# 4 THE MORE THINGS CHANGE, THE MORE THEY STAY THE SAME: STRATEGIES FOR FINANCING UNIVERSAL BROADBAND ACCESS

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## 4.1 Executive Summary

Chatting, tweeting, blogging and browsing are becoming the norm for the estimated 2.4 billion Internet users globally in 2011.[1] However, over five billion people have never experienced the Internet, let alone participated in the impending "broadband revolution" or have only experienced it through public or shared access. The mobile voice story, however, is very different. Mobile voice and SMS, now considered "basic" in many countries are available to 90 percent of the global population, and 85 percent of people living in rural areas.[2] The challenge in this area relates to affordability.

While countries strive to close the ever narrowing mobile voice gap and start to grapple with access to Internet, they are also forced to tackle a new development in the ICT sector: the emergence of high speed broadband networks.[3] It is anticipated that a 'broadband revolution' will facilitate access to information carried over high speed networks, yet today broadband only reaches a small segment of the global population. The disparity in broadband[4] access is wide. Penetration sits at 34 percent and 36 percent in North America and the European Union ("EU") respectively. This can be compared to 3.4 percent in Latin America and the Caribbean, 1.7 percent in Sub-Saharan Africa and 0.1 percent in South Asia[5] – mind the gap!

In light of the divides that still exist across technologies (e.g. mobile, fixed, Internet, broadband), across regions and within countries, universal service and access, an old concept which seeks to narrow the divide between the haves and the have-nots, has unfortunately, not lost its relevance. It is, however, time to reassess it. With two decades of experience with shared access, infrastructure funding, end-user subsidies, and most importantly market reform, the time is ripe to critically consider what strategies have worked and those that have not, particularly with respect to universal access funding, which remains a key challenge. This will enable the development of effective strategies to tackle the challenges posed by low levels of affordability and insufficient rollout of networks in "high risk," rural and remote areas on the one hand and to take advantage of the opportunities presented by advances in technology, and developments in society on the other.

This chapter deals briefly with universal service and access concepts and principles, but is concerned primarily with the financing of universal access. As a starting point, that a public financing mechanism is introduced in a liberalized market indicates the existence of a market access gap. A market access gap is a gap between what the private sector can deliver and what is needed by the public; it is arrived at through a thorough analysis of the relevant market based on national definitions of universal service and access and agreed targets in a country. The premise of universal access projects is that they are deployed in high risk areas or to low income users and communities where without a financial incentive to invest, operators or other suppliers will not provide the services. As such, creative public or public-private partnership ("PPP") financing models are required to encourage the rollout of networks and services in such areas and in so doing meet the socio-economic objectives of the country.

| Table 4.1: Mind the Gap, Access across the World, 2011* | | | | |
|---|---|---|---|---|
| **Region** | **Internet Users per 100 inhabitants** | **Mobile Broadband (Active) Subscriptions per 100 inhabitants** | **Fixed Broadband Subscriptions per 100 inhabitants** | **Mobile Cellular Subscriptions per 100 inhabitants** |
| **Africa** | 12.8 | 3.8 | 0.2 | 53 |
| **Arab States** | 29.1 | 13.3 | 2.2 | 96.7 |
| **Asia- Pacific** | 27.2 | 10.7 | 6.2 | 73.9 |
| **CIS** | 47.6 | 14.9 | 9.6 | 143 |
| **Europe** | 74.4 | 54.1 | 25.8 | 119.5 |
| **The Americas** | 56.3 | 30.5 | 15.5 | 103.3 |
| **Estimate*<br>*Source: ITU Key Global Telecom Indicators for the World Telecommunication Service Sector*<br>***www.itu.int/ict*** | | | | |

This chapter begins with a discussion of the scope and objectives of universal service and universal access, particularly in an age of broadband and Next Generation Networks in Section 4.2; it notes that despite shifts in society and technology, in many ways, the more things change, the more they stay the same. Section 4.3 considers the policy and regulatory building blocks that should be in place in order to facilitate the execution of sustainable universal access strategies, and the establishment of viable and credible options for funding universal access through a combination of public and private funds.

Section 4.4 of this chapter starts to look specifically at the funding models that exist, while Section 4.5 considers the question of how such funding can be structured, namely, through equity investments, PPPs, and various types of financial incentives and subsidies. This chapter considers what scenarios are appropriate for the different models of funding in Section 4.6. In section 4.7, the chapter discusses Universal Service and Access Funds, one of the most popular funding models that has been employed, however with mixed results. The strengths and weaknesses of USAF models and approaches are discussed with the intention of providing lessons for other types of funding based on subsidies and incentives. Finally, in Section 4.8, the approach to measuring the success of a funding strategy by assessing its "return on investment" is canvassed.

## 4.2 Contextualizing universal service and access

"Universal access" and "universal service" (jointly "UAS") are age-old concepts that predate the information and communications technologies ("ICT") sector. According to the International Telecommunication Union ("ITU"), Universal Service means that every household or individual in a country has the opportunity for telephone service.[6] Universal Access means that everyone in a community can gain access to a publicly available telephone, although not necessarily in their homes. While these basic notions have stood the test of time, the concepts are evolving in light of changes with respect to technology (i.e., ICT has move beyond the 'telephone'), applications (i.e., offerings other than simple voice) and society (the development of highly mobile populations, increased urbanization, globalization, and increased levels of education in most countries).

