I am honored to have this opportunity to present to you the second issues paper of the CSTD Secretariat – Development-oriented policies for socio-economic inclusive information society, including access, infrastructure and an enabling environment.

CSTD has agreed on a multi-year work programme to assess the outcomes of the World Summit on the Information Society (or WSIS) and focus each biennium on a specific theme related to the developmental aspects of the Information Society for the purposes of bridging the digital divide.

This theme is the first of the biennial themes as part of CSTD’s Multi-year WSIS follow-up work program.

In light of contributing to the overall goal to bridge the digital divide, I would like to review whether we are on track to meet the WSIS targets by 2015.
The Figure shows the gap between different groupings of countries in the penetration rates of fixed lines, mobile cellular subscribers, Internet users and fixed broadband subscribers for 1995, 2000 and 2005.

Although middle-income developing countries (led by China and India) are closing gaps in fixed line access with OECD+ countries, the gap with LDCs is widening. For mobile telephony, the gap between OECD+ and developing countries' has been reduced with LDCs making significant progress as well.

Even for Internet access, the digital divide has shrunken remarkably, with the ratio between OECD+ and developing economies plummeting over the past decade. For these reasons, the debate over the future digital divide is now moving away from inequalities in basic “quantity” and “access” to include differences in “quality” and “capacity.”

I must note, that although the broadband subscriber gap between OECD+ economies and developing economies has reduced, the absolute gap has grown almost tenfold between 2000 and 2005. In some LDCs, broadband users may pay over US$2,000 per month while in Japan, broadband subscribers often pay less than 10 US cents per month for the same broadband service.
Interestingly enough, the global digital divide is not as extreme as the global wealth divide.

Mobile phones are the most evenly distributed ICT and fixed broadband connections are the least.

Also interesting is that among low-income countries, their greatest share of global ICTs is in Internet users, since Internet usage in low-income countries includes many forms of communal access, like telecentres.

Overall, mobile phones are more evenly distributed than fixed line telephones.

Although the digital divide is shrinking in some aspects and increasing in others, access to ICT infrastructure for digital inclusion can help realize the WSIS goal of attaining universal, sustainable, ubiquitous and affordable access to ICTs by all.
Now, the digital divide is a complex concept that is the result of underlying socioeconomic inequalities.

Communities lacking ICT infrastructure usually do not have access to other critical infrastructures as well, including water, sanitation, energy, and transport. The electricity divide, for example, reinforces the digital divide, presenting major barriers to the acquisition of modern ICTs in developing countries for mass production.

Failure to develop ICT infrastructure along with other critical infrastructure further marginalizes developing countries from integration into the global knowledge economy and participation in the Information Society.

The critical challenge is how to provide access to ICT infrastructure in infrastructure-poor communities?
Increasing ICT Access by Maximizing Infrastructural Interdependencies

- ICT infrastructure can be developed alongside other infrastructure to achieve national socioeconomic development objectives.
- Different types of infrastructure are often interlinked and interdependent.
- It is possible to link ICT infrastructure development with almost any other form of infrastructure.

One option is that ICT infrastructure can be developed alongside other infrastructure to achieve national socioeconomic development objectives.

It is technically possible to link ICT infrastructure development with almost any other form of infrastructure. Developing access to one form of infrastructure can perhaps boost the development of infrastructure in related sectors. Infrastructure projects can be coordinated to maximize these synergies and potentially reduce costs, especially for ICT infrastructure and services.
Maximizing Infrastructural Interdependencies for ICT Access

1. ICT-Bundled Infrastructure
   - Embedding ICT within Infrastructure
     - Roads + Fibre/Telephone Cables
     - Railroad + Fibre/Telephone Cables
     - Sewer Lines + Fibre/Telephone Cables
     - Gas Pipeline + Fibre/Telephone Cables

2. ICT-Enabled Infrastructure
   - Using Power Lines for Communications
     - Power Grid + Fibre/Telephone Cables
     - Water Lines + Fibre/Telephone Cables
     - Oil Pipeline + Fibre/Telephone Cables
     - Multiple Utilities + Fibre/Telephone Cables

3. ICT-Shared Infrastructure
   - Sharing Network Facilities for ICT
     - Power Line Communication (PLC)
     - Broadband over Power Line (BPL)
     - Site Sharing (Masts, Antennas, Buildings)
     - Base Station Sharing
     - Network Sharing
     - Wireless Capacity-Sharing
     - Satellite Capacity-Sharing

In this slide, I am presenting three possible ways to link ICT infrastructure to other forms of infrastructure to increase access to telecom services in the developing world.

The first way is ICT-Bundled Infrastructure. Here, ICT infrastructure is laid alongside other critical infrastructure such as gas and oil pipelines, sewers, drinking water pipes, railroads, electricity power grids and roads that can accommodate fibre optic cables.

The second way is ICT-Enabled Infrastructure. Here, new technologies allow power lines to be used as telecommunications media. This type of infrastructure is being deployed across America, Europe and Africa.

The third way is ICT-Shared Infrastructure. This arrangement includes the sharing of common ICT infrastructure by mobile operators to provide coverage to areas that may be otherwise not be economically viable.
The first method, ICT-bundled infrastructure, takes advantage of the Rights of Way of utility owners and their conduits to provide facilities for ICT infrastructure, radically reducing the construction costs associated with ICTs and making ICT services available in places where other utilities operate.

It has been estimated that for every $1 million US dollars spent on building fibre networks, only US$300,000 is actually spent on the cables themselves with the rest spent on rights of way and infrastructure. If countries can coordinate the laying of fiber with other infrastructure, they can potentially save money in the deployment of broadband access.

