



Technical Report
NREL/TP-5400-60796
November 2013

Stationary Fuel Cell System Composite Data Products

Data through Quarter 2 of 2013

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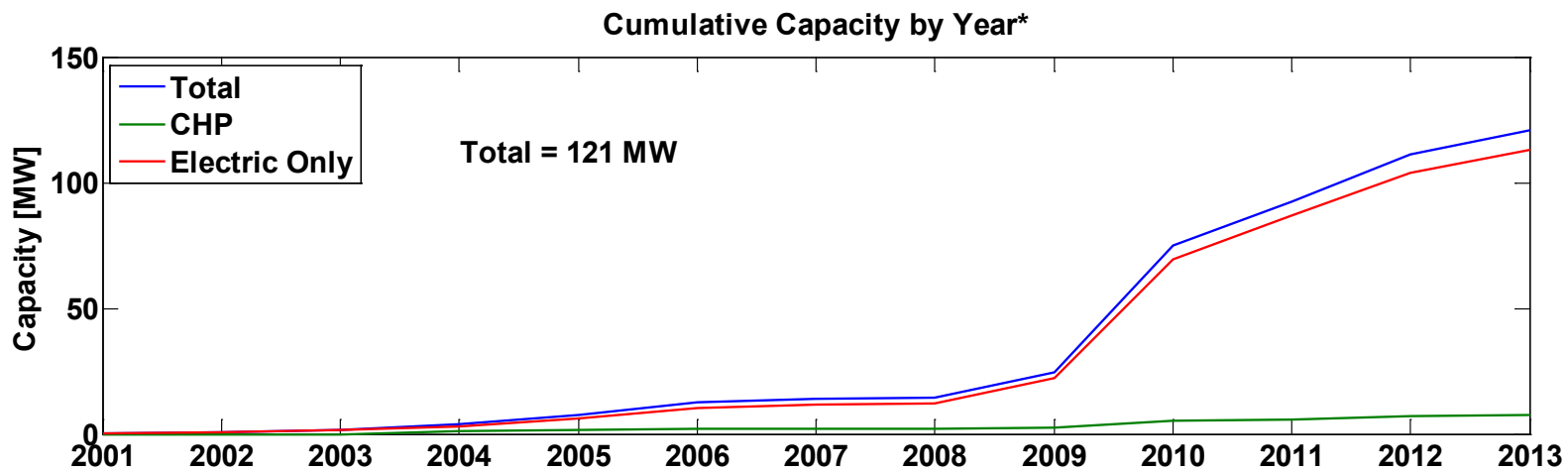
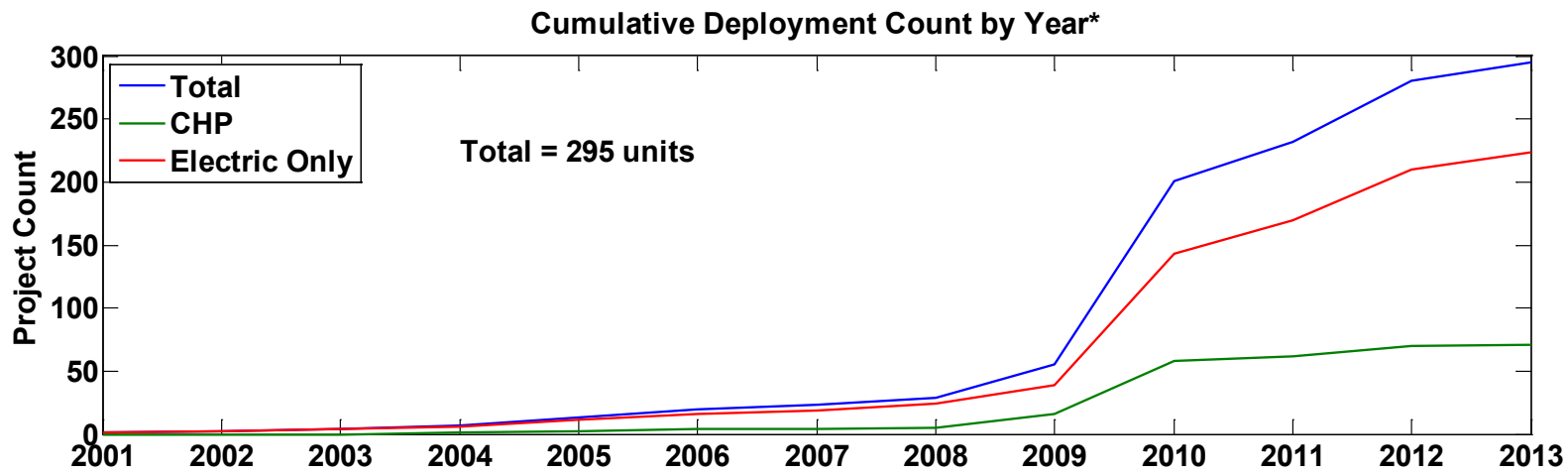
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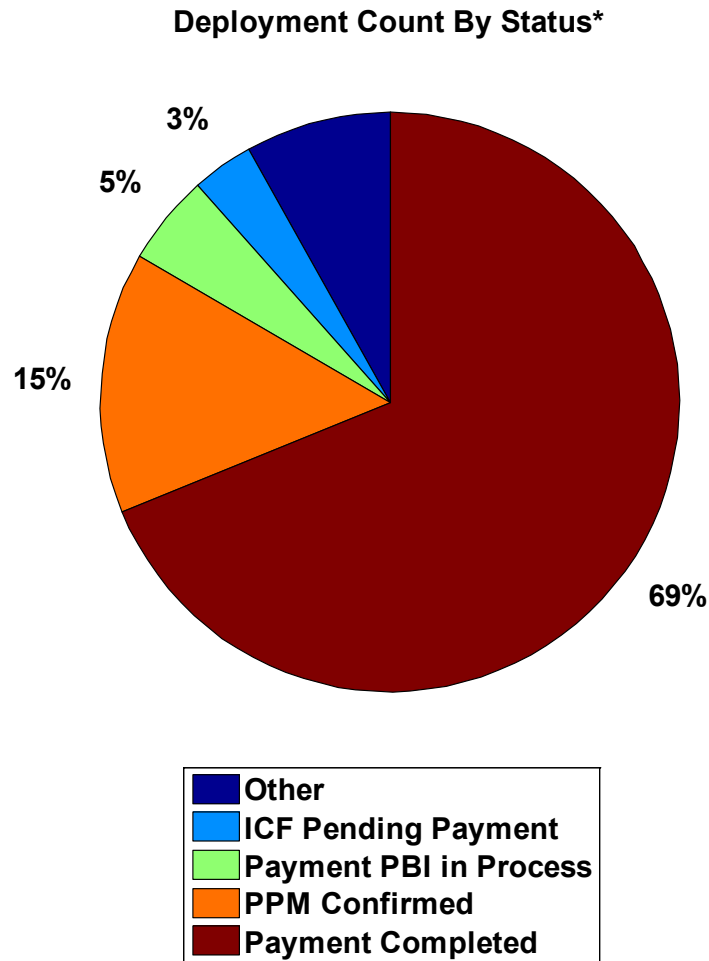


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Fuel Cell Stationary Systems Deployed by Year



Stationary Fuel Cell System Count by Status

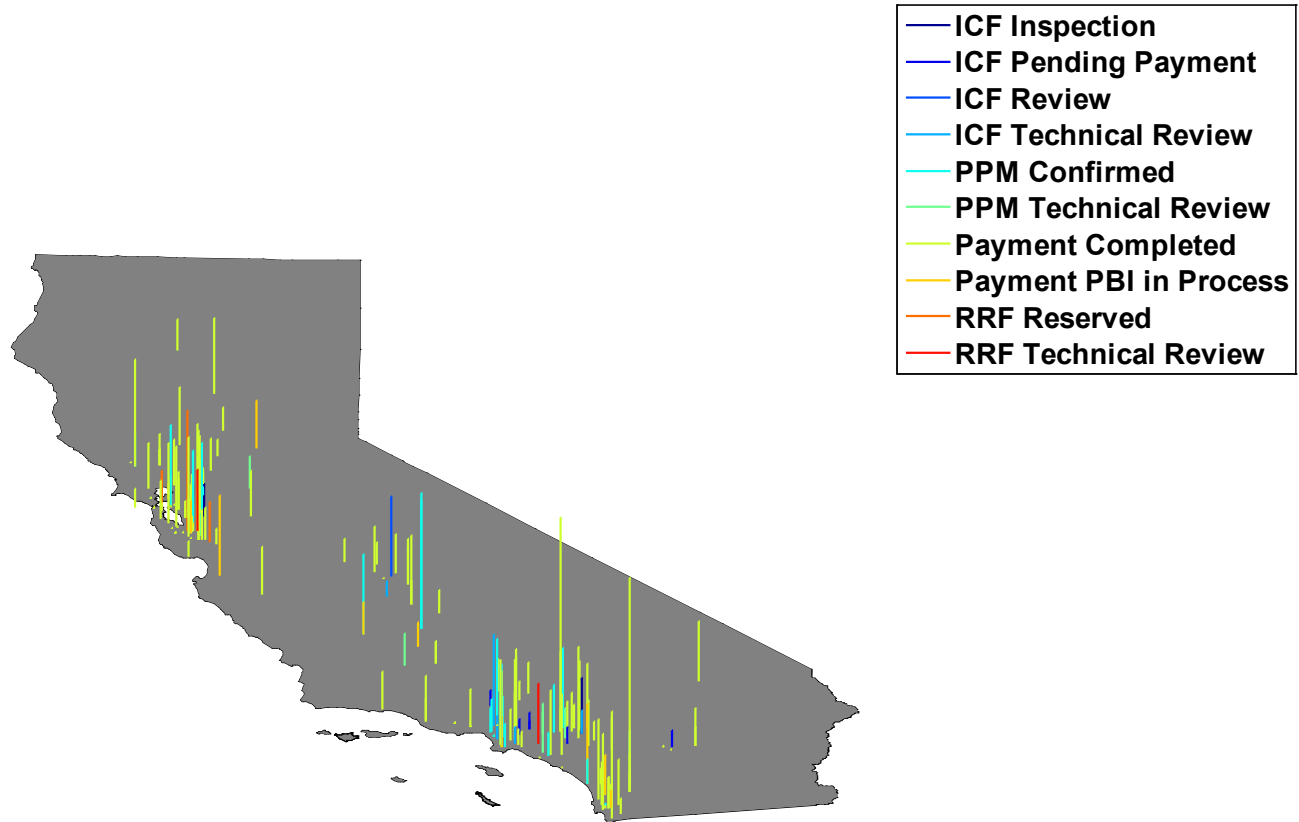


Definitions: RRF = Reservation Request Form, is the first step in the SGIP incentive claim process.
PPM = Proof of Project Milestone; the applicant must prove progress and commitment to the project.
ICF = Incentive Claim Form is the step where the applicant, after meeting all SGIP requirements requests payment of the incentive.
PBI = Performance Based Incentive is the way in which the incentive is paid out over time based on performance of the system.

*Data from the California SGIP.

Location of Stationary Fuel Cell Systems Analyzed

CA Stationary Fuel Cell Installations* (2001 - 2013)



NREL cdp_stat_03

Created: Sep-19-13 8:57 AM | Data Range: 2001Q2-2013Q2

Definitions: RRF = Reservation Request Form, is the first step in the SGIP incentive claim process.

PPM = Proof of Project Milestone; the applicant must prove progress and commitment to the project.

