

AII - CA2

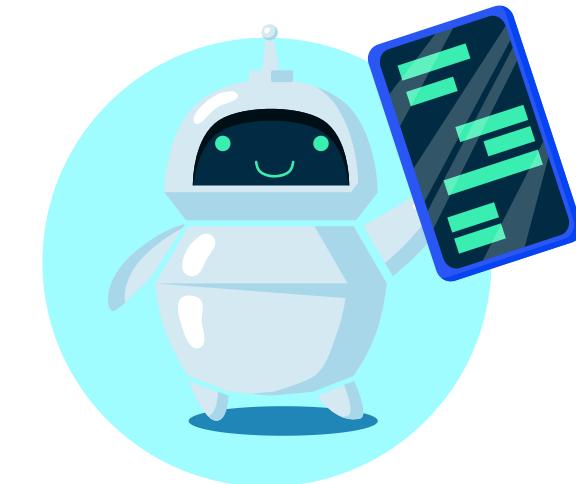
Brought to You By - Lucas,
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CONTENTS



**Research
on SDG**



Our AI



**Impacts of
the AI**

UN SDG 7.2

- UNSDG 7 ensures access to affordable, reliable, sustainable and modern energy for all, and it does so by making clean energy accessible. One of its targets that we are focusing on in this presentation is SDG 7.2, which aims to substantially increase the share of renewable energy in the global energy mix.

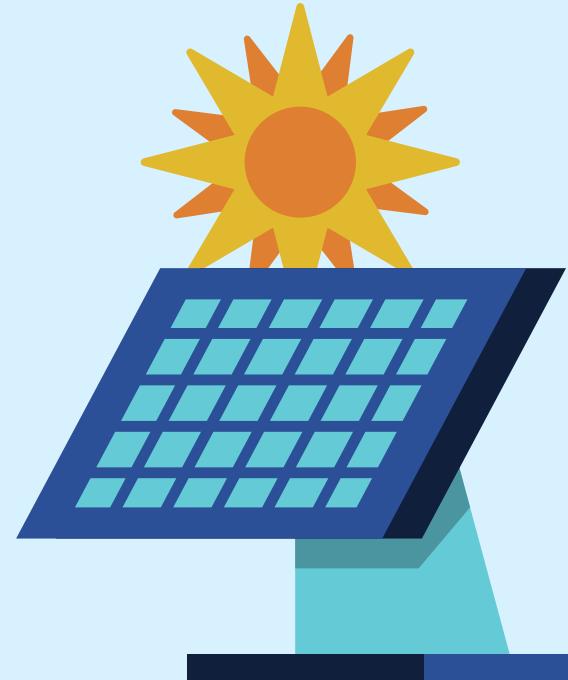


Why Convert to Clean & Sustainable Energy?

- Research has shown that we only have 10 years to prevent irreversible damage.
- Fossil fuels contribute to 80% of the world's energy
- Burning fossil fuels contributed 78% of greenhouse gasses produced from 1970 to 2010

Impact of Converting to Clean Energy

- As of 2022, about 25% of the world's energy comes from renewable sources
- Increasing this percentage to 35%, can reduce greenhouse gas emissions by about 25-45%





Modern energy refers to energy that is based on petroleum, electricity, or other energy forms that are commercialized. Although about 90% of the population has access to modern energy, however, the other 700 million still live without access to modern energy and many of these people live in poverty.

We, humans, are also heavily dependent on energy. It is used to power or create anything around us and is essential for transportation, healthcare, clean water supplies, communication, agriculture, business, science, and research.



