Artificial Intelligence Driven Transitions

by

Paving the Way for Energy-Efficient Green Ports of Tomorrow

ASEAN Ports and Shipping 2023, Bangkok

SigmaViridis

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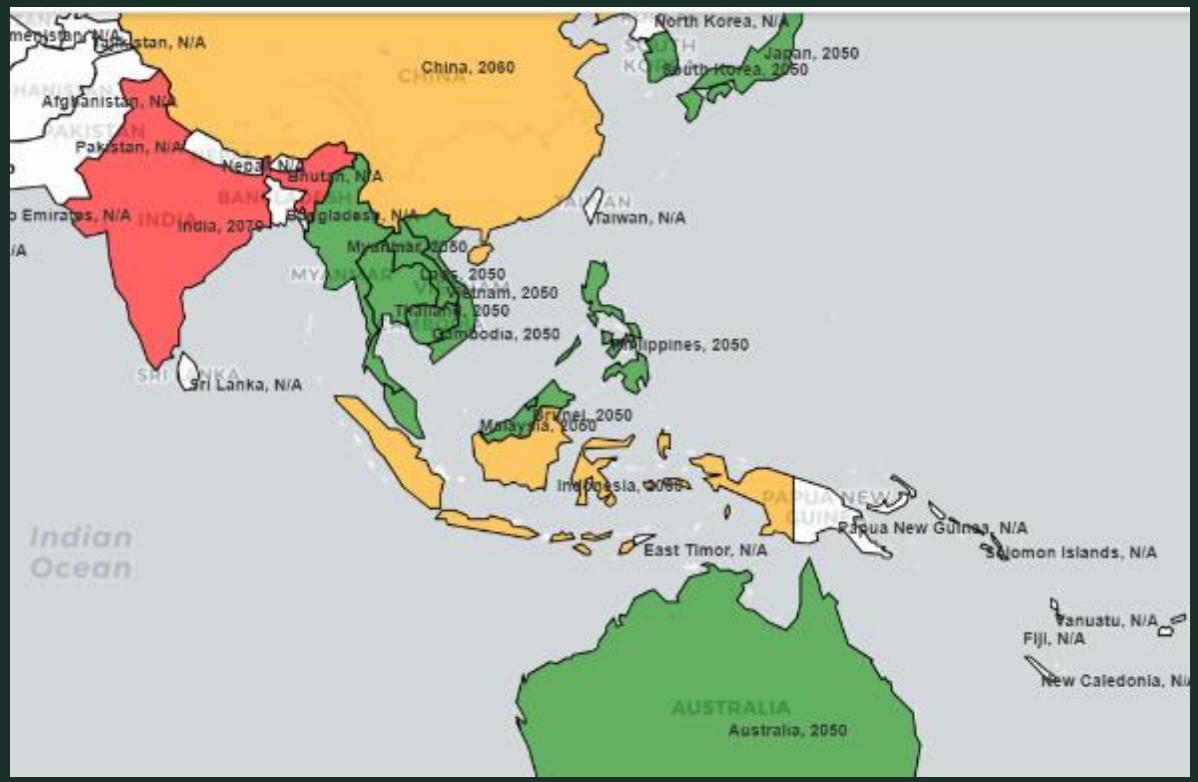
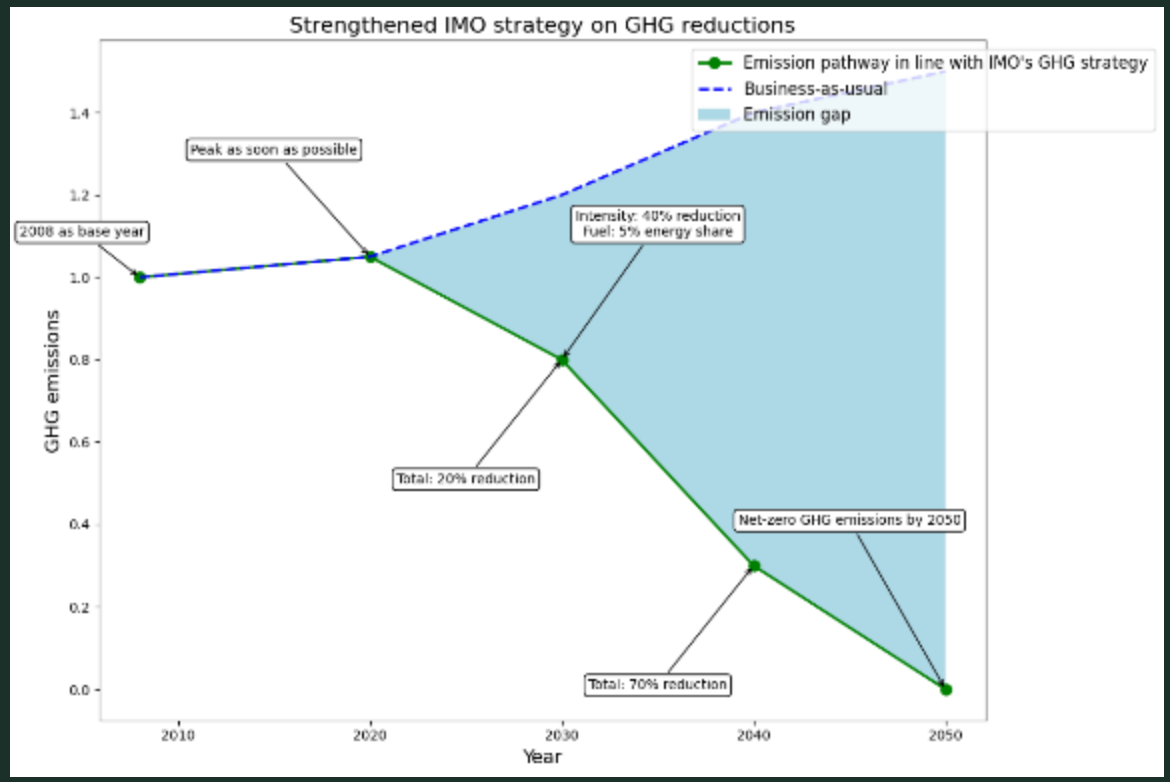
Net Zero Goals for the World and Maritime Industry

