DOCKETED

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Draft Pool Pump and Motor Standards

July 13, 2016

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Presentation Agenda

- Background
- Workshop Purpose
- Staff Proposal
- Technical Feasibility
- Savings Methodology
- Cost Effectiveness
- Statewide Energy Savings
- Environmental Benefits
- Discussion Items
- Comments

Workshop Purpose

- Many points of staff's proposal remain unchanged
  - Expand scope to commercial pool pump motors under 5 hp
  - Expand scope to include filter, booster, and waterfall pumps
  - Remove prescriptive prohibition of certain motor types
  - Adopt CSA 747-09 Motor Efficiency Test Procedure
  - Adopt ANSI/HI14.6-2011 Pump Efficiency Test Procedure
- Updates from previous proposal
  - Adjusted minimum motor efficiency requirements
  - Consolidated motor efficiency to single effective date
  - Added requirements for freeze protection
  - Added timer requirement for integral filter pool pumps

Workshop Purpose

- The draft staff report contains proposal details

  http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-02/TN211842_20160616T124038_Revised_Analysis_of_Efficiency_Standards_for_Pool_Pumps_and_Mot.pdf

- Staff seeks public comments on the proposal

Staff Proposal

- Scope:

  All pool pump motors and replacement pool pump motors

  - 5 total hp (thp) or less
  - Residential and commercial applications
  - Filter pumps, pressure cleaner booster pumps, waterfall pumps

  Including pool pump motors for

  - in-ground
  - above ground
  - storable pools

Staff Proposal

- Motor Efficiency
  - In-ground filter, above-ground filter, and pressure cleaner booster pool pump motors shall meet the motor efficiency standard
  - 1,277 gigawatt-hours per year of California electricity savings at full stock turnover
  - Single Tier effective two years from adoption, January 1, 2019

Staff Proposal

- Minimum Pool Pump Motor Efficiency

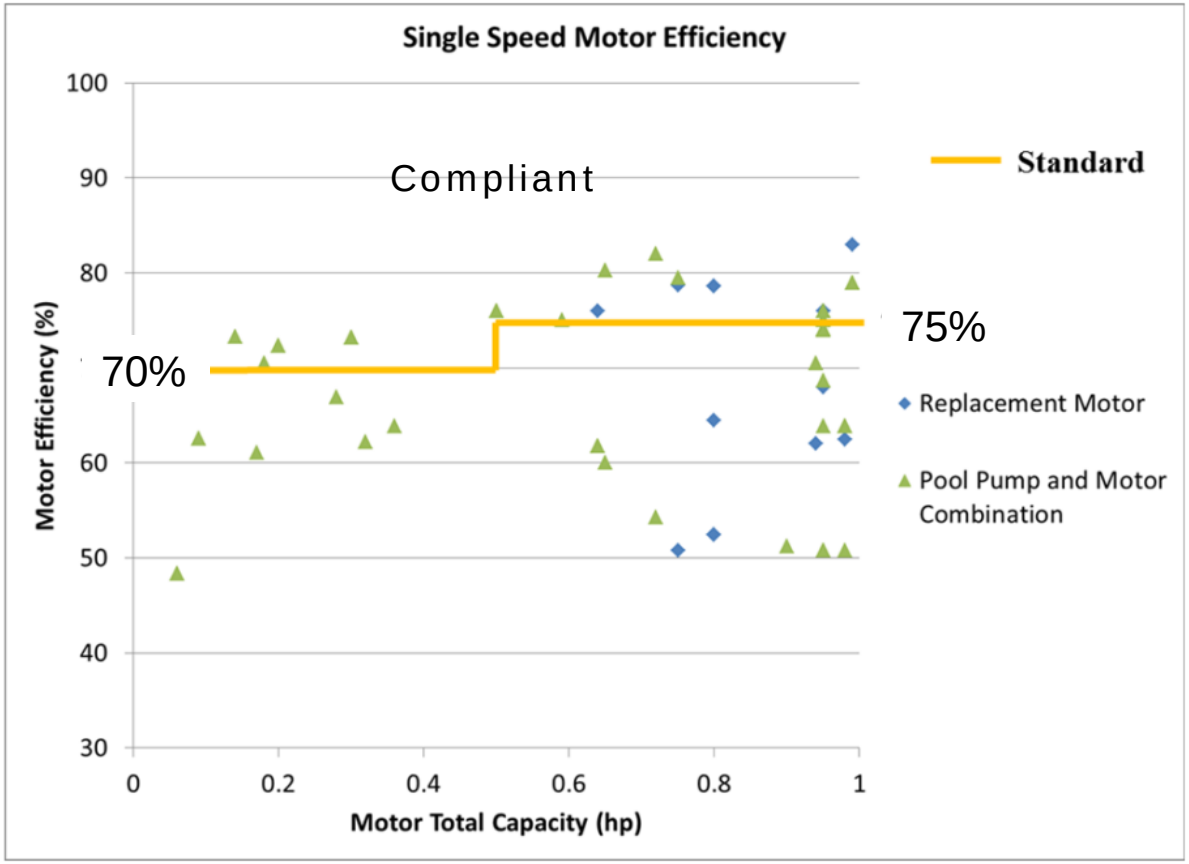
Proposed Minimum Efficiency According to Modified CSA C747-09 Test Procedure		
Motor Design	**Full-Speed (3450 RPM)**	**Half-Speed (1725 RPM)**
Single-Speed (0 total hp =< Motor Capacity < .50 total hp)	70%	N/A
Single-Speed (0.50 total hp=<Motor Capacity < 1.00 total hp)	75%	N/A
Variable-/Multiple-/Dual-Speed (1 total hp=< Motor Capacity =< 5 total hp)	80%	65%

