DIPA's Response to TRAI Consultation Paper on "Regulatory Framework for promoting Data Economy through establishment of Data Centres, Content Delivery Network and, Interconnect Exchanges in India"

PREAMBLE

1. At the outset, we would like to thank the Authority to bring out this Consultation paper for discussion on Regulatory Framework for promoting Data Economy through establishment of Data Centres, Content Delivery Network and, Interconnect Exchanges in India as the implementation of the same is pending for a very long time. We appreciate the Authority for its constant efforts for the growth of digital infrastructure in the Country which carries utmost importance especially when the country is aiming to be one of the first countries deploying 5G.

2. Such efforts need to be continued in the right direction for achieving national objectives and meeting the exponentially growing demand for telecommunication/digital services especially for the implementation of various Government programmes like Digital India, Make in India, development of Smart Cities and timely deployment of 5G etc.

3. A data centre is a facility that centralizes an organization's shared IT operations and equipment for the purposes of storing, processing, and disseminating data and applications. Because they house an organization's most critical and proprietary assets, data centres are vital to the continuity of daily operations. Consequently, the security and reliability of data centres and their information are among any organization's top priorities.

4. In the past, data centres were highly controlled physical infrastructures, but the public cloud has since changed that model. Except where regulatory restrictions require an on-premises data centre without internet connections, most Modern Data Centre infrastructures have evolved from on-premises physical servers to virtualized infrastructure that supports applications and workloads across multi-cloud environments.

5. **Current Status**
    a. India has around 375 MW installed power capacity for Data Centre and as per projections, this may grow to three-time by 2025
    b. Businesses in India aiming to extract investments in the data centre sector which is likely to reach a magical figure of INR 450 crore, in the next five years

c. As per Nokia Mobile Broadband India Traffic Index, overall data usage increased by 36% in 2020 due to increased usage of smartphones and fixed wireless access
d. This digital connectivity was provided seamlessly by India's 447 Megawatt (MW) of Colo Data centre capacity and telecom network
e. The growth prospects of India's DC industry have led to ~USD 400 mn M&A deals over and above the organic investments by operators during 2020 as many operators have announced expansion plans over the next few years

6. **Impact on Economy**
    a. The thriving Data Centre industry has spilled over benefits to several sectors and industries in form of digitization, which has been a great focus of the Government of India. Data Centres help in:
        i. Creating localized low-cost data storage
        ii. Processing services that help the digital start-up ecosystem to get cost benefits
        iii. Localized Data Centres lead to a reduction of latency in data access
        iv. High-speed services in the Indian market

7. DCs being **critical hubs for both technological and economic reasons** are core for digital infrastructure **at a regional, national, and global level.** They provide a substantial economic impact to the regions in which they are located through **direct (economic impact directly from a Data Centre construction and operation), indirect (economic impact through suppliers of goods and services), and induced (economic impact that occurs when employees at the Data Centre and their supplier industries spend their wages throughout the economy) effects.**

BACKGROUND

8. **Some of Global Trends regarding Data Centres are:**

    a. United States of America

        i. Exemption from states and local sales and property taxes
        ii. Sales tax exemption
        iii. Status under Enterprise Zone incentives program, which has a qualified target industry tax refund incentive
        iv. Sales Tax Exemption for equipment
        v. General job-based tax breaks
        vi. Job creation incentives

b. United Kingdom

i. Safe structured environment, ownership rights, EoDB, and ROI (return on investment) potentials
ii. Unparalleled Global Fibre Connections

c. Singapore

i. Robust infrastructure, access to fibre, talented local workforce, and great set of community partners
ii. Ease of acquiring and registering property
iii. Strong and substantially well placed legal system to protect its investors against any capital risks
iv. Strong network infrastructure, large content distribution network, diverse connectivity to major APAC markets, pro-business environment, and political stability
v. Corporate tax exemption or a concessionary tax rate of 5% or 10%, respectively, on income derived from qualifying activities
vi. Singapore's Data Centre parks also provide power-related infrastructural facilities like on-site power plants, dual power feeds, and redundant sources of network path diversity
vii. Low Tax Environment

d. Malaysia

i. Freedom to source funds globally for investments
ii. Globally competitive telecommunication tariffs
iii. Income tax exemption
iv. Unrestrained employment of local and foreign knowledge workers

e. China

i. Designated Data Centres as a nationally strategic investment sector since 2017
ii. Chinese Governments are promoting the DC sector as a means of advancing regional economic development
iii. China's regulator Ministry of Industry and Information Technology (MIIT) has formulated a separate license called Internet Data Centre (IDC) license in 2015
iv. Various tax and land incentives in lower-tier cities

f. Hong Kong

i. Low tax rate
ii. Well-established legal system,
iii. Extensive business network
iv. Reliable energy supply & network connectivity

v. Blooming start-ups
vi. IP protection

Our Question-wise response to TRAI Consultation Paper is as follows:

DATA CENTRES

Q1. What are the growth prospects for Data Centres in India? What are the economic/financial/infrastructure/other challenges being faced for setting up a Data Centre business in the country?

DIPA's Response:

India is one of the fastest-growing Data Center market globally and surpassed Global and APAC Data center growth rates.

