



# Bonneville Power Administration's Power Function Review Renewables Program Technical Workshop

February 8, 2005



# BPA's Financial Disclosure Information

1. "All FY05-09 information was provided in February 2005 and cannot be found in BPA-approved Agency Financial Information but is provided for discussion or exploratory purposes only as projections of program activity levels, etc."
2. "All FY97-04 information was provided in February 2005 and is consistent with audited actuals that contain BPA-approved Agency Financial Information".
3. This information has been made publicly available by BPA in February 2005. The figures shown are consistent with audited actuals that contain Agency approved financial information, except for forgone revenues and power.
4. This information is a derived estimate for presentation purposes and cannot be found in BPA-approved Agency Financial Information but is provided for discussion or exploratory purposes only as projections of program activity levels, etc."

*Moved slide from #5 to slide #2.*



# History of BPA's Renewable Program

- BPA began funding renewable-related research nearly 30 years ago:
  - 1977 the solar monitoring network established.
  - 1980 BPA's MOD-2 wind demonstration project became operational.
  - 1985 BPA published the geothermal and wind resource assessments.
- BPA commits to renewable acquisition in 1996 with the \$15M/year renewable spending commitment.
  - 1996: began offering green power; Salem was the only purchaser.
  - 1997: Foote Creek I PPA signed and BEF/BPA partnership formed.
  - 1998: BPA rolls out Blended EPP (5% wind, 95% endorsed hydro)
  - 1999: Foote Creek II PPA signed.
  - 2000: Ashland Solar, Foote Creek IV and Fourmile Hill PPAs signed.
  - 2001: 1000 MW wind RFP issued, BPA co-funds White Bluff solar and Condon & Stateline PPAs signed.
  - 2002: Klondike PPA signed.



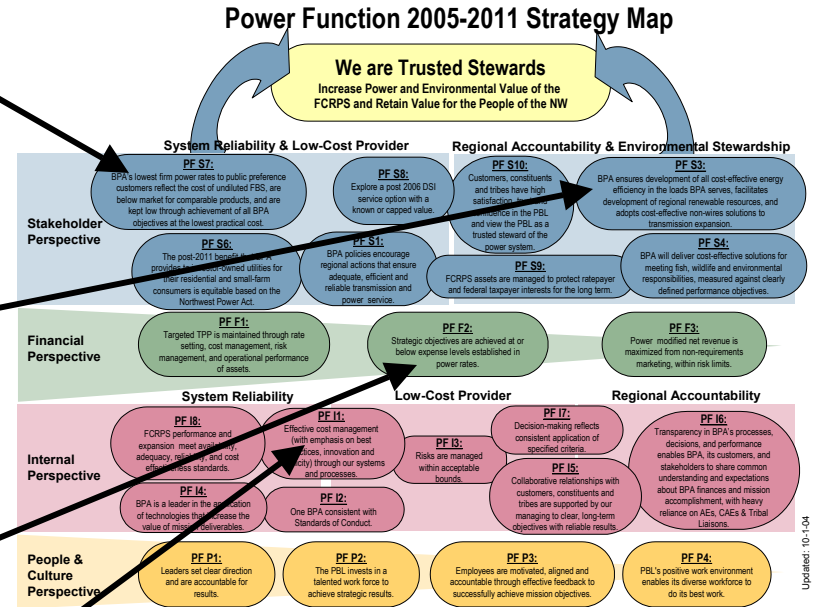
# Power Function Review Renewable Program Support of PBL Balanced Scorecard

**PF S7:** BPA's lowest firm power rates to public preference customers reflect the cost of undiluted FBS, are below market for comparable products, and are kept low through achievement of all BPA objectives at the lowest practical cost.

**PF S3:** BPA ensures development of all cost-effective energy efficiency in the loads BPA serves, facilitates development of regional renewable resources, and adopts cost-effective non-wires solutions to transmission expansion.