Staff Proposal

- Waterfall pool pump motors shall test and list
  - no minimum motor efficiency standard
  - Insufficient cost effective savings to propose a motor efficiency standard
- Integral filter pool pump motors (sand or cartridge) shall meet a prescriptive timer requirement
  - no minimum motor efficiency standard
- Pool pump motors with freeze protection shall ship with default settings
- Pool pump motors shall test and list power factor

Technical Feasibility

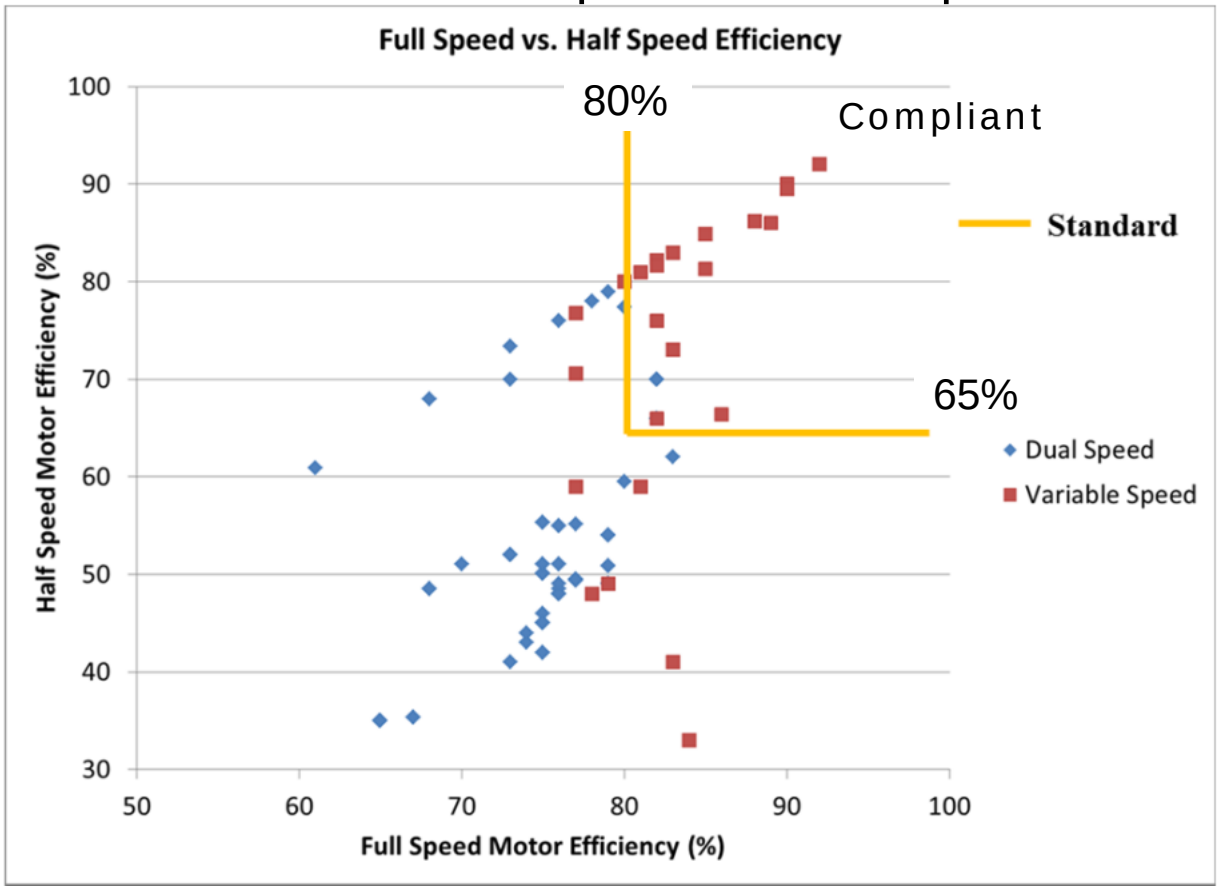
Single Speed Pool Pump Motors



Source: Energy Commission Appliance Database (March, 2016)

