

End-Use Variable Revisions

Load Analysis Subcommittee
July 17, 2017



- The Load Forecast model uses variables to capture changes in end-use saturation and efficiency (Heat, Cool, and Other)
 - Come from Itron Energy Forecasting Group membership, which are derived from the Energy Information Administration's (EIA) National Energy Modeling System (NEMS)
 - Available at the Census Division level
 - Supplemented by some TO zones that supplied end-use saturation data from their load research functions

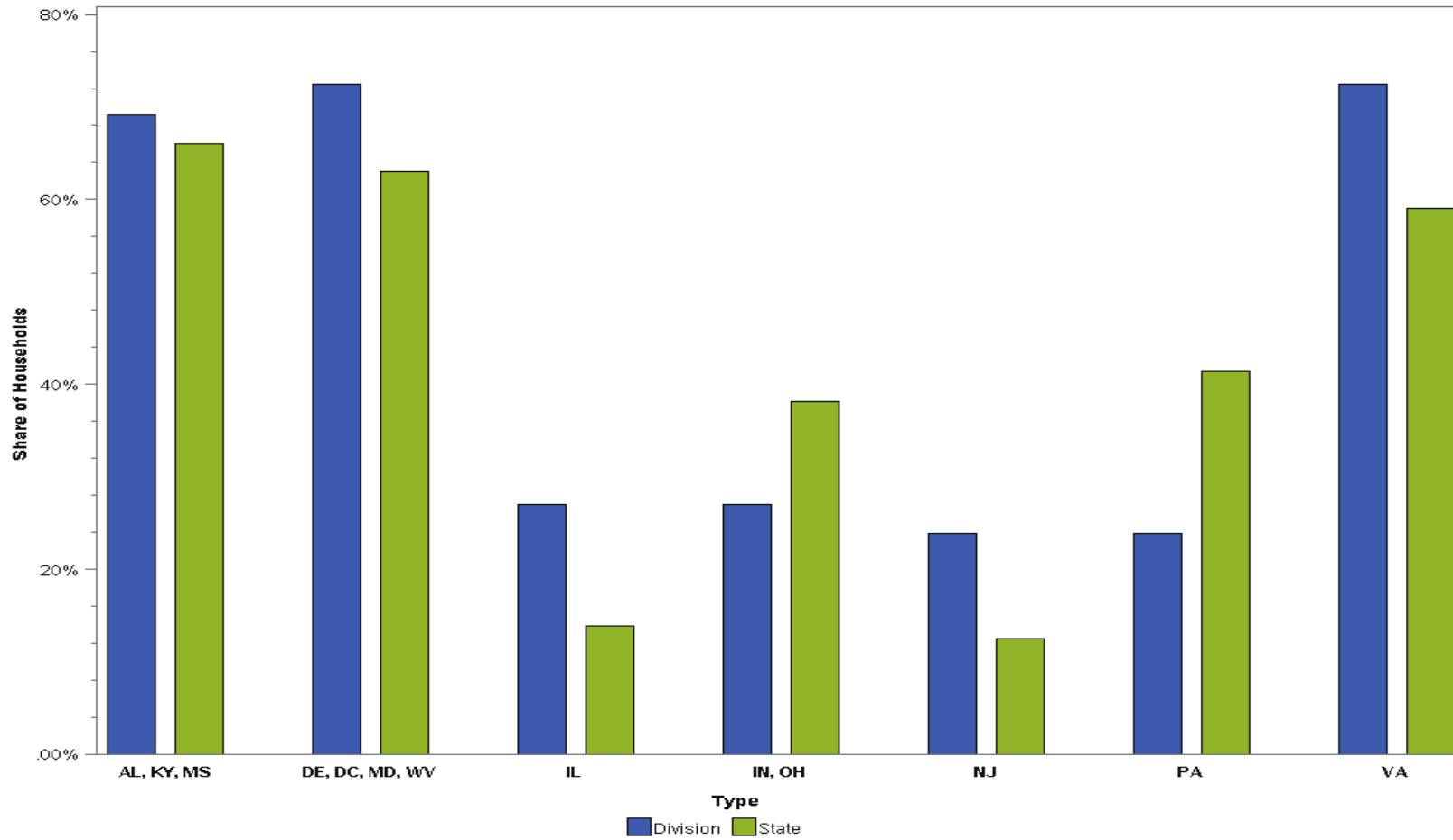
- The EIA's 2009 Residential Energy Consumption Survey (RECS) has some state level data (located in the microdata), which is then leveraged to benchmark the end-use inputs in the Load Forecast model to:
 - Align saturation data
 - Calibrate categorical energy use



