

**32nd Annual Conference of the
Northeast Asia Economic Forum**

Unleashing Energy Cooperation Potential in Northeast Asia: Trilateral and Multilateral Perspectives

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- Energy trilemma in NEA
- Energy cooperation levels in NEA
- China-Mongolia-Russia energy cooperation: Power of Siberia II

Energy trilemma in NEA

ENERGY SECURITY

Import independence
Diversity of electricity generation
Energy storage



SUSTAINABILITY

Final energy intensity
Low carbon electricity generation
CO2 emissions per capita

ENERGY EQUITY

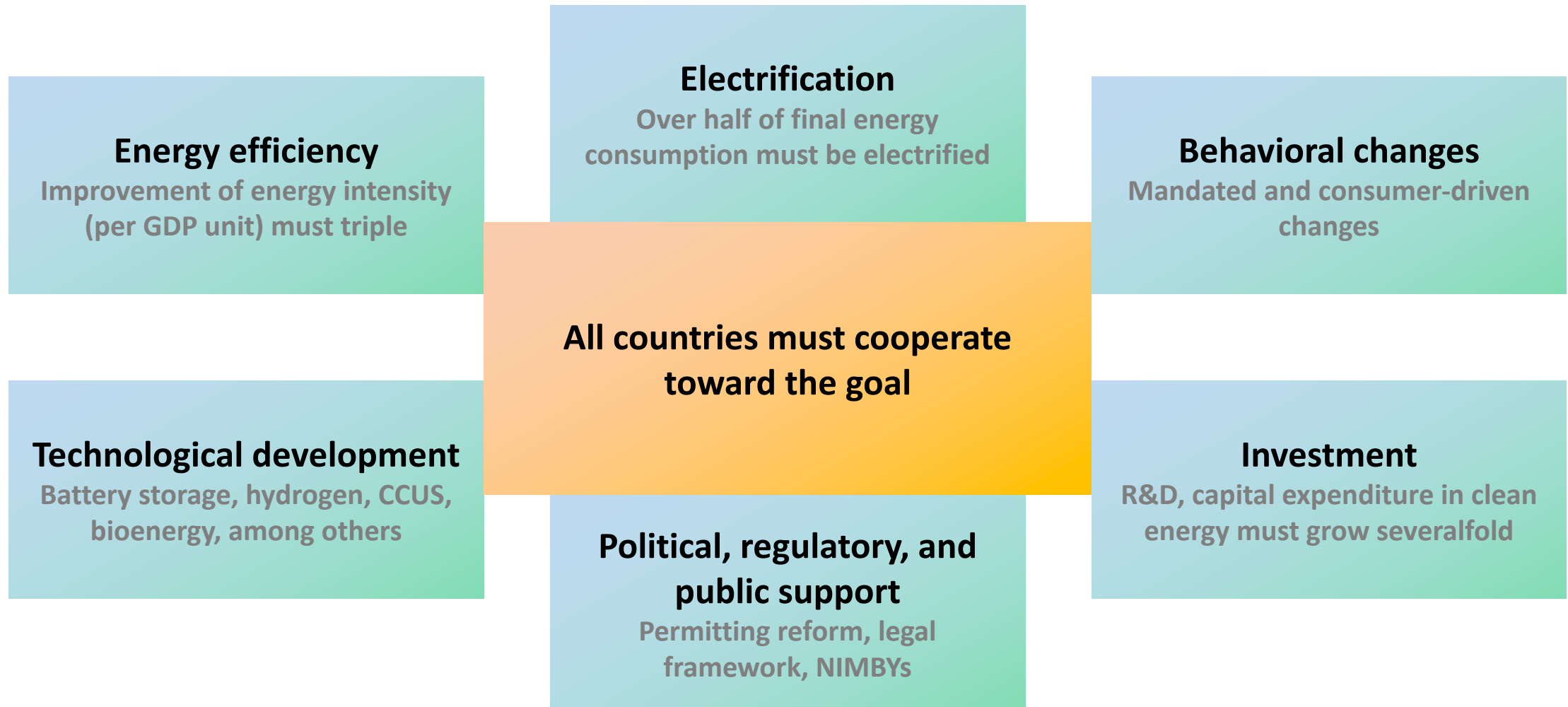
Access to electricity
Electricity prices
Gasoline and diesel prices

Energy Trilemma Index (2022)

Trilemma score (/100)	Energy equity	Energy security	Sustainability
China (PRC)	71.8	66.3	59.4
Japan	94	59	74.8
Korea (ROK)	95.1	62.2	66.1
Mongolia	63.1	47.6	46.7
Russia	81.4	69.9	63.9

