



## REVUE DE PRESSE SECTORIELLE ÉNERGIE ET DÉVELOPPEMENT DURABLE

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### En bref

#### Infrastructures

- EGIS India a remporté un contrat pour la modernisation du port de Mongla au Bangladesh en majorité financée par l'Inde via sa ligne de crédit concessionnelle de 4,5 Mds USD.

#### Ferroviaire

- Le ministère du Logement et des Affaires urbaines invite les opérateurs de métros à adhérer largement aux mécanismes de crédits carbone.
- Indian Railways s'est lancé dans la production de trains à hydrogène qui devraient entrer en service en décembre 2023.

#### Développement urbain

- La desserte du dernier kilomètre doit devenir l'enjeu prioritaire du développement des transports urbains en Inde et s'appuyer sur un développement du réseau de transports publics, des modes doux et une meilleure intégration des différents transports publics (en termes de planification, d'information disponible et de coordination entre les acteurs concernés).
- La société Vishwa Samudra Engineering et son partenaire suisse Maschinenbau AG ont remporté le contrat pour la construction et maintenance d'un transport par câble urbain à Varanasi pour un montant de 90 MEUR en PPP. La mise en service est prévue pour 2025.

#### Energies fossiles et biocarburants

- Le marché de l'électricité redevient favorable pour les producteurs d'électricité thermique grâce aux revenus stables générés par des contrats d'achat à long terme (PPA) et une diversification de leurs activités en faveur des énergies renouvelables mais une réforme majeure de la tarification de l'électricité est nécessaire pour garantir la santé financière des discoms, en charge de la distribution d'électricité.

- La coalition du G7 et de l'Australie pour le plafonnement des prix du pétrole brut exporté par la Russie pourrait certes compliquer le transport de pétrole brut russe vers l'Inde mais permettrait de réduire la facture énergétique de l'Inde.
- L'Inde souhaite développer des SMR (réacteurs nucléaires modulaires de petite et moyenne puissance) en Inde et affiche l'objectif de mise en service de 20 centrales nucléaires d'ici 2031 pour une capacité additionnelle de 15 000 MW.
- L'amendement adopté sur le projet de loi sur la conservation de l'énergie pose des premiers jalons pour la mise en place d'un marché du carbone en Inde en s'appuyant sur une part minimum d'énergie non fossile qui pourra être imposée pour certains gros consommateurs d'énergie et de nouvelles normes sur la consommation d'énergie.


#### Electricité et énergies renouvelables

- Epsen Mehlum, directeur énergies, matériaux et infrastructures du *World Economic Forum*, considère que les investissements privés dans le secteur des énergies renouvelables sont insuffisants en regard des objectifs fixés et identifie trois freins: la couverture du taux de change, la santé financière des discoms et le cadre réglementaire, en particulier sa stabilité.
- Le Ministre de l'électricité R.K. Singh dévoile un plan pour parvenir à intégrer sur le réseau électrique les 500 GW de capacité non-fossiles d'ici 2030 pour un montant avoisinant les 28 Mds EUR.
- Le Ministre de l'électricité devrait bientôt annoncer un nouveau cadre réglementaire pour faciliter le déploiement des stations de transfert d'énergie hydraulique par pompage (STEP), solution de stockage d'énergie identifiée comme moins onéreuse que les batteries.

#### Mobilités électriques

- 63 000 stations de recharge pour véhicules électriques et 302,6 M EUR d'investissements cumulés au cours des cinq prochaines années seront nécessaires pour répondre à la croissance prévue des ventes des véhicules électriques en Inde.

#### Environnement et qualité de l'air

- L'Inde pourrait subir une perte de 4,5 % de son PIB d'ici 2030 à cause de la hausse des températures moyennes liées au changement climatique, selon les scénarios les plus pessimistes de la Banque Mondiale et de McKinsey.
  - A la COP15, le Ministre de l'environnement Bhupender Yadav s'oppose à la déclinaison des objectifs par région et promeut les investissements positifs pour protéger la biodiversité.
  - Dans le cadre de sa mission pour l'économie bleue, l'Inde déploiera en 2026 un véhicule submersible pour l'exploitation des ressources en eaux profondes tels que les minerais stratégiques et terres rares.
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# Revue de presse

## 1. Infrastructures

Indian firm bags consultancy contract for Bangladesh port

*The Economic Times, 29/12/2022*

*Bangladesh state minister for shipping Khalid Mahmud Chowdhury was present at the signing of the contract. High Commissioner of India to Bangladesh Pranay Verma highlighted that Bangladesh is India's largest development partner, both in terms of value and number of projects. Nearly one-fourth of India's development assistance abroad is extended to various projects across sectors in Bangladesh.*

An Indian firm has bagged a contract for providing consultancy for a capacity building project at Mongla port, the second largest seaport in Bangladesh, which will boost sub-regional connectivity in South Asia.

The contract was signed between Mongla Port Authority and EGIS India Consulting Engineers Pvt Ltd earlier this week.

While India will provide the majority finance for the project under its concessional line of credit of \$4.5 billion to Bangladesh, the Sheikh Hasina government will provide the rest. The project is scheduled to be completed by July 30, 2024.

The project includes constructing a container terminal, handling and delivery yards, a residential complex and community facilities, marine workshop and service jetty,

according to Bangladesh officials. Once upgraded, the Mongla port will serve the business interests of eastern India, north-eastern states and Southeast Asian countries, said officials.

Bangladesh state minister for shipping Khalid Mahmud Chowdhury was present at the signing of the contract. High Commissioner of India to Bangladesh Pranay Verma highlighted that Bangladesh is India's largest development partner, both in terms of value and number of projects. Nearly one-fourth of India's development assistance abroad is extended to various projects across sectors in Bangladesh.

The upgradation of Mongla port will strengthen maritime connectivity for Bangladesh, not just for the movement of goods with India but also with Bhutan and Nepal, said officials here.

## 2. Ferroviaire

Govt. requests Metro Rail Corporations to register for carbon credits

*Metro Rail News, 22/12/2022*

*A carbon credit is a tradable permit or certificate granting the right to emit one tonne of carbon dioxide or the equivalent amount of another greenhouse gas.*

NEW DELHI (Metro Rail News): The Union Ministry of Housing and Urban Development has requested metro rail corporations to register for carbon credits for the government's goal to reach net zero carbon emission status.

The development occurred when the parliamentary housing and urban affairs



standing committee recommended that the government put pressure on metro rail corporations to register for carbon credits.

A carbon credit is a tradable permit or certificate granting the right to emit one tonne of carbon dioxide or the equivalent amount of another greenhouse gas.

In a recent report detailing the government's response to the committee's recommendations, the ministry said that registering for carbon credits is only encouraged, not required, for metro networks.

"M/o Housing and Urban Affairs has requested metro rail corporations, who have not yet registered for carbon credits, to explore economic benefits of registration," the ministry quoted to the panel.

The committee has said that being the nodal ministry for metro operations, the housing and urban affairs ministry can do much more. For example, the upcoming metros can be persuaded to register carbon credits to lower GHG (greenhouse gas) emissions.

"The committee, therefore, recommends the ministry to make GHG emission mandatory for all upcoming metros, apart from persuading metros in operation," it said.

The committee noted the fact that several metro projects had registered for applications to reduce greenhouse gas (GHG) emissions under the UNFCCC's Clean Development Mechanism (CDM) and the Gold Standard Registry (GS).

The Delhi Metro has reported earning 4.4 million carbon credits through CDM and GS projects. In contrast, Kochi and Lucknow's metro rail corporations have stated that the

registration for carbon credits is in progress. The standing committee stated in its report that Nagpur Metro would apply for it following the project's commissioning. On the other hand, Bhopal and Indore have informed us that their stations and depot are being planned or designed for India Green Building Council (IGBC) Platinum rating, leading to carbon credits in due course.

According to the committee, since several metros are either using or planning to use renewable energy to a considerable extent to meet their requirements, the committee feel that it is essential to ensure that all these metro rail networks are registered for carbon credits so that they earn benefits for being environmentally friendly.

