



Performance Based Incentive Design

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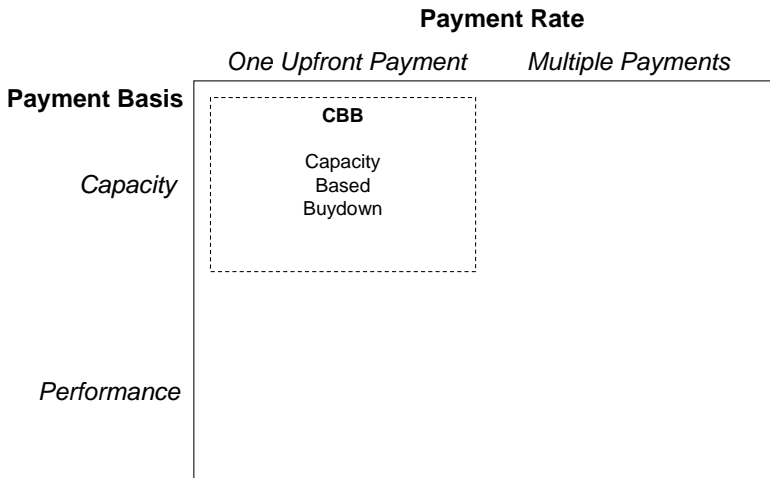
Objective

- Describe structures available to PV incentive programs
- Discuss structure strengths and weaknesses
- Recommend approach to select structure

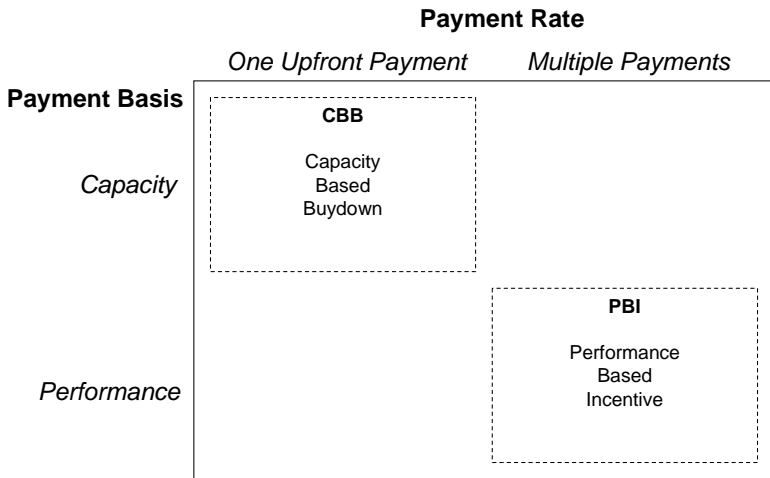
Questions to Answer

- Which type of incentive should be offered?
 - Capacity based buydown (CBB)?
 - Performance based incentive (PBI)?
 - Other?
- If PBI is selected:
 - What should the PBI rate be?
 - What should the PBI duration be?
 - Should PBI rate be constant or variable?
 - How should structure change over time?
 - Should structure be customer-specific?
 - Should PBI structure vary geographically?

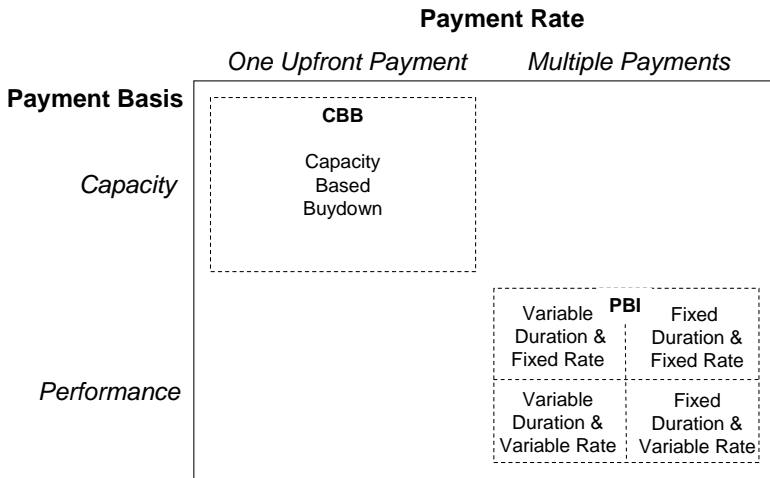
Most PV Incentive Programs are Capacity Based



