



# **ENERGY STAR® Commercial Dishwasher Stakeholder Meeting Draft 1 Discussion**

February 10, 2011  
Orange County Convention Center  
Orlando, Florida



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# Purpose of Revision

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- ENERGY STAR market penetration is high
- ENERGY STAR idle data shows differentiation, additional savings potential
- Evaluate potential inclusion of flight type
- Investigate stakeholder concerns regarding the adjustment of water settings in field

# EPA Data Set and Methodology

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- Data set combines non-ENERGY STAR models listed in NSF Directory with models on ENERGY STAR QP list
- Assume that non-ENERGY STAR models are able to meet existing Version 1.2 idle energy rate levels
  - Purpose of Version 1.1 levels was to serve as a ceiling until more data was made available
  - Limited data was available to differentiate products



# Potential Savings of V2.0

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- Under Counter
  - Electricity: 5,275 kWh/year (high temp)
  - Gas: 168 – 253 therms/year
- Door Type
  - Electricity: 7,088 kWh/year (high temp)
  - Gas: 455 – 704 therms/year
- Single Tank Conveyor
  - Electricity: 576 – 9,150 kWh/year
  - Gas  $\approx$  500 therms/year
- Multi Tank Conveyor
  - Electricity: 432 – 16,166 kWh/year
  - Gas: 798 – 993 therms/year

