

Smart Water Heater Report Errata April 22, 2019

A simple error was discovered in the economic model that combines the prorated public costs and benefits to those of the IOU sector as set in cell G3 on the "P-P-split" tab of the "Econ-Model-biz-case-Final" spreadsheet. The error added the public-sector results incorrectly. A revised spreadsheet is available on the BPA web page: "**Econ-Model-biz-case-fix**". The specific text to be removed is shown below in **brown**. The new text to replace it is shown in **blue**.

Page iii: "A long-term net present value (total resource) of ~~\$106 million~~,..." becomes: "A long-term net present value (total resource) of **\$230 million**,..."

Page iv: "...the ~~\$106+~~ million present value (PV) benefits would extrapolate to approximately ~~\$2 billion across the US~~." becomes: "the **\$230 million** present value (PV) benefits would extrapolate to approximately **\$4.3 billion** across the US."

Page 44: "...we estimate a conservative benefit-cost ratio of ~~1.74~~ and a present value benefit in Section 5.5 for this market transformation initiative at ~~\$106 million~~ dollars in today's dollars." becomes: "...we estimate a conservative benefit-cost ratio of **2.59** and a present value benefit in Section 5.5 for this market transformation initiative at **\$230 million** dollars in today's dollars."

Page 51 Table 13:

| | | | | |
|-------------------|---------------------------|-----------------------|--------------------|---------------------------|
| Time Frame | PV of Peaker Costs | PV of WH Costs | Net Benefit | Benefit Cost Ratio |
| Through 2054 | \$251 | \$144 | \$106 | 1.74 |

becomes:

| | | | | |
|-------------------|---------------------------|-----------------------|--------------------|---------------------------|
| Time Frame | PV of Peaker Costs | PV of WH Costs | Net Benefit | Benefit Cost Ratio |
| Through 2054 | \$374 | \$144 | \$230 | 2.59 |

Page 51: "...the net benefit (in 2039 dollars) is ~~\$320 million~~ with a benefit-cost ratio above ~~4~~." becomes: "...the net benefit (in 2039 dollars) is **\$610 million** with a benefit-cost ratio above **7**."

Page 56: Figure 7 is replaced completely by the following figure/picture:

Business Case Results

| | | | | | | |
|----------------------------------|-------------------------------|----------------------------------|-------------------|---------------------------|--------------------------------|------------------|
| Public Share 33% | Mix of Public and IOU | | | | 26.5% Regional Adoption | |
| IOU Share 67% | B/C Ratio in 2054 2.59 | | | | | |
| 301 PV Benefits of Peaker | MW PV Cost of WH DR | Savings as NPV in 2019 \$ | PV of all Expense | Recurring Program Expense | Utility Total PV Cost | Total MT PV Cost |
| \$374 | \$144 | \$230 | \$144 | \$70 | \$46 | \$29 |

\$ in millions

| | | | | | | | |
|----------------------------------|----------------------------|--|-------------------|---------------------------|-----------------------|------------------|--|
| | | All Public Discount Factor 4.2% | | | | | |
| | | B/C Ratio in 2054 2.77 | | | | | |
| 301 PV Benefits of Peaker | MW PV Cost of WH DR | Savings as NPV in 2019 \$ | PV of all Expense | Recurring Program Expense | Utility Total PV Cost | Total MT PV Cost | |
| \$506 | \$183 | \$323 | \$183 | \$94 | \$57 | \$32 | |

| | | | | | | | |
|----------------------------------|----------------------------|-------------------------------------|-------------------|---------------------------|-----------------------|------------------|--|
| | | All IOU Discount Factor 7.2% | | | | | |
| | | B/C Ratio in 2054 2.47 | | | | | |
| 301 PV Benefits of Peaker | MW PV Cost of WH DR | NPV in 2019 \$ | PV of all Expense | Recurring Program Expense | Utility Total PV Cost | Total MT PV Cost | |
| \$309 | \$125 | \$184 | \$125 | \$58 | \$41 | \$27 | |

Page 58:

“...but a broad range of forecasts indicate the \$106 million benefit reported in Section 5.5 could be increased by between 10% and 25%.” *becomes:* “...but a broad range of forecasts indicate the \$230 million benefit reported in Section 5.5 could be increased by between 5% and 15%.”

“The Northwest Power & Conservation Council’s (NPCC’s) Seventh Power Plan [NPCC 2016] estimated the value of locational benefits at \$57 per kW-year. At this level, the \$106 million benefit reported in Section 5.5 would increase to \$209 million and the benefit-cost ratio would increase from 1.74 to 2.45.” *becomes:* “...“The Northwest Power & Conservation Council’s (NPCC’s) Seventh Power Plan [NPCC 2016] estimated the value of locational benefits at \$57 per kW-year. At this level, the \$230 million benefit reported in Section 5.5 would increase to \$383 million and the benefit-cost ratio would increase from 2.59 to 3.66.”

“Using the \$10 to \$25 range would add \$18 and \$45 million, respectively, to the PV benefit of \$106 million reported in Section 5.5.” *becomes:* “Using the \$10 to \$25 range would add \$27 and \$67 million, respectively, to the PV benefit of \$230 million reported in Section 5.5.”

Page 59: Table 15 [If end state enrollment at 50% enrollment versus 26.5%]

| Time Frame | Size of Resource in MW | PV of Peaker Costs | PV of WH Costs | Net Benefit | Benefit Cost Ratio |
|--------------|------------------------|--------------------|----------------|-------------|--------------------|
| Through 2054 | 569 | \$476 | \$228 | \$248 | 2.09 |

becomes:

| Time Frame | Size of Resource in MW | PV of Peaker Costs | PV of WH Costs | Net Benefit | Benefit Cost Ratio |
|--------------|------------------------|--------------------|----------------|-------------|--------------------|
| Through 2054 | 569 | \$709 | \$228 | \$481 | 3.11 |

Page 60: Table 16 Results when End State Enrollment is 6.7% (actual level in report 6.7% not 5%)

| Time Frame | Size of Resource MW | PV of Peaker Costs | PV of HW Costs | Net Benefit | Benefit Cost Ratio |
|--------------|---------------------|--------------------|----------------|-------------|--------------------|
| Through 2054 | 77 | \$67 | \$67 | \$0 | 1.0 |

becomes:

Table 16 Results when End State Enrollment is 6.7%

| Time Frame | Size of Resource MW | PV of Peaker Costs | PV of HW Costs | Net Benefit | Benefit Cost Ratio |
|--------------|---------------------|--------------------|----------------|-------------|--------------------|
| Through 2054 | 77 | \$99 | \$67 | \$32 | 1.49 |

Page 60: Table 17 [Total benefits when kW Benefits are 25% higher per tank]

| Time Frame | Size of Resource in MW | PV of Peaker Costs | PV of WH Costs | Net Benefit | Benefit Cost Ratio |
|--------------|------------------------|--------------------|----------------|-------------|--------------------|
| Through 2054 | 376 | \$313 | \$144 | \$168 | 2.17 |

becomes:

| Time Frame | Size of Resource in MW | PV of Peaker Costs | PV of WH Costs | Net Benefit | Benefit Cost Ratio |
|--------------|------------------------|--------------------|----------------|-------------|--------------------|
| Through 2054 | 376 | \$467 | \$144 | \$323 | 3.24 |