MILESTONE 2 (TEAM) – COVER PAGE

Team Number:	Tues-08

Please list full names and MacID's of all *present* Team Members

Full Name:	**MacID:**
Zhuduoyi Zhang	zhanz526
Joon Lee	lee718
Harshit Palta	paltah
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Any student that is ***not*** present for Design Studio will not be given credit for completion of the worksheet and may be subject to a 10% deduction to their P-1 grade.

MILESTONE 2 (STAGE 1) – REFINED PROBLEM STATEMENT FOR A WIND TURBINE

Team ID: Tues-08

The Title of The Assigned Engineering Scenario

Pioneer in Clean Energy

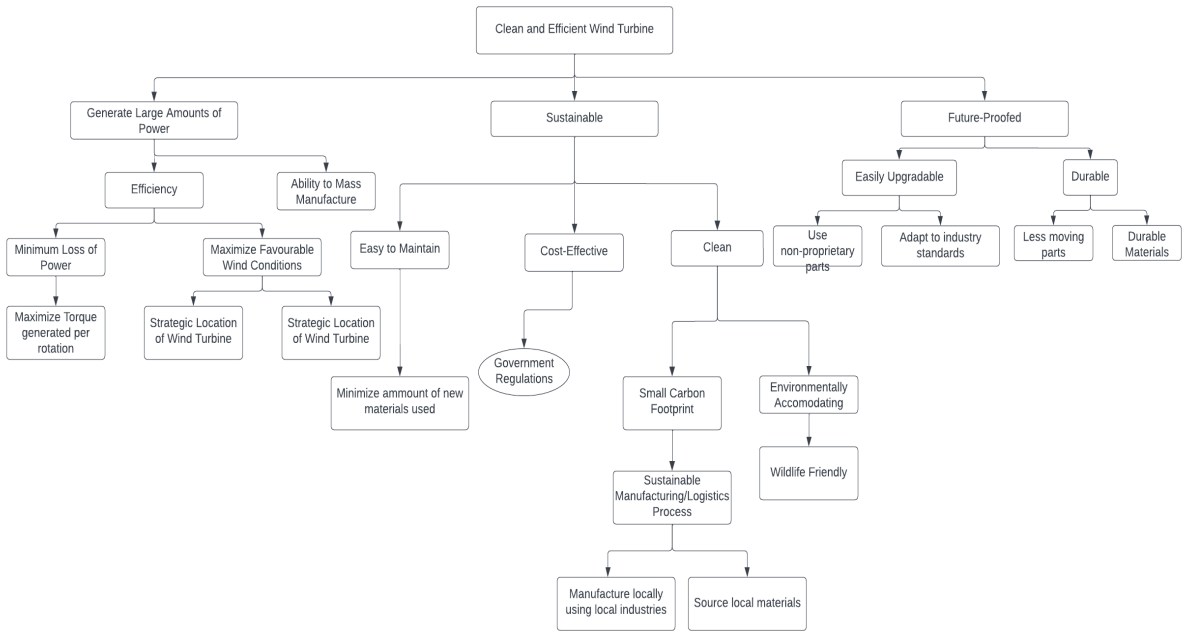
Write the Initial Problem Statement Below

→ This is a *copy-and-paste* submission of what you submitted for Milestone 1

Design a wind turbine to maximize the amount of energy generated while considering the environmental factors that may affect the efficiency of the turbine.

Finalized Objective Tree of Wind Turbine for Your Assigned Engineering Scenario

→ Please insert a copy of your finalized team objective tree of a wind turbine for your assigned engineering scenario.



Refined Problem Statement:

→ Write the refined problem statement for the design of a wind turbine based on your assigned scenario.

