

SOLAR AND ENERGY SYSTEM VALUATION REPORT



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BRIGHTFOX CONSULTANTS

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SOLAR AND ENERGY SYSTEM VALUATION REPORT

Disclaimer

This valuation report has been prepared for the valuation of 12.8 KW Solar Panel and 220 KWH Battery System specifically for our client Yellow Star Power, which is intended to be submitted as per the needs of stakeholders to ascertain their interest in this proposed project's valuation by reflecting its true capabilities and potential.

This report contains certain statements, estimates and calculations with respect to anticipated market performance of the project. Such statements, estimates and calculations reflect certain assumptions concerning anticipated results. Whilst the statements, estimates and calculations contained in this report represents the view of the management based on what they considered to be reasonable as per market norms at the time these are prepared, the same should not be considered as an absolute representation. Similarly, whilst due care and attention was taken in performing the exercise, no liability can be inferred for any inaccuracies or omissions reported from the results thereof.

The inputs disclosed herein are those that management believes are significant to the calculations. This report should not be considered as investment advice, but is intended to assist the investors / authorities in making an independent analysis of the commercial and financial assumptions. Therefore, each recipient of this report will be deemed to have made its own independent investigation and appraisal of the business, financial position, prospective credit worthiness, status and affairs of Yellow Star Power or any other relevant party.

This report is confidential and being supplied on the basis that the recipients will keep its contents confidential. Such information / report should not be quoted, used or disclosed to any third party other than the addressee to whom this valuation is issued, and cannot be disclosed, used or duplicated in whole or in part by the addressee for any purpose other than for evaluating the valuation herein, unless our written consent is first obtained in writing.

Muhammad Asad

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PURPOSE

This valuation report is intended to value the Solar and Energy storage system for the purpose of determination of price that someone would be expected to pay for it.

SUMMARY OF COMPANY QUALIFICATION

Over the past three years since establishment of **Brightfox Consultants** in June 2019 as a consultancy firm based in Pakistan, we have continued to expand our global network by providing high valued-added consulting services that assist our clients in expending their business operations on a global basis.

OUR MISSION

We bring success to our clients, continuously contribute toward enhancing their corporate value, care for people and deliver results through innovation.

SCOPE OF REPORT

We were required to calculate the market value of 12.8 KW Solar panels and 220 KWH Capacity Battery Storage System. The inputs required for this process were provided by Yellow Star Power (Our client).

We used two methods for the calculation based on the inputs provided which are as follows:

1. **Cost Based valuation**
2. **Sales based valuation (Market based valuation)**

INTRODUCTION ABOUT THE PROJECT

This is solar plus energy storage project consisting of solar panels having capacity of 12.8 KW and battery energy storage system having 220 KWH capacity. Further details are as follows:

SOLAR PANELS	
Tier 1 Solar Panels Capacity	12.8 KW
Mounting – Roof Top	Warranty 25 Years
Hybrid Inverter – 8 kW Grid Tied Output+	Off Grid AC 36 kW Output+

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BATTERY ENERGY STORAGE SYSTEM	
220 kWh Capacity	Total AC Power Output 44 kW
6 hour duration at 44 kW	66 hours at 4 Kw
6,000 Cycles @80% DoD	LIFEPO4 Chemistry
Online Virtual Power Plant Capable	25 Year Warranty Replacement Warranty
Outdoor Rated Enclosure	UL Complaint Cells

VALUATION OVERVIEW

The valuation of solar energy projects is a complex subject and is a source of tension between regulators, developers and debt and equity investors. Depending on the purpose of a valuation, there can also be different standards of value required by regulators, or requested by the users of valuations. There are many accepted methods for valuing assets that do not have a readily available or quoted market price such as solar assets. These valuation methods can generally be aggregated into the above-mentioned categories in our scope of services.

In the valuation of solar assets, each approach provides relevant information to estimating FMV (i.e., the price that would be negotiated between a buyer and seller). Each approach has its strengths and weaknesses and will be afforded different weight based on the facts and circumstances.

VALUATION VIA COST BASED APPROACH

The cost approach is applied using either the:

- 1- reproduction cost method (costs to replicate an identical asset) or
- 2- replacement cost method (costs to develop an asset of similar utility).

This method becomes much less reliable for in-service assets because of the difficulty in estimating physical, functional, technological and economic obsolesce/depreciation.