This part of the chapter looks at some of the changes in UAS principles and approaches over the past 20 years. It notes that UAS is firmly rooted in the market liberalization context and that despite the changes in the environment, its rationale is fairly consistent.

### 4.2.1 The More Things Change...

#### 4.2.1.1 Expanding the Scope of Universal Service and Access

Over the past two decades, the scope of universal service and universal access has widened. Historically, these concepts related to basic voice (including access to emergency services and access for people with disabilities); today, however, UAS is increasingly being re-conceptualized to include Internet – and even broadband – and to address issues around digital inclusion.

The scope of universal service and access varies across countries that are at various stages of development and that have different social, political, technological and institutional contexts (see Figure 1). The basis for including a particular service in the scope of national definitions of "universal service" and "universal access" is generally related to the uptake of the service in society in general and its importance in order for people to participate meaningfully in society. To remove the subjectivity from this decision, the 2002 EU Universal Service Directive provided that in order to be included in the scope of a UAS policy, a service has to satisfy two tests:

(1) In the light of social, economic and technological developments, the service has the ability to become essential for social inclusion; and

(2) Are normal commercial forces unable to make the service available for all to use?

Meeting just one of the two criteria is not sufficient. As early as 2006, for example, mobile telephony was not included in the scope of UAS policy even though mobile telephony met the first test, *i.e.*, it had become essential, since it failed the second test, *i.e.*, normal commercial forces were able to make the service available in the EU. At the time, broadband was also not eligible for inclusion in light of the fact that in 2006 absence of access could not be said to imply social exclusion given the low level of broadband penetration in Europe. There have, however, been shifts in this approach in Europe; recently in France proposals have been made for the government to develop a social tariff for broadband Internet access for low income households. French draft legislation entitled Reinforcing the Rights, Protection and Information of Consumers proposes the implementation of a social tariff through a labeling regime to make consumers aware of ISP products and services that form part of the tariff scheme.[7]

**Box 4.1: Broadband as part of the UAS Strategy**

Today, over 40 countries include broadband in their universal service or universal access definitions. These include:

- Estonia: in February 2000, the Estonian *Riigikogu* (Parliament) enacted the new Telecommunications Act, adding Internet access to its universal service list. It has also been indicated that Internet access is a legal right.
- India: India was one of the first countries to include broadband in the mandate of its universal service fund in 2006.
- The United States, which has had a complete re-think of universal service financing: now the universal service fund has helped increase broadband penetration by providing funding for new lines in rural areas.
- Greece: in 2001, Greece amended its Constitution to provide that all persons have the right to participate in the Information Society. The State is obliged to facilitate access to electronically transmitted information, as well as to the production, exchange and diffusion of information.
- Switzerland: in Switzerland, broadband has been included in the scope of the Universal Service Obligations since 2008; the universal service provider charged with USO must provide a broadband connection to the whole population, via DSL or satellite or other technologies (at least 600 Kbit/s downloads and 100 Kbit/s uploads, and monthly subscription < CHF 69).
- Finland: in Finland, broadband access is a legal right and recent national legislation extended USO to cover broadband with the objective of a basic 1Mbit/s broadband connection available to all by 2011.
- Costa Rica: the Constitutional Court of Costa Rica declared Internet access a fundamental legal right in September 2010. The government has thus been urged to adopt the necessary measures to promote its universal service in the country.[8]

*Source: Author, based on Press Releases and Articles*

In a developing country context, mobile voice services would pass the first test set out in the 2002 EU Universal Service Directive, and only in certain rural and underserviced areas would it not pass the second test. Therefore although UAS strategies include mobile voice, they should be limited to areas where the service gap exists. The reality is that, through innovative means, 2G and more recently 3G mobile networks, service and applications have done wonders for access to ICTs. In fact, in developing countries they are being used to achieve many of the same functionalities that broadband enables, including banking, mobile money, and now e-commerce in Kenya, Bangladesh and Afghanistan. Whilst consumers would get a better experience from broadband, it is far from being a requirement for social inclusion and commercial forces have yet to be given time to deliver broadband services in light of pending mobile broadband spectrum licensing processes.

In many developing countries, where initial universal service and access targets have yet to be met, the challenge of universal broadband access is being tackled alongside the challenge of ensuring access to more basic services including affordable voice and Internet using narrowband networks. The debate around whether or not to include broadband in the scope of UAS is an important one. The inclusion of broadband in both developed and developing countries is not based on the fact that it is already 'essential' but rather on the *potential* that it will become essential in light of the potential socio-economic benefits. Governments are increasingly recognizing the critical role of broadband and the Internet; the belief is that the benefits for society as a whole appear to be much greater than the private incentives to invest in high speed networks.[9] In addition, the benefits of broadband are reaped when there is a critical mass of users.[10]

