

# Energy Security in Global Energy Transition

Session 2: Medium Term Perspectives

Energy Security and Market Stability: A More Volatile New Normal?  
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# Unprecedented simultaneous energy price hikes

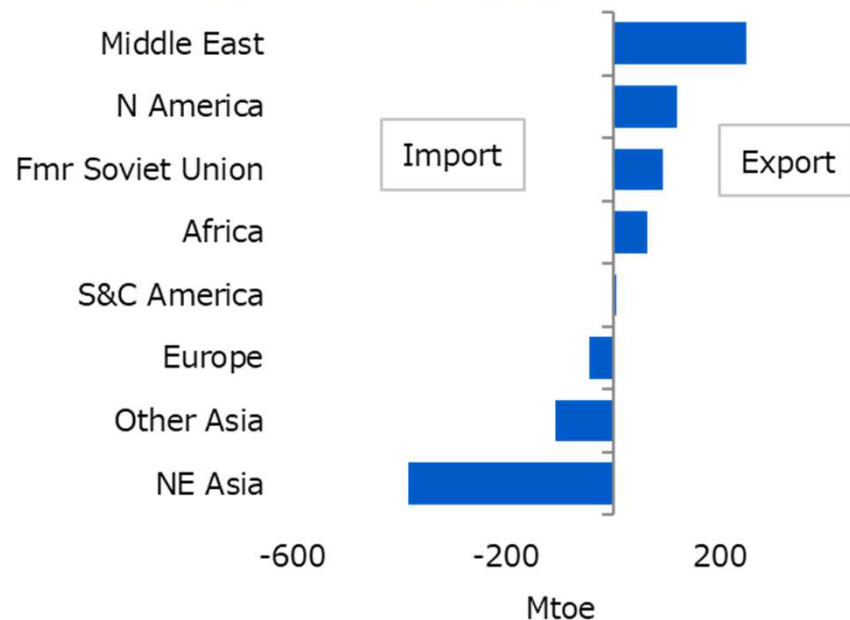


- Oil price topped 90\$
- Extremely high European gas and Asian spot LNG price
- Soaring coal price
- European power price run-up
- Concern for “energy crisis” in Europe
- Power shortage in China in 2021
- Corona-rebound: Lower the bottom, higher the peak
- Reduced surplus supply capacity
- Impact of low/decarbonization?
- Chain reaction and no loophole
- Revisited “geopolitics of energy”

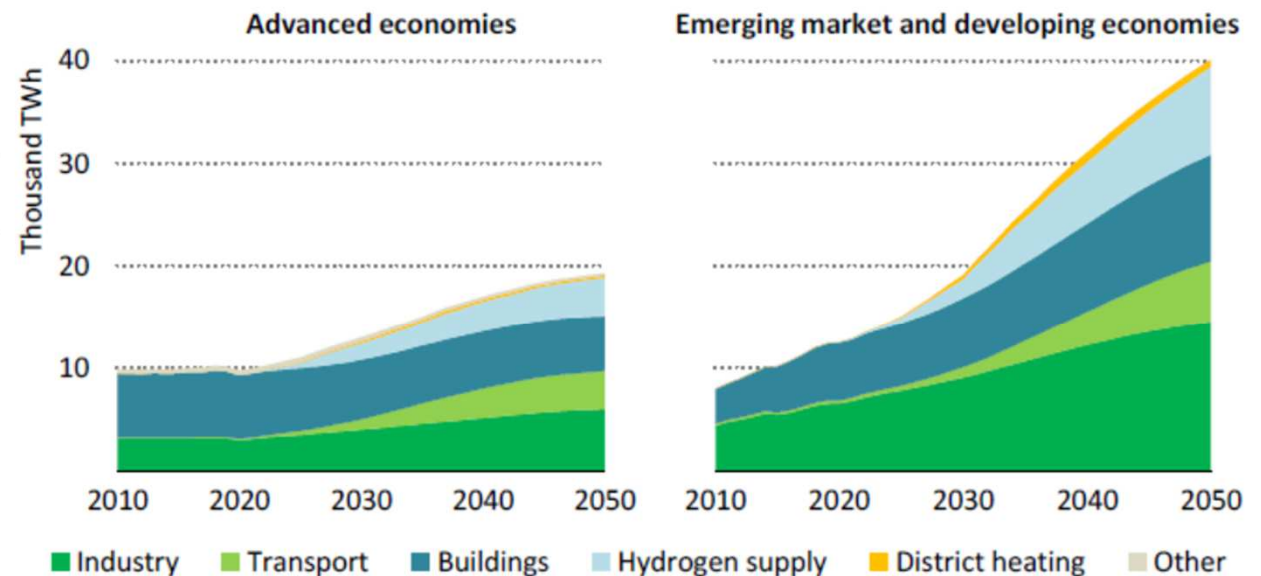
# Energy security with increased complexity

