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IDAHO PUBLIC
UTILITIES COMMISSION

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF IDAHO POWER COMPANY'S APPLICATION TO UPDATE SOLAR INTEGRATION RATES AND CHARGES.	)	CASE NO. IPC-E-16-11

IDAHO POWER COMPANY

DIRECT TESTIMONY

OF

MICHAEL J. YOUNGBLOOD

Q. Please state your name and business address.

A. My name is Michael J. Youngblood and my business address is 1221 West Idaho Street, Boise, Idaho 83702.

Q. By whom are you employed and in what capacity?

A. I am employed by Idaho Power Company ("Idaho Power" or "Company") as the Manager of Regulatory Projects in the Regulatory Affairs Department.

Q. Please describe your educational background.

A. In May of 1977, I received a Bachelor of Science Degree in Mathematics and Computer Science from the University of Idaho. From 1994 through 1996, I was a graduate student in the Executive MBA program of Colorado State University. Over the years, I have attended numerous industry conferences and training sessions, including Edison Electric Institute's "Electric Rates Advanced Course."

Q. Please describe your work experience with Idaho Power.

A. I began my employment with Idaho Power in 1977. During my career, I have worked in several departments of the Company and subsidiaries of IDACORP, Inc., including Systems Development, Demand Planning, Strategic Planning, and IDACORP Solutions. From 1981 to 1988, I worked as a Rate Analyst in the Rates and Planning

Department where I was responsible for the preparation of electric rate design studies and bill frequency analyses. I was also responsible for the validation and analysis of the load research data used for cost-of-service allocations.

From 1988 through 1991, I worked in Demand Planning and was responsible for the load research and load forecasting functions of the Company, including sample design, implementation, data retrieval, analysis, and reporting. I was responsible for the preparation of the five-year and twenty-year load forecasts used in revenue projections and resource plans, as well as the presentation of these forecasts to the public and regulatory commissions.

From 1991 through 1998, I worked in Strategic Planning. As a Strategic Planning Associate, I coordinated the complex efforts of acquiring Prairie Power Cooperative, the first acquisition of its kind for the Company in 40 years. From 1996 to 1998, as part of a Strategic Planning initiative, I helped develop and provide two-way communication between customers and energy providers using advanced computer technologies and telecommunications.

From 1998 to 2000, I was a General Manager of IDACORP Solutions, a subsidiary of IDACORP, Inc., reporting to the Vice President of Marketing. I was directly

