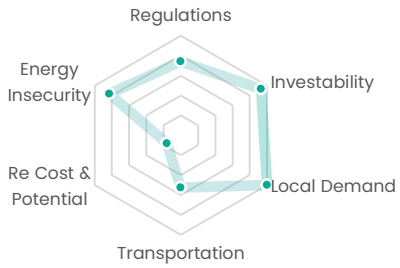
# South Korea

**Index rank** # **12**

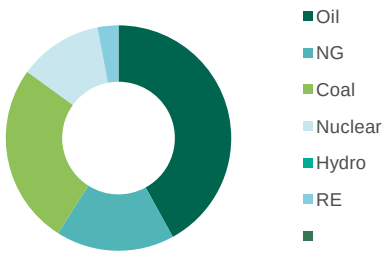
**Aggregate score (out of 5)** **3.6**

| | |
|---|---|
| GDP - USD (trn): | **1.6** |
| GDP per capita - USD: | **31,489** |
| Land area ('000 km2): | **98** |
| Population density (per km²): | **529** |
| Grid emissions factor (gCO²/kWh): | **517** |

### Hydrogen Drivers Matrix




### Primary Energy Mix




**3.7** **Regulatory commitment**
- Net zero commitment 2050
- Considerable c.USD9bn targeted hydrogen funding earmarked
- Carbon pricing fairly robust

**2.6** **Transportation**
- Established ammonia and LNG import infrastructure are serving as starting points for hydrogen value chain

**4.7** **"Investability"**
- AA rated by S&P
- 40th in WB Ease of Doing Business
- Strong domestic investment angle

**0.8** **RE cost and potential**
- Solar resource below average; very high population density poses challenge
- Early stages of developing offshore wind potential

**5.0** **Local demand potential**
- 6th largest steel manufacturing
- 5th largest oil refiner
- 4th busiest container port traffic

**4.2** **Energy insecurity**
- Net energy import of >80%

# Strong Government funding and *chaebol* united behind Korean hydrogen

South Korea was the second country in the world to issue a hydrogen strategy, after Japan, and shares similar priorities of energy security and technology export. South Korea's total energy supply is made up of 40% oil, 30% coal, 15% LNG, and <15% nuclear with a very small share of renewables, explaining the strong focus on hydrogen for mobility. The country is highly energy dependent, importing more than 80% of its total energy needs.

Under the national hydrogen roadmap, the Government plans to put 67,000 FCEVs on the road by 2022, deploy 1.5GW of fuel cells in power generation, secure 470ktpa of hydrogen supply[1], and achieve a clean hydrogen price of USD5.2/kg. While progress in 2021 seems to be falling short of 2022 targets, large-scale projects have been initiated and receive strong Government backing. In 2021, the Government offered up to USD33.5m in subsidies for FCEV purchase, twice that for BEV.

South Korea's emissions trading scheme, in place since 2015, serves as an underlying driver for companies' long-term decarbonization planning. It reached prices of c.USD35/tonCO2 in 2020, albeit having fallen to the mid-teens in 2021, on the back of a COVID-driven slowdown. The scheme expanded to include transportation and construction in 2021 and has a comprehensive scope covering 74% of national GHG emissions.

## Green New Deal funding

Under the Green New Deal, the Government has earmarked investments of KRW20.3trn (USD17bn) for green mobility and KRW11.3trn (USD10bn) for green energy through 2020-2025. Priority projects and businesses would be financed over 2021-2025 via debt issuances.

## Five hydrogen clusters

In August this year, the Ministry of Trade, Industry and Energy announced plans to invest KRW1.27trn (USD1.07bn) to establish five hydrogen clusters across the country: a green hydrogen production cluster powered by 100MW of solar; a biogas and blue hydrogen production cluster; a hydrogen storage and transportation cluster; a hydrogen mobility cluster in Ulsan; and a hydrogen fuel cell cluster in North Gyeongsang Province.

## *Chaebol* alliance

In September, 11 of South Korea's largest conglomerates—Samsung, Hyundai Motor, Hyundai Heavy, SK, Lotte, Posco, Hanwha, GS, Doosan, Hyosung and Isu—joined in an uncommon alliance for hydrogen development domestically and abroad, promising to invest a combined KRW43trn (USD38bn) by 2030.

## SK Group

SK Group has been particularly active, with plans to invest USD1.65bn over the next five years on domestic hydrogen. The company has been selected by the Government to build a 250ktpa blue hydrogen value chain at the Yeosu and Gwangyang ports in the south, leveraging existing LNG infrastructure. The Group is also investing USD1.5bn into fuel cell company Plug Power for expansion in Asia.

hydrogen investability index

Cranmore Partners energy estate.

[1] From by-product, SMR and electrolysis