2.1 Regional Energy Planning and Grid Integration

ASIA CLEAN ENERGY FORUM 2025

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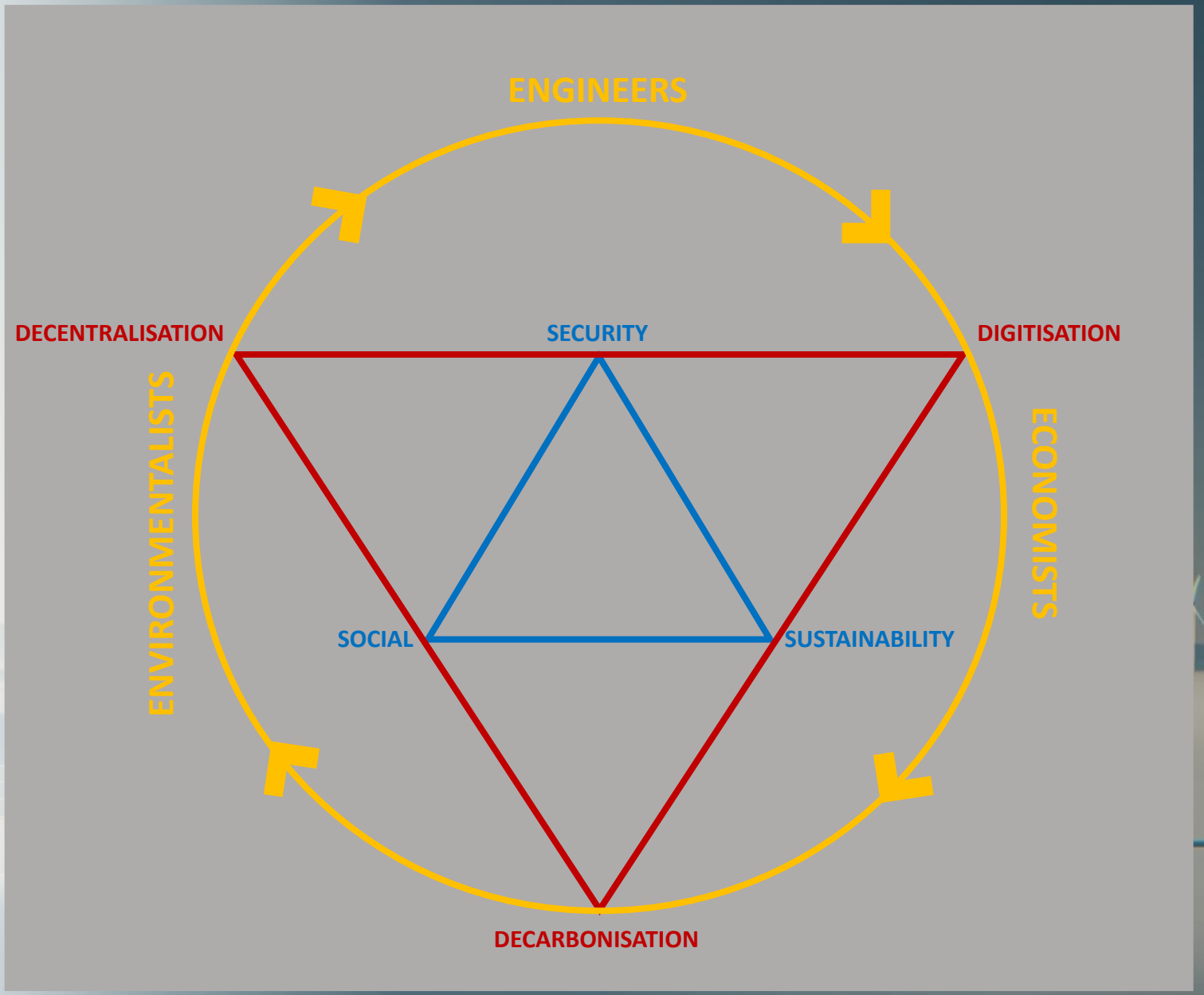
ETNA

