

Special Report

# Changing Energy Dynamics Amid Russia-Ukraine Conflict

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# Executive summary

In line with the Paris Agreement, countries across the globe had earlier implemented net-zero emission (NZE) initiatives to decarbonize electricity generation by 2050. However, the war between Russia and Ukraine has put pressure on countries to reuse various energy sources.



- Impact of war on fuel**
  - In this report, we analyze the impact of the Russia-Ukraine war on various fuels for electricity generation, such as nuclear, coal, LNG, solar, and wind. We also compare each source's current usage against original goals set under NZE for each fuel.
- Risk to solar energy**
  - Although the Russia-Ukraine war would significantly promote the usage of solar energy, we see an immediate risk associated with installation of solar modules due to the hike in raw material prices and imposition of tariffs.
- Key takeaways**
  - Energy security, coupled with power independence, is now on the priority list of developed countries.
  - An uptick in coal use is likely to drive carbon emissions. However, this is expected to be offset by an increase in the adoption of nuclear power, supported by increased focus on setting up nuclear facilities across the world in the long term.

# Impact of Russia-Ukraine war on coal and nuclear fuel



## Coal

- Under the NZE initiative, coal usage was anticipated to dip 90% by 2050. Moreover, no further investment was planned for the construction of new coal plants and less efficient plants had to be phased out by 2030.
- Due to the current geopolitical conflict, the EU, the US, Japan, and South Korea intend to reactivate coal-fired plants to maintain the energy storage level for the coming winter. However, fuel availability is limited and tied to long-term contracts. Hence, these regions are buying coal from developing countries such as Indonesia.
- Over the medium term, demand for this less expensive fuel source is expected to surge to address the electricity supply gap until other fuel plants, such as nuclear and solar, commence operations. This would significantly impact the green energy initiatives.



## Nuclear

- Initially, developed economies had set a target of generating <10% of the total energy via nuclear fuel by 2050 after the Fukushima nuclear incident in Japan.
- The current war has compelled these countries to adopt nuclear as a fuel to prevent blackouts.
  - The US is highly focused on quick installation of small modular as well as advanced reactors.
  - The UK plans to install eight new reactors to triple its atomic power capacity by 2050. This would scale up its nuclear energy contribution to 25% of the total power output as opposed to 16% at present.
- Several existing nuclear plants have been shut down and resuming operations at these facilities would create short-term obstacles as advance technology is required. In France, nuclear power accounts for 66% of overall power generation, but 50% of nuclear plants are non-operational. Major electric utility company, EDF has cut its nuclear output by ~5% for 2022. Japan's Kyushu Electric has halted operations at its two-offline plant to implement anti-terror measures.
- Despite these challenges, with the aid of the initiatives mentioned above, nuclear energy contribution to total power generation is expected to reach >10% in the long term. Although this would help decrease the carbon footprint, disposal of radioactive waste could become a major concern.

# Impact of Russia-Ukraine war on LNG and wind-solar sources



## LNG

- In line with NZE goals, use of LNG in electricity generation would increase slightly by 2025.
- The US and EU are together working to boost LNG imports on account of the Russia-Ukraine conflict.
- The global target of LNG for mid-2020s is in accordance with NZE goals as current reserves are manageable until summer 2022.

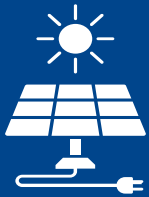


## Wind and Solar

- Based on global NZE initiatives, the share of solar and wind power is expected to jump from 9% in 2020 to 40% by 2030 and to 70% by 2050. However, the Russia-Ukraine war has accelerated the green emission target before 2050, as several developed nations have increased wind/solar installations by quickly giving regulatory approvals to these projects.
  - The UK plans to raise its wind energy output target by 25% to 50 GW by 2030 (earlier target: 40 GW) from the current output of 14 GW. Moreover, solar capacity is expected to surge 5x by 2035, supported by quick project approvals.
  - France's solar output is projected to increase 10x by 2050, with offshore wind farms' output expected to double during this period.

# Short-term risk

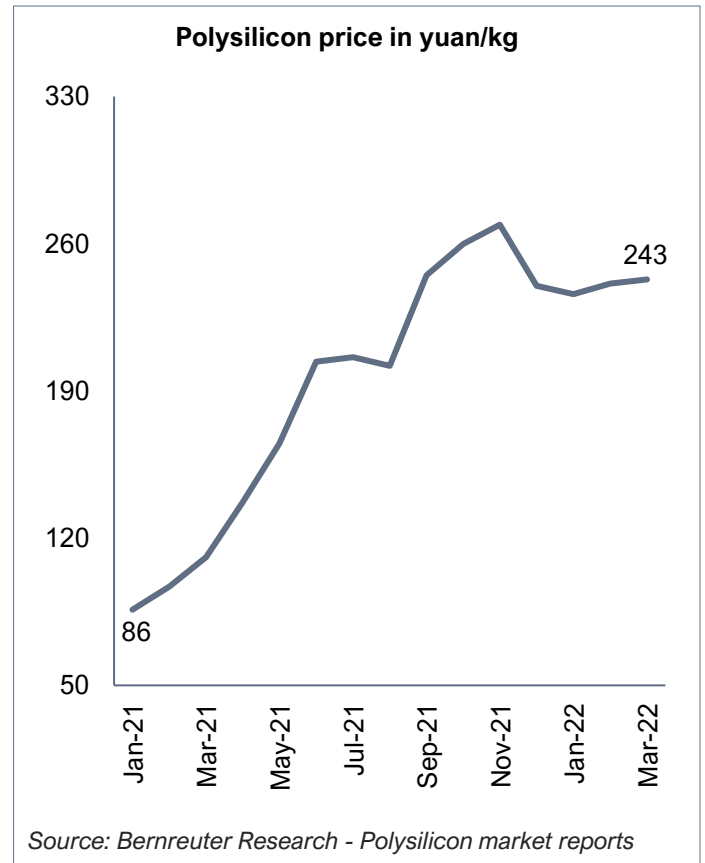
Solar energy to benefit the most from war-induced energy crisis; however, higher input cost and tariff uncertainties could delay solar module manufacturing.



- Strict lockdown measures in China owing to the resurgence of the pandemic have negatively impacted industrial supply chains, leading to a hike in the prices of various commodities. For instance, the price of polysilicon, used for manufacturing solar panels, tripled between January 2021 and March 2022 due to tight supply.



- The US government has tightened trade policies with China by imposing anti-dumping and countervailing duties. This has led to delays in solar panel installation as ~90% of photovoltaic cell manufacturing plants are located in China.
- However, depreciation of the yuan since April has partly offset the spike in solar equipment export prices. This has brought a slight relief to many utility-scale projects.



## Key takeaways

- Decarbonization goals depend on the readoption of coal and nuclear fuels for power generation.
- The pledge to wean off Russian gas is likely to affect the coming winter energy supply, mainly in the US and EU.
- The conflict has led to pile-up of demand for solar energy capacity to ensure energy security. However, ongoing supply constraints have inflated solar module installation charges.
- The phrase “never say never” seems relevant, with the Russia-Ukraine war putting a spotlight on nuclear as a future source of energy generation.



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