Ports and Shipping Enabling the Clean Energy Transition Through Common User Infrastructure

PIANC APAC Conference 2024

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28 August 2024

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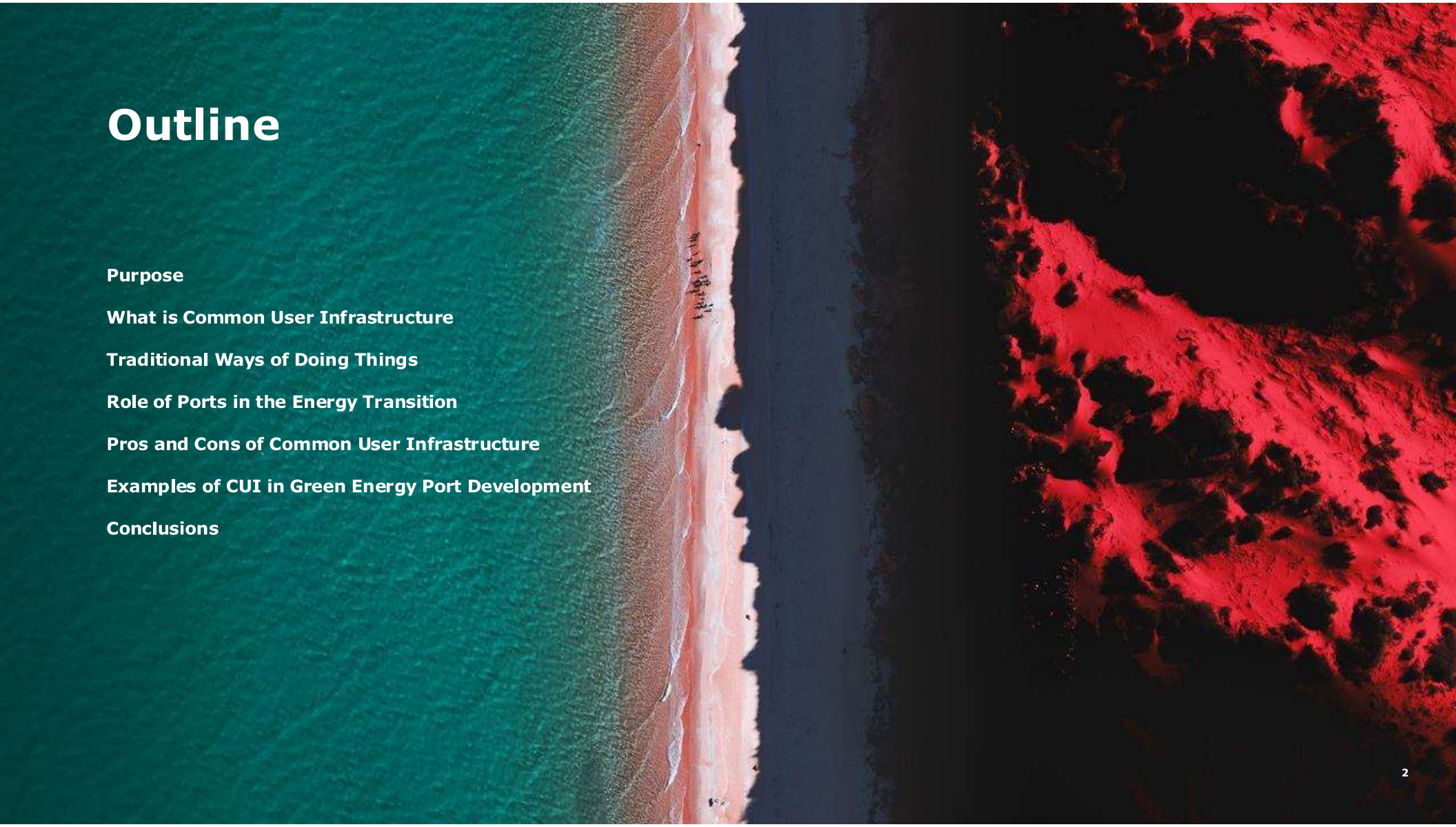

