

NAVIGANT

Memorandum

To: Illinois Non-Energy Impacts Working Group
From: Illinois Evaluation Teams
Date: January 30, 2019
Re: Illinois Economic and Employment Impact Methodology

Background

On request of Illinois stakeholders, the Illinois evaluation teams included as part of their 2018 evaluation plans a commitment to assess and report non-energy impacts (NEIs) from Illinois energy efficiency (EE) programs. As part of this assessment, the evaluation teams also planned to assess employment impacts from 2018 EE programs, and initially committed to assessing the total change in employment resulting from EE programs in 2018. In August 2018, the evaluation teams conducted initial discussions on the details of this analysis with the Illinois Stakeholder Advisory Group (SAG) NEI Working Group. As a result of these conversations, a number of topics of interest emerged, including:

- Assessment of economic impacts, including employment, from EE programs on the Illinois economy
- Assessment of the statewide impacts from utility programs on Illinois rather than restricted to utility service territories
- To the degree possible, assessment of localized impacts of Illinois EE programs (e.g. impacts on specific communities)

Further discussion and agreement on the specific details around evaluation of economic and employment impacts in Illinois will occur at future SAG NEI Working Group meeting(s). This document serves as an initial outline of the methodology that will be used to assess these impacts to aid in discussion but will be subject to revision over time.

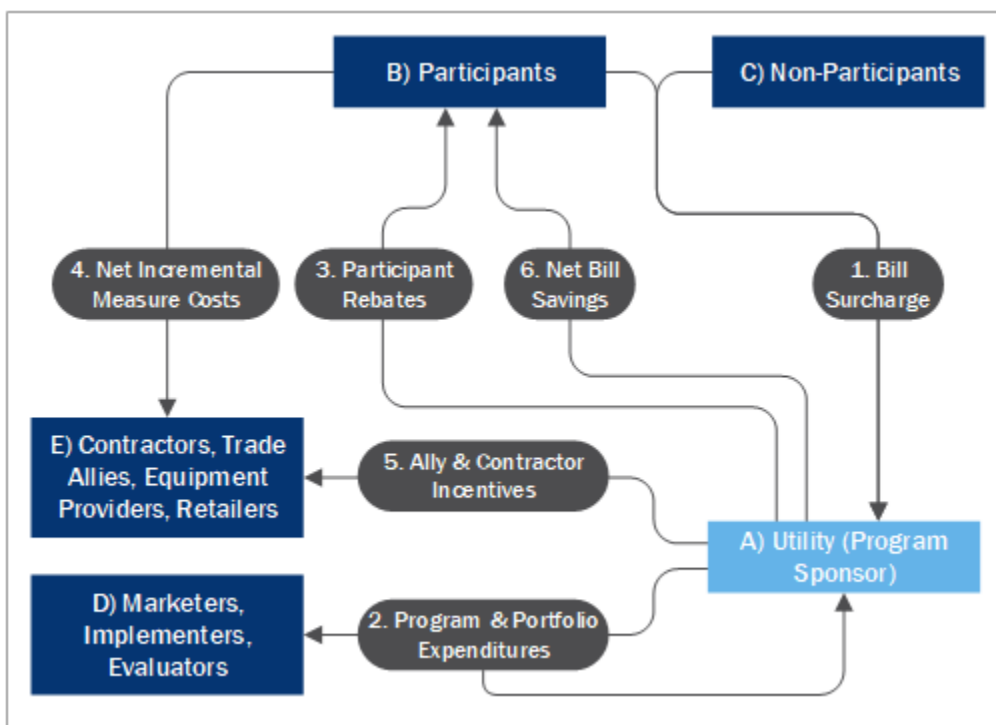
High-Level Methodology Description

To conduct this assessment, the evaluation teams will use IMPLAN (Impact Analysis for Planning) software, an industry standard economic input-output (I-O) modeling tool, to conduct this analysis. Utilizing information on program spending and costs, and the IMPLAN software, the evaluation teams will build a static model for the effects of program spending based on a matrix of underlying economic relationships among various sectors of the economy, including households, industries, and government. Assumptions about these relationships are an underlying component of the IMPLAN software, based on localized economic and employment data from such sources as the Bureau of Economic Analysis (BEA) Regional Economic Accounts and the Bureau of Labor Statistics (BLS) Census of Employment and Wages. These assumptions are specific to the regional

economy defined for the analysis (i.e., Illinois) containing information on how activity within each sector of the economy impacts other local sectors, as well as what portion of activity that may extend beyond the local economy.¹ In addition to simplifying assumptions made in the model itself, it should be noted that the I-O model approach to assessment of economic impacts makes an overall assumption – that program activity is a change imposed on an otherwise-static economy. This approach is generally accepted to be an effective tool for the evaluation of impacts that do not shift economic equilibrium conditions and has been used successfully in economic impact evaluations of several other energy efficiency programs.