Net Zero Goals in APAC

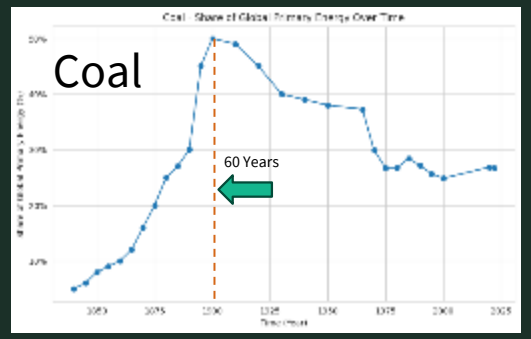


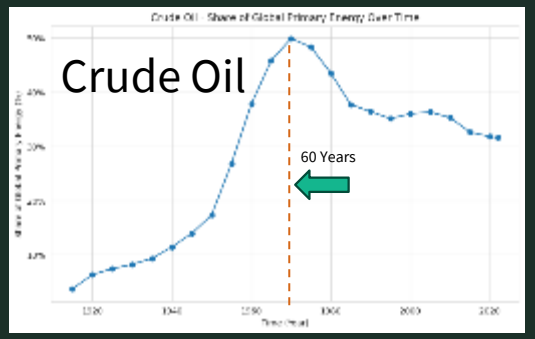
IMO Scenarios

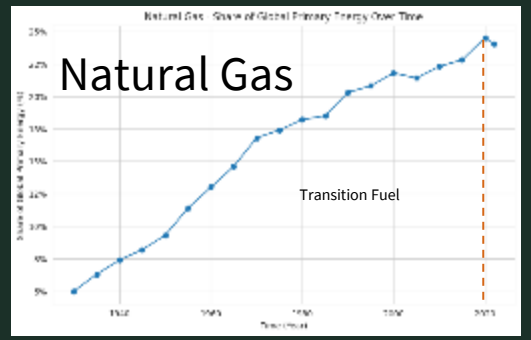


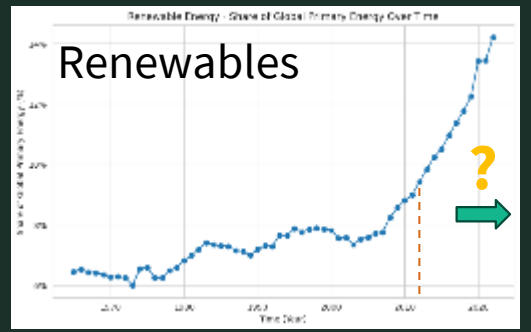
History of Energy Transitions

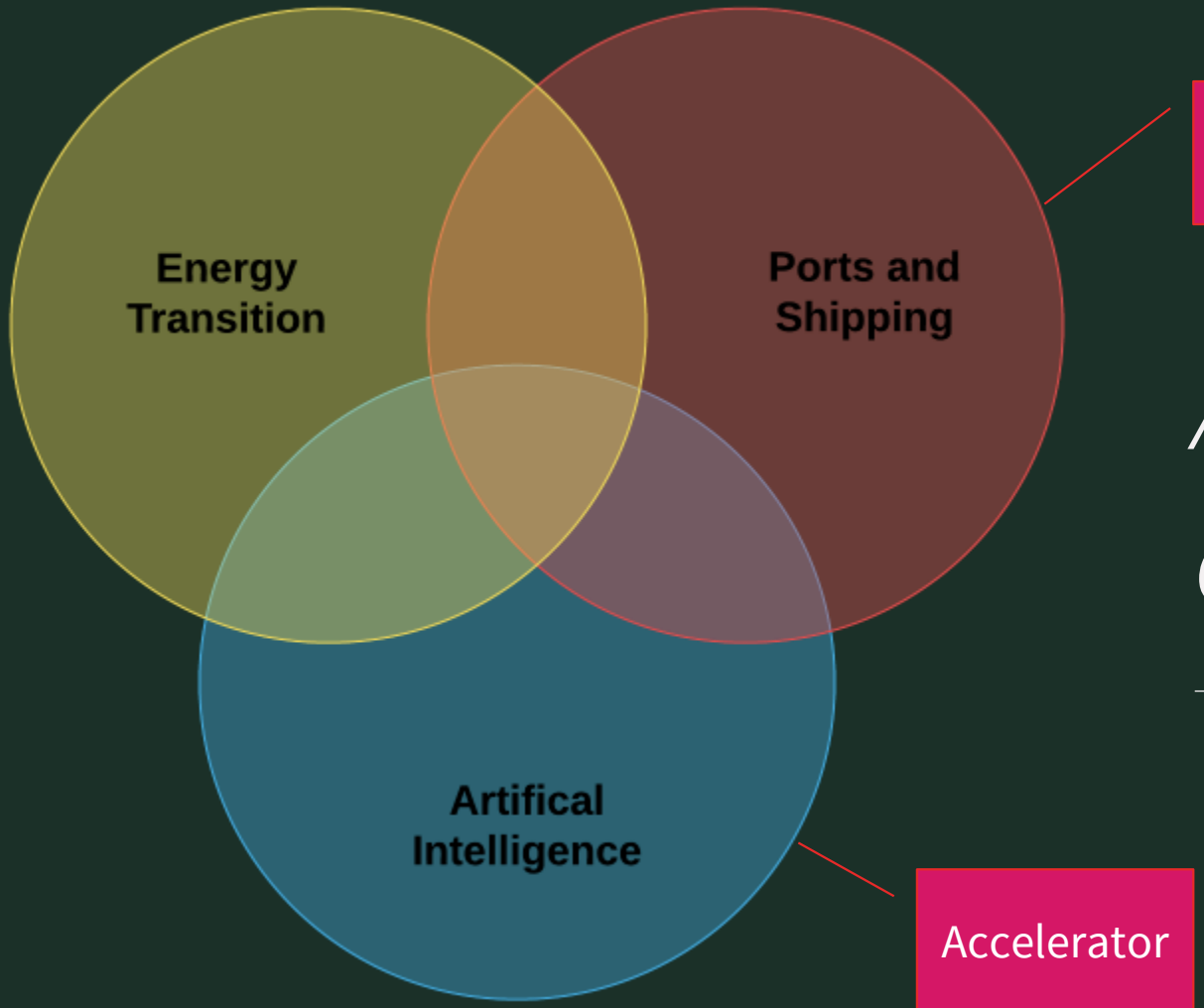
It took 60 years for previous transitions (coal to oil) to reach 50% penetration , this time for renewables the goal is to achieve 100% penetration in 35 years (by 2050). How can we achieve this rate?