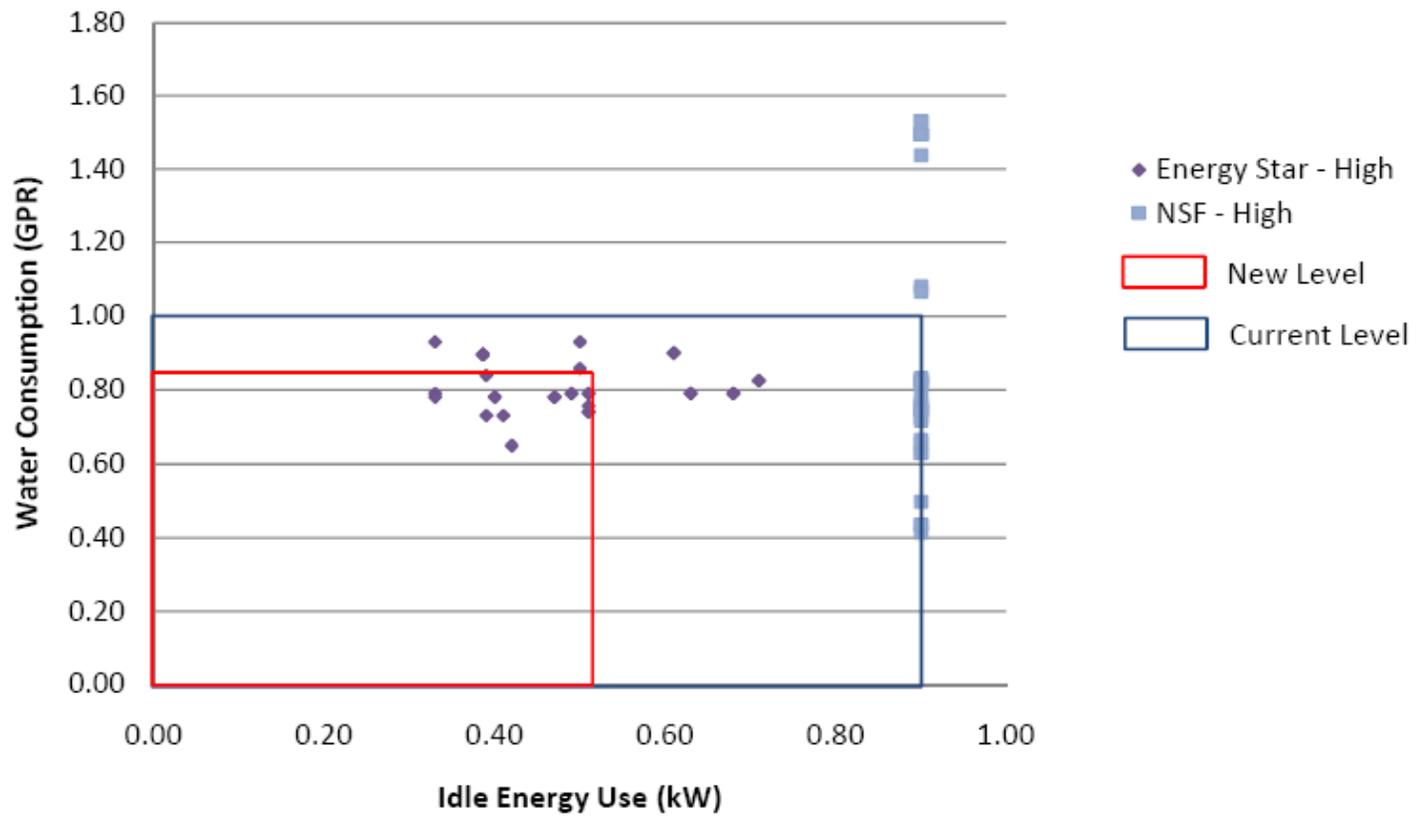


# Under Counter Type

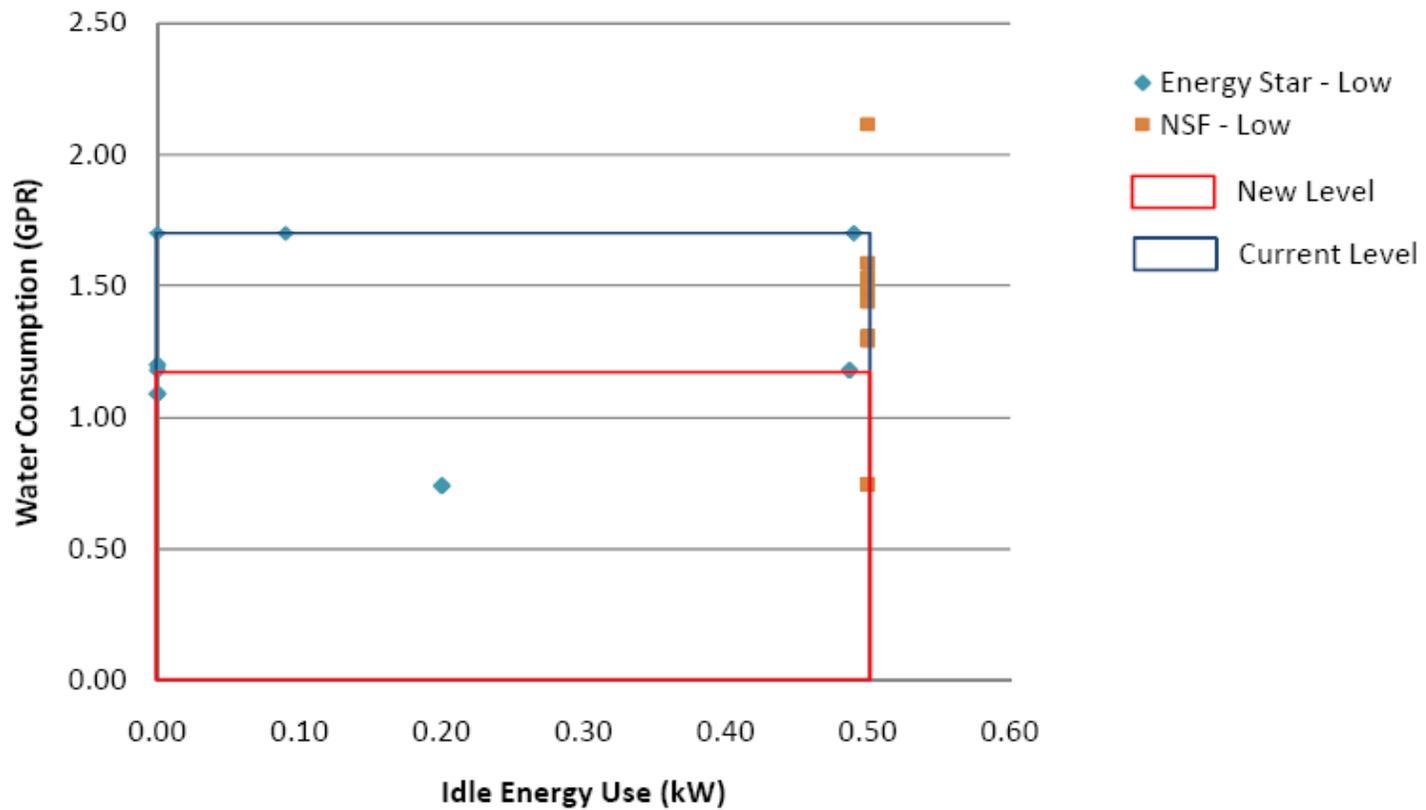


Temp	Version 2.0 Water Level (GPR)	Version 2.0 Idle Level (kW)	Total Models ES/NSF	Compliant Models	% Compliance	Number Manufacturers Represented
High	0.84	0.51	68	17	25%	8
Low	1.19	0.50	37	9	24%	4