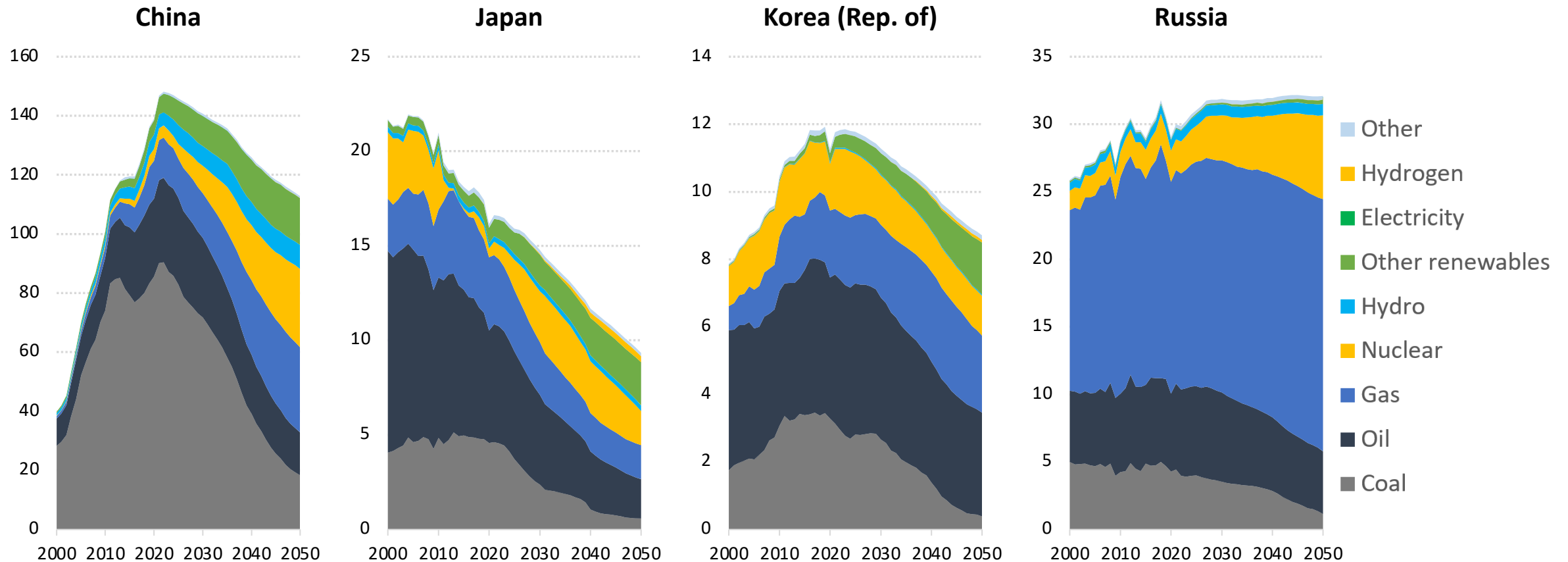
Source: World Energy Council

Net zero requirements and challenges



Climate targets require overhaul of existing energy mix

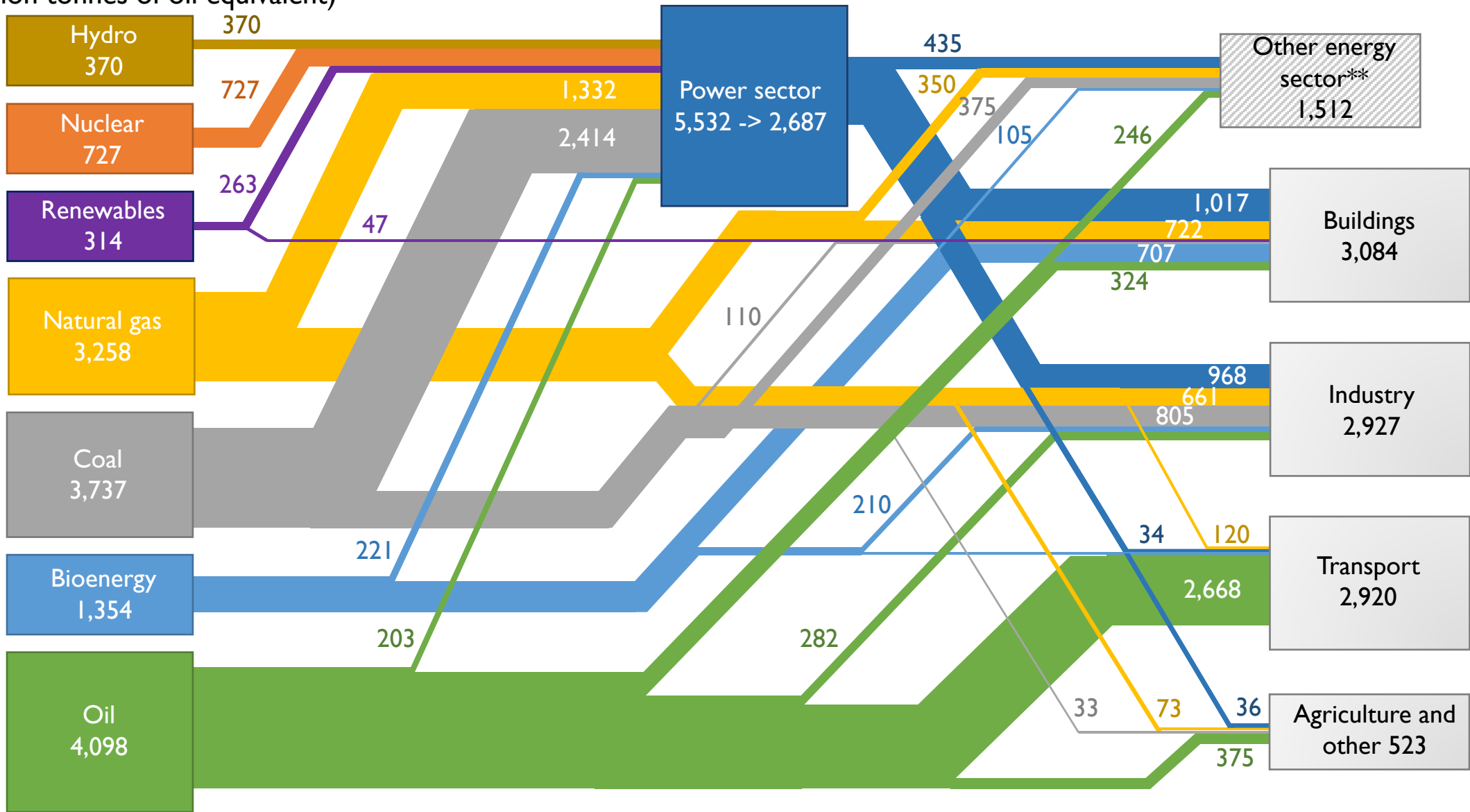
Primary energy supply under carbon neutrality scenario (exajoules per year)



Source: APEC Energy Demand and Supply Outlook

World final energy consumption (2019)

(Million tonnes of oil equivalent)

