

TOWARDS ASEAN POWER GRID

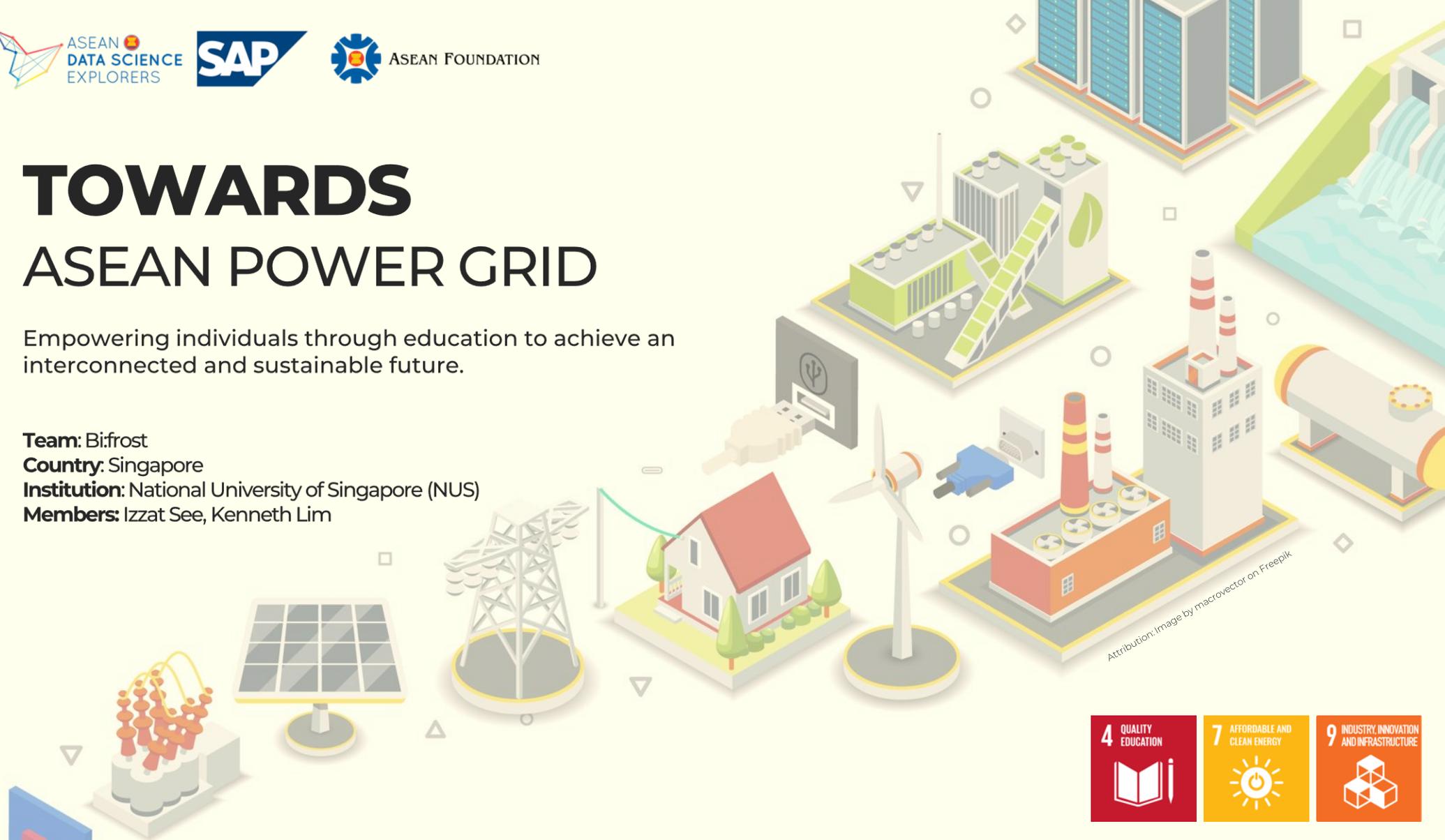
Empowering individuals through education to achieve an interconnected and sustainable future.

Team: Bi:frost

Country: Singapore

Institution: National University of Singapore (NUS)

Members: Izzat See, Kenneth Lim



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FINDING #1

RISING DEMAND FOR ENERGY

1

To achieve GDP growth, countries need to generate more energy

FINDING #1

RISING DEMAND FOR ENERGY

FINDING #2

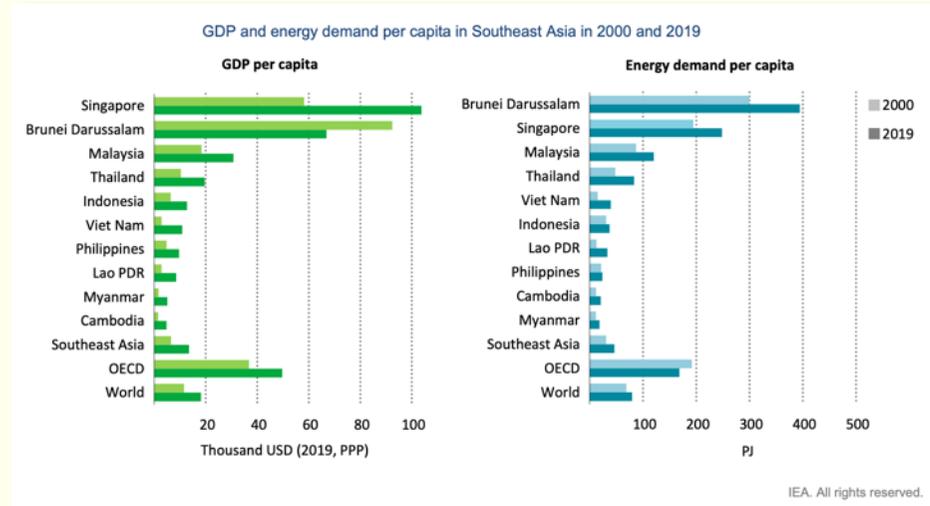
THE NEED FOR RENEWABLE ENERGY

FINDING #3

LIMITATIONS IN RENEWABLE ENERGY CAPACITY

FINDING #4

CHALLENGES FACING APG



Which sources of energy should capacity be increased?