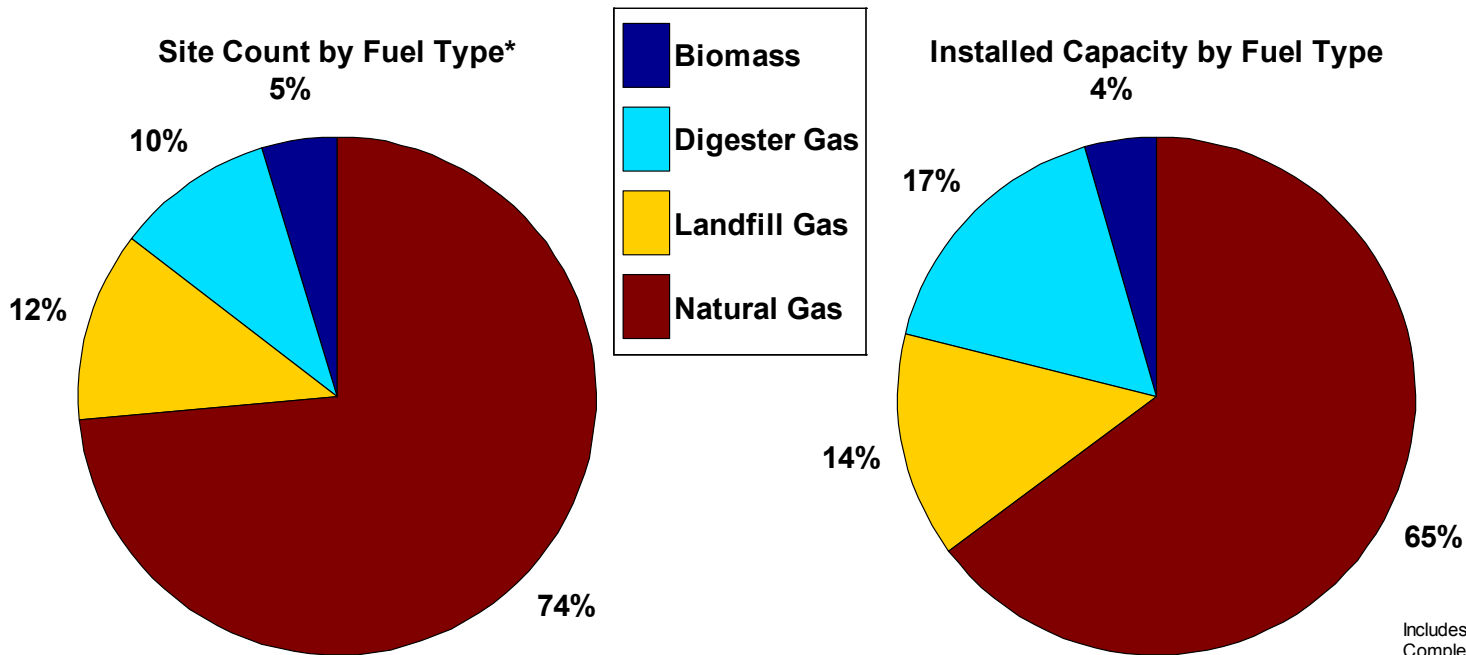
ICF = Incentive Claim Form is the step where the applicant, after meeting all SGIP requirements requests payment of the incentive.

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*Data from the California SGIP.

Stationary Fuel Cell System Count and Capacity by Fuel Type

Installations by Fuel Type
(All Fuel Cell Systems)



Total Sites: 295

Total Capacity: 121 MW

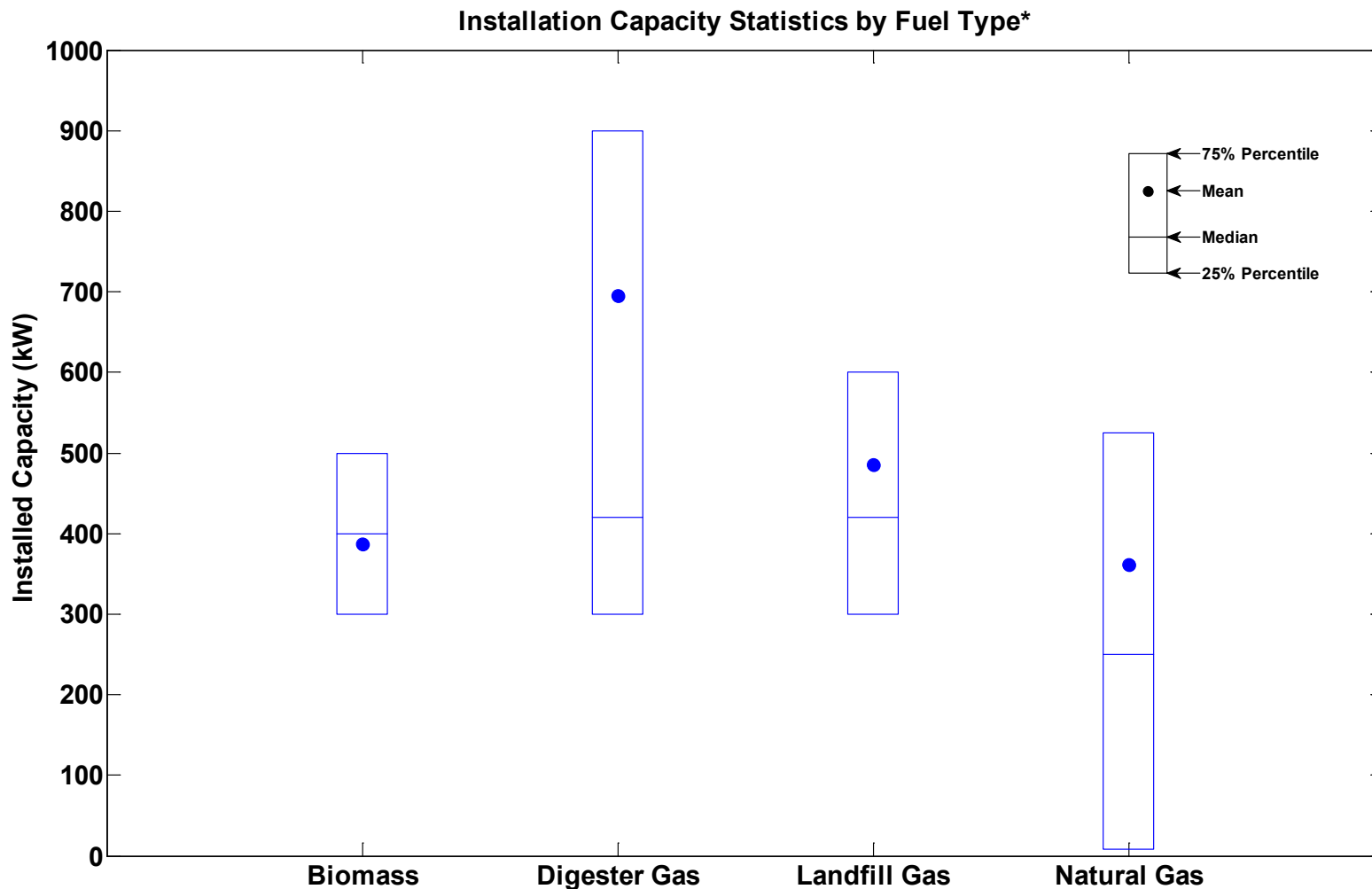
Includes Status Categories:
 Completed
 Advancement
 Pending Payment
 Payment Completed
 ICF Inspection
 ICF Pending Payment
 ICF Review
 ICF Technical Review
 Payment PBI in Process
 PPM Confirmed
 PPM Technical Review
 RRF Reserved
 RRF Technical Review

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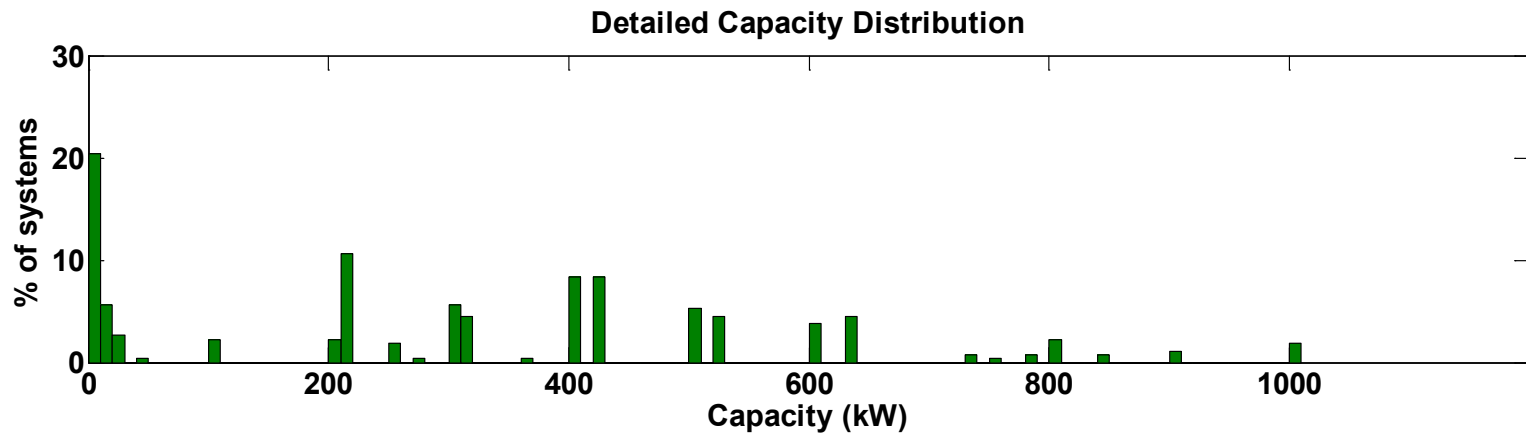
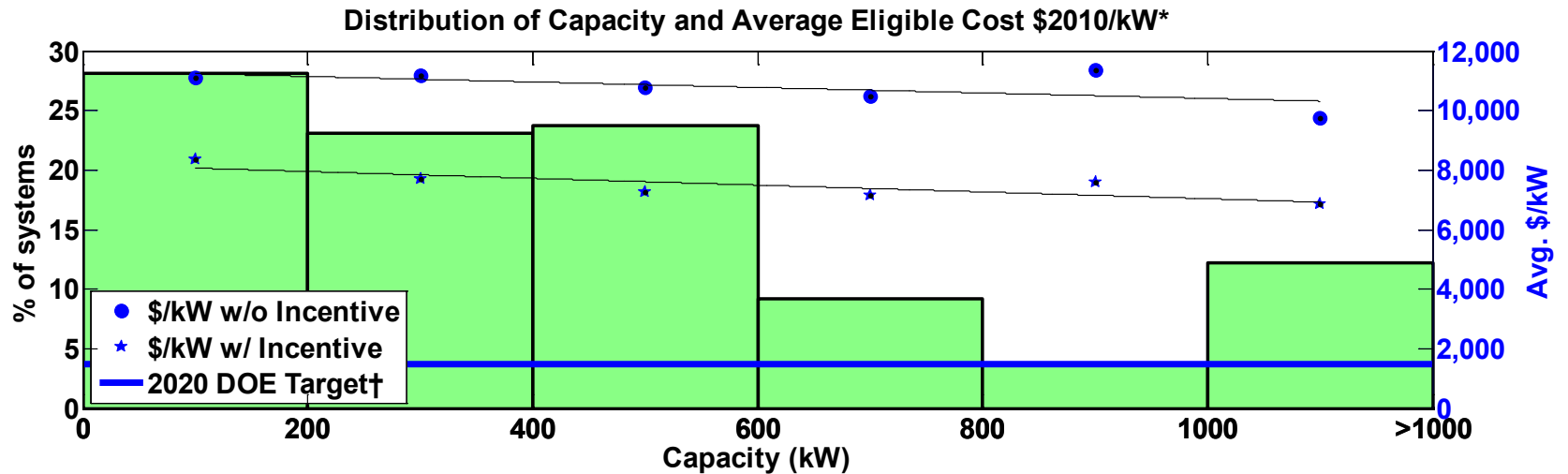
Fuel Type Capacity



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*Data from the California SGIP.

