Identifying and Accounting for Transfers in Benefit-Cost Analysis of Distributed Energy Resources

Supplemental Guidance to the National Standard Practice Manual™ (NSPM)

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EXECUTIVE SUMMARY

Purpose

This paper serves as a supplement to the *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources* (NSPM) (NESP 2020). The NSPM provides guidance on how to conduct benefit-cost analysis (BCA) of distributed energy resources (DER) in a sound, consistent, transparent way that properly captures the energy policy goals of each state or jurisdiction.[1] It describes the Jurisdiction-Specific Test (JST) that reflects the regulatory perspective. Section 1 below describes the traditional BCA tests and the JST in more detail.

Some impacts from DERs represent transfers from one party to another.[2] In the context of BCAs, an offsetting transfer occurs when one party incurs a cost that is equal to a benefit experienced by another party, and both parties are within the scope of the BCA test.

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If the cost and corresponding benefit are an offsetting transfer, they will net each other out of the net benefits of the BCA. If the cost and corresponding benefit are not an offsetting transfer, one of them should be included in the BCA while the other should be excluded, depending upon which party is within the scope of the test. Consequently, the treatment of transfers can have significant impacts on BCA results.

In some cases, it is not obvious whether an impact is an offsetting transfer. The purpose of this document is to demystify transfers and provide practical guidance for how to identify and treat offsetting transfers when conducting a BCA.[3]

Benefit-cost analysis tests

The key to identifying offsetting transfers is to determine whether both parties experiencing the cost and corresponding benefit are within the scope of the BCA test used. The four main tests used to assess DER cost-effectiveness are the utility cost test (UCT), the total resource cost test (TRC), the societal cost test (SCT) and the jurisdiction-specific test (JST). Each of these tests is designed to represent a different perspective. As such they each have a different scope, i.e., they each have different boundaries regarding which parties are included in the test, and which are not.

Identifying and accounting for offsetting transfers

As noted, an offsetting transfer occurs in a BCA when a cost (or benefit) to one party within the scope of the BCA test is exactly offset by an equivalent benefit (or cost) of another party within the scope of the BCA test. Therefore, offsetting transfers can be identified by the following steps:

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[1] Distributed energy resources may include energy efficiency (EE), demand response (DR), distributed generation (DG), distributed storage (DS), and electric vehicles (EVs).

[2] Throughout this paper, the term "impact" is used to refer to either a cost or a benefit that might be included in a BCA test.

[3] This paper refers to transfers that occur in BCAs for *electric utility* DERs. Many of the same concepts apply to BCAs for *gas utility* DERs as well. The document does not discuss the gas utility transfers separately, for simplicity.

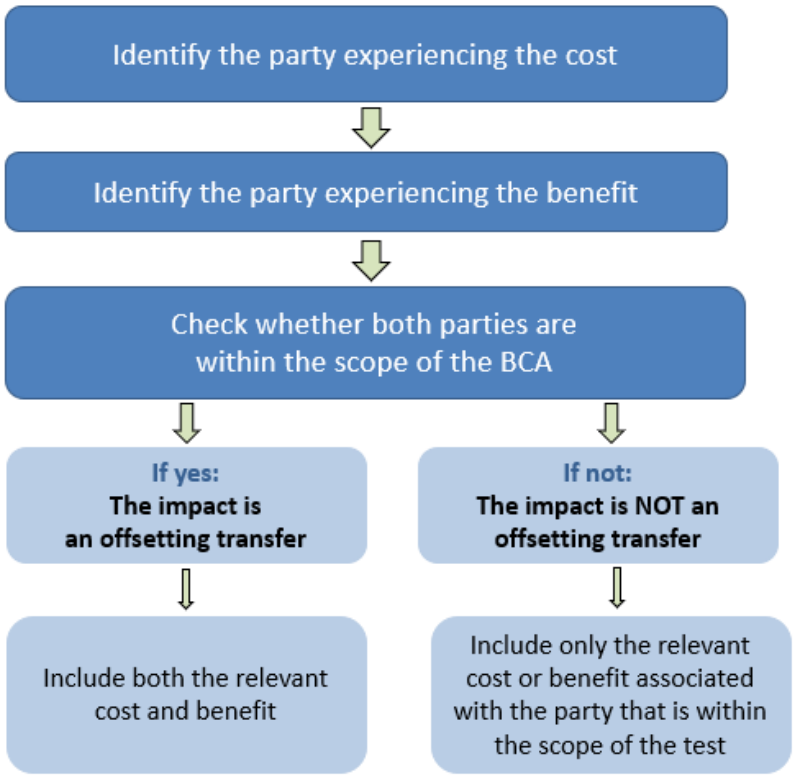
- Identify the party experiencing the cost.
- Identify the party experiencing the benefit.
- Check whether both the party experiencing the cost and the party experiencing the benefit are within the scope of the BCA test used. If so, then the set of costs and benefits is an offsetting transfer.

If a set of costs and benefits is determined to be an offsetting transfer, then the BCA analysis would include both the costs and benefits. One could also exclude both the costs and benefits from the BCA, but this is less transparent and will result in a benefit-cost ratio that is slightly incorrect.

If a set of costs and benefits is determined to not be an offsetting transfer, then either the cost or the benefit should be included in the BCA, depending on which party is within the scope of the BCA test.

Figure 1 presents a summary of these steps.

Figure 1. Steps for identifying and accounting for offsetting transfers



Summary of potential offsetting transfers discussed in this paper

Table 1 presents a summary of which of the impacts discussed here are offsetting transfers. In some cases, the impact is not an offsetting transfer under any BCA tests. In other cases, whether an impact is an offsetting transfer depends on the BCA test in use. Section 3 describes why these impacts are an offsetting transfer or not.

