Office of the State Auditor

Kerri L. Hunter, CPA, CFE
State Auditor

Residential Energy Storage Systems Tax Expenditures Evaluation Update

In December 2025, our office released its evaluation of the Residential Energy Storage Income Tax Credit [Section 39-22-546, C.R.S.] and the Residential Energy Storage System Sales Tax Exemption [Section 39-26-733, C.R.S.]. At that time, the Department of Revenue (Department) was not able to provide data on the revenue impact to the State or the number of claims of either tax expenditure. In January 2026, the Department released Residential Energy Storage Credit individual and corporate claims data for Tax Year 2023, which was the first year this credit was available. The Department did not publish, nor does it plan to publish in the future, data on claims or the revenue impact of the Residential Energy Storage Exemption because the exemption is reported by sellers on the "other exempt sales" line of the sales tax return, which aggregates several sales tax exemptions. On page 14 of the report, we estimated the revenue impact of the sales tax exemption to be about $690,000 in Tax Year 2023 and about $750,000 in Tax Year 2024. The purpose of this memo is to provide updated information on the revenue impact and claims of the Residential Energy Storage Credit that was published by the Department after the release of our report.

According to Department data, in Tax Year 2023, the Residential Energy Storage Credit was claimed on 396 individual income tax returns for a total revenue impact to the State of $832,400. The credit was not claimed by any corporations in Tax Year 2023. However, it is possible that the Department data does not capture the entire revenue impact of the credit. The Department data released in January 2026 only include credits claimed by individuals and C corporations. To the extent that the credit was claimed on an estate, trust, or composite nonresident partnership or S corporation return, those credits would not be captured in the Department's data but would still have a revenue impact to the State in Tax Year 2023.

The credit's total revenue impact to the State as reported in the Department data is less than the potential revenue impact we estimated in our report. A comparison of the data we used to generate our estimate to Department data on the number of claims made by taxpayers suggests that this credit may be underutilized. In Exhibit 2 on page 14 of our report, we estimated that the number of systems eligible for the credit in Tax Year 2023 was about 1,550 with a potential revenue impact to the State for Tax Year 2023 of about $2,393,000 based on information we received from utilities operating in Colorado and U.S. Energy Information Administration data on the number of residential energy storage systems installed in Colorado. If we assume that each claim reported in the Department's data represents one system installed, only about 26 percent of the potentially eligible systems installed in Tax Year 2023 had a credit claimed for their installation. It is unclear why

credit utilization may be low, but it is possible that some taxpayers are not aware of it or do not think they are eligible to claim it. It is also possible that some of the systems reported as being installed to the U.S. Energy Administration or to us by utilities were not eligible for the credit.

As discussed on pages 4 and 5 of our report, the credit can be claimed in two ways: (1) by the purchaser who had the system installed in a residential dwelling, in which case the credit is not refundable and cannot be carried forward to future years if the credit amount exceeds the taxpayer's tax liability, or (2) by the purchaser assigning the credit to the system seller (with the seller's permission), in which case the entire credit is refundable to the seller since the seller is required to compensate the purchaser for the full nominal value of the tax credit at the time of purchase through a discount on the purchase price of the system. The Department breaks down the individual credit claims of the Residential Energy Storage Credit by nonrefundable and refundable credits, which we present in Exhibit 1.

Exhibit 1
Number of Claims, Revenue Impact, and Average Credit for Individual Taxpayers Who Claimed the Residential Energy Storage Credit in Tax Year 2023, Broken Down by Nonrefundable and Refundable Credits

Credit	Claims	Revenue Impact	Average Credit
Residential Energy Storage Credit - Nonrefundable	365	$738,475	$2,023
Residential Energy Storage Credit - Refundable	31	$93,925	$3,030
Total Credits	**396**	**$832,400**	**$2,102**

Source: Office of the State Auditor analysis of Department of Revenue individual credit data for the Residential Energy Storage Credit.

The refundable credits represent credits that were assigned by the purchaser to the seller. On pages 9 and 10 of our report, we discussed that during our evaluation, we spoke with four energy storage system installers in Colorado and none of them accept assignments of the credit, and therefore, we thought it was not common for these credits to be assigned. On page 10 of our report, we also discussed that sellers do not have a financial incentive to accept assignment of the credit. Despite this, as shown in the Department data, some sellers have accepted assignments of the credit. However, as we expected, it is much more common for purchasers to claim the (nonrefundable) credit themselves rather than the seller taking assignment of the credit. Additionally, it is important to note that although the refundable/assigned credit was claimed on 31 income tax returns in Tax Year 2023, it is possible that this figure represents fewer than 31 businesses that sell and install residential energy storage systems. This is because the credits were claimed on individual returns that could represent several individuals that operate the same business (e.g., a partnership or S corporation that passed through credits to their owners to be claimed on the owners' individual tax returns).

On page 10 of our report, we discussed that some homeowners/purchasers, in particular those with lower incomes, may not have sufficient tax liability to be able to receive the full benefit of the credit,

which would reduce its effectiveness when the credit is not assigned. In January 2026, the Department also released data on the claims of the nonrefundable Residential Energy Storage Credit by individuals by the size of their federal adjusted gross income (AGI), which we present below in Exhibit 2.

Exhibit 2
Number of Claims, Revenue Impact, and Average Credit for Individuals Who Claimed the Nonrefundable Residential Energy Storage Credit in Tax Year 2023 by Size of Federal Adjusted Gross Income

Size of Federal Adjusted Gross Income	Claims	Revenue Impact	Average Credit
Negative Income	0	$0	$0
$0 to Under $10,000	0	$0	$0
$10,000 to Under $30,000[1]	3	$543	$181
$30,000 to Under $40,000	8	$4,385	$548
$40,000 to Under $50,000	10	$6,085	$609
$50,000 to Under $60,000	9	$4,791	$532
$60,000 to Under $75,000	18	$20,039	$1,113
$75,000 to Under $100,000	32	$47,512	$1,485
$100,000 to Under $200,000	128	$251,519	$1,965
$200,000 to Under $500,000	115	$282,276	$2,455
$500,000 to Under $1,000,000	31	$87,105	$2,810
$1,000,000 or More	11	$34,220	$3,111
Total	**365**	**$738,475**	**$2,023**

Source: Office of the State Auditor analysis of Department of Revenue individual credit data for the Residential Energy Storage Credit.
[1] In its data, the Department of Revenue has separate categories for $10,000 to under $20,000 and $20,000 to under $30,000. For the nonrefundable Residential Energy Storage Credit, these categories, separately, are not releasable in order to preserve taxpayer confidentiality. The Department of Revenue will generally not release aggregated taxpayer data when there are fewer than three taxpayers or one taxpayer claimed 80 percent or more of the total amount. Since these were the only two nonreleasable categories in the data, we combined them into one group ($10,000 to under $30,000) in order to present a total for this combined AGI group.

