



USER GUIDE

# Essential Use of Electricity Web Tool

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Date: March 31, 2023







## Table of contents

1	ESSENTIAL USE OF ELECTRICITY STUDY (EUS) WEB TOOL USER GUIDE .....	1
1.1	Background of Essential Use Study	1
1.2	Access to the Web Tool	1
1.2.1	Web URL	1
1.2.2	Registration	3
1.2.3	Login	3
1.2.4	Home Page (after Login)	4
1.3	How to Design Scenario to query the EUS Data	5
1.3.1	Step 1: Select components of electric essential use	5
1.3.2	Step 2: Create comparisons and specify households	7
1.3.3	Step 3: Choose Results Options	14
1.3.4	Run Scenario	15
1.4	Output Report	15
1.4.1	Input Summary	15
1.4.2	Results Table	16
1.4.3	Data Displayed	17
1.4.4	Total Household Consumption	18
1.4.5	Estimated Essential Use Consumption	19
1.4.6	Confidence Interval	19
1.4.7	Sample Size and Population Represented	19
1.4.8	Download Output Report as csv file	20

## List of figures

Figure 1: Home page with Login and Registration link .....	2
Figure 2: Registration link .....	2
Figure 3: Registration Page .....	3
Figure 4: Login area .....	3
Figure 5: Home Page (after login) .....	4
Figure 6 Select components to include in Essential Use.....	6
Figure 7: Create comparisons – Group by rows in report.....	8
Figure 8: Specify Households – Filter area with accordions collapsed .....	13
Figure 9: Specify Households – Filter area for Electric utility expanded.....	14
Figure 10: Seasonal Usage and Thermostat Settings.....	14
Figure 11: Seasonal usage menu expanded.....	14
Figure 12: Run Scenario button .....	15
Figure 13: Output Report -- Input Summary.....	16
Figure 14: Output Report -- Results Table with Building Type (Single Family Detached) filter applied.....	17
Figure 15: Output Report -- Results Table with Building Type (Single Family Detached) and Children Present (Yes & No) filters applied.....	18

## List of tables

Table 1 Utility baseline territory group to utility baseline territory mapping.....	9
<b>Table 2. CEC Climate Zone Group to CEC T24 Climate Zone Mapping.....</b>	<b>9</b>
Table 3: Characteristics and values to specify households to be included in analysis .....	10





# 1 ESSENTIAL USE OF ELECTRICITY STUDY (EUS) WEB TOOL USER GUIDE

## 1.1 Background of Essential Use Study

The California electric Investor-Owned Utilities (IOUs), including Pacific Gas and Electric (PG&E), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E), engaged DNV to conduct the Essential Use Study (EUS) as ordered by CPUC Decision 18-08-013. The EUS developed data and constructed a web tool to provide users the ability to define what household electricity usage is essential and to explore and evaluate the estimated usage across differently situated customers throughout California.

The EUS is based on data from the 2019 California Residential Appliance Saturation Survey (RASS) and primary data collection via qualitative interviews and a supplemental survey to the RASS survey. The interviews explored the issues surrounding essential use and potential energy underutilization by low- to moderate -income households and households participating on a medical baseline rate (additional energy purchased at the lowest tier pricing). The surveys investigated incremental electricity usage for heating and cooling to mitigate medical needs and the use of electric equipment for medical conditions.

The study's primary deliverables included a final report and a publicly available web tool that produces estimates of the electric essential use consumption and the average total household consumption for seasonal (summer, winter) and annual time periods. The web tool user selects electric end-uses to be included in the essential use estimate and chooses geographic and demographic characteristics to refine the population of interest.

The study's scope of work was developed in consultation with its stakeholders: the Center for Accessible Technology (CforAT), the Public Advocates Office at the California Public Utilities Commission (Cal Advocates), and The Utility Reform Network (TURN).

The EUS Final Report is available on the CALMAC database (<https://www.calmac.org/search.asp>) and from the web tool landing page.

## 1.2 Access to the Web Tool

### 1.2.1 Web URL

The EUS Web Tool can be accessed through the following web link:

<https://caessentialuse.dnv.com>

The EUS Web Tool where users design and run a scenario is only accessible to registered users. The home page (linked above) includes a link to initiate the registration process. New users should click on the "Register Here" link on the home page to activate the Registration process. Returning users do not need to re-register and can directly proceed to login.

Registration is not required to download EUS-related documents via links soon-to-be located on the Home page below the Login area. The documents will be posted as they become available.

Figure 1 is a screen shot of the Home page and Figure 2 is a magnified version of the location of the Registration link.

