

Application No. 11-08-____
Exhibit No. PPL/100
Witness: Hui Shu

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

PACIFICORP

Direct Testimony of Hui Shu

August 2011

1 **Q. Please state your name, business address and present position with**
2 **PacifiCorp, dba Pacific Power (the Company).**

3 A. My name is Hui Shu, my business address is 825 NE Multnomah Street, Suite
4 600, Portland, Oregon 97232, and my present position is Manager, Net Power
5 Costs.

6 **Qualifications**

7 **Q. Briefly describe your education and business experience.**

8 A. I received an undergraduate degree in Electrical Engineering and finished training
9 in the program for Master in Business Administration from University of
10 Shanghai for Science and Technology. I received a PhD in Systems Science with
11 a focus on Econometrics from Portland State University. I have worked for
12 PacifiCorp since 1992 and have held positions in the commercial and trading and
13 regulatory areas. I accepted my current position in February 2008.

14 **Q. Please describe your current duties.**

15 A. I am responsible for the coordination and preparation of net power cost and
16 related analyses used in retail price filings. In addition, I represent the Company
17 on power resource and other related issues in regulatory proceedings across the
18 Company's six-state service territory.

19 **Summary of Testimony**

20 **Q. Will you please summarize your testimony?**

21 A. I present the Company's proposed Energy Cost Adjustment Clause (ECAC)
22 Balancing Rate and Offset Rate for calendar year 2012. In addition, my
23 testimony:

- 1 • Presents the updated 2010 adjusted actual and 2011 adjusted
2 actual/forecast net power costs (NPC), which are used to develop the 2012
3 Balancing Rate;
- 4 • Presents the 2012 normalized forecasted NPC, which are used to develop
5 the 2012 Offset Rate;
- 6 • Presents the carrying charge of coal fuel stock (Carrying Charge); and
- 7 • Describes the determination of NPC using the Company's production cost
8 model, the Generation and Regulation Initiatives Decision Tools (GRID)
9 model.

10 In addition, I present the Company's request to include in the ECAC filing the
11 costs and benefits associated with implementing the Assembly Bill 32 (AB 32)
12 greenhouse gas (GHG) emissions reduction program.

13 **Overview of ECAC Filing**

14 **Q. Please provide a brief overview of the Company's ECAC filing.**

15 A. On August 1, 2010, the Company filed its 2011 ECAC filing which resulted in a
16 rate increase of approximately \$9.3 million or 10.7 percent overall effective
17 January 1, 2011.

18 In this 2012 ECAC filing, the Company is requesting a \$2.0 million
19 increase or a 1.96 percent overall average increase, effective January 1, 2012. As
20 discussed in detail below, the increase is comprised of: (1) an approximate \$0.4
21 million decrease associated with changes to the Balancing Rate; and (2) an
22 approximate \$2.4 million increase associated with changes to the Offset Rate due
23 to an increase in forecast 2012 costs. The major drivers for these increases are

1 discussed in detail below.

2 **Q. Please describe Exhibit PPL/101.**

3 A. Exhibit PPL/101 shows the calculation of the proposed Offset Rate and Balancing
4 Rate for the 2012 rate effective period. Lines 1 through 16 are used to develop
5 the Offset Rate. Lines 17 through 60 are used to develop the Balancing Rate.

6 **Implementation of AB 32 GHG Emissions Reduction Program**

7 **Q. Please explain the AB 32 GHG emissions reduction program, and the
8 revenues and costs associated with implementing the program.**

9 A. Under AB 32, PacifiCorp is required to comply with California's GHG emissions
10 reduction program. The program includes a number of specific requirements
11 including mandatory reporting of emissions and implementation of a cap and
12 trade program. While the rules for the program have not been finalized, program
13 costs and revenues will include California Air Resource Board (CARB)
14 implementation fees, mandatory reporting verification costs, revenue from the
15 sale of free allowances, and costs for purchasing allowances.

16 **Q. Please explain how the Company proposes to recover the costs or return the
17 benefits of the AB 32 program.**

18 A. Given that the costs and benefits of the AB 32 GHG program are related to the
19 Company's generation to serve its load obligation, the Company proposes to
20 include the program costs and revenues in the Company's annual ECAC filing.

1 **Renewable Energy Credits**

2 **Q. Does the 2012 ECAC filing include any revenue from the sale of renewable**
3 **energy credits (RECs)?**

4 A. No. The Company has retained all of its California-allocated RECs to be used for
5 compliance with California's renewable portfolio standard (RPS) program.