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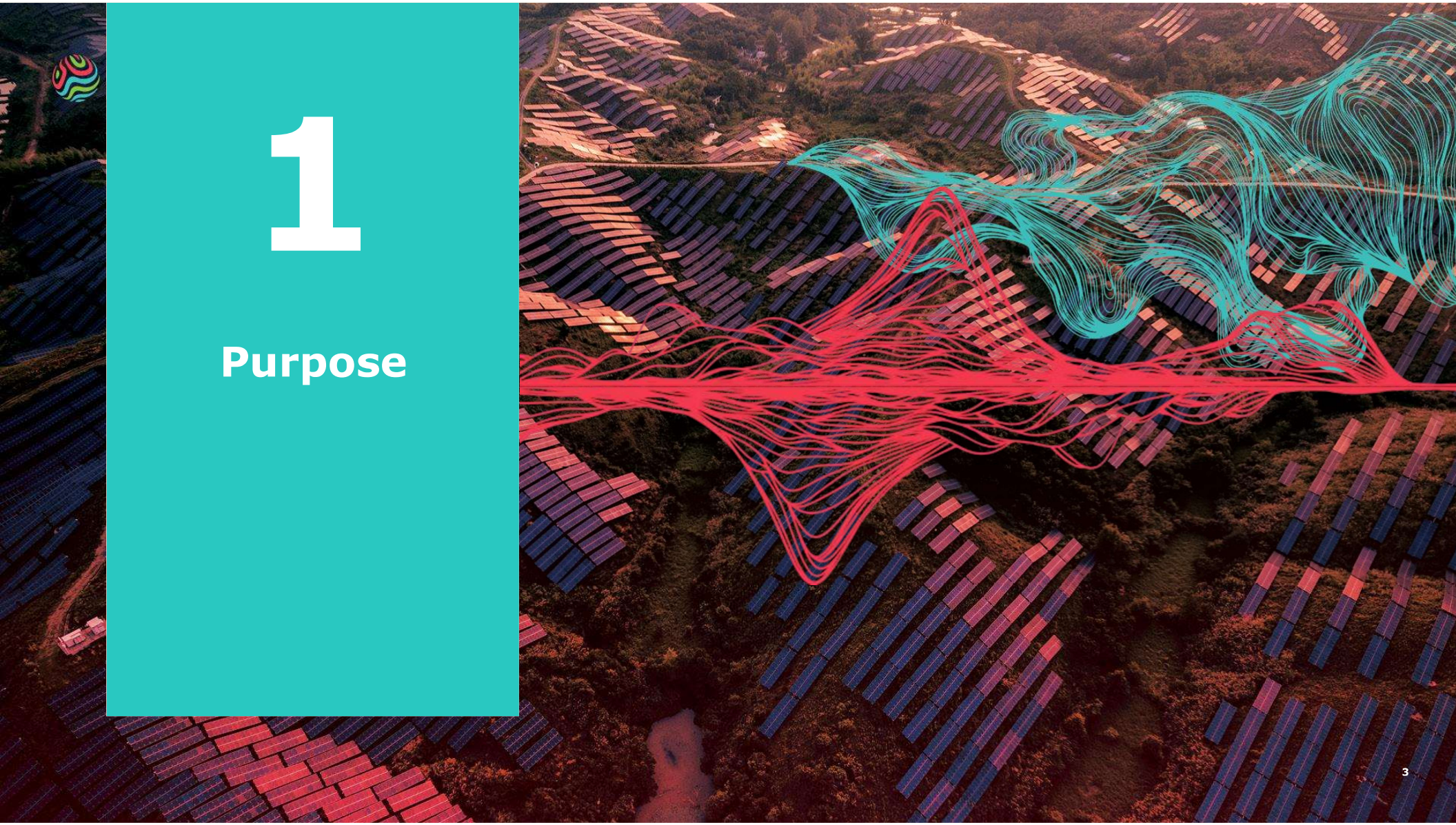
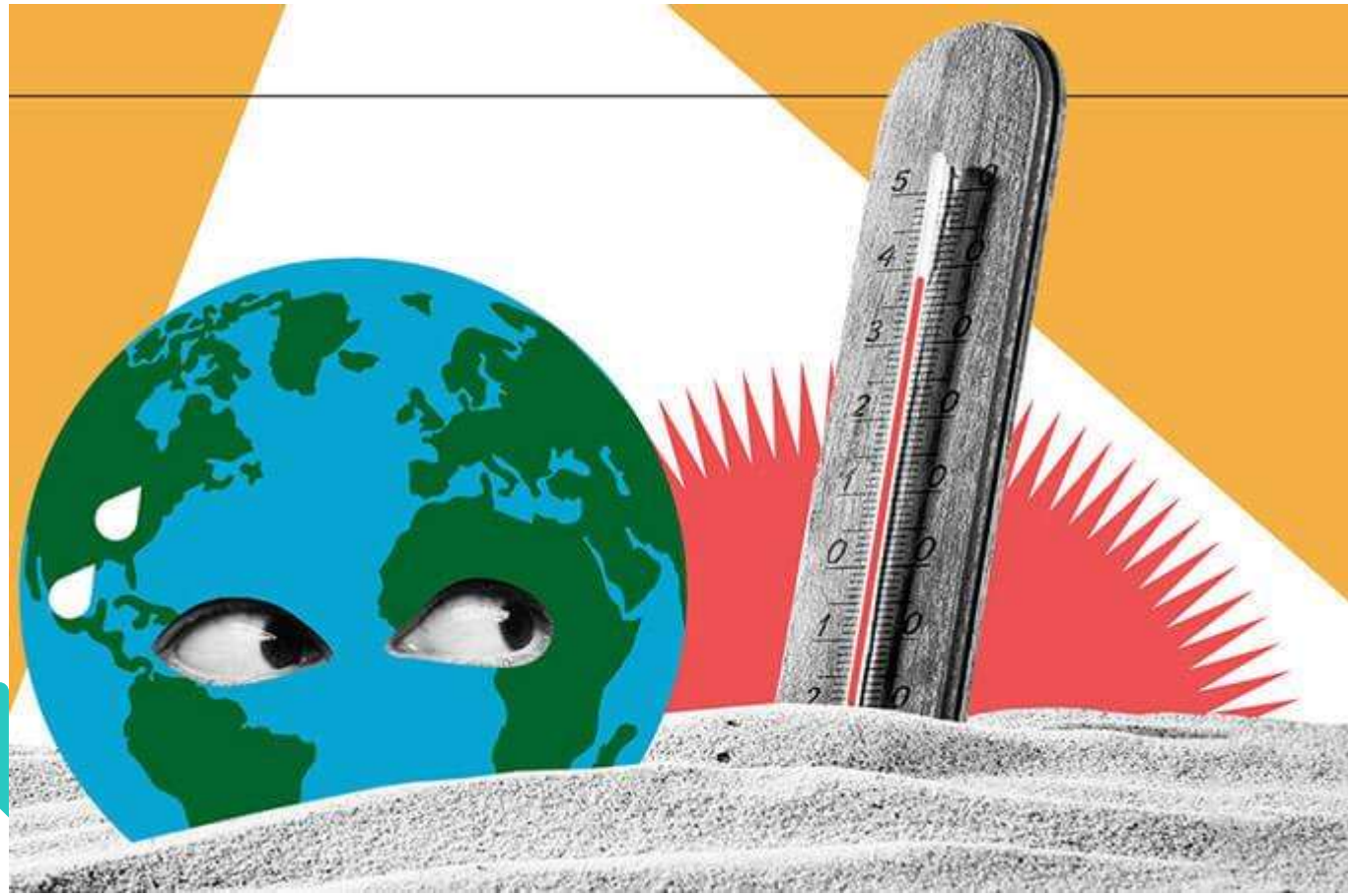
Purpose



Transitioning to a net-zero world is one of the greatest challenges humankind has faced. It calls for nothing less than a complete transformation of how we produce, consume, and move about. The energy sector is the source of around three-quarters of greenhouse gas emissions today and holds the key to averting the worst effects of climate change. Replacing polluting coal, gas and oil-fired power with energy from renewable sources, such as wind or solar, would dramatically reduce carbon emissions.

