



Pasadena Water & Power 2009 Integrated Resource Plan

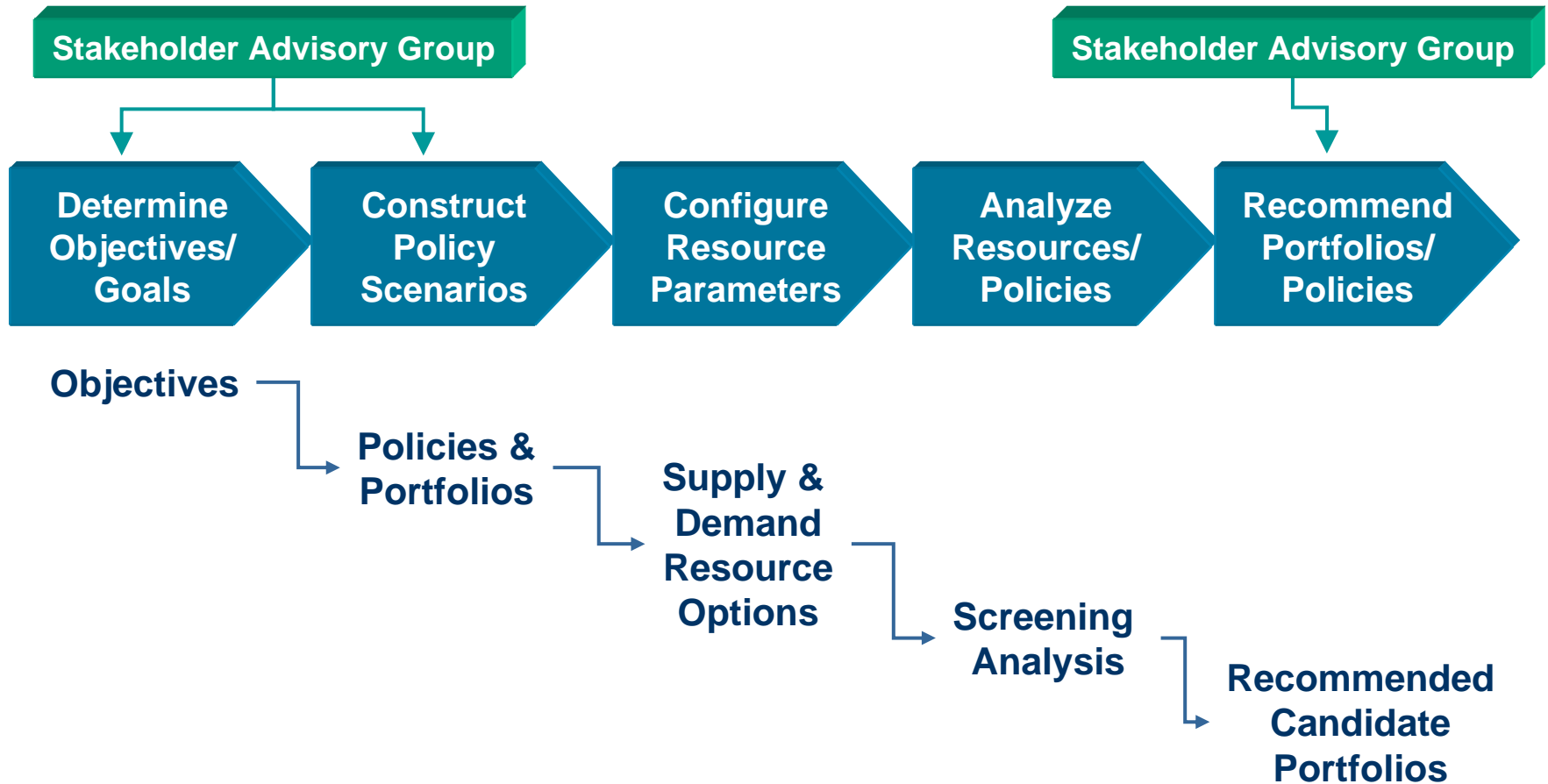
Advisory Group Meeting #4

November 18, 2008

Agenda

- IRP Process Review and Current Status
- Phase 1 Executive Summary
 - Findings
 - Portfolio Updates
 - Customer Cost Analysis
 - Discussion and Guidance
- Phase 2
 - Risk Factors
 - Preliminary Results
 - Guidance
- Next Steps

