

Recognizing and Rewarding Higher Efficiency: Case Studies in Moving to a Single Test Metric for Fixed and Variable Speed Air Conditioners

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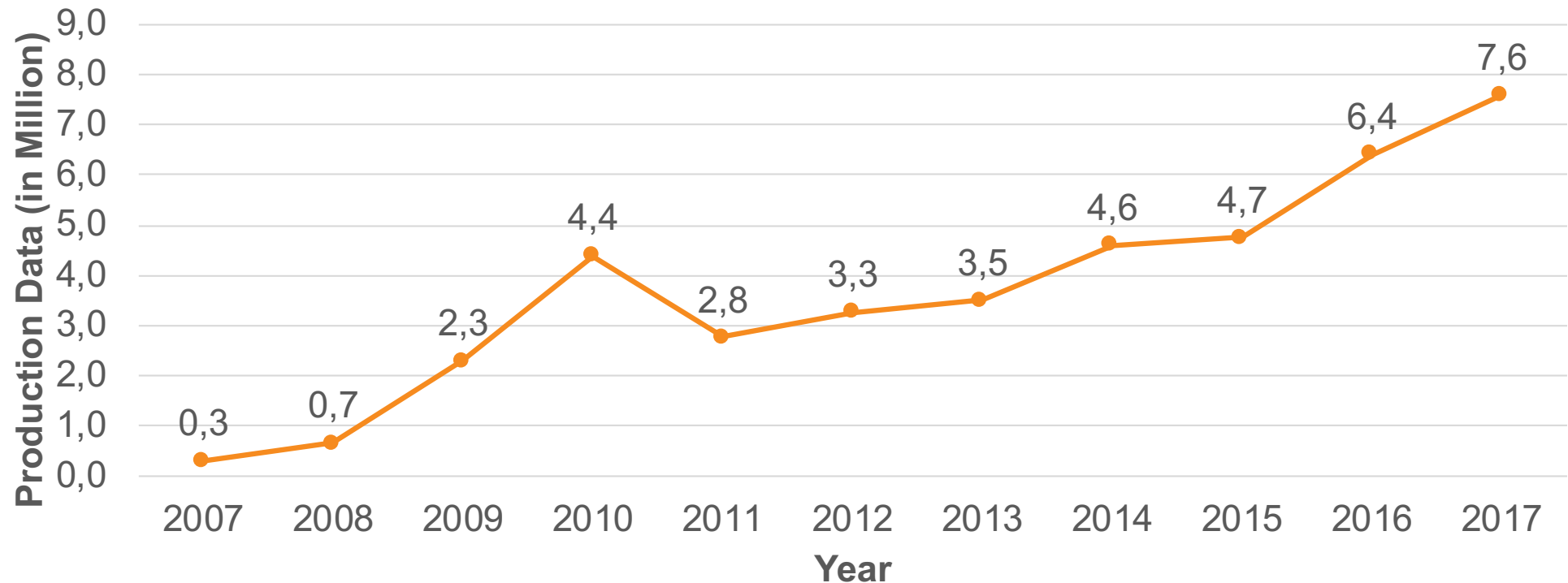
Why Move to a Single Metric?

- Inverter ACs are as much as 51% more efficient than fixed speed units.
- Traditional efficiency metrics, such as EER and COP do not reflect this
- Seasonal metrics such as SEER, CSPF, HSPF, and APF capture these benefits
- A single metric allows consumers to directly compare product efficiency



India: Why Was the ISEER Developed?