United Nations

Net Zero Coalition



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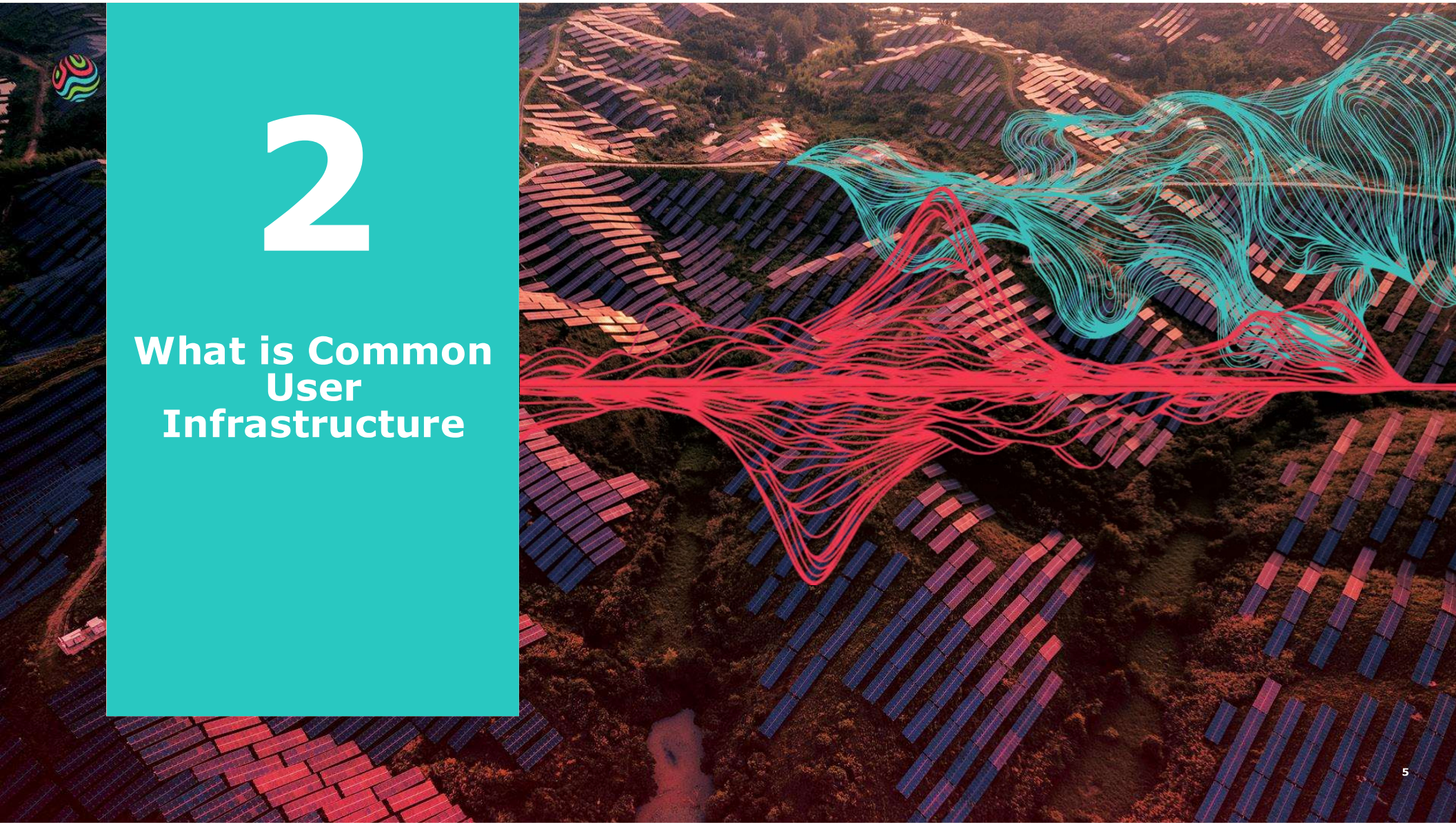
What is Common User Infrastructure



What is Common User Infrastructure

- Common User Infrastructure (CUI) is infrastructure where capacity is shared between multiple users under a defined set of terms.
  - It can range from simple to complex, for example:
    - Airport and internal facilities
    - Utilities networks
    - Transportation infrastructure
    - Industrial Parks
    - Telecommunications
    - Ports

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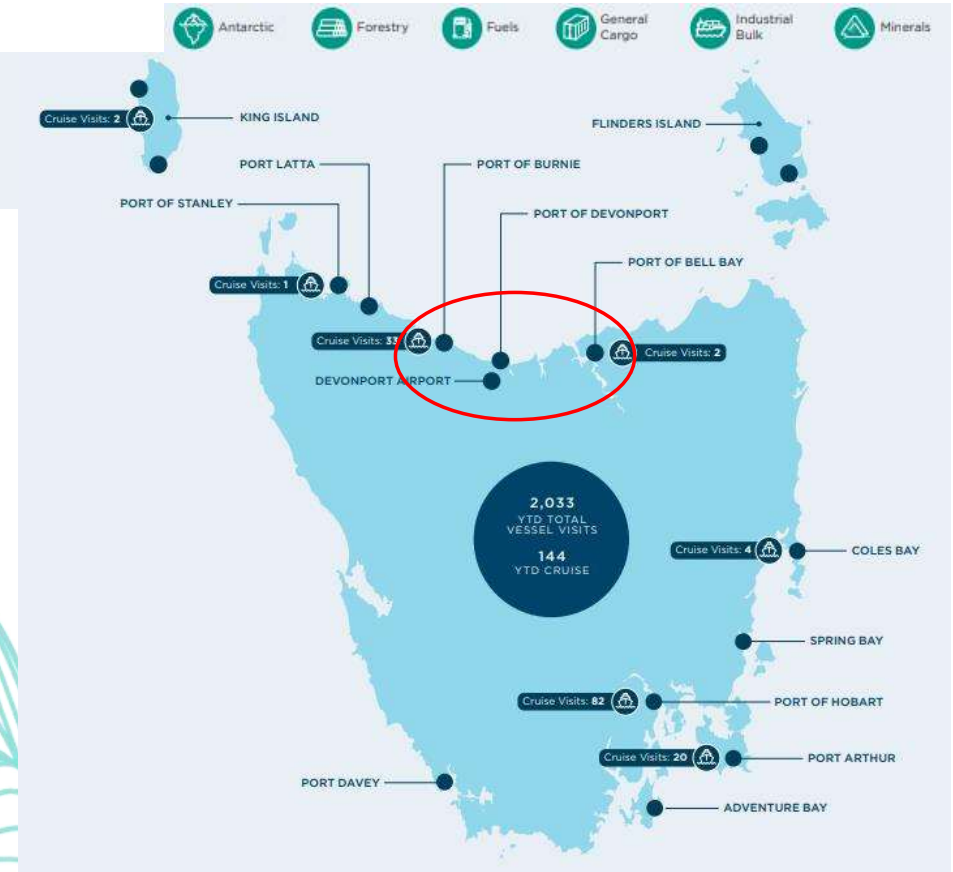
Traditional Ways of Doing Things

Legacy Operating Model

- Legacy operating model in Tasmania was local council run ports in competition with each other vying for each commodity and profit
- Currently all operated by TasPorts with a more wholistic view
- Left with highly underutilised and aged assets



