NATIONAL LABORATORY OF THE ROCKIES

REopt

Accessing and Understanding REopt's Federal Assumptions

Overview

Accessible via **user-friendly web tool and open-source code**, REopt® is a techno-economic optimization platform that facilitates life cycle cost (LCC) analysis of on-site energy technologies. REopt identifies the most affordable mix, sizing, and operations of on-site energy technologies to help agencies save money and improve energy security.

Need more help?

This guide supplements existing REopt resources including:

- REopt Web Tool User Guides
- REopt Web Tool User Manual
- REopt Web Tool "tool tips"

For additional REopt resources for the federal sector, see FEMP's REopt webpage.

REopt now includes built-in default values for federal users, accessible via a federal sector input shown in Figure 1. These federal default values include financial modeling assumptions based on U.S. statutory requirements for LCC analyses of energy conservation measures at federal facilities per 10 CFR 436 Subpart A, along with federal tax considerations. Specifically, when a user changes the sector to "federal," the default values for the following inputs are updated: ownership model, host discount rate, O&M and energy cost escalation rates, tax rate, and incentives.

This guide introduces the regulatory context for federal defaults in REopt, describes how users can access these defaults in the REopt Web Tool, and explains the default financial inputs for federal sites. Note that although this guide focuses on evaluating a single federal site in REopt, these federal default values are also accessible for portfolio screenings and sensitivity analyses.

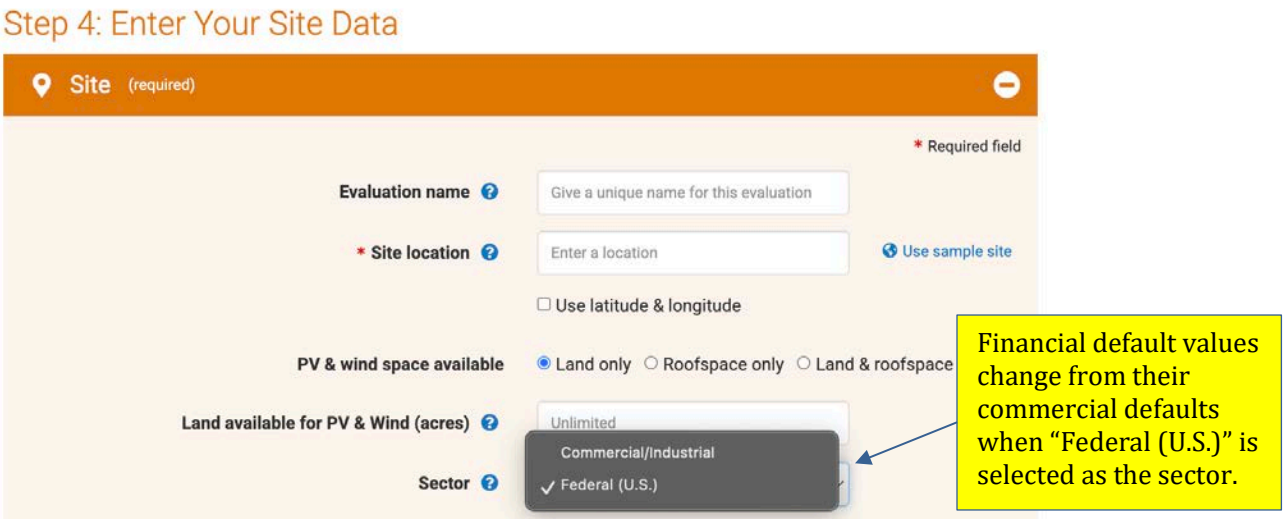


Figure 1. REopt offers tailored default assumptions for analyses at federal sites.

Context for Federal Default Assumptions in REopt

REopt now offers default values tailored to federal facilities, aligned with 10 CFR 436 Subpart A. This regulation establishes the statutorily required methodology to standardize LCC analysis of energy conservation measures for federal facilities. It includes specific **discount rates**, **inflation rates**, and **energy cost escalation rates** described in National Institute of Standards and Technology (NIST) Handbook 135 "Life Cycle Costing Manual for the Federal Energy Management Program" ("NIST Handbook") and updated annually its Annual Supplement ("NIST Annual Supplement").[1]

Additionally, REopt's default federal assumptions include **tax rates, tax incentives, and ownership models** tailored to reflect federal procurement mechanisms.

Note that REopt is intended for pre-feasibility analyses: it does not provide detailed engineering designs or detailed financial models for specific procurement methods, nor is it a regulatory tool. Engineers, procurement specialists, and other federal stakeholders should use other tools to prepare project designs, detailed financial plans, and regulatory reports.

Accessing Federal Default Values in REopt

Figure 2 shows where in REopt to indicate that the analysis is for a U.S. federal facility. Once "Federal (U.S.)" is selected as the sector, the "Federal procurement category" will appear. Users can select the procurement category to consider for this site.

