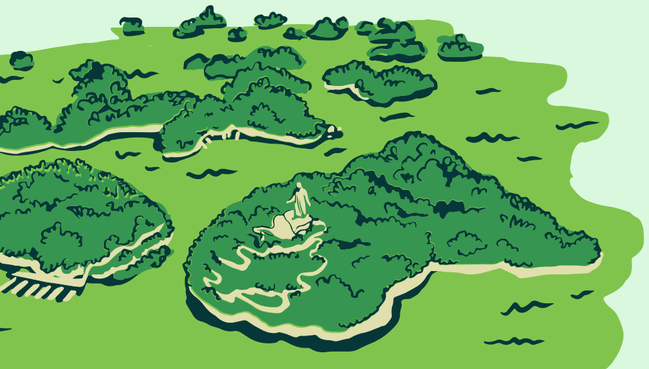
TINY WIND TURBINE (TWT)

Bringing Affordable Electricity to All with Innovative Turbines



A1. SOCIAL MANTRA ONE LINER

A local person from Ha Giang

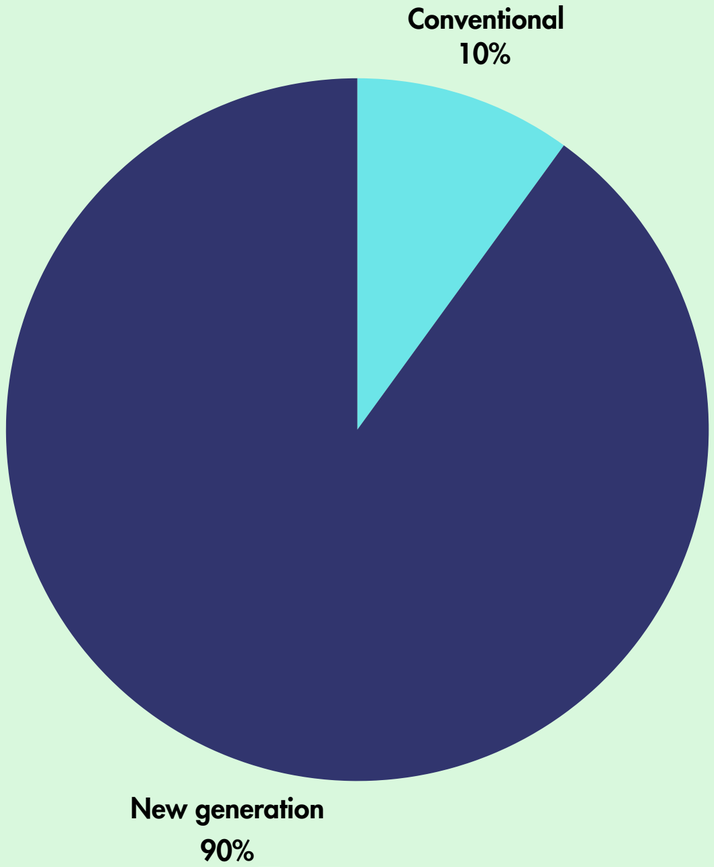
TAM ĐẢO

The place, The team conducted a survey

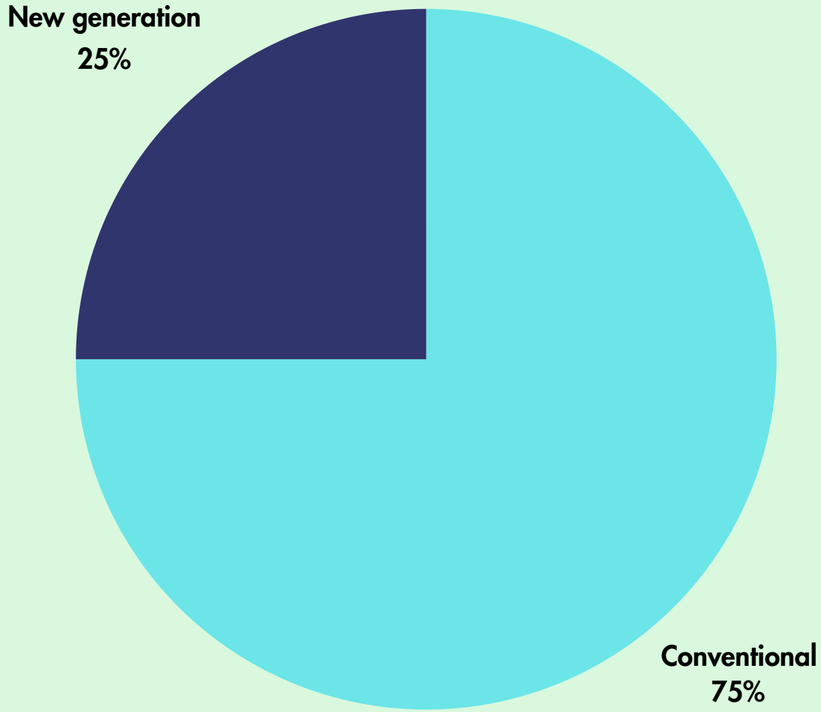
A2. BUSINESS MODEL OVERVIEW

Economic value

"Affordable solution to get innovation wind energy for off-grid communities"



