

Resource Shuffling, Complementary Measures and Competitiveness under California's Cap and Trade Market

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Comments based mostly on research with Elizabeth Bailey, Jim Bushnell, Frank Wolak and Matthew Zaragoza-Watkins

- <http://ei.haas.berkeley.edu/power>

Leakage vs. Resource Shuffling (Reshuffling)

- Leakage: Regulations cause economic activity to move to less regulated regions without lessening pollution problem.
- Reshuffling: Regulations cause buyers and sellers to adjust their counterparties, without changing the location of the economic activity.
- *More flexible regulations can exacerbate these problems*

Figure 1 Supply of Abatement

Allowance
Price

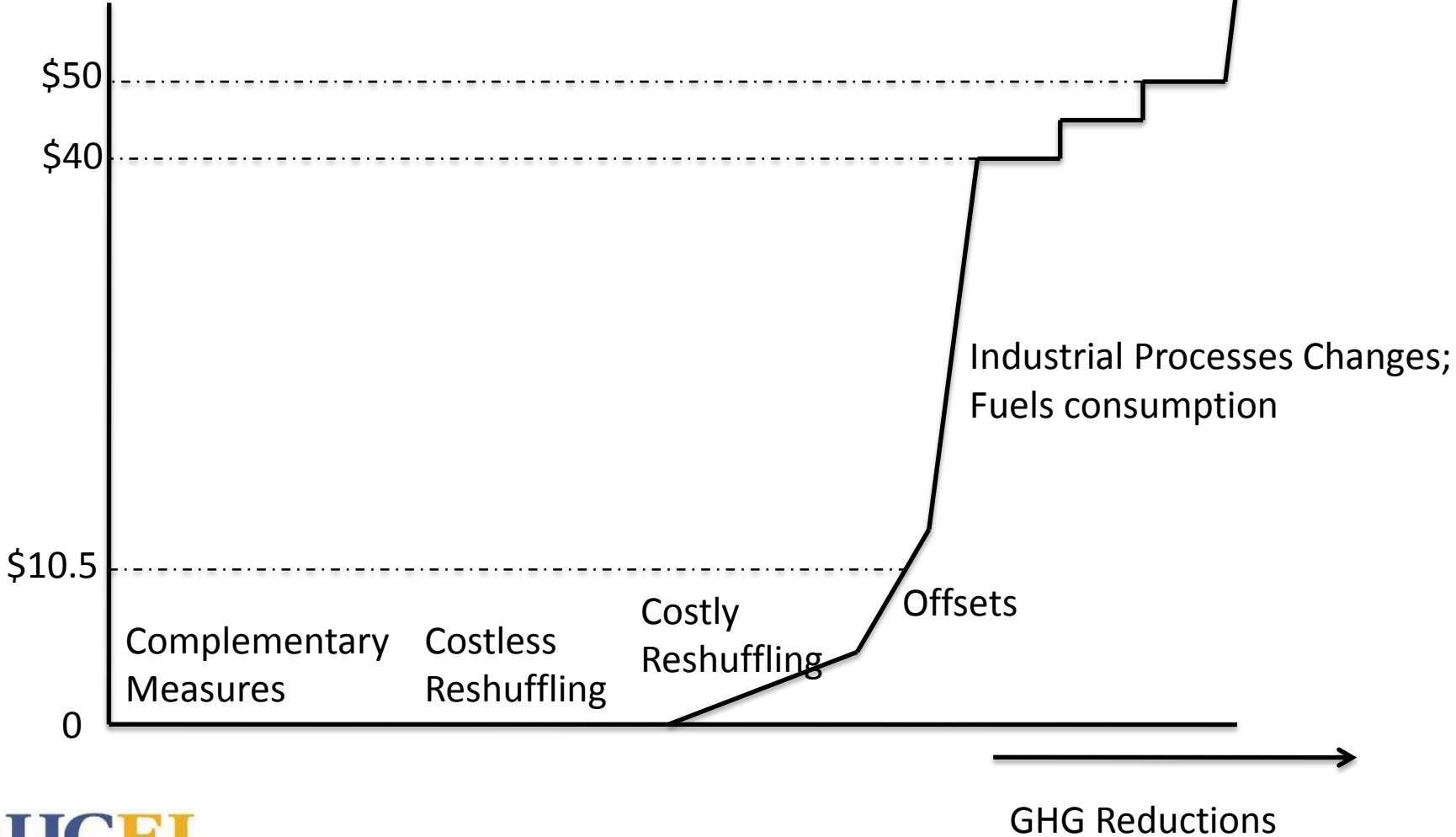


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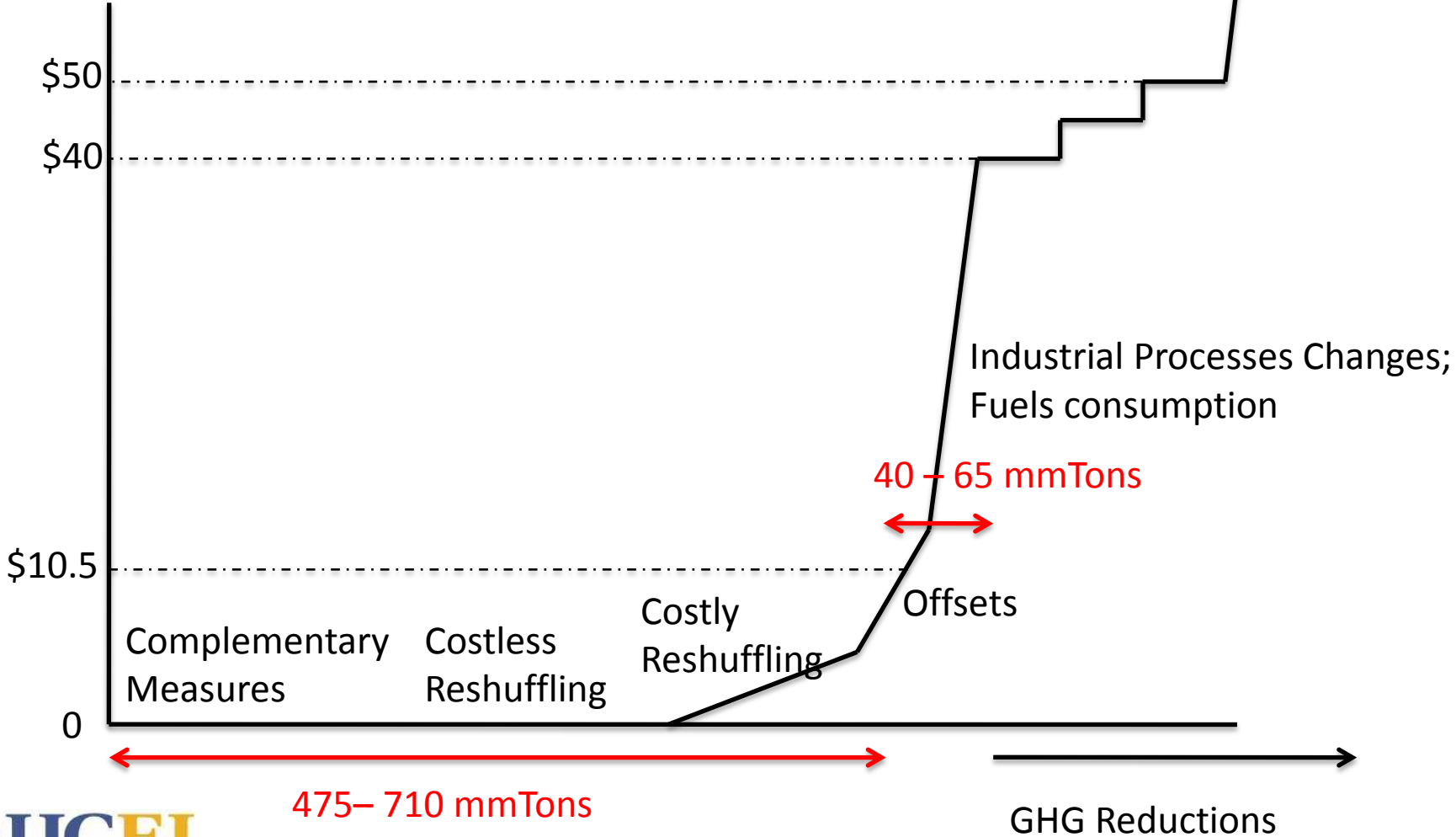


Figure 2

Hypothetical Distribution of Abatement Demand (BAU minus Allowances Outside Containment Reserve) vs Abatement Supply

