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**Question 1: Corporate Finance and Equity Valuation and Analysis**

You are the chief financial officer (CFO) of the Hydrogen Production Corporation Ltd. (HPC). HPC is specialized in the industrial production of molecular hydrogen ( $H_2$ ) and located in the south of France. Electric power for the production process is generated from solar energy using solar plants.

HPC is offered 2 alternative types of industrial solar panels which differ with respect to initial investment costs (including installation costs), maintenance costs, and length of the usage cycle. At the end of the usage cycle all the industrial solar panels have zero salvage value and must be replaced by the same type panels for technical reasons. The usage cycles of the two types of industrial solar panels have durations of 3 or 4 years.

The initial investment costs (year 0) and the annual maintenance costs (years 1-4 or years 1-3) for the 2 types of industrial solar panels are shown in Table 1 below.

**Table 1: Expected costs in EUR (per solar panel)**

Year	0	1	2	3	4
Long-life panel	1,000	100	150	200	250
Short-life panel	1,200	100	100	100	—

The beta of HPC's shares is 1.5. HPC's current financial leverage (debt-to-equity ratio in market values) equals 1. Currently, HPC's outstanding corporate debt is risk free, i.e., the debt beta equals zero. The nominal risk-free rate of return equals 1% p.a. in the euro zone and the term structure of interest rates is flat. The European stock market is expected to earn a 9% return p.a. The relevant corporate tax rate of HPC is 20%.

- a) Determine HPC's weighted average cost of capital (WACC). Show your calculations. (8 points)

Regardless of your previous calculations in question a), assume a WACC of 7.1% for the rest of the question 2.

b) As both types of solar panels generate electric power of equal quality and quantity, an investment decision relies on the comparison of operating costs (incl. initial investment).

b1) The son of the company's best employee is doing an internship with you. He would like to evaluate the present value of operating costs (incl. initial investment) for the 2 types of industrial solar panels and suggests selecting the industrial solar panel with the least cost.

i) What is the present value of the operating costs (incl. initial investment) for the long-life panel? Show your calculations. (3 points)

ii) What is the present value of the operating costs (incl. initial investment) for the short-life panel? Show your calculations. (3 points)

iii) Which industrial solar panel would be favoured by the intern? Explain briefly. (1 point)

b2) Do you agree with the choice of the method? If yes, explain. If no, explain why not and what your suggestion would be. (5 points)

Regardless of your previous calculations in question b1), assume the present value of the costs for the long-life panel as EUR 1,575 and the present value of the costs for the short-life panel as EUR 1,467.

b3) You instruct the intern to calculate the equivalent annual annuity (EAA) cost for each type of industrial solar panels.

i) What is the EAA cost for the long-life panel? Show your calculations. (3 points)

ii) What is the EAA cost for the short-life panel? Show your calculations. (3 points)

iii) Which industrial solar panel would be favoured? Explain briefly. (2 points)