As shown in Exhibit 2, taxpayers with less than $60,000 of AGI had average credits of less than $700. Although it is possible that some of these taxpayers installed smaller and less expensive residential energy storage systems (which would generate smaller credits), if they installed a more common system with one battery costing about $11,000, this data indicates that they might have lacked the tax liability to claim the full $1,100 credit (calculated as 10 percent of the $11,000 of eligible property) that they might have otherwise been able to claim. Therefore, because it appears that many sellers are not accepting assignments of credits, it is likely that many taxpayers with lower incomes are not able to fully utilize their credits since the nonrefundable credit claimed by purchasers cannot be carried forward to future tax years. This may also decrease the incentives for taxpayers with lower incomes to purchasing these systems since they will not get a significant amount back from the tax credit. In Tax Year 2023, most of the nonrefundable credits were claimed by taxpayers with at least $100,000 in AGI; these taxpayers claimed 78 percent of the total nonrefundable credits and accounted for 89 percent of the total revenue impact to the State.

STATE · OF · COLORADO
UNION AND CONSTITUTION
NIL SINE NUMINE
1876

Residential Energy Storage System Tax Expenditures

Tax Expenditure Evaluation • December 2025 • 2025-TE15

OFFICE OF THE STATE AUDITOR
COLORADO

Category	Residential Energy Storage Credit	Residential Energy Storage Exemption
Tax Type:	**Income**	**Sales and use**
Expenditure Type:	**Credit**	**Exemption**
Statutory Citation:	**Section 39-22-546, C.R.S.**	**Section 39-26-733, C.R.S.**
Year Enacted:	**2022**	**2022**
Repeal/Expiration Date:	**January 1, 2027**	**January 1, 2033**
Revenue Impact:	**Could not determine**	**Could not determine**
Purpose given in statute or enacting legislation? Yes		

This report covers our evaluation of two tax expenditures that are available for the purchase of residential energy storage systems—the Residential Energy Storage System Income Tax Credit and the Residential Energy Storage System Sales Tax Exemption.

The Residential Energy Storage Credit allows an energy storage system (ESS) purchaser to claim an income tax credit in an amount equal to 10 percent of the system's purchase price as long as it is installed in a residential dwelling. The purchase price of the system includes the tangible personal property installed, any sales taxes charged, and freight, but does not include any charges for assembly, installation, other construction services, or permit fees. The credit may either be claimed by the taxpayer or assigned to the seller of the energy storage system. If it is claimed by the taxpayer, it is not refundable; if it is assigned to the seller, it is refundable.

The Residential Energy Storage Exemption exempts the purchase of ESSs that are used in residential dwellings from the state's 2.9 percent sales and use tax.

According to statute, the purposes of the credit and exemption are to "…[i]nduce certain designated behavior by taxpayers, specifically the purchase and installation of residential energy systems…" and "…[c]ontribute to the state's efforts to achieve its climate goals" [Sections 39-22-546(1)(a)(I) and (II) and 39-26-733(1)(a)(I) and (II), C.R.S.].

We found:

- It appears that residential ESS installations in Colorado have been increasing since 2019, including after the credit and exemption became available in 2023. However, it is likely that the increase is mostly attributable to other factors besides the credit and exemption.

- Department of Revenue data on the claims and revenue impact of the credit and exemption are not available, but the revenue impact could be more substantial than was anticipated when the credit and

exemption were created in 2022. The Department anticipates publishing Tax Year 2023 claims of the credit in early 2026, after the publication of this report. We plan to add an addendum to our report with the revenue impact as reported by the Department when it releases that data in early 2026.

- Installation of residential energy storage systems could play an important role in achieving the State's climate goals if they are more widely adopted. However, the credit and exemption on their own are likely not the primary factors that incentivize the purchase and installation of these systems, and therefore, their impact on achieving the State's climate goals is likely small unless paired with other, larger tax incentives and rebates.

Policy Considerations

We did not identify any policy considerations for the Residential Energy Storage Credit or Residential Energy Storage Exemption.

Residential Energy Storage System Tax Expenditures

Background

This report covers our evaluation of two tax expenditures that are available for the purchase of residential energy storage systems: the Residential Energy Storage System Income Tax Credit (Residential Energy Storage Credit) [Section 39-22-546, C.R.S.] and the Residential Energy Storage System Sales Tax Exemption (Residential Energy Storage Exemption) [Section 39-26-733, C.R.S.].

For purposes of these tax expenditures, an energy storage system—referred to as "ESS" or "system" throughout this report—is a commercially available battery system that is capable of storing and delivering energy that is installed in a residential building. The primary component of an ESS is a battery, but an ESS can be comprised of other components such as a protective enclosure, wiring, and an inverter. The size of a battery system is reported in two different ways. The most common is the energy capacity, which is measured in kilowatt-hours (kWh). Energy capacity denotes how much energy an ESS can store; the typical energy capacity of a single battery used in an ESS is 13.5 kWh, though the ESS can include multiple batteries to increase its capacity. The other way that the size of a battery system is reported is the continuous output or power capacity of the battery, which is measured in kilowatts (kW). The continuous output of an ESS was typically around 5 kW until early 2024. The introduction of the Tesla Powerwall 3 boosted continuous power supply by 130 percent from 5kW to 11.5 kW. Higher continuous power enables an ESS to run high electricity need appliances like air-conditioners and heat pumps without exceeding the system's power limit.