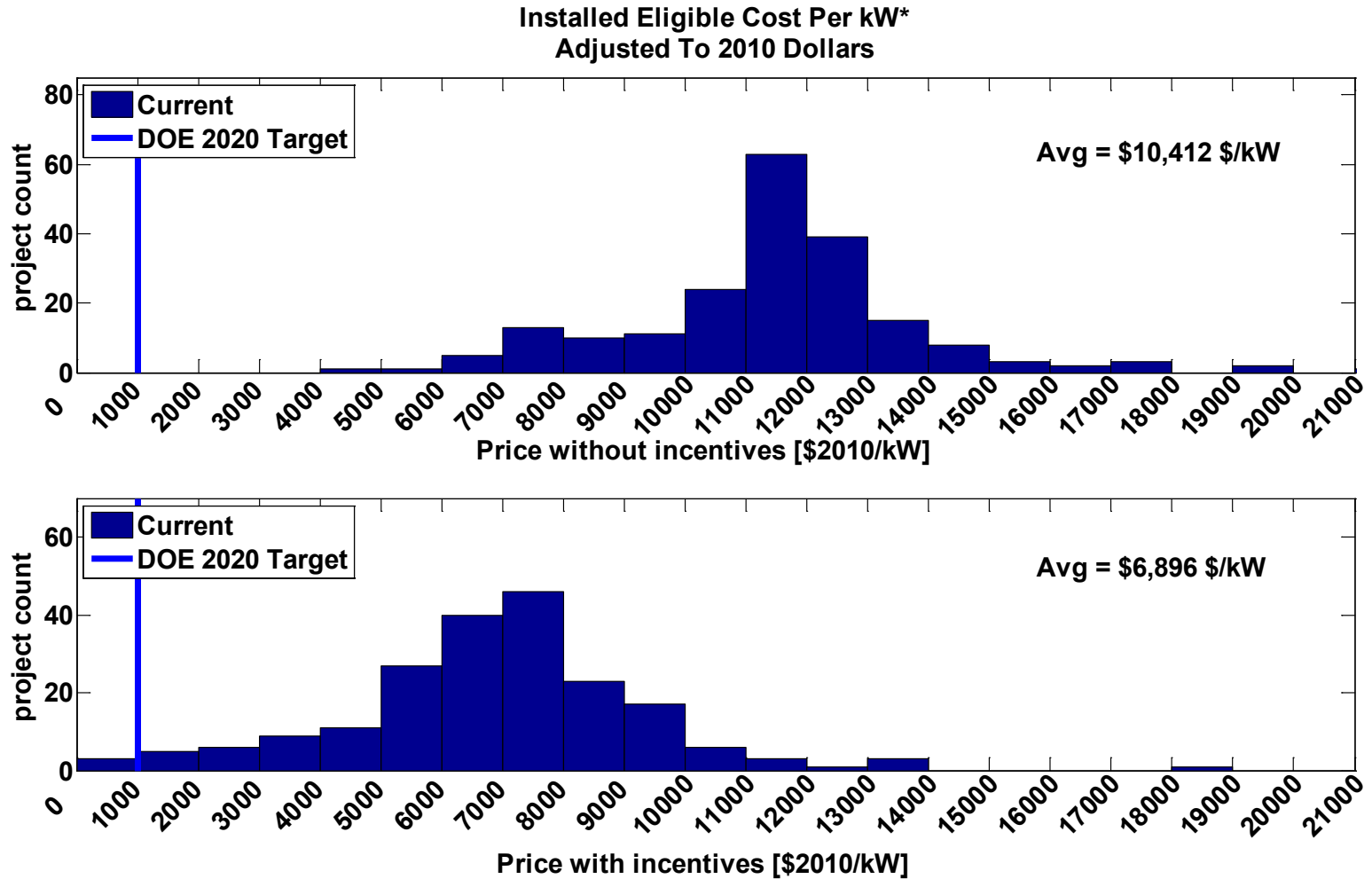
Fuel Cell Stationary Capacity and Average Prices



Eligible Costs May Include: Planning & Feasibility Study, Engineering & Design, Permitting, Self-Generation Equipment Waste Heat Recovery Costs, Construction & Installation Costs, Gas & Electric Interconnection, Warranty, Maintenance Contract Metering, Monitoring & Data Acquisition System, Emission Control Equipment Capital Gasline Installation, Fuel Gas Clean-up Equipment, Electricity Storage Devices, Bond to Certify Renewable Fuel Sales Tax, Fuel Supply (digesters, gas gathering, etc.), Thermal Load, & Other Eligible Costs

†for the year 2020, operating on natural gas.
*Data from the California SGIP.

Distribution of Stationary Fuel Cell Install Price With and Without Incentives

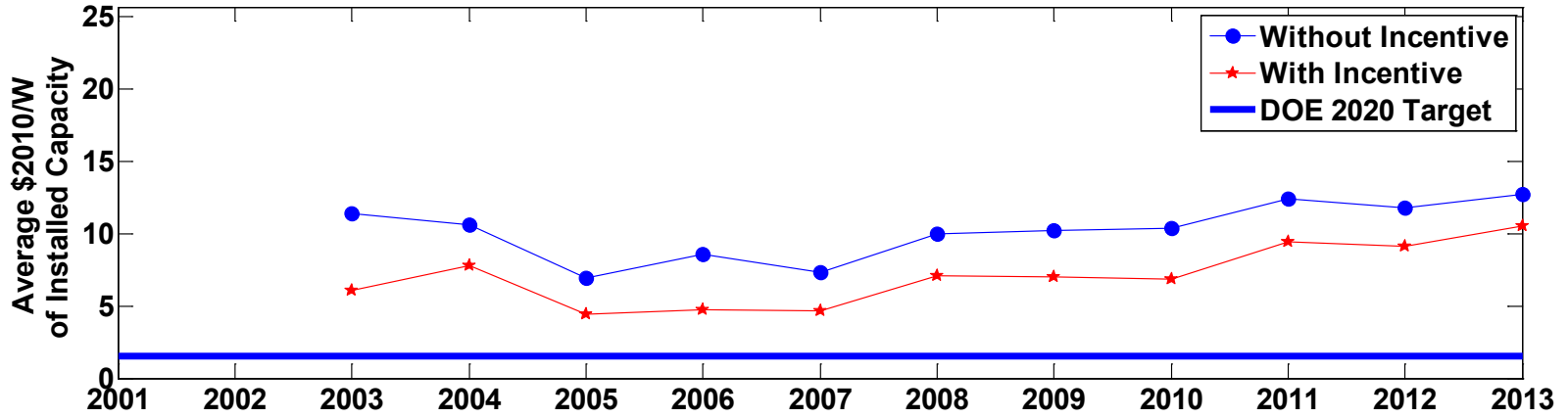


Eligible Costs May Include: Planning & Feasibility Study, Engineering & Design, Permitting, Self-Generation Equipment Waste Heat Recovery Costs, Construction & Installation Costs, Gas & Electric Interconnection, Warranty, Maintenance Contract Metering, Monitoring & Data Acquisition System, Emission Control Equipment Capital Gasline Installation, Fuel Gas Clean-up Equipment, Electricity Storage Devices, Bond to Certify Renewable Fuel Sales Tax, Fuel Supply (digesters, gas gathering, etc.), Thermal Load, & Other Eligible Costs

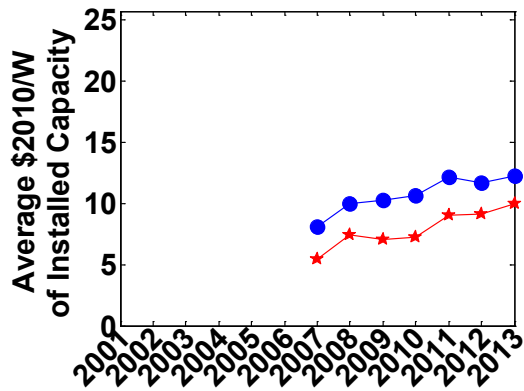
*Data from the California SGIP.

Stationary Fuel Cell Install Price Over Time With and Without Incentives

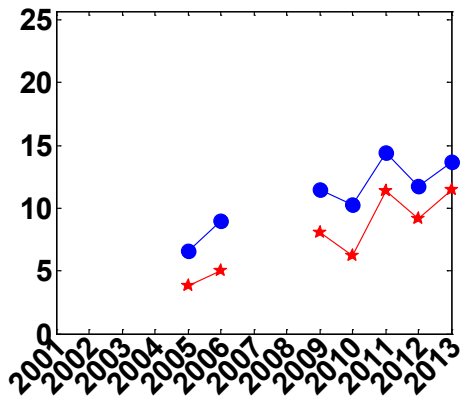
Average Eligible Cost \$2010/W Trend for Overall Deployments*



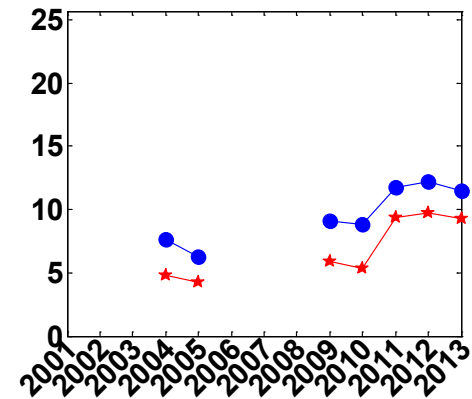
Capacity < 500 kW



500 kW <= Capacity < 1000 kW

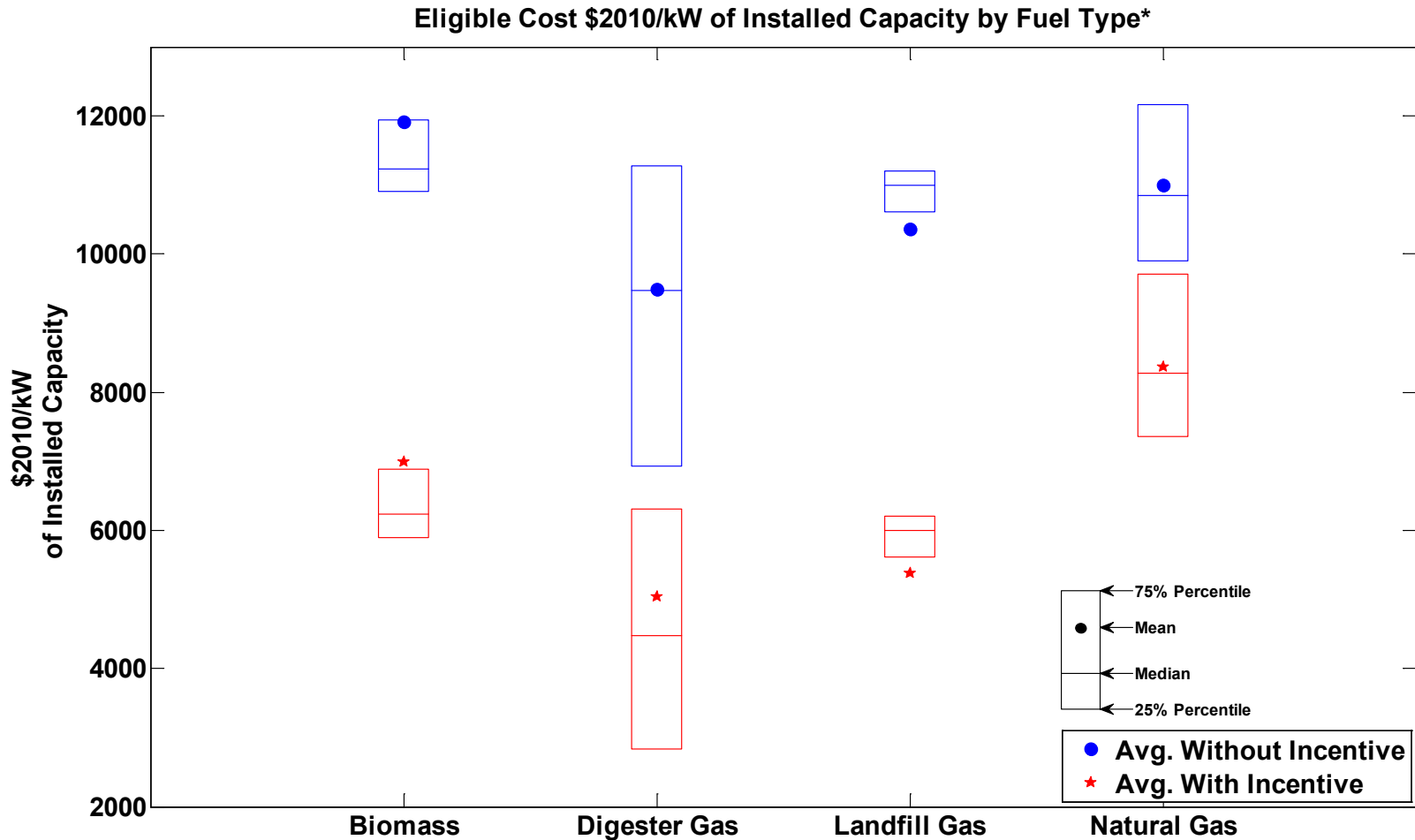


Capacity >= 1000 kW



Eligible Costs May Include: Planning & Feasibility Study, Engineering & Design, Permitting, Self-Generation Equipment Waste Heat Recovery Costs, Construction & Installation Costs, Gas & Electric Interconnection, Warranty, Maintenance Contract Metering, Monitoring & Data Acquisition System, Emission Control Equipment Capital Gasline Installation, Fuel Gas Clean-up Equipment, Electricity Storage Devices, Bond to Certify Renewable Fuel Sales Tax, Fuel Supply (digesters, gas gathering, etc.), Thermal Load, & Other Eligible Costs