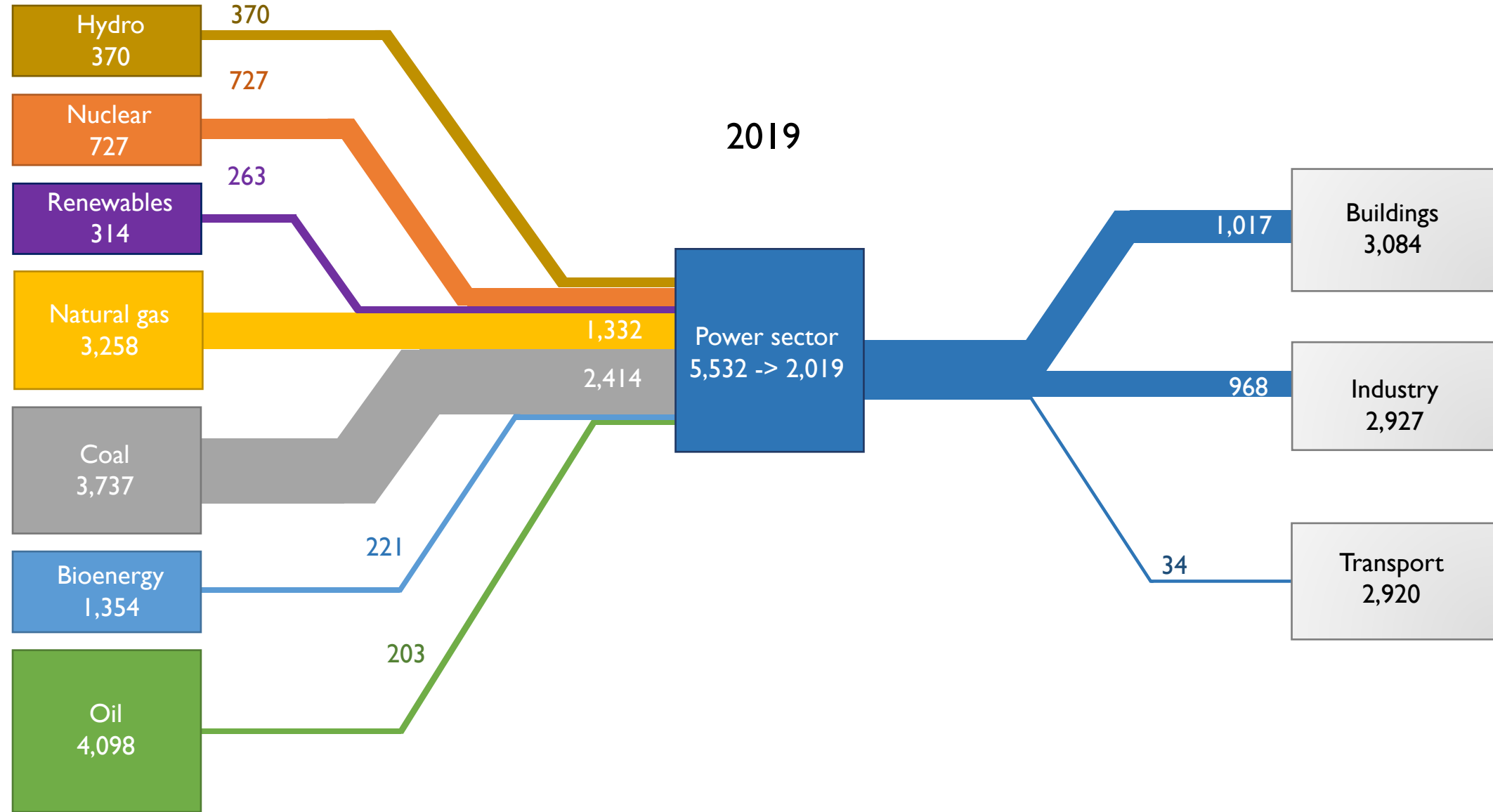


* Flows/values of less than 25 Mtoe are not shown.

**Other energy sector "covers the use of energy by transformation industries and the energy losses in converting primary energy into a form that can be used in the final consuming sectors." (IEA)

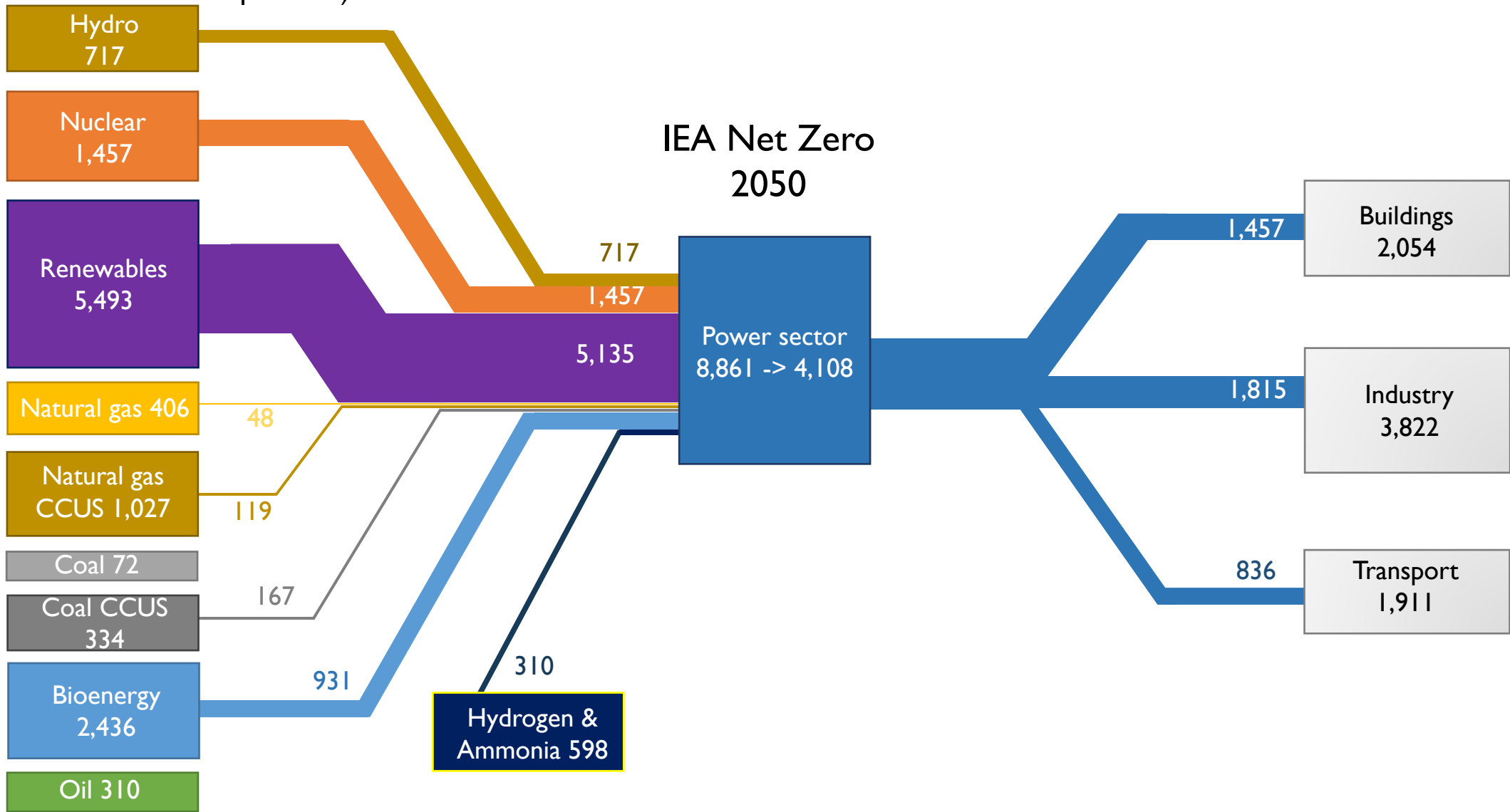
Global electricity mix today

(Million tonnes of oil equivalent)



Global electricity mix under net zero

(Million tonnes of oil equivalent)