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Valuation of Solar plus Battery storage system based on our calculation is as follows:

SOLAR PANELS		12.8 kW
BATTERY STORAGE SYSTEM		220 kWh
System Description	Annex	Price
System 1: Sol-Ark + Blue Planet Energy Blue Ion	1	\$ 491,983.00
System 2: Sol Ark + Discover AES	2	\$ 511,073.00
System 3: Enphase + Enphase Encharge	3	\$ 432,013.00
System 4: Enphase + Sonnen EcoLinx	4	\$ 854,585.00
Average System Price		\$572,413.5

Using the cost approach over the other valuation methods have the following pros:

➤ *The cost approach is most applicable in estimating the value of a new or hypothetical "as if complete" solar asset which means we can calculate an estimated cost to complete an asset before starting its production, thus this can be a part of feasibility study for a project.*

- *The cost approach also includes*
 - *Market based Direct costs to develop an asset of equivalent utility*
 - *Market based indirect costs to develop an asset of equivalent utility*
 - *Opportunity costs*
 - *Entrepreneurial profit to compensate for the risk*

Despite of the fact that actual costs are not used but due to linking of costs to the market indicators a notion of profit and related costs of undertaking a project can be estimated in advance and better-informed decisions can be made.

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- *This approach is also important in statutory perspective because certain grant applications required a cost certification from an independent certified public accountant (“Cost Certification”).*
- *The cost approach provides relevant information in estimating FMV under the premise that a market participant would pay no more for an asset than their cost to develop an asset of equivalent utility. The cost approach often provides the upper bound for the FMV of the solar asset.*

(Detailed cost analysis of the above-mentioned systems is given as annexures next)

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ANNEXURE 1:

System 1: Sol-Ark + Blue Planet Energy Blue Ion

Main Equipment Costs			
Item Description	Cost	QTY	Subtotal
Solar Panels - Hanwha Q CELLS Q.PEAK DUO BLK ML-G10+,c400W x 32 (12,800 Watt of Total Power)	\$ 286.00	32	\$ 9,152.00
Tigo Optimzers and Safety Disconnect	\$ 40.00	32	\$ 1,280.00
Tigo Monitoring and Rapid Shutdown Equipment	\$ 800.00	1	\$ 800.00
Rooftop Mount - IronRidge Railing 14'	\$ 70.00	22	\$ 1,540.00
Rooftop Mount - IronRidge Flashfoot	\$ 17.44	58	\$ 1,011.52
Rooftop Mount - IronRidge Remaining Materials	\$ 1,400.00	1	\$ 1,400.00
Inverter - Sol-Ark 12K, 9kW (total 45 kW On/Off Grid)	\$ 6,800.00	5	\$ 34,000.00
Blue Planet Energy Blue Ion - 16 kWh (224 kWh total)	\$ 19,750.00	14	\$ 276,500.00
Additional Materials Cost			
200A Manual Bypass Switch	\$ 1,000.00	1	\$ 1,000.00
200A Disconnect	\$ 760.00	2	\$ 1,520.00
200A Load Center + 12 Breakers	\$ 650.00	2	\$ 1,300.00
Line Side Tap Connection	\$ 350.00	1	\$ 350.00
PV Wire - 1000 ft	\$ 0.35	1000	\$ 350.00
TTHN Wire - 10 AWG	\$ 0.25	1000	\$ 250.00
TTHN Wire - 4 AWG	\$ 4.00	240	\$ 960.00
Battery Cable 4/0 AWG (Red / Black Pair)	\$ 100.00	20	\$ 2,000.00
DC Combiner 48V 400A	\$ 1,000.00	1	\$ 1,000.00
Outdoor Rated Battery Enclosure Cost	\$ 5,000.00	1	\$ 5,000.00
Labor Cost (Soft Cost)			
Engineering and Management Cost	\$ 15,000.00	1	\$ 15,000.00
Permitting and City Inspection Fees	\$ 5,000.00	1	\$ 5,000.00
Solar Panel Installation Labor Cost	\$ 8,320.00	1	\$ 8,320.00
Inverter Installation Cost	\$ 750.00	5	\$ 3,750.00
Battery Installation Cost	\$ 500.00	14	\$ 7,000.00
Battery, Inverter Wiring Cost	\$ 750.00	5	\$ 3,750.00
Solar, Inverter Wiring Cost	\$ 250.00	1	\$ 250.00
Load Center Install + Disconnect + Transfer Switch Labor	\$ 500.00	4	\$ 2,000.00
Outdoor Rate Battery Enclsoure Building Labor Cost	\$ 2,500.00	1	\$ 2,500.00
Estimated Overhead Costs	\$ 5,000.00	1	\$ 5,000.00
Estimated Delivery Cost	\$ 20,000.00	1	\$ 20,000.00
Builder Profit Margin (20%)	\$ 80,000.00	1	\$ 80,000.00
Total Build Cost of System	\$		491,983.52

