

## Small modular reactors (SMRs)

- The world's quest to decarbonize itself is guided, among other things, by the UN Sustainable Development Goal 7: "to ensure access to affordable, reliable, sustainable and modern energy for all".
- Since the world still depends on fossil fuels for 82% of its energy supply, decarbonizing the power sector is critical; the share of electricity in final energy consumption will also increase by 80%-150% by 2050.
- Conventional nuclear power plants often suffer from time and cost overruns.
- As an alternative, several countries are developing small modular reactors (SMRs) nuclear reactors with a maximum capacity of 300 MW to complement conventional NPPs.
- SMRs are designed with a smaller core damage frequency (the likelihood that an accident will damage the nuclear fuel) and source term (a measure of radioactive contamination) compared to conventional NPPs.
- They also include enhanced seismic isolation for more safety.
- The amount of spent nuclear fuel stored in an SMR project will also be lower than that in a conventional NPP
- Accelerating the deployment of SMRs under international safeguards, by implementing a coal-to-nuclear transition at existing thermal power -plant sites, will take India closer to net-zero and improve energy security because uranium resources are not as concentrated as reserves of critical minerals.
- Most land-based SMR designs require low-enriched uranium, which can be supplied by all countries that possess uranium mines and facilities for such enrichment if the recipient facility is operating according to international standards.
- Since SMRs are mostly manufactured in a factory and assembled on site, the potential for time and cost overruns is also lower.

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### THE HINDU

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## Drug Wegovy

- Novo Nordisk said a large study had shown its highly effective obesity drug Wegovy also had a clear cardiovascular benefit, boosting the Danish drugmaker's hopes of moving beyond Wegovy's image as a lifestyle drug.

- Novo, Eli Lilly, and Pfizer are among the dozens of drugmaker's chasing an up to \$100 billion market of obesity treatments, which could also include oral options in the future.

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#### China & deflation

- China's consumer sector fell into deflation and factory gate prices extended declines in July, as the world's second- largest economy struggled to revive demand and pressure mounted for Beijing to release more policy stimulus.
- Anxiety is rising that China is entering an era of much slower economic growth
- For China, the divergence between manufacturing and services is increasingly apparent, meaning the economy will grow at two speeds in the rest of 2023, especially as the problem in real estate re-emerges,"
- "It also shows China's slower -than-expected economic rebound is not strong enough to offset the weaker global demand and lift commodity prices.
- In economics, deflation is a decrease in the general price level of goods and services. Deflation occurs when the inflation rate falls below 0%.

- Inflation reduces the value of currency over time, but sudden deflation increases it.

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#### An amendment to the New Drugs and Clinical Trial Rules (2023)

- An amendment to the New Drugs and Clinical Trial Rules (2023), recently passed by the Government of India, aims at stopping the use of animals in research, especially in drug testing.
- The amendment authorizes researchers to instead use non-animal and human -relevant methods, including technologies like 3D organoids, organs-on- chip, and advanced computational methods, to test the safety and efficacy of new drugs.
- In the last few decades, several technologies have been developed using human cells or stem cells.
- These include milli metre- sized three- dimensional cellular structures that mimic specific organs of the body, called "organoids" or "mini-organs".
- Another popular technology is the "organ-on-a-chip": they are AA- battery -sized chips lined with human cells connected to the

microchannel, to mimic blood flow inside the body.

- These systems capture several aspects of human physiology, including tissue- tissue interactions and physical and chemical signals inside the body.
- Several innovations in the last decade now allow a 3D bio-printer to 'print' biological tissues using human cells and fluids as 'bio-ink'.
- Such technologies, researchers say, are bringing us closer to recreating a human tissue or organ system in the laboratory.
- One problem is that developing an organ-on-a-chip system typically requires multidisciplinary knowledge.

**THE HINDU**

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