Solar Facility Evaluation

You have been asked by your CFO to evaluate a potential equity investment in a solar power plant. He would like you to provide the pre-tax and after-tax returns for the facility on both an unlevered and levered basis based upon a purchase price of $100,000,000.

Solar Power Plant Details

The power plant's sponsor has negotiated an off-take agreement with a major US utility to sell the power (and all RE certificates) at $130 / mwh for 20 years, with an annual escalation factor of 2.5%. An independent engineer has studied the insolation (Solar Irradiance) history for that region and has determined that the median available sunlight in that region can produce 2,000 kwh annually for each kilowatt of installed capacity. The plant has an installed capacity of 25,000kw-dc. The engineer has also determined that the facility's generation is scheduled to degrade at a rate of 0.50% per annum (100% output in year 1; 99.5% output in year 2, etc.). The plant has an estimated useful life of 20 years with no residual value or decommissioning costs thereafter.

An independent consultant has reviewed the potential operating expenses for the project and has indicated that a) O&M expenses should cost $0.015 per installed dc-watt per year, escalating at 2.0% per year, b) insurance expenses should be $200,000 per year, declining by 1.0% per year and c) the site lease will be $175,000 per year, fixed.

Assume the sponsor is fully tax efficient (any tax benefits such as taxable losses can be monetized in the same period at the given tax rate). Assume a tax rate of 21%.

Financing Details

Your CFO has given you the following details to model the cash flows associated with the debt:

Debt service coverage ratio = 1.35x
All-in interest rate = 6.5%
Debt term = 20 years

Assignment

Create a pro-forma cash flow schedule based upon the details listed above, report a) the project's unlevered pre-tax return, b) the levered pre-tax return, c) the unlevered after-tax return, d) the levered after-tax return, e) 20 year cash-on-cash yield, and f) payback period. Finally, make a recommendation to your CFO with the understanding that the company's current ***after-tax*** equity return hurdle is **12.0%**. Discuss briefly the risks associated with the investment.

Hint
Focus on calculating key metrics a-f in the "Assignment" section in the allotted time. If a concept in the "Solar Power Plant Details" section is confusing, move on and come back to it at the end.

Notes:
Sponsor = owner of the plant. This would be National Grid Renewables in this scenario.
Off-take agreement = agreement to purchase the energy generated from the solar plant
mwh = megawatt-hour, a unit of energy. 1 mwh = 1,000 kwh