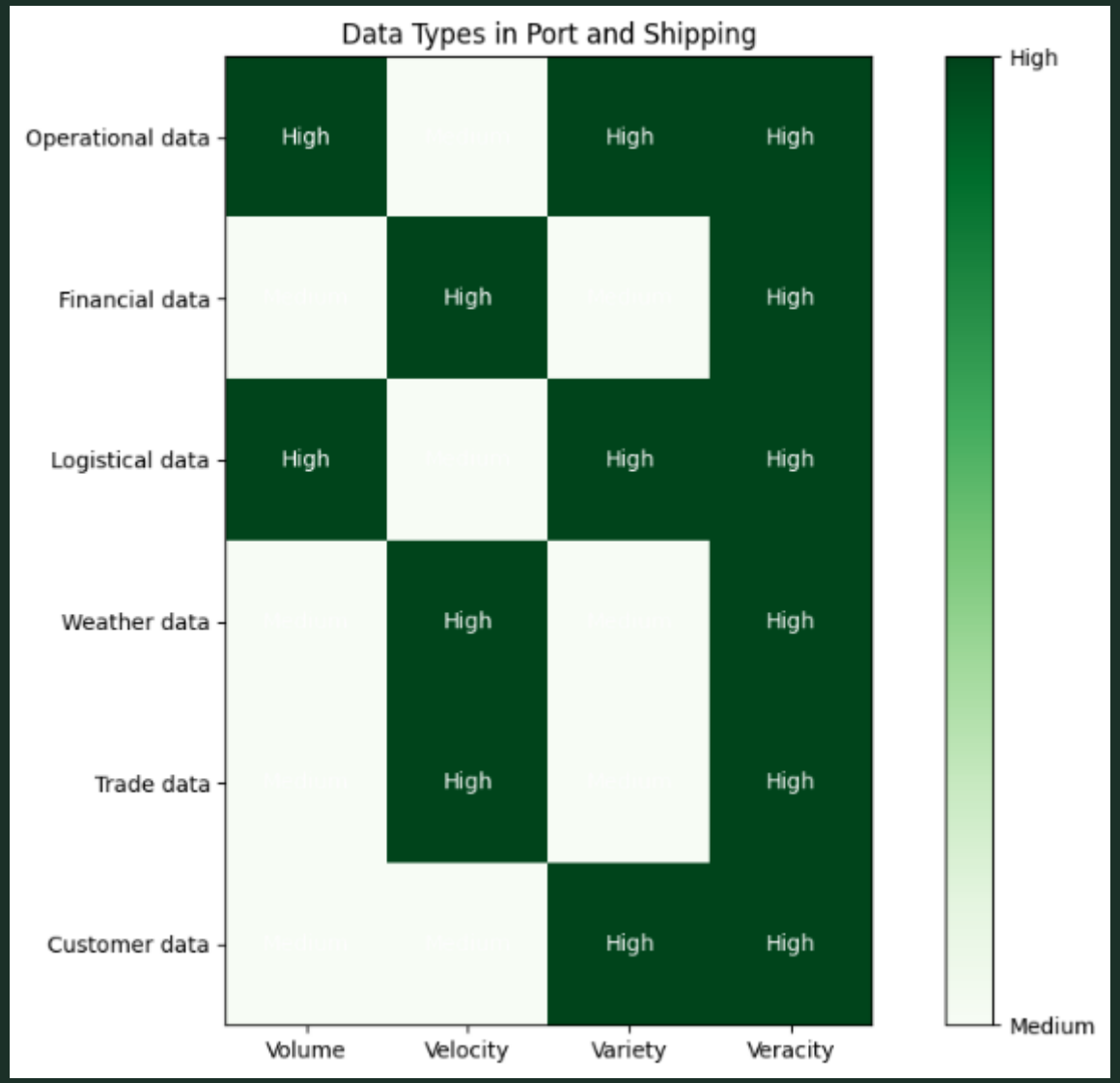




Source: SigmaV

Accelerating the ongoing Transition

AI has the potential to accelerate energy transition to reach net zero within such as short span which is unprecedented

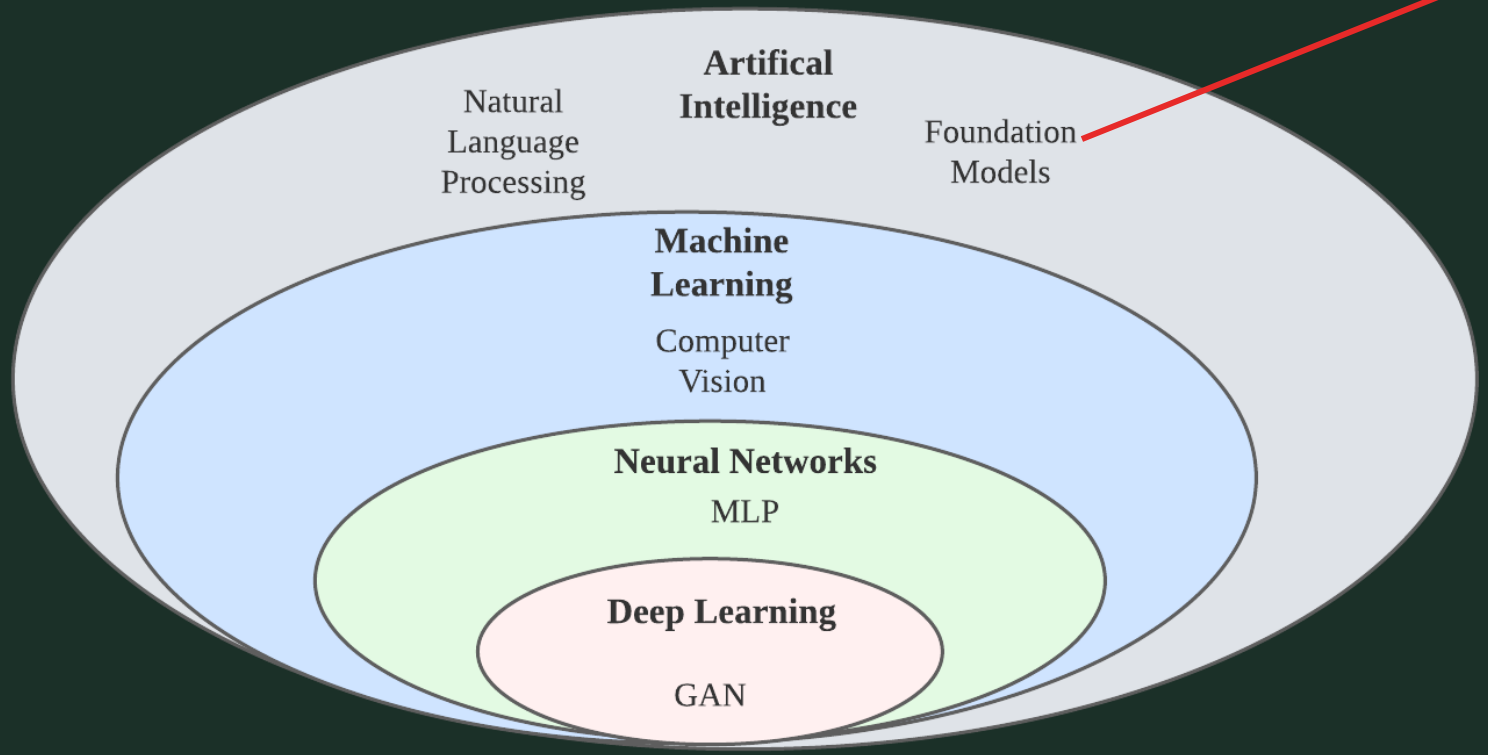


Source: SigmaV

Big Data Problem

Decisions depend on analysing data which comes with 4V challenge.

AI Current State of the Art

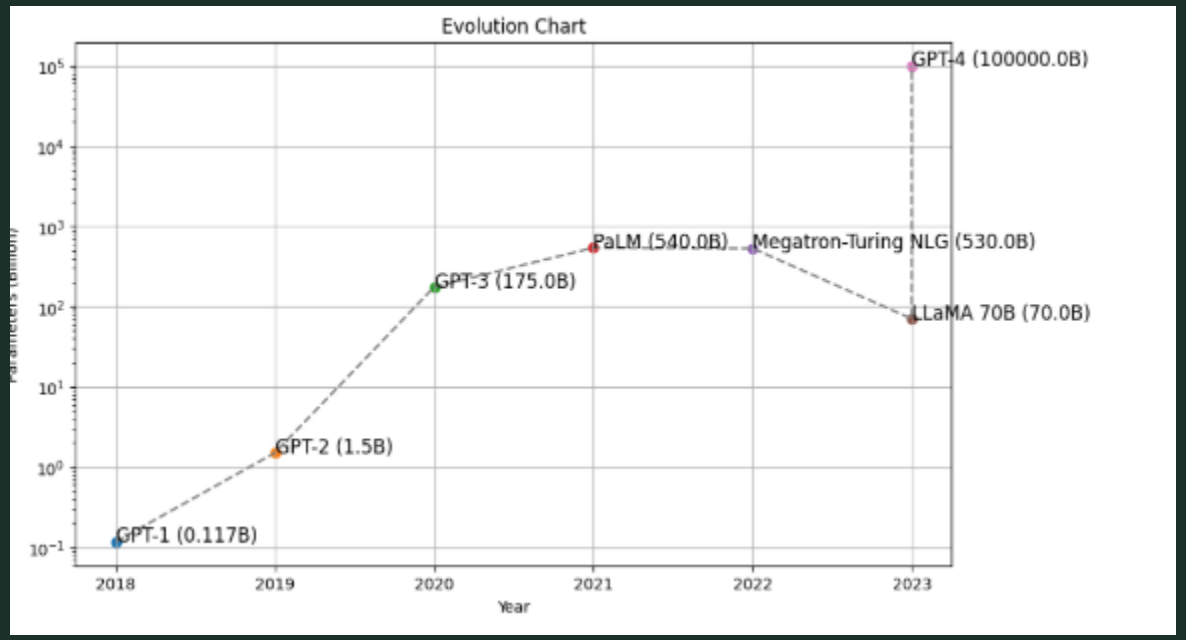


Evolving at rapid pace: Generative AI, LLM, AGI

Source: SigmaV

Dawn of Generative AI and LLMs

Post COVID, the rate of AI models and its capacity has exploded,
disruption to industries and businesses is matter of time.