Table 1. Summary of which impacts are offsetting transfers

Impact	UCT	TRC	SCT	JST
Tax Incentives [a]	no	no	offsetting transfer	depends [b]
Utility Performance Incentives	no	no	no	no
Host Customer Incentives	no	offsetting transfer	offsetting transfer	depends [c]
Market Price Effects	no	no	no	no

[a] *Tax incentives require additional consideration. DER tax incentives must be treated consistently with tax incentives for other types of utility resources. Section 3 describes this further.*

[b] *Under a JST, tax incentives are an offsetting transfer only if regulators choose to include taxpayers within the BCA test.*

[c] *Under a JST, host customer incentives are an offsetting transfer only if regulators choose to include host customers within the BCA test.*

Table 2 presents a summary of how a BCA should account for the impacts discussed here. Section 3 explains why these impacts discussed in this study should be treated this way.

Table 2. Summary of how to account for selected impacts in BCA tests

Impact		UCT	TRC	SCT	JST
Tax Incentives	Cost to taxpayers	x	x	x	x
	Benefit to host customer	x	✓	✓	✓
Utility Performance Incentives	Cost to utility system	✓	✓	✓	✓
	Benefit to utility shareholders	x	x	x	x
Host Customer Incentives	Cost to utility system	✓	✓	✓	✓
	Benefit to host customer	x	✓	✓	depends*
Market Price Effects	Cost to generation company	x	x	x	x
	Benefit to utility system	✓	✓	✓	✓

"✓" indicates that the impact should be included in the BCA. "x" indicates that the impact should be excluded from the BCA.
**Under a JST, host customer incentives should be included only if regulators choose to include host customers within the BCA test.*

1. BCA Tests and Perspectives

1.1 Traditional Benefit-Cost Analysis Perspectives

Historically, assessment of the costs and benefits of DERs have entailed using three traditional cost-effectiveness tests: the UCT, the TRC, and the SCT. Each of these tests examines the costs and benefits of a DER from a different perspective.

Utility Cost Test: The purpose of the UCT is to indicate whether the benefits of a DER will exceed its costs from the *perspective of the utility system*. The UCT includes all benefits and costs that affect the operation of the utility system and the provision of electric and/or gas services, including

generation, transmission, distribution, and general costs and benefits. This is true for vertically integrated utilities, transmission and distribution utilities, and distribution-only utilities.

Total Resource Cost Test: The purpose of the TRC is to indicate whether the benefits of a DER will exceed its costs from the *combined perspective of the utility system and program participants*. Thus, this test includes all impacts of the UCT, plus all impacts on the program participants.

Societal Cost Test: The purpose of the SCT is to indicate whether the benefits of a DER will exceed its costs from the *perspective of society as a whole*. This test provides the most comprehensive picture of the total impacts of a DER. It includes all the impacts of the TRC, plus the additional impacts on society. The *California Standard Practice Manual* refers to the SCT as a "variation" of the TRC (CPUC 2001, 4). Many jurisdictions and many studies have referred to the SCT as a separate test with different implications (NESP 2020, Appendix E).

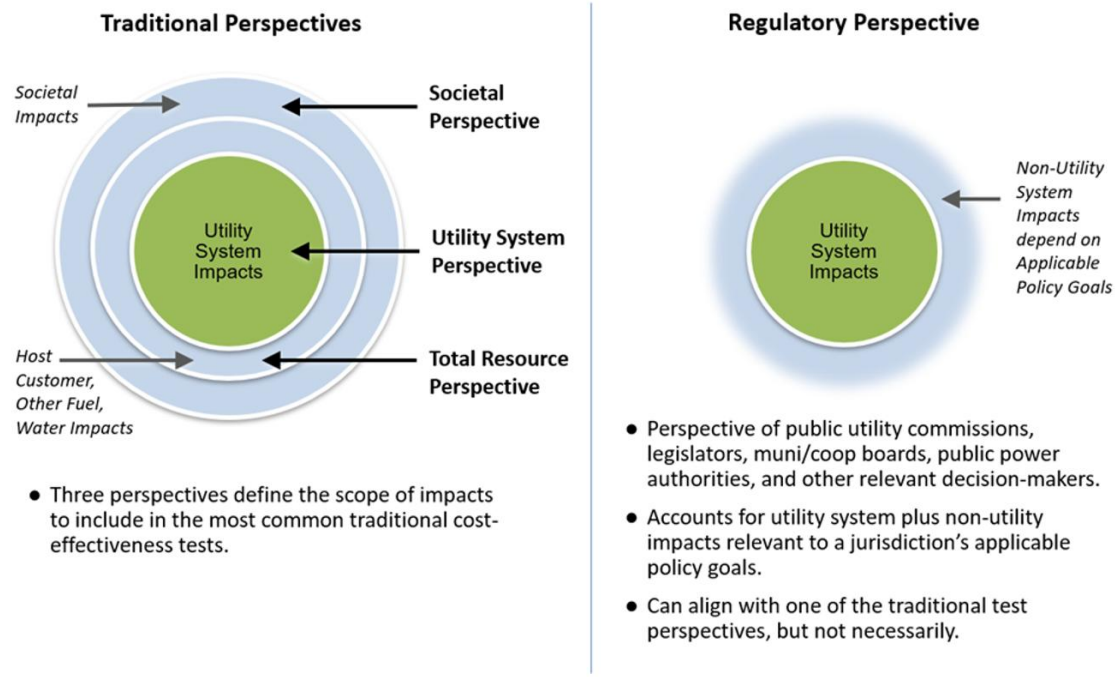
Two other tests are sometimes used for BCAs: the Participant Cost Test (PCT) and the Ratepayer Impact Measure (RIM) test (CPUC 2001). The PCT is useful for designing DER programs (e.g., to inform decisions on customer rebate levels) but less useful for screening programs (i.e., determining which programs have net benefits and warrant utility investment). The RIM test is inappropriate for cost-effectiveness analyses because it addresses a different question of whether rates—which include recovery of sunk costs—will go up or down. Instead, rate impacts should be analyzed separately from BCA (NESP 2020, Appendix A). For these reasons, this paper does not address the PCT or the RIM tests further.