Because key federal assumptions (specifically, energy cost escalation rates) vary by location, users can specify the site location by indicating the U.S. state or "Other" (which uses U.S. national averages). **Once the federal procurement category and U.S. state are selected, default values will automatically populate to align with the selection.**

[1] Please refer to values and guidance from the most recent versions of these documents when they are available. This REopt Federal Assumptions guide references the latest versions of the NIST Handbook 135 and associated Annual Supplement for which published values are available (2025 NIST Handbook 135 and 2025 Annual Supplement) at time of publication.

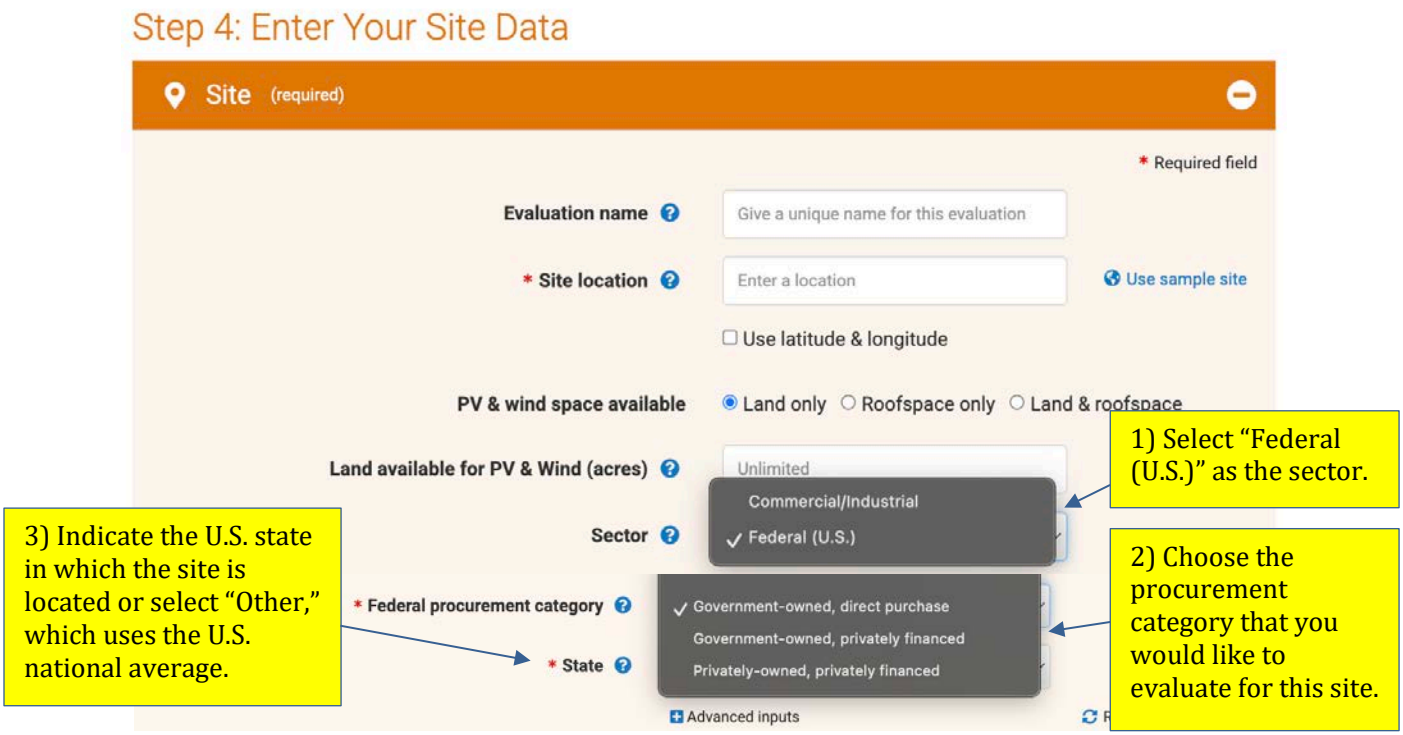


Figure 2. How to tailor REopt default values for analyses of federal sites.

Table 1 shows federal procurement options that align with the federal procurement categories in the REopt dropdown. The default values for each of these federal procurement categories are summarized in the next section.

Table 1. Federal procurement options mapped to REopt federal procurement categories.

REopt Federal Procurement Category	Potential Federal Procurement Options
Government Owned – Direct Purchase	Appropriations
Government Owned – Third-Party Financed	UESC/USC, ESPC
Privately Owned – Third-Party Financed	ESPC ESA, On-Site Electricity Purchase Contracts

Summary of Assumptions for Federal Agencies in REopt

Table 2 summarizes default REopt inputs that are customized when "Federal (U.S.)" is selected as the sector, organized by procurement type and associated REopt federal procurement category. These inputs are explained in more detail, with screenshots, in the sections that follow. Note that this guide shows inputs in units of nominal, rather than real, dollars (nominal values reflect current market prices, while real values adjust for inflation to reflect purchasing power).

Table 2. Summary of current[2] federal REopt analysis assumptions when conducting an analysis in nominal dollars. Orange cells indicate a difference between commercial and federal default values.