The panel said that as the registration for carbon credits is not mandatory, several metro networks have not yet registered for it.

All you need to know about India's First Hydrogen Train: Vande Metro

*Metro Rail News, 23/12/2022*

*Hydrogen trains make very little noise and emit no pollution, emit just steam and evaporated water.*

The Indian Railways are now manufacturing the Vande Metro train. The design would replace the design created in the 1950s and 1960s. Vande Metro will be the first hydrogen train designed and manufactured domestically. It would debut in December 2023.



Hydrogen trains make very little noise and emit no pollution, emit just steam and evaporated water.

Railways are designing, and the design should be available anywhere by May or June. It would be a world-class Vande Metro, a tremendous leap forward.

[...]

Governments and energy companies worldwide are betting on clean hydrogen to play a significant part in reducing greenhouse gas emissions. However, its uses in future and costs are still unknown.

Germany was the first country that started operating hydrogen-powered trains for the first time in the world in August. These trains make very little noise and emit no pollution. It only emits just steam and evaporated water.

### 3. Développement urbain

Shifting focus to Last Mile Connectivity through NMT

*Metro Rail News, 23/12/2022*

*In Indian cities, intermediate public transportation (IPT) modes such as auto-rickshaws, cycle rickshaws, battery rickshaws, and taxis account for up to 8% of daily trips.*

India's growing urbanisation has boosted the demand for transportation in cities and surrounding areas, with commuters making many long daily trips. This has resulted in an increased demand for public transportation. Public transportation accounts for 30% of journeys in cities with populations of one to two million, 42% in cities with populations of

two to five million, and 63% in cities with more than five million populations.

However, due to the insufficiency of public transit in fulfilling demand, reliance on private vehicles has grown tremendously. As a result, between 1961 and 2011, the number of cities in India expanded threefold (from 2,363 to 7,935), and the urban population increased fivefold (from 79 million to 377 million), while the number of private vehicles climbed 200 times (from 0.7 million to 142 million). Metropolitan cities account for most of this private vehicular expansion, with New Delhi at the forefront.

In Indian cities, intermediate public transportation (IPT) modes such as auto-rickshaws, cycle rickshaws, battery rickshaws, and taxis account for up to 8% of daily trips. IPT modes are convenient but expensive to utilise; frequently, they cost the commuter more than 50% of the overall fee. Furthermore, compared to public transportation systems, they can only convey a limited number of commuters, taking up more road space.

Commuters may also encounter site-specific difficulties. For example, public transit may be too far to reach, necessitate navigating uneven footpaths and dangerous street crossings, or may not be safe, particularly for female passengers. Furthermore, an unfavourable and dangerous pedestrian environment forces commuters to rely on private vehicles.

The extra time and hassle involved in travelling from home to a transit station and from the station to the destination is an essential disincentive to public transportation. This is aggravated further by a lack of physical integration for multiple modes at transit terminals, resulting in accessibility concerns that create a mental

barrier to public transportation. Deterrents include a need for more information about parking availability, public transportation schedules, and traffic signage.

Low-income groups, those with disabilities, the elderly, women, and people with debilitating medical conditions are among India's most vulnerable public transportation users. Furthermore, walkways and other pedestrian facilities are not universally accessible, thus discouraging economic, social, and cultural participation.

To address issues and promote public transportation, urban planners and managers have recognised the necessity to develop a city-wide integrated and multimodal transportation system. In India, however, multiple independent agencies plan, administer, and run various kinds of transportation. These agencies need to be accountable to each other and frequently need coordination. At the same time, organisations have yet to be mandated to integrate various public transportation systems and private modes, which is a considerable challenge.

Commuters may use one or more modes of transportation to complete a journey. However, commuters must finish the initial and last portions of their excursions on their own—they must walk, drive, or be driven to the nearest station. Public transit organisations usually provide bus and train services that may constitute the core of such trips. This is known as the 'first and last mile of the user's journey, or 'last-mile connectivity.' Last-mile connectivity improves a public transportation system's overall efficiency.

Last-mile connectivity emphasises the importance of planning for an improved commuter environment in the larger context

of the station catchment area, as opposed to the existing myopic strategy of station-centric infrastructure.

Last-mile connectivity is critical for shifting private car users to public transportation. Public mass transit systems meet an expanding city's economic and social needs. As a result, all efforts should be directed at increasing ridership and making it easier for commuters to switch to their preferred mode of transportation. Poor last-mile connectivity forces commuters to rely on private automobiles, exacerbating traffic congestion and increasing journey times, fuel consumption, and pollution.

## NMT – The Global Scenario

Polluted air, economic losses, and higher stress levels caused by traffic congestion make it critical for communities worldwide to minimise the number of private cars and establish efficient public transportation solutions. However, while metro, bus, and tram networks serve to alleviate traffic congestion, they must also be financially viable for commuters and operators.

Globally, several new ways are being used to plan for greater transport network access, focusing on NMT (Non-Motorized Transportation). For example, Singapore is implementing its National Cycling Plan (NCP) to use bicycles to offer last-mile connectivity for mass rapid transit systems in Asia. Given the country's limited land resources, Singapore facilitated a smart first and last-mile strategy by constructing a cycling network as part of the NCP and redesigning streets to allow walkers, cyclists, buses, and cars to cohabit.

The Land Transport Authority (LTA) intends to triple the country's bike route network to 1,000 by 2040, up from a 2013 commitment

to build 700 kilometres of cycling lanes by 2030. The LTA's ambition of establishing a '45-minute city with 20-minute towns' includes expanding Singapore's bike path network (where commuters need only a 45-minute journey to get to work and 20 minutes to reach amenities within residential towns).

Similarly, the UK is investigating the 'travel hub' concept as an alternative to the usual 'park and ride' notion of leaving private automobiles in a designated facility and utilising public transportation for the remainder of the route. A travel hub is a bus, tram, metro, or train station that provides more amenities than existing public transportation stops, with walking and cycling being the primary ways of access. In addition, it offers simple access to public transportation and interchange between different types of transportation.

It also provides regular public transportation and clear and thorough travel information. Importantly, when major car parks are required to accommodate private automobiles that are the predominant or exclusive form of access for 'park and ride' facilities, this requirement is eliminated with the 'travel hubs' idea since connection by other modes such as cycling is strengthened.

The European Union supported pilot projects for 'BiTiBi' in Barcelona (Spain), Milan (Italy), Liverpool (UK), and Ghent (Belgium) between 2014 and 2017. As a result, according to data, approximately 10% of bicycle parking users at railway stations were formerly automobile users for the entire distance. In comparison, 15% to 20% stopped driving to the train station.

Another project that helps towns develop better transportation strategies is Europe's Sustainable Urban Mobility Plan (SUMP). A

city-specific SUMP analyses the entire functional urban area and anticipates collaboration across policy areas, levels of government, locals, and other key stakeholders. It provides various sustainable transportation solutions for commuters and commodities while considering locals and the urban environment.

### Metro Rail Systems

The metro rail system has played an essential role in alleviating urban transportation concerns such as traffic congestion, air and noise pollution, and accidents. It is also a more efficient and secure means of mass transportation. As a result, numerous Indian cities have built or planned to build metro rail transit systems.

At the same time, despite a growing need for transit options, most of the country's existing metro systems have remained within their planned ridership. Fare increases, poor last-mile connectivity, a lack of integration and operational improvements, and permissive policies for private-vehicle use have all contributed to this deficit (such as the availability of economical or free parking and subsidised road taxes for cars).

While feeder services (shared autos, minibuses, shuttle cabs, or app-based bikes and vehicles) exist for functioning metros, they are limited to a few locations. Last-mile connection is primarily fulfilled via IPT services, which can be costly and limited to specific regions. Furthermore, the infrastructure surrounding metro stations, which comprise the last-mile connectivity system, is outside the purview of metro authorities, posing accessibility challenges for travellers. The lack of dedicated walking and cycling pathways complicates access to metro stations even further.