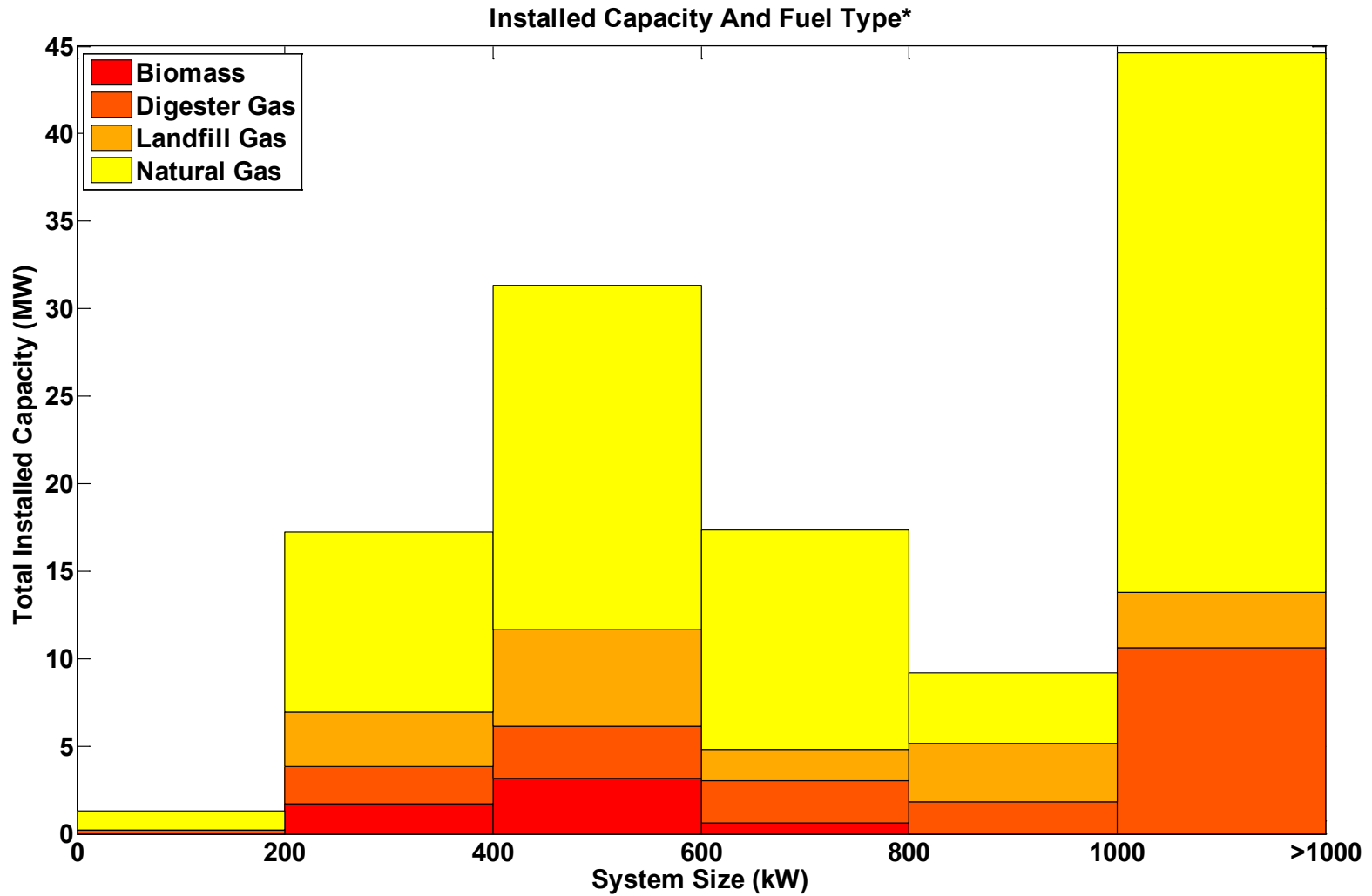
*Data from the California SGIP.



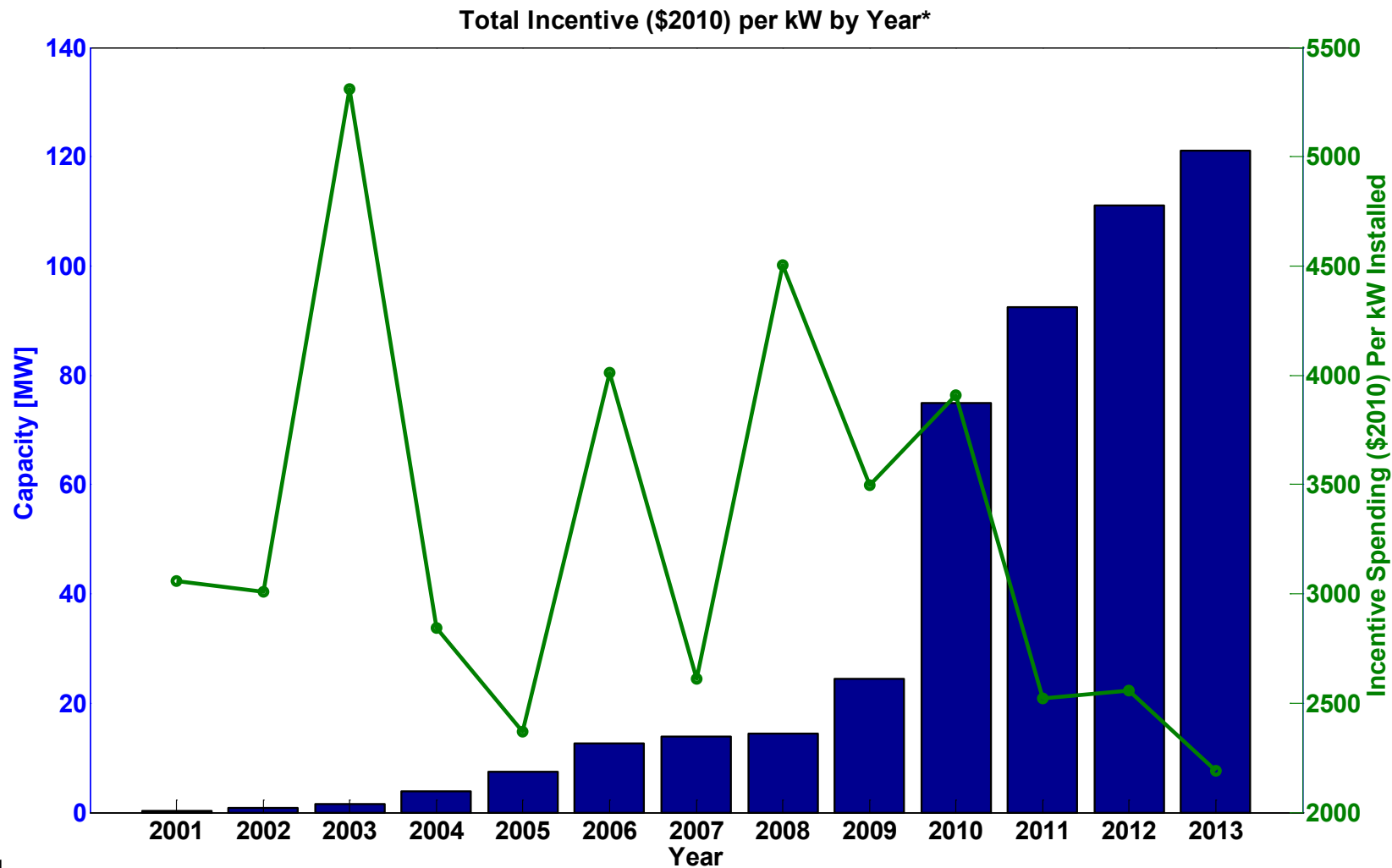
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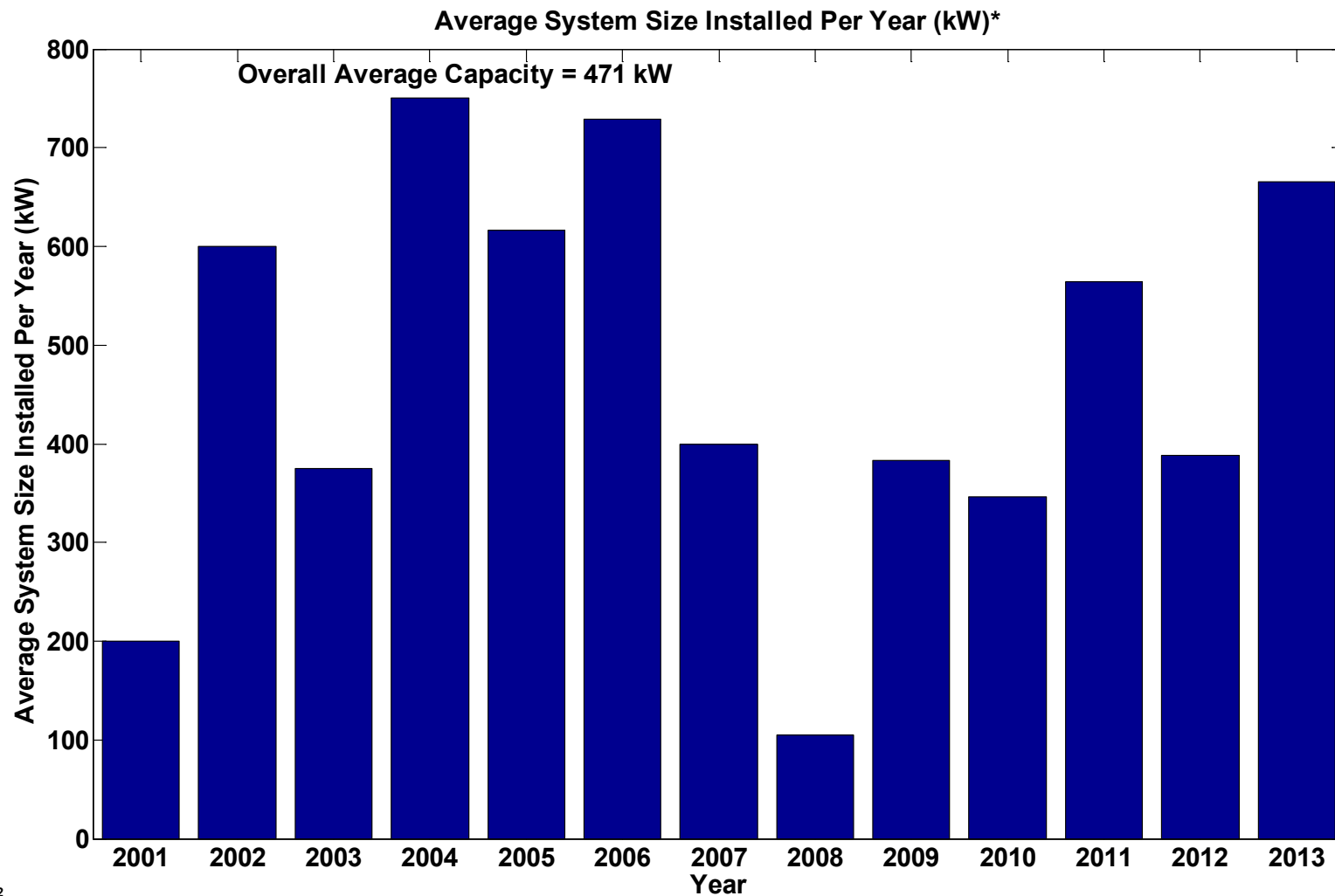
Installed Capacity and Fuel Type



