

The SCA Integrative Design Process Facilitator Guide includes the following description of the LCA discovery and report requirements:

Discovery #3 - Preliminary Life-Cycle Impacts Assessment (LCA)

Perform a preliminary Life-Cycle Assessment by identifying potential building envelope assemblies that may be used for the project and quantifying the LCA impacts of each using the SCA LCA Assessment Tool (Athena). Include results and LCA design considerations in the IDP Workshop Report.

Report - Preliminary Life-Cycle Assessment

- Document the LCA considerations impacts of all building envelope assemblies selected for the project.
- Building Envelope Assemblies to be analyzed should include at minimum exterior wall(s) and roof. Examples of exterior wall assemblies to be analyzed may include brick cavity wall, concrete insulated panel wall, rainscreen wall, etc. Examples of roof assemblies may include blue roof, green roof, standard SCA roof.
 - LCA environmental impacts for each assembly selected using a LCA Assessment Tool (Athena)
 - LCA environmental impacts any assemblies that were considered and not selected with brief summary of why each assembly was not selected
 - LCA considerations in selection of building envelope assemblies

Implementation

A life cycle assessment can be performed using the free Athena Building Impact Estimator software, see link below.

<https://calculatelca.com/software/impact-estimator/download-impact-estimator/>

After downloading the Athena software, project teams can define assemblies by selecting materials from a list, and the program will generate a comparison report based on LEED criteria.

General project information should be consistent among all assemblies, suggested criteria listed below. Note any deviations from these criteria.

Project Location- New York City
Building Type- Institutional
Building Life Expectancy- 60 years
Building Height- 50 ft

The software allows teams to enter information for foundations, walls, column and beam, roofs, floors, and project extra materials. The IDP discovery is limited to building envelope so only wall and roof assemblies should be evaluated. Teams are to assess 2-3 wall assemblies (e.g. brick cavity wall, concrete insulated panel wall, rainscreen wall) and 2-3 roof assemblies (blue roof, green roof, and standard SCA roof) for consideration.

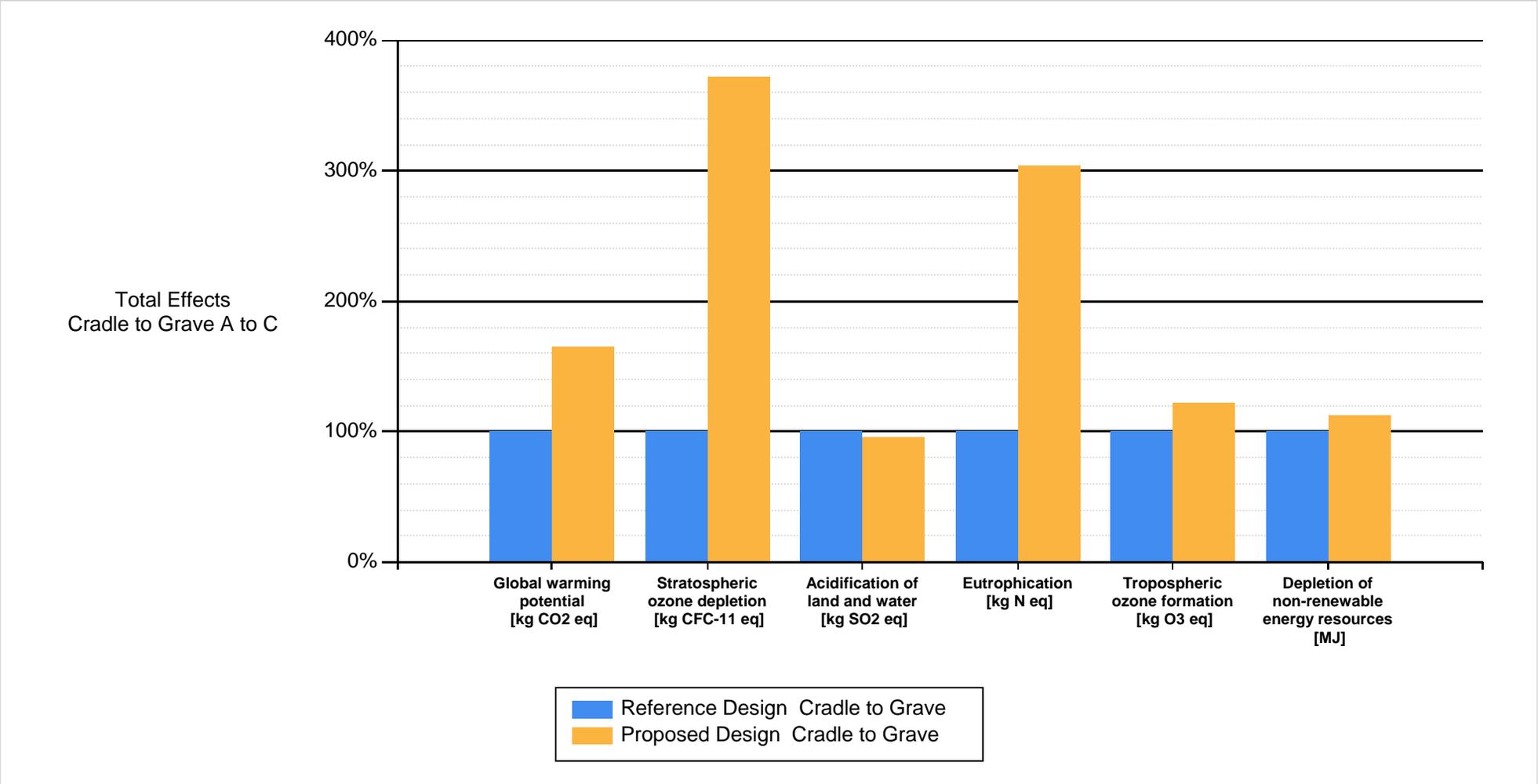
Attached is a sample Athena LCA comparison report between a brick and precast panel wall assembly. It includes only the elements of the opaque wall, not including windows.

Teams should include a brief description, sketches of the envelope systems (wall and roof), and the comparison report for the discovery in the IDP meeting.

LEED LCA Measure Comparison Report Cradle to Grave (A to C)

Reference Design: IDP Wall Assembly 02

Proposed Design: IDP Wall Assembly 01



LEED LCA Measure Comparison Report Cradle to Grave (A to C)

Reference Design: IDP Wall Assembly 02

Proposed Design: IDP Wall Assembly 01

Summary Measure	Unit	Reference Design Total Effects Cradle to Grave A to C	Proposed Design Total Effects Cradle to Grave A to C	% Difference
Global warming potential	kg CO2 eq	5.16E+03	8.52E+03	65.22%
Stratospheric ozone depletion	kg CFC-11 eq	4.07E-05	1.51E-04	272.11%
Acidification of land and water	kg SO2 eq	3.92E+01	3.77E+01	-3.88%
Eutrophication	kg N eq	2.55E+00	7.77E+00	204.35%
Tropospheric ozone formation	kg O3 eq	5.77E+02	7.00E+02	21.49%
Depletion of non-renewable energy resources	MJ	6.96E+04	7.82E+04	12.31%