

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

Fern Solar LLC)
) Docket Nos. ER20-2186-003,
) EL20-62-001
)

**SUPPLEMENTAL TESTIMONY
RESPONDING TO BENCH QUESTIONS, SET #1**

1 **B-1-99**

2 **Ex. IMM-0001 at 10-11 (Bowring Dir.):**

3 *The Market Monitor used the CRF approach to determine an annual revenue*
4 *requirement based on the capital cost data and financing structure provided in the*
5 *Clayton Testimony. The results are shown in Exhibit Nos. IMM-0004 and IMM-0005. For*
6 *a 25 year cost recovery period, the Market Monitor's CRF is 0.085862 and the*
7 *corresponding annual revenue payment is \$860,321. The Market Monitor's CRF is lower*
8 *than the CRF proposed by Clayton. The Market Monitor's annual revenue payment in*
9 *Exhibit No. IMM-0004 reflects a reduction to the reactive capital cost to account for an*
10 *investment tax credit (ITC). The Fern Solar plant would have been eligible for an ITC*
11 *and it should be reflected in the reactive cost recovery. The annual payment for capital*
12 *cost recovery proposed by Witness Clayton apparently does not reflect an ITC."*

13 *a. [Bowring]: I wish to compare your 0.085862 to Fern's proposed fixed charge*
14 *rate, recognizing that your figure addresses the components other than the fixed*
15 *operating expense rate: Please prepare a table that compares each component of your*
16 *0.085862 with the components displayed in Column H of FS-3, Schedule 1, Attachment*
17 *C.*

18 Please see Attachment A.

19 *b. [Bowring]: I have trouble understanding your pages 8-11 for the following four*
20 *reasons: The material is not organized logically, it doesn't explain why Fern's*
21 *methodology is flawed and yours is not, the technical appendix lacks an English*
22 *translation, and the material nowhere compares the components of your result to the*
23 *components of Fern's result. The immediately preceding question will solve the last*
24 *problem, I hope. To solve the remaining problems I need a new version of pages 8- 11*

25 Please see Attachment B.

Attachment A

Table 1 shows the capital recovery factor (CRF) included in the original revenue requirement request, filed on June 26, 2020.¹ The total fixed charge rate is the sum of the fixed operating rate and the CRF value 9.14 percent.

Table 1 Fern Solar CRF in Exhibit FS-3, Schedule 1, Attachment C²

Item	Rate	
Sinking Fund Depreciation	1.42%	Column H, Line 12
Composite Income Tax Factor	1.13%	Column H, Line 20
Rate of Return (Before Tax)	7.76%	Column H, Line 26
ADIT	-1.17%	Column H, Line 28
CRF	9.14%	

The CRF has three components: the return of the investment, the return on the investment, and a gross up tax factor. To facilitate comparison with the MMU CRF, the Fern Solar CRF is shown by component in Table 2.

Table 2 Fern Solar CRF

Item	Rate
Return of Investment	1.42%
After Tax Return on Investment	7.29%
After Tax Return on Investment and Return of Investment	8.71%
Gross Up Tax Factor	0.43%
CRF	9.14%

The return of the investment under the Fern CRF is calculated using the sinking fund depreciation method. Sinking fund depreciation assumes an equal annual return of the original investment. The after tax return on investment is equal to the before tax return less the adjustment for the fact that interest is not taxable (*Gross Income Tax Rate*) \times (*Debt Percent*) \times (*Debt Rate*). The gross up tax factor includes the composite tax factor, the ADIT (accumulated deferred income taxes) and the difference between the before and after tax rate of return.

Formula (1.4) in the CRF Technical Reference can be rewritten as

¹ In an updated filing, FERN Solar removed all the tax elements. The original version will provide a more illuminating comparison with the MMU CRF.

² Exhibit FS-3 as originally filed on June 26, 2020, sponsored by Donald J. Clayton

$$CRF = \frac{r(1+r)^N}{[(1+r)^N - 1]} \frac{1}{\sqrt{1+r}} + \frac{r(1+r)^N}{[(1+r)^N - 1]} \frac{1}{\sqrt{1+r}} \left(\frac{s}{1-s}\right) \left\{ 1 - \sqrt{1+r} \sum_{j=1}^N \frac{\delta_j}{(1+r)^j} \right\}$$

or more succinctly as $CRF = A + T$ where³

$$A = \frac{r(1+r)^N}{[(1+r)^N - 1]} \frac{1}{\sqrt{1+r}} \text{ and } T = A \left(\frac{s}{1-s}\right) \left\{ 1 - \sqrt{1+r} \sum_{j=1}^N \frac{\delta_j}{(1+r)^j} \right\}.$$

Factor A represents the after tax return on the investment and the return of the investment. Factor T is the gross up tax factor.

Table 3 Comparison of MMU CRF and Fern Solar CRF

Item	Fern Solar	MMU
After Tax Return on Investment and Return of Investment	8.7053%	8.4986%
Gross Up Tax Factor	0.4347%	0.0876%
CRF	9.1400%	8.5862%

The basic difference in the methods is that the MMU CRF approach is an internally consistent method based on a standard financial model of investments in capital assets and the associated returns on and of capital over the asset life that produce a constant annual revenue requirement. The MMU CRF reflects the actual tax liabilities by incorporating the actual depreciation rates into the CRF formula. The MMU CRF reflects the fact that 100 percent bonus depreciation was available to the Fern Solar investors. The MMU CRF method calculates an after tax revenue requirement based on a single, internally consistent and standard approach to investment valuation. The MMU CRF method calculated for Fern Solar uses the cost of capital requested by Fern Solar. The single biggest difference between the two methods is that the MMU CRF accounts for bonus depreciation while Fern Solar CRF fails to do so.