Figure 1 provides a visual representation of the model we built to quantify the effects of program spending.

Figure 1. Market Actors, Direct Impact Flows, and Transfers Modeled in IMPLAN



In the sections below, we define the actors and flows presented in this diagram.

Market Actors

- A. Utility (Program Sponsor): Illinois utility sponsoring residential and non-residential EE programs and the associated staff within the utility that work to implement the program in 2018.

¹ It is worth noting that IMPLAN makes several simplifying assumptions, such as fixed prices, no substitution effects, no supply constraints, and no changes in competitiveness or other demographic factors. However, such assumptions are not worrisome in assessing short-term impacts, in which the focus is on attaining a snapshot of a regional economy. This methodology is generally accepted to be an effective tool for the evaluation of impacts that do not shift economic equilibrium conditions and has been used successfully in economic impact evaluations of several different energy efficiency programs.

- B. Participants: Residential and non-residential participants in the utility's energy efficiency programs during the 2018 program year.
- C. Non-Participants: Residential and non-residential customers of the utility that are eligible for utility-sponsored energy efficiency programs but did not participate in any program offerings in 2018.
- D. Marketers, Implementers, Evaluators: These are companies outside the utility that participate in the implementation, marketing, evaluation of the programs in 2018.
- E. Contractors, Trade Allies, Equipment Providers, Retailers: These are the market actors that work with the program to install equipment, provide energy efficiency related services to customers, and provide equipment for installation. This can include skilled trades such as HVAC or lighting contractors, energy efficient equipment suppliers, and consultants that facilitate the installation of energy efficiency improvements for utility customers.

Direct Impacts

1. Program and Portfolio Administration

This includes the total spending involved in administration of the programs and portfolio.

2. Electric and Gas Program Bill Surcharge

This cash flow represents the transfer of funds from the utility's customers in all segments eligible for EE programs. These funds represent recovery of utility costs for implementation of EE programs. From the perspective of the utility customers, this is a negative cash flow. Note that this cash flow comes from both program participants who utilize EE programs in 2018 and non-participant ratepayers who do not participate in 2018.

The magnitude of this cash flow is assumed to be exactly equal to the program's expenditures in 2018. This impact is also assumed to take place in the program year under analysis. Please note that this is a simplifying assumption for modeling; in reality, Illinois ratepayers bear the costs of EE programs over the life of the measures they receive through those programs. For modeling purposes, we assume that the net present value of the amortized energy conservation expenditures that would be recouped through customer bills over the lifetime of the installed measures are equal to the expenditures the program incurs during the program year.

3. Program and Portfolio Expenditures

This cash flow models the payments made to market actors that work on delivering the EE programs within the utility and on behalf of the utility. This cash flow is modeled as a positive flow to IMPLAN sectors representing marketers, implementers, EM&V contractors, and the utility sector. There is no corresponding negative cash flow to the utility sector, as these charges are directly recovered from customers.

4. Ally and Contractor Incentives

This cash flow represents payments made by the utility to program allies and contractors as part of the installation of program-sponsored equipment. From the perspective of the trade allies and contractors this is a positive cash flow. There is no corresponding negative cash flow to the utility sector, as these charges are directly recovered from customers.

5. Participant Rebates

This is a cash flow to residential and non-residential sectors for the installation of energy efficiency measures in 2018. Within the IMPLAN model, this is a positive cash flow to sectors representing program participants. There is no corresponding negative cash flow to the utility sector, as these charges are directly recovered from customers.

6. Net Incremental Measure Costs

This impact flow is the sum of all incremental measure costs that program participants expend on energy efficiency projects through the utility's programs in 2018. As in the ex post cost-effectiveness analysis, incremental measure costs are net costs calculated using SAG-approved NTG values for 2018.

From the perspective of the participants this is a negative flow as they expend money implementing a project. From the perspective of contractors, trade allies, and equipment providers this is a positive cash flow as they receive income from sales of energy efficiency products and services.

7. Net Bill Savings

This cash flow represents the monetized savings program participants realize from their energy efficiency improvements through the utility program. Bill savings are monetized by multiplying the net ex post savings values by each customers' applicable unit energy cost. Bill savings are realized through the lifetime of the measure as a positive cash flow to the participant. Within IMPLAN net bill savings will be distributed to sectors that are representative of the 2018 program participants.

Table 1 summarizes the cash flows and their influence on each market actor in the IMPLAN model. A negative sign indicates that the cash flow is modeled as a negative input to that market actor, while a positive indicates that the cash flow is modeled in IMPLAN as a positive input to that market actor.