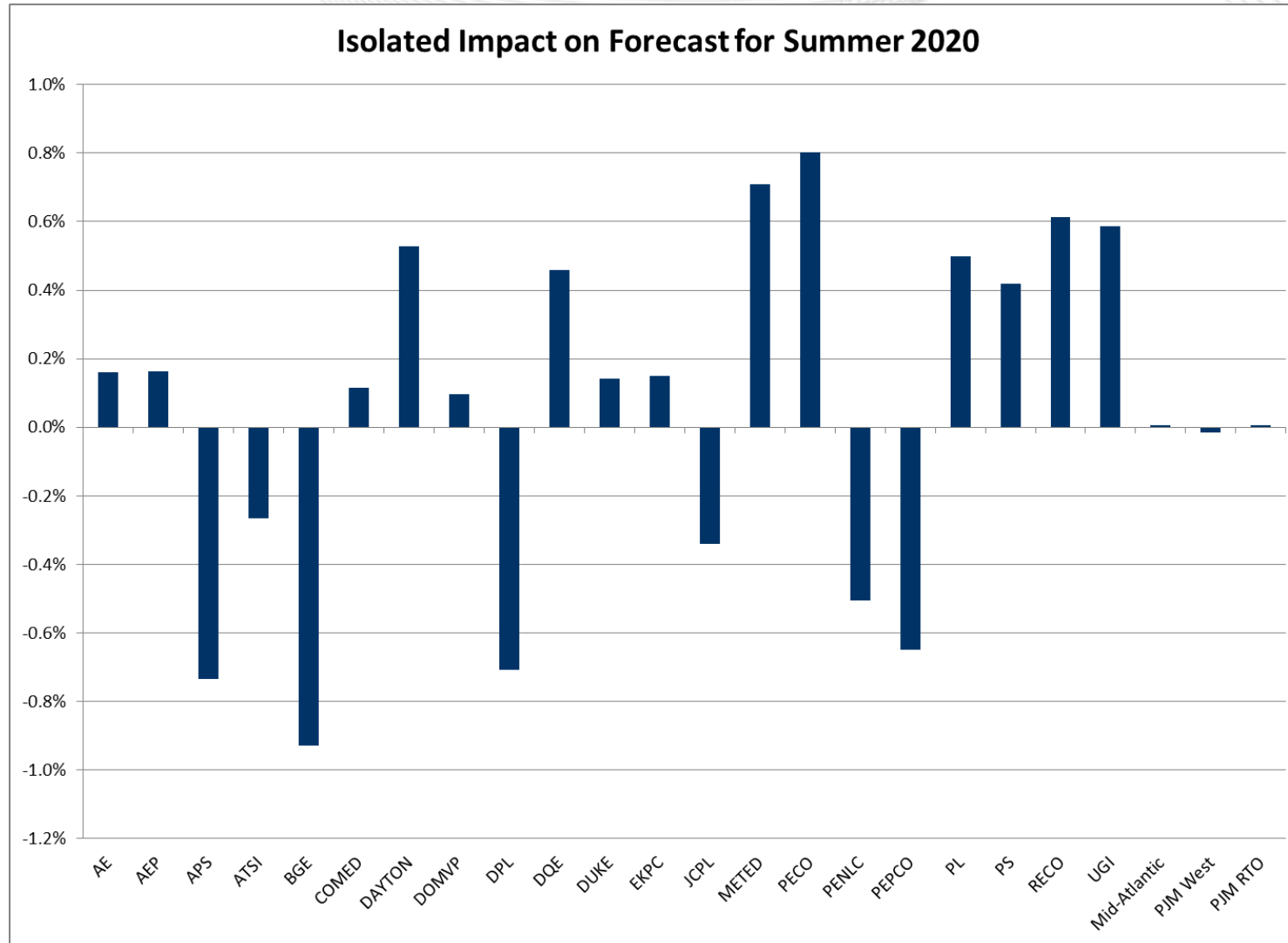
States Available in 2009 RECS Data

- 1 Connecticut, Maine, New Hampshire, Rhode Island, Vermont
- 2 Massachusetts
- 3 New York
- 4 New Jersey
- 5 Pennsylvania
- 6 Illinois
- 7 Indiana, Ohio
- 8 Michigan
- 9 Wisconsin
- 10 Iowa, Minnesota, North Dakota, South Dakota
- 11 Kansas, Nebraska
- 12 Missouri
- 13 Virginia
- 14 Delaware, District of Columbia, Maryland, West Virginia
- 15 Georgia
- 16 North Carolina, South Carolina
- 17 Florida
- 18 Alabama, Kentucky, Mississippi
- 19 Tennessee
- 20 Arkansas, Louisiana, Oklahoma
- 21 Texas
- 22 Colorado
- 23 Idaho, Montana, Utah, Wyoming
- 24 Arizona
- 25 Nevada, New Mexico
- 26 California
- 27 Alaska, Hawaii, Oregon, Washington

- Saturation data alignment
 - Appliance saturation was calculated for 2009 by state (or group of states).
 - RECS-based state saturation figures are fed into the model to adjust up or down.



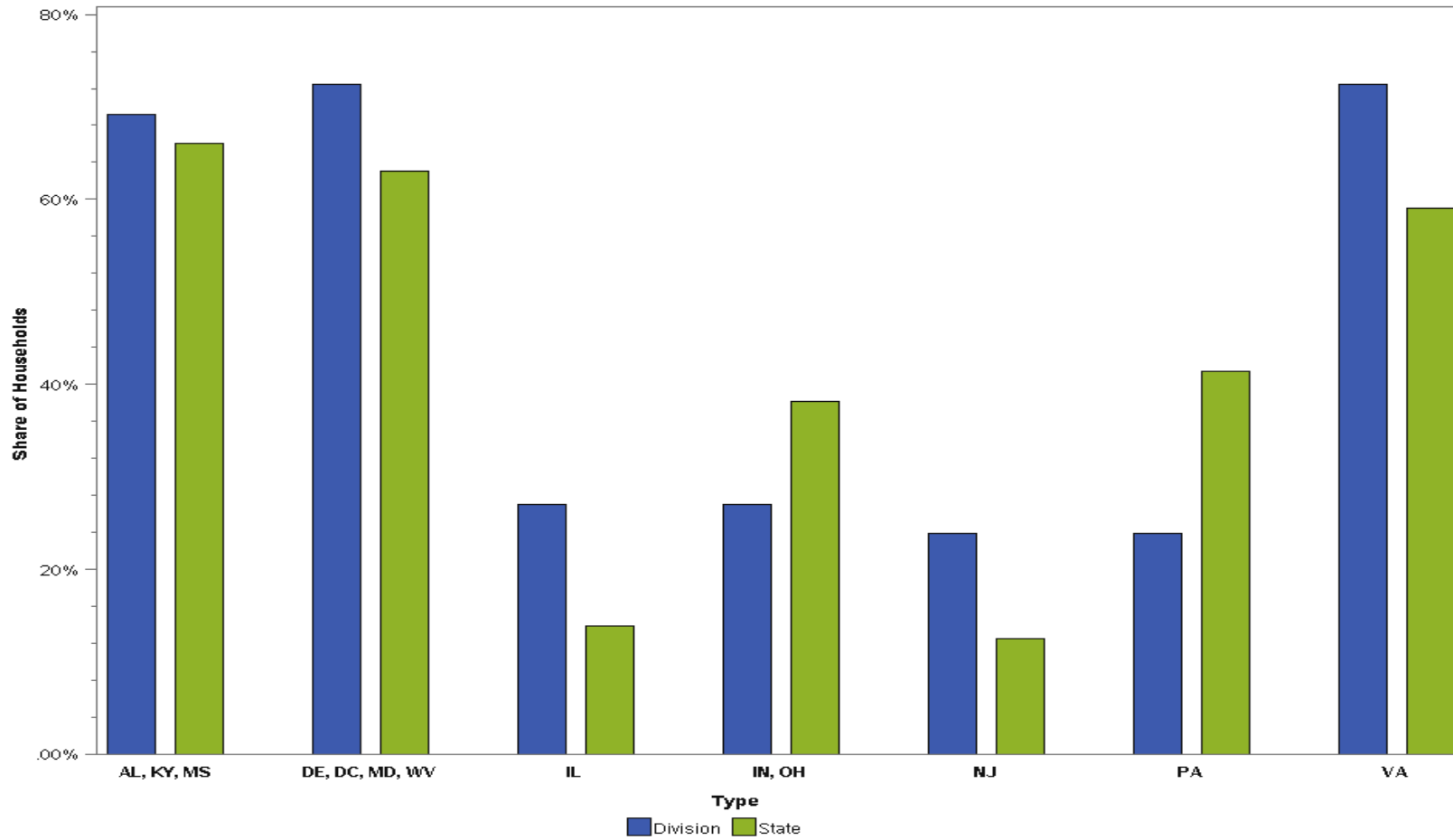
- Calibrate categorical energy use
 - 2009 RECS data has information on total energy use, and energy use by six subcategories (space heating, space cooling, water heating, refrigerators, and other purposes)
 - These are used to help weight the importance of one end-use versus another.
 - Mostly useful in allocation of residential end-uses within the Other Equipment Index