Although metro agencies have begun to integrate innovative technology and economic models to improve the level of service at metro rail transportation systems, most of these are small-scale pilot projects that provide feeder services to metro systems. There is also a need for more data on the influence of last-mile connectivity services on metro systems or reducing private vehicle usage. This makes determining the relevance of last-mile connectivity for Indian cities difficult.

### **Last-Mile Connectivity: The Policy framework in India**

While India's principal transportation policies emphasise public transportation, multimodal integration, and non-motorised transport (NMT), they are generally silent on the issue of last-mile connectivity. As more communities across the country establish metro networks, regulations must prioritise the role of last-mile connections in consolidating the benefits of public transportation and achieving sustainable mobility goals.

The 2014 National Urban Transport Policy (NUTP) prioritises human transportation over vehicle movement. First, the movement of pedestrians and people with disabilities, which accounts for zero emissions, is prioritised, followed by NMT (bicycles), public transportation, IPT users, and those who use private modes of transportation. According to the NUTP, this priority structure will assist in minimising congestion and pollution caused by private transportation.

Similarly, for metro networks, pedestrians and NMT modes are preferred for first and last-mile connectivity, and the NUTP mandates that these modes be accessible

within 50 metres of metro stations. The following essential element is feeder service pick-up and drop-off facilities (should be positioned fewer than 100 metres from metro station entry and exit structures), followed by IPT stops, private car pick-up and drop-off facilities and parking spaces.

The 2017 Metro Rail Policy of the MoHUA aims at enhancing metro commuters' last-mile connectivity. The ministry has emphasised feeder bus services, e-rickshaws, clever rentable cycles, e-scooter services, and collaborations with cab aggregators as part of the existing last-mile connectivity measures. Another goal is to ensure that the cheapest mass transit mode is chosen and employed for public transportation. Furthermore, the policy requires that every metro rail design contain plans for feeder networks that increase the catchment area of each metro station by at least five kilometres. The provision of last-mile connectivity via pedestrian walkways, NMT infrastructure, and the inclusion of facilities for IPT modes are necessary prerequisites for receiving any central aid for the planned metro rail projects.

To go beyond traditional practises, metro rail executing agencies such as the Delhi Metro Rail Corporation (DMRC), Bengaluru Metro Rail Corporation Limited (BMRCL), and Mumbai Metropolitan Region Development Authority (MMRDA) are beginning to adopt plans focused on first and last-mile connections.

The DMRC offers various options to improve last-mile connection, which is essential given the city's and neighbouring areas' increasing vehicular congestion and pollution. The DMRC promotes electric mobility through agreements with companies such as YULU (a micro-mobility vehicle company), SmartE (a provider of e-

rickshaws), cab aggregator Uber, and others. In addition, the Delhi Transport Corporation currently operates 174 non-AC CNG buses on 32 routes available at 69 metro stations. However, commuter usage is low due to the transient nature of such feeder bus service, particularly during peak hours. This problem can be solved by assessing all routes' demand levels to improve coverage and operational efficiency.

The Parliamentary Standing Committee on Home Affairs advocated multimodal integration at metro stations in its 2021 report on the traffic situation in Delhi to encourage commuters to use public transportation and discourage the usage of private vehicles for long distances. Multimodal integration plans for 59 stations have been finalised for Phase III of the metro project, with another 96 stations in the works. However, the committee expressed concern that a lack of coordination among the several projects executing agencies (the DMRC, the Public Works Department, and the Municipal Corporation of Delhi) could affect the speed with which these plans are implemented.

In Bengaluru, the BMRCL has introduced low-cost transit choices such as e-cycle rentals and e-bikes to the city's current bus service, which is run by the state-owned Bengaluru Metropolitan Transport Corporation (BMTC). The BMTC manages metro feeder bus services that serve 17 metro stations with 1,981 trips per day. In addition, the Bengaluru-based bike-sharing business Bounce operates keyless scooters, while YULU offers e-bikes at numerous metro stations.

Similarly, last-mile connectivity in Mumbai is expected to improve because new innovative solutions are applied across the city's currently running Metro Line-1. Before more lines became operational, the

MMRDA, World Resources Institute India, and Toyota Mobility Foundation developed the Station Access and Mobility Program to foster public-private partnerships through innovative data and technology-based solutions to improve crowd management and last-mile connectivity to the Mumbai metro. As a result, three startups were chosen to roll out solutions at Metro Line-1 stations: Orbo.ai, MYBYK, and AllMiles. While Orbo.ai employs artificial intelligence to shorten journey time through fare collection gates, MYBK and AllMiles offer app-based transportation for last-mile connection. As a result, Mumbai Metro One Private Limited, the operator of Metro Line-1, collaborated with MYBYK to establish a bicycle-rental business to improve last-mile connectivity.

### **Metro Rail Transit Systems: Achieving Last-Mile Connectivity**

#### A Symbolic Representation of Last-Mile Connectivity

Structured last-mile connectivity could be critical in retaining and amplifying the sustainability gains from metro rail transit systems and improving the commuter experience. Last-mile connectivity alternatives at metro stations tailored to commuters' needs would go a long way toward increasing adoption. This can be accomplished in four ways: physical integration, service integration, information integration, and institutional integration.

#### Achieving Last Mile Connectivity

**(i) Physical Integration:** Extending the metro rail network to bring stations closer to residential areas and significant destinations, adding new stations to the existing network, creating a comfortable walking and cycling environment near metro

stations, and providing infrastructure for e-mobility and shared modes are all effective physical interventions to ensure structured last-mile connectivity systems.

India's government should explore transit-oriented development within 500 metres of metro corridors to encourage integrated land use and transportation planning. This will stimulate high-density construction near metro stations, allowing more people to live or work nearby and walk straight to the station. Planners also can explore offering ground-level or underground direct access to metro stations from surrounding developments.

While only a tiny portion of a metro rail system's total cost, access quality directly impacts ridership. An easily accessible station area helps boost metro ridership, enable a barrier-free environment, effectively manage parks, give inexpensive options to commuters, and create dynamic public spaces. This will assist in realising the economic development benefits of metro rail networks while also meeting the needs of passengers.

**(ii) Service Integration:** Authorities should promote integrated planning of various kinds of transportation in station locations. Integrating various forms of public transportation, IPT, and NMT with metros would result in a higher quality of service at stations and improved connection at station areas for the smooth and orderly movement of vehicle and pedestrian traffic. It is also essential to improve the frequency of feeder services and synchronise frequencies and headways with metro rail services to reduce commuter wait times when changing modes of transportation.

**(iii) Institutional Integration:** Last-mile connection services are governed by many

bodies. Taxis and auto-rickshaws, for example, are typically regulated by state transportation departments. Similarly, urban local governments are responsible for developing bicycle and pedestrian paths, while electrical service providers are responsible for lighting the pathways. The absence of coordination, combined with each institution developing its norms and processes, eventually impedes the implementation of well-intended programmes and objectives. Therefore, Metro rail authorities must work with diverse service providers to smoothly incorporate all last-mile connectivity initiatives.

**(iv) Information Integration:** The availability of data and technological solutions helps enhance the drive to promote last-mile connectivity. Providing real-time service information on feeder service arrival and departure will encourage commuters to use public transportation. For example, an urban bus service should be integrated with metro rail services such that when a train arrives, bus services are accessible quickly. Similarly, integrating fare payments between feeder services and metro rail and enabling smart cards and cashless fare payments will make life easier for metro rail users.

## Conclusion

India's population is predicted to reach 1.4 billion by 2025, with roughly 40% of the population living in cities. The number of cities with populations greater than 50 million is expected to double by 2025, with 15 cities having populations more significant than 10 million and 85 cities expected to have populations between one million and ten million. This population growth will exacerbate India's existing strains on public transportation systems.



In India, the size of a city and the percentage of daily commuter journeys are directly related. According to 2008 Ministry of Housing and Urban Affairs (MoHUA) research, daily journeys in the top 87 urban centres will double from 228 million in 2007 to 482 million in 2031. This growth has raised a demand for public transportation, which most Indian cities have been unable to meet due to the current imbalance in the modal split favouring private car usage in the face of limited public transportation infrastructure and suboptimal utilisation.

