



WATURBINE

Small Wind Turbine Team

Sponsorship Package

2024-2025



engineers without borders
ingénieurs sans frontières
Canada



UNIVERSITY OF
WATERLOO

WATurbine

WATurbine is a team of ambitious engineering students from the University of Waterloo, dedicated to driving innovation in the fields of renewable energy and sustainable technology. Our goal is to design and manufacture a highly efficient and sustainable small wind turbine that is being researched for use in sub-Saharan Africa. The team aims to showcase the wind turbine at the International Small Wind Turbine Competition held annually in the Netherlands.

As a subsidiary of the University of Waterloo's Engineers Without Borders Chapter, WATurbine aims to embody the non-profit's vision through wind power advancement.

Engineers Without Borders (EWB)

Engineers Without Borders Canada is a charitable organization whose vision is to engineer an equitable and sustainable future for marginalized people and the planet, mobilizing the engineering community and leveraging technological innovation to address urgent and important global challenges, both within Canada and beyond. The University of Waterloo's Engineers Without Borders Chapter was the first in the country, and has since had a long history of success in launching sustainable engineering endeavours.

About the Team

Small Wind Turbines



While large commercial wind turbines are used to power the electric grid, small wind turbines are smaller both in size and output. Small wind turbines can be used in urban and rural settings on tall building rooftops or to power off-grid communities.

International Small Wind Turbine Contest (ISWTC)

The International Small Wind Turbine Contest is a week-long competition taken place in the Netherlands, run by the Hanze University of Applied Sciences. Post-secondary student teams around the world compete to build small wind turbines that have the highest power and the most sustainable design. These turbines are designed to be implemented in rural, developing regions as a means for self-sustaining, renewable power.

Turbines are tested at the Delft University's open jet wind tunnel, and are judged on energy output sustainability, and teams' presentations.

WATurbine, from Engineers Without Borders, aims to be the first team from the University of Waterloo to compete in the ISWTC in 2025.

Impact

Wind Energy

Wind is a completely renewable source of energy and is one of the fastest growing forms of energy globally, with a **50% year-on-year growth** in total installations from 2022 to 2023 [1]. In 2023, 7.3% of global electricity was generated by wind power [2]. If the wind industry triples its annual growth by 2030, we will be globally on track meet the UN's COP28 climate change goals [1]. The advancement of wind power technology is therefore crucial to contributing to the clean energy transition and the fight against climate change.

Sustainability of Wind Turbines

While wind energy is a critical form of renewable energy, there are important improvements that must be made within the wind turbine industry. Wind turbines have large footprints and last around 20 years, requiring land for installation, heavy transportation and intensive material and manufacturing costs [3]. Turbine blades, for example, **cannot be recycled** and are left as huge masses of waste in landfills [4]. Innovation in sustainable wind turbine engineering is critical and starts with us!

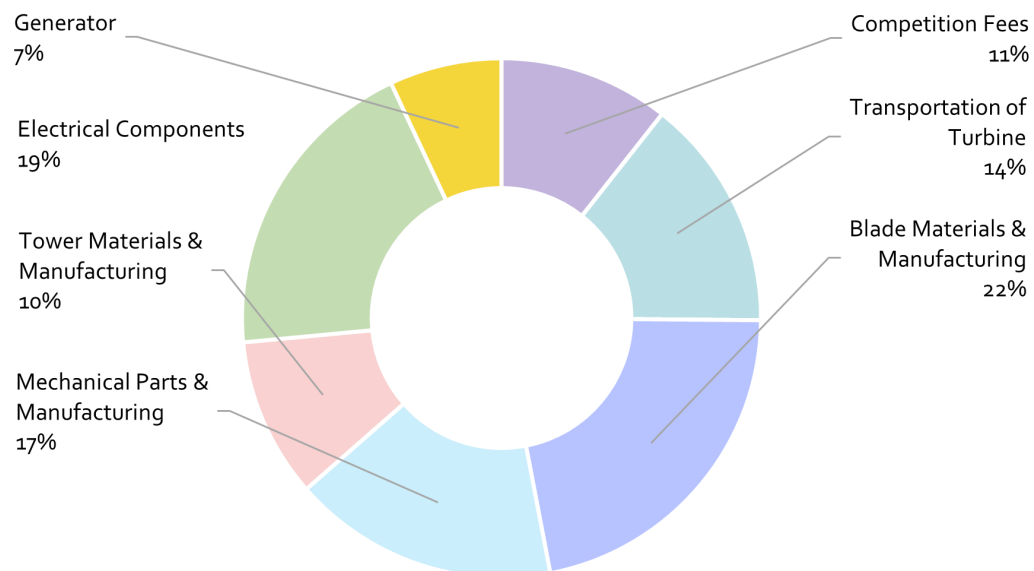
ISWTC & Wind in Sub-Saharan Africa

The ISWTC calls for teams to develop sustainability reports, modelling the use of their small wind turbines in Sub-Saharan Africa. **48%** of the Sub-Saharan population is **without access to electricity**, with the rest of the region depending on fossil fuels and biomass [5]. There is immense untapped wind power potential in Africa, with the continent only using **0.01% of its potential** as of 2020 [5]. The development and deployment of small wind turbines is an economical and efficient way to deliver sustainable power to communities across developing countries. With this project, we present to industry and research leaders, pushing advancement in initiatives of wind power for communities in need!

Power our Goals

With a total initial budget of \$11,257, WATurbine's costs are directed towards sourcing the materials, manufacturing the turbine, and transporting the turbine from Canada to the Netherlands.

With your help, we can build a wind turbine that uses the sustainable, recyclable, and long lasting materials, while achieving optimal efficiency.




Small Wind, Big Hearts

As a team of driven students with a vision, we would not be able to accomplish our goals without sponsors like you. We are determined to engineer a wind turbine that pushes the boundaries of sustainability and power, while proudly representing the University of Waterloo's reputation for innovation and Engineers Without Borders' mandate for socioenvironmental development.

Your contribution, whether monetary or in-kind, will play a crucial role in our team's success and will help advance the skills and knowledge of future renewable energy engineers. Our sponsors will be proudly displayed on our turbine, team apparel and website. We appreciate your consideration of supporting WATurbine, and hope that you will cheer us on as we embark on this new and exciting challenge of engineering a greener future for all.

| |  Platinum \$5000+ |  Gold \$3000+ |  Silver \$1000+ |  Bronze <\$1000 |
|--------------------------------|---|--|---|---|
| Logo on Turbine | XL Choice of Location | L | M | S |
| Logo on Team Apparel | XL | L | M | S |
| Logo on Website + Social Media | XL | L | M | S |
| Certificate of Appreciation |  |  |  |  |
| Logo on PCBs |  |  |  | |
| Mini-Turbine Model Gift |  |  | | |



Thank you for powering our team and the future of wind energy!

References

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- [2] "Wind Power," Ember, Jun. 16, 2022. <https://ember-climate.org/topics/wind/> (accessed Sep. 22, 2024).
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- [4] "Wind energy and the environment - U.S. Energy Information Administration (EIA)," Eia.gov, 2024. <https://www.eia.gov/energyexplained/wind/wind-energy-and-the-environment.php> (accessed Sep. 22, 2024).
- [5] M.. Mukhtar et al., "Juxtaposing Sub-Saharan Africa's energy poverty and renewable energy potential," Scientific Reports, vol. 13, no. 1, Jul. 2023, doi: <https://doi.org/10.1038/s41598-023-38642-4>.