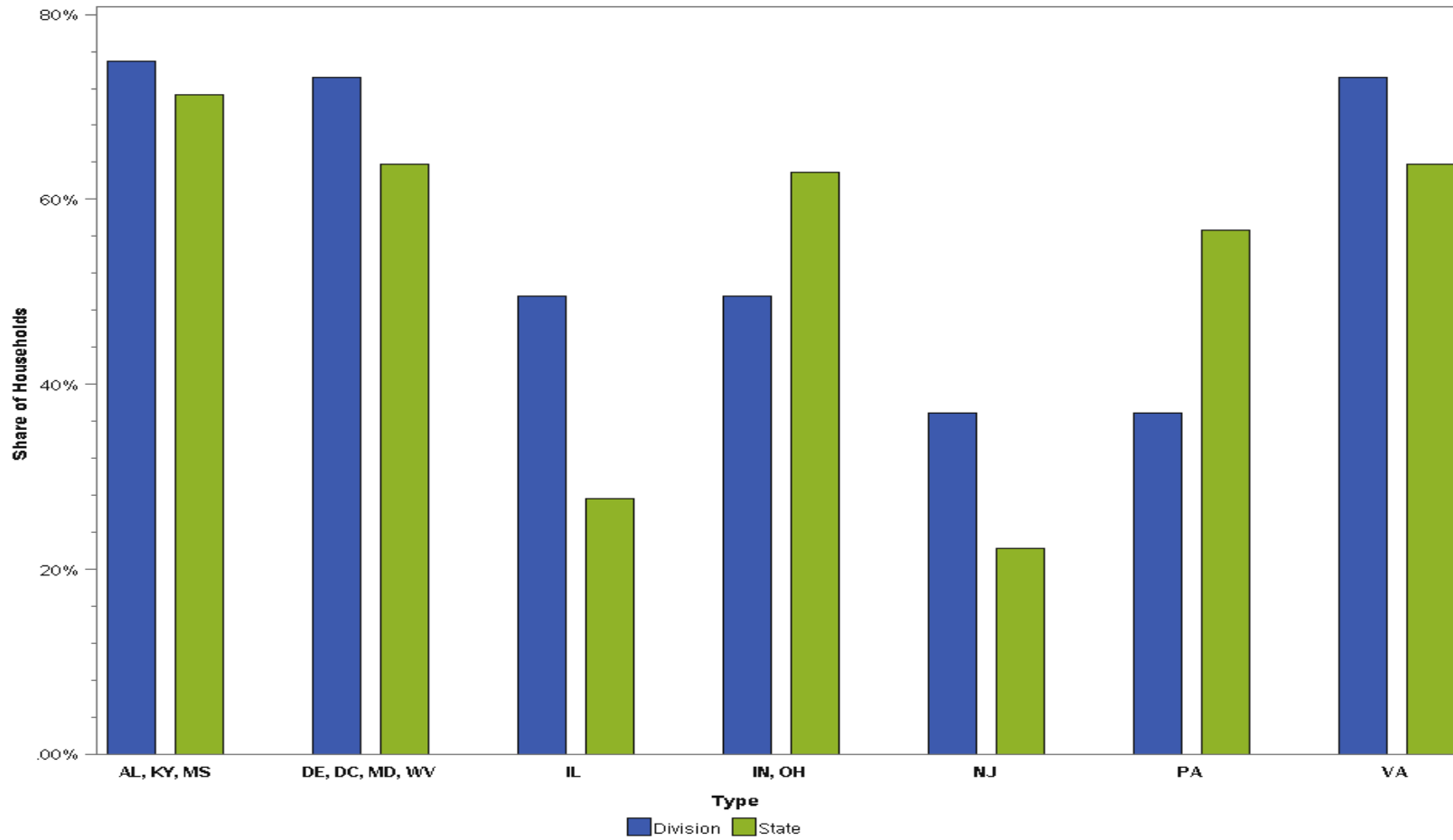
Appendix: Saturation Data



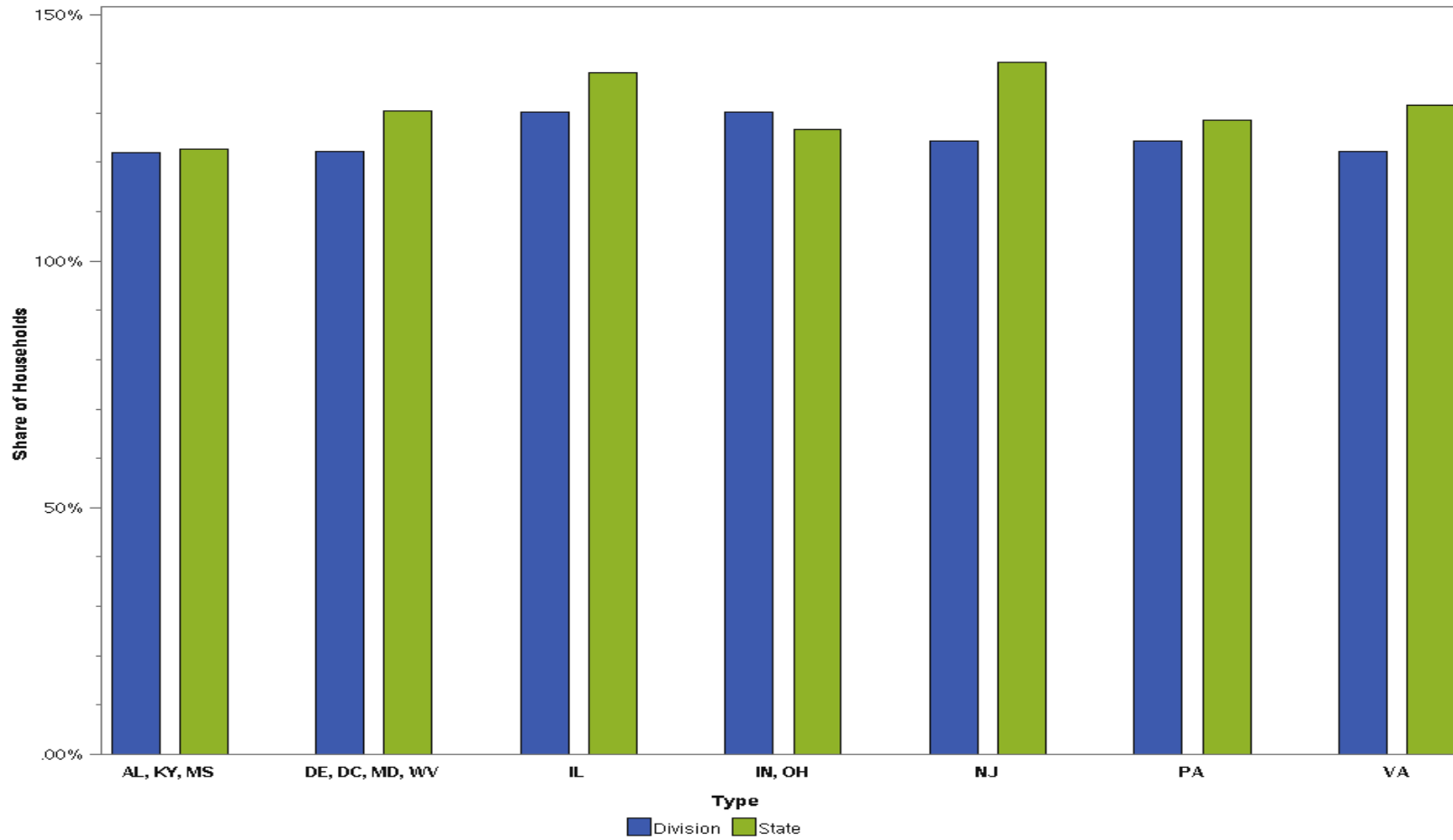
Water Heaters