**PF F2:** Strategic objectives are achieved at or below expense levels established in power rates.

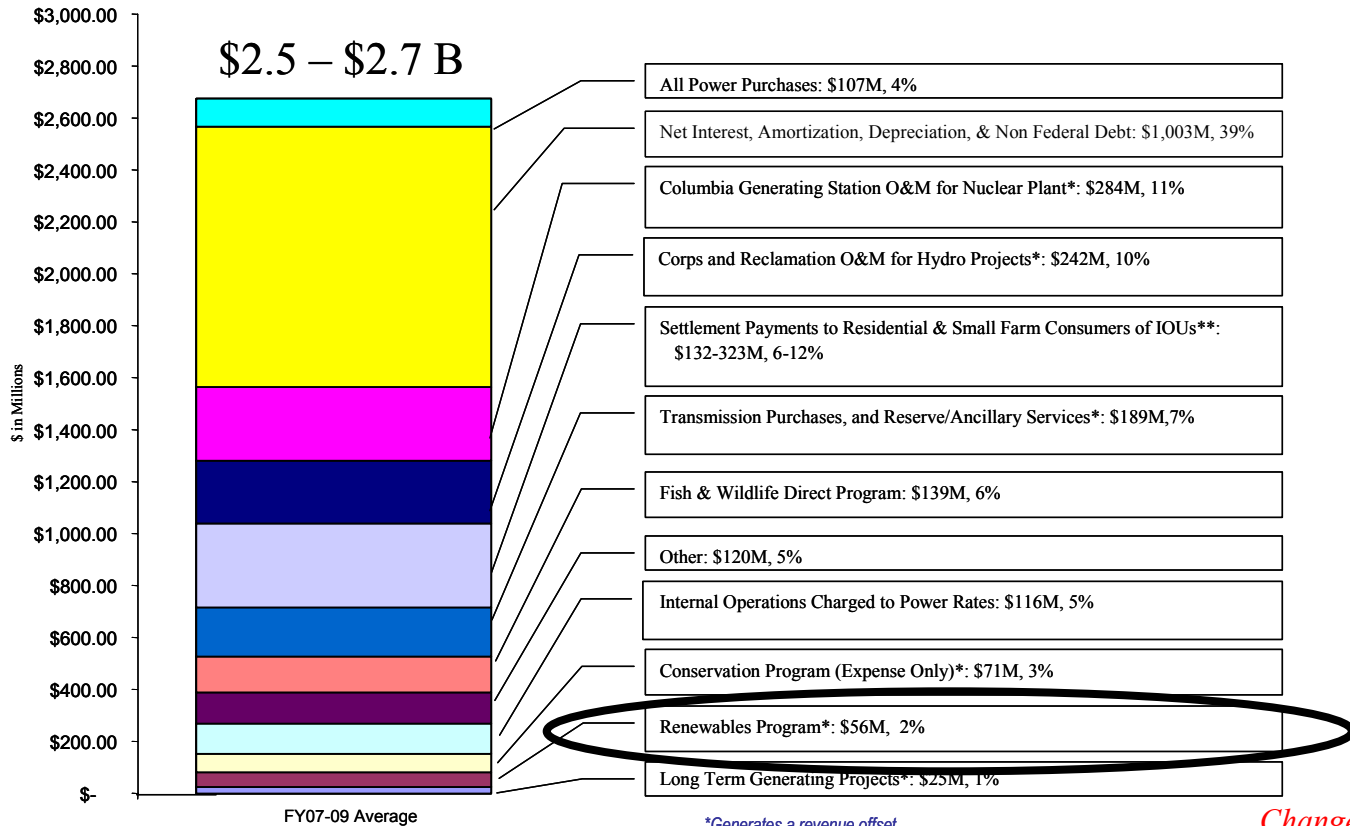
**PF I1:** Effective cost management (with emphasis on best practices, innovation and simplicity) through our systems and processes.





# Renewable Portion of the Power Expense Structure

- The Renewables program costs are included in the revenue requirement of the PBL rate structure. The costs are primarily driven by energy produced at the wind projects and varies by how much wind blows. Revenues from the sale of power generated by these facilities help offset the expense of these contracts.



\*Generates a revenue offset  
 \*\* This level is heavily dependant on forward market prices  
 Percentages may not add to 100% due to rounding

*Changed title to reflect Renewables rather than Conservation.*

\*See BPA's Financial Disclosure Information



## BPA's Existing Renewable Portfolio

Year PPA Signed	On-Line Date	Project	BPA Share (MW)	Cumulative Capacity (MW)
1997	April 22, 1999	Foote Creek I Wind	15.32	15.32
1998	June 18, 1999	Foote Creek II Wind	1.8	17.12
1999	October 1, 2000	Foote Creek IV* Wind	16.8	34
2000	June 15, 2000	Ashland Solar	0.015	34
2001	December 31, 2001	Condon Wind	49.8	84
2001	December 18, 2001	Stateline Wind	90.42	174
2001	December 31, 2001	Klondike Wind	24	198
2001	May 30, 2002	White Bluffs Solar * (WA)	0.0387	198
2000	2007 (?)*	Fourmile Hill Geothermal (CA)	49.9	248