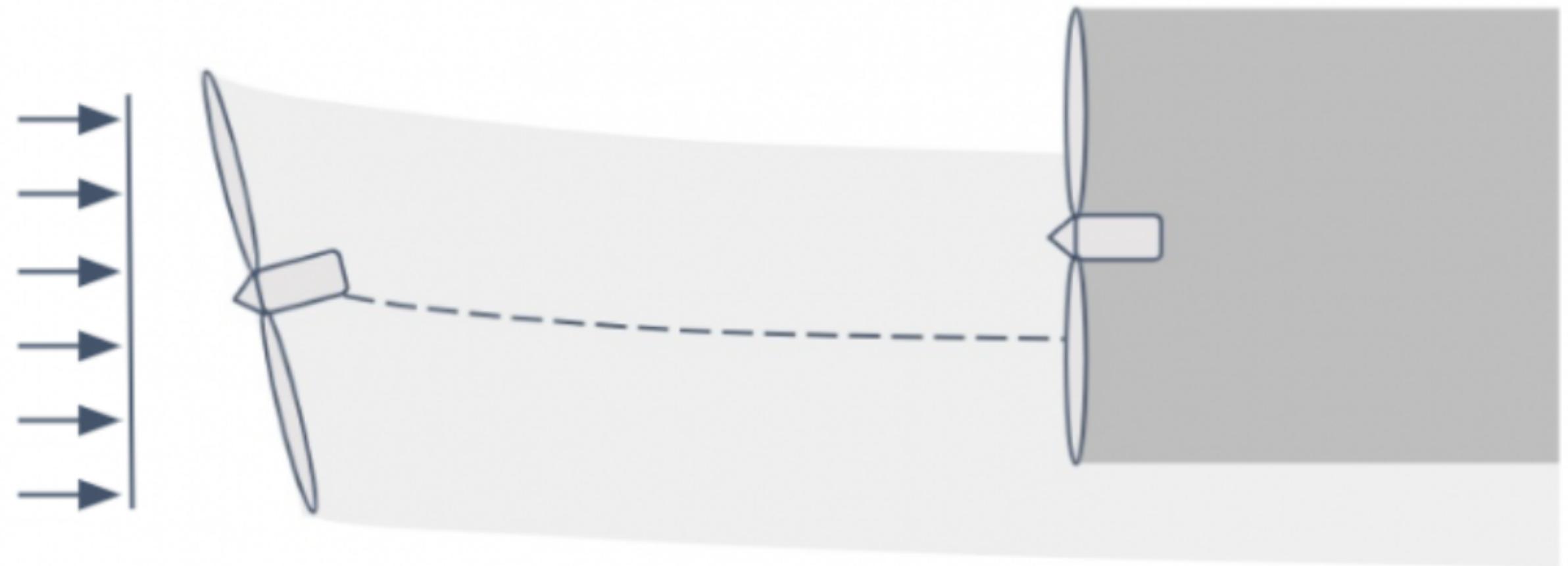


WHY WIND TURBINES?

Problems Faced In Wind Turbine Farms



What Is Done?