- Energy security risks growing in significance
- The world continues to depend on fossil fuels during the transition to CN.
- Existing resource exporters may reinvent themselves as exporters of decarbonized fossil fuels, such as hydrogen and ammonia.
- As power demand grows, issues of electricity supply security becomes far more important while VRE's intermittency, system reform, cyber attacks remain important critical issues.
- Supply security of critical minerals emerged as a new potential security issue.

## ❖ Hydrogen trade balance as of 2050 in CCE scenario



## ❖ Electricity demand in IEA Net Zero scenario

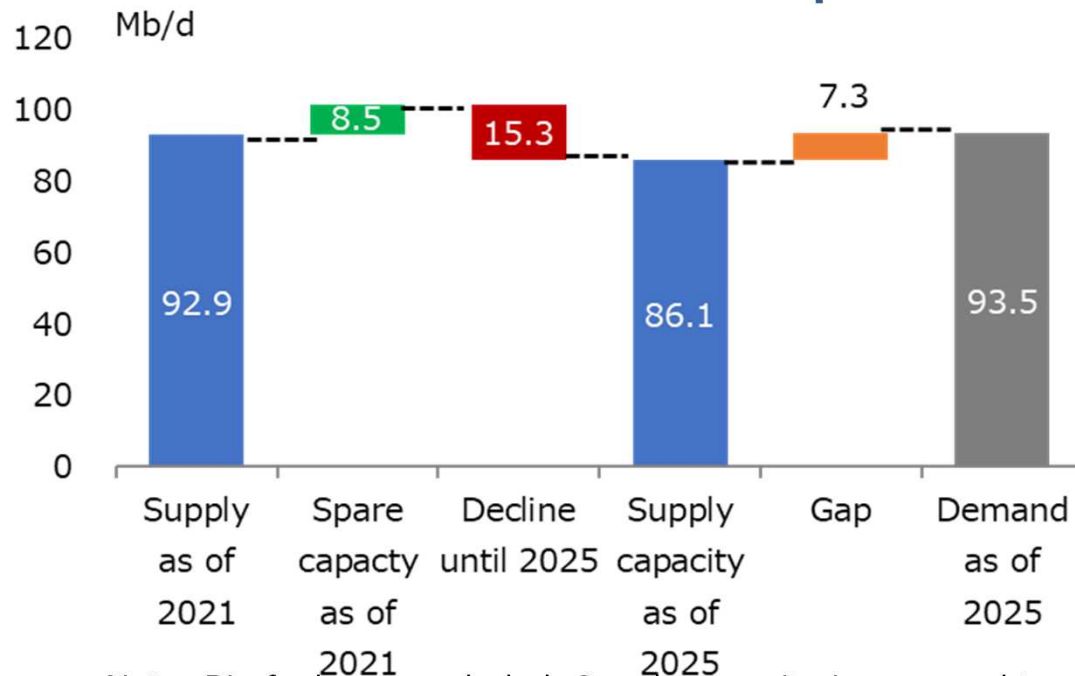


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# Potential impact of under-investment

- Global oil and gas/LNG demand expected to continue grow driven by Asia
- Underinvestment may cause mid-term supply crunch in oil and gas market
- Securing necessary investment is the key to market stability and energy security
- Sufficient supply capacity, supply diversification and flexible supply are needed
- US oil and gas needs to play an important role