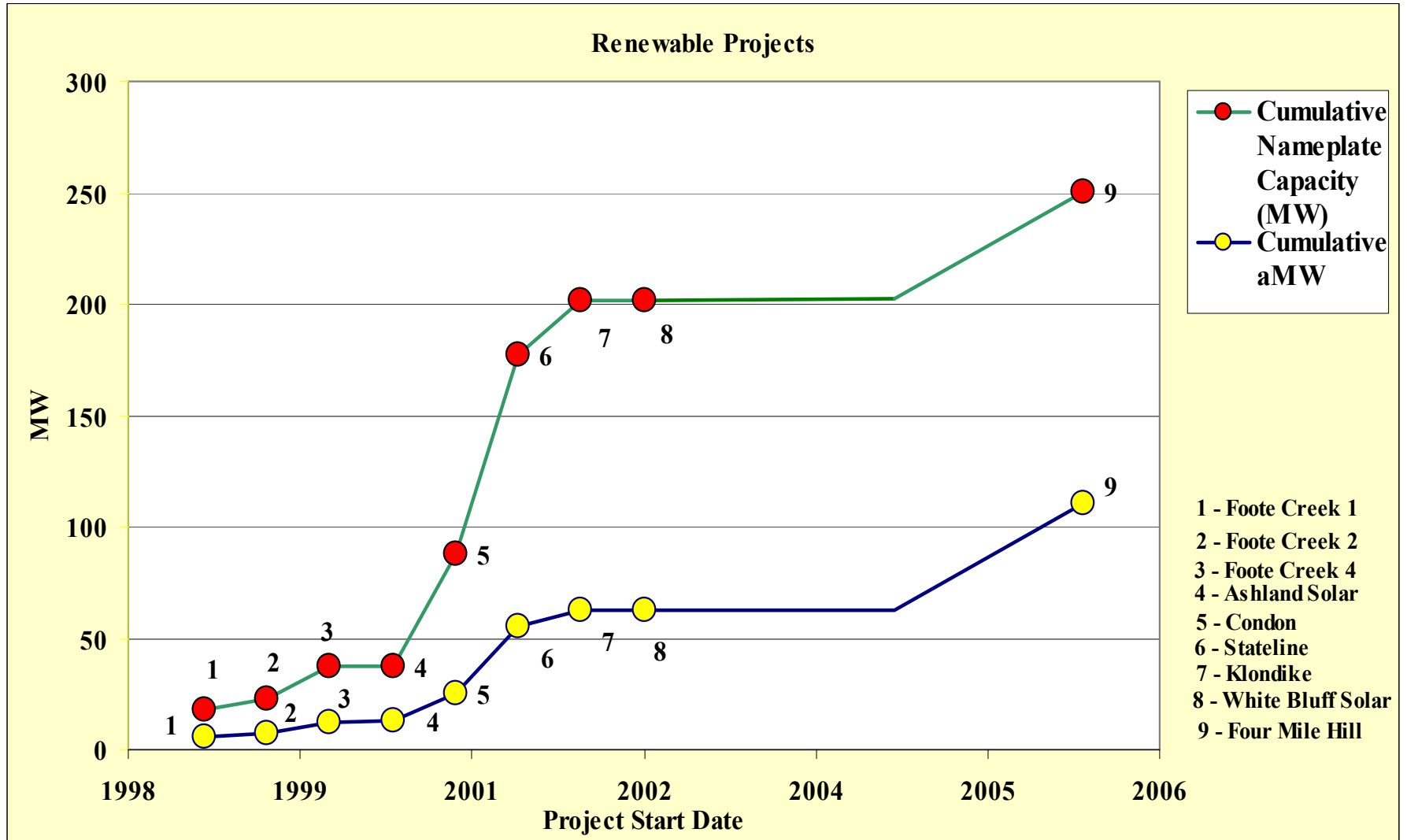
\* Fourmile Hill is scheduled to be on-line post-2006.

Cinergy owns the FC IV attributes.

BEF owns the White Bluff attributes.