SOLAR AND ENERGY SYSTEM VALUATION REPORT

ANNEXURE 2

System 2: Sol Ark + Discover AES

Main Equipment Costs			
Item Description	Cost	QTY	Subtotal
Solar Panels - Hanwha Q CELLS Q.PEAK DUO BLK ML-G10+, 400W x 32 (12,800 Watt of Total Power)	\$ 286.00	32	\$ 9,152.00
Tigo Optimzers and Safety Disconnect	\$ 40.00	32	\$ 1,280.00
Tigo Monitoring and Rapid Shutdown Equipment	\$ 800.00	1	\$ 800.00
Rooftop Mount - IronRidge Railing 14'	\$ 70.00	22	\$ 1,540.00
Rooftop Mount - IronRidge Flashfoot	\$ 17.44	58	\$ 1,011.52
Rooftop Mount - IronRidge Remaining Materials	\$ 1,400.00	1	\$ 1,400.00
Inverter - Sol-Ark 12K, 9kW (total 45 kW On/Off Grid)	\$ 6,800.00	5	\$ 34,000.00
Discover AES Battery - 7.4 kWh (222 kWh total)	\$ 7,066.00	40	\$ 282,640.00
Additional Materials Cost			
200A Manual Bypass Switch	\$ 1,000.00	1	\$ 1,000.00
200A Disconnect	\$ 760.00	2	\$ 1,520.00
200A Load Center + 12 Breakers	\$ 650.00	5	\$ 3,250.00
Line Side Tap Connection	\$ 350.00	1	\$ 350.00
PV Wire - 1000 ft	\$ 0.35	1000	\$ 350.00
TTHN Wire - 10 AWG	\$ 0.25	1000	\$ 250.00
TTHN Wire - 4 AWG	\$ 4.00	240	\$ 960.00
Battery Cable 4/0 AWG (Red / Black Pair)	\$ 100.00	40	\$ 4,000.00
DC Combiner 48V 400A	\$ 1,000.00	2	\$ 2,000.00
Outdoor Rated Battery Enclosure Cost	\$ 5,000.00	1	\$ 5,000.00
Labor Cost (Soft Cost)			
Engineering and Management Cost	\$ 15,000.00	1	\$ 15,000.00
Permitting and City Inspection Fees	\$ 5,000.00	1	\$ 5,000.00
Solar Panel Installation Labor Cost	\$ 8,320.00	1	\$ 8,320.00
Inverter Installation Cost	\$ 750.00	5	\$ 3,750.00
Battery Installation Cost	\$ 500.00	30	\$ 15,000.00
Battery, Inverter Wiring Cost	\$ 750.00	5	\$ 3,750.00
Solar, Inverter Wiring Cost	\$ 250.00	1	\$ 250.00
Load Center Install + Disconnect + Transfer Switch Labor	\$ 500.00	4	\$ 2,000.00
Outdoor Rate Battery Enclsoure Building Labor Cost	\$ 2,500.00	1	\$ 2,500.00
Estimated Overhead Costs	\$ 5,000.00	1	\$ 5,000.00
Estimated Delivery Cost	\$ 20,000.00	1	\$ 20,000.00
Builder Profit Margin (20%)	\$ 80,000.00	1	\$ 80,000.00
Total Build Cost of System	\$		511,073.52

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ANNEXURE 3:

System 3: Enphase + Enphase Encharge

Main Equipment Costs			
Item Description	Cost	QTY	Subtotal
Solar Panels - Hanwha Q CELLS Q.PEAK DUO BLK ML-G10+, 400W x 32 (12,800 Watt of Total Power)	\$ 286.00	32	\$ 9,152.00
Enphase IQ8+	\$ 200.00	32	\$ 6,400.00
Enphase IQ8 Combiner	\$ 400.00	5	\$ 2,000.00
Rooftop Mount - IronRidge Railing 14'	\$ 70.00	22	\$ 1,540.00
Rooftop Mount - IronRidge Flashfoot	\$ 17.44	58	\$ 1,011.52
Rooftop Mount - IronRidge Remaining Materials	\$ 1,400.00	1	\$ 1,400.00
Enphase Empower Gateway and Backup Controller	\$ 2,500.00	6	\$ 15,000.00
Enphase Encharge 10 kWh (220 kWh Total)	\$ 9,500.00	22	\$ 209,000.00
Additional Materials Cost			
200A Manual Bypass Switch	\$ 1,000.00	1	\$ 1,000.00
200A Disconnect	\$ 760.00	2	\$ 1,520.00
200A Load Center + 12 Breakers	\$ 650.00	8	\$ 5,200.00
Line Side Tap Connection	\$ 350.00	1	\$ 350.00
Enphase Wire	\$ 30.00	32	\$ 960.00
Enphase AC wiring	\$ 4.00	240	\$ 960.00
Encharge Battery Cable	\$ 100.00	22	\$ 2,200.00
Labor Cost (Soft Cost)			
Engineering and Management Cost	\$ 15,000.00	1	\$ 15,000.00
Permitting and City Inspection Fees	\$ 5,000.00	1	\$ 5,000.00
Solar Panel Installation Labor Cost	\$ 8,320.00	1	\$ 8,320.00
Inverter Installation Cost	\$ 250.00	32	\$ 8,000.00
Battery Installation Cost	\$ 200.00	22	\$ 4,400.00
Battery, Inverter Wiring Cost	\$ 500.00	22	\$ 11,000.00
Solar, Inverter Wiring Cost	\$ 500.00	32	\$ 16,000.00
Load Center Install + Disconnect + Transfer Switch Labor	\$ 1,200.00	8	\$ 9,600.00
Estimated Overhead Costs	\$ 5,000.00	1	\$ 5,000.00
Estimated Delivery Cost	\$ 20,000.00	1	\$ 20,000.00
Builder Profit Margin (20%)	\$ 72,000.00	1	\$ 72,000.00
Total Build Cost of System	\$		432,013.52

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ANNEXURE 4:

System 4: Enphase + Sonnen EcoLinx

Main Equipment Costs			
Item Description	Cost	QTY	Subtotal
Solar Panels - Hanwha Q CELLS Q.PEAK DUO BLK ML-G10+, 400W x 32 (12,800 Watt of Total Power)	\$ 286.00	32	\$ 9,152.00
Enphase IQ8+	\$ 200.00	32	\$ 6,400.00
Enphase IQ8 Combiner	\$ 400.00	5	\$ 2,000.00
Rooftop Mount - IronRidge Railing 14'	\$ 70.00	22	\$ 1,540.00
Rooftop Mount - IronRidge Flashfoot	\$ 17.44	58	\$ 1,011.52
Rooftop Mount - IronRidge Remaining Materials	\$ 1,400.00	1	\$ 1,400.00
Enphase Empower Gateway and Backup Controller	\$ 2,500.00	6	\$ 15,000.00
Sonnen EcoLinx 30 kWh (240 kWh Total)	\$ 65,704.00	8	\$ 525,632.00
Additional Materials Cost			
200A Manual Bypass Switch	\$ 1,000.00	1	\$ 1,000.00
200A Disconnect	\$ 760.00	1	\$ 760.00
200A Load Center + 12 Breakers	\$ 850.00	10	\$ 8,500.00
Line Side Tap Connection	\$ 350.00	1	\$ 350.00
Enphase Wire	\$ 30.00	32	\$ 960.00
Enphase AC wiring	\$ 4.00	240	\$ 960.00
Encharge Battery Cable	\$ 100.00	22	\$ 2,200.00
Sonnen Wiring	\$ 1,000.00	8	\$ 8,000.00
Outdoor Rated Battery Enclosure Cost	\$ 10,000.00	1	\$ 10,000.00
Labor Cost (Soft Cost)			
Engineering and Management Cost	\$ 20,000.00	1	\$ 20,000.00
Permitting and City Inspection Fees	\$ 5,000.00	1	\$ 5,000.00
Solar Panel Installation Labor Cost	\$ 8,320.00	1	\$ 8,320.00
Inverter Installation Cost	\$ 250.00	32	\$ 8,000.00
Battery Installation Cost	\$ 200.00	22	\$ 4,400.00
Battery, Inverter Wiring Cost	\$ 500.00	22	\$ 11,000.00
Solar, Inverter Wiring Cost	\$ 500.00	32	\$ 16,000.00
Load Center Install + Disconnect + Transfer Switch Labor	\$ 1,200.00	10	\$ 12,000.00
Outdoor Rate Battery Enclsoure Building Labor Cost	\$ 10,000.00	1	\$ 10,000.00
Estimated Overhead Costs	\$ 5,000.00	1	\$ 5,000.00
Estimated Delivery Cost	\$ 20,000.00	1	\$ 20,000.00
Builder Profit Margin (20%)	\$ 140,000.00	1	\$ 140,000.00
Total Build Cost of System	\$		854,585.52