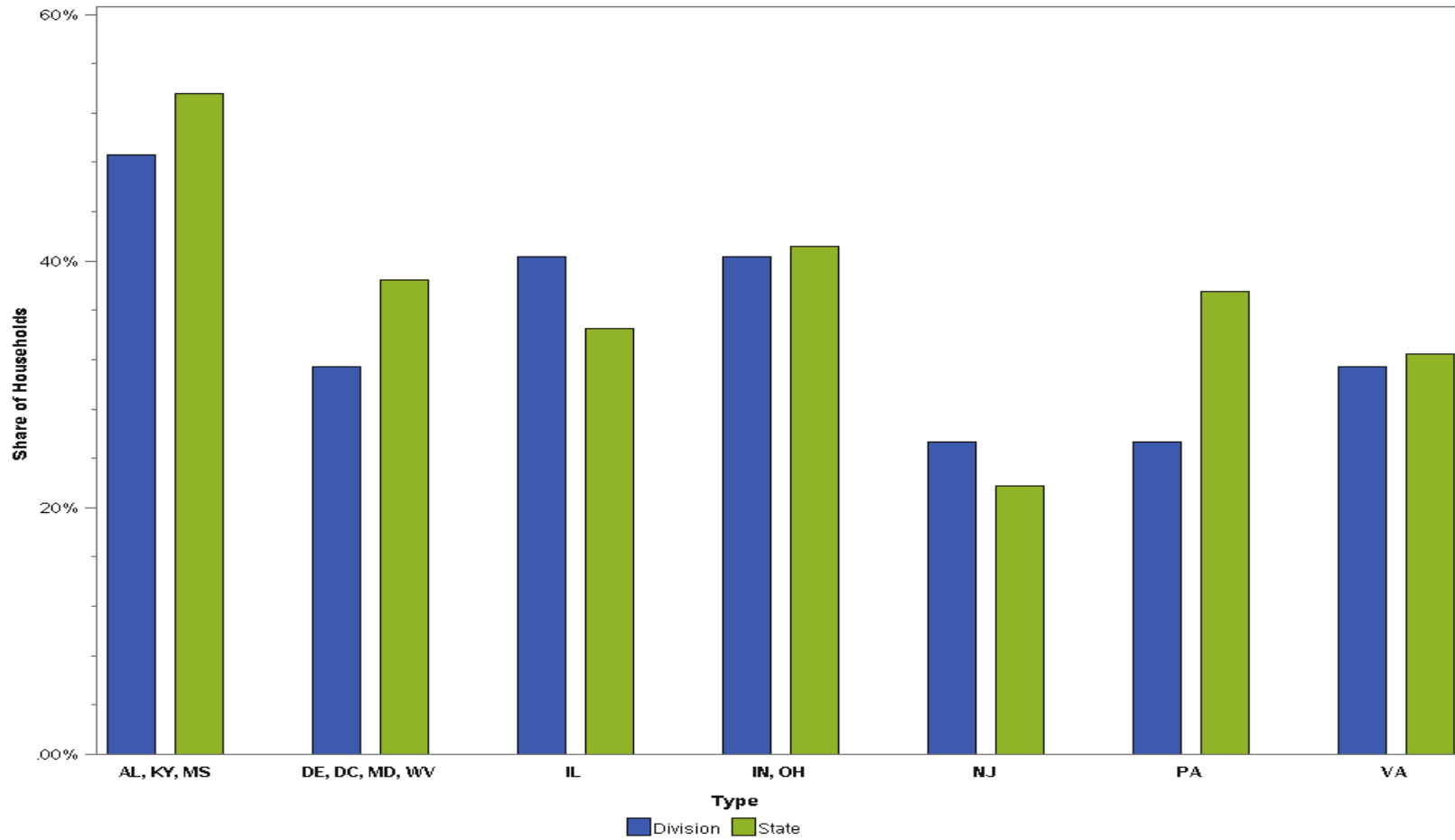
Cooking



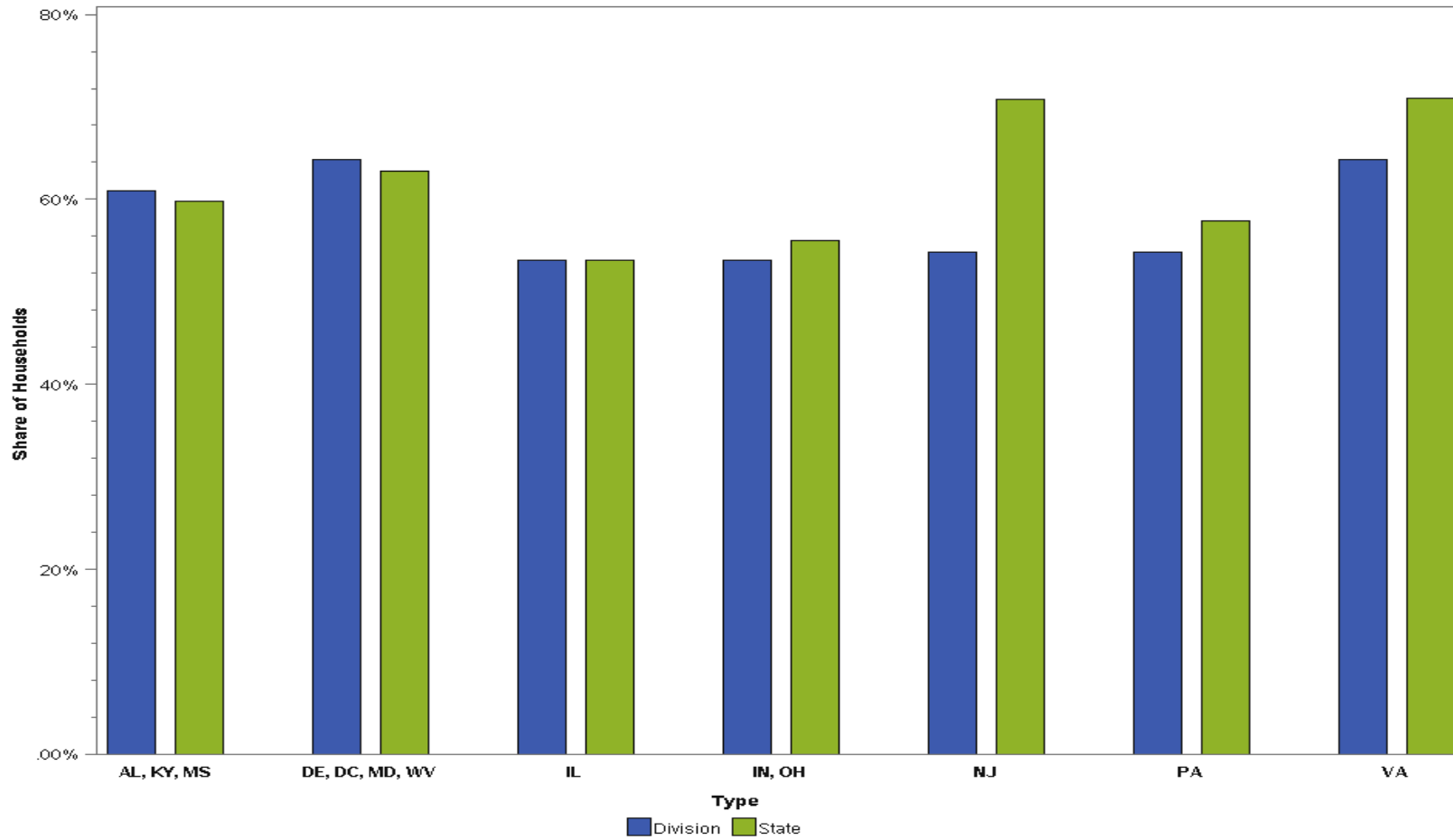
Refrigerators



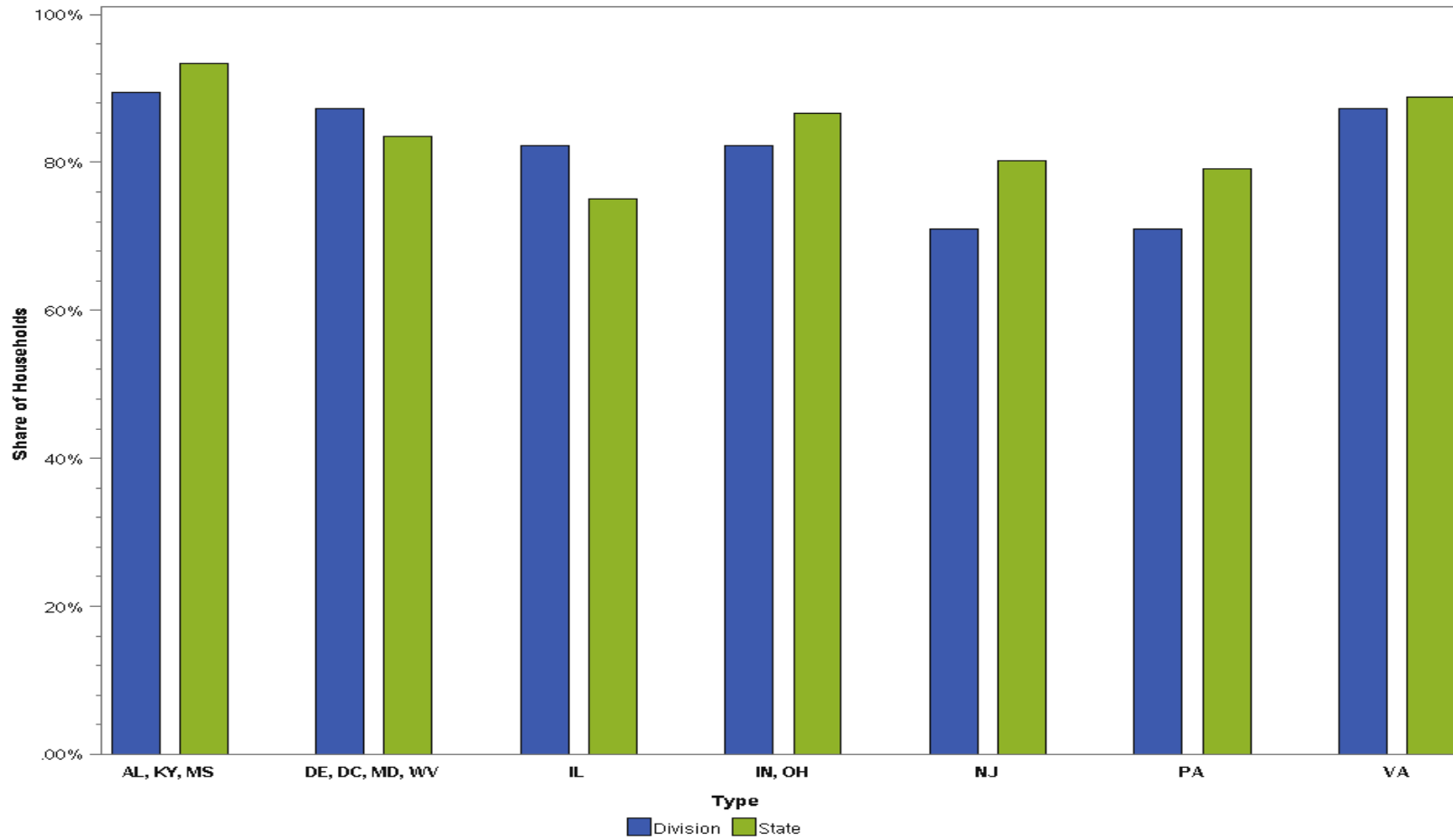