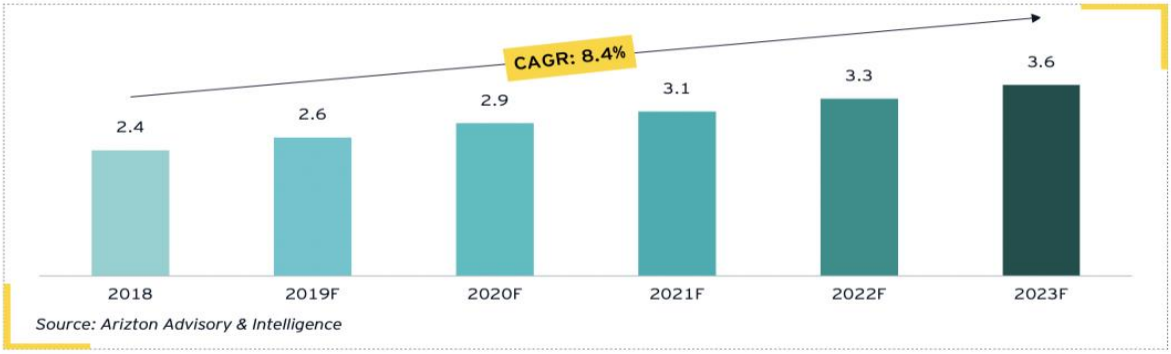
Key contributors of data center growth:

a. Surging Domestic Data consumption
b. Migration from Captive Data Centers to Cloud by Enterprise customer: Cloud market Forecasted to grow @ CAGR 38%
c. OTT Adoption: Forecasted to grow @ CAGR 28%+
d. Advent of 5G resulting in proliferation of IoT
e. Proposed Data sovereignty law
f. Geographical Advantage: can act as Data Center Hub for Countries in Indian Subcontinent
g. Submarine Cable Connectivity: Multiple Cable systems both on Trans-Atlantic and Trans- pacific side
h. Moratorium on New DCs in Singapore

Expected Growth

- Data Centre Market expected to grow at CAGR of 8.4% over 2018 to 2023
- India data centre market size will witness investments of USD 8 billion by 2026
- Indian DC industry is expected to more than double to 1007 MW by 2023 from its existing capacity of 447 MW

- Mumbai and Chennai are expected to drive 73% of the sector's total capacity addition during 2021-23, while other cities like Hyderabad and Delhi NCR will emerge as new hotspots
- Technology trends like 5G rollout, IoT-linked devices and AI will result in stronger growth in demand
- Demand is likely to be driven by data localisation laws and IT infrastructure upgrade across enterprises and Govt departments
- Promising asset class is expected to provide a greenfield real estate development opportunity of 6 million sq. ft over the next three years



Key Challenges

a. OFC Connectivity: high RoW cost for rollout of OFC network to ensure inter DC / IX connectivity
b. Approval Process & Timeline to get approvals
c. **Dearth of required skillset** - India is hampered greatly by a shortage of skilled labour, that is essential for a successful data centre. Additionally, problem-solving skills and critical thinking with a high priority on efficiency are also much required.
d. **Paucity of Adequate Infrastructure** - There is also the need for ample infrastructure to be in place. Fibre network and Power supply are the key components of a data centre that are still not established in various places.
e. **Adequate Power and Water Supply** - Unstable power supply and heavy reliance on generators is a major challenge for operators. Scarcity of resources such as water to cool the facilities leads to various hindrances.
f. **Location and Land Constraints** - Development of a data centre requires keeping multiple things in mind like the adequate power infrastructure, land devoid of any drawbacks etc. Thus, it is a difficult to access land banks in cities with these requirements.

g. **Policy requirements** - Concerted efforts are needed on several fronts, including creation of uninterrupted power supply at affordable costs, provision of financial incentives and efficient tax structures amongst others. government has to build far-sighted policies around these.

h. **Capital intensive** - Data centres being capital intensive acts as a barrier of entry. Factors such as high real estate cost, expenses on improving WAN connectivity and increased cost of equipment have further risen the already heavy capex in the sector.

Q2. What measures are required for accelerating growth of Data Centres in India?

AND

Q3. How Data Centre operators and global players can be incentivized for attracting potential investments in India?

AND

Q4. What initiatives, as compared to that of other Asia Pacific countries, are required to be undertaken in India for facilitating ease of doing business (EoDB) and promoting Data Centres?

DIPA's Response Q2, Q3, Q4:

In view of the impending and ongoing growth of the Data Centre Industry, the government should take the following measures immediately to further accelerate the same.

1. Govt may allocate land parcels for DC on long term lease and at nominal cost
2. Stamp Duty Charges can be exempted or reduced
3. Improving Grid availability & Power Infrastructure for Data Centres
4. Power Availability on the fly – Waiver of security charges and power availability at industrial tariffs
5. Free RoW for Inter Data Center/IX Connectivity or at nominal charges
6. Promote Infrastructure Sharing for Cost and Power efficiencies

Q5. What specific incentive measures should be implemented by the Central and/or the State Governments to expand the Data Centre market to meet the growth demand of Tier-2 and Tier-3 cities and least focused regions? Is there a need of special incentives for establishment of Data Centres and disaster recovery

sites in Tier-2 and Tier-3 cities in India? Do justify your answer with detailed comments.

AND

Q6. Will the creation of Data Centre Parks/Data Centre Special Economic Zones provide the necessary ecosystem for promoting the setting up of more Data Centres in India? What challenges are anticipated/observed in setting up new Data Parks/zones? What facilities/additional incentives should be provided at these parks/zones? Do give justification.

