to award recipients but does not include funding obligated for OCED's program direction.

^dSome of the projects in the Advanced Nuclear Portfolio were previously awarded by Office of Nuclear Energy and transferred to OCED.

^eOCED used \$50 million from its overall fiscal year 2023 annual appropriations for the Distributed Energy Systems Demonstrations Portfolio.

Table 6: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Advanced Nuclear Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded ^a	Funding: Appropriated ^b	Funding: Competed ^c	Funding: Committed ^d	Funding: Obligated ^e
Advanced Reactor Demonstrations Projects:	\$2,477	f	\$2,302	\$1,095
Advanced Reactor Demonstrations Projects: X-energy Xe-100 Advanced Reactor Demonstration Project			845	447
Advanced Reactor Demonstrations Projects: Natrium TM Demonstration Project			1,457	648
Generation III+ Small Modular Reactor Pathway to Deployment	800	800	0	0
Portfolio total	3,277	800	2,302	1,095

Source: GAO analysis of Department of Energy data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bAdvanced Reactor Demonstration Projects funding was appropriated through the Infrastructure Investment and Jobs Act (IIJA). The Generation III+ Small Modular Reactor Pathway to Deployment funding was appropriated through reprogramming of unobligated IIJA appropriations.

^cAmount identified as available for award in published program funding opportunity announcements.

^dTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^eRepresents the amount obligated to award recipients but does not include funding obligated for OCED's program direction.

^fThe Advanced Reactor Demonstration Projects were previously awarded by Office of Nuclear Energy in fiscal year 2021 and transferred to OCED in the IIJA legislation.

Table 7: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Carbon Management Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded ^a	Funding: Appropriated ^b	Funding: Competed ^c	Funding: Committed ^d	Funding: Obligated ^e
Carbon Capture Large-Scale Pilot Projects	\$937	\$820	\$304	\$14
Carbon Capture Pilot at Cane Run Generating Station			72	5
Carbon Capture Pilot at Vicksburg Containerboard Mill			88	4
Carbon Capture Pilot at Big Spring Refinery			95	0
Carbon Capture Pilot at Dry Fork Power Station			49	5
Carbon Capture Demonstration Projects Program	2,537	1,700	890	25
Baytown Carbon Capture and Storage Project			270	13
Project Tundra CCS Commercial Demonstration			350	4
Sutter Decarbonization Project			270	9
Front-End Engineering Design Studies for Integrated Carbon Capture, Transport, and Storage Systems	100	189	51	46
Duke Energy Indiana, LLC: Edwardsport Flex Fuel Integrated Capture for Indiana's EEnergy Transition (EFFICIENT)			8	8
Heidelberg Materials US Inc			5	5
Taft Carbon Capture			Withdrawn	Withdrawn
Polk Power Station CO2 Capture Project			5	5
Lake Charles Power Station Integrated CO2 Capture Project			9	9
Integrated Carbon Capture and Storage Project at Dry Fork Station			5	5
Four Corners Power Plant Integrated CCS Project			7	7
Foreman Cement Plant Carbon Capture and Storage FEED			8	8
Integrated Capture, Transport, and Geological Storage of CO2 Emissions from City Water, Light and Power			5	0
Regional Direct Air Capture Hubs (Topic Area 3)	3,500	1,100 ^f	1,050	100
Project Cypress DAC Hub			550	50
South Texas DAC Hub			500	50
Portfolio total	7,074	3,809	2,295	186

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bThe Infrastructure Investment and Jobs Act (IIJA) appropriated funding to OCED for the Carbon Capture Large-Scale Pilot Projects program and the Carbon Capture Demonstrations Projects program. OCED is also managing two programs for which IIJA appropriated funding to Department of Energy's Fossil Energy and Carbon Management Office: the Front-End Engineering Design Studies and the Regional Direct Air Capture Hubs program.

^cAmount identified as available for award in published program funding opportunity announcements.

^dTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^eRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

^fA total of \$1.2 billion were competed in this funding opportunity announcement, of which OCED is responsible for the \$1.1 billion topic area 3.

