Widespread access to and diffusion of ICTs are highly desirable for social and economic reasons. Ensuring the full participation of all in the Information Society is a major policy goal, the implementation of which brings all the benefits and transformational opportunities of ICTs. For example, countries participating in WSIS set the ambitious goal of connecting all villages of the world to ICTs by 2015, including establishing community access points, and connecting universities, schools, libraries, post offices, health centers, and local governments. The EU has adopted the term “e-inclusion” to refer to full access and participation and is particularly conscious of the promises of new digital opportunities and the new risks of digital exclusion.

As the ITU observes, two different terms are used to describe levels of inclusion. Universal Service (US) means that every household in a country has the opportunity for telephone service. Universal Access (UA) means that everyone in a community can gain access to a publicly available telephone, although not necessarily in their homes. Normally, both include free access to emergency services, the availability of directory services and special provision for customers with disabilities. Since many countries have reached universal access for telephony and now strive to achieve universal service, they are now focusing on reaching universal access for broadband. Therefore, the generic term UAS (or UA/S) is becoming more common as policies target both UA and US.

The term “Universal” encompasses several elements including availability, affordability, and accessibility (see Module 4). The focus of UAS policies is delivering service to those segments of society that are least able to attract the commercial provision of service. Policies targeted at US address non-commercially viable households and those targeted at UA address non-commercially viable communities. High cost-of-service provision and/or low incomes are the primary reasons that such customers are unattractive to operators.

However, the provision of UAS should not be viewed as a burden since extending access brings about the economic benefits of “network externalities” (increasing the customer base brings benefits to all customers), “call externalities” (new customers may not make many calls but they generate revenues when they receive calls), and externalities derived from substituting electronic communications for other forms of participation or access to important public services. Generally, operators do not take these externalities into account when making purely commercial decisions. The possibility of materializing such externalities provides a rationale for policy interventions.

The WSIS target is one for universal access, which is appropriate for developing countries at this time. But as markets and technology unfold, the bar will continue to be set higher. This implies a periodic reconsideration of what types of service should be included in any definition of UAS (ranging from single line voice-grade, incrementally all the way to two-way broadband services) and at what cost to the consumer. Flowing from these issues are the mechanisms for both delivering and financing the desired level of service.

Global experience with extending access and UAS policies has expanded considerably since the publication of the infoDev Telecommunications Regulation Handbook. Separately or in combination, the following approaches have been implemented:

- Market based reforms
- Mandatory service obligations
- Leveraging new technologies, e.g., mobile services
- Leveraging new business practices, e.g., pre-paid cards
- Cross subsidies
- Access deficit charges
- Universal Funds
- Public-private partnerships

Of these, the most successful have been the market-based reforms associated with the liberalization of the mobile sector,
supported by a stable regulatory environment and the subsequent exponential growth in customers in developing countries. These initiatives have allowed market forces to contribute fully and thereby close the "market gap." Regulators have used a variety of methods to achieve UAS through market forces, including regulatory reforms that create incentives for the private sector to extend universal access, establishing interconnection frameworks, flexible spectrum rules and other technology-neutral policies to encourage the entry and use of new and innovative technologies and provide a wider range of participants to achieve UAS goals. The remaining "access gap" can be categorized as:

- Communities that only require a targeted capital injection where future revenues will support operational expenditure, often referred to as the "sustainability frontier" and
- Communities that require ongoing support for both capital and recurring expenditures.

The practice of ensuring universality by using cross subsidies between the different services of an operator (from international to local and/or access) to ensure affordability has been severely strained by the introduction of competition. Access deficit charges have also been found to be sub-optimal in competitive environments. In many jurisdictions, Universal Service Obligations (USO) are in place. The informational demands on regulators are considerable where a designated operator (frequently the incumbent) is reimbursed for the losses incurred or reported in the provision of UAS.

As the Toolkit illustrates, Universal Access/Service Funds (UAS Funds) have been established to provide financial incentives to operators to close the access gap. They require mechanisms to garner finance and disburse the incentives in a cost-effective manner to achieve the ends of the UAS policy objective. Frequently, the sector is the source of finance for the UAS Fund in the form of levies and in other cases the fund is financed from the general budget. While UAS Funds (also called Universal Service Funds or USFs) are an important tool, they should not be solely relied on to achieve universality. Other mechanisms to be considered and adopted include direct state aid and public financing such as loan guarantees and public-private partnerships, as well as liberalizing the licensing and spectrum frameworks.