### Undercounter Type Water v Idle Graph (High Temp)



**Undercounter Type  
Water v Idle Graph (Low Temp)**

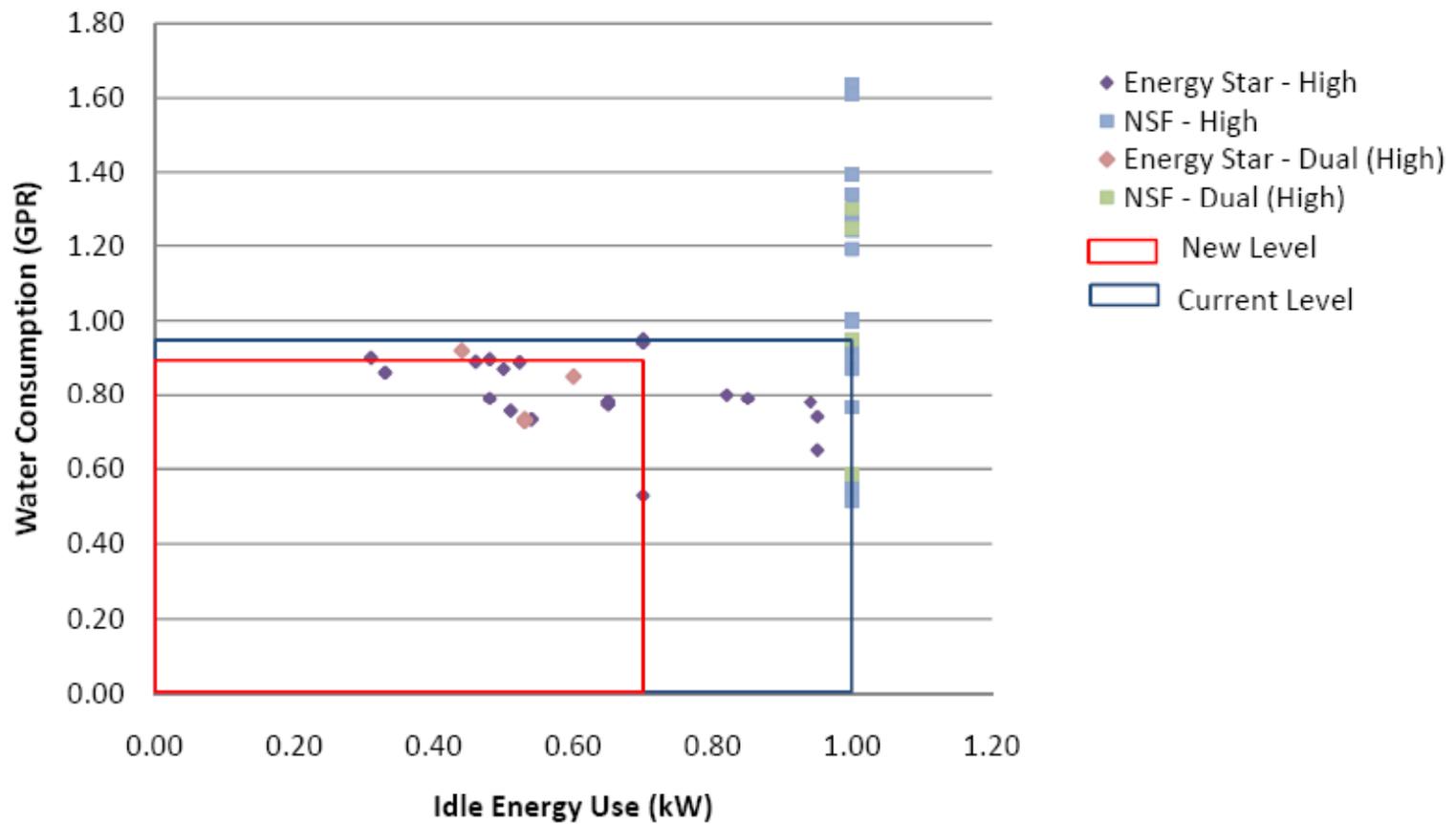


# Single Tank Door Type

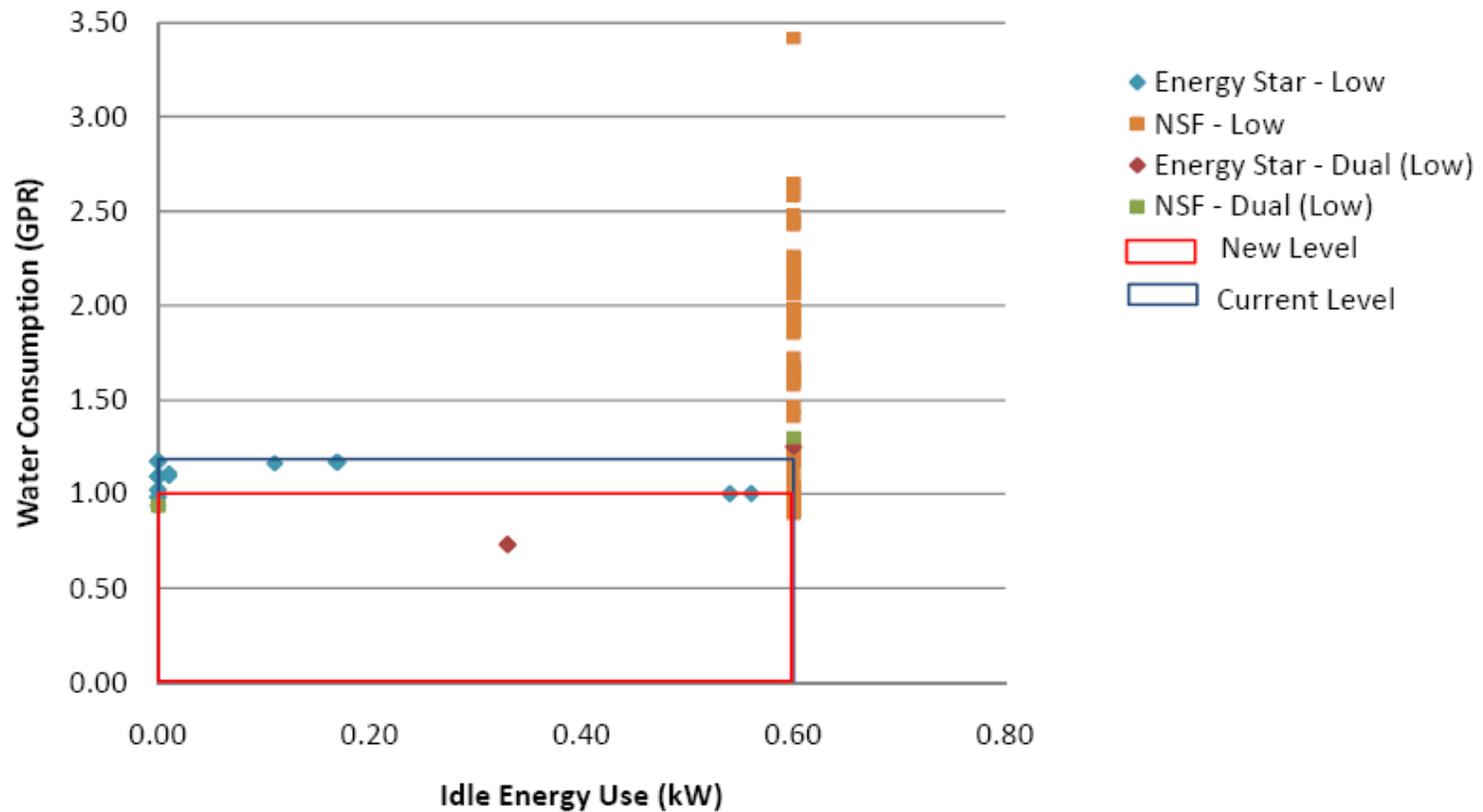


Temp	Version 2.0 Water Level (GPR)	Version 2.0 Idle Level (kW)	Total Models ES/NSF	Compliant Models	% Compliance	Number Manufacturers Represented
High	0.89	0.70	108	29	27%	10
Low	1.00	0.60	222	34	15%	7