Technical Feasibility

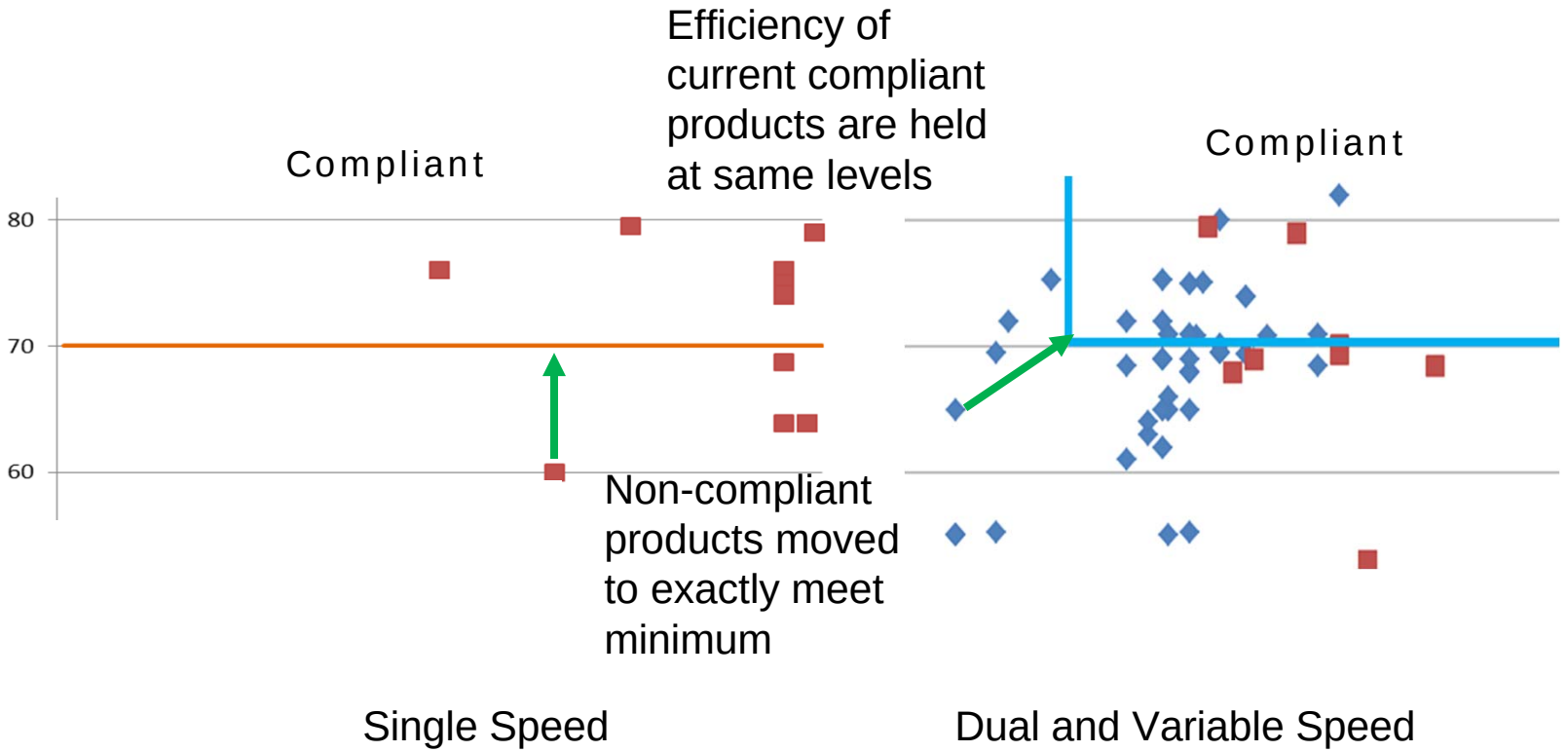
Dual and Variable Speed Pool Pump Motors



Source: Energy Commission Appliance Database (March, 2016)

Savings Methodology

- The average unit energy savings calculated by comparing performance data to minimum efficiency



Cost Effectiveness

Product	Design Life (years)	Electricity Savings (kWh/yr)	Incremental Cost	Average Annual Savings	Life-Cycle Savings	Life-Cycle Benefit
Variable-Speed	7	51	$18	$8	$57	$39
Dual-Speed	7	424	$276	$68	$475	$199
Single-Speed Residential Filtration	7	400	$59	$64	$448	$389
Pressure Cleaner Booster Pumps	5	338	$126	$54	$270	$144
Waterfall Pool Pumps	7	0	$0	$0	$0	$0
Single-Speed Commercial	7	3,144	$395	$503 (661)	$3,522 ($4627)	$3,127 (7,754)
Integral Filter Pool Pumps	4	888	$10	$142	$568	$558