DIPA's Response Q5, Q6:

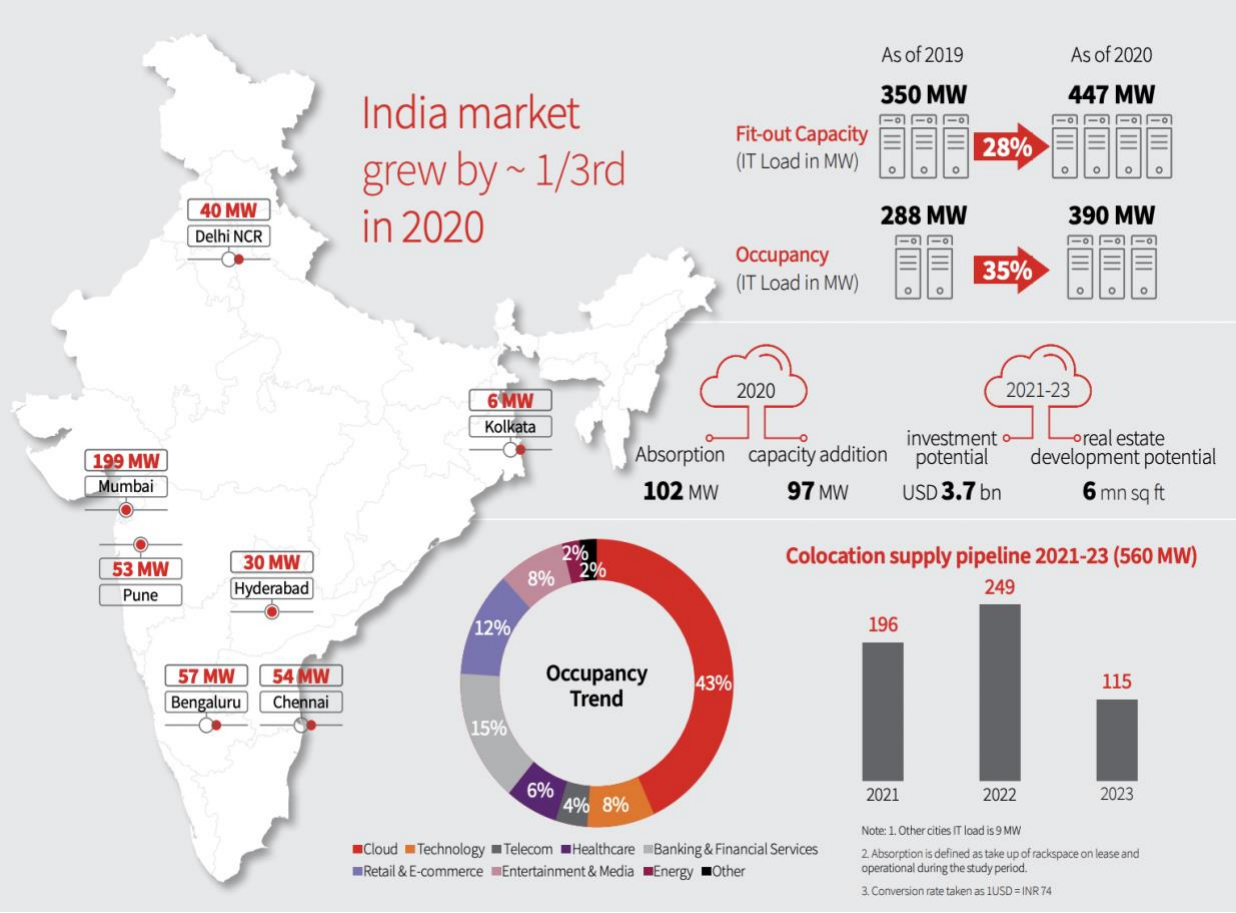
Management of Data Centres

Data centre management requires administering several different topics that relate to the data centre, including:

- Facilities Management - Managing the physical data centre facility can include duties related to the real estate of the facility, utilities, access control and personnel.
- Data Centre Inventory or Asset Management - Data centre facilities include the hardware assets, as well as software licensing and release management.
- Data Centre Infrastructure Management - DCIM lies at the intersection of IT and facility management and is usually accomplished through monitoring of the data centre's performance to optimize energy, equipment and floor space use.
- Technical Support - The data centre provides technical services to the organization, and as such it must also provide technical support to enterprise end users.
- Operations - Data centre management includes day-to-day processes and services that are provided by the data centre.

Current Status

- India has around 375 MW installed power capacity for Data Centre and as per projections, this may grow to three time by 2025
- Businesses in India aiming to extract investments in the data centre sector which is likely to reach a magical figure of INR 450 crore, in the next five years
- As per Nokia Mobile Broadband India Traffic Index, overall data usage increased by 36% in 2020 due to increased usage of smartphones and fixed wireless access
- This digital connectivity was provided seamlessly by India's 447 Megawatt (MW) of Colo Data centre capacity and telecom network
- The growth prospects of India's DC industry has led to ~USD 400 Mn M&A deals over and above the organic investments by operators during 2020 as many operators have announced expansion plans over the next few years



- Occupancy rose to 390MW in 2020 by 35%
- Cloud ranked the highest in Occupancy Trend Index at 43% followed by Banking at 15% and Retail & E-Commerce at 12%
- Investment Potential for 2021-23 is estimated at USD 3.7 billion
- Real Estate Development Potential for 2021-23 is estimated at 6mn sq. ft
- Absorption i.e. the utilised capacity as compared to the entire rented is seen at 102MW in 2020

Data centre operations were to see significant strides in the year 2020, but the COVID-19 crisis put the spanner in the works. However, the importance of data centres has only increased, and it was **accorded the status of essential services during the pandemic**.

