CLEER TOOL EXERCISE: Building Energy Efficiency

Instructions: The purpose of this exercise is to familiarize users with the CLEER tool by estimating the potential greenhouse gas (GHG) reductions of a sample building energy efficiency project over the equipment lifetime. For this exercise, users should do the following:

1. Read the project description.
2. Create a "Project" and "Action" in the CLEER Tool, following 7 steps below.
3. Compare your estimate of emissions avoided/reduced with the value at the end of this exercise.

Project Description: USAID is helping to implement building energy efficiency upgrades across buildings in a municipality in South Africa. USAID and the implementing partner agreed that energy efficiency activities would result in avoided GHG emissions due to reduced building electricity use. The implementing partner was required to work with the local municipal officials to collect baseline data on electricity consumption by the buildings that would be impacted by these upgrades. They found that, in total, the buildings used about 2,000 MWh per year (before the upgrades). The implementing partner then developed estimates of reduced electricity consumption based on the observed impact of the energy efficiency upgrades in a pilot project, which found that building electricity use decreased on average by 15% with energy efficiency improvements. The project implementers are tasked with estimating the GHG emissions avoided/reduced and energy savings after installation in 2027 through the year 2050 from these upgrades.

Create Your Practice Project and Action

STEP 1: On your dashboard, navigate to "**My Projects**", and select [+ Create Project] to create a new project. Enter in the details of the project on the following page.

Summary Information	
Project Name * ❓	Building Energy Efficiency Example
Project ID ❓	
Project Number ❓	
Value ❓	$ 0.00 USD
Start Date * ❓	01/01/2023
End Date * ❓	12/31/2050
Currency (if applicable) ❓	
Description	USAID is helping to implement building energy efficiency upgrades across buildings in a municipality in South Africa that will reduce building electricity use by 15% beginning in 2027. These buildings used an average total of 2,000 MWh per year before the upgrades. The project implementers are tasked with estimating the GHG emissions avoided/reduced and energy savings through the year 2050 from these upgrades.

At the bottom of the page, select **Save and View Summary** to go to project dashboard.

STEP 2: On your project dashboard, navigate to the "Actions" button and select **+ Add Action**

STEP 3: On the **Create an Action** page, enter the action details below, choose "**Save and estimate Projected GHG Emission Reductions**", and then click "**Save and Continue**" to navigate to the data input page.

Enter Action Details

Action Name *	Building Upgrades
Technology Type * ❓	Building Energy Efficiency
Region * ❓	Africa
Country * ❓	South Africa
Project Partner(s) ❓	
Description	

What would you like to do next? (choose one and select "Save and Continue")*

- Save and estimate Annual GHG Emission Reductions
- **Save and estimate Projected GHG Emission Reductions**
- Save and return to Action Details

Help   Save and Continue

STEP 4: On the first **Data Input** page, enter the projection start year. You also have the option to make specific changes in the project's assumptions by selecting "Custom Projection." To continue with the default factors and assumptions, select "Default Projection," and then click "**Save and Review Results**" to navigate to the next page.

Select a Projection Start Year

Select a Projection Start Year * ❓   2027

Would you like to create projection using default values where the impact of the action remains constant each year, or would you like to input custom values because you expect the impact to change over time (e.g., grow)? * ❓

Default Projection   Custom Projection

Go Back   Save and Review Results

Fill in Your Data Input Responses

STEP 5: On the **Data Input** page, enter the details of the project using the ones provided below to see how the tool estimates GHG emission reductions for this energy efficiency project. Note that many of the questions will not appear until you have answered the previous question.

Enter Energy Data for the Action

Select Projection Start Year	2027

Do you know the combined absolute or percent energy savings due to the implementation of all of the efficiency measures?

Yes - Absolute Energy Savings	**Yes - Percent Energy Savings**	No - I need help estimating my energy savings

Do you know the energy consumed by the old equipment or by the new equipment? ❓

I know the energy consumed for old equipment	I know the energy consumed for new equipment

What type of energy (electricity or fuel) is consumed? — Grid Electricity

How much energy (electricity or fuel) would have been consumed without the efficiency measures in the Projection Start Year? ❓ — 2,000   MWh

What is the percent energy savings achieved by the efficiency measures in the Projection Start Year? — 15 %

Do you want to estimate the energy cost savings? (Project has assumed USD) ❓ — No

Go Back   **Save and Review Results**

At the bottom of the page, select [Save and Review Results] to review your data inputs and results.

Check Your Results!

STEP 6: At the bottom of the **Calculator Summary** box, you will see the GHG reduction estimate for year 1 of this action along with the energy saved or generated highlighted in green.
Select [Review Projection Summary] to view a chart and table projecting the reductions to 2050.

Click [Download] to export results for each year to Excel. From this spreadsheet, you can sum the GHGs reduced annually over the required number of years to produce the result for EG.12-7.