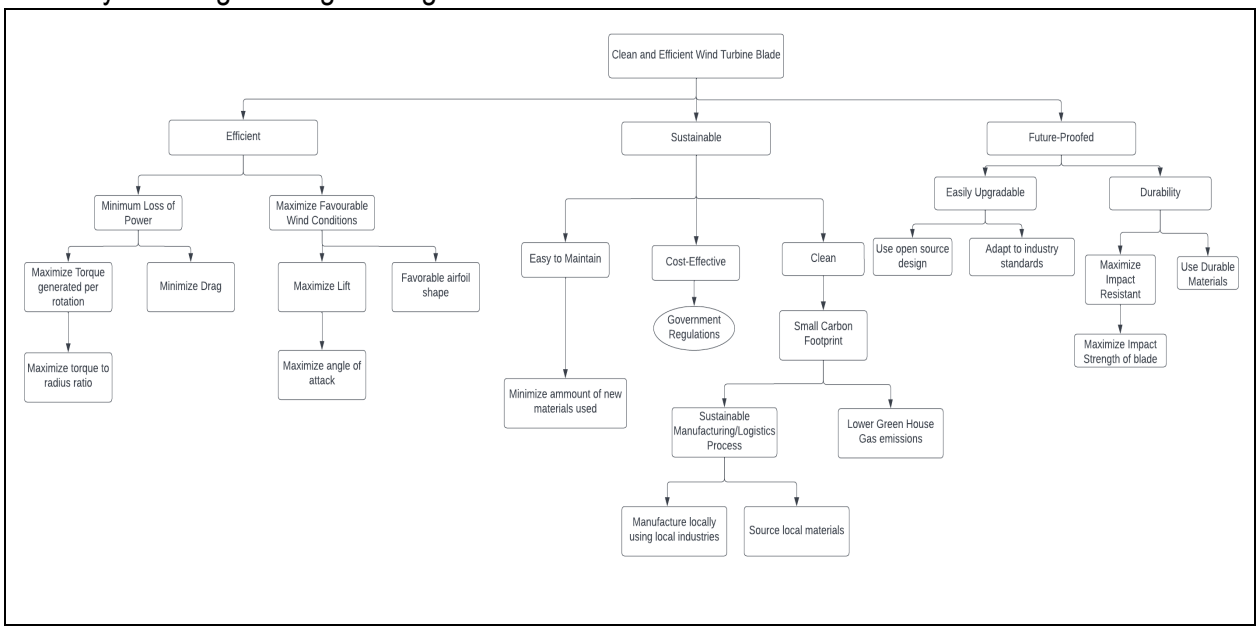
Design an efficient and sustainable wind turbine to maximize the amount of energy generated while considering the future needs and advancements in renewable energy industry.

MILESTONE 2 (STAGE 2) – DESIGN REQUIREMENTS FOR A TURBINE BLADE

Team ID: Tues-08

Objective Tree of turbine blade for assigned engineering Scenario

→ Please insert a copy of your team objective tree for the design of a turbine blade based on your assigned engineering scenario.



Turbine Blade Problem Statement:

→ Write a complete problem statement for the design of a turbine *blade* based on your assigned engineering scenario.

Design an efficient and sustainable wind turbine blade to harvest the maximum amount of energy while considering the environmental impacts during the manufacturing process of the blade and the longevity of the blade.

MILESTONE 2 (STAGE 3) – SELECTION OF TOP OBJECTIVES FOR A TURBINE BLADE

Team ID: Tues-08

List the top three objectives of a turbine blade for your assigned engineering scenario

1: Impact resistance

2: Small carbon footprint

3: Maximize lift-to-drag ratio

Include a rationale for selecting each of these objectives

→ Write *maximum* 100 words for each objective

Objective 1: Impact resistance

Rationale: If the blade can handle being struck by various debris or animals repeatedly and not compromise its shape or functionality, it will last longer and be more sustainable, as fewer new materials will be needed to create the blades, repair, and maintain them.

Objective 2: Small carbon footprint – measurement of greenhouse gases

Rationale: Reducing the amount of greenhouse gases produced during the manufacturing process will aid Sweden in achieving its net zero emissions goals. This will help make wind energy a staple source of energy for Sweden in the future, opening the possibility for Sweden to be fully dependent on wind energy in the future.

Objective 3: Maximize lift-to-drag ratio

Rationale: If the blade can generate energy more efficiently, the number of turbines, and therefore the number of blades manufactured can be decreased. By maximizing the lift-to-drag ratio, energy from the wind can be harvested more efficiently from the blade thus improving the efficiency of the farm. This provides the largest power output from a minimum number of turbines.

MILESTONE 2 (STAGE 4) – METRICS

Team ID: Tues-08

For your selected top three objectives fill out the table below with associated metrics (including units) for each objective.

Objective 1:	Impact resistance
Unit/Metric:	Joules per meter (J/m)

Objective 2:	Small carbon footprint – measurement of greenhouse gases
Unit/Metric:	Mass (tonnes)

Objective 3:	Maximize lift-to-drag ratio
Unit/Metric:	Force (Newtons), coefficient of drag (N/A)