Table 8: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Clean Energy Demonstration Program on Current and Former Mine Land Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded ^a	Funding: Appropriated ^b	Funding: Competed ^c	Funding: Committed ^d	Funding: Obligated ^e
Clean Energy Demonstration Program on Current and Former Mine Land	\$500	\$450	\$475	\$16
Copper Recovery in Arizona for the Domestic Energy Supply Chain			80	0
Lewis Ridge Pumped Storage Project			81	12
Decarbonizing Gold Mines in Nevada			95	0
Mineral Basin Solar Project			90	2
A Model for Transition: Coal-to-Solar in West Virginia			129	2
Portfolio total	500	450	475	16

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bThe Infrastructure Investment and Jobs Act appropriated the funding for the Clean Energy Demonstration Program on Current and Former Mine Land portfolio.

^cAmount identified as available for award in published program funding opportunity announcements.

^dTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^eRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

Table 9: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Distributed Energy Systems Demonstrations Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded ^a	Funding: Appropriated	Funding: Competed ^b	Funding: Committed ^c	Funding: Obligated ^d
Distributed Energy Systems Demonstrations	\$50 ^e	\$50	\$49	0
GRI Integration and Demonstration of FLEXible Energy Resources			17	0
Outer Cape Microgrid Optimization			20	0
Prime Time Virtual Power Plant			13	0
Portfolio total	50 ^e	50	49	0

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bAmount identified as available for award in published program funding opportunity announcements.

^cTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^dRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

^eOCED used \$50 million from its overall fiscal year 2023 annual appropriations for the Distributed Energy Systems Demonstrations Portfolio.

Table 10: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Energy Improvements in Rural or Remote Areas Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded ^a	Funding: Appropriated	Funding: Completed ^b	Funding: Committed ^c	Funding: Obligated ^d
Energy Improvement in Rural or Remote Areas Fixed Award Grant	^e	\$50	\$81	\$30
Adams Electric Cooperative Green Energy			5	3
Clean Energy and Efficiency for Dallas County Alabama Schools			5	0
Cost-Effective and Equitable Cooperative Community Solar in Western Maine			5	2
Decarbonizing the Tongass with Tribally Owned Heat Pumps			3	0
East Central Community College Solar and Lighting Upgrades			3	0
Greencare: Empowering Resilience in Poteau			5	3
Grid Access and Resiliency for Unserved Rural and Indigenous People Project			5	2
High Penetration Solar-Battery Project in Ambler, Alaska			2	0
Kokhanok's Paradigm Shift - Big Battery Energy Backbone			5	2
Lake City Area Power and Resiliency Augmentation Enterprise			5	1
Navajo Sun Power! Home Solar Installation Project			3	3
New Stuyahok Solar-Battery Project			4	1
Independent Power Energy Improvement Project			2	2
Permanent, High-Quality Clean Energy Access for Rural Indigenous Communities			5	5
Ravalli Electric Community Storage Project			5	0
Improving Reliability and Cost Effectiveness of the Electric Grid in Rural Areas Using Environmentally Sound Practices			5	0.5
Transmission Line Rebuild			5	1
Rural Rebuild and Reconductor			5	1
Tanacross Solar PV and Tok Battery Energy Storage System			5	3
Energy Improvement in Rural or Remote Areas	^e	700	366	28
Advancing Energy Sovereignty for Taos Pueblo			10	0
Alaskan Tribal Energy Sovereignty			26	4
Chignik Hydroelectric Dam and Water Source Project			7	0.06
Clean Energy in the Northwest Arctic			55	0
Rural Community Bioenergy Facilities for Energy Resiliency and Forest Climate Adaptation			30	8
Energizing Rural Hopi and Navajo with Solar Powered Battery-Based Systems			8	0.4
Fort Lupton Microgrid Project			6	0.3
Whole-Home Heat Pump Solutions for Mobile/Manufactured Homes			10	0.03
Achieving Resilience, Sovereignty, and Economic Independence through Community Solar			9	1
Mashkiiziibii Minigrid			14	1
Microgrids for Community Affordability, Resilience, and Energy Decarbonization (CARED)			45	9
Montezuma Microgrid			9	0
Old Harbor Hydroelectric Project			10	1
Resilience and Prosperity in Rural Northern Wisconsin			10	0
Solar + Storage Microgrids for Rural Community Health Centers			57	0

Program: Projects selected or awarded^a	Funding: Appropriated	Funding: Competed^b	Funding: Committed^c	Funding: Obligated^d
Thayer Hydroelectric Project			27	3
Yakama Tribal Solar Canal & Hydro Project			32	1
Energizing Rural Communities Prize	^e	15	13	13
67 Phase 1 awards and 33 Phase 2 awards			13 ^f	13 ^f
Portfolio total	1,000	765	461	71

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bAmount identified as available for award in published program funding opportunity announcements.

^cTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^dRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

^eThe Infrastructure Investment and Jobs Act appropriated funding to carry out activities for energy improvement in rural and remote areas, which OCED used to develop the three programs in the portfolio.

^fOCED provided 67 winning organizations with a cash award of \$100,000 in Phase 1. Each winning organization was eligible to participate in Phase 2, where 33 organizations received cash awards of \$200,000.

Table 11: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Industrial Demonstrations Portfolio, as of October 2024

Dollars in millions

Program: Project Category: Projects selected or awarded^a	Funding: Appropriated	Funding: Competed^b	Funding: Committed^c	Funding: Obligated^d
Industrial Decarbonization and Emissions Reduction Demonstration-to-Deployment	\$6,312 ^e	\$6,300	\$5,928	\$78
Aluminum and Metals: Advanced Copper Recycling Facility			270	0
Aluminum and Metals: Green Aluminum Smelter			500	0
Aluminum and Metals: Low Carbon SmartMelt Furnace Conversion			75	4
Aluminum and Metals: Nexcast - Next Generation Aluminum Mini Mill			22	0
Aluminum and Metals: Zero Waste Advanced Aluminum Recycling			67	0
Cement and Concrete: Deeply Decarbonized Cement			189	0
Cement and Concrete: First Commercial Electrochemical Cement Manufacturing			87	0
Cement and Concrete: Lebec Net Zero Cement Plant Project			500	0
Cement and Concrete: Calcined Clay Production for Limestone Calcined Clay Cement			62	1
Cement and Concrete: Low-Carbon Calcined Clay Cement Demonstration			216	0
Cement and Concrete: Mitchell Cement Plant Decarbonization Project			500	0.3
Chemicals and Refining: Baytown Olefins Plant Carbon Reduction Project			332	0
Chemicals and Refining: ISP Chemicals LLC			Withdrawn	Withdrawn
Chemicals and Refining: Novel CO2 Utilization for Electric Vehicle Battery Chemical Production			95	0
Chemicals and Refining: Advanced manufacturing facility for low carbon intensity, fully chemically recycled polyethylene terephthalate			375	37
Chemicals and Refining: Star e-Methanol			100	0
Chemicals and Refining: Sustainable Ethylene from Chemicals and Refining: CO2 Utilization with Renewable Energy (SECURE)			200	0
Chemicals and Refining: Decarbonization through Replacing Waste Steam Incinerators with Plasma Gasification to Produce Syngas			75	2
Food and Beverage: Decarbonization of Unilever Ice Cream Manufacturing			21	0
Food and Beverage: Delicious Decarbonization Through Integrated Electrification and Energy Storage			171	0
Food and Beverage: Heat Batteries for Deep Decarbonization of the Beverage Industry			75	0
Glass: Demonstration of Low-Emission Glass Furnace Glass: Technology with Flexible Fuel Source			45	1
Glass: Glass Furnace Decarbonization Technology			125	0
Glass: Hybrid Electric Glass Furnace Project			75	0
Iron and Steel: Hydrogen-Fueled Zero Emissions Steel Making			500	0

