

## *2016 Title 24 Code Change Advocacy*

# Request for Input: Tankless Water Heaters

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April 2014

## Introduction

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The California Investor Owned Utilities (IOUs) are actively supporting the California Energy Commission in updating the California Building Energy Efficiency Standards (Title 24). Their joint intent is to achieve significant energy savings through the development of reasonable, responsible, and cost-effective code change proposals for the 2016 code update and beyond. Through Codes and Standards Enhancement (CASE) Reports, the IOUs will provide the Energy Commission with the technical and cost-effectiveness information required to make informed judgments on proposed standards for promising energy efficiency design practices and technologies. This Request for Input provides an opportunity for stakeholders to help inform the development of these codes change proposals. The IOUs encourage participation in this step of the process through the submission of data— both primary sources and references to existing data, e.g., reports, spreadsheets, etc. Further opportunities to provide feedback regarding these code change proposals will follow this Request for Input.

### How to submit responses

Please submit responses to the questions presented below by Friday, May 16, 2014 to: [info@title24stakeholders.com](mailto:info@title24stakeholders.com).

## Summary of Potential Code Change Proposal

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The Tankless Water Heaters measure proposes to modify the prescriptive requirements for gas domestic hot water systems in newly constructed single-family buildings and multi-family buildings with dedicated water heaters for each dwelling unit. The current prescriptive approach allows the use of either gas storage water heaters or tankless gas water heaters. The proposed measure would modify the language by specifying that the Energy Factor (EF) of the water heater would have to be at least as high as the minimum federal EF for tankless gas water heaters which will become effective on April 16, 2015.<sup>1</sup> Buildings using the performance approach to comply with the new standards could deploy a number of strategies to achieve the energy budget for water heating, including installing a high-efficiency condensing gas storage water heater.

Since tankless gas water heaters have higher EF ratings than storage-type water heaters<sup>2</sup> and water heating typically accounts for the largest share of energy usage in a California home, the proposed prescriptive requirement is anticipated to garner significant energy savings for California.

This measure builds upon the high-efficiency water heater (HEWH) ready measure that was adopted into the 2013 Title 24 standards. The HEWH standards requires domestic water heating systems in new

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<sup>1</sup>  $EF = 0.82 - (0.0019 * V_s)$ ;  $V_s$ : rated storage volume (in gallons)

<sup>2</sup> The U.S. Department of Energy estimates that tankless gas water heaters can be up to 24 –34 percent more energy efficient than conventional storage tank water heaters.

residential construction (single family and multi-family buildings with dedicated water heaters in individual dwelling units) to be designed to accommodate condensing gas storage and tankless gas water heaters. By the time the 2016 Title 24 standards take effect in 2017, builders will be accustomed to designing for higher-efficiency water heaters. High-efficiency water heaters have also been proven to be cost-effective in all climate zones across California.

The IOU CASE Team is seeking feedback on the feasibility of revising the prescriptive requirements for domestic hot water heating systems in single-family buildings and multi-family buildings with dedicated water heating units for each individual dwelling unit. In particular, feedback is desired on current construction practice, on relative costs of techniques, and on design issues of advanced construction assemblies, if any, not directly related to cost.

## Questions for Interested Parties

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The IOU CASE Team is seeking input on the case proposal in general, and open-ended comments and feedback are welcome. In addition, the IOU CASE Team is requesting feedback on the specific questions listed below. Answers to these questions will inform the cost-effectiveness analysis, energy savings estimates, environmental impacts, and market impacts that will be presented in the CASE Reports.

### Tell us about yourself:

Please check all that apply to your current job description:

Home Builder  General Contractor  Plumber  Manufacturer or Representative

Building Inspector  Compliance Documentation Author

Other (Please describe) \_\_\_\_\_

What fraction of your business serves the California residential market? \_\_\_\_\_

1. Do you find any of the 2013 Title 24 high-efficiency water heater ready requirements difficult to comply with, please explain why? The requirements are that gas or propane water heating systems serving individual dwelling units shall include the following components:
  - A. A 120V electrical receptacle that is within 3 feet from the water heater and accessible to the water heater with no obstructions; and
  - B. A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; and
  - C. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and
  - D. A gas supply line with a capacity of at least 200,000 Btu/hr.
2. How often do you install a water heater that exceeds the current minimum federal efficiency level of EF 0.62 (gas tankless water heater) or 0.67 (gas storage water heater with a capacity between 20 gallons and 100 gallons)? What EF level do you install?
3. How often do you find tankless gas water heaters installed, expressed in percent of buildings?

4. How frequently do you specify tankless gas water heaters in domestic hot water systems (single-family and/or multi-family buildings), expressed in percent of dwellings?
5. What type of water heating system do you typically specify (or see) for new multi-family buildings with 3-10 units (e.g., centralized water heating systems, dedicated water heater for each unit, other)?
6. What type of water heating system do you typically specify (or see) for new multi-family buildings with 10-30 units (e.g., centralized water heating systems, dedicated water heater for each unit, other)?
7. What type of water heating system design do you typically specify (or see) for new multi-family buildings with over 30 units (e.g., centralized water heating systems, dedicated water heater for each unit, other)?
8. What type of water heating system do you typically specify (or see) for new multi-family buildings with four stories or more?
9. Do you specify or find condensing storage water heaters in new single family or multi-family new construction? If so, what applications use them?
10. What is the installed cost differential between a minimum efficiency storage gas water heater and a tankless non-condensing water heater (in percent and dollars)?
11. In the past one to two years, has the installed cost of gas tankless water heaters (both condensing and non-condensing) increased, decreased, or remained more or less the same?
12. How do you expect the installed cost of gas tankless water heaters (both condensing and non-condensing) to change between now and January 2017?
13. How does water heater performance change over time? Is there a difference between minimum efficiency and high-efficiency? Please any provide data you have on all types of high-efficiency water heaters (condensing and non-condensing tankless, condensing and non-condensing storage).
14. What maintenance is needed for tankless water heaters and how much does it cost? How does this differ from the maintenance needs and costs for storage water heaters?
15. The Department of Energy (DOE) has determined that the average life span of a tankless gas water heater is 20 years. To your knowledge, is this a reasonable estimate? Can you provide evidence to support your claim if it differs significantly from DOE's approximation?
16. We are seeking examples of multi-family buildings with centralized water heating systems that have used tankless gas water heaters on a manifold system. Information of interest includes design details, design challenges, performance data, and installed costs.
17. What is the ratio of multi-family buildings with a dedicated water heater for each unit versus multi-family building with a centralized domestic hot water system?