

DOCKETED

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Project Title:	Appliance Efficiency Standards Rulemaking for Portable Electric Spas and Battery Charger Systems
TN #:	222816
Document Title:	Staff Presentation on Portable Electric Spas and Battery Charger Systems
Description:	By Jessica Lopez, for the March 6, 2018 Lead Commissioner Meeting on Appliance Efficiency Regulations for Portable Electric Spas and Battery Charger Systems
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Docketed Date:	3/1/2018



California Energy Commission

Public Meeting for Portable Electric Spas and Battery Charger Systems

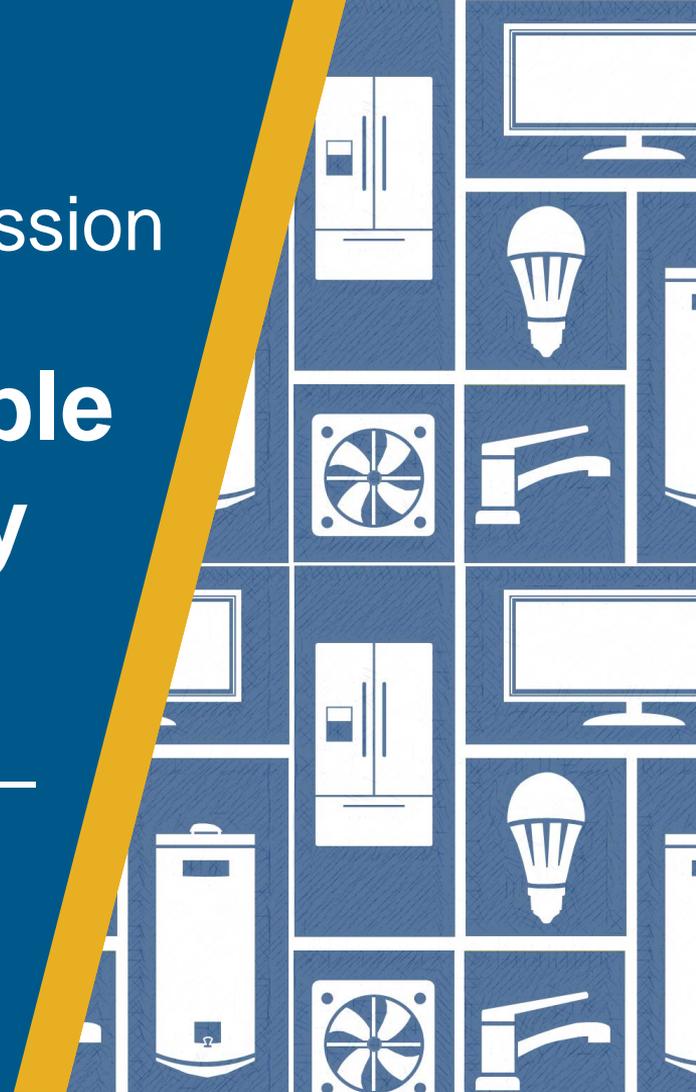
March 6, 2018

Jessica Lopez

Associate Energy Specialist

Appliances and Outreach & Education Office

Efficiency Division





Presentation Agenda

- **Purpose**
- **Portable Electric Spas**
 - ▶ Review Proposed Regulations
 - ▶ Technical Feasibility
 - ▶ Cost Effectiveness
 - ▶ Statewide Energy Savings
- **Battery Charger Systems**
 - ▶ Review Proposed Regulations
- **Initial Study and Proposed Negative Declaration**
- **Next Steps**
- **Clarifying Questions**



Purpose

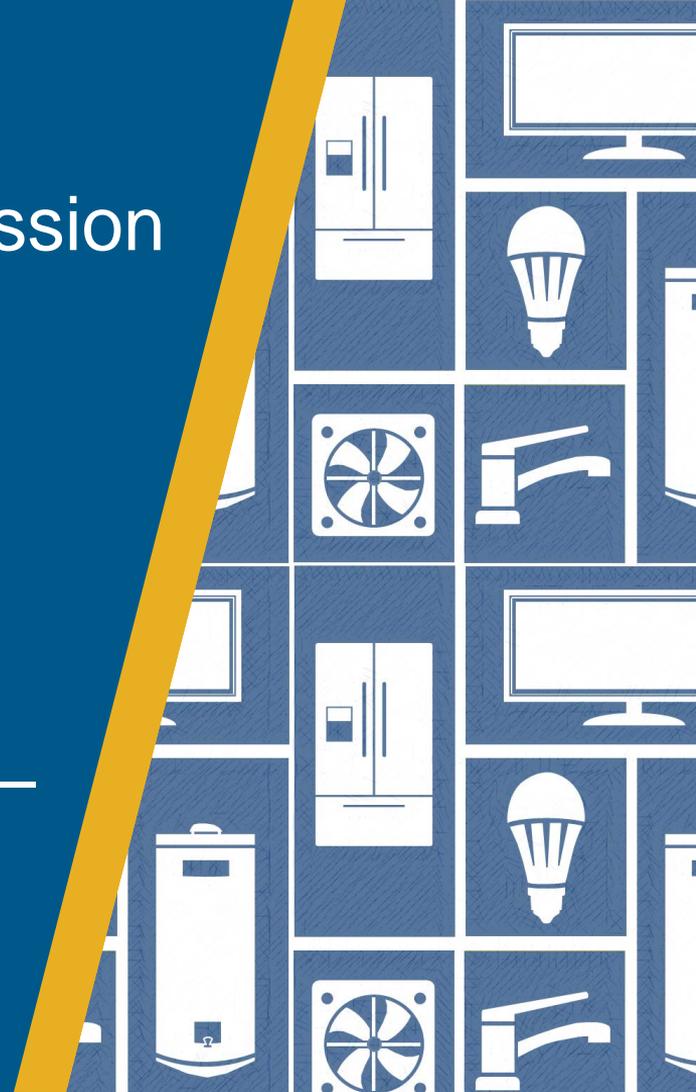
- Review proposed regulatory language for portable electric spas and battery charger systems
- Seek public comments on proposed regulatory language
- Provide interested parties the opportunity to comment on the initial study and proposed negative declaration



California Energy Commission

Portable Electric Spas

-
- Review proposed regulatory language
 - Technical Feasibility
 - Cost Effectiveness
 - Statewide Savings





Portable Electric Spas

PROPOSED REGULATORY LANGUAGE

Scope

Portable electric spas would maintain the existing broad scope that includes standard, storable, inflatable, flexible/soft, exercise/swim, and combination spas.