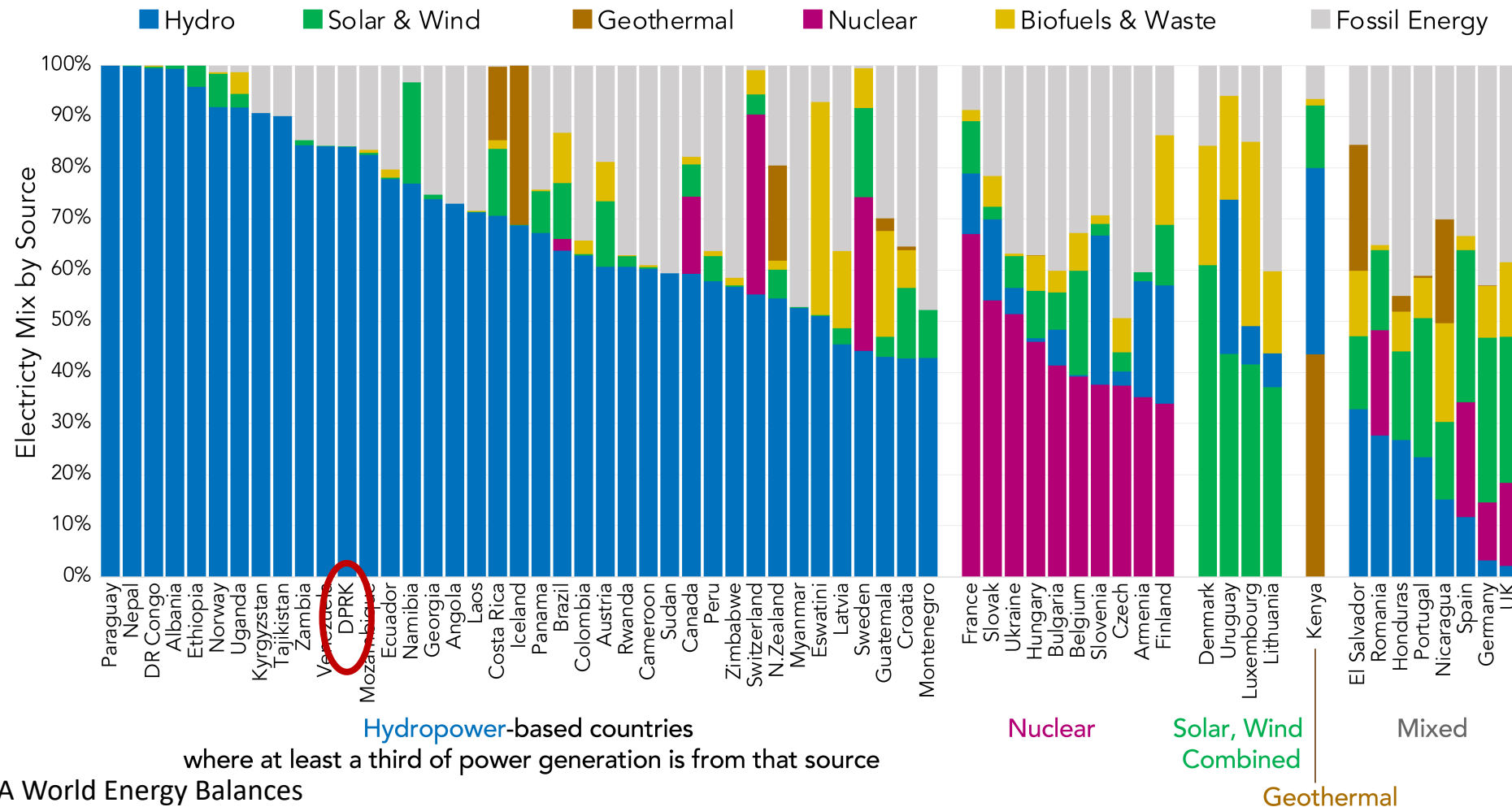


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*Other energy sector “covers the use of energy by agriculture, transformation industries and the energy losses in converting primary energy into a form that can be used in the final consuming sectors.” (IEA)

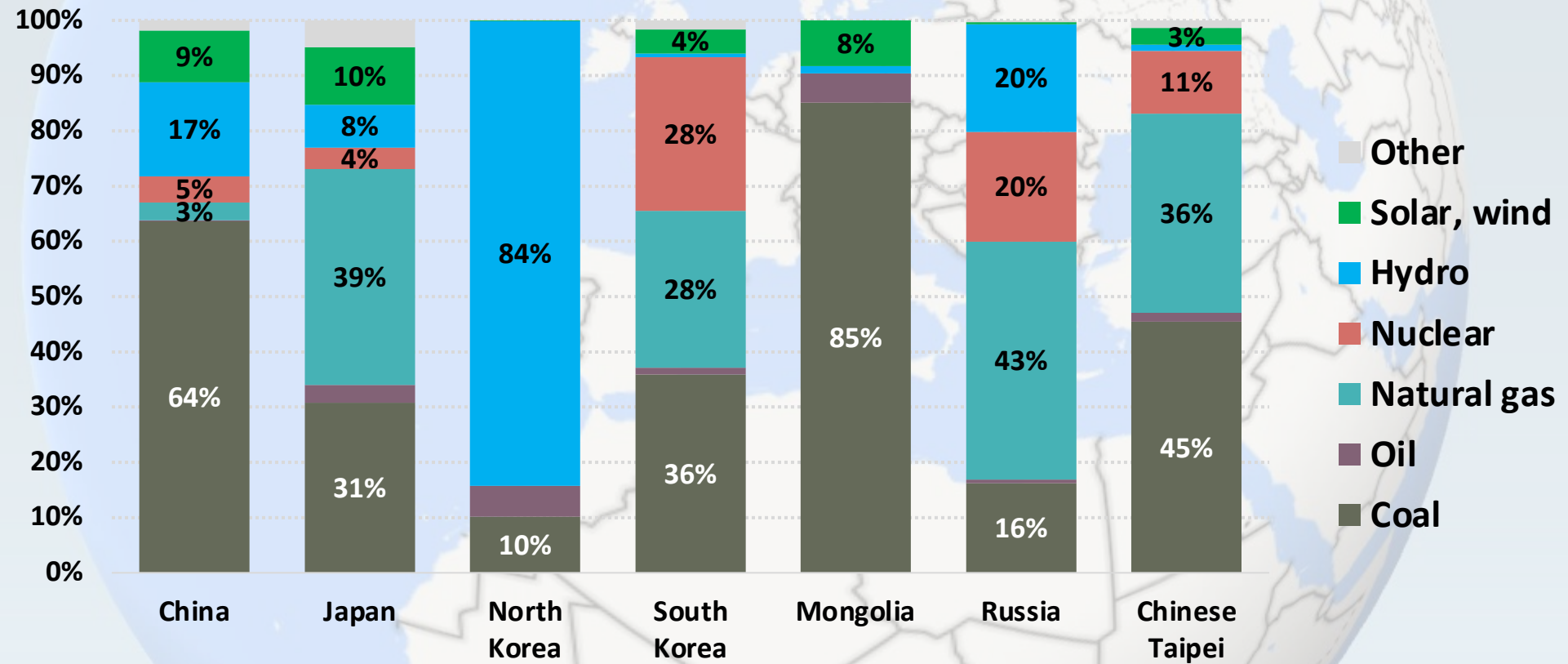
Role of low-carbon baseload capacity, low energy intensity, small population, regional interconnectivity