Expense



Wind sweeping area

Note

New generation wind turbine

Conventional wind turbine

PRICE	
Conventional Turbine: 32.000.000 đ/1kw	New generation turbine: 10.000.000 đ/1kw

A2. BUSINESS MODEL OVERVIEW

Social value

Develop sustainable energy

Help off-grid communities out of electrical problems

Improve learning and teaching conditions

“Accessible wind energy for off-grid communities”

A2. BUSINESS MODEL OVERVIEW

The mechanisms to capture values

"A detail plan for success"

Business Model Canvas

Key Partners

Related manufacturing units, investors, and financial entities.

8

Key Activities

- **System development**
- **Human resource development**
- **Performance enhancement**

6

Key Resources

- Intellectual resources
- Natural resources
- Technology
- Human resources

7

Value Proposition

- Affordable electricity
- For everyone
- For everywhere

2

Customer Relationships

Business-to-Consumer
DHAN Co., Ltd., Thanh Phong Technlogy and Services, Homegy Technology

Channels

online : social media (Facebook)
offline: local workplaces

4

Customer Segments

1.The remote people can't make up for themselves, they're dependent on the support of the community.

2. Ordinary households in the area have the advantage of winc so they want to take advantage of it. They don't have investment experience, they may have financial constraints

1

Cost Structure

Fixed costs: 592,800,000 VND
Variable costs: 417,000,000 VND

9

Revenue Streams

Main income generated from the sale of TWT wind turbines about 1.000.000.000 VND in 12 first month (20 million VND per turbine)

5

Practice in reality

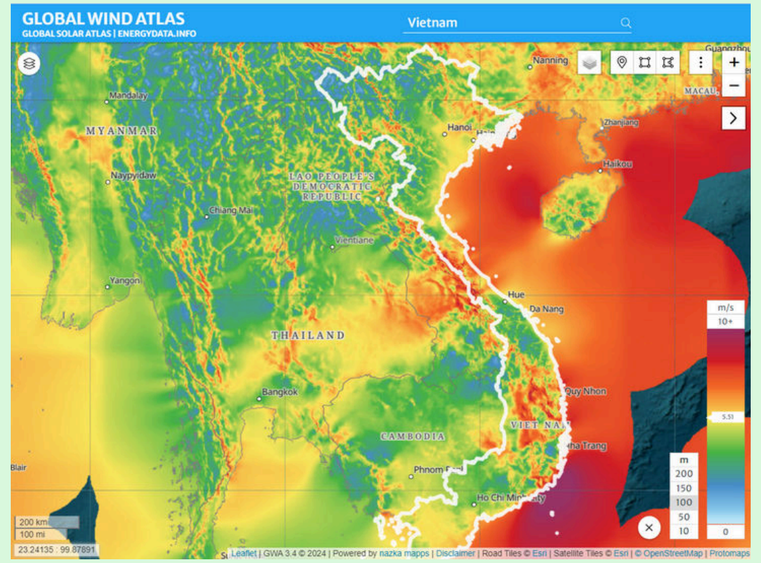
A3. GROWTH POTENTIAL

Potential of Target Market

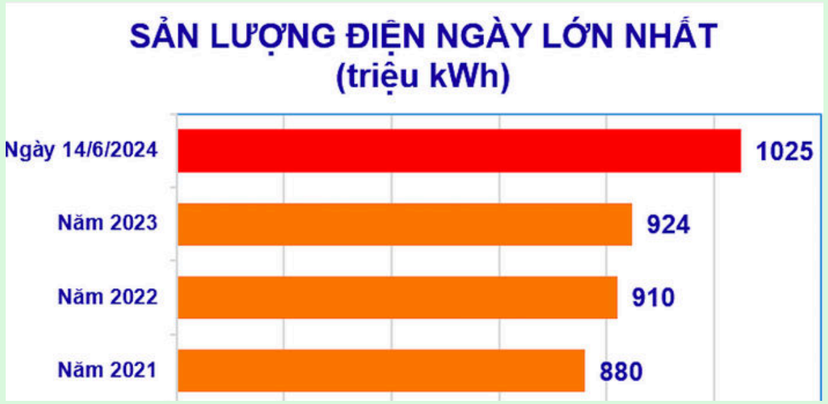
Natural conditions

- Over 39% of Vietnam's landmass experiences an average annual wind speed of over 6 m/s at a height of 65 meters.
- Significant onshore wind power potential of 42 GW.
- Offshore wind power potential estimated at nearly 600 GW (according to Vietnam Energy Journal).