6 **Q. Has the Company purchased any RECs to be used for compliance with**
7 **California's RPS program?**

8 A. No. While Commission Decision (D.) 10-03-021, as modified by D.11-01-025,
9 authorizes the use of RECs for RPS compliance, the Company has complied with
10 California's RPS program through 2010 without having to purchase any RECs.
11 However, the Company is continually evaluating its compliance position and may
12 need to purchase RECs at some point to meet future RPS compliance needs. If
13 so, these costs would be reflected in future ECAC filings.

14 **2012 Balancing Rate**

15 **Q. Please explain the Balancing Rate.**

16 A. The Balancing Rate is the rate which returns to or recovers from customers the
17 Total California Balancing Account. The Balancing Rate is calculated by:

18 (1) calculating the sum of the changes in the 2010 adjusted actual NPC
19 since the 2011 ECAC Filing, the 2011 adjusted actual/forecast NPC, Carrying
20 Charge, and GHG program costs;

21 (2) dividing by the California retail sales included in the Company's most
22 recent general rate case, A.09-11-015, (2009 Rate Case); and

23 (3) grossing-up the amount for the Franchise Fees & Uncollectible

1 Accounts Expense Factor.

2 Pursuant to the Commission-approved terms of the ECAC, if the new
3 Balancing Rate differs from the current rate by five percent or more, the rate is
4 updated for the upcoming rate period. Otherwise, the rate is not updated.

5 **Q. How are the differences in actual NPC, the Carrying Charge and the GHG**
6 **program costs reflected in the Balancing Account adjusted for the actual**
7 **collections based on the Offset Rate?**

8 A. The Balancing Account balance is reduced or increased for the over or under-
9 collection of the Offset Rate for the same period.

10 **Q. What is the Company's proposed Balancing Rate?**

11 A. As shown on Exhibit PPL/101, line 60, the proposed Balancing Rate is \$0.82 per
12 megawatt-hour. The Balancing Rate currently in effect is \$1.34 per megawatt-
13 hour. As shown on line 57 of the exhibit, the change in the proposed Balancing
14 Rate exceeds the five percent threshold required for updating the rate.

15 **2012 Offset Rate**

16 **Q. What is the Offset Rate?**

17 A. The Offset Rate sets the amount of forecast NPC, Carrying Charge and GHG
18 program costs that will be recovered from customers for the forecast test year.
19 Pursuant to the Commission-approved terms of the ECAC, if the new Offset Rate
20 differs from the current rate by five percent or more, the rate is updated for the
21 upcoming forecast period.

22 **Q. Please explain the Offset Rate calculation and the proposed Offset Rate.**

23 A. The Offset Rate is calculated by summing the projected 2012 NPC, Carrying

1 Charge, and GHG program costs, dividing the sum by California retail sales, and
2 then grossing up the amount by the Franchise Fees & Uncollectible Accounts
3 Expense Factor. As shown in Exhibit PPL/101, line 16, the proposed Offset Rate
4 is \$31.26 per megawatt hour. This differs from the current rate of \$28.35 per
5 megawatt hour by more than five percent.

6 **2010 Adjusted Actual and 2011 Adjusted Actual/Forecast NPC, Carrying Charge,**
7 **and GHG Program Costs**

8 **Q. Please explain NPC.**

9 A. NPC are defined as the sum of fuel expenses, wholesale purchase power expenses
10 and wheeling expenses, less wholesale sales revenue.

11 **Q. Please explain adjusted actual NPC.**

12 A. Adjusted actual NPC is the sum of the total Company amounts recorded in FERC
13 Accounts 501, 503 and 547 (Steam Production Fuel Expense) for coal, steam and
14 natural gas purchased and/or sold; 555 (Purchased Power); 565 (Wheeling); and
15 447 (Sales for Resale). These amounts are adjusted to: 1) remove actual costs
16 consistent with the rate setting process for the non-NPC items in those accounts
17 so comparable costs are used in the deferral calculation, and 2) remove prior
18 period accounting entries recorded during the deferral period that are not
19 applicable to the current period.

20 **Q. Are the forecast NPC for this filing calculated the same way as in the 2011**
21 **ECAC Filing?**

22 A. Yes.

1 **Q. Why are the 2010 adjusted actual NPC different from what the Company**
2 **included in its 2011 ECAC Filing?**

3 A. At the time of the 2011 ECAC Filing, actual NPC were only available for January
4 through May 2010. As a result, the data used to calculate the 2011 Balancing
5 Rate included five months of adjusted actual NPC (January through May 2010)
6 and seven months of forecast NPC (June through December 2010). In the current
7 filing, the Company updated its 2010 data to incorporate the actual NPC for the
8 entire 12-month period. The 2010 adjusted actual NPC are shown in Exhibit
9 PPL/102.