Program: Project Category: Projects selected or awarded^a	Funding: Appropriated	Funding: Competed^b	Funding: Committed^c	Funding: Obligated^d
Iron and Steel: IRA: Hydrogen-Ready Flex-Fuel Direct Reduced Ironmaking and Electric Melting Furnace Retrofit at Cleveland-Cliffs Integrated Iron and Steel Facility			500	10
Iron and Steel: Induction Melting Upgrade			75	0
Iron and Steel: Decarbonization and Emissions Reduction Initiative: Alabama Works Conversion to Induction Melting			76	3
Iron and Steel: Low-Emissions, Cold-Agglomerated Iron Ore Briquette Production			283	0
Iron and Steel: IRA: Steel Slab Electrified Induction Reheat Furnace Upgrade to Reduce GHG Emissions and Enhance Quality Project			75	19
Process Heat: Steam-Generating Heat Pumps for Cross-Sector Deep Decarbonization			145	0
Process Heat: Casa Grande Vikrell Electric Boiler & Microgrid System			51	1
Pulp and Paper: Pulp and Paper Energy Efficiency and Electrification Upgrades			47	0
Portfolio total	6,312	6,300	5,928	78

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bAmount identified as available for award in published program funding opportunity announcements.

^cTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^dRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

^eThe Industrial Demonstrations portfolio was appropriated \$500 million in the Infrastructure Investment and Jobs Act and \$5,812 million in the Inflation Reduction Act for a total of \$6,312 million.

Table 12: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Long-Duration Energy Storage Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded ^a	Funding: Appropriated ^b	Funding: Competed ^c	Funding: Committed ^d	Funding: Obligated ^e
Energy Storage Pilot Demonstrations	f	\$100	\$0	\$0
Long-Duration Energy Storage Demonstrations	\$355	349	286	23
Communities Accessing Resilient Energy Storage (CARES)			10	1
Repurposed EV Batteries for Long-Duration Energy Storage Applications and Resilient Communities			10	1
Stored Rechargeable Energy Demonstration (STORED)			7	1
Rural Energy Viability for Integrated Vital Energy (REVIVE)			30	0
Children's Hospital Resilient Grid with Energy Storage (CHARGES)			30	3
Front of the Meter Utilization of Zinc Bromide Energy Storage			49	0.4
Columbia Energy Storage Project			31	7
Resilient Energy for the Railbelt: Pumped Thermal Storage in Alaska			50	5
Multiday Storage at Scale for Firm Renewable Energy			70	4
Long-Duration Energy Storage Demonstrations National Laboratory Call	f	30	29	0
Argonne National Lab and Idaho National Lab with CMBlu			6	0
Sandia National Lab			4	0
National Renewable Energy Lab (H2-battery)			5	0
Sandia National Lab with E-Zinc			Withdrawn	Withdrawn
Pacific Northwest National Lab with Invinity Energy Systems			10	0
National Renewable Energy Lab (TES)			4	0
Portfolio total	505	479	315	23

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Notes: Values may not sum to totals shown due to rounding. OCED jointly awarded funding for one additional program, but this program information was finalized too late to be included in our review.

^aProjects selected for award negotiations, or that have been awarded.

^bThe Infrastructure Investment and Jobs Act (IIJA) appropriated the funding for the Long-Duration Energy Storage portfolio.

^cAmount identified as available for award in published program funding opportunity announcements.

^dTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^eRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

^fThe IIJA appropriated \$150 million to carry out the Long-duration Demonstration Initiative and Joint Program, which OCED used to carry out activities for programs in this portfolio.

Table 13: Status of Office of Clean Energy Demonstrations (OCED) Programs in the Regional Clean Hydrogen Hubs Portfolio, as of October 2024

Dollars in millions

Program: Projects selected or awarded^a	Funding: Appropriated	Funding: Competed^b	Funding: Committed^c	Funding: Obligated^d
Regional Clean Hydrogen Hubs	e	\$7,000	\$7,000	\$109
Appalachian Regional Clean Hydrogen Hub (ARCH2)			925	30
ARCHES DOE H2 Hub			1,200	30
Gulf Coast Hydrogen Hub			1,200	0
Heartland Hydrogen Hub			925	0
Mid-Atlantic Hydrogen Hub			750	0
Midwest Alliance for Clean Hydrogen Hub			1,000	22
Pacific Northwest Hydrogen Association (PNWH2 Hub) – Phase I			1,000	28
Clean Hydrogen Hubs Demand-Side Support	e	1,000	10	10
EFI Foundation			10	10
Portfolio total	8,000	8,000	7,010	119

Source: GAO analysis of Department of Energy documents and data. | GAO-25-106748

Note: Values may not sum to totals shown due to rounding.

^aProjects selected for award negotiations, or that have been awarded.