Freezers



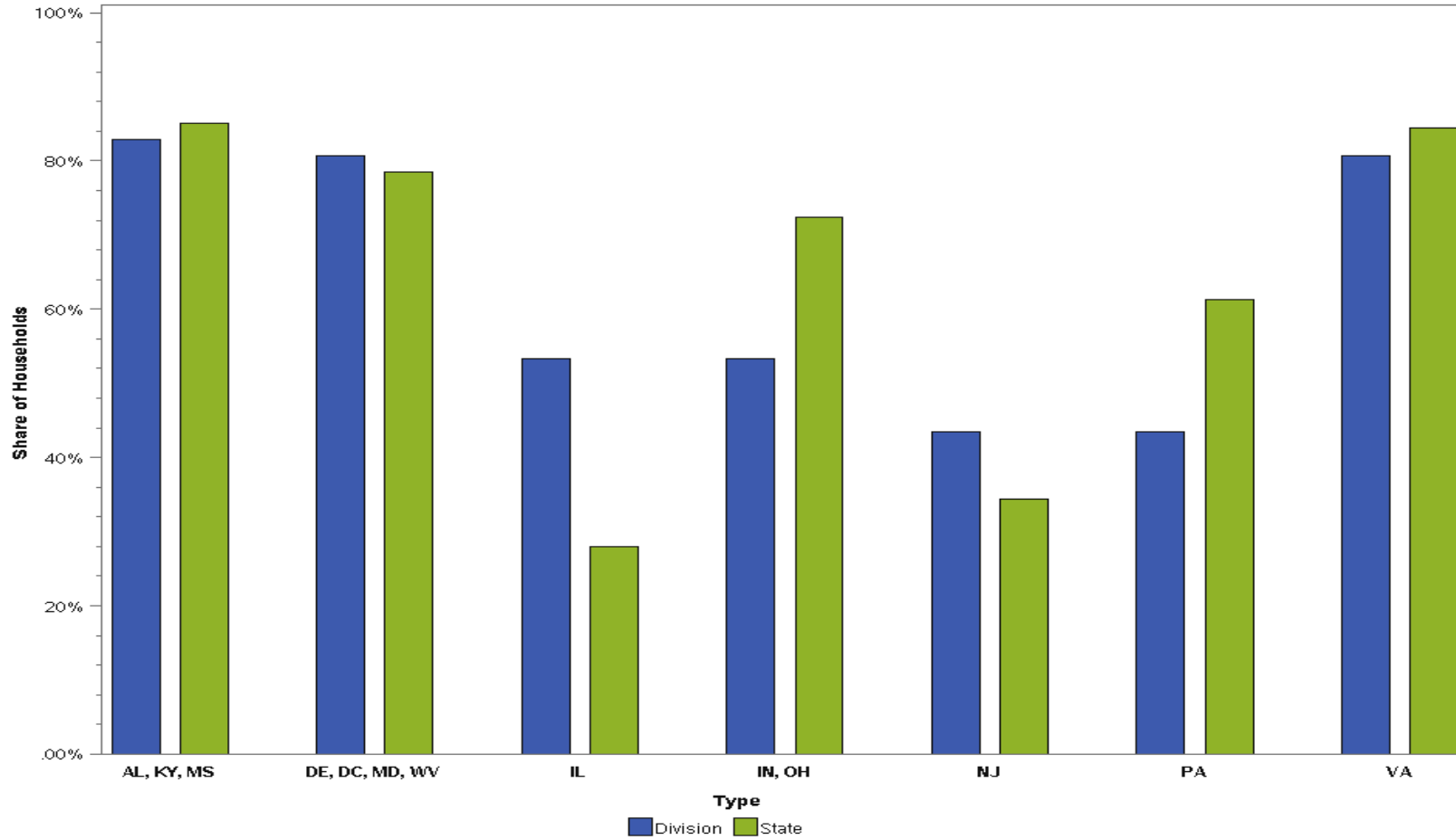
Dishwashers



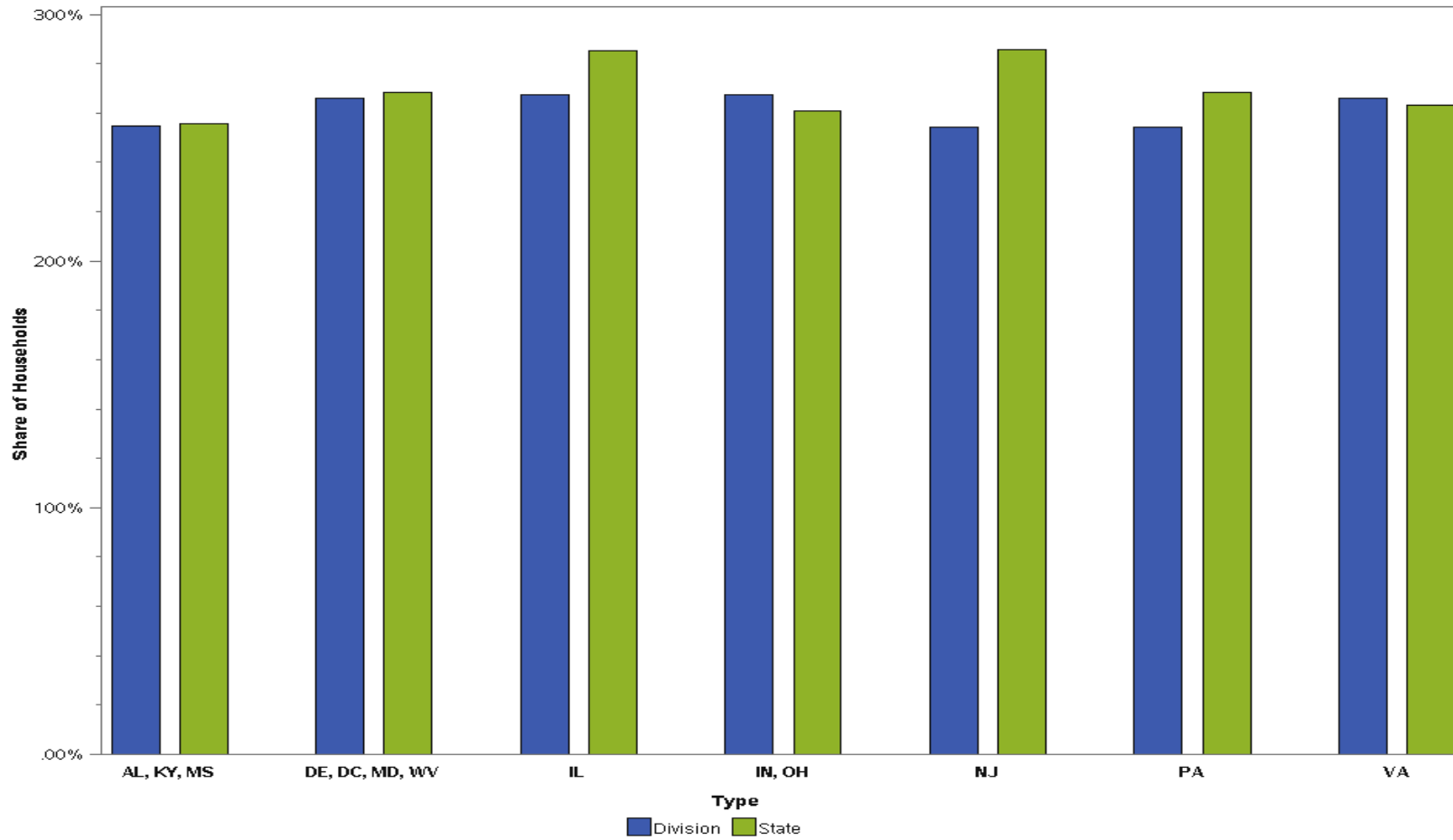