Ownership and Financing Options		Government Owned – Direct Purchase (e.g., Appropriations)	Government Owned – Third-Party Financed (e.g., UESC/USC, ESPC)	Privately Owned – Third-Party Financed (e.g., ESPC ESA, On-Site Electricity Purchase Contracts)
REopt Inputs	Use Third-Party Model?	No	**Yes**	**Yes**
	Third-Party Discount Rate, Nominal	N/A	REopt default	REopt default
	Third-Party Tax Rate	N/A	REopt default[3]	REopt default[3]
	Host Discount Rate, Nominal	**4.5% (NIST)**	**4.5% (NIST)**	**4.5% (NIST)**
	Host Tax Rate	**0%**	**0%**	**0%**
	Electricity and Fuel Cost Escalation Rates, Nominal	**Varies[4] (NIST)**	**Varies**Error! Bookmark not defined. **(NIST)**	**Varies**Error! Bookmark not defined. **(NIST)**
	O&M Cost Escalation Rate[5]	**1.5%/year (NIST)**	**1.5%/year (NIST)**	**1.5%/year (NIST)**
	Federal Tax-Based Incentives (Federal %-based incentive, MACRS, Bonus MACRS)	**None[6]**	**None[6]**	REopt defaults

[2] NIST values shown are from the 2025 edition of the NIST Annual Supplement.
[3] Utilizing the REopt default third-party owner tax rate assumes the third party incurs the O&M costs and can claim these costs as tax-deductible. If instead the agency pays for O&M, this "Third-Party Tax Rate" can be set to 0%.
[4] Electricity and fuel cost escalation rate assumptions vary by state/region and depend on the analysis period duration and sector. See the "Updated Default Values for Federal Sector, Explained" section for more information.
[5] Nonfuel O&M costs are assumed to increase at the inflation rate specified in the NIST Annual Supplement.
[6] Up to three incentive inputs modified per technology evaluated—Federal incentive based on percentage of cost: 0%; MACRS schedule: No MACRS; MACRS bonus depreciation: 0%.

Updated Default Values for Federal Sector, Explained

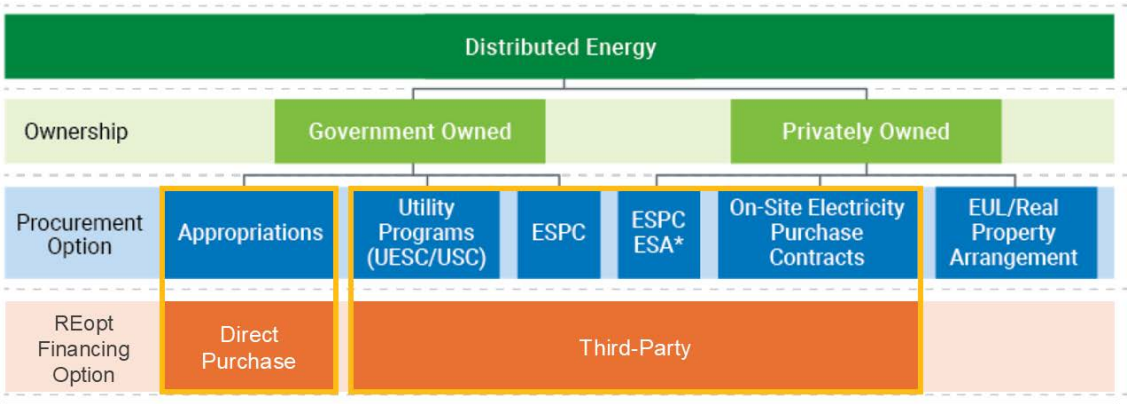
The subsections below explain the REopt default input values that are modified for federal analyses, as listed in Table 2. These default values automatically update when "Federal (U.S.)" is selected as the sector and a "Federal procurement category" and location (U.S. state) of the site are specified. Most federal-specific inputs are found in REopt's "Financial" section. The tax-based incentive inputs are located within the section for each technology being considered in the analysis.

Overview: Ownership Models

Figure 3 maps federal procurement options to REopt's two financial models—direct purchase or third-party. This mapping happens automatically in REopt when a user selects the federal procurement type. REopt's two financial models are summarized as follows:

1. REopt's **direct purchase** model assumes that the host—in this case, the federal agency—purchases, owns, and is responsible for operations and maintenance (O&M) costs of the distributed energy system. **Federal direct purchase of an energy project via appropriations most closely aligns with REopt's direct purchase model.**

2. REopt's **third-party** model assumes a third party develops and operates an energy system located at the host site, and the host consumes the energy and pays the third party for energy services. **Federal third-party procurement options, regardless of ownership type (e.g., government or privately owned), most closely align with REopt's third-party model.**



Legend and Abbreviations

UESC	Utility energy service contract	ESPC ESA*	ESPC energy sales agreement
USC	Utility service contract	EUL	Enhanced use lease
ESPC	Energy savings performance contract		