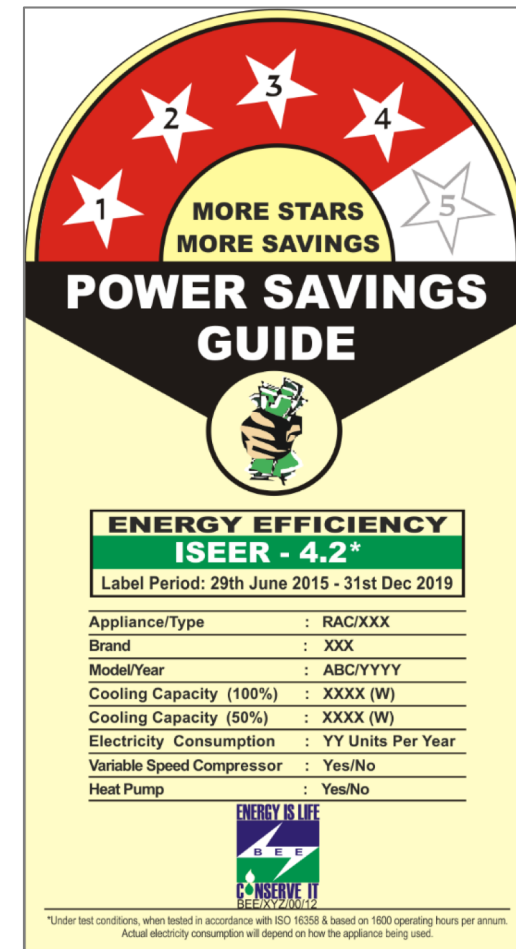
India RAC Market Growth 2007-2017



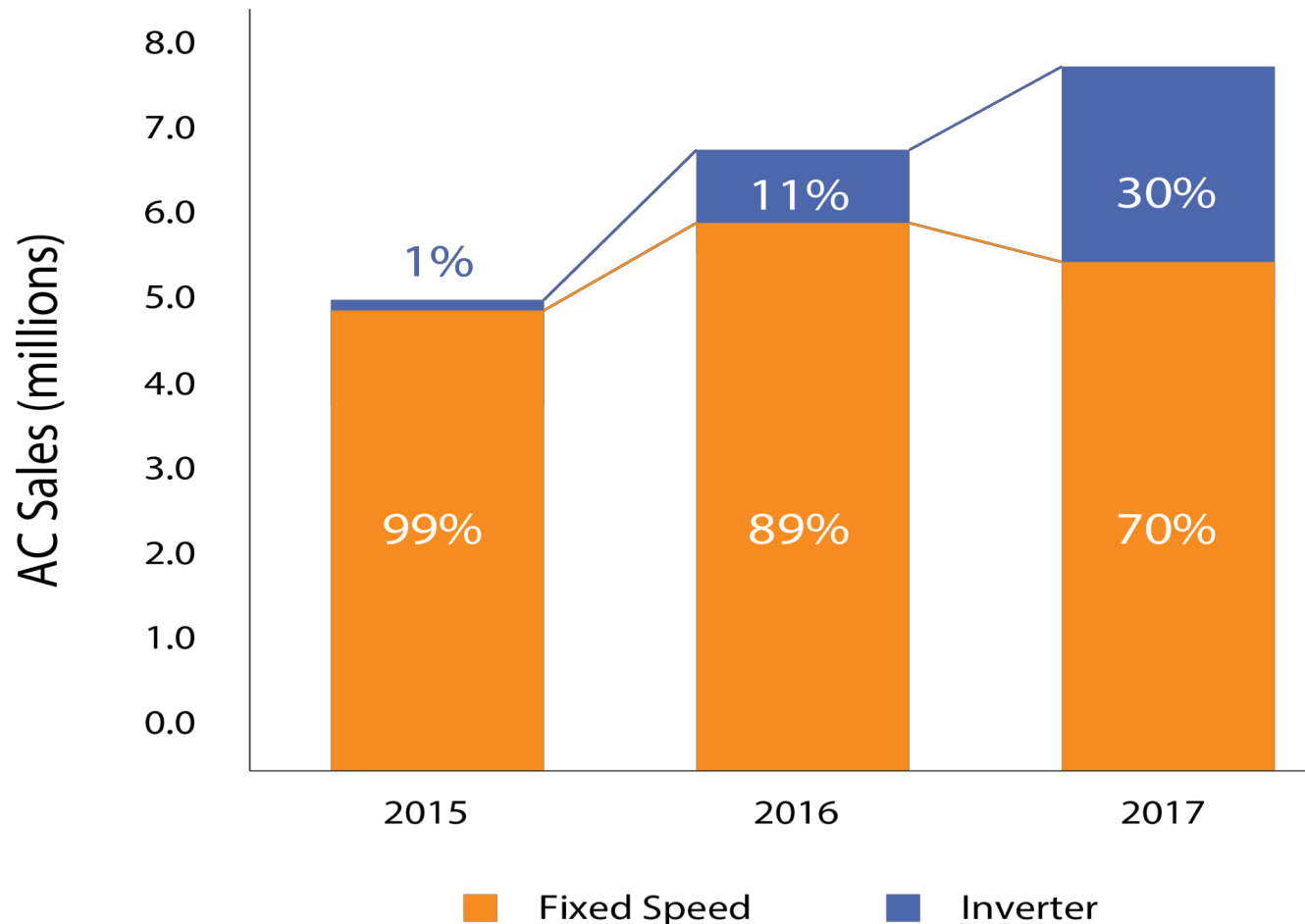
- 2013 publication of ISO 16358 started the discussion
- Industry recognized exponential growth in the inverter AC market and wanted to prepare the regulatory framework
- BEE recognized the massive energy saving potential