Metro rail transit systems face the same problems as other forms of public transportation. Commuters must have easy access to metro stations to boost ridership and the effectiveness of India's metro rail transit systems. However, providing affordable and accessible last-mile connectivity—the transportation alternatives available to a commuter from the start of a trip to the point of accessing a public transit system—is a much-neglected area of planning in Indian cities. This brief evaluates the need to improve and extend public transportation services in Indian cities by integrating diverse transit modes and allowing commuters to effectively move between them to improve last-mile connectivity to metro rail transit systems.

Metro rail transportation systems improve a city's economic competitiveness by facilitating the rapid movement of people, products, and services. They also reduce per capita vehicle ownership and usage, leading to less traffic congestion, lower parking and transportation expenses, and fewer per capita traffic accidents. Thus, metro rail transit systems foster compact and walkable urban development patterns.

It is essential to provide secure and accessible last-mile connectivity to realise

the realisation of metro rail transit networks. Therefore, developing a network of secure and user-friendly last-mile connecting solutions to metro stations is essential for the long-term viability of such a mass transit system.

Getting commuters to their destinations necessitates collaboration among different stakeholders to plan, develop, and deploy a cohesive network of integrated transportation options. New infrastructure constructed to bridge accessibility gaps cannot be adequately utilised for futility of access. Public transportation providers and government entities in charge of streets and infrastructure must collaborate to establish accessible and safe last-mile connectivity services to metro rail transit systems. This would significantly improve people's quality of life while positively influencing urban economic growth. It may also be an inspiration and development model for other public mass transit networks.

VS Engg bags contract to build India's first urban ropeway project in Varanasi

*Metro Rail News, 28/12/2022*

*This will be India's first "urban ropeway project," to be built in Varanasi, and it is anticipated to begin operations in May 2025. Construction on this project will probably begin by May 2023.*

The National Highways Logistics Management Ltd (NHLML), a subsidiary of NHAI, has awarded a contract worth Rs 807 crore (US\$16 million) to Vishwa Samudra Engineering Private Limited for the construction of a 3.85 km urban ropeway project in Varanasi, Uttar Pradesh. This

company has obtained the technology and equipment supply from a Swiss company specialising in ropeway systems. After commissioning, the contract order includes 15 years of ropeway system maintenance.

This will be India's first "urban ropeway project," to be built in Varanasi, and it is anticipated to begin operations in May 2025. Construction on this project will probably begin by May 2023.

The urban ropeway system will reduce the length of one of the most congested areas, from the Cantonment train station to Godowali Chowk, in only 17 minutes. Due to traffic congestion, the same trip could take longer than an hour.

Five stations will be built as part of this ropeway project. They will be located at the Varanasi Cantonment, Vidya Peeth (Bharatmala Mandir), Rath Yatra, Girja Ghar, and Godowlin Chowk. There will be no boarding or deboarding at Girja Ghar. For the ropeway, 30 towers will be constructed, ranging in height from 10 to 55 metres.

The National Highways Logistics Management Ltd (NHLML), which manages the ropeway, will choose the cost of the tickets. A policy on tickets will be developed as the Center plans to implement numerous such ropeway projects throughout the country in urban areas and to connect tourism destinations.

"The Varanasi ropeway project has been won by Vishwa Samudra Engineering and its technological partner Bartholet Maschinenbau AG of Switzerland. A bid price of Rs 8156 crore was provided by the company, which is 77% more than the projected bid price. The ropeway will be built using a hybrid annuity model (HAM), in which 40% of the project cost will be paid as

an annuity during the operation and maintenance phase and 60% of the project cost will be paid as construction assistance during the construction phase," said an official.

The connectivity project is expected to operate for 16 hours per day and have a maximum capacity to handle 3,000 passengers per hour per direction (PPHPD). A passenger load of approximately 96,000 people per day can be carried by it in both directions. About 153 gondolas or cabins would be used on this route, and each gondola could accommodate ten passengers.

The GEO technical company Sai Geotechnical Engineer Pvt. Ltd., based in Ghaziabad, began geotechnical investigation work for this ropeway project after setting up three rigs at various locations throughout Varanasi. The Uttar Pradesh government is purchasing the land for towers and ropeway stations.

#### 4. Energies fossiles et biocarburants

Watt a turnaround. The balance of power is now getting favourable for thermal gencos, from 'battery critically low' to 'charged'

*Business Line, 04/12/2022*

A little over a decade back, the Indian power sector looked like one of the most interesting investing opportunities. Expectations of high growth, huge power deficits and grand government plans for multiple ultra-mega power projects (UMPP) attracted large investments from Indian business houses and global private equity giants.

But then, the sector got short circuited with lower than forecast economic growth, overzealous bidding for projects, significant currency depreciation and higher interest rates that resulted in project costs going way out of budget, lack of fuel supplies, and discom issues. All combined, resulted in a massive outage in the sector for over a decade. Many projects ended up unviable and landed in bankruptcy courts. From its earlier peak in 2008, the BSE Power index was down by 60 per cent by January 2020 (prior to the Covid crash) compared to the Sensex rise of over 100 per cent.

However, post Covid crash of March 2020, the sector has seen a significant turnaround. From Covid lows of 1331, the BSE Power Index is up 247 per cent against Sensex gains of 120 per cent. The index even crossed its 2008 peak in August 2022. This optimism can be attributed to many factors — supportive fiscal/monetary policies driving economic growth, increased power demand, shakeout in the sector resulting in strong players emerging stronger and weak ones getting weeded out.

There are reasons now to believe the worst may be over for the sector. While it is anybody's guess how the near term will play out, given prospects of the global economic slowdown, trends in commodity prices (coal, gas etc), and market volatility, the long-term prospects appear brighter now. With thermal power remaining the mainstay and the large thermal gencos (70 per cent of current India's power generated) aggressively diversifying into renewables as well, here are the factors to consider before zeroing in on them.

## PPA/TARIFFS AND FUEL SUPPLIES

Thermal power gencos sell electricity by way of long-term Power Purchase Agreements (PPAs) or through short-term arrangements such as auction-based bilateral agreements (up to one year) and power trading platforms (up to 11 days). Majority of power is sold through long-term PPAs of around 25 years to distribution companies (discoms). Higher the capacity tied up with long-term PPAs, higher is the revenue visibility.

To have seamless power generation, it is necessary for companies to have sources for fuel procurement (coal, gas and lignite), which might include fuel supply arrangements (FSAs) with Coal India and its subsidiaries, procure through captive mines, or e-auction in merchant trading platforms. Lack of such arrangements in the past led to certain companies resorting to an expensive option — imported coal. For instance, of a total 195.03 MT of coal, around 87 per cent of NTPC's coal comes through annual contracted quantity under FSA with Coal India, while the rest is from captive mines, bridge linkage and importing. Long-term FSA ensures fuel availability and helps in inventory management. Companies also have plants dependent on imported coal.