# BPA's Renewable Projects By Online Date





# BPA's Current Renewable Program

- **BPA runs one of the nations largest wholesale renewable marketing programs**
  - Sell to 40+ utilities and 3 national marketers, nearly \$3 million/year net revenues.
- **BPA's network wind integration service is used by 4 utilities.**
- **BPA-managed expenses:**
  - BPA purchases nearly 1/3 of the region's wind (198 MW) and funds some of the region's most valuable research (e.g., wind and solar monitoring, avian use, wind integration, etc.).
  - Wind Power purchases and program costs will total \$23.6 million/year\* (FY 2005). This is included in rates.
  - Revenues from the sale of the underlying energy, plus green premiums offset these expenses, leaving an expected net gain of about \$84K in FY 2005\*.
- **Customer-managed expenses:**
  - BPA is administering \$6 million/year of renewables spending through the R portion of the C&RD program. BPA has agreed to act as a back stop if customers do not invest, on average, \$6 million/year on renewables over this rate period.

\* Without the \$6M 'R' portion of C&RD.

*Added clarifying footnote.*





# BPA's \$21M/year Renewable (Net Expense) Management Target

$$\begin{aligned} & \text{(Renewable Generation Costs)} \\ & + \text{(Support costs) + (facilitation costs)} \\ & + \text{(Firming/Shaping/Transmission Costs)} \\ & - \text{(LRMC}^1 \text{ of equivalent amount of power based on a CCCT}^2\text{)} \\ & - \text{(Green Premium Revenues)} \\ & \leq \text{\$21 million/year} \end{aligned}$$

<sup>1</sup> Long Run Marginal Cost

<sup>2</sup> Combined Cycle Combustion Turbine



## How we manage the \$21M/Year Renewable (Net Expense) Management Target

- BPA's management target for renewable investments: Manage *up to* \$21 million/year in net renewable expenses relative to LRMC<sup>1</sup> of the conventional alternative (currently using net of \$4 gas CCCT<sup>2</sup>; we recognize this may need updating from time to time).
- The \$21 million net budget calculation is a management tool, not a rates number. It is a measurement of the expected, added costs of our renewable program measured against avoided power costs.
- It is a net spending limit as well as an indication of our enthusiasm to support renewables.
- The \$21 million net is measured at any point over the rate period. Because the LRMC can change, this net program evaluation can change without BPA making any changes in the renewable program. It is a rough tool.
- The \$21 million management tool helps BPA decide whether and choose what costs we put into the renewable budget and eventually into rates.
- When new opportunities arise, they are included in the \$21 million net calculation as a test to see if we have exceeded our management spending target limit before we proceed.

<sup>1</sup> Long Run Marginal Cost

<sup>2</sup> Combined Cycle Combustion Turbine

*Deleted "at any point" from second sentence in the 4<sup>th</sup> bullet. Clarifies that BPA will only change LRMC assumptions when we evaluate the \$21M management target, not whenever natural gas prices change.*



