



**Subject: Deployment of better-quality Optical Fibre in the BharatNet project.**

Consistent supportive policies of the Government have driven the Indian industry to become increasingly robust, self-reliant, and globally competitive. Witnessing transformative changes, India is headed in the right direction.

The improvement has particularly been significant in sectors related to optical fibre and optical fibre cable manufacturing. As India pushes ahead with its digital inclusion drive, broadband infrastructure is being rapidly expanded. It is expected to grow further with the roll out of such ambitious initiatives as the BharatNet project which aims to connect all 2.5 lakh gram panchayats across the country.

Powering the BharatNet project – for which the Government of India recently approved a further INR 1.39 lakh crores - has been optical fibre and optical fibre cables that form the backbone of broadband connectivity. Indian manufacturers of optical fibre and optical fibre cables too have successfully lived up to the needs and expectations of the country. They have generously invested in beefing up production capacity, which currently is about 4 times in excess of domestic demand.

India's optical fibre manufacturing capacity stands at about 90 million fibre Km, against a domestic demand of some 26 million fibre km.

With an abundant capacity of optical fibre that is globally recognised to be of premium quality, India has the potential to become the optical fibre capital of the world.

However, the challenge faced in India is that the existing technical specifications for optical fibre and optical fibre cable products deployed under BharatNet are not sufficient to meet the present and future requirements of the country. The current specifications include legacy G.652.D single-mode fibre, which is not bend-insensitive, has lesser lifespan and has high optical power loss. Globally, many countries have stopped deploying G.652.D cable, replacing it with G.657.A1 fibre for access network and G.657.A2 for last-mile connectivity.

The continuing deployment of legacy G.652.D single-mode fibre in access and core networks is increasing the risk of network failure and incompatibility with future applications.

In order to ensure the long-term success of BharatNet, it is important to adopt better-quality fibre that is less prone to failures, has lower optical power loss, and can be used to extend the reach of the network.

Considering that the country's digital infrastructure is built keeping in mind its long-term utilisation, it is essential that the fibre network being created by BharatNet lasts for at least 30 years to satisfy service level agreements with operators and realise its revenue potential.

Deployment of better-quality optical fibre in the BharatNet network is therefore imperative. It is an option that India must not miss out since there is barely any price difference between the legacy G.652.D and the better-quality G.657.A1 fibre. The price of G.657.A1 fibre is also expected to come down further in the country with increased consumption, making its deployment further economical.

The importance of deploying better-quality fibre cannot be overstated. BharatNet is 100% government funded, and therefore it will not be prudent to leave the option of choosing the quality of optical fibre to be used in the project with the vendors. The Government should ensure that only future-ready components are deployed to reduce capital expenditure on replacements and O&M without compromising the quality of the network.



## Centre for Digital Economy Policy Research

H-1584, Chittaranjan Park, New Delhi-110019

Phone No. +919818213076; Email Id: [president@c-dep.org](mailto:president@c-dep.org)

---

Building a digital infrastructure is a long-term investment. Future-ready optical fibre networks can be upgraded and expanded without major changes or investment. Only future-ready optical fibre can handle the increasing demand for data traffic efficiently, ensuring high-speed and reliable connectivity.

ITU-T G.657.A fibre is being deployed in many countries around the world such as the UK, US, and Europe. This fibre is more durable than legacy fibre and is less susceptible to optical power loss due to accidental bends. Some countries have even stopped deploying G.652.D cable. Instead, they are now using G.657.A1 fibre as the bare minimum standard.

G.657.A fibre is designed to support the deployment of next-generation optical systems. It performs better in bending conditions, making it well-suited for advanced network architectures and technologies like wavelength division multiplexing (WDM) and passive optical networks (PON). By using G.657.A1 fibre, network operators can prepare their infrastructure for future upgrades and advancements.

All major optical fibre (OF) manufacturers in India have the capability to produce G.657.A1/A2 fibre. The significant capacity for G.657.A fibre has been built in India because almost all private telecom operators and major broadband service providers have been using this type of fibre for a long time. This means that India is well-positioned to deploy bend-insensitive fibre to extend its optical networks and provide better connectivity to its rural communities.

Use of high quality, bend-insensitive ITU-T G.657.A1/A2 fibre is essential for the long-term success of the BharatNet project, and it is strongly suggested that its use should be adopted as a minimum standard for the project. There should be no provision for the use of lower-quality G.652.D fibre.

The issue at stake is extremely significant, given the importance of BharatNet project in India's journey towards digital inclusivity. It is important that we consider using only ITU-T G.657.A1/A2 fibre and removing G.652.D as an option from the BharatNet tender document. For, if the legacy G.652.D is kept as an option, System Integrators will continue to deploy it in the construction of BharatNet network, compromising its quality and longevity.