“Building Life Cycle”
Balancing the Equation of Total Ownership Cost
With our Clients
AIAT Green Day Workshop
Building Life Cycle

Introduce
Define
Discuss
Now what?

Balancing the Equation of Total Ownership Cost with our Clients
Introduce

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Now what?

Building Life Cycle

AGENDA

Balancing the Equation of Total Ownership Cost with our Clients
Building Life Cycle Champions: Energy

AVERAGE BUILDING ENERGY BY %

- Cooling: 35%
- Lighting: 25%
- Water Heating: 2%
- Office Equipment: 3%
- Refrigeration: 3%
- Computers: 10%
- Other: 10%
- Ventilation: 6%
- Heating: 10%

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Definitions and Aspects of Life Cycle Assessment
The LCA process is governed under ISO 14000, the series of international standards addressing environmental management. According to International Standard ISO 14040, LCA is a “compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its lifecycle.”

The Code of Practice by the Society of Environmental Toxicology and Chemistry (SETAC) describes LCA as “a process to evaluate the environmental burdens associated with a product, process, or activity by identifying and quantifying energy and materials used and wastes released to the environment, to assess the impact of those energy and materials used and released to the environment; and to identify and evaluate opportunities to affect environmental improvements.”

The Environmental Protection Agency (EPA) refers to LCA as “a cradle-to-grave approach for assessing industrial systems that evaluates all stages of a product’s life.”

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Total Ownership Cost

According to Investopedia

DEFINITION OF 'TOTAL COST OF OWNERSHIP - TCO'
The purchase price of an asset plus the costs of operation. When choosing among alternatives in a purchasing decision, buyers should look not just at an item's short-term price, which is its purchase price, but also at its long-term price, which is its total cost of ownership. The item with the lower total cost of ownership will be the better value in the long run.

INVESTOPEDIA EXPLAINS 'TOTAL COST OF OWNERSHIP - TCO'
For example, the total cost of ownership of a car is not just the purchase price, but also the expenses incurred throughout its use, such as repairs, insurance and fuel. A used car that appears to be a great bargain might actually have a total cost of ownership that is higher than that of a new car, if the used car requires numerous repairs while the new car has a three-year warranty.
Where Does Building Life Cycle Meet Total Ownership Cost?
Begin with Total Cost in Mind

Operations costs include:

- Utilities/ Energy
- Facility Maintenance
- Repairs/ Replacements
- Alterations
- People (Users)
Identify Potential for Building Life Cycle Impact

- Ability to impact cost & function
- 66% of lifecycle cost committed during the planning phase
- Cost of design change

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Understand the Process: Traditional

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- Common Understanding
- Owner
- Architect Hired
- Engineers Hired
- CM/GC Hired
- Major Trades Hired
- Schematic Design
- Design Development
- Construction Documents
Understand the Process: Collaborative

Traditional Behaviors & Roles MUST change!

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Understand the Process: Integrated Delivery

- **Collaborative team/behaviors** – significant early engagement of key stakeholders (including Owner), mutual trust/respect, multi-party contract, colocation

- **Jointly developed and validated targets** – project conditions of satisfaction, values, quality, cost and schedule

- **Innovative design and construction processes/tools** – lean, TVD, VSM, commitment based planning, BIM

- **Joint project control** – joint decision making/governance, shared risk/reward, safe harbor decisions, dispute resolution, performance based pay, incentive pool
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Collaborate!

1. People & Teams
   - Individuals whose behaviors promote team-building, collaboration, transparency and trust

2. Integrated Processes
   - That create an environment in which the team puts the project’s welfare first (e.g., contract parties share risk and reward)

3. Innovative Tools
   - That foster the complete integration of services (e.g., Knowledge management, Building Information Modeling, Lean)

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Let’s Identify the Stakeholders

Who is involved?
Owner, Broker, Developer, Program Manager, Property Manager, Facility Manager, Manufacturers, Design Team, Engineers, Construction Team, sub-contractors

How do each define building life cycle and/or TOC and why?
What if...

We had defined roles to balance the equation?

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What if...

We each had defined roles to balance our equation?

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Vision: A Step by Step Process

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Tactics: Traditional Capital Cost Waste Metrics

In a typical project uncertainty is generally managed by contingency (maybe 10-15% of project cost)

80% of every $1 believed goes to value adding scope (work)

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In an integrated project uncertainty and delivery inefficiency is seen as waste (30% of project cost).

65% of every $1 may only go to value adding scope (work).

Tactics: Integrated Capital Cost Waste Metrics
Tactics: Operational Cost Waste Metrics

- Uncertainty & Waste in Project Delivery
- Excess debt service, utility costs
- Lost operating income (bldg. or grid issue)
- Poor facility mgmt productivity
- Poor product performance
- Warm/ cold calls
- Inefficient layout/ underutilized eqpt/ space
- Lost productivity

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Tactics: Establish a Timeline for Target Cost

Business Case Sufficient to Price Preliminary Cost Expected Cost Target Cost Final Cost

PROCURE ALIGN VALIDATE IMPLEMENT

SmartStart®

Key Players:
O A/E CM SC MS

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Tactics: Target Value Design
# Tactics: Choose by Advantages

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<th>% energy reduction</th>
<th>Capital Cost</th>
<th>Innovation/Wow Factor</th>
<th>Reduced energy consumption</th>
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Balancing the Equation of Total Ownership Cost with our Clients
Agreed Outcome: A balanced approach to ROI

We're going to have to sell all of your toys and clothes to leverage our losses. You just haven't given us a good ROI. Your total cost of ownership was much greater than we anticipated.
Agreed Outcome: Balancing the Equation

STEWARDS OF THE ENVIRONMENT THROUGH WHAT OUR INDUSTRY IS FACING

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