1.2 The Regulatory Perspective

As described in the NSPM, a JST branches off from the traditional cost-effectiveness tests by relying on the *regulatory perspective*. The core responsibility of utility regulators is to prevent the abuse of monopoly power and protect consumers from unfair practices, excessive rates, and poor service quality. In many cases, public utility regulators are also tasked with aligning their decisions and actions with broader energy policy objectives of the jurisdiction in which they operate.

Figure 2 compares the range of impacts included in the traditional perspectives with those included in the regulatory perspective. The left panel illustrates the perspectives of the traditional tests as multiple "layers" of impacts. The narrowest perspective is the UCT, which includes only impacts to the utility system. The TRC expands this perspective to include impacts on participants, such as avoided costs associated with fuel, water, or other resources. The SCT is the largest circle, which adds societal impacts, including environmental and other non-energy benefits and costs.

Figure 2. Traditional BCA perspectives compared with the regulatory perspective



The right panel shows the regulatory perspective, which is implemented through a JST. This perspective includes, at a minimum, the impacts to the utility system, as with the UCT. The extent to which it includes other non-utility system impacts depends on the regulator's mandate to protect customers and support jurisdictional policy goals. The regulator's mandate does not typically line up neatly with any of the other traditional tests; hence the scope of the regulatory perspective is rendered as a fuzzy blue circle beyond utility system impacts. Some jurisdictions may decide that their policy goals are consistent with one of the traditional tests and therefore their JST would be consistent with one of the traditional tests.

In the case that a JST includes some of the same impacts as the SCT, the inclusion of certain societal impacts should not be confused with the societal perspective. As discussed above, the regulatory perspective is distinct from the societal perspective in that regulators have a unique charge to protect utility customers and meet policy goals. This distinction is where some of the confusion regarding offsetting transfers arises since regulators do not necessarily have the responsibility to protect all members of society.

For example, regulators in one jurisdiction might decide it is consistent with the jurisdiction's policy goals to include low-income customer and greenhouse gas impacts in the JST. This choice, however, does not mean that this JST is an SCT just because it includes these two societal impacts.

If a JST includes some of the same impacts as the SCT, this should not be confused with the societal perspective. The regulatory perspective is distinct from the societal perspective in that regulators have a clear charge to protect utility customers and meet policy goals.

1.3 Summary of BCA Tests

Table 3 presents a summary of the costs and benefits included in the traditional tests and the JST.

Table 3. Summary of cost-effectiveness tests and perspectives

		UCT	TRC	SCT	JST
	Perspective:	Utility System	Utility System + Host Customers	Society	Regulatory
Utility System	Costs & Benefits	✓	✓	✓	✓
Host customer	Costs & Benefits	--	✓	✓	Depends on policy goals
Societal	Costs & Benefits	--	--	✓	

2. Identifying and Accounting for Offsetting Transfers

2.1 Terminology: Transfers and Offsetting Transfers

In the context of BCAs, a *transfer* occurs when one party incurs a cost that is equal to a benefit experienced by another party.

An *offsetting transfer* occurs when one party incurs a cost that is equal to a benefit experienced by another party, and both parties are within the scope of the BCA test. In this case, the cost to one party exactly offsets the cost to another party in the BCA results, i.e., the costs and the benefits net each other out.

The *California Standard Practice Manual* uses the term *transfer payment* as it relates to cost-effectiveness tests for energy efficiency programs (CPUC 2001). However, the theoretical definition of transfer payment (referring to government programs to support those in need) does not apply to utility BCA.[4] Therefore, this paper does not use the term *transfer payment* any further.

2.2 Identifying Offsetting Transfers

Identify the parties that experience the relevant cost and benefit

The first step to identifying an offsetting transfer is to determine the parties that experience the relevant cost and benefit. The potential parties include utility customers, host customers, and various members of society.

Identifying the parties that experience the relevant costs and benefits often requires further delineations beyond these categories. The utility system might include several different parties, such as utility customers, utility management, utility shareholders, independent power producers,

[4] Economists use the term *transfer payment* to refer to efforts by local, state, and federal governments to redistribute money to those in need. Common examples of transfer payments include government programs such as Social Security, Medicare, student grants, and unemployment compensation. The concept of transfer payments has been used for decades in public finance theory, particularly by economists studying the implications of wealth redistribution through taxes and government welfare programs (Pigou 1932). Sometimes the term *transfers* is used synonymously with *transfer payments* (U.S. OMB 2023, 57).

and parties that provide other goods and services to utilities. Identifying the specific party might be necessary to determine whether it is within the scope of the BCA test, as described further in Section 3.

Similarly, society includes many different parties and can theoretically include all parties that might be affected by DERs or the resources to which they are compared in a BCA. Identifying the specific party within the broad scope of society is sometimes necessary to determine whether it is within the scope of the BCA test. Again, Section 3 provides examples of this.

Check whether both parties are within the scope of the BCA test

BCA tests with different scopes

As described in Section 1, BCA of DERs can entail several different tests. The scope, i.e., boundary, of each test determines which parties are included and which are not. If the BCA includes one party in the test but not another party, then the cost (or benefit) does not offset the relevant benefit (or cost). Thus, whether an impact is an offsetting transfer depends upon the test used.