=> Promising position for wind energy development across both onshore and offshore environments.



(Source: Global Wind Atlas)



(Source: EVN)

Electricity consumption

Vietnam Electricity (EVN):

- 04/2024: commercial electricity reached 96.2 billion kWh.
- The national electricity consumption on June 14, 2024 has reached 1025 billion kWh.

=> The substantial demand for electricity.

A3. GROWTH POTENTIAL

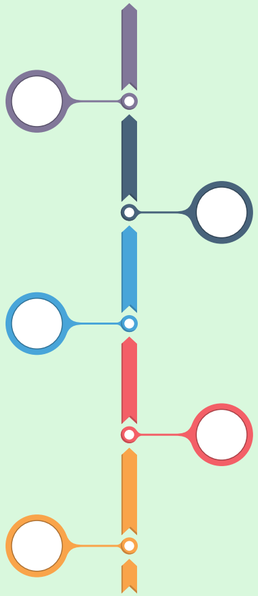
Potential of Target Market

Supportive policies

Resolution No. 55-NQ/TW on 11th February 2020 on the orientation of Vietnam's National Energy Development Strategy to 2030, with a vision to 2045

Decision No. 1658/QĐ-TTg approved the Green Growth Strategy for the period 2021-2030, with a vision to 2050

The Implementation Plan for Power Development Plan VIII



Resolution No. 140/NQ-CP issued the Government's Action Program to implement Resolution No. 55-NQ/TW

The Power Development Plan VIII, set a target of 6 GW of offshore wind power by 2030 and 70-91 GW by 2050

=> Strong support from goverment

A3. GROWTH POTENTIAL

Target Social Issues

- ***National power grid quality:***

160,000 households lack access to electricity (according to The Ministry of Industry and Trade in 2024)

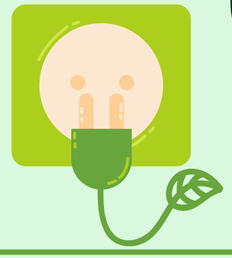
715,000 households require power grid upgrades across **3,000** communes in 2024.

=> Poor area about life and electric conditions

The rugged terrain and unpredictable weather in mountainous and island regions frequently disrupt the power grid.

Extending power lines over long distances to remote communities and leads to voltage instability.

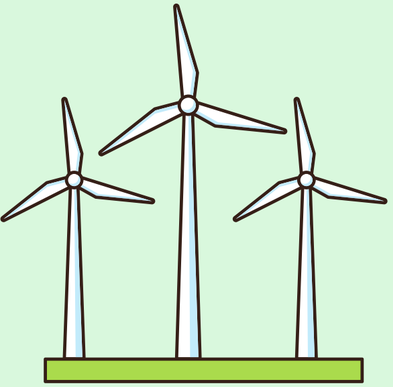
- ***Maintaining and repairing*** power lines in these challenging areas is highly demanding and dangerous: 79 electricity accidents resulted in 30 deaths and 65 injuries in 2022.
- ***Financial problems*** of residents in remote areas: 815,101 households were classified as poor (2.93%) & 771,235 households were classified as near-poor (2.78%) in 2023.



=> Social problems occur on a large scale, especially in the problem of difficulty accessing electricity sources

*Report in 2021

A3. GROWTH POTENTIAL



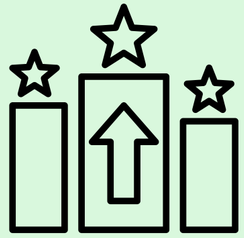
Avoid Fierce Competition

Small size and light weight: With a height of 3 meters, TWT can be installed in a wider range of windy locations without complex installation procedures compared to hundreds-of-meters-high conventional turbines.

Distinctive two-blade design: TWT feature a unique two-blade design that sets them apart from conventional turbines.

Cost-effective: The price around 20 million VND (approximately $8,600 USD) for a lifespan of 3 to 5 years compared to conventional one costs about 30 million VND.

Maintenance: The compact size does not require complicated or risky maintenance procedures. Also easy to repair, install, and clean, making TWT user-friendly and safe.