### Single Tank Door Type Water v Idle Graph (High Temp)



### Single Tank Door Type Water v Idle Graph (Low Temp)

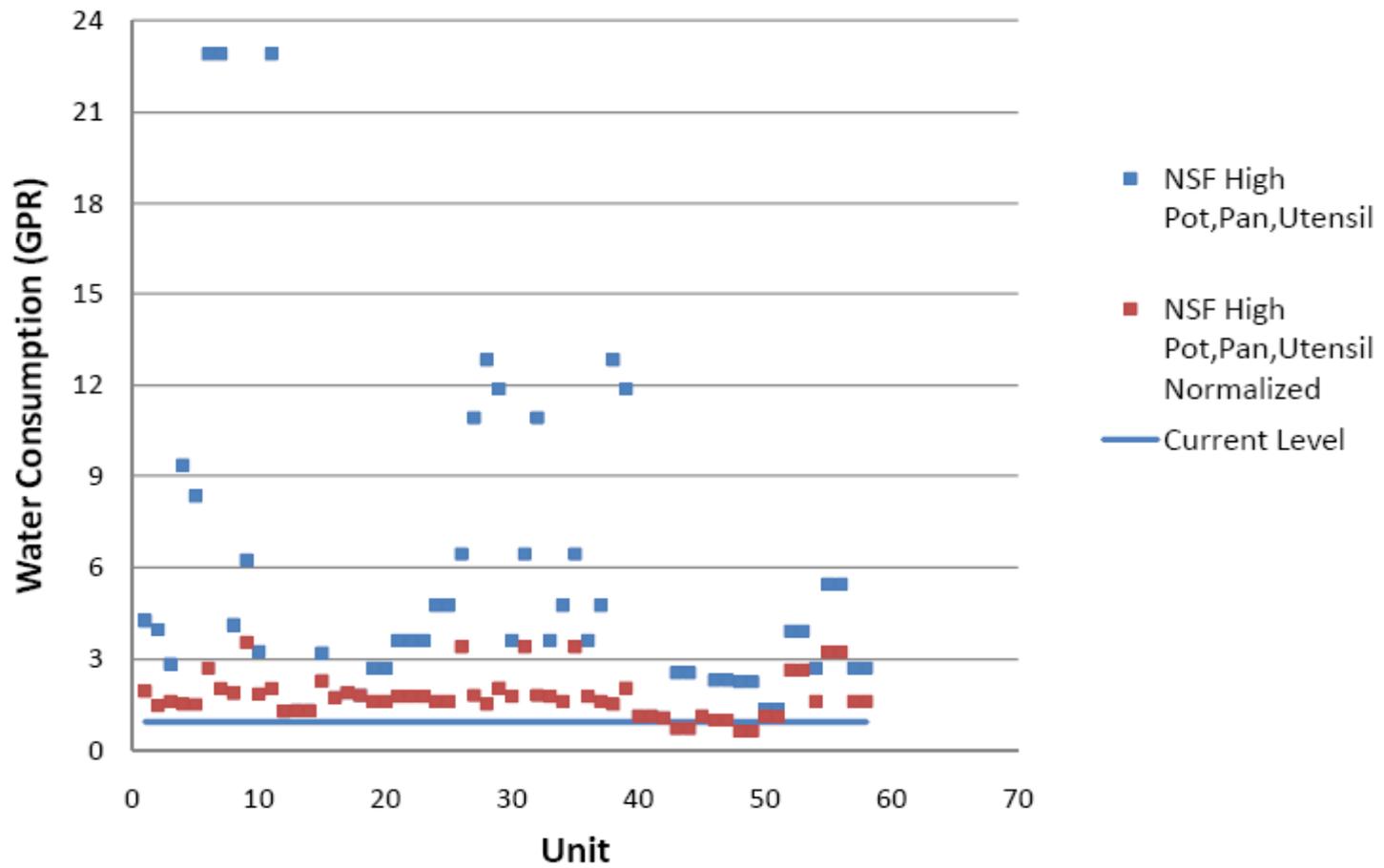


# Pot and Pan Machines

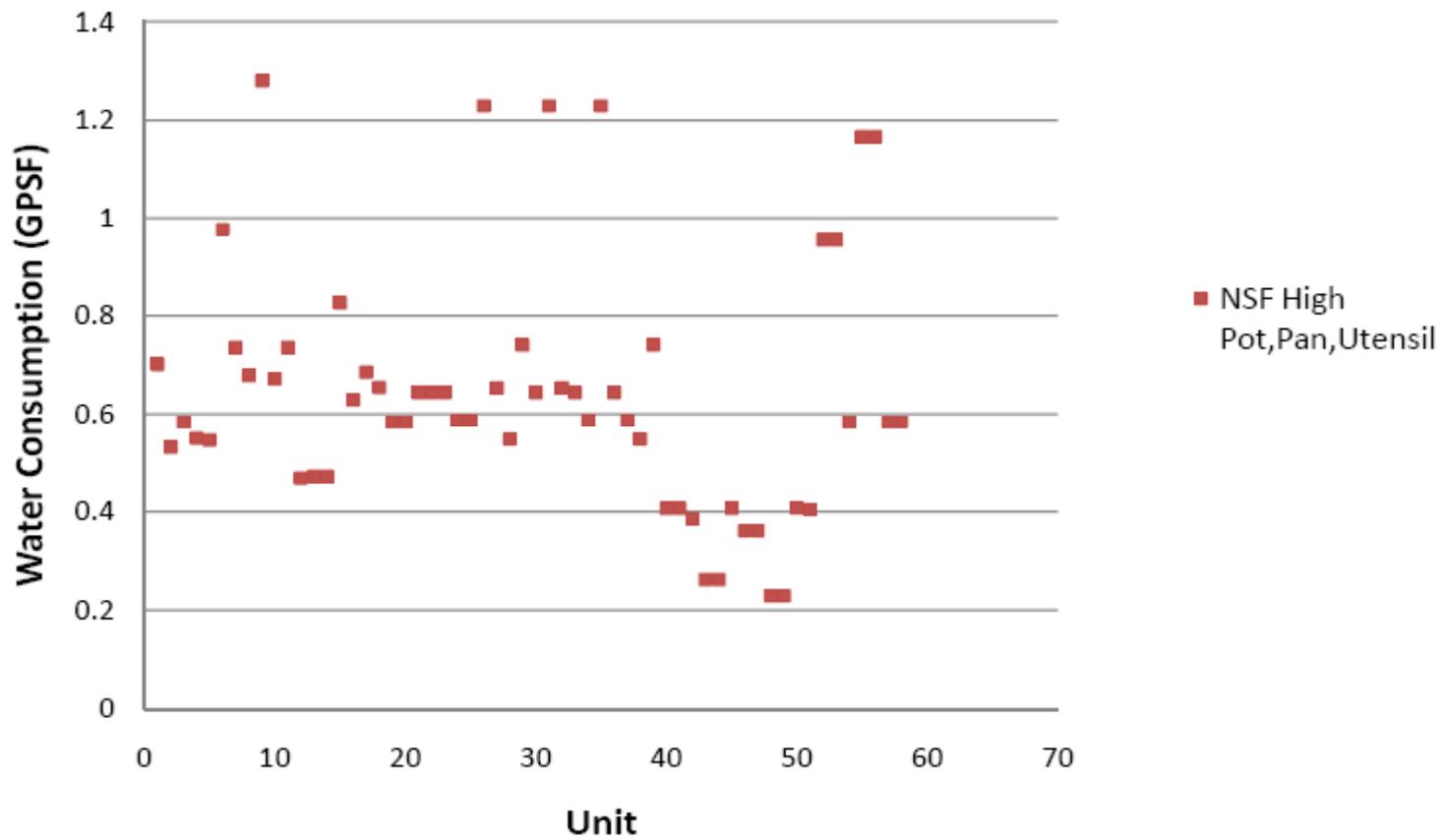


- Consume significantly more water compared to standard door type using NSF GPR calculation
  - Calculation assumes standard 20x20 rack
  - Current specification treats them as door type
- Product types often used in institutions
  - Important player in ENERGY STAR program
  - Provide opportunity to identify the most efficient models and encourage more efficient designs
- EPA is proposing to treat these separately