2

Rising energy demand needs to be fuelled by renewable sources

FINDING #1

RIISING DEMAND FOR ENERGY

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THE NEED FOR RENEWABLE ENERGY

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CHALLENGES FACING APG

“

Our assessment of ASEAN's power sector pathways to **net zero emissions (NZE) by 2050** is consistent with the **Paris Agreement** goal to limit global warming to **1.5°C¹**

- K. Handayani et al. (2022)
ASEAN Centre of Energy

”

The **adoption of EV** also opens the opportunity to **accelerate the deployment of renewable energy** and in the long term can provide flexibility in the demand side through vehicle-to-grid operation.²

- F. Padhilah et al. (2023)
Institute of Essential Services Reform

[1] K. Handayani et al., 2022 (<https://doi.org/10.1016/j.apenergy.2022.118580>)

[2] F. Padhilah et al., 2023 (<https://iesr.or.id/wp-content/uploads/2023/02/Indonesia-Electric-Vehicle-Outlook-2023.pdf>)

2

Rising energy demand needs to be fuelled by renewable sources

FINDING #1

RIISING DEMAND FOR ENERGY

FINDING #2

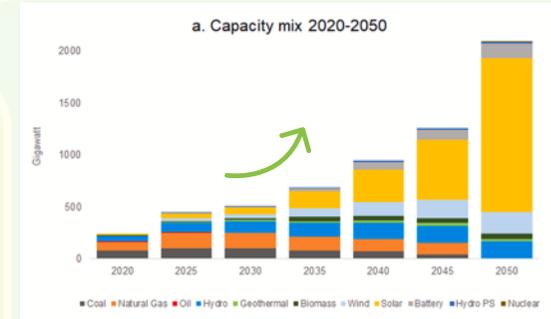
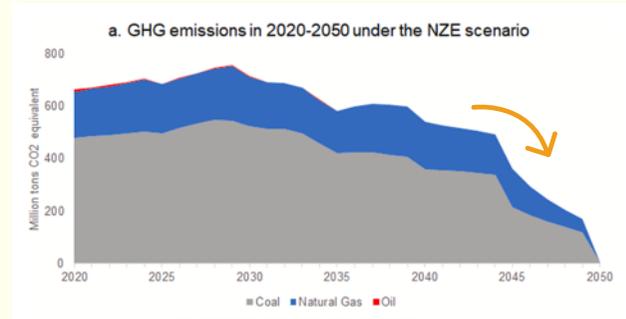
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- K. Handayani et al. (2022)
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Institute of Essential Services Reform

Is a net-zero energy sector achievable?



[1] K. Handayani et al., 2022 (<https://doi.org/10.1016/j.apenergy.2022.118580>)
 [2] F. Padhilah et al., 2023 (<https://iesr.or.id/wp-content/uploads/2023/02/Indonesia-Electric-Vehicle-Outlook-2023.pdf>)

3

Regional energy trades can facilitate access to renewable energy

FINDING #1

RIISING DEMAND FOR ENERGY

FINDING #2

THE NEED FOR RENEWABLE ENERGY

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LIMITATIONS IN RENEWABLE ENERGY CAPACITY

FINDING #4

CHALLENGES FACING APG

ENERGY EXPORTERS*



CAMBODIA



LAO PDR



MALAYSIA



ENERGY IMPORTERS*



THAILAND



SINGAPORE



PHILIPPINES

ASEAN Power Grid is key to our net-zero vision

*Based on the LCO projections at year 2050, in The 7th ASEAN Energy Outlook 2020-2050. Image from freepik.com

4

Many obstacles need to be overcome to progress towards ASEAN Power Grid

FINDING #1

RIISING DEMAND FOR ENERGY

FINDING #2

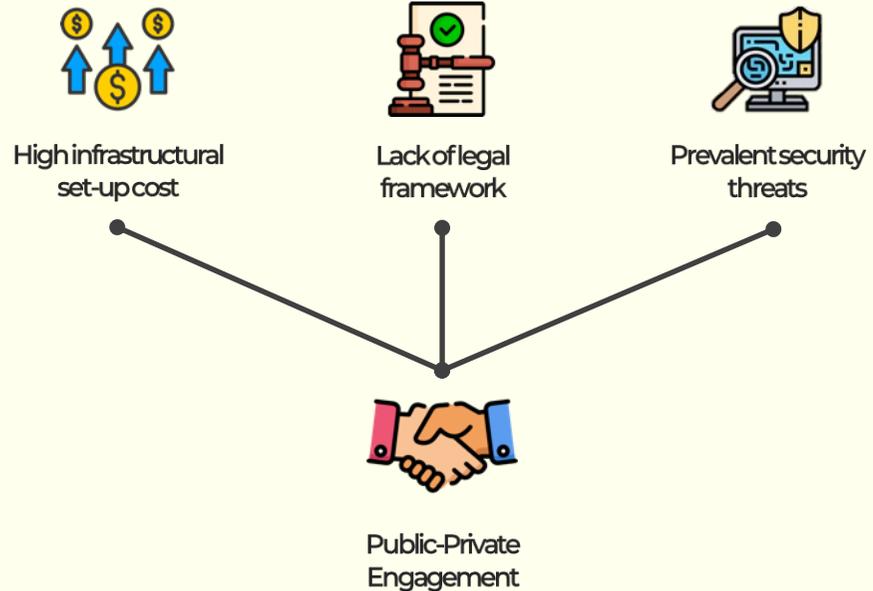
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Many obstacles need to be overcome to progress towards ASEAN Power Grid

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CHALLENGES FACING APG



High infrastructural set-up cost



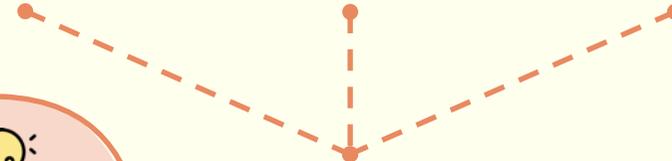
Lack of legal framework



Prevalent security threats



Public-Private Engagement



IN SUMMARY...



