

SOUTH KOREA'S CLEAN ENERGY TRANSITION

**THE STATE OF PLAY AND HOW TO BEST
CONTRIBUTE**

MARCH 30TH, 2023, BETD SIDE EVENT

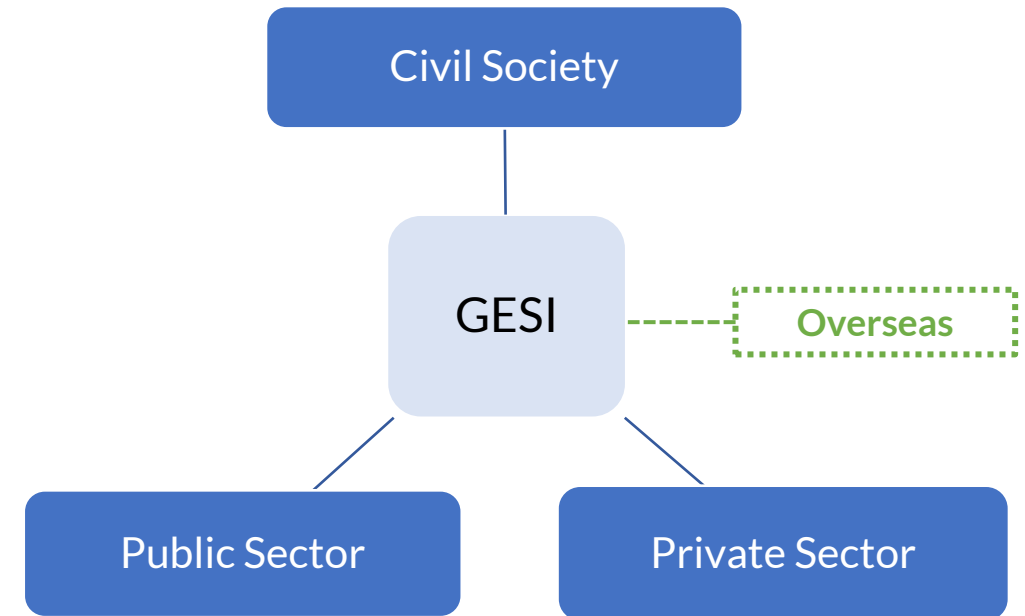
BORAM KIM (RESEARCHER)



INETTT
International
Network of
Energy Transition
Think Tanks

Green Energy Strategy Institute (GESI)

- GESI, founded in 2009, is a leading independent organization that brings expertise to advance energy system and expand renewable energy in south Korea
- Our Expertise includes -
Energy system modeling, public acceptance of renewable energy, energy transition policy and electricity market analysis
- We collaborate with diverse stakeholders - Governments agencies, corporates, civil societies and overseas organizations