10 **Q. Based on the updated 2010 data, how much has the Company deferred in the**
11 **California Balancing Account in 2010 related to NPC?**

12 A. In the 2011 ECAC Filing, the amount estimated to be deferred for 2010 was a
13 balance owed to customers of \$501,089. The actual amount deferred for 2010
14 was an under-recovery of \$1,392,858, including interest. The difference of
15 \$1,893,947 between the estimated deferral in the 2011 ECAC Filing and the
16 actual deferral is included in the calculation of the proposed Balancing Rate for
17 2011 in the current filing.

18 **Q. Based on the 2011 adjusted actual/forecast NPC, and the NPC recovered in**
19 **rates, how much has the Company deferred in the California Balancing**
20 **Account in 2011?**

21 A. Based on the 2011 actual data for five months (January through May 2011) and
22 forecast NPC for seven months (June through December 2011), the deferral,

1 including interest, for 2011 is estimated to be a \$972,032 balance due to
2 customers.

3 **Q. What are the primary drivers of the differences in NPC?**

4 A. In 2010, the differences between forecast and actual NPC were mainly due to the
5 impact of lower generation from Company wind and thermal generating units
6 (approximately 1.8 million megawatt-hours and 0.2 million megawatt-hours,
7 respectively), and higher actual retail load.

8 For the actual and forecast deferral in 2011, the differences from the 2011
9 Offset Rate are mainly due to lower system load (approximately 0.7 million
10 megawatt-hours), better than expected hydro generation (0.4 million megawatt-
11 hours) and lower market prices.

12 **Q. Which months in 2011 reflect adjusted actual results?**

13 A. January through May 2011 reflects adjusted actual results of the Company's
14 operations. June through December 2011 is a forecast of the Company's
15 operations. Consistent with the design of the ECAC, these are combined to
16 reflect the overall forecast NPC for 2011. The 2011 adjusted actual/forecast NPC
17 are shown in Exhibit PPL/103.

18 **Q. Please explain which data inputs are updated for the June through December
19 2011 forecast period as compared to those used to set the level currently in
20 rates.**

21 A. NPC data inputs are updated to include:

- 22 • The Company's June 30, 2011 forward price curve for electricity and
23 natural gas prices;

- 1 • New wholesale electricity sales and purchase transactions, both physical
- 2 and financial;
- 3 • New natural gas purchase and sales transactions, also both physical and
- 4 financial;
- 5 • New wheeling contracts;
- 6 • Updates to existing contracts for wholesale sales and purchases of
- 7 electricity and natural gas, and wheeling, as well as hydro generation;
- 8 • New contracts and updates to existing coal supply contracts and costs at
- 9 the Company's captive mines;
- 10 • Updates to forecast loads; and
- 11 • Updates to the capabilities of the Company's owned generation resources.

12 **Q. How will the forecast be reconciled to actual NPC?**

13 A. The difference between adjusted actual NPC and the forecast amount is recorded
14 in the Balancing Account where it accrues interest based on the Commercial
15 Paper Rate.

16 **Q. Does the Balancing Account also include the Carrying Charge?**

17 A. Yes. A Carrying Charge in the amount of \$39,516 due to customers is included in
18 the 2012 Balancing Account, which resulted from differences in actual and
19 projected fuel stock balances and interest rates used to determine the carrying
20 charges.

21 **Q. What does the Company include in the Balancing Rate for the CARB**
22 **implementation fees associated with the AB 32 GHG program?**

23 A. CARB estimates that it will cost \$62 million in 2011 to administer the AB 32

1 emissions reduction program. GHG emitters subject to the AB 32 GHG program
2 are required to cover these costs. In March 2011, CARB billed PacifiCorp
3 \$188,476 for its allocated share of the program costs which has been included in
4 the Balancing Rate. Exhibit PPL/106 summarizes the GHG program costs
5 included in the 2012 ECAC.

6 **Q. Please explain the CARB verification fees associated with the AB 32 GHG**
7 **program.**

8 A. Since 2009, PacifiCorp has been subject to the mandatory GHG reporting
9 requirements. Beginning in 2010, PacifiCorp was required to hire an independent
10 third party auditor to verify the accuracy of its GHG emissions reports that are
11 submitted to CARB. In 2011 PacifiCorp expects to spend \$99,580 for a third
12 party to verify the 2010 emissions report. This cost is included in the 2012
13 Balancing Rate and will be trued up to actual costs in next year's ECAC filing.

