

Evolving Market Designs for Cross-Border Electricity Trade

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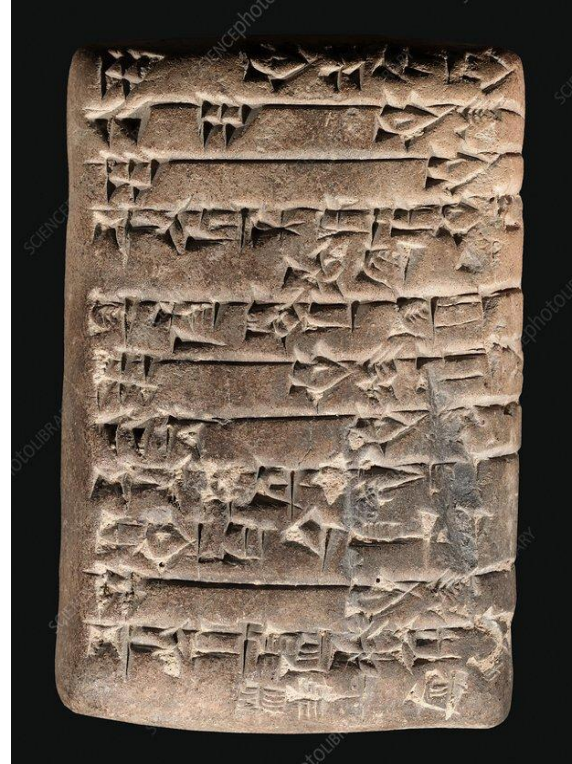


AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

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Outline

- Trading - Historically
- Case of Electricity
- IEA World Energy Investment Analysis - Challenges!
- 'Regional Energy Hub' Framework
- Climate Change Puzzle



Cuneiform
5000 years old
Mesopotamia
Source: BBC.com

Evolution of Trading

<p>1. Trading: buyer and seller</p> <ul style="list-style-type: none"> → Silk to Horse, Ox, Wheat, Cotton → Many forms of commodity 	<p>2. Rationale</p> <ul style="list-style-type: none"> → Exchange of goods, barter → Economic
<p>3. Linking trades: connectivity.</p> <ul style="list-style-type: none"> → Camel, Horse Carriages → Road, Railroads, Tankers, Pipelines 	<p>4. Benefits</p> <ul style="list-style-type: none"> → (Country) comparative advantage → Fueling economic growth

Trading enables markets through connection(s)

Markets: Community > Bilateral > National > Regional > Global

Instruments: Barter, Physical, Financial to Sophisticated Derivatives.

Electricity Trading (Cross-Border)

<p>1. Trading: connecting buyer and seller</p> <ul style="list-style-type: none"> → Electricity → Hydrogen 	<p>2. Rationale:</p> <ul style="list-style-type: none"> → Supply to load (Point to point connect) → Reliability → Economic Dispatch → Capacity, energy delivery → Flexibility
<p>3. Links connecting trades: transmission</p> <ul style="list-style-type: none"> → Market Coupling → HVDC → UHVDC 	<p>4. Benefits</p> <ul style="list-style-type: none"> → Helped develop wholesale markets at the country level. → Regional cost optimization, emissions → Hurricane, Flood (Short) → Covid-19 (Mid Term) → Climate Change (Long Term)

UNFCCC
 COP26

Common
 Benefits

Fundamentals of Markets have not changed!
 Market are assets as well.



→ World Energy Investment Analysis - 2020

- ◆ One specific finding for Tx developers "Electricity networks are the backbone of today's power systems and they become even more important in clean energy transitions, but investment needs to pick up"
- ◆ "Regional variations in grid spending are explained by the balance of different regulatory priorities to support market reforms, boost resilience and integrate new technologies".
- ◆ <https://www.iea.org/reports/world-energy-investment-2020/power-sector#abstract>

→ Clean Energy Transitions Summit - July 9 (Sustainable Recovery)

- ◆ Electricity Sector - Regional Energy Integration - integration of renewables
- ◆ <https://www.iea.org/news/chair-s-summary-for-iea-clean-energy-transitions-summit>

