



*Super-efficient Equipment and Appliance Deployment (SEAD) Initiative:*

# Lessons from the Technical Analysis of Ceiling Fans

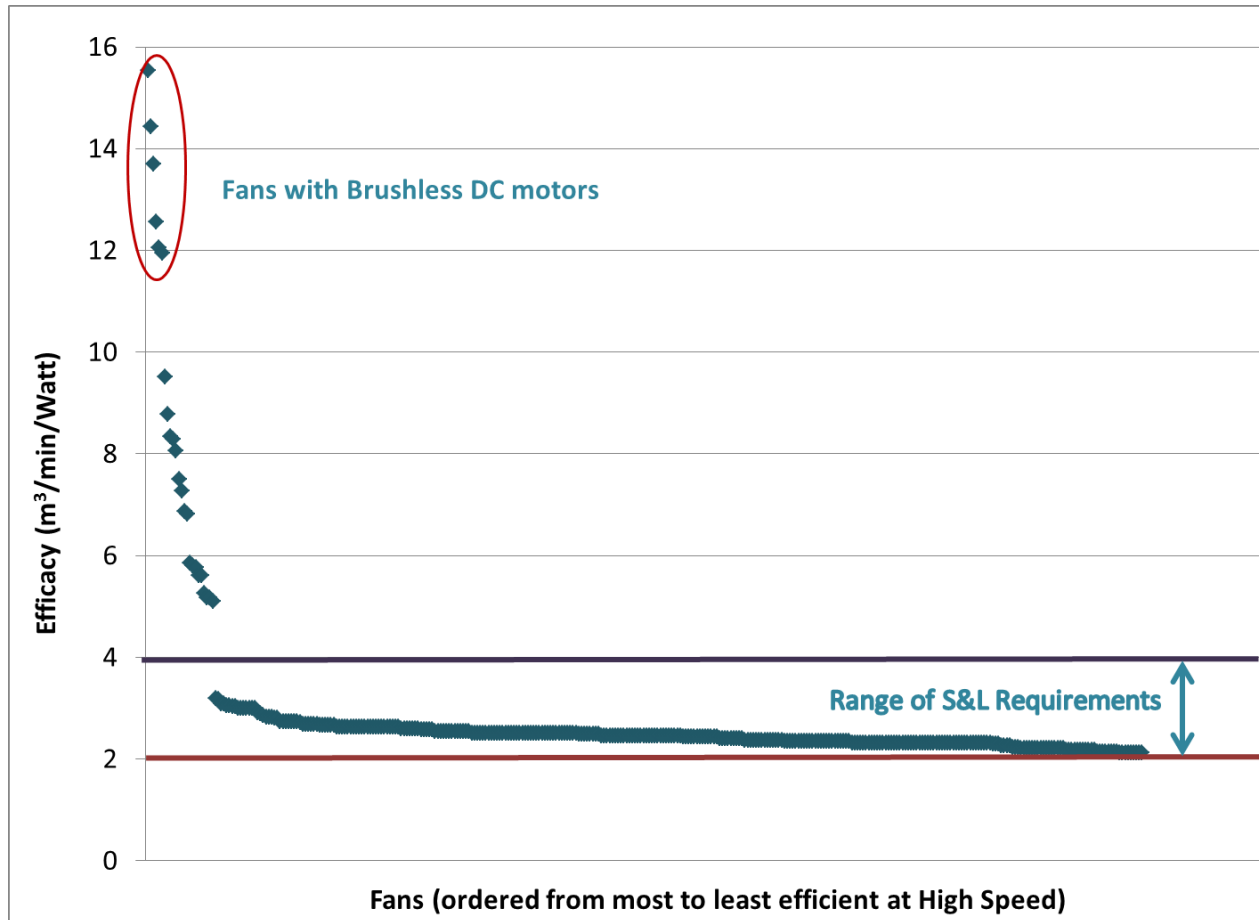


International Energy Studies Group  
Lawrence Berkeley National Laboratory