14 **Q. How does the Company capture the difference in the Balancing Account**
15 **between what was authorized by the Commission in the 2010 ECAC filing**
16 **and what was actually collected or returned to customers?**

17 A. The Company includes the unamortized balance from the prior year in the current
18 year's ECAC filing. In the 2010 ECAC, the Company was authorized to return to
19 customers \$3,083,729 in the Balancing Account. Due to variations in customer
20 usage, the actual amount returned to customers was less than expected and at the
21 end of 2010 there is a credit balance of \$209,871, including interest, that is due to
22 customers.

1 **Q. How is this balance included in the current filing?**

2 A. The credit of \$209,871 is included in the Balancing Account beginning January
3 2011 and accrues interest at the Commercial Paper Rate.

4 **2012 Forecast NPC**

5 **Q. What are the forecast 2012 NPC?**

6 A. Forecast NPC for calendar year 2012 are \$1.530 billion total Company, or
7 approximately \$25.3 million on a California-allocated basis. The Company's
8 2012 net power cost study is provided as Exhibit PPL/104, and the allocation of
9 the Company's NPC to California is provided as Exhibit PPL/105.

10 **Q. How does this projection compare with the level currently included in rates?**

11 A. The 2012 forecast total Company NPC are approximately \$135.5 million higher
12 than the \$1.394 billion 2011 forecast total Company NPC used to determine the
13 Offset Rate in the Company's 2011 ECAC Filing.

14 **Q. What are the major drivers of the increase in the forecast NPC?**

15 A. The increase in 2012 NPC is driven by a range of factors, including increases in
16 the Company's total system load, changes in the Company's portfolio of
17 wholesale purchase and sales contracts, and increases in coal costs.

18 **Q. How does the retail load forecast impact the Company's NPC?**

19 A. This filing reflects an increase of approximately 0.7 million megawatt-hours, or
20 one percent, in the total company load forecast compared to loads reflected in the
21 2011 ECAC filing, which increases NPC by approximately \$22 million on a total
22 Company basis.

1 **Q. What are the major changes to power contracts in the calendar year 2012**
2 **test period?**

3 A. The 2012 test period in the current filing reflects a full year impact of the
4 contracts that expired during the 2011 ECAC test period. NPC increased when
5 those contracts expired because the prices of those contracts were more favorable
6 as compared to the current market prices. The increase in NPC is offset
7 somewhat by the expiration in 2012 of relatively expensive qualifying facility
8 (QF) contracts, such as the Biomass QF and ExxonMobil QF. As compared with
9 the 2011 ECAC test period, market prices are lower in the 2012 ECAC test
10 period. As a result, revenues from the wholesale electricity transactions that the
11 Company enters into are lower, which increases NPC.

12 **Q. Have the Company's coal costs impacted the NPC in the current proceeding?**

13 A. Yes. NPC are higher due to increases in costs of coal supply, as compared to
14 what were in the 2011 Offset Rate. The costs at the Company's Deer Creek mine
15 are higher by approximately \$9 million. The costs of the third-party coal supply
16 contracts increased by approximately \$43 million, of which approximately \$15
17 million is due to new contracts and the rest due to price adjustments of the
18 existing contracts.

19 **Q. Has the Company made assumptions about the power rates and transmission**
20 **rates proposed in the current rate cases of the Bonneville Power**
21 **Administration (BPA)?**

22 A. Yes. The BPA rate cases will determine the new rates for the fiscal period
23 beginning in October 2011. Given the current proposals made by BPA, the

1 Company assumes that the wheeling expenses of the Company's transmission
2 contracts with BPA would not change in the new BPA rate effective period that
3 begins in October 2011. In the current filing, the Company has incorporated the
4 proposed wind integration charge at \$1.32/kW-month beginning in October 2011,
5 which is a change from the current \$1.29/kW-month. The Company has also
6 incorporated the impact of BPA's proposal in charges for reserves and power.

7 **Q. Has the Company updated its inputs for wind integration costs?**

8 A. Yes. Instead of calculating the wind integration costs as a line item outside
9 GRID, the Company now models in GRID the additional reserves required to
10 integrate generation from wind resources in its balancing authority areas. The
11 additional reserve requirements are from the Company's Wind Study as part of
12 the 2011 Integrated Resource Plan (IRP).