Installing an ESS is a major home improvement project that takes months to bid, permit, and install. According to U.S. Energy Information Administration (EIA) data, 98.5 percent of ESSs installed in Colorado were paired with rooftop solar systems in 2024, although solar energy systems are not required in order to install an ESS. Similar to installing a solar panel system, ESS projects are done by certified installers who customize the bid based on the energy needs of the household. The amount of electricity usage the household desires to offset will determine the size and number of batteries needed, but the brand of battery, electrical updates needed, placement of the battery, and whether it is added in conjunction with solar can lead to large disparities in costs among households. ESS batteries typically last 10 to 15 years before they need to be replaced, though this can vary based on the type of battery, environmental conditions, and usage volume.

An ESS can reduce household energy costs and greenhouse gas emissions by maximizing the use of clean energy through storing excess residential-produced solar electricity and charging from the grid at times when the grid is producing excess renewables. As noted, residential ESSs are almost always paired with a rooftop solar panel system and EIA data from 2023 shows that there were 160,694

residences in Colorado with rooftop solar installed and the number rose to 179,751 in 2024. Installing an ESS allows a home with solar panels on its roof to capture excess electricity and store it for use at a later point in time, typically later in the day when electricity usage and prices increase (e.g., under utilities' Time of Use rate structures, or TOU for short) or once the sun goes down. In addition to providing cost savings on electricity bills, an ESS also provides energy security by providing backup power to a residence during a power outage.

Using stored energy during high load times contributes to a more sustainable and efficient grid and could help reduce the need for utilities to build out more costly electricity generating plants and transmission infrastructure, which reduces greenhouse gas emissions and saves money for all electric customers. Utilities also benefit when residents install an ESS because they can power homes during times of peak demand, thereby reducing the need for the utility to produce or purchase additional energy. Additionally, some systems can provide additional grid support, allowing utilities to pull electricity stored in the battery during times of peak electricity demand. ESS owners can enter into an agreement with their utility to allow the utility to have control over their storage system for a set amount of times per year. In exchange, system owners are typically provided with rebates on the purchase of the system and/or periodic payments from the utility (these rebate and payments are discussed in further detail in the evaluation results section of this report). In some cases, the utility will purchase the ESS and lease it back to the consumer for a set period of time (usually 10 years) before turning ownership of the ESS over to the homeowner.

The Residential Energy Storage Credit allows an energy storage system purchaser to claim an income tax credit in an amount equal to 10 percent of the system's purchase price as long as it is installed in a residential dwelling. The credit is available for Tax Years 2023 through 2026. For the purposes of determining the credit amount, the purchase price of the system includes the tangible personal property installed, any sales taxes charged, and freight, but does not include any charges for assembly, installation, other construction services, or permit fees. Renters who install systems are eligible for the credit as long as they have the owner's approval to install the system and the building is residential.

There are two ways that this credit may be claimed:

1. The purchaser of the system may claim the credit. If the purchaser claims the credit, they may only apply it to the tax year during which the purchase was made and, if the credit exceeds their tax liability for the year, they cannot receive a refund or carry forward the unused amount to any future years; or

2. The purchaser may assign the credit to the seller of the energy storage system. If the credit is assigned, it must be assigned at the time of purchase, the purchaser forfeits the right to claim the credit on their own tax return, and the seller must compensate the purchaser for the full nominal value of the tax credit at the time of purchase through a discount on the purchase price of the system. If the credit is assigned to the seller and exceeds the seller's tax liability for the tax year in which the sale occurred, the seller can receive a refund for the excess amount. The assignability of the credit to the seller was intended to help taxpayers with lower incomes in two ways. First,

assigning the credit to the seller reduces the initial cost of the battery, allowing the purchaser to pay less in upfront costs. Second, it allows taxpayers with a tax liability that is less than the credit amount to realize the full value of the credit.

Technical Note: To claim the credit, taxpayers must complete and file the DR 1307 form (Residential Energy Storage System Credit Eligibility Certification and Assignment Election) with the Department of Revenue. If the purchaser is claiming the credit themselves, they complete Part 1 of the DR 1307 form and attach it to their income tax return when they file their taxes. Part 1 requires that the taxpayer include information about the location where the system was installed, provide information about the system (i.e., purchase price, date of purchase, serial number, and system make and model), and certify that the system meets the requirements to qualify for the credit. If the purchaser instead assigns the credit to the seller, the purchaser completes Part 1 of the DR 1307 form, and the purchaser and seller must also complete Part 2, which is the election statement for assignment of the income tax credit. Part 2 includes information about the seller (i.e., name/business name, SSN/FEIN, address), date of assignment, and credit amount. The purchaser and seller both must sign the form indicating that the credit has been assigned to the seller by the purchaser. After the form has been completed, the seller must file the form electronically with the Department of Revenue within 30 days of the date of the purchase. The seller must also attach the form to their income tax return.

A few other states offered a credit similar to Colorado to help reduce the purchase price of an ESS. Oregon offered residents a $300/kWh credit, up to 40 percent of the total cost or $2,500, with larger credits available to residents with low and moderate incomes. Maryland had a residential energy storage credit from 2022 through 2024 and offered up to $5,000. Many other states have programs administered through their Public Utilities Commission (PUC) or large Investor Owned Utilities (IOU). For example, California's PUC administers rebates through utilities of $150/kWh for smaller systems and $1,000/kWh for larger systems, and Hawaii Electric has offered rebates for many years and offers customers who own and enroll an ESS a one-time cash incentive and a monthly credit.

The Residential Energy Storage Exemption exempts the purchase of energy storage systems that are used in residential dwellings from the State's 2.9 percent sales and use tax. The exemption is available for Calendar Years 2023 through 2032. Sellers apply the exemption at the time of the purchase, and report the exempt sales on their sales tax return. In general, statute [Section 29-2-105(1)(d)(I), C.R.S.] requires counties and municipalities with sales taxes that are collected by the State to adopt the same exemptions that apply to the state sales tax. However, the Residential Energy Storage Exemption is one of several exceptions to this rule; the exemption does not apply to state-collected local sales taxes unless the local jurisdiction expressly adopts the exemption via local ordinance. As of July 1, 2025, only three counties (Adams, Arapahoe, and Douglas) with state-collected sales taxes have followed the state exemption and created an exemption for residential energy storage and none of the 166 municipalities with state-collected city sales tax have adopted the exemption. Colorado's home rule jurisdictions can set their own sales tax policies if they collect their own sales taxes, so these jurisdictions can also choose whether to adopt an exemption for residential energy storage systems.