62 Countries Where Over Half of Electricity Comes from Non-Fossil Energy Sources (2020)



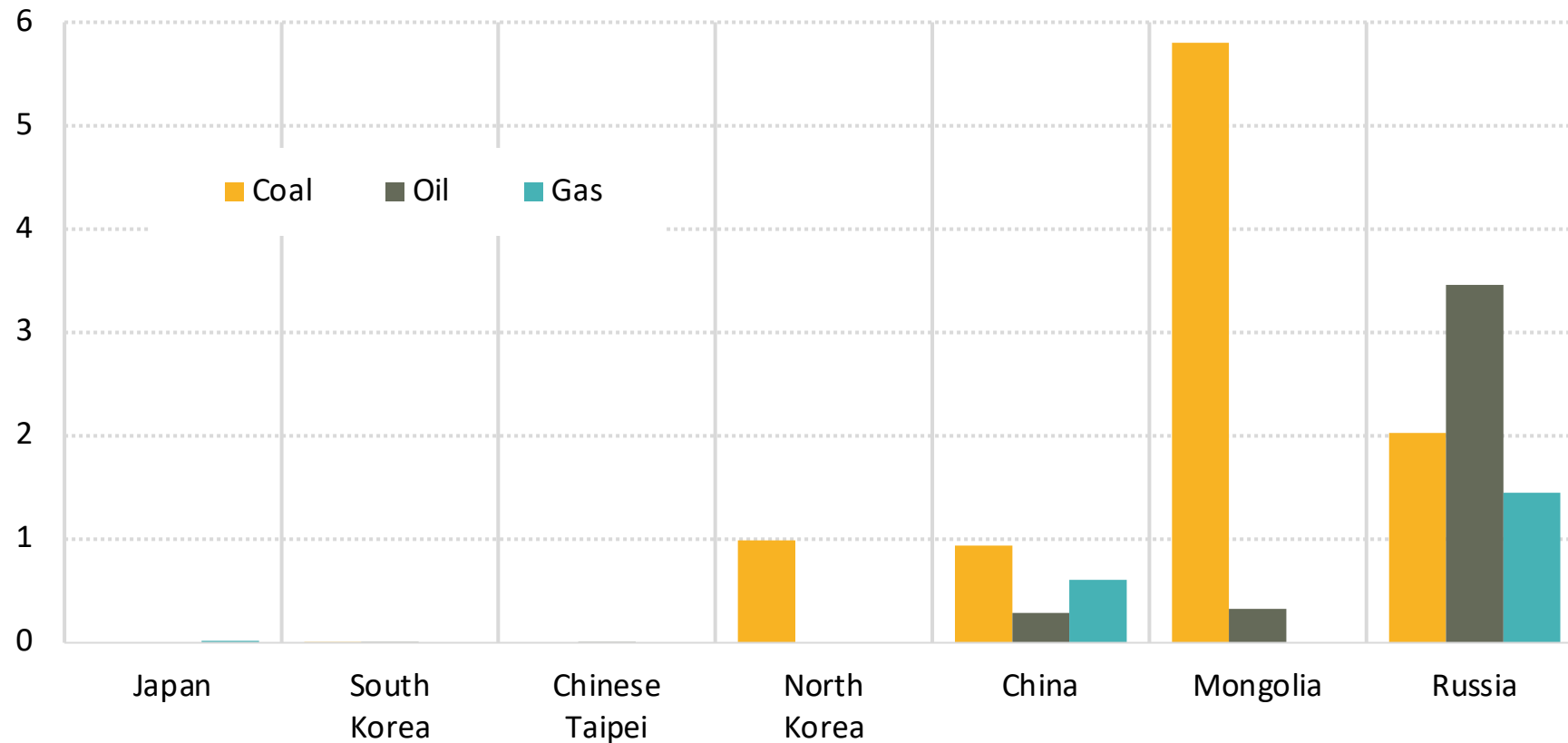
Power generation capacity in NEA (GW)

Electricity generation by fuel source (2020)



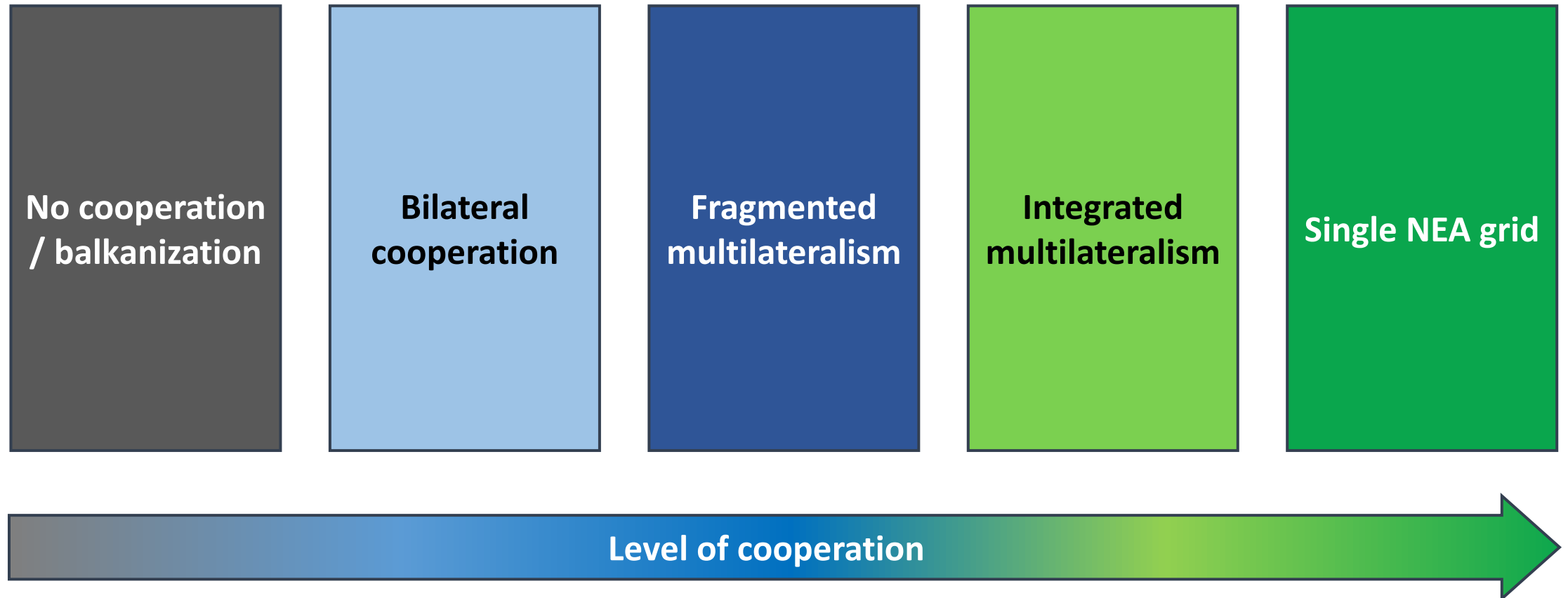
Ensuring energy security in energy transition