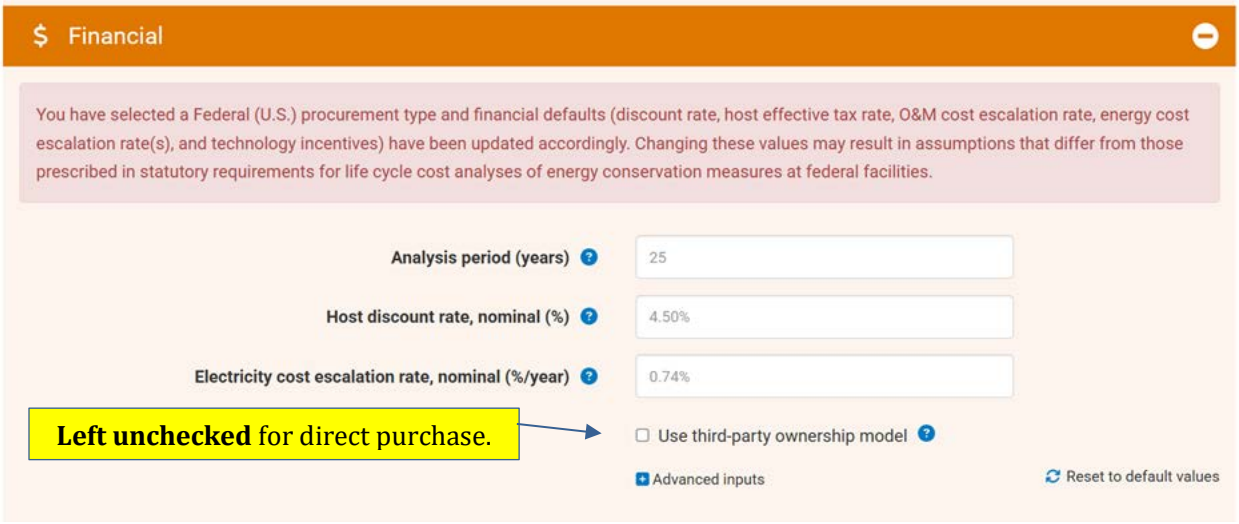
*System is privately owned initially; government must retain title by the end of the contract (Office of Management and Budget Memo requirement)

Figure 3. Federal distributed energy ownership, procurement, and financing options. Adapted from Federal On-Site Distributed Energy Procurement Options. Note that EUL/Real Property Arrangements do not typically align with REopt's financial models.

Federal Defaults for: Ownership Model Selection

Figure 4 shows the "Use third-party ownership model" checkbox that is either left blank or modified based on the procurement category chosen in the "Site" section.

REopt's Direct Purchase Model: Default for "Government-owned, direct purchase" procurement type.



REopt's Third-Party Model: Default for "Privately Financed" procurement types.

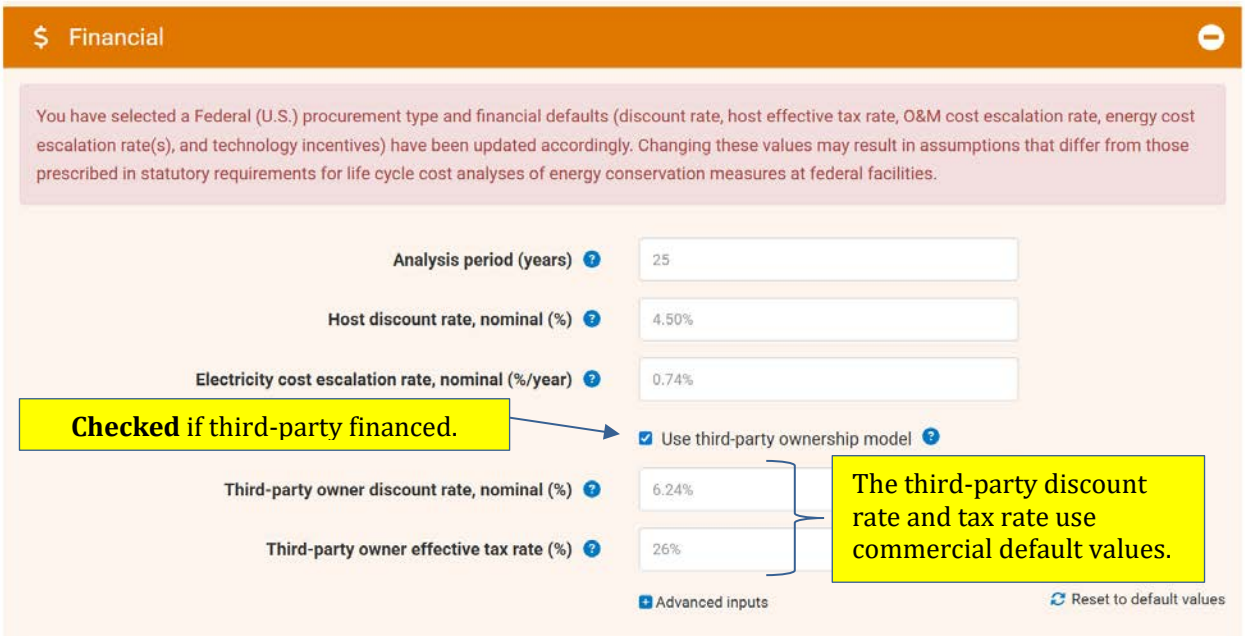


Figure 4. REopt web tool screenshot showing the third-party check box relevant to the intended federal energy procurement option. Note that while the input indicates third-party "ownership," this option more closely maps to federal third-party "financing" and is thus appropriate to be used for all federal third-party financing procurement options as shown in Figure 3.