The economic and social impact of broadband is well researched and documented. An increase in broadband penetration is said to have a greater impact on economic development than a concomitant increase in access to other telecommunication services that preceded it, including 2G mobile. Recent research on the impact of broadband suggests that in low and middle-income countries every ten-percentage point increase in broadband penetration accelerates economic growth by as much as 1.38 percentage points.[11] In addition to the economic impact, the network externalities resulting from broadband penetration include the promotion of access to information, thus promoting transparency and good governance; innovation; the growth of service industries; job creation and employment; the mass customization of products; and new forms of commerce and financial intermediation.[12]

#### 4.2.1.2 Facilitating Demand as well as Supply

Notwithstanding the benefits that have been associated with broadband, in developing countries it has to be understood that broadband for all is a long term strategy and the main beneficiaries, in the short term, of the broadband revolution will be businesses. Because broadband networks need to generate traffic to lower their costs and increase their profitability, and in light of the fact that broadband is an ecosystem in which users play a central role, stimulating demand is a priority. Funding that was previously focused on supply-side interventions – networks and facilities – is now increasingly being channeled to interventions that will stimulate demand. Demand-side interventions include funding access to content, applications, services and even training. This is important to promote digital inclusion. As with the evolution of 2G and 3G, broadband for the mass market, accompanied by low cost services and, importantly, devices, will be introduced over time and only as operators, vendors and equipment manufacturers broaden their consumer markets.

#### 4.2.1.3 Reconsidering Approaches to Funding

Universal Service funding trends have changed along with the ICT environment. Most of the changes are related to the impact of the introduction of competition and market reform on the sustainability of funding models that prevailed in a monopoly or duopoly environment. The initial practice of promoting universal service through the cross-subsidization of services by monopoly operators in an era that pre-dated rate rebalancing gave way in the mid-1990s to the establishment of a first generation of Universal Service Funds; these funds were mainly directed to supporting access to basic voice and public telephony in developing countries like Peru and Chile. As competition has increased, reliance by incumbents on access deficit charges to fund 'uneconomical' areas has been found to be unsustainable, as have asymmetric interconnection charges to promote rural operators, in many cases.

The first generation Universal Service Funds have paved the way for more modern Universal Service and

Access Funds ("USAF" or "Fund") which recognize the important role of competition and no longer assume that the fixed line incumbent is the sole (or even necessarily *a*) universal service provider. India, Chile, Brazil, and the United States have reviewed their Funds to broaden their scope to enable them to take a converged approach.[13] The newly conceptualized Funds increasingly rely on an Output-Based Aid approach to funding to ensure transparency, fairness and the efficient and effective delivery of UAS objectives.

### 4.2.2 The More Things Stay the Same?

Notwithstanding the changes in the ICT market, particularly the broadening of the scope of UAS services in many countries and the increased focus on demand side, considerations in designing universal service and access projects and the fundamentals of universal service and access have not changed. In particular, some of the constants include:

- Availability, affordability and accessibility are still the pillars of UAS;
- Market reform and good regulation remain the foundations for UAS policy and strategy;
- UAS interventions have to be competitively and technologically neutral; and
- The UAS funding question persists.

#### 4.2.2.1 The three pillars underpinning universal service and access – availability, affordability and accessibility – remain critical

Infrastructure still needs to be available in inhabited parts of the country (i.e., where people live, work and play) through public, community, shared or personal devices. Additionally, infrastructure must be accessible to all people, regardless of location, race, gender or disability. All consumers should be able to afford communications services. In addition, "awareness" and "ability" are fast becoming central tenets of universality as the Internet and broadband services are included in the scope of universal service, and access *enabling the use* of ICTs is a factor.

#### 4.2.2.2 Market reform and liberalization should be the first step to meeting US/UA targets.

The principle that good regulation and market reform are the first approaches that should be taken to achieving universal access remains unchanged. The "mobile miracle" has clearly demonstrated the potential of the private sector to deliver services where demand warrants it. Regulatory strategies supporting UAS such as the promotion of infrastructure sharing, the reduction in interconnection rates, the lowering of taxes on services and devices, and the issuing of spectrum at reasonable fees, should complement private action to address gaps. The traditional market gap analysis described in the Figure 4.1a is therefore still relevant, although the size of the gap may vary across technologies, especially in low income countries (Figure 4.1b).

Universal service and access financing still assumes that as a first step, policy and regulatory strategies have been put in place to create an environment that promotes access in the "market efficiency gap" where network reach is commercially viable. Strategies and funding should focus on areas like the "smart subsidy zone", where there is or is likely to be insufficient competition with respect to the rolling out of networks and services unless a one-time subsidy is provided, and the "true access gap" where on-going financial support is required in order for the area and beneficiaries to be served.

#### 4.2.2.3 Universal service and access interventions should be competitively and technologically neutral and should not distort the market.

Using a market gap analysis assists to ensure that USOs and USF financing are not employed in competitive market segments. In the case of Next Generation Networks (NGNs) and broadband projects (whose deployment is still at an early stage, yet it is critical that the public has access to the services on an urgent basis in order to participate effectively in society), assessment of market access, efficiency and true gaps alone will not lead to the identification of areas needing attention. The EC recognizes that these networks, which require significant capital investment, tend to cover only part of the population profitably since they are demand driven and more likely to be rolled out in high demand areas including urban areas, densely populated regions and areas with high income users.