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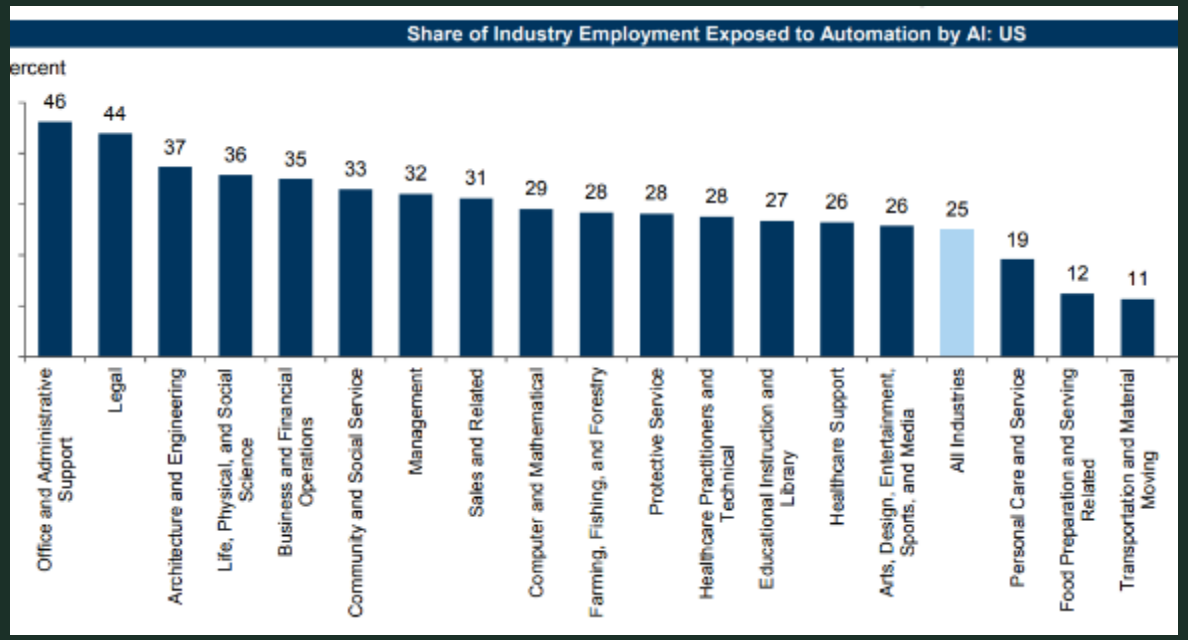
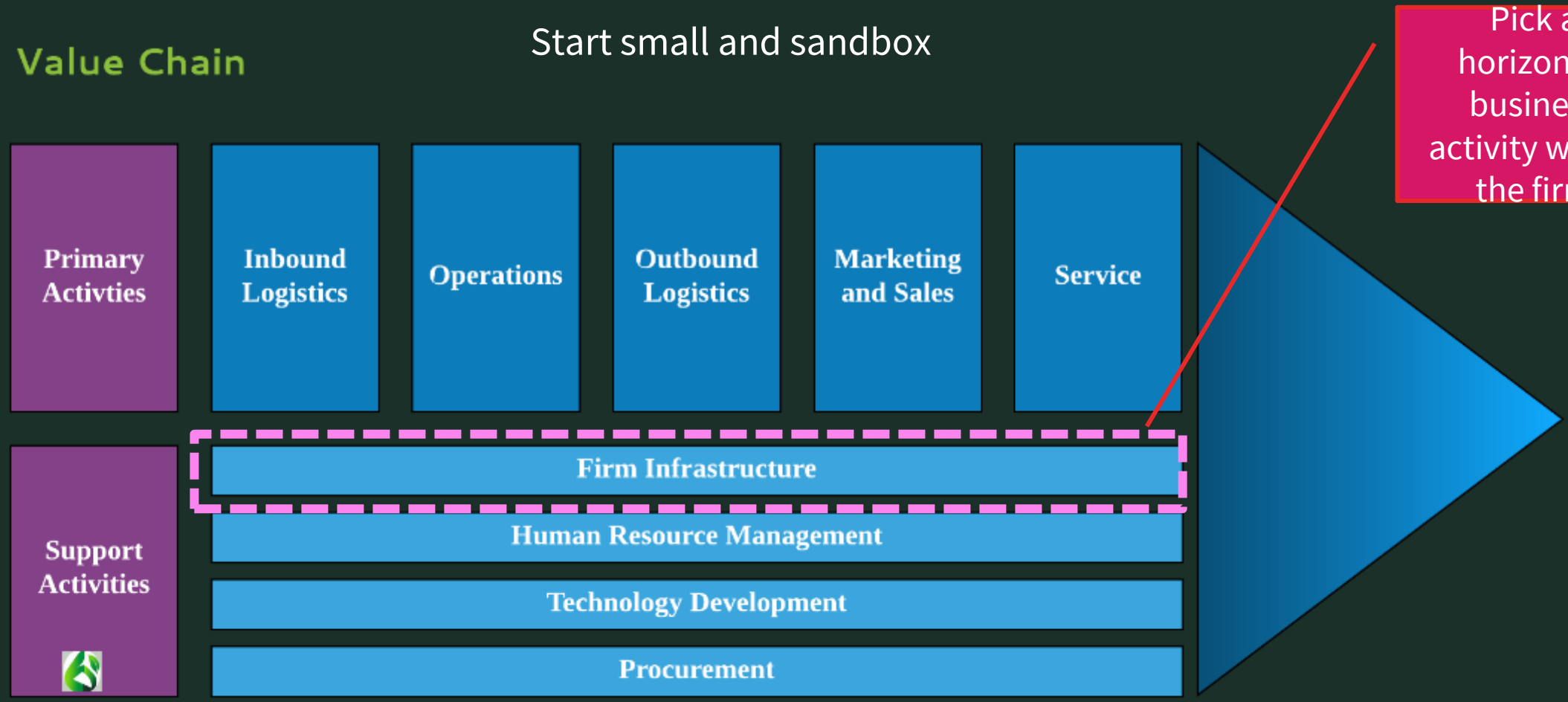


Source: WEF

Firms need to evolve or dissolve?
Can firms gain competitive advantage?

Where do we start AI implementation in an organization?