Phase 1 – Screening to narrow the range of possibilities



Phase 1 Executive Summary

Key Phase I Findings

- We have addressed the key shortcomings of the previous IRP analysis that were highlighted by the EAC:
 - **Clear articulation of planning objectives:** Reliability, environment, price stability and competitive costs were selected as priorities for PWP resource planning objectives
 - **Address environmental impacts:** The identified carbon reduction strategies permit direct, quantitative evaluation of the trade-offs between environmental stewardship and the resulting costs to PWP's customers
 - **Inadequate RPS goals:** Each of the proposed carbon reduction strategies involve significant expansion of current renewable portfolio standards beyond likely future State requirements (including both RPS and GHG policies)
 - **Local vs. remote renewables:** The final Phase 2 portfolios were constructed specifically to evaluate the environmental, cost and risk implications of a focusing on local renewable options rather than remote options
 - **Increased energy efficiency:** All carbon reduction strategies rely on significantly expanded energy efficiency programs, with some portfolios including very aggressive expansions of demand-side programs, including options aimed at the behavioral aspects of energy consumption and an expanded focus on the residential sector
 - **Feasibility of reducing fossil-fuel reliance:** The most aggressive carbon reduction scenarios specifically contemplate reducing IPP generation, partially or completely, in order to achieve the targeted emission reductions and estimate the likely cost consequences of displacing PWP's major fossil-fueled supply source

Key Phase I Findings (continued)

- Numerous resource options are available to satisfy Pasadena's multiple objectives, but they each carry potentially significant risks that must be considered:
 - Landfill and geothermal are least-cost, but may have limited availability and dependence on new transmission to make them feasible
 - Wind and solar thermal are feasible, but at a higher cost and by increasing PWP's exposure to reliability and commodity market risks
 - Local resource options are viable, but with significant risk that customers may not adopt their use as quickly or to the extent anticipated or desired
 - Options premised on the displacement of IPP power carry significant risk related to the feasibility of this approach and the price that can be realized by the displaced power
 - All options expose PWP to potential risks associated with uncertainty and volatility in:
 - customer demand
 - gas and power market prices
 - emerging state/regional/federal carbon policy constraints and valuation
 - constrained transmission capacity and continuing availability of local gas-fired generation
- Selection of a preferred Pasadena resource plan hinges primarily on customers' willingness to pay to reduce PWP's environmental impacts, while ensuring the reliable operation and financial integrity of the utility

Updated Phase 2 Portfolios

		20% Carbon Reduction Strategy	30% Carbon Reduction Strategy	60% Carbon Reduction Strategy	80% Carbon Reduction Strategy
Carbon Reduction Goals		10% by 2010 20% by 2020	10% by 2010 30% by 2020	20% by 2010 60% by 2020	20% by 2010 80% by 2020
RPS Goals and Targets		2007 IRP RPS Goals	Emerging CA RPS Goal	Aggressive RPS	Green
		10% by 2010 20% by 2017	20% by 2010 33% by 2020	20% by 2010 50% by 2020	20% by 2010 80%+ by 2020
Plan Concepts	Existing Portfolio	√	1, 2, 3		
	Local Fossil Generation			6	
	Coal Displacement			5	9, 10
	Aggressive Efficiency & Technology	√	4	7	8