- *The Utility Cost Test*: An offsetting transfer would occur only if the relevant costs and benefits are experienced by parties within the utility system.
- *The Total Resource Cost Test*: An offsetting transfer would occur only if the relevant costs and benefits are experienced by parties within the utility system and host customers.
- *A Jurisdiction-Specific Test*: An offsetting transfer would occur only if the relevant costs and benefits are experienced by parties within the scope of the JST, which will depend on the energy policy goals of the jurisdiction.
- *The Societal Cost Test*: An offsetting transfer would occur if the relevant costs and benefits are experienced by parties within society. Theoretically, the SCT includes all parties in society, which suggests that all parties are within the scope of the BCA test. However, it is conventional practice to exclude certain parties from even the SCT, as described below.

The scope of the Societal Cost Test

While the societal perspective implies that all parties should be included within the SCT because society could theoretically include any party, this is not necessarily the case. There are many instances when applying the SCT in a BCA where certain parties are excluded from the analysis. That is, certain parties are considered to be outside the boundaries of the SCT.

Excluding certain parties from the scope of the SCT is necessary to make the BCA meaningful. If all parties within society are included in the SCT, and therefore all sets of costs and benefits are considered to be offsetting transfers when applying a SCT, then all costs and benefits would net each other out and thus render the BCA meaningless. Some parties have to be left out of the analysis so that the remaining costs and benefits can be used to answer the question the BCA is designed to answer.

If all parties within society are included in the SCT, then all costs and benefits would net each other out rendering the BCA meaningless.

For example, consider some of the key costs that utilities incur in order to provide electric services: fuel costs, costs to procure generation, transmission, or distribution equipment, costs to procure DER technologies, costs to pay vendors to help install DERs, and others. In all cases, there is a counterparty within society that receives payment for those products and services, which represents a benefit equal to the cost incurred by the utility. If all parties that sell fuels, equipment,

and other materials, to utilities are included within the scope of the SCT, then all the costs that the utility incurs to pay those parties will net out to zero, rendering the BCA meaningless and useless. Therefore, it is conventional practice to exclude these parties from a BCA, even when applying the SCT.

As another example, the profits that utilities pay to vendors when procuring goods and services of any type are theoretically a transfer from the utilities to the vendors' shareholders. If these were treated as an offsetting transfer, then the profits that utilities pay for goods and services would be netted out of the BCA. This would understate the total cost of the goods and services incurred by the utility and would therefore make it difficult for regulators and others to assess the true costs that would be incurred by the utility and passed on to customers. Thus, the profits that utilities pay vendors for goods and services are not considered offsetting transfers by convention, even when applying the SCT.

2.3 Accounting for Offsetting Transfers

One of the key principles in the NSPM is to treat benefits and costs symmetrically for any given type of impact. This means The BCA will either include both the costs and the benefits or exclude both the costs and the benefits for each type of impact (NESP 2020).

This principle applies to offsetting transfers as well. If a particular impact is deemed to be an offsetting transfer, then both the costs and the benefits can be included or both the costs and benefits can be excluded (U.S. OMB 2023, 57–60).

The choice of whether to include or exclude both offsetting transfer costs and benefits can affect the BCA results.

- *The net benefits* will be the same regardless of whether the BCA includes both offsetting transfer costs and benefits or excludes both, because when they are both included the subtraction nets them out.
- *The benefit-cost ratio*, however, will depend on whether offsetting transfer costs and benefits are both included or excluded because when they are included in both the numerator and denominator they do not exactly net out.

Table 4 presents an example of BCA results showing the effects of including versus excluding offsetting transfers in a hypothetical BCA. It shows how the net benefits do not differ, but the benefit-cost ratio does differ.

Table 4. Example presentation of including versus excluding offsetting transfers

Impacts	Include Both Costs and Benefits	Exclude Both Costs and Benefits
Transfer cost	10	0
Other costs	55	55
Total costs	**65**	**55**
Transfer benefits	10	0
Other benefits	95	95
Total Benefits	**105**	**95**
Net Benefits	**40**	**40**
Benefit-cost ratio	**1.6**	**1.7**

These values are hypothetical, for illustrative purposes.

Including both the costs and benefits of an offsetting transfer is more transparent because it reveals the parties affected by the transfer as well as the magnitude and the direction of the transfer. This information might not be apparent if the costs and benefits are both excluded from the BCA. Further, including both the costs and benefits of an offsetting transfer provides a more accurate benefit-cost ratio, as indicated in Table 4. Therefore, including both the costs and benefits of an offsetting transfer is preferable to excluding them both.

3. Potential Offsetting Transfers in DER BCAs

3.1 DER Tax Incentives

Description

Federal, state, or local governments sometimes provide tax incentives to DER host customers to defray some of the costs of adopting DERs. In recent years, the federal government has established a wide range of tax incentives to encourage the adoption of DERs, in the *Inflation Reduction Act* and the *Infrastructure Investment and Jobs Act* (Analysis Group 2023). The scope and magnitude of these tax incentives can be large, so it is important that BCAs properly characterize and account for these tax incentives.

The term *tax incentives* is used broadly here to refer to all forms of subsidies or support provided by federal, state, and local governments. These might include tax credits, tax deductions, research and development grants, mineral, fuel mining, and drilling rights, property tax breaks, and more.

It is important to think broadly about where and how tax incentives might be relevant in a BCA, as discussed further below. DERs are not the only energy resources offered tax incentives. There are numerous tax incentives for various types of energy technologies and resources, including fossil fuels, nuclear power, fuel renewable resources, biofuels, and more. Further, tax incentives are available at various points in the energy supply chain, including mineral rights, mining and drilling rights, research and development grants, investment credits, production credits, and accelerated

depreciation accounting methods. When conducting a BCA of DERs, some of these other tax incentives might be relevant because they are likely to affect the energy resources avoided by the DERs.