=> TWT has outstanding competitive advantages establish a strong market position.

COMPARING THE EFFECTIVENESS BETWEEN TWT AND CONVENTIONAL

Option	Production cost	Number of operating hours at rated capacity	Total number of electricity generation days
TWT investment option for 15m/s wind speed	47,627,520 VND	2,047hours/year 5.6 hours/day	335 days/year
TWT investment option for 10m/s wind speed	47,627,520 VND	2,047hours/year 5.6 hours/day	335 days/year
Conventional turbine option (16 times smaller area, cut-in speed of 3m/s and optimal speed at 12m/s, assumed efficiency of 45%).	180,835,740 VND	134 hours/year 0.4 hours/day	310 days/year

B1. KEY CAPITALS

HUMAN CAPITAL

- **Knowledge and expertise:**

+ founded by engineer Mai Quoc Phong with constructionand engineering experience
+ include student members majoring in finance, marketing, and related fields.

- **Skills and abilities:** networking, financial literacy, project management, strong communication, problem-solving skills, conflict resolution, critical thinking, research skills, adaptability, flexibility.

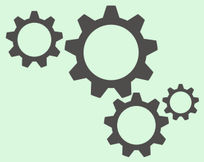
SOCIAL CAPITAL

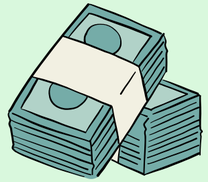
- **The Vietnamese government** is actively promoting wind energy through various supportive policies. **Electricity Planning VIII** focuses on renewable energy development, especially wind power, with 2030 goals to achieve 21,880 MW of onshore wind power capacity, with a total technical potential of approximately 221,000 MW.a
- The project aims to create job opportunities for local residents through the affordable provision of electricity.

B1. KEY CAPITALS

INTELLECTUAL CAPITAL

- The project's R&D team has 8 technical designers of wind turbines and 12 researcher members.
- The team is in the phase of developing and testing products.





MANUFACTURED CAPITAL

- **Cooperation with factories**: partners with manufacturing company DHAN Co., Ltd to produce wind turbines.
- **Benefits**: helps reduce initial investment costs and enables the capacity to fulfill large orders.

FINANCIAL CAPITAL

- **Phase one funding**: Primarily funded by Thanh Phong Company to test and develop optimal turbine designs.
- **Revenue Source**: In the first stages of the project, main income generated from the sale of TWT wind turbines.

B2. BUSINESS TRACTION

Is the product/service ready for the market ?

The wind turbine market value will grow with a compound annual growth rate (CAGR) of 5.6 percent from 2021 to 2027, reaching over 144 million U.S. dollars by the latter year.

Growth rate is expected to make Asia-Pacific an excellent business destination for the company entering the wind turbine market during the forecast period with many favorable geographical factors, wind sources and wind power.

=>The market has development potential and is on a strong growth trend in the future

B2. BUSINESS TRACTION

Is the product/service ready for the market ?

At this period, the product is completed in model and gear due to this product adapt completely in wind and install conditions after 2 experiment

B2. BUSINESS TRACTION

Revenue growth rate

YEAR	2025	2026	2027	2028	2029	2030
Expected profit	50.000.000 đ	140.000.000 đ	230.000.000 đ	310.000.000 đ	500.000.000 đ	700.000.000 đ
Revenue	1.102.572.899 đ	1.256.946.827 đ	1.411.320.755 đ	1.548.542.024 đ	1.874.442.539 đ	2.217.495.712 đ
Estimated volume	55	72	90	100	113	140
Revenue growth rate	0%	14,0%	12,3%	9,7%	21,0%	18,3%

- Base on market size and market growth, TwT estimated that will sell 55 products and increase significantly in the near future.
- Revenue growth rate in 5 next years: 101,12%.

=> Revenue growth rate above completely possible.