While REopt captures high-level economics of direct vs. third-party-owned and/or -financed systems, the model **does not** fully capture the complexities of a particular financial arrangement. A more detailed financial model would be needed for this. Additional details on REopt's direct vs. third-party models are available in the REopt Web Tool User Manual. Additional information about federal on-site distributed energy procurement options is available from the Federal Energy Management Program (FEMP).

Federal Defaults for: Host Discount Rate, Host Tax Rate, O&M Cost Escalation Rate

For a federal analysis, the "host" is the federal agency. Regardless of procurement type, the host discount rate is modified to the value specified in the NIST Annual Supplement, and the host effective tax rate is updated to 0%. The O&M cost escalation rate is updated to the annual inflation rate specified by NIST.

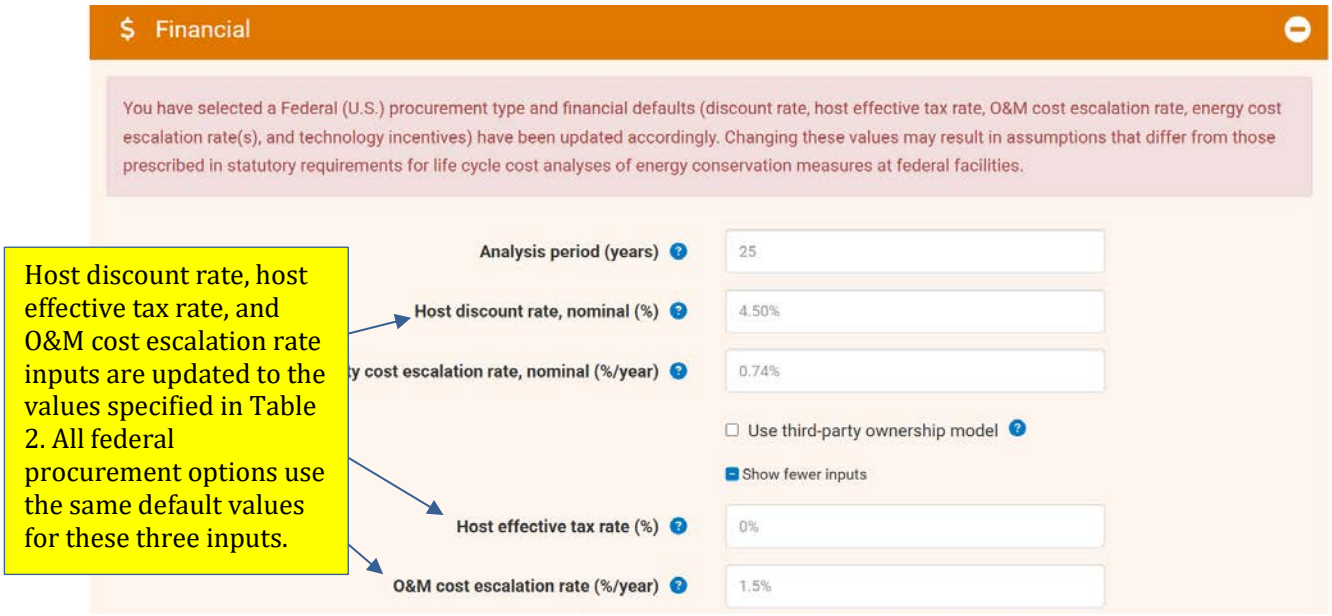


Figure 5. REopt web tool screenshot showing where to modify the "host discount rate, nominal," "host effective tax rate," and "O&M cost escalation rate" (inflation rate) inputs.

Federal Defaults for: Electricity and Fuel Cost Escalation Rates

Electricity and fuel cost escalation rate assumptions for federal life cycle cost analyses are mandated by 10 CFR 436A, which points to the NIST Handbook 135 and its Annual Supplement. NIST energy cost escalation rate values vary depending on the analysis period, census district, end-use sector (i.e., commercial vs. industrial), and energy type.

NIST provides these values for four U.S. Census regions and a U.S. national average in real terms as a modified uniform present value (UPV*) in a companion spreadsheet to the NIST Annual Supplement. These UPV* values can be converted to units of %/year, to align with REopt's energy cost escalation rate input units.