1. Currently, Data Center Capacity is concentrated in Metro / Tier -1 Cities, out of that 50% capacities are in Mumbai largely due to good infrastructure and CLS.
2. Availability & Affordability of Data Services have fueled Data Growth in Tier-II Towns

3. Industry Understand that Next wave of capacity requirements would come from Tier -II cities, but following would be key considerations:
    a. Data Center in Tier – II Locations would be more of Metro aggregation Nodes, preferably a neutral facility which is highly interconnected to OpCos Network
    b. Typical location would be on CBDs – where Fiber Network of all the operators are located / Govt offices / Commercial areas
    c. Sizing of Data Center would be much smaller than deployments in Metro / Tier -1 Locations (up to 2 MW)
    d. DC Players Challenge in Moving towards Tier – II
        i. Arriving at right Data Center Sizing – predicting capacity requirements at this juncture is difficult
        ii. Cost / KW would be substantially higher than that of deployments in metro / Tier -1 Markets due to smaller sizing
        iii. Markup in Colocation Cost / Rack is needed to offset higher Capex / Opex, but there is uncertainty whether Users would be interested to pay a premium over established pricing.
        iv. Lack of Pre- commitments from Wholesale buyers – CDN , CSPs
4. Evolving Technology would need data Center at these locations but need to make economic sense for Data Center players, hence support from Government would be crucial for developing this ecosystem.
5. Suggested Govt Measures:
    a. Land Allocation
        i. Land Cost is major item of DC Capex
        ii. Allocation at Token amount /Nominal Rates on Long Term Lease without precondition like minimum Capex commitment / Employment generation
        iii. Waiver of Stamp Duty Charges
    b. Committed Govt. Business:
        i. Government is also having Policy to create State Data Centers and Data Center are created as part of smart city initiatives.
        ii. In place of creating Data Center infrastructure, Govt may support DC players by committing 25–50 Racks capacity and act as Anchor Customer
        iii. In place of periodically inviting applications from CSPs for empanelment under ‘Meghraj’, the window of opportunity to get empanneled should always be open through rolling advertisement by Ministry of Electronics and IT (MeitY).
    c. Opex Support:
        i. Subsidized Electricity may offset premium required for DCs in Tier-II Cities
        ii. Waiver of Municipal Taxes, Property Taxes
        iii. Tax Benefits
    d. Data Centre parks are needed to provide capacity for hyper-scale investments in India

e. Focus on building Disaster Recovery (DR) Data Centre infrastructure, edge Data Centres in Tier-2 and Tier-3 cities to increase the country's technological comprehensiveness

Q7. What should be the draft broad guidelines to be issued for Data Centre buildings, to facilitate specialized construction and safety approvals?

AND

Q8. Is there a need to develop India-specific building standards for construction of Data Centres operating in India? If yes, which body should be entrusted with the task? Do provide detailed justification in this regard.

AND

Q9. Till India-specific standards are announced, what standards should be followed as an interim measure?

AND

Q10. Should there be a standard-based certification framework for the Data Centres? If yes, what body should be entrusted with the task?

AND

Q11. Should incentives to Data Centres be linked to the certification framework?

AND

Q12. Are there any specific aspects of the disaster recovery standard in respect of Data Centres that need to be addressed? If so, then provide complete details with justification.

DIPA's ResponseQ7, Q8, Q9, Q10, Q11, Q12:

The maintenance of minimum standards for Data Centres is essential for the operation and for establishing trust with end-users by ensuring a basis for QoS requirements.

1. Standards & Certificates
    a. ISO 27000, PCI DSS, HIPAA, TIA 942, or AICPA SOC - These international standards have been developed, updated as necessary, and tested for many years by experts from different industries and geographies. They have proven to be an effective way to ensure data protection.

b. TIA-942 Data Centre Standards describe the requirements for the Data Centre infrastructure in a thorough, quantifiable manner under four levels (called tiers) of Data Centres.
c. Quality of service standards is also specified by the Uptime Institute, which classifies Data Centres into tiers based on uptime percentage in a year.
d. Major IT/telecom/networking products being used across Data Centre markets are primarily based on global standards. Harmonization of these standards to work across the Data Centre markets is critical.

2. Data Centre Building Norms
    a. In India, the National Building Code of India (NBC 2016) does not recognize 'Data Centre' as a separate category. In absence of separate building norms, DCs have to follow commercial office building norms raising the cost for DCs.
    b. A standard Data Centre building approval guideline across the country for all the municipal corporations can be helpful for Data Centre companies to build their pan-India plans without many variations and get the approvals of regional authorities within stipulated timelines.
    c. Same is also stated in the draft policy of MeitY on Data Centres

3. Making Data Centre related equipment and products in India

MeitY's policy intended to promote local manufacturing by encouraging the use of indigenous hardware (IT as well as non-IT equipment) and software products used in the Data Centres, thereby reducing the overall import burden of the country.

- Strengthen the testing and certification framework for the Data Centre ecosystem, including for the IT and non-IT equipment and software products pertaining to Data Centres operations
- Incentivizing global equipment manufacturers to set up manufacturing units of IT/non-IT components in India
- Catering not only to local demands but also for export purposes.