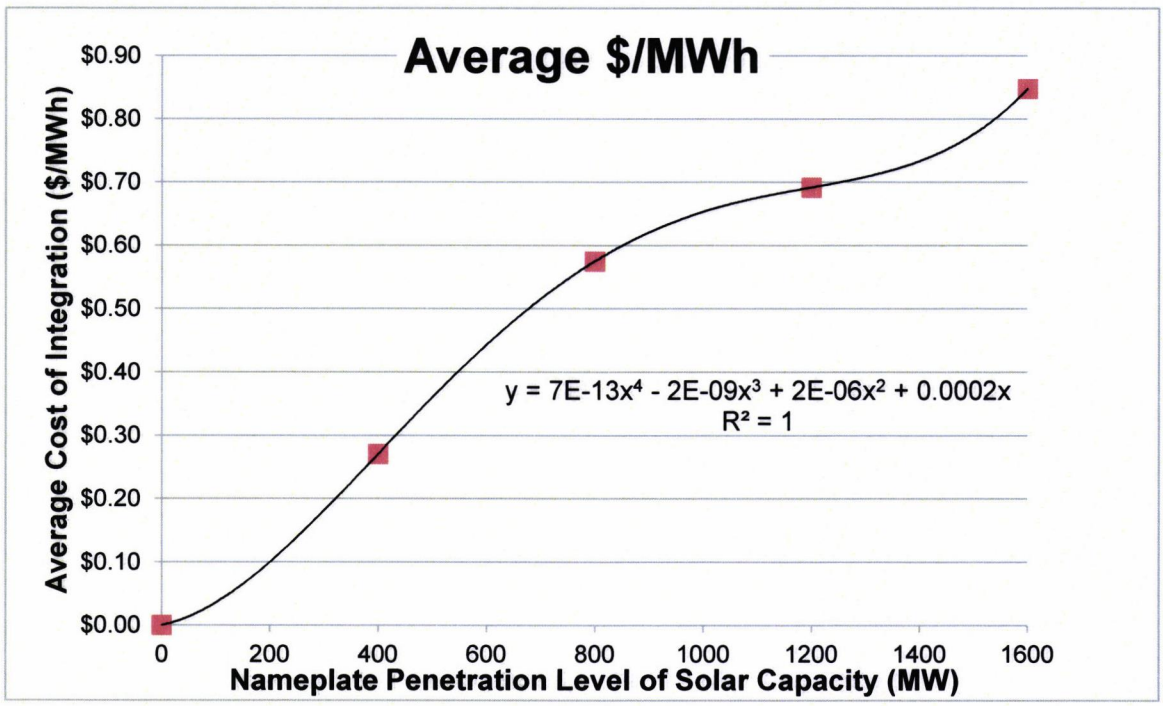
1 responsible for the direction and management of the
2 Commercial and Industrial Business Solutions division.
3 In 2001, I returned to the Regulatory Affairs
4 Department and worked on special projects related to
5 deregulation, the Company's Integrated Resource Plan
6 ("IRP"), and filings with both the Idaho Public Utilities
7 Commission ("Commission") and the Public Utility Commission
8 of Oregon.
9 In 2008, I was promoted to the position of Manager
10 of Rate Design. In that position I was responsible for the
11 management of the rate design strategies of the Company, as
12 well as the oversight of all tariff administration.
13 In January of 2012, I became the Manager of
14 Regulatory Projects, which is my current position. In this
15 position, I provide the regulatory support for many of the
16 large individual projects and issues currently facing the
17 Company. I provided the regulatory support for the
18 inclusion of the Langley Gulch power plant investment in
19 rate base and have supported the Company's efforts to
20 address numerous issues involving Qualifying Facilities
21 ("QF") as defined under the Public Utility Regulatory
22 Policies Act of 1978 ("PURPA"), including the Company's
23 efforts in Case No. GNR-E-11-03, the review of PURPA QF
24 contract provisions.
25

1 Q. What is the purpose of your testimony in this
2 matter?
3 A. Idaho Power is requesting that the Commission
4 authorize the Company to update the solar integration rates
5 and charges consistent with its most recently completed
6 solar integration study ("Solar Study"). The 2016 Solar
7 Integration Study Report ("Study Report") is attached to
8 the Application filed contemporaneously with my testimony.
9 Philip DeVol's Direct Testimony provides a summary of the
10 Solar Study, a description of the role of the Technical
11 Review Committee and process utilized for the analysis, and
12 the results of the 2016 Solar Study. The purpose of my
13 testimony is to provide the Commission with the Company's
14 request to update the incremental solar integration charges
15 contained in Schedule 87, Intermittent Generation
16 Integration Charges, based upon the costs identified by the
17 2016 Solar Study.
18 Q. Based on the results of the 2016 Solar Study,
19 what is the cost of integrating solar generation on Idaho
20 Power's electrical system?
21 A. As presented in Mr. DeVol's testimony, the
22 Solar Study analyzed four solar build-out scenarios at
23 installed capacities of: 400 megawatts ("MW"), 800 MW,
24 1200 MW, and 1600 MW. Table 9 on page 21 of the Study
25 Report shows the average integration costs per

megawatt-hour ("MWh") for each of the four build-out scenarios. The costs identified by the Solar Study reflect the costs to integrate solar generation for the calendar year 2016 and are reported in 2016 dollars. They are not averaged or levelized over the life of the solar project or plant.

Q. Does the Company propose to update Schedule 87 with incremental integration costs based upon the average integration costs identified in the Solar Study?

A. Yes. However, as demonstrated by the chart below, when a line connecting the average integration costs for each of the build-out scenarios is determined, it is apparent that the average cost of integrating solar generation is not a linear equation.



By using the formula for the polynomial equation for the trendline connecting the individual build-out average costs, the average cost of solar integration can be determined at any discrete point along the line. Therefore, based upon the average integration costs determined in the 2016 Solar Study for each of the four build-out scenarios, the average integration costs can be determined at 100 MW increments.

Q. Have you provided an exhibit which shows how the average costs of solar integration at 100 MW intervals are used to determine the incremental costs of solar integration on Idaho Power's system?