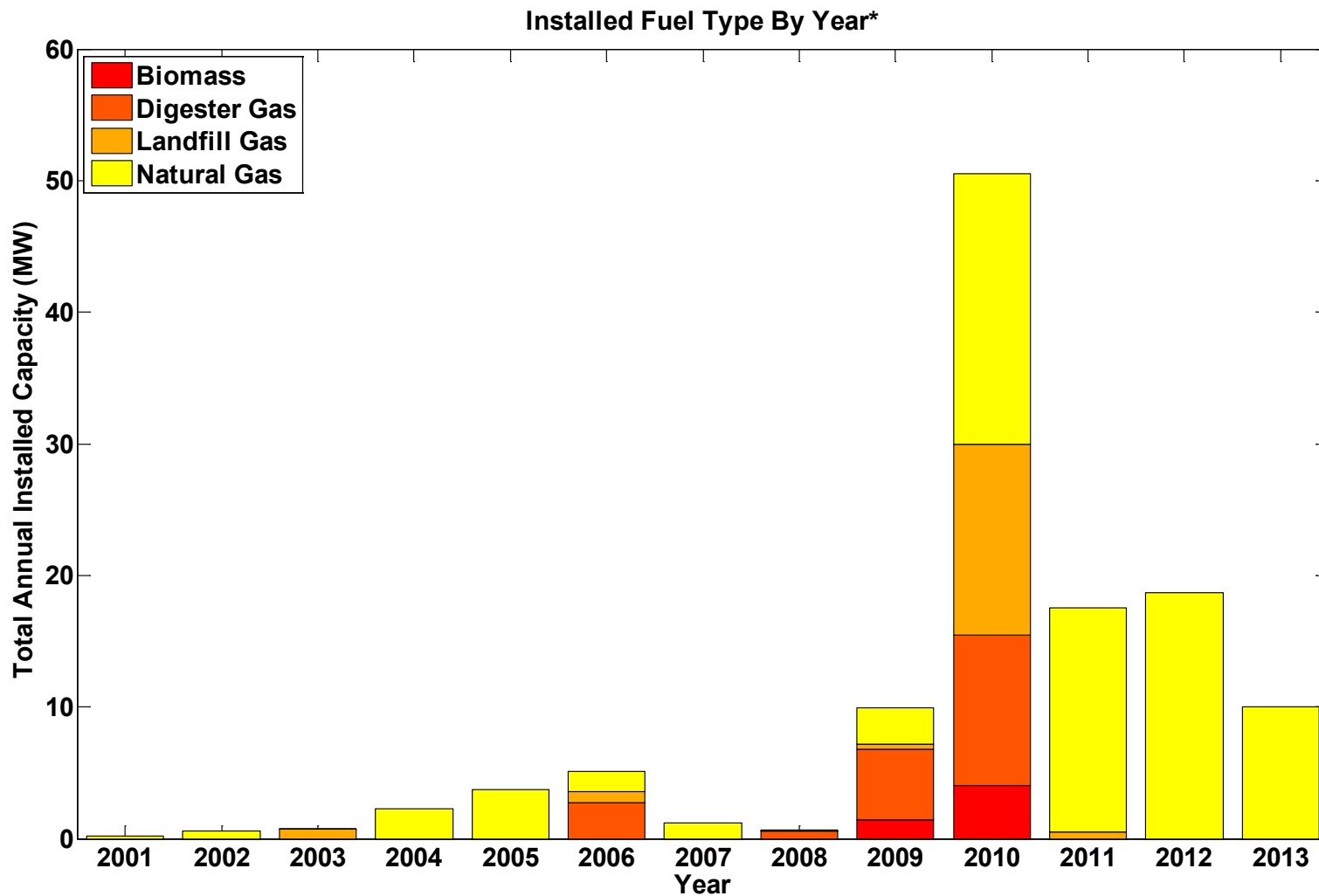
Total Incentive Spending (\$2010) per kW by Year



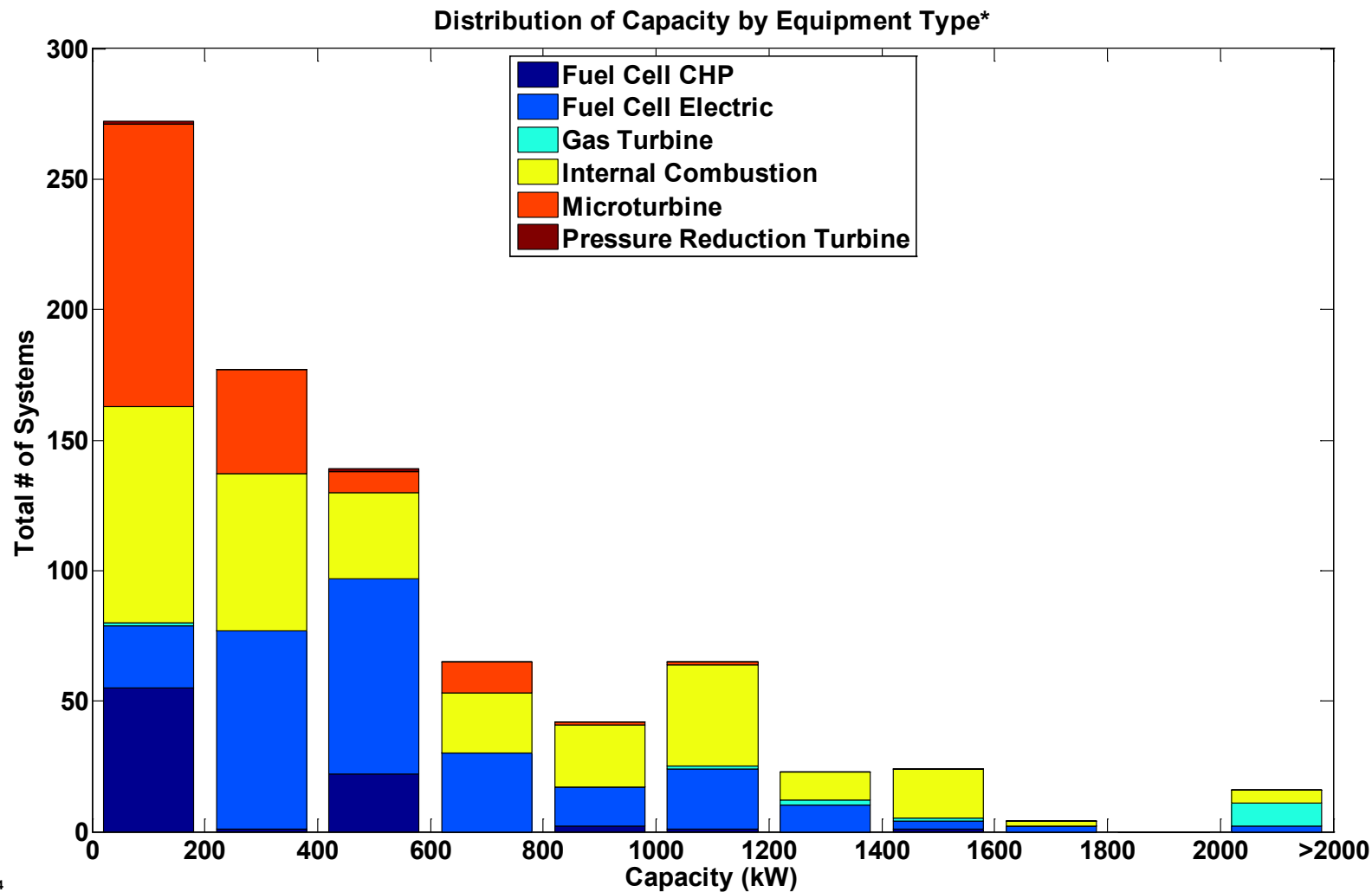
Average System Size Installed per Year (kW)



Installed Annual Capacity by Fuel Type

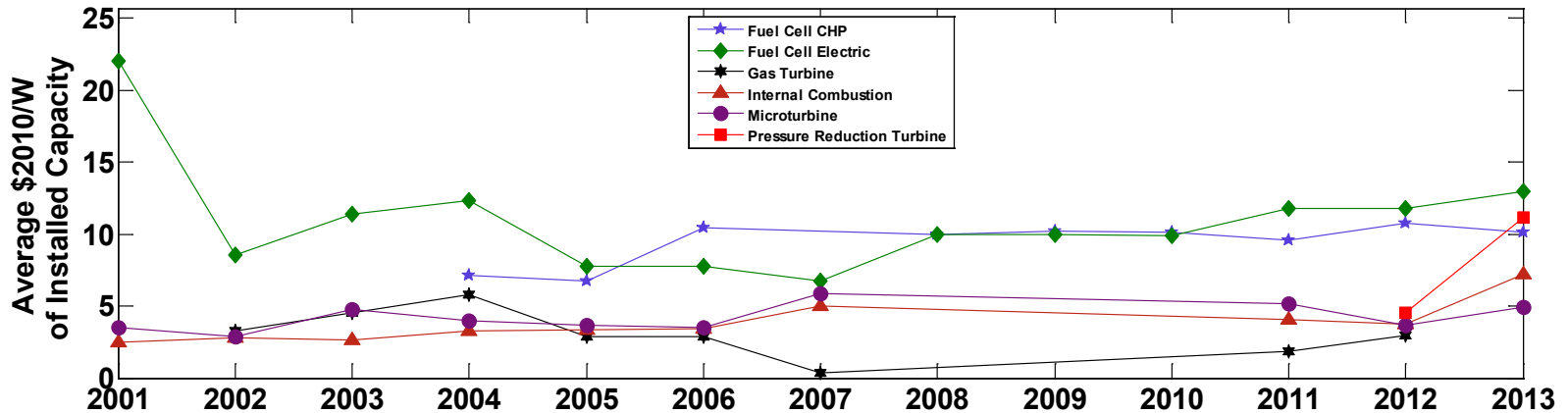


Distribution of Capacity by Equipment Type

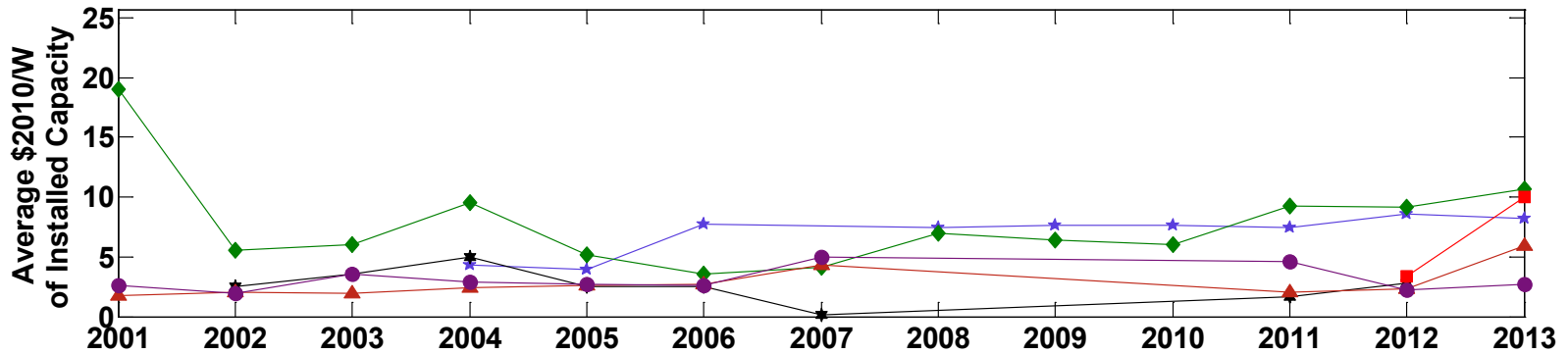


Average Eligible Cost by Equipment Type, Including Other DG

Average Eligible Cost \$2010/W Trend for Overall Deployments*
Without Incentives



Average Eligible Cost \$2010/W Trend for Overall Deployments*
With Incentives

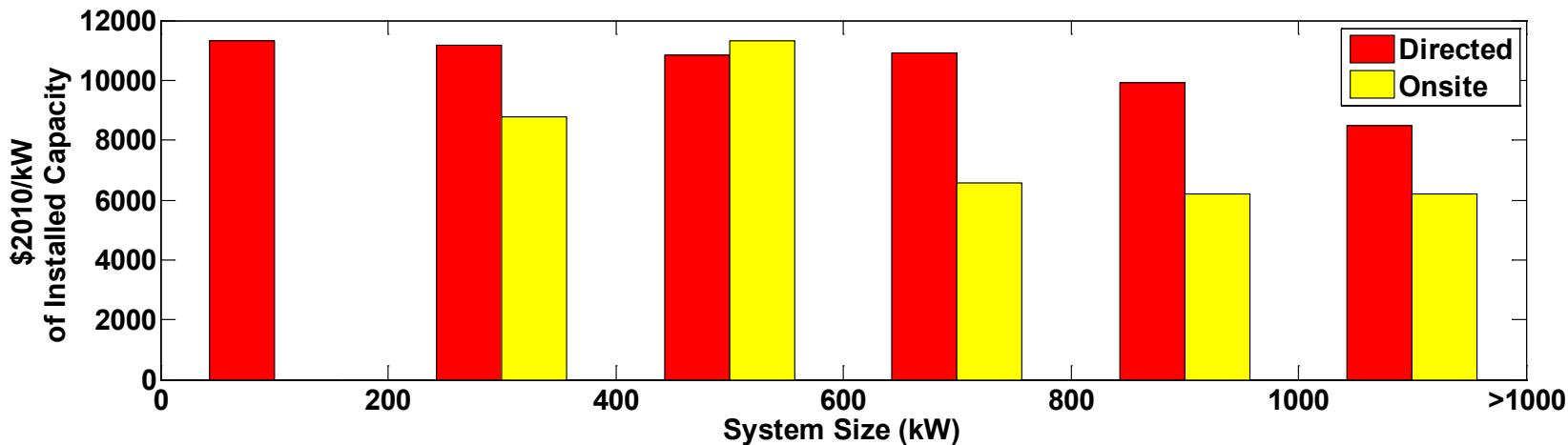


Eligible Costs May Include: Planning & Feasibility Study, Engineering & Design, Permitting, Self-Generation Equipment Waste Heat Recovery Costs, Construction & Installation Costs, Gas & Electric Interconnection, Warranty, Maintenance Contract Metering, Monitoring & Data Acquisition System, Emission Control Equipment Capital Gasline Installation, Fuel Gas Clean-up Equipment, Electricity Storage Devices, Bond to Certify Renewable Fuel Sales Tax, Fuel Supply (digesters, gas gathering, etc.), Thermal Load, & Other Eligible Costs