Hydrocarbon self-sufficiency in NEA



Data: IEA World Energy Balances

Possible energy cooperation scenarios in NEA



Possible energy cooperation scenarios in NEA

Fragmented multilateralism

Most probable

- **China-Russia-centered hydrocarbon network**
 - Power of Siberia 2?
- **US-Japan-Korea(+Mongolia) network**
 - J-K partnership in semiconductor supply chain
 - US-Korea-Mongolia critical mineral partnership
- **Occasional trilateral cooperation on extra-regional issues**
 - US-Japan-China on Vietnam

Integrated multilateralism

Most desirable

- **Regional formal energy dialogue mechanism**
- **Energy facilitator organization**
- **Joints energy projects with multiple NEA stakeholders**
- **Regional energy security response mechanisms / emergency stock sharing**
- **Training, capacity building**

Single NEA grid

Most aspirational

- **Integrated regional power grid**
- **Convergence of regulatory frameworks**
- **Pool funds for regional UHV transmission infrastructure**
- **Regional electricity regulator**
- **Existing research**
 - Asian Super Grid
 - North-East Asian Power System Interconnection (NAPSI)
 - North-East Asian Energy Interconnection (NEAEI)

Finding realistic solutions to promote trilateral & multilateral energy-sector cooperation in NEA

Short- & medium-term

- Track 1 platform or mechanism for NEA periodic dialogue

- Regional independent, intergovernmental organization (similar to the IEA)

- Joint investment in low-carbon projects

Long-term

- Regional energy security response mechanisms (critical minerals, LNG, oil)

- Increased intra-regional low-carbon energy trade (hydrogen, electricity, gas)

- Expanded infrastructure connectivity (pipelines, transmission lines)

Anything else?

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China-Mongolia-Russia Energy Cooperation: Power of Siberia II

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China-Mongolia-Russia Energy Cooperation