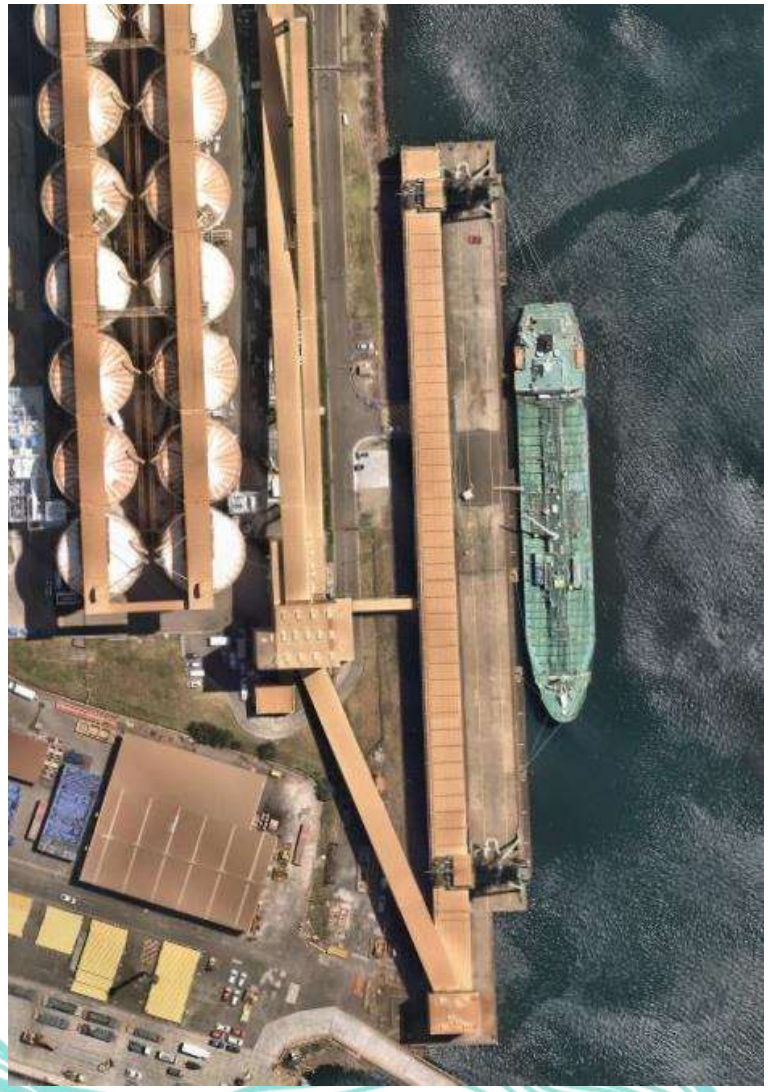
Traditional Operating Model

Curtis Island LNG Export precinct

- Triplication of assets due to 3 proponents
- 850 ha of land utilised for the same purpose

Hybrid Operating Model

- Port Kembla Berth 104 and Mackay Berth M3/M4
  - Taking advantage of seasonal berth usage – alternative commodities during grain/sugar off seasons



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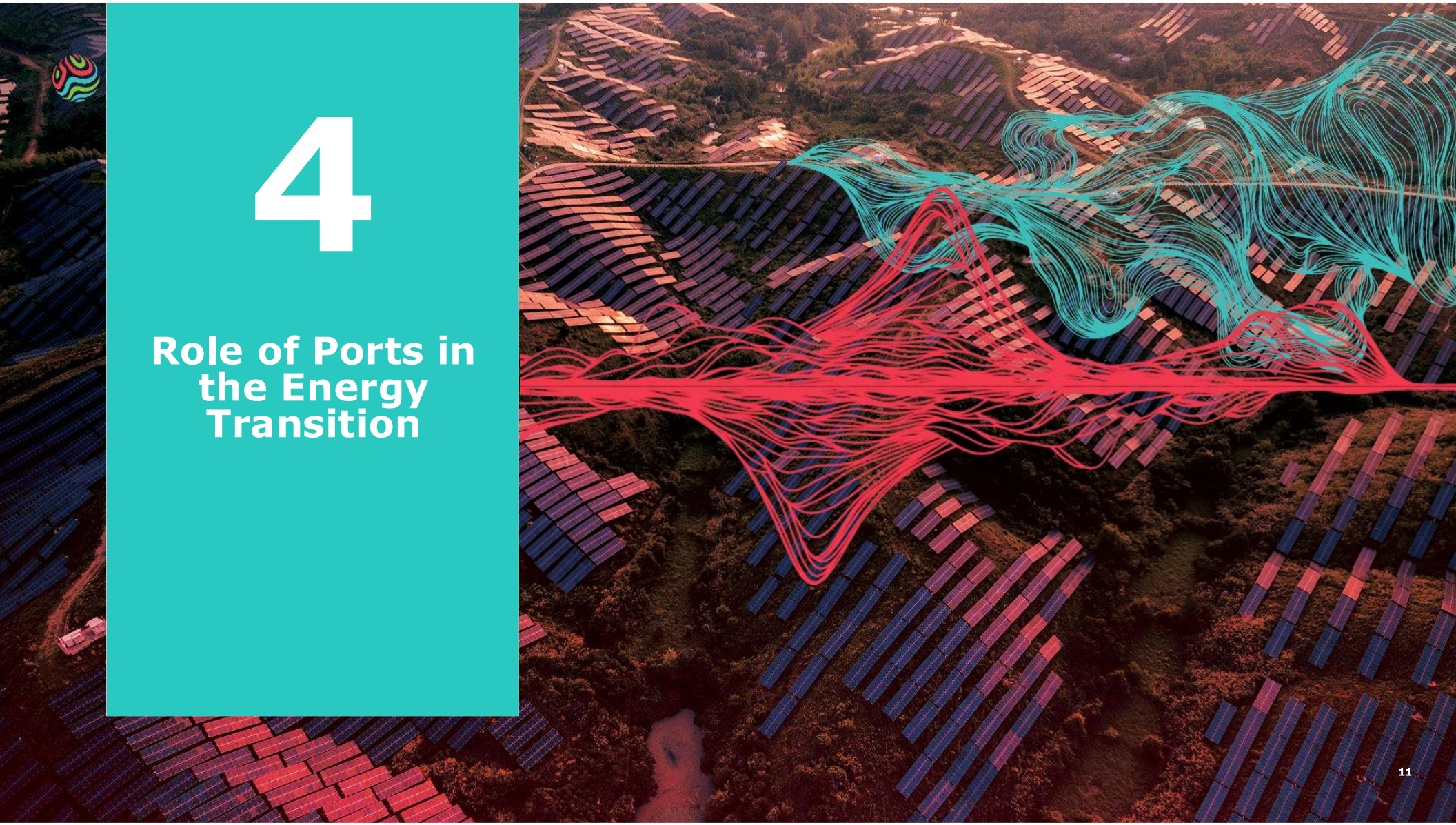
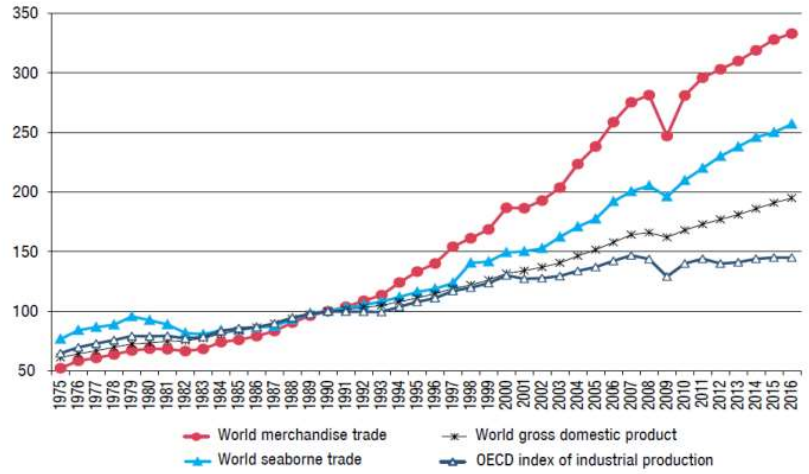
Role of Ports in the Energy Transition