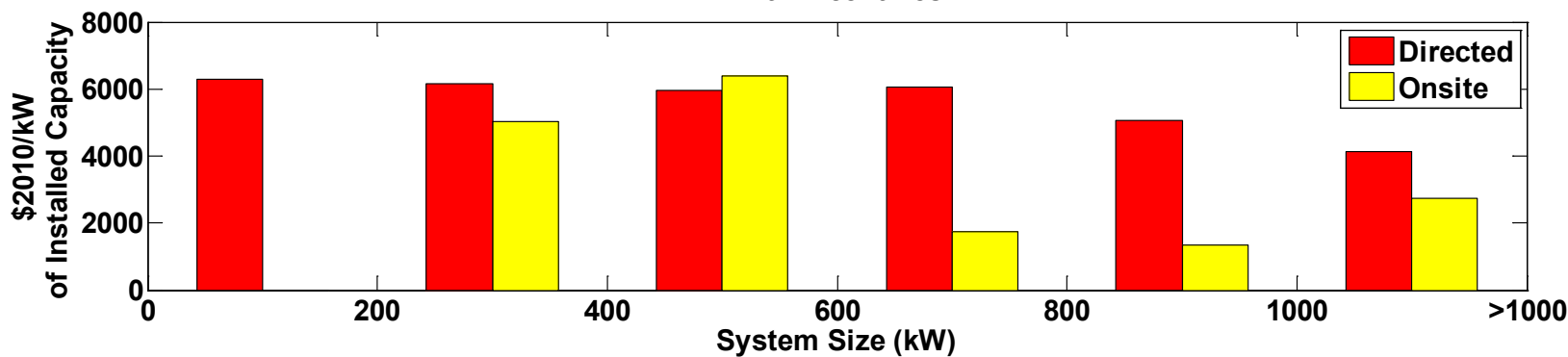
*Data from the California SGIP.

Average Eligible Cost for Biogas Sources

Average Eligible Cost \$2010/kW Biogas Source*
Without Incentives



Average Eligible Cost \$2010/kW Biogas Source*
With Incentives

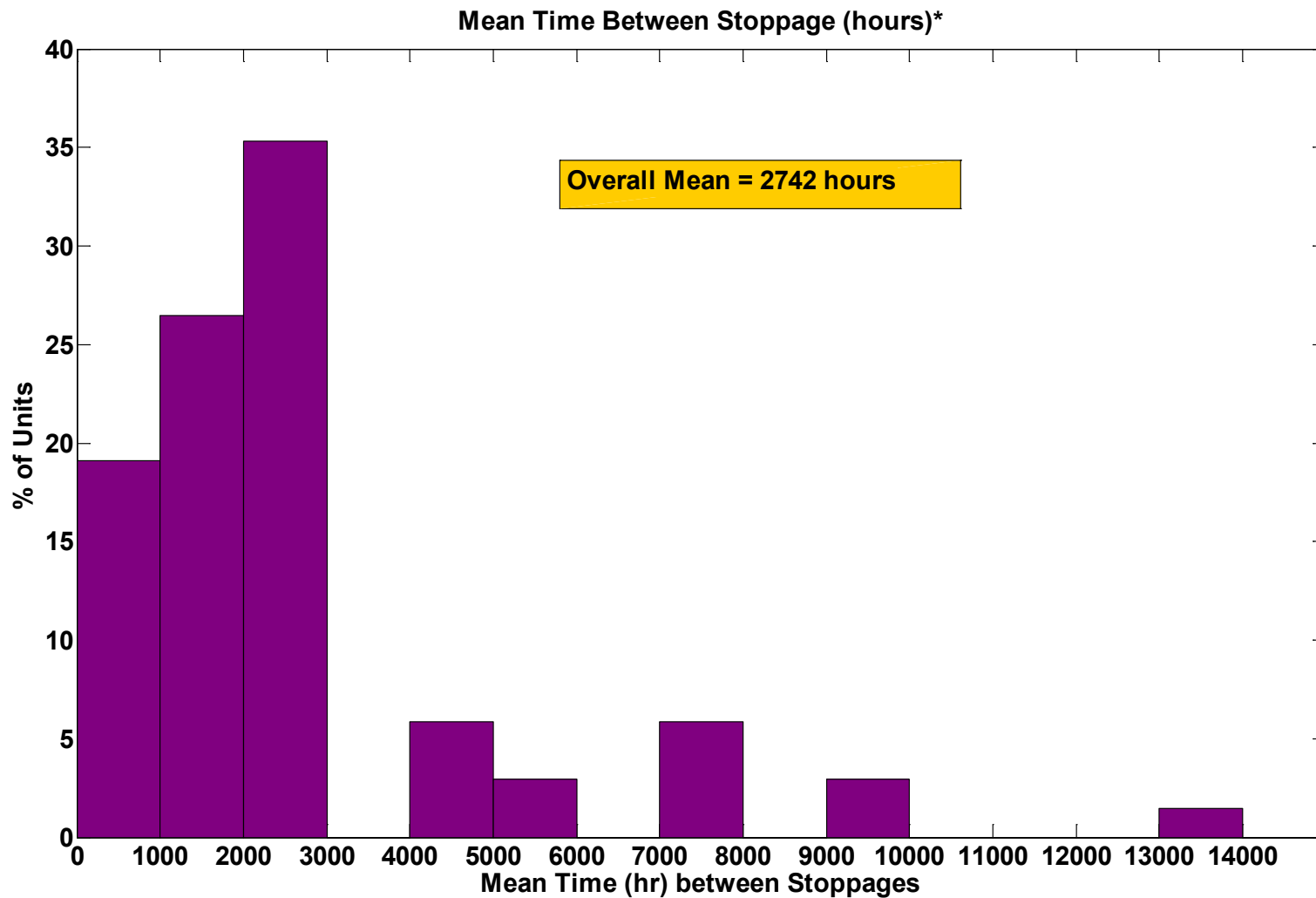


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*Data from the California SGIP.

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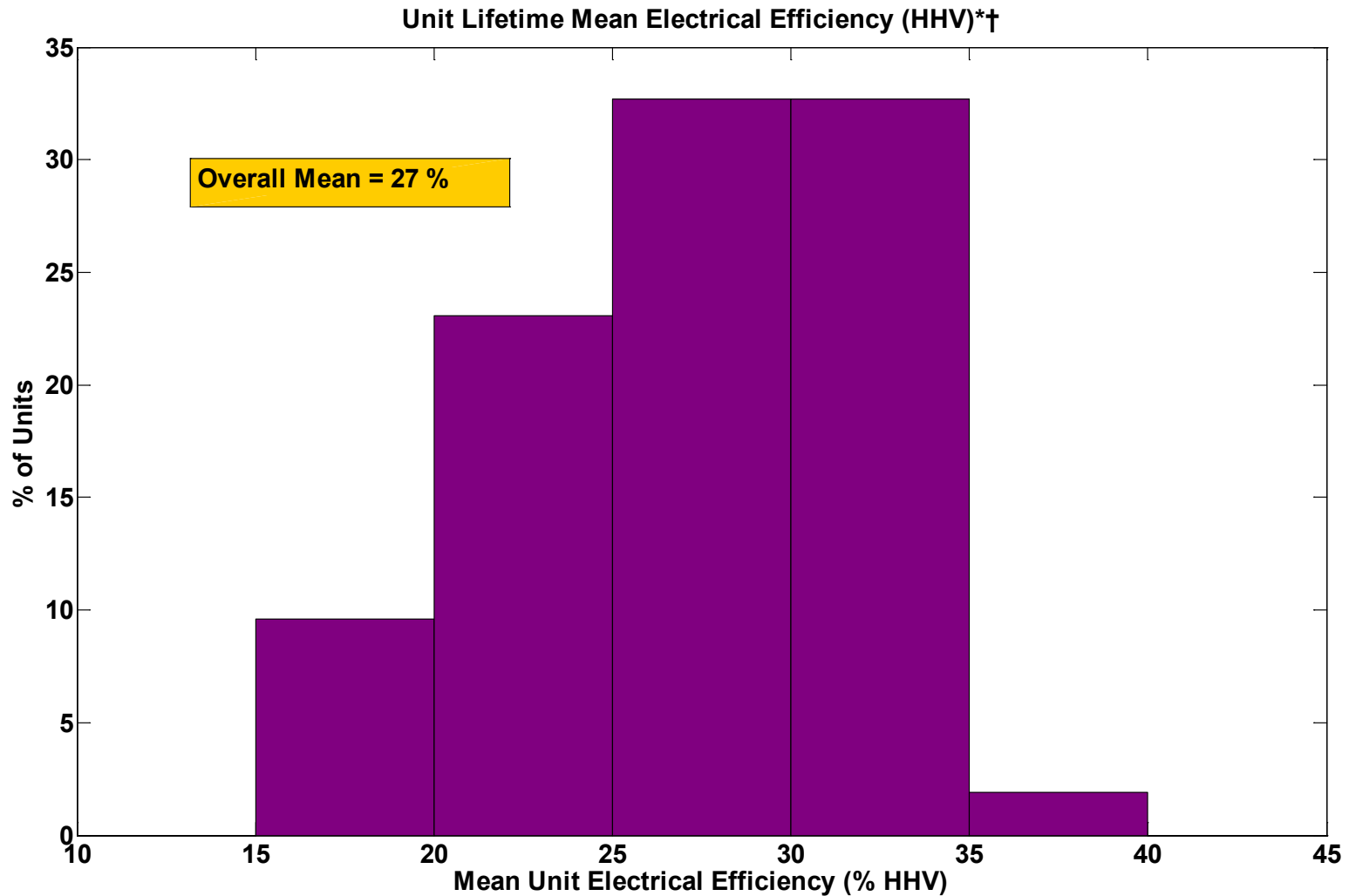
Mean Time Between Stoppage (for any reason)



