BUILDING A WORLD OF DIFFERENCE®

BLACK & VEATCH

Renewable Energy Transmission Initiative Phase 1B Work Group Meeting 2

Black & Veatch

Phase 1B Work Group

June 5, 2008

Agenda

- Actions taken last meeting
  - Tentative recommendation on reference forecast
- Carry-over items from 5/27/08
  - Energy price forecast – reference and scenario development
- Net short calculation

Phase 1B Work Group Issues

- Energy price forecast –reference and sensitivities — Today
- Net short calculation — Today
- Resource valuation model review — 1 week
- Project characterization & identification — 2 weeks
- Transmission cost assumptions — 2 weeks
- Uncertainty assumptions - cost and CF data by resource type — TBD
- Advise on sensitivity analyses and data — TBD

TBD

Energy Price Forecast Reference Case Tentative Recommendation Pending Review

- Proposed reference case basis: CEC 2007 IEPR Scenario 1B w/ GED (Ventyx) high fuel price forecast
  - Pending review of:
    - CEC IEPR gas price forecasts
    - Comparison of CEC scenarios 1 and 1B
- Greenhouse gas values
  - Reference & sensitivity case assumptions

Energy Price Forecast Reference Case - Comparison of CEC IEPR Scenarios 1 and 1B

- **What's Different**

Scenario	Energy Efficiency	Demand Response	Rooftop PV	Renewables
1 – Current *Conditions*	Committed EE only	Existing program capability	Negligible	RPS not achieved
IB- Current *Requirements*	IOU 2009-2011 goals	IOU proposed program expansion	Existing IOU subsidy levels	RPS achieved

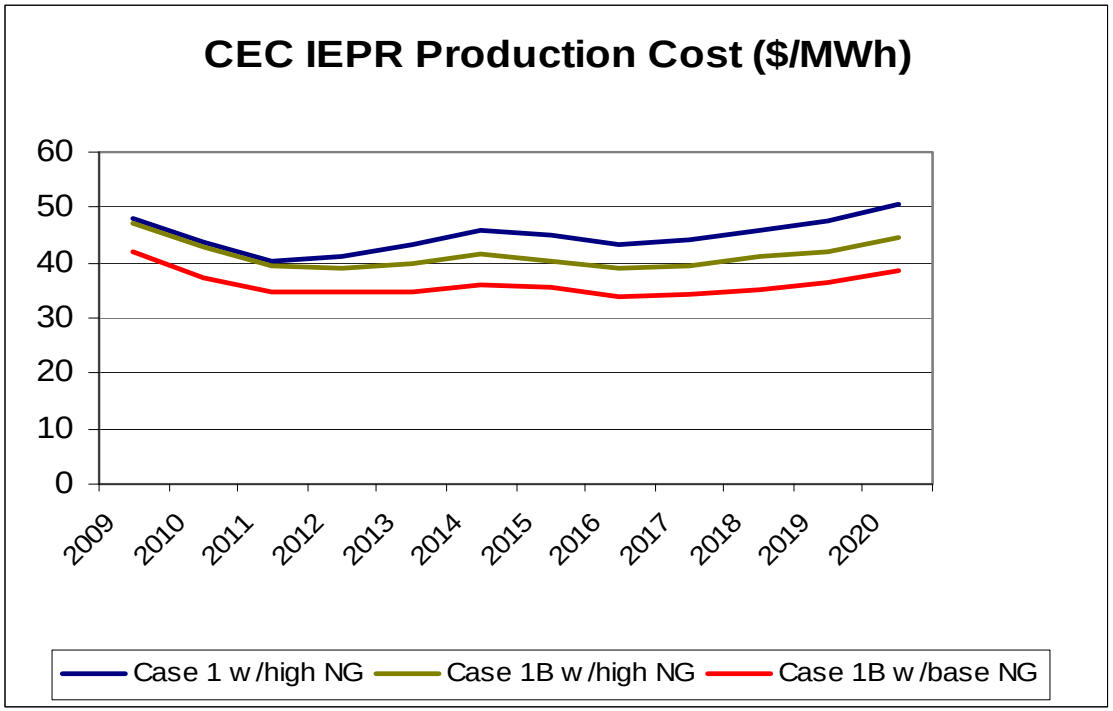
Source: CEC Scenario Analyses, June 2007, Table 2-1, p.21