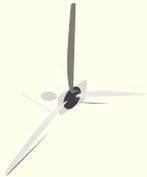
The progress of APG is **not in pace** with our net-zero emission vision



Pertinent challenges of APG **needs to be addressed**



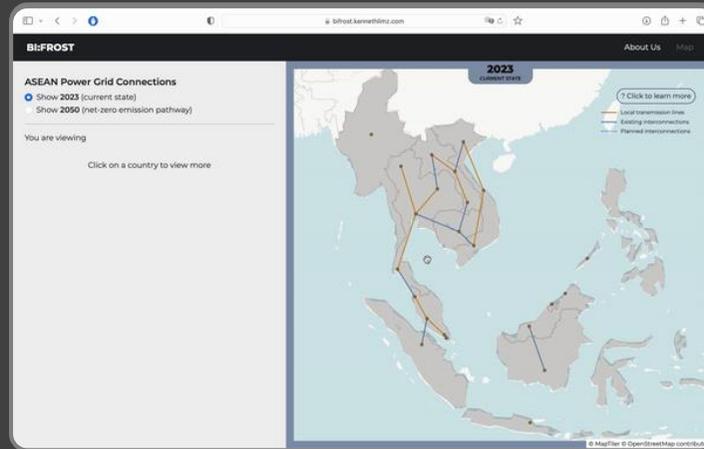
Empower individuals through education and bring APG into the spotlight in order to drive the progress of APG.





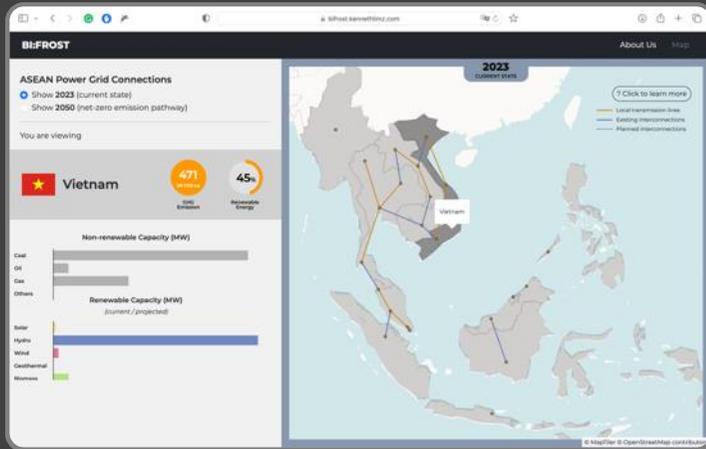
BI:FROST

BI:FROST



A **visualisation** and **modelling** platform that seeks to accelerate the region's progress on ASEAN Power Grid.

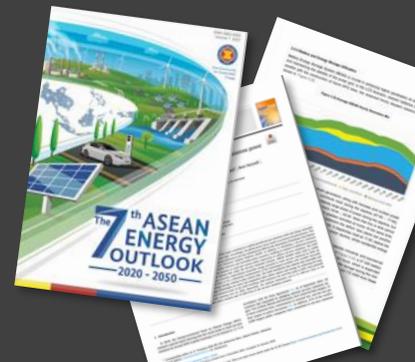
BI:FROST



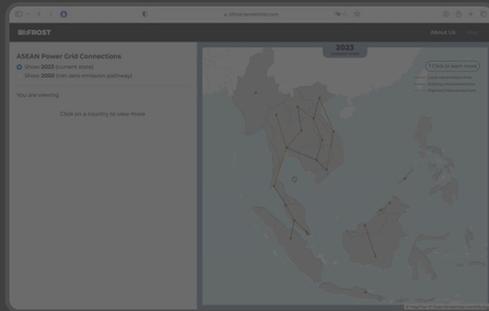
A **visualisation** and **modelling** platform that seeks to accelerate the region's progress on ASEAN Power Grid.

WHY IS THERE A NEED?

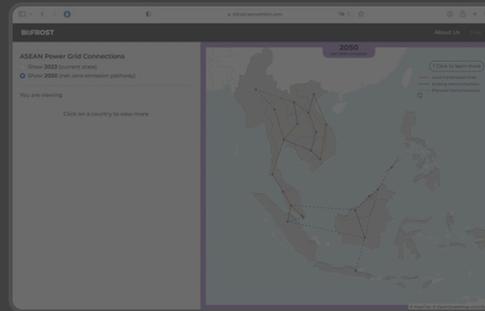
1. Ease of access to information
2. Empower individuals through easy to understand visualisations
3. Support key decision-makers with region's grid planning