^bAmount identified as available for award in published program funding opportunity announcements.

^cTotal federal cost share amount for the full selected or awarded project (as identified in selection or award documentation). For awards with multiple phases, this represents the full federal amount if the project successfully meets all milestone requirements to advance to subsequent phases and is subject to future award negotiations at the end of each phase.

^dRepresents the amount obligated to award recipients but does not include funding obligated for program direction.

^eThe Infrastructure Investment and Jobs Act appropriated funding for Regional Clean Hydrogen Hubs, which OCED used to develop the two programs in this table.

Appendix II: Comments from Department of Energy



Department of Energy
Washington, DC 20585

October 28, 2024

Mr. Frank Rusco
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

Dear Mr. Rusco:

The Department of Energy (DOE or Department) appreciates the opportunity to comment on the Government Accountability Office's (GAO) draft report titled, "*Clean Energy: New DOE Office Should Take Steps to Improve Performance Management and Workforce Planning (GAO-25-106748)*."

As recognized in the report, the Department's Office of Clean Energy Demonstrations (OCED) was established in December 2021 to manage a historic amount of funding for clean energy projects. In the nearly three years since its establishment, OCED has issued funding announcements for all its demonstration and pilot programs, selected projects for the majority of its programs, and completed negotiations for the initial phase of work for a substantial number of projects. Noting that OCED has made significant progress on its programs while simultaneously building up its workforce, we fully recognize that more work is needed over the next few years to formalize OCED's suite of planning and guidance documents over the lifecycle of its programs.

The draft report contained two recommendations from GAO and DOE concurs with both. Therefore, the Department will implement GAO's recommendations articulated in the draft report. The first recommendation on performance management will be a focus area for OCED in Fiscal Year (FY) 2025. Regarding the second recommendation on ensuring that OCED has the workforce in place to meet its needs, OCED will develop a strategic workforce plan in FY 2025 and evaluate progress toward human capital goals.

GAO should direct any questions to Casey Johnson, Office of Clean Energy Demonstrations, at (240) 243-8666 or casey.johnson2@hq.doe.gov.

Sincerely,

KELLY
CUMMINS

Digitally signed by KELLY
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Date: 2024.10.28
12:08:08 -04'00'

Kelly Cummins
Acting Director
Office of Clean Energy Demonstrations

Enclosure

Management Response
GAO Draft Report:
Clean Energy: New DOE Office Should Take Steps to Improve Performance
Management and Workforce Planning (GAO-25-106748)

Recommendation 1: The Director of Office of Clean Energy Demonstrations (OCED) should take steps to fully implement leading performance management practices related to performance management. These practices include defining goals and outcomes for all OCED activities, collecting performance information to measure progress toward goals, and using that information to assess results and make decisions, and ensure accountability.

DOE Response: Concur

Given the current status of OCED's portfolio (e.g., over 100 projects selected from funding opportunities), OCED will be updating its Multi-Year Program Plan (MYPP) to outline its near-, mid-, and long-term goals supported by the selected projects and anticipated programs funded through the Bipartisan Infrastructure Act, Inflation Reduction Act, and annual appropriations. This will provide an additional layer of specificity not in the first MYPP given the nascency of OCED.

Regarding measuring project- and program-level investments and impacts, OCED negotiated terms in the awards that allow OCED to collect key project performance data and information during each phase to be used internally for portfolio risk management and project management oversight decision making (such as go/no go reviews). OCED has also negotiated terms that allow data to be aggregated and anonymized for publications that inform a broad set of stakeholders on the progress of clean energy demonstration projects toward commercial liftoff. In addition to updates to Pathway to Commercial Liftoff reports, OCED is working on a Portfolio Insight Series to describe program- and project-level impacts that could ultimately catalyze the crowding in of private sector funding in particular technologies or sectors where clean energy demonstrations are making significant progress toward being derisked.

To help set the framework for these efforts, at the start of fiscal year (FY) 2025, OCED will establish specific organizational goals to accomplish in FY 2025. OCED will ensure that these goals align with DOE strategic goals and that significant OCED goals are reflected in DOE's performance management program. OCED Leadership will review progress against these goals on a quarterly basis, as well as review status against the goals at an annual OCED offsite with all OCED staff.