Profitability is mainly reliant on tariffs earned on their PPAs. Tariff determination can broadly be classified into two types — cost plus based and competitive bidding based. For cost-plus based PPAs, tariff comprises fixed capacity charge on plant availability (measured by PAF) and energy (variable) charge. Plant can recover 100 per cent of the fixed charge with post-tax project ROE of 15.5 per cent over and above costs at normative levels, if plant is technically available more than 80-85 per cent with sufficient fuel in stock. Further, companies can earn incentives if they



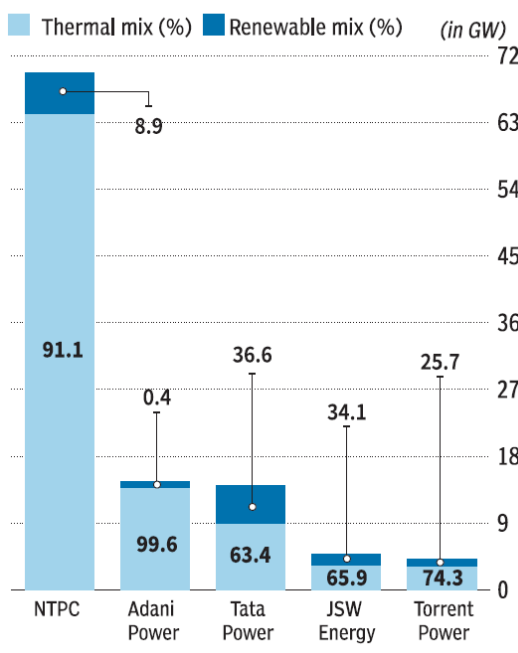
## Key operational metrics

	Long term PPA (%)	PLF (%)*	PAF (%)#
NTPC	Nearly 100	69	93
Adani Power	75	49	85
Tata Power	90	60	92
JSW Energy	85	70	85
Torrent Power	50	17	NA

\*PLF - Plant load factor (capacity utilization)

#PAF - Plant availability factor. This measures technical availability of plant to generate electricity with sufficient fuel in stock

## Total capacity



## Financials and valuations

	EBITDA margin %	Net debt/ EBITDA	EV/ EBITDA	P/E
		Times		
NTPC	29.8	4.8	8.5	9.7
Adani Power	20.9	7.5	29.5	88.8
Tata Power	15.6	4.9	14.4	21.4
JSW Energy	40.4	2.0	14.8	35.2
Torrent Power	18.9	2.3	8.9	15.8

Numbers based on Bloomberg consensus estimates for FY23 EBITDA and earning  
Source: Company filings, Credit rating reports, Bloomberg

achieve PLFs more than 85 per cent. Fuel cost can be allowed depending on efficiency levels . For instance, majority of NTPC's installed capacity earns tariff on cost-plus basis on account of which the company has stability in earnings and cash flows.

However, the case is not the same with competitive based tariff as all the costs can't be of pass-through nature while certain components might have escalation clause. There have been cases when aggressive bidding led to unprofitable projects. For instance, Tata Power emerged as the lowest bidder at tariff of 2.26 INR per kwh for Mundra's imported coal-based UMPP of 4 GW. Further, it acquired 30 per cent stake in Indonesia-based coal mines for its coal supplies. However, due to changes in mining regulations in Indonesia, the cost of fuel rose; consequently, it became difficult for Tata Power to run the Mundra plant profitably.

Tariffs earned by selling power on merchant trading platforms (IEX ) exposes companies to volatility in earnings as tariffs can vary on a daily basis. As per an ICRA report, after remaining high at 8-10 INR per unit during June end quarter, the spot tariffs have moderated to around 3.8 INR per unit. Ideally, gencos should sell majority of power via long-term PPAs backed by long-term FSAs. Having plants as close to the (coal) pithead as possible is also a differentiating fact or in cost competitiveness. A small merchant trading component can help companies generate opportunistic profits, but this cannot be mainstay as it can lead to volatile earnings.

## DISCOMS' ISSUES

Non-realisation of billed amount, losses due to tariff order delays and insufficient

increase in tariffs on sale of power to end-customers despite costs passed on by gencos have adversely affected the financial health of state discoms. Discoms are currently plagued by humongous debts and dues to gencos. Delayed payments by discoms creates working capital issues for gencos which, in turn, leads to inadequate procurement of coal. For instance, NTPC was owed about 27,000 INR crore by state gencos as of FY22. As per Central Electricity Authority, due to cash crunch created by such situation, certain stressed thermal gencos had to resort to short-term loans at expensive rates (12 – 13 per cent), which burdened their financials.

Of course, there have been attempts to resolve these issues. Fallback options exist in the form of letters of credit, termination of PPA and merchant selling. However, lack of PPA can lead to FSA termination, creating fuel security issues for gencos.

To address these issues, in June 2022, the Power Ministry notified amended late payment surcharge rules to liquidate discom dues on EMI basis to ensure payment discipline. Eight States opted to clear dues on their own, five took loans from PFC and REC — and those flouting rules have been barred from transacting on power exchanges. Timely and adequate tariff revisions are critical to sustainably improve the discoms's financials. It remains to be seen to what extent these changes help thermal power gencos.

### RENEWABLES STRATEGY

In line with the Government's target of altering the energy mix to usher in 50 per cent of non-fossil fuel capacity by 2030, major thermal gencos have started foraying into green energy space with aggressive capex plans. Tata Power appears front-

runner in this space as it is slowing its thermal capex and has ventured into businesses such as EV charging, rooftop solar and solar EPC. Its renewables subsidiary even attracted investment of close to 4,000 crore INR by monetizing 11.43 per cent stake. JSW Energy announced its target of increasing installed capacity from 4.8 GW to 10 GW with a 61 per cent share of renewables by 2030. It has also ventured into Battery Energy Storage System. NTPC has 2.5 GW of renewable capacity with 5.3 GW of capacity under construction and targets renewable capacity of 60 GW by 2032. It aims to transfer its renewable assets to its subsidiary NGEL, thereby monetising stake of 10-20 per cent by H2FY23. Torrent Power aims to increase its renewable capacity from current 1 GW to 5 GW within 3-4 years. Adani Power doesn't have any renewable plans as such projects are carried out by the group's other arm, Adani Green. It needs to be noted that renewables' PLF fares much worse than thermal gencos. Substantially higher capacity is required in renewables to match the power generated by a thermal plant.

### WHAT TO LOOK FOR IN POWER PLAYS

The biggest thermal player NTPC seems to have the most stable financials backed by regulatory cost-plus PPAs, long-term coal linkages and 60 per cent of plants located at pit-heads. However, unlike other companies, NTPC has less room for opportunistic profits from merchant tariffs. JSW Energy has seen an increase in portion of PPA-based capacity, including its pithead plants (35 per cent of thermal capacity) which earns cost-plus tariffs. It has strong margins, good cash position and low debt. However, the stock's valuation looks stretched as strong fundamentals and renewable strategy are already factored in.

Adani Power has seen volatility in earnings with 25 per cent of its capacity exposed to merchant tariffs and logistical issues on coal materialisation. The situation seems to be improving for the company, thanks to favourable factors such as imported coal pass-through, better coal materialisation from FSAs and clearing of dues by discoms.

For Tata Power, thermal generation accounts for close to 30 per cent of revenue while the rest comes from transmission, distribution, renewables and coal mining. Its profitability is lately aided by invoking of Section 11 which has temporarily allowed its imported coal-based Mundra plant, a pass-through of fuel costs till December 2022. Its coal mining business in Indonesia is also generating profits due to uptick in coal prices. The spike in valuation in recent times has been due to its renewable strategy and temporary relief for Mundra. However, uncertainty remains on future fuel cost pass-through for Mundra.

Torrent Power is a gas-based generation company with the distribution segment also contributing to revenues. While its financials are backed by regulatory cost-plus based arrangements, untied capacity and low PLFs remain hurdles.

Ultimately, to make a choice, investors can check how much of gencos' capacity is tied up with long-term PPAs and FSAs for revenue visibility and whether tariffs allow pass-through of majority of costs. Consider PLF, PAF, proximity of coal-based plants to coal mines and renewable strategy also in stock choices.

Except NTPC, others have seen major spike in valuations due to renewables strategy and

other factors. For majority of gencos, positives seem priced in while for NTPC, renewable arm monetisation can be a catalyst for further upside.

Deciphering the impact of Russian oil price cap

*Business Line, 8/12/2022*

*For India, ferrying the crude will become difficult as the financial services sanctions have kicked in.*

**What is the price cap imposed on Russian oil? Which are the nations bound by the cap?**

The G7 and Australia, as current members of the Price Cap Coalition, on December 2 reached consensus on a maximum price of \$60 a barrel for seaborne Russian origin crude oil, in line with the unanimous decision taken by Member States of the European Union to endorse a price level for the price cap on seaborne Russian origin crude oil.

The cap, which will be adjustable to respond to market developments, will be implemented by all members of the Price Cap Coalition through their respective domestic legal processes.