With wake steering



Difficulties Implementing the Solution

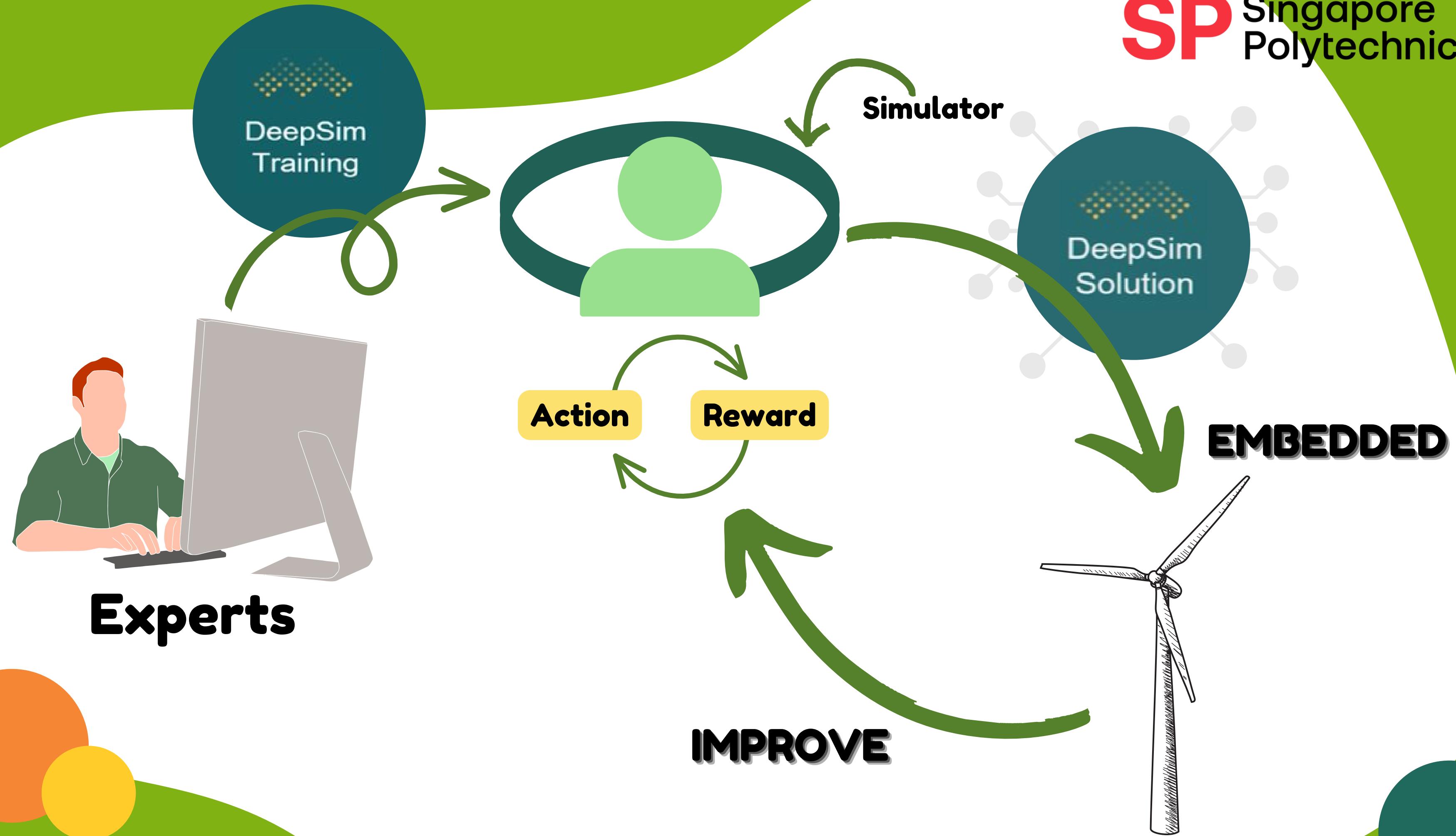
- Manually controlling the turbines to optimize wind energy can be a very difficult task as there are many possibilities to explore
- Simulations would be run by professionals to find the best way to tilt the turbines to harness the most energy for different scenarios and would later be embedded into the wind turbine system.
- Too many possibilities to simulate, it could become a performance intensive task!

This is where
AI is
able to be implemented!

- Automate tasks!
- Less tedious!
- Better results!



Vestas is one of the world's largest wind turbine companies. It partnered with Microsoft Partner Network member, minds.ai to create an intelligent windfarm controller through the use of the reinforcement learning platform DeepSim.



HOW IT IS INTELLIGENT AND DATA REQUIRED

- It is able to learn to tilt the turbine blades based on data and simulations through algorithms
- Able to adapt to the surrounding environment
- Improve itself to achieve its goal
- Weather conditions
- Location of wind turbines
- How they allocated relative to one another

Benefits for Users

- According to Vestas, wake steering reduces wake turbulence and increases power production by almost 1-2 %
- Consumers will enjoy lower energy costs while companies gain increased revenue



BENEFITS TO THE ENVIRONMENT, GOVERNMENTS, AND AI COMPANIES

01

The increased energy generation and reduced costs make wind energy a more attractive source of power

02

Governments and society as whole can benefit from the use of wind energy, an environmentally friendly source of power that can help reduce greenhouse gas emissions

03

AI companies can also benefit from the new market opportunity in optimizing wind energy production using AI

- One study from PNAS (Proceedings of the National Academy of Science) found that there may be decrease in power production for downstream turbines in certain conditions



Use of AI in wind energy systems is a relatively new development, and experts have raised concerns about the potential security risks



Wildlife, particularly birds and bats, could be affected by the changes in wind patterns caused by wake steering

Ethical Concerns

- One major ethical concern with AI is bias, which can arise from human bias and systemic bias, not just biased data
- While there are no known bias or privacy issues with wake steering AI application, these concerns can still apply to wake steering
- Privacy is another major concern with AI, as sensitive data can be collected and used for unintended purposes.

How AI Addresses The Issue

This can reduce reliance on non-renewable sources of energy and support transition to a more sustainable energy system

Wake Steering is an effective way to increase energy production from wind turbines, which helps to increase the share of renewable energy in the global energy mix, supporting SDG 7 target 7.2

It can also support SDG 13 by reducing greenhouse gas emissions and supporting sustainable energy production

The End

Do you have any questions?



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