

Task 2: 3 Case Studies

By IBM (Inverse Model)

Case Study 1&2: Building 101, Philadelphia Navy Yard & One Montgomery Plaza

An Energy Balance based inverse model has been developed, implemented and tested through data for two buildings: (1) Building 101 at the Navy Yard and (2) One Montgomery Plaza, by IBM, and has been deployed in the EEB Hub Cloud. The tool computes overall building energy performance, benchmark its retrofit potential and screen (i.e. triage) a set of candidate buildings for retrofits. The overall envelope conduction parameter (R Value) and convection parameter (air exchange rate) are computed through the IBM's inverse modeling. The simulation tool computes the energy savings impact of improved parameters (i.e., retrofits) (See Figure 1). The GIS (geographic information systems) based visualization and benchmarking tool allows users to compare the energy performance of buildings in a portfolio and screen a set of buildings as candidates for retrofits using the computed parameters, building performance indicators and other building characteristics (see Figure 2). The screened set of buildings can be inputted to the higher level tools (partial, substantial and comprehensive) for more detailed modeling of retrofits. Using the screened buildings, the higher level tools can focus more on the buildings that can substantially save more energy than others through retrofits.

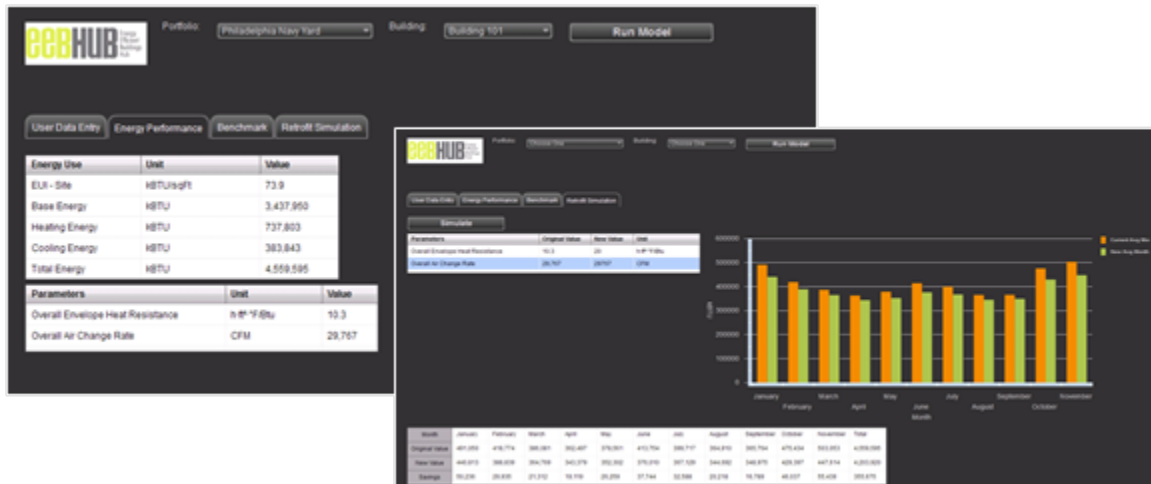


Figure 1 Inverse Modeling/Parameter Estimation and Simulation of Retrofit Savings

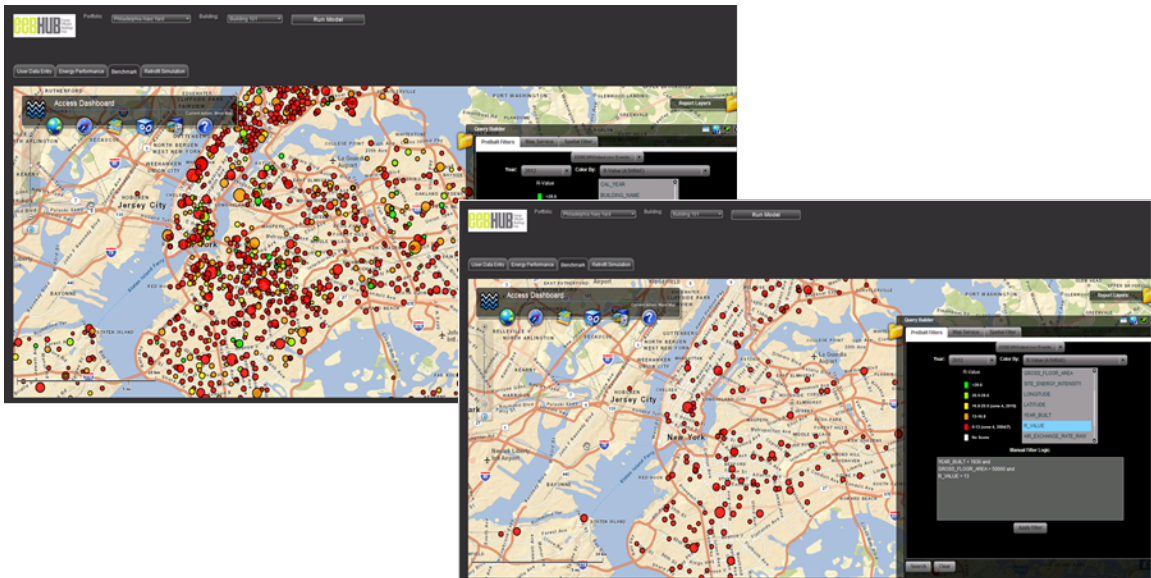


Figure 2 Visualization of Energy Performance and Filtering Retrofit Candidates