SOURCE: **Telecommunications Regulatory Authority of Lebanon**

Subject of the Contribution

This document identifies regulatory approaches that policy makers and regulators can adopt to advance the deployment of broadband networks, encourage innovation and extend digital literacy to enable digital inclusion of all citizens in a the broadband ecosystem. These approaches are discussed in the following four areas:

I. Funding mechanisms to foster public and private investment in broadband, defining the policy and regulatory framework, goals and expected achievements;

II. Investment incentives, coordination with stakeholders, other national entities involved and collaboration at the regional and international levels;

III. Stimulating innovation and development of applications and services; and

IV. Expanding Digital literacy.

Introduction

There is no doubt about the importance and impact of Broadband on economic development in both developed and developing countries as well as on innovation, productivity, trade, employment and foreign investments. Examples from countries around the world as well as studies from different independent groups (Booz, Mckinsey, World Bank, and research centres) show how the increase in broadband penetration is contributing to the growth of economies. An analysis from the European Commission estimates that broadband can create more than two million jobs in Europe by 2015, and increase GDP by at least 636 billion Euros. In China every 10% increase in broadband penetration can contribute to a 2.5% growth in GDP. According to a World Bank Study, in developing countries with low to middle income, every 10% increase in broadband penetration might result in a 1.38% increase in GDP.

The rollout of national broadband infrastructure is very important for the economic development of countries and it is becoming evident that governments need and are adopting overarching broadband policies and direct funding initiatives in order to push for the widespread implementation of broadband networks. For example in the US, the government announced that it will invest 15.5 billion USD from USF to connect 100 million households with a speed of 100 Mbits/s by 2020.

The rollout of national broadband infrastructure or migration of existing infrastructure mainly in developing countries requires from one hand substantial investments and on another the revision of all ICT policy, regulatory framework and other related legal frameworks in order to increase broadband adoption all along the value chain (Supply, connectivity and demand).

Yet there are many impediments in the supply of local online content, broadband services and products, as well as barriers to widespread connectivity. There is currently limited demand for broadband in many developing countries, however once broadband networks are deployed it is expected that consumer demand will rise considerably especially with the implementation of applications such as e-health, and provided also that broadband services, applications and content are made affordable to consumers (especially local content).

There are several important applications that could be introduced with broadband networks such as e-government, e-commerce, smart grid, cloud computing. Those applications require very high coordination among the public and private sector in order to synchronise the implementation and prepare all related laws and regulations to make broadband a reality.

In order to drive the quick national rollout of broadband infrastructure and the adoption of broadband products, applications and services, governments must be creative in finding solutions to the four issues discussed below.

Funding mechanisms to foster public and private investment in broadband, defining the policy and regulatory framework, goals and achievements expected

1. As a mandatory step, governments need to issue a consistent and overarching ICT policy. This policy must not only provide obligations on speed and coverage for broadband infrastructure, but also provide clarity on commitment of the government to foster broadband development across all sectors and through liberalizing the broadband market and empowering the regulator to move forward with its liberalization plan.

2. Market liberalization remains the most effective mechanism to encourage greater investment in Telecommunication networks and eliminate restrictions on foreign investment. Due to the high cost of network deployment, duplication of key infrastructure must be avoided through different alternatives. One alternative for government is to fund the construction of one network and oversee its access by all service providers. Another alternative is to allow the sharing of existing infrastructure and license private operators to deploy the key network infrastructure.

3. Governments and regulators should revise and update all existing laws in order to reduce barriers that hinder broadband usage such as ICT law (lower market entry barriers, enable new technologies, etc..), e-transaction law, Intellectual property law and protection of personal information.

4. Governments need to be involved in funding new broadband networks in order to ensure decent access of underserved areas. In Lebanon, the government is investing around 120 million USD to develop a nationwide DWDM core network and 130 million USD to upgrade the Mobile network to 3.5G/4G.

Investment incentives, coordination with stakeholders, other national entities involved and collaboration at the regional and international levels

1. Government policies and rules must be oriented to maximize the ability of incumbents and market entrants to choose from a variety of business plans and long-term strategies, including resale, wholesale and niche markets.

2. As the telecom sector moves toward an open and horizontal business model, the regulatory licensing regime should to be adapted accordingly, especially at the infrastructure and service layers. Therefore, regulators should strive to adapt the regulatory framework including the licensing regulation and the issuance of unified licenses where licensed service providers are authorized to provide all types of electronic communications services (Fixed, fixed wireless and mobile broadband services) by complying to regulatory guidelines and procedures. This new regulatory regime will increase competition at all network layers (services, active and passive infrastructure) and should encourage service providers to invest and develop the broadband sector.

3. Involving the private sector as a full partner is a key for developing the broadband ecosystem. Governments and regulators have several options to provide incentives for the private sector to invest in the telecom sector such as reduce administrative burdens to obtain licenses, reduce regulatory obligations (e.g. Infrastructure sharing obligation etc.), provide Loans with low interest rates at initial period and offer tax breaks.

4. Regulators, along with the public and private sectors should coordinate efforts to ensure the successful implementation of regulatory instruments that foster the investment in the broadband sector. These tools can be summarized as follows:

   – Adopting rules conducive to and encouraging infrastructure sharing, particularly involving "passive" sharing of towers, ducts, rights of- way and other support facilities

   – Implementing building requirements in such a way as to enable building to be ready for fiber to the home deployment as well as to accommodate the delivery of broadband multi-play services.

