

# ENERGY WILL SEE BIGGEST DISRUPTION

INFRASTRUCTURE IS OVERDUE FOR  
CHANGE. AND, THE **DIGITAL REVOLUTION**  
WILL FURTHER REDEFINE THE SECTOR



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**s Mirabai Chanu put an end to India's** 21-year-old wait for the second Olympic medal in weightlifting, one can resonate with what writer and philosopher Sun Tzu famously said, "Victory comes from finding opportunities in problems."

Resilience is an imperative, as nobody knows what our world will look like when coronavirus is over. But one thing is certain — as an industry whose projects are built to last for generations,

we believe that our big opportunity may be right where we are now. The projects we build today have to be ready for the requirements of tomorrow.

The rate at which the infrastructure ecosystem is evolving, we feel certain in creating an opportunity for everyone. The time to start rebuilding society is now. Fresh thinking is the need of the hour, as dual demands of climate change and urbanisation are putting urban infrastructure under pressure like never before. As we navigate the fourth industrial revolution with a human-centered approach to design, our imagination is the limit to fostering a culture of enjoyment and personal responsibility for building socially stable and vibrant communities. We envision smart highways embedded with neural networks connecting smart cities, intelligent buildings with real-time digitally-monitored utilities, data-driven traffic management systems, autonomous vehicles, sustainable energy sources and zero emissions. We are super-excited at the potential of these new opportunities.

The world is surely and steadily moving towards adopting hydrogen as green fuels take centre stage. This is a huge opportunity for Indian infrastructure. Electrolyser technology, used for splitting water using renewable power for production of green hydrogen, is poised for large-scale commercial adoption.

A Bloomberg report recently predicted that hydrogen could meet up to 24 per cent of the world's energy needs by 2050, creating a market worth \$600 billion. India has taken some concrete steps towards producing green hydrogen. With five pilot plants being set up to ascertain its commercial viability, India holds the potential to become a large producer of green hydrogen, considering these plants can produce 175 GW of renewable power by 2022, which will grow to 450 GW by 2030.

Hydrogen can ultimately replace fossil fuels. However, sectors such as transport, buildings and power need to significantly increase its adoption. According to scientists, hydrogen will revolutionise the global transport system. It will power vehicles for much larger distances than the present electric vehicles. Imagination is the limit to the opportunity that green hydrogen can provide.

The Centre's National Hydrogen Mission is expected to incentivise various approaches and the nation's medium- to long-term strategy of becoming a sizeable player in green energy. L&T is seriously exploring opportunities for acquiring integrated capabilities in this area.

In fact, the biggest disruption in the future of infrastructure will be in the energy sector. Hydrogen economy, carbon capture, biofuels, electric vehicles, green buildings,



**UNDER THE CENTRE'S HOUSING FOR ALL PROGRAMME, INDIA HAS SET A ROBUST TARGET OF BUILDING SIX CRORE HOUSES BY 2022. 3D PRINTING WILL BOLSTER THE PROGRESS OF THE MASS HOUSING SEGMENT UNDER THE PRIME MINISTER AWAS YOJANA**

water desalination will be some of the major catalysts. All these are unique business opportunities.

#### **THE DETAILS**

Making air-conditioned mass-transit faster and safer, especially for a bustling metropolis such as Mumbai, where suburban local trains are the lifeline, will provide convenient mass-transit options, raising the happiness index of its inhabitants.

The workplace of the future is also set for possibly the biggest change, opening a plethora of opportunities. We envisage 'safety' at workplace through simulated (VR) systems that can mimic potential dangers, hazards and feel of the ecosystem. 'Connected workmen' wearing 'smart wearables' that can detect altitude, temperature and other

environmental conditions, besides monitoring vitals such as heart-beat, pulse rates, blood pressure and fatigue will come to the forefront. Use of artificial intelligence (AI) models, sensors and beacons will generate timely alerts to prevent accidents.

Imagine Internet of Things (IoT) technology connecting thousands of machines, deployed across hundreds of project sites, communicating with each other in real time. Consider remote monitoring and insights into various performance parameters of factory equipment. Use of neural-control technology to move and control machinery at sites is another big opportunity. We also foresee drones scanning sites, inspecting the works and using the data collected to predict problems before they arise. These are not only real opportunities but work-in-progress.

We are going for 3D-printing of entire houses as a big opportunity.

The successful 3D-printing of a ground-plus-one-floor building by L&T in Kanchipuram, Tamil Nadu, sets the platform for leveraging 3D concrete printing to radically redefine construction methods and fast-track conversion of innovative design ideas into final products.

Under the Centre's Housing For All programme, India has set a robust target of building six crore houses by 2022. 3D printing will bolster the progress of the mass housing segment under the Prime Minister Awas Yojana. Generating and analysing intelligent insights from the large volume of data in the construction-infrastructure industry will require new software & algorithms, skilled data analysts and robust information management. This represents one more business opportunity.

Smart buildings represent another opportunity to deploy communication and automation technologies and integrate various building subsystems, including HVAC (heating, ventilation and air-conditioning), lighting, fire protection, access control, surveillance, smart meters, water, UPS, elevators. All these subsystems can share information to improve the performance of buildings, which will be in sync with smart grids, thereby enabling energy optimisation.

In future, IoT will power smart buildings built with new energy-generating or breathable materials. This will be a great opportunity for infrastructure players. Smart cities will instantly adapt to changing circumstances. By then, we will also have 4D printing, which will have self-transforming objects, responding to heat, sound or moisture levels to change shape. Focusing on design and construction alone will become an outdated concept as infrastructure becomes multi-functional.

In the near future, a whole host of other new innovations — both in terms of regulations and skills — await us. Multi-pronged security solutions on turnkey basis, which are modern and reliable for a whole spectrum of smart infrastructure, will be the norm. Smart buildings, smart energy, smart water solutions, smart transportation and logistics, smart emergency response systems, smart real-time information systems and smart cities will become standard very soon. All of these translate into great opportunities for infrastructure.

As we see it, infrastructure is overdue for change. And, the digital revolution will further redefine the sector. For companies to capitalise on this opportunity, digital transformation must be made to encompass the whole organisation and pushed down the supply chain. Considering the inevitability and significance of a 'green future', all infrastructure players should increasingly shift their focus towards the environmental impact of business. L&T is one of the few companies that started reporting sustainable practices long before it was mandated by the regulator. Our focus is not only on our operations but also engineering sustainable solutions for our customers. We approach these solutions holistically, going beyond the environmental regulations that govern them, to fully consider the communities and environments they impact.

Green and clean technologies must become a part of our mainstay offerings. That will help companies cater to areas such as renewable energy generation from solar and wind, energy storage and transmission, decarbonisation, and hydrogen generation and utilisation. Huge opportunities exist in all these businesses for capable enterprises.

Across the world, building infrastructure is a political and economic priority. Increasingly, complex projects will be commissioned to stimulate economies, upgrade old systems and cater to growing and changing populations. For a country such as ours, high economic growth (once Covid subsidies) and fast-growing populations will typically lead to significant urbanisation. Therefore, the demand for new infrastructure is bound to see massive growth in the coming future, which will again translate into a great opportunity for our industry.

We are eagerly waiting to embrace that future. **BT**