Estimated Completion Date: September 30, 2025

Management Response
GAO Draft Report:
Clean Energy: New DOE Office Should Take Steps to Improve Performance
Management and Workforce Planning (GAO-25-106748)

Recommendation 2: The Director of OCED should take steps to fully implement leading practices for effective workforce planning by developing a strategic workforce plan and processes to monitor and evaluate progress towards its human capital goals.

DOE Response: Concur

OCED will develop a robust and detailed strategic workforce plan in FY 2025. As a Departmental Element of the Department of Energy (DOE), OCED conducts workforce planning in line with the agency's requirements. These actions include prioritizing recruitment actions by quarter, analyzing workforce data to refine recruitment methods, and collaborating with the Office of the Human Capital Officer and other DOE offices on recruitment activities. In FY 2024, OCED launched a tailored training curriculum and in FY 2025 is expanding that into a training and development program for staff that will help address skill gaps and support career planning for the current workforce. OCED will also evaluate improvements needed in its workforce planning process and capture specific goals in a strategic workforce plan that will support the attainment of human capital goals.

Estimated Completion Date: March 30, 2025

Accessible Text for Appendix II: Comments from Department of Energy

Department of Energy
Washington, DC 20585

October 28, 2024

Mr. Frank Rusco
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

Dear Mr. Rusco:

The Department of Energy (DOE or Department) appreciates the opportunity to comment on the Government Accountability Office's (GAO) draft report titled, "Clean Energy: New DOE Office Should Take Steps to Improve Performance Management and Workforce Planning (GAO-25-106748)."

As recognized in the report, the Department's Office of Clean Energy Demonstrations (OCED) was established in December 2021 to manage a historic amount of funding for clean energy projects. In the nearly three years since its establishment, OCED has issued funding announcements for all its demonstration and pilot programs, selected projects for the majority of its programs, and completed negotiations for the initial phase of work for a substantial number of projects. Noting that OCED has made significant progress on its programs while simultaneously building up its workforce, we fully recognize that more work is needed over the next few years to formalize OCED's suite of planning and guidance documents over the lifecycle of its programs.

The draft report contained two recommendations from GAO and DOE concurs with both. Therefore, the Department will implement GAO's recommendations articulated in the draft report. The first recommendation on performance management will be a focus area for OCED in Fiscal Year (FY) 2025. Regarding the second recommendation on ensuring that OCED has the workforce in place to meet its needs, OCED will develop a strategic workforce plan in FY 2025 and evaluate progress toward human capital goals.

GAO should direct any questions to Casey Johnson, Office of Clean Energy Demonstrations, at (240) 243-8666 or casey.johnson2@hq.doe.gov.

Sincerely,

KELLY CUMMINS

Digitally signed by KELLY CUMMINS
Date: 2024.10.28
12:08:08 -04'00'

Kelly Cummins
Acting Director
Office of Clean Energy Demonstrations

Enclosure

Recommendation 1: The Director of Office of Clean Energy Demonstrations (OCED) should take steps to fully implement leading performance management practices related to performance management. These practices include defining goals and outcomes for all OCED activities, collecting performance information to measure progress toward goals, and using that information to assess results and make decisions, and ensure accountability.

DOE Response: Concur

Given the current status of OCED’s portfolio (e.g., over 100 projects selected from funding opportunities), OCED will be updating its Multi-Year Program Plan (MYPP) to outline its near-, mid-, and long-term goals supported by the selected projects and anticipated programs funded through the Bipartisan Infrastructure Act, Inflation Reduction Act, and annual appropriations. This will provide an additional layer of specificity not in the first MYPP given the nascency of OCED.

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Estimated Completion Date: September 30, 2025

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Estimated Completion Date: March 30, 2025

Endnotes

¹IIJA, Pub. L. No. 117-58, 135 Stat. 429, 1376-79 (2021); and “An Act To Provide for Reconciliation Pursuant to Title II of S.Con. Res. 14,” Pub. L. 117-169, § 50161(a), 136 Stat. 1818, 2049 (2022) (codified at 42 U.S.C. § 17113b(a)) (commonly known as the Inflation Reduction Act).