Energy Transition Navigation Assessment



PHASE 1 -THE THREE “S”s

SUSTAINABILITY

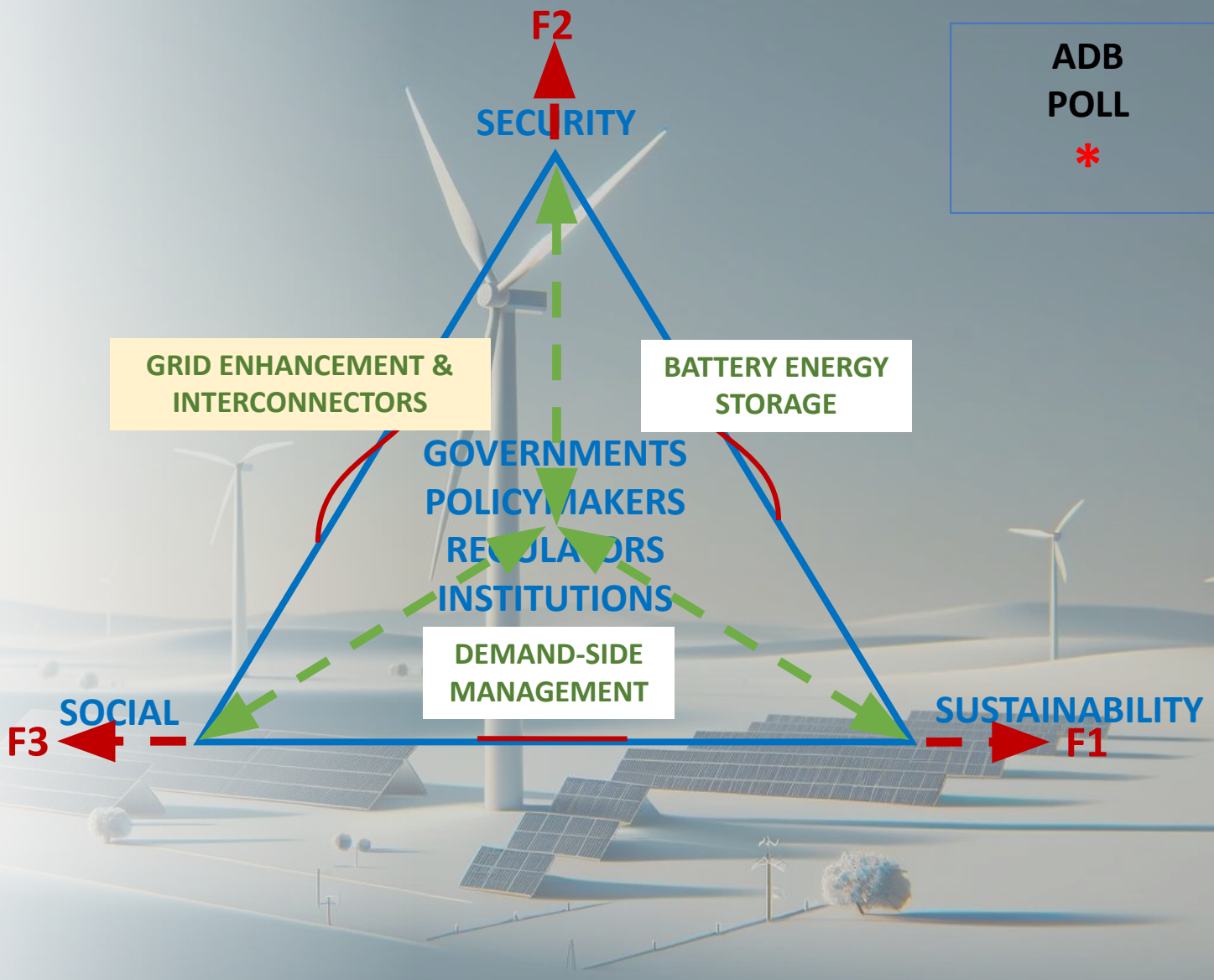
- R.E Generation (Mandating renewable energy quotas)
- EU, UNCC, NDCs, Corporate & sector targets.
- Attractive to investors – defined asset limits, defined offtakes / PPAs
- Intermittent – Variable - Unpredictable

SECURITY OF SUPPLY

- Ensuring grid stability and customer continuity while incorporating renewables.
- Strengthening energy infrastructure - resilience
- Localization, reduce import of fossil fuels.
- BESS – DSM - Grid Enhancement & Interconnection

SOCIAL AFFORDIBILITY & DEMOCRITISATION

- Enduring affordability & democratisation
- Creating green jobs and opportunities.
- Addressing renewable energy equity.
- Inequality of cost burden of grid development
- Promoting energy consumption awareness.