Of the 45 states that have a sales tax, at least 25 offer a sales tax exemption for solar energy systems, but fewer offer a sales tax exemption for storage. Florida exempts solar energy systems and ESSs from state sales taxes and Maine offered a refund of the sales and use tax paid on purchases of ESSs with a capacity of 50 megawatts (MW) or greater from January 1, 2023 to December 31, 2025. Another 36 states provide a property tax exemption for solar energy property.

The Residential Energy Storage Credit and Residential Energy Storage Exemption were created in 2022 by Senate Bill 22-051. The credit was originally available for Tax Years 2023 and 2024. In 2025, Senate Bill 25-026 extended the credit so it is also available for Tax Years 2025 and 2026. The exemption has not been changed since it was enacted.

According to statute, the purposes of the credit and exemption are to "… [i]nduce certain designated behavior by taxpayers, specifically the purchase and installation of residential energy systems…" and "[c]ontribute to the state's efforts to achieve its climate goals" [Sections 39-22-546(1)(a)(I) and (II) and 39-26-733(1)(a)(I) and (II), C.R.S.]. Colorado's climate goals seek to reduce the state's greenhouse gas emissions by 26 percent (from 2005 levels) by 2025, by 50 percent by 2030, and by 100 percent by 2050. One way in which it plans to reach this is through its clean energy goal, which aims to achieve 100 percent clean energy in the state by 2040.

Statute provides one performance measure for the Residential Energy Storage Credit and Residential Energy Storage Exemption. Specifically, regarding the credit, statute [Section 39-22-546(1)(b), C.R.S.] says, "…the state auditor shall measure the effectiveness of the [Residential Energy Storage Credit]…based on the number of residential energy storage systems purchased and installed in the state. The Colorado energy office shall provide the state auditor with any available information that would assist the state auditor's measurement." Similarly, regarding the exemption, statute [Section 39-26-733(1)(b), C.R.S.] provides that "…the state auditor shall measure the effectiveness of the [Residential Energy Storage Exemption]… based on the number of residential energy storage systems sold and used in the state. The Colorado energy office shall provide the state auditor with any available information that would assist the state auditor's measurement."

We created two additional performance measures to determine whether the Residential Energy Storage Credit and Residential Energy Storage Exemption are meeting their purposes:

1. To what extent do the Residential Energy Storage Credit and Residential Energy Storage Exemption induce the purchase and installation of residential energy storage systems in the state?

2. To what extent do the Residential Energy Storage Credit and Residential Energy Storage Exemption contribute to the State's efforts to achieve its climate goals?

Evaluation Results

Based on our review of available data, it appears that installations of residential ESSs in Colorado have been increasing since 2019, including after the credit and exemption became

available in 2023. However, it is likely the increase in residential ESSs installed in Colorado is mostly attributable to factors other than the credit and exemption. As discussed below, we could not identify a source for complete information on the number of ESSs installed in Colorado. However, as shown in Exhibit 1, our review of information provided to us by utilities and/or reported by the U.S. Energy Information Administration (EIA) indicates that the cumulative number of residential ESSs in the state as well as the annual number installed have increased each year since 2019. Additionally, since the credit and exemption have been available (starting in 2023), the number of residential ESSs has increased by over 1,600 per year. Although most of these systems were likely eligible for the credit, some of these systems were installed by nonprofit electric cooperatives that are not eligible.

Exhibit 1

Cumulative number of residential energy storage systems and number of systems installed each year 2019 through 2024, as identified by Colorado utilities providers and reported to the EIA and/or the OSA

Category	2019	2020	2021	2022	2023	2024
Cumulative Residential Energy Storage Systems Installed in Colorado	705	1,145	2,079	3,525	5,158	6,907
Residential Energy Storage Systems Installed Per Year in Colorado	309	440	934	1,446	1,633	1,749
Annual Growth in Residential Energy Storage Systems in Colorado	78%	62%	82%	70%	46%	34%

Source: Office of the State Auditor analysis of data provided by Colorado utilities to the Office of the State Auditor and U.S. Energy Information Administration EIA 861 M reports, Monthly Electric Power Industry Report, 2019-2024 filed by utilities serving customers in Colorado.

It is important to note that the Exhibit 1 data is incomplete and likely undercounts the number of ESSs installed in Colorado. The Colorado Energy Office (CEO) reported that it does not track the number of residential ESSs installed in the state and we could not identify a complete source for the information. Although we identified one publicly-available report on residential ESSs installed in Colorado from the EIA, it only includes data from eight utilities, serving about 20 percent of residential utility customers in Colorado. To provide a more comprehensive review, we contacted all 52 of the electric utilities CEO reported as operating in the state and asked them to provide us with the number of residential ESSs installed in their service territory. We received usable data from 17 utilities, some of which overlapped with data reported to the EIA. Between EIA data and utility responses, we compiled storage data (in Exhibit 1) from 19 utilities that provide service to more than 2.25 million customers—or 88 percent of the approximately 2.56 million residential energy customers in the state in 2024. However, it is likely that there have been ESSs installed in the areas served by the utilities that did not provide us with information and that are not counted in our analysis. Additionally, many of the utilities that reported to us cautioned that the data on residential ESSs they provided are unofficial numbers and only represent the systems of which they are aware. Also, it is likely that there are residential ESSs that are not connected to any utility's grid

infrastructure (i.e., ESS installations that allow the residence to operate off-grid) and, therefore, are not known by any utilities and not captured in the data we used.

To assess the potential impact of the Residential Energy Storage Credit and Exemption on homeowners' decisions to install an ESS, we reviewed the factors that homeowners would likely consider, including the benefits of the system, costs, and available incentives, including the credit and exemption, that can reduce the overall cost. Overall, we found that the credit and exemption are likely too small on their own to incentivize most homeowners to install an ESS. However, ESSs have a high up front cost and collectively, incentives, such as those offered by federal, state and local governments and public utilities providers, are likely important for encouraging their adoption. Therefore, the credit and exemption combined with other incentives offered have likely been a significant factor behind the growth in ESSs.