The method used by Fern Solar starts by incorrectly assuming straight line depreciation over the life of the asset and then making ad hoc adjustments, including an adjustment for ADIT, which are captured in the Fern Solar gross up tax factor. The ADIT

³ See Table 1-1 in the CRF Technical Reference for variable definitions.

term is a relic of cost of service accounting in a regulated environment in which rates were set based on straight line depreciation and the tax benefits of accelerated depreciation were returned to customers only later in the asset life. This does not match the actual accounting treatment of the Fern Solar assets and therefore does not match the actual cost of the facility. In addition the Fern Solar method calculates a before tax return and then makes further ad hoc adjustments to calculate an after tax return.

The difference between the two approaches is illustrated by the difference in the annual after tax return on investment and return of the investment components. In the MMU CRF calculation, as with a standard mortgage, the components change each year. Table 4 provides a comparison of the MMU return of investment and return on investment with the corresponding components of the Fern Solar calculation.

Table 4 Comparison of Fern Solar and MMU return on and of the investment

Recovery Year	Investment Return		Return of Investment	
	Fern Solar	MMU	Fern Solar	MMU
1	7.2853%	3.5786%	1.4200%	4.9200%
2	7.2853%	6.9269%	1.4200%	1.5717%
3	7.2853%	6.8124%	1.4200%	1.6862%
4	7.2853%	6.6895%	1.4200%	1.8091%
5	7.2853%	6.5577%	1.4200%	1.9409%
6	7.2853%	6.4163%	1.4200%	2.0823%
7	7.2853%	6.2646%	1.4200%	2.2340%
8	7.2853%	6.1019%	1.4200%	2.3967%
9	7.2853%	5.9273%	1.4200%	2.5714%
10	7.2853%	5.7399%	1.4200%	2.7587%
11	7.2853%	5.5390%	1.4200%	2.9597%
12	7.2853%	5.3233%	1.4200%	3.1753%
13	7.2853%	5.0920%	1.4200%	3.4066%
14	7.2853%	4.8438%	1.4200%	3.6548%
15	7.2853%	4.5776%	1.4200%	3.9211%
16	7.2853%	4.2919%	1.4200%	4.2067%
17	7.2853%	3.9854%	1.4200%	4.5132%
18	7.2853%	3.6566%	1.4200%	4.8420%
19	7.2853%	3.3039%	1.4200%	5.1948%
20	7.2853%	2.9254%	1.4200%	5.5732%
21	7.2853%	2.5194%	1.4200%	5.9793%
22	7.2853%	2.0838%	1.4200%	6.4149%
23	7.2853%	1.6164%	1.4200%	6.8822%
24	7.2853%	1.1150%	1.4200%	7.3836%
25	7.2853%	0.5771%	1.4200%	7.9215%

Attachment B

The Market Monitor noted that “Witness Clayton did not account for the actual tax treatment of the facility and did not adequately explain his tax treatment, did not account for the actual expected life of the facility, did not adequately explain or support his depreciation method, and did not account for the actual cost of capital of the facility.” [Bowring 6/15/2022 testimony].

The CRF is a factor which when multiplied by an investment capital amount, results in an annual payment that provides for the return of and return on the initial investment and the income tax payments attributable to the periodic revenue payments. The MMU CRF is derived from standard cash flow analysis. The income tax treatment, and the impact of depreciation on the income tax liability, significantly affects the level of the CRF. The MMU CRF formula uses income tax assumptions that reflect the actual income tax liabilities and the actual available depreciation treatment.

The Fern Solar CRF calculation is not consistent with expected cash flows and the tax assumptions do not reflect the actual income tax liabilities. Fern Solar’s sinking fund depreciation calculation assumes an equal annual return of the investment. The composite income tax factor reflects this assumption (Schedule 1, Attachment C, line 20). In recognition that the sinking fund depreciation calculation does not align with the actual tax depreciation, an ADIT calculation is necessary. The depreciation assumption in the ADIT calculation does not use the 100 percent bonus depreciation that was available to Fern Solar as a capital investment placed in service after September 27, 2017.

The Fern Solar calculation includes several adjustments to compensate for assumptions that are counter to the expected cash flows and the expected income tax liability. As a result of the flaws in the calculation, the Fern Solar CRF exceeds the MMU CRF.⁴

⁴ The MMU CRF calculation uses the FERC Solar financial parameter assumptions including the cost of capital and income tax rate assumptions.

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Fern Solar LLC

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Docket No. ER20-2576-001

DECLARATION

JOSEPH E. BOWRING states that I prepared the testimony to which this declaration is attached with the assistance of the staff of Monitoring Analytics, LLC, and that the statements contained therein are true and correct to the best of my knowledge and belief. Monitoring Analytics, LLC, is acting in its capacity as the Independent Market Monitor for PJM.

Pursuant to Rule 2005(b)(3) (18 CFR § 385.2005(b)(3), citing 28 U.S.C. § 1746), I further state under penalty of perjury that the foregoing is true and correct.

Executed on September 15, 2022.



Joseph E. Bowring