ADB POLL *

PHASE 2 -THE THREE “D”s

Decentralisation

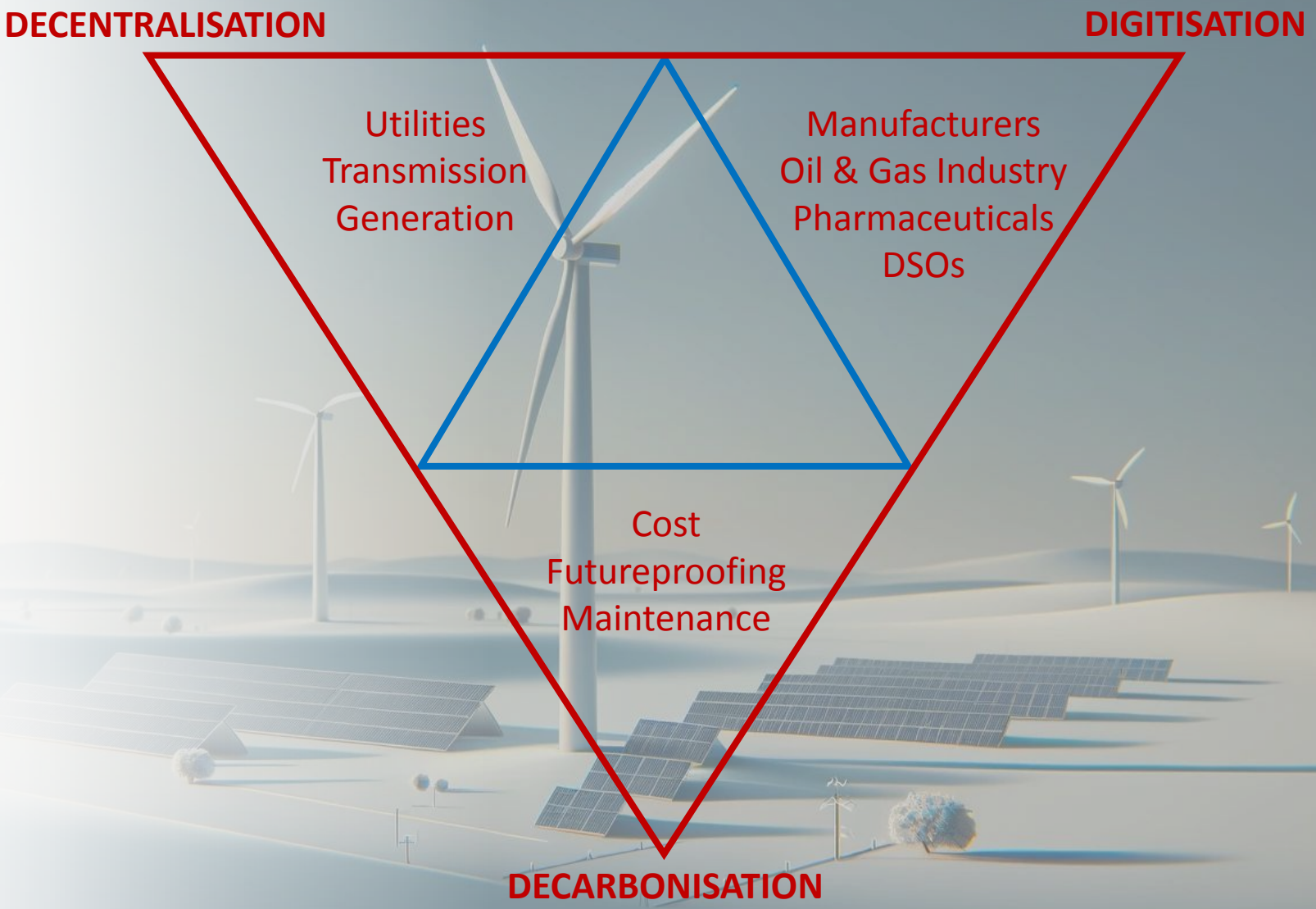
- Locational energy systems.
- IPPs, Industry, Community, Domestic
- Peer-to-peer RE trading.
- Distributed Energy Resources – DERs
- Virtual Power Plants - VPPs

Digitisation

- Integrating Smart Grid technology.
- Enhancing energy data analytics. AI.
- Digital energy management tools.

Decarbonisation

- Accelerating shift towards net zero.
- Net zero policies.
- Supply-Side + Demand Side.