A. Yes, my Exhibit No. 1. The first four columns on Exhibit No. 1 reflect the calculations of the average solar integration costs at 100 MW intervals, based upon the 2016 Solar Study build-out scenarios. Column A identifies the individual 100 MW interval designations. Column B uses the formula for the polynomial equation for the trendline shown on the chart above to determine the average dollar per MWh at each 100 MW interval. Column C reflects the cumulative MWh for the intervals based upon the average load factor for each of the 400 MW blocks in the Solar Study. Column D is the simple multiplication of the average dollar per MWh times the number of MWh in each block to determine the cumulative average annual cost for

solar integration. The Solar Study's build-out scenarios of 400 MW, 800 MW, 1200 MW, and 1600 MW are highlighted. The average dollar per MWh for each of those build-out scenarios is the same as those presented in Table 9 on page 21 of the Solar Report.

Q. Please describe the remainder of Exhibit No. 1.

A. The remainder of Exhibit No. 1, columns E through H, develops the incremental costs for integrating solar generation at 100 MW intervals. Column E uses column D to determine the incremental annual cost in each 100 MW interval. Column F reflects the incremental MWh for each of the 400 MW build-out scenarios. Column G simply divides column E by column F to calculate the incremental cost of integration on a dollar-per-MWh basis. Column H calculates the cumulative incremental cost for solar integration. Please note that the cumulative incremental costs in column H are the same as the average annual costs in column D. However, with the costs being allocated on an incremental basis, the individual costs per MWh are more closely aligned with the cause of those costs; thus, the initial generation is assigned a lower cost than the later generation, which is more costly to integrate.

Q. Does column G in Exhibit No. 1 also reflect a decrease in the incremental cost per MWh around the 800 MW

through 1200 MW intervals? If so, please explain this decrease.

A. Yes, it does. While the average cost per MWh as shown on the chart on page 5 of my testimony is always increasing, as I noted before, it is not a linear equation. The Solar Study estimates the costs of the operational modifications necessary to integrate the intermittent generation from solar plants, where the operational modifications are in the form of differing system reserve requirements. Depending on the various resources that are required to be run at various levels of integration, the cost of those resources has an impact on the incremental cost of integration at any given level. Exhibit No. 2 is a step-wise chart depicting the incremental cost at each 100 MW interval. You will note that the decrease in the incremental costs per MWh between the 800-1200 MW penetration levels align with the change in slope of the average cost per MWh shown in the chart on page 5. While the average cost per MWh is still increasing, it is increasing at a slower rate through that portion of the chart. It steepens once again after the 1200 MW level, just as does the incremental cost per MWh shown on Exhibit No. 2.

Q. How do the incremental 2016 solar integration costs shown in column G on Exhibit No. 1 compare to the

1 incremental solar integration costs from the Company's 2014
2 Solar Study?
3 A. The 2014 Solar Study was used to calculate the
4 solar integration charges currently included in Schedule
5 87. In order to compare the costs between the two studies,
6 I took the non-levelized rates for the year 2016 from each
7 of the solar capacity penetration level sheets. (Schedule
8 87, Sheet Nos. 87-9 through 87-15.) When compared to the
9 incremental integration costs from the 2016 Solar Study,
10 there is a significant decrease in the integration costs at
11 each interval. Exhibit No. 3 is a chart which graphically
12 depicts the comparison between incremental costs of solar
13 integration based upon the 2014 Solar Study and updated
14 values provided from the 2016 Solar Study.
15 Q. Have you provided the updated tables that the
16 Company is proposing will replace the tables contained in
17 Schedule 87?
18 A. Yes. Exhibit No. 4 contains 16 tables which
19 would replace the tables in the current Schedule 87, Sheets
20 87-9 through 87-15, and would be used to create new Sheets
21 87-16 through 87-24. Each table discloses both the
22 levelized integration charge, as well as the non-levelized
23 stream of integration charge amounts listed by year. Just
24 like published avoided cost rates, the scheduled operation
25 date for the proposed generation project is used as the

1 starting point in the table, and each yearly amount through
2 the term of the proposed contract is set out accordingly.
3 The tables were created using the escalation and
4 discount rates from the 2015 IRP, the Company's most recent
5 acknowledged IRP. The General O&M Escalation Rate of 2.20
6 percent and the Discount Rate (weighted average cost of
7 capital) of 6.74 percent can be found in the 2015 IRP,
8 Appendix C - Technical Report, page 83.
9 Q. Does this conclude your testimony?
10 A. Yes, it does.
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ATTESTATION OF TESTIMONY

STATE OF IDAHO)
) ss.
County of Ada)

I, Michael J. Youngblood, having been duly sworn to testify truthfully, and based upon my personal knowledge, state the following:

I am employed by Idaho Power Company as the Manager of Regulatory Projects in the Regulatory Affairs Department and am competent to be a witness in this proceeding.