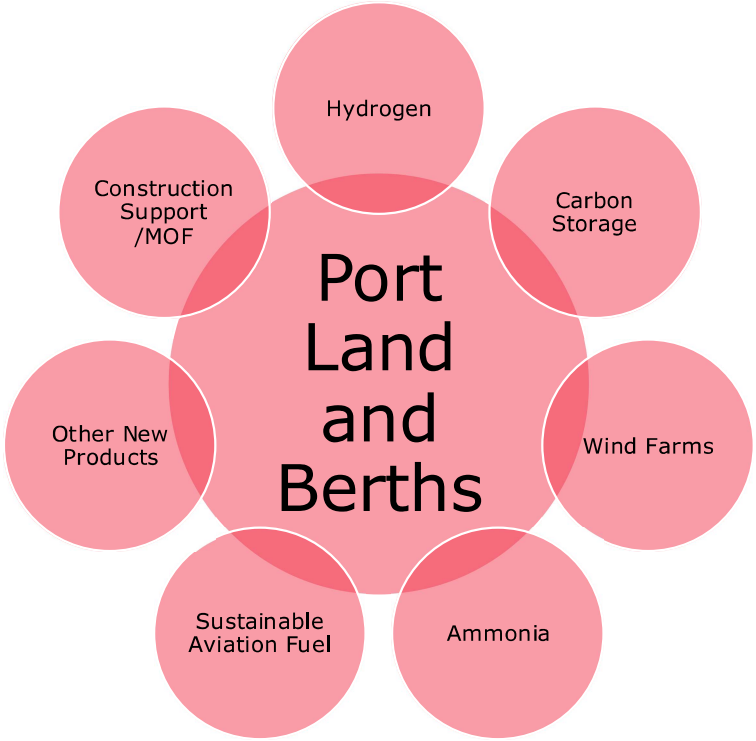


The Role of Ports in the Energy Transition

Figure 1.1. Organization for Economic Cooperation and Development index of industrial production and world indices: Gross domestic product, merchandise trade and seaborne shipments, 1975–2016 (1990 = 100)

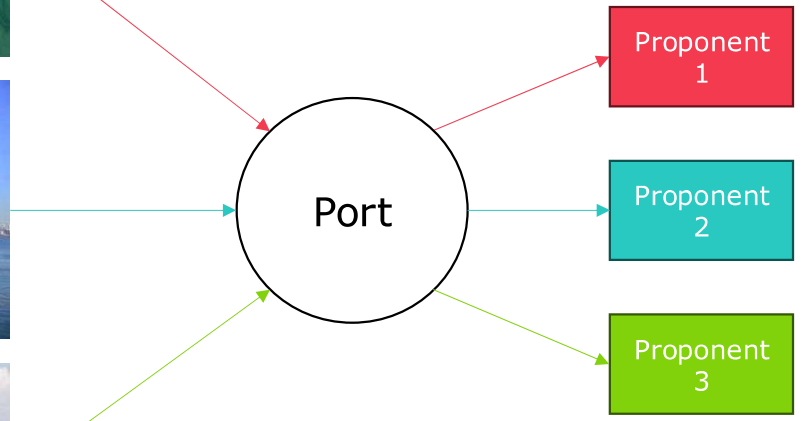


Sources: UNCTAD secretariat calculations, based on data from OECD, 2017; United Nations, 2017; *UNCTAD Review of Maritime Transport*, various issues; World Trade Organization, 2012.
Note: Index calculations are based on GDP and merchandise trade in dollars, and seaborne trade in metric tons.



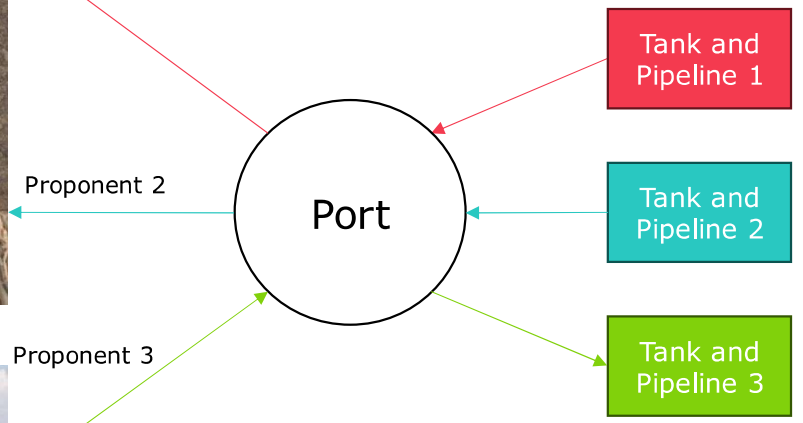
The Role of Ports in the Energy Transition

- In the Australian context during the transition
  - Import gateways for
    - Green power plant
    - componentry and plant to enable production of fuels
    - Carbon for storage (from other ports/area)
  - Export gateways for
    - Commodities
    - Carbon for storage (to other ports/areas)



The Role of Ports in the Energy Transition

- Two green energy export and LCO2 Import
  - Traditional way



The Role of Ports in the Energy Transition

- Two green energy export and LCO2 Import
  - Utilising common user infrastructure