Start small and sandbox



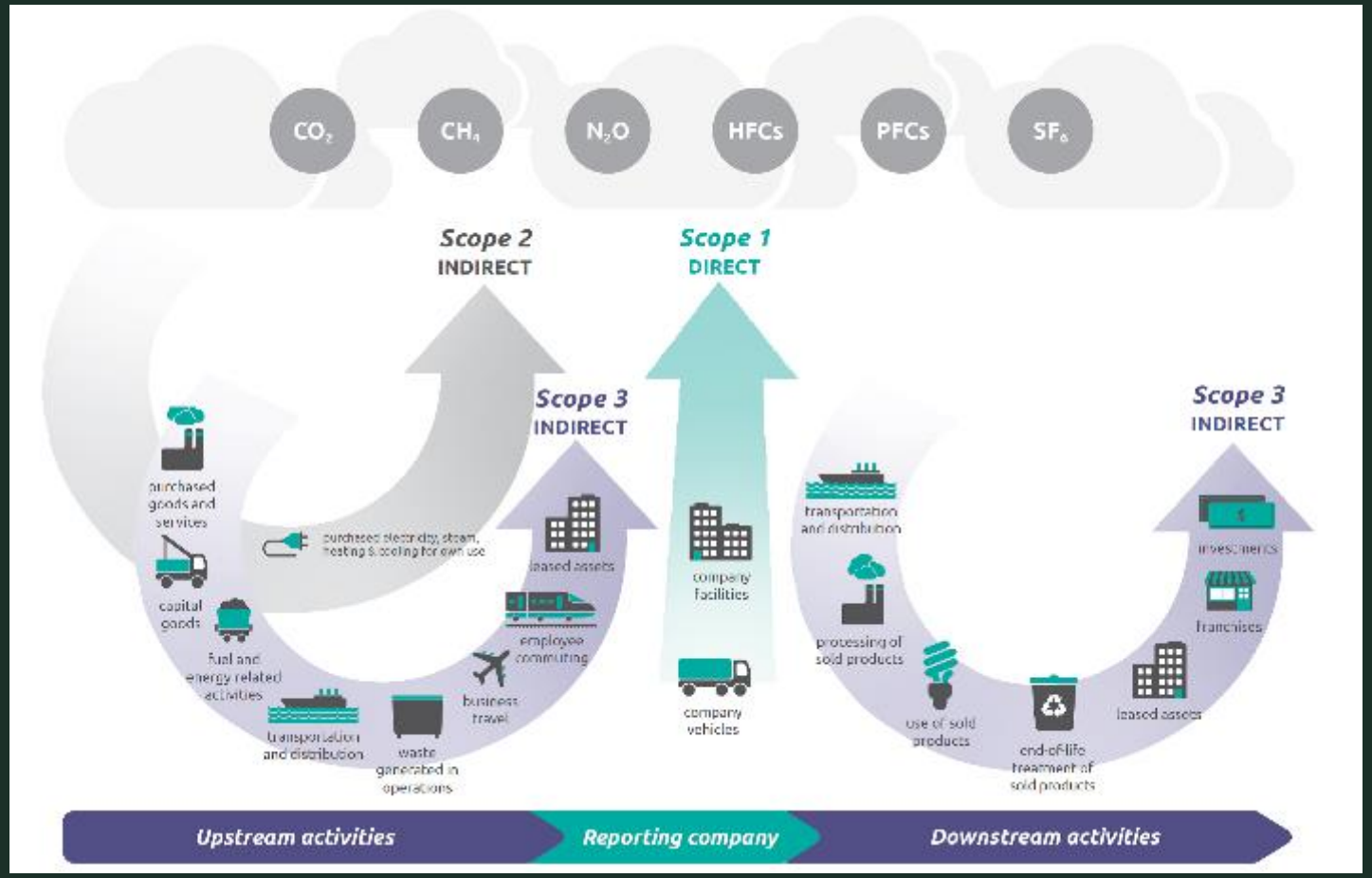
Source: SigmaV

Artificial Intelligence
Used Case – Green Port

AI Used Case – Green Port

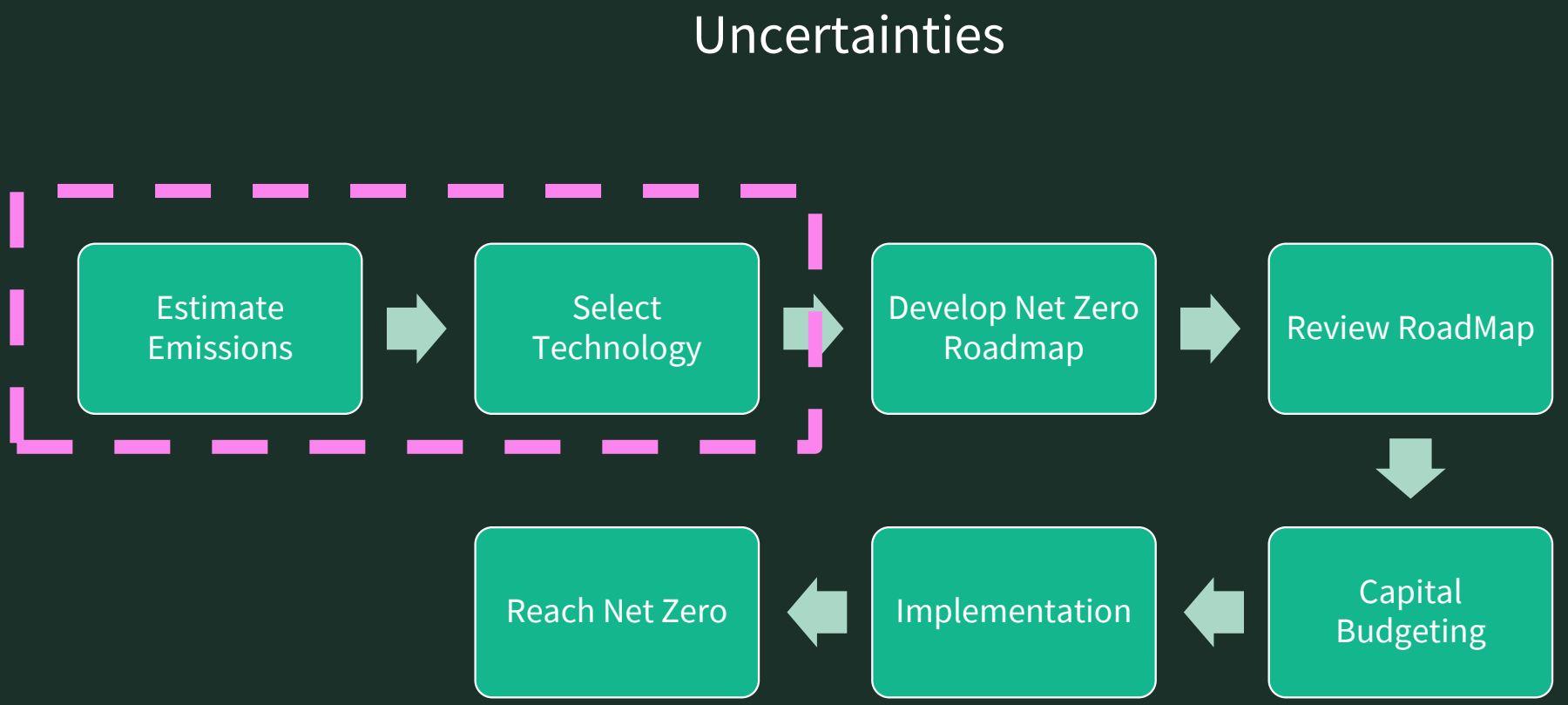
Emissions

- Scope 1
  - Offices
  - Warehouses
  - Yard Trucks
  - Quay Cranes
  - RTGs
- Scope 2
  - Suppliers
  - Electricity Grid if coal
- Scope 3
  - Indirect