# Details of the Renewable Budget

## BPA's PBL RENEWABLE BUDGET

1/21/2005

	FY 2001*	FY 2002*	FY 2003*	FY 2004*	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
				(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
<b>1 RENEWABLES PURCHASE COSTS</b>									
2 <i>Wind total</i>	\$6,481,810	\$17,121,650	\$17,573,443	\$ 18,783,555	\$ 22,538,798	\$ 22,888,400	\$ 22,636,895	\$ 23,147,963	\$ 24,404,486
3 <i>Idaho Falls Hydro 2/</i>		\$3,256,846							
4 <i>White Bluffs Solar</i>	\$50,000	\$1,975	\$11,316	\$11,316	\$11,321	\$11,321	\$11,321	\$11,321	\$11,321
5				-	-	-	31,012,616	31,414,700	31,678,389
6 <i>Fourmile Hill Geothermal 3/</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 31,012,616	\$ 31,414,700	\$ 31,678,389
7 <b>Total Power Purchase costs</b>	<b>\$6,531,810</b>	<b>\$20,380,471</b>	<b>\$17,584,759</b>	<b>\$ 18,794,871</b>	<b>\$ 22,550,119</b>	<b>\$ 22,899,720</b>	<b>\$ 53,660,831</b>	<b>\$ 54,573,983</b>	<b>\$ 56,094,196</b>
<b>8 SUPPORT COSTS</b>									
9 <i>Solar Data Collection - UO</i>	NA	NA	NA	66,460	101,748	104,800	107,944	111,182	114,518
10 <i>Wind Data Collection - OSU</i>			43,482	36,730	70,226	72,483	74,657	76,897	79,204
11 <i>Wind Forecasting Study</i>	\$ -	\$ -	\$ -	\$ -	100,000	100,000			
12 <i>EPP/ REC Mktng Support</i>	\$ -	\$ -	16,472	85	20,000	20,000			
13 <i>Anemometer Maint. Contract</i>	NA	NA	NA	72,450	45,000	45,000			
14 <i>Project Development Costs</i>	NA	NA	NA	\$ -	163,026	157,717	332,399	342,370	352,642
15 <b>SUBTOTAL: Base Support Project Costs</b>	<b>1,345,253</b>	<b>1,292,164</b>	<b>264,276</b>	<b>175,725</b>	<b>500,000</b>	<b>500,000</b>	<b>515,000</b>	<b>530,450</b>	<b>546,364</b>
<b>PLUS:</b>									
16 <i>BEF MOA 5/</i>	\$ -	\$ -	\$ -	86,000	136,000	136,000	847,117	849,367	847,117
17 <i>Wind Project Termination</i>				-	250,000	-	-	-	-
18 <b>Total Support and Other Costs</b>	<b>\$1,345,253</b>	<b>\$1,292,164</b>	<b>\$264,276</b>	<b>\$ 261,725</b>	<b>\$ 886,000</b>	<b>\$ 636,000</b>	<b>\$ 1,362,117</b>	<b>\$ 1,379,817</b>	<b>\$ 1,393,481</b>
19 <i>Corporate Charges - KEC 6/</i>			49,149	7,687	132,941	17,614	18,561	19,387	20,256
20 <i>Corporate Charges - Gen. Counsel 6/</i>			7,212	1,582	27,169	24,487	25,344	26,231	27,149
21 <b>Total Corporate Charges</b>			<b>\$ 56,361</b>	<b>\$ 9,269</b>	<b>\$ 160,110</b>	<b>\$ 42,101</b>	<b>\$ 43,905</b>	<b>\$ 45,618</b>	<b>\$ 47,405</b>
22 <b>RENEWABLE RATE INCENTIVE 7/</b>	<b>\$ 81,482</b>	<b>\$ 5,627,096</b>	<b>\$ 8,484,322</b>	<b>\$ 4,746,731</b>	<b>\$ 6,000,000</b>	<b>\$ 6,000,000</b>	<b>\$ 6,000,000</b>	<b>\$ 6,000,000</b>	<b>\$ 6,000,000</b>
23 <b>TOTAL COST OF RENEWABLES PROGRAM</b>									
24	<b>\$ 7,958,545</b>	<b>\$ 27,299,731</b>	<b>\$ 26,389,718</b>	<b>\$ 23,812,596</b>	<b>\$ 29,596,229</b>	<b>\$ 29,577,821</b>	<b>\$ 61,066,853</b>	<b>\$ 61,999,419</b>	<b>\$ 63,535,081</b>

### ADJUSTMENTS FOR \$15 - \$21 Million Management Target

#### REVENUE OFFSETS

25 <i>Completed + Forecast EPP &amp; Tag Sales 8/</i>	273,861	1,230,891	1,627,863	1,770,413	1,765,840	1,765,840	2,353,102	2,359,354	2,353,102
26 <i>Energy Value of Power at Gas CCCT cost</i>									
27 <i>9/</i>	3,976,581	12,783,689	15,874,213	20,618,505	24,190,511	24,190,511	43,652,256	43,768,230	43,652,256
28 <b>Total Revenue Offsets</b>	<b>4,250,442</b>	<b>14,014,580</b>	<b>17,502,076</b>	<b>22,388,919</b>	<b>25,956,351</b>	<b>25,956,351</b>	<b>46,005,358</b>	<b>46,127,584</b>	<b>46,005,358</b>
29 <b>PLUS: Wind Integration (Opp'ty Cost @ \$ 4.50/MWh) 10/</b>	<b>(203,534)</b>	<b>(1,953,357)</b>	<b>(2,642,554)</b>	<b>(1,604,048)</b>	<b>(2,444,667)</b>	<b>(2,444,667)</b>	<b>(2,444,667)</b>	<b>(2,450,999)</b>	<b>(2,444,667)</b>
30 <b>NET COST OF RENEWABLES PROGRAM</b>									
	<b>(\$3,911,637)</b>	<b>(\$15,238,508)</b>	<b>(\$11,530,196)</b>	<b>(\$3,027,725)</b>	<b>(\$6,084,546)</b>	<b>(\$6,066,138)</b>	<b>(\$17,506,162)</b>	<b>(\$18,322,834)</b>	<b>(\$19,974,390)</b>
<i>Total Energy, Power Projects (MWh)</i>									
31	105,062	337,746	419,398	544,743	543,335	543,335	980,459	983,064	980,459



