DOCKETED	
Docket Number:	26-AAER-01
Project Title:	Commercial Dishwashers
TN #:	269482
Document Title:	CEC Workshop Presentation for Commercial Dishwashers
Description:	Presentation for the commercial dishwashers workshop.
Filer:	Alex Galdamez
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	4/15/2026 7:22:39 AM
Docketed Date:	4/15/2026

Commercial Dishwashers

Staff Workshop on Proposed Appliance Efficiency Standards

April 15, 2026

10:00 AM to 12:00 PM PST

Agenda

Time	Topic	Presenter
10:00 am	Welcome	David Johnson, Supervisor
10:05 am	Opening Remarks	Andrew McAllister, Commissioner
10:15 am	Logistics	David Johnson, Supervisor
10:20 am	Overview of Proposed Standards	Alejandro Galdamez, Project Lead
11:00 am	Discussion and comments	Alejandro Galdamez, Project Lead
12:00 pm	Adjourn	

Opening Remarks

J. Andrew McAllister, Ph.D.

Commissioner

California Energy Commission

Logistics

Commercial Dishwashers Workshop

David U. Johnson, Ph.D.

Wednesday, April 15, 2026

Workshop Guidelines

- All lines are muted
- Comments will be taken at the end of the presentation
- General or clarifying questions can be typed into the Q&A section
- To comment – raise hand to speak
  - Online: Raise your hand, host will give you the ability to speak, then caller must push unmute
  - Phone: Raise your hand by pushing *9, host will give you the ability to speak, then caller must push *6 to mute and unmute
- This workshop will be recorded
- State your name and affiliation when speaking

Overview of Staff's Analysis of Proposed Efficiency Standards for Commercial Dishwashers

Alejandro Galdamez, P.E. Mechanical Engineer

Wednesday, April 15, 2026

Commercial Dishwashers

Rulemaking History

Order Instituting Rulemaking
08/10/2023

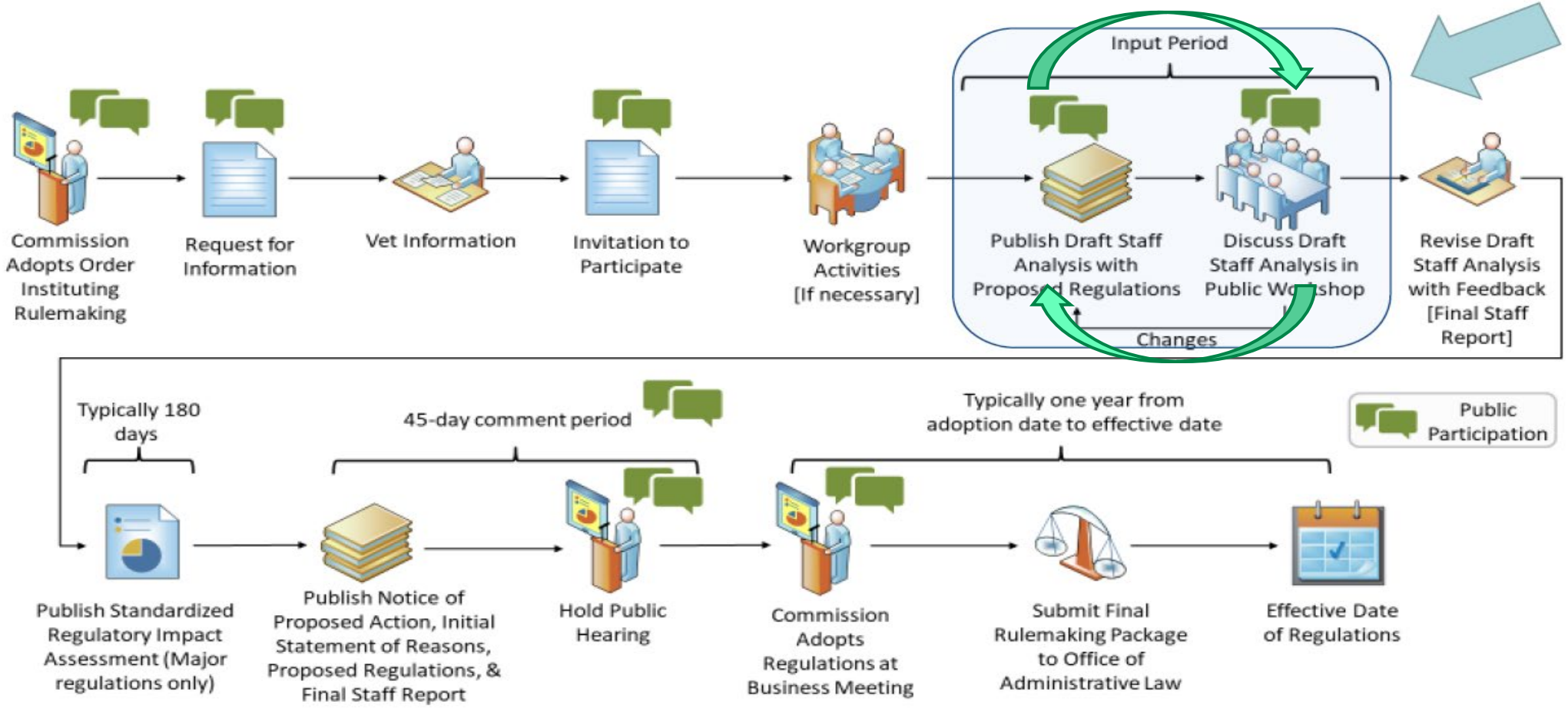
Request for Information & Proposals
11/14/2023

Draft Staff Report
03/09/2026

Workshop
04/15/2026

Commercial Dishwashers

Current Status in Rulemaking Process



Overview of Proposed Standards

Scope

Commercial Dishwashers

Commercial Dishwashers

Types

Stationary Rack Machines

Undercounter (UC)

Undercounter Glasswasher (GWW)

Door Type and Pot, Pan, Utensil Washers (UR, PPU)

Conveyor Machines

Single and Multiple Tank Conveyor (CST, CMT)

Flight Type (FST, FMT)

Commercial Dishwashers

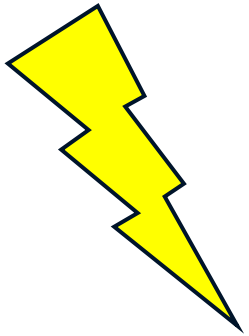
Definition Undercounter Glasswasher

- Undercounter Commercial Glasswasher means an undercounter commercial dishwasher specifically designed to clean and sanitize glass only.

- Please review all proposed definitions in section 1602 in Appendix B.

Commercial Dishwashers

Scope Comparison

Energy Star:	California Energy Commission:
	
Electrical Units	**Electrical, Natural Gas, and Steam Units**

Commercial Dishwashers

Classifications

Electric/NG/Steam

High Temp.

> 180 °F

Low Temp.