 Belt and Road Initiative

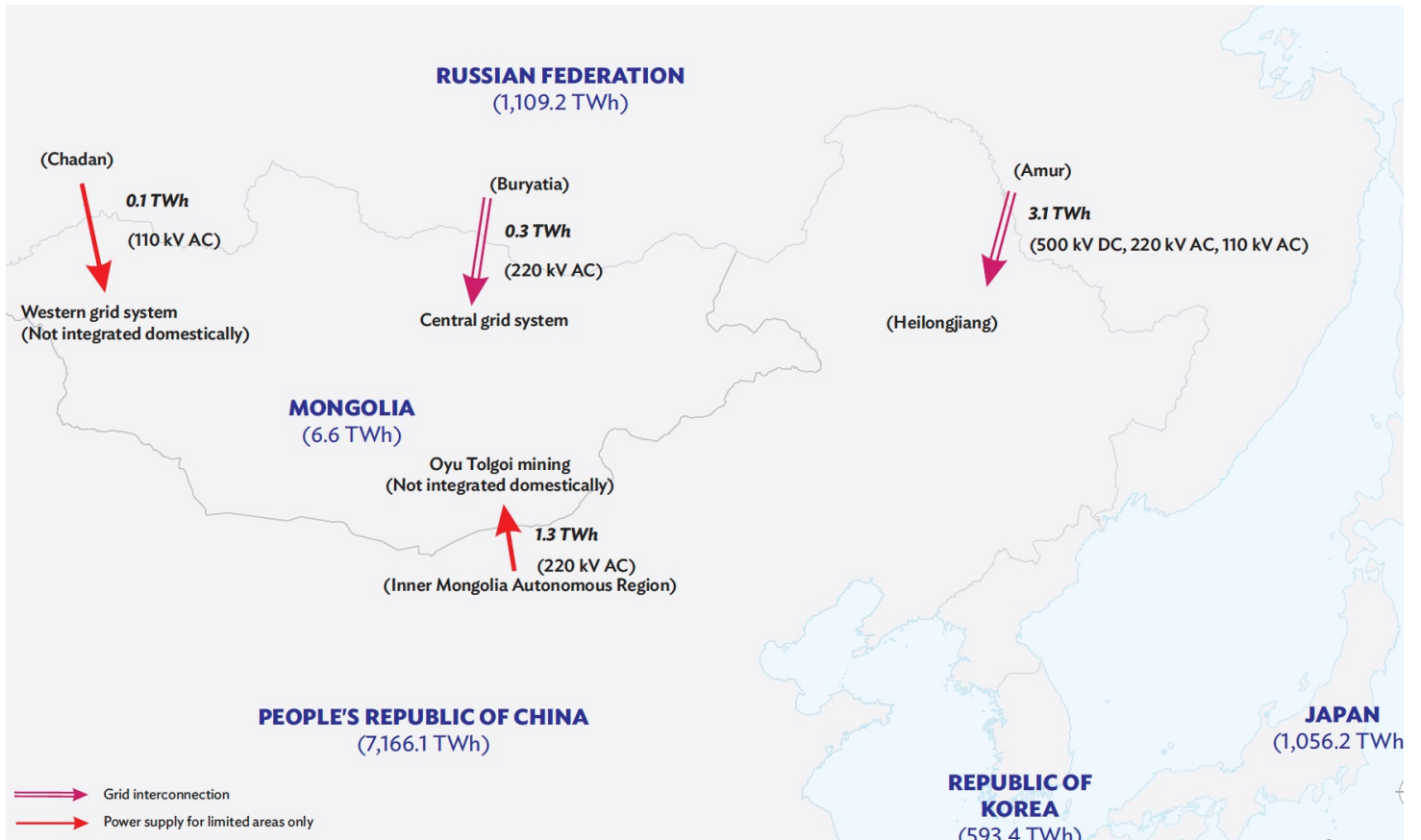
 Trans-Eurasian Railway
Network

 Steppe Road



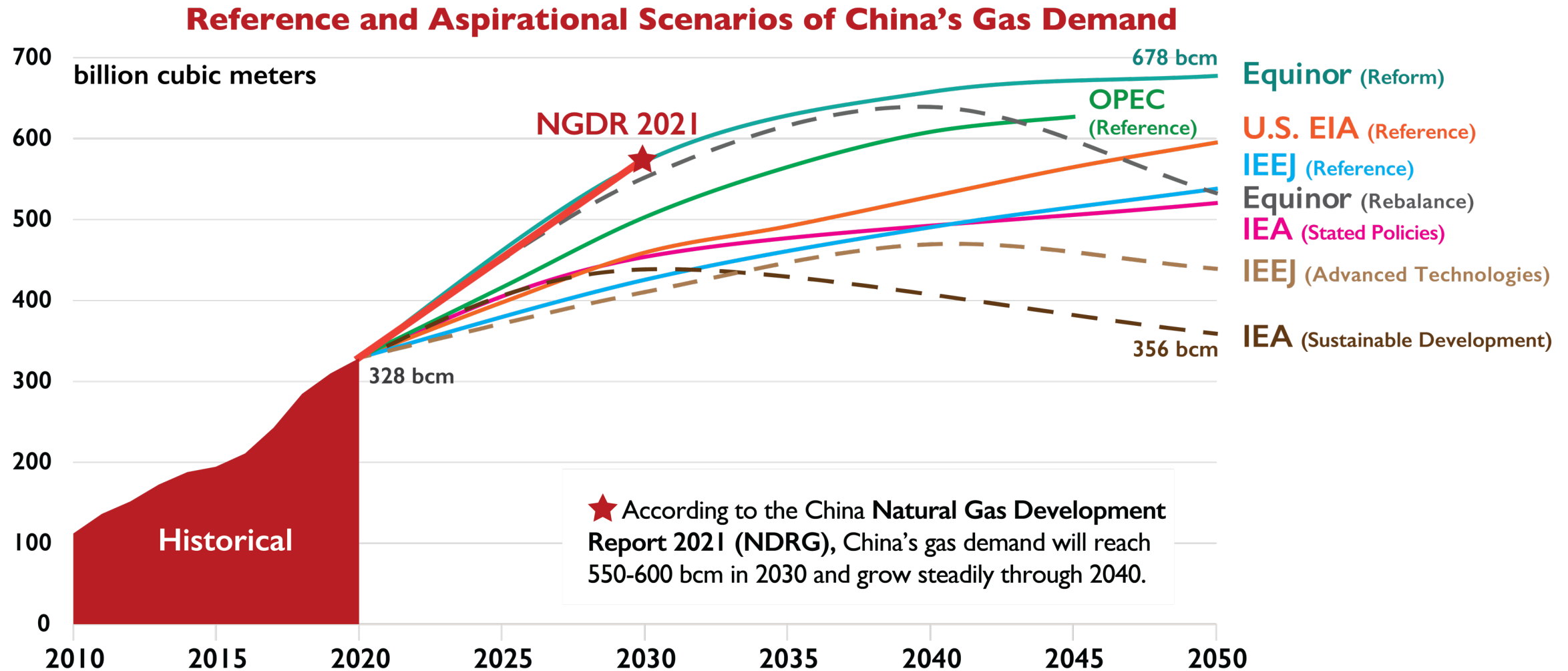
China-Mongolia-Russia
Economic Corridor

Electrical Interconnections and Domestic Power Generation in NEA, 2018



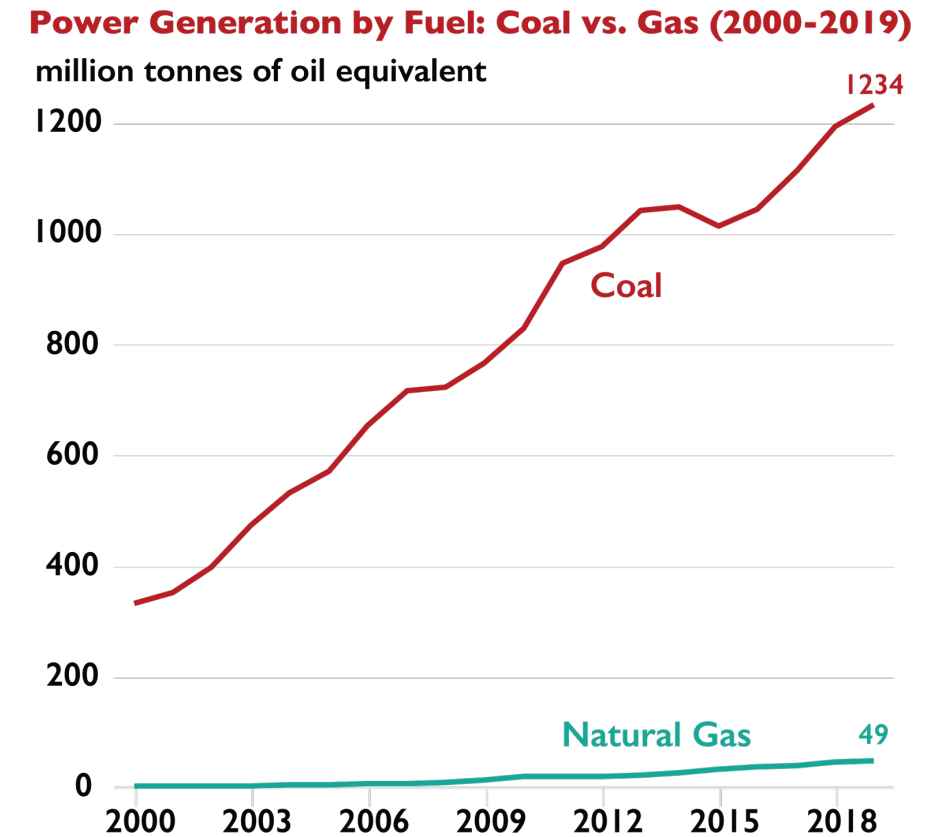
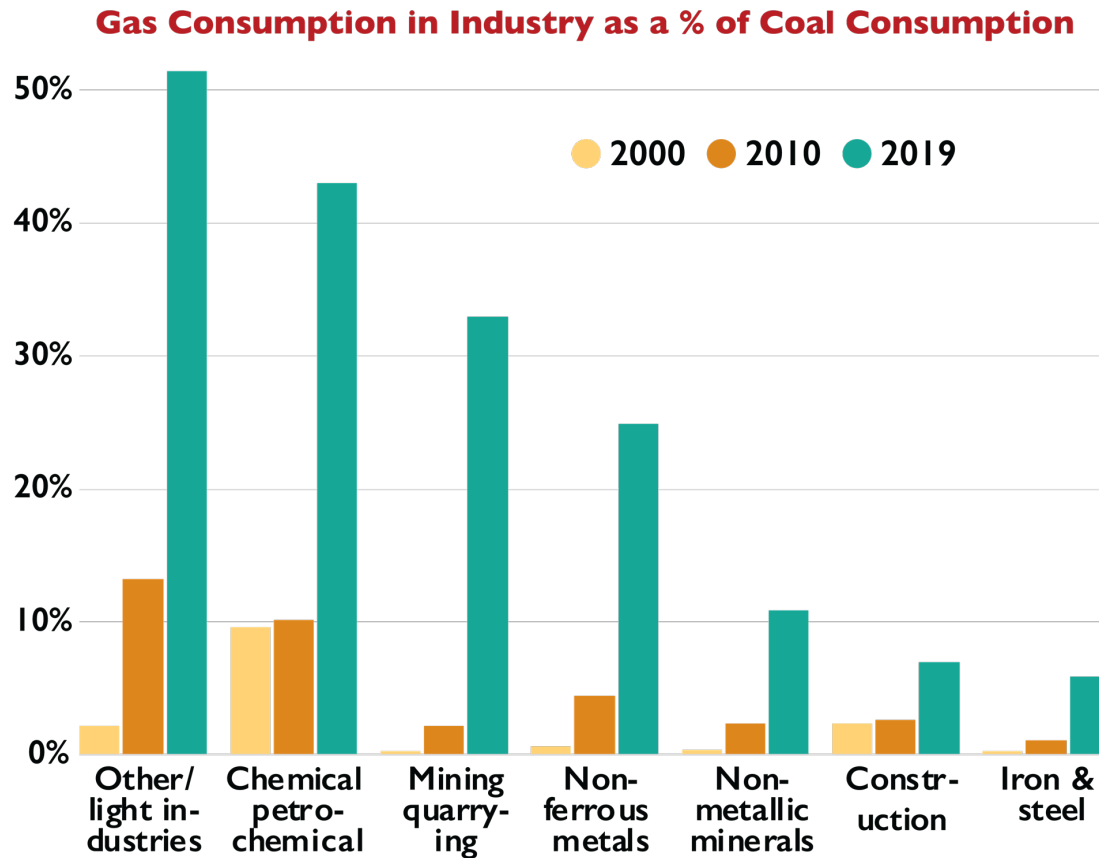
Source: ADB

China's natural gas demand scenarios



EPRINC figure based on data from China Statistical Bureau, IEA WEB, U.S. EIA IEO 