I declare under penalty of perjury of the laws of the state of Idaho that the foregoing pre-filed testimony and exhibits are true and correct to the best of my information and belief.

DATED this 6TH day of May 2016.

Michael J. Youngblood

Michael J. Youngblood

SUBSCRIBED AND SWORN to before me this 6th day of May 2016.

Kimberly K. Towell

Notary Public for Idaho
Residing at: Star, Idaho
My commission expires: 12/20/2020

KIMBERLY K. TOWELL
NOTARY
PUBLIC
STATE OF IDAHO

BEFORE THE

IDAHO PUBLIC UTILITIES COMMISSION

CASE NO. IPC-E-16-11

IDAHO POWER COMPANY

YOUNGBLOOD, DI TESTIMONY

EXHIBIT NO. 1

Average and Incremental Costs of Solar Integration

A	B	C	D	E	F	G	H
Nameplate Penetration MW	Average $/MWh	Average MWH	Average Annual Cost	Incremental Annual Cost	Incremental MWH	Incremental $/MWH	Cumulative Incremental Cost
0	$0.00	0	$ -	$ -		$ -	
100	$0.04	151,954	$ 5,424	$ 5,424	151,954	$ 0.04	$ 5,424
200	$0.10	303,908	$ 30,384	$ 24,960	151,954	$ 0.16	$ 30,384
300	$0.18	455,863	$ 82,755	$ 52,371	151,954	$ 0.34	$ 82,755
400	**$0.27**	**607,817**	**$ 164,597**	**$ 81,842**	**151,954**	**$ 0.54**	**$ 164,597**
500	$0.36	761,063	$ 273,949	$ 109,352	153,247	$ 0.71	$ 273,949
600	$0.44	914,310	$ 404,975	$ 131,026	153,247	$ 0.86	$ 404,975
700	$0.52	1,067,557	$ 550,222	$ 145,247	153,247	$ 0.95	$ 550,222
800	**$0.57**	**1,220,803**	**$ 701,722**	**$ 151,500**	**153,247**	**$ 0.99**	**$ 701,722**
900	$0.62	1,374,380	$ 852,539	$ 150,817	153,577	$ 0.98	$ 852,539
1000	$0.65	1,527,957	$ 997,514	$ 144,975	153,577	$ 0.94	$ 997,514
1100	$0.68	1,681,534	$ 1,135,168	$ 137,654	153,577	$ 0.90	$ 1,135,168
1200	**$0.69**	**1,835,110**	**$ 1,268,874**	**$ 133,706**	**153,577**	**$ 0.87**	**$ 1,268,874**
1300	$0.71	1,991,177	$ 1,409,964	$ 141,089	156,067	$ 0.90	$ 1,409,964
1400	$0.73	2,147,244	$ 1,573,902	$ 163,938	156,067	$ 1.05	$ 1,573,902
1500	$0.78	2,303,311	$ 1,786,808	$ 212,906	156,067	$ 1.36	$ 1,786,808
1600	**$0.85**	**2,459,378**	**$ 2,085,139**	**$ 298,331**	**156,067**	**$ 1.91**	**$ 2,085,139**