Figure 1: Home page with Login and Registration link

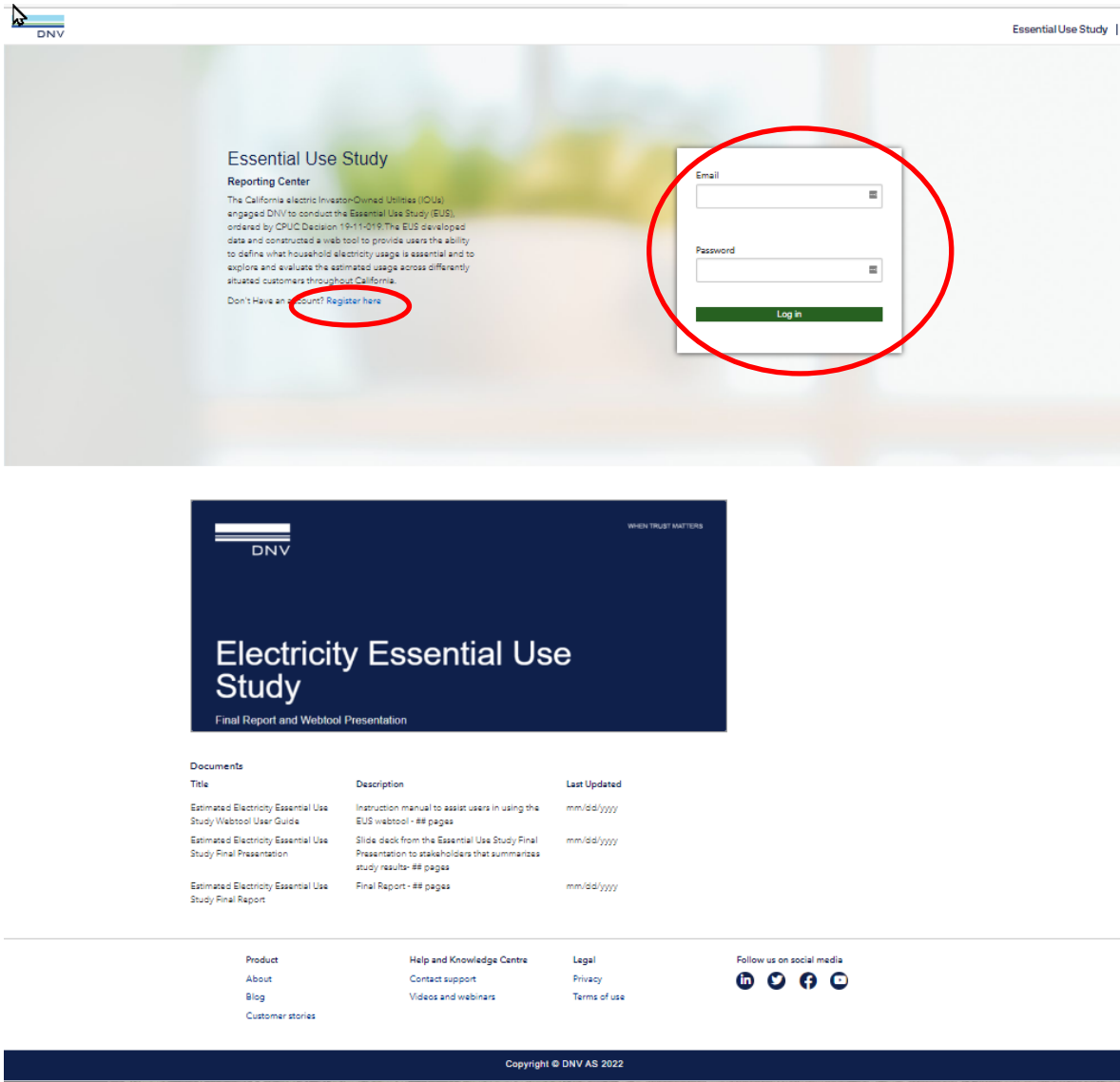
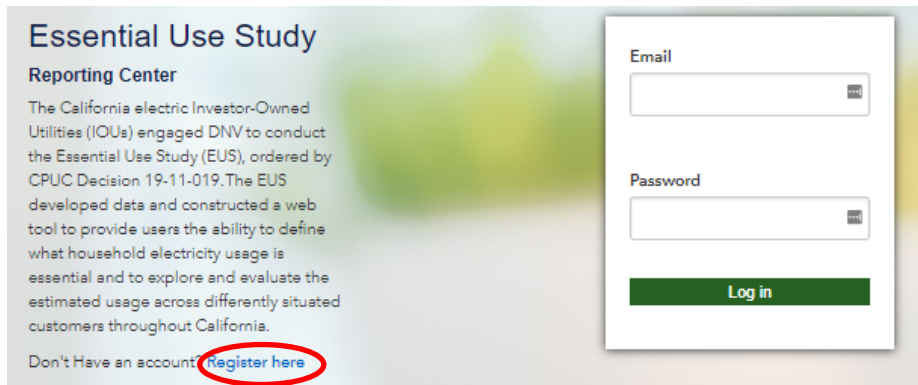


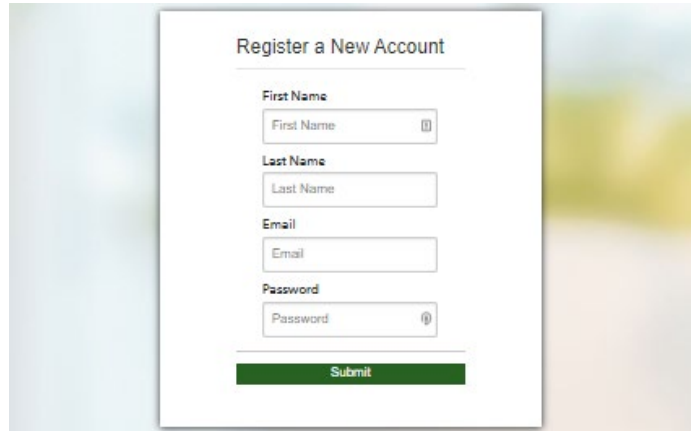
Figure 2. Registration link



## 1.2.2 Registration

As shown on the Registration page in Figure 3, the user will be asked to provide a valid email address and to create a password. An email address is required but will only be used for authenticating the registration process and resetting the password at the user request.

Figure 3. Registration Page

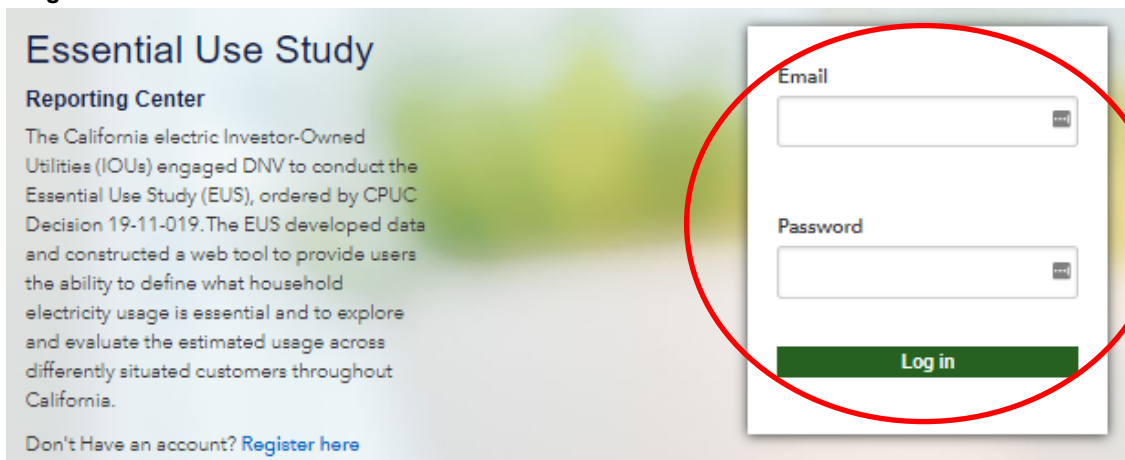


The registration form is titled "Register a New Account". It contains four input fields: "First Name", "Last Name", "Email", and "Password". Each field has a small icon to its right (a person icon for names, an envelope icon for email, and a key icon for password). Below the fields is a green "Submit" button.

## 1.2.3 Login

Registered users will enter the email and password used in the registration process to login to the EUS Web Tool, as shown in Figure 4. Once logged in, the Home page will refresh, and show an area describing and linking to the Design Scenario area of the EUS Web Tool.