B2. BUSINESS TRACTION

Beneficiary growth rate

Northwest

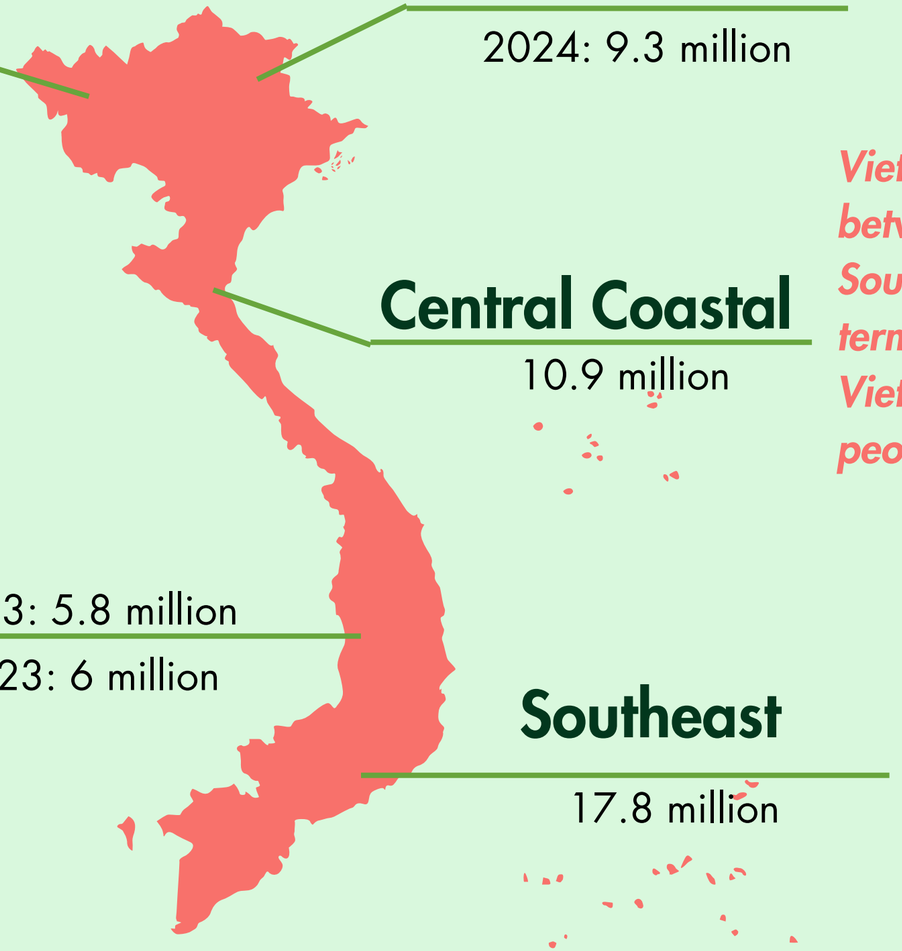
2023: 7 million

2024: 7.2 million

Northeast

2023: 9 million

2024: 9.3 million



In total, Vietnam's mountainous population in 2024 is estimated to be about 22.5 million people and having any trends to increase in the future

Central Coastal

10.9 million

Vietnam's total population is evenly divided between the Northern, Central and Southern regions, with the South leading in terms of population (BANKERVN). Vietnam's current population density is 321 people/km²

Central Highlands

2023: 5.8 million

2023: 6 million

Southeast

17.8 million

In total, Vietnam's provinces population in 2024 is estimated account for the majority of the population's VietNam. That is considered is one of the most economic in country and have potential growth in future