# Details of the Renewable Budget (continued)

## Footnotes

\* Data for FY 2001 through FY 2004 are actuals. Some project's actual costs are not available FY 2001-2003 ("NA").

1/ Transmission and resource integration included in purchases for the Foote Creek wind projects only.  
Transmission for other projects included in Transmission Cost budget (per PTT staff).

2/ Idaho Falls Hydro project output included in renewables budget for FY 2002 only. This purchase is included elsewhere in FY 2003-FY2006. Contract sunsets end of FY 2006.

3/ Assumes Fourmile Hill geothermal will be completed under terms of current contract, with commercial operation date of 10/1/06.

4/ FY 01- FY 03 include loaded PBL staff costs, which are not included in later years. Project-specific breakouts not possible for some projects during FY 2001-2003.  
AGGREGATE Base Support costs assumed to escalate after FY 2006 at 3% annually (e.g., \$500k x 1.03 for FY 2007).

5/ Assumes MINIMUM BEF MOA payment of \$86k/year + MOA formula-driven payment through FY06; post-2006, assumed to equal 36% of EPP & Green Tag revenues.

6/ KEC & General Counsel charges for FY 2006-11 per budget update information from D. Steele, 12/22/04.

7/ Renewable portion of the C&RD program. Actuals FY01-FY04.

8/ Forecast for FY 2005-06 assumes that completed PLUS future sales will equal 65% of green inventory, at an average green attribute sales price of \$5.00/MWh (PBL share). Post FY2006: assumes sales equal 60% of inventory @ \$4.00/MWh.

9/ FY01- FY04 Based on lifecycle costs of Gas CCCT @ \$3.00 per MMBTU (nomina). Retained for consistency with Sounding Board Materials.  
FY05 - FY09 Based on lifecycle costs of Gas CCCT @ \$4.00 per MMBTU (nominal). Updated to reflect market.

10/ FY 01-FY 03 Opportunity costs assumed to be \$7.52/MWh (prior to deriving \$4.50 integration charge). Retained for consistency with Sounding Board materials.  
FY 01-FY 03 Opportunity costs for FCI & FCII only assigned to 50% of the output (168 hour delayed delivery mimics generation) .  
FY 04-FY 09 Opportunity costs not assigned to FC I or FCII energy. Change due to advent of integration products and increased knowledge base.  
Opportunity costs for all years do not include FCIV generation (delivered in flat blocks).