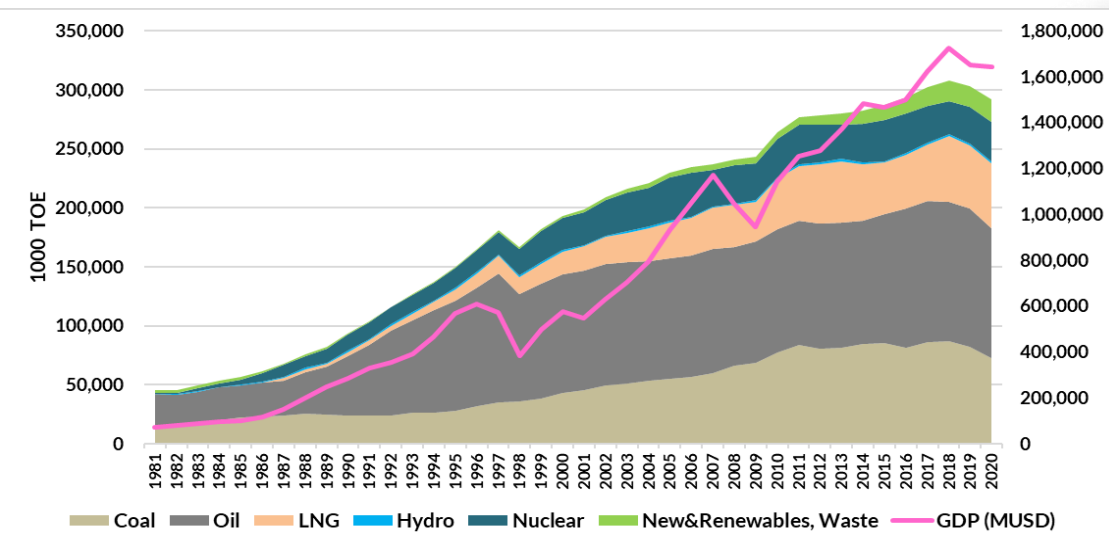


Contents

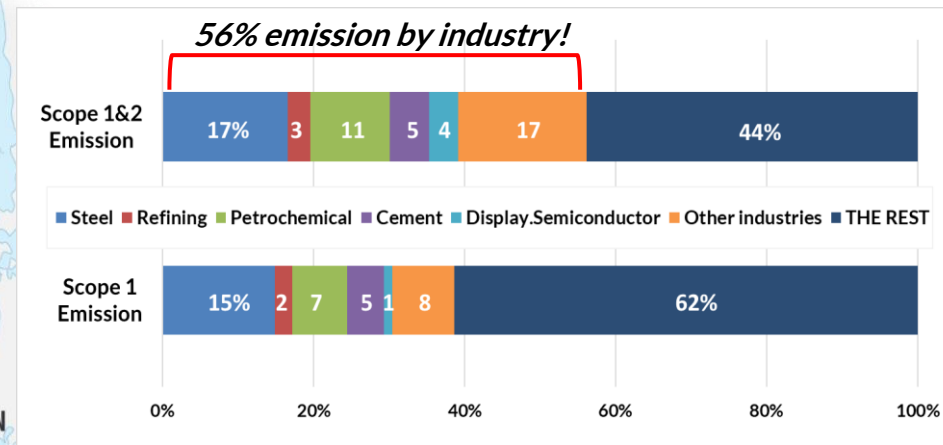
1. South Korea- State of play
2. Immediate, Mid, Long-term issues
3. Main issue - Industry
4. How can we best contribute globally?

1. South Korea- State of play

- 8th largest energy consumer in the world in 2020
- Foundation of South Korean economy built on use of imported fossil fuels (93% in 2020)
- Isolated electricity/gas grid , 63% of territory covered by mountains



Primary energy supply by source (1981-2020)



