

# WINDLYTICS:

*BRINGING AI TO NOVA SCOTIA'S WIND  
POWER INDUSTRY*



11.09.2025  
COGNIZANT BRAINSTORM CHALLENGE

PRESENTERS: AIRBENDERS  
XANDER BROWN  
SHAUN RAMSAY  
JAKE WALDNER



# Theme #1

*Sustainable Development Goal 11*

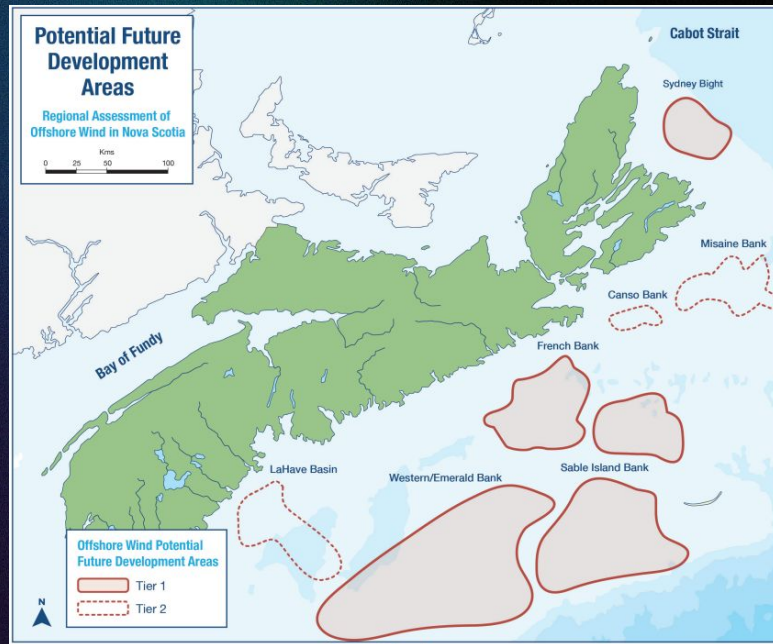
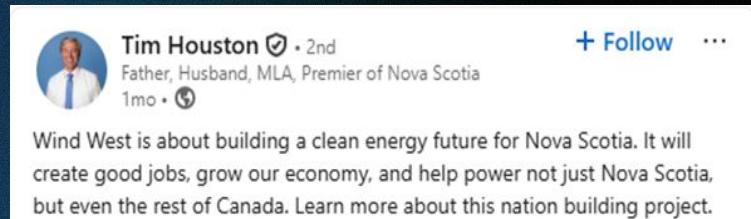
Helping communities use  
resources more efficiently





# Wind West

- Wind West is an initiative started in 2023 to help bring offshore turbines to NS
- Potential to power **27% of Canada**
- Backed by private equity and the government
- Public bids to go out in late 2025
- Offshore wind turbines **generate more power** than onshore wind turbines



PICTURED: AREAS OF FUTURE DEVELOPMENT

<https://novascotia.ca/offshore-wind/docs/offshore-wind-roadmap-module-3.pdf>



# Problem Statement

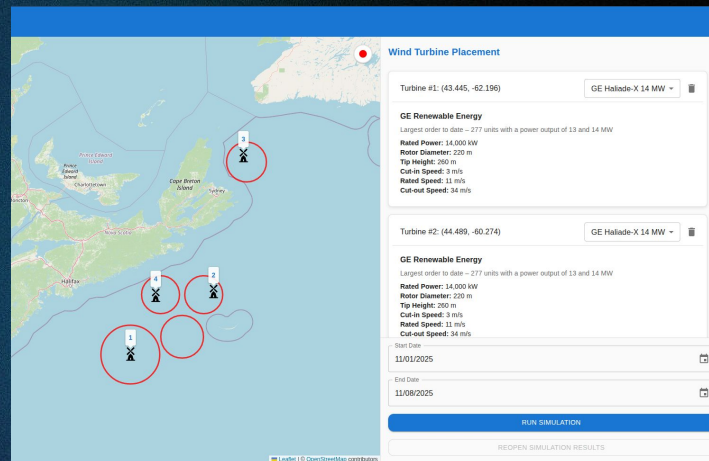
"Despite having world-class offshore wind speeds, Nova Scotia has zero offshore wind turbines. One of the key barriers developers face is the potential for project costs to reach \$60 billion, yet they **lack local historical data** to demonstrate potential profits."