Storable/Standard



Inflatable



Flexible/Soft



Standard



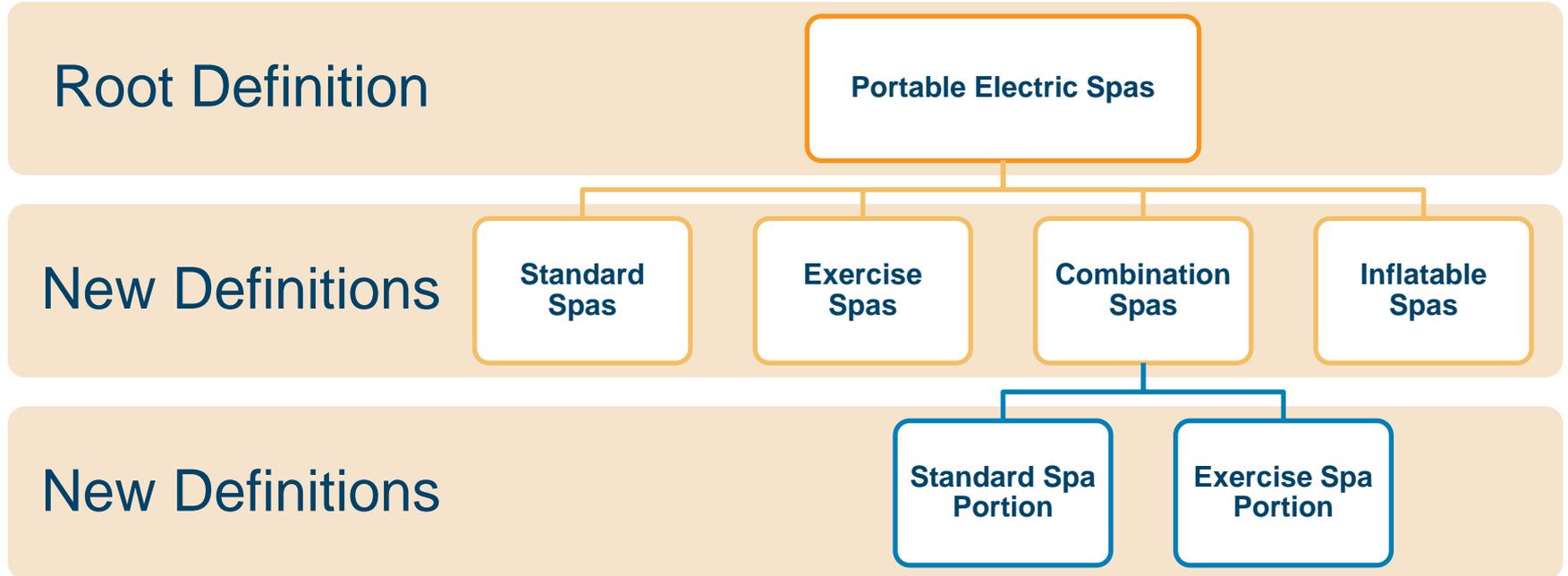
Exercise/ Swim



Combination



Definitions – Scope Organizational Chart





Definitions – Section 1601(g)

- **Portable electric spa** means a factory-built electric spa or hot tub, supplied with equipment for heating and circulating water at the time of sale or sold separately for subsequent attachment.
- **Combination spa** means a portable electric spa with two separate distinct reservoirs, where (1) one reservoir is an exercise spa; (2) the second reservoir is a standard spa; and (3) each reservoir has an independent water temperature setting control.
- **Exercise spa** (also known as a “swim spa”) means a portable electric spa that includes specific features and equipment to produce water flow for water physical therapy or physical fitness activity, including, but not limited to, swimming in place.



Definitions – Section 1601(g)

- **Inflatable spa** means a portable electric spa where the structure is collapsible and is designed to be filled with air to form the body of the spa.
- **Standard spa** means a portable electric spa that is not an inflatable spa, an exercise spa, or the exercise spa portion of a combination spa.
- **Exercise spa portion** means the reservoir of a combination spa that is an exercise spa.
- **Standard spa portion** means the reservoir of a combination spa that is a standard spa.



Definitions – Section 1601(g)

- **Standby mode** of a portable electric spa means that only the default settings as shipped by the manufacturer are enabled, except water temperature, which may be adjusted to meet the test conditions. No manual operations are enabled.
- **Fill volume** means the water capacity of the portable electric spa, in gallons, at the halfway point between the bottom of the skimmer opening and the top of the skimmer opening. In the absence of a skimmer, the fill volume is six inches below the overflow level of the spa as defined in the test method in section 1604(g)(2)(B)(1).
- **Skimmer** means a suction opening intended to remove floating debris from the water surface and installed where part of the water intake opening is open to atmospheric pressure.
- ~~**Spa volume** means the actual fill volume of the spa, under normal use, in gallons, as defined in the test method in Section 1604(g)(2)(B).~~



Definitions – Section 1601(g)

- **Rated capacity** of a portable electric spa means the number of people capable of fitting in a portable electric spa as specified by the manufacturer.
- **Rated voltage** of a portable electric spa means the voltage, in volts, as it appears on the nameplate of the spa.
- **Rated volume** means the water capacity of a portable electric spa, in gallons, as specified by the manufacturer on the spa, on the spa packaging, or the spa marketing materials.

Test Methods – Section 1604(g)(2)

B. The test method for portable electric spas **manufactured on or after June 1, 2019** is ANSI/APSP/ICC-14 2014, **excluding section 8.2**, and with the following modifications:



1. All portable electric spas **shall be filled with water to the halfway point between the bottom of the skimmer opening and the top of the skimmer opening**. In the absence of a skimmer, the fill volume is six inches below the overflow level of the spa.
2. For **standard spas** and **inflatable spas**, the test shall start when the water temperature has been at 102°F, $\pm 2^\circ\text{F}$ for at least four hours. The water temperature of the spa shall be a minimum 100°F for the duration of the test.



Test Methods – Section 1604(g)(2)

3. For **exercise spas**, the test shall start when the water temperature has been at 87°F, $\pm 2^\circ\text{F}$ for at least four hours. The water temperature of the spa shall be a minimum 85°F for the duration of the test. If the exercise spa is capable of maintaining a minimum water temperature of 100°F for the duration of the test, the exercise spa shall be tested in accordance with section 1604(g)(2)(B)(2).
4. For **combination spas**, the standard spa portion shall be tested in accordance with section 1604(g)(2)(B)(2), and the exercise spa portion shall be tested in accordance with section 1604(g)(2)(B)(3). Record the total energy use for each spa portion separately as described in Section 5.6.5 of ANSI/APSP/ICC-14 2014, while both spa portions are powered on for the duration of the test.



Test Methods – Section 1604(g)(2)

C. **Test lab report requirements** for portable electric spas manufactured on or after June 1, 2019. In addition to the requirements of **section 5 of ANSI/APSP/ICC-14 2014** and **section 1606 Table X**, test lab reports shall include:

Additional Test Lab Report Requirements	Section 5 of ANSI/APSP/ICC-14
Date of test	Measured fill volume
<u>Minimum and maximum water temperature settings</u>	Ambient air temperature at one point during the test
<u>Copy of label(s)</u>	Make, model, and serial number of model tested
Minimum, maximum, and average water temperature during test	<u>Spa cover manufacturer and model number</u>
Minimum, maximum, and average ambient air temperatures during test	Record watt-hours, voltage, and current used during entire test period
Length of test	<u>Record elapsed time during test period</u>
<u>Record and plot ambient air temperature, water temperature, current, voltage at a maximum interval of 5 minutes during test</u>	Total energy use
<u>For inflatable spas, a list of the accessories that were tested with the spa</u>	



State Standards – Section 1605.3(g)(6)

The normalized standby power, as defined in Table G-3 (below), of portable electric spas **manufactured on or after June 1, 2019**, shall be no greater than the applicable values shown in Table G-3 (below).

Appliance	Normalized Standby Power Condition 	Maximum Standby Power (Watts)
Standard spas and the standard spa portion of combination spas	as defined in Section 6.1 and 6.2 of ANSI/APSP/ICC-14 2014	$3.75V^{2/3}+40$
Exercise spas and the exercise spa portion of combination spas	as defined in Section 6.1 and 6.3 of ANSI/APSP/ICC-14 2014	$3.75V^{2/3}+40$
Exercise spas and the exercise spa portion of combination spas capable of maintaining a minimum water temperature of 100°F for the duration of the test	as defined in Section 6.1 and 6.2 of ANSI/APSP/ICC-14 2014	$3.75V^{2/3}+40$
Inflatable spas	as defined in Sections 6.1 and 6.2 of ANSI/APSP/ICC-14 2014	$7(V^{2/3})$

Where V= the fill volume, in gallons.



