

## **Breaking the Code: Deciphering HVAC Equipment Nameplate for Market and Evaluation Insights**

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This poster presents some key findings from an analysis of Massachusetts HVAC equipment nameplates that DNV GL completed in 2016. From 2014 through 2016, DNV GL led an evaluation team which completed over 800 visits of C&I sites as part of a Massachusetts Existing Building Market Characterization study. This study was designed to understand what types of energy-using equipment the Massachusetts C&I customers were using as well as to collect information on the age, condition, efficiency, and operating characteristics of this equipment.

Data collected by this Existing Building Market Characterization study included manufacturer nameplates for thousands of HVAC units. DNV GL recorded manufacturer serial numbers from these nameplates and then used these serial numbers to find out the dates of equipment manufacture. We found much of this manufacture date information in publicly-available databases. In other cases, we had to reach out to HVAC manufacturers for unpublished lists of serial numbers.

The poster shows that through these lookups of manufacturer serial numbers, we could nearly double the number of units for which we could determine a manufacture date. Once we analyzed this manufacture date information, we uncovered interesting patterns in the age of different equipment types. For example, we found that Package Terminal Air Conditioners (PTACs) were the oldest type of unitary HVAC equipment while window or wall air conditioners were among the newest. Across all of these equipment types we found that about a third were either past their Estimated Useful Life (EUL) or within a couple of years of their EUL.

Our analysis also found interesting differences in equipment ages across different Massachusetts Program Administrators. For example, we found that the commercial split AC systems in the Eversource service territory were much older than those in other Massachusetts service territories. Our hypothesis for this was that since Eversource served downtown Boston, the equipment tended to be older because the building stock was older, partly due to the higher cost and difficulty of new construction in that area.

We also found that nearly all the PTACs in the Cape Light Compact service territory were past their EUL. One explanation we proposed for this was that the cooler temperatures and greater seasonality of AC usage on Cape Cod meant lower usage and longer equipment life. Another explanation we put forward is that Cape's many small, independent business owners are less likely to replace their equipment due to financial constraints or the lack of broader corporate equipment policies. A small sample size (n=107) also likely played a role.

Across all of Massachusetts, we were unable to find the manufacture date for about a third of the equipment. We assumed that these units of unknown vintage were, on average, older than the units for which we could find a manufacture date. We assumed this because many of the factors that make the age of a unit undeterminable, such as sun or salt damage to the nameplate, or lack of manufacturer information, are correlated with old equipment age.