5. Subscribers are suffering from high taxes on retail prices. Thus, governments and regulators should cooperate to reduce taxes on end user services which will in turn increase penetration of telecom services and pave the way for high demands of broadband services among all segments.

6. The broadband auctions shouldn't be about paying large upfront lump sum, but instead should be focused on the highest bid on the percentage of (actual) revenue to be paid to the government over time. This way the investor will invest more and more to maximize his profit instead of paying huge upfront lump sum and delaying broadband implementation waiting for technology to be more stable and cheaper.

7. The increase in broadband penetration and capacity leads to new start-up broadband businesses that could be financed through regional/int'l funds managed by a specialized organization that approves and finances the implementation of new innovative broadband projects/businesses such as applications. A process should be established on how to move the applications from idea to business.

8. With the advance in broadband coverage and capacity, efforts should be focused on local communities helping them promoting their local contents/products (agriculture, industrial, cultural, etc.). Municipalities will play a major role in encouraging local initiatives by providing public resources such as lands, buildings and infrastructure.

Stimulating innovation and development of applications and services

Governments should:

1. be actively involved in regional initiatives to create nationalized cultural content similar to the UNESCO World Digital Library and other initiatives.

2. Support the setup of updated well equipped labs in universities, and establish training centres to encourage students' technological innovations.

3. Provide training that addresses the need of people with the right mix of skills required for the development of services and applications.

4. Empower and encourage academic research and development centres on devices, services, applications, and content as it plays an important role in technical developments such as assessing new products in terms of security, privacy and applicability, as well as modifying products as needed. These centres should also collaborate with universities, regulators, the industry and government.

5. Support the existence of business development centres to provide hi-tech hosting, training and analysis to small and medium enterprises (SMEs). Assist existing entrepreneurs to identify new projects, develop their skills, and help them access local and international networks, and offer funds in start-up information, communication & technology companies.

6. Organize workshops and conferences for public examination and specialized assessment of new innovations and marketing, and encourage the deployment of new and emerging technologies.

7. Support small application-developing companies by offering funds and promoting new innovations locally and internationally through Internet, social networks and applications sharing on the internet.

8. Spur the local content deployment in local languages and domain names, and establish a scholar system in digital format (multimedia base learning, laptops customized for students).

9. Establish a a National Information System to assess ICT indicators and to provide feedback to regulators, policy makers and vendors. The Role of the National Information System is to:

   - Provide the executives of the concerned ICT institutions with the required information in order to make the right decisions;

   - Investigate the following:
     - The level of development of networks and access to ICT services;
     - The level of accessibility to ICT services in the different areas of the territory and by different categories of users;
     - The level of actual utilization of available services;
     - The level of satisfaction of users; and
     - The market needs for new services;

   - Monitor the quality of service provided by networks operators and service providers;

   - Compare the situation of ICT in the country with that of other countries in the region;

   - Provide international institutions (ITU especially) all the statistics that they periodically request.

Expanding Digital literacy

The use of information and communications technology (computers and internet) has become one of the most critical skills for today's knowledge society. Technologies have the ability to connect students to the world as well as to help people in rural and remote areas to be connected. In this regard, coverage and Internet access are not enough if targeted people cannot afford or/and do not have the required skills to use them. Below are some suggestions to expand digital literacy.

1. The availability of a vital infrastructure and tools:
   - Ensure the setup of computer labs and the implementation of new technologies in educational programs;
   - Improve technological infrastructure at schools and provide access to resources for students to improve their general education; and
   - Provide low income families in rural areas with end user equipment /computer and Internet connection at an affordable cost.

2. Teaching information technology Skills:

- Provide necessary courses to teach the technological skills required in schools and at business offices through interactive comprehensive training courses to ensure skill improvement and acquirement;

- Formulate awareness campaigns at schools and universities in order to alert consumers about new technologies, their benefits and their limitations;

- Encourage educational usage of technology by children outside schools;

- Support interactive training sessions for families with online tutorials and help desk (customer support team);

- Set up free or low cost classes where citizens of all ages can learn about new digital technologies (e.g. digital TV, Dish receivers, etc.), computers and how to access the Internet; and

- Reduce complications currently encountered in implementing new applications and software (e.g. Smartphones, new pads, net books, etc.) by offering simple and easy to understand user manuals for end users.

3. Connectivity concerns:

- Encourage wireless expansion in rural areas to benefit from the new mobile device applications and encourage end users to acquire the skills needed to use such technologies and applications;

- Use alternative wireless technologies to extend access points to other users and to remote communities, e.g. using microwave links to achieve connectivity between entities over wide geographical areas;

- Connect educational institutions (schools and universities) in rural areas to the Internet backbone through alternative means, e.g. via VSAT connections; and

- Encourage the deployment of new and emerging technologies (especially wireless technologies due to their low-investment cost, scalability, open standards, and adaptability to voice and data requisites).

4. Other Regulatory roles:

- Address immediate and long-term needs for ICT infrastructure;

- Ensure that any regulatory barrier to progress, such as technology entry restrictions, high license fees, and inequitable interconnection are reduced as fast as possible;

- Offer financial support for unaffordable services in particular areas, and offer finance schemes to allow low income users purchase mobile phones and get access to voice and data networks; and

Study marketing effect of services on low income customers; create marketing factors such as price management, payment options and service packaging.