

# **NATIONAL ENERGY SAVINGS AND NET PRESENT VALUE ANALYSIS**

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## National Energy Saving and Net Present Value Analysis: Overview

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- Energy consumption for commercial space cooling by equipment class will be calculated for a base case and standards cases
- The difference between base case consumption and consumption in each standards case represents energy savings
- Results will be reported in physical units (kwh site energy) (quadrillion Btus source energy) and economic units (dollars) for each year and cumulatively
- The period of analysis is from start date of standard to about 30 years later (ca. 2040)



## National Energy Saving and Net Present Value Analysis: Methods for Forecasting Shipments

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- Extrapolate from time series
  - No explicit accounting for number of buildings, percent owning equipment, changes in installed cost or operating expense
- Forecast using accounting model
  - New buildings and percent by equipment type
  - Replacement as function of equipment lifetime
- Consider impacts of existing non-regulatory efforts on base case efficiencies in future years.



National Energy Saving and Net Present Value Analysis:

## DOE Requests Input from Stakeholders on Shipments

- *What other approaches should the Department consider to establish the forecasts for base case and standards cases?*
- *What information sources for past shipment data by efficiency level are available?*
- *What existing non-regulatory initiatives should be considered in the base case?*



# National Energy Saving and Net Present Value Analysis: Consumer Economic Factors

- **Operating expenses:** typically thousands of dollars per building per year

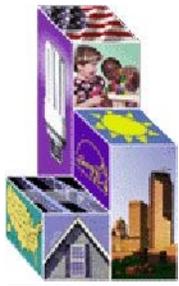
## Operating Expenses Depend on

- AC or HP
- Climate
- Building loads and usage
- Equipment capacity
- Energy prices

- **Purchase expenses:** typically thousands of dollars per installation

## Purchase Expenses Depend on

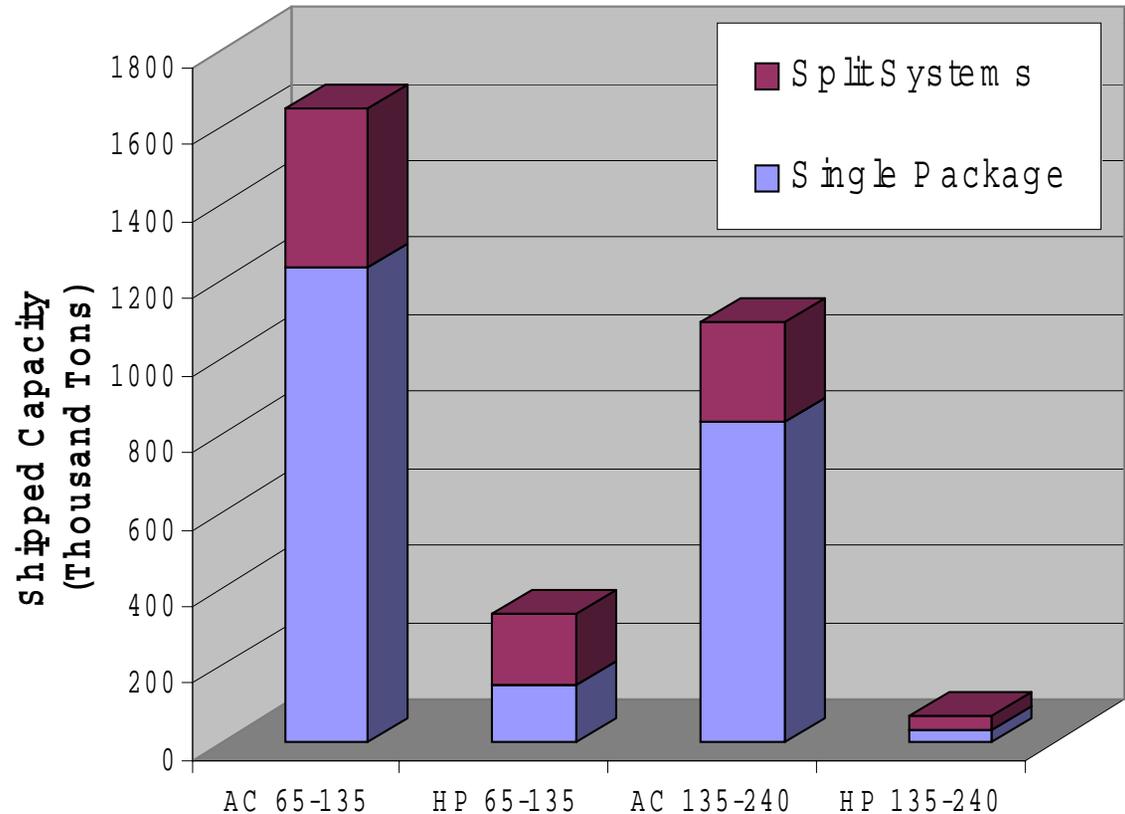
- AC or HP
- Location
- New or Replacement Construction
- Equipment capacity
- Split or Single Package



# National Energy Saving and Net Present Value Analysis:

## Equipment Class Distribution

- Chart at right shows estimated equipment shipped tonnage from census data (1997)
- DOE Needs to determine shipments to building type and region for national energy savings analysis





## National Energy Saving and Net Present Value Analysis: Method: Net Present Value (NPV)

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- For each year analyzed, calculate the difference in installed costs and operating costs between the base case and each standards case
- Discount future values to the present
  - Include operating costs over lifetime of equipment purchased
- Sum over years to get NPV
  - If present value of savings exceeds costs, NPV is positive.
  - If present value of costs exceeds savings, NPV is negative.