# Pot, Pan, Utensil Single Tank Door Type Water Consumption in GPR



## Pot, Pan, Utensil Water Consumption in GPSF





## Discussion: Pots, Pan, Utensil

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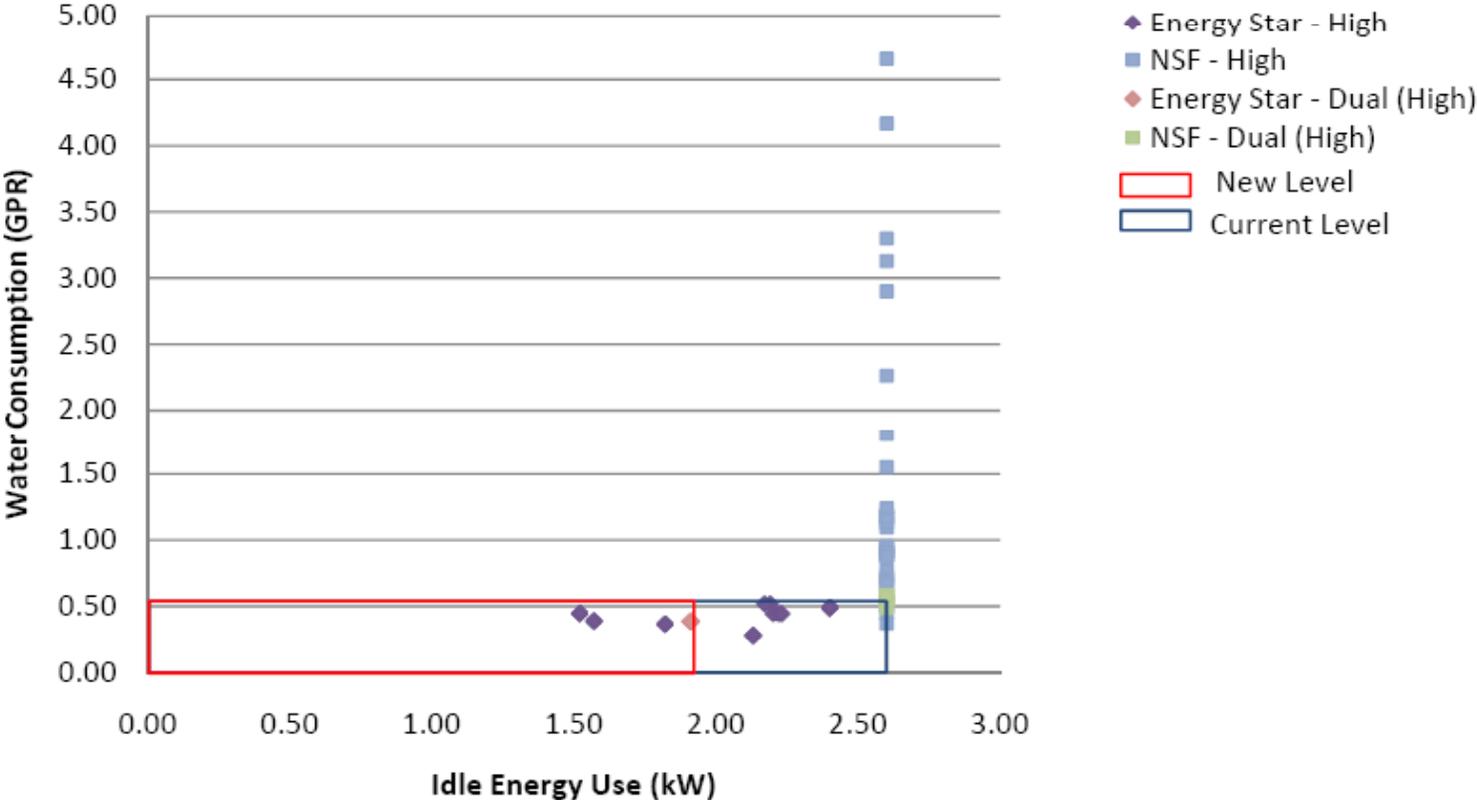
- Is gallons per square foot (GPSF) a good metric for evaluating these products?
  - Data seems to indicate there is no standard rack
- Would the V2.0 idle level for door type machines be applicable to these products?
  - Typically these are high temp machines
  - No currently qualified products, EPA has no data
  - Is tank/heater design similar to door type?
  - Would manufacturers be willing to share data?