PHASE 3 – THE THREE “E”s - MANAGEMENT ETHOS, CORPORATE KEY DRIVERS, & MATURITY ASSESMENT

Engineers

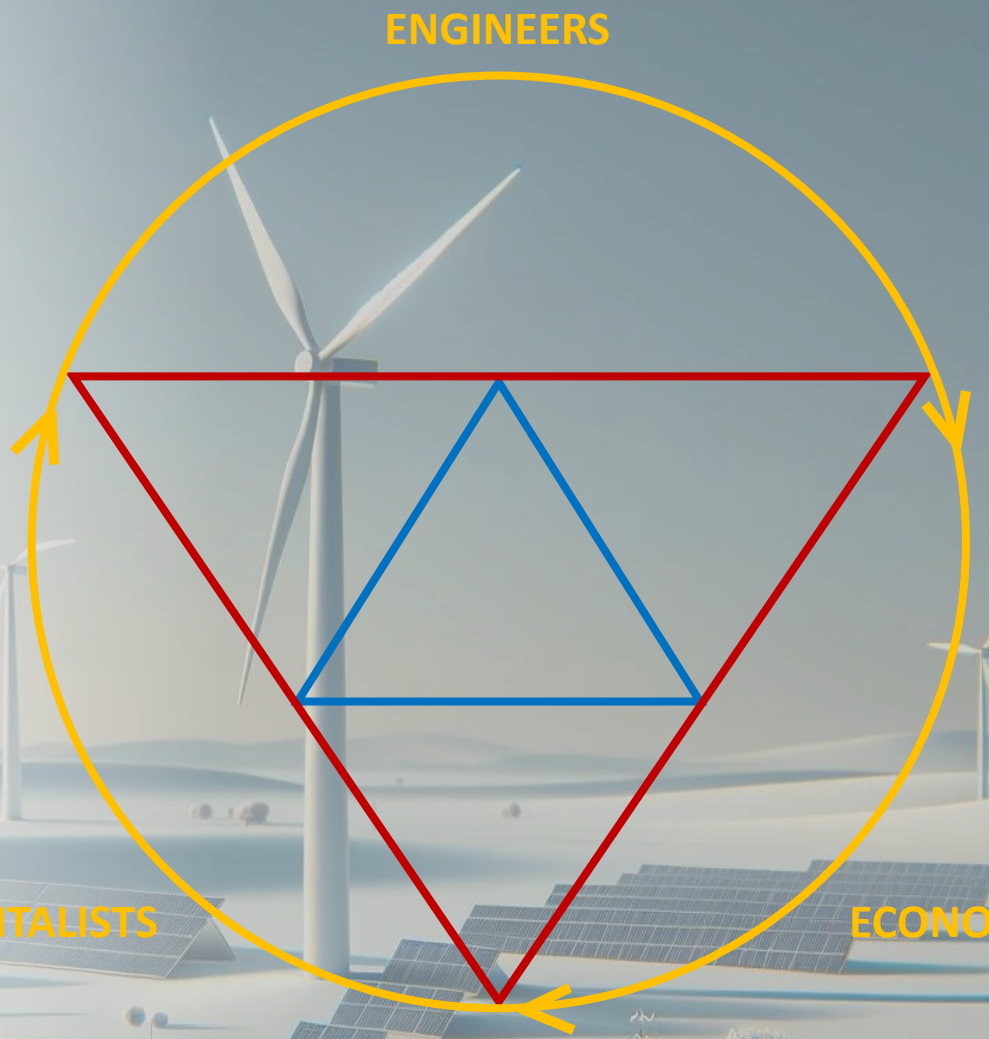
- Designed, built, operated Systems
- Engineering practicality; fit-for-purpose
- New-builds; refurbishments; continuous improvement

Economists (financials)

- Analysing energy market trends.
- Advising on sustainable economic models.
- Assessing the financial benefits of solutions
- WACC; IRR; ROI; NPV, hurdle rates.