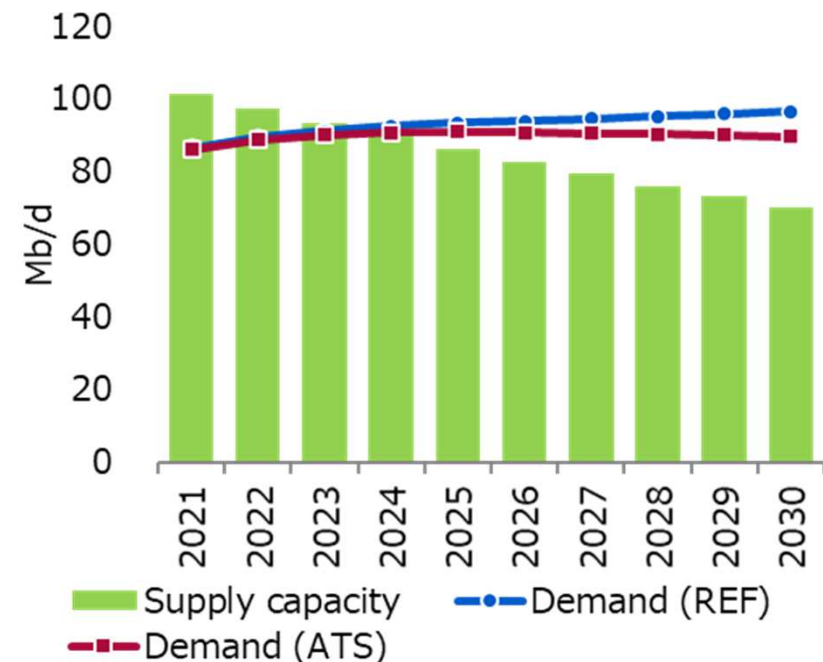
## ❖ World oil demand and supply capacity as of 2025 if investment stops



Note: Bio fuels are excluded. Supply capacity is assumed to decline by 4% annually.

Source : IEA; IEEJ estimate

## ❖ World oil demand and supply capacity if investment stops



Note: Demand excludes bio fuels.

Sources: IEA, IEEJ estimates

Source : IEEJ, IEEJ Outlook 2022

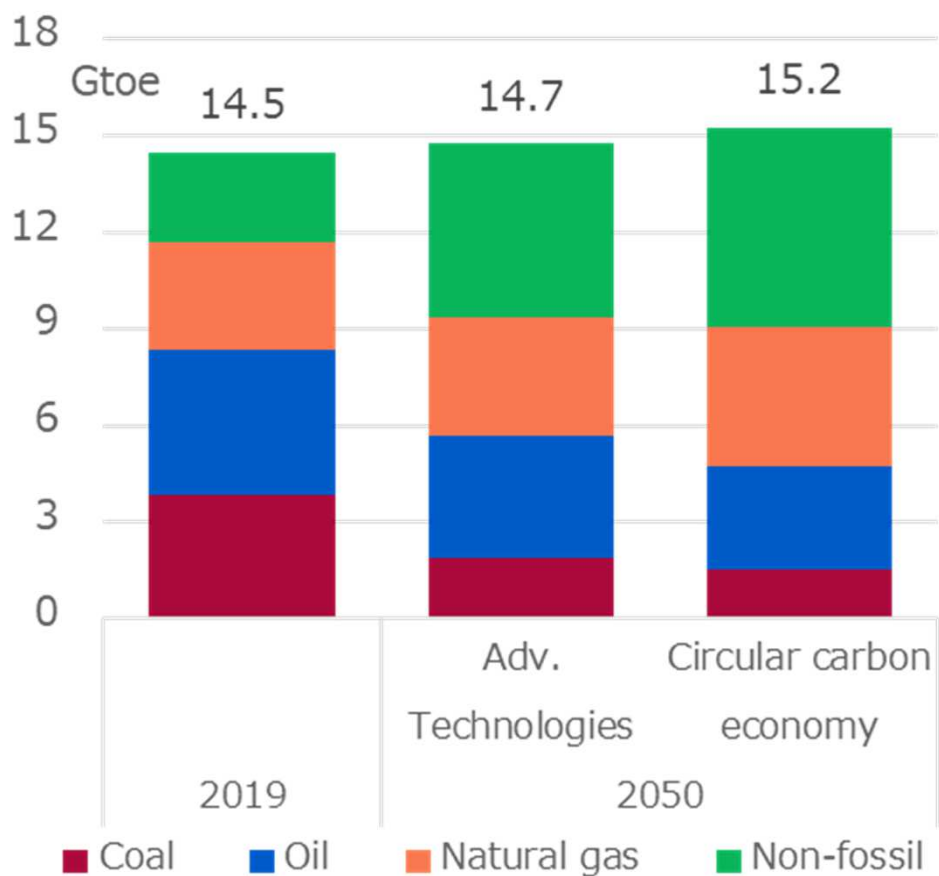
# Energy security and geopolitics of energy