Clothes Washers



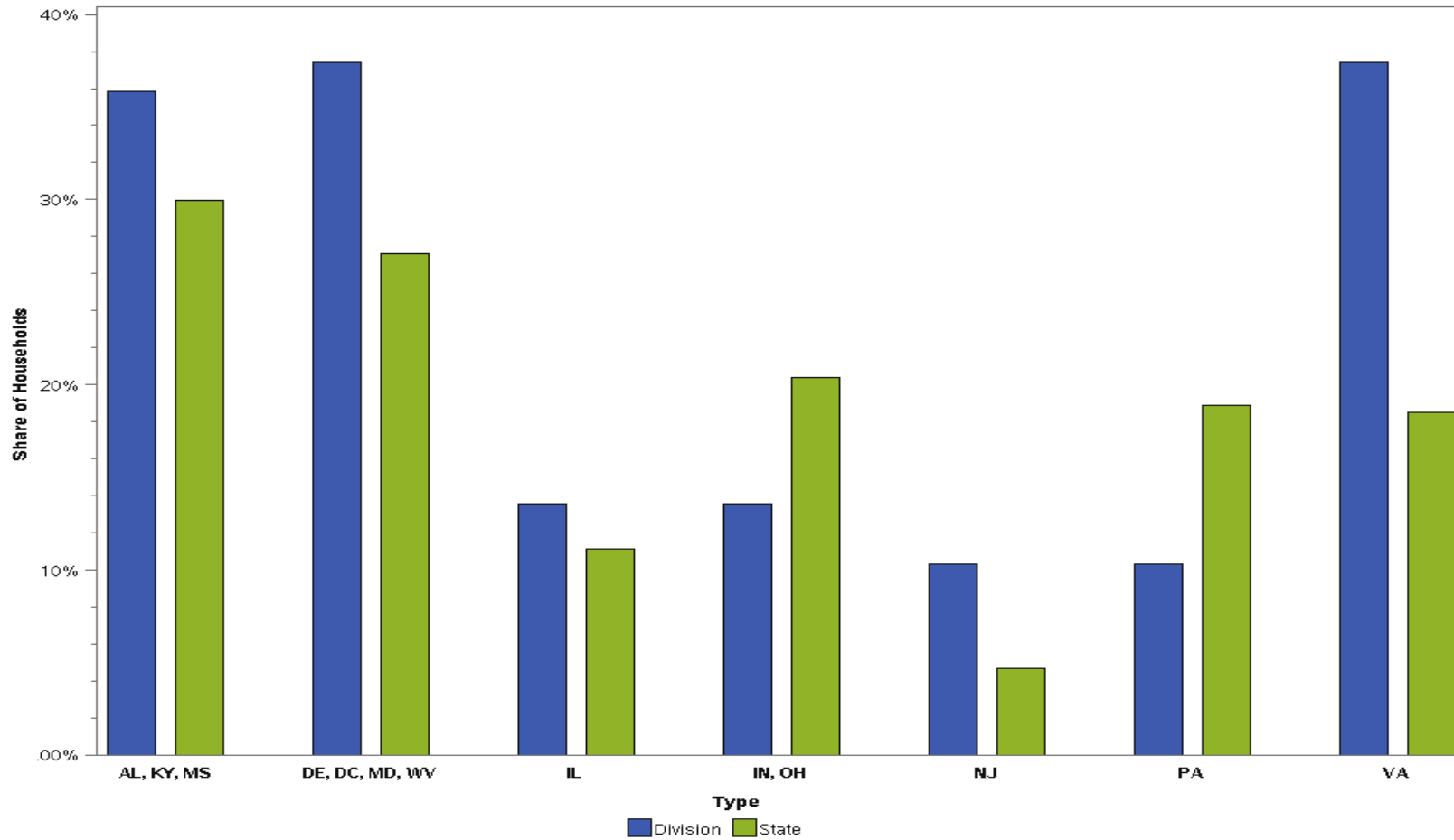
Clothes Dryers



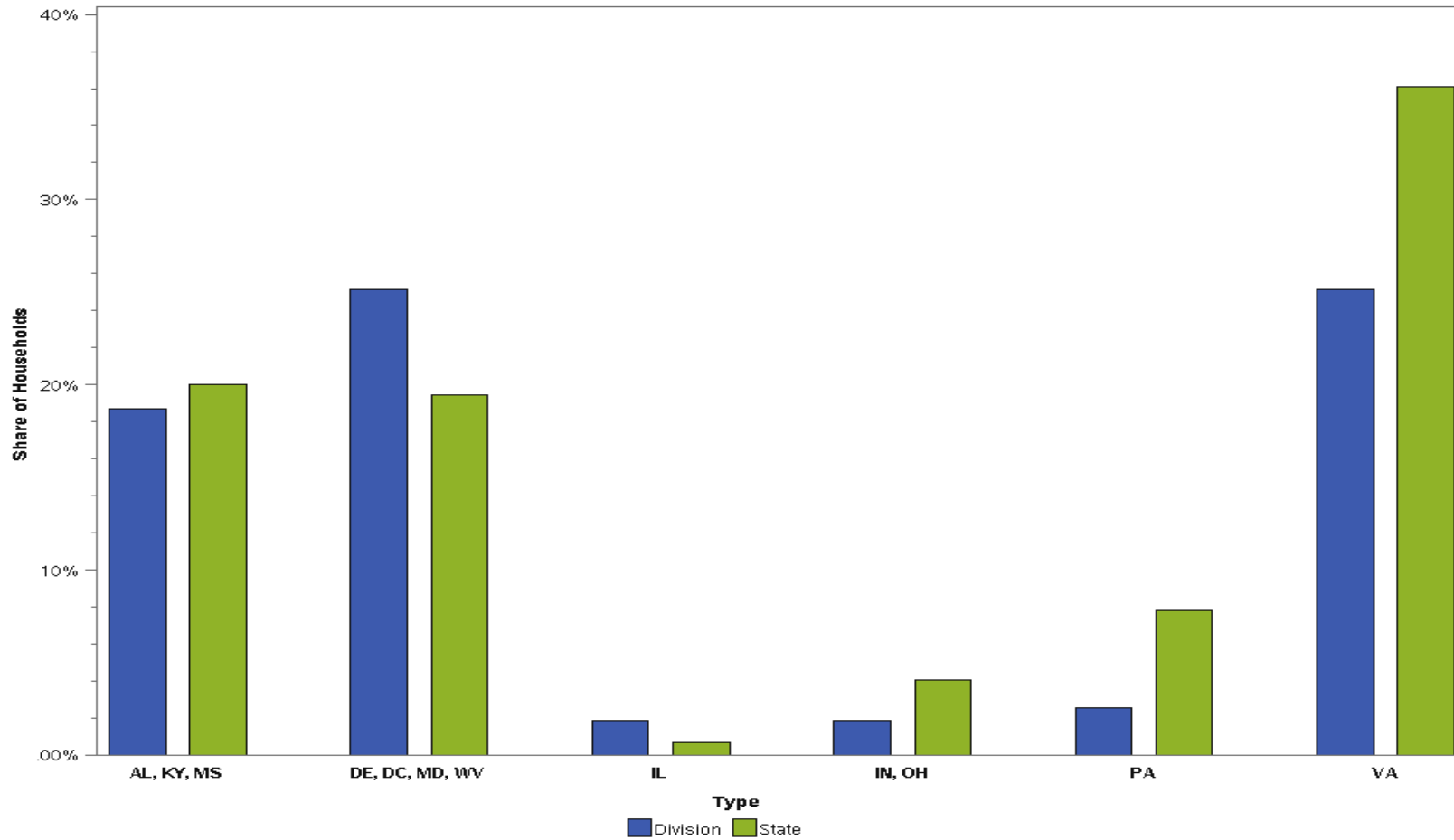
Televisions