Updated Final Phase 2 Portfolios

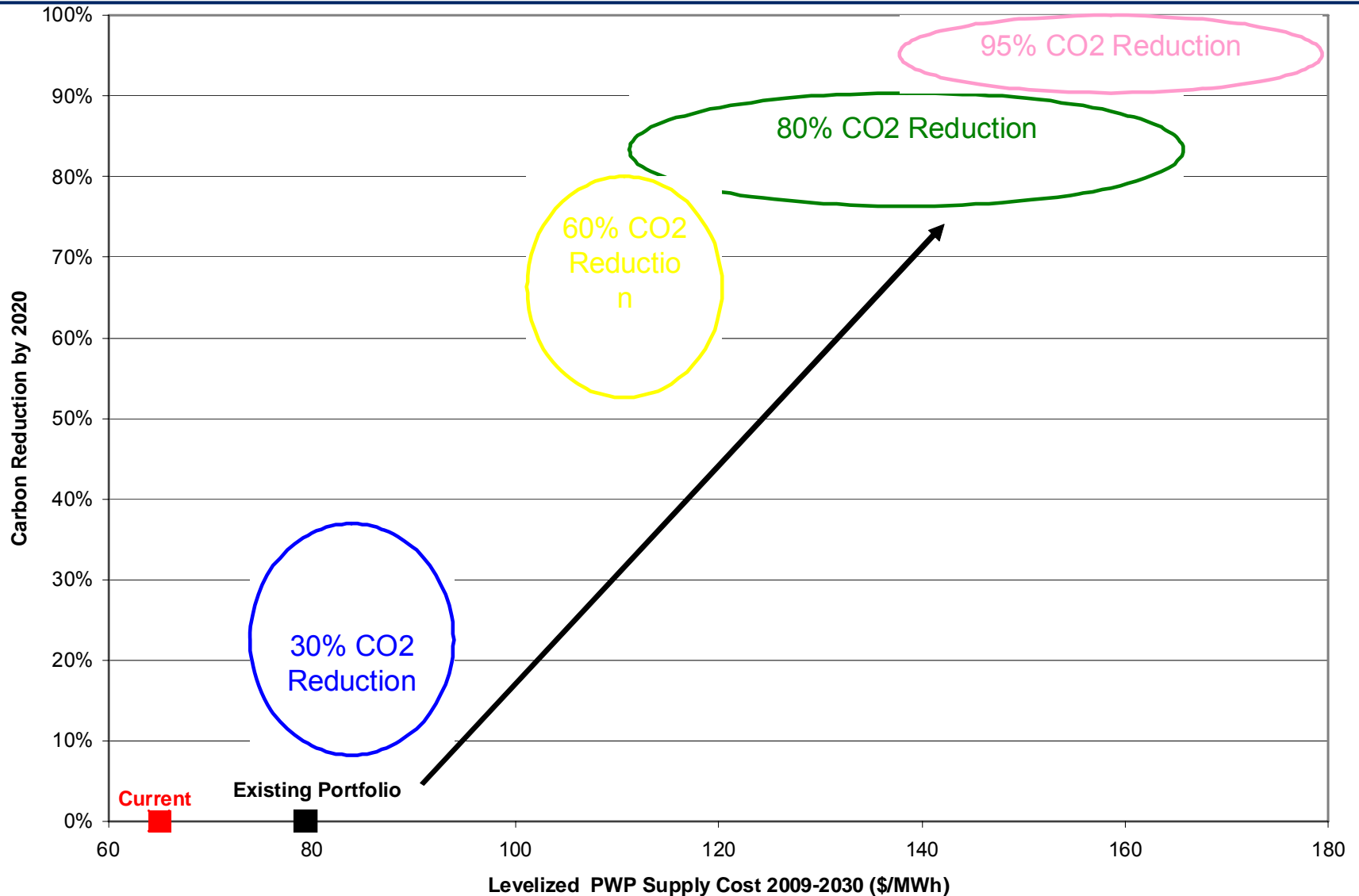
- Add a 95% carbon reduction portfolio to illustrate the costs of a carbon-free strategy, as requested
- Propose to screen-out 20% and 95% carbon reduction strategies and concentrate Phase 2 analysis on 30%, 60% and 90% strategies
- Measure carbon reductions relative to estimated 2008 emissions and the estimate the anticipated costs of achieving the targeted reductions that exceed AB 32 requirements (i.e., we are not developing an AB 32 compliance plan)
- Add the new 4.5 MW Skunk Creek landfill gas contract to existing portfolio
- Local renewables options: scale-back the unspecified “feed-in tariff (FIT)” additions, raise FIT price to \$150/MWh, and, back-fill with incremental solar photovoltaic additions to make these portfolios more realistic
- Remote renewable options: reduce the amount of least-cost landfill and geothermal additions (generally 10 to 15 MW each) to address concerns over the limited availability of these options and the feasibility of these portfolios
- Analyze peak-hour value of intermittent solar and wind options in response to concerns about our technology screening analysis approach
- Add demand response programs to the aggressive efficiency and technology portfolios to address request for demand-side programs relating to customer behavior