Summary of Data Input

Do you know the combined absolute or percent energy savings due to the implementation of all of the efficiency measures?	Yes - Percent Energy Savings
Do you know the energy consumed by the old equipment or by the new equipment?	I know the energy consumed for old equipment
How much energy Grid Electricity would have been consumed without the efficiency measures in the reporting year in MWh?	2,000
What is the percent energy savings achieved by the efficiency measures in the reporting year?	15

Calculator Summary

	Default Values	Alternate Values ?
Emission Factor – (gCO$_2$e/kWh):	952.60	
Line Loss Savings – (%):	7.00	

Recalculate

Action Emissions Reduction Estimate: 305.85 tCO$_2$e
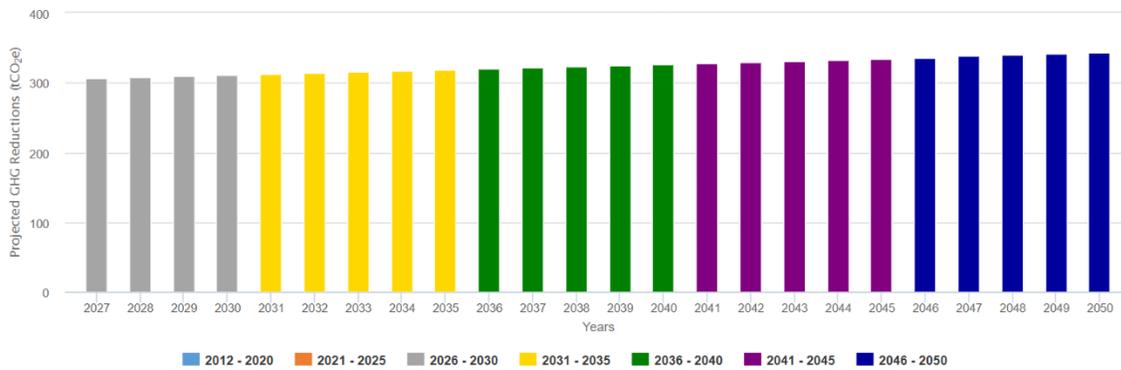Energy Saved or Generated: 300,000.00 kWh

Data Assumptions

Document all assumptions, data sources, or comments regarding the action or any of the data used for the estimation.

Go Back   **Review Projection Summary**

Action Projected GHG Reductions

Projected GHG Emission Reductions

Period	Emissions Reductions (tCO$_2$e)
2012 - 2020	0.00
2021 - 2025	0.00
2026 - 2030	1,232.62
2031 - 2035	1,575.77
2036 - 2040	1,615.56
2041 - 2045	1,656.35
2046 - 2050	1,698.18
Total GHGs Reduced/Avoided from - 2050	**7,778.48**

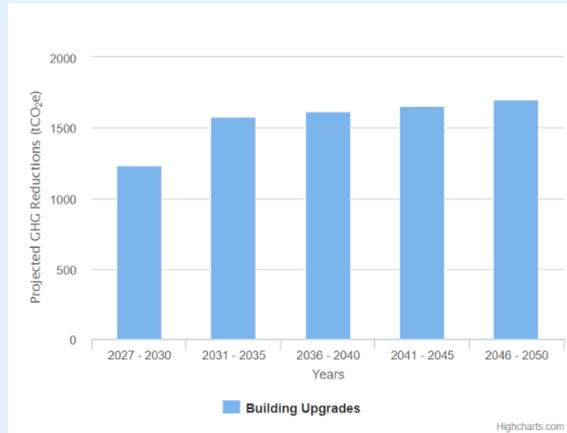|	A	B	C	D	E	F	G
1	Period	Emissions Reduced (tCO2e)					
2	2012	0.00					
3	2013	0.00					
4	2014	0.00					
5	2015	0.00					
6	2016	0.00					
7	2017	0.00					
8	2018	0.00					
9	2019	0.00					
10	2020	0.00					
11	2021	0.00					
12	2022	0.00					
13	2023	0.00					
14	2024	0.00					
15	2025	0.00					
16	2026	0.00					
17	2027	305.85					
18	2028	307.38					
19	2029	308.92					
20	2030	310.47					
21	2031	312.02					
22	2032	313.58					
23	2033	315.15					
24	2034	316.72					
25	2035	318.31					
26	2036	319.90					
27	2037	321.50					
28	2038	323.10					
29	2039	324.72					
30	2040	326.34					
31	2041	327.97					
32	2042	329.61					
33	2043	331.26					
34	2044	332.92					
35	2045	334.58					
36	2046	336.26					
37	2047	337.94					
38	2048	339.63					
39	2049	341.33					
40	2050	343.03					
41	Action Name	Building Upgrades					
42	Technology Type	Building Energy Efficiency					
43	Projection Start Year	2012					

Finalize and Report Action Results

STEP 7: After finalizing the results, navigate to your **Action Home** by selecting "**Submit Projections for Approval**" or clicking on the Action name.

Projected GHG Emission Reductions [1]

Years	Projected Emission Reductions (tCO$_2$e)
2027 - 2030	1,232.62
2031 - 2035	1,575.77
2036 - 2040	1,615.56
2041 - 2045	1,656.35
2046 - 2050	1,698.18
Total GHGs Reduced/Avoided from 2027 - 2050	7,778.48

Additional Materials

For more information on CLEER and its capabilities, please visit the Support and Resources page. This page provides a user guide, the CLEER Protocol, a CLEER factsheet, Excel calculators, and more.