Disaster Recovery

A disaster recovery (DR) site is a facility that any organization can use to recover and restore its infrastructure and operations when its primary Data Centre becomes unavailable.

Fundamental DR Site Options

- Internal – Data Centre company itself sets up and maintains an internal site
- External – An external site is maintained by an outside provider

Disaster Recovery Standards

- ISO 22301 covers the continuity of business as a whole, considering any type of incident as a potential disruption source and using plans, policies, and procedures to prevent, react, and recover from disruptions caused by them.

4. ISO 27031 is a tool to implement the technical part of ISO 22301, providing detailed guidance on how to deal with the continuity of ICT elements to ensure that the organization's processes will deliver the expected results to its clients.

<u>Global Certification standards may continue to prevail</u> as major customers of Data Centres are global players (CSPs, OTTs) and would be comparatively more comfortable in collocating at Data Centre following Global standards /Certification.

Q13. Whether trusted source procurement should be mandated for Data Centre equipment? Whether Data Centres should be mandated to have security certifications based on third-party Audits? Which body should be entrusted with the task? Should security certifications be linked to incentives? If so, please give details with justifications

<u>DIPA's Response</u>:

1. Trusted Source procurement is applicable more on active compute infrastructure, may follow similar policy as applicable for Telecom Equipment.
2. Passive Infrastructure like fibre, racks etc. may be kept out of this and may be left to discretion of Data Center players.

Q14. What regulatory or other limitations are the Data Centre companies facing with regards to the availability of captive fiber optic cable connectivity, and how is it impacting the Data Centre deployment in the hinterland? How can the rolling out of captive high-quality fiber networks be incentivized, specifically for providing connectivity to the upcoming Data Centres/data parks? Do justify.

AND

Q15. What are the necessary measures required for providing alternative fiber access (like dark fiber) to the Data Centre operators? Whether captive use of dark fiber for DCs should be allowed? If so, please justify.

AND

Q16. What are the challenges faced while accessing international connectivity through cable landing stations? What measures, including incentive provisions, be taken for improving the reliable connectivity to CLS?

DIPA's Response Q14, Q15, Q16:

1. Fiber connectivity is key to achieve interconnection, data carriage, Low latency requirements, huge bandwidth requirement and improve quality of service. Currently Data Center Provider / their customers takes leased bandwidth for meeting their connectivity requirement
2. Leased Bandwidth may not be the best suited connectivity option
    a. Capacity requirements have grown multiple folds and it might not be economical for DC players / their customers to meet connectivity requirement by leasing Bandwidth in coming years
    b. Futuristic networks would need low latency network, requiring a different network topology eliminating multiple hops
    c. Cloud and content players are opting for alternate protection schemes to meet their redundancy requirements
3. Dark fiber may potentially address technological & economical requirements
4. Incentivizing rollout of captive high-quality fiber networks would support over all ecosystem and go long-way in meeting back haul requirements. however.
    a. Incentivizing Fiber networks should not be limited to Fiber rollout specifically for providing connectivity to the upcoming Data Centres/data parks
    b. Building parallel Fiber network for different use case (DC connectivity, 5 G Rollout) may not be best model, rather shared fiber networks catering to all backhaul requirement would be a more effective approach
    c. Neutral shared fiber network could be a potential solution to address all type of connectivity requirement, Govt may incentivize shared fiber initiatives by giving Free ROW / reasonable ROW to such networks

International Connectivity

- Some of the biggest enterprise Data Centre developers—Google, Facebook, Microsoft, and Amazon—now are also major investors in new submarine cables. The amount of capacity deployed by these providers has outpaced internet backbone operators in recent years.
- If Data Centres are the heart of the digital economy, then submarine cables are the arteries of modern connectivity. These cables terminate in the country through cable landing stations (CLS). Access to submarine CLS is an essential input for services requiring international connectivity.

Q17. Is the extant situation of power supply sufficient to meet the present and futuristic requirements for Data Centres in India? What are the major challenges faced by the Data Centre Industry in the establishment of Data Centres in naturally cooled regions of India? What are the impediments in and suggested nonconventional measures for ensuring continuous availability of power to companies interested in establishing Data Centres in the country? What incentivization policy measures can be offered to meet electricity requirements for Data Centres

AND

Q18. Should certification for green Data Centres be introduced in India? What should be the requirement, and which body may look after the work of deciding norms and issuing certificates?

AND

Q19. Are there any challenges/restrictions imposed by the States/DISCOMs to buy renewable energy? Please elaborate. Please suggest measures to incentivize green Data Centres in India?

AND

Q20. What supportive mechanisms can be provided to Data Centre backup power generators?

AND

Q21. Availability of Water is essential for cooling of Data Centres, how the requirement can be met for continuous availability of water to the Data Centres? Are there any alternate solutions? Please elaborate.

DIPA's Response to Q 17, 18, 19, 20, 21

Access to Power and Water

Despite making remarkable progress in electricity distribution over the years, India still faces challenges in meeting its growing power demand. In FY 2020-21, the country's energy supply deficit stood at 1,441 MU. The reliable supply remains low in the country with unstable grid connectivity in many parts.

Unstable power supply and heavy reliance on generators is a major challenge for operators. Scarcity of resources such as water to cool the facilities leads to various hindrances.