Data Submittal Requirements – Section 1606

Table X – (G) Portable Electric Spas

Required Information	Permissible Answers
*Spa Type	Combination Spa, Exercise Spa, Inflatable Spa, Standard Spa
*Tested Spa Cover Model Number (applies to models manufactured on or after June 1, 2019 only)	
Tested Spa Cover Manufacturer (applies to models manufactured on or after June 1, 2019 only)	
Tested Spa Cover Is Insulated (applies to models manufactured on or after June 1, 2019 only)	True, False
Rated Voltage (volts)	
Rated Capacity	
Spa Enclosure is Fully Insulated	True, False
Spa Includes a Skimmer	True, False

* “Identifier”



Data Submittal Requirements – Section 1606

Table X – (G) Portable Electric Spas - Continued

Required Information	Permissible Answers
<u>Maximum water temperature setting is less than 100°F</u> (for exercise spas and the exercise spa portion of combination spas only) (applies to models manufactured on or after June 1, 2019 only)	True, False
<u>Portable Electric Spa Rated Volume</u> (gallons) (for standard spas, inflatable spas, and the standard spa portion of combination spas only)	
<u>Exercise Spa Rated Volume</u> (gallons) (for exercise spas and the exercise spa portion of combination spas only)	
Portable Electric Spa Fill Volume (gallons) (for standard spas, inflatable spas, and the standard spa portion of combination spas only)	
Exercise Spa Fill Volume (gallons) (for exercise spas and the exercise spa portion of combination spas only)	
Portable Electric Spa Normalized Standby Power (watts) (for standard spas, inflatable spas, and the standard spa portion of combination spas only)	
Exercise Spa Normalized Standby Power (watts) (for exercise spas and the exercise spa portion of combination spas only)	



Declaration – Section 1606(a)(4)

- A. Each statement shall include a declaration, executed under penalty of perjury of the laws of California, that
- 5) all units of the appliance are marked as required by Section 1607, and, for the following appliances, are marked as follows:
 - i) for all portable electric spas manufactured on or after June 1, 2019, each portable electric spa is marked by the manufacturer with the tested spa cover model number, the tested spa cover manufacturer, with the statement “Based on testing with the spa manufacturer’s specified cover. This spa must be sold with this cover or a manufacturer’s approved equivalent that has also been tested with the unit per California Code of Regulations Title 20, Section 1608(a).” If the portable electric spa has been tested with multiple spa covers, the label shall display the most recent spa unit-cover combination that yielded the maximum normalized standby power test result obtained in accordance with section 1605.3(g)(6)(B). The label shall be removed only by the consumer.



Marking of Appliances – Section 1607(d)(14)

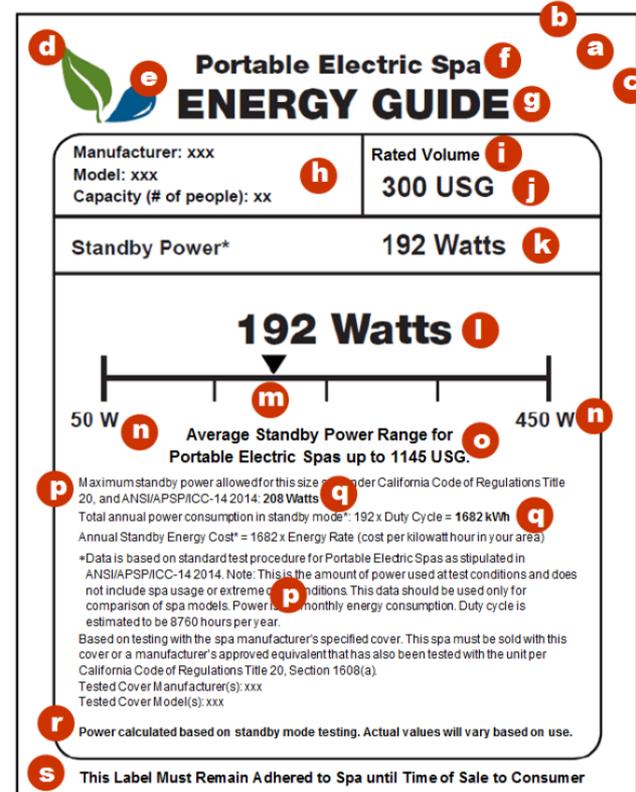
- A. All portable electric spas manufactured on or after June 1, 2019, shall be marked by the manufacturer in a readily visible location on the shell or front skirt panel. The marking shall be removed only by the consumer.

- B. The label for all portable electric spas shall conform to the design specifications listed in subdivisions (d)(14)(B)(1) through (d)(14)(B)(4) in this section (inclusive). If the spa has been tested with multiple spa covers, the label shall display the spa unit-cover combination that yielded the maximum normalized standby power test result obtained in accordance with section 1605.3(g)(6)(B).

Marking of Appliances – Section 1607(d)(14)(B)

- Label Specifications.** The label shall be formatted as shown in Figure 1 and as directed in subdivision (d)(14)(B)(2) of this section.

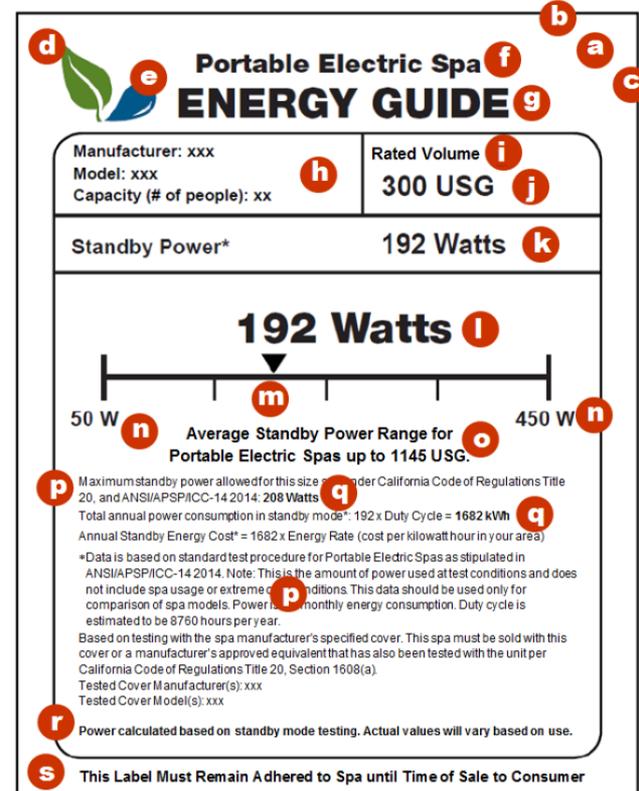
Figure 1. Label Design



Marking of Appliances – Section 1607(d)(14)(B)

2. **Letter Codes for Figure 1 Label Design.** Letter codes for Figure 1 above:
- Shall be printed on a white label with black text.
 - Minimum label width: 5 inches.
 - Minimum label height: 6.25 inches.
 - Leaf color: equivalent to Pantone 363 green (also permitted to be black).
 - Water drop color: equivalent to Pantone 7691 blue (also permitted to be black).

Figure 1. Label Design



Marking of Appliances – Section 1607(d)(14)(B)

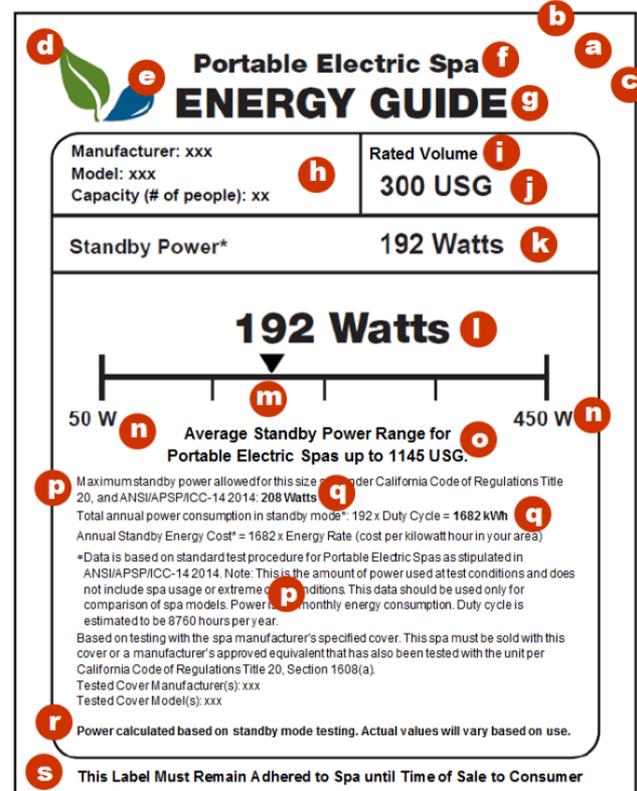
2. Letter Codes for Figure 1 Label Design.