140 °F - 180 °F

Commercial Dishwashers

Proposed Test Procedures

- Stationary Rack Commercial Dishwashers:
  - ASTM F1696-20, Standard Test Method for Energy Performance of Stationary-Rack, Door-type Commercial Dishwashing Machines

- Conveyor Commercial Dishwashers:
  - ASTM F1920-20, Standard Test Method for Energy Performance of Rack Conveyor Commercial Dishwashing Machines

Commercial Dishwashers

Standards High Temperature (Energy Star V3.0)

Type	Idle Energy	Washing Energy	Water Consumption
Under Counter and Under Counter Commercial Glasswashers	≤ 0.30 kW	≤ 0.35 kWh/rack	≤ 0.86 GPR
Door Type	≤ 0.55 kW	≤ 0.35 kWh/rack	≤ 0.89 GPR
Pot, Pan, and Utensil (PPU)[2]	≤ 0.90 kW	≤ 0.55 + 0.05 X SFR	≤ 0.58 GPSF
Single Tank Conveyor	≤ 1.20 kW	≤ 0.36 kWh/rack	≤ 0.70 GPR
Multiple Tank Conveyor	≤ 1.85 kW	≤ 0.36 kWh/rack	≤ 0.54 GPR
Single Tank Flight Type	Report	Report	GPH ≤ 2.975x + 55.00
Multiple Tank Flight Type	Report	Report	GPH ≤ 4.96x + 17.00

Commercial Dishwashers

Standards Low Temperature (Energy Star V3.0)

Type	Idle Energy	Washing Energy	Water Consumption
Under Counter and Under Counter Commercial Glasswashers	≤ 0.25 kW	≤ 0.15 kWh/rack	≤ 1.19 GPR
Door Type	≤ 0.30 kW	≤ 0.15 kWh/rack	≤ 1.18 GPR
Single Tank Conveyor	≤ 0.85 kW	≤ 0.16 kWh/rack	≤ 0.79 GPR
Multiple Tank Conveyor	≤ 1.00 kW	≤ 0.22 kWh/rack	≤ 0.54 GPR

Commercial Dishwashers

Certification

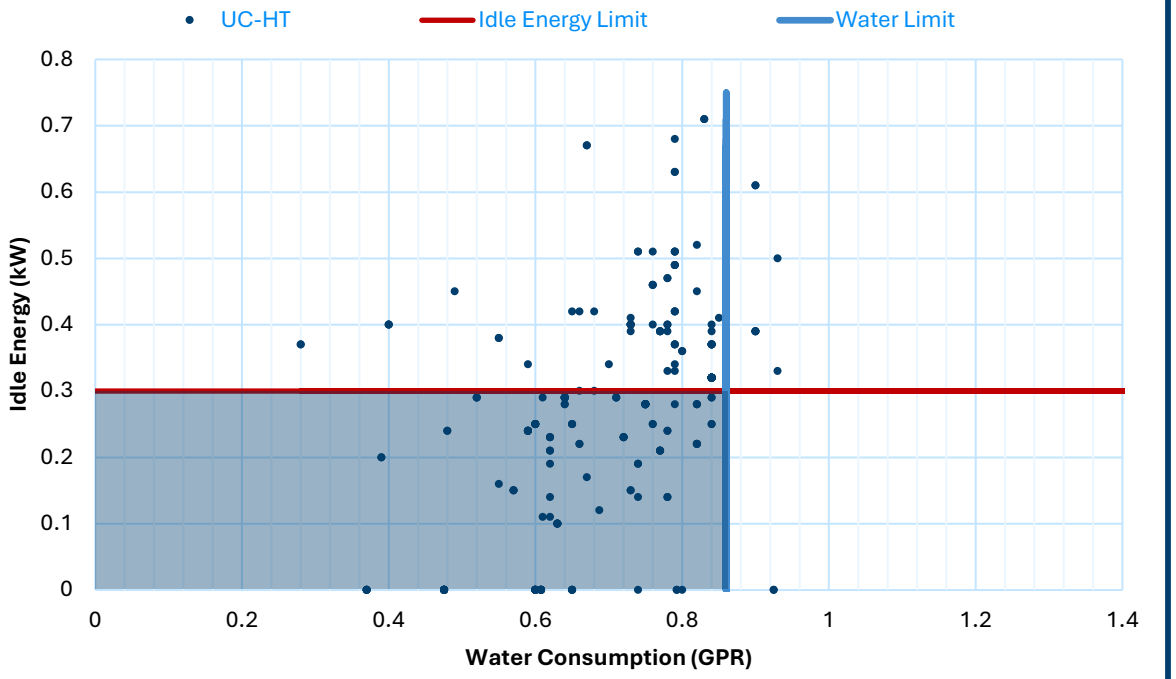
- Information needed for certification:
  - Idle Energy
  - Washing Energy
  - Water Consumption
  - Heat recovery
    - Percent cold water
    - Percent hot water
    - Primary Hot water Energy Offset

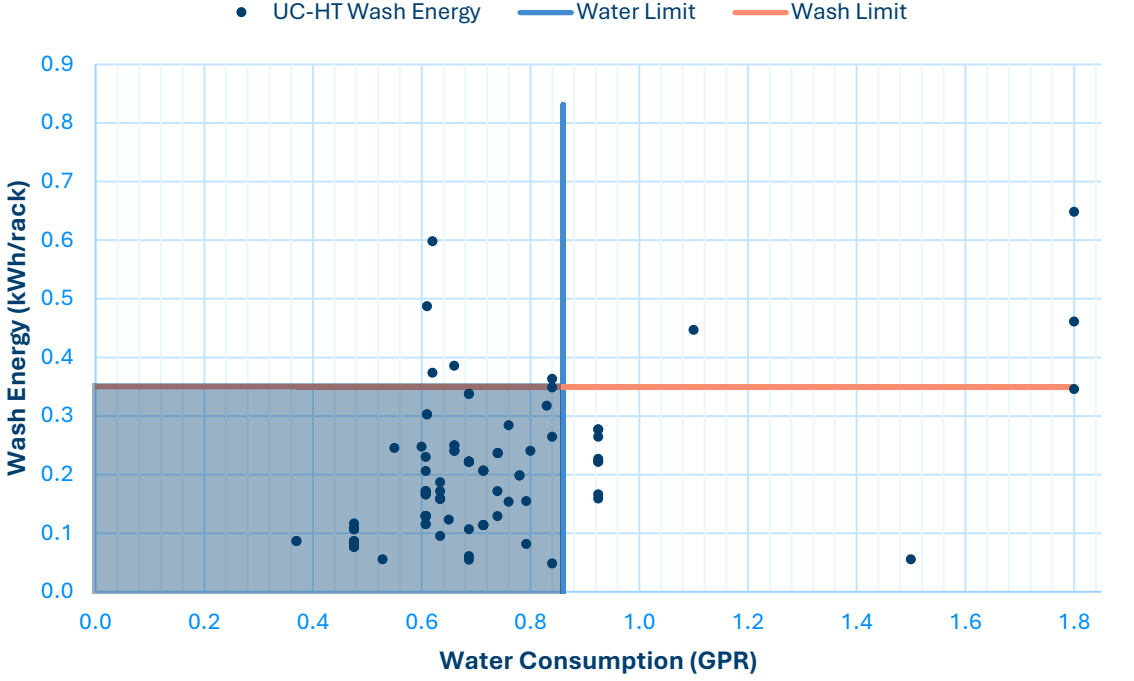
Market Availability and Feasibility

Commercial Dishwashers

Commercial Dishwashers

Market Availability





Commercial Dishwashers

Feasibility

- The proposed test procedures are currently being used by industry to certify for Energy Star.
- The test procedure includes the testing of natural gas (fossil gas), steam, and electrical machines.
- Current Energy Star certified models already comply and exceed the proposed standards.