Source: US EPA

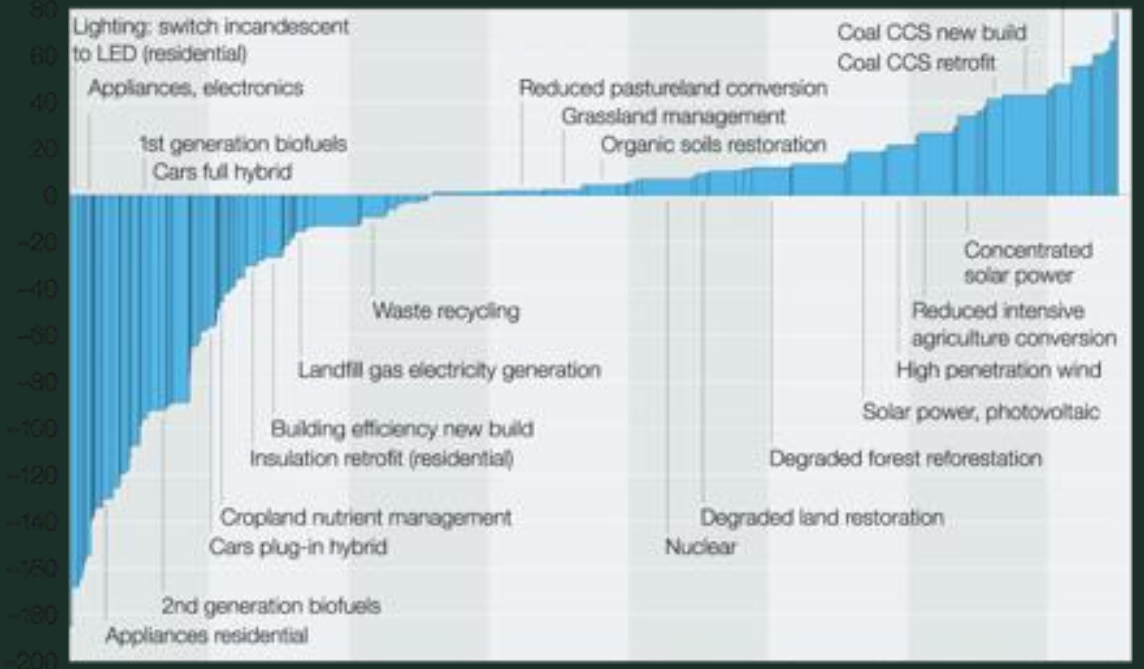
Green Port Decarbonization Roadmap

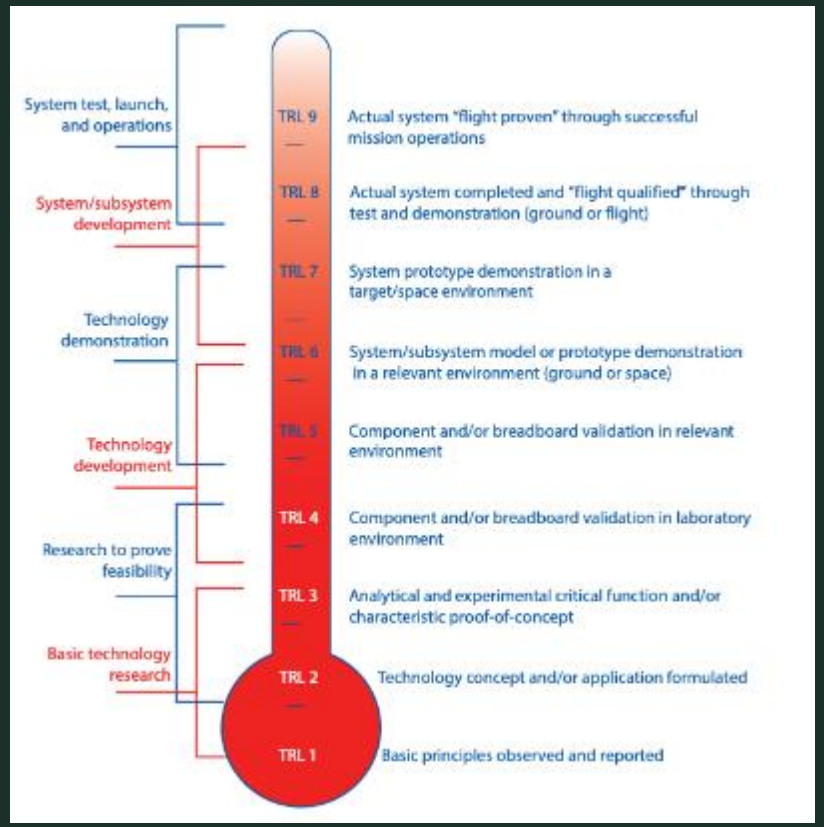


Source: SigmaV

AI Used Case – Green Port

Decarbonization Technologies are Uncertain

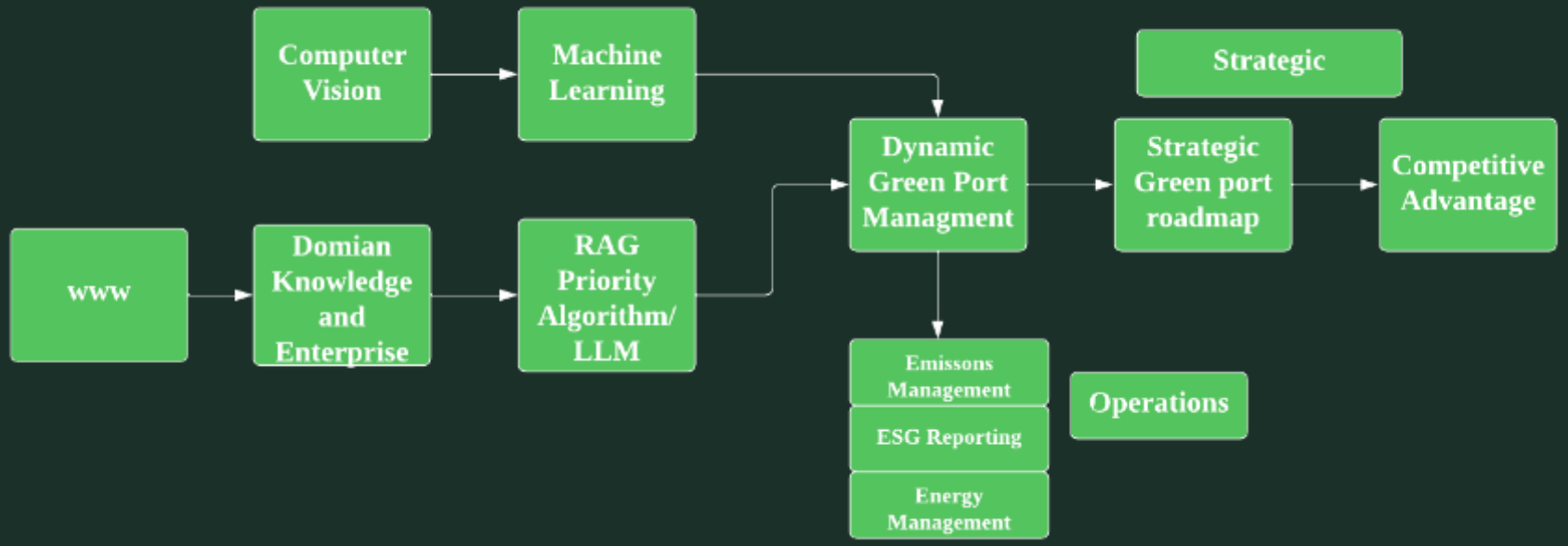




Source: NASA

AI Used Case – Green Port

Green port LLM Model



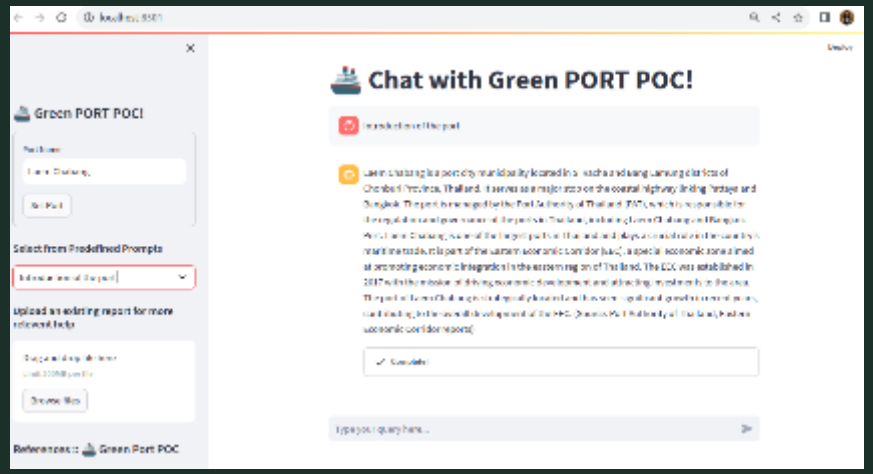
Source: SigmaV

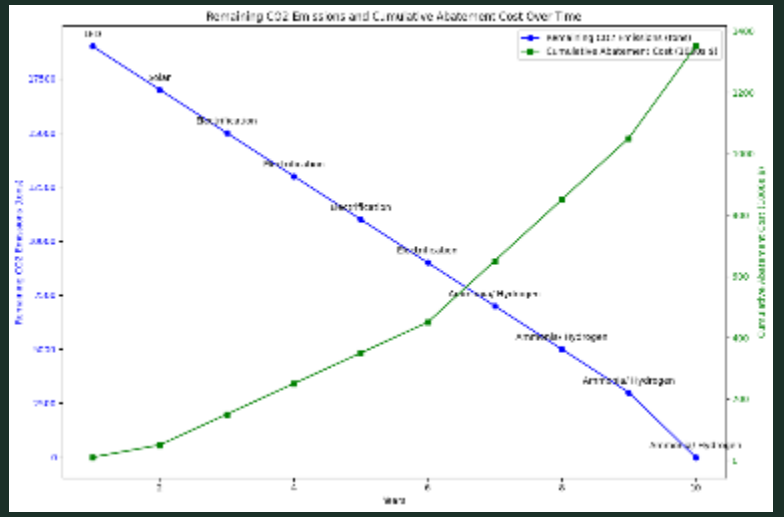