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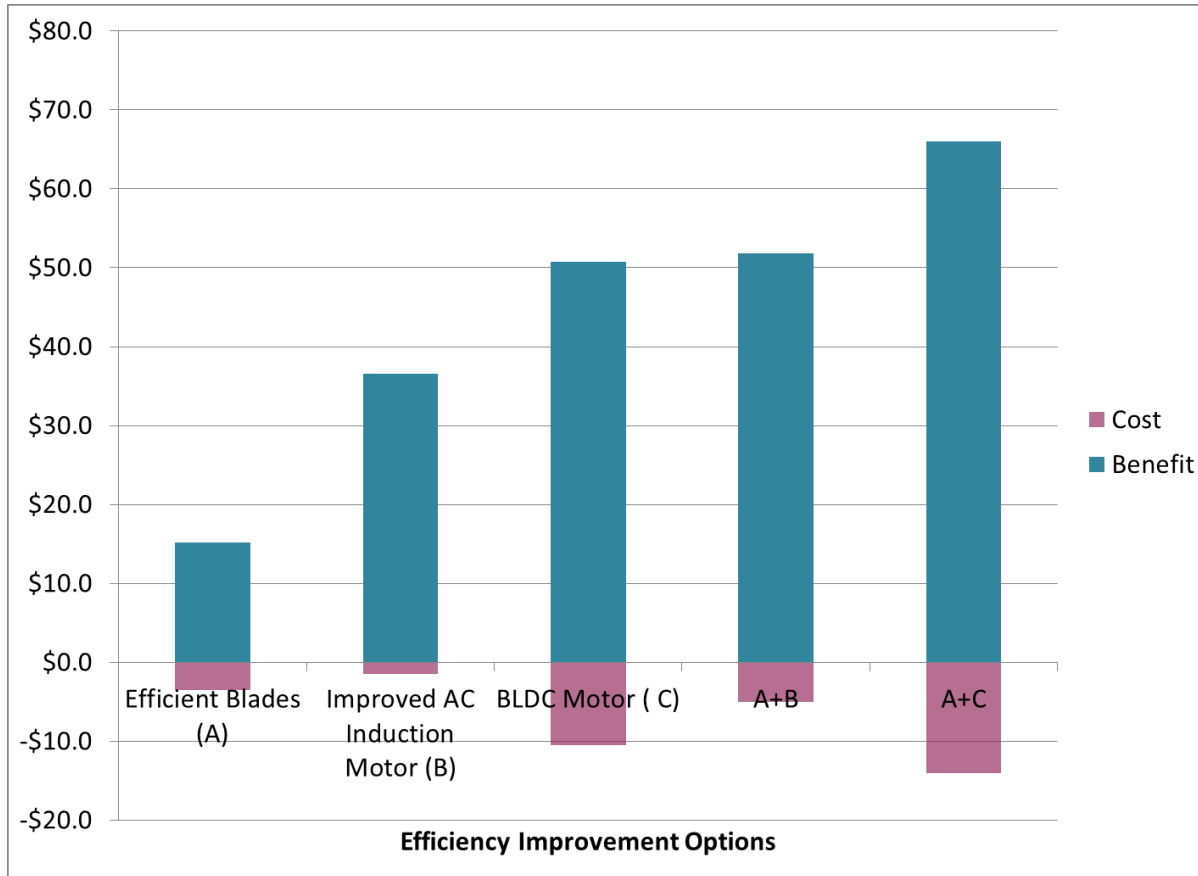
# High Efficacy Fans are Commercially Available



Source: Data from ENERGY STAR qualified fans in US EPA ENERGY STAR data base (Nov. 2012)