Statewide Savings and Cost Effectiveness

Commercial Dishwashers

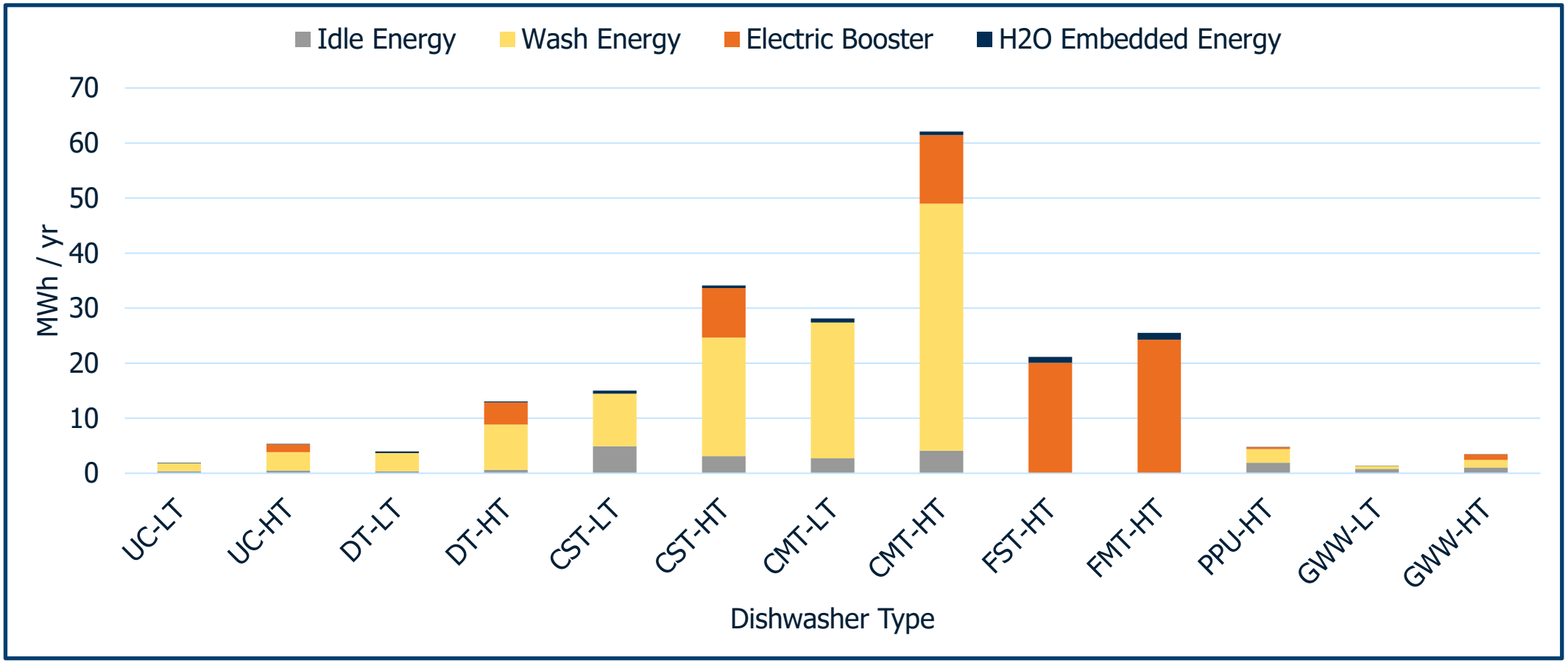
Commercial Dishwashers

Assumptions

- Thermal efficiency for water heaters and the booster of commercial dishwashers was assumed to be 95%.
- Hours of operations of facilities that use different types of commercial dishwashers.
- Washing water temperature: 140 ºF.
- Fossil gas and steam units only 25% of shipments.
- Performance of units based on downloaded specification sheets.
- Please review calculations and assumptions discussed in Appendix A.