Final Phase 2 Portfolios

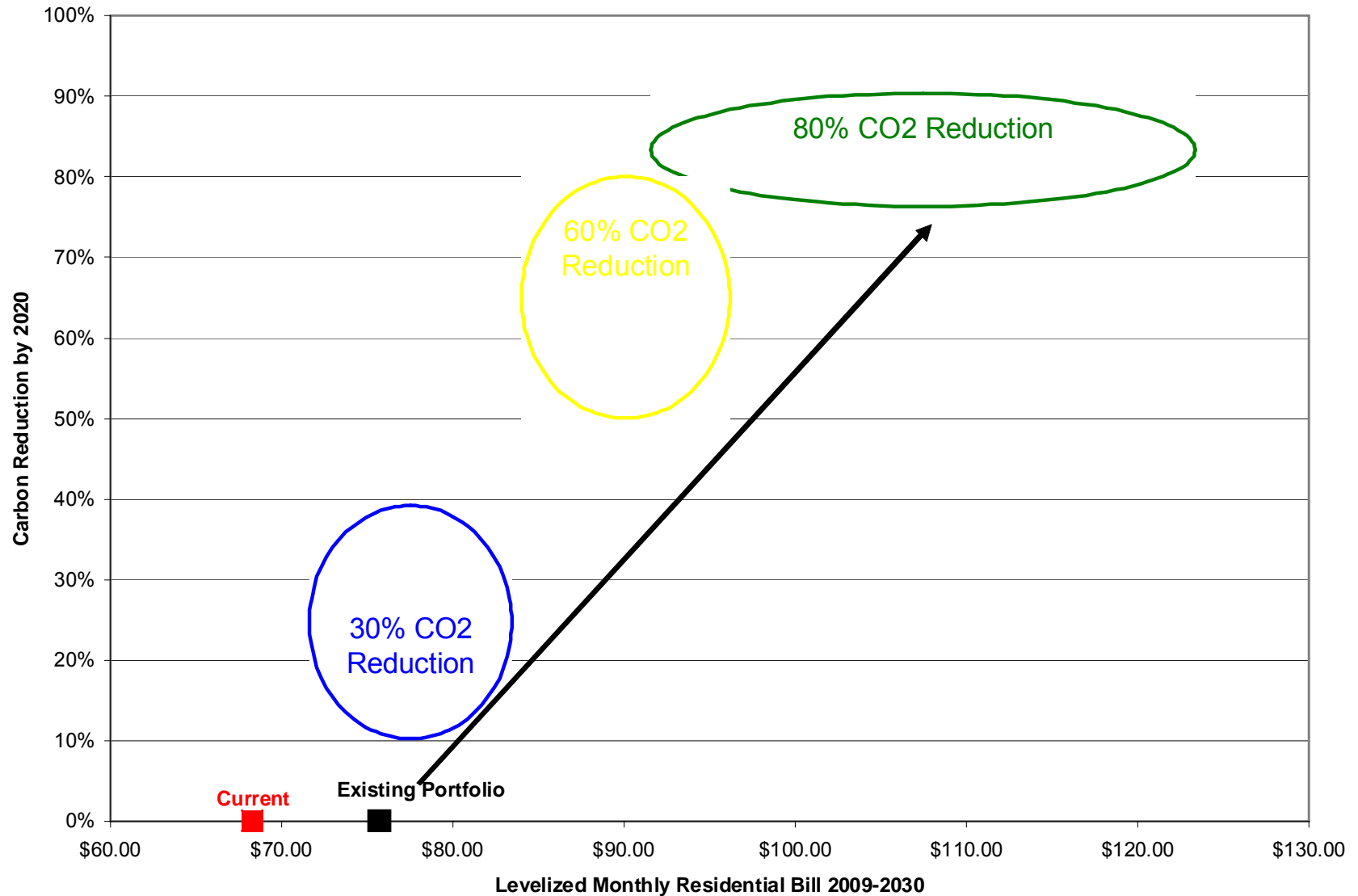
Capacity Additions (MW, 2009-2028)

Carbon Reduction Target	Portfolio #	Remote Renewables				Local Renewables/DSM				Fossil-fueled		Total
		Landfill	Geo thermal	Wind	Solar Thermal	Solar PV (Existing)	Solar PV (Expand)	Feed-In Tariff	DR & RA	Gas	Coal	
30%	1	15	15			14						44
	2	10	10	20		14						54
	3	10	10		20	14						54
	4	10	10			14	15	21				70
60%	5	15	15	60	60	14					-47	117
	6	15	15			14			65	-108		1
	7	5	5			14	15	21	55	-108		7
80%	8	25	25	10	10	14	15	21	25		-108	37
	9	25	65			14					-108	-4
	10			125	125	14					-108	156
100%	11	50	50	65	65	14					-108	136