According to several utilities, solar installers, and nonprofit organizations, there are several reasons why a homeowner would choose to install an ESS:

1. Energy Security—Similar to a generator, an ESS provides backup power to a house during a power outage. Many customers cite energy security as the most important reason for purchasing a system. Generally, Colorado has relatively fewer power outages than other states, with Colorado consumers experiencing an average of 99 minutes of total outage time in 2023. However, this can vary significantly based on the location of a home. Residents in areas of the state more prone to outages due to wildfires, high winds, blizzards, and floods likely find ESSs more valuable. A few stakeholders we spoke with mentioned a significant uptick in interest for an ESS after the September 2013 floods and the December 2021 Marshall fire. Additionally, Boulder County and parts of the Denver Metro area experienced the first "Public Safety Power Shut-off" on April 6, 2024. Due to high winds (over 25 MPH), low relative humidity (below 20 percent), and a high fire index risk, Xcel cut power to over 50,000 customers for several hours. Homeowners impacted by these outages may also consider an ESS more valuable.

2. Cost Savings and Partial Energy Independence—Electricity consumers that are subject to TOU rates, under which utilities charge higher rates during peak times, can reduce their bills by charging their ESS battery during low-cost periods and then discharging the ESS in the early evening when electricity prices are the highest. In particular, rooftop solar owners can minimize their reliance on utility-provided electricity and increase energy independence by storing excess solar production. An ESS allows homeowners to store their excess solar power during the day in order to use it during the evening hours, making them less reliant on utility provided electricity and increasing the value of their rooftop solar system.

3. Interest in Reducing Environmental Impact—As discussed, by using an ESS to store excess renewable electricity and discharging this electricity during high-demand periods, homeowners can help make the grid more stable and efficient and maximize the use of energy produced by clean sources, such as wind and solar. Therefore, some homeowners may choose to install ESSs as a way to reduce the environmental impact of their energy consumption.

4. Off-Grid Housing and Local Requirements—For residents living in remote areas or in off-grid communities, an ESS might be the most economical way or the only way permitted in the community covenants to provide reliable electricity for their houses. Additionally, communities and builders striving for net-zero ready homes (homes that are energy efficient and can run only from renewable energy produced onsite) may require batteries. For example, in April 2025, Pitkin County adopted a new building code that provides, "All Photovoltaic systems installed shall include an energy storage system with a minimum rated energy capacity of 5 kWh OR 25% of the PV system's daily output." In Pitkin County and other local governments that might adopt similar building codes requiring storage systems, the credit and exemption will see more usage and would provide discounts to residents who are required to install these systems. However, these consumers will have purchased the system because of the requirement, not because of the credit or exemption.

Although ESSs may offer benefits that homeowners would find valuable, they currently have a high upfront cost that is difficult for most homeowners to recover in Colorado due to relatively low electricity costs. For example, an average 13.5 kWh residential energy storage system with one battery in Denver in 2025 could cost around $18,000, including assembly, permitting, and installation costs. In comparison, the average consumer in the state paid about $1,200 per year for electricity in 2024. As mentioned earlier, most ESSs installed in residences in Colorado are paired with rooftop solar systems, so the cost of an ESS is in addition to the cost of the solar system, which can also cost tens of thousands of dollars. While some homeowners may find that the benefits of an ESS outweigh the costs, many would need additional incentives that lower the cost to make installing an ESS an attractive option. Further, the installers who sell and install batteries that we contacted said that incentives, such as the State's credit and exemption, are valuable marketing tools they can use to incentivize people to install batteries and show that the State values their investment in this technology.

Incentives have likely been an important factor driving the adoption of ESSs in Colorado, but the Residential Energy Storage Credit and Exemption are likely too small on their own to drive most homeowners' decisions to install an ESS. Using the example above, for a typical ESS system costing about $18,000, only $12,000 of this cost is for tangible personal property (e.g., the battery, wiring, and inverter) that is eligible for the Residential Energy Storage Credit and Exemption. Therefore, the credit—equivalent to 10 percent of the qualifying cost—would offset $1,200 of the total cost and the exemption from the State's 2.9 percent sales tax would reduce the cost by another $348 for a total benefit of $1,548, or about 8.6 percent of the total cost of purchasing and installing the system. Although this difference could be enough to tip the decisions of a few homeowners, for most, it would be unlikely to make a significant enough impact to change their decision since the cost of an ESS would still be very high relative to their energy costs.

Additionally, although the credit is assignable to the seller, in which case the purchaser would get an upfront discount on the purchase price, not all ESS installers accept assignment of the credit. We did not have Department of Revenue (Department) data showing how many credits have been assigned, but we talked to four energy storage system installers in Colorado, and none of them accept assignments of the credit. Unlike other credits in Colorado for electric vehicles (EVs), electric

bikes, and electric lawn equipment that are assigned or assignable at the time of purchase and reduce the purchase price, the Residential Energy Storage Credit is not designed in a way to provide a financial incentive for installers to accept assignment of the credit in order to reduce the upfront cost to the consumer. For example, for the Innovative Motor Vehicle Credit [Section 39-22-516.7, C.R.S.] and the Electric Bicycle Tax Credit [Section 39-22-555, C.R.S.], retailers may to elect to get an advance payment of the assigned credits quarterly. Retailers claiming those credits as well as the Electric Lawn Equipment Credit [Section 39-22-550, C.R.S.] may retain an administrative fee for taking assignment of the credit; for the Innovative Motor Vehicle Credit, the administrative fee is up to $250, for the Electric Bicycle Credit, the administrative fee is $50 (going down to $25 in 2026), and for the Electric Lawn Equipment Credit, the fee is up to 3 percent of the purchase price of new electric lawn equipment sold. Additionally, if the Residential Energy Storage Credit is not assigned, it is not refundable and cannot be carried forward to future years. Therefore, homeowners without sufficient tax liability may not be able to receive the full benefit of the credit, which would reduce its effectiveness.