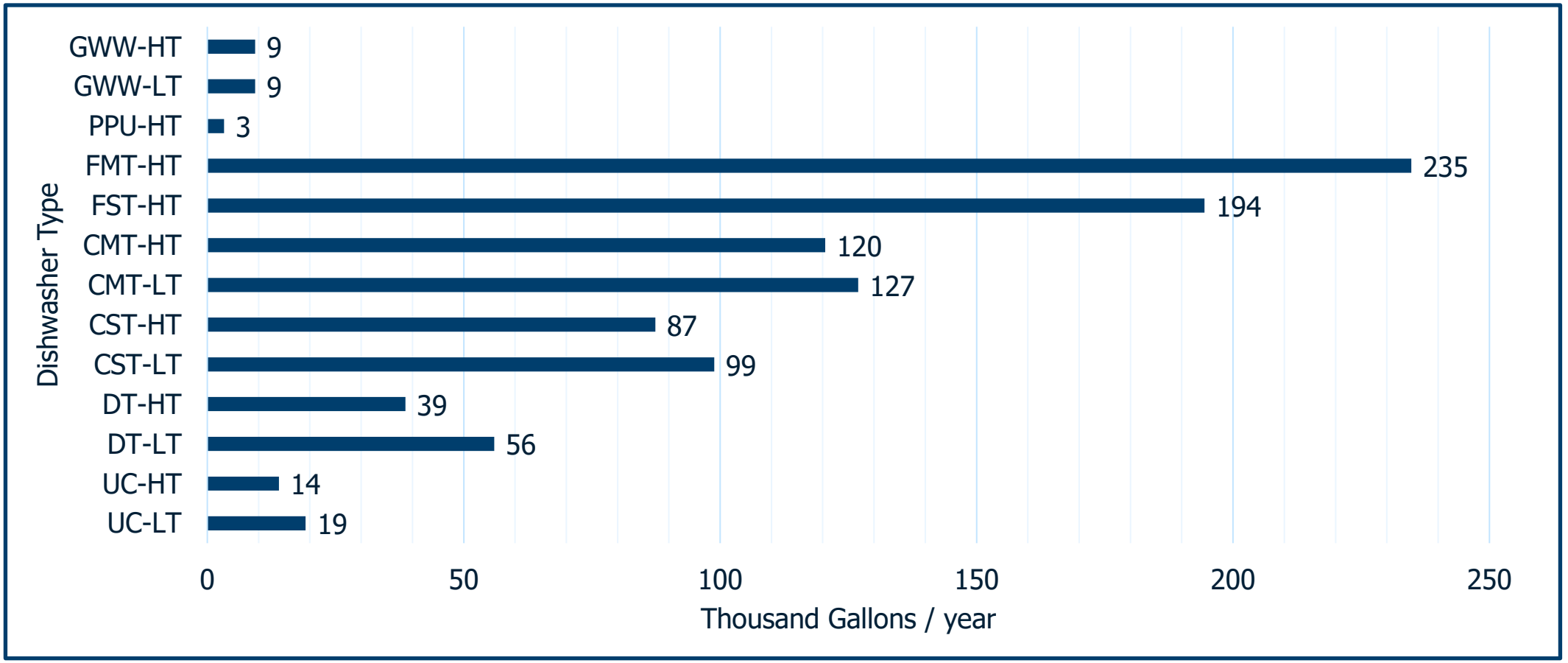
Unit Savings

Unit Average Electricity Savings



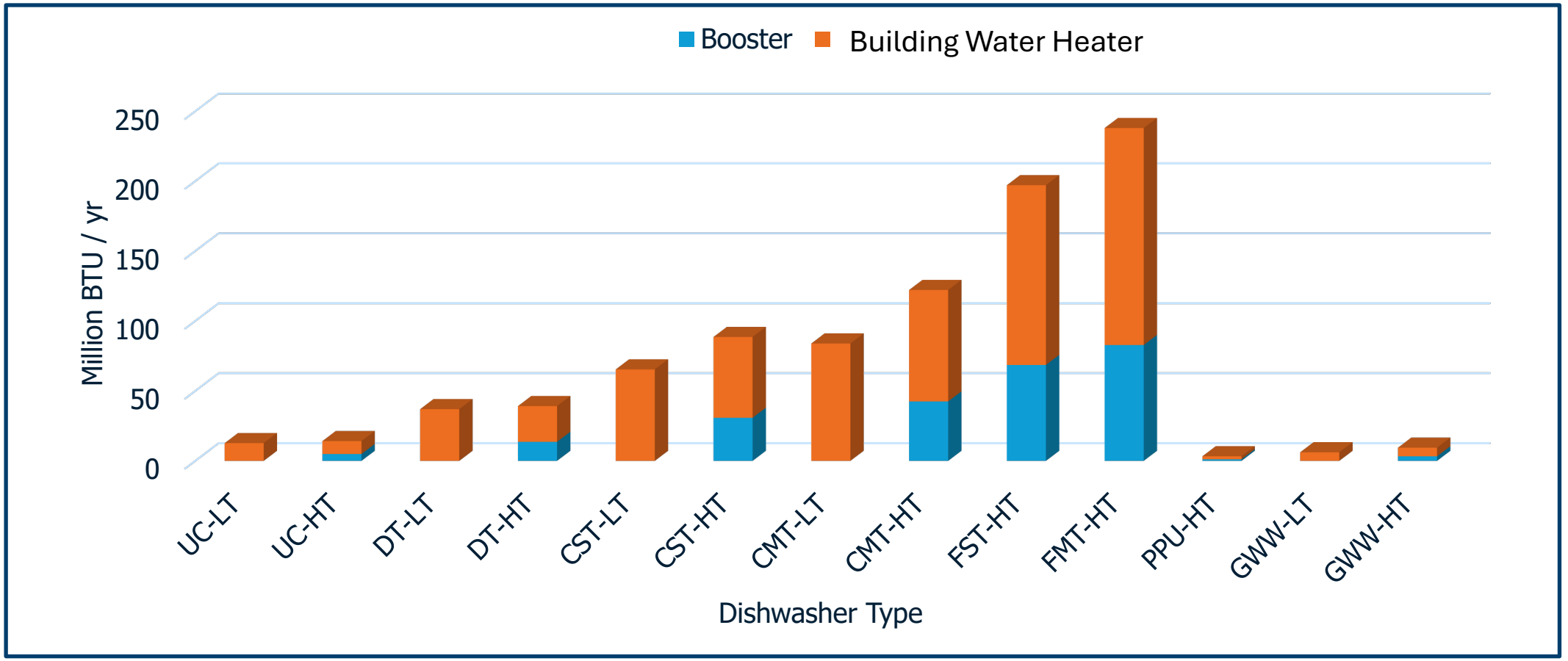
Unit Savings

Unit Average Water Savings



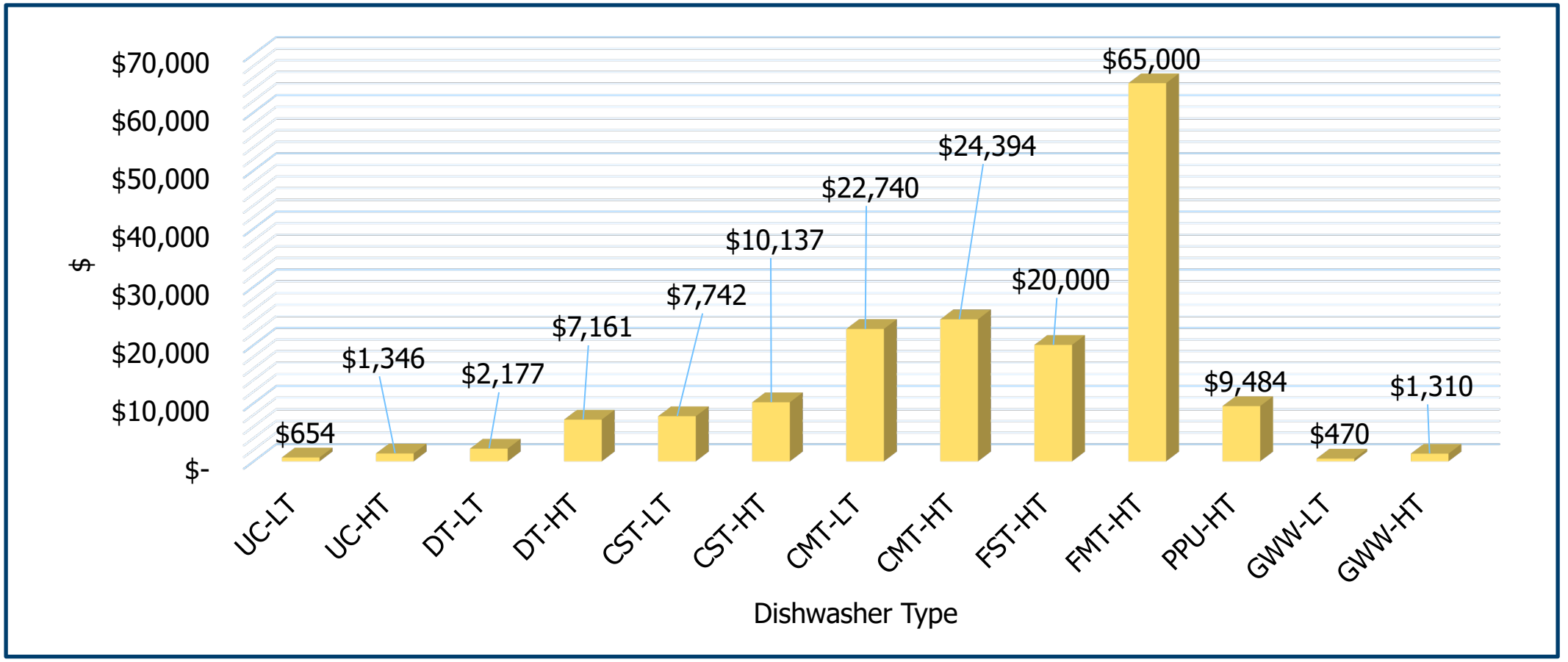