Proponent 1

Proponent 2

Proponent 3

Port With CUI

Tank and Pipeline 1

Tank and Pipeline 1

Tank and Pipeline 2

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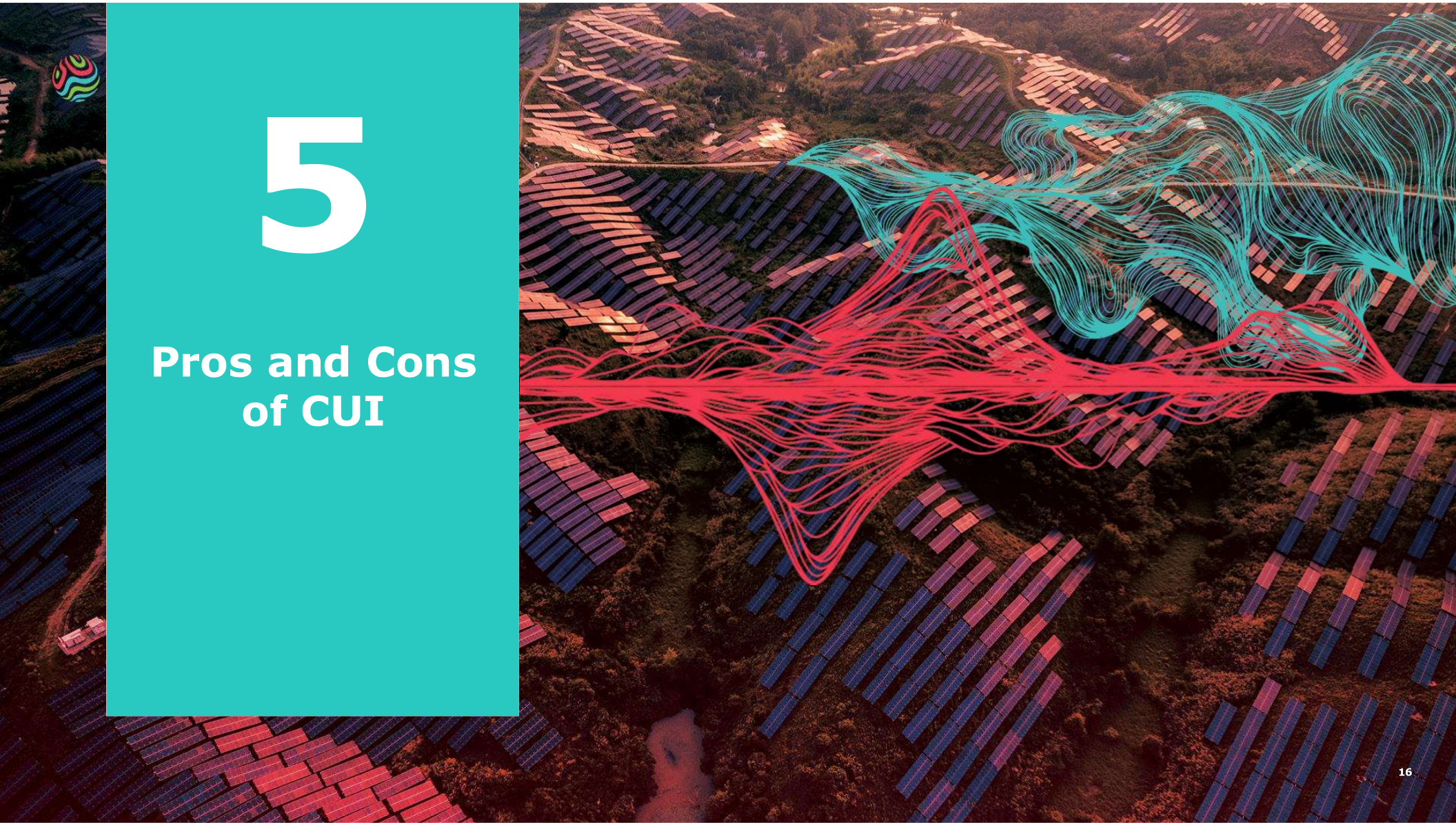
Pros and Cons of CUI



General Benefits and Downside of CUI

- Pro
  - Allows for a more level playing field for smaller players
  - Less risk for proponents to start a new industry, such as H2 export through a port
  - Minimise risk of proponents not maintaining infrastructure leading to spills/leaks/failures as they rent pipelines etc

- Con
  - Commercial and contractual risks for owner/port
    - Can require collaboration of competing entities
  - Large upfront capital cost and planning from port
  - Proponents' hands can be 'tied'
  - The unknown of 'not business as usual'
  - Storage of different 'colours' of H2 and certification

Single Proponent Example

- Assuming single proponent for green energy export
  - Each area includes the hazard zone
  - Total site equivalent to 17 MTPA of Ammonia production

CUI Example

- Assuming CUI for all green energy production
  - Land use reduction by ~2/3
  - 50% less tanks
  - Construction CO2 emissions reduced > 50%
  - Capital cost reduction of ~50%
  - Consolidation of pipelines and corridors