BEFORE THE

IDAHO PUBLIC UTILITIES COMMISSION

CASE NO. IPC-E-16-11

IDAHO POWER COMPANY

YOUNGBLOOD, DI TESTIMONY

EXHIBIT NO. 2

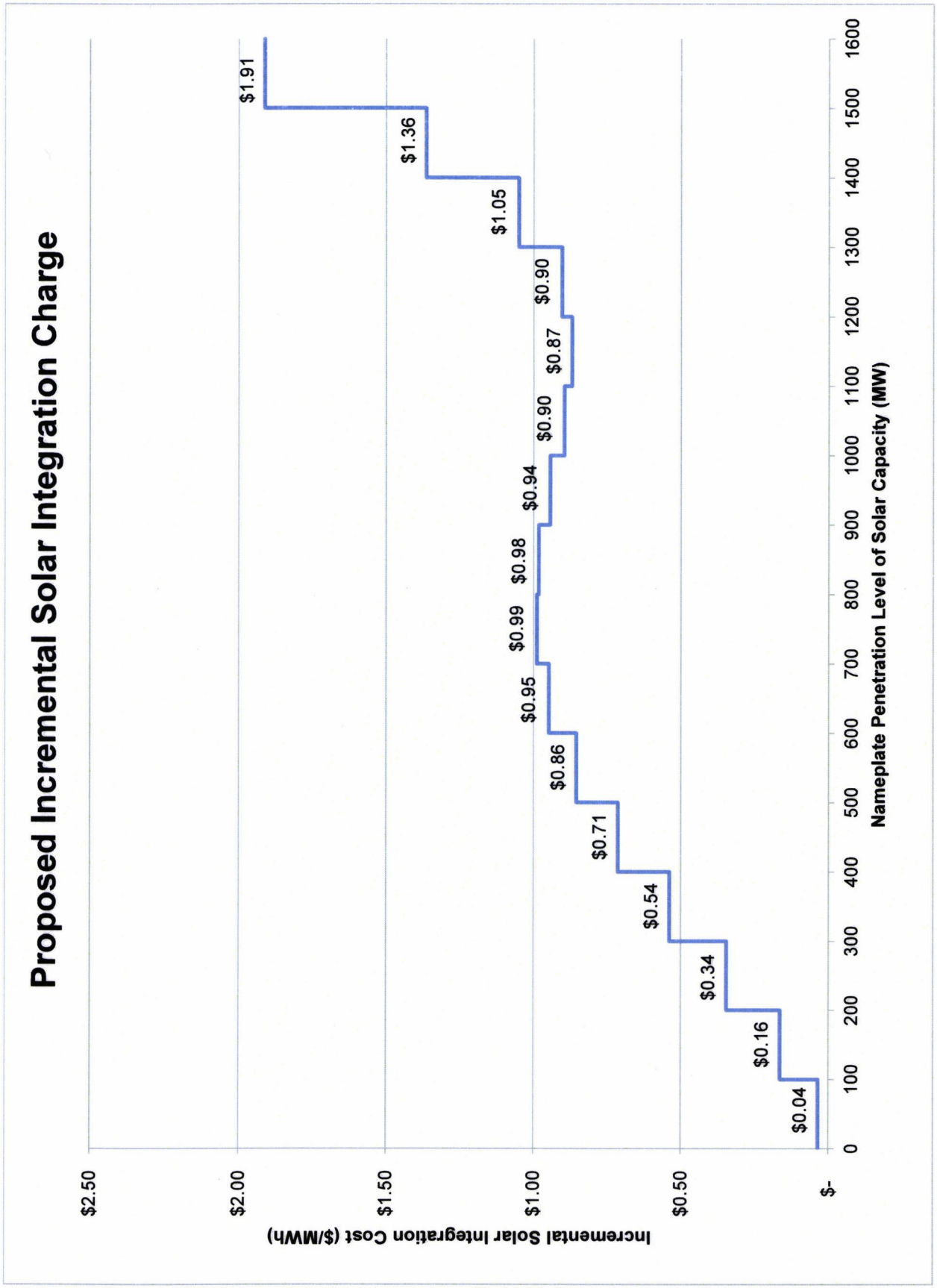

Exhibit No. 2
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M. Youngblood, IPC
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BEFORE THE