Figure 4. Login area



The login area is part of the "Essential Use Study Reporting Center" page. It features a login form with two input fields: "Email" and "Password". Each field has a small icon to its right (an envelope icon for email and a key icon for password). Below the fields is a green "Log in" button. The form is circled in red.

## 1.2.4 Home Page (after Login)

After a user successfully logs in to the Web Tool, they can navigate to query the EUS data by clicking on the **Design Scenario** tab near the top of the page or on the **Go to Design Scenario** link. Figure 5 shows the location of the links to Design Scenario.

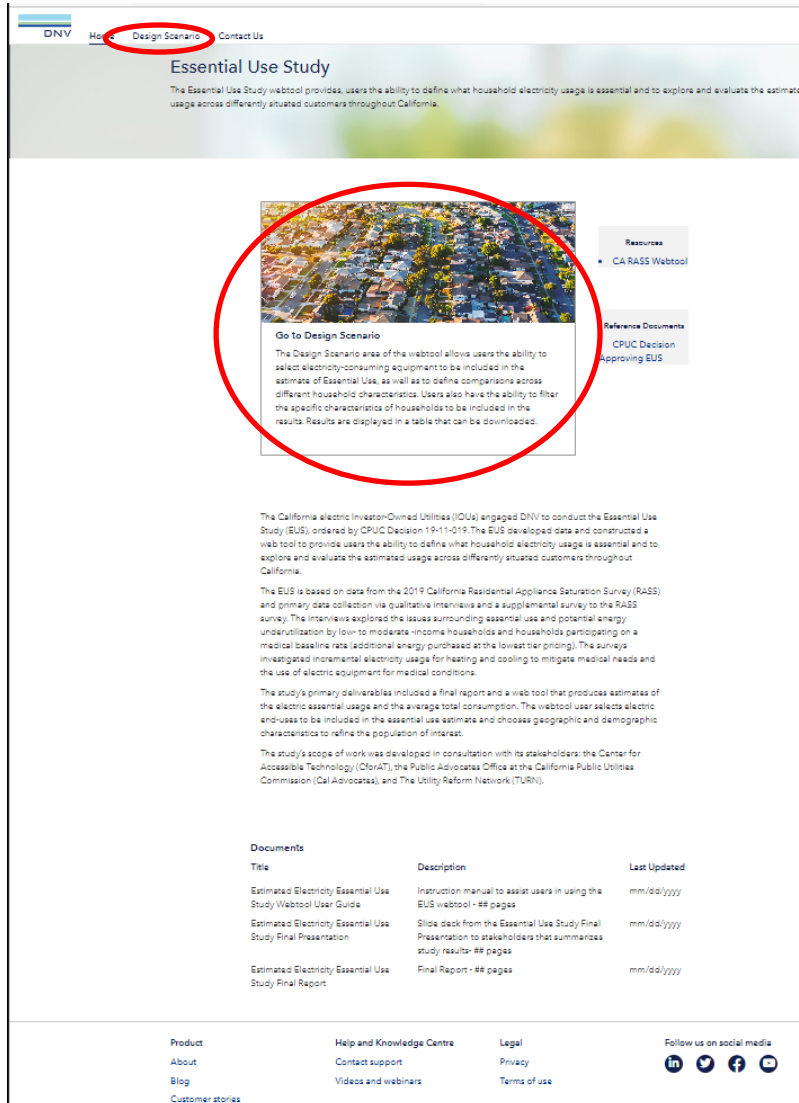
The “Resources” area contains links to related projects and web tools.

The “Reference Documents” area contains links to downloadable documents specific to EUS.

The “Documents” area will contain links to download the CA Essential Use Study documents. Descriptions and last updated dates are also included in this area. The documents will be posted as they become available.

A user can click “Log out “on top right to log out of the web tool.

**Figure 5. Home Page (after login)**







## 1.3 How to Design Scenario to query the EUS Data

Clicking on the **Design Scenario** tab at the top of the Home page or clicking on the **Go to Design Scenario** link in the middle of the Home page will take a user to the Design Scenario page, where they can configure the analysis of EUS data.

There are three steps to designing a scenario to query the EUS data.

1. Select components of electric essential use.
2. Create comparisons and specify households.
3. Choose results options.

This section outlines each step of the design scenario process.

### 1.3.1 Step 1: Select components of electric essential use

#### 1.3.1.1 Default Essential Use Consumption

By default, Essential Use Consumption includes estimated usage for the first refrigerator and interior lighting. If a user does not select any additional types of equipment, the Essential Use Consumption will display the electricity usage of the first refrigerator plus usage for interior lighting. A user cannot remove either the first refrigerator or indoor lighting from essential use. Because the majority of respondents indicated in the 2019 RASS that household water was heated using natural gas or propane, water heating is not included as part of the default essential use of electricity. Web tool users can include electric water heating as part of their user-defined essential use of electricity.

#### 1.3.1.2 Electric equipment types


Users can create their own definition of Essential Use Consumption of electricity by selecting electric equipment (end uses) to include in essential usage, beyond the default outlined above. Selections are made by clicking on the checkbox next to the item or by using the drop-down menu for Miscellaneous. The Miscellaneous (plug load) is available in increments of 10% (on a scale of 0% to 100%) for a user to include in Essential Use Consumption. Electric usage attributed to medical devices is contained in the Miscellaneous plug load category.

Figure 6 shows the categories of equipment available for users to select to be included in the Essential Use Consumption.

Users can select as many appliances as they choose, but each piece of equipment is **additive** to the default essential usage. As more electric appliance categories are selected, the calculated Essential Use Consumption will increase.

For example, if a user selects both electric water heating and solar water heating with electric backup, usage for both will be added so the resulting essential usage estimate would reflect usage for a household that would have both types of electric water heating (unlikely).