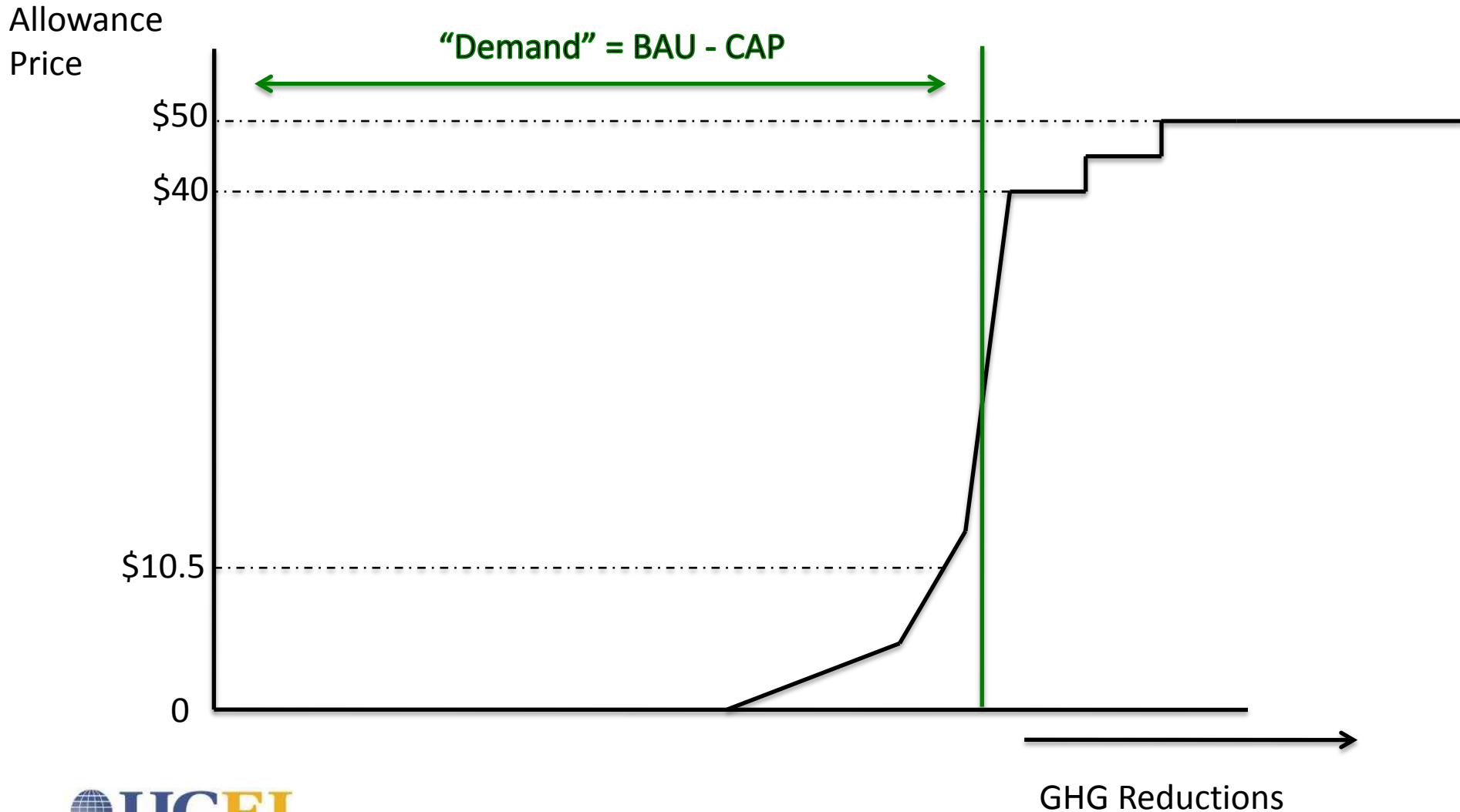


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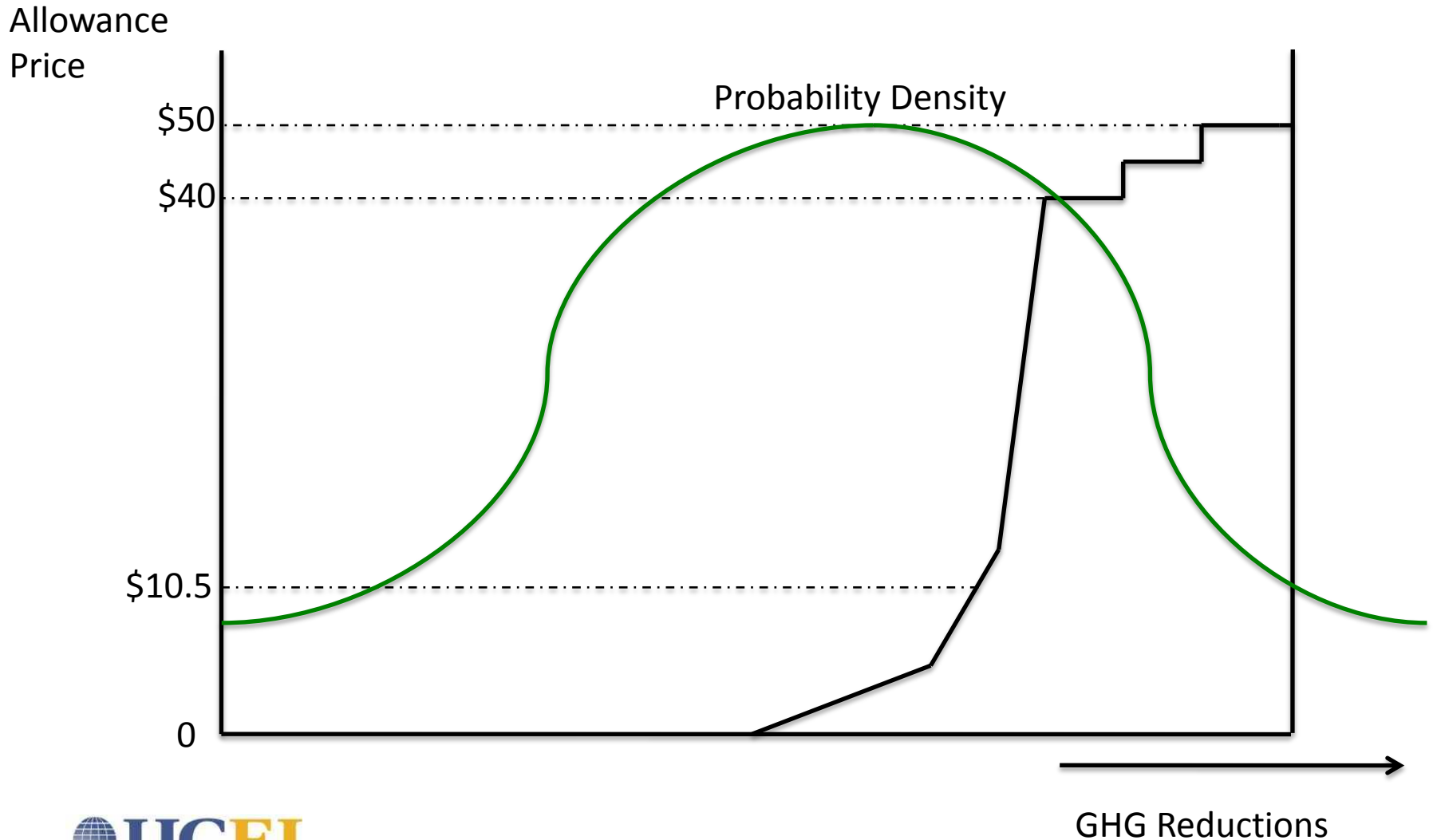