# Multi Tank Conveyor Type

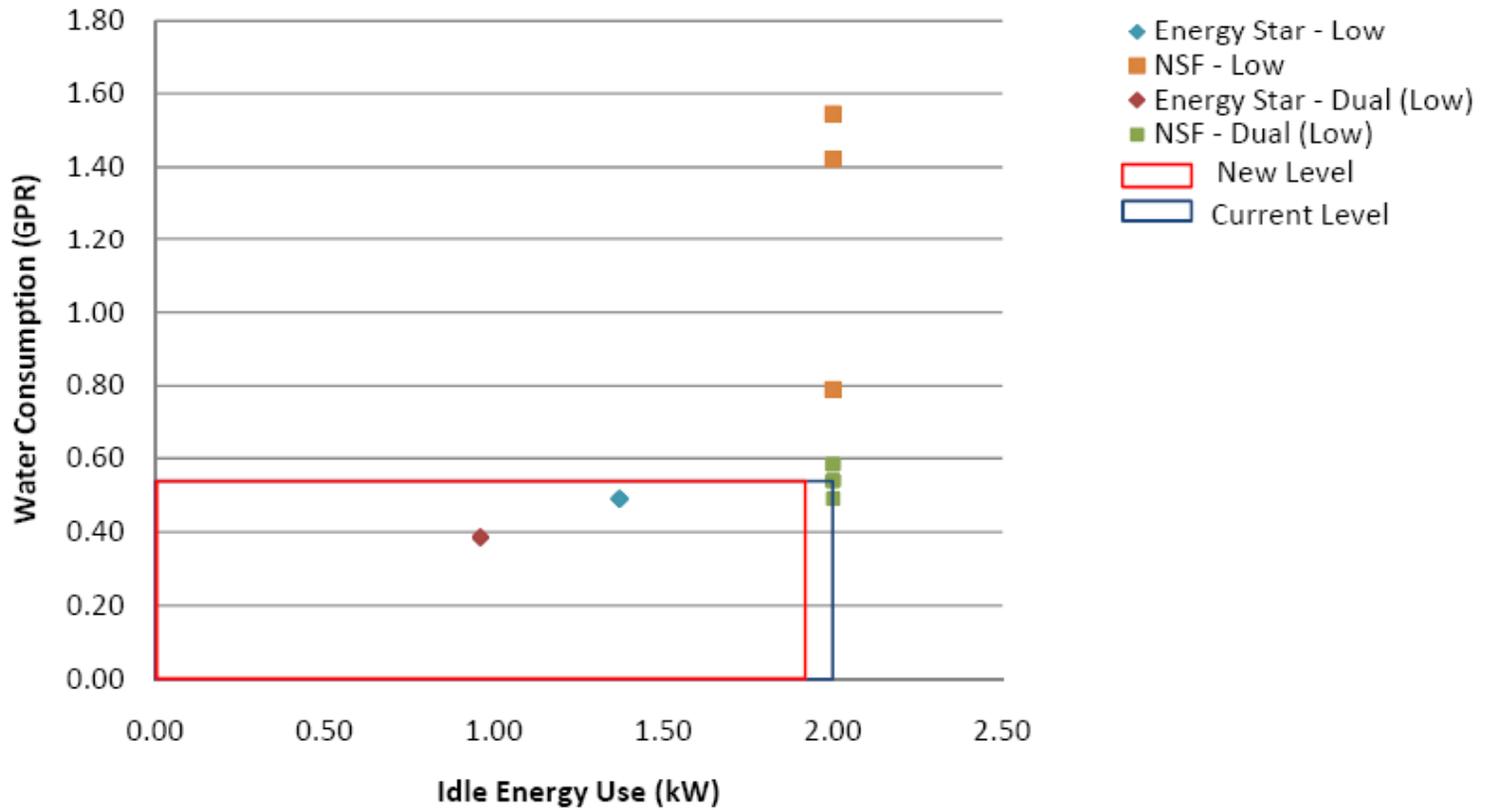


Temp	Version 2.0 Water Level (GPR)	Version 2.0 Idle Level (kW)	Total Models ES/NSF	Compliant Models	% Compliance	Number Manufacturers Represented
High	0.540	1.92	120	16	13%	3
Low	0.540	1.92	28	13	46%	2

