STEMCREW supported by INEOS

Name .... Class .... Date ....

INEOS TEAM UK is planning to install solar panels on their base to generate electricity. Using renewable energy will help make the team's base more sustainable.

James Stagg: Head of Operations at INEOS TEAM UK

James raced in the 2003 America's Cup with GBR Challenge.
He is responsible for the base and the team's operations.
Help James plan a solar array for the INEOS TEAM UK base.

You are a Solar Energy Consultant, tasked with designing the system for the INEOS TEAM UK base. Your goal is to produce a cost-effective solar panel array that balances energy produced against installation cost.

Task 1: Solar Array Scaling

On your blueprint sheet is a scale drawing of the base roof. Determine the maximum area available for solar panel installation (remember that solar panels are usually square or rectangular). Keep paved terraces, service ducts and the skylight clear.

Suggested method:
- Draw rectangles on the blueprint to fit as many solar cells in as possible.
- Measure the dimensions of your rectangles and calculate their total area.
- Measure the scale on the blueprint and work out the scaling factors between the blueprint and the real building. Remember: area scaling factor = (length scaling factor)^2.
- Multiply the area on the blueprint by your area scaling factor.
- Each solar panel is 2m^2. How many panels can you fit?

....

....

....

....

....

....

....

....

Task 2: Panel Selection

Your task is to choose the most cost-effective solar panel solution for INEOS TEAM UK. The table below details the cost per m² and the maximum solar output per m² of five brands of solar panels. Assume that you have sufficient available space to install as many panels as possible. You will need to think about how many panels you can buy and the subsequent maximum solar output they could achieve. Your total budget is £400,000.

Prepare a short explanation for the client, including information on why you chose that panel and not the others, how many panels you will buy, and what the maximum power output will be.

Manufacturer	Model	Installation cost (£/m²)	Maximum output (W/m²)
SunnyTech	VBHN325	180	80
Fusion	SPR-X20-445	210	100
AZ Electronics	AZ325N1C-G4	300	150
PowerSun	SPR-E20-327	510	230
Easthouse	WTW-250	1200	300

The base has a flat roof and lots of space. Name two factors people might consider when installing solar panels on a domestic house that would affect the maximum solar output they might achieve.