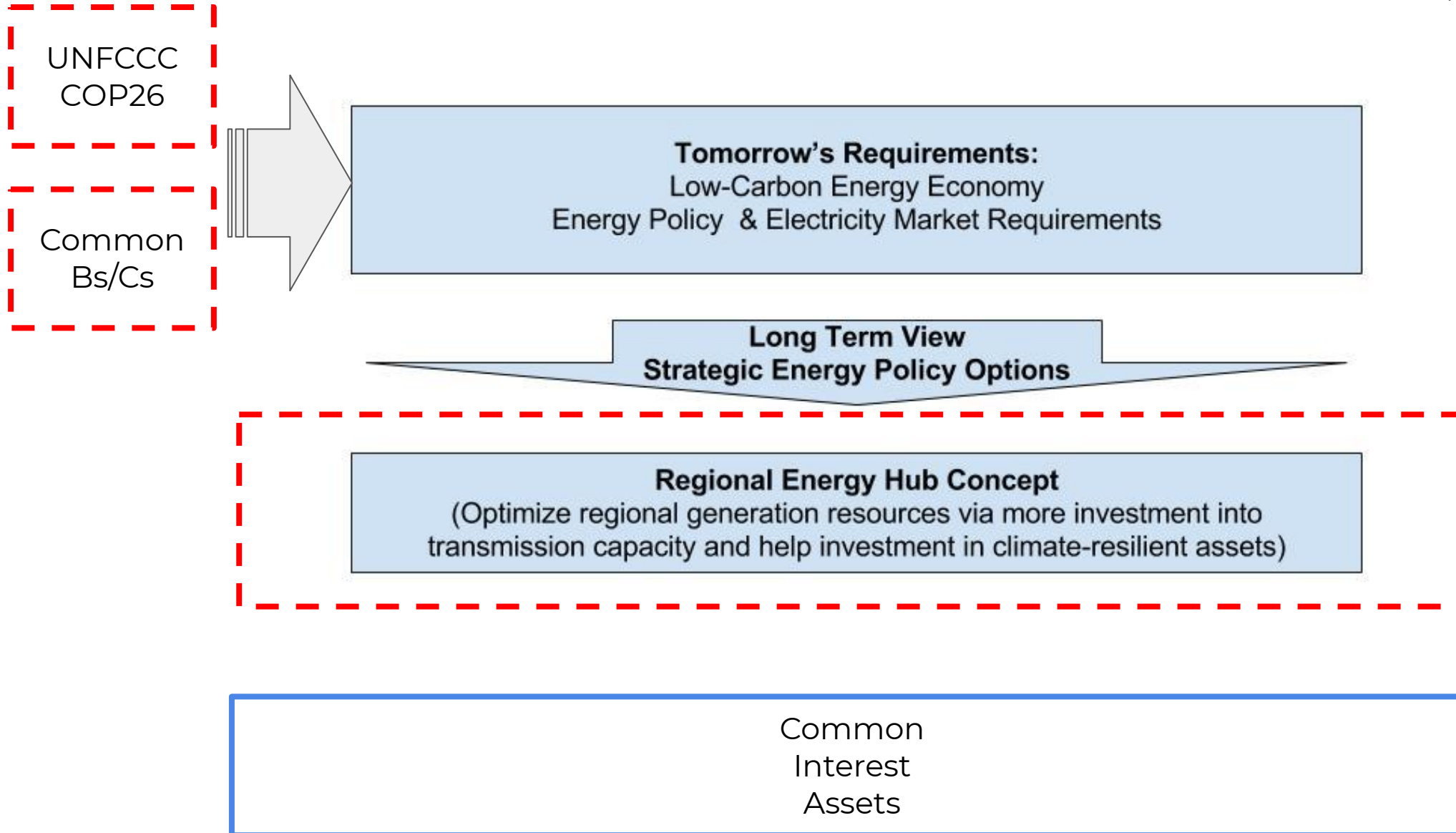
→ Challenges

- ◆ Governance: standardization, market opening, different maturity of electricity markets
- ◆ Investment: cost/benefit challenges of connection covering geographic area, Covid-19
- ◆ Trading: liquidity, lack of standard agreements, credit issues.