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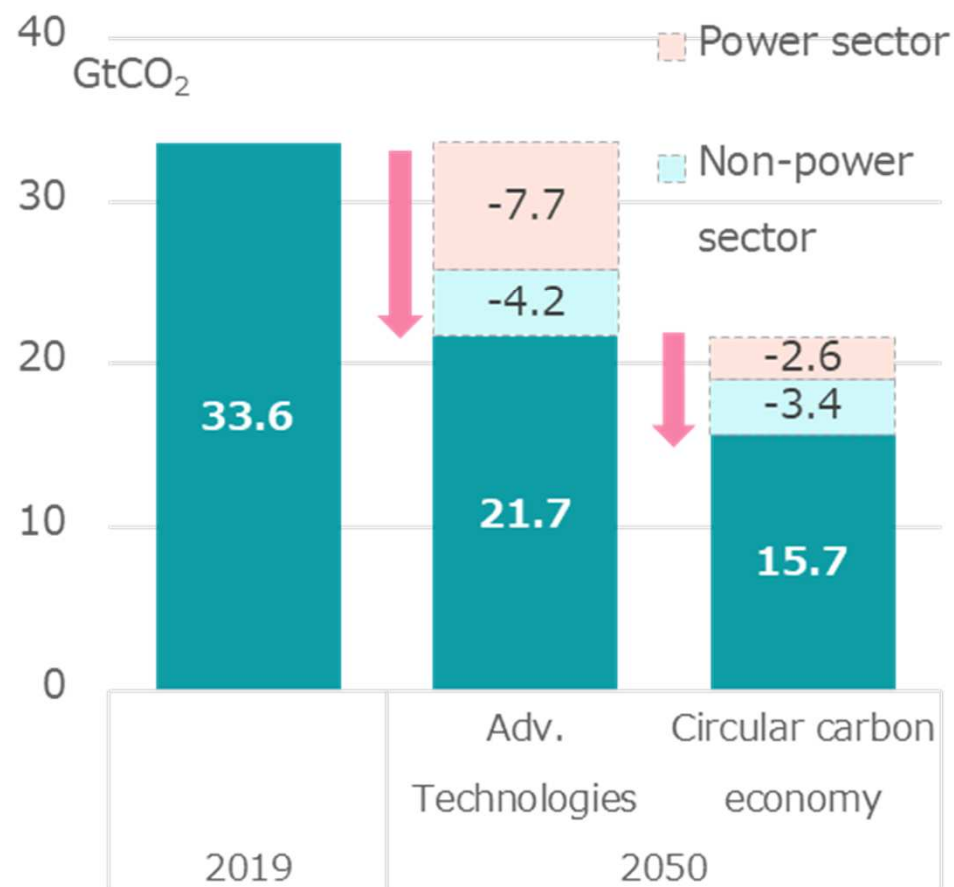
- **Ukraine crisis as the top global security concern**
- **Gravity center of global energy market shift to Asia**
- **Tense and complicated US-China relation**
- **Impact of interaction among “big players” (US, Russia, Middle East producers, China, EU, etc.)**
- **Market stability likely continues to be influenced by geopolitics of energy**
- **“Externalities” are important sources to impact on energy market stability and global energy governance**

# Clean hydrogen contributes to substantial CO<sub>2</sub> reduction without reducing fossil fuel use

## ❖ Primary energy demand



## ❖ Energy-related CO<sub>2</sub> emissions



Fossil fuel consumption in the CCE scenario is almost the same as that in the ATS. Demand for natural gas for hydrogen production will increase slightly.

On the other hand, the CO<sub>2</sub> emissions decline significantly. The center of gravity for emission reductions is shifting to the non-power generation sector.

Source : IEEJ, IEEJ Outlook 2022