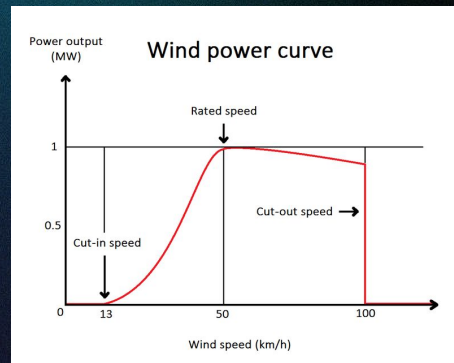


# Proposed Solution

- AI-Powered simulator to model wind speed and turbine efficiency for **private developers**
- Projects revenue as a function of turbine type and placement
- Highlights areas of development designated by the Wind West project
- Designed for accessible use in a web browser with WCAG 2 principles



PICTURED: SCREENSHOT FROM WINDLYTICS



PICTURED: EXAMPLE WIND TURBINE POWER CURVE  
[https://energyeducation.ca/encyclopedia/Wind\\_power](https://energyeducation.ca/encyclopedia/Wind_power)



# Demonstration Video

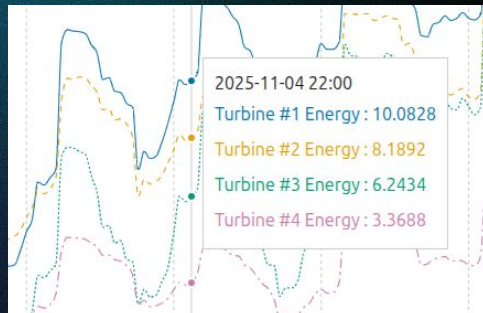


# Accessibility (WCAG 2)

- Website Accessible via Keyboard
- Use of alternative text for images
- High Contrast and Colorblind-friendly colors in UI/UX
- Compatible with screen readers



PICTURED: EASY-TO-UNDERSTAND LABELS FOR IMAGES

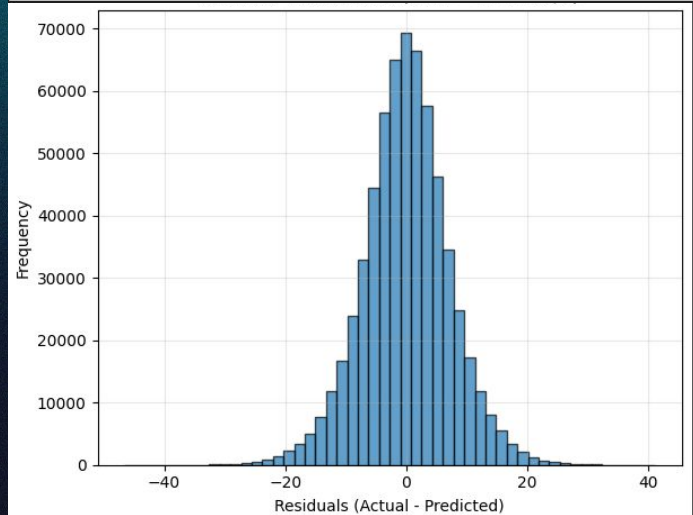
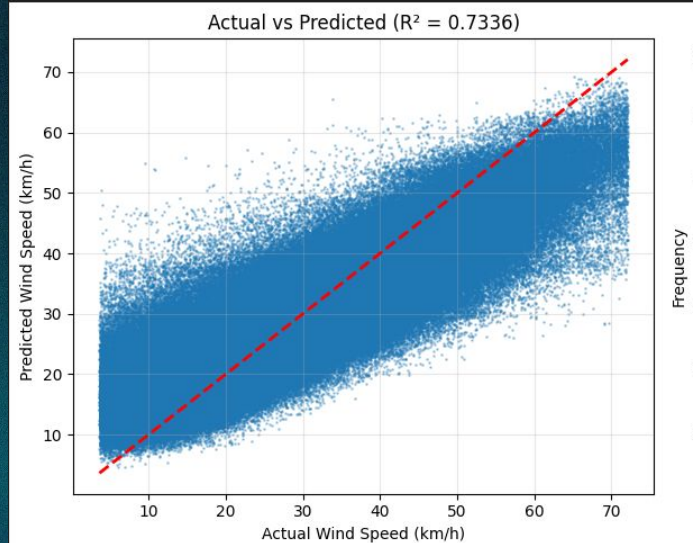


PICTURED: COLORBLIND FRIENDLY COLOR SCHEME



# AI Model and Ethics

- No large scale LLM (Power Hungry)
- Small scale energy efficient model
  - Runs on a **consumer grade laptop**
- Trained on open source data
- 3,000,000 data points (2024-2025)
- $R^2$  (0.73) MAE (5.84 km/h) RMSE (7.14km/h)





# Future Works

- Model retraining based on future weather conditions
- Real time sensors on constructed turbines for modeling and analysis.
- Working with developers to add predictive cost tracking features.
- Expansion outside of Nova Scotia



PICTURED: ABERDEEN OFFSHORE WIND FARM  
<https://www.vattenfall.co.uk/our-projects/european-offshore-wind-deployment-centre>



# THANK YOU

*“GO WHERE THE WIND TAKES YOU”*  
- WINDLYTICS

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