**Figure 4.1: Then and Now – Market Gap Analysis**

**Figure 4.1a: Then – Classic Market Gap Analysis**

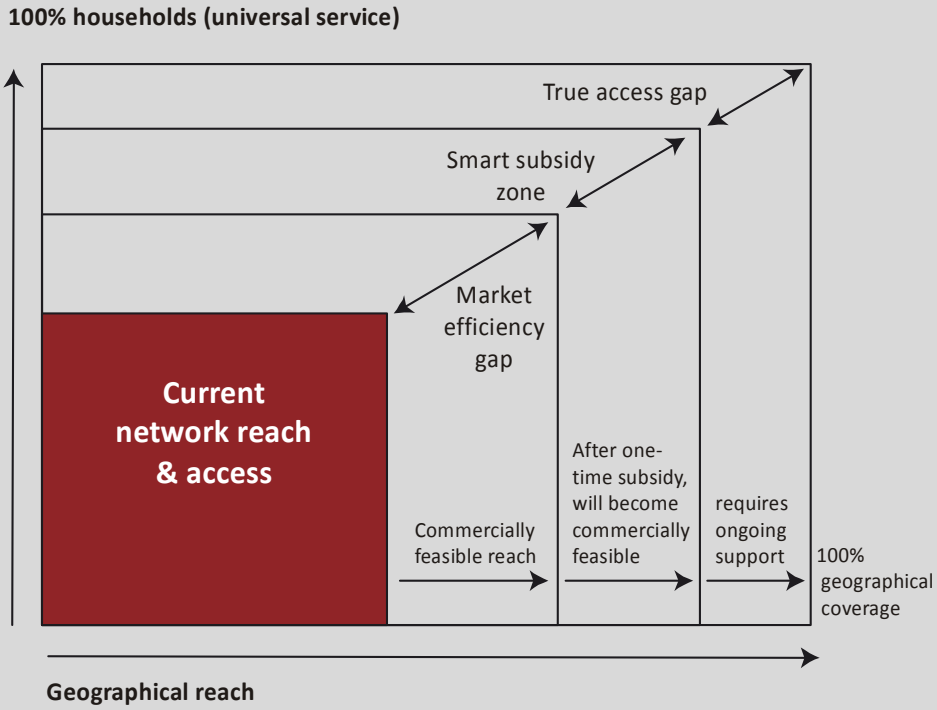
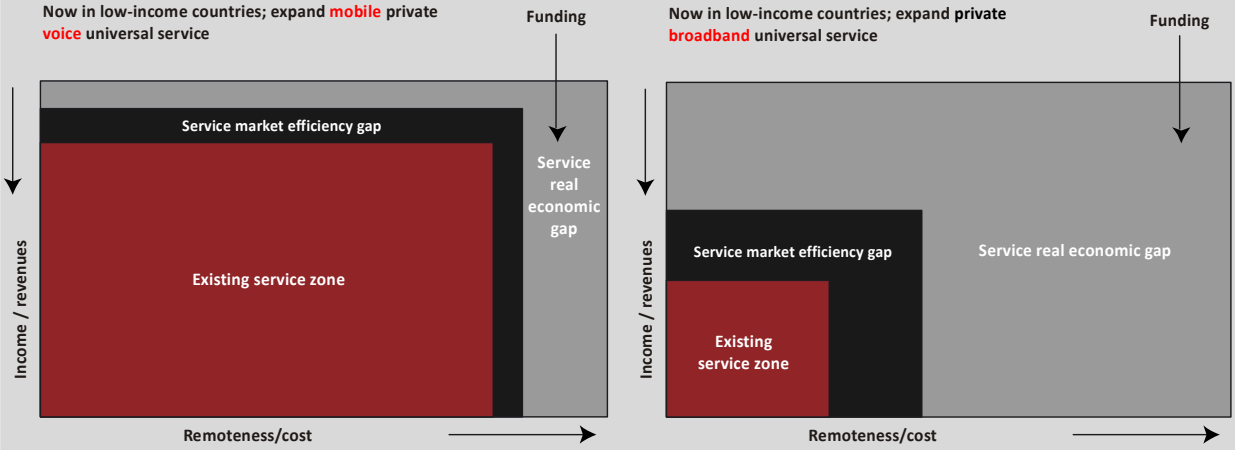



**Figure 4.1b: Now – Low Income Country Market Gap Analysis**




*Source: Then: www.ictregulationtoolkit.org/en/Section.3144.html, based on initial concept by J Navas Sabater, A Dymond, N Juntunen, 2002; Now: ITU Report on Universal Service Funds in the Sub-Saharan Africa Region ( Sepulveda, 2009)*

To guide broadband investment, which tends to be investment *ahead* of the market, the EU has published State Aid Guidelines that follow a colour-coded map of areas that should be awarded funds. The State Aid rules cover any form of public funding, including subsidies, tax rebates and, in some cases, the public ownership of firms. State ownership constitutes state aid when equity participation or capital injection by a public investor does not have sufficient prospects of profitability.[14]

**Box 4.2: When to provide public funding for broadband, EU example**

To ensure that funding does not distort the market, the EC Criteria for Determining an Area's Eligibility for State Aid for Broadband is:

- **White areas:** *no broadband infrastructure exists* and none is likely to be developed in the near future. Support measures for broadband deployment in these areas are most likely to be considered compatible with state aid rules.
- **Grey areas:** *only one broadband operator exists*. Measures may be compatible if no affordable or adequate services are offered or are likely to be offered to satisfy the needs of citizens or business users and if no less distortive measure is available. The Commission accepts that state aid may be the only alternative where the area is underserved and the inherent profitability of investment is low.
- **Black areas:** *at least two or more broadband network providers are present and broadband services are provided under competitive conditions.* Any state intervention in these areas will be viewed negatively as there is in principle no need for intervention, unless the member state is able to establish a clear market failure.