Unit Savings

Unit Average Natural Gas Savings



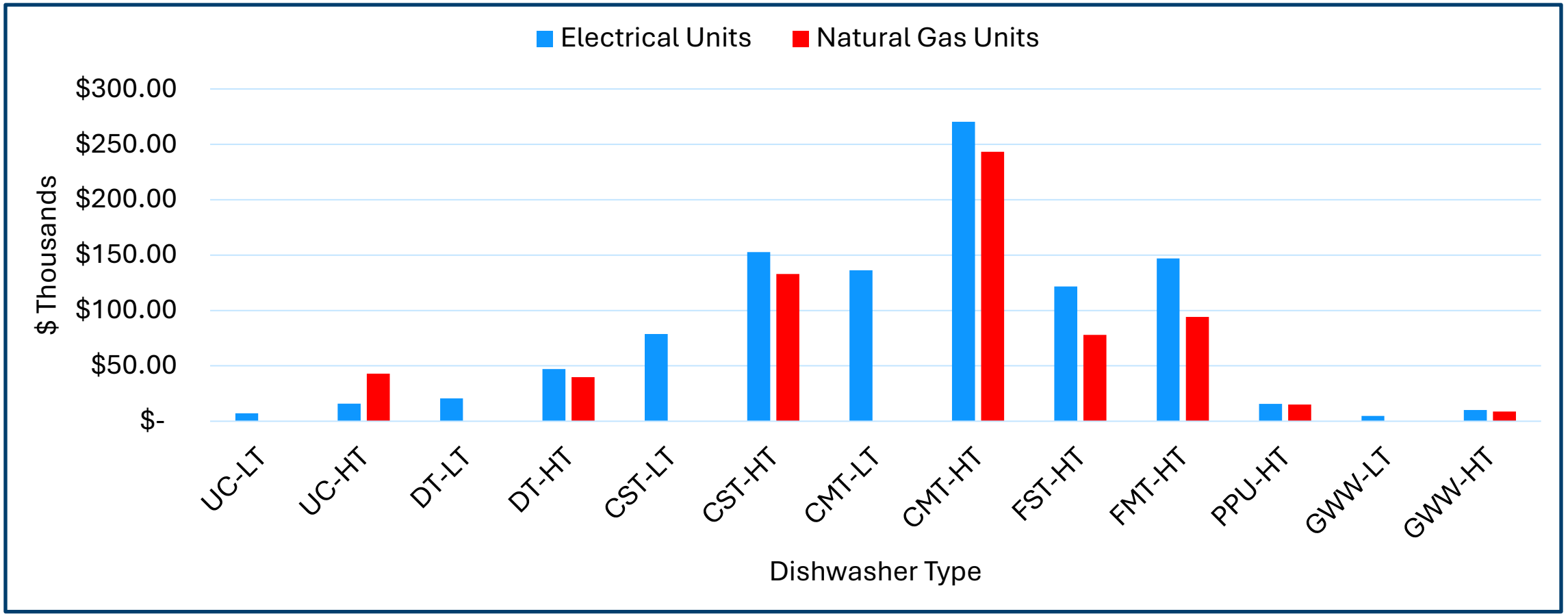
Cost Effectiveness

Incremental Cost



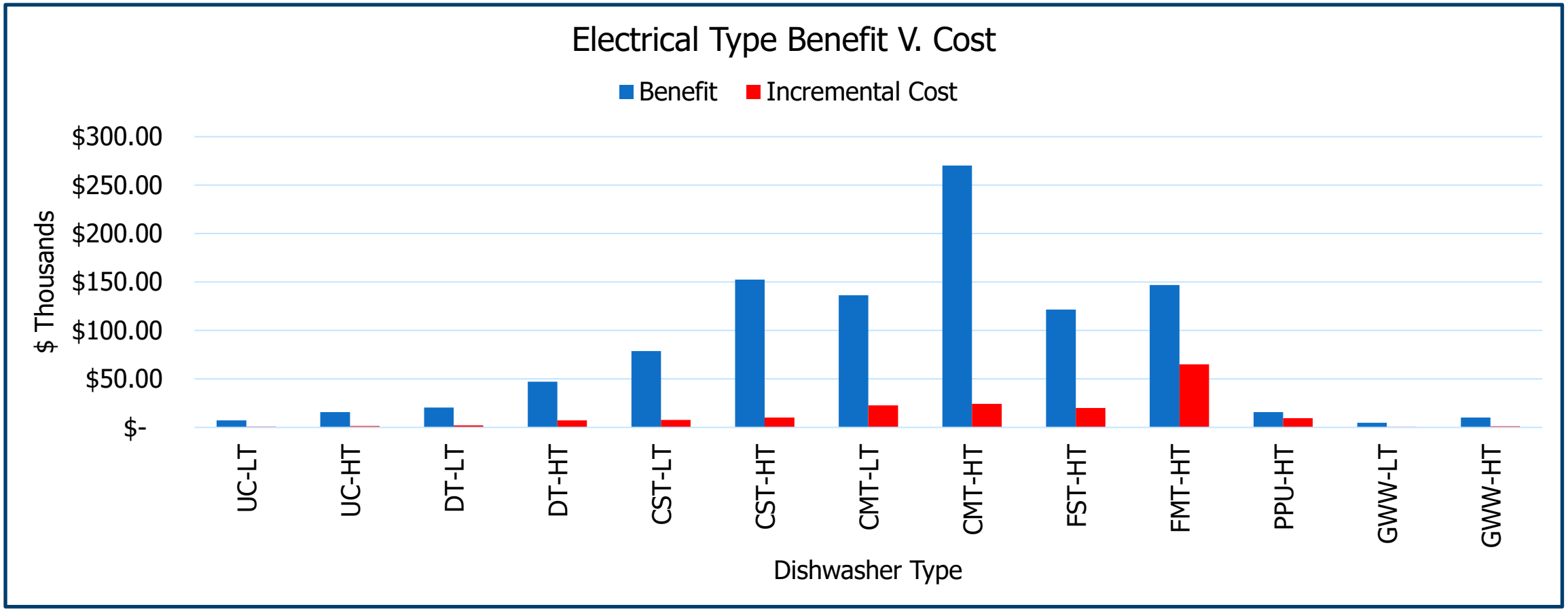
Cost Effectiveness

Lifetime Benefit at 3%