IDAHO PUBLIC UTILITIES COMMISSION

CASE NO. IPC-E-16-11

IDAHO POWER COMPANY

YOUNGBLOOD, DI TESTIMONY

EXHIBIT NO. 3

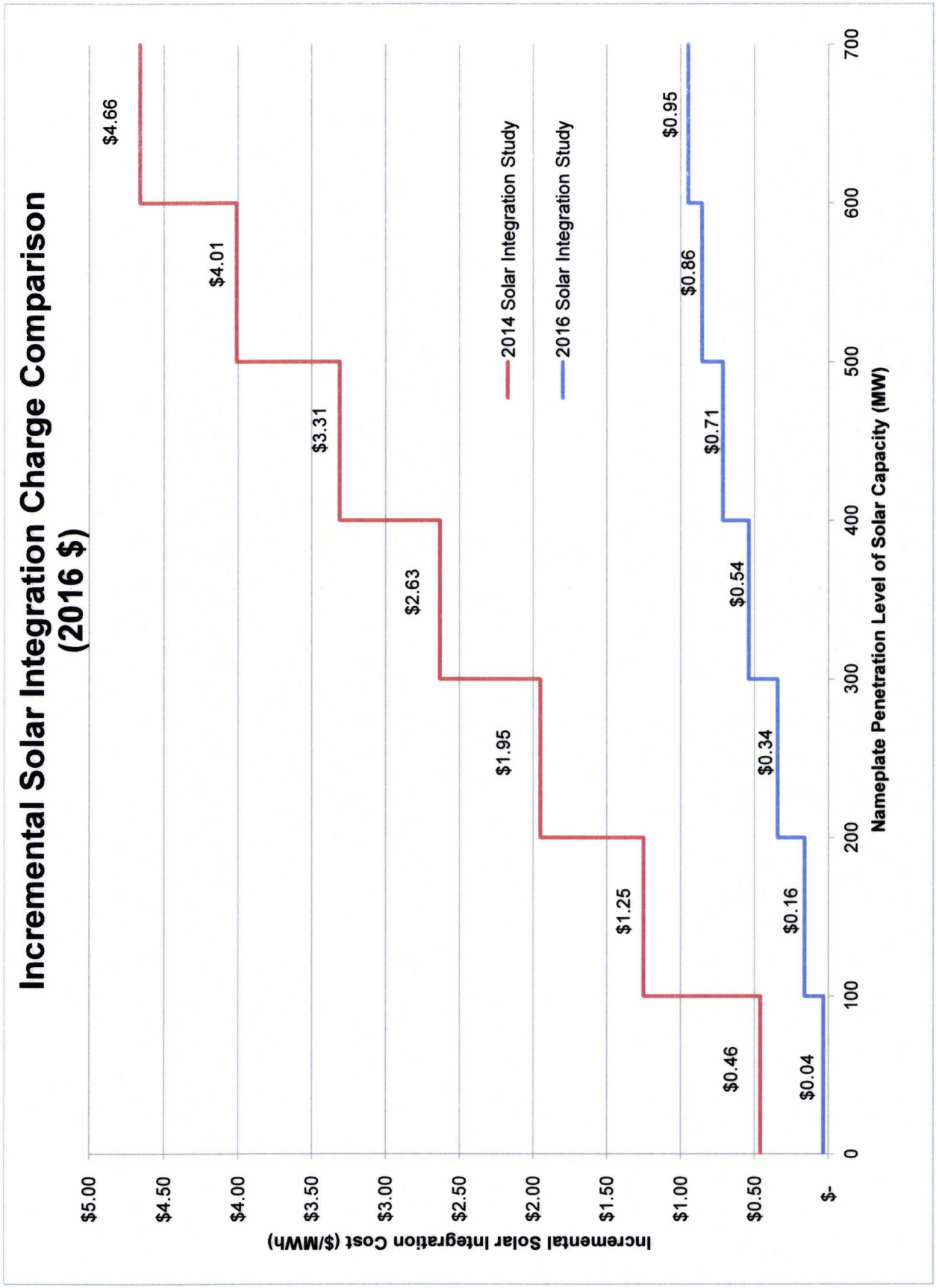

Exhibit No. 3
Case No. IPC-E-16-11
M. Youngblood, IPC
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BEFORE THE

IDAHO PUBLIC UTILITIES COMMISSION

CASE NO. IPC-E-16-11

IDAHO POWER COMPANY

YOUNGBLOOD, DI TESTIMONY

EXHIBIT NO. 4

0 - 100 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	0.04
2017	0.04
2018	0.04
2019	0.05
2020	0.05
2021	0.05

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.04
2017	0.04
2018	0.04
2019	0.04
2020	0.04
2021	0.04
2022	0.04
2023	0.04
2024	0.04
2025	0.04
2026	0.04
2027	0.05
2028	0.05
2029	0.05
2030	0.05
2031	0.05
2032	0.05
2033	0.05
2034	0.05
2035	0.05
2036	0.06
2037	0.06
2038	0.06
2039	0.06
2040	0.06
2041	0.06

101 - 200 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	0.19
2017	0.20
2018	0.20
2019	0.21
2020	0.21
2021	0.22