*Source: Author and Communication from the Commission – Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks (http://eur-lex.europa.eu)*

Areas with no broadband infrastructure are considered "white," those with one network are classified as "grey" areas, and "black" areas have at least two or more broadband network providers. Funding in "black" areas is unlikely to be justifiable in light of existing competition (Figure 4.3). As in the case of the market gap analysis, when making public investment decisions, countries have to take into account not only existing NGN infrastructure but also concrete investment plans by telecommunication operators to deploy such networks in the near future. The rules prohibit any form of public funding that distorts or threatens to distort competition in an attempt to ensure that public participation does not crowd out private investment. In fact, it must not crowd out the government's own market reform process and initiatives.

#### 4.2.2.4 The question of how to fund universal service and access persists

The age-old question of how to finance the deployment of networks and the provision of services, whether narrowband or broadband, in underserviced areas and to under-serviced communities remains. The general consensus has not changed – private capital should be used first to address the gaps identified. However, in light of the greater financing requirements of Next Generation Networks and also bearing in mind the constrictions on liquidity following the 2009 global financial crisis, there is increasingly a return to public funding. Three particular models continue to stand out: equity investment, public-private partnerships ("PPPs") and financial incentives. (See Section 5.1, Public Funding, below.) The mix of approaches and where they are best applied has, however, changed, mainly in light of experience over the years with more infrastructure PPPs and USAFs as a means of providing financial incentives, amongst others. Nevertheless, as will be explored in this chapter, the rules for and principles underpinning such funding remain the same.

## 4.3 Flavours of Public Funding

There are many 'flavours' of public universal access financing. Public funding can be done solely by governments or in collaboration with NGOs, donor organizations, and the private sector, each of which have been jointly and separately financing ICT sector investment for decades. It is important to note that there are a number of different funding partners and vehicles available to fund universal access projects. In most cases, the appropriate structure and set of partners depend on the type of project and its objectives. *No single funding model is appropriate for all universal access projects or for all countries.*

The shift away from the public provision and funding of ICT infrastructure to a model centred on private sector participation in the 1980s was premised on the fact that the public sector had competing priorities for funding, coupled with the belief that the private sector could:

- better handle risks associated with the high value and long-term investments that are characteristic of ICT infrastructure projects;
- secure debt and/or equity sourced from a variety of investors whose main interest would be to increase take-up and usage in order to derive revenue from services which, in turn, would contribute to their return on investment;

- manage the complex structuring, funding and contracting arrangements related to infrastructure rollout; and
- ensure efficient delivery of services, particularly in a competitive market.

Left to commercial forces, the market has delivered well in some areas, but has failed to reach others. An important nuance in UAS funding is that the failure of the private sector to deliver on its own does not necessitate the public sector "taking over" the commercial function of service delivery. Rather, it necessitates the public sector developing 'in cash' or 'in kind' strategies to incentivize its telecommunication operators to deploy networks and provide services (i.e. "play"/in kind) or to provide funding for willing operators to address those markets (i.e. "pay"/ in cash).

Notwithstanding the differences between countries, there is a specific universal service and access framework checklist that will facilitate the selection of an appropriate funding model. The minimum policy and regulatory considerations required in this regard are:

(1) Any legal requirements relating to public financing mechanisms should be considered. Examples include EU State Aid Rules, South Africa's PPP Manual[15], the legal scope and mandate of a USAF if one is in place, and national or municipal supply chain regulations that would apply to ICT sector procurement;

(2) Country specific definition of "universal service" and "universal access";

(3) Determination of national targets with respect to UA and US; and

(4) Determination of access gaps[16] and a related decision on what constitutes "underserviced areas" and who are eligible beneficiaries.

These four considerations provide parameters for the public funding of universal access projects and a "roadmap" for project financiers to assess the relevance of projects in the context of the legal and policy environment and the defined socio-economic objectives. The first criterion relates to the legal mandate of the financing mechanism, and any rules surrounding the public funding of ICT. It is probably the most inflexible of the identified criteria. Quite simply, projects that fall outside of the legal mandate or scope of the Fund or other forms of public funding cannot be eligible for financing.

The other three criteria exist in visions, strategies and policies and can evolve over time. An understanding of UAS definitions, targets, and identified gaps assist funders with the prioritization of projects. For example, if universal access (as opposed to universal service) is defined as a priority in a country, and if universal access is defined as access to voice and data services through Multi-Purpose Community Centres, then projects geared at meeting this objective can be considered eligible for financing and would be prioritized ahead of projects that enable personal access through, for example, the provision of subsidies to categories of individual users.