# Renewable Forecast

Project: Renewables	FY06	FY07	FY08	FY09	FY97-01 Average	FY02-06 Average	FY07-09 Average
<b>Forecasted Program costs w/out Fourmile Hill</b>	\$29.6	\$29.7	\$24.2	\$25.5	\$3.0	\$21.2	\$24.5
<b>Forecasted Program costs w/Fourmile Hill (2007)</b>	\$29.6	\$61.0	\$62.2	\$63.9	\$3.0	\$21.2	\$62.4
<b>Net Costs w/out Fourmile Hill</b>	-\$0.01	\$6.6	\$7.1	\$8.4	\$3.0	\$21.2	\$7.4
<b>Net Costs w/Fourmile Hill (2007)</b>	-\$0.01	\$17.5	\$18.3	\$19.9	\$0.0	\$2.0	\$18.6
<b>Headroom remaining in \$21M Target w/out Fourmile Hill:</b>	<b>\$21.01</b>	<b>\$14.40</b>	<b>\$13.91</b>	<b>\$12.60</b>			<b>\$13.6</b>
<b>Headroom remaining in \$21M Target w/Fourmile Hill:</b>	<b>\$21.01</b>	<b>\$3.50</b>	<b>\$2.70</b>	<b>\$1.10</b>			<b>\$2.4</b>
<b>Describe opportunities to increase efficiencies or reduce costs</b>							
1) Resolve Fourmile Hill 2) Reduce solar and wind monitoring, market support and wind forecasting budgets.				<i>Changed FY 06 &amp; FY 07 Forecasted Program costs to include \$6M from the 'R' portion of C&amp;RD. (i.e.. changed \$23.6M to \$29.6M.) Corrected FY08 and FY09 'Net Costs w/Fourmile Hill' to reflect updated integration costs. Previously included in slide 12, but not carried forward to slide 11. (\$18.5 to \$18.3, \$20.3 to \$19.9.)</i>			
<b>Describe risks to further reduce costs</b>							
1) Fourmile Hill - uncertainty. 2) Reducing solar and wind monitoring would compromise both data sets. 3) Reducing the wind forecasting budget increases uncertainty, limiting BPA's ability to integrate large amounts of wind. 4) Reducing the marketing support budget limits BPA's ability to help w/customer advertising and promotional programs.				<i>Redrafted #4 to clarify BEF MOA expenses.</i>			
<b>What are the drivers of change from FY02-06 to FY07-11?</b>							
1) Renewable portion of the existing C&RD program (\$6M) included in renewable budget FY07-FY09. Previously in Conservation budget. 2) Fourmile Hill on-line date moved out to FY 2007 (from 2005). 3) Contracted power prices are included in current forecast, we'd previously used leveled costs. (Condon +\$1.2M and Stateline +\$2M have largest impact). 4) \$850K/year payment to BEF in FY 07-11 replaces \$+1M/year customer endorsement payments assoc. w/EPP. 5) Assumes \$3 gas FY 02-04 and \$4 gas FY 05 and beyond. 6) Support costs cut by \$2M/year in 2003 and beyond. 7) 25 aMW new wind (previously budgeted post 2006) was removed from the budget.				<i>Redrafted #4 to clarify BEF MOA expenses.</i>			
<b>What has fundamentally changed in FY07-11 compared FY97-01?</b>							
1) Power Purchases before 2001: 3 Foote Creek Projects and Ashland Solar. Purchases after 2001: Condon, Klondike and Stateline 2) 1000 MW RFP no longer in budget. 3) \$4 gas vs \$3 gas.							



## Details of Support Costs

- Solar Data collection (est. 1977, a partnership, 23 monitoring sites)
- Wind monitoring (OSU collects & manages data, est. 1980, 4 remaining monitoring sites)
- Anemometer Maintenance Contract: supports wind monitoring and forecasting.
- Wind forecasting study, evaluates the impacts of existing wind projects on the FBS. Supports additional wind integration.
- Green power marketing support. \$20K place-holder for public customer green pricing marketing assistance as needed.
- BEF MOA. Signed 7/15/04. Term extends through FY2011.
  - ▶ MOA was created as a vehicle for renewable reinvestment, a way to leverage private funds for the benefit of the region and as a replacement for the 'endorsement fee' currently associated with EPP.
  - ▶ BEF will reinvest 80% of MOA funds on renewable projects or renewable education programs in BPA's public customer service territories.
- Maiden Wind Project termination (\$250K) remains in the FY 2005 budget because the contract was a liability until it sunset (1/01/05).



## Budget Cuts during the Current rate period.

- Cut nearly \$2M/year from RD&D and support programs as part of the effort to lower rates for FY04 - FY06. Support budget now capped at \$500K.
  - Energy Information Center funding terminated in FY 2003
  - Wind Research Cooperative terminated in FY 2003
  - UWIG power impact study terminated in FY 2004
  - Wind data collection budget reduced by 30% (reduced from 5 to 4 sites)
- Large cuts to the acquisition program;
  - 1000 MW RFP and site banking costs removed from budget in 2002.
  - Sunset of Maiden wind project predevelopment agreement.
  - 25MW additional wind project removed from budget this year.