- Local host for security
- Retrieval-augmented generation (RAG)
- Persistent and optimal tokenization
- Efficient API
- Low GPU cost

AI Used Case – Green Port

Dynamic Net Zero Plan using AI

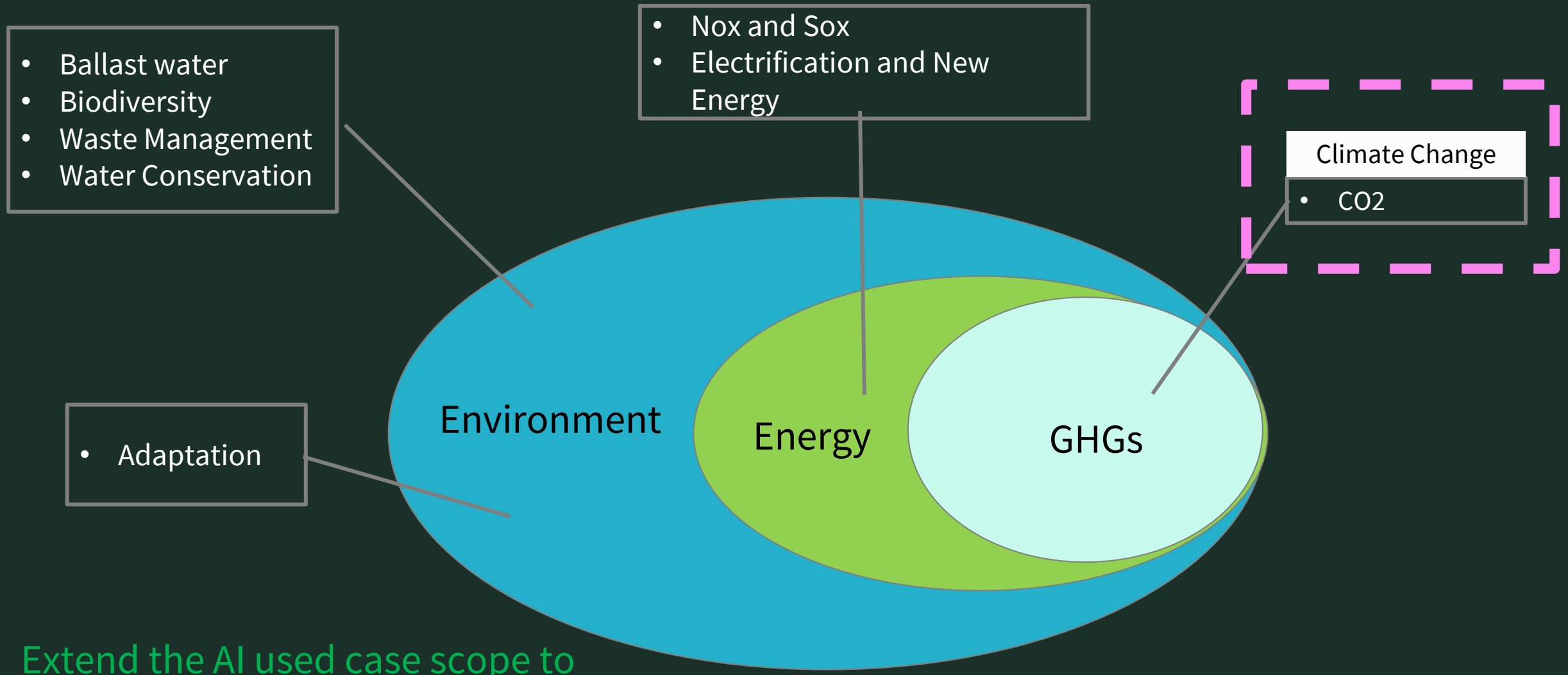
AI LLM → AI ML → Report





- Generative AI and computer vision
- Dynamic Knowledge base updates and unsupervised learning
- Proof of concept to Beta Version