# Efficiency options are highly cost effective

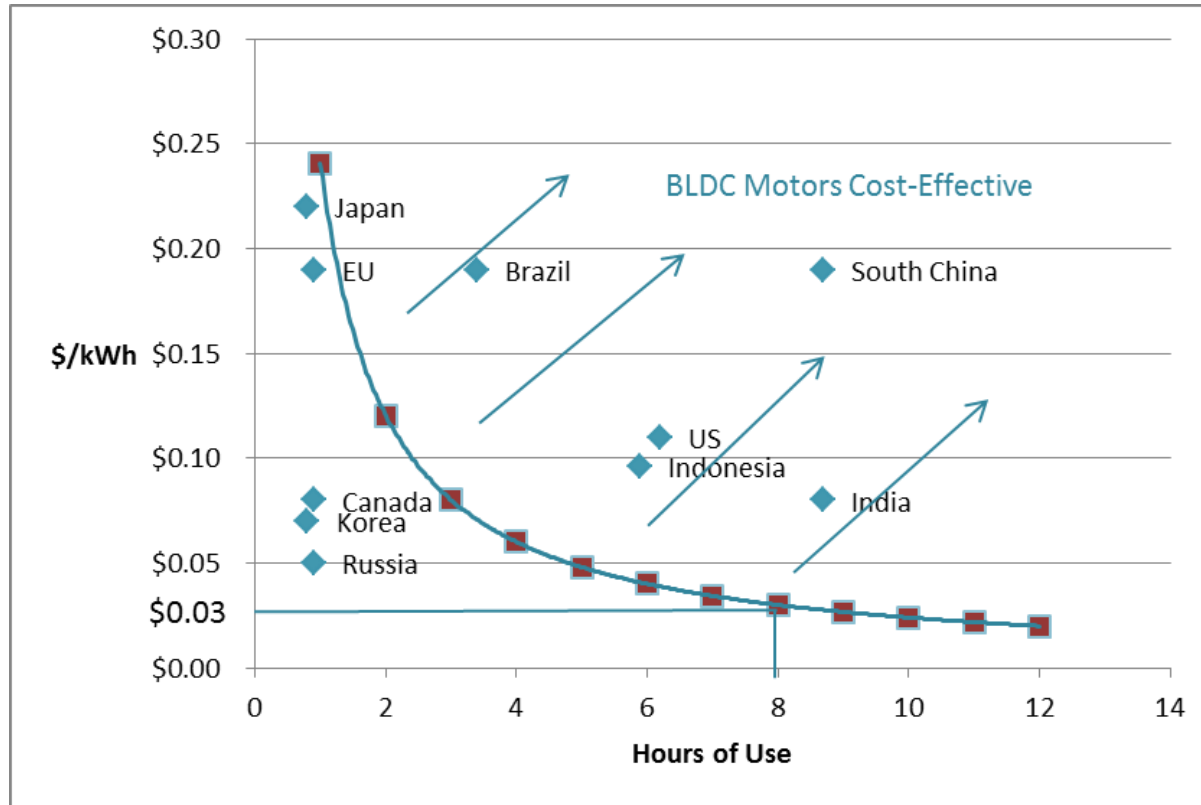


Assumptions: Discount Rate =2%, Lifetime=10 years, Electricity Tariff =\$0.10/kWh

Positive Average Net Benefit for Brazil, China, India, Indonesia, Mexico, South Africa, US



## ~ 50% energy savings is cost-effective with BLDC motors under a wide range of electricity prices and hours of use

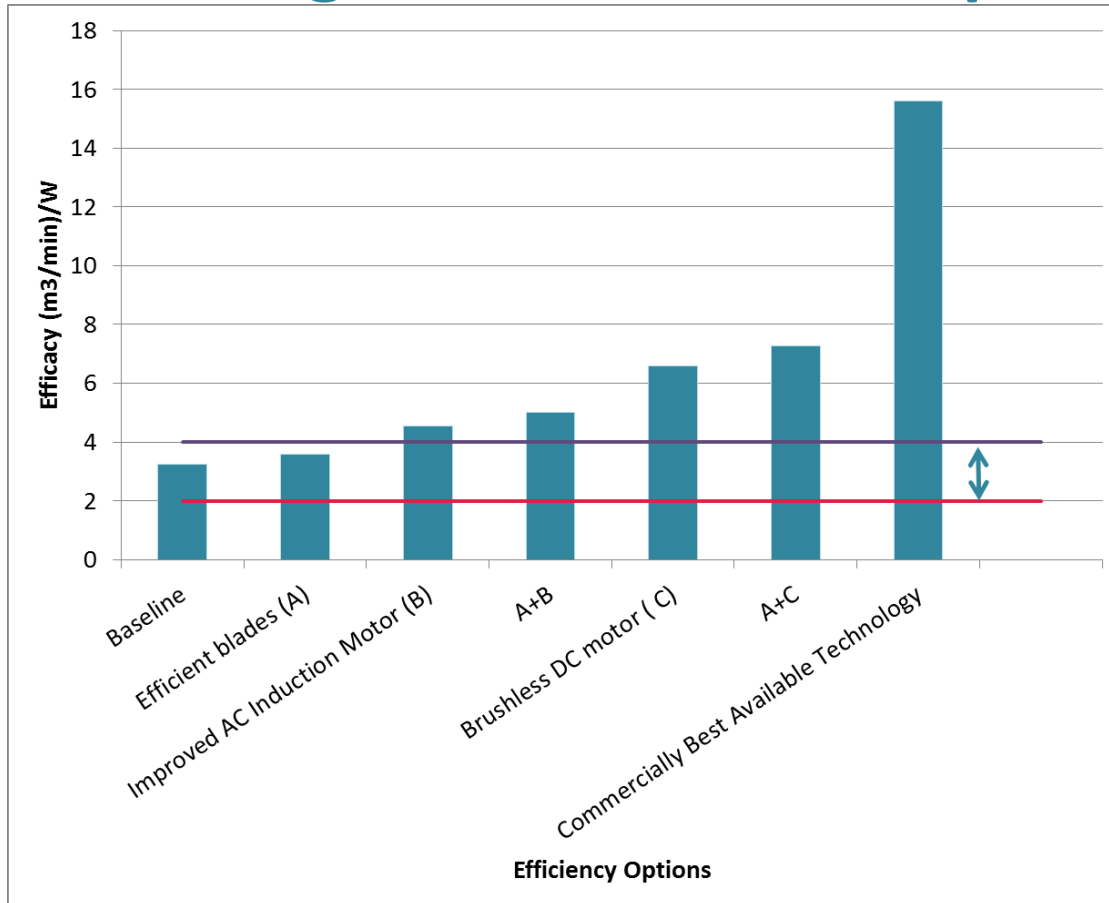


Hours of use and electricity price drive cost effectiveness

Example If hours of use are 8 hours a day – then BLDC cost effective if electricity price > 3 cent