Provisioning of Power Tariffs and Services

- Electricity connection should be given on priority for telecom sites at the time of installation of new towers. Telecom services being critical and most of the other sectors being dependent on telecom, electricity connection to be given on priority, within 15 days max.
- Demand notice at the time of connections is generally on higher side siting various reasons such as need of separate transformers, lines to be fetched from far areas

etc. Telecom being critical and essential service discounted prices and minimum requirements and charges should be imposed while raising demand notice at the time of EB installation.

- DISCOMS should not process Disconnection easily on minor complaints of residents and corporators.
- Telecom being an essential and critical service, the tariffs for electricity should be provided on discounted/industrial price.

- Establishment of dual power grid networks to ensure an uninterrupted quality supply of electricity to the Data Centre is required. Additional power generation capabilities through captive power sources such as solar and wind farms should be installed to supplement power sourcing.
- Fuel subsidies for providing backup power to the eligible players where grid supply is not available adequately will improve the Data Centre foundation in rural and Tier-2 cities and divert the concentration of Data Centres in already crowded Tier-1 cities. Although, diesel is not used as a first choice but needed for backup in case of emergencies or where no alternate means are available.
- Certain Data Centre companies have shown an interest in funding research on renewable-energy-based solutions for Data Centres. Energy or duty tax may be exempted to benefit the industry in a situation where many outsourcing companies are experimenting with renewable energy for bundling or part-powering their units.

Promoting Green Data Centres

- There should be a Government initiative to promote green technology-enabled DCs. The DC players interested in setting up Green Data Centres can be given supplementary benefits like easy approvals and permits, ease of restrictions in availing existing renewable energy resources, buying renewable energy through open access, or investing in renewable energy power plants.
- Several criteria can be used to incentivize energy savings and green energy at Data Centres. These include cooling optimization by the creation of Data Centres in naturally cooled regions, using or investing in research on renewable energy resources for Data Centres, and Data Centres designed on green computing principles that use natural cooling and natural light in addition to having low energy requirements processes.
- There are certifications for green Data Centres that can be obtained from several agencies that are used around the world
    - LEED (Leadership in Energy and Environmental Design) certification
    - Indian Green Building Council (IGBC)
- Renewable Energy Certificates (RECs): Renewable energy certificates (RECs) are tradable commodities that are purchased in voluntary markets and then retired/redeemed once that electricity is consumed.
- **Viability Gap Funding**: It is suggested that for the sites / locations with less than 12 hrs. power availability, may be funded/ subsidized for installation of

Renewable Energy Technology solution, subject to the technical feasibility of the solution at the location. MNRE may be approached to incentivize RET installations at such locations. This facilitation would be for Viability Gap Funding. **For accelerating high efficiency storage solution utilization, we need to see if incentive scheme like FAME – II (Faster Adoption and Manufacturing of Electric Vehicles) for automotive sector, can be extended to telecom sector.**

- **Kisan Urja Suraksha Evam Utthaan Mahabhiyan (KUSUM) benefits**: The Government has come up with a scheme, wherein capex subsidy is provided to farmers for installing solar solution on infertile land. The scheme should be extended to RESCOs which would help them to proliferate in the untapped areas and supply power for the telecom sector.
- Reliable access to Water - A Data Centre construction is feasible only when an adequate water supply is available nearby as there is a need for a reliable, continuous source of water for the systems to be effective.

Q22. Whether the existing capacity-building framework for vocational or other forms of training sufficient to upskill the young and skilled workforce in India for sustenance of Data Centre operations? What dovetailing measures for academia and industry are suggested to improve the existing capacity building framework, and align it with the emerging technologies to upskill the workforce in India?

DIPA's Response

1. Capacity Building - The skillset demand in the Data Centre sector is high, and the competition is fierce. This calls for the planned implementation of suitable capacity building initiatives as part of vocational training along with the extant university education. Introduction of vocational vendor-neutral certification courses in the field of Computing System, Data Centre Infrastructure Management, Certified Network Associate/Network professional will give due impetus to the much-required capacity-building initiatives in the field of DCs in the country.
2. Centre-State Coordination – With the huge investments that Data Centres can represent, the playing field has changed. This calls for a greater thrust on Centre-State coordination favouring the implementation of uniform tax abatement code, analogous labour laws, and a common framework to facilitate ease of doing business.
3. Edge Data & AI - enabled Data Centre –Given that, new technological developments will keep happening in the DC space, policy measures must be put in place to promote the adoption of future technologies for Data Centres.
4. Data Digitization and Monetization – For ensuring that the digitization of all records is completed in a time-bound manner some institutional mechanism needs to be put in place.

5. Government has also created the Sector skilled councils for skilled professionals in various fields. The Telecom Sector skill council can be utilised here to ensure the needed quality and education in the people employed and working at these data centres. Telecom Sector skill council and industry bodies of telecom such as DIPA, COAI etc. should be associated for content development and consumption on the online skill development platforms like 'futureskillsprime' of MeitY.

Q23. Is non-uniformity in state policies affecting the pan-India growth and promotion of Data Centre industry? Is there a need for promulgation of a unified Data Centre policy in India, which acts as an overarching framework for setting Data Centres across India? What institutional mechanisms can be put in place to ensure smooth coordination between Centre and States for facilitating DC business? Do support your answers with detailed justification.

AND

Q24. What practical issues merit consideration under Centre-State coordination to implement measures for pan-India single-window clearance for Data Centres?