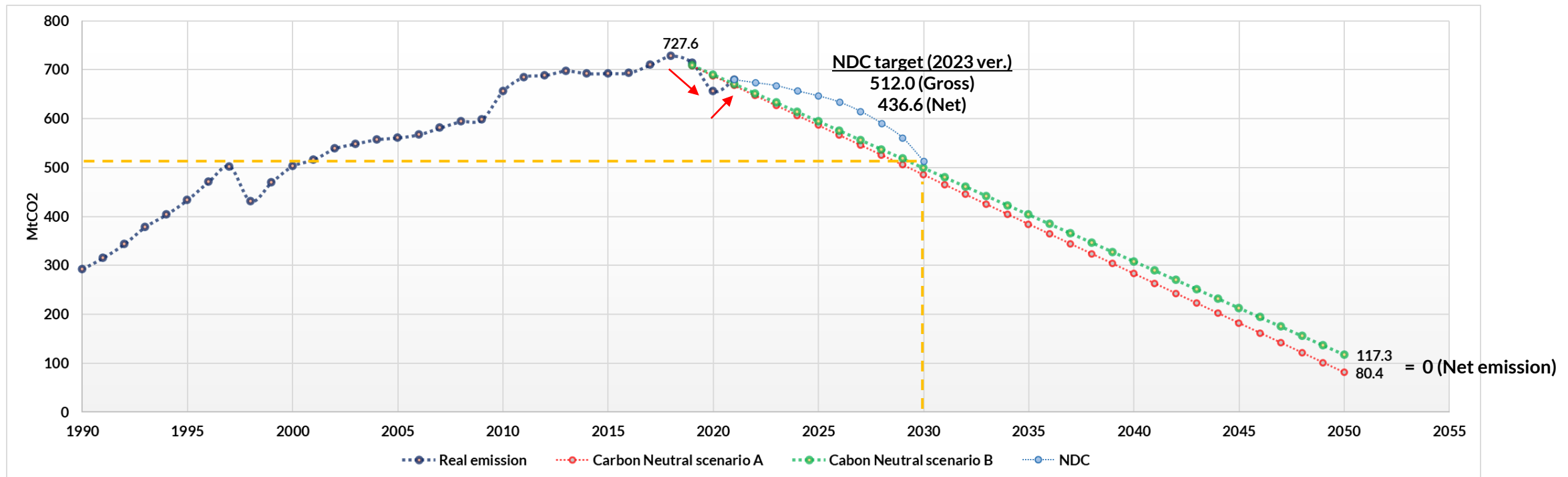
2020 GHG emission by sectors

*New&Renewable energy includes hydrogen, fuel cell, liquified/gasified coal and gasified vacuum residue

Based on GIR, National Energy Statistics, World Bank, US EIA data

1. South Korea- State of play

- 2050 national carbon neutrality target announced in 2021 (scenario A & B)
- Slight dip in emission due to Covid-19 in 2020, bounced back with a 3.5% increase during the recovery
- The updated NDC target (2023 ver.) - 8 MtCO₂ increase in industry sector emission to be offset by energy transition and CDM credits, CCUS



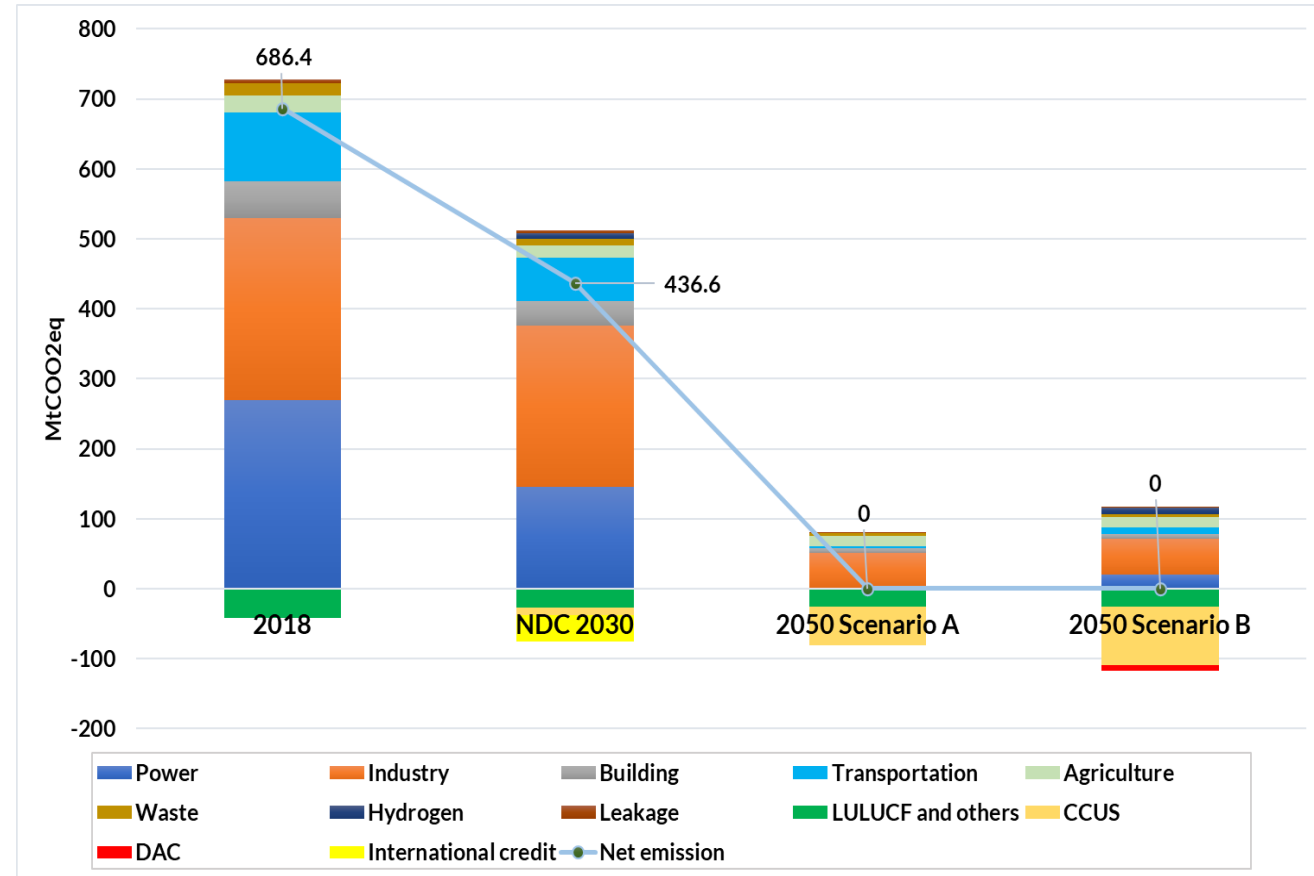
Gross GHG Emission Pathway (Excluding carbon sinks)