# S&L Programs- Room for Improvement

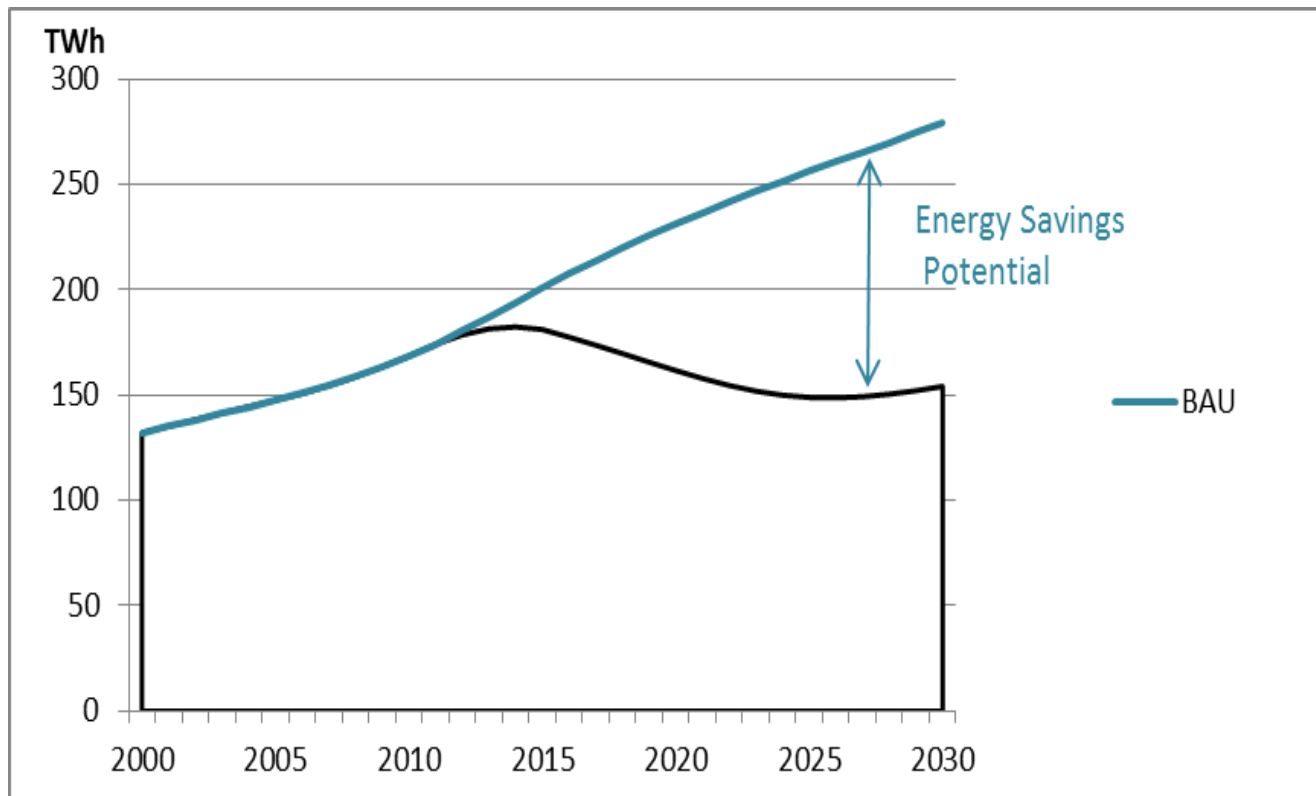


Range of S&L Requirements

Cost effective efficacy levels are significantly higher than current S&L requirements.



# Ceiling Fans Savings Potential (SEAD countries +China)



**Efficiency Scenario : Efficient fans enter the market at a rate of 20% per year starting in 2013**

**Techno-economic savings potential of 125 TWh/year in 2030 in SEAD countries + China  
(output from ~ 40 medium sized (500 MW) power plants)**



# Conclusions

- Improved blade design, improved AC induction motor materials, or the increased use of brushless DC motors provide significant ceiling fan power consumption savings
- These options are proven to be cost effective in most SEAD countries
- Even best available technology (BLDC Motors) is highly cost-effective in countries with high use, and provides power consumption savings over 50%
- Data presented can support the implementation of various policy instruments in order to capture cost-effective savings:
  - S&L programs
  - Financial Incentives (upstream and downstream programs)



# SEAD Fan Analysis (full report)

Available at: <http://superefficient.org/en/Activities/Technical%20Analysis.aspx>

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