Despite having a limited impact when it is the only incentive available to homeowners, when paired with other incentives, the Residential Energy Storage Credit and Exemption may be more effective. Several other incentives are available that could induce a homeowner in Colorado to install an energy storage system, many of which provide a larger benefit than the credit and exemption. For some homeowners, being able to claim the state credit and exemption in addition to other incentives likely helps reduce the overall cost enough to incentivize them to purchase an ESS. However, the extent to which the credit and exemption can act in conjunction with other incentives depends on the individual taxpayer's financial situation; the availability of federal credits, which are set to expire after 2025; and whether the system is installed in a location where the utility company and/or local government offer incentives, such as rebates. We identified the following additional incentives that seek to induce a taxpayer to install an energy storage system in their residence and that appear to be helping to drive increased demand for ESSs in Colorado:

- **The Federal Residential Clean Energy Credit [26 USC 25D]** allows taxpayers who install an ESS to claim a credit for a percentage of the total price of the system. This credit is only available to homeowners and second homeowners who do not rent out their house and is not available to landlords. The Inflation Reduction Act of 2022 increased the amount that can be claimed from 26 percent in Tax Years 2020 and 2021 to 30 percent in Tax Years 2022 to 2032, and created a provision to allow stand-alone batteries that are not connected to a renewable energy source to qualify. This larger, expanded credit likely raised the interest of numerous taxpayers who were considering purchasing an ESS and helped drive the increase in ESS adoption in the state. However, the One Big Beautiful Bill Act in 2025 accelerated the expiration of this credit to the end of 2025, so it will no longer be available for residential ESSs purchased and installed after 2025. Until the end of 2025, this credit can be combined with the state credit, and the federal credit does not need to be reduced by the state credit amount. Based on the total installation cost of an energy storage system in 2025 ($18,000), this credit would provide a benefit of about $5,400. However, the credit is calculated based on the purchase price, less any rebates that the taxpayer receives from utilities.

- **Xcel Energy's Renewable Battery Connect (RBC) Program** allows residential and small business customers with rooftop solar in Xcel's service area—which covers 1.37 million of the 2.56 million (53 percent) residential electric customers in Colorado—to install an ESS and receive a rebate. When the program began in June 2023, customers installing an ESS could receive a rebate of $500 for every kW of installed maximum continuous output capacity. An ESS with an 11.5 kW output capacity could get a $5,750 rebate check within 60 days of installation and permission from Xcel to operate the system. In late 2024, Xcel reduced the rebate to $350 per kW and capped the rebate at $5,000. In return, for 5 years, customers must agree to allow Xcel to tap into their ESS up to 60 times per year and drain it to 40 percent of its capacity when it does so; customers discontinuing participation in the program early will owe the company a prorated portion of their rebate amount. Additionally, Xcel's rebate amount is higher for customers who install an ESS and either have a qualifying low income or are located in a disproportionately impacted community; the rebate for these customers is $800 per kW of continuous output capacity, up to 75 percent of the equipment cost. For example, in 2025, if a Denver homeowner that qualifies as having a low income (based on Area Median Income) or lives in census tract designated as a disproportionately impacted community installed a battery with 11.5 kWof continuous output, they could receive a rebate of up to $9,200—or 75 percent of the total cost of the battery, whichever is less. As noted earlier, Xcel's rebate must be subtracted from the total system cost before applying the 30 percent Federal Residential Clean Energy Credit, lowering its value, but it has no impact on the state credit.

  From the program's inception in June 2023 through October 2024, Xcel processed 1,462 rebates at a cost of about $6.8 million and added 22.3 MW of capacity. Additionally, Xcel submitted a budget proposal to the PUC in November 2024, anticipating a total budget through 2025 of about $12.9 million, projecting it would approve 2,820 batteries with a total capacity added of 45.7 MW through 2025. Xcel's filings with the PUC indicate the company has spent about $4,550 per customer that claimed a rebate through its RBC Program. Although we do not know the average amount claimed for the Residential Energy Storage Credit in 2023, it is likely the Xcel incentive was several times larger than the State's credit and, therefore, may have been a more important factor driving the growth of ESS installations in recent years.

- **Black Hills Electric offers a battery rebate up to $1,000.** The rebate provides $100 per kWh of energy storage capacity installed, when paired with solar.

- **La Plata Electric Association offers a battery rebate up to $3,000.** This program began in January 2025 and is available when purchasing one of seven different ESS brands. For an ESS with a storage capacity of between 10 and 19.9 kWh, the rebate is $1,000, with customers living in designated areas eligible for a $500 bonus. An ESS with at least 20 kWh in storage capacity gets double the rebate ($2,000).

- **Holy Cross Energy Electric Cooperative's Power+ and Power+FLEX Programs.** Under its Power+ Program, which was available from 2021 to 2025, Holy Cross Energy purchased and installed the ESS and charged the cooperative member a monthly fee, which started at $65 a month, but was reduced by more than 60 percent after Holy Cross applied the federal credits it

received. Holy Cross Energy purchased and owns the ESSs, but after 10 years of program participation, Holy Cross Energy transfers ownership to the member. Like Xcel's program, to participate in this program, the member must allow Holy Cross Energy to tap into the battery 100 times per year and drain it to 20 percent. Unlike Xcel's program, Holy Cross allows for stand-alone batteries not connected to a rooftop solar system to enroll in this program and 19 customers had installed stand-alone batteries as of 2024. For the Power+ Program, the members are not eligible for the state credit since the battery is owned by Holy Cross Energy rather than the member. However, in 2025, Holy Cross introduced its Power+FLEX Program; this program replaced the Power+ program. Under the Power+FLEX Program, the member purchases the battery (which means they are also eligible for the state credit) and receives a rebate of $500 per kW of enrolled battery capacity (up to $12,500) as well as a monthly bill credit of $10.30 per kW of enrolled battery capacity.

- **Fort Collins Utilities** offers a rebate of $150 per kWh of storage capacity, with a 6-kWh minimum, up to a total of $3,000. This rebate is available to utility customers who have solar as well as to those without rooftop solar panels (i.e., stand-alone storage systems).

- **Gunnison County Electric Association** has also offered a rebate of $2,000, with an 8-kWh minimum storage capacity, but as of September 2025, none of its members have applied for it.