Letter codes for Figure 1 above:

f. Font: Helvetica Neue Black; character height shall not be less than 15 point type. For standard spas, inflatable spas, and the standard spa portion of combination spas the text shall state the following: **Portable Electric Spa**. For exercise spas and the exercise spa portion of combination spas, the text shall state the following: **Exercise Spa**.

g. Font: Helvetica Neue Black; character height shall not be less than 24 point type. Text shall state the following: **ENERGY GUIDE**.

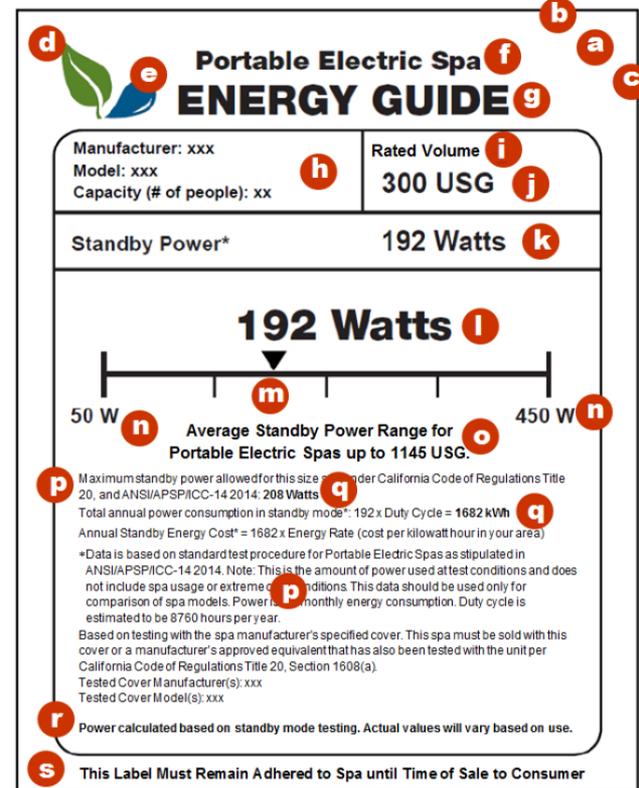
Figure 1. Label Design



Marking of Appliances – Section 1607(d)(14)(B)

Figure 1. Label Design

2. **Letter Codes for Figure 1 Label Design.** Letter codes for Figure 1 above:
- h. Font: Arial Bold; character height shall not be less than 9.5 point type. Text shall state the following:
- **Manufacturer:** [insert name of manufacturer here].
 - **Model:** [insert model number here].
 - **Capacity (# of people):** [insert number of people here].
- i. Font: Arial Bold; character height shall not be less than 9.5 point type. Text shall state the following: **Rated Volume.**
- j. Font: Arial Bold; character height shall not be less than 16 point type. The text shall state the **value of the rated volume** in U.S. gallons and shall state the units of the rated volume.

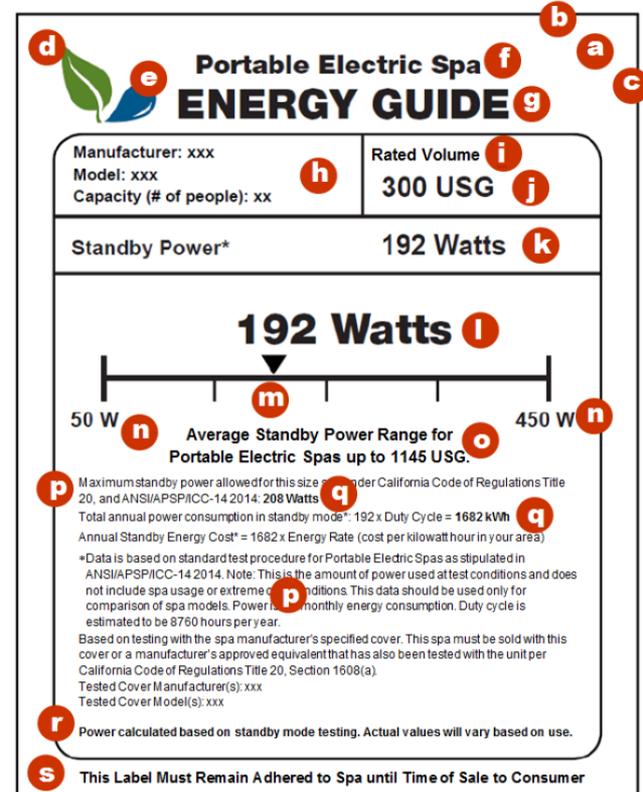


Marking of Appliances – Section 1607(d)(14)(B)

Figure 1. Label Design

2. **Letter Codes for Figure 1 Label Design.** Letter codes for Figure 1 above:

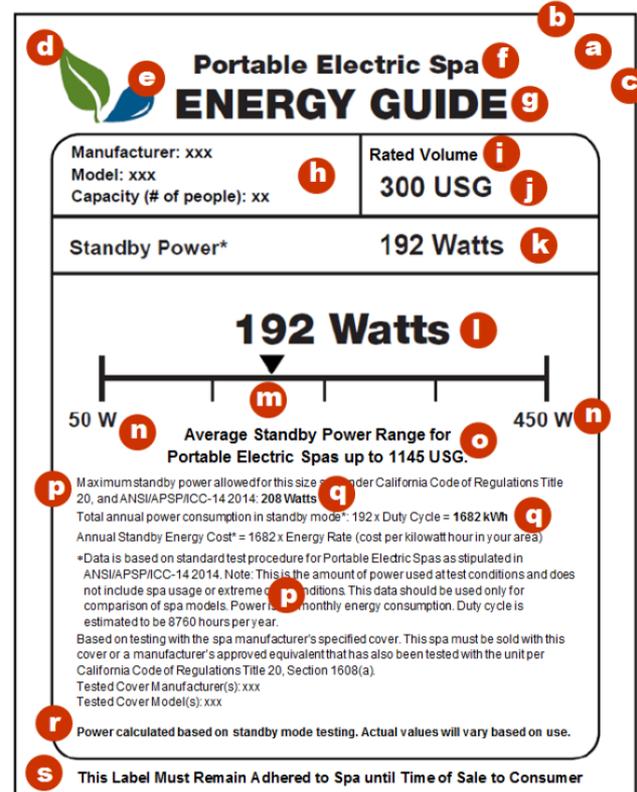
- k. Font: Arial Bold; Character height shall not be less than 16 point type. The text shall state the following: **Standby Power*** [insert the normalized standby power value resulting from the test in watts here, rounded to a whole number] Watts.
- l. Font: Helvetica Neue Black; character height shall not be less than 24 point type. The text shall state the **normalized standby power value** resulting from the test in Watts, rounded to a whole number, and shall state the units of the tested standby power.
- m. The standby power **chart arrow shall be scaled** at the appropriate location between the minimum and maximum power range using the normalized standby power test result value for the spa which is being installed. The **minimum standby power shall be 50 watts**, and the **maximum standby power shall be 450 watts** for standard spas, inflatable spas, and the standard spa portion of combination spas. The **minimum standby power shall be 100 watts** and the **maximum standby power shall be 750 watts** for exercise spas and the exercise spa portion of combination spas.