While the EU's ban on import of Russian seaborne crude oil and petroleum products remains in place, the price cap will allow European operators to transport Russian oil to third countries, provided its price remains strictly below the cap. Seaborne Russian crude purchased above the price cap has a 45-day wind-down period provided it is loaded onto a vessel at the port of loading prior to December 5, and unloaded at the final port of destination prior to January 19, 2023.



### **What do the nations imposing the price cap hope to achieve?**

The sanctions and the price cap are targeted at the Kremlin, to weaken the Russian government's ability to finance its aggression against Ukraine.

Also, the cap has been specifically designed to keep global energy markets stable. The price cap for crude will take effect after December 5 and for refined petroleum products, after February 5, 2023 — the price for refined products will be finalised in due course.

### **Will the price cap impact India's oil trade?**

Though the price cap and the EU sanctions do not target India directly, they will have an indirect impact as ferrying this crude will become difficult as the financial services sanctions have kicked in. If a third country flagged vessel intentionally carries Russian oil above the price cap, EU operators will be prohibited from insuring, financing and servicing it for the transport of Russian oil or petroleum products for 90 days after the cargo purchased above the price cap has been unloaded.

If an EU flagged vessel violates the price cap, it will be subject to the consequences that follow under each member state's national legislation.

Also, the price cap does not affect in any way the full EU import ban on Russian crude and petroleum products (which kicks in on February 5) and the specific exceptions and derogations thereunder, which were agreed in previous sanctions packages.

### **Will Russia be affected?**

Opinions are divided on the issue. If large consumers like China and India continue to purchase oil from Russia, the impact will not

be huge. Besides, Russia generally plays politics over gas, not oil.

### **What is OPEC+ likely to do?**

OPEC+ has so far cleverly managed the supply side, while ensuring that prices do not fall very low. According to reports, the group may "stand pat" while adopting a waitandwatch approach.

### **Is this good or bad for India?**

India has been firm in its stand — it will buy from wherever cheap oil is available. If India continues to buy at a discount, which it currently gets from Russia, it will be advantage New Delhi as a smaller crude import bill will reduce the strain on the Budget.

Centre to include private sector in boosting nuclear power capacity: Report

*Business Standard, 15/12/2022*

*The NITI Aayog will come up with guidelines and regulations for new small modular nuclear reactors keeping in mind the safety standards and the impact on local communities*

To supplement India's green energy programme, the Centre will soon incentivise the private sector to set up small modular nuclear power plants under the public-private partnership (PPP) model. The NITI Aayog will soon start consultations with stakeholders for the same, a report in the Economic Times (ET) said.

Small modular nuclear reactors (SMRs) require less capital and space than traditional nuclear power plants. They have a power generation capacity of 300 MW per

unit, one-third of regular nuclear plants. It generally takes five years to make one SMR.

NITI Aayog will also issue guidelines and regulations keeping in mind the safety standards and the impact on local communities.

The decision is in line with India's commitment to reduce carbon emissions by half by 2030 and to become a net-zero carbon emitter by 2070. By volume, it is currently the third-largest emitter of carbon dioxide. Its per capita emissions, however, are lower than the global average.

In a written reply to Lok Sabha on Wednesday, minister of state Jitendra Singh said that India will commission 20 nuclear plants by 2031. They will generate an additional 15,000 MW.

The first of these 20 nuclear power plants, a 700 MW unit, is expected to be commissioned in 2023 at Kakrapar in Gujarat, which already has three atomic power generating units operational. The 500 MW Prototype Fast Breeder Reactor at Kalpakkam is likely to be operational in 2024, followed by two 1,000 MW units at Kudankulam in 2025.

Two 700 MW units at Rawatbhata in Rajasthan are likely to be completed by 2026, while another two 1,000 MW units are likely to be completed at Kudankulam by 2027. Two 700 MW units are expected to be completed at Gorakhpur in Haryana by 2029, Singh said.

Shopping for net-zero in carbon markets

*Business Line, 19/12/2022*

*Non Fossil Energy Sources. How the amended Energy Conservation Act can hasten the decarbonisation of Indian economy? – by Manish Dabkara (President of Carbon Markets Association of India)*

The Energy Conservation (Amendments) Bill, 2022, passed by the Rajya Sabha recently, mandates the use of nonfossil energy sources such as biomass, ethanol and green hydrogen to ensure faster decarbonization of the Indian economy.

The Act has several significant features. First, it will foster a carbon market in India, through the creation of a National emissions trading system (National ETS). It empowers the central government to specify a trading scheme for carbon credits. Under this, the central government or any authorised agency may issue carbon credit certificates to entities registered and compliant with the scheme. The entities can trade the certificates. Anyone can purchase a carbon credit certificate on a voluntary basis.

Second, the Act will encourage the use of non-fossil sources of energy. It empowers the government to direct 'designated consumers' to meet a minimum share of energy consumption from non-fossil sources. Different consumption thresholds may be specified for different non-fossil sources for the designated consumers who comprise (i) industries such as mining, steel, cement, textile, chemicals, and petrochemicals; (ii) transport sector including railways; and (iii) commercial buildings, as specified in the schedule.

Third, it brings even large residential buildings within the scope of the Energy and Sustainable Building Code. The new code will provide norms for energy efficiency and conservation, use of renewable energy, and other requirements for green buildings.

Under the Bill, the new Energy Conservation and Sustainable Building Code will also apply to office and residential buildings meeting the above criteria.

Fourth, energy consumption standards may be specified for equipment and appliances that consume, generate, transmit, or supply energy. It expands the scope to include vehicles (as defined under the Motor Vehicles Act, 1988), and vessels (includes ships and boats).

### CARBON CREDIT QUALITY

The current trading schemes in India — energy saving certificates (ESCerts) and renewable energy certificates (RECs) will be merged into a single commodity called 'carbon credits certificate' (CCC) and operate under the 'cap and trade' system of the National ETS. With the implementation of the National ETS, the domestic carbon credits market will enable the development of higher quality sources of carbon credits, benefiting both buyers and sellers and, ultimately, supporting progress toward a low carbon future.

In conjunction with international carbon markets, India's domestic market can play a key role in reducing global greenhouse gas emissions.

A new 'registered entity' — the National Carbon Registry, under the central government or an agency authorised by it, has been proposed for registering new projects with 'measurement, verification and reporting' protocols in line with international registry systems.

'Designated consumers' and other consumers deemed appropriate will be part of the scheme — the 'obligated entity' will be allowed to sell and purchase CCCs. Other

entities (non-obligated) can participate as purchaser.

A national carbon registry under the Bureau of Energy Efficiency (at present) or a future 'carbon regulatory commission' will be formulated and linked to the Centralised Accounting and Reporting Platform (CARP) of the Article 6 supervisory body of the United Nations Framework Convention on Climate Change (UNFCCC).

India's voluntary carbon market (where companies that have voluntarily committed to reducing their carbon footprint buy carbon credits) will witness a surge in growth with the National ETS.

The annual demand for voluntary carbon credit in India is expected to touch 500-plus million units by 2030.

### RULES OF OPERATION

The government should introduce measures to establish a transparent and vibrant carbon market, which will help provide indexing facilities that can be leveraged for green or carbon finance instruments, facilitating India's carbon neutral growth path and attaining its nationally determined contributions or NDC goals under the Paris Agreement.

Respective line ministries — which may include the Ministry of Environment, Forest and Climate Change, Ministry of Power, Ministry of Finance, and Ministry of Commerce and Industry, among others — must formulate a policy for the creation of a national carbon market, making it effective beyond the energy production and usage sectors, such as forestry, agriculture, animal husbandry and so on.

Regulations should be brought in urgently to formulate the rules for the operation of such



a carbon market. The market should be effectively synced with the national carbon registry.

There is need for a level playing field to encourage private sector participation in carbon emission reductions and international voluntary carbon trading, which, in turn, can attract foreign direct investments.

With the introduction of operational modalities under the Article 6 supervisory body of UNFCCC and its administered international carbon registry, the Indian national carbon registry should be linked to it on a realtime basis.