### Multi Tank Conveyor Water vs Idle (High Temp)



### Multi Tank Conveyor Water vs Idle (Low Temp)

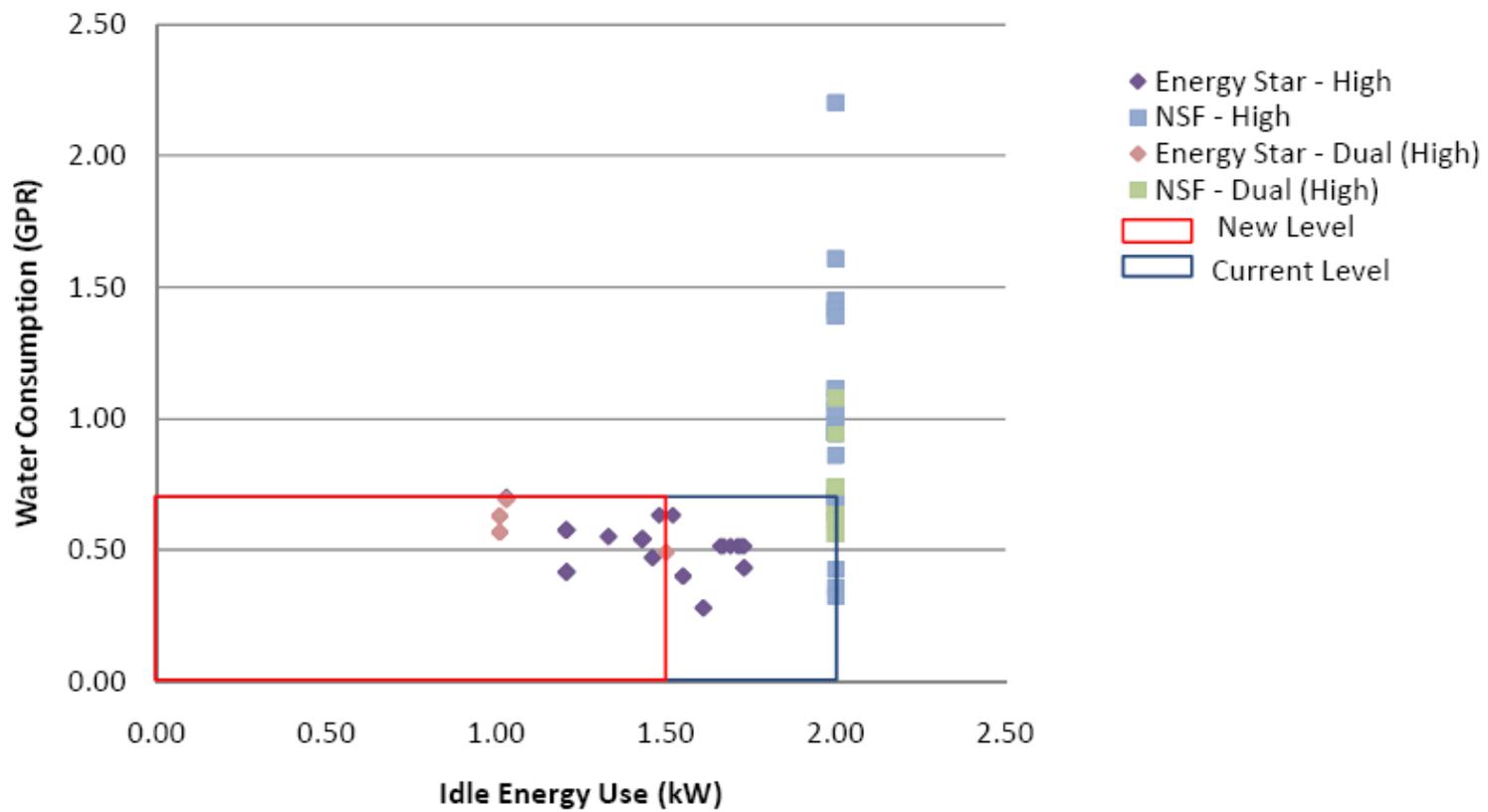


# Single Tank Conveyor Type

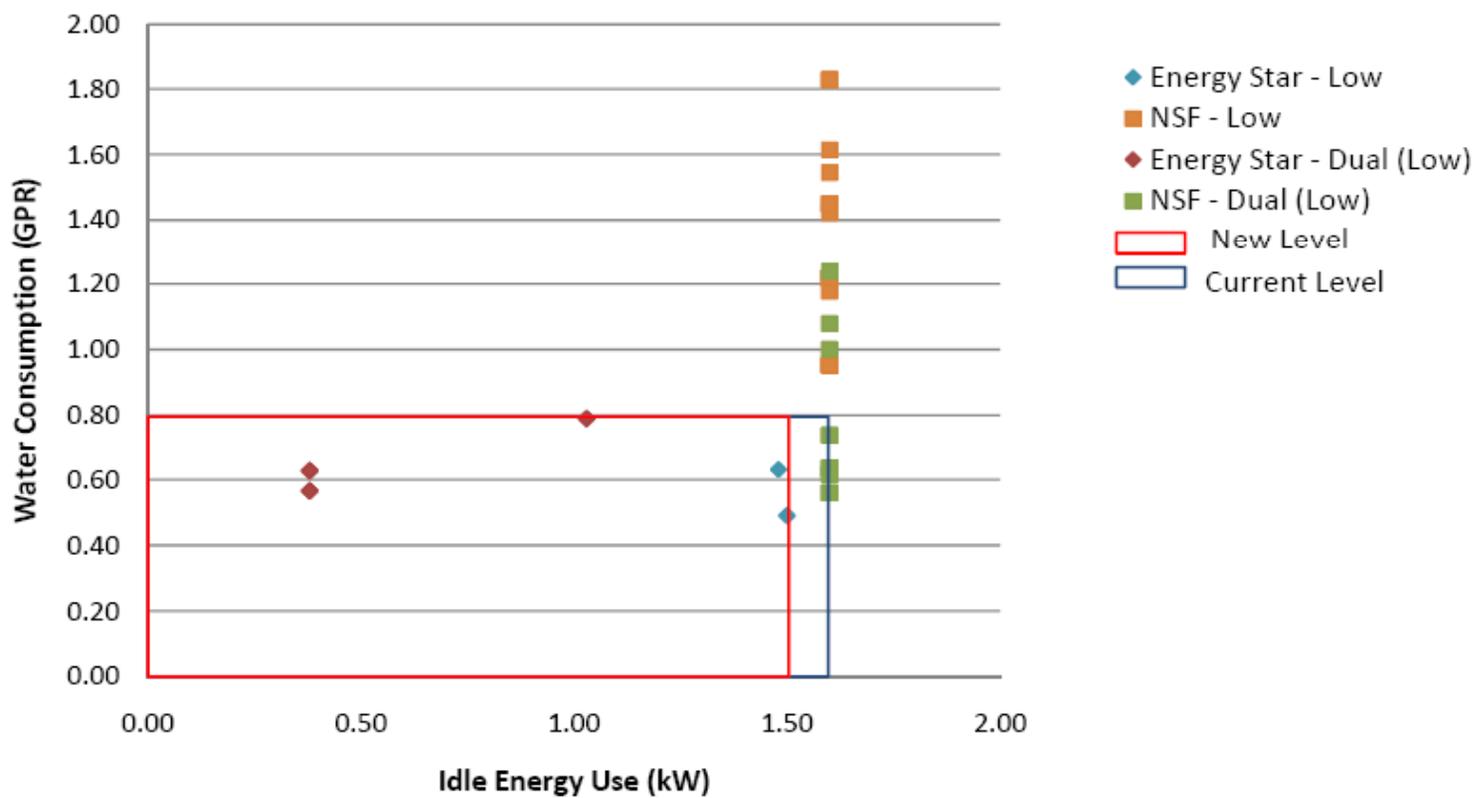


Temp	Version 2.0 Water Level (GPR)	Version 2.0 Idle Level (kW)	Total Models ES/NSF	Compliant Models	% Compliance	Number Manufacturers Represented
High	0.700	1.50	190	49	26%	8
Low	0.790	1.50	84	19	23%	5