Marking of Appliances – Section 1607(d)(14)(B)

2. **Letter Codes for Figure 1 Label Design.** Letter codes for Figure 1 above:
- n. Font: Arial Bold; Character height shall not be less than 12 point type.
 - o. Font: Arial Bold; Character height shall not be less than 9.5 point type. For standard spas, inflatable spas, and the standard spa portion of combination spas, the text shall state **“Average standby Power Range for Portable Electric Spas up to 1145 USG.”** For exercise spas and the exercise spa portion of combination spas, the text shall state **“Average standby Power Range for Exercise Spas up to 2605 USG.”**

Figure 1. Label Design

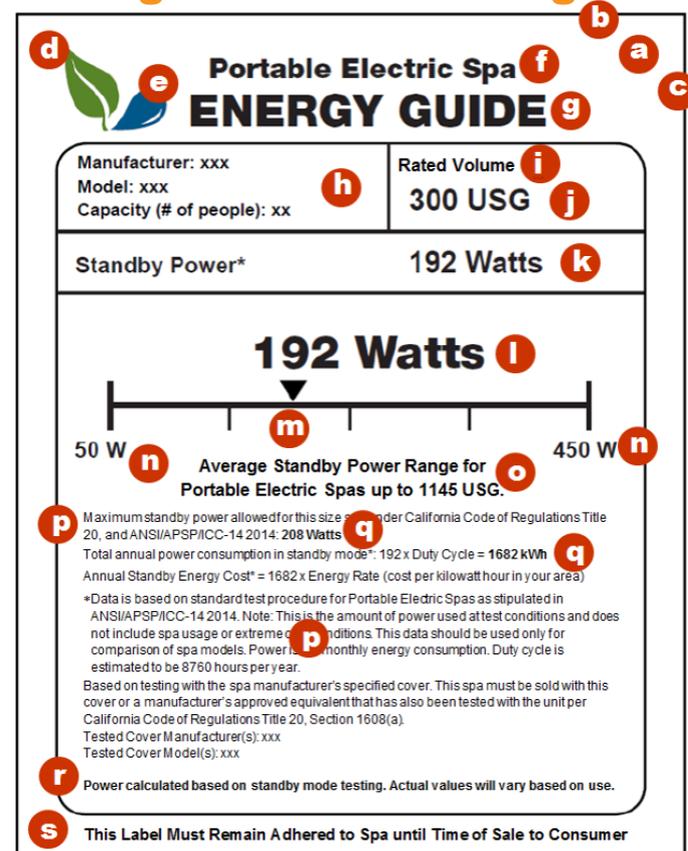


Marking of Appliances – Section 1607(d)(14)(B)

2. Letter Codes for Figure 1 Label Design. Letter codes for Figure 1 above:

- p. Font: Arial; Character height shall not be less than 8 point type, and may be horizontally scaled to no less than 85 percent. The text shall state the following:
- **Maximum standby power allowed** for this size spa under California Code of Regulations Title 20, and ANSI/APSP/ICC-14 2014: [insert the allowed maximum normalized standby power value based on fill volume, rounded to a whole number] Watts.
 - **Total annual power consumption in standby mode***: [insert the normalized standby power value resulting from the test in watts here, rounded to a whole number] x Duty Cycle = [insert calculated value of total annual power consumption in standby mode here in kilowatts per hour, rounded to a whole number] kWh.
 - **Annual Standby Energy Cost*** = [insert total annual power consumption value here, rounded to a whole number] x Energy Rate (cost per kilowatt hour in your area).
 - ***Data is based on standard test procedure for Portable Electric Spas as stipulated in ANSI/APSP/ICC-14 2014.** Note: This is the amount of power used during test conditions and does not include spa usage or extreme cold conditions. This data should be used only for comparison of spa models. Power is not monthly energy consumption.
 - **Duty cycle** is estimated to be [insert duty cycle value in hours here. For standard spas, exercise spas, and combinations spas insert 8,760. For inflatable spas, insert 5,040] hours per year.
 - Based on testing with the spa manufacturer's specified cover. This spa must be sold with this cover or a manufacturer's approved equivalent that has also been tested with the unit **per California Code of Regulations Title 20, Section 1608(a).**
 - **Tested Cover Manufacturer(s)**: [insert name of manufacturer here].
 - **Tested Cover Model(s)**: [insert cover model number here].

Figure 1. Label Design

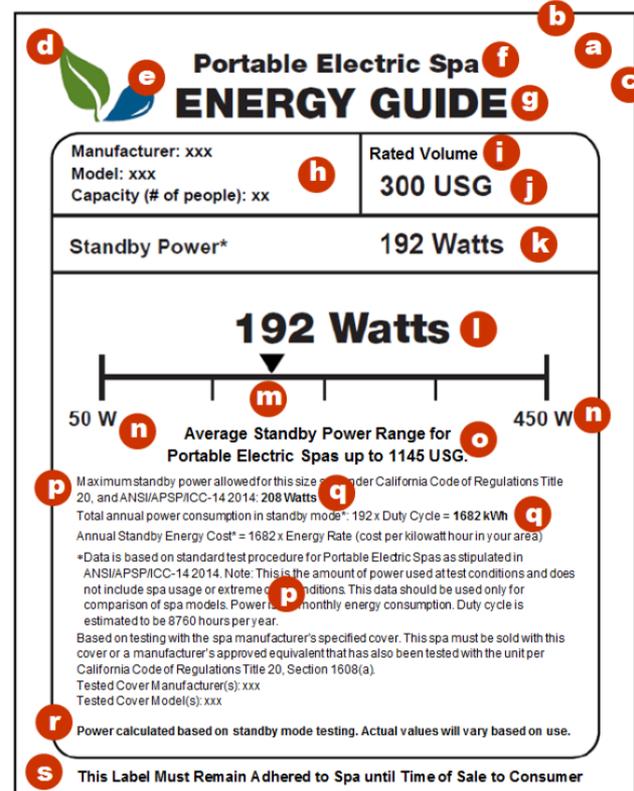


Marking of Appliances – Section 1607(d)(14)(B)

Figure 1. Label Design

2. Letter Codes for Figure 1 Label Design. Letter codes for Figure 1 above:

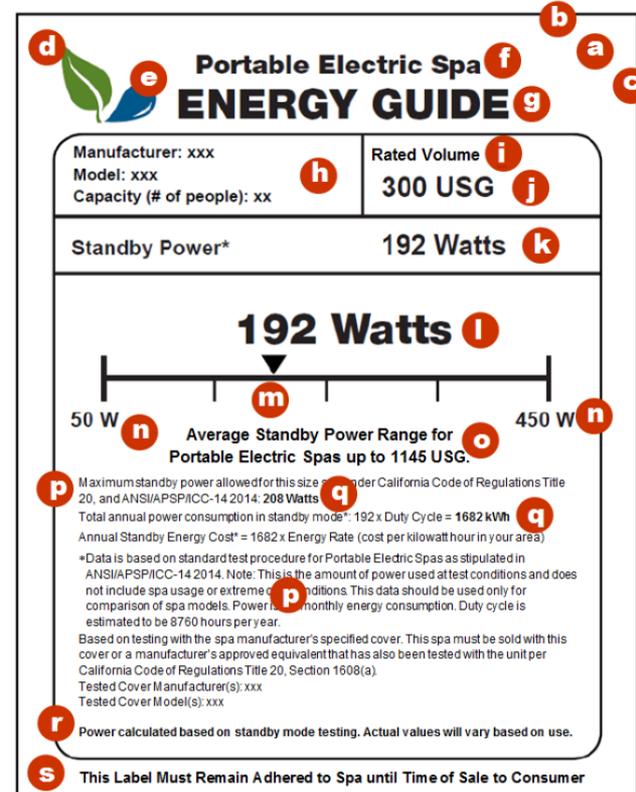
- q. The format for the maximum standby power value and total annual power consumption value is the following: Font: Arial Bold. Character height shall not be less than 8 point type and may be horizontally scaled to no less than 85 percent.
- r. Font: Arial Bold; Character height shall not be less than 8 point type, and may be horizontally scaled to no less than 85 percent. The text shall state the following: **Power calculated based on standby mode testing. Actual values will vary based on use.**
- s. Font: Arial Bold; Character height shall not be less than 8 point type, and may be horizontally scaled to no less than 85 percent. The text shall state the following: **This Label Must Remain Adhered to Spa until Time of Sale to Consumer.**