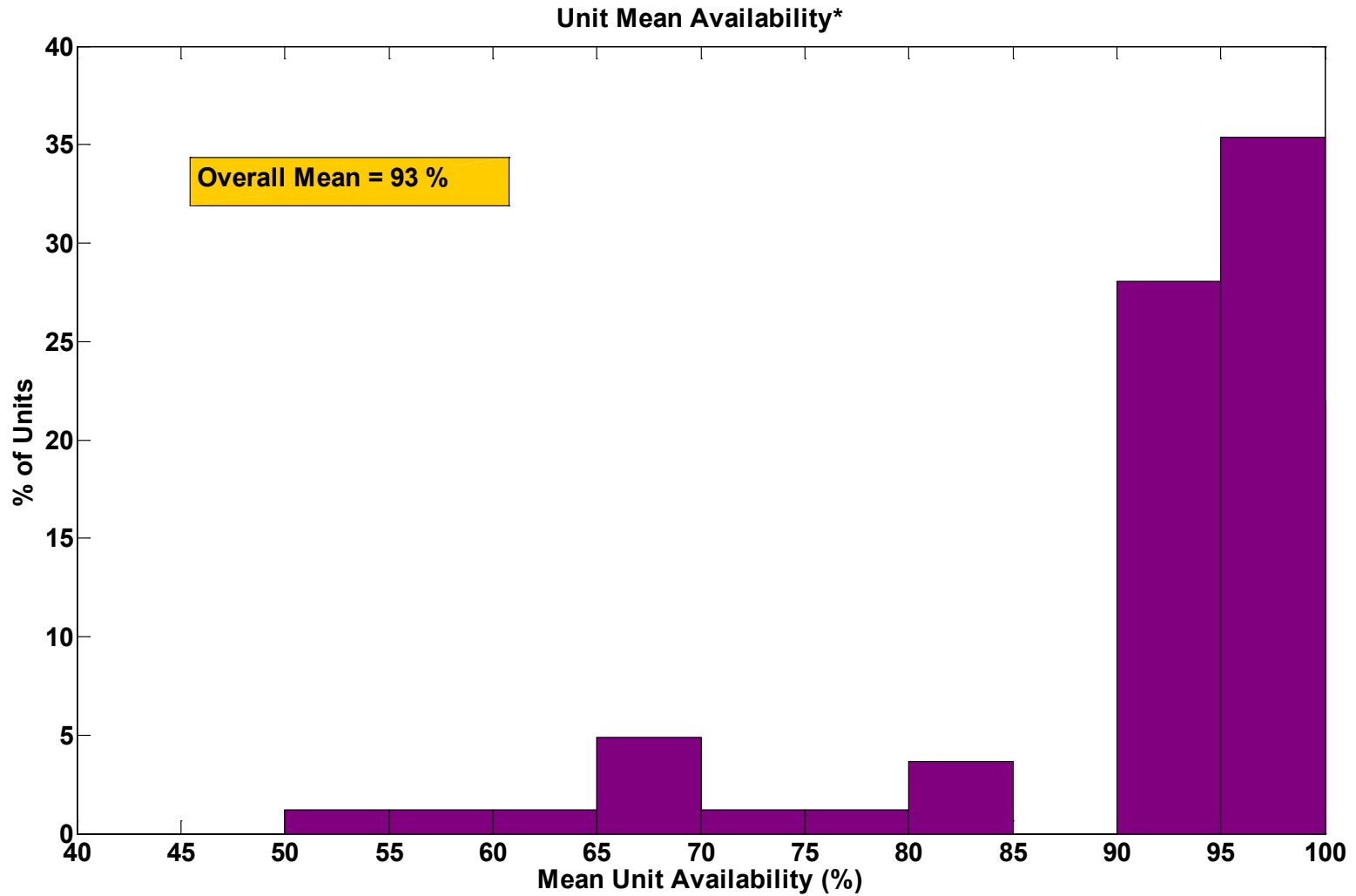
NREL cdp_stat_17
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*Data from outside the SGIP.

Mean Unit Lifetime Electrical Efficiency (%HHV)

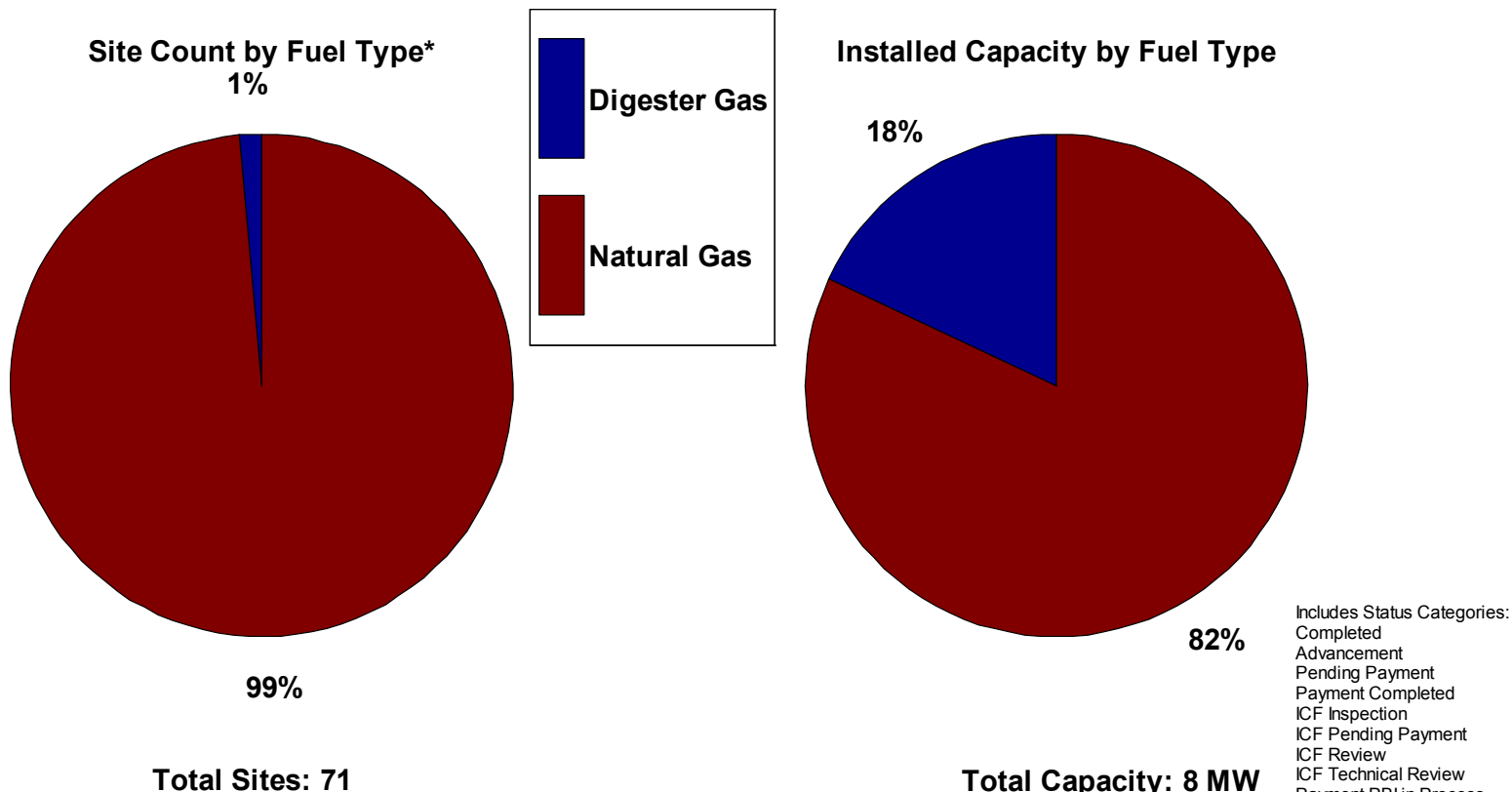


Mean Unit Lifetime Availability



Installations By Fuel Type (CHP Fuel Cells)

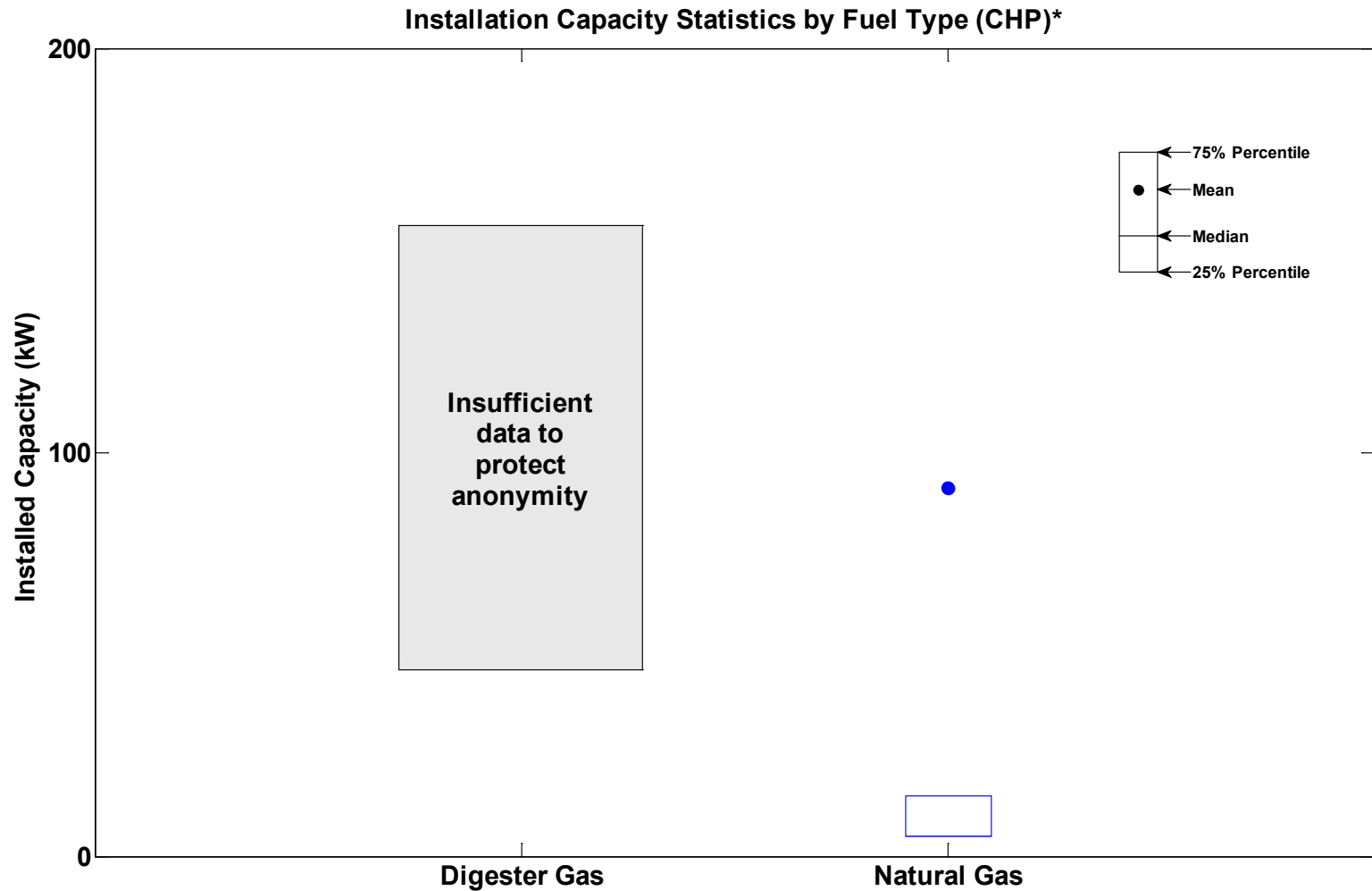
Installations by Fuel Type
(CHP Fuel Cell Systems)