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.16
2017	0.17
2018	0.17
2019	0.18
2020	0.18
2021	0.18
2022	0.19
2023	0.19
2024	0.20
2025	0.20
2026	0.20
2027	0.21
2028	0.21
2029	0.22
2030	0.22
2031	0.23
2032	0.23
2033	0.24
2034	0.24
2035	0.25
2036	0.25
2037	0.26
2038	0.27
2039	0.27
2040	0.28
2041	0.28

201 - 300 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	0.41
2017	0.42
2018	0.43
2019	0.44
2020	0.44
2021	0.45

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.34
2017	0.35
2018	0.36
2019	0.37
2020	0.38
2021	0.38
2022	0.39
2023	0.40
2024	0.41
2025	0.42
2026	0.43
2027	0.44
2028	0.45
2029	0.46
2030	0.47
2031	0.48
2032	0.49
2033	0.50
2034	0.51
2035	0.52
2036	0.53
2037	0.54
2038	0.56
2039	0.57
2040	0.58
2041	0.59

301 - 400 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	0.64
2017	0.65
2018	0.67
2019	0.68
2020	0.70
2021	0.71

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.54
2017	0.55
2018	0.56
2019	0.57
2020	0.59
2021	0.60
2022	0.61
2023	0.63
2024	0.64
2025	0.66
2026	0.67
2027	0.68
2028	0.70
2029	0.71
2030	0.73
2031	0.75
2032	0.76
2033	0.78
2034	0.80
2035	0.81
2036	0.83
2037	0.85
2038	0.87
2039	0.89
2040	0.91
2041	0.93

401 - 500 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	0.84
2017	0.86
2018	0.88
2019	0.90
2020	0.92
2021	0.94

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.71
2017	0.73
2018	0.75
2019	0.76
2020	0.78
2021	0.80
2022	0.81
2023	0.83
2024	0.85
2025	0.87
2026	0.89
2027	0.91
2028	0.93
2029	0.95
2030	0.97
2031	0.99
2032	1.01
2033	1.03
2034	1.06
2035	1.08
2036	1.10
2037	1.13
2038	1.15
2039	1.18
2040	1.20
2041	1.23

501 - 600 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.01
2017	1.03
2018	1.06
2019	1.08
2020	1.10
2021	1.13

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.86
2017	0.87
2018	0.89
2019	0.91
2020	0.93
2021	0.95
2022	0.97
2023	1.00
2024	1.02
2025	1.04
2026	1.06
2027	1.09
2028	1.11
2029	1.13
2030	1.16
2031	1.19
2032	1.21
2033	1.24
2034	1.26
2035	1.29
2036	1.32
2037	1.35
2038	1.38
2039	1.41
2040	1.44
2041	1.47

601 - 700 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.12
2017	1.15
2018	1.17
2019	1.20
2020	1.22
2021	1.25

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.95
2017	0.97
2018	0.99
2019	1.01
2020	1.03
2021	1.06
2022	1.08
2023	1.10
2024	1.13
2025	1.15
2026	1.18
2027	1.20
2028	1.23
2029	1.26
2030	1.29
2031	1.31
2032	1.34
2033	1.37
2034	1.40
2035	1.43
2036	1.46
2037	1.50
2038	1.53
2039	1.56
2040	1.60
2041	1.63

701 - 800 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.17
2017	1.20
2018	1.22
2019	1.25
2020	1.28
2021	1.30

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.99
2017	1.01
2018	1.03
2019	1.06
2020	1.08
2021	1.10
2022	1.13
2023	1.15
2024	1.18
2025	1.20
2026	1.23
2027	1.26
2028	1.28
2029	1.31
2030	1.34
2031	1.37
2032	1.40
2033	1.43
2034	1.46
2035	1.49
2036	1.53
2037	1.56
2038	1.60
2039	1.63
2040	1.67
2041	1.70

801 - 900 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.16
2017	1.19
2018	1.21
2019	1.24
2020	1.27
2021	1.30

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.98
2017	1.00
2018	1.03
2019	1.05
2020	1.07
2021	1.09
2022	1.12
2023	1.14
2024	1.17
2025	1.19
2026	1.22
2027	1.25
2028	1.28
2029	1.30
2030	1.33
2031	1.36
2032	1.39
2033	1.42
2034	1.45
2035	1.48
2036	1.52
2037	1.55
2038	1.59
2039	1.62
2040	1.66
2041	1.69