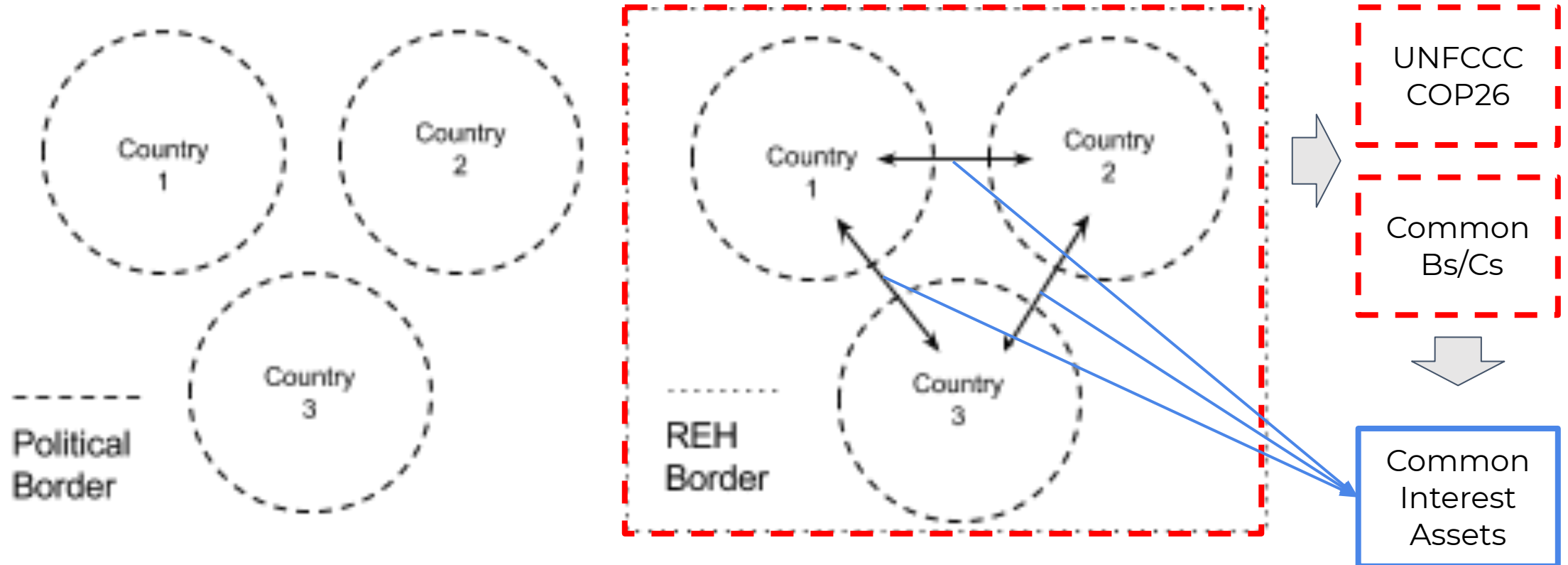
UNFCCC
COP26

Common
Challenges

Strategic Energy Policy Options for COP26 Countries

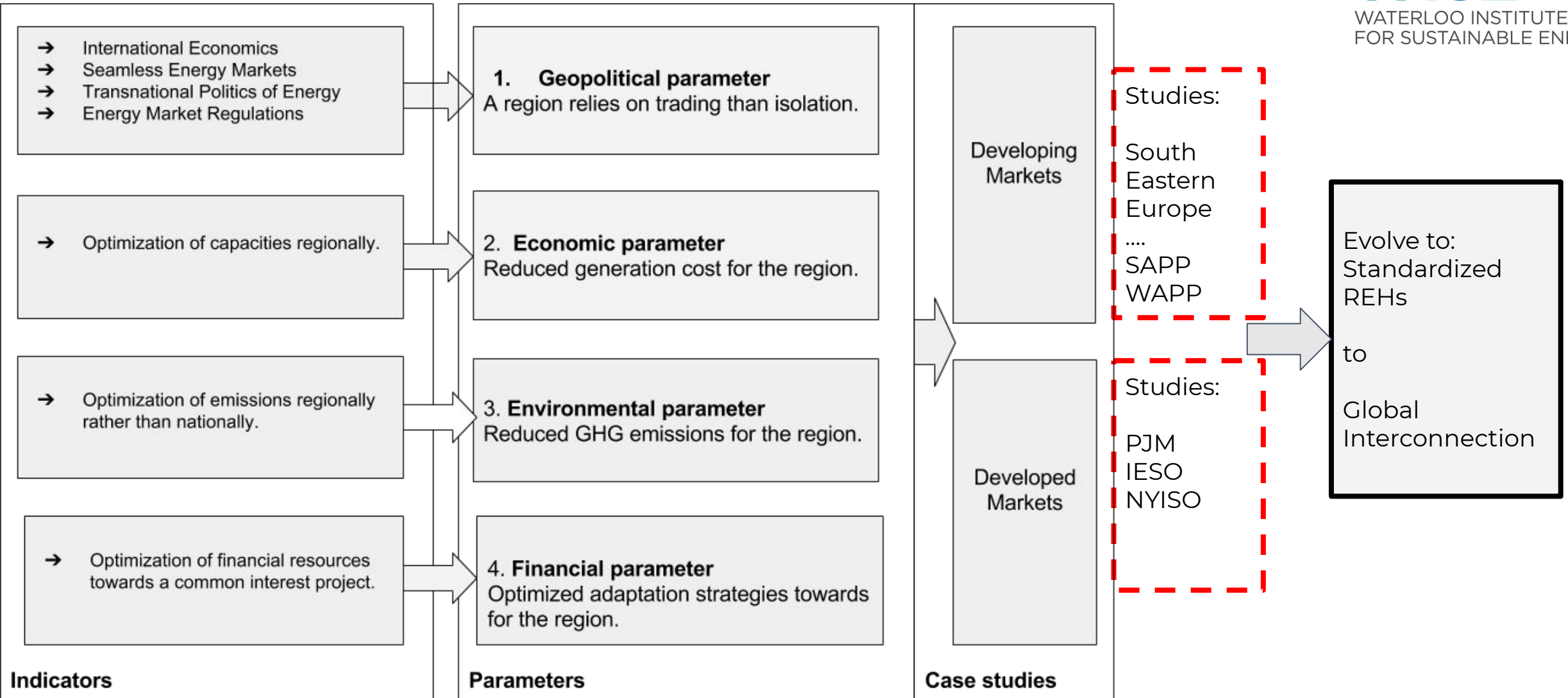


Regional Energy Hub: Bottom-Up Approach



Markets (countries) to rely more on:
Trading than Isolation

'Regional Energy Hub' Framework



Markets (Countries) could meet their many targets regionally or nationally by a standardized REH applied globally



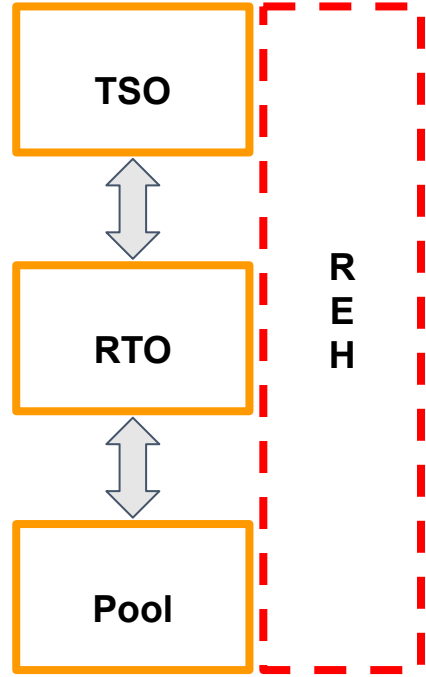
Source: GeoPuzzle

Climate Change is a global puzzle and
Regional Energy Hub Framework
Enables Markets (Countries) work through this puzzle by prioritizing
Common interest assets such as transmission to meet targets such as:
Paris Agreement
SDG#7 -SE4ALL - ESG

Representative!- standardized REHs applied globally



Source: GeoPuzzle



'Regional Energy Hub' is a building block for:
a Global Energy Interconnection

REH Framework is a platform to cooperate

1. Governance

- Enables countries to form REHs, **first step to institutionalization**, governance,
- Facilitates and enables political platform & cooperation among REH members to **build consensus and pinpoint assets for common interest.**

2. Investment

- Enables **investment through the REH Framework**
- Tx capacity is an anchor investment into the future as part of IEA's sustainable recovery efforts.
- **Globally standardized REHs** to meet Paris Targets
- Path to electricity market openings, **hence pricing of resources competitively.**

3. Trading

- Market Opening
- Enabling and standardization of Electricity / Day Ahead Markets.
- **Enables trading among REH members.**
- Effective instrument in lowering politics' influence on energy markets transition through carbon (tax) and regional energy trade, hence enhances trading multilateral agenda UNFCCC/COP26.

Conclusion:

1. Challenge is not technology but rather cooperation. And window of opportunity is now. REH Framework enables platform to cooperate.
1. One energy policy instrument in realizing our common goal is for **COP26** countries to invest in transmission and interconnector assets, to form 'Regional Energy Hubs' .
1. Trading could be an effective instrument for **COP26** in managing risks ranging from short term (floods, hurricanes), to mid term (**Covid19**) to long term (**Climate Change**), hence moving countries towards the Paris Agreement effectively.
1. Transmission and interconnector assets are an anchor investment into the future, and It will help with Sustainable Recovery.

Questions to consider

1. How to efficiently design the market model for cross- border electricity trade? while facing challenges from short term to long term.
2. What are the most difficult issues during the cross-border electricity trade?
3. How to facilitate the cross-border electricity trade?



Energy Policy

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Thank you!

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