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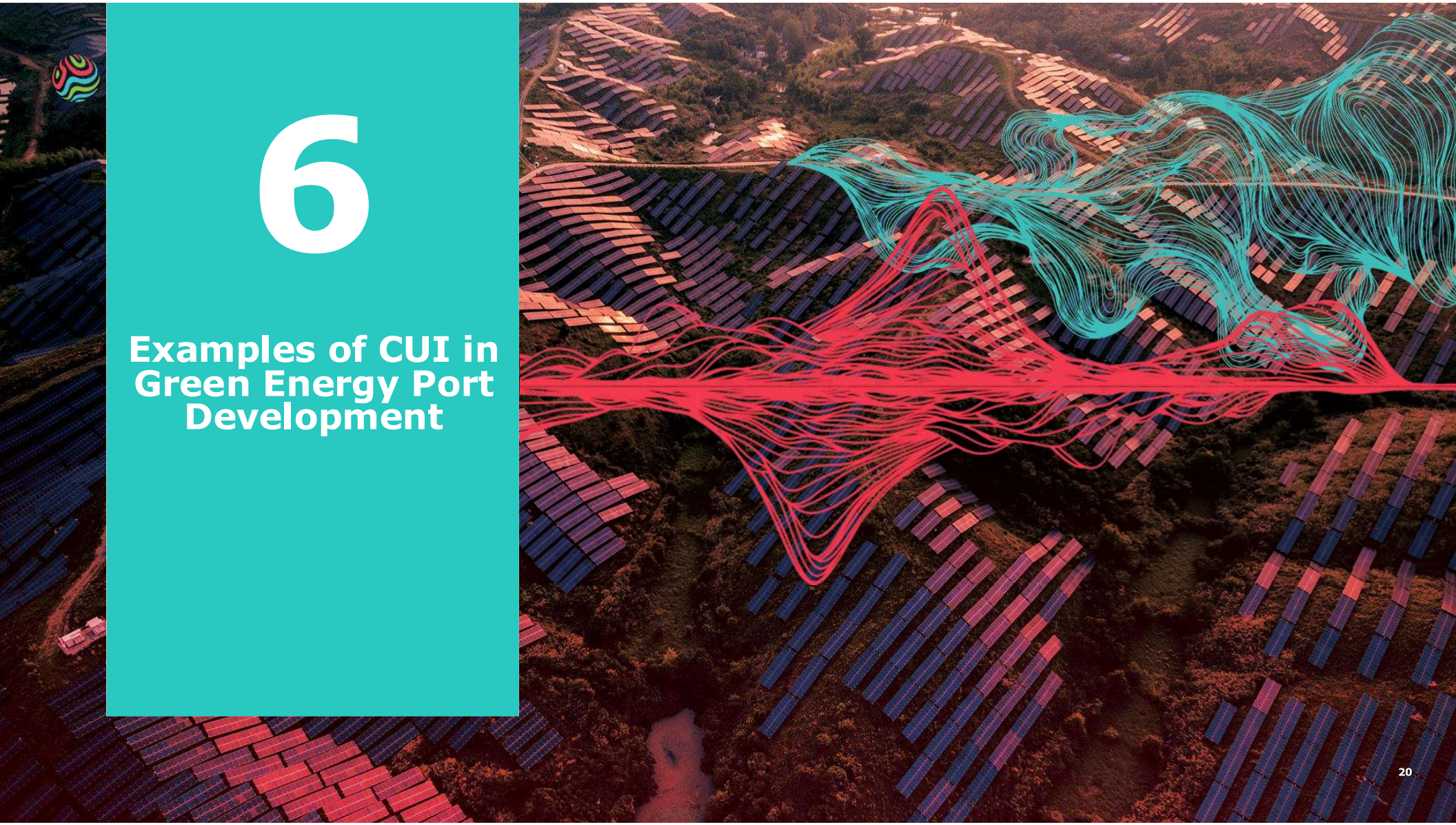
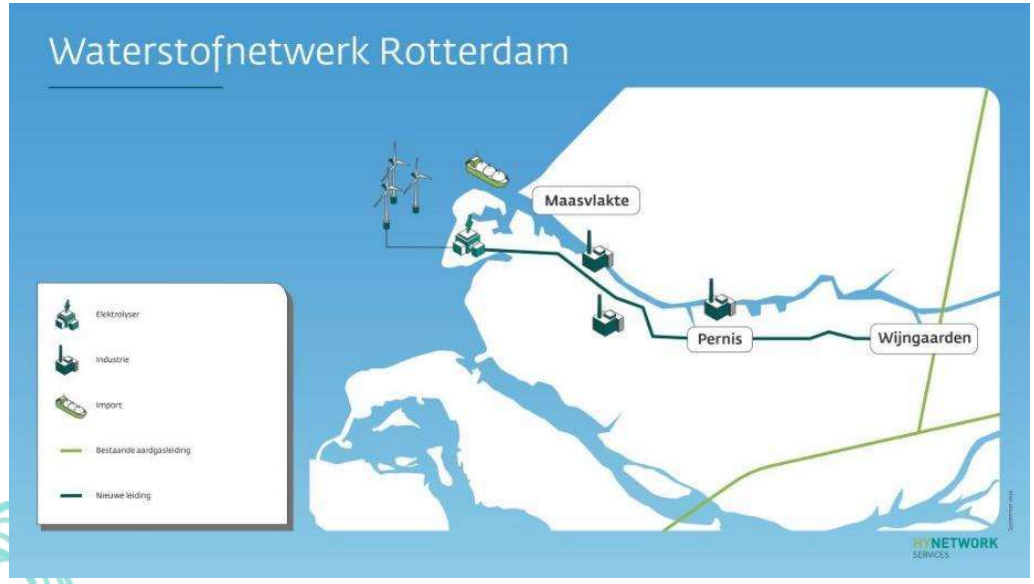
Examples of CUI in Green Energy Port Development



Port of Rotterdam

CUI/open access H2 pipeline from port and producers through city to consumers developed by Hynetwork

Port developing a conversion park to produce green hydrogen. By grouping the plants, they can use common facilities such as power, pipelines, transport etc.



Pecém Port Brazil

- Natural Deepwater port operating since 2002
- Pecém's strategic location gives it the potential to become the logistical and industrial hub of Northeast Brazil.
- World Bank’s first green hydrogen shared infrastructure project

Port of Newcastle Clean Energy Precinct

- Will support all green energy projects by providing access to
  - Land
  - Utilities
  - Storage
  - Transport
  - Export infrastructure and services
- The common user model encourages efficiency through economies of scale and supply chain coordination and is a critical part of the existing energy supply chain at the Port