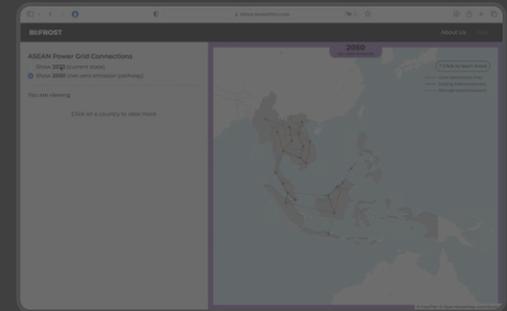
FEATURES OF **BI:FROST**



Visualise each country's **energy profile and the renewable capacity**



Learn about the **challenges** behind a regional grid

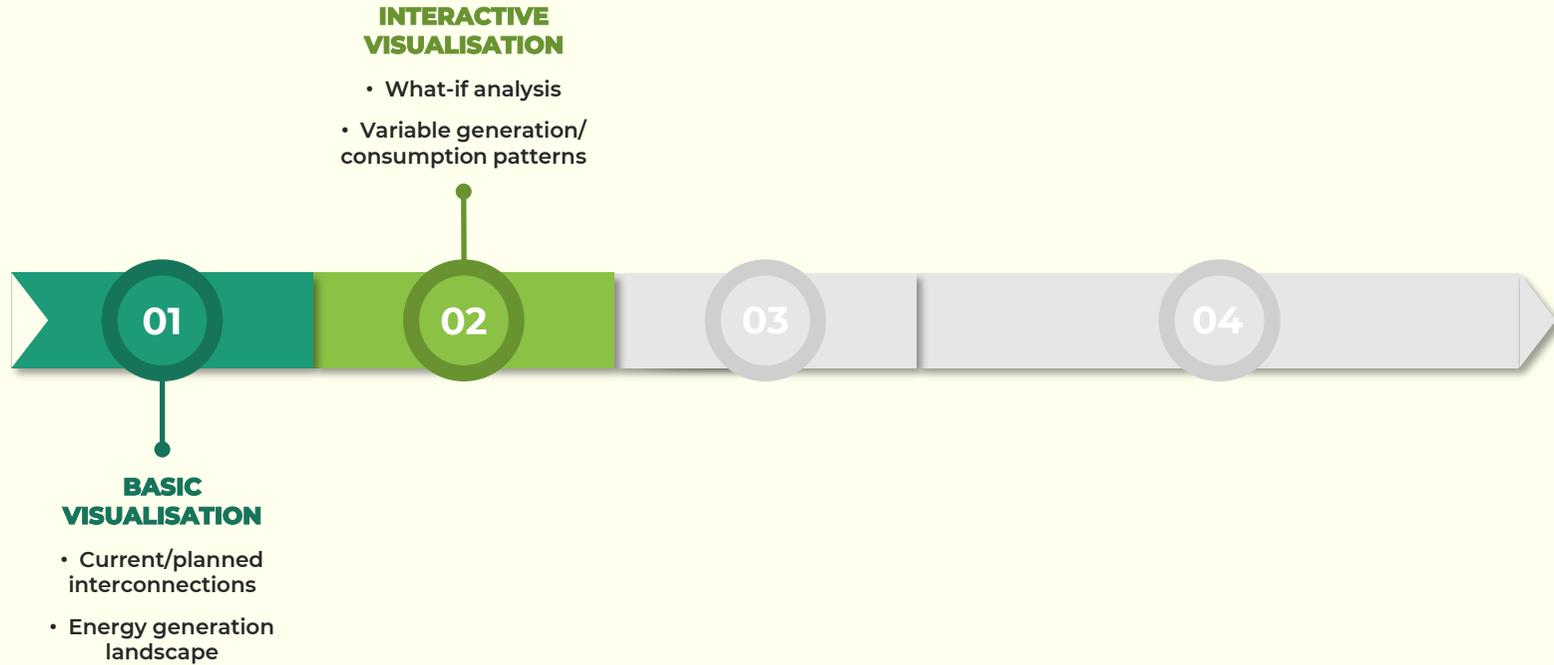


Keep up-to-date on the **latest grid development**

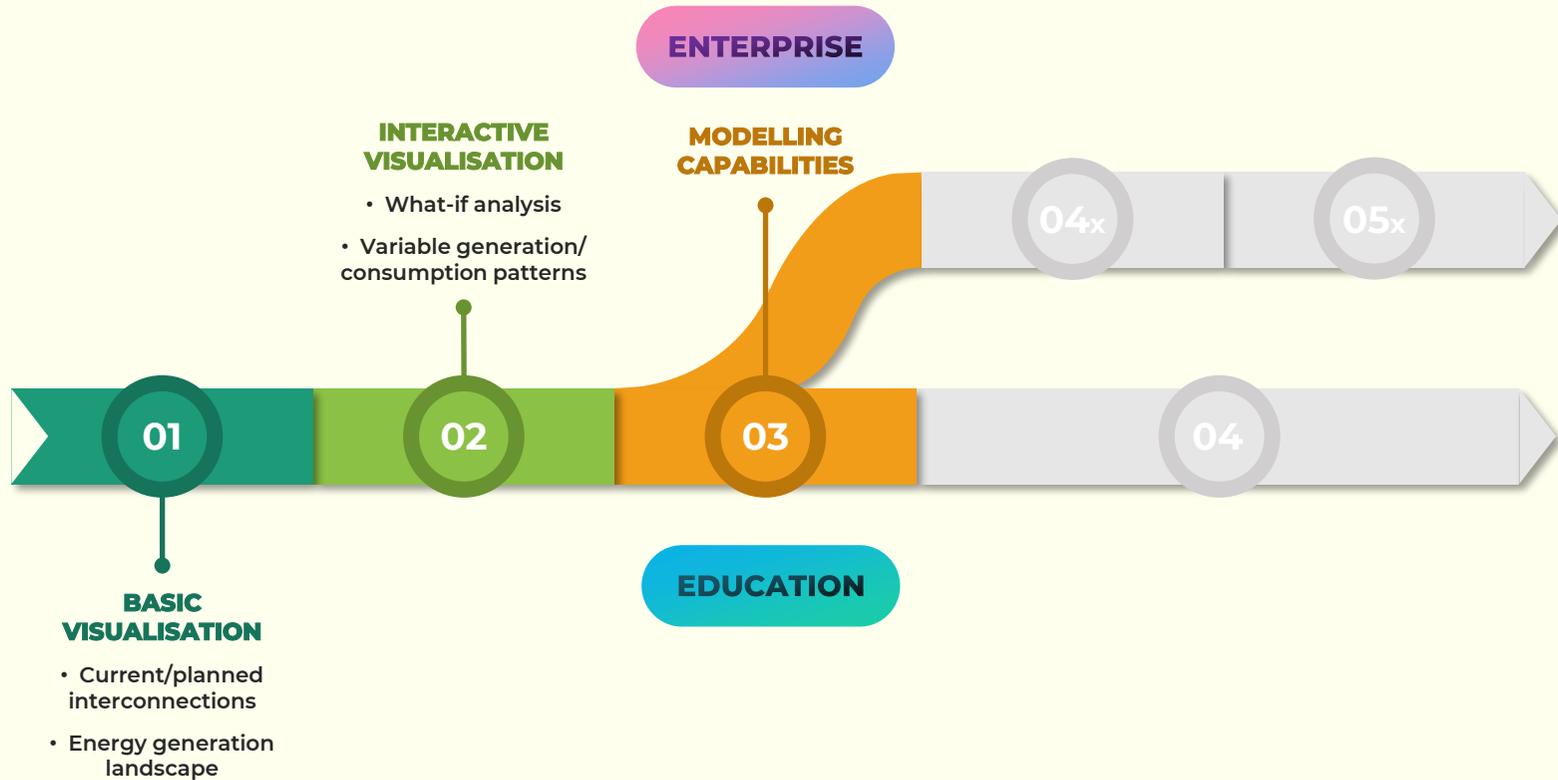
FEATURES ROADMAP



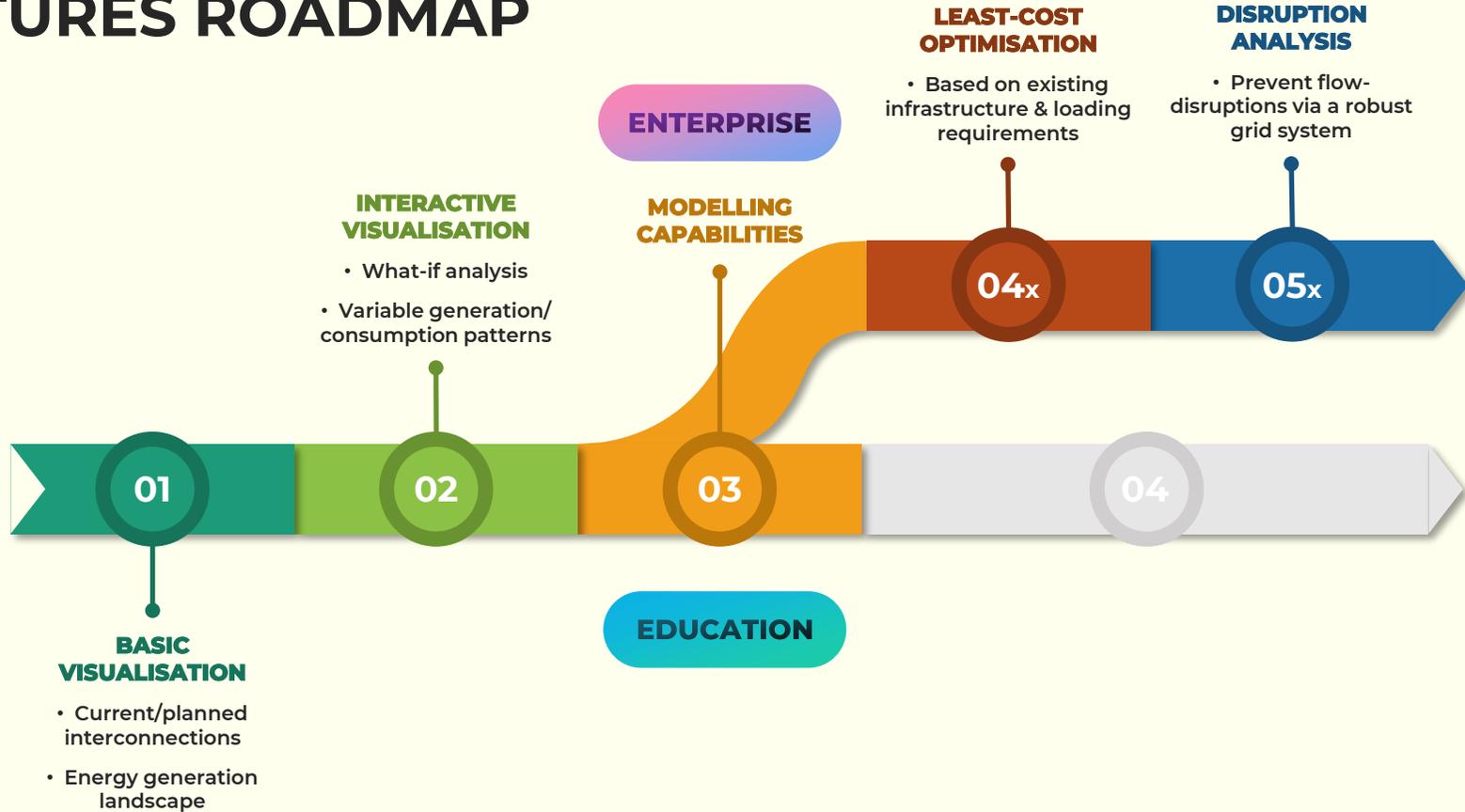
FEATURES ROADMAP