2021, Equinor Energy Perspectives 2021, IEEJ Outlook 2022, IEA WEO 2021, OPEC WOO 2021, China Natural Gas Development Report 2021

China: Coal still dominant vs. natural gas



EPRINC figure based on data from IEA World Energy Balances and China Energy Statistical Yearbook 2020

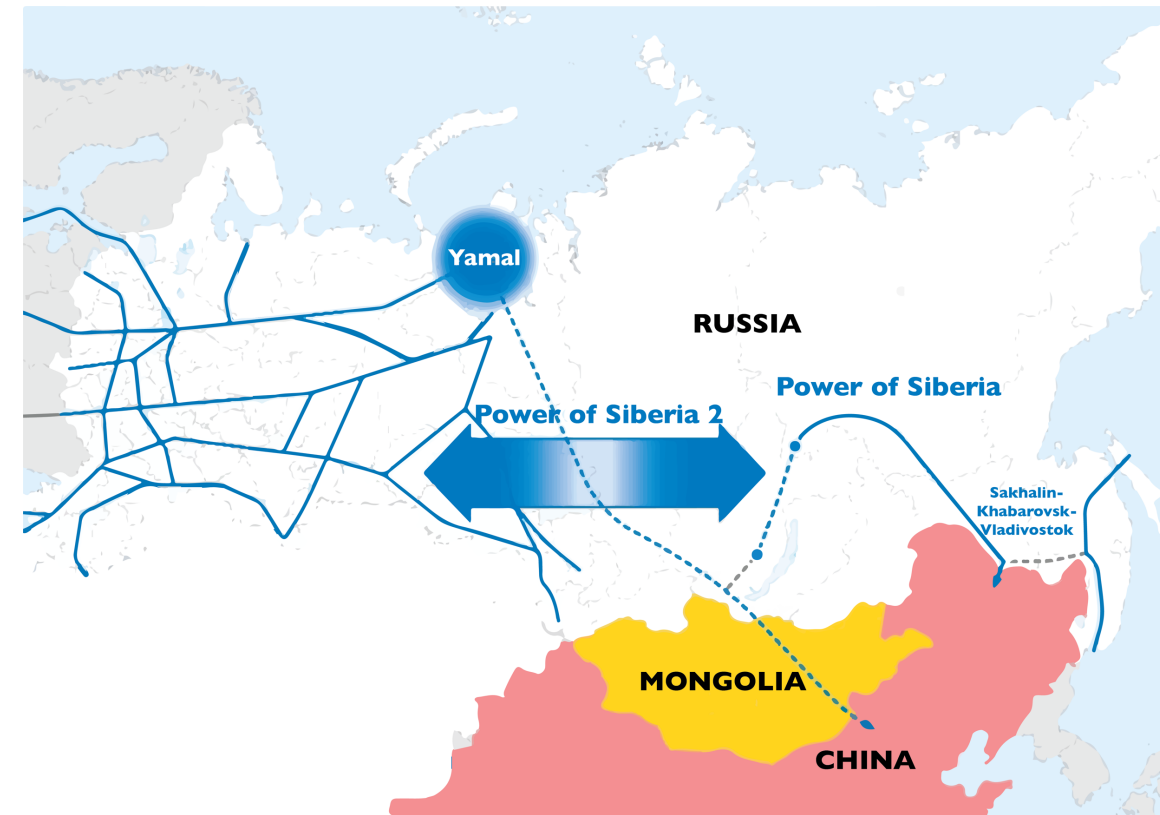
PoS1, Altai gas pipeline, Soyuz Vostok

Original Altai pipeline



Source: <https://globalriskinsights.com/>

New (proposed) Power of Siberia 2 route



Sources: Gazprom