Table 1. Summary of Cash Flows and Influences on Market Actors

Direct Impact	Market Actors				
	A) Utility (Program Sponsor)	B) Participants	C) Non-Participants	D) Marketers, Implementers, Evaluators	E) Contractors, Trade Allies, Equipment Providers
1. Program and Portfolio Administration	+				
2. Electric and Gas Program Surcharge		-	-		
3. Program and Portfolio Expenditure	+			+	+
4. Participant Rebates		+			
5. Net Incremental Measure Costs		-			+

Direct Impact	Market Actors				
	A) Utility (Program Sponsor)	B) Participants	C) Non-Participants	D) Marketers, Implementers, Evaluators	E) Contractors, Trade Allies, Equipment Providers
6. Trade Ally/Contractor Incentives					+
7. Net Bill Savings		+			

Indirect and Induced Impacts

The impacts that are described in the previous section all result in direct impacts within the IMPLAN model outputs. These are the first order impacts of the utility energy efficiency programs on the Illinois economy and they reflect cash flows moving between market actors involved in the program in some direct fashion. In addition to these direct impacts, the energy efficiency programs generate indirect and induced impacts that are also modeled in IMPLAN.

- **Indirect Impacts:** Indirect impacts reflect the purchases that made by local Illinois industries from other local industries and are determined by the amount of the direct impacts. For example, indirect impacts attributable to the efficiency programs in Illinois could include purchases made by local contractors for supplies needed to install energy efficiency measures, such as if a local wholesaler of HVAC equipment increased sales and added additional workers to help meet the growing demand for the company’s products and services.
- **Induced Impacts:** Induced impacts are associated with the effects of the direct and indirect impacts on household and business income. By increasing economic activity there is increased money that flows throughout the rest of the economy due to households and businesses spending the additional income. For example, if a household has annual bill savings due to their installation of energy efficient equipment, they will then spend that money on other goods and services such as a local restaurant or purchasing other durable goods.

Model Geography

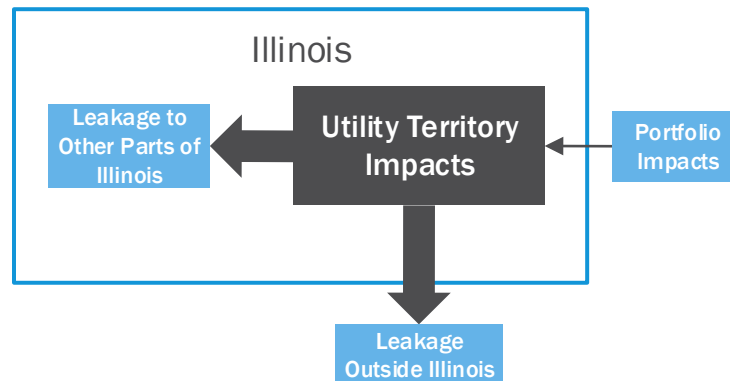
Within IMPLAN, we plan to model the impacts for each utility through a Multi-Regional Input-Output (MRIO) Model. This model allows for distinct geographic regions to be designated that receive indirect and induced impacts in addition to the primary geographic region where the direct impacts occur – in this case the utility service territory. The MRIO model also allows for impacts that occur outside of the utility’s service territory, but within Illinois, to be estimated.

Figure 2 demonstrates the general structure of the MRIO model. Inputs to the MRIO model will include all direct impacts attributable to an individual utility’s programs, as outlined earlier in this methodology. The portfolio impacts will be modeled as direct cash flows to the utility’s service territory, defined as any Illinois counties that are at least partially served by the utility. The remaining counties in Illinois that are not served by the utility will be defined as the other region in the MRIO model.

When direct cash flows are modeled in the utility’s territory, there are linkages both within the state to the other non-utility region, as well as out of state. We are able to determine the direct, indirect, and induced

impacts in the utility’s territory as well as in the rest of the state by entering the direct cash flows attributable to the utility portfolio in the utility service territory with a separate and defined non-utility region.

Figure 2. Geographic Component of Impacts



Model Outputs

From the MRIO model we will be able to generate impact estimates for the following regions:

- Impacts within the utility’s territory
- Impacts in the rest of the state outside the utility’s territory
- Overall statewide impacts

The model will also allow us to generate impacts by industry segment. The IMPLAN model uses a set of 536 economic sectors that can be mapped to 2-digit NAICs codes. We are able to report the following impacts by industry:

- Total FTE
- Labor Income
- Output
- Gross Regional Product

The categories of impacts that are generated by the IMPLAN model are as follows:

- Employment, calculated as full-time equivalent (FTE) employees. This includes full-time and part-time jobs
- Labor Income, measured in dollars (\$) is the income generated from jobs created
- Gross Regional Product, measured in dollars (\$) is the economic output minus the value of inputs (raw materials, etc.) for the defined region
- Output, measured in dollars (\$) is the value of industry production within the defined region