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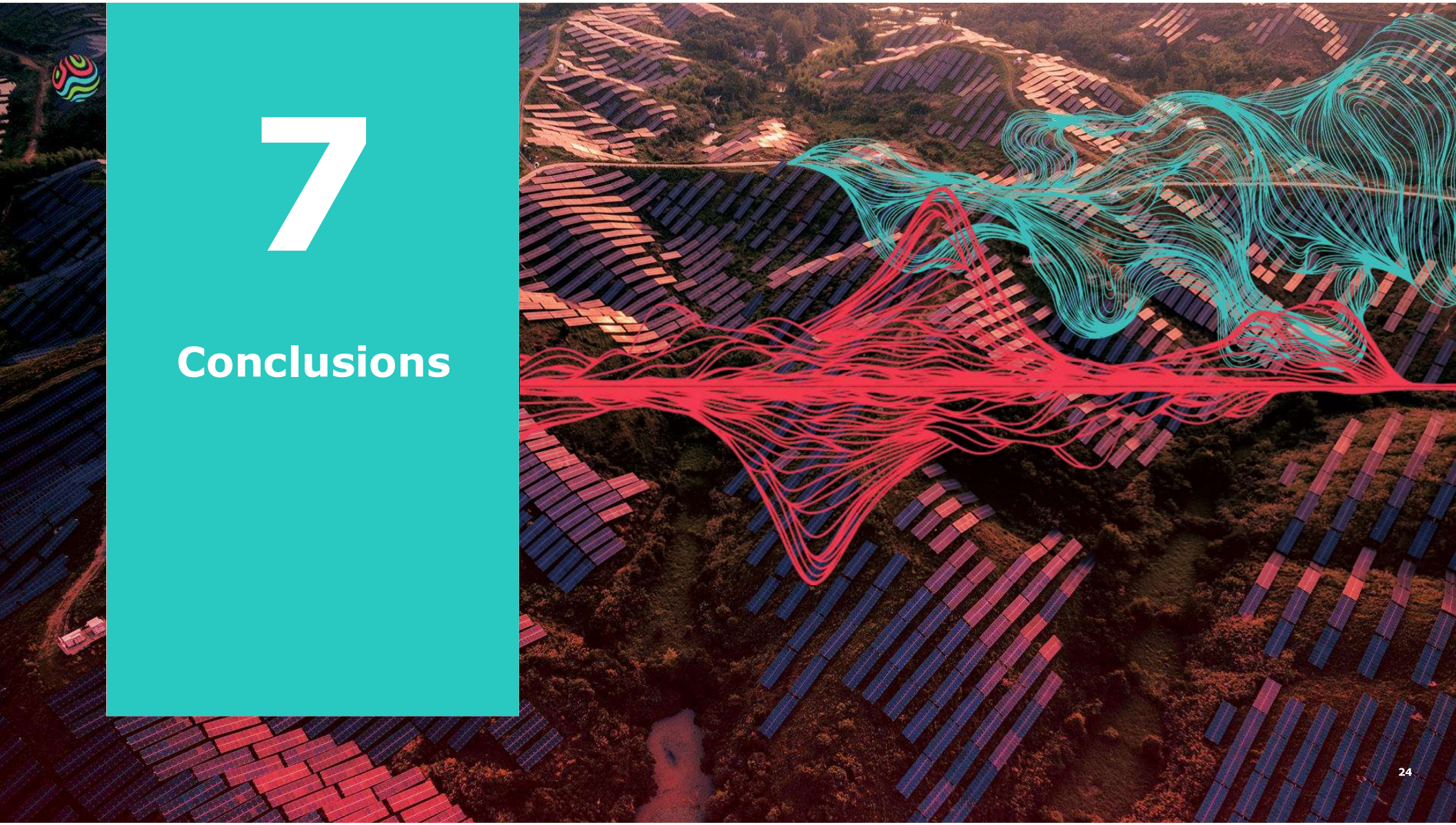
Conclusions



Conclusions

- Can provide consolidation of green energy infrastructure reducing footprint and cost
- Allow smaller players an opportunity to start up
- Requires additional commercial discussions compared to 'traditional' operations
- Requires thought out planning and early risk reviews

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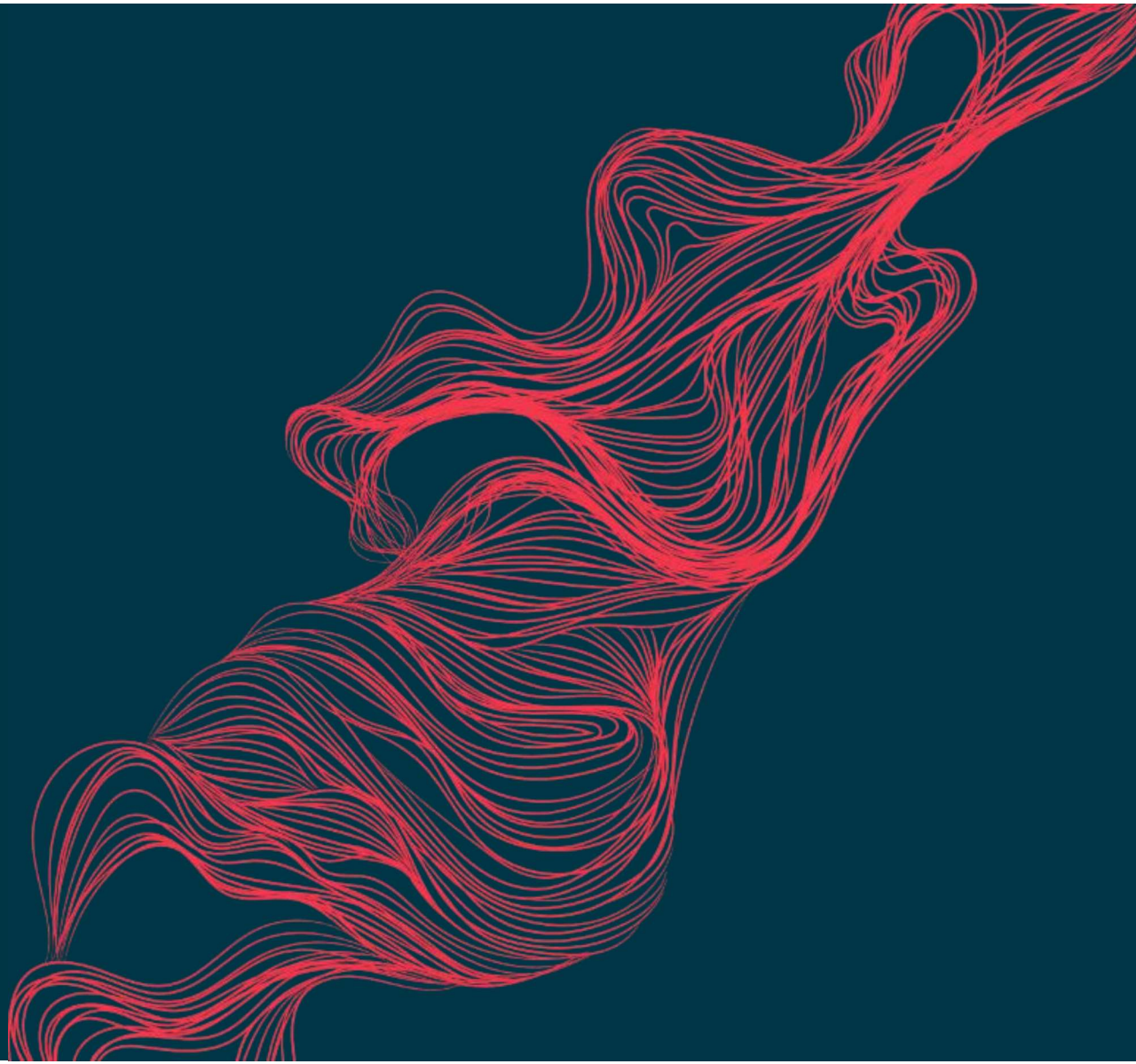


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