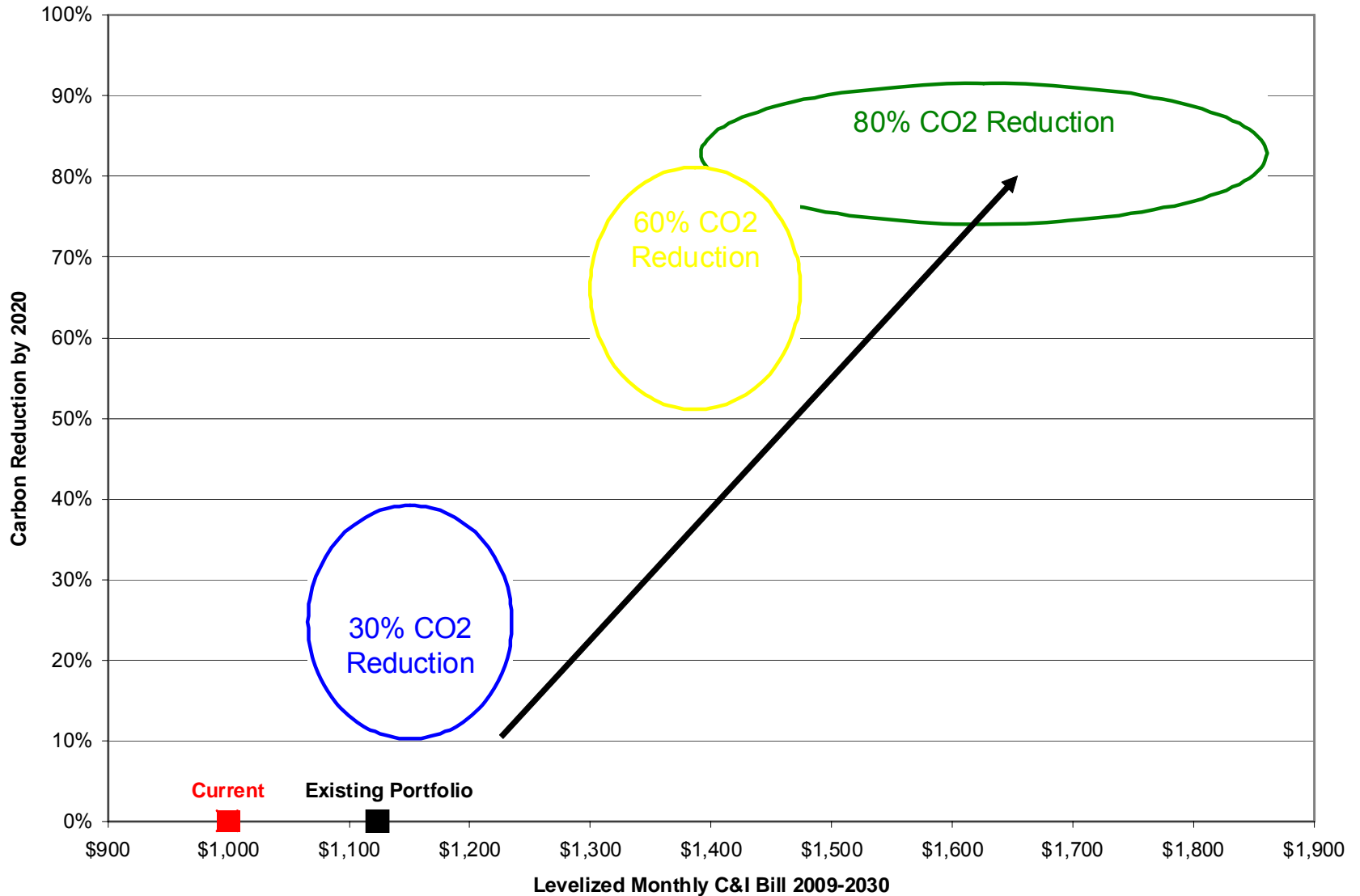
Impact on PWP Supply Costs



Illustrative Residential Monthly Bill Impacts



Illustrative Commercial/Industrial Monthly Bill Impacts

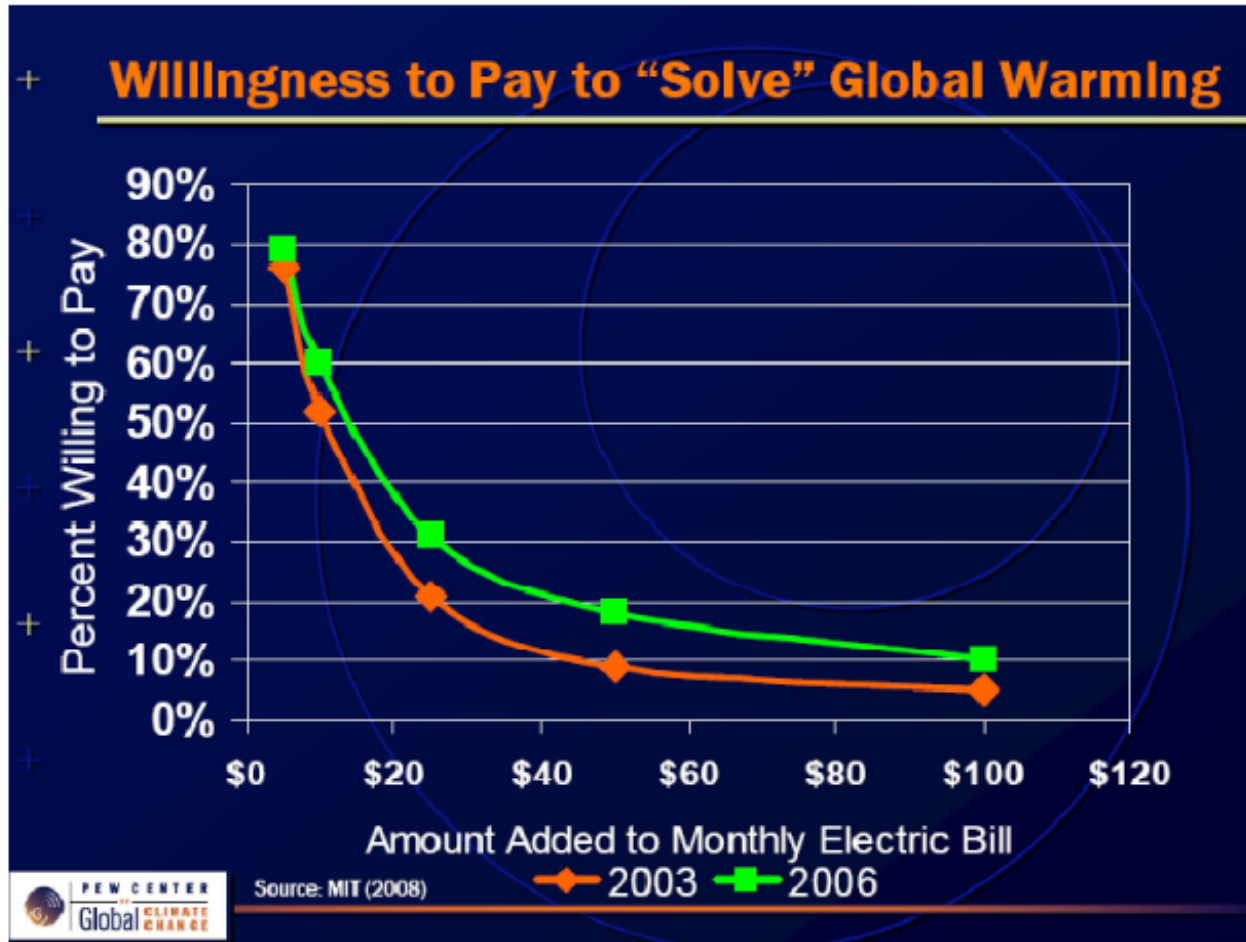


AG Members' Indicative Tolerance for Cost Increases to Support Environmental Objectives

Perspective Represented	Acceptable Increase (%)	Unacceptable Increase (%)
General Public	10	15
Residential	5	15
Commercial	10	20
Residential	20	25
Residential	15	30
Small Business	0-10	10
Small Business	0-10	35
Environmental	30	50
Simple Average	12.5	25

PWP Sales/Revenue (Source: 2007 Annual Report)	PWP Revenue (\$ Thousand)	Electricity Volume (MWh)	Average Rate (cents/kWh)	Number of Accounts	Average Usage (kWh/yr)	Average Usage (kWh/mo)
Residential	\$44,363	337,905	13.13	54,315	6,221	518
C&I	\$101,743	880,660	11.55	8,478	103,876	8,656
Retail Total	\$162,526	1,242,961	13.08	62,799	19,793	1,649