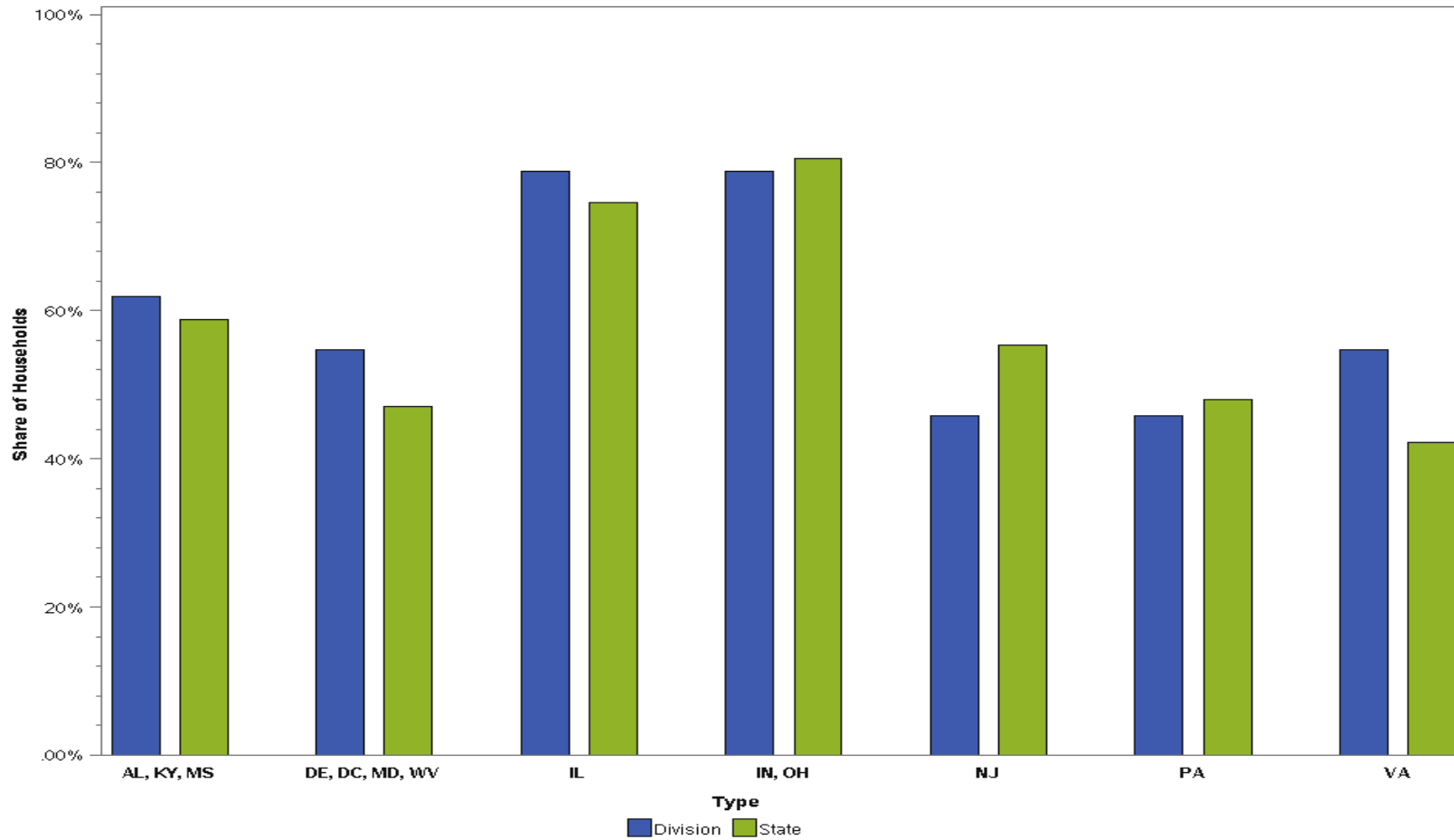
Electric Furnaces



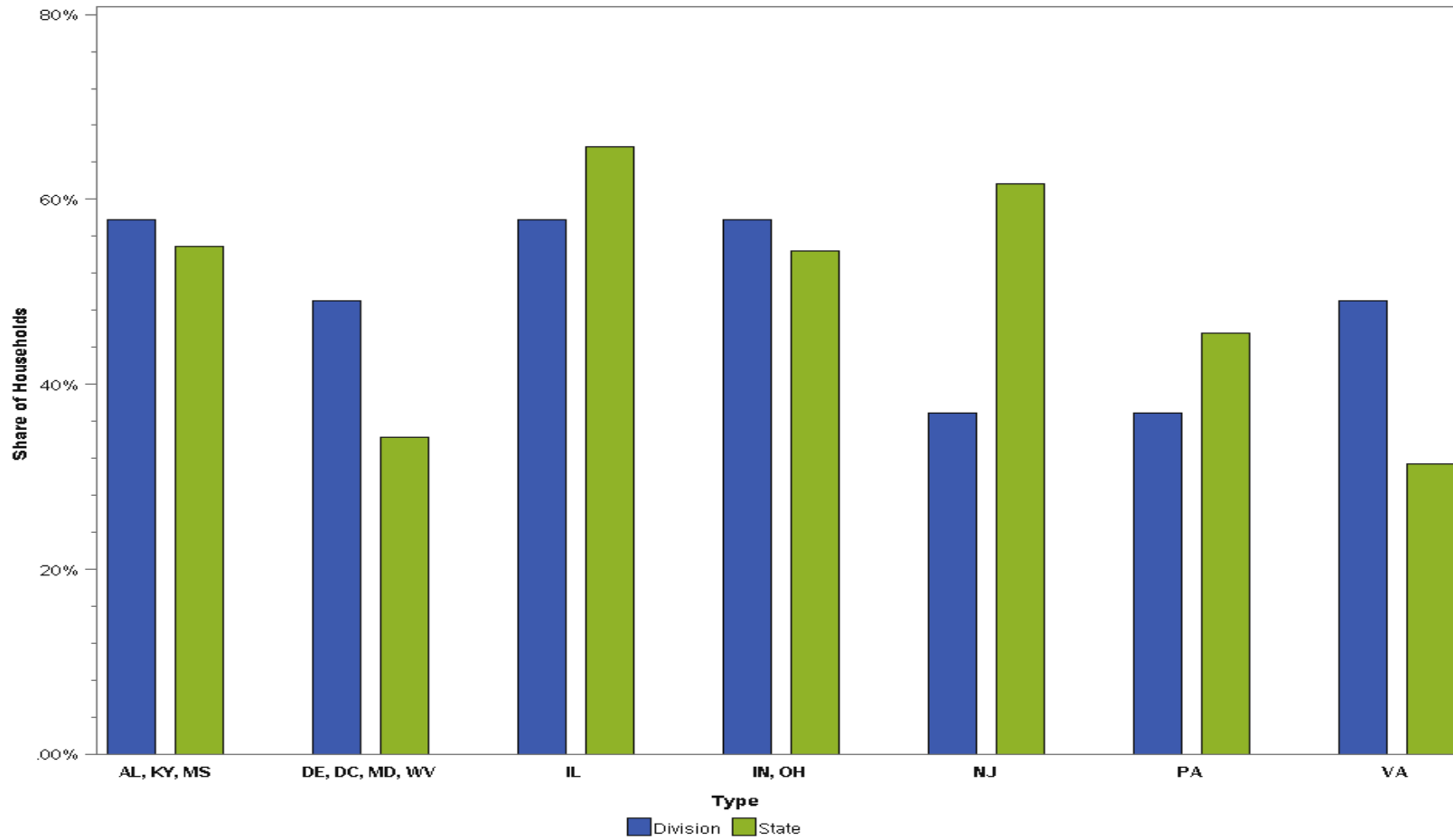
Heat Pumps (for Heating)