Marking of Appliances – Section 1607(d)(14)(B)

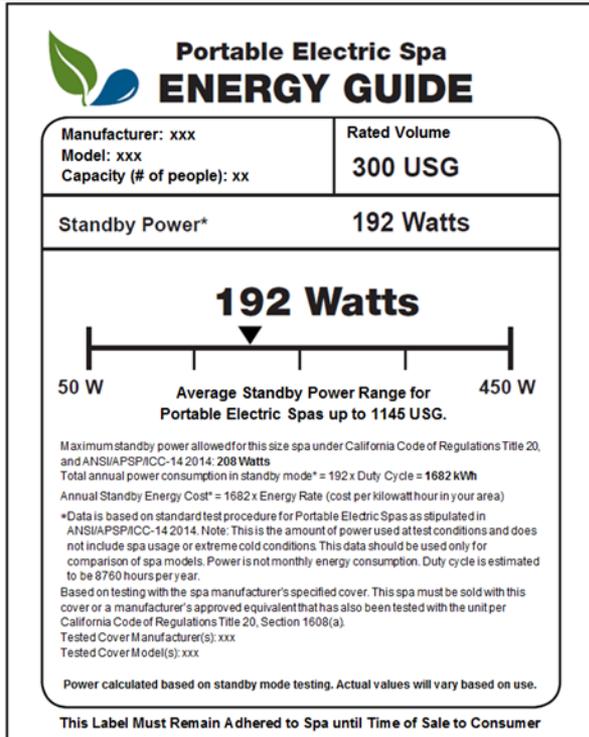
3. The label shall be printed on a removable adhesive-backed white polymer label or the equivalent.
4. All adhesive labels shall be applied so they can be easily removed without the use of tools or liquids, other than water, but shall be applied with an adhesive with an adhesion capacity sufficient to prevent dislodgment during normal handling throughout the chain of distribution to the consumer.

Figure 1. Label Design

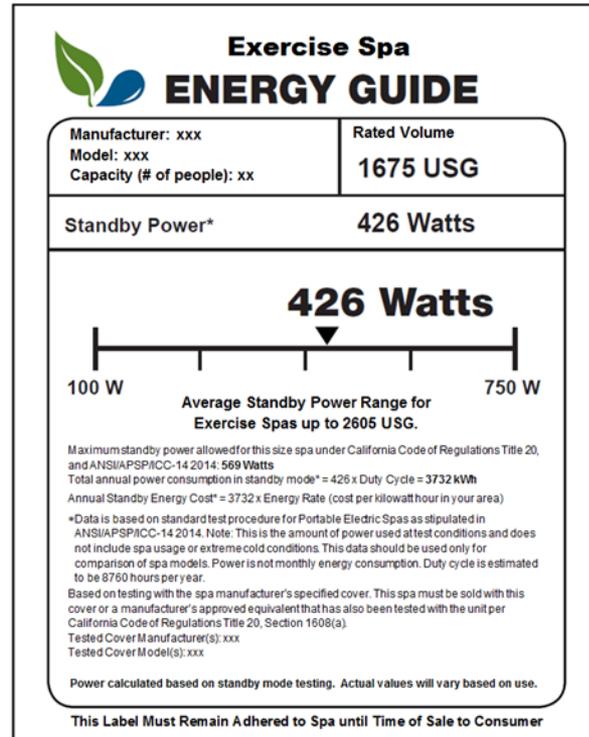


Example of Proposed Label

Standard, Inflatable, or Combo Spa
(Standard Spa Portion) Label



Exercise Spa or Combo Spa
(Exercise Spa Portion) Label





Portable Electric Spas

TECHNICAL FEASIBILITY

Technical Feasibility

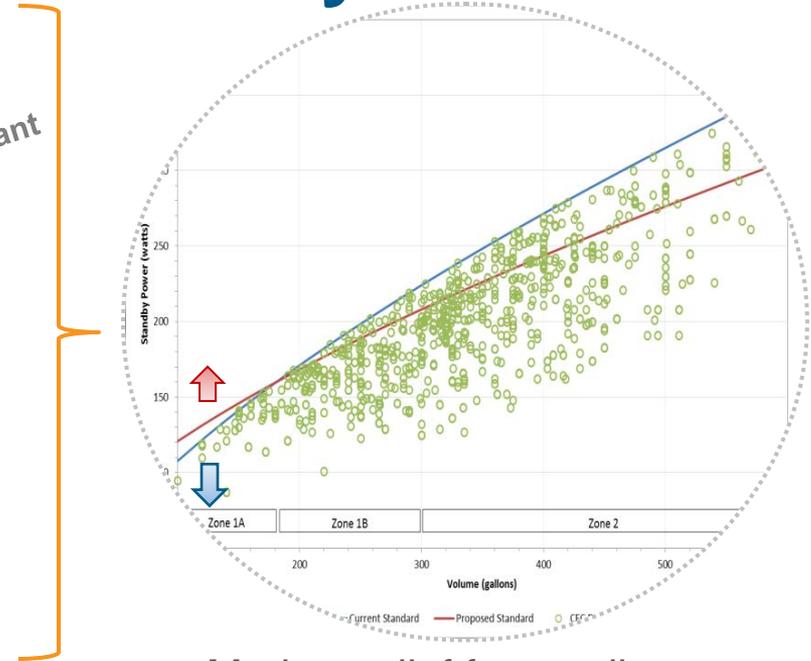
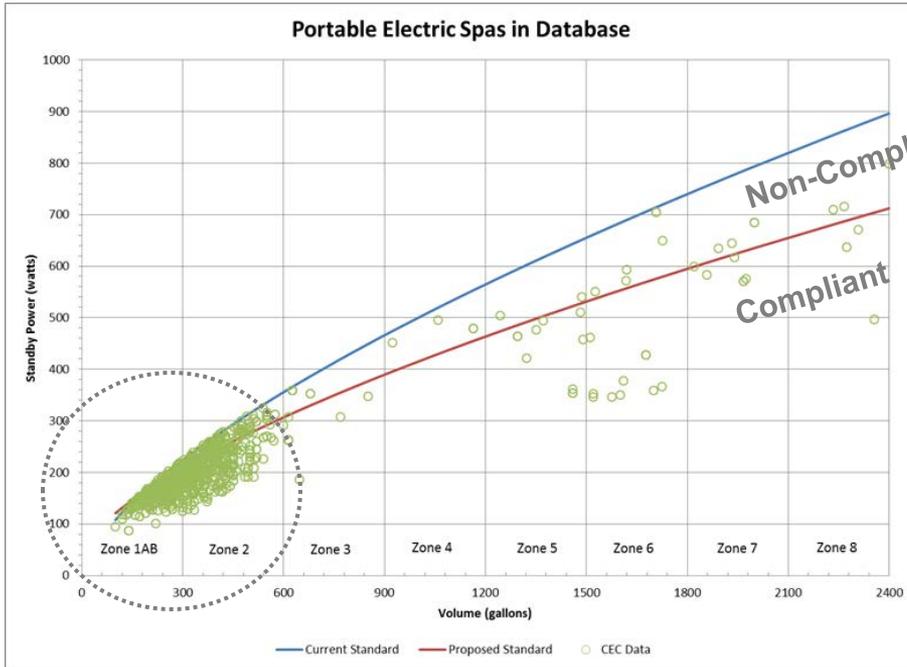


Table 1: Compliance Rates

Spa Type	Zones	Compliant (%)	Non-Compliant (%)
Standard Spas	1AB to 3	79	21
Exercise Spas	4 to 8	58	42
Combo Spas	-	44	56
All Certified Units		77	23