²Our review covers funded projects that OCED manages (according to OCED officials), and appropriations for these projects come from a variety of sources, including the IIJA, Inflation Reduction Act, and other appropriations.

³The IIJA reserved for administrative costs up to 3 percent of the program appropriations to OCED and Fossil Energy and Carbon Management (FECM), including the FECM programs managed by OCED. IIJA, 135 Stat. at 1379. This reserve was later amended to up to 5 percent. Consolidated Appropriations Act, 2024, Pub. L. No. 118-42, § 314(d), (e), 138 Stat. 25, 212 (2024). The Inflation Reduction Act reserves for administrative costs not more than \$300 million of the \$5,812 million appropriated for the program, which is approximately 5.2 percent of the total. Inflation Reduction Act § 50161(a), (f), 136 Stat. at 2049–50 (codified at 42 U.S.C. § 17113b(a), (f)).

⁴According to OCED, the majority of OCED’s funding will be issued through a competitive process, as described in our report. OCED uses different program development and proposal review processes for some of its funding, such as for its Liffoff Enabling Programs, and these are not included in GAO’s review of OCED’s processes.

⁵We refer to applicants whose proposals were selected by OCED for award negotiations as “selectees” throughout this report.

⁶GAO, *Carbon Capture and Storage: Actions Needed to Improve DOE Management of Demonstration Projects*, [GAO-22-105111](#) (Washington, D.C.: Dec. 20, 2021).

⁷GAO, *Decarbonization: Opportunities Exist to Improve the Department of Energy’s Management of Risks to Carbon Capture Projects*, [GAO-24-106489](#) (Washington, D.C.: May 16, 2024).

⁸[GAO-22-105111](#).

⁹GAO, *Government Performance Management: Leading Practices to Enhance Interagency Collaboration and Address Crosscutting Challenges*, [GAO-23-105520](#) (Washington, D.C.: May 24, 2023).

¹⁰[GAO-23-105520](#).

¹¹For the purposes of this report, we refer to these steps as leading practices. See GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GGD-96-118](#) (Washington, D.C.: June 1, 1996).

¹²GAO, *Evidence-Based Policymaking: Practices to Help Manage and Assess the Results of Federal Efforts*, [GAO-23-105460](#) (Washington, D.C.: July 12, 2023).

¹³[GAO-23-105460](#).

¹⁴GAO, *FDA Workforce: Agency-Wide Workforce Planning Needed to Ensure Medical Product Staff Meet Current and Future Needs*, [GAO-22-104791](#) (Washington, D.C.: Jan. 14, 2022)

¹⁵[GAO-22-104791](#); *Human Capital: Key Principles for Effective Strategic Workforce Planning*, [GAO-04-39](#) (Washington, D.C.: Dec. 11, 2003).

¹⁶GAO, *DOE Loan Programs: DOE Should Fully Develop Its Loan Monitoring Function and Evaluate Its Effectiveness*, [GAO-14-367](#) (Washington, D.C.: May 1, 2014)

¹⁷[GAO-22-104791](#).

¹⁸U.S. Department of Energy, Office of Inspector General, Special Report: Prospective Considerations for Clean Energy Demonstration Projects, DOE-OIG-22-39 (Washington, D.C.: Aug. 12, 2022).

¹⁹[GAO-23-105520](#).

²⁰[GAO-23-105460](#).

²¹[GAO-22-104791](#); [GAO-04-39](#).

²²Pub. L. No. 117-58, div. D, tit. XII, § 41201(f)(2), 135 Stat. at 1131 (2021) (codified as amended at 42 U.S.C. § 18861(h)(2)). This engagement started with funding provided in the Consolidated Appropriations Act of 2023, the Joint Explanatory Statement for which included a provision for GAO to conduct oversight, including audits and investigations, in support of implementation of the IIJA. House Cmtee. Print 50-348 (117th Cong.), “Legislative Text and Explanatory Statement for Pub. L.

No. 117-328, Consolidated Appropriations Act, 2023 (Book 2 of 2),” div. I, at p. 2342. Work continues using other available funds from GAO’s general appropriation. Further Consolidated Appropriations Act, 2024, Pub. L. No. 118-47, div. E, tit. I, 138 Stat. 460.