The questions below help determine whether tax incentives are an offsetting transfer.

Which party experiences the cost?

Taxpayers pay the costs of tax incentives. This might include local taxpayers for tax incentives such as reduced property taxes, state taxpayers for tax incentives provided by state government, and federal taxpayers for the variety of tax incentives offered by the federal government.

Which party experiences the benefit?

The party that benefits from a tax incentive will depend upon the type of tax incentive. For example, fuel mining and drilling rights will benefit the coal, gas, or oil companies that conduct the mining and drilling. Research and development grants will benefit the companies researching and manufacturing energy technologies. Property tax breaks will benefit the power plant owner. Investment and production tax credits will benefit the power plant owner.

Regarding DER tax incentives, most incentives go to the owner of the DER, which might depend on the type of DER. For example, some DERs might be owned by the host customer, the DER developer, or the host customer's landlord.[5]

Are both parties within the scope of the BCA test?

Utility Cost Test

Host customers are not within the scope of the UCT. Taxpayers are not within the scope of the UCT. Therefore, DER tax incentives are not an offsetting transfer under this test.

While it is true that utility customers are also taxpayers, this does not mean that they should be considered the same "party" for this purpose. Regulators have a responsibility to protect utility customers, but no similar responsibility to taxpayers. This is consistent with the fact that many utility customers are also utility shareholders, but they are treated as different parties for regulatory purposes.

Total Resource Cost test

Host customers are within the scope of the TRC test. Taxpayers are not within the scope of the TRC test. Therefore, DER tax incentives are not an offsetting transfer under this test.

Societal Cost Test

Host customers are within the scope of the SCT. Taxpayers (federal, state, and local) are also within the scope of the SCT test. Therefore, DER tax incentives are an offsetting transfer under the SCT.

[5] In some situations, the utility providing a DER program might choose to reduce the host customer incentive provided by a DER program because of the DER tax incentive. Nonetheless, the benefit of the DER tax incentive is experienced by the host customer.

Jurisdiction-Specific Test

If the JST does not include host customers, then the party benefitting from DER tax incentives is not within the scope of the test, and therefore DER tax incentives are not an offsetting transfer.

If the JST does include host customers, then *regulators need to decide whether to include taxpayers within the scope of the JST*, depending upon their jurisdiction's policy goals. Regulators might decide that taxpayers should be *outside* the scope of the JST, meaning that costs to taxpayers should not be included in the test. Alternatively, regulators might decide that taxpayers should be included *inside* the scope of the JST, meaning that the costs to taxpayers should be included in the test. Further, this choice of whether to include taxpayers within the scope of the JST needs to be made for federal, state, and local taxpayers, depending on the source of the tax incentive.

Under a JST, regulators might decide that taxpayers should be *outside* the scope of the test, meaning that costs to taxpayers should not be included in the test.

As explained in the NSPM, decisions about which impacts to include in the JST should be based on transparent and robust stakeholder input (NESP 2020). Similarly, stakeholder input should inform the decision of whether the JST will include federal, state, or local taxpayers.

How to treat the relevant cost and benefit

How to treat the relevant cost and benefit depends on the test applied.

- For the UCT, neither the cost nor the benefit of the DER tax incentive should be included.[6]
- For the TRC test, the benefits to host customers should be included. The costs to taxpayers should be excluded.
- For the SCT, the benefits to host customers should be included in the SCT. Theoretically, costs to taxpayers should also be included in the SCT. However, for consistency purposes it is better not to include the costs to taxpayers, as discussed below.
- For the JST:
    - If it does not include host customers, then this test should include neither the cost nor the benefit of DER tax incentives.
    - If it includes host customers and not taxpayers, then this test should include the benefits of the DER tax incentives but exclude the costs.
    - If it includes both host customers and taxpayers, then this test should include the benefits of DER tax incentives. Theoretically, the BCA should also include costs to taxpayers in this situation. However, for consistency purposes it is better not to include the costs to taxpayers, as discussed below.

Consistency with other types of tax incentives

As noted above, there are numerous types of tax incentives for a variety of energy resources, at multiple points in the supply chain, from federal, state, and local governments. The box below presents a partial list of several federal tax incentives.

[6] If the utility that implements the DER program chooses to reduce the incentive/rebate provided to host customers because of the DER tax incentive, then the BCA should account for the reduced incentive/rebate to the host customer.

Examples of federal tax incentives for various energy technologies include the following ("Earth Track," n.d.):

- Expensing of intangible drilling costs (26 U.S. Code § 263)
- Deduction for percentage depletion for oil and gas wells of 15 percent of gross income from the property (26 U.S. Code § 613)
- Two-year amortization of geological and geophysical expenditures (26 U.S. Code § 167(h))
- Expensing of tertiary injectants for crude oil production (26 U.S. Code § 193)
- Exception from passive loss limitation for any working interest in oil or gas property (26 U.S. Code § 469)
- Corporate income tax exemption for publicly traded oil and gas partnerships (26 U.S. Code § 469)
- Credit for clean coal investments (26 U.S. Code § 48A)
- Credit for enhanced oil recovery (26 U.S. Code § 43)
- Credit for producing oil and gas from marginal wells (26 U.S. Code § 45 I)
- Credit for nuclear power (26 U.S. Code § 45J and 26 U.S. Code § 45U)
- Credit for biodiesel and renewable diesel (26 U.S. Code § 40A, 26 U.S. Code § 6426(c), 26 U.S. Code § 6427)
- Incentives for biofuel (26 U.S. Code § 40)
- Credit for renewable energy investment or generation (26 U.S. Code § 45, 26 U.S. Code § 48)

These tax incentives are typically, perhaps always, accounted for in BCAs by including the benefit to the mining or drilling company, the power plant owner, the utility, or the customer but not including the cost to taxpayers. In other words, tax incentives are conventionally not treated like an offsetting transfer—even when using the SCT, despite the fact that tax incentives are theoretically a transfer under the SCT.

