

Challenges of integrating renewables into the Korean power grid

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Solutions for Our Climate(SFOC)

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SFOC is

an independent research and advocacy organization founded in 2016, working to align emissions trajectories in Korea and across Asia to be Paris Agreement-compliant.

Carve out innovative ways to advocate for a faster fossil fuel phase-out and renewable energy transition by shifting policymakers, financiers and businesses.

Addresses the climate crisis through a combination of **Research, communications, litigation, diplomacy, and grassroots organizing**, and joins forces with domestic and international organizations to accelerate change.

Our work includes :

Climate finance

- ° Public finance
- ° Private finance
- ° Transition finance

Industry

- ° Steel
- ° Shipping
- ° Methane

Power sector

- ° Renewables
- ° Gas & Demand response
- ° Power market
- ° Corporate engagement
- ° Bioenergy

- **How is renewable energy doing in Korea?**

- Low penetration & lowered target

- **What are the challenges?**

- Fossil-fuel dominant state-owned utility monopolization and the conflict of interest

- “Tilted Playing Field”: Unfair grid and market for RE

- **What would be the role of civil society?**

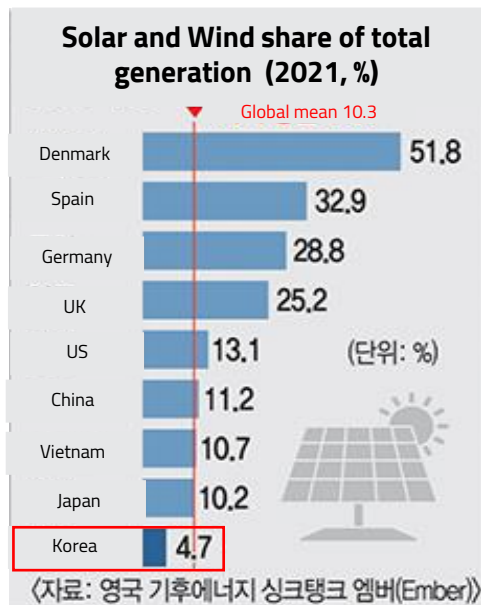
- What can we do?

- SFOC Power Market & Grid Program's Strategies

Renewable Energy Penetration in Korea

1-1

- Lowest renewable energy share among the OECD - 4.7%
- Reduced renewable energy target - 21.5% by 2030



Source: EMBER

- **Lowest among the OECD countries**

Solar and wind energy take up only 4.7% of total generation in Korea, while the global average exceeded 10% as of 2021.

- **Scaled down the 2030 renewable energy target (30% → 19.5%)**

The updated national electricity plan for '22-'36 set out the new RE target as 21.5%, which is cut down from 30%, Korea's 2030 NDC target. Considering other fossil-fuel-based chemical energy sources, solar and wind are expected to take up around **19.5%**.

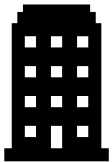
* Fossil-fuel generation +0.8%

How Korea's Vertically Integrated Power Market Acts As A Key Obstacle to Renewables

- Fossil fuel-centered KEPCO and GENCOs have the monopolistic status
- Inevitably entails conflict of interest risk

