

**Illinois Energy Efficiency Stakeholder Advisory Group
Policy Manual Subcommittee Version 3.0: Proposed Policy Template**

**Proposed Policy: Electrification Savings in Cost-Effectiveness
Submitted By: Opinion Dynamics**

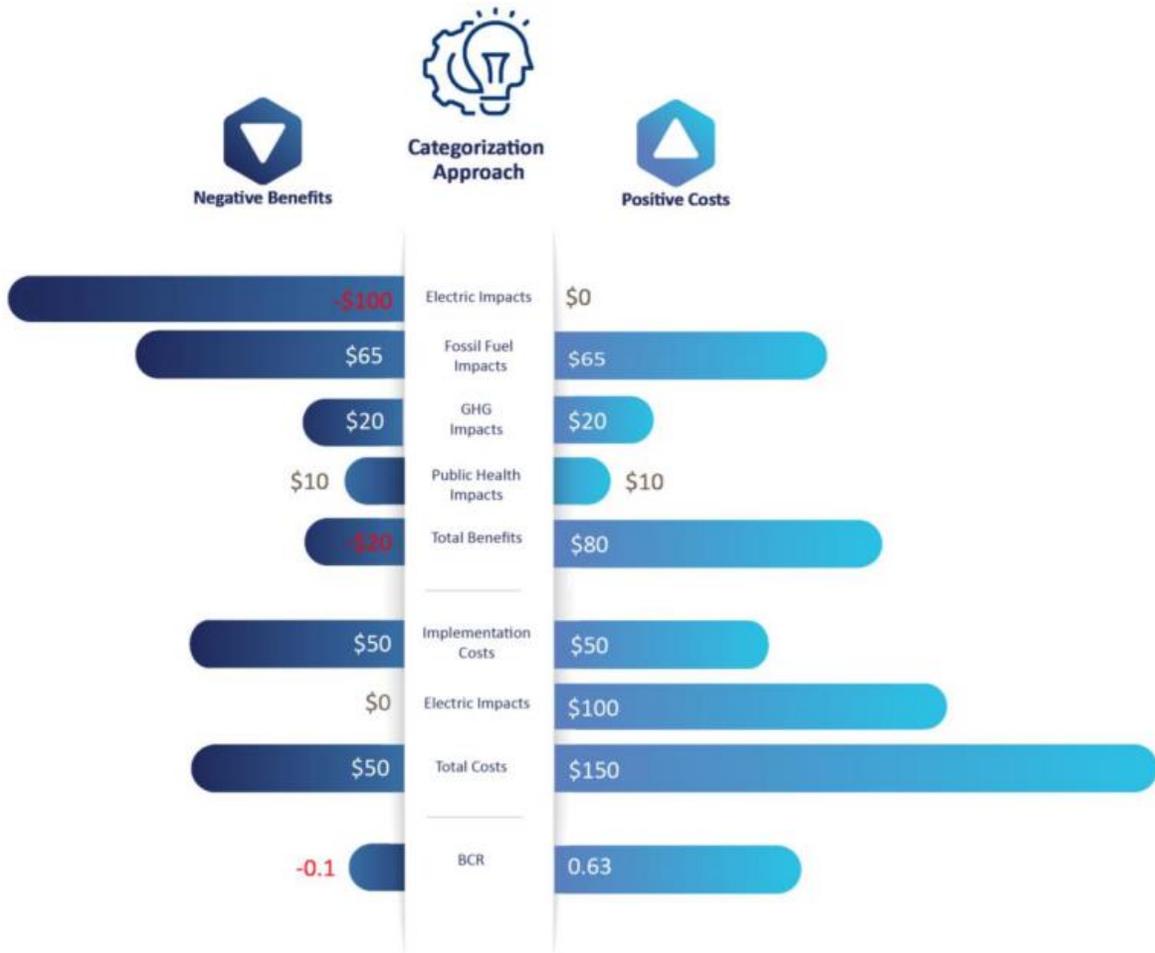
Question 1: Proposed Policy and Rationale

The passing of CEJA has authorized the Illinois utilities to pursue opportunities for electrification across several end uses. Widespread electrification will result in large changes in consumption of several different fuel types -- resulting in energy savings for some fuels, as we are used to dealing with in traditional energy efficiency paradigms -- and large increases in electric consumption (i.e., negative fuel savings), which introduces a relatively new paradigm about how to appropriately define and monetize costs and benefits from electrification in cost-effectiveness analysis.

Historically, we have encountered the concept of negative savings in the form of heating penalties. Under existing frameworks, we have left these penalties as negative savings on the benefits side of the cost-effectiveness analysis, taking a “net benefits” approach to defining and monetizing the costs and benefits of these measures. However, the magnitude of these penalties is minimal compared to what we could encounter in future years from electrification. An alternative to a “net benefits” approach would be to treat negative savings as costs and move them to the cost side of the benefit-cost equation.