DIPA's ResponseQ 23, Q24:

Currently States are coming with their own DC Policies with different incentivization frameworks and schemes. This helps to attract Data Center investment in their state but may result in centralization of DC capacity.

1. National Data center policy and incentivization framework would support creation of distributed compute infrastructure across the country. National Policy may define minimum support mechanism to Data Center
2. Incentivization framework should be designed with aim to attract DC investment in Tier -II city to meet overall digitization objective

Example

West Bengal

On 06-Sep-2021, Department of Information Technology and Electronics, Government of West Bengal has announced the West Bengal Data Centre Policy. This done with a view to make West Bengal the most preferred destination for the Data Centre Industry by:

1. Building a world class Data Centre ecosystem
2. Attracting foreign and domestic investments
3. Mentoring MSMEs/Start-ups leverage the new ecosystem and grow into unicorns

4. Generating employment opportunities and provide critical skill-based training to increase employability
5. Creating an anonymised public transactional data repository for various academic and industrial use

Target

1. Develop a 400 MW - capacity Data Centre Industry in West Bengal by 2025
2. Attract investment of around INR 20,000 Crores to support this growth
3. Set up three dedicated State-of-the-art Data Centre Parks across the State

Q25. Is there a need for Data Centre Infrastructure Management System (DCIM) for Data Centres in India? What policy measures can be put in place to incentivize Data Centre players to adopt the futuristic technologies? Elaborate with justification.

DIPA's Response

- Data Centres require a high level of electrical reliability, and uninterrupted power availability continues to be a significant concern for Data Centre managers.
- Power quality issues can cause equipment failure, downtime, data corruption, and are obstacles for DC operations. It is frequently the case that Data Centre managers tend to overprovision power to avoid downtime. This leads to unnecessary wastage of power and space.
- As India plans the expansion of Data Centres, such wastages need to be eliminated. To optimize the cost of operation, it is significant to create an efficient Data Centre Infrastructure Management System (DCIM) to correctly assess the requirements of the concerned Data Centres.
- DCIM not only streamlines the costs but also ensures sustainability by reducing its carbon footprint. However, creating and maintaining a robust DCIM might pose cost concerns, especially in a country like India, which still does not possess the necessary framework for technical and designing expertise as compared to the developed countries of the world.

Since it is significant to create an efficient DCIM, therefore IP1s today can efficiently manage the data centres due to their existing experience in the same.

Q26. What institutional mechanism needs to be put in place to ensure digitization of hard document within a defined timeframe?

DIPA's Response

Digitization of hard copy documents can be on a case-to-case basis and prescribing a common timeframe for the same may not be advisable.

Q27. Would there be any security/privacy issues associated with data monetization? What further measures can be taken to boost data monetization in the country?

DIPA's Response

Data monetization is governed by the prevailing national data privacy laws and the applicable international treaties, framework etc. Any further measures in this direction may be decided after the enactment of the proposed data privacy law.

CDN

Q28. What long term policy measures are required to facilitate growth of CDN industry in India?

AND

Q33. Do you think CDN growth is impacted due to location constraints? What are the relevant measures required to be taken to mitigate these constraints and facilitate expansion of ecosystem of Digital communication infrastructure and services comprising various stakeholders, including CDN service providers, Data Centre operators, and Interconnect Exchange providers expansion in various Tier-2 cities?

DIPA's Response Q28, Q33:

1. Currently CDNs are Hosted is Hyperscale Data center and /or deploying Caches at Network PoPs of TSPs / having Direct peering arrangement @ hyperscale Data centers where they are hosted.
2. In present set up – CDNs deploy infrastructure @ every operator PoP, serving the customers of that TSPs, implying multiple installation per location, and even with multiple deployments they connect to leading providers only
3. CDNs are looking for deploying their infrastructure at connected Neutral facility; where all eligible service provider would get connected, resulting in improved experience for their end users
4. As a long-term policy connected Data Center in tier–II towns is required to facilitate growth of CDN

Q29. Whether the absence of regulatory framework for CDNs is affecting the growth of CDN in India and creating a non-level-playing field between CDN players and telecom service providers.

DIPA's Response:

1. CDN and Telecom Player are integral part of Digital content ecosystem, both have their own play and need to co-exist.
2. Industry is seeing enhanced cooperation's & partnership between CDNs & Telcos to bundle Content & Connectivity to serve end-user.

Q30. If answer to either of the above question is yes, is there a need to regulate the CDN industry? What type of Governance structure should be prescribed? Do elucidate your views with justification.

AND

Q31. In case a registration/licensing framework is to be prescribed, what should be the terms and conditions for such framework?

DIPA's Response Q30, Q31:

1. CDNs are comparable to Print & media/broadcast business, and if at all Govt plans to regulate this industry it should be line with comparable industry.
2. Light touch Regulation Focused to take care of matter / contents pertaining to national security, protection of minors / human dignity/ privacy, intellectual property etc.
3. Regulation may also envisage that
    a. CDNs would provide peering / caching arrangement to all eligible service provider in non – discriminatory way
    b. CDNs need to deploy such setups at all town having population of 1 million + and such infrastructure would be hosted at Own facility / Neutral facility

Q32. What are the challenges in terms of cost for growth of CDN? What are the suggestions for offsetting such costs to CDN providers?

AND

Q 35. Is there a need to incentivize the CDN industry to redirect private investments into the sector? What incentives are suggested to promote the development of the CDN industry in India?