Based on GIR, Climate neutrality committee reports

2. Immediate, Mid, Long-term issues

- **Immediate issues? – meeting NDC 2030**
 - 1) Heavy reliance on CCU and CDM credits which are highly improbable
 - 2) Energy sector will need to step up to act as buffer
 - 3) Strengthen buildings and transportation sector decarbonization as viable methods already exists
 - 4) Establish implementation roadmap – budget, specific means, timeframe

- **Mid& Long-term issues? - towards net zero**
 - 1) Energy transition – expanding renewables
 - 2) How are we going to incentivize structural changes in the industry sector?



Sectoral reduction targets 2030 and 2050

Based on GIR, Climate neutrality committee reports

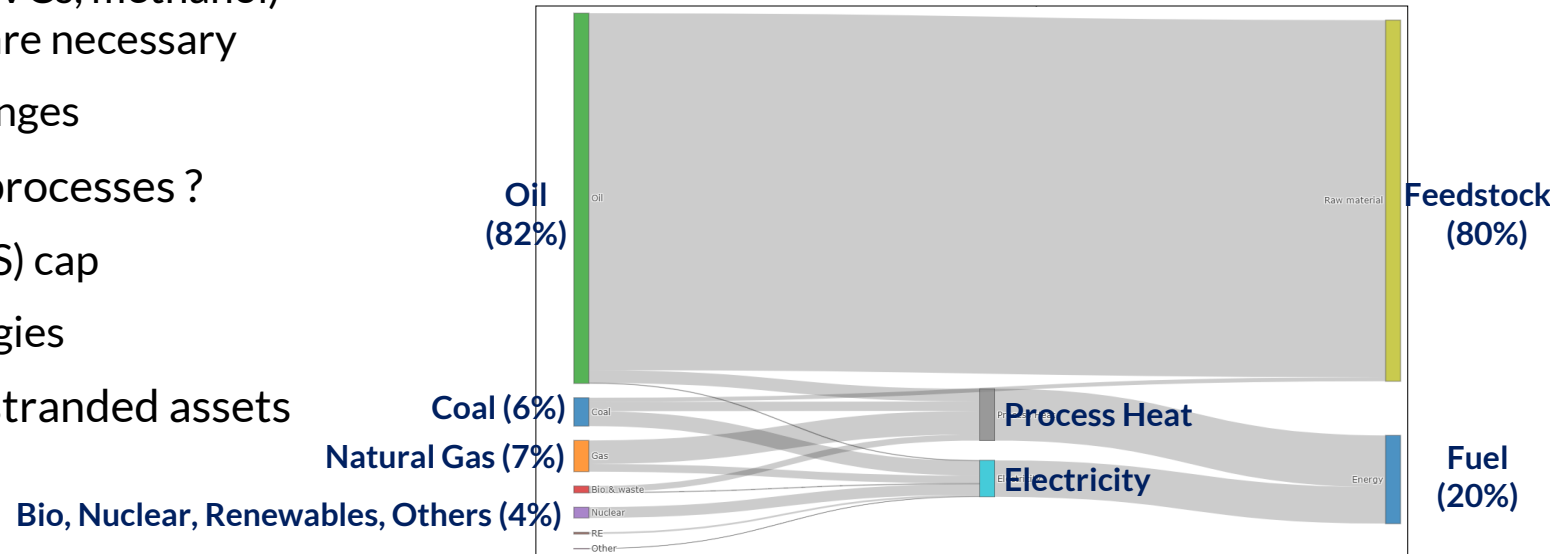
3. Main issue - Industry

Industry Decarbonization

- Carbon neutrality is nonviable without Industry sector decarbonization in South Korea
- Challenges in the petroleum and chemical industry have led to lowered NDC industry reduction targets (March 2023)