For convenience, Table 3 shows nominal electricity and fuel escalation rates calculated from NIST UPV* values by census district (mapped in Figure 6), assuming a start year of 2026, 25-year duration, commercial sector, and 1.5% annual inflation rate. These values are used as

REopt's default values. If users would like to assume a different start year, analysis period, or sector (commercial vs. industrial), they could calculate these escalation rates using NIST's UPV* tables.

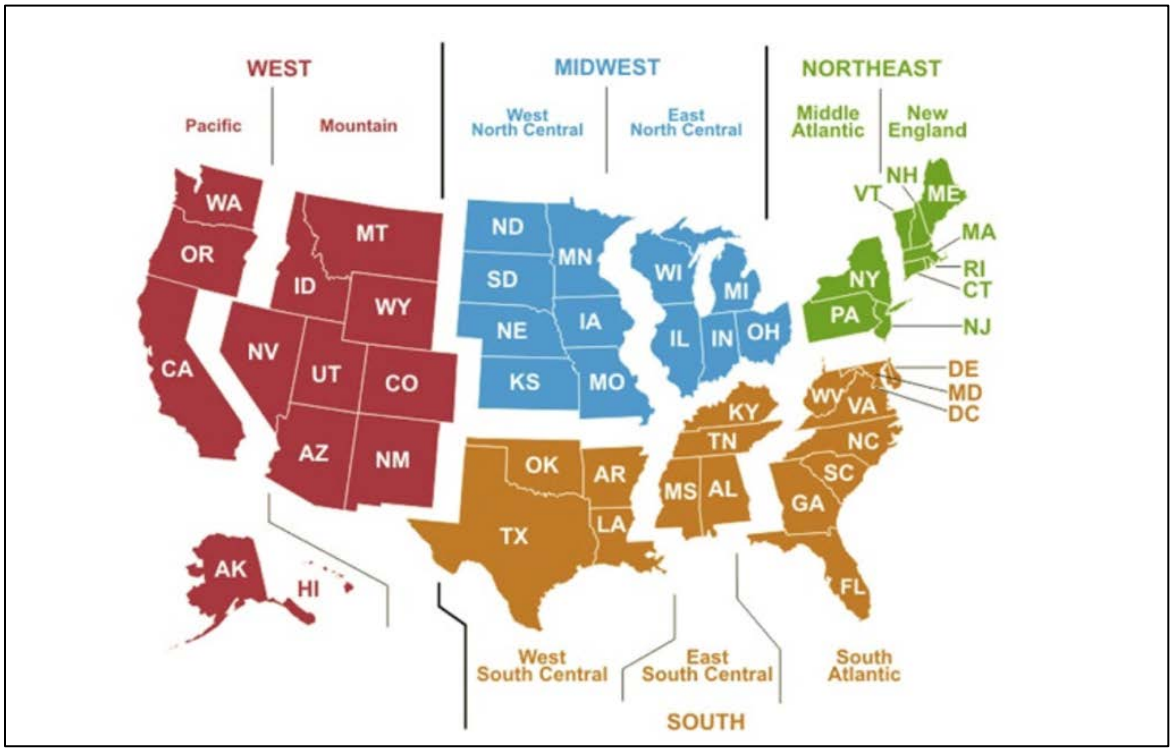


Figure 6. Census regions and districts used to determine applicable NIST energy cost escalation based on site location.

Table 3. NIST commercial electricity and fuel cost nominal escalation rates (%/year) by census region. Precalculated for convenience assuming a 2026 start year, 25-year duration, commercial sector.

Region	West		Midwest		South			Northeast		U.S.
District	Pacific	Mountain	West North Central	East North Central	West South Central	East South Central	South Atlantic	Middle Atlantic	New England	National Average
Electricity	-0.62%	0.68%	1.15%	0.64%	1.36%	0.83%	1.29%	1.01%	-0.03%	**0.74%**
Diesel	1.00%	1.08%	0.92%	0.93%	1.09%	1.09%	1.11%	1.03%	1.06%	**1.01%**
Natural Gas	0.79%	3.25%	3.63%	3.38%	2.30%	3.45%	3.02%	0.55%	2.60%	**2.40%**
Propane	2.96%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	**2.98%**

10 CFR 436A specifies the following **two exceptions to using values published by NIST**:

(1) "If the Federal agency is using component prices under §436.14(c), that agency may use corresponding component escalation rates provided by the energy or water supplier.

(2) For Federal buildings in foreign countries, the Federal agency may use a 'reasonable' escalation rate."

Additionally, the NIST Annual Supplement specifies that federal agencies and contractors are encouraged to seek electricity and fuel cost escalation rate projections from their local utility or energy supplier and can utilize these values in life cycle cost analyses instead of those published by NIST.[7] The NIST Annual Supplement further specifies that federal projects in states, territories, and commonwealths not covered by the census regions may use data that are "reasonable under the circumstances," and may refer to the tables with U.S. average data for guidance.[8]

Figure 7 shows where in the REopt Web Tool the default electricity and fuel cost escalation rates are updated for analyses at federal sites.