## 5. Electricité et énergies renouvelables

India will need \$800 billion by 2030 to meet COP26 commitments on renewable energy capacity addition

*Business Line, 02/12/2022*

*Commending India's efforts in transitioning to clean energy as part of its pledges at the COP26, Espen Mehlum, World Economic Forum's Head of Energy, Materials and Infrastructure Programs, Benchmarking and Regional Action, said it is an example for other countries. In an interview with businessline, Mehlum said the country will require around \$800 billion by 2030 to meet its renewable energy (RE) commitments.*

**What are your views on India's energy transition?**

What's happening here in terms of solar and wind is amazing. Frankly, it's an example for many similar countries. But there is more to be done (COP26 pledges). One is that India

wants to be ambitious, that's really good. But the country needs to speed up. I understand one needs to install in the range of 40 GW annually in RE till 2030 to meet the 500 GW target. That's a bit more than double from what's being installed right now.

To be able to do that, one needs a lot of capital, both from domestic and foreign sources. To make that capital flow to project developers on ground, there are several elements that will be important. Policy is one, but so is unlocking the power of regular bond market, green bonds and other funding sources.

**What is the cost of India's RE targets?**

We have worked with IEA and World Bank on a study released last year, which shows that if you look at all developing and emerging economies, except China, in the range of \$150 billion was invested in clean energy in 2020.

But in reality, to me, the Net Zero by 2050 (IEA) and SDG goals, you will have to multiply by seven. Which is a 700 per cent increase from 2020 to 2030, in the range of over \$1 trillion annually, and a lot of this will have to go to India.

India is one of the fastest-growing emerging economies. It is set to overtake some countries in terms of emissions, energy demand and population. So, this country needs significant investment, and a big share of that clean energy investment. We may be talking in the range of something like \$800 billion, from now till 2030 for India only, accumulated.

**Investments in the RE sector have not been as expected. What are your views?**

Capital matters for energy transition, and one cannot subsidise one's way out of the problem. Government money cannot do it all. The needs of energy system are so huge that the biggest engine has to be private

capital. Private is going to look at investment opportunities and cost of capital. So, what is happening today is that one, there are some real challenges. A couple of the biggest, which we have found, is the currency exchange risks. It is a big one and we are working on solutions for that.

Second, is the off-taker (discoms) risks if the off-taker is insolvent or cannot pay for it. Third, is the risks around government policy and policy stability.

### How can India make investing in RE attractive?

Speeding up processes is needed. Permit clearances should be fast. Then, availability of critical materials can be a bottleneck. The third is the wider policy environment. Organisations like the International Solar Alliance are important to globalise the movement. For perspective, what is happening today is that in solar, the radiation is concentrated in the global south, but investments are often concentrated in the global north.

Transmission System for 500 GW Renewable Capacity to Cost ₹2.44 Trillion

*Mercom India, 07/12/2022*

*Union Power Minister R.K. Singh unveiled a comprehensive plan to evacuate the planned renewable power capacity of 500 GW by 2030 at an estimated cost of INR 2.44 trillion (~\$29.64 billion).*

The power transmission infrastructure required to evacuate 500 GW of non-fossil fuel includes 8,120 circuit kilometers of high voltage DC transmission corridors, 25,960 circuit kilometers of 765 kV AC lines, 15,758

circuit kilometers of 400 kV lines, and 1,052 circuit kilometers of 220 kV cable.

The Ministry of Power had constituted a high-level committee to plan the system.

The construction of a transmission system becomes critical as the gestation period of wind and solar projects is much less than that of the associated transmission system.

As per the plan, a transmission system will also be developed to evacuate 10GW of offshore wind power in Gujarat and Tamil Nadu at the cost of INR 280 billion (~\$3.41 billion).

With the implementation of the planned transmission system, the interregional capacity will increase to 150 Gw by 2030 from 112 GW at present.

Further, the installation of battery energy storage systems (BESS) to the tune of 51.5 GW is expected by 2030 to provide round-the-clock power to consumers.

The ministry has identified Fatehgarh, Bhadla, Bikaner, Khavda, Anantpur, Kurnool, and offshore wind potential in Tamil Nadu and Gujarat along with Ladakh as the potential renewable generation centers, for which the transmission systems will be deployed.

The proposed system will give developers a clear idea of the potential development sites and the investment opportunity for developing the transmission infrastructure.

Further, it will provide the transmission service providers a window of opportunity with an investment of about INR 2.44 trillion.

India has emerged as one of the leaders in the renewable energy sector, with the fastest growth of renewable capacity in the

world. With a robust transmission system in place, it can achieve its target of 500 GW of non-fossil fuel-based electricity by 2030.

In October this year, Singh stated that the government was planning to set up thirteen renewable energy management centers to address generation variability and uncertainty and transmission systems for integrating an additional 52 GW of potential renewable energy zones by 2026-27.

The members of the parliamentary consultative committee were informed of plans to strengthen the country's transmission capacity, with power consumption reaching 1,400 billion units and expected to double by 2030.

Earlier, the ministry of Power approved 23 new interstate transmission system projects to augment the seamless transfer of power from surplus regions to regions with a deficit. The estimated cost of the project is INR 158.93 billion (~\$2.11 billion).

Framework for Pumped Hydro Storage Plants on the Anvil

*The Economic Times, 28/12/2022*

*The power ministry is expected to soon announce a framework to facilitate setting up pumped hydro storage plants, which will boost round-the-clock electricity supply from non-fossil sources.*

The power ministry is expected to soon announce a framework to facilitate setting up pumped hydro storage plants, which will boost round-the-clock electricity supply from non-fossil sources.

The framework includes details identifying sites for project development, single-window clearance, and central monitoring of the projects. It is expected to be notified around the end of December or January beginning, a senior government official told ET.

The move will promote renewable addition as pumped hydro storage will help resolve the issue of intermittent power supply from solar and wind sources, and it is cheaper than battery storage, the official said.

The stored power can be sold or used in peak demand hours. Independent storage owners can even sell the capacity to renewable energy generators at a certain cost.

Pumped hydro storage act like a giant battery that stores power to release it when needed. It is a two-reservoir system at different elevations. In the case a renewable project has surplus power, it can be used to pump water to the higher reservoir during the non-peak hours.

When electricity is needed, water can drop through a turbine to the lower reservoir giving back the stored electricity.

Renewable power generators and hydropower producers can set up pumped storage plants at existing or completely new sites like in abandoned mines.

It will also help companies wanting round-the-clock non-fossil power for heavy captive consumption like in the steel and cement sectors. Such companies can set up their own pumped hydro storage plants or purchase storage facilities from those setting up.



"In the long run, the industries think that it [pumped hydro storage] will be cheaper. They will get the main energy from solar or wind and can mix that with the storage from PSP and the combined basket will be cheaper from what is being supplied by distribution companies after cross-subsidy," the official said.

## 6. Mobilités électriques

"INR 1.05 lakh cr needed for EV charging infra in 10 years"

*Business Line, 08/12/2022*

*What's needed*

*In line with growth in EV sales, the country would need 2.3 lakh charging stations in the next decade.*

*With expenses such as chargers, electricity connection, civil works, land rentals (Mumbai rates), and software, the total cost of a station works out to INR 35.5 lakh.*

India will require about 63,000 charging stations and cumulative investments of INR 26,900 crore for setting them up over the next five years to cater to the growing demand for power for operating electric vehicles (EV).

In the next decade, in line with growth in EV sales, the country could need 2,30,000 charging stations, entailing a total investment of INR 1.05 lakh crore by FY32, said a report by India Ratings and Research. Per government data, there are about 1,000 commercial charging stations in the country in FY22.

The total demand for EVs in the country could grow at a CAGR of 39 per cent in 10 years, the report said.

The EV penetration for the overall automobile industry is expected to reach 40 per cent by FY32 from about 4 per cent in FY23. The proliferation of commercial EV charging stations, which provide plug-in chargers on the road, would play a pivotal role in EV penetration.