**Figure 6 Select components to include in Essential Use**



[Home](#)
[Design Scenario](#)
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[Essential Use Study](#) | [Logout](#)

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## Design Scenario

Sections

- Step 1: Select Components of electric essential use
- Step 2: Create Comparisons and specify households
- Step 3: Results Options
- Run Scenario

**Step 1: Select components of electric essential use**

Default essential use includes indoor lighting and the first refrigerator

<p><b>Electric Primary Space Heating (Optional - select one)</b></p> <p><input type="checkbox"/> Electric Forced Air or Resistance Space Heating</p> <p><input type="checkbox"/> Electric Heat Pump Space Heating</p>	<p><b>Cooling Equipment</b></p> <p><input type="checkbox"/> Central Air Conditioning or Heat Pump Cooling</p> <p><input type="checkbox"/> Evaporative Cooler</p> <p><input type="checkbox"/> Room Air Conditioning Unit(s)</p>
<p><b>Electric Water Heating (Optional - select one)</b></p> <p><input type="checkbox"/> Electric Water Heater(s)</p> <p><input type="checkbox"/> Solar Water Heater w/Electric Backup</p>	<p><b>Heating and Ventilation</b></p> <p><input type="checkbox"/> Attic/Whole House/Ceiling Fan(s)</p> <p><input type="checkbox"/> Electric Auxiliary Space Heating</p> <p><input type="checkbox"/> Furnace Fan</p>
<p><b>Food Preparation</b></p> <p><input type="checkbox"/> Electric Range/Oven</p> <p><input type="checkbox"/> Microwave</p> <p><input type="checkbox"/> Dishwasher</p> <p><input type="checkbox"/> Additional Refrigerator</p> <p><input type="checkbox"/> Stand-alone Freezer</p>	<p><b>Spa, Hot Tubs, Pools</b></p> <p><input type="checkbox"/> Spa Filter Pump</p> <p><input type="checkbox"/> Spa Electric Heating</p> <p><input type="checkbox"/> Pool Pump</p>
<p><b>Additional Categories</b></p> <p><input type="checkbox"/> Electric Vehicle</p> <p><input type="checkbox"/> Outdoor Lighting</p> <p><input type="checkbox"/> Well Pump</p> <p><input type="checkbox"/> Miscellaneous Plug Load</p>	<p><b>Entertainment and Technology</b></p> <p><input type="checkbox"/> Television(s)</p> <p><input type="checkbox"/> Personal Computer(s)</p> <p><input type="checkbox"/> Home Office Equipment</p>
<p><b>Laundry</b></p> <p><input type="checkbox"/> Clothes Washer</p> <p><input type="checkbox"/> Electric Clothes Dryer</p>	<p><b>Miscellaneous</b></p> <p><input style="width: 100%; border: 1px solid #ccc;" type="text" value="No Miscellaneous"/></p>

All user-selected electric equipment categories will be included as part of the Essential Use Consumption calculation outputs and are additive. The more electric appliance categories that are selected, the greater the calculated essential use will be.

Note: Users are recommended to select **only one** type of:

- Primary Heating (Conventional Electric Heat **or** Electric Heat Pump)
- Water Heating (Electric Water Heating **or** Solar Water Heater with Electric Backup)

**Users should use care in selecting Cooling Equipment as they are able to select multiple types of Cooling Equipment.** The resulting Essential Use estimate will include usage for the “stacked” combination the user selected, i.e., estimate will be for households that have **both** Central AC and Evaporative Cooling if they are both selected. Combinations of cooling equipment may represent the types of cooling necessary in warmer regions but may not reflect the typical cooling equipment present in cooler regions where a single type is more common than combinations of types.



## 1.3.2 Step 2: Create comparisons and specify households

This step allows users to decide how they would like to compare Essential Use Consumption and Total Household Consumption between groups or what attributes they would like to define by rows in the scenario, i.e., how to “slice” the population of households. Users can also select a specific subset of households to analyze using the Filters feature.

### 1.3.2.1 Create comparisons

The scenario analysis requires a minimum of one comparison to be selected. The default scenario slices the results by Electric Utility. A user can keep the comparison of Electric Utility or select a different way to slice the groups by using the drop-down menus. A user can select up to three ways to slice the results to compare across groups.

Users can select from one to three of the following categories to segment or slice households into groups (rows) in the table of results:

- Electric utility
- Utility baseline territory group
- CEC Title 24 Climate Zone group
- Building type
- Year home built
- Square feet of living space
- Insulated attic
- Insulated exterior walls
- Cooling type
- Primary Heating Electric
- Number of residents
- Children present in home
- Ethnicity of head of household
- Own or rent home
- Estimated household income
- Household on CARE/FERA
- Household on Medical Baseline
- Household Reports Having Medical Equipment
- Net Energy Metered (NEM) household
- Own/lease electric vehicle

The “Slice by” fields define the rows in the results table for the scenario. Figure 7 shows the drop-down menu of options for slicing categories. For example, if “Electric Utility” is selected as a “slice by” field, the results table will display a row with essential usage and total household usage estimates for each electric utility. The default number of “slice by” categories is one, but a user can select up to three. Each category has two or more values that will be displayed as rows. As the number of categories selected increases, the EUS data is “sliced” into a greater number of sub-groups or rows (more slices). As the number of rows increase, the sample sizes for each sub-group or row decrease (thinner slices).

**Figure 7. Create comparisons – Group by rows in report**

**Step 2: Create comparisons and specify households**

Select up to three ways to slice the households into groups

First slice by:

Secondly slice by:

Thirdly slice by:

**Step 3: Results Options**

**Results Options**

Seasonal Usage

Cooling Season

Thermostat Settings

Heating Season

Select Subgr

Optional

Geographi

- Electric utility
- Utility baseline territory group
- Title 24 Climate Zone group
- Building type
- Year home built
- Square feet of living space
- Insulated attic
- Insulated exterior walls
- Cooling type
- Primary Heating Electric
- Number of residents
- Children present in home
- Ethnicity of head of household
- Own or rent home
- Estimated household income
- Household on CARE/FERA
- Household on Medical Baseline
- Household Reports Having Medical Equipment
- Net Energy Metered (NEM) household
- Own/lease electric vehicle

If the sample size (that is, the number of households from the RASS billing data from which the usage estimate is formulated) for a sub-group falls below 25, the values of the EUS calculation for that sub-group are not shown. This is because small sample sizes do not provide sufficient statistical power to generate household estimates of energy use. The user will see the sample size and the population the sample represents but will not see the results for that row. However, the “Total” row at the bottom of the results table includes all the households from the rows, i.e., includes households that are too small of a sample to show results in a separate row (fewer than 25).

### Baseline Territory groups

Each utility defines geographic areas called baseline territories or regions. The baseline territories are one factor the utilities consider when they assign a monthly allowance (baseline allocation) of energy that residential customers can purchase at the lowest price. For the EUS and some other purposes, the Baseline Territories are collapsed into a smaller number of groups. The EUS Web Tool provides the Utility Baseline Territory Group as a way for users to “slice” the data. Table 1 shows how the baseline territories are aggregated into baseline territory groups.