 - ✓ Green feedstock (e.g., Green hydrogen, HVCs, methanol) acquisition and new processes adoption are necessary
 - ✓ This will inevitably require structural changes
- How to incentivize low-carbon production processes ?
 - ✓ Strengthen emissions trading system (ETS) cap
 - ✓ Govt. investment in low-carbon technologies
- Immediate vs. Long-term competitiveness, stranded assets



\$7 b Shaheen project to increase ethylene production by 20% from 2026

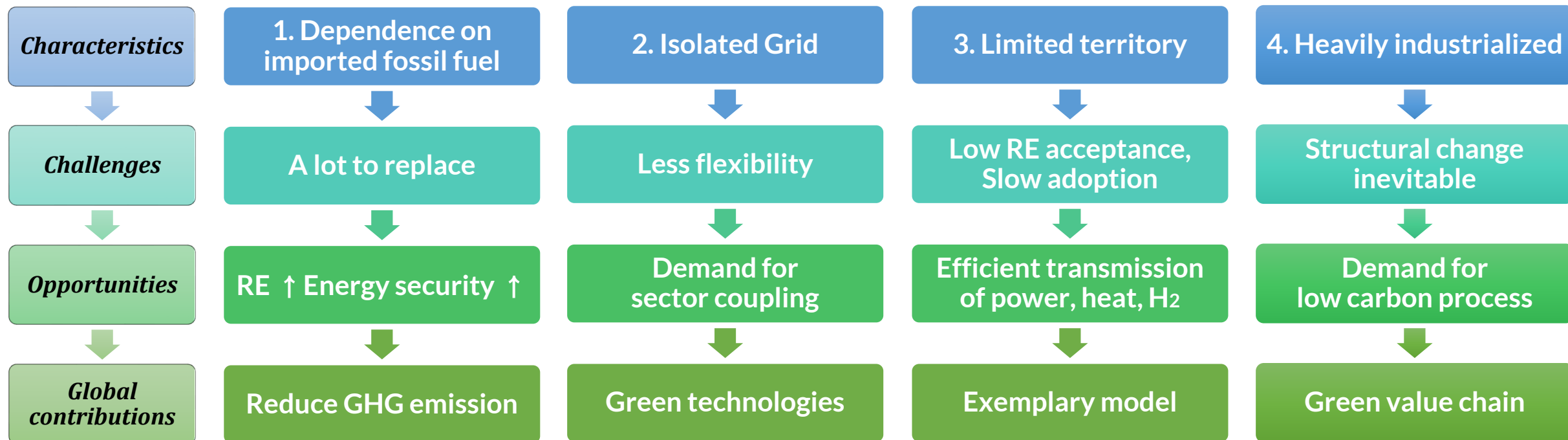


2020 Chemical and Petrochemical Industry Energy Sankey Diagram (1000 TOE)

Based on Energy Balance data (KEEI)

4. How can we best contribute globally?

- By reducing our own GHG emission (10th largest GHG producer in 2021)
- Extremely difficult to abate country type – An exemplary model for countries with similar challenges
- Green technology e.g., battery, EV, semiconductors, possibly green value chain



Comprehensive policy reforms and a shift in public perception are essential to achieve decarbonization

Thank you for listening !