A typical public charging station, comprising a slow charger of 3 kwh power, two medium chargers of 20 kwh power, and two fast chargers of 60 kwh power, requires a capital investment of INR 20,40,000 (3 kwh=10,000, 2x20 kwh=2 lakh and 2x60 kwh=18 lakh). With other expenses such as electricity connection, civil works, land rentals (Mumbai rates), and software, the total cost will work out to INR 35.5 lakh. The costs are estimated to go up in line with inflation as well as demand pick-up in the EV industry.

The proliferation of charging stations would lead to growth of charging station manufacturers as well as charging station operators (CSO). Charging station manufacturers would be responsible for providing complete charging point solutions for public and private charging, including hardware and software installation, maintenance of the hardware, and additional support services.

Some of the major charging infrastructure manufacturers are Delta Electronics Inc, ABB India Ltd, Exicom Power Solutions Ltd, and Okaya Power Ltd. CSOs would be responsible for operating a network of chargers, which includes EV electric vehicle charging, customer support, and network solutions (standalone or in partnership with a network service provider).

Meanwhile, the Union Ministry of Power has categorised EV charging as a service, and thus, the charging station providers would not need licensing under the Electricity Act, 2003. Some of the companies that offer CSO services are Energy Efficiency Services, Tata Power and Magenta Group.

## 7. Environnement et qualité de l'air

Heat waves may break survivability limit: World Bank report

*Business Line, 8/12/2022*

**GLOOMY FORECAST.** The report also warned that rising heat across India can jeopardise economic productivity. Up to 75% of workforce depends on heat-exposed labour, at times working at life-threatening temperatures.

Severe heat waves, responsible for thousands of deaths across India over the last few decades, are increasing with alarming frequency and soon the country could become one of the first places in the world to experience heat waves that break the human survivability limit, according to a new report.

The World Bank report titled *Climate Investment Opportunities in India's Cooling Sector* said the country is experiencing higher temperatures that arrive earlier and stay far longer.

"In April 2022, a punishing early spring heat wave brought the country to a standstill, with temperatures in the capital, New Delhi, topping 46° C.", it said. The report will be released during the two-day "India Climate and Development Partners' Meet" being

organised by World Bank in partnership with the Kerala government here.

### WORSENING SCENARIO

"In August 2021, the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) warned that the subcontinent would suffer more frequent and intense heat waves over the coming decade."

"The G20 Climate Risk Atlas also warned in 2021 that heat waves across India were likely to last 25 times longer by 2036-65 if carbon emissions remain high, as in the IPCC's worst case emission scenario," the report said.

"Up to 75 percent of India's workforce, or 380 million people, depend on heat-exposed labour, at times working in potentially life-threatening temperatures. By 2030, India may account for 34 million of the projected 80 million global job losses from heat stress associated productivity decline", the report said.

### ECONOMIC IMPACT

Analysis by global management consulting firm, McKinsey & Company shows that lost labour from rising heat and humidity could put up to 4.5 per cent of India's GDP – approximately \$150-250 billion – at risk by the end of this decade.

It said India's long-term food security and public health security will depend on a reliable cold chain network. Transporting food and pharmaceutical goods across India requires a system of cold chain refrigeration that works every step of the way. "A single temperature lapse in the journey can break the cold chain, spoiling fresh produce and weakening the potency of vaccines. With only 4 per cent of fresh produce in India covered by cold chain facilities, annual estimated food losses total \$13 billion", it said.

"Not applicable": India at COP 15 rejects area-based targets for conserving biodiversity approach.

*Mint, 17/12/2022*

*Delivering the national statement at COP15 on Friday, Union Environment Minister Bhupender Yadav said, 'Our experience shows that area-based targets are a one-size-fits-all approach that is not acceptable.'*

India at the UN biodiversity talks or COP 15 being held at Montreal, Canada has rejected the concept of area-based targets for biodiversity conservation and have stated that the one-size-fits-all approach is unacceptable.

In a barrage of differences that defined India's participation in the COP 15 summit in 2022, India also said that essential support to vulnerable sectors, such as agriculture, cannot be described as subsidies and targeted for elimination.

The Fifteenth Conference of the Parties (COP 15) started on 7 December with 196 parties coming together in the hope of finalising negotiations for a new Global Biodiversity Framework (GBF) -- a new set of goals and targets that will guide global action on nature through 2030.

This conference is the second part of the Convention on Biological Diversity (CBD).

The GBF has sought to propose and accept the "30x30" conservation target. In the "30x30" conservation target- 30% of the earth's land and sea will be conserved through the establishment of protected areas and other area-based conservation measures.

Delivering the national statement at COP15 on Friday, Union Environment Minister Bhupender Yadav said, "Our experience shows that area-based targets are a one-size-fits-all approach that is not acceptable."

The parties are also trying to achieve a consensus on eliminating subsidies that are harmful to the environment, such as subsidies for fossil fuel production, agriculture, forestry and fisheries, and using this money for biodiversity conservation.

India has said "essential support to vulnerable sectors cannot be called subsidies and targeted for elimination", while they may be rationalised. Biodiversity must be promoted through positive investment, it has added.

"Our agriculture, as for other developing countries, is the source of life, livelihoods and culture for hundreds of millions. Their food and nutrition security must be ensured, while supporting the modernisation of their activity," Yadav said.

COP15, the most important gathering on biodiversity in a decade, aims at achieving a historic deal to halt and reverse biodiversity loss on par with the 2015 Paris Agreement on climate change.

Yadav arrived at Montreal on Friday and will lead the Indian delegation through the final phase of the negotiations next week.

India to deploy manned submersible vehicle into deep sea by 2026 for exploring minerals, conducting scientific research.

*The Times of India, 21/12/2022*

NEW DELHI: As part of a central mission for exploration of deep sea resources, the



government will deploy specially designed vehicle — called MATSYA 6000 — by 2026 to explore minerals such as Nickel, Cobalt, Rare Earth materials and Manganese, and carry out biodiversity assessment.

The manned submersible vehicle, which can carry three personnel to 6000 meter depth into the deep sea, is being designed and developed by National Institute of Ocean Technology (NIOT), Chennai. It will have an endurance of 12 hours under normal operation and 96 hours in case of emergency for human safety.

"Design of the vehicle is completed and realization of various components of the vehicles is in progress", said Union earth sciences minister Jitendra Singh in his written reply to a Parliament Question on "Samudrayaan" mission in Lok Sabha on Wednesday.

He said, "Apart from the scientific research and technological empowerment as its benefits, this mission has immediate spin-offs in the form of underwater engineering innovations in asset inspection, tourism and promotion of ocean literacy. The mission is expected to be realised by year 2026".

With "Samudrayaan" mission, India will join the elite club of nations such as the US, Russia, China, France and Japan to have indigenous technology and vehicles to carry out activities in deep sea.

The mission is part of India's larger plan on expanding its blue economy by utilizing its marine and deep sea oceanic resources. The

plan focuses on optimal utilization of all sectors of the maritime – living, non-living resources, tourism and ocean energy for sustainable development of coastal areas in the country.

A draft cabinet note on the blue economy plan has already been prepared and circulated for inter-ministerial consultations.

India is rich in coastal and offshore placer minerals including strategic ones such as nickel, uranium, copper, thorium, titanium, poly metallic sulphides, poly metallic manganese nodules, coastal ilmenite, garnet and zircon among others.

A placer deposit or placer is an accumulation of valuable minerals formed by gravity separation from a specific source rock during sedimentary processes.

#### India's oceanic link for blue economy:

- Coastline: Nearly 7,516km
- Nine of its 28 states are coastal
- Nation's geography includes 1,382 islands
- No. of ports: 199 ports including 12 major ports
- India's Exclusive Economic Zone: Over 2 millions square kms.
- These ports handle approx. 1,400 million tons of cargo every year
- Coastal economy sustains over 4 million fisherfolk and coastal communities.

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Pour s'abonner :

Responsable de la publication : Service économique de New Delhi  
2/50-E, Shantipath, Chanakyapuri, New Delhi, Delhi  
110021, INDIA

Rédacteurs : Logan Pasbeau, Marie Khater, Marion Velut

<https://www.tresor.economie.gouv.fr/Pays/IN/breves-economiques-et-financieres-d-asie-du-sud>