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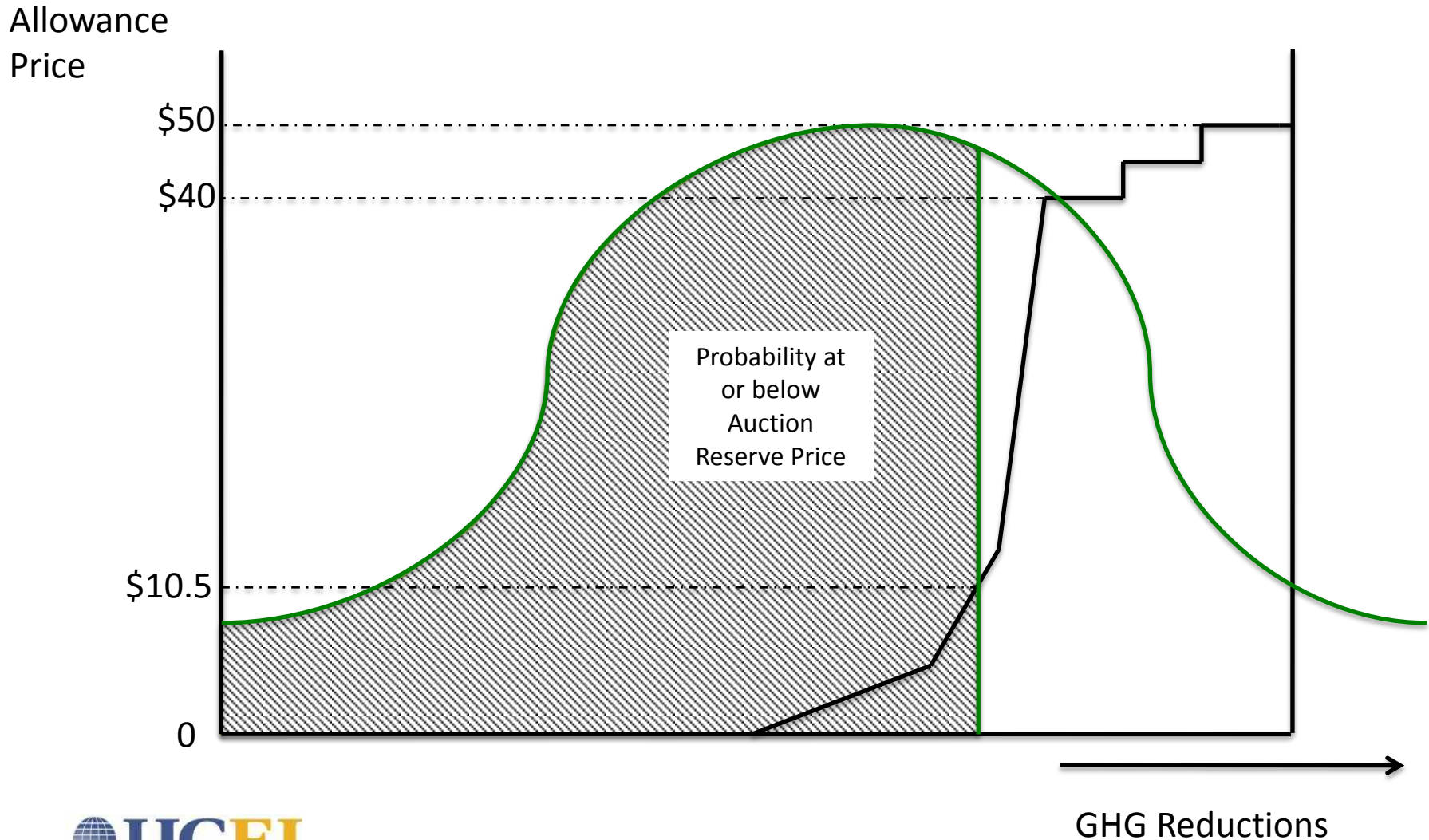