- Some local governments offer rebates. For example, the City and County of Denver offered a Climate Action Rebate (CARe) worth up to $2,750 when an ESS is paired with a heat pump, heat pump water heater, or certain EV Chargers, and up to a $500 rebate for those only installing an ESS. This program ran from 2022 to 2025. This rebate was paid directly to the contractor installing the system, reducing the out-of-pocket costs to the Denver homeowner who installed the ESS. However, the budget for this program was limited and it was offered in rounds that were fully subscribed within a few months. In 2022, Denver issued two ESS rebates, increasing to 21 in 2023, 34 in 2024, and 77 in 2025. About two-thirds of the Denver CARe rebates were for $2,750 each, meaning the household also installed an EV charger or heat pump at the same time as the ESS.

Because homeowner incentives vary considerably, the Residential Energy Storage Credit and Exemption's potential to encourage the purchase of an ESS likely also varies considerably. For example, in 2025, a Denver homeowner that qualifies as being low income (based on Area Median Income) or living in a census tract designated as a disproportionately impacted community who participates in Xcel's RBC Program rebate and claims the federal and state credits could reduce the cost of an ESS by more than 70 percent ($18,000 battery, reduced by $9,200 from Xcel's RBC rebate and an additional $2,640 federal tax credit and $1,200 state credit would bring the total out of pocket cost of the system to less than $5,000). Conversely, in 2026, if a customer is located in an area with no local or utility rebates and the federal credit has expired, the state credit and exemption may be the only reduction in cost the taxpayer can get.

At the time of our review, the Department lacked data showing the revenue impact of the credit and exemption to the State. However, we identified information showing that their

potential revenue impact may have exceeded $3 million in each of the 2023 and 2024 Tax Years, which is significantly larger than what was anticipated when these tax expenditures were established. Because the Residential Energy Storage Credit did not begin until 2023, the Department will not have data available on the first year of tax credit claims until 2026, after the publication of this report. We plan to add an addendum to our report with the revenue impact as reported by the Department when it releases that data in early 2026. Additionally, the data on the number of claims and revenue impact of the Residential Energy Storage Exemption will not be available because they are reported by sellers on the "other exempt sales" line of the sales tax return, which aggregates several sales tax exemptions.

However, based on our review of EIA data and information reported to us by utilities, it appears likely that the revenue impact of the credit and exemption will be larger than initially anticipated when the credit and exemption were created and when the credit was extended. The fiscal note for Senate Bill 22-051 assumed that 110 ESSs would be installed in 2023 and 130 ESSs in 2024 with an equipment price of between $11,500 and $11,800, which would result in a revenue impact to the State for the credit and exemption of around $165,000 in 2023 and $195,000 in 2024. The fiscal note for Senate Bill 25-026, which extended the credit to 2025 and 2026, estimated the credit's annual revenue impact to be around $130,000. Our review of EIA data and information provided by utilities show that significantly more ESSs were installed in the state than what was expected in the fiscal notes. We also identified information showing that the average qualifying costs for each ESS may be higher than anticipated, increasing the average credit amount. For these reasons, we estimated that the revenue impact for Tax Years 2023 and 2024 could be substantially larger, potentially over $3 million per year. Exhibit 2 shows how we calculated our estimate.

Exhibit 2

Estimated Revenue Impact of the Residential Energy Storage Credit and Exemption

Tax Years 2023 and 2024

Estimated Revenue Impact Calculation Steps	2023	2024
Residential energy storage systems installed per year based on information provided by utilities and EIA data (From Exhibit 1)	1,633	1,749
Number of Systems that were likely ineligible for the Credit and Exemption based on EIA data and Holy Cross Electric annual reports	79	67
Number of Potential Exemption and Credit Eligible Systems Installed Per Year	1,554	1,682
Estimated Cost of an Average Battery[1] Purchase for Systems	$15,400	$15,400
Estimated Revenue Impact of the Exemption (Number of Potential Systems x Estimated Cost of a Battery x 2.9%)	$694,016	$751,181
Estimated Revenue Impact of the Credit (Number of Potential Systems x Estimated Cost of a Battery x 10%)	$2,393,160	$2,590,280
Total Estimated Revenue Impact of the Exemption and Credit	**$3,087,176**	**$3,341,461**

Source: Office of the State Auditor analysis of data provided by utilities and U.S. Energy Information Administration data, Xcel filings with the Public Utilities Commission, Holy Cross Electric annual reports, and price of system data.
[1]Energy Storage Systems have a wide range in price. We found price estimates of between $3,000 and $25,000+ per battery, so we used $11,000 per battery for our estimate. Xcel rebate data showed 40 percent of customers purchased more than one battery, so we used an average of 1.4 batteries purchased per taxpayer to come up with the $15,400 price.

There are several factors that could impact the accuracy of this estimate:

1. We do not know whether all of the 1,554 and 1,682 ESSs installed in 2023 and 2024, respectively, were eligible for the credit. Additionally, even if they were all eligible, we do not know whether the taxpayer claimed the credit or whether the exemption was properly applied. If some of these systems were not eligible, the homeowner did not claim or only partially claimed the credit, or the seller did not properly apply the exemption, the revenue impact would be less.

2. There could be additional ESSs that were installed off-grid and were not reported to utilities or in territories of utilities that did not provide us with data on the number of systems installed. These ESSs could potentially be eligible for the credit and exemption and are not accounted for in our estimate. To the extent that the credit and exemptions were claimed for these ESSs, the revenue impact would be larger.

3. There is a wide range of prices for ESSs, largely driven by the size and number of batteries, and we lacked information to precisely determine the average cost that would be eligible for the credit and exemption. As noted, we found estimates ranging from $3,000 to $25,000+ per battery, but we used $11,000 per battery in our estimate. Additionally, in our estimate we assumed 1.4 batteries per building as many utilities reported customers with multiple batteries in their system. It is common for an ESS to have more than one battery; some off grid homes

could install multiple batteries. To the extent that a system had more than 1.4 batteries, our estimate would underestimate that impact.

4. The credit is available for 10 percent of the system's cost, including any local sales taxes and freight charged. Our estimate of the credit does not account for sales taxes and freight (lithium-ion batteries can weigh several hundred pounds and require special shipping procedures that could add to the final cost of the battery).

We identified several factors that may be driving stronger growth in ESS installation than what was projected at the time the Residential Energy Storage Credit and Exemption were established. First, it is possible that a large increase in ESS installations in 2023 and 2024 (and systems eligible for the state credit and exemption) were driven by Xcel Energy's RBC Program. As discussed, in mid-2023 Xcel Energy, which covers a large service area in the state, began offering its RBC Program rebate, which provides a large financial incentive to install an ESS and has had very high uptake. As a result of the success of the RBC Program, more ESSs may have been installed, a consequence of which may be a higher revenue impact to the State for its tax incentives.