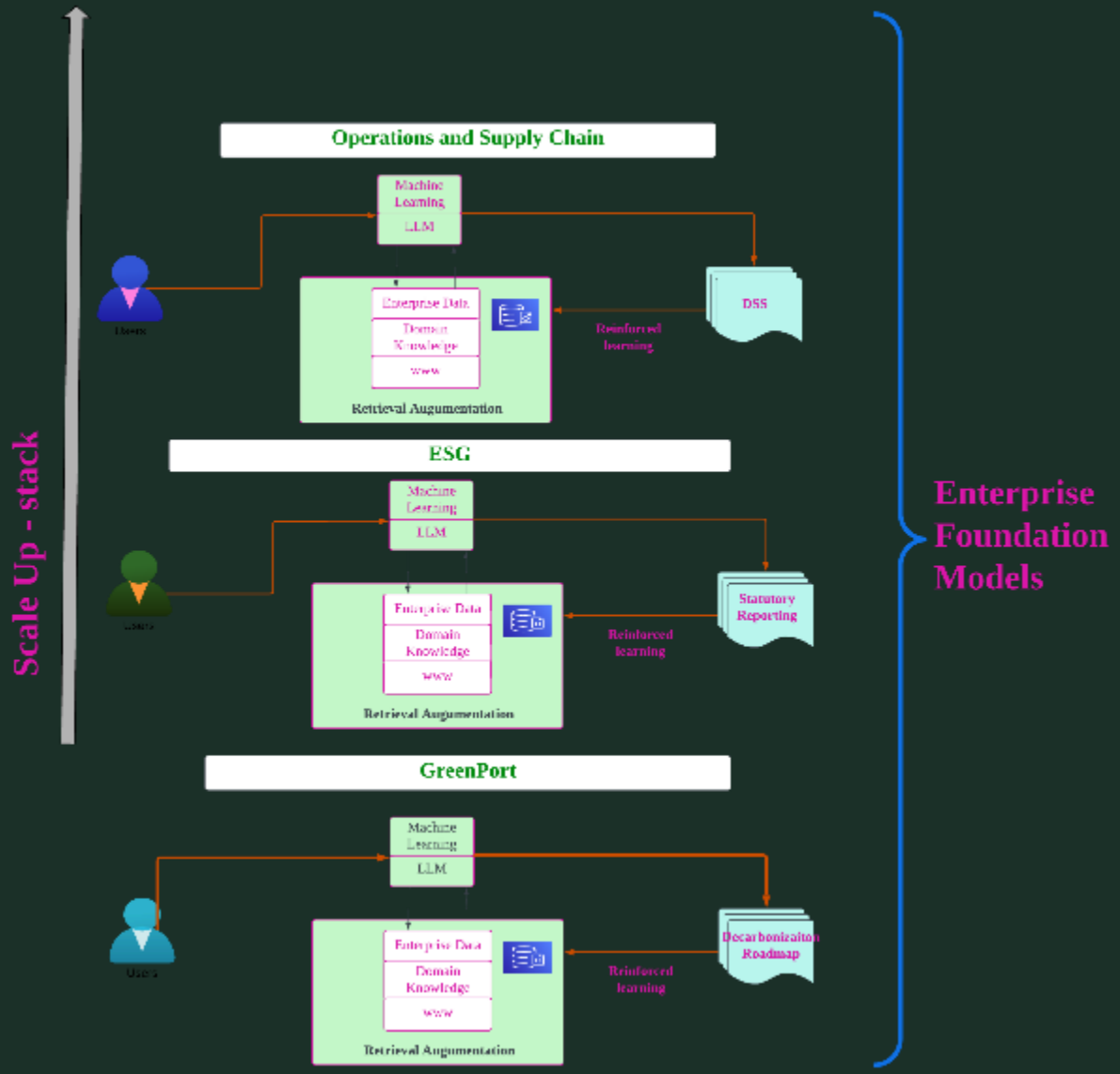
AI Used Case – Green Port



Extend the AI used case scope to cover ESG aspects

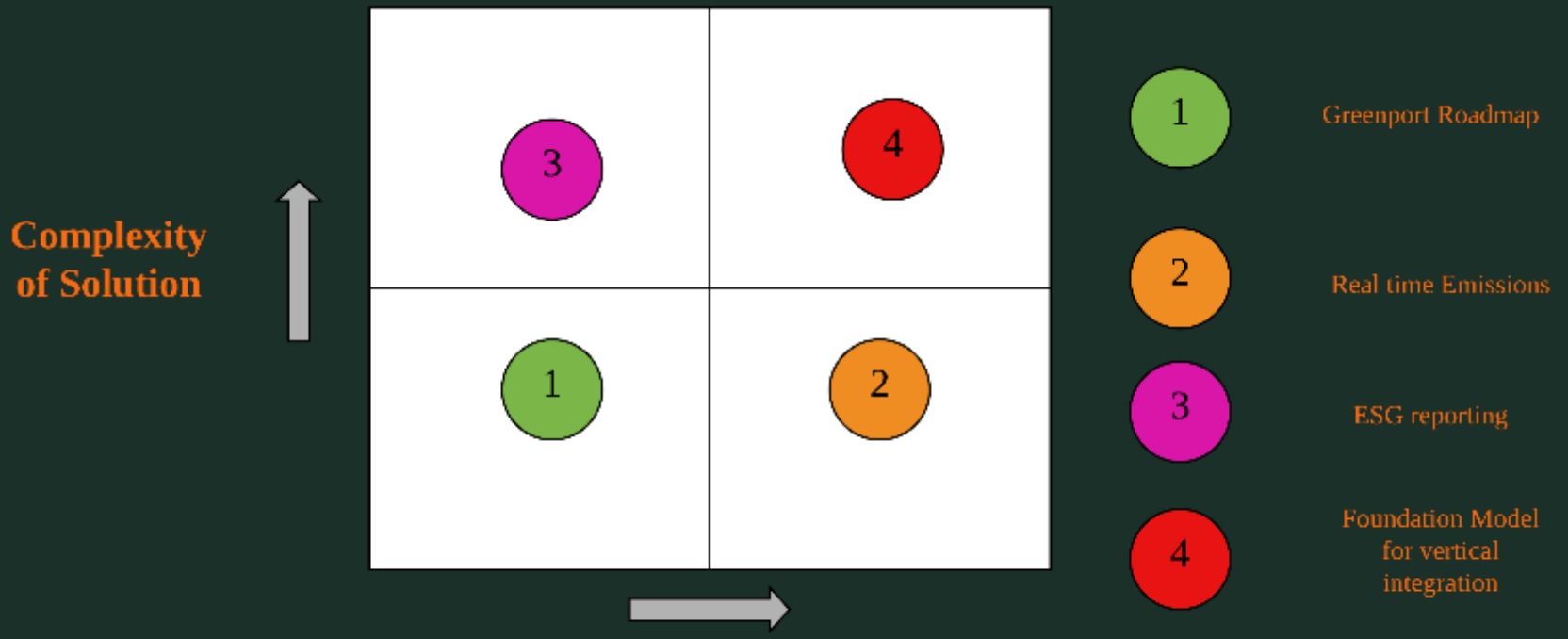
Source: SigmaV

Towards Foundation model



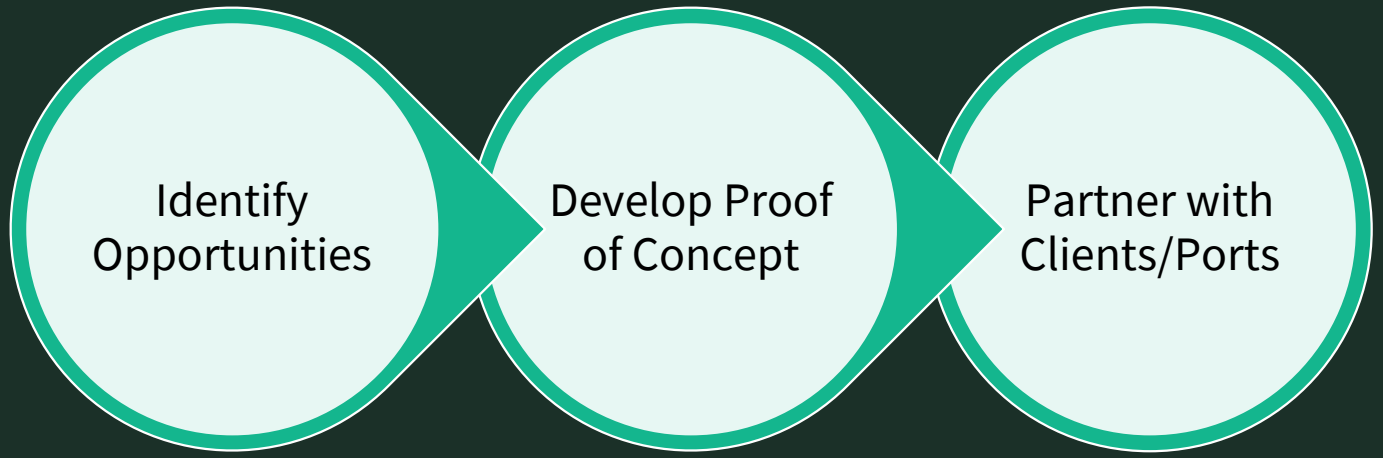
Artificial Intelligence as Competitive Advantage

Step by Step approach towards foundation models



Source: SigmaV

How can we collaborate?



- Low risk and high impact opportunities
- Sandboxing to horizontal
- Architecture based on AI platform development and technical knowledge
- Proof of concept by deploying low hardware and software costs with scalability
- Data protection and IP

Conclusions

1. To meet climate change goals, energy transition is key to decarbonize overall economies including ports and shipping.
2. The main uncertainty is in deploying evolving decarbonization technologies and adopting to ever changing supply chains.
3. Artificial Intelligence will play an important role in accelerating the transition and as means for organizations to gain competitive advantage.
4. Used case of port decarbonization roadmap, dynamically managed the journey towards net zero and green port status, this can be extended to holistically cover ESG aspects
5. Early mover tactics and sandboxing implementation of AI into organizations towards scalability would offer competitive advantage to ports.

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Thank You

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