AND

Q36. How can TSPs/ISPs be incentivized to provide CDN services? Please elucidate your views.

DIPA's Response Q32, Q35, Q36:

The initial costs associated with establishing a CDN are quite high, while it takes time to get the returns on investment. Private investments are required to set up a large number of CDN servers in India. Private investments are required to set up a large number of CDN servers in India. Suitable fiscal incentives through policies can support the companies during initial investment.

Q 34. What measures can be taken for improving infrastructure for connectivity between CDNs and ISPs, especially those operating on a regional basis?

DIPA's Response

- The relationship between CDN players and ISPs is that of a **mutual facilitator**. While CDN providers help ISPs in terms of helping them save bandwidth cost and in enhancing the user experience, ISPs provide the access without which CDNs cannot deliver the content.

- While the CDN providers are investing in the server hardware, the ISP is also arranging space, power, and bandwidth for fetching cache content, etc. Thus, both the players invest in their own systems and in-process they help each other improve their commercial viability.

- The market for the interconnection of CDNs and ISPs is at a nascent stage. There is a need to see that the market is not misused to create dominance, hurting the business of smaller players by way of arbitrary demands. Such a market may require regulatory interventions.

- With data traffic set to grow and a limited number of players controlling a significant proportion of internet traffic, chances are there for anti-competitive agreements between CDNs, ISPs/TSPs, and internet companies.

- Since commercial arrangements between internet companies, CDNs, and ISPs/TSPs are not disclosed, monitoring of such arrangements and traffic patterns would help in ensuring net-neutrality principles and fair competition. However, for monitoring any such interconnect agreement, some regulatory framework will be required.

- DNS based content filtering and URL blocking allows or blocks access to the website´s or URLs as per the Government orders under Section 69A of the IT Act. In absence of any regulatory and security framework, it has been observed that few CDN providers are hosting their contents colocating them with ISP gateways through direct peering or at Private IXPs. This arrangement results into bottleneck in effective blocking of contents under the direction of Hon'ble courts or under provision of IT Act and there is possibility of by-pass of Lawful Interception system.

Q37. Are there any other issues that are hampering the development of CDN Industry in India? If there are suggestions for the growth of CDNs in India, the same may be brought out with complete details.

DIPA's Response:

To provide optimum user experience to users – CDNs should have their deployments near to user and connected to all eligible Service provider, which is not happening currently due to:

1. Non – availability of Neutral facilities
2. CDNs work on asset light model and prefer to collocate at existing DC facilities
3. Even if they plan to build their PoPs, the sizing required for their solo use makes preposition economically non-viable

IXP

Q42. Whether TSPs/ISPs should be mandated to interconnect at IXPs that exist in an LSA? Do justify your response.

AND

Q43. Is there a need for setting up IXP in every state in India? What support Govt. can provide to encourage setting up new IXPs in the states/Tier-2 locations where no IXPs exist presently?

AND

Q44. Whether leased line costs to connect an existing or new IXP is a barrier for ISPs? If yes, what is the suggested way out? What are other limitations for ISPs to connect to IXPs? What are the suggestions to overcome them?

DIPA's Response:

1. Currently all Major IX are in Metro / Tier -1 Location, so are the content providers

2. Key advantage of IX is to avoid Multi Hop Traffic Routing and Peer to Peer traffic exchange between connected parties
3. Mandating TSPs / ISP to interconnect might not help up till CDNs are also connected available at IX @ LSA for Peer-to-Peer Traffic exchange
4. Setting up IXs at LSAs would support to create a future ready Digital Ecosystem, however this would effective only with CDNs are interconnect to these IXs for peering
5. This would benefit particularly to smaller & Regional ISPs for whom Bandwidth cost is impediment to connect to IXs hosted in Metro / Tier -1 Location
6. Net – Net, neutral facilities at Tier -II Locations hosting IXs, Content providers & guidelines mandating all TSPs & ISPs to interconnect.

Q38. Do you think that presently there is lack of clear regulatory framework/guidelines for establishing/operating Interconnect Exchanges in India?
Q 39. What policy measures are required to promote setting up of more Internet Exchange Points (IXPs) in India? What measures are suggested to encourage competition in the IXP market?

Q40. Whether there is a need for separate light-touch licensing framework for operating IXPs in India? If yes, what should be the terms and conditions of suggested framework? Do justify your answer.

Q41. What business models are suitable for IXPs in India? Please elaborate and provide detailed justifications for your answer.

Q45. Is the high cost of AS number allocation an impediment for small ISPs to connect to IX? If yes, what is the suggested way out?

Q46. What other policy measures are suggested to encourage investment for establishing more number of IXPs? Any other issue relevant with IXP growth may be mentioned.

Q47. How can the TSPs empower their subscribers with enhanced control over their data and ensure secure portability of trusted data between TSPs and other institutions? Provide comments along with detailed justification.

Q48. What is the degree of feasibility of implementing DEPA based consent framework structure amongst TSPs for sharing of KYC data between TSPs based on subscriber's consent?

Q49. Are there any other issues related to data ethics that require policy/regulatory intervention apart from the issues that have already been dealt with, in TRAI's recommendations on the issue of 'Privacy, Security and ownership of the Data in

the Telecom Sector' dated 16th July 2018 and the draft PDP Bill? Provide full details.

Q50. Stakeholders may also provide comments with detailed justifications on other relevant issues, if any.

ISP/TSP may comment