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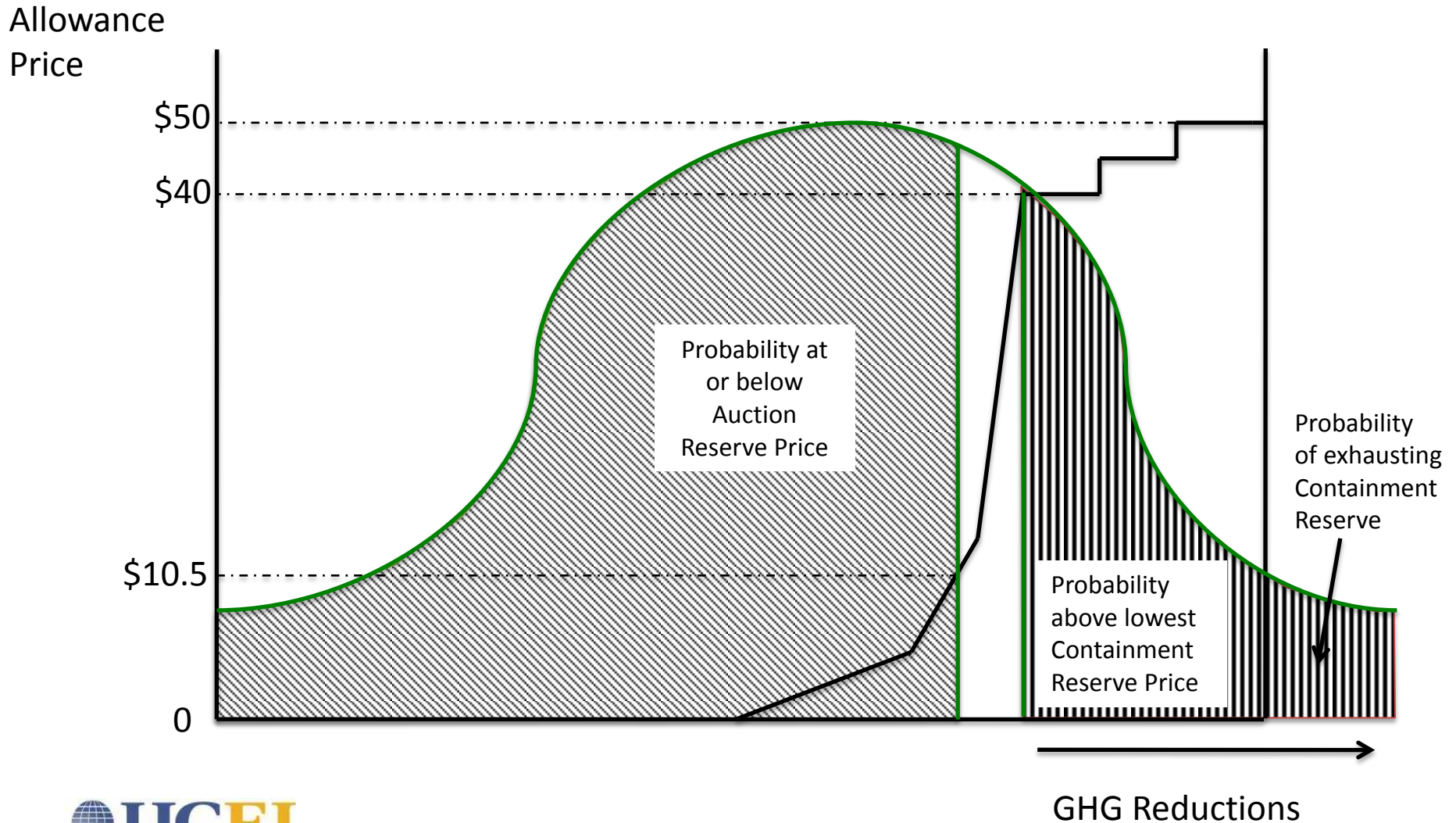