901 - 1000 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.12
2017	1.14
2018	1.17
2019	1.19
2020	1.22
2021	1.25

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.94
2017	0.96
2018	0.99
2019	1.01
2020	1.03
2021	1.05
2022	1.08
2023	1.10
2024	1.12
2025	1.15
2026	1.17
2027	1.20
2028	1.23
2029	1.25
2030	1.28
2031	1.31
2032	1.34
2033	1.37
2034	1.40
2035	1.43
2036	1.46
2037	1.49
2038	1.52
2039	1.56
2040	1.59
2041	1.63

1001 - 1100 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.06
2017	1.08
2018	1.11
2019	1.13
2020	1.16
2021	1.18

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.90
2017	0.92
2018	0.94
2019	0.96
2020	0.98
2021	1.00
2022	1.02
2023	1.04
2024	1.07
2025	1.09
2026	1.11
2027	1.14
2028	1.16
2029	1.19
2030	1.22
2031	1.24
2032	1.27
2033	1.30
2034	1.33
2035	1.36
2036	1.39
2037	1.42
2038	1.45
2039	1.48
2040	1.51
2041	1.54

1101 - 1200 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.03
2017	1.05
2018	1.08
2019	1.10
2020	1.12
2021	1.15

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.87
2017	0.89
2018	0.91
2019	0.93
2020	0.95
2021	0.97
2022	0.99
2023	1.01
2024	1.04
2025	1.06
2026	1.08
2027	1.11
2028	1.13
2029	1.16
2030	1.18
2031	1.21
2032	1.23
2033	1.26
2034	1.29
2035	1.32
2036	1.35
2037	1.37
2038	1.41
2039	1.44
2040	1.47
2041	1.50

1201 - 1300 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.07
2017	1.09
2018	1.12
2019	1.14
2020	1.17
2021	1.19

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	0.90
2017	0.92
2018	0.94
2019	0.97
2020	0.99
2021	1.01
2022	1.03
2023	1.05
2024	1.08
2025	1.10
2026	1.12
2027	1.15
2028	1.17
2029	1.20
2030	1.23
2031	1.25
2032	1.28
2033	1.31
2034	1.34
2035	1.37
2036	1.40
2037	1.43
2038	1.46
2039	1.49
2040	1.52
2041	1.56

1301 - 1400 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.24
2017	1.27
2018	1.30
2019	1.33
2020	1.36
2021	1.39

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	1.05
2017	1.07
2018	1.10
2019	1.12
2020	1.15
2021	1.17
2022	1.20
2023	1.22
2024	1.25
2025	1.28
2026	1.31
2027	1.33
2028	1.36
2029	1.39
2030	1.42
2031	1.46
2032	1.49
2033	1.52
2034	1.55
2035	1.59
2036	1.62
2037	1.66
2038	1.70
2039	1.73
2040	1.77
2041	1.81

1401 - 1500 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	1.61
2017	1.65
2018	1.69
2019	1.72
2020	1.76
2021	1.80

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	1.36
2017	1.39
2018	1.42
2019	1.46
2020	1.49
2021	1.52
2022	1.55
2023	1.59
2024	1.62
2025	1.66
2026	1.70
2027	1.73
2028	1.77
2029	1.81
2030	1.85
2031	1.89
2032	1.93
2033	1.97
2034	2.02
2035	2.06
2036	2.11
2037	2.15
2038	2.20
2039	2.25
2040	2.30
2041	2.35

1501 - 1600 MW Solar Capacity Penetration Level

LEVELIZED	
ON-LINE YEAR	20 YEAR CONTRACT TERM LEVELIZED RATES ($/MWh)
2016	2.26
2017	2.31
2018	2.36
2019	2.41
2020	2.47
2021	2.52

NON-LEVELIZED	
CONTRACT YEAR	NON-LEVELIZED RATES ($/MWh)
2016	1.91
2017	1.95
2018	2.00
2019	2.04
2020	2.09
2021	2.13
2022	2.18
2023	2.23
2024	2.28
2025	2.33
2026	2.38
2027	2.43
2028	2.48
2029	2.54
2030	2.59
2031	2.65
2032	2.71
2033	2.77
2034	2.83
2035	2.89
2036	2.95
2037	3.02
2038	3.09
2039	3.15
2040	3.22
2041	3.29