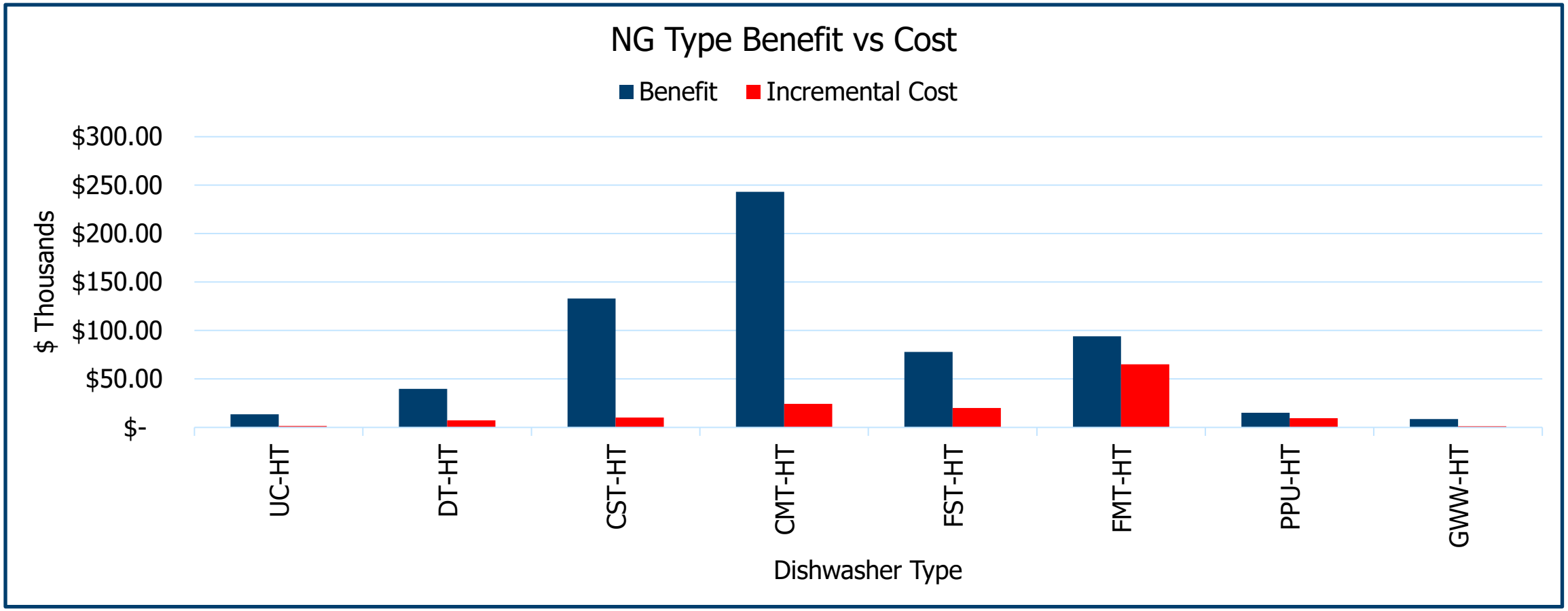
Cost Effectiveness

Net Benefit part 1



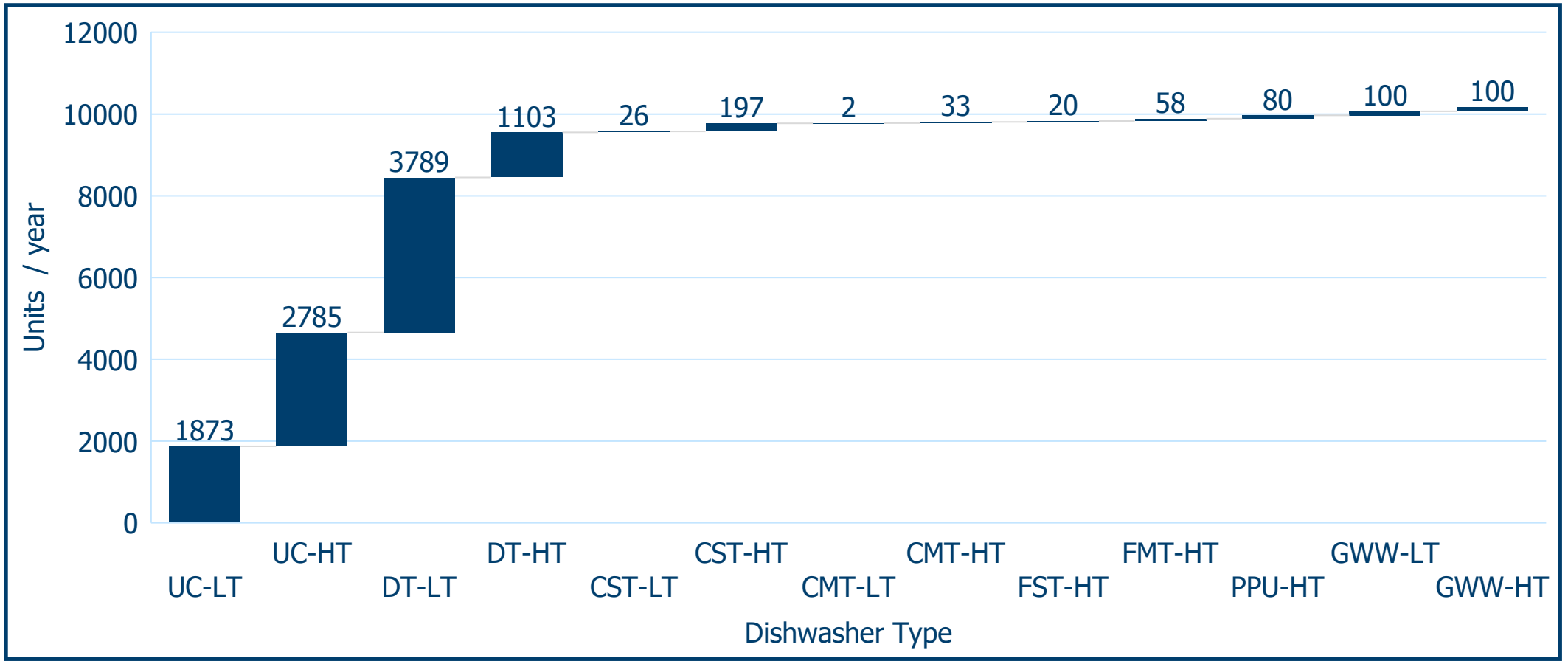
Cost Effectiveness

Net Benefit part 2



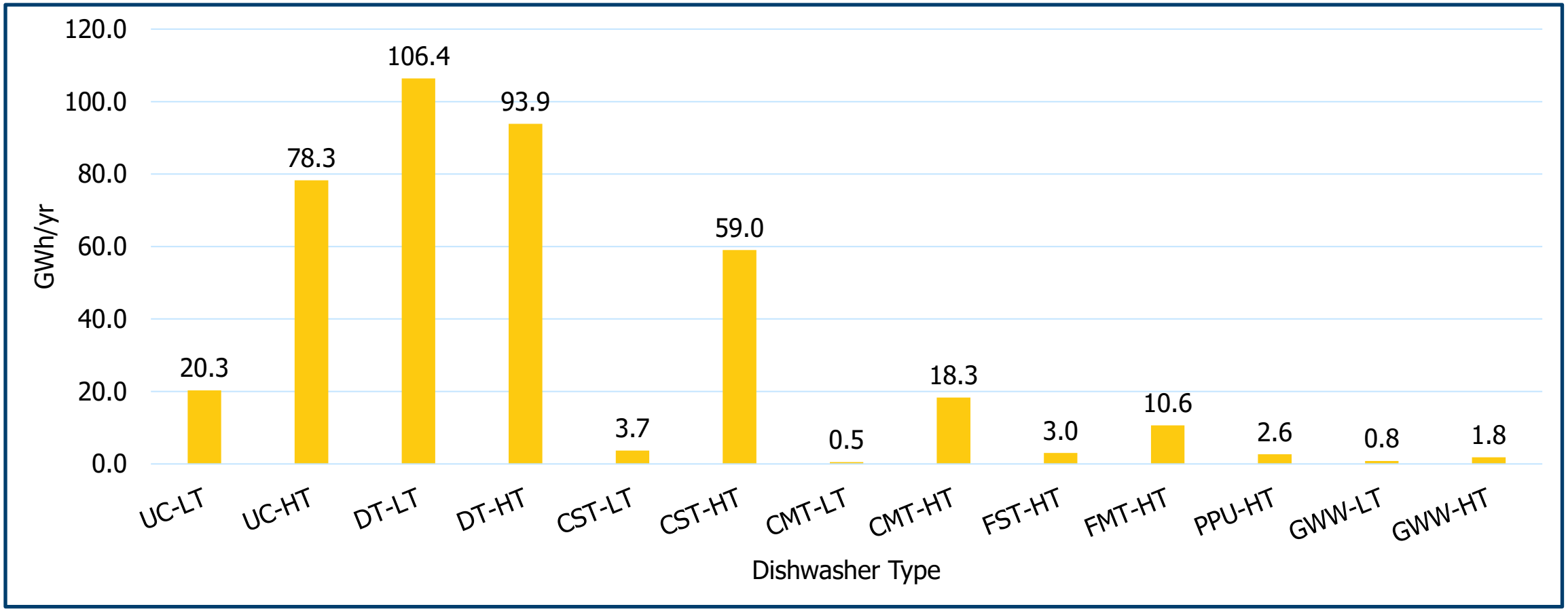
Statewide Savings