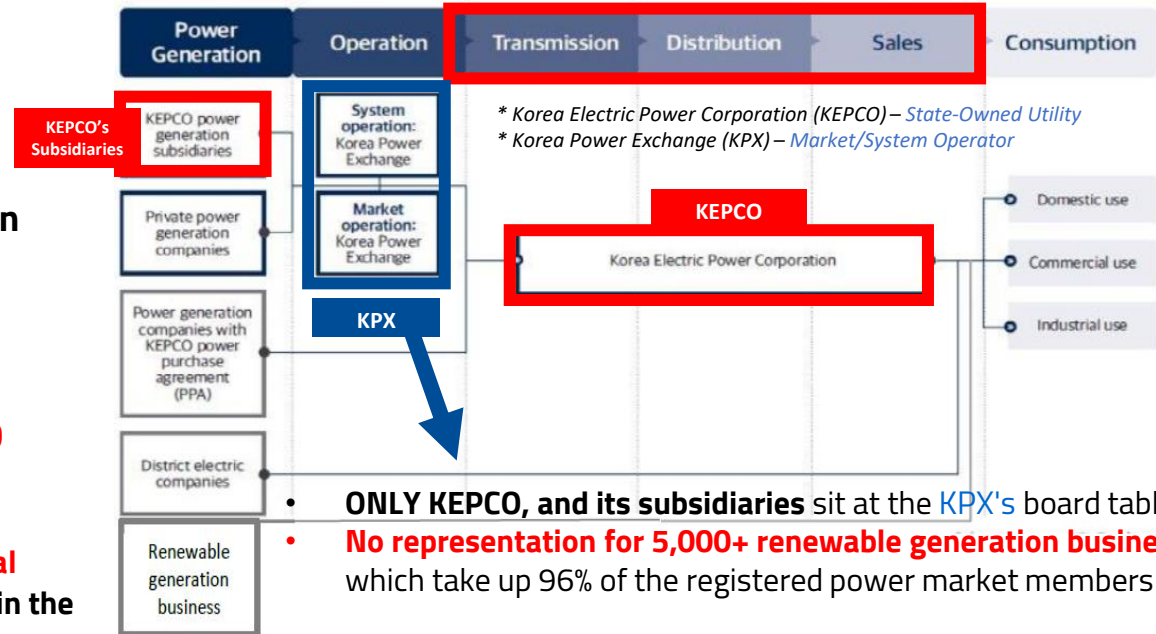


6 major power generation companies (KEPCO's subsidiaries) are powering almost **70%** of Korea's entire electricity – heavily reliant on **fossil-fuels**



KEPCO is the **one and only retailer** in the power market, owning **all transmission AND distribution grids**.

Fossil-fuel-centered KEPCO has **substantial dominance** and exerts **profound influence** in the power market structure

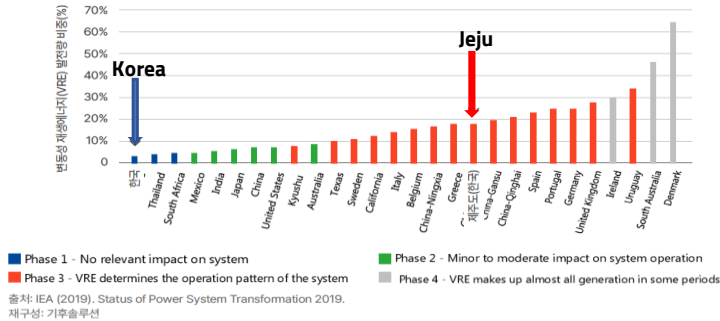


Case Study – Tilted Playing Field on Jeju island

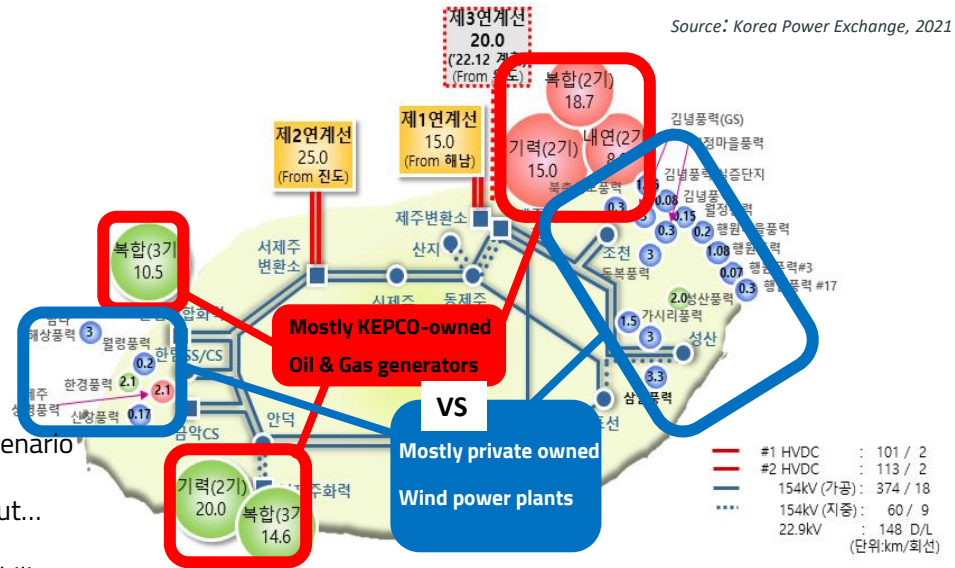
Unwinnable competition between fossil-fuel generators and renewables

In 2012, Jeju Island announced its “Carbon Free Island 2030” initiative

Annual VRE share and corresponding system integration phase in selected countries/regions, 2018



- Extensive curtailment in wind generation – an average of 3% FOR NOW but expected to increase up to 19% in 2034 in the BAU scenario
- System reliability is the rationale presented for RE curtailments – but...
- Technically feasible and cost-efficient scenarios of dispatching flexibility resources to minimize the RE curtailment DO exist – confirmed by SFOC’s recent cost-benefit analysis
- However, operating a more flexible grid and expanding RE means a lower operation rate for pre-existing fossil-fuel generators = **conflict of interest!**



Ideal picture of the “renewable-friendly” power grid & market structure in Korea

Policy Recommendations:

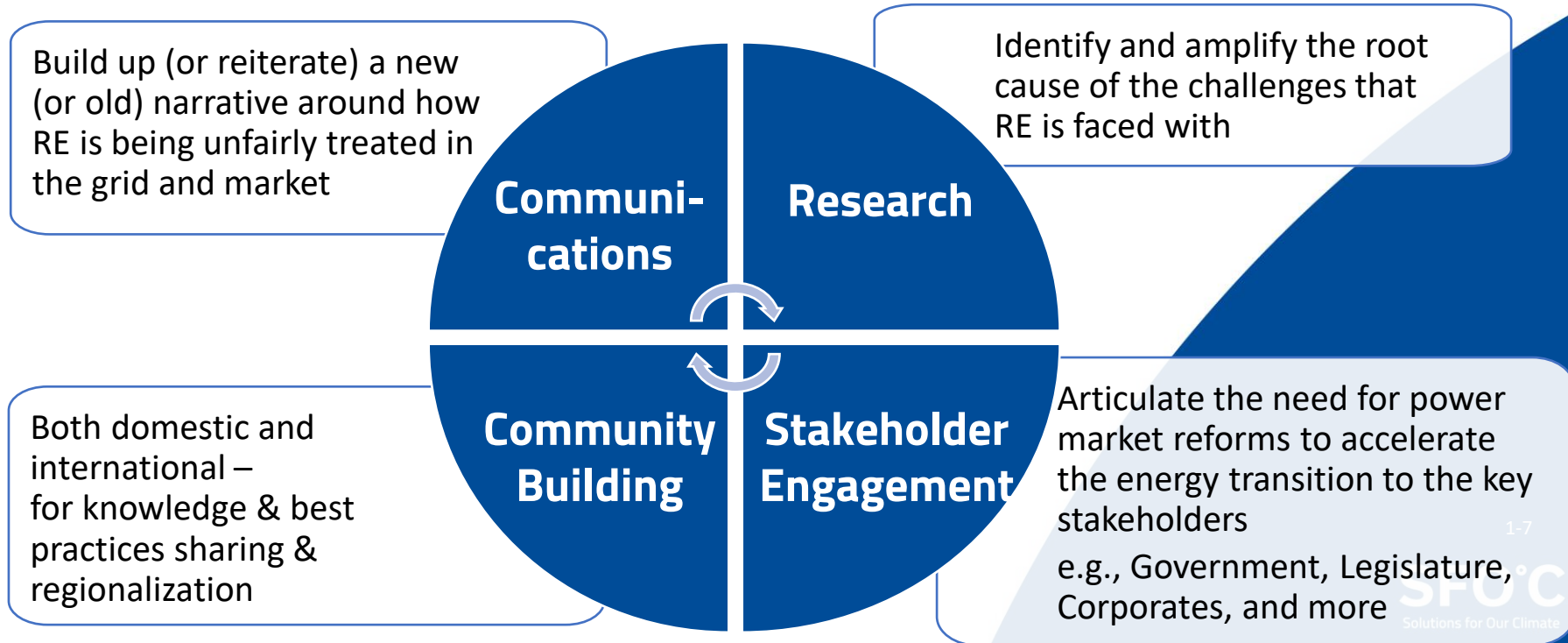
- **Ensure independence and transparency** throughout the entire decision-making process of the power market governance
- **Disconnect the financial linkage** between the grid and generation assets

Relevant stakeholders:

- (Government) MOTIE, MOEF, Presidential Office
- (Legislature) National Assembly
- (Core players) KEPCO, KPX, and more
- (Corporates) RE100 initiative, etc.
- (CSOs) Local CSOs, think tanks, climate advocacy groups, etc.
- Diplomatic stakeholders and more

What roles can be played by civil society in planning renewable-friendly power grid & market?

What WE can do as a member of the climate civil society:



SFOC Power Market & Grid Program's Strategies

- **Communication** – Speak in your own language, not theirs'
 - A) Be mindful of not falling into the trap of the “insider-only” discussion.
 - B) Find a key case that can bring the public into the narrative.
- **Research** – What we discovered through extensive research are...
 - A) KEPCO’s heavy reliance on fossil fuels (obvious, yet worth reiterating)
 - B) Conflict of interest within the power market – governance issue
 - C) The existence of technical solutions to improve grid flexibility
- **Community building** – Regionalization matters. We need to learn from each other.
 - The same problem with the fossil-fuel-reliant SOU monopolization may occur in other regions with a state-led power market**
 - ex) TEPCO(Japan), PLN (Indonesia), EVN (Vietnam), CFE (Mexico), ESKOM (South Africa)...
- **Stakeholder engagement** – Carrot(positive) and Stick(strategic) approach
 - Carrots to encourage and/or to persuade the stakeholders to take action:
Joint seminars, policy consultation, closed workshops
 - Sticks to push the stakeholders further and make firm decisions:
National Assembly audit, media campaign, grassroots-oriented actions
- **Diplomacy** – Introduce the decision-makers to international best practices of unbundling the market

Thank you

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