All tax incentives should be treated consistently in BCAs. Otherwise, BCA results will be skewed in favor of those utility resources where only the tax incentive benefits are included and skewed against those where both benefits and costs are included. Specifically, if the tax incentives for the DER being evaluated are treated as an offsetting transfer and netted out of the analysis but the tax incentives for the resources avoided by the DER are not treated as an offsetting transfer and thus not netted out of the analysis, then the DER BCA will be skewed against the DER.

Further, DERs should be analyzed consistently with all other types of resources. This is a fundamental principle from the NSPM.[7] This means analyzing tax incentives for DERs consistently with the way that tax incentives are analyzed for other types of utility resources.

All tax incentives should be treated consistently in BCAs. Otherwise, BCA results will be skewed.

However, identifying and calculating all the costs and benefits associated with all the tax incentives that affect all the resources in a BCA is infeasible because they are so extensive and affect many different parts of the electricity and gas supply chains.

When applying an SCT, if all the tax incentives for all the resources in the analysis are not identified and treated as offsetting transfers, then there are two options for how to treat the DER tax incentives:

1. **Treat the DER tax incentives as if they are an offsetting transfer.** This means *including* the cost to taxpayers and *including* the benefits to DER host customers, effectively netting

[7] Principle 1: Treat DERs as a Utility System Resource. DERs are one of many energy resources that can be deployed to meet utility/power system needs. DERs should therefore be compared with other energy resources, including other DERs, using consistent methods and assumptions to avoid bias across resource investment decisions (NESP 2020, iv).

out the benefit of the DER tax incentive. This option results in a bias against the DER because the other resources in the BCA do not have their tax incentives netted out.

2. **Treat DER tax incentives as if they are not an offsetting transfer.** This means *excluding* the cost to taxpayers and *including* the benefits to DER host customers, effectively including the benefit of the DER tax incentive. This option also results in a bias, but it is not certain whether that bias is in favor of the DER or against the DER because the direction and the extent of the bias will depend on the magnitude of the tax incentives embedded in the DER costs and the avoided costs.

In sum, when applying an SCT, analysts face a dilemma: either violate the principle of treating DERs consistently with other resource types (option 1), or deviate from the theoretically appropriate treatment of offsetting transfers (option 2).

In this situation, this guide recommends treating DER tax incentives as if they are not an offsetting transfer (option 2). This will result in a bias that might be for or against the DER, which is likely to be more accurate than using a BCA test that will certainly result in a bias against the DER (option 1). Further, if the tax incentives for the DER are comparable to those for the avoided resources, then the combined tax incentives will work in opposite directions, thereby reducing the bias. In sum, it is conventional practice to treat tax incentives for energy resources as if they are not offsetting transfers, and therefore it is appropriate to do the same for DER tax incentives.

Note that this dilemma occurs only in the context of the SCT. For the UCT and the TRC test, tax incentives are not offsetting transfers. For the JST, regulators can resolve this dilemma by deciding that taxpayers are outside the scope of the BCA test and therefore tax incentives are not offsetting transfers.

Summary

Table 5 presents a summary of how to account for DER tax incentives.

- *For the UCT,* the host customer is not part of the test, so the DER tax incentive does not affect it.
- *For the TRC tests*, the taxpayers that incur the cost are not included in the test, thus DER tax incentives are not an offsetting transfer. The benefit to host customers should be included in the test.
- *For the SCT*, both the taxpayers that experience the cost and the host customer that experience the benefit are included in the test, thus DER tax incentives are an offsetting transfer. However, they should not be treated as an offsetting transfer in order to be consistent with how tax incentives for other resources are treated.
- *For the JST*, regulators can choose whether to include taxpayers as a part of the test, which will determine whether DER tax incentives are an offsetting transfer. Either way, however, DER tax incentives should not be treated as an offsetting transfer in order to be consistent with treatment of tax incentives for other resources.

Table 5. Identification and treatment of offsetting transfers: DER tax incentives

Impact	Cost: Increased Taxes	Benefit: Reduced DER Cost	Both Parties in Test	Treatment
Affected party	*Federal, state, or local taxpayers*	*Host customers*	--	--
Utility Cost Test	--	--	No	Exclude cost and benefit
Total Resource Cost test	--	✓	No	Include benefit only
Societal Cost Test	✓	✓	Yes	Include benefit only, for consistency
Jurisdiction-Specific Test	Depends on whether taxpayers are deemed to be within scope of test	✓	Depends	Include benefit only, for consistency

3.2 Utility Performance Incentives

Description

Many jurisdictions provide utilities and other programs administrators with performance incentives for successfully implementing energy efficiency programs (ACEEE 2015) and other DER types. Some jurisdictions provide similar incentives for successful implementation of other DER types.

These performance incentives can take many forms. Utilities might be receive rewards for achieving targets for energy or capacity savings. They might receive rewards for maximizing the savings of a DER program, where the utility receives a portion of the DER cost savings.

The questions below help determine whether utility performance incentives are an offsetting transfer.

Which party experiences the cost?

The utility customers experience the costs of utility performance incentives. These are typically included as part of the cost of implementing the relevant DER program.

Which party experiences the benefit?

The utility shareholders experience the benefits of utility performance incentives because utility performance rewards are typically used to increase utility earnings.[8]

Are both parties within the scope of the BCA test?