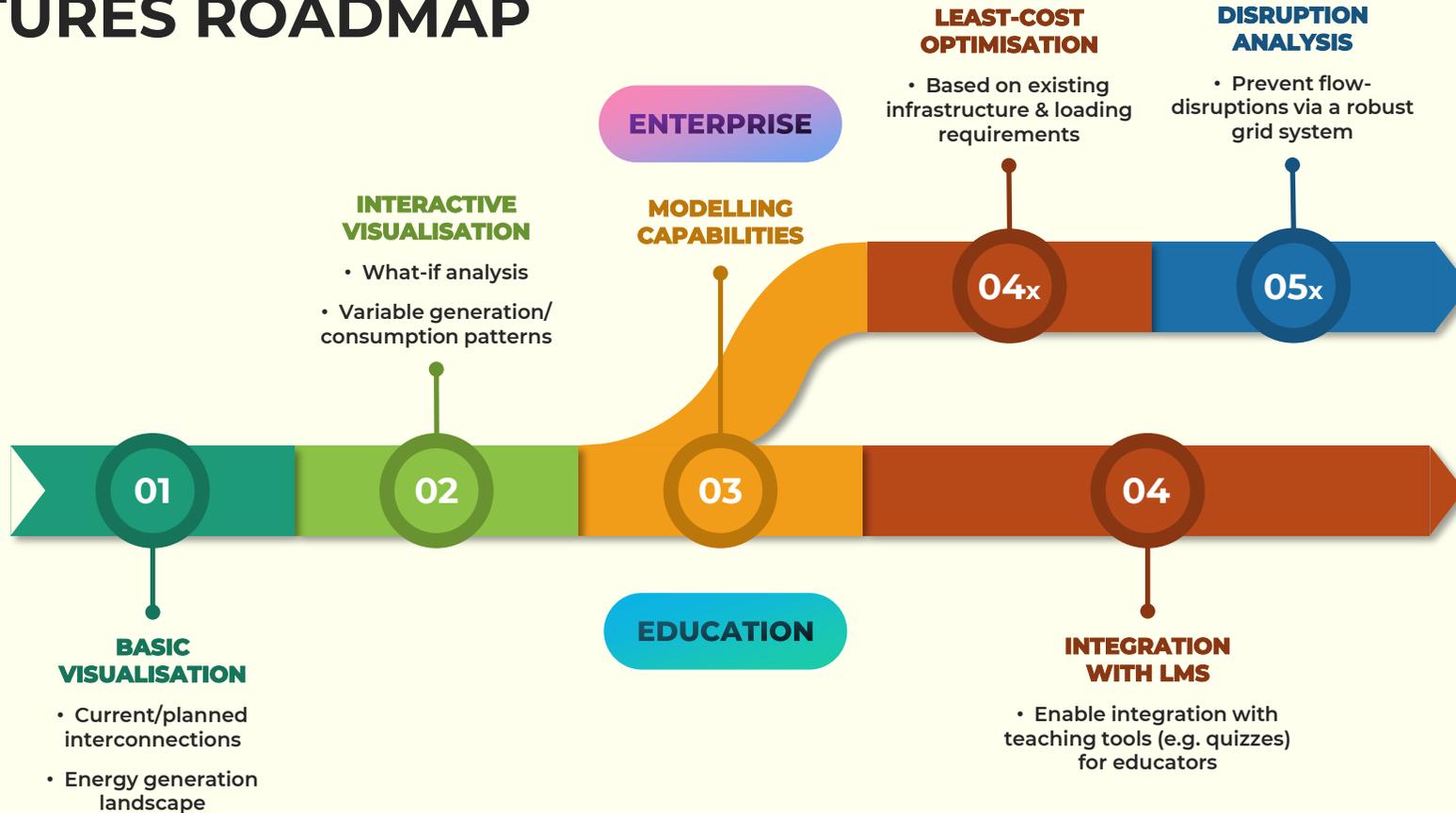
FEATURES ROADMAP



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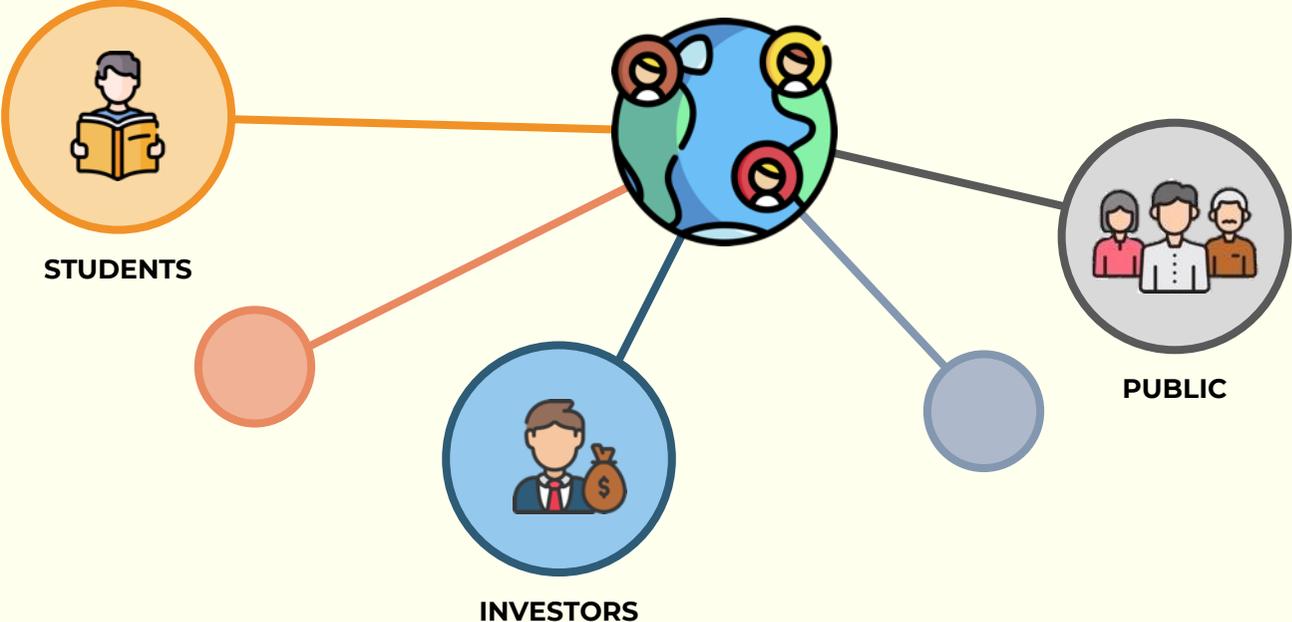


FEATURES ROADMAP



TARGET AUDIENCE

How can users benefit from our platform?

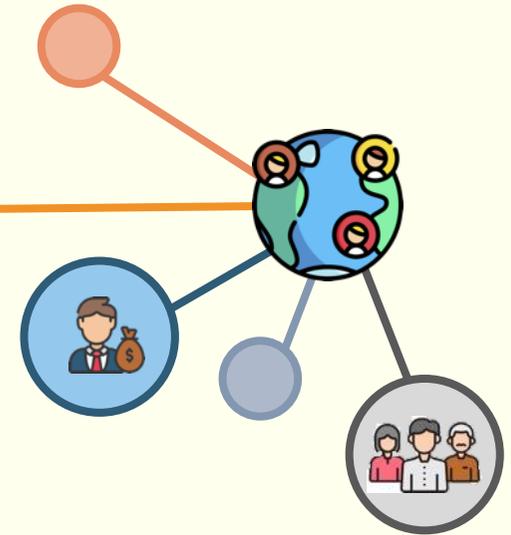


TARGET AUDIENCE

How can users benefit from our platform?

STUDENTS

-  Access to information regarding the ASEAN Power Grid (APG)
-  Early exposure to challenges facing APG
-  Early interest development

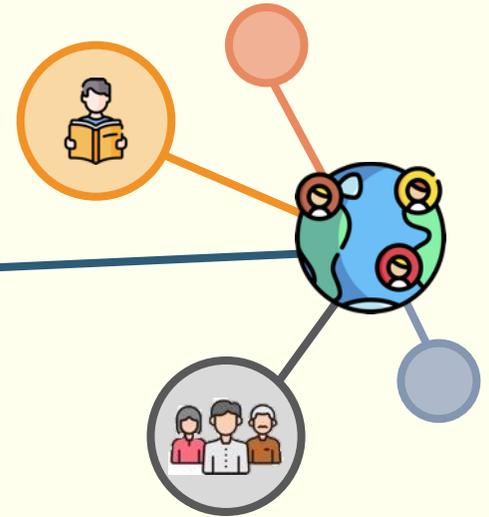


TARGET AUDIENCE

How can users benefit from our platform?

INVESTORS

-  Understand importance of APG in securing the region's future
-  Make better informed business decisions
-  Visualise potential of their investments towards APG



TARGET AUDIENCE

How can users benefit from our platform?