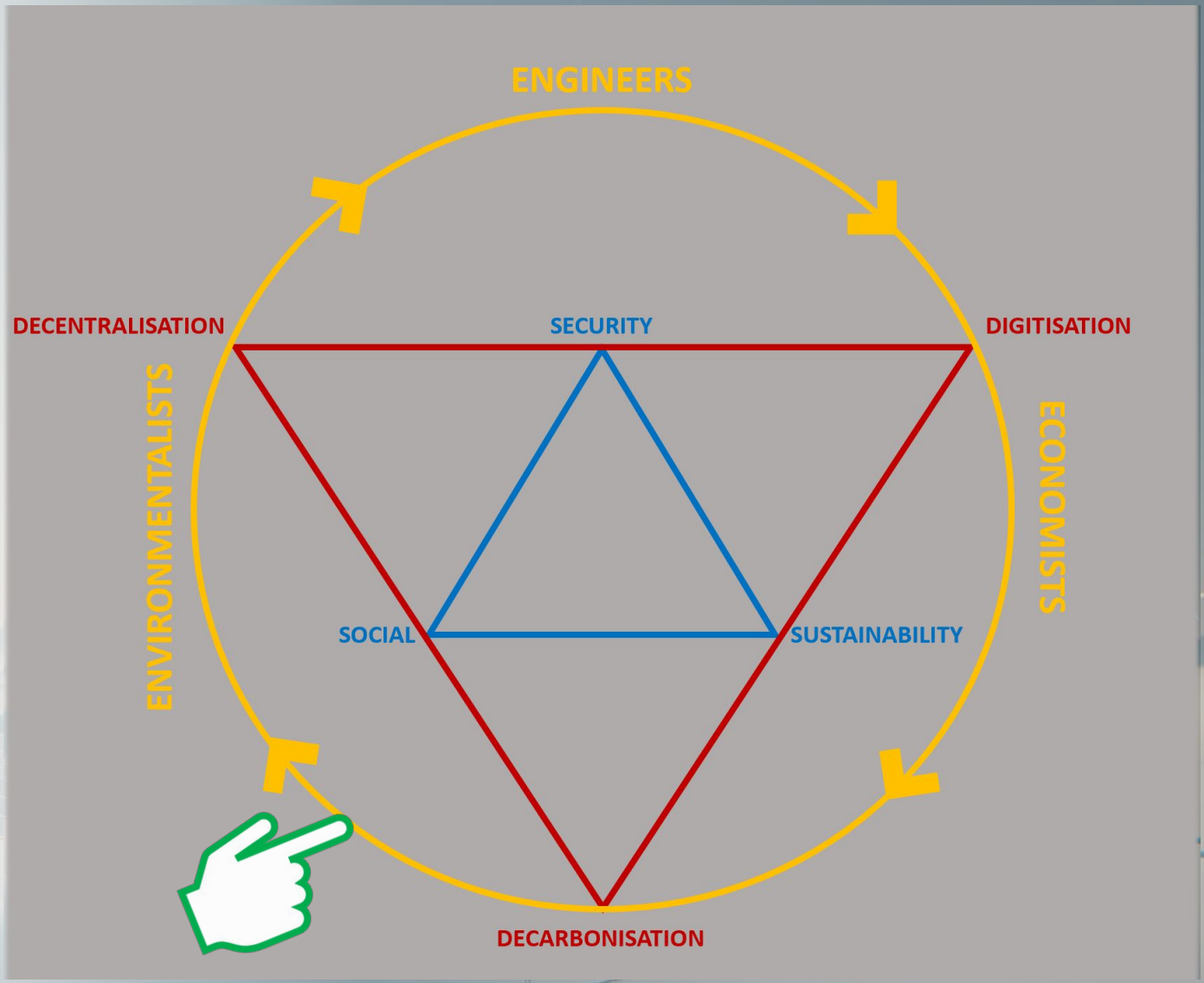
Environmentalists

- Advocating for sustainable energy policies and ESG
- Compliance and adherence



Navigating ETNA

- Where are you currently?
- What is your end goal?
- What technologies & practices will help you get there?
- What are the obstacles involved?
- What validations & certifications will be required?
- How can you measure progress?
- How will you know when you have arrived?
- What, How, and under what management style?



ADVANCED GRID CONDUCTORS – ACCC Conductor Highlights

Carbon Fiber Composite Core Replaces Steel Core of ACSR/ACSS

- ***70% Lighter & 50% Stronger***
- ***Reduction in Power losses - Up to 40% compared to traditional ACSR/ACSS type conductors***
- ***Major sag profile solutions improvements***
- ***10x More Thermally Stable***
- ***Resists Corrosion & Fatigue***

- **High Capacity:** ***2X capacity vs. same diameter ACSR/AAAC conductor***.
- **Lowest Thermal Sag:** *Minimizes thermal sag even at high temperatures.*
- **Most Energy Efficient & Sustainable:** *Lower electrical resistance reduces line losses, power generation costs, associated GHG emissions and national Water resource consumption*

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Case Study – Alberta, Canada: Forecasted renewable growth exceeded expectations mid-project.