Performance Based Incentives (PBI) Protect Against Poor System Installation & Performance



There are Various Types of PBI Structures

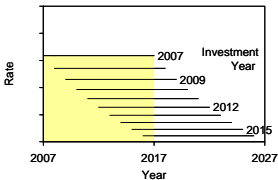


PBI Structure Classes

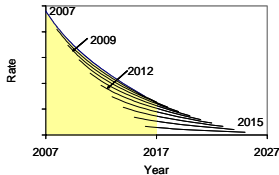
		Once a customer invests, the PBI rate:	
		Is fixed over time	Varies over time
The duration of PBI payments:	Is a fixed number of years independent of when the customer invests	Fixed duration Fixed rate	Fixed duration Variable rate
	Varies depending upon when the customer invests	Variable duration Fixed rate	Variable duration Variable rate

Payouts for Various PBI Structures (Customer invests in 2007)

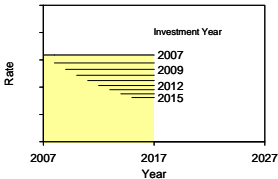
Fixed Duration, Fixed Rate



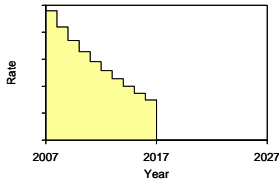
Fixed Duration, Variable Rate



Variable Duration, Fixed Rate

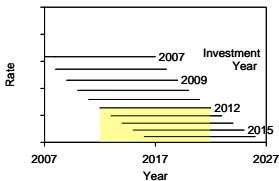


Variable Duration, Variable Rate

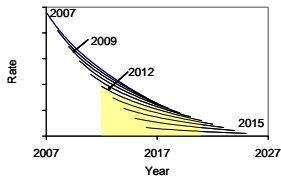


Payouts for Various PBI Structures (Customer invests in 2012)