**Table 4.2: ICT Funding Options**

| | CASH | IN KIND (INDIRECT) |
|---|---|---|
| **PRIVATE** | Infrastructure rollout<br>Device subsidies | Mandatory USAF obligations |
| **PUBLIC** | Equity investment<br>PPPs<br>Disbursement of USAF subsidies<br>Commitment of Stimulus plan funds | Tax incentives<br>Spectrum licensing<br>Rights of way<br>Risk guarantees |

*Source: Author*

### 4.3.1 Public Funding: In Kind and Indirect Contributions

Governments have a range of instruments at their disposal to narrow market gaps or accelerate roll-out of broadband. In a way, governments too are faced with a decision on whether to pay in cash or in kind. Instead of playing in the market, and thus risking distorting it, it is government's primary role to make an "in kind" contribution in the UAS policy space. The government needs to put in place institutions, policies, rules and regulations to promote competition that will enable operators to play their role in providing services and thus indirectly to fund universal service and access. Regulatory and policy approaches that assist in lowering capital and operational costs include regulations relating to:

- **Tax breaks and discounts** – Governments indirectly fund the provision of universal service and access by making interventions that directly affect operators' cash flow, such as allowing for lower or deferred licence fees and providing tax incentives. In 2003, Kenya's Department of Finance, in line with measures taken in Tanzania and Uganda, zero-rated tax on all computers and other ICT equipment imported into the country. In the 2009/10 financial year, Kenya's government took further bold moves by committing to allowing ISPs to offset the costs incurred in acquiring the right to use undersea cables over a 20 year period against their taxable income; by providing tax deductions of five percent on software; and by exempting all handsets from VAT.[17] These incentives should stimulate the supply of computers, reduce costs, and increase PC penetration, which, in turn, will facilitate broadband use.
- **Infrastructure sharing** – Australia, Saudi Arabia, Tunisia and Nigeria facilitate infrastructure sharing as a way of ensuring effective use of existing networks and encouraging the entry of new players. Infrastructure sharing is mandated in countries like Greece, Italy, South Africa and Spain. In India, it has been specifically linked to the universal service and access tendering process, with TRAI recommending in a 2007 study that operators installing base stations in rural or remote areas should be offered a one-time subsidy from the USOF provided that the installed infrastructure is shared with at least one other operator.[18]
- **Facilitating access to rights of way** – As much as 70 percent of the upfront costs of constructing fibre optic cable networks are related to civil works.[19] Governments can lower the costs of accessing public infrastructure such as roads, pipelines, and electricity transmission lines by reducing fees, providing clear and rapid application processes for rights of way, and entering into Public-Private Partnership arrangements with operators where state owned entities in the electricity and railway sectors, for example, own rights of way and infrastructure.
- **Assigning spectrum** – The timely assignment of spectrum is key to enabling the delivery of universal service and access, particularly in light of the fact that the solution to ICT access to date has been primarily mobile. In many developing countries and especially in rural areas, it is likely that wireless broadband will continue to outstrip fixed. Assigning spectrum through flexible allocations that are technology- and service-neutral is important for enabling last mile access. This should be done through open and transparent licensing processes. In some cases, spectrum assignment should be coupled with an obligation to provide access in rural areas and to underserviced communities in order to facilitate universal service and access. Broadband Wireless Access (BWA) spectrum has been linked to the provision of services in rural areas in Peru, for example, where the regulator, OSIPTEL, allows high powered use of the 2.4 GHz band for wide area Wi-Fi in rural areas.

Government's response to universal service is not black and white. "In kind" or policy interventions as discussed above are a first option and can enable operators to conduct business in a cost effective and stable environment. But governments can also 'pay.' The German model (Box 4.4) demonstrates that in some countries, governments can 'play' through regulatory incentives, as well as 'pay' through financing broadband.

### 4.3.2 Public Funding: Cash Contributions

The fact that public money is being used to fund ICT deployment means that normal funding mechanisms have failed. It means that internally generated funds, equity contributions (in exchange for shares), debt funding through commercial banks, vendor funding, and partnerships with donor agencies[20] have not delivered and need to be combined with government support in order to finance infrastructure roll-out. Importantly, it does not mean that private sources of funding must be *replaced* by public money. In some cases, public support through loans, partial equity, and government guarantees enable traditional funding mechanisms to work.

**Box 4.3: Electricity Company & Infrastructure Sharing: The Kenyan Case**

Kenya Power and Lighting Company (KPLC) was granted a Network Facility Provider licence (Tier 2, with regional spectrum) by the regulator, enabling it to construct, install and operate an electronic communications system which may in turn be leased to licensed operators. KPLC has indicated that it has 18 pairs of fibre for leasing and has so far leased three through infrastructure sharing agreements signed with licensed operators Safaricom (20 years), Wananchi Group (5 years) and Jamii Telecoms (5 years) in 2010. The agreements allow them access to KPLC's fibre optic network that runs on the national electricity grid. KPLC's model enables ISPs to connect to these operators to reduce their time to market and to reduce the need to duplicate costly broadband infrastructure.[21] Their infrastructure sharing model provides a supplementary revenue stream for KPLC. The three infrastructure sharing contracts signed to date are worth KES 828 million (USD 7.2 million) and may potentially provide access to 1.3 million customers on the national grid.