In the pictures on this slide, you can see how fiber optic cables can be laid within a gas pipeline as well as within drinking water pipes.
The second method, ICT-Enabled infrastructure, is where power lines are used to transmit telecommunications signals.

Power line communication (PLC) and Broadband over Power Lines (BPL) are key technologies that allow the transmission of data over power lines.

Africa is beginning to harness PLC and BPL technologies to expand ICT access through the power grid infrastructure.

For example, Goal Technology Solutions (GTS), a company based in South Africa, is pioneering BPL technology at home and throughout the continent for the roll-out of broadband Internet in a way that is significantly cheaper than existing fibre-based solutions, with contracts in Uganda and Rwanda.
The third method, ICT-shared infrastructure, is where various ICT services share the same communications infrastructure or facilities to increase ICT access, reduce costs, and differentiate ICT services.

One common example is when multiple mobile operators use a common site to erect radio masts and install their own equipment.

Beyond site sharing, base station equipment can be shared, where signal transmission is managed over the mobile network. For example, Orange and Vodafone in the UK have realized that it is financially unattractive to build separate base stations in rural areas and have established a non-binding agreement to share Radio Access Networks.

Another more involved option is network sharing. In Tanzania, Zantel was granted permission to roll-out its mobile service from its base in Zanzibar to the mainland of Tanzania through an arrangement with Vodacom Tanzania to make use of the existing operator’s network.
Potential Benefits of Maximizing Infrastructure Interdependencies for Increased ICT access

- Increased ICT access
- Cheaper services for the consumers
- Minimized environmental impact of ICT infrastructure
- Alternative revenue streams for Utility companies

The greatest benefits of these options from a developmental perspective are increased access to ICTs, potentially cheaper services, and minimized damage to the environment.

Besides these developmental benefits, financial incentives can be made available to utility and telecommunications companies to maximize these infrastructure interdependencies. Bundling ICT infrastructure with other utility infrastructure is possibly a way to generate alternative revenue streams and reduce operating costs for utility companies.
And now to the enabling environment for the Information Society.

An enabling environment at the national, regional, and international levels can help foster a socio-economic inclusive Information Society.

Through a development-oriented policy and regulatory framework, governments can help build a people-centred Information Society.

Not only governments, but other stakeholders like the private sector, civil society, intergovernmental organizations, and international and multilateral organizations are instrumental in creating the enabling environment that promotes inclusion in the Information Society.

I will now discuss specific areas to consider regarding the enabling environment.
Developing countries can decide whether (and to what extent) regulation is required, as this is often an essential incentive for investment.

Ensuring that telecommunication services remain affordable often depends on regulatory control of prices. Legislation can provide clearly established and enforceable guidelines in respect of the ICT sector that market agents can operate by.

To increase access and foster diversity of choice, it is important that governments consider adopting a policy framework that maximizes competition and that allows users to choose the technology that best meets their specific needs.
Since telecommunications infrastructure is expensive, private and external financing is key. Liberalization in the telecommunications market can help make available the private investment necessary to finance the telecommunication infrastructure, lower prices for ICT services and address inequities related to ICT access.
Education is the cornerstone of success in the use of ICTs and in promoting an information society for all. Governments can provide training in ICT skills. Partnerships between governments, employers, schools and college authorities can be developed to provide the necessary training. There can also be special programs in developing countries to address societal needs for the education and training of women.
Countries can also develop policies on access and regulatory targets adopted for universal access commitments. Take the example of Malaysia, which distinguished between the right to collective access (or universal access) and individual access, and stated a clear preference for collective access.

Other aspects of State policy on access include recognition of gender equality, non-discrimination, and access by minorities and promotional programs for rural areas, schools and hospitals. State policy on access also includes broader awareness programs, wider education policy, and computer training in schools and libraries to improve computer literacy.
Affordability

- Supply-side and demand-side financing models
  - Trust funds
  - Subsidies
  - Tariffs

To make ICT access more affordable, governments, multilaterals, and investments funds can support supply-side financing models where funds are provided for IT equipment and training investments. They can also support demand-side financing models to ensure equitable access and promote the creation of financing mechanisms. This can take the form of trust funds and partnerships in ICTs.

Socially progressive tariff schemes using progressive pricing have been utilized to make access cheaper for rural areas and public interest groups. In some countries, initiatives to promote affordability have focused on subsidies to specific groups or programs to recycle and rehabilitate used equipment.
Regional intergovernmental organizations can carry out WSIS implementation activities, exchange information and best practices at the regional level and facilitate policy debate on the use of ICTs for development, with a focus on attaining the Millennium Development Goals.

In fact, most United Nations Regional Commissions have adopted regional plans of action for WSIS implementation. These plans are designed as roadmaps for the regional implementation of WSIS outcomes as well as the MDGs, with built-in follow-up mechanisms to ensure monitoring and assessment on a regular basis.
International organizations can also support developing countries in their efforts to engage in the consultative and participatory design and review of ICT-strategies. Specific action plans include continued efforts to benchmark the Information Society, as well as regular consultations to review and assess progress made and lessons learned and to share good practice examples.
The presentation and issues paper raise several issues regarding access trends, technical infrastructure for ICT, and the enabling environment for the Information Society.

For example, what radical measures are needed to make broadband more affordable in the developing world?

Could the coordination of ICT infrastructure development with other infrastructure increase access to ICTs in the developing world?

Could other technologies, like mobile broadband and IPV6 that are being deployed in Malaysia, for example, also increase access to ICTs?

And how can countries encourage increased competition, regulatory changes, and investment in the telecommunications sector to make telephone and Internet services more affordable and assessible?

We look forward to the discussion on these and other related issues.

Thank you very much for your attention.