B2. BUSINESS TRACTION

Evidence: Market acceptance

TWT

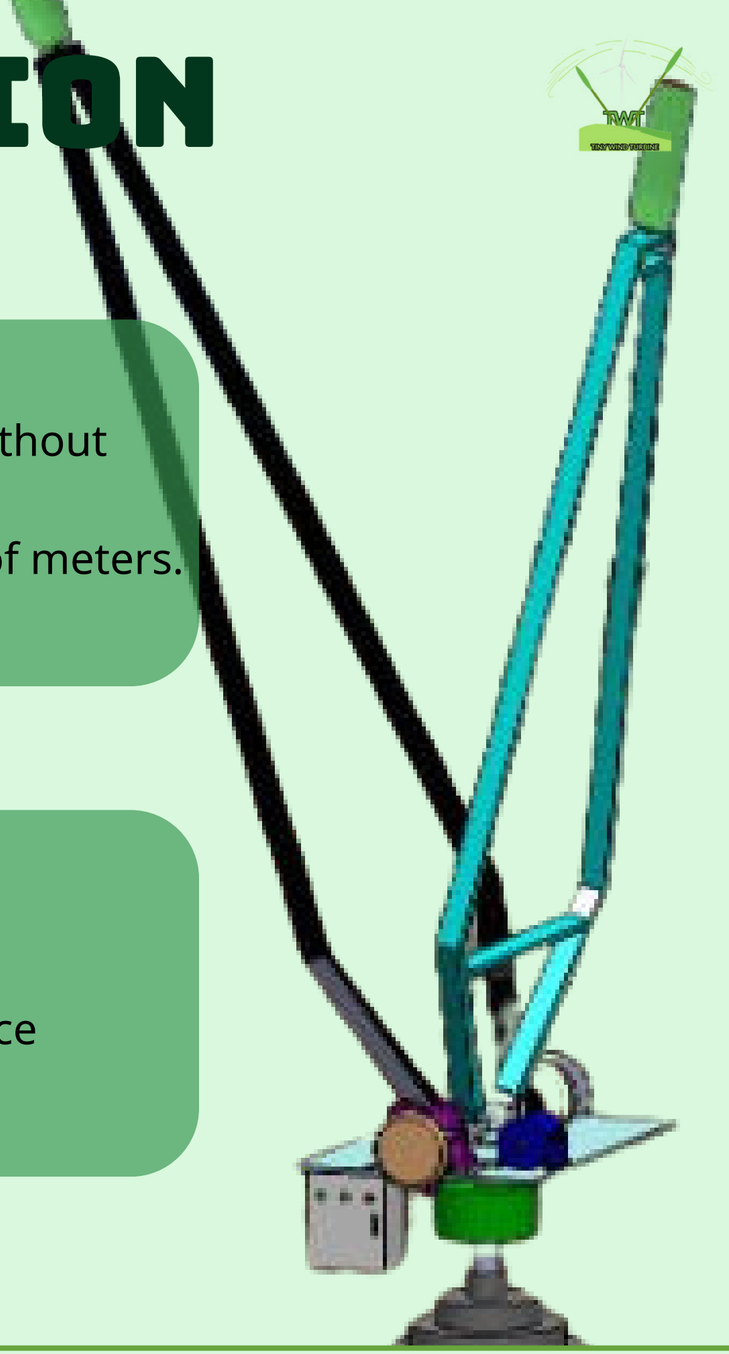
OVERCOME THE DISADVANTAGES

SMALLER SIZE (3m in height)

The product can be installed in many windy terrains without requiring as much installation space and effort as a conventional turbine with a height of up to hundreds of meters.

2 blades

- the installation cost is only about 20 million VND
- Period of use up to 5 years
- Does not require complicated and risky maintenance



B2. BUSINESS TRACTION

Evidence: Apply social solutions

CURRENT SITUATION

2021 **153,911** households, accounting for **0.74%**, do not have electricity; **717,352** households have electricity but the power supply is not stable or continuous.

2022 **160,000** households still without electricity, **715,000** households need to improve power lines in **3,000** communes.

2023 **815,101** poor households account for **2.93%. 771,235** near-poor households account for **2.78%.**

B2. BUSINESS TRACTION

Evidence: Apply social solutions

Both the terrain and altitude here make the work many times more complicated and dangerous.

+

Most people in remote areas do not have economic prosperity and need a stable source of electricity suitable to their income while at the same time having to take care of other living issues.

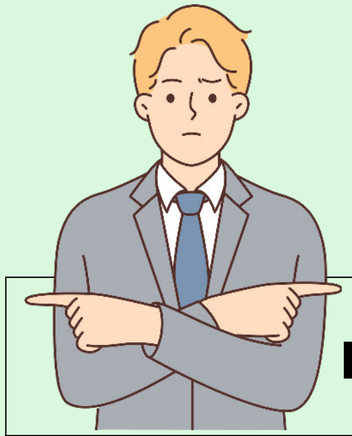
The 110kV power grid system often encounters problems, causing property damage. In the process of bringing electricity from the lowlands through high mountain passes, in addition, the people live scattered and not concentrated, so they have to extend the line over long distances, leading to an unstable voltage situation.

The innovative wind turbine with its advantage are expected to relieve the increasing gradual fee of electricity significantly

B3. RISK MANAGEMENT

- Installation and technology
- Market
- Financial
- Regulatory and Compliance
- Operational and Scalability

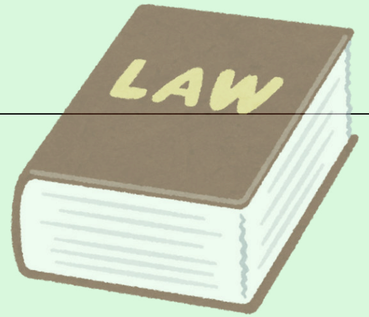
- Environmental
- Monitoring and Evaluation
- Governance and Leadership
- Marketing and Communication
- Cultural Sensitivity and Contextual Understanding