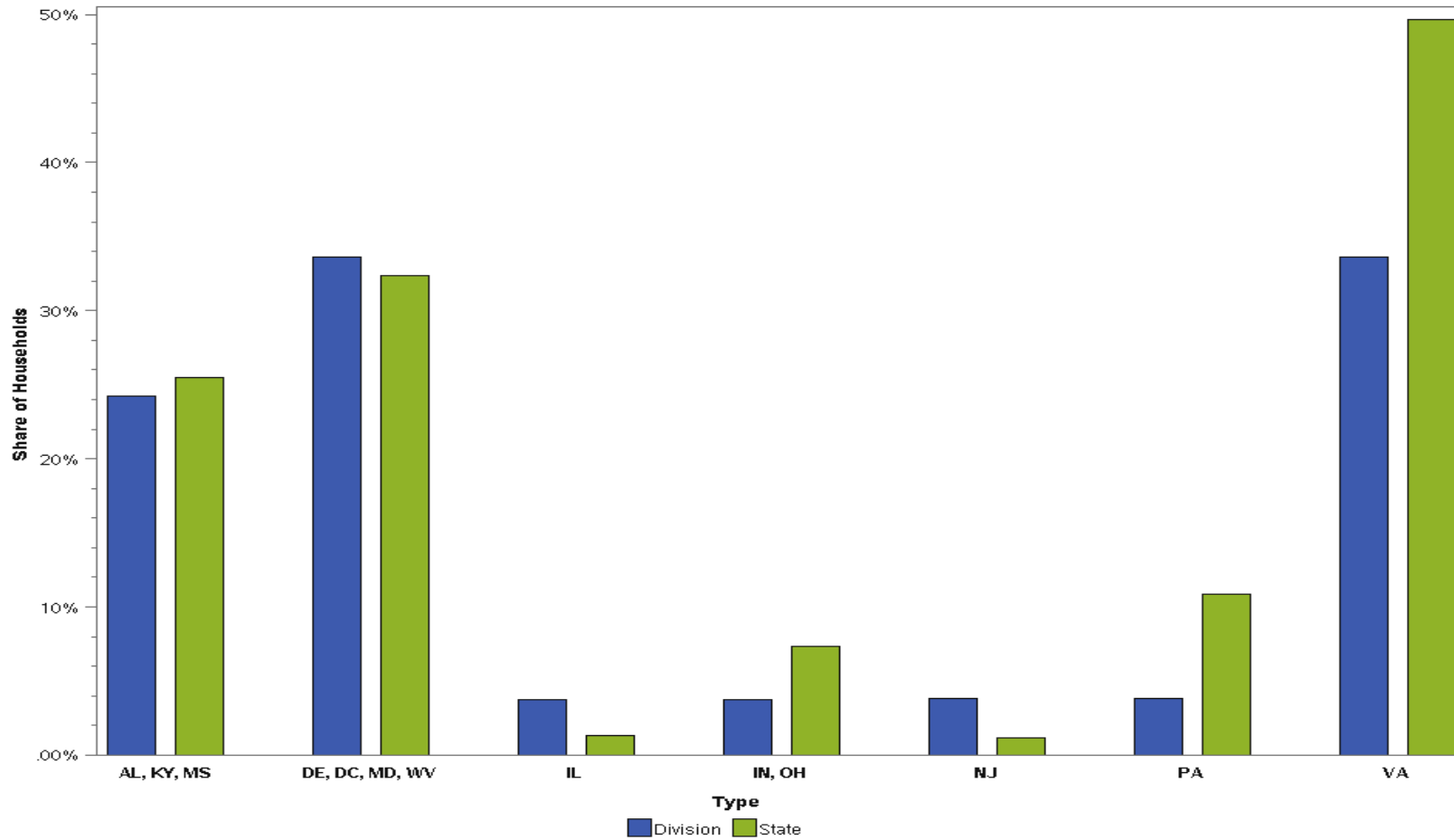
Furnace Fans



Central A/C



Heat Pumps (for Cooling)



Room Air Conditioners

