EM-Tools Development Project - Status Update

# 1. Project Overview

The EM-Tools development project is an ongoing effort to build and integrate tools that support energy modeling, lifecycle cost analysis (LCCA), and compliance with energy standards like ASHRAE 90.1. The project is divided into multiple tracks, each with specific goals and deliverables.   
 The tracks include EM Core Tools, Reference Documents, EnergyPlus, and LCCA. Each track is designed to ensure modular development, enabling fast iterations and seamless integration across components.

# 2. Current Status

## 2.1 EM Core Tools Track

This track focuses on developing the foundational tools used across all other tracks, including model visualization, data parsing, conversion, and comparison functionalities. The modules are being developed in parallel, with a focus on early delivery of key components.

Current Status:  
- \*\*Model Viewer/Inspector\*\*: Initial development has begun. Basic CBECC and IESVE models are being loaded and displayed.  
- \*\*Model Conversion Engine\*\*: Parsing of CBECC and IESVE models is being developed for basic geometry and system data conversion.  
- \*\*Data Processing Modules\*\*: Core modules for parsing XML and generating IDF files are under development, with basic data extraction functionality in place.  
- \*\*Comparison Engine\*\*: A basic comparison of energy consumption between baseline and proposed models is implemented.  
- \*\*Report Generation\*\*: Initial versions of ECON-1 and ASHRAE 90.1 compliance reports are being generated.  
- \*\*Visualization Tools\*\*: Early-stage development of interactive dashboards is underway.

## 2.2 Reference Documents Track

The Reference Documents track is tasked with creating the necessary documentation to guide users and developers in energy modeling. The deliverables are aligned with the development of the core tools to ensure proper documentation is available at each stage.

Current Status:  
- \*\*CBECC Modeling Guide\*\*: The initial draft of input field descriptions and common use cases is being completed.  
- \*\*IES Modeling Guide\*\*: Input field descriptions and system configurations for IESVE models are being documented.  
- \*\*CBECC vs. IES Modeling Comparison\*\*: The modeling process and system comparison documents are in progress, with a focus on building type-specific examples.

## 2.3 EnergyPlus Track

The EnergyPlus track is developing tools to validate energy models against ASHRAE 90.1 compliance and to generate IDF files for EnergyPlus simulations. The core functionality for baseline modeling and compliance checking is being built out.

Current Status:  
- \*\*EnergyPlus Baseline Modeling Tool\*\*: Baseline generation logic for residential building types is being finalized.  
- \*\*EnergyPlus Compliance Validator\*\*: Compliance checks for HVAC systems and envelope configurations are being tested.  
- \*\*EnergyPlus IDF Generator\*\*: The IDF export functionality for basic building geometry is working.  
- \*\*Performance Analysis Tool\*\*: Energy consumption analysis is in progress, with early testing of cost savings analysis underway.

## 2.4 LCCA Track

The LCCA track focuses on integrating lifecycle cost analysis and energy modeling results. Tools are being developed to project costs and savings, using data from the core tools and EnergyPlus simulations.

Current Status:  
- \*\*LCCA Tool\*\*: The scenario comparison logic is working, and early cost projections are being generated.  
- \*\*Construction Cost Database\*\*: Material cost data entry is underway, with escalation factors being implemented.  
- \*\*Cost Estimator\*\*: Basic system cost estimations for HVAC and PV systems are being tested.  
- \*\*Integration\*\*: Data integration between LCCA Tool, EM Core Tools, and EnergyPlus is in the early stages.

# 3. Milestone Review Dates

The following dates mark key review milestones for the EM-Tools development project. These milestones are based on the fast-tracking strategy, with incremental deliverables and testing at each stage.

- \*\*August 15, 2025\*\*: Review of Model Viewer/Inspector (Basic model display) and CBECC to IESVE parsing.  
- \*\*September 1, 2025\*\*: Review of baseline model generation logic and compliance checks for EnergyPlus.  
- \*\*September 15, 2025\*\*: Review of scenario comparison logic in LCCA Tool and CBECC Modeling Guide.  
- \*\*October 1, 2025\*\*: Review of data normalization modules and integration with EnergyPlus IDF export.  
- \*\*October 15, 2025\*\*: Full integration testing of core tools and cost estimator for HVAC systems.  
- \*\*November 1, 2025\*\*: Review of report generation (ECON-1) and energy consumption analysis results.  
- \*\*December 1, 2025\*\*: Final testing and integration of all tools, including dashboards, and final documentation.

# 4. Naming Convention and File Structure

Deliverables and track components are named according to the following format, ensuring compatibility with GitHub organization:

- \*\*File Format\*\*: [Track]\_[Module]\_[Deliverable]\_vX.Y  
- Example: EM\_Core\_Tools\_Model\_Viewer\_v0.01.docx  
  
- \*\*Folder Structure\*\*:  
/EM\_Core\_Tools/Model\_Viewer\_Inspector/...  
/Reference\_Documents/CBECC\_Modeling\_Guide/...  
/EnergyPlus/EnergyPlus\_Baseline\_Modeling\_Tool/...  
/LCCA/LCCA\_Tool/...  
  
Versioning: v0.X for in-development, v1.0+ for production-ready files.