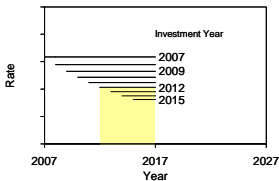
Fixed Duration, Fixed Rate



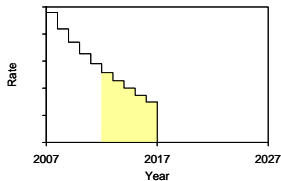
Fixed Duration, Variable Rate



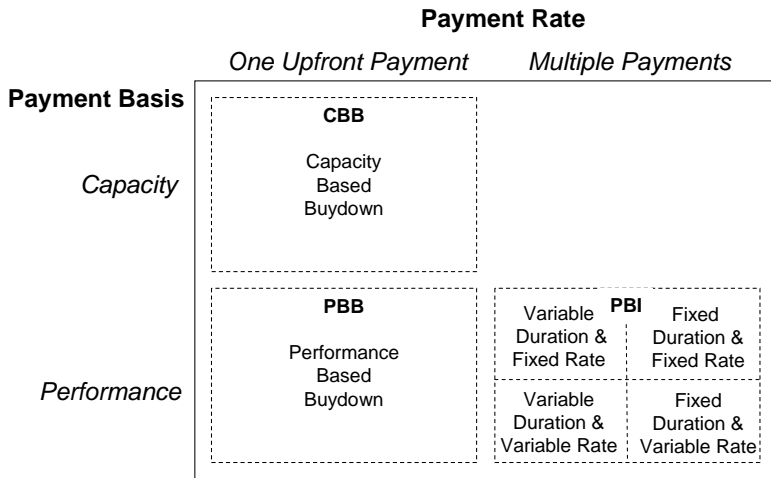
Variable Duration, Fixed Rate



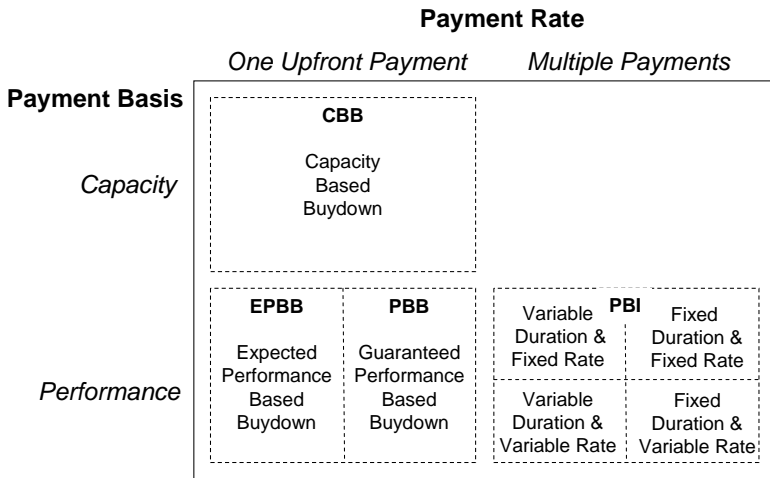
Variable Duration, Variable Rate



Performance Based Buydown (PBB) Combines Aspects of CBB and PBI

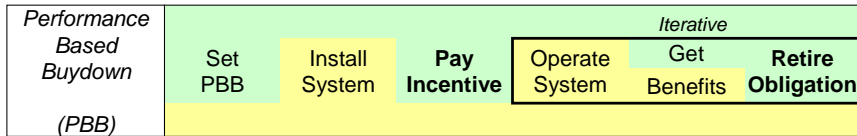
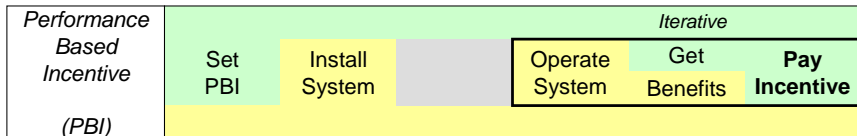
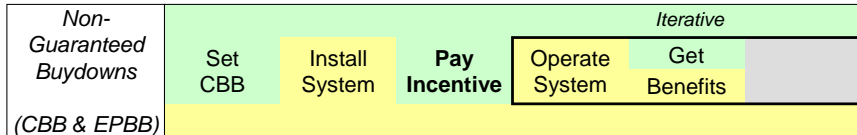


Implement PBB on Expected or Guaranteed Basis



How the Types of Incentives Work

Program Customer



Strengths and Weaknesses (Incentive Agency or Utility Perspective)

	CBB	EPBB	PBB	PBI
Incentive agency or utility				
<i>Direct Program Cost (\$ of incentives per kWh of production)</i>				
<i>Protects against poor system design and installation</i>	-	+/-	+	+
<i>Protects against poor system performance</i>	-	-	+/-	+
<i>Capitalizes on agency's lower discount rate</i>	+	+	+	-
<i>Reduces production risk premium required by customers</i>	+	+	-	-
<i>Maximizes state and federal tax benefits</i>	?	?	?	+
Indirect & Administrative Cost				
<i>Minimizes number of payments to make to customer</i>	+	+	+/-	-
<i>Reduces need to verify system performance for payment</i>	+	+	-	-
<i>Minimizes number of customer interactions</i>	+	+	-	-
Other Factors				
<i>Simple to have constant annual budget w/o escrow account</i>	+	+	+	-
<i>Funding comes from short-term budget</i>	+	+	+	-
<i>Structure is flexible to respond to changing market conditions</i>	+	+	+	+/-
<i>Easily designed to have continuously decreasing incentive</i>	-	-	-	+/-
<i>Promotes installations that maximize energy production</i>	-	+/-	+	+
<i>Ease of structure to promote time-varying value of power</i>	+	+	+	-

Strengths and Weaknesses (Manufacturer & Reseller Perspective)

	CBB	EPBB	PBB	PBI
Manufacturer and System Reseller				
<i>Product innovation</i>				
<i>Rewards products w/ high kWh production per kW of capacity</i>	-	+/-	+	+
<i>Rewards products (e.g. inverters) with long life times</i>	-	-	+	+
<i>Lessens need to meet agency equipment performance standards</i>	-	-	+	+
<i>Product Sale</i>				
<i>Promotes ease of sale</i>	+	+	+/-	+/-
<i>Reduces need for additional warranties</i>	+	+	-	-

Strengths and Weaknesses (Customer Perspective)

	CBB	EPBB	PBB	PBI
Customer				
<i>Customer Economics</i>				
<i>Minimizes payment risk</i>	+	+	-	-
<i>Reduces initial capital/loan amount required by customer</i>	+	+	+	-
<i>Can be engineered to provide various cash flow streams</i>	-	-	-	+

Suggested Incentive Design Approach

1. Derive fundamental incentive structure
2. Translate to derivative structures: EPBB, PBB, four classes of PBI, and hybrid structures
3. Quantify long-term budget and levelized cost
4. Apply strengths and weaknesses filter to evaluate structures from all perspectives
5. Select incentive structure