The decision to treat negative savings as negative benefits or costs can have considerable impacts on program benefit-cost ratios (“BCRs”). Consider a fictional electrification program that costs \$50 to implement, increases electricity usage by \$100, saves \$65 in fossil fuel impacts, and produces \$30 in societal benefits. This program could have a BCR of 0.63 or -0.1, depending on how the increased electric usage is accounted for in the analysis (Figure 1 below). These two BCRs send very different messages to regulators and utility staff.

Figure 1. BCA distortions associated with negative savings



In addition to considering how best to categorize the impacts of electrification, we may also need to deliberate over how to appropriately monetize these impacts; particularly if we decide it is most appropriate to recategorize negative benefits as costs. The avoided costs typically used to monetize the impacts from energy efficiency measures are theoretical values meant to reflect how much it would have cost a utility to procure a kilowatt-hour that is saved through energy efficiency. However, when analyzing an electrification program, we flip this paradigm, and the kWh *does* need to be procured. Utilities may be inclined to think about these costs (e.g., transmission and distribution system upgrades) as real costs when they are the drivers of significant actual investments.

Applying the same monetization approach (via avoided costs) when calculating the benefit of saving a kilowatt-hour and the cost of procuring a kilowatt-hour helps to maintain consistency in the analysis and is a theoretically valid approach. It also ensures that electrification is monetized and analyzed consistently with other energy efficiency resources. Additionally, the cost per kilowatt-hour avoided cost values are theoretical, counterfactual values. Just as saving a single kilowatt-hour may not actually save any money in terms of procuring additional energy, adding a kilowatt-hour of consumption may not actually result in additional expenses to procure energy. Depending on the magnitude and location of the added electric load, however, electrification can result in real costs, such as infrastructure

investments (e.g., transformers), and at scale, could result in a need to procure additional generation. Incorporating the real costs of these investments may produce more useful and actionable cost-effectiveness results for utility staff.

A third consideration relates to the level of analysis at which it becomes relevant to recategorize negative benefits as costs (if at all). For example, replacing an old fossil fuel furnace and inefficient central air conditioner (CAC) with an efficient heat pump could result in electric cooling savings while adding electric heating consumption; that heat pump might be installed as part of a larger HVAC program that, overall, results in net electricity savings. Therefore, the decision to recategorize added consumption as a cost at the end-use (e.g., treating negative heating savings as a cost and positive cooling savings as a benefit), measure (e.g., taking the net of the cooling and heating savings), or program level will produce different results.

As presented later in this proposal, most of the available literature and industry resources appear to indicate that recategorizing increased electric consumption as a cost is most appropriate. However, other resources indicate a “net benefits” approach is most appropriate, and this would align with how we have historically accounted for heating penalties.

Opinion Dynamics does not have a position on what the correct policy should be, but we do believe that this topic is important to discuss and that explicit guidance should be included in the Policy Manual about how to treat the impacts of electrification, to ensure all parties conduct cost-effectiveness analyses in a consistent manner and to ensure costs and benefits are defined consistently across the broader DER landscape in Illinois (e.g., EE, managed charging, building electrification, etc.).

Question 2: Utility Impact

This policy will directly affect electric utilities authorized to pursue electrification activities under 8-103B (b-27). This policy will also likely indirectly affect Illinois gas utilities.