Constructing a “Demand Curve” for Carbon Reductions

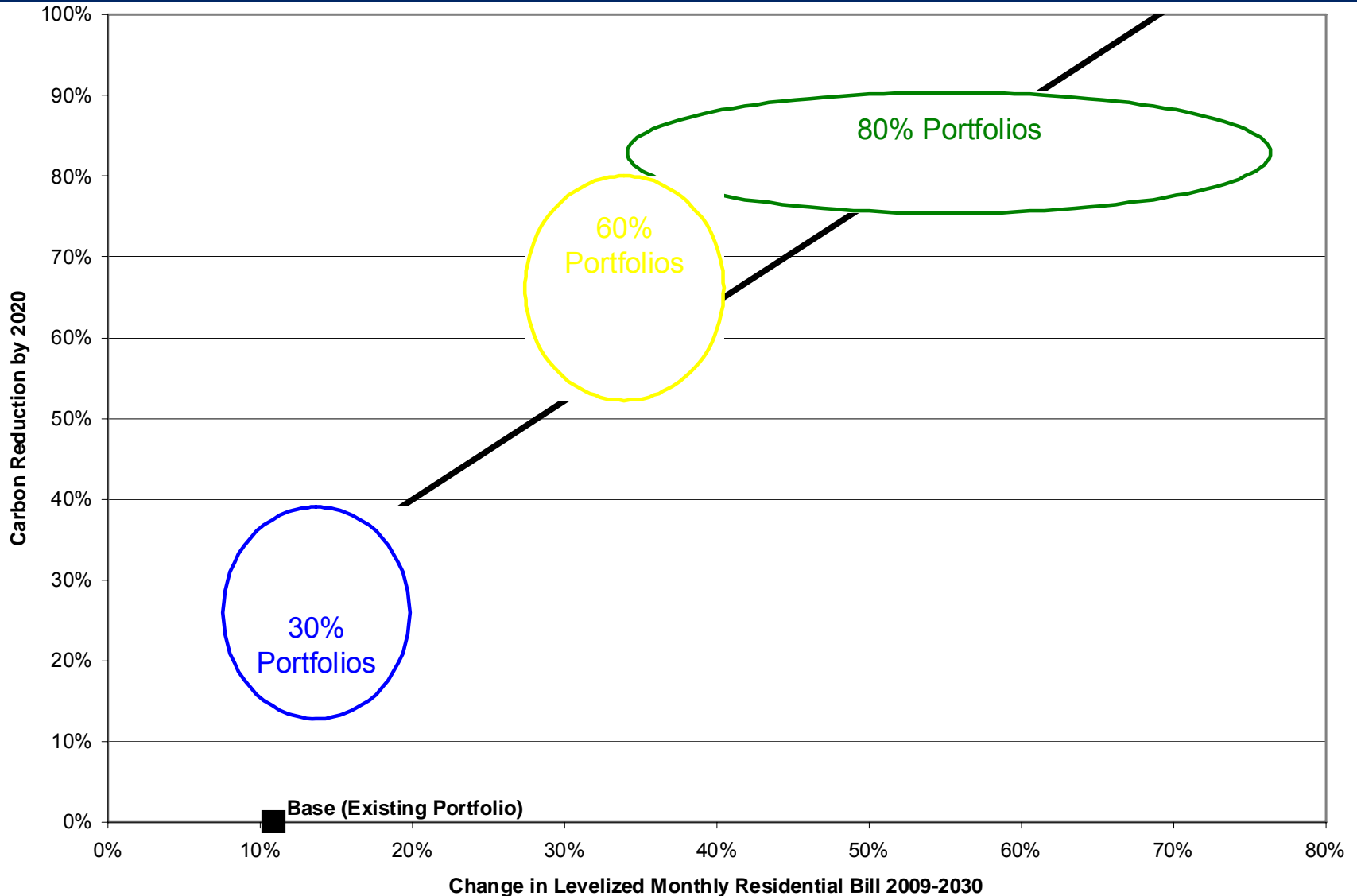


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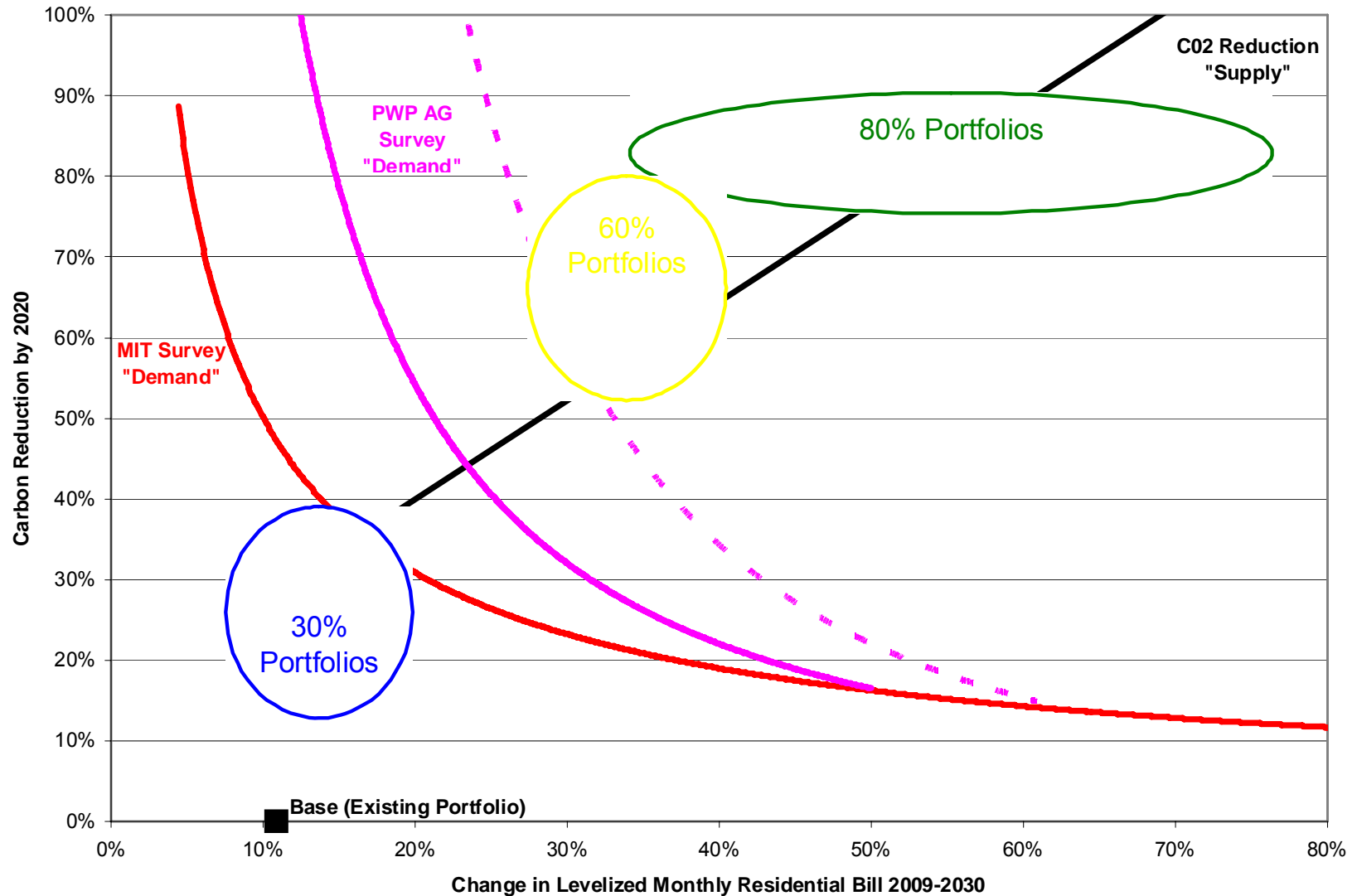
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Constructing a “Supply Curve” for Carbon Reductions



Phase 1 Carbon Reduction Supply/Demand Illustration



Policy Implications of Phase 1 Analysis

- Overall preferences for carbon reduction strategies can be defined now
 - 20% reduction strategy should be dropped—fails to achieve likely minimum renewable portfolio standards in emerging state policy and does not represent environmental leadership
 - 30% reduction strategy can be achieved with modest incremental cost impacts through reconfiguring the existing supply portfolio with renewables to achieve a 33% RPS target
 - 60% and 80% carbon reduction strategies are feasible if IPP coal generation can be displaced, but they create potentially significant cost and risk exposures (30%+ increases in monthly residential bills above current rates)
- Selection of preferred options require further evaluation of key risks that affect the Phase 1 portfolios and specific choices that should be pursued:
 - Cost and availability of renewable resources to displace IPP
 - Feasibility of liquidating IPP power and the price that can be realized for it
 - Reliability impacts of replacing PWP’s existing firm capacity resources with remote, intermittent, emerging and/or market-based alternatives;
 - Unproven customer adoption of preferred resource options (solar PV, efficiency, and DSM)
- Final resource plan requires clear articulation of willingness to pay higher rates in order to achieve environmental leadership through carbon reductions
- Each carbon reduction strategy involves similar planning and procurement decisions over the next 3-5 years, so it may be possible to defer a final commitment to a specific carbon reduction strategy to develop further clarity regarding emerging carbon policies, IPP displacement options, and the cost/availability of alternative renewable resources