International Olympiad "5R – Green Technolympics"
8-9th JANUARY, 2020, Klaipeda, Lithuania

COMPANY ANSWER

Short company description:

The Company POPA LT is developing electric catamarans design to be used in inland waters: lakes, rivers, channels in order to reduce pollution and CO2 emissions. The average consumption of a Popa boat is EUR 71.52 per month (30 days). To make Popa boat catamarans even more sustainable vehicles, we're decorating the roofs of catamarans with solar panels. Solar panels on the roof of a Popa boat produce an average of 1.5 kWh of energy per working day.

Solar panel dimensions of Popa boat: 1,1 m x 2 m.

POPA LT wants to rent electric catamarans and is looking to build a rental point infrastructure.

Questions:

1) What should be the cover area of the same solar panels at the rental point to cover the electricity costs of the 3 catamarans with solar power, if:

- The solar panel dimensions of the boat are 1,1 m x 2 m.
- Electricity price in Lithuania - 0,149 Eur.

2) What amount of CO2 (kg) does 1 Popa boat avoid every month when choosing an electric motor instead of a petrol engine, if:

- 1 l gasoline - 2,3 Kg (CO2)
- 1 l gasoline - 8.8 kwh (attention: it loses 75% of its effect when converting).

Bonus Question :)
3) Which European city is targeted by the Popa boat because of its political and geographical location?

Answer:

63,8 m2.

71,52 Eur : 0,149 Eur = 480 kwh/month
1,5 kwh *30 = 45 kwh/month
480 kwh - 45 kwh = 435 kwh (missing)
for 3 boats: 435 kwh * 3 = 1305 kwh (missing).
1,1 * 2 = 2,2 m2 (solar panel).
if 2,2 m2 = 45 kwh/month, then x m2 = 1305 kwh
2,2 * 1305 :45 = **63,8 m2**

504 kg co2.
8.8 kwh * 0,25 = 2,2 kwh.
480 kwh / 2,2 kwh = 218,18 (218 l)
218 l x 2,31 kg CO2 = **504 kg co2.**

Amsterdam. (Because it's a canal city (popa boat is designed to be used in inland waters) and Amsterdam plans to ban all gasoline vehicles in the city center till 2025.