D-05
Version 1
1st June 2018

WHITE PAPER ON LIFE CYCLE COSTING (LCC)

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Introduction

In line with our objective of 'Do Good and Do Well', we also have to enhance our comparative costing methods while evaluating sustainable alternatives with our standard practices. This will help us especially while comparing building systems which contribute to its energy profile, such as:

- Efficient machines
- HVAC
- Facade options (envelope, fenestrations)
- Renewable energy sources
- Building automation

As lot of us are writing white papers and comparing sustainable alternatives in design, the objective of this paper is to help us with a structure and format of Life Cycle Costing (LCC) which can be used in our analyses. With LCC we move away from a capex only to a holistic view of the alternative, which shall include:

- current costs
- recurring energy costs
- recurring maintenance costs
- duration of service
- *occupant productivity - not considered in this paper*
- *environmental costs*[1] *- not considered in this paper*

Input Considerations

Essential data to be gathered from vendors, market as input (**non exhaustive**):

1. Capital cost and service life of the compared systems
    a. Consider end of life costs, if feasible

2. Annual energy consumption profile of the system, where the same is not available, please do as follows:
    a. for passive systems - please ask the sustainability consultant to run the existing/under development energy model for both options
    b. for active systems - while the data may be available, it is still worth to verify the same through the model (simulation) as compared to linear extrapolations (which many times fails to consider seasonal energy demand and consumption variations)

3. Annual maintenance costs of both the options, also consider if there is a cascading impact on maintenance of any other element in the building.
    a. Consider inflation (5%)

4. Current energy costs, sources:
    a. Input from FM or liaison
    b. Online - applicable utility tariff orders[2]
    c. Consider if the option under analysis might be fed majorly from a renewable energy source (solar, etc.) which might be cheaper than the above
    d. Consider inflation (3%)

[1] Global Warming, Ozone Depletion, Acidification, Air and Water Contamination, Biodiversity Impact
[2] https://www.mahadiscom.in/download.php?docname=tariff/Order-48%20of%202016-03112016.pdf

5. Any other item, not listed above but essential and relevant for the required analysis. Such items include cascading effects on other systems as well.

Analysis

The analysis shall be done with Net Present Value (NPV) approach for ten years, considering SBI MCLR(3 years)[3]+400bps.

A sample excel is attached with this paper for reference (this excel includes the NPV analysis done for high efficiency motors and air conditioners).



NPV Calcs Format.xlsx

[3] https://www.sbi.co.in/portal/web/interest-rates/mclr