**Table 1 Utility baseline territory group to utility baseline territory mapping**

Utility baseline territory group	Utility baseline territories
PG&E Cool	T, V and Z
PG&E Warm	Q, X and Y
PG&E Hot	P, R, S and W
PG&E Unknown	Unknown
SCE Cool	6, 8 and 16
SCE Moderate	5 and 9
SCE Hot	10, 13, 14 and 15
SCE Unknown	Unknown
SDG&E Cool	Coastal
SDG&E Moderate	Inland
SDG&E Hot	Mountain and Desert
SDG&E Unknown	Unknown

### CEC Climate Zone groups

The California Energy Commission (CEC) has defined geographic areas called Building Code Climate Zones (T24 Climate Zones). These T24 Climate Zones are used for implementing the Building Energy Efficiency Standards (Title 24, Parts 6 and 11). For the EUS, the Title 24 Climate Zones are collapsed into a smaller number of groups. The EUS Web Tool provides the Climate Zone Group as a way for users to “slice” the data. Table 2 shows how Title 24 Climate Zones are aggregated up to Climate Zone Groups.

**Table 2. CEC Climate Zone Group to CEC T24 Climate Zone Mapping**

CEC Climate Zone Group	CEC Title 24 Climate Zones
Coastal	1, 2, 3, 4, 5, 6 and 7
Inland	8, 9, 10, 11, 12 and 13
Desert	14 and 15
Mountain	16



### 1.3.2.2 Specify Households

By default, all households are included in the analysis. A user can choose to select specific types of households to be included in the analysis by using the Filters functionality. The categories available as Filters are the same categories available as Group by fields.

The Filters section is on the right side of the Design Scenario page. A user can click on each category to open the accordion to view the list of attributes available to select. By default, all items are included, but the checkboxes appear unchecked.

The EUS Web Tool provides Geographic characteristics, Building Characteristics and Household Characteristics for users to help specify their desired population. Table 3 shows the characteristics and available values for the Filters.

**Table 3: Characteristics and values to specify households to be included in analysis**

<b>Geographic Characteristics</b>	
<b>Electric utility</b>	PG&E SCE SDG&E
<b>Utility baseline territory</b>	PG&E (P, Q, R, S, T, V, W, X, Y, Z, Unknown) SCE (5, 6, 8, 9, 10, 13, 14, 15, 16, Unknown) SDG&E (Coastal, Desert, Inland, Mountain, Unknown)
<b>Utility baseline territory group</b>	PG&E (Cool, Warm, Hot, Unknown) SCE (Cool, Moderate, Hot, Unknown) SDG&E (Coastal, Desert, Inland, Mountain, Unknown)
<b>Title 24 Climate Zone</b>	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
<b>Title 24 Climate Zone group</b>	Coastal (1,2,3,4,5,6,7) Inland (8,9,10,11,12,13) Desert (14,15) Mountain (16)
<b>Building Characteristics</b>	
<b>Building type</b>	Single Family Detached Townhouse, Duplex, Or Row House Apartment Or Condo (2-4 Units) Apartment Or Condo (5+ Units) Mobile Home
<b>Year home built</b>	Before 1975 1975-1978 1979-1983 1984-1991 1992-1999 2000-2005 2006-2012 2013-2019



<b>Square feet of living space</b>	Less than 500 500-750 751-1000 1001-1250 1251-1500 1501-2000 2001-2500 2501-3000 More than 3000
<b>Insulated attic</b>	Yes, No, Unknown
<b>Insulated exterior walls</b>	Yes, No, Unknown
<b>Cooling type</b>	Central Air Conditioning System or Heat Pump Cooling Only Central Evaporative Cooler Only Room Air Conditioning Unit(s) Only Multiple Air Conditioning Systems No Cooling Unknown
<b>Primary Heating Electric</b>	Yes, conventional electric heat Yes, electric heat pump No
<b>Household Characteristics</b>	
<b>Number of residents</b>	One Two Three Four Five or More
<b>Children present in home</b>	Yes, No, Unknown
<b>Ethnicity of head of household</b>	American Indian AK Native Asian Pacific Islander Black African American Hispanic Latino White Caucasian Other Mixed Unknown
<b>Own or rent home</b>	Own, Rent, Unknown
<b>Estimated household income</b>	Less than \$25K \$25K-49K \$50K-74K \$75K-99K \$100K-149K \$150K-199K Over \$200K Unknown



<b>Household on CARE/FERA</b>	Yes, CARE Yes, FERA No Unknown
<b>Household on Medical Baseline</b>	Yes, No, Unknown
<b>Household Reports Having Medical Equipment</b>	Yes, No
<b>Net Energy Metered (NEM) household</b>	Yes, No
<b>Own/lease electric vehicle</b>	Yes, No

A user can refine their output report to a specific population of households with the use of filters. A user specifies their population by the checking the box next to the value they want to include. For example, if a user checks the filter box for **Electric Utility > PG&E**, then only households with Electric Utility equal to PG&E will be used in calculation of the results.

Note: If a user groups by electric utility and filters to keep only PG&E, then the output report will only show values for PG&E and not include the other electric utilities.

Figure 8 shows the location of the Filters feature.



Figure 8. Specify Households – Filter area with accordions collapsed

**Step 2: Create comparisons and specify households**

Select up to three household attributes to group by

Group column 1 by:

Group column 2 by:   *Optional*

Group column 3 by:   *Optional*

---

**Step 3: Results Options**

**Results Options**

Seasonal Usage:

Cooling Season Thermostat Settings:

Heating Season Thermostat Settings:

---

**Filters** *Optional*

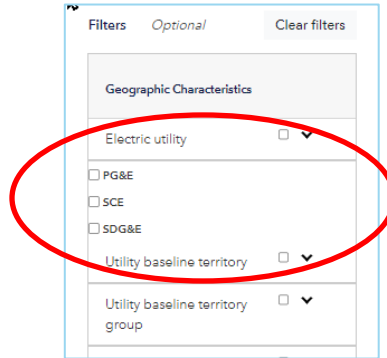
Geographic Characteristics	
Electric utility	<input type="checkbox"/> <input type="button" value="v"/>
Utility baseline territory	<input type="checkbox"/> <input type="button" value="v"/>
Utility baseline territory group	<input type="checkbox"/> <input type="button" value="v"/>
Title 24 Climate Zone	<input type="checkbox"/> <input type="button" value="v"/>
Title 24 Climate Zone group	<input type="checkbox"/> <input type="button" value="v"/>
Building Characteristics	
Building type	<input type="checkbox"/> <input type="button" value="v"/>
Year home built	<input type="checkbox"/> <input type="button" value="v"/>
Square feet of living space	<input type="checkbox"/> <input type="button" value="v"/>
Insulated attic	<input type="checkbox"/> <input type="button" value="v"/>
Insulated exterior walls	<input type="checkbox"/> <input type="button" value="v"/>
Cooling type	<input type="checkbox"/> <input type="button" value="v"/>
Primary Heating Electric	<input type="checkbox"/> <input type="button" value="v"/>
Household Characteristics	
Number of residents	<input type="checkbox"/> <input type="button" value="v"/>
Children present in home	<input type="checkbox"/> <input type="button" value="v"/>
Ethnicity of head of household	<input type="checkbox"/> <input type="button" value="v"/>
Own or rent home	<input type="checkbox"/> <input type="button" value="v"/>
Estimated household income	<input type="checkbox"/> <input type="button" value="v"/>
Household on Medical Baseline	<input type="checkbox"/> <input type="button" value="v"/>
Household Reports Having Medical Equipment	<input type="checkbox"/> <input type="button" value="v"/>
Household on CARE/FERA	<input type="checkbox"/> <input type="button" value="v"/>
Net Energy Metered (NEM1) household	<input type="checkbox"/> <input type="button" value="v"/>
Own/lease electric vehicle	<input type="checkbox"/> <input type="button" value="v"/>

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Figure 9 shows the expanded view of the accordion menu for Electric Utility in the Filters section.

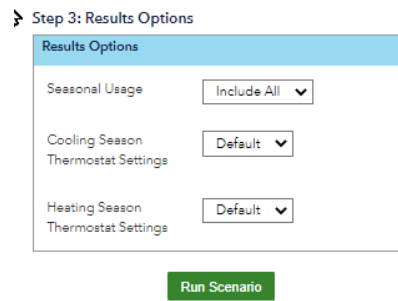
**Figure 9: Specify Households – Filter area for Electric utility expanded**



### 1.3.3 Step 3: Choose Results Options

Users can specify the type of results they would like to see as well as set specific thermostat settings for the cooling season and heating season in the Results Options area. Figure 10 shows the Results Options section of the Design Scenario area.

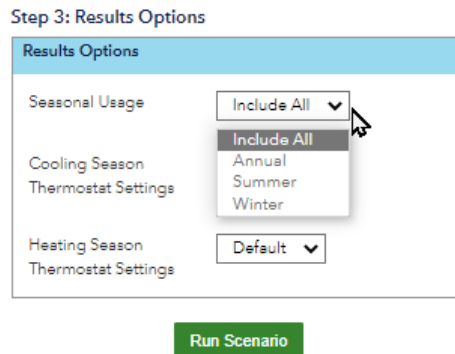
**Figure 10. Seasonal Usage and Thermostat Settings**



#### 1.3.3.1 Seasonal Usage

As shown in Figure 11, users can select whether the essential use values are reported over an annual, summer or winter usage periods. By default, the Web Tool will display all three seasonal usages: annual, summer and winter.

**Figure 11: Seasonal usage menu expanded**



### 1.3.3.2 Thermostat Settings

The EUS Web Tool makes the option available for users to select Cooling Season and Heating Season Thermostat settings as an indicator of what the user wants to model as the essential use thermostat setting. By default, the web tool uses the thermostat settings as specified by the household in the RASS survey.

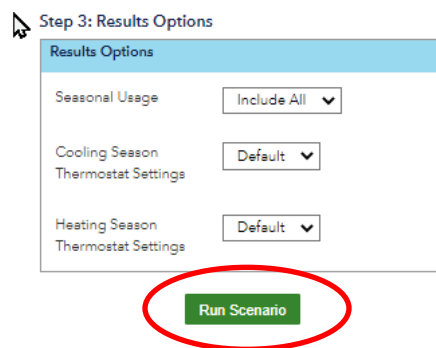
In general, as the thermostat setting increases in the cooling season, the calculated estimates of essential use will decrease. The opposite is also true, as thermostat setting decreases in the cooling season, the calculated estimates of essential use will increase.

The inverse is true during the heating season. As thermostat settings increase in heating season, the calculated estimates of essential use will increase. And as the thermostat settings decrease in the heating season, the calculated estimates of essential use will decrease..

### 1.3.4 Run Scenario

After the user completes making their selections, they may click on Run Analysis (Figure 12) to generate an Output Report table that will open in a new browser tab. Each time the user runs an analysis, the results will open in an additional new tab in the browser window.

Figure 12: Run Scenario button



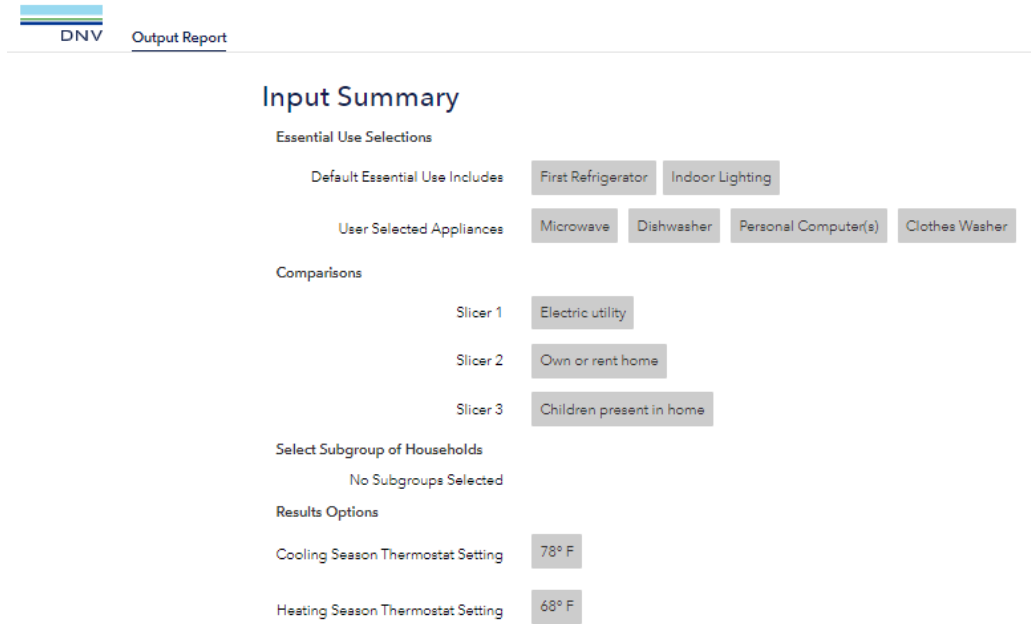
## 1.4 Output Report

The Output Report will open in a new tab in the browser window. Each analysis opens in a new tab, so the user can adjust the analysis and produce a new set of results without losing the previous analysis. The output report has two sections-- the Input Summary and the Results Table.