Modest relief for smaller spas



Technical Feasibility – Inflatable Spas

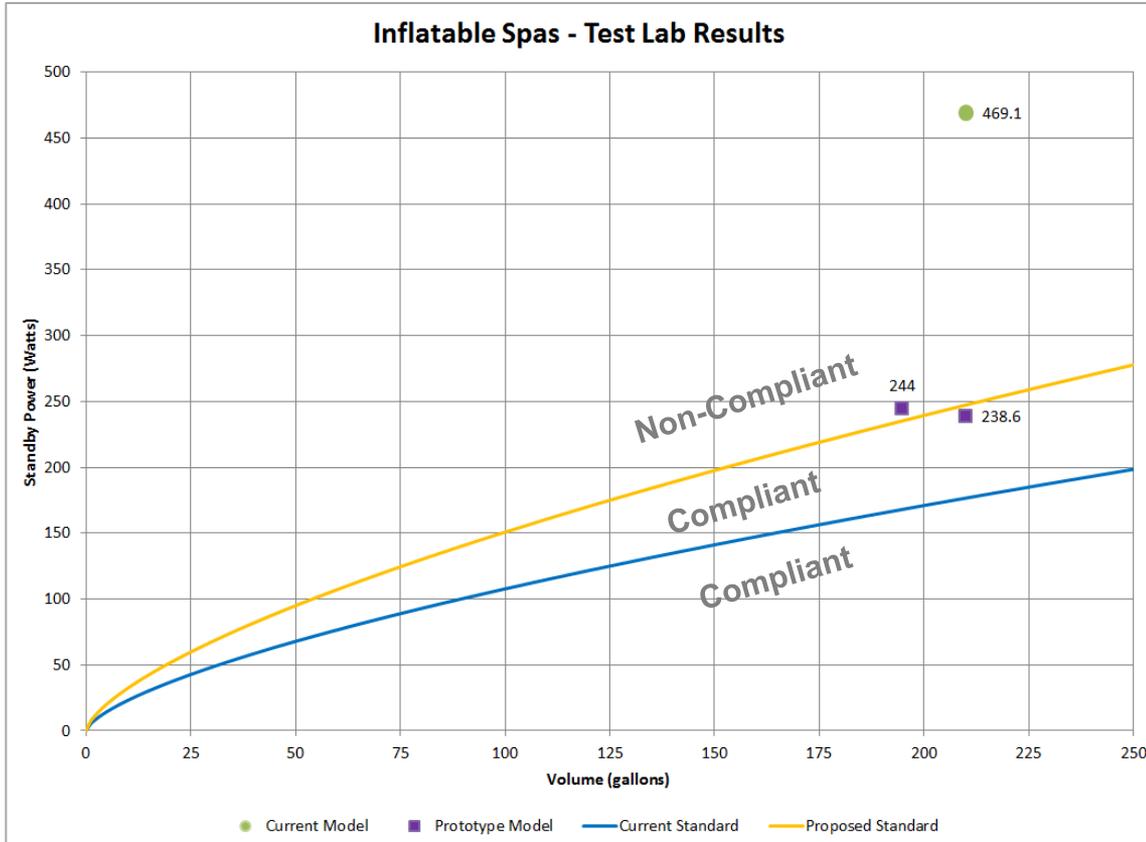


Table 2: Compliance Rates for Inflatable Spas

Year	Compliant (%)	Non-Compliant (%)
Present	0	100
Effective Year	33	67



Technical Feasibility

- Increase spa standby performance by:
 - ▶ Using better insulation,
 - ▶ Applying insulation strategically,
 - ▶ Improving piping layout,
 - ▶ Improving spa cover designs or insulation materials,
 - ▶ Incorporating radiant barriers, and
 - ▶ Improving the controls.
- Test method and standby power standard are:
 - ▶ Performance-based and technology-neutral, and
 - ▶ Accepted by the industry.



Portable Electric Spas

COST EFFECTIVENESS

Life-Cycle Cost and Benefits

Table 3: Unit Energy Savings and Life-Cycle Costs/Benefits

	Design Life (years)	Energy Savings (kWh/year)	Life-Cycle Costs (\$/unit)	Life-Cycle Benefit (\$/unit)
Standard Spas	10	307	\$ 100.34	\$ 569
Exercise Spas	10	1,426	\$ 230.34	\$ 2,645
Combination Spas	10	1,643	\$ 231.51	\$ 3,047
Inflatable Spas	3	1,180	\$100.83	\$ 657



Portable Electric Spas

STATEWIDE ENERGY SAVINGS



Energy Savings

Table 4: Total Statewide Annual Stock Savings

	First-Year Savings (2019)		Complete Stock Turnover Savings (2028)	
Type	Energy Consumption (GWh/yr)	Savings (\$ Million)	Energy Consumption (GWh/yr)	Savings (\$ Million)
Standard Spas	11.7	2.1	137.5	25.5
Exercise Spas	5.3	1.0	62.6	11.6
Combo Spas	1.6	0.3	18.1	3.4
Total	18.6	3.4	218.2	40.5



Energy Savings – Inflatable Spas

Table 5: Total Statewide Annual Stock Savings for Inflatable Spas

Type	First-Year Savings (2019)		Complete Stock Turnover Savings (2021)	
	Energy Consumption (GWh/yr)	Savings (\$ Million)	Energy Consumption (GWh/yr)	Savings (\$ Million)
Inflatable Spas	7.4	1.4	23.8	4.4



California Energy Commission

Battery Charger Systems

-
- Review proposed regulatory language





Marking of Appliances – Section 1607(d)

- 10) Battery Charger Systems. Each state-regulated battery charger system shall be marked with a “BC” inside a circle. The marking shall be legible and permanently affixed to:
- A. the product nameplate that houses the battery charging terminal or;
 - B. the retail packaging and, if included, the cover page of the instructions.



California Energy Commission

Initial Study and Proposed Negative Declaration

for Portable Electric Spas and Battery Charger Systems





Initial Study and Proposed Negative Declaration

- Energy Commission has prepared an initial study to assess the potential significant effects of the proposed regulations on the environment.
- This initial study demonstrates that the proposed energy efficiency regulations for portable electric spas and battery chargers will not have any significant adverse effect on the environment. Therefore, a negative declaration is the appropriate environmental document.
 - ▶ The initial study includes an environmental checklist supporting this finding.

Public Review Period: February 8, 2018 to March 19, 2018
Comments due by 5:00 pm on March 19, 2018



Document Availability

To obtain a copy of the initial study and proposed negative declaration, and all relevant documents to this proceeding, please visit the Energy Commission's website at:

<https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=18-AAER-02>

or

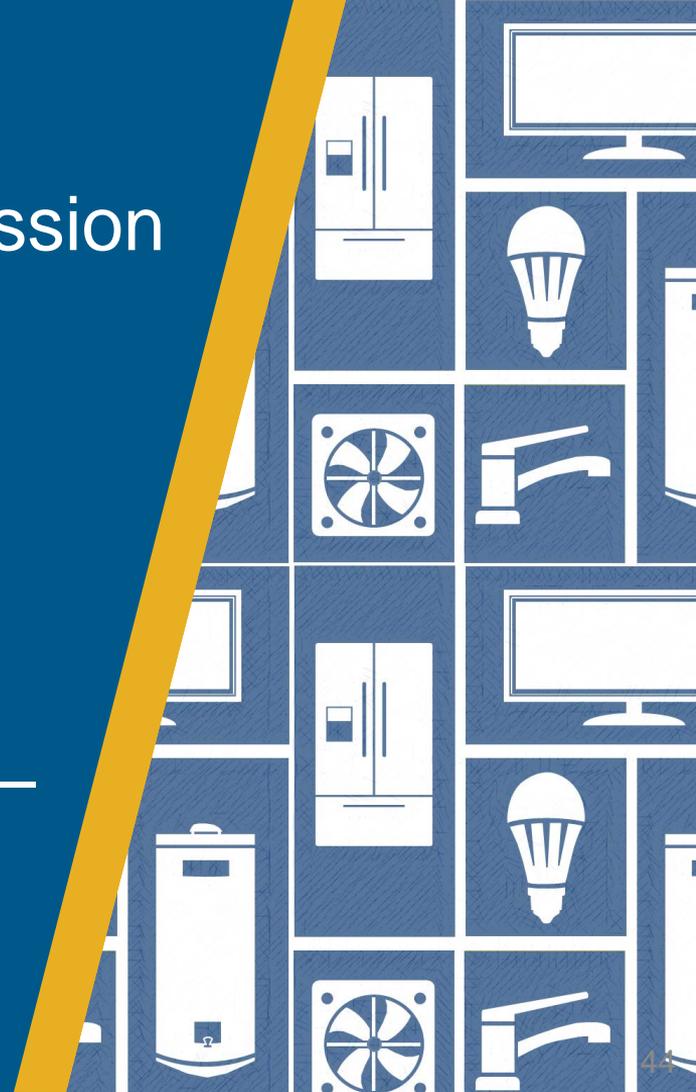
contact Angelica Romo-Ramos at
Angelica.Romo@energy.ca.gov or (916) 654-4147.