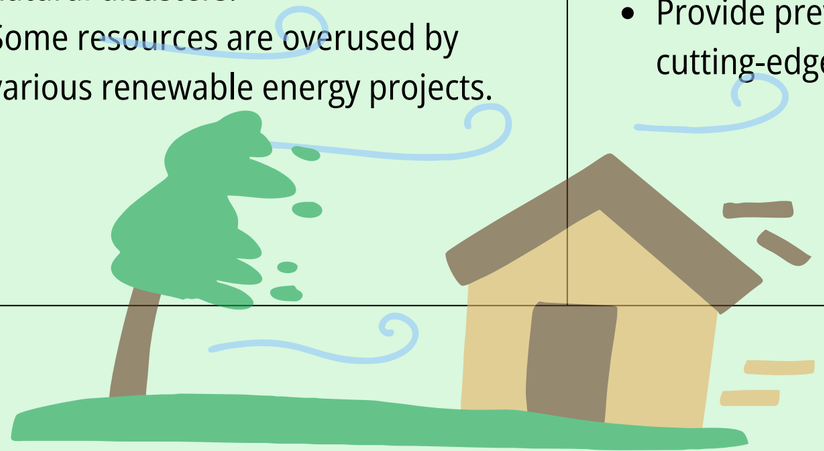
HOW

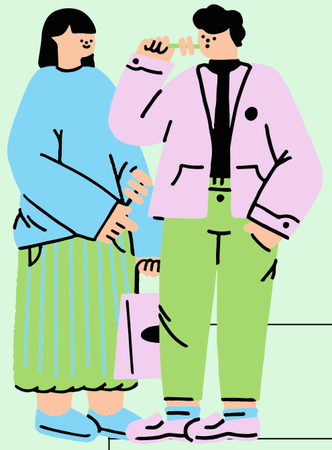
RISK	SOLUTION
1. Installation risk, technology • Noise from wing movements • The design, installation, operation of the product may encounter errors • Risk of collapse	• R&D proficiency continuously improves products • Create a thorough product design, installation process, operation with the supervision of experts • Backup product
2. Market risk • The challenge of meeting the needs and tastes of the consumer • Competition, economic volatility	Thorough market research and analysis, including identifying target markets, assessing demand, and understanding competitive dynamics.
3. Financial Risk • Challenges related to funding, capital availability, revenue generation and financial sustainability	• The project is in R&D transition and is expected to require a reserve of about VND 540 million VNĐ for six months • The company's 12-month plan: There's about 50kw of first order capacity (10/25 products from 2-5kw)

HOW

RISK	SOLUTION
4. Regulatory and compliance • Location, angular coordinates; land-use area with term and temporary land use area • Technical plans and options, dismantling and handling of wind power plant equipment after completion of the project. • Power Grid Agreement; Text of the agreement of the authority on the location of the project • Requirements for testing and completion of wind power plants: pursuant to Article 8 of Circular 02/2019/TT-BCT	  Compliance protocols need to be regularly reviewed and updated to ensure compliance with changing regulations
• Requirements for equipment of the wind power project • Requirements for Land Use Management in the Wind Power Area	Building partnerships with legal professionals and industry colleagues can help you navigate complex legal contexts.

RISK	SOLUTION
5. Operational and Scalability Risk • Challenges related to operational expansion, growth management, process optimization and organizational capacity-building	• Modify and improve the workflow to improve management efficiency. • Implement technological solutions and efficient supply chain management to improve production processes and service delivery • Testing and refining models before scaling up operations is a cautious approach.
6. Environmental Risk • Changes in wind, weather conditions, natural disasters. • Some resources are overused by various renewable energy projects.	• Apply environmentally friendly production techniques as well as conduct environmental impact assessments prior to project deployment, and adopt environmental protection measures. • Provide preventive plans and enhance the project's adaptability to climate change, including the use of cutting-edge technologies to optimize energy production in different climatic conditions.



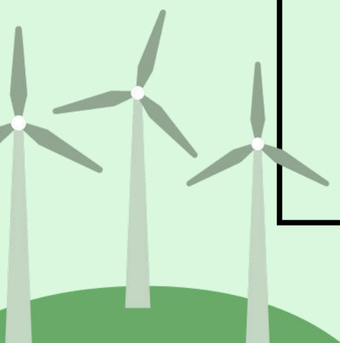


HOW

RISK	SOLUTION
7. Governance and Leadership The challenges associated with inefficient leadership, inadequate governance structures, and ethical gaps,	• Invest in human resources training, promote a culture of ethics at work by establishing clear ethical standards and ensuring compliance. • Recruit and develop competent leadership: Ensure that leadership positions are taken by people with good management experience and competence. • Organizing training and developing leadership skills for project management.
8. Marketing and Communication Difficulty in changing people's perception of the use of wind power.	• Organize local meetings and seminars to address community questions about the project. • Collaborate with reputable non-governmental and local organizations to build trust and promote the project's message.