Energy Price Forecast Reference Case - Comparison of CEC IEPR Scenarios 1 and 1B

- Energy prices lower with additional renewables, EE and DG since they are infra-marginal

CEC 2007 IEPR Production Costs ($/MWh)

	Case 1 w/high NG	Case 1B w/high NG	Case 1B w/base NG
2009	48.14	47.21	41.97
2010	43.70	42.72	37.47
2011	40.32	39.26	34.89
2012	41.31	39.04	34.52
2013	43.31	39.67	34.51
2014	45.73	41.40	35.93
2015	44.79	40.42	35.45
2016	43.50	39.15	33.87
2017	43.93	39.26	34.08
2018	45.89	40.97	35.26
2019	47.55	42.21	36.39
2020	50.66	44.61	38.55

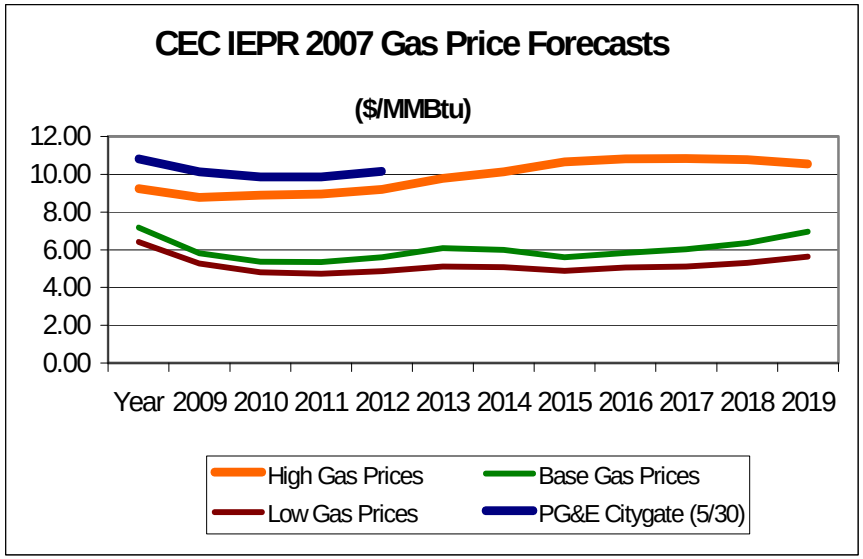


Energy Price Forecast Reference Case – Gas Price Forecasts

- CEC high gas price forecast lower than current gas prices

CEC IEPR Natural Gas Forecast Prices ($2006 $/MMBtu)

Year	High Gas Prices	Base Gas Prices	Low Gas Prices	PG&E Citygate (5/30)
2009	9.23	7.17	6.42	10.82
2010	8.78	5.82	5.28	10.14
2011	8.88	5.36	4.80	9.87
2012	8.94	5.34	4.72	9.87
2013	9.20	5.61	4.86	10.16
2014	9.78	6.09	5.12	
2015	10.13	5.99	5.08	
2016	10.66	5.60	4.89	
2017	10.82	5.83	5.05	
2018	10.84	6.02	5.11	
2019	10.78	6.36	5.30	
2020	10.55	6.96	5.64	



Sources:

CEC Scenario Analysis Apprendix H-3, Nymex

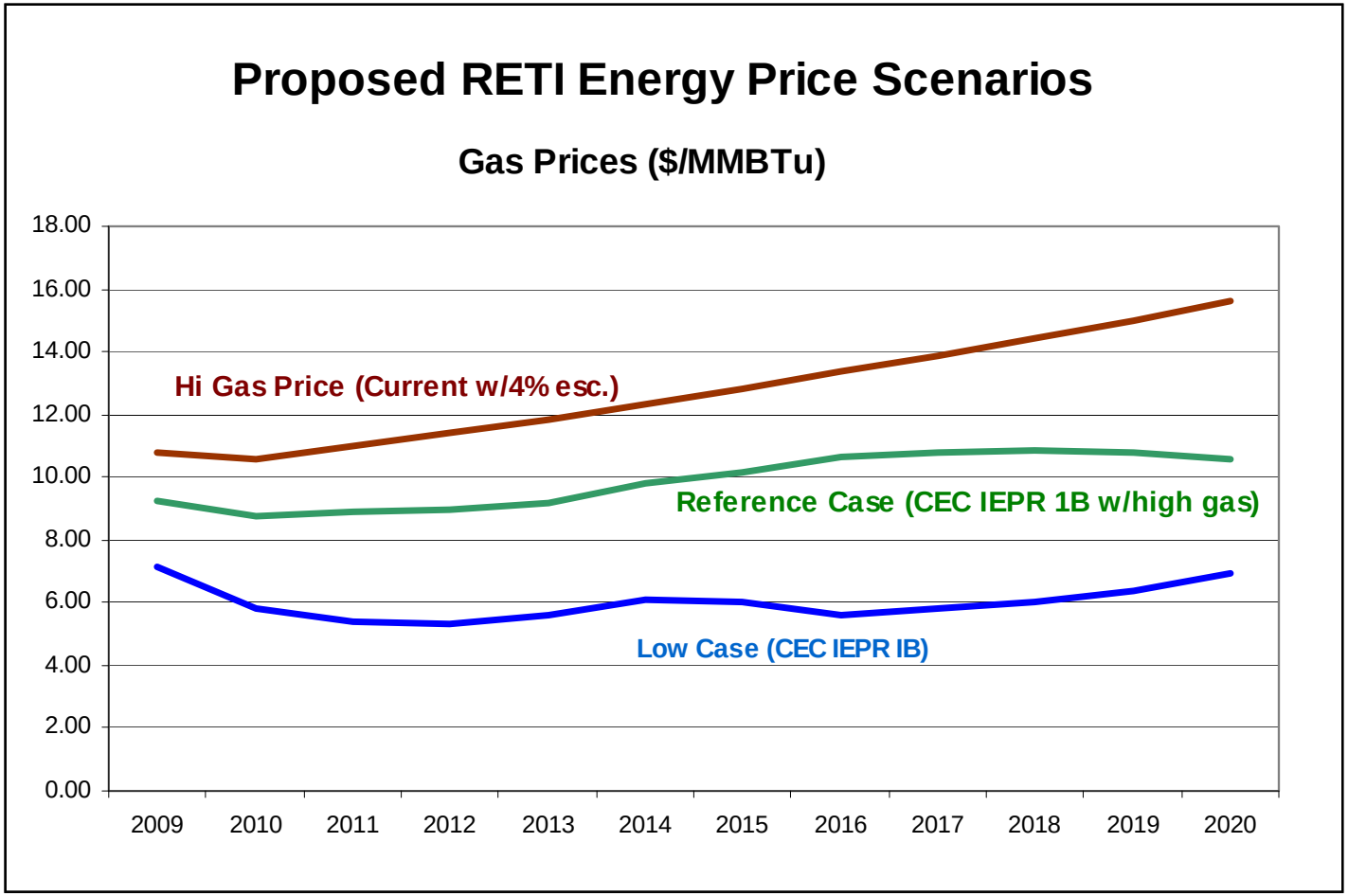
Energy Price Forecast Sensitivity Case Development

- Goal to develop alternative forecasts that represent a plausible range of potential future energy prices
  - High – Reflect reasonable upper bound
  - Low – Reflect reasonable lower bound
- Should reflect major uncertainty – fuel prices

Energy Price Forecast Sensitivity Case Development – Straw-man proposal

- Low energy price scenario - Use CEC IEPR Scenario 1B with base gas prices
  - Costs approximately 24% lower than reference case
  - Match CEC IEPR IB analysis
- High energy price scenario
  - Use current NYMEX fuel prices increasing 4% annually
  - Costs increase 30% over reference case

Energy Price Forecast Sensitivity Case Development – Straw-man proposal



RPS Net Short Calculation

- Identify renewable resource requirements to meet RPS goals
- Formula:

Annual California electric demand
x annual RPS requirement
- customer distributed renewable generation
- (50% of CSI forecast)
- existing renewable generation
- renewable generation under construction

Net Short

Thank You!

Ryan Pletka
pletkarj@bv.com
Tel: 925-949-5929

Tim Mason
masont@bv.com
Tel: 925-949-5943

Kevin Joyce
joycekp@bv.com
Tel: 913-458-8768