MARKET APPROACH (SALES APPROACH)

The market approach is typically developed in valuing solar assets when a sufficient number of adequately comparable assets have recently transferred ownership, and valuation metrics for the transactions can be obtained. Given the volume of solar transactions in most jurisdictions and access to reliable data, the market approach is utilized for most solar asset valuations using the comparative transaction method. Using the comparative transaction method, the reported price per capacity unit (e.g, megawatt) for recent comparable systems is analyzed and a selected cost per capacity unit is then applied to provide an indication of the estimated fair market value for the solar asset.

Cost of Solar (12,800 x 2.69) =	\$34,400.00
Cost of Battery (220 x 1,434.97) =	\$315,693.58
Total System Cost	\$350,093.58

Market approach (sales approach) has strategic advantages over the other valuation methods due to following considerations:

- *It takes into consideration the current market conditions for valuation.*
- *It is based on publicly available data which makes it easier for comparison.*
- *It is straightforward and involves simple calculations as it involves only two variables: the multiple and the corresponding earnings metric (revenue, gross profit, EBITDA, or SDI).*
- *It uses data that is real and public and it does not depend on the future forecasts and projections which are subject to judgement and self-biasness.*
- *It is not dependent on subjective forecasts as the data is obtained from the comparable industry.*

(The detailed calculation of valuation is given in Annexure A next)

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ANNEXURE A:

Required Solar System	12.8 Kw
Required Energy Storage System	220 kWh

Solar System Price Source	Price per Watt
Energy Sage 2022 - Texas price	\$2.60
solarreviews.com - Texas Price	\$2.77
EcoWatch Texas Price	\$2.69
Forbes – 2022	\$2.69
Average System Price	\$2.69

Battery System Price Source	Price per kWh
Energy Sage 2022 - Texas price	\$1,240.00
<u>NREL - 2021 (\$22,041 for 20 kWh)</u> <u>https://atb.nrel.gov/electricity/2021/residential_battery_storage</u>	\$1,102.05
<u>NREL - 2021 (\$12,287 for 6 kWh)</u> <u>https://atb.nrel.gov/electricity/2021/residential_battery_storage</u>	\$2,047.83
<u>Sonnen Battery Core (\$13,500 for 10 kWh Installed)</u> <u>https://www.solarreviews.com/blog/sonnen-releases-new-sonnencore-solar-battery</u>	\$1,350.00
Average System Price	\$1,434.97

CONCLUSION

Rigorous, accurate, third-party appraisals are critical to proper evaluation of solar energy generating assets. Even after valuation approaches are applied rigorously with the best available market data, reaching a conclusion is often difficult. In reaching a conclusion, each method should be analyzed for the quality of data obtained, actual and inherent weaknesses, and the importance of the indications from each method to a hypothetical purchaser.

According to the above calculations value of the Solar and energy project is as follows

- 1- Cost basis \$ 572,416.50/-
- 2- Market basis \$ 350,093.58/-

It is generally accepted that in circumstances where the cost approach provides a higher indication of value than income and market approaches (as in this case), the cost approach should be given more weight in reaching a conclusion of FMV to best reflect the expected action of the hypothetical buyer because:

- Getting solar systems have additional benefit of long-term emergency power
- Energy independence
- Inherent complexity of large scale system

There is an obvious difference between the values amounting to \$ 222,322.92/-. This uncertainty in value might be due to market conditions, economies of scale, quality of input data, below-market PPA (power purchase agreement), government subsidies and incentives which may not have been considered during valuation.

Hence this valuation report provides the valuation of **\$ 572,416.50/-** for 12.8 KW Solar panels and 220 KWH Capacity Battery Storage System on the basis of Cost Approach.