[7] "Federal agencies and contractors to federal agencies are encouraged to seek energy price projections from their local utility to use in place of the U.S. Department of Energy/Energy Information Administration projections, especially when evaluating alternative fuel types. In such cases, the Building Life Cycle Cost program can be used to calculate appropriate 'modified uniform present value' (UPV*) factors for use in the LCC analysis of federal capital energy efficiency, water conservation, or renewable resource projects." (NIST Annual Supplement)
[8] "The Census regions and divisions do not include American Samoa, Canal Zone, Guam, Puerto Rico, associated states and commonwealths in the Pacific Islands, or the U.S. Virgin Islands. Analysts of federal projects in these areas should use data that are 'reasonable under the circumstances,' and may refer to the tables with U.S. average data for guidance."

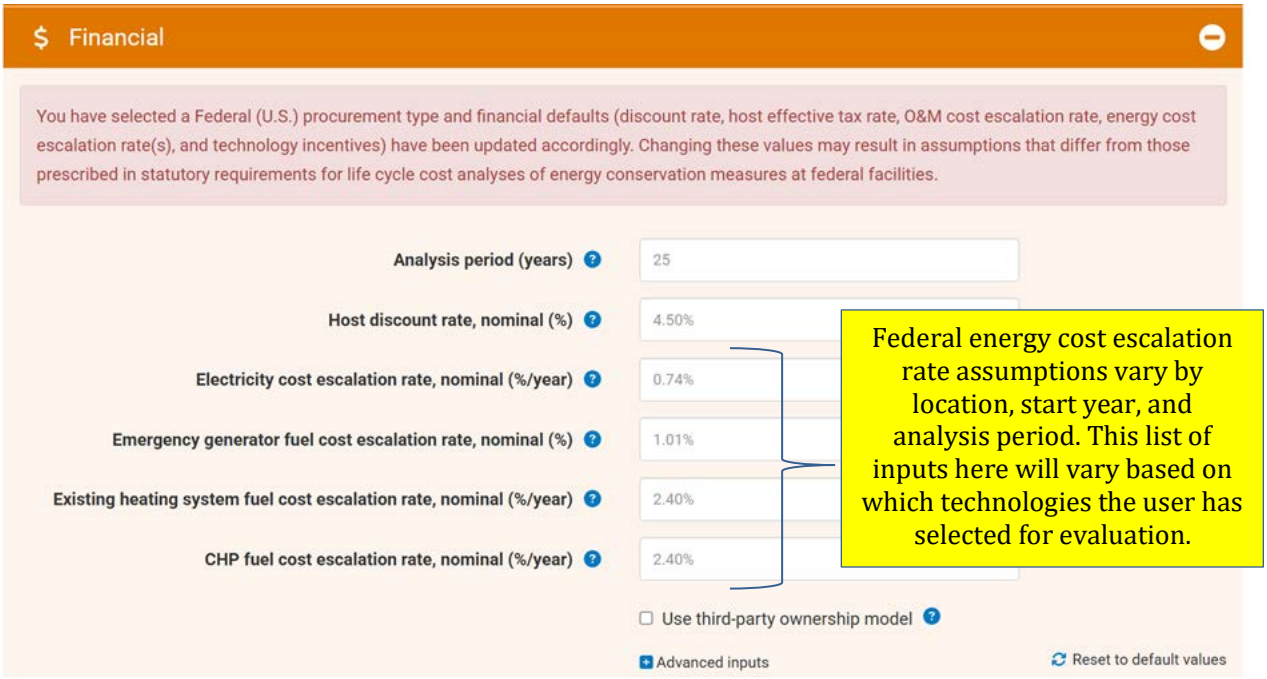


Figure 7. REopt web tool screenshot showing where the electricity and fuel cost escalation rate default values are updated for federal analyses.

Federal Defaults for: Federal Tax-Based Incentives

REopt's tax-based incentive inputs are found within the technology sections of the web tool inputs page. As shown in Table 2, for **government-owned systems** (whether direct-purchase or third-party financed), **all federal tax-based incentives** are removed, as federal agencies are not tax-paying entities and thus are ineligible for tax-based incentives. For federal analyses of **privately owned systems**, **the commercial default incentive assumptions** are left unchanged. Users can **modify the values** to reflect anticipated incentives that may be monetized by the third party.

The screenshots below show where the tax-based incentive inputs are located—under each technology accordion, after expanding the "Advanced Inputs" sub-section.

For **government-owned energy systems**, the incentives are zeroed out as follows:

- Federal incentive based on percentage of cost (%) or total percentage-based incentive (%): 0%
- Modified Accelerated Cost Recovery System (MACRS) schedule: "No MACRS"
- MACRS bonus depreciation: 0%

Note that REopt's incentive inputs vary slightly by technology. For example, some technologies may not typically be eligible for incentives and may not offer some or all of the incentive options listed above. An example of federal incentives zeroed out for solar PV is shown in Figure 8.