*Source: Author based on Jamii Telecoms Press Release, March 2010 (http://jamii.co.ke/home/?p=235)*

**Box 4.4: Broadband Financing in terms of the German Broadband Strategy**

In Germany, broadband expansion is to be done through:

- Capitalizing on synergies in infrastructure construction across the country
- Guaranteeing supportive frequency policies
- Committing to growth and innovation-geared regulation
- Providing appropriate financial support

As with all financing, broadband financing in Germany exists in the policy and regulatory context. Funding broadband to meet national targets has two main objectives: (1) connecting households without broadband access, and (2) connecting households with broadband access below 1Mbit/second. The maximum subsidy is 200,000 Euros per project; up to 90 percent of the profit gap can be funded. In addition, funding can be made for technical and consulting services obtained from third parties ; a maximum of an additional 100,000 Euros is available for such services per project.

There is also a scheme enabling people to claim tax deductions for laying cables to homes; the plan is to expand this scheme to any installations connecting broadband to buildings to be distributed within houses and apartments.

*Source: The Federal Government's Broadband Strategy (Germany)*[22]

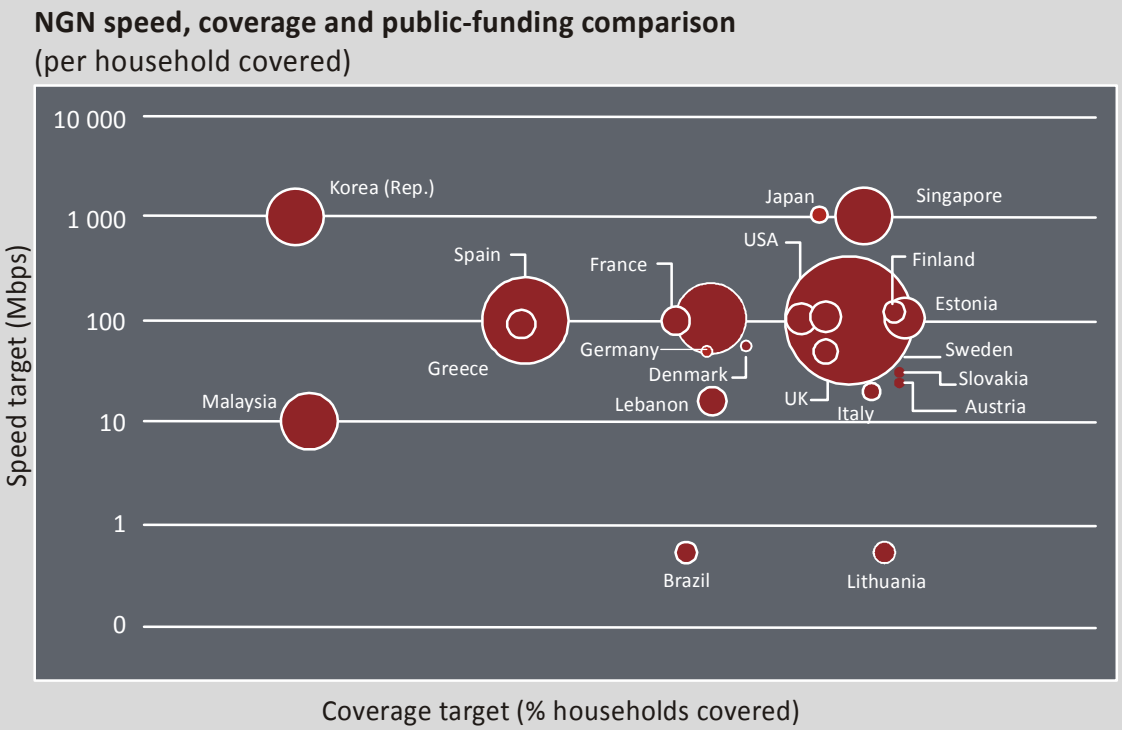
The failure of the private sector to finance deployment through traditional funding mechanisms necessitates that public money be used to roll-out services to 'high risk' or 'unprofitable' areas or to address certain categories of users.

#### 4.3.2.1 Allaying fears, keeping public funding neutral

Generally, government investment in the ICT sector is less of a concern in under-serviced areas that are considered uneconomic to serve or in areas where there is little or no existing infrastructure. It is thus important to define these areas upfront (through public consultation) and to design Universal Access Programmes that set out clear objectives and targets so that it is clear that public funding is not conflicted. Uganda's Rural Communications Development Fund Programme[23] and Canada's Broadband for Rural and Northern Development Pilot Program[24] are examples of programmes that have been designed from the outset to achieve some generally accepted socio-economic objectives; as a result, these programmes do not typically attract much criticism from the perspective of their policy objectives.

Government loans and grants – and, for that matter, any type of public financing – become more problematic when the effect of the financing may be to distort competition. Where public funding is used to develop networks and services in areas with existing networks, there is generally more resistance to such approaches. This is not to say that such funding is always anti-competitive; however, where this is the case, primarily in the case of the funding of broadband networks, clear guidelines are needed. A good example is the European Union where countries have agreed to provide public funding for broadband as part of Europe's Recovery Plan. Public funding must be provided in accordance with the Guidelines on the application of EC Treaty state aid rules to the public funding of broadband networks[25].