### 1.4.1 Input Summary

The Input Summary section of the Output Report outlines the default and user-selected electric equipment included in the essential use estimates, as well as lists the characteristics used to slice the results and the filters applied to define what households are included in the analysis. The results options also lists the user selection for seasonal usage and thermostat settings for heating and cooling seasons. Figure 13 shows an example of the Input Summary.

**Figure 13: Output Report -- Input Summary**



## 1.4.2 Results Table

The Results Table displays the estimated Essential Use Consumption based on the user inputs and the Total Household Consumption for the sample comprising each row. Confidence intervals at the 90% level are presented for each estimate. Sample size and population represented by that sample are provided for each row. Figure 14 shows an example Results Table in the Output Report.



Figure 14: Output Report -- Results Table with Building Type (Single Family Detached) filter applied

Electric utility	Own or rent home	Children present in home	Estimated Essential Use Consumption						Total Household Consumption						Sample Size	Population Represented
			Winter		Summer		Annual		Winter		Summer		Annual			
			kWh	+/-	kWh	+/-	kWh	+/-	kWh	+/-	kWh	+/-	kWh	+/-		
PG&E	Own	Yes	1,697	18.3	858	8.8	2,555	27.1	5,260	110.2	3,148	78.0	8,408	178.6	2,337	802,125
		No	1,529	11.5	779	5.9	2,308	17.3	4,637	69.1	2,794	47.9	7,431	112.2	7,006	1,675,742
		Unknown	1,526	77.3	778	41.9	2,304	119.0	3,699	359.4	2,065	223.3	5,764	577.0	233	34,330
	Rent	Yes	1,669	40.8	836	19.7	2,505	60.3	4,505	222.5	2,905	177.2	7,409	373.0	382	241,023
		No	1,500	38.8	758	19.5	2,258	58.1	3,723	194.9	2,357	168.2	6,080	347.5	525	194,301
		Unknown	1,679	144.2	845	64.9	2,524	209.1	2,858	250.9	1,672	340.5	4,530	585.9	35	6,918
	Unknown	Yes	1,741	123.3	874	58.1	2,614	180.9	4,964	831.2	3,239	746.6	8,203	1389.5	30	9,503
		No	1,372	83.4	703	47.2	2,074	130.4	4,431	568.2	2,814	337.0	7,245	873.8	67	13,384
		Unknown	1,552	95.3	789	42.4	2,341	137.8	2,664	26.3	1,302	18.8	3,966	44.7	263	39,050
SCE	Own	Yes	1,681	19.2	855	9.3	2,536	28.4	5,028	114.5	3,355	94.3	8,383	200.9	2,254	879,581
		No	1,528	11.9	783	6.1	2,311	17.9	4,608	83.2	3,171	81.2	7,779	160.2	5,500	1,408,318
		Unknown	1,546	64.3	794	35.2	2,339	99.2	4,363	1205.0	3,077	1373.3	7,440	2574.3	142	29,279
	Rent	Yes	1,699	46.1	856	21.4	2,555	67.4	3,909	172.2	2,683	143.1	6,592	300.8	389	225,552
		No	1,493	40.5	758	19.8	2,251	60.1	3,446	225.1	2,405	183.5	5,851	398.4	375	164,638
		Unknown													20	6,743
	Unknown	Yes	2,017	167.2	1,010	76.3	3,027	243.0	5,496	705.3	3,562	542.3	9,059	1169.0	27	16,942
		No	1,449	72.4	747	35.6	2,196	107.8	4,206	347.2	2,917	344.4	7,123	672.2	66	11,888
		Unknown	1,590	166.9	808	74.7	2,398	241.6	2,682	104.9	1,369	81.1	4,050	179.4	161	14,524
SDG&E	Own	Yes	1,428	29.0	1,033	19.8	2,461	48.8	4,378	181.6	3,329	138.2	7,707	317.7	733	190,595
		No	1,287	15.8	939	11.2	2,226	26.9	3,720	119.7	2,826	81.9	6,545	200.3	1,994	372,164
		Unknown	1,511	184.0	1,084	120.8	2,595	304.7	3,806	2029.5	2,811	1552.8	6,617	3582.2	63	9,042
	Rent	Yes	1,336	46.7	964	32.6	2,301	79.3	3,077	206.8	2,298	163.5	5,375	364.5	129	48,564
		No	1,227	41.5	888	29.7	2,115	71.0	2,636	146.3	1,972	122.2	4,608	265.8	159	46,155
		Unknown													9	1,886
	Unknown	Yes													8	3,523
		No													20	1,363
		Unknown	1,223	53.3	894	37.5	2,117	90.7	2,148	103.1	1,508	76.1	3,655	179.1	88	4,660
		Total				2,384	9.4					7,522	67.2	23,015	6,451,797.192	

### 1.4.3 Data Displayed

Results are shown for all rows with estimates based on 25 or more households, as listed in the “Sample Size” column of the table. Rows with results based on fewer than 25 households will not display the usage estimates but will show the sample size and population represented by that row.

Electric Utility is required to be a slicer for the seasonal usage (summer, winter) to be shown for accuracy purposes. This requirement is in place because the electric utilities define the seasons differently – SDG&E has an additional month included in their definition of summer, and one fewer month in their definition of winter, as compared to how PG&E and SCE define their summer and winter seasons for allocating baseline usage. Thus, the Total row at the bottom of the Results table will not display the seasonal usage, to avoid combining estimates covering varying time periods.

When a user groups and filters on the same characteristic, the rows representing subsets the user has not included in the analysis will be omitted in the results table. For example, if the user applied a filter to only include “Children Present in Home” equal to Yes and No (omitting the “Unknown” category), the results table would omit the rows representing results for Unknown whether children are present in the home.