Transmission Planning Risks: Long timelines increase exposure to changing load and generation forecasts.

Solution: Utilities used **Advanced Conductors** as drop-in replacements for unbuilt lines.

Outcome:

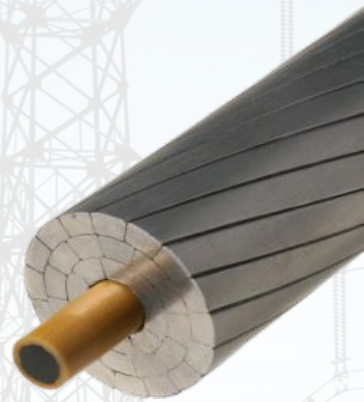
- Met all original performance requirements
- Increased steady state load carrying capacity by 200%
- Reduced line losses significantly (30 %)
- Reduced sag
- Embedded sensors and automation

Key Takeaway:

- Advanced Conductor tech enables late-stage upgrades without delays
- Applicable to Asia's late-stage trans. projects to optimize reliability and energy access
- Avoided CO2 Emissions – monetised via CDM / Paris Art. 6.2 (see ADB Bangladesh)

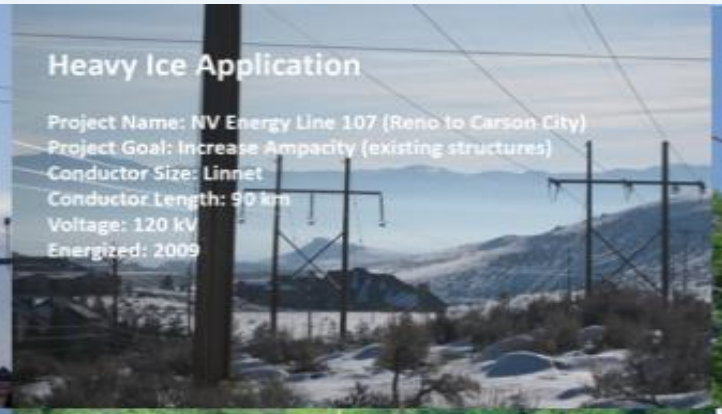
All Climate Range of PROVEN Applications GLOBALLY

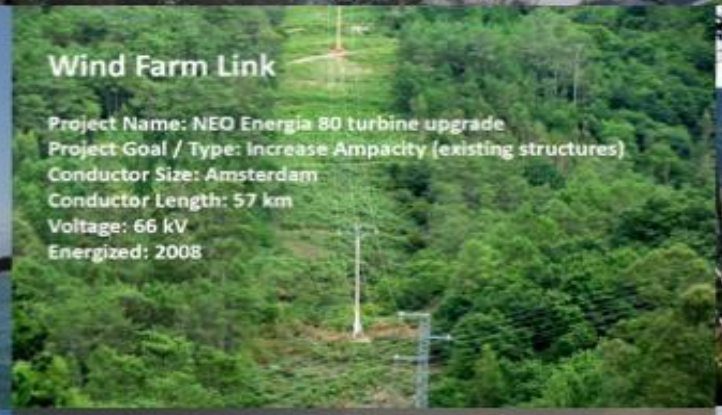
- **Reconductor Projects** – increase corridor capacity, reduce environmental impact, permitting, and capital costs by retaining existing towers but carry more amps.
- **Rebuild Projects** – When its determined that existing structures are too old or when storm hardening is required



- **New Lines** – reduce upfront capital costs by increasing spans between fewer and/or shorter less expensive structures. Reduce land costs / corridor needs and ROW issues.
- **Generation Tie Lines** – 'Renewables' increase asset efficiency and investment returns
- **Long Span Applications** – enables critical long spans with high strength, reduced sag and excellent damping
- **EHV / UHV (and DC) Voltages** – around 36,000 km between 345 kV and 1,100 kV. Excellent core stability and surface smoothness enable bundling and decreased corona
- **Mountainous Terrain** – outstanding strength, toughness and field experience help installations in difficult and mountainous terrain
- **Highly Corrosive Environments** – ACCC® composite core is impervious to corrosion in marine / coastal salty air and heavy polluted industrial environments.