Source: CASE report and U.S. DOE ASRAC Working Group, as modified by Energy Commission staff

Statewide Energy Savings

Product	First Year Savings		Annual Existing and Incremental Stock Savings	
	Electricity Savings (GWh/yr)	Savings ($ million)	Electricity Savings (GWh/yr)	Savings ($ million)
Motor Efficiency Total Savings	164.0	$26.2	1,081	$173
Integral Filter Timer Savings	49.0	$7.8	196	$31.3
Total Savings	**213.0**	**$34.1**	**1,277**	**$204.3**

Environmental Benefits

Annual Reductions (tons)	Avoided Emissions (tons)				
	NO_x	SO_x	CO	Particulate Matter ($PM_{2.5}$)	eCO_2
Dual- and Variable-Speed	3.36	0.48	4.80	1.44	33,125
Single-Speed	34.48	4.93	49.26	14.78	339,864
Integral Filter	6.86	0.98	9.80	2.94	67,596
Total Avoided Emissions	44.70	6.39	63.85	19.16	440,585

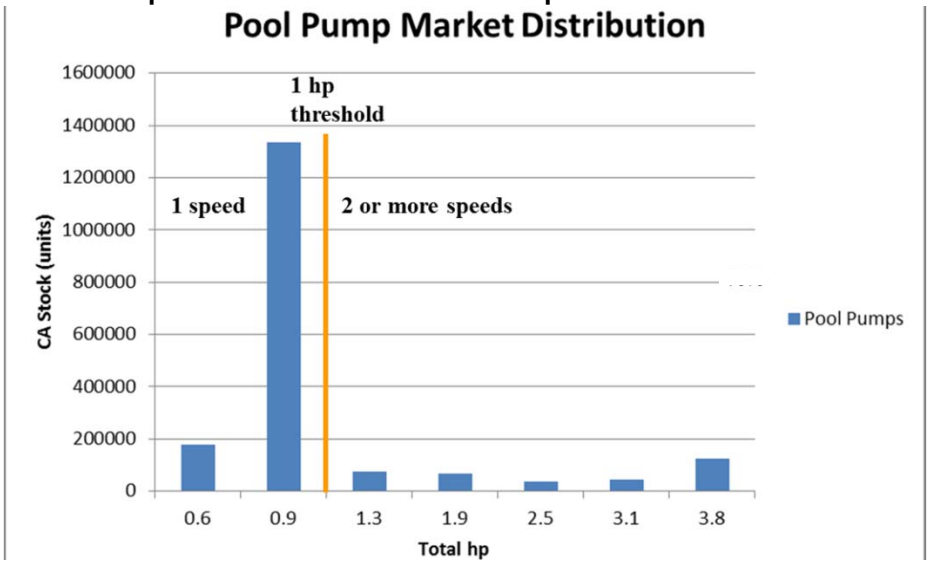
Discussion Items

- Describe industry's manufacturing timeline versus effective date
- Identify unintended environmental impacts from the proposed standard
- Identify any small businesses/manufacturers impacted by the proposed standard

Discussion Items

- Describe market share of pool pump motors sold with pool pumps vs. pool pump motors sold as replacement motors.
  - 75% market share for pool pump and motor combinations
  - 25% market share replacement pool pump motor

  Staff Assumption
- Describe market share of pool pumps vs total horsepower
  - US DOE ASRAC DPPP meeting finding: 10% market share <1 THP
  - Request information to update distribution shown below



Staff Assumption

Discussion Items

- The U.S. Department of Energy reached consensus with industry and advocates for national standards on dedicated purpose pool pumps
  - Consensus efficiency standard is roughly equivalent to the proposed California Efficiency Standard for pool pump motors.
  - Effective Dates differ for the proposed CA standard vs. the national standard (2 years vs. 4.5 years)
  - Staff seeks comments for the Commission's proposal in light of U.S. DOE ASRAC consensus on the dedicated purpose pool pump standard

Comments

- Comments due by 5:00 p.m. on July 29, 2016
- To submit electronically:
  - Go to http://www.energy.ca.gov/appliances/2015-AAER-02/rulemaking/
  - Click on “Submit eComment”
- To send a hard copy:

  California Energy Commission
  Dockets Office, MS-4
  Re: Docket No. 15-AAER-02
  1516 Ninth Street
  Sacramento, CA 95814-5512
- To send a digital copy: docket@energy.ca.gov, include docket number 15-AAER-02 and indicate Pool Pump Motors and Portable Electric Spas in the subject line

Thank You!

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