9. Monitoring and Evaluation

RISK	SOLUTION
Technical, financial or social problems arise during the implementation => greater losses and adversely affecting the progress and effectiveness	Build a monitoring and evaluation system with specific indicators and clear criteria. Encourage community input.
Lack of transparency	
Without clear indicators and evaluation criteria .	



10. Lack of Cultural Sensitivity and Contextual Understanding

RISK	SOLUTION
The project does not understand local cultural values and customs	Study of local culture, customs and norms Understand the needs and desires of the community
	Recruit and train local people to generate income
	Organize meetings, seminars and community consultations to listen to people's opinions and feedback.

C1. OVERALL IMPACTS

It can cause conflicts if there is no consultation and consensus from the community.

Can impact ecosystems and wildlife, particularly birds and bats.

Regulations related to the environment, safety, and land management.

MITIGATION STRATEGY.

Environmental

- Develop R&D, improve design.
- Choose a suitable location,
- Minimize artificial light at night.

Social

- Promote and explain the benefits of the product to them.
- Create a fixed weekly plan for regular inspections.

Governance

- Establish clear policies and procedures for all stages of the project.
- All processes are conducted transparently and fairly. 24/7 hotline.

C2. GOVERNANCE STRUCTURE

Immediate business goals

Affordable solution to get innovation wind energy for off-grid communities.

Long-term vision

Become well-known on the international market and be able to participate in wind farms.

C2. GOVERNANCE STRUCTURE

1. Board of Directors

Roles and Responsibilities:

The Board of Directors provides strategic oversight, ensures the company adheres to its mission and values, and makes key decisions on policies and major initiatives.

Composition:

A diverse group including experts in renewable energy, social entrepreneurship, finance, and representatives from the communities served.

Committees:

Specialized committees (e.g., Audit Committee, Governance Committee) to handle specific areas of governance and oversight.

C2. GOVERNANCE STRUCTURE

2. Executive Management:

CEO/Managing Director:

Responsible for the overall management and day-to-day operations, implementing the board's strategic vision.

CFO:

Manages financial planning, reporting, and ensures the financial health of the company.

COO:

Oversees the operational aspects, ensuring efficient and effective service delivery.

CTO:

Leads the technical aspects, including the development, maintenance, and improvement of wind energy technologies.

C2. GOVERNANCE STRUCTURE

3. Advisory Board:

Roles and Responsibilities:

Provides non-binding strategic advice and expertise, helps with networking, and supports the company's mission.

Composition:

Industry experts, academics, experienced social entrepreneurs, and community leaders.

C2. GOVERNANCE STRUCTURE

4. Operational Teams:

Engineering and Maintenance Team:

Responsible for the design, installation, and maintenance of Turbine.

Community Engagement Team:

Works directly with the communities to understand their needs, provide education on Turbine wind energy, and ensure the project's benefits are maximized.

Sales and Marketing Team:

Promotes the company's services, raises awareness, and manages customer relationships.

Administration and Support Team:

Handles the administrative functions, HR, legal compliance, and other support services.

C2. GOVERNANCE STRUCTURE

5. Community Advisory Council:

Roles and Responsibilities:

Ensures the voices of the communities served are heard in decision-making processes.

Composition:

Representatives from the beneficiary communities, local leaders, and stakeholders.

C2. GOVERNANCE STRUCTURE

6. Stakeholder Engagement Mechanism:

Regular Meetings:

Includes community meetings, stakeholder forums, and public consultations to gather feedback and ensure transparency.

Reporting:

Regular impact reports and financial statements made available to stakeholders to maintain accountability.

C2. GOVERNANCE STRUCTURE

7. Ethical and Compliance Framework:

Code of Conduct:

Outlines the ethical standards and expectations for all employees and stakeholders.

Grievance Mechanism:

Provides a way for stakeholders to report and resolve issues or concerns.

Compliance Officer:

Ensures adherence to laws, regulations, and internal policies.

C2. GOVERNANCE STRUCTURE

8. Sustainability and Impact Measurement:

Impact Assessment Team:

Regularly measures and reports on the social, environmental, and economic impacts of the company's activities.

Sustainability Goals:

Clear objectives and targets related to sustainability and social impact.

This governance structure aims to balance the need for effective management, stakeholder engagement, and a strong focus on the company's social mission of providing affordable wind energy to remote areas in Vietnam.

D. LEARNING CURVE

Human resources

The survey together with travelling to Tam Dao
=> Motivate, enhance personal performance

Scale - up

- Developing a Scalability Mindset
- Developing Leadership and Management skills
- Developing Awareness

THANK YOU