Schneider-Electric Cold Start Challenge

Summary

Buildings account for 40% of global CO_2 emissions, but are often overlooked in the public consciousness even though they are fertile ground for climate and energy innovation. Forecasting energy consumption in a building due to Heating, Ventilation and Air Conditioning (HVAC) is a vital tool for minimizing energy waste. By knowing how much load to place on these systems for a given outside temperature, we can optimally achieve desired comfort settings without wasteful expenditure.

In practice two situations can arise: either the building under consideration has been instrumented for years, enabling the use of past data to create (and validate) models for the energy consumption of this specific building; or the building is new or only recently instrumented, in which case very little data on this specific building is available. The latter is the situation considered for this "Cold Start" challenge. Forecasts can then be established by analogy with other buildings, considering the little data available for the building of interest.
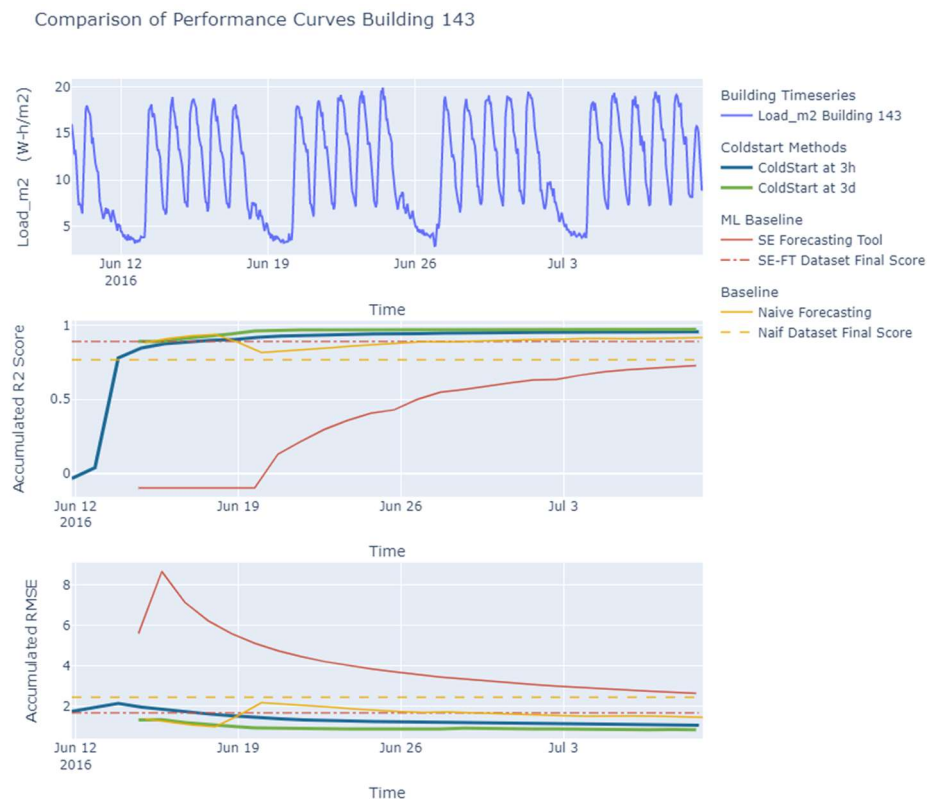
Figure 1: *Performance of ColdStart Methods vs baselines.* **Top**: *Energy Consumption for sample building.* **Middle**: *Accumulated R2 score for chosen method.* **Bottom**: *Accumulated Root-mean-square for given method. Note how much faster ColdStart achieves above-threshold performance for minimizing energy waste.*