PUBLIC



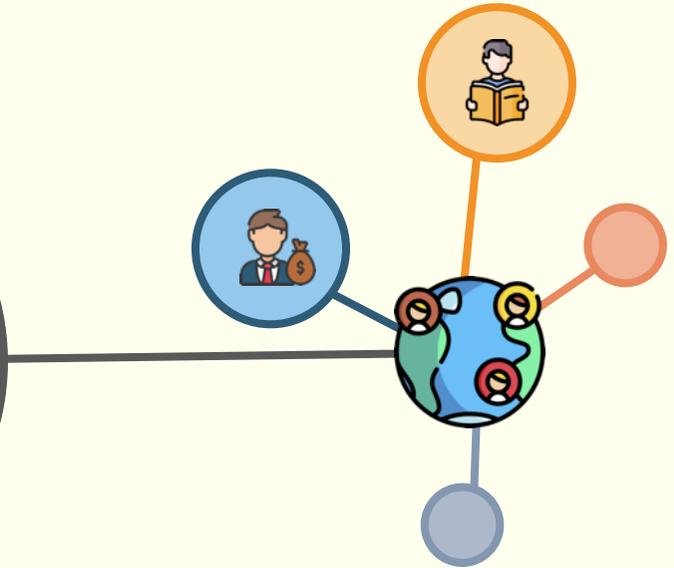
Stay updated on changes to regional energy landscape



Take part in energy conversations

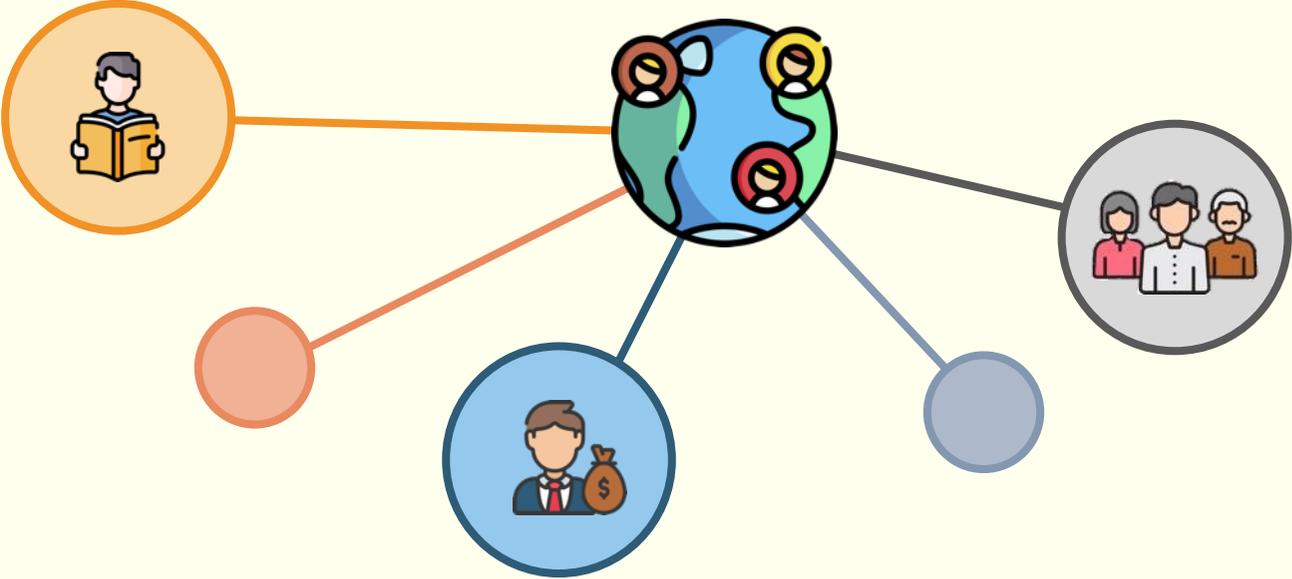


Become advocates for change



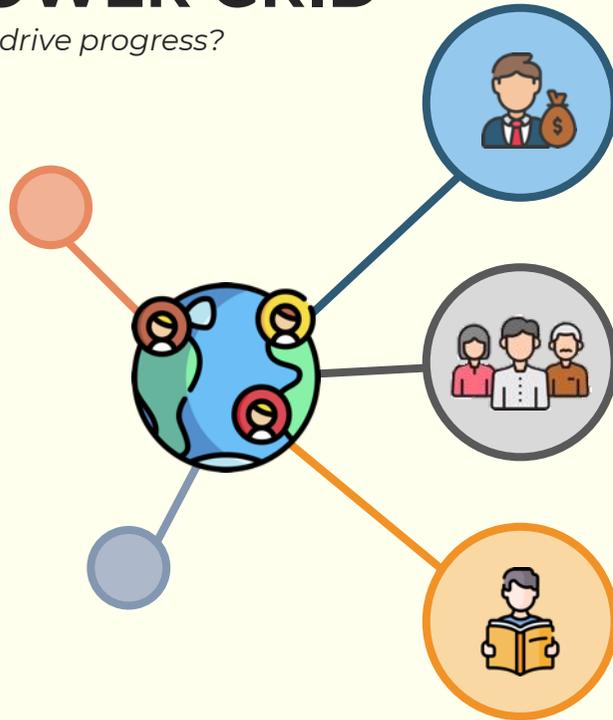
TARGET AUDIENCE

How can users benefit from our platform?



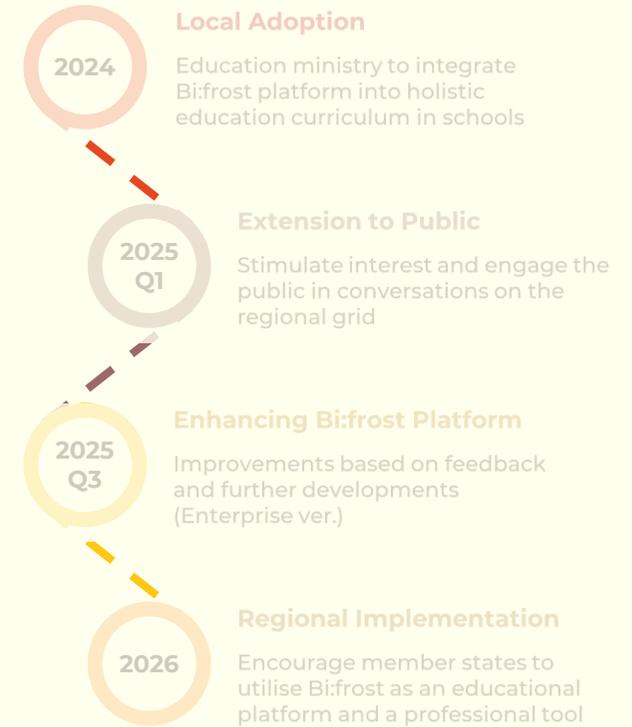
ACCELERATING ASEAN POWER GRID

How does awareness drive progress?