Shipments per year



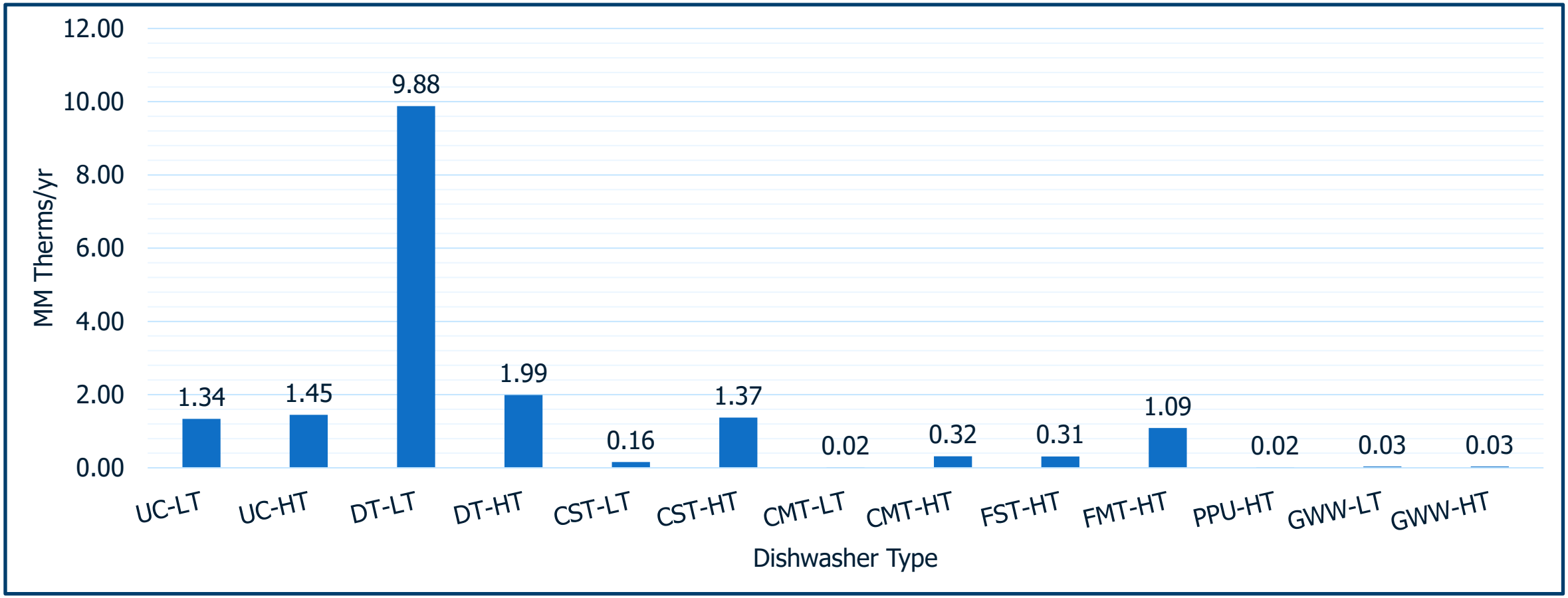
Statewide Savings

Electrical Savings (Full Stock Turnover)



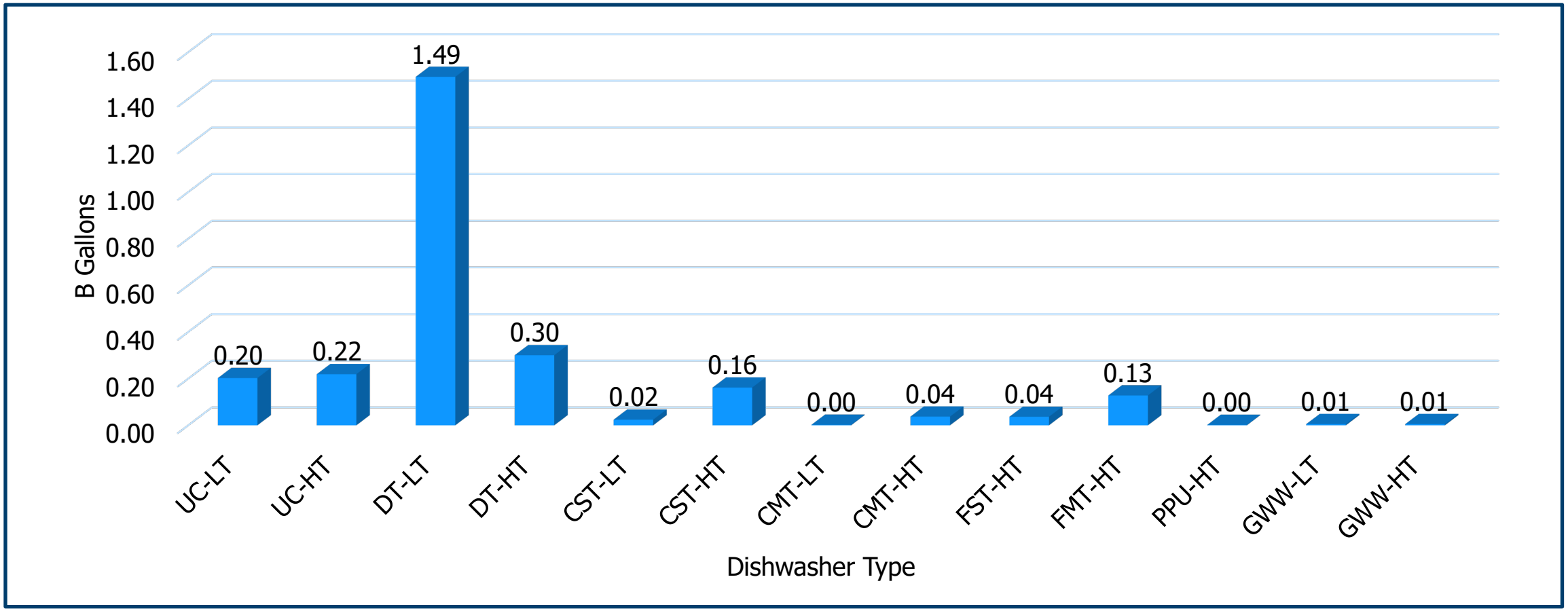
Statewide Savings

Natural Gas Savings (Full Stock Turnover)