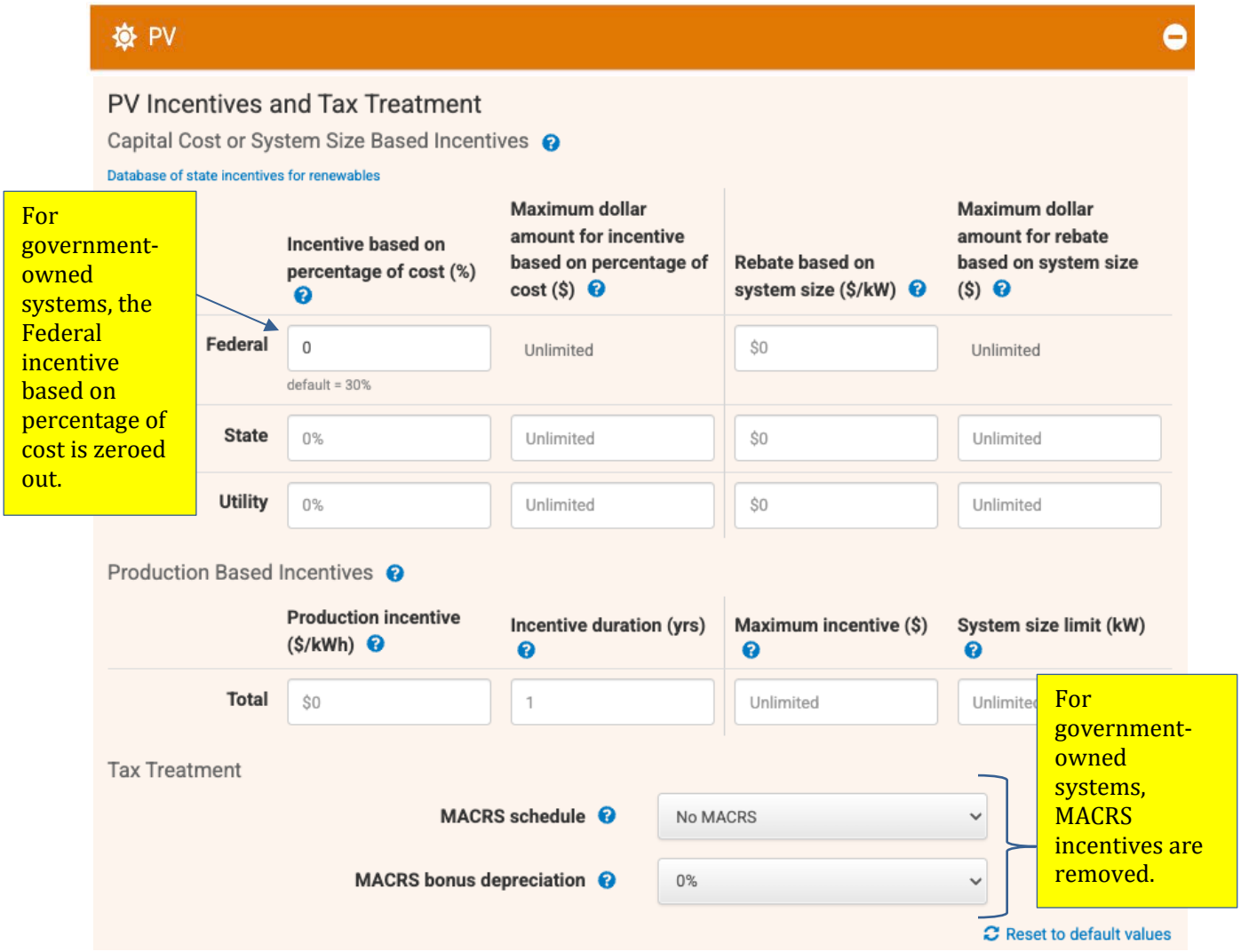


Figure 8. Screenshot of REopt web tool showing zeroing out federal tax incentive inputs for government-owned systems.

Users can follow this process of reviewing and updating assumed incentives for each technology considered in the analysis by reviewing each technology accordion (example accordions shown in Figure 9).

Figure 9. Examples of technology options in the REopt web tool. Each technology accordion can be expanded to view and update assumed incentives. Technology accordions only appear if the user selected that technology for evaluation.

REopt

The National Laboratory of the Rockies REopt Web Tool identifies the cost-optimal mix, sizing, and operations of hybrid distributed energy systems to help sites (including buildings, campuses, and microgrids) meet their energy affordability and reliability goals.

Learn more about REopt at reopt.nlr.gov/tool.

This work was authored by the National Laboratory of the Rockies for the U.S. Department of Energy (DOE), operated under Contract No. DE-AC36-08GO28308. Funding provided by the U.S. Department of Energy Office of Critical Minerals and Energy Innovation Federal Energy Management Program. The views expressed in the article do not necessarily represent the views of the DOE or the U.S. Government.

NLR/FS-7A40-97413 • February 2026

15013 Denver West Parkway
Golden, CO 80401
Phone: 303-275-3000

The National Laboratory of the Rockies is a national laboratory of the U.S. Department of Energy, Office of Critical Minerals and Energy Innovation, operated under Contract No. DE-AC36-08GO28308.