Figure 15 shows an example of the Results Table with Filters applied.:

**Figure 15: Output Report -- Results Table with Building Type (Single Family Detached) and Children Present (Yes & No) filters applied**

Electric utility	Own or rent home	Children present in home	Estimated Essential Use Consumption						Total Household Consumption						Sample Size	Population Represented
			Winter		Summer		Annual		Winter		Summer		Annual			
			kWh	+/-	kWh	+/-	kWh	+/-	kWh	+/-	kWh	+/-	kWh	+/-		
PG&E	Own	Yes	1,697	18.3	858	8.8	2,555	27.1	5,260	110.2	3,148	78.0	8,408	178.6	2,337	802,125
		No	1,529	11.5	779	5.9	2,308	17.3	4,637	69.1	2,794	47.9	7,431	112.2	7,006	1,675,742
	Rent	Yes	1,669	40.8	836	19.7	2,505	60.3	4,505	222.5	2,905	177.2	7,409	373.0	382	241,023
		No	1,500	38.8	758	19.5	2,258	58.1	3,723	194.9	2,357	168.2	6,080	347.5	525	194,301
	Unknown	Yes	1,741	123.3	874	58.1	2,614	180.9	4,964	831.2	3,239	746.6	8,203	1389.5	30	9,503
		No	1,372	83.4	703	47.2	2,074	130.4	4,431	568.2	2,814	337.0	7,245	873.8	67	13,384
SCE	Own	Yes	1,681	19.2	855	9.3	2,536	28.4	5,028	114.5	3,355	94.3	8,383	200.9	2,254	879,581
		No	1,528	11.9	783	6.1	2,311	17.9	4,608	83.2	3,171	81.2	7,779	160.2	5,500	1,408,318
	Rent	Yes	1,699	46.1	856	21.4	2,555	67.4	3,909	172.2	2,683	143.1	6,592	300.8	389	225,552
		No	1,493	40.5	758	19.8	2,251	60.1	3,446	225.1	2,405	183.5	5,851	398.4	375	164,638
	Unknown	Yes	2,017	167.2	1,010	76.3	3,027	243.0	5,496	705.3	3,562	542.3	9,059	1169.0	27	16,942
		No	1,449	72.4	747	35.6	2,196	107.8	4,206	347.2	2,917	344.4	7,123	672.2	66	11,888
SDG&E	Own	Yes	1,428	29.0	1,033	19.8	2,461	48.8	4,378	181.6	3,329	138.2	7,707	317.7	733	190,595
		No	1,287	15.8	939	11.2	2,226	26.9	3,720	119.7	2,826	81.9	6,545	200.3	1,994	372,164
	Rent	Yes	1,336	46.7	964	32.6	2,301	79.3	3,077	206.8	2,298	163.5	5,375	364.5	129	48,564
		No	1,227	41.5	888	29.7	2,115	71.0	2,636	146.3	1,972	122.2	4,608	265.8	159	46,155
	Unknown	Yes													8	3,523
		No													20	1,363
		<b>Total</b>					<b>2,384</b>	<b>9.5</b>					<b>7,574</b>	<b>67.2</b>	<b>22,001</b>	<b>6,305,363.615</b>

Note that the rows with the Children Present equal to Unknown have been deleted when the additional filter is applied. The sample size for the Total row reflects the omission of the “Unknown” for Children Present – the sample was reduced from 23,015 to 22,001 when the additional filter is applied.

### 1.4.4 Total Household Consumption

The Total Household Consumption represents the average consumption across the subset of households included in that row. The average is calculated as the Total Household Consumption across households that have different combinations of equipment. For example, some households will have dishwashers, some will not. Some households will have spa filter pumps and spa heaters, and some will not. The average Total Household Consumption only looks at the total for each household but does not break it down into specific types of equipment.

Total Household Consumption stays the same for the type of households (slices) regardless of what categories of equipment the web tool user selects to include in the Essential Use Consumption. If a user runs two scenarios by changing the type of equipment to include in the Essential Use Consumption but not changing the way to slice the households by type, the Total Household Consumption will not change but the Essential Use Consumption will change because different sets of equipment types were selected for each scenario. For example, if a user runs the first scenario by selecting a dishwasher to be included in the Essential Use Consumption, and adds central cooling to the Essential Use Consumption for



the second scenario, the values of the estimated the Essential Use Consumption would change, but the values for the Total Household Consumption would remain the same as long as the user did not change the types (slices) of households.

Total Household Consumption will vary across scenarios where the web tool user selects different ways to slice the households into different types. If a webtool user selects the same categories of equipment to include in the Essential Use Consumption for two scenarios, but selects an additional way to slice the households, the Total Household Consumption will change. For example, if a user selects Electric Utility as a slicer in the first scenario but selects both Electric Utility and Building Type as slicers in the second scenario, the Total Household Consumption will be different for the scenarios because the Total Household Consumption is being calculated for different subsets of households in each scenario.

Note: Sum of Winter and Summer Total Household Consumption will be equal to annual consumption.

### 1.4.5 Estimated Essential Use Consumption

By default, essential use includes the first refrigerator and interior lighting. If a user has not selected any additional types of equipment, the Essential Use Consumption will display the electricity usage of the first refrigerator plus usage for interior lighting.

For each of the additional types of equipment a user selects to include in the Essential Use Consumption, the average usage (kWh) will be calculated for the subset of households in that row that have that type of equipment. The average usage will be added to the default to create the estimated Essential Use Consumption for that row. The usage will be summarized by seasonal usage according to the seasonal estimates of each type of equipment.

For example, if a user elects to include dishwashers in Essential Use Consumption, the average usage for dishwashers will be calculated for households in the row that have dishwashers. The average use for dishwashers will be added to the Default Essential Use to represent the Essential Use Consumption of households that have dishwashers.

It is possible that the estimated Essential Use Consumption may be higher than Total Household Consumption based on the end uses a user selects. This can happen because the Essential Use Consumption is additive for the categories of equipment, whereas the Total Household Consumption is an average consumption of all households of the same type and includes all categories of equipment.

### 1.4.6 Confidence Interval


Each column within the estimated Essential Use Consumption and Total Household consumption includes a confidence interval represented as a +/- in kWh. Confidence Intervals are calculated at the 90% level.

### 1.4.7 Sample Size and Population Represented

The sample size shows the number of households included in the row, as defined by the grouping field selected by the user. The population represented shows the population of households represented by the sample sizes. The population represented is calculated by applying the sample weights for each household. The sample weights were developed under the 2019 RASS project and are unique to each household based on various characteristics. The sample weights per household vary from representing a population of under 10 households to representing almost 15,000 households.



## 1.4.8 Download Output Report as csv file

The top right of the results table section has an icon  that a user can click to download a .csv file of the Input Summary and the Results Table shown in the Output Report tab.





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DNV is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas, power and renewables industries. We also provide certification, supply chain and data management services to customers across a wide range of industries. Operating in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.