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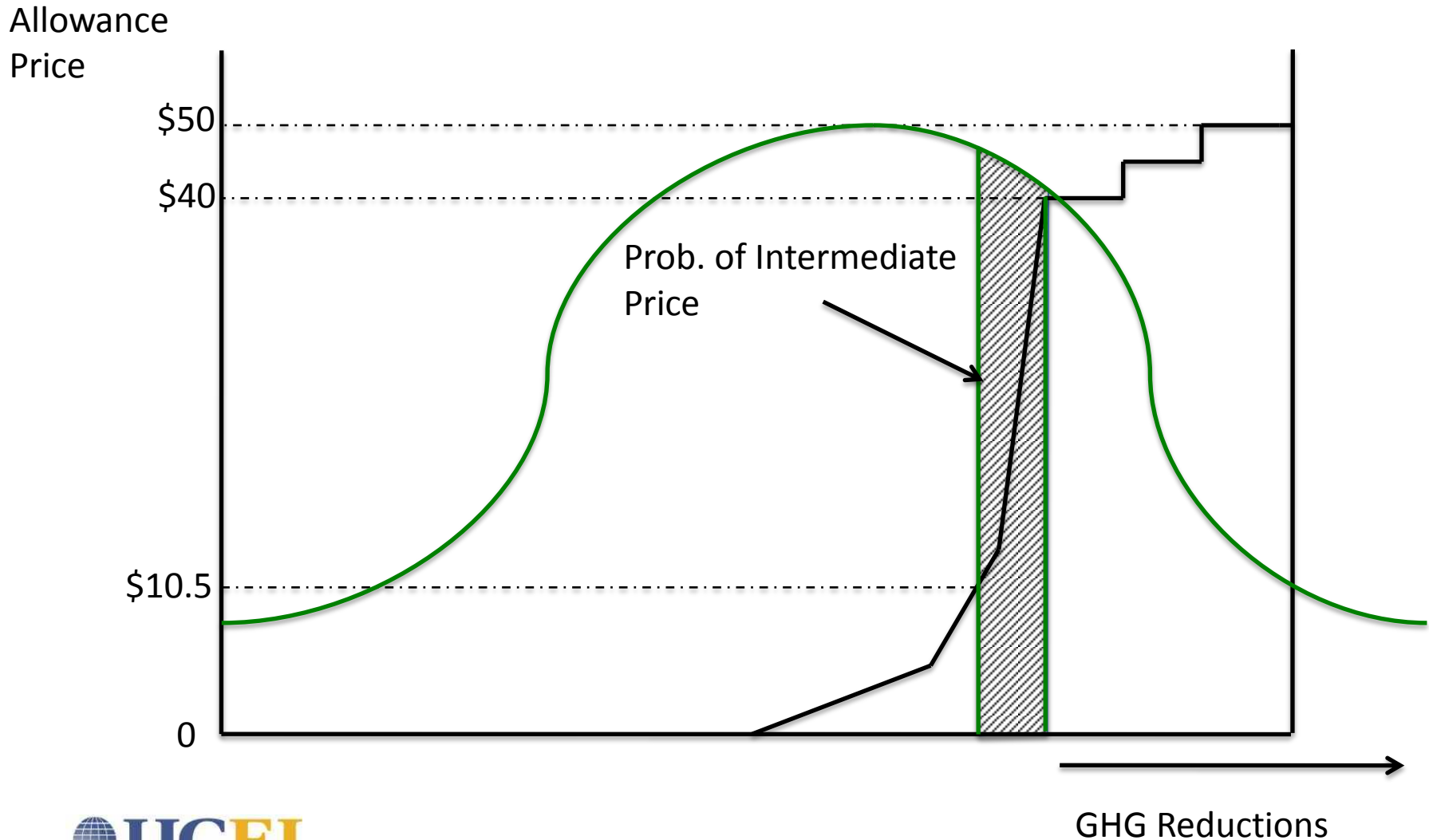
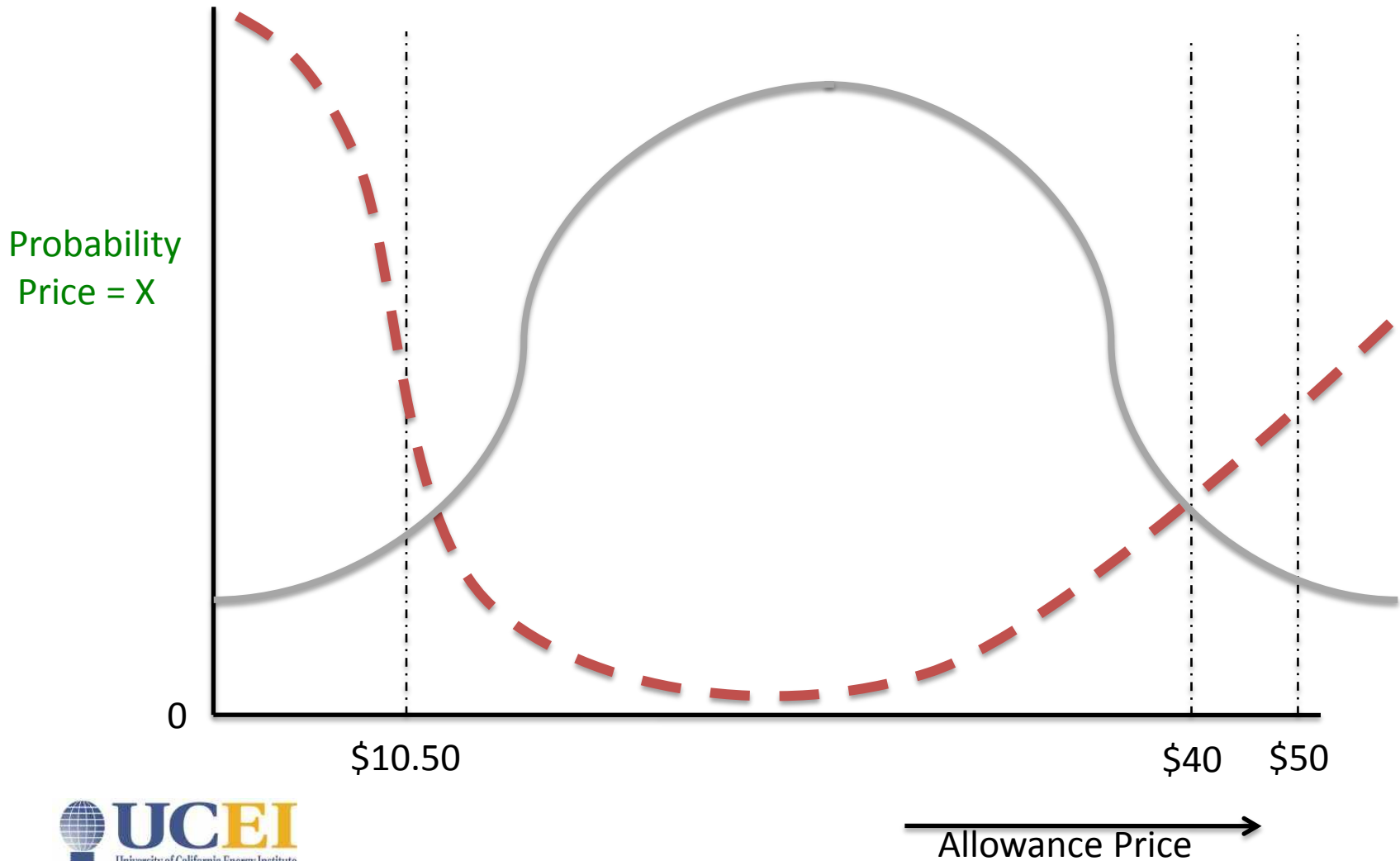