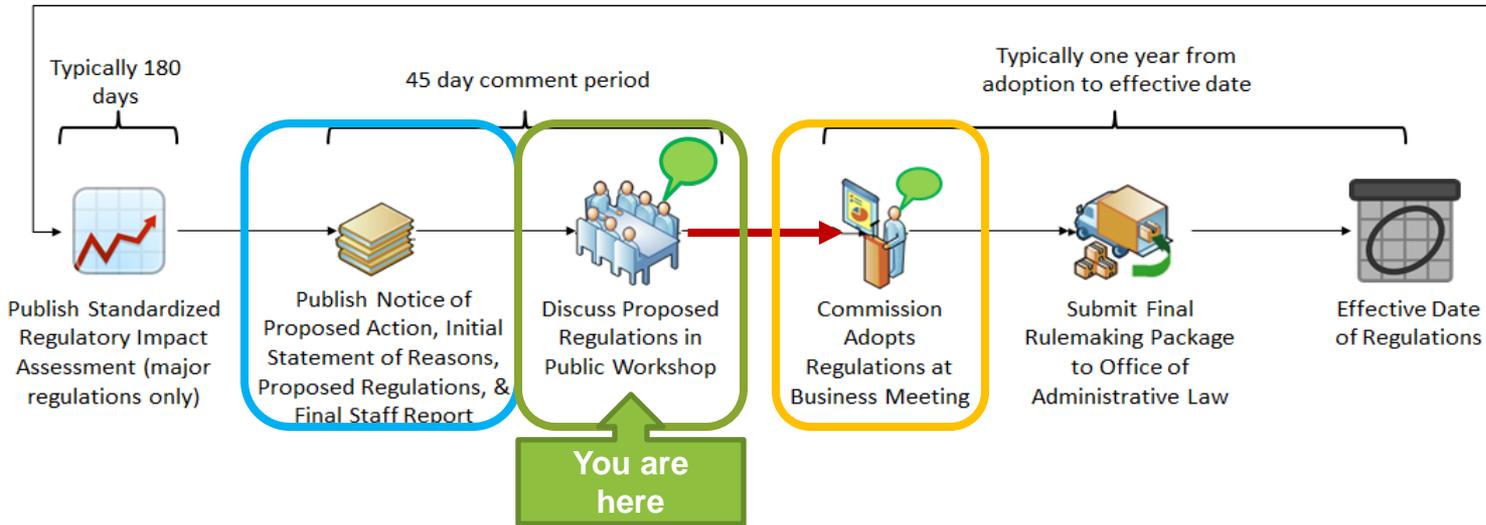
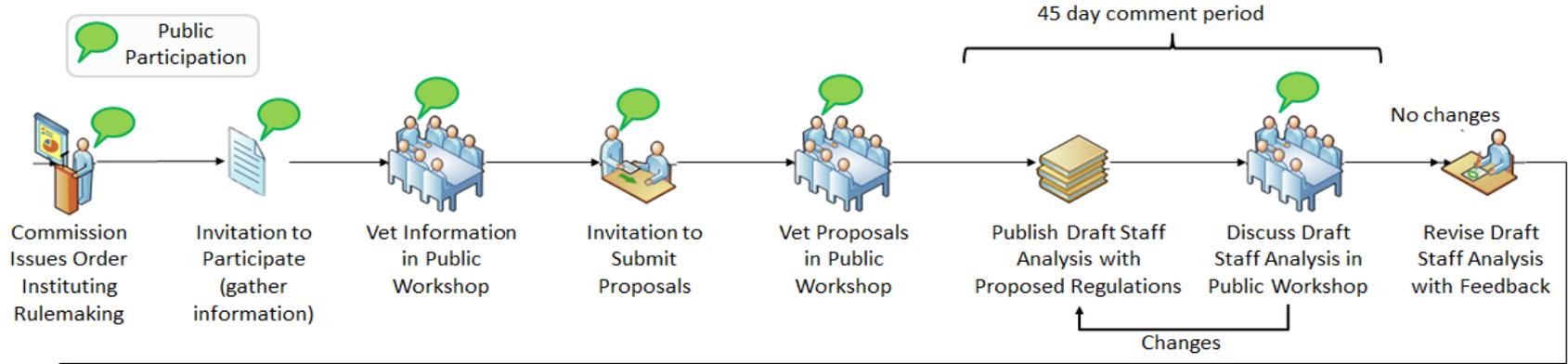
California Energy Commission

Next Steps

-
- Rulemaking Process
 - Document Availability
 - Comments
 - Adoption Hearing



Rulemaking Process





Document Availability

To obtain a copy of all relevant documents to this proceeding, please visit the Energy Commission's website at:

<https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=18-AAER-02>

or contact Angelica Romo-Ramos at Angelica.Romo@energy.ca.gov or (916) 654-4147.

Documents Available Now

Notice of Proposed Action (NOPA)

Express Terms (45-day language)

Initial Statement of Reasons (ISOR)

Final Staff Report

Economic and Fiscal Impact Statement (Standard Form 399)

Initial Study and Proposed Negative Declaration

Presentation Materials



Comments

- **Comments due by 5:00 p.m. on March 19, 2018.**
- **To submit electronically:**
 - ▶ Go to <http://www.energy.ca.gov/appliances/2018-AAER-02/>
 - ▶ Click on “Submit eComment”

- **To send a hard copy:**

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 18-AAER-02
1516 Ninth Street
Sacramento, CA 95814-5512

- **To send a digital copy:** e-mail docket@energy.ca.gov, include docket number 18-AAER-02 and indicate “Portable Electric Spas and Battery Charger Systems” in the subject line.



Adoption Hearing

The date set for the adoption of regulations at a public hearing is as follows:

Commission Business Meeting
April 11, 2018
Beginning 10:00 a.m. (Pacific Time)
California Energy Commission
1516 9th Street
Sacramento, CA 95814
Rosenfeld Hearing Room
(Wheelchair accessible)

Oral comments will be accepted at the public hearing, but may be limited to 3 minutes per speaker. All comments will become part of the public record of this proceeding.



Today's Public Meeting

- Oral comments will be accepted at the public meeting, but may be limited to 10 minutes per speaker.
- Interested parties may comment on the proposed regulations or on the initial study and the proposed negative declaration.
- All comments will become part of the public record of this proceeding.



Thank You!

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Clarifying Questions?

Q&A



Informational Items

1. Section 8.2 states the maximum allowable standby power for swim spas: $P = 5 \times V^2/3$. Data from MAEDBS indicates exercise (swim) spas are capable of meeting a stricter standard, thus staff recommends excluding section 8.2. (see slide 12)
2. Calculation of power consumption to eliminate temperature bias. (see slide 15)