Examples of the 1,400+ ACCC projects operational in 66 utilities across the globe since 2005. Today +200,000 kilometres of ACCC contracted.





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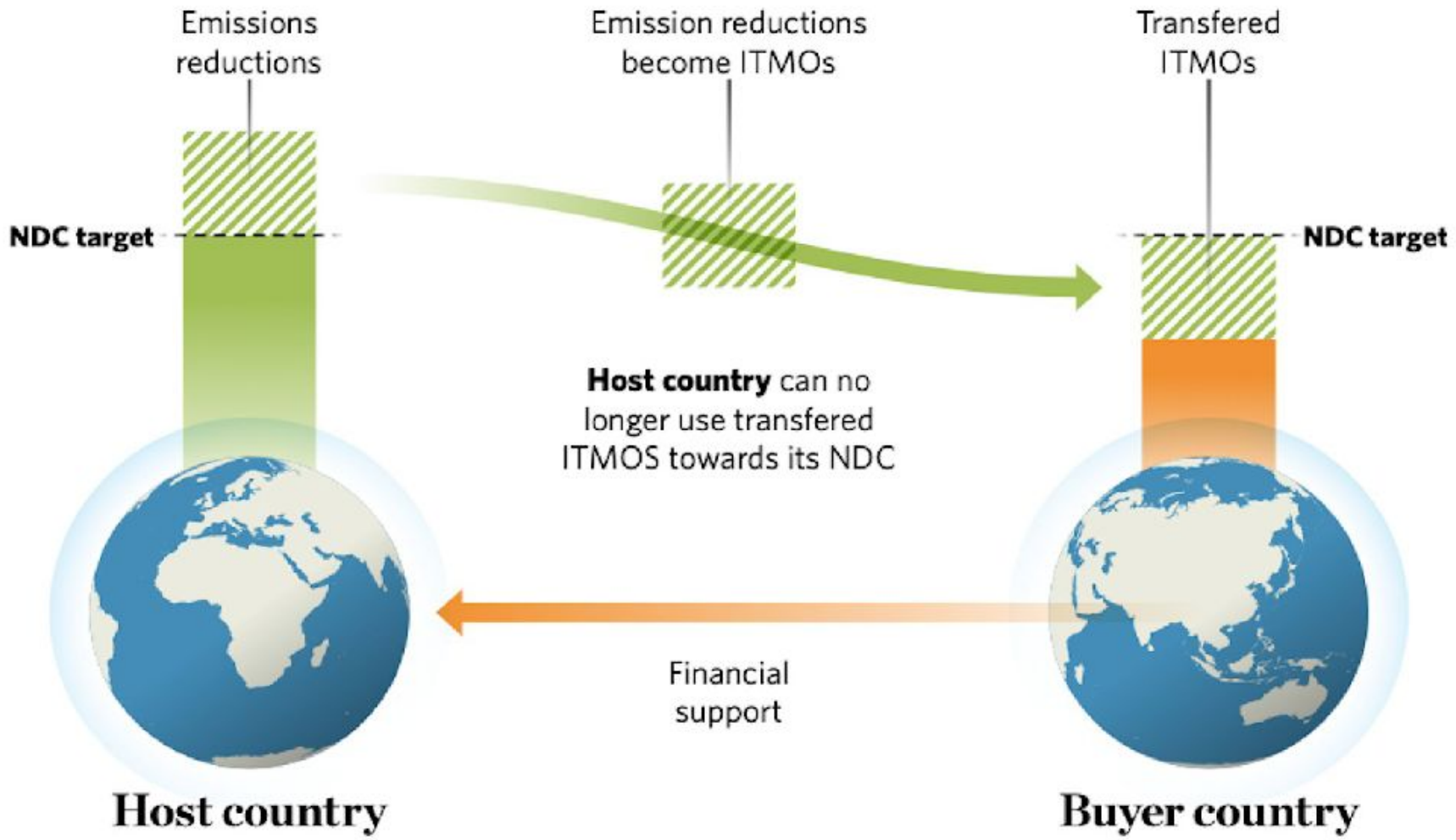
ADB Video ACCC Transmission Project Bangladesh PGCB 400kV

Dhaka and Western Zone Transmission Grid ExpansionYouTube · Development Asia25 Nov 2022

The road from Baku

Paris Article 6 markets are "operational"



No Transmission - No Transition

Thank you!

Thomas Lynch