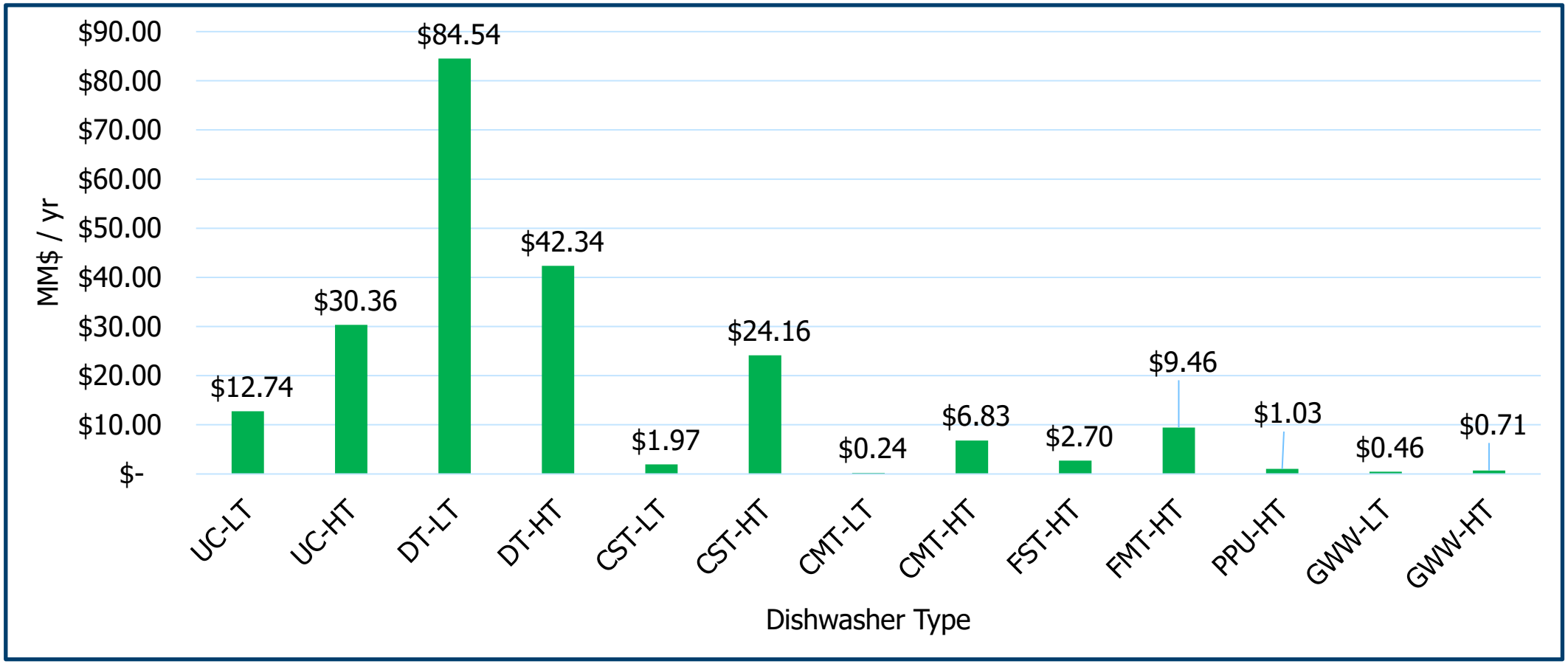
Statewide Savings

Water Savings (Full Stock Turnover)



Statewide Savings

Monetary Savings at Full Stock Turnover



Statewide Savings

Full Stock Turnover Savings

Electricity (GWh/yr)	Fossil Gas (MM Therms/yr)	Water (B Gallons/yr)	Capital (MM$)	Benefit Cost Ratio
399.2	18.01	2.6	217.5	1.4 - 15.1

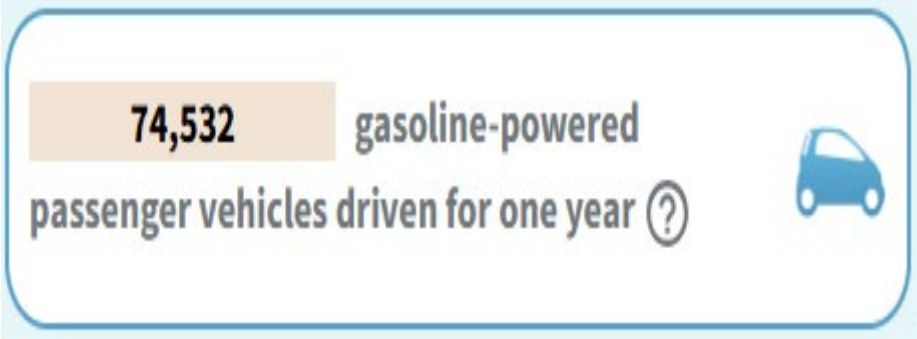
Environmental Benefits

Commercial Dishwashers

Environmental

Emissions Reduction Electricity Generation

- Prevented emissions from Electric Generation and water heating:
  - Carbon Dioxide: 289,000 Metric Tons
  - Nitrogen Oxides (NO_x): 115 Metric Tons
  - Methane (CH_4): 1.95 Metric Tons



Next Steps

Commercial Dishwashers

Commercial Dishwashers

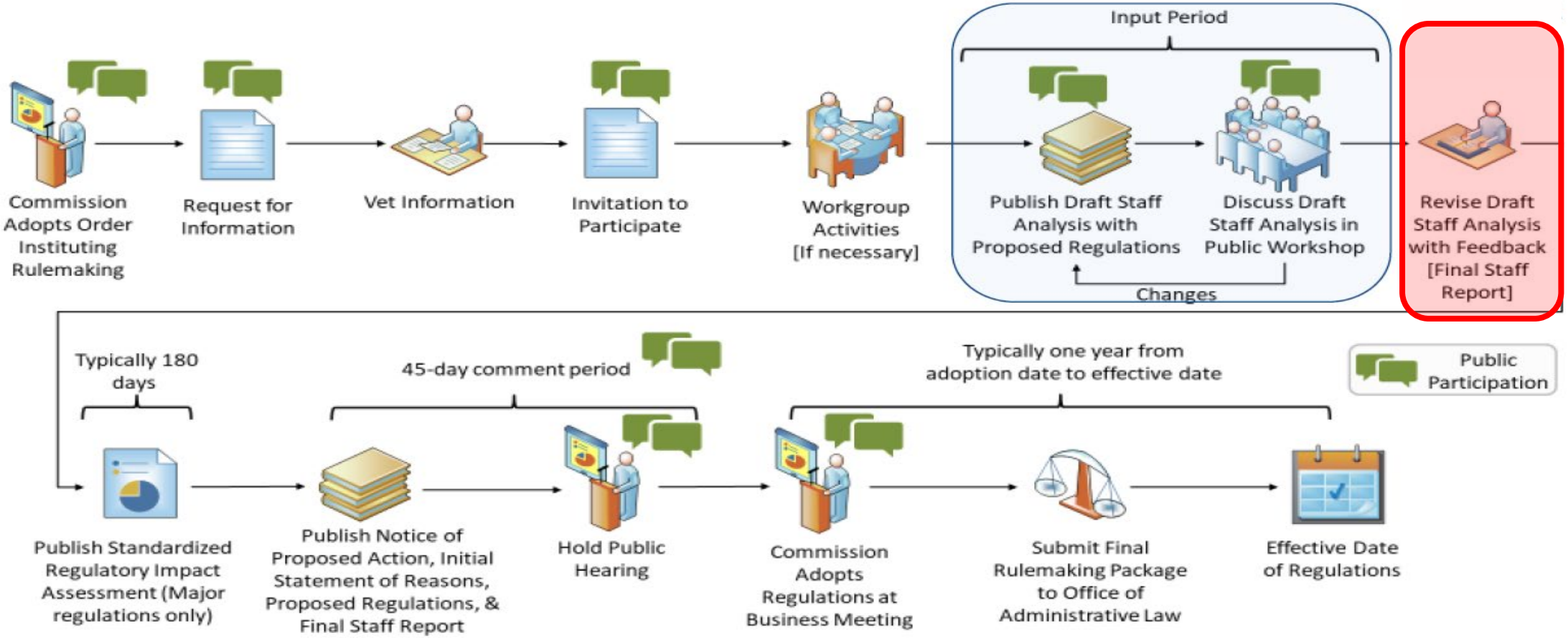
Written and Oral comments

- Comments are due by 5:00 pm on May 12, 2026
- Oral comments will be accepted at the end of the workshop today
- To submit electronically go to:
  - https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=26-AAER-01
- To send a digital copy, email to: docket@energy.ca.gov with docket number 26-AAER-01 and "Rulemaking on Appliance Efficiency Regulations for Commercial Dishwashers" in the subject line
- To send a hard copy, mail to:

  California energy Commission
  Docket Unit, MS-4
  Docket No. 26-AAER-01
  715 P Street
  Sacramento, California 95814

Commercial Dishwashers

Next Process Step



Public Comments

Commercial Dishwashers

Public Comments

Commenting Guidelines

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Thank you

Alejandro Galdamez (Alejandro.Galdamez@energy.ca.gov)

Appliance Office (appliances@energy.ca.gov)