## Other Changes

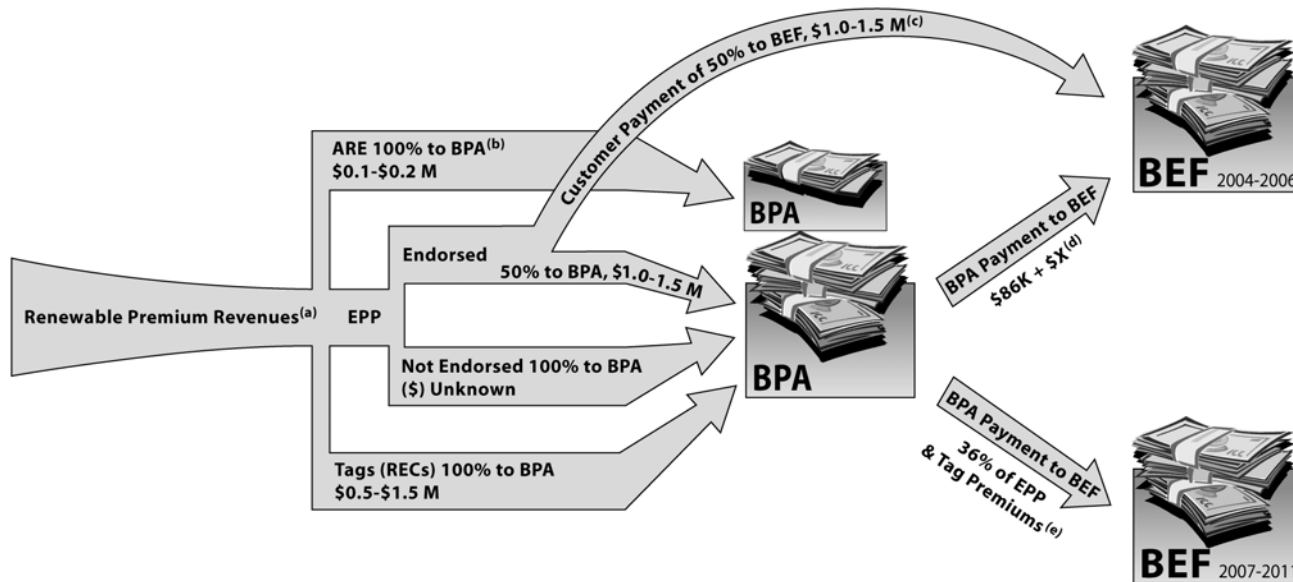
- Fourmile Hill Geothermal Project was moved out to FY 2007 from 2005.
  - BPA is currently in arbitration over Calpine's claim that uncontrollable forces prevented them from meeting contractual obligations.
- BEF MOA - Increases regional renewable investments and BPA control.
  - FY 04-06
    - Provides a base payment to BEF of \$86K/year for FY04-06.
    - \$86K is a true-up for 2003 contract modifications benefiting BPA and harming BEF, no additional cost to ratepayers.
    - Additional money directed to BEF if BPA experiences windfall renewable sales.
  - FY07-FY11
    - MOA directs 36% of Green premiums to BEF for reinvestment in renewables.



# BEF MOA

## How it works:

### Payments associated with the BEF/BPA Memorandum of Agreement



- (a) Includes Green Energy Premiums from EPP & ARE, green tags, Renewable Energy Certificates (RECs) or any other yet to be identified BPA renewable premium product.
- (b) Premiums from the sales of ARE are excluded from the MOA.
- (c) Endorsement optional in 2007-2011 period.
- (d)  $\$X = ((\text{EPP Premiums} + \text{Tag Premiums}) \times 35\%) - (\$86 \text{ K} + \text{Customer Endorsement Payments to BEF})$
- (e) Payment not required if total BPA Renewable Premium Revenues less than \$250 K a year, otherwise, BEF is guaranteed at least \$250 K/year. Customer payments to BEF pursuant to BPA contracts will be subtracted from BPA MOA payments

August 11, 2004



# Uncertainties

- **Risks which May increase Forecasted Budget**
- Fourmile Hill
  - PAC and/or BPA TBL transmission rates could increase or transmission could become unavailable, all increase project wheeling costs.
- Uncertainties surrounding allocation.
  - (If BPA needs to acquire resources to meet load expenses may increase.)
- Foote Creek I maintenance costs. (BPA Shares maintenance costs.)
- Above average wind years will increase energy costs.
- **Other Uncertainties**
- Upcoming Conservation ROD will determine if the rate incentives for Conservation and Renewables will be separate (as budgeted) or combined (akin to the current program).
  - Either way the \$6M will remain in rates- it's a question of where (C or R).



## Contact Information

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**For Information on Renewable Focus Group  
and Regional Dialogue, go to:**

**<http://www.bpa.gov/power/pl/regionaldialogue/>**