### Single Tank Conveyor Water v Idle Graph (High Temp)



### Single Tank Conveyor Water v Idle Graph (Low Temp)



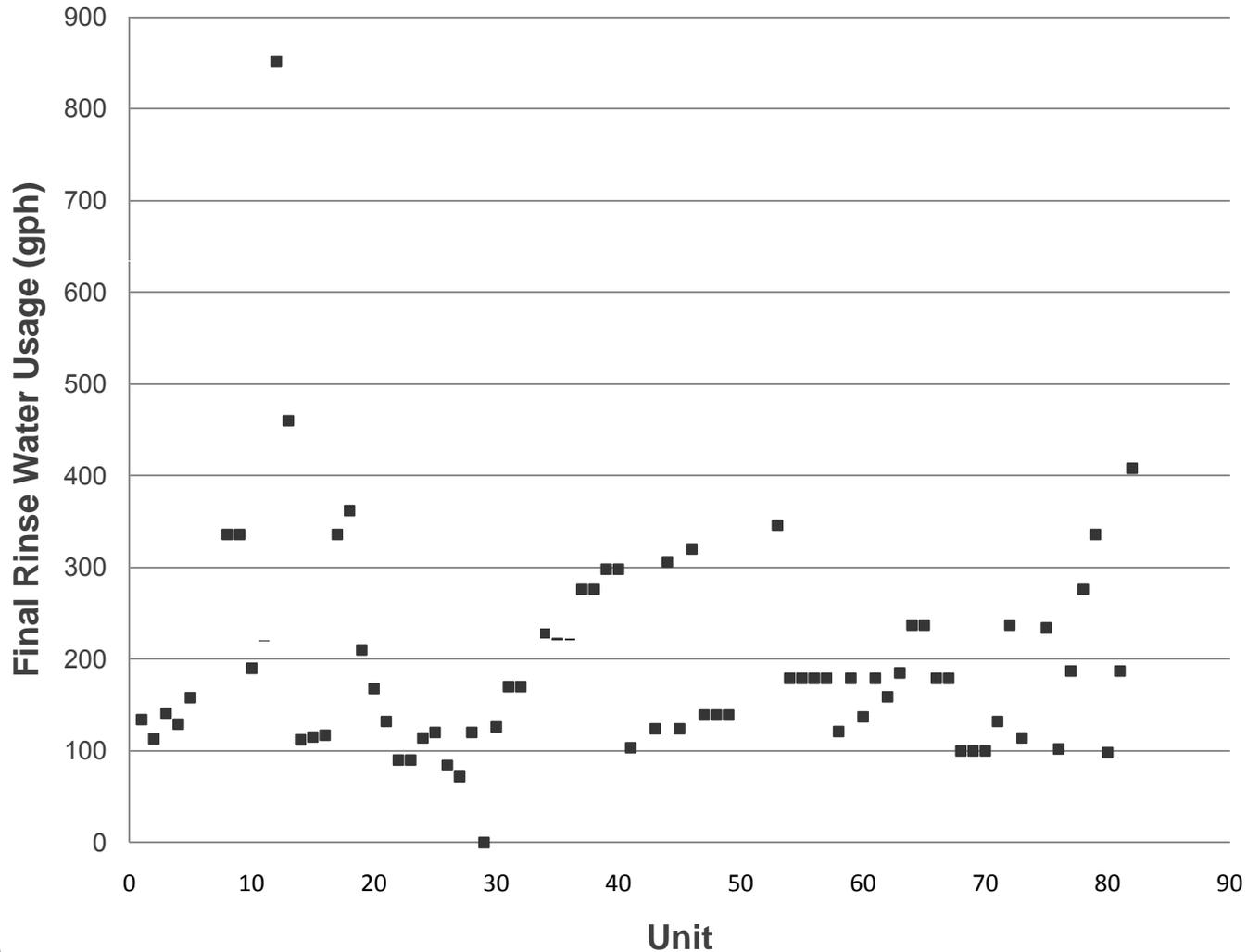
# Flight Type Machines

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- Significant water and energy savings opportunity
- Interest from manufacturers, utilities, end users
- Greatest challenge is that these machines tend to be customized based on customer needs
  - Difficult to choose a standardized metric that takes into account different wares
- NSF provides GPH ratings for each machine
  - Data indicates sufficient differentiation regarding water usage

# Flight Type Water Consumption - GPH





# Flight Type Discussion

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- Is GPH the right metric for evaluating flight type energy efficiency performance?
- **Comment Received:** Use a gallons per 100 dishes metric
  - Provides a level playing field for evaluating performance
  - Provides end user with information on capacity/speed
  - Peg spacing and conveyor speed greatly influence calculation and can be easily manipulated



## Gallons/100 Dish Metric cont.

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- **Idea:** Choose a standard peg spacing and lowest conveyor speed
- Mixed support for using lowest conveyor speed
  - Will provide worst case scenario
  - But may also penalize machines that effectively wash and sanitize at a faster rate
- Mixed support for standard peg spacing
  - Compared apples to apples
  - But varies widely based on ware type being cleaned



# Additional Flight Type Suggestions

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- **Comment Received:** Provide a weighting scheme where slowest speed would be averaged with one or more high speeds deemed representative of typical operating conditions
  - Addresses tested vs. typical operation concern
  - May be too confusing to the end user



## Flight Type Suggestions cont.

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- **Comment Received:** Similar to other conveyors, analyze single and multi tank models separately
- **Comment Received:** If using GPH, bin requirements based on single vs. dual rinse and narrow vs. standard width
  - Is this dissecting the product category too much?
  - What are the inherent differences between these product characteristics?

# Flight Type Suggestions cont.

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- **Comment:** Require additional prescriptive requirements to further reduce water use:
  - Deactivation of final rinse when dishes are not traveling through machine or conveyor stops
  - Deactivation of prewash, wash, and power rinse pumps after a period of time where dishes have not been run through the machine
  - Prewash temperature control, if provided should be temperature activated rather than continuous

# Flight Type Discussion cont.

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- Are manufacturers employing additional water saving features – such as deactivation of final rinse – that could further differentiate efficient designs?
- Should EPA look at idle energy requirements?
  - How much time do machines spend in idle?

# Adjustment of Machines in Field

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- Manufacturers are testing machines at lowest water consumption setting for sanitation
  - Machines are being adjusted to use more water in operation and not delivering savings
  - Appears to be more of a low temp machine issue

# Field Adjustment Discussion

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- **Comment Received:** Require testing at highest water setting in addition to lowest required for sanitation
- **Comment Received:** Educate distributors, installers, end users
  - Publish study consisting of actual water and energy usage associated with various machine types in typical restaurant settings
  - Publish data on the impact an ENERGY STAR rated machine can have on utility expenses



## Other V2.0 Discussion Topics

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- NSF/ANSI 3 standard under revision
  - Should be finalized shortly, ENERGY STAR will reference 2011 version
- ASTM standard development efforts for measuring washing energy
  - EPA interested in this approach longer term



# Revision Timeline

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- Late February --- Draft 2 released for review and comment
- Mid March --- Comments due to EPA
- Late March --- Final Draft released
- Early April --- Comments due to EPA
- May 1, 2011 --- Specification finalized\*
- February 1, 2012 --- V2.0 becomes effective

*\*Flight type would go into effect immediately upon finalization.*

# ENERGY STAR Contacts

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