Figure 3

Possible Density Functions of Allowance Price



Supply of Abatement

Table 1: Potential Emissions Reductions from Complementary Policies

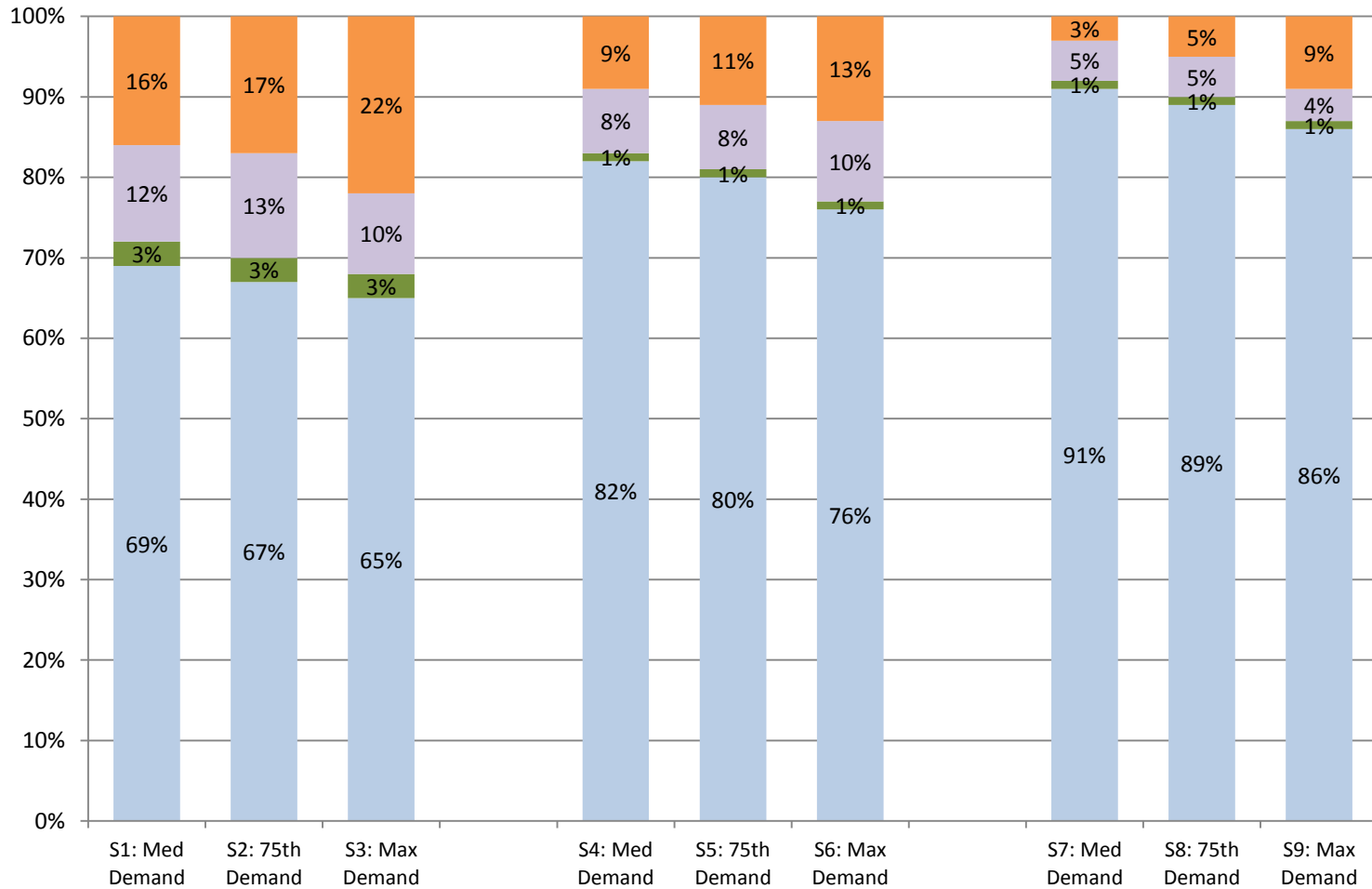
Category	Measure	Average Annual Reductions	Years Under Cap	Total Aggregate Reductions
Complimentary Measures	20% and 33% RPS	7.8 – 12.4 MMT	2013 – 2020	62.4 – 98.8 MMT
	Auto Standards	9.3 – 16.2 MMT	2015 – 2020	74.2 – 129.8 MMT
	LCFS	0 – 10.3 MMT	2015 – 2020	0 – 61.9 MMT
	Energy Efficiency	0 – 3.4 MMT	2013 – 2020	0 – 27 MMT
	Other transport	0 – 1.5 MMT	2015 – 2020	0 – 12.4 MMT
Low-price Responses	Offsets	9.4 – 17.4 MMT	2013 – 2020	75 - 139 MMT
	Reshuffling	15 – 45 MMT	2013 – 2020	120 – 360 MMT
Price-Responsive (at \$50/ton)	Gasoline		2015 - 2020	13.4-26.7 MMT
	Natural Gas		2015 - 2020	18.5-35.8 MMT
	Electricity		2013 - 2020	15-25 MMT
Totals				378.5 – 916.4

Three Abatement Scenarios

- Low Availability:
 - 475 MMT from comp. and low price policies
 - Medium price response
- Medium Availability:
 - 583 MMT from comp. and low price policies
 - Low price response
- High Availability:
 - 710 MMT from comp. and low price policies
 - Medium price response

Figure 5

Allowance Price Probabilities by Scenario



Policy Implications

- Small, but real chance of reaching and exhausting allowance reserve before 2021.
 - Specific policies to respond to potential exhaustion of reserve are needed. CARB is working on these.
- Allowance revenues could fall well below previous forecasts.
 - Floor price most likely outcome
 - Lower sales at the floor price
- Prices could be volatile as market updates to new information
 - Small swings in BAU or abatement could lead to large prices swings