Where UAS Funds are used, they have proved effective when disbursement is coupled with competitive bidding or auctions for these financial incentives, requiring operators to compete for the minimum subsidies needed to fulfill the UAS targets. Since subsidizing ICT projects carries certain risks such as market distortion, dependence on funding, fraud and abuse, favoritism and wasted resources, regulators have introduced "smart subsidies." Smart subsidies provide a one-time award geared towards obtaining results in areas where investors have been reluctant to invest, but will ultimately become commercially viable. Thus, the subsidy acts as more of a kick start to investment rather than as a crutch. The Dominican Republic provides an example of where a smart subsidy, known as an output-based aid (OBA) subsidy, has been used. The regulator conducted transparent, minimum subsidy auctions in which the winners receive the subsidies in phases over the course of the project rather than all at once. Thus, winners receive 20 percent upon signing the contract, 40 percent upon completion of the required installations and the remaining 40 percent in six month installments over a five-year period.

In some instances, subsidies have been provided directly to customers or to particular institutions, such as libraries, schools, and public tele-centers. Early, large-scale UAS projects were frequently undertaken on a top-down, supply-driven approach where a single provider, often the incumbent, was selected to provide a standard set of services, using a narrow set of technologies over a wide geographical area. The introduction of NGN-related technologies, such as Broadband Wireless Access (BWA) and Wi-Fi, has substantially reduced economies of scale in both the infrastructure and service segments. This has opened up the field to a wider range of small or local providers to expand universal access from a bottom-up, demand-driven approach.

The phenomenal spread of the Internet has had an impact on notions of universal service. In the 2002 Universal Service Directive, the EU included the concept of "Functional Internet Access," in the definition of universal service and is currently constructing a "future-proof" regulatory environment. For example, in September 2009, the EU announced that it will inject EUR 1.02 billion into the European Agricultural Fund for Rural Development (EAFRD), part of which will be used to support investment in high-speed broadband to help ensure 100 percent coverage to EU citizens by 2010. As part of the EU’s stimulus plan to secure investments in broadband deployment, Member States must ensure that provision of state aid is 1) granted out of state resources; 2) confers an economic advantage to businesses; 3) selectively targeting recipients and is not distorting or threatening to distort competition; and 4) affects intra-Community trade.

In a converged economic space of electronic communications, new forces have been set in motion. VoIP business models are leading to the erosion of revenues from voice services for operators, while the intensification of competition is hastening the transition to NGNs. While NGNs provide the opportunity for a much wider range of revenue-generating services, the platforms will be deployed on a commercial basis. It is quite possible that this deployment will follow the geographic and income-related distribution of computers in businesses and households. This implies that those locations currently underserved or benefiting from a UAS Fund will not be among the first to be connected. Furthermore, given the shift in cost towards the user, when the cost of a computer is included, the concept of "affordability" must be re-examined.
Clearly there will be an enhanced role for shared access and community-based initiatives. There is growing interest in and experience of community-based projects to provide Internet services based on the “municipal open access model.” A study by infoDev found numerous examples of community-based projects, including the Myagdi, Kaski, and Parbat districts in north-west Nepal; the municipality of Pirai in the Rio de Janeiro state of Brazil; and the city governments of Philadelphia (USA) and Knysna (South Africa).

The debate over the role of broadband in universal service is underway around the world, such as Chile and India. In 2006, India was one of the first countries to include broadband in the UAS Fund, which allows fund to support broadband connectivity and mobile services in rural and remote areas of the country. Convergence, facilitated by NGNs, raises the potential externalities by increasing the potential benefits to households of services if they had access to them. Convergence may possibly increase the sector base on which levies can be made for a UAS Fund while also raising specific regulatory issues related to universal service regarding voice quality, emergency services, and services for the disabled. Overall, policy makers should keep in mind that UAS requirements have expanded to include broadband due to the rise of NGNs and convergence. While market forces are dynamic, UAS policies should build on competition to encourage deployment to all. These issues are addressed in Module 4 of the Toolkit.

**Reference Documents**

- GSR 2009 Background Paper, *Bringing Broadband To Rural Areas: A Step-by-Step Approach, the Experience of the Dominican Republic*
- GSR 2009 Background Paper, *Trends in Universal Access and Service Policies*

The ICT Regulation Toolkit is a joint production of infoDev and the International Telecommunications Union (ITU).