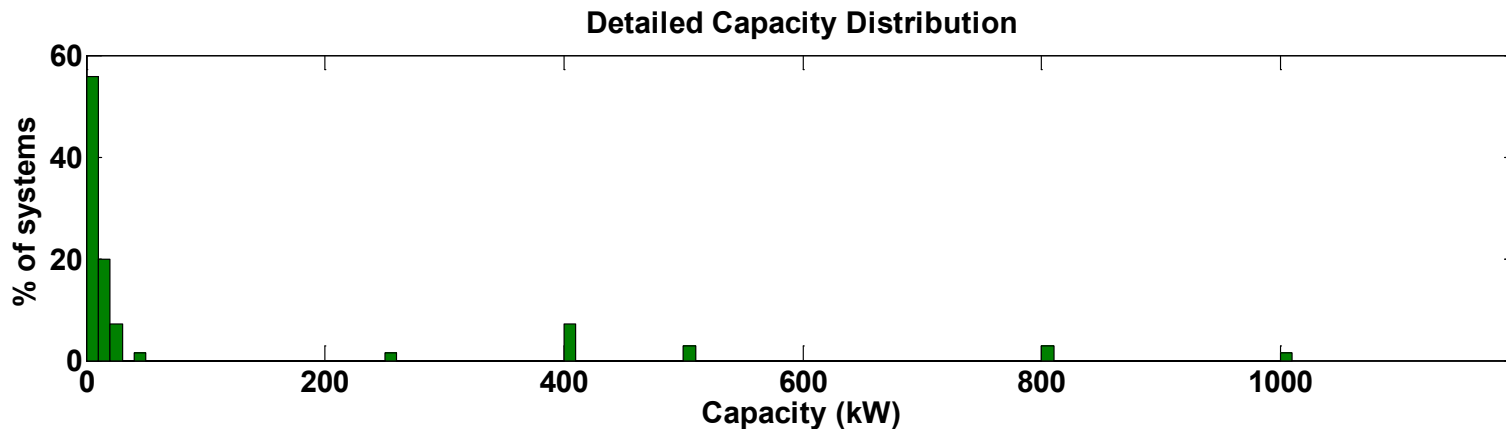
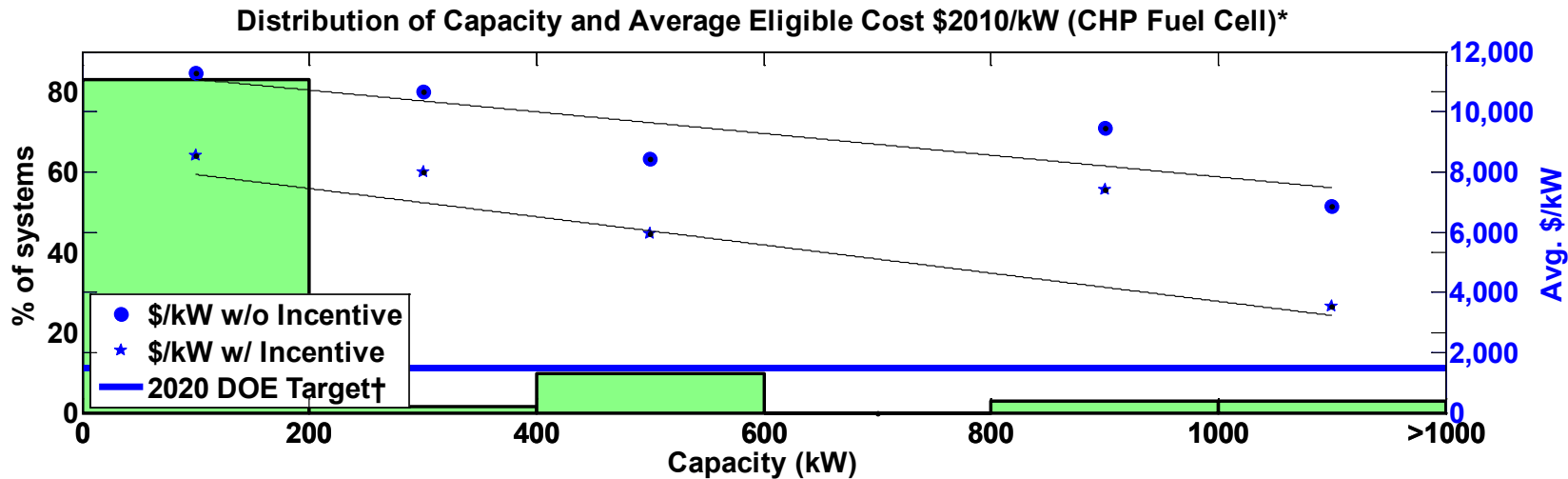
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Installation Capacity by Fuel Type (CHP Fuel Cells)



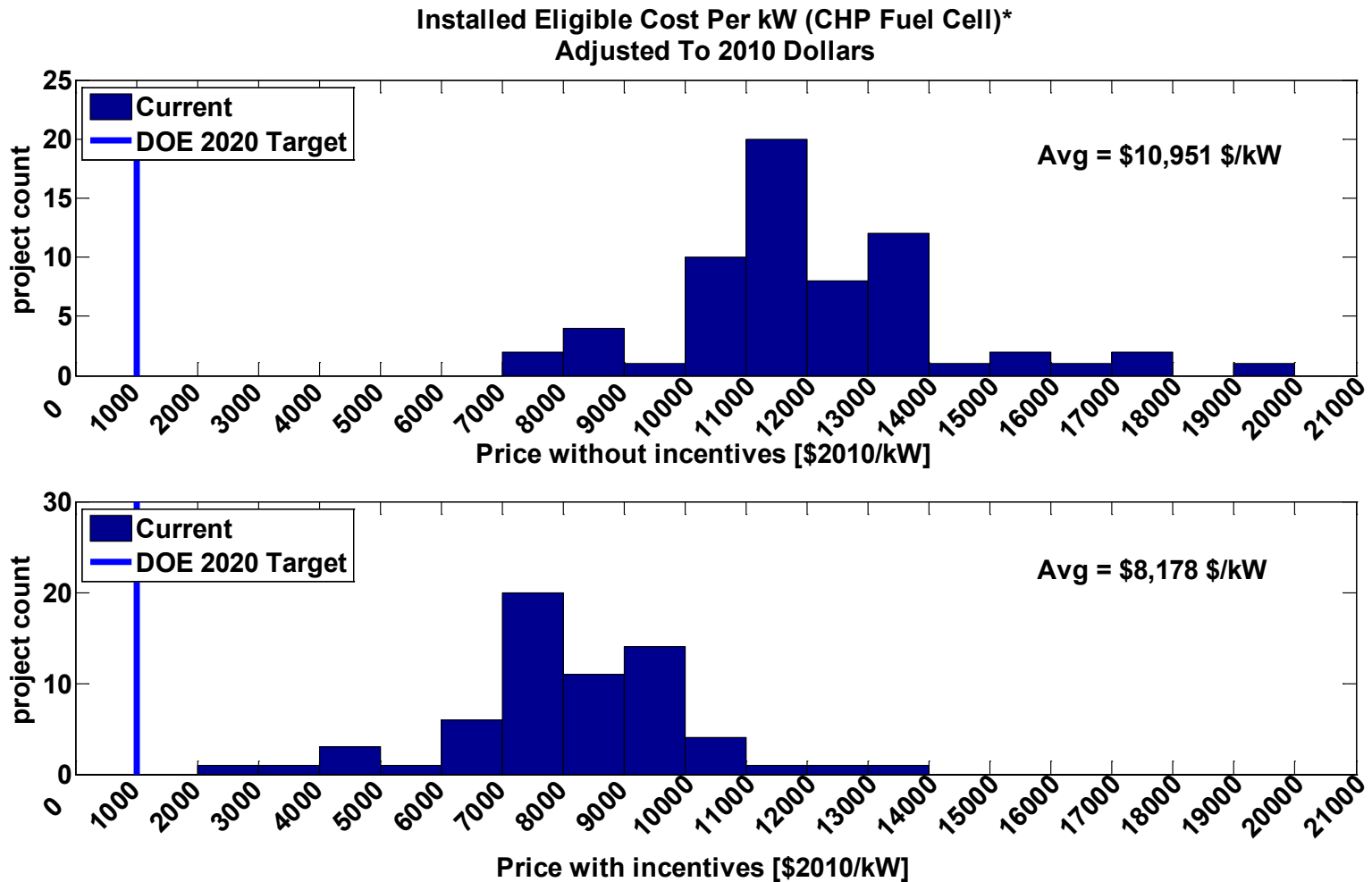
Distribution of Capacity and Eligible Cost (CHP Fuel Cells)



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†for the year 2020, operating on natural gas.
*Data from the California SGIP.

Distribution of Eligible Cost With and Without Incentives (CHP Fuel Cells)

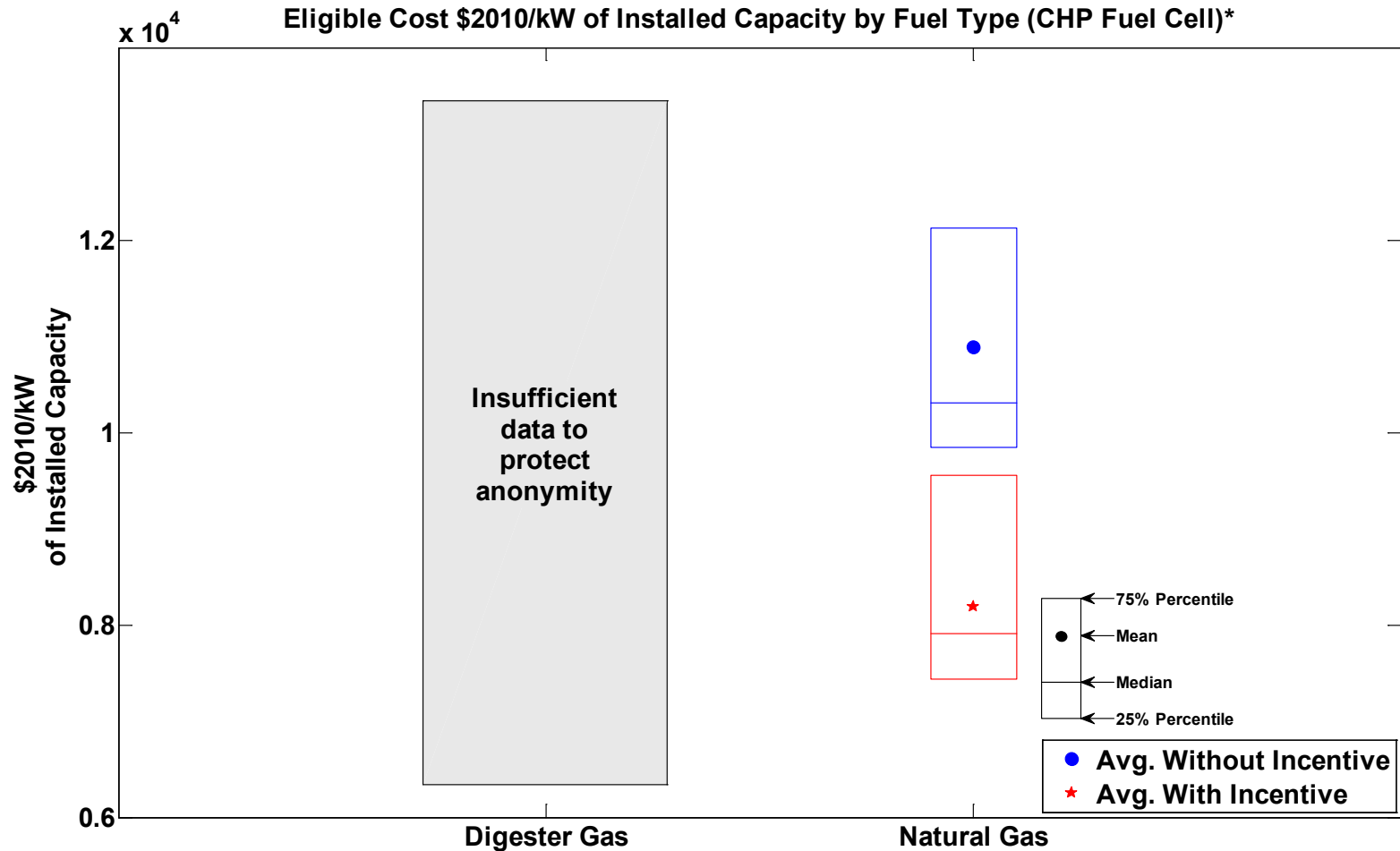


Eligible Costs May Include: Planning & Feasibility Study, Engineering & Design, Permitting, Self-Generation Equipment Waste Heat Recovery Costs, Construction & Installation Costs, Gas & Electric Interconnection, Warranty, Maintenance Contract Metering, Monitoring & Data Acquisition System, Emission Control Equipment Capital Gasline Installation, Fuel Gas Clean-up Equipment, Electricity Storage Devices, Bond to Certify Renewable Fuel Sales Tax, Fuel Supply (digesters, gas gathering, etc.), Thermal Load, & Other Eligible Costs

*Data from the California SGIP.

CDP-STAT-24

Eligible Cost By Fuel Type With and Without Incentives (CHP Fuel Cells)



Eligible Costs May Include: Planning & Feasibility Study, Engineering & Design, Permitting, Self-Generation Equipment Waste Heat Recovery Costs, Construction & Installation Costs, Gas & Electric Interconnection, Warranty, Maintenance Contract Metering, Monitoring & Data Acquisition System, Emission Control Equipment Capital Gasline Installation, Fuel Gas Clean-up Equipment, Electricity Storage Devices, Bond to Certify Renewable Fuel Sales Tax, Fuel Supply (digesters, gas gathering, etc.), Thermal Load, & Other Eligible Costs

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