13 **Q. Please briefly describe the Company's Wind Study.**

14 A. The Wind Study identified additional reserve requirements needed to maintain
15 reliability in two categories: regulating services that deal with load and wind
16 variability in 10-minute intervals, and load following services that deal with load
17 and wind variability over hourly time intervals. Both services respond to the up
18 and down variations of wind generation. That is, the additional reserve
19 requirements to integrate wind generation into the Company's resource portfolio
20 consist of regulation up, regulation down, load following up and load following
21 down. In addition, given the size of the wind portfolio, and the possibility of
22 rapid variations in wind generation from the forecast as displayed in the historical
23 actual operation, the Company expects that it will need to continue committing its

1 gas units to be able to quickly respond to the magnitude of changes. At times, this
2 “must-run” operation would require gas units to run when it would otherwise be
3 uneconomic to do so, therefore adding to the wind integration costs.

4 **Q. How did the Company apply the results from the Wind Study?**

5 A. Instead of applying the dollar per megawatt-hour charge to the wind generation,
6 the Company reflected in GRID the amount of load following requirement, and
7 modeled the Currant Creek unit, and Gadsby units 4, 5 and 6 as must-run units
8 that are not subject to the logic of being committed to run only when economic.

9 **Carrying Charge and GHG Program Costs**

10 **Q. Does the 2012 Offset Rate include the forecast Carrying Charge?**

11 A. Yes. The 2012 Offset Rate included \$44,408 of forecast Carrying Charge.

12 **Q. What does the Company include in the Offset Rate for GHG program costs?**

13 A. Due to CARB rule changes that will be implemented in 2012, PacifiCorp expects
14 the verification costs will be lower than in 2011. The 2012 Offset Rate includes
15 \$50,000 in forecast GHG program costs related to mandatory reporting
16 verification fees. Based on the current formula for allocating the CARB
17 implementation fee, no fees would be allocated to PacifiCorp in 2012. As such,
18 the Company has not included the CARB implementation fee in its 2012 Offset
19 Rate. If fees are assessed in 2012, the Company will include these costs in its
20 2013 ECAC filing as part of the Balancing Rate. Exhibit PPL/106 summarizes
21 the GHG program costs included in the 2012 ECAC.

1 **Q. Please explain the costs and revenues expected in 2012 associated with cap**
2 **and trade emissions allowances.**

3 A. In the AB 32 cap and trade program, GHG emitters are expected to receive an
4 allocation of free allowances which must be sold at auction. Any allowances
5 needed for compliance must be purchased at auction. The cap and trade program
6 was expected to begin in 2012. However, in July 2011, CARB announced a one-
7 year delay in the start of the enforcement of the cap and trade program. As such,
8 no costs or revenues from the purchase or sale of emissions allowances are
9 included in this 2012 ECAC filing.

10 **New Resources**

11 **Q. Has the Company included any new purchase contracts that would account**
12 **for more than one percent of total purchases?**

13 A. No.

14 **Determination of NPC and Model Inputs and Outputs**

15 **Q. Please explain how the Company forecasts NPC using its GRID model.**

16 A. NPC costs are calculated for a future test period based on projected data using the
17 GRID model on an hourly basis.

18 **Q. Is the Company's general approach to the calculation of NPC using the**
19 **GRID model the same in this case as in previous ECAC filings?**

20 A. Yes. The Company has used the GRID model in previous ECAC filings in
21 California.

22 **Q. What inputs were updated for this filing?**

23 A. The net system load, wholesale sales and purchase contracts for electricity,

1 natural gas and wheeling expenses, market prices for natural gas and electricity,
2 fuel expenses, characteristics of the Company's generation facilities, planned
3 outages and forced outages of the Company's generation resources, and
4 availability of transmission capability are updated for this filing.

5 **Q. What reports does the GRID model produce?**

6 A. The major output from the GRID model is the NPC report. The 2012 report is
7 attached to my testimony as Exhibit PPL/104. Additional data with more detailed
8 analyses are also available in hourly, daily, monthly and annual formats by heavy
9 load hours and light load hours.

10 **Q. Do you believe that the GRID model appropriately reflects the Company's**
11 **forecast NPC over the 2012 test period?**

12 A. Yes. The GRID model reasonably simulates the operation of the Company's
13 system load and resource portfolio consistent with the Company's operation of its
14 system including operating constraints and requirements. Any variances from
15 forecast NPC are handled through the use of a Balancing Account where forecast
16 NPC are trued up to actual NPC each month.

17 **Q. Does this conclude your direct testimony?**

18 A. Yes.