Second, according to the Joint Center for Housing Studies of Harvard University, there has also been an increase in home remodeling that has occurred post-COVID, with the annual amount homeowners spent on remodeling growing by 51 percent from a total of $404 billion in 2019 to a total of $611 billion in 2022 and then plateauing at a total of $609 million in 2023. Spending on energy efficiency projects grew by $28 billion (25 percent) from 2021 to 2023 and was likely spurred further by the Inflation Reduction Act tax credits that were claimed by 3.4 million taxpayers in 2023. This surge in spending on home remodeling and the growth in spending on energy improvement projects was likely a large driver of ESS installation in Colorado and throughout the United States.

Third, ESS technology and software have seen improvements over the past decade that are making them a more attractive option for homeowners, with most of the gains experienced over the past few years. In particular, the introduction of Tesla's Powerwall 3, altered the market in two ways—it contains a built-in inverter and produces larger output capacity than other batteries on the market. The built-in inverter made it considerably cheaper than other storage systems that required an additional inverter, which is necessary to allow utilities to draw electricity from the battery, and the larger output capacity generates 11.5 KW, which allows them to power high electricity usage appliances, such as vacuums and air conditioners.

We do not have an estimate for the exemption and credit for Tax Year 2025; however, it is possible the revenue impact could again be substantial. Xcel's RBC Program has continued to be popular and had fully exhausted its nearly $6.8 million budget for 2025 by October 2025. Additionally, it is possible that the One Big Beautiful Bill Act's acceleration of the expiration of the Federal Residential Clean Energy Credit at the end of 2025 increased demand for ESSs in 2025, since homeowners may have installed ESSs sooner so that they would still be able to claim the credit. Conversely, the revenue impact in 2026 may fall if fewer ESSs are purchased due to the expiration of the federal credit.

Installation of residential energy storage systems could play an important role in achieving the State's climate goals if they are more widely adopted. However, as discussed above, in most cases, the credit and exemption on their own are likely not the primary factors that incentivize the purchase and installation of these systems, and therefore, their impact on achieving the State's climate goals is likely small unless paired with other, larger tax incentives and rebates.

Colorado is making progress towards its goal of 100 percent of electricity generation in the state coming from renewable sources by 2040, but will need to significantly expand renewable electricity generation capacity to achieve this goal. According to the EIA's 2024 Colorado State Energy Profile, renewable energy sources accounted for 43 percent of total in-state electricity generation, with about two-thirds of this from wind power and 27 percent coming from solar. Generation from small-scale customer-sited solar panel systems, which are sometimes paired with ESSs, increased by 20 percent in 2024 and accounted for almost one-third of the state's total solar generation in 2024. In 2024, coal-fired power plants accounted for 27 percent of state electricity generation, down from 60 percent in 2014.

As coal-fired electricity generation is replaced by renewables, the need for energy storage in Colorado will continue to grow. Unlike a fossil fuel power plant that can run 24 hours a day, solar power is only generated when the sun is shining and wind power is only generated when the wind is blowing, meaning storage is needed to keep power available when it is not being generated. Conversely, if renewable energy generation exceeds the energy consumption needs at the time it is produced and there is inadequate storage capacity, utilities may turn off renewable energy production since they cannot sell the excess energy economically. ESSs play an important role in balancing demand because they can be charged when there is excess solar generated at a residence or from the grid at times when electricity prices are low due to low demand or excess renewable electricity generation.

Based on the available data, it appears that not enough ESSs have been installed in the Colorado to have a significant impact on the State achieving its climate goals, with our review showing it is likely that about 0.25 percent of the state's residential energy customers had installed ESSs as of 2024. However, as adoption of these systems increases, they may have a larger impact. Although utilities in the state are constructing their own systems to store electricity generated by renewable sources, their plans call for residential ESSs to also contribute to overall storage needs. For example, in January 2024, the PUC approved Phase II of Xcel's clean energy plan, which called for 6,100 MW of new generation from renewable sources, and included a storage goal of 1,850 MW. It reported that the majority of this storage will come from utility-scale storage, but small-scale residential energy storage will also contribute to this goal. Grid of the Future, Xcel's white paper, projected small-scale storage in their territory would grow from 52 MW as of 2025 by 9 to 14 times that amount by 2050, with projected amounts ranging from 472 MW to 755 MW. Holy Cross Electric's plan calls for 100 percent renewable electricity by 2030, with about 80 percent coming from utility-scale solar, wind, and battery storage and the remaining 20 percent coming from small-scale generation and storage, which includes residential rooftop solar and residential battery storage.

To the extent the Residential Energy Storage Credit and Exemption encourage the purchase and installation of ESSs, they can help the State meet its clean energy goal that is a component of its climate goals. As discussed, the State's credit and exemption alone are likely not large enough on their own to incentivize most homeowners to install an ESS. However, due the high up front cost of ESSs, incentives and other programs that lower their cost are likely important to sustaining their continued adoption and the credit and exemption contribute to the range of incentives homeowners may be able to use. Additionally, around the time that the credit and exemption were adopted, the General Assembly passed several bills that focused on encouraging the adoption of technologies that reduce overall greenhouse gas emissions and these tax expenditures appear to be intended to act as one part of a broader set of policies aimed at reducing individuals' contributions to climate change. Although it is difficult to isolate the impact ESSs to the State's climate goals, when combined with other technologies, such as solar power, heat pumps, EVs, and electric appliances, they can offer a larger potential benefit.

Policy Consideration

We did not identify any policy considerations for the Residential Energy Storage Credit or Exemption.

Office of the State Auditor

State Auditor	**Kerri L. Hunter, CPA, CFE**
Deputy State Auditor	**Michelle Colin, JD**
Evaluation Managers	**Trey Standley, JD** **James Taurman, MPA**
Evaluation Supervisor	**Kim Tinnell, MBA, MS, MA**
Evaluation Team	**Chris Akers**

OFFICE OF THE STATE AUDITOR

C O L O R A D O

Working to improve government for the people of Colorado.