Question 3: Background Research

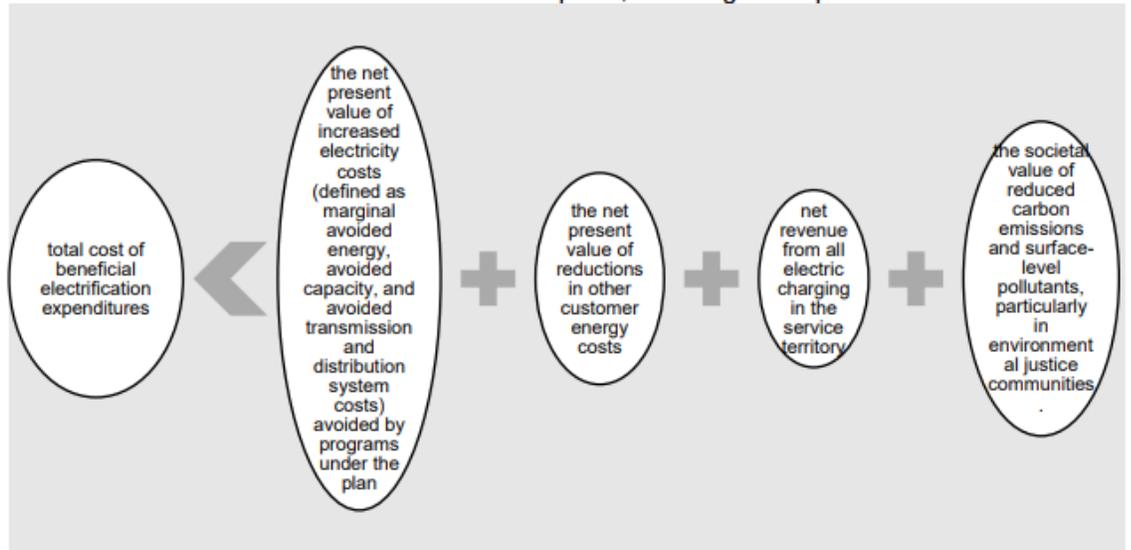
- a. **California Public Utilities Commission:** When the CPUC originally formulated the traditional set of cost-effectiveness tests used to evaluate energy efficiency programs, the CPUC adopted a principle that benefits and costs should always be positive values (i.e., a negative benefit is a cost).
 - a. Source: https://www.aceee.org/files/proceedings/2016/data/papers/4_837.pdf
- b. **The National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources:** The NSPM for DERs is somewhat ambiguous in its discussion of how to treat added electric consumption from electrification. For example, the document notes that electrification resources often increase electric system costs, which can be interpreted to mean negative savings from electrification should be treated as costs. However, the document later states that the inclusion of other benefits associated with electrification technologies, such as Demand Response, can “reduce” added costs resulting from electrification, which could be interpreted as a suggestion to use a “net benefits” approach.
 - a. Source: https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-24-2020.pdf

- c. **Cost-Effectiveness Analyses of TE in Various Jurisdictions:** As a point of comparison, we reviewed cost-effectiveness reports for transportation electrification programs across the country. We consistently found that added electricity consumption was treated as a cost.
 - a. Example: https://www.xcelenergy.com/staticfiles/xeresponsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/CO%20Recent%20Filings/04_Attachment%20SWW-7.pdf
 - b. Example: <https://www.epri.com/research/products/000000003002007751>

Optional Question 4: Commission Decision

To our knowledge, the ICC has addressed similar issues on two occasions:

1. **Current Policy Manual Guidance on O&M Cost Reductions from EE Measures:** In previous Policy Manual discussions, it was decided that any avoided O&M costs (i.e., negative O&M costs) should be treated as benefits and moved to the benefits side of the equation.
 - a. **Source:** https://ilsag.s3.amazonaws.com/IL_EE_Policy_Manual_Version_2.1_Final_12-7-2021-1.pdf
2. **CEJA Working Group Staff Report:** Per requirements from the CEJA legislation, the ICC initiated a series of workshops to solicit feedback on the Beneficial Electrification provisions in the law (separate from the electrification provisions included in Section 8-103B (b-27)). One of the topics of discussion in the workshops was the law’s requirement that the utilities’ Beneficial Electrification Plans be “cost-beneficial”, and how that standard should be defined. Ultimately, the staff report identified the topic of how to perform cost-effectiveness analysis of these plans as an “Open Issue” because several parties disagreed. However, the report also included an extract of the legislation’s definition of “cost-beneficial”, as well as a visual interpretation of the definition, which indicated that it was appropriate to calculate the benefits of the plans as the net of increased electric costs and avoided costs of other fuels:
 - a. “The plan shall be determined to be cost-beneficial if the total cost of beneficial electrification expenditures is less than the net present value of increased electricity costs (defined as marginal avoided energy, avoided capacity, and avoided transmission and distribution system costs) avoided by programs under the plan, the net present value of reductions in other customer energy costs, net revenue from all electric charging in the service territory, and the societal value of reduced carbon emissions and surface-level pollutants, particularly in environmental justice communities. The calculation of costs and benefits should be based on net impacts, including the impact on customer rates.”



- b. **Source:** <https://www.icc.illinois.gov/downloads/public/informal-processes/ICC%20Beneficial%20Electrification%20Workshops%20Staff%20Report%20and%20Appendices.zip>

Optional Question 5: Statutory Consistency

As mentioned under Question #4, the CEJA legislation includes guidance on how to determine if utility Beneficial Electrification plans are “cost-beneficial”. As part of this guidance, the legislation indicates that it is appropriate to calculate the benefits of the plans as the net of increased electric costs and avoided costs of other fuels. However, interested parties that participated in the Beneficial Electrification Workshops expressed disagreement over how to interpret the language in CEJA, as well as over how the calculation should be conducted. Among these disagreements were: (1) the best way to properly account for the costs and benefits associated with increased electricity usage and decreased fossil fuel usage and (2) the degree to which cost-effectiveness methodologies should align between EE and BE.

Source: <https://www.icc.illinois.gov/downloads/public/informal-processes/ICC%20Beneficial%20Electrification%20Workshops%20Staff%20Report%20and%20Appendices.zip>