India: Developing the Metric, Label and Tiers

- Examined weather from 57 Indian cities and AC usage across the country to develop the temperature bins ranging from 24C to 43C, with annual usage hours of 1600
- Cooperated with manufacturers to test 4 samples each from 4 manufacturers in 3 test labs
- Created calculator to determine ISEER from test results
- Used test results to develop label tiers in consultation with stakeholders



India: the ISEER Drives Transition to Inverter Units



In 2017-18, the production of Fixed Speed AC has been dropped from 5.7 to 5.3 Million and increase in Inverter AC sales due to the policy.

China: MEPS and Label Convergence in Progress

- Moving to a single regulation has provoked a long discussion
- Current plan is to move to 5-tiered label, with the bottom 2 tiers disappearing after 2 years.

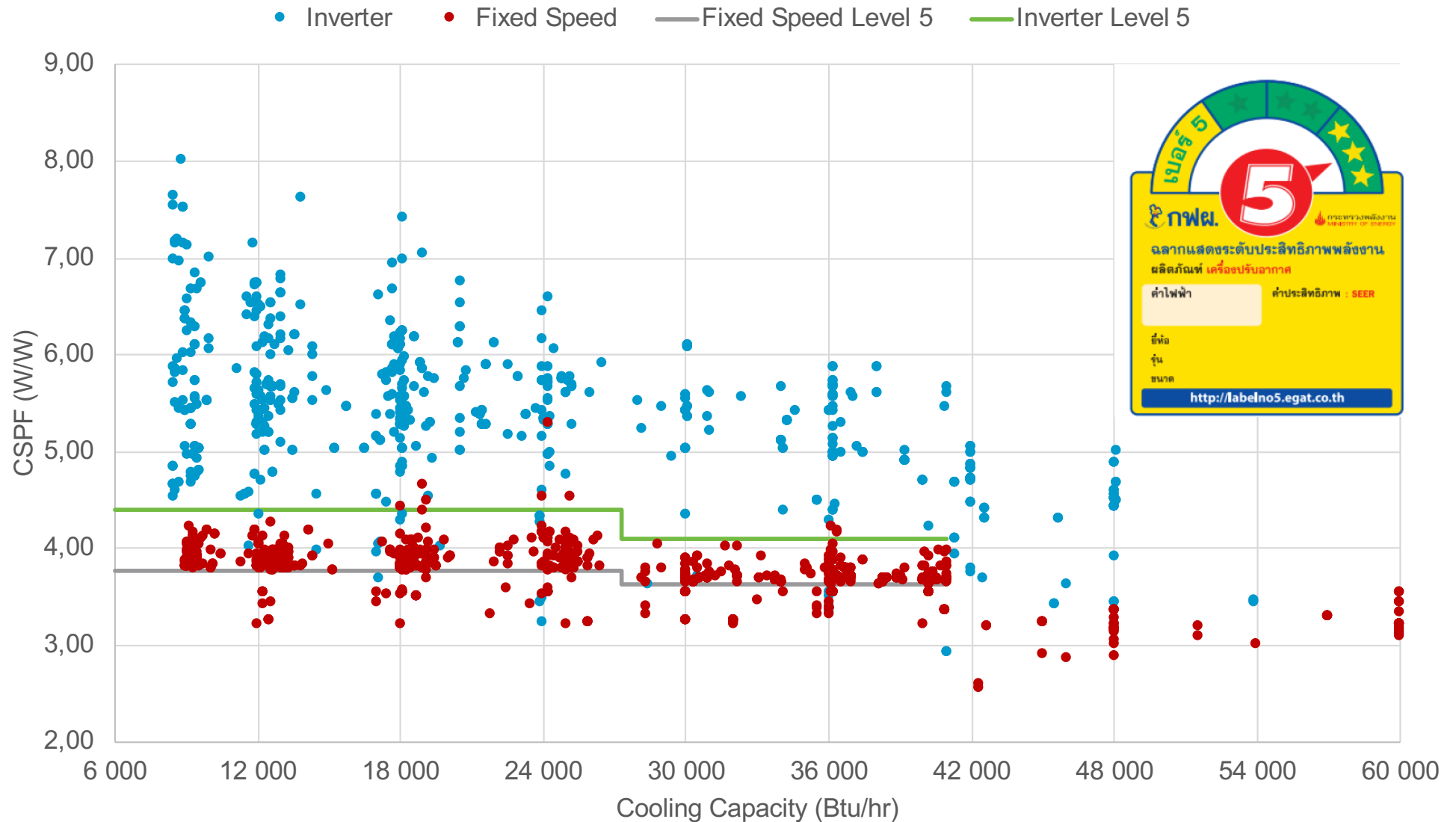
Inverter AC Label



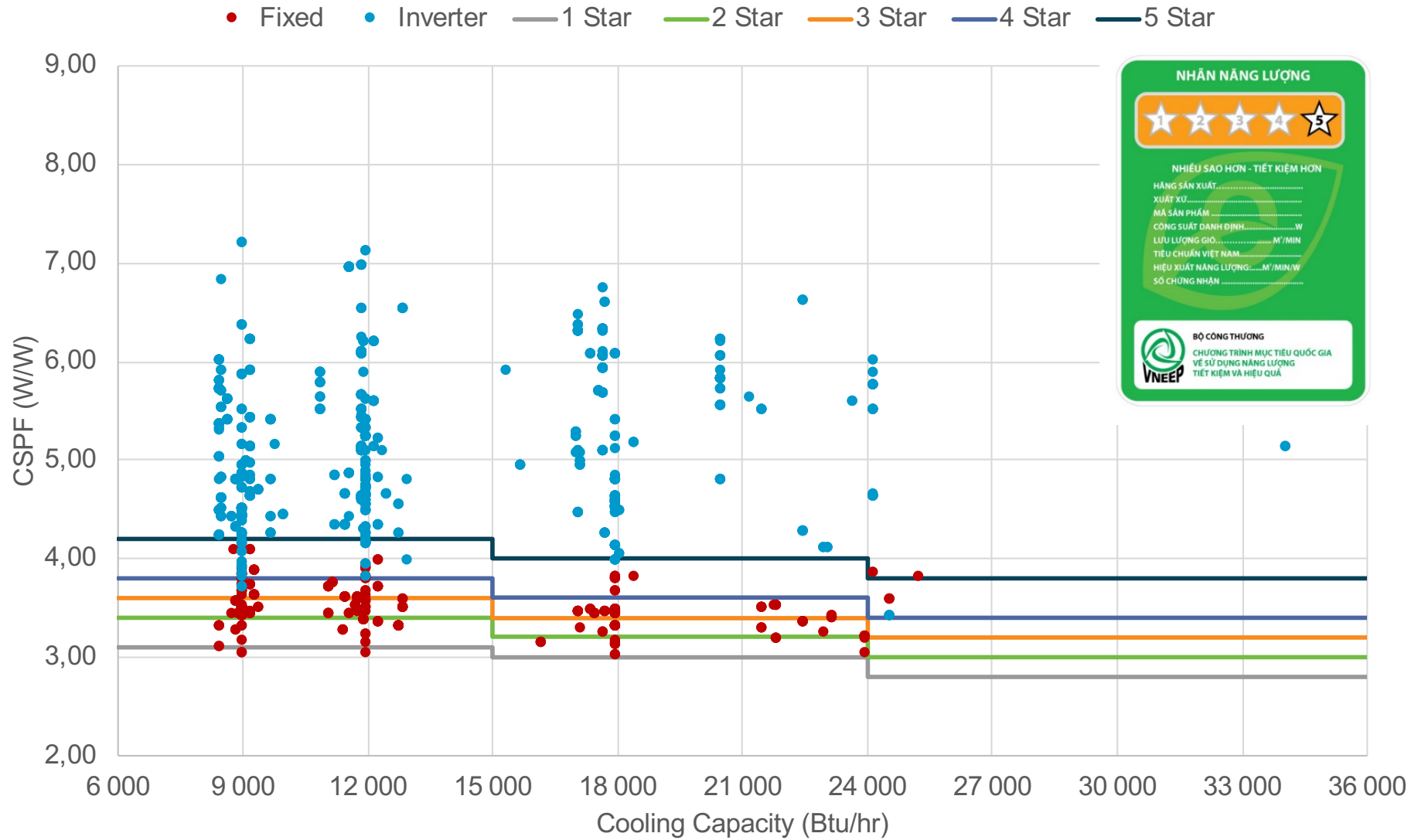
Fixed Speed AC Label



Thailand: Separate Inverter vs. Fixed Speed Requirements



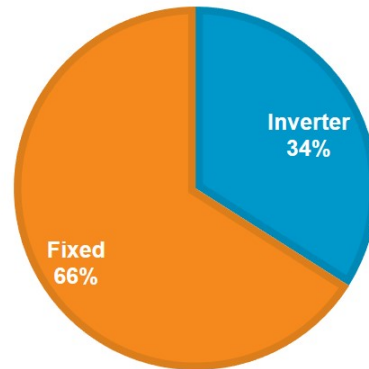
Vietnam: Single Rating Plan for All ACs



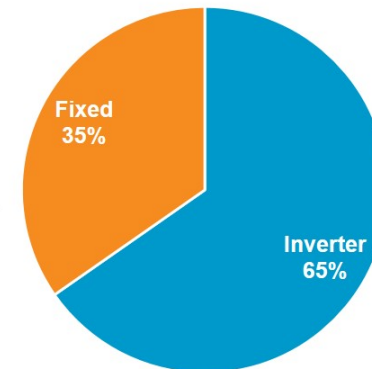
ASEAN: Switch to Seasonal Metric Drives Markets

Vietnamese AC market after switching label to seasonal metric

Compressor Types in 2013

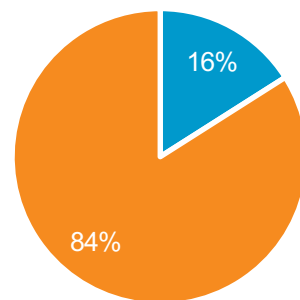


Compressor Types in 2018

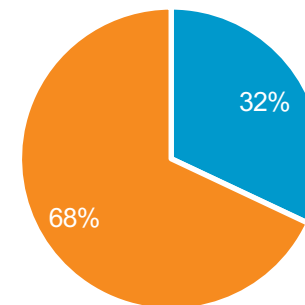


Thai AC market after switching to seasonal metric, with different tiers for fixed vs. inverter

Compressor Types in 2013



Compressor Types in 2018



■ Inverter ■ Fixed

■ Inverter ■ Fixed

Key Lessons

- Weigh developing country-specific temperature bins against importance of trade
- Lab capacity investments shouldn't be needed, but tools for calculating the SEER/CSPF/APF are helpful
- Involve all stakeholders early and give manufacturers policy visibility ahead of time
- Apply the metric to all ACs on a common rating plan