- Increased **confidence** and **financial support** towards the regional grid
- **Vote for policies** which prioritizes grid development and regional energy trades
- **Future** policymakers, engineers, stakeholders, etc.

IMPLEMENTATION PROCESS

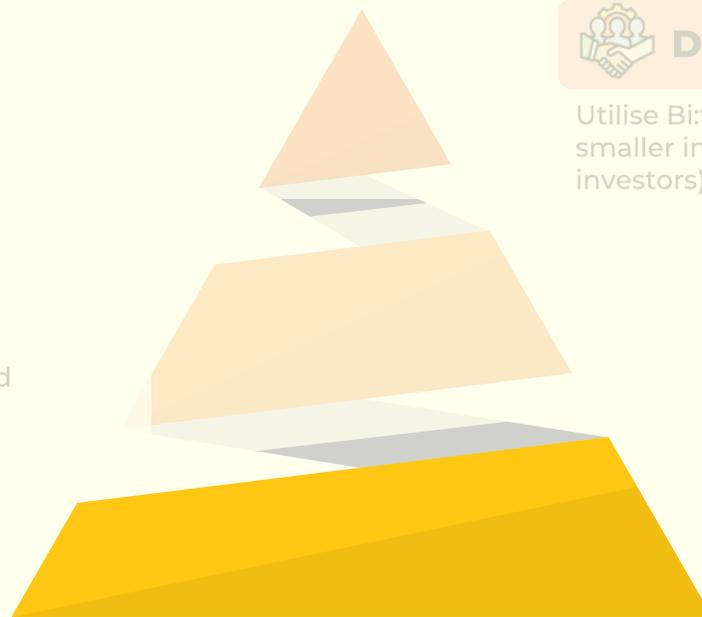


FUNDING APPROACH



PRIVATE SECTOR ENGAGEMENT

Seek investments from businesses and enable companies to support through CSR programs



DIVERSIFY INVESTOR BASE

Utilise Bi:frost platform to further engage smaller investors (e.g. smaller companies, retail investors)



PUBLIC FUNDING

Secure grants from governments and international development agencies (e.g. ADB, World Bank)

Regional effort headed by
ASEAN Centre for Energy

IN ALIGNMENT WITH...



IN ALIGNMENT WITH...



IN ALIGNMENT WITH...



4 QUALITY EDUCATION

- Promote sustainable development through global citizenship education and national education
- Education as the driver of sustainability**



9 INDUSTRIES, INNOVATION AND INFRASTRUCTURE

- Developing **reliable and sustainable regional/Invest in transborder infrastructure to enable equitable access**
- Upgrading infrastructure and retrofit industries to make them sustainable by 2030



7 AFFORDABLE AND CLEAN ENERGY

- Significantly **increase global renewable energy share** by 2030
- Enhancing international cooperation to facilitate access to **clean energy research and technology** by 2030
- Increase renewable energy capacity; Expand infrastructures to support sustainable energy services**
- Expanding infrastructure and upgrading technology for modern and sustainable energy services to developing countries by 2030



IN ALIGNMENT WITH...



B.6 GOOD GOVERNANCE

- Enhance engagement with private sector and other stakeholders
- Enhance public-private collaboration
- Improve government policies and business actions across industries in ASEAN region.



B.8 SUSTAINABLE ECONOMIC DEVELOPMENT

- Foster policies supportive of renewable energy and set collective targets accordingly
- Enhance connectivity through multilateral electricity trade under framework of ASEAN Power Grid.



C.4 ENERGY

- Increase component of renewable energy to a mutually agreed percentage number
- Increase renewable capacity
- Boost profile of ASEAN energy sector internationally through annual publication on ASEAN energy cooperation



C.5 CONTRIBUTION OF STAKEHOLDERS ON REGIONAL INTEGRATION EFFORTS

- Enhance engagement to promote better understanding of ASEAN economic integration initiatives
- Increase communication with stakeholders on ASEAN initiatives
- Enhance consultation with stakeholders on new initiatives

IN ALIGNMENT WITH...



A.2

EMPOWERED PEOPLE AND STRENGTHEN INSTITUTIONS

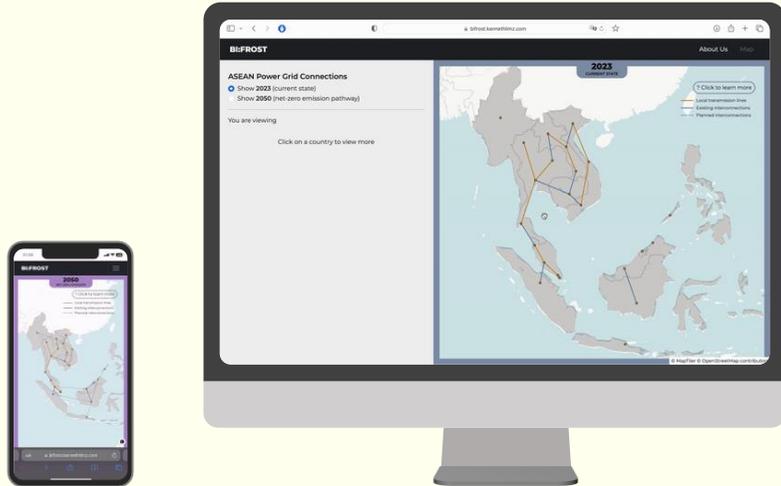
- Increase competencies and resilience of relevant stakeholders with **advanced technological and managerial skills**
- **Empower individuals through education** and promote the use of information and communication technologies as a means to connect regional community
- **Promote ASEAN awareness** among government officials, students, children, youths and stakeholders as part of building ASEAN identity

C.4

SUSTAINABLE CONSUMPTION AND PRODUCTION

- **Enhance capacity of stakeholders; Integrate sustainable practices into policies as part of CSR activities**
- **Strengthen public-private partnerships** to promote the adoption of environmentally-sound technologies for maximizing resource efficiency
- **Promote integration of sustainable consumption** and production strategy and best practices **into national and regional policies as part of CSR activities**

IN CONCLUSION



Empower individuals through education



Enable key decision makers with modelling and analysis tool



Achieve progress towards ASEAN Power Grid

THANK YOU

FOR YOUR ATTENTION



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DEMO



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