**Figure 4.2: Government Funded High Speed Networks, Global (2011)**




Note: Bubble size is determined by the level of the public-funding commitment.

*Source: Economist Intelligence Unit,* www.eiu.com/public/topical_report.aspx?campaignid=broadbandMay2011

## 4.4 Public Funding Models

Government financing of universal access networks includes at the most 'intrusive' level of support equity participation. Other mechanisms for government financing include subsidies, grants, loans, and guaranteed purchase of services. Three main models of public or government funding for universal access are:

- Ownership or Equity Participation in broadband projects, as seen in Australia, Brazil, New Zealand, Malaysia, Sweden and South Africa;
- Public-Private Partnerships, such as the broadband infrastructure deployment projects undertaken in France, Thailand, Kenya and Tanzania; and
- Provision of financial incentives and subsidies as seen in many Latin American countries through the use of first-generation Universal Service Funds, and also as seen in China, Japan, the USA and the EU through broadband stimulus packages.

### 4.4.1 Ownership or Equity Participation

The government 'ownership or equity participation model' features a direct role for government in the rollout of infrastructure. In many ways, this model seems to be the antithesis of the privatization efforts that have accompanied market reform and liberalization in many countries. Investing equity involves cash contributions up front that may be recovered in the long run (e.g., as dividends) to the extent that the ventures are commercially successful. In this model a public company, for example a national or municipal utility, undertakes the construction and the operation of the broadband network.

In Australia, the government has deployed and operates a national broadband network, and has committed A$46billion in funds for this project, the highest public funding commitment globally (see Figure 3).[26] The national fibre to the home (FTTH) network will provide wholesale services on an open access basis. In Sweden, a state owned fibre backbone is combined with municipal networks. Brazil's model sees the government owning the fibre backbone and

being a retailer of last resort as well. In the South African case, the national signal distributer has had its mandate increased to include being a national broadband network. In addition, under the Department of Public Enterprise, a national infrastructure company has been established; however, its ability to provide retail services has been debated, and the provision of such services is not currently included in its mandate.

The government ownership model sees government taking the investment 'risk' usually reserved for the private sector. The risk, however, is related to the return. If government's desired return is related to social and economic objectives rather than a financial return on investment, then the risk relates to the non-achievement of those objectives. As such, the risk relates to factors such as universal access, job creation and increase productivity. However, in light of the liberalization of the sector and the fact that the return is normally defined in terms of financial return, which in turn impacts sustainability, then one of the core principles of public investment is that such risk should not be managed using tax payers' money.

### 4.4.2 Public-Private Partnerships

The role of Public-Private Partnerships in the development and implementation of universal access projects is recognized as an effective means of achieving universal access objectives. PPPs recognize the broad range of skills, expertise and resources needed to execute universal access projects successfully, whether they are telecentre projects or higher investment fibre networks. As narrowband and broadband Internet access begin to fall within the scope of universal access definitions and targets, these partnerships have begun to include more than just network operators and government; PPPs now include equipment suppliers, vendors, manufacturers, academics, civil society and communities. The scope of PPPs reflects the fact that increasingly, in underserved areas, bottom-up approaches to project development and implementation are key.

### 4.4.3 Financial Incentives and Subsidies

Financial incentives and subsidies remain a key approach to financing universal service and access, although the form and framework have changed over the last five years, in particular in light of the lessons learned from USAFs, the growing importance of broadband, and the impact of the global financial crisis on the liquidity of telecommunication companies. Subsidizing investment requires cash outlays up front that will never be recovered. If there is an expectation for the recovery of the monies, a loan or long-term debt financing would be granted. Whereas producer subsidies (i.e. subsidizing operators to rollout infrastructure) are likely to be one-off payments, subsidizing users (e.g., schools, elderly, people with disabilities) involves long-term and repeated payments. Two main approaches to providing financial incentives and subsidies are:

- Universal Service and Access Funds, and
- Stimulus Packages

#### 4.4.3.1 USAF

The most popular response to the funding challenge posed by universal service and access in developing countries has been the establishment of Universal Service and Access Funds. Over the past 15 to 20 years, the model of a mainly industry-financed Universal Access and Service Fund has been implemented in many countries, although primarily those in the developing world and emerging markets, with only nine Funds operational in Europe and the Americas.[27] Presently, Funds or plans to establish Funds exist in over 66 countries. Operators are required to contribute from 0.1 percent of revenues in France to over 10 percent in the United States. Most countries have contributions of between two percent (Nepal) and five percent (Colombia, India).

Funds are firmly situated within the ICT sector and seek to ensure the affordability, availability and accessibility of networks and services to all communities. The first generation of USAFs was implemented in Latin America (e.g. Peru, Chile) and in Africa by the Ugandan Rural Communications Development Fund ("RCDF"). While these models were successful, in the last decade there has been a move towards using the principles of Output-Based Aid ("OBA") to finance investments targeted under UAS policy, particularly in developing countries. OBA is an innovative approach to increasing access in a manner that seeks to ensure that money is well spent and that the benefits go to the identified beneficiaries by linking the payment of aid to the delivery of specific services, outcomes or "outputs."