Utility customers are within the scope of every BCA test (see Figure 2 and Table 3). They are the central party to the utility system.

[8] In some cases, utilities might choose to provide rewards, i.e., bonuses, for the utility employees responsible for implementing the DER program and earning the reward. In these cases, the rationale for identifying whether the performance incentive is a transfer is the same as for cases where the performance incentive goes to utility shareholders.

Utility shareholders, however, are not within the scope of any BCA test. While utility shareholders are a part of society, and therefore it might seem like they should be included in the scope of the SCT, this is an example of a party that is excluded from BCA tests by convention to make the BCA meaningful.

As described in Section 2.2, some parties have to be left out of an SCT so that the remaining costs and benefits can be used to answer the question that the BCA is designed to answer. Examples include counterparties to the materials, fuels, and labor that utilities procure to provide their services. If these counterparties are included within the SCT, or any BCA test, then many critical utility costs would be netted out of the analyses, rendering it meaningless. The utility performance incentives represent profits to the utility and these profits are part of the total cost of producing the DER. It is necessary to include such costs in the BCA to account for the full cost of the DER.

Therefore, utility performance incentives are not an offsetting transfer. This is true for all BCA tests.

How to treat the relevant cost and benefit

All BCA tests should include the cost of utility performance incentives as a utility system cost. None of them should include the benefit of utility performance incentives.

Summary

Table 6 presents a summary of how to account for utility performance incentives. For all tests, the utility shareholders are not within the scope of the test and therefore this set of costs and benefits is not an offsetting transfer. Under all BCA tests, the utility performance incentives costs should be included but the benefits should be excluded.

Table 6. Identification and treatment of offsetting transfers: utility performance incentives

Impact	Cost: Increased Program Cost	Benefit: Increased Earnings	Both Parties in Test	Treatment
Affected party	*Utility customers*	*Utility shareholders*	--	--
Utility Cost Test	✓	--	No	Include cost Exclude benefit
Total Resource Cost test	✓	--	No	Include cost Exclude benefit
Societal Cost Test	✓	--	No	Include cost Exclude benefit
Jurisdiction-Specific Test	✓	--	No	Include cost Exclude benefit

3.3 Incentives to Host Customers

Description

Many DER programs provide host customers with rebates, loans, or other forms of financial incentives to participate in the program and adopt the DER measure.

The questions below help determine whether incentives to host customers are an offsetting transfer.

Which party experiences the cost?

The utility customers experience the costs of host customer incentives. These are typically included as part of the cost of implementing the relevant DER program.

Which party experiences the benefit?

The host customer experiences the benefits of host customer incentives. The incentives are used to help the host customer offset the costs of the DER measure.

Are both parties within the scope of the BCA test?

For the UCT, host customers are not within the scope of the test. Therefore, host customer incentives are not an offsetting transfer under the UCT. The cost to utility customers should be included in the UCT, but the benefits to host customers should not be included.

For the TRC test and the SCT, the host customers are within the scope of the test. Therefore, host customer incentives are an offsetting transfer under these tests. The TRC test and the SCT should include both the costs to utility customers and the offsetting benefits to host customers.

For a JST that *does not include* host customers, the incentives to host customers are not an offsetting transfer, and only the costs should be included in the test. For a JST that *does include* host customers, the incentives to host customers are an offsetting transfer and both the costs and offsetting benefits should be included in the test.

How to treat the relevant cost and benefit

The cost of host customer incentives should be included in all BCA tests as a utility system cost.

The benefit of host customer incentives should be included in all BCA tests that include the host customer.

Even though the host customer incentive is an offsetting transfer under some tests, this does not mean that the host customer portion of the cost of the DER measure is netted out of the BCA. This is because after the offsetting transfer from the utility to the host customer, the host customer has to use that incentive to pay for the incremental cost of the DER measure.

Even though the host customer incentive is a transfer under some tests, this does not mean that the host customer portion of the cost of the DER measure is netted out of the BCA.

Table 7 illustrates this point. It presents a hypothetical scenario where the incremental cost to purchase an efficiency measure is $80 and the host customer receives a rebate of $20 to offset a portion of that cost.[9]

The effect of this host customer incentive on the two parties is a net cost to the utility system of $20 and a net cost to the host customer of $60, as indicated in the two middle columns. These parties experience these effects, regardless of which test is used in the BCA.

[9] The incremental cost of an efficiency measure represents the cost beyond the cost of a comparable non-efficient measure. For example, assume that the total cost of an efficient motor is $500 and the total cost of a baseline, inefficient motor is $420. The incremental cost of the efficiency measure would be $80.

Under the UCT, only the utility incentive is included in the BCA test, and therefore the net cost in the BCA is $20. Under the TRC, SCT, and a JST that includes host customer impacts, the host customer pays the $80 for the efficiency measure, and there is an offsetting transfer of $20 from the utility system to the host customer. Therefore, while the offsetting transfer of $20 is netted out, the full incremental measure cost paid by the host customer is included in the BCA. In this case, the $20 host customer incentive is assigned to the utility system and the remaining $60 is assigned to the host customer.

Table 7. Example of treatment of host customer incentives as offsetting transfers

	Affected Party		Total Effect on BCA	
	Utility system	Host customer	UCT	TRC, SCT, or JST*
Incremental measure cost paid by host customer	---	-$80	---	-$80
Utility incentive	-$20	$20	-$20	Offsetting transfer: Utility -$20 Host customer $20
Net cost	-$20	-$60	-$20	-$80

This example assumes the JST includes host customer impacts.

Summary

Table 8 presents a summary of how to account for host customer incentives. In all tests that include host customers, this incentive is an offsetting transfer. In these cases, both the costs and benefits should be included in the BCA test.

Table 8. Identification and treatment of offsetting transfers: host customer incentives

Impact	Cost: Increased Program Costs	Benefit: Reduced DER Cost	Both Parties in Test	Treatment
Affected party	*Utility customers*	*Host customers*	--	--
Utility Cost Test	✓	--	No	Include cost only
Total Resource Cost test	✓	✓	Yes	Include cost & benefit
Societal Cost Test	✓	✓	Yes	Include cost & benefit
Jurisdiction-Specific Test	✓	Depends	Depends	Depends

3.4 Wholesale Market Price Effects

Description

When DERs reduce electricity load and/or peak demand, they can cause a reduction in wholesale electricity market energy and capacity clearing prices.[10] The market price reduction is multiplied by the entire quantity of energy or capacity purchased from the market, resulting in potentially significant cost savings to all customers purchasing from the wholesale market.[11]

The opposite effect occurs when DERs, such as heat pumps or electric vehicles, increase electricity load and peak demand. In these cases, marginal increases in wholesale market prices may increase generation and distribution company profits and impose higher costs on retail customers purchasing from the market.

The questions below help determine whether wholesale market price effects are an offsetting transfer.

Which parties experience the costs and the benefits?

The two parties affected by this impact are the wholesale generation companies and the customers that purchase power from the wholesale market. Whether those parties experience a cost or a benefit depends on whether the effect is a decrease in prices or an increase.

- When DERs *reduce* electricity consumption, they can cause a *reduction* in wholesale market prices. In this case, the *costs* are experienced by the wholesale generation companies in the form of reduced revenues, and the *benefits* are experienced by the wholesale market customers.
- When DERs *increase* electricity consumption, they can cause an *increase* in wholesale market prices. In this case, the *benefits* are experienced by the wholesale generation companies in the form of reduced revenues, and the *costs* are experienced by the wholesale market customers.

Are both parties within the scope of the BCA test?

Wholesale market customers are within the scope of every BCA test. Even if some of these wholesale market customers are not utilities, the power they procure will eventually be sold to retail customers, who are central to the utility system.

Wholesale generators, however, are not within the scope of any BCA test. While wholesale generators are a part of society, and therefore it seems like they should be included in the scope of at least the SCT test, this is an example of a party that is excluded from BCA tests by convention to make the BCA meaningful.

Wholesale generators are an example of a party that is excluded from BCA tests by convention to make the BCA meaningful.

[10] In the theoretical economic supply and demand curves, a reduction in load shifts the demand curve inward (i.e., to the left), resulting in the demand curve intersecting the supply curve at a lower price point. In the energy markets, all energy or capacity is purchased at the market clearing price, so the price reduction applies to all purchases, not just the marginal unit.

[11] This same effect applies to wholesale gas markets. The discussion here refers only to wholesale electricity markets for simplicity.

As described in Section 2.2, some parties must be left out of an SCT so that the remaining costs and benefits can be used to answer the question that the BCA is designed to answer. Examples include counterparties to the materials, fuels, and labor that utilities procure to provide their services. If these counterparties are included within the SCT, or any BCA test, then many critical utility costs would be netted out of the analyses, rendering it meaningless.

The same is true for wholesale generators. It is necessary to exclude them from the analysis in order to isolate the costs and benefits associated with the DER being evaluated.

A simple thought experiment illustrates the importance of excluding wholesale generation companies from any BCA test. If a BCA test included wholesale generators, then that would make all the electricity purchased from the market an offsetting transfer. This would mean that the primary benefit of implementing DERs (avoided energy and capacity) would be netted out of the BCA and make the BCA meaningless. Another way to put this thought experiment is: If *wholesale market price effects* are an offsetting transfer, why are *wholesale market costs* not also an offsetting transfer?

Therefore, wholesale market price effects are not an offsetting transfer. This is true for all BCA tests.

How to treat the relevant cost and benefit

The cost (or benefit) of wholesale market price effects on wholesale generators should be excluded from all BCA tests.

The benefit (or cost) of wholesale market price effects on wholesale customers should be included in all BCA tests.

Geographic scope

There is one important nuance to wholesale market price effects. Wholesale markets often span multiple states. Thus, wholesale price effects created in one state might be experienced across multiple states. This raises the question of which wholesale market customers to include in the BCA test: those within the state where the DER is installed, or those within the entire wholesale market region.

A strict interpretation of the UCT suggests that wholesale market customers outside of the state are not a part of the utility system where the DER is implemented, and therefore should not be included in the UCT. A similar conclusion applies to the TRC test.

Under an SCT, the wholesale customers in other states could be considered to be within the scope of the test. In this case, the full wholesale market price effects should be included in the BCA.

Under a JST, regulators can choose whether to include in the BCA the full wholesale price effects or only the effects experienced in the state where the DER is implemented. This is a policy decision for each jurisdiction to make, with input from relevant stakeholders.

Summary

Table 9 presents a summary of how to account for wholesale market price effects. For all tests, the wholesale generation companies are not within the scope of the test and therefore this set of costs and benefits is not an offsetting transfer. Under all BCA tests, the wholesale market price effects on customers should be included but the effects on wholesale generation companies should be excluded.

Table 9. Identification and treatment of offsetting transfers: wholesale market price effects

Impact	Reduced or Increased Price	Increased or Reduced Price	Both Parties in Test	Treatment
Affected party	*Wholesale customers*	*Wholesale generators*	--	--
Utility Cost Test	✓	--	No	Include customer impact only
Total Resource Cost test	✓	--	No	Include customer impact only
Societal Cost Test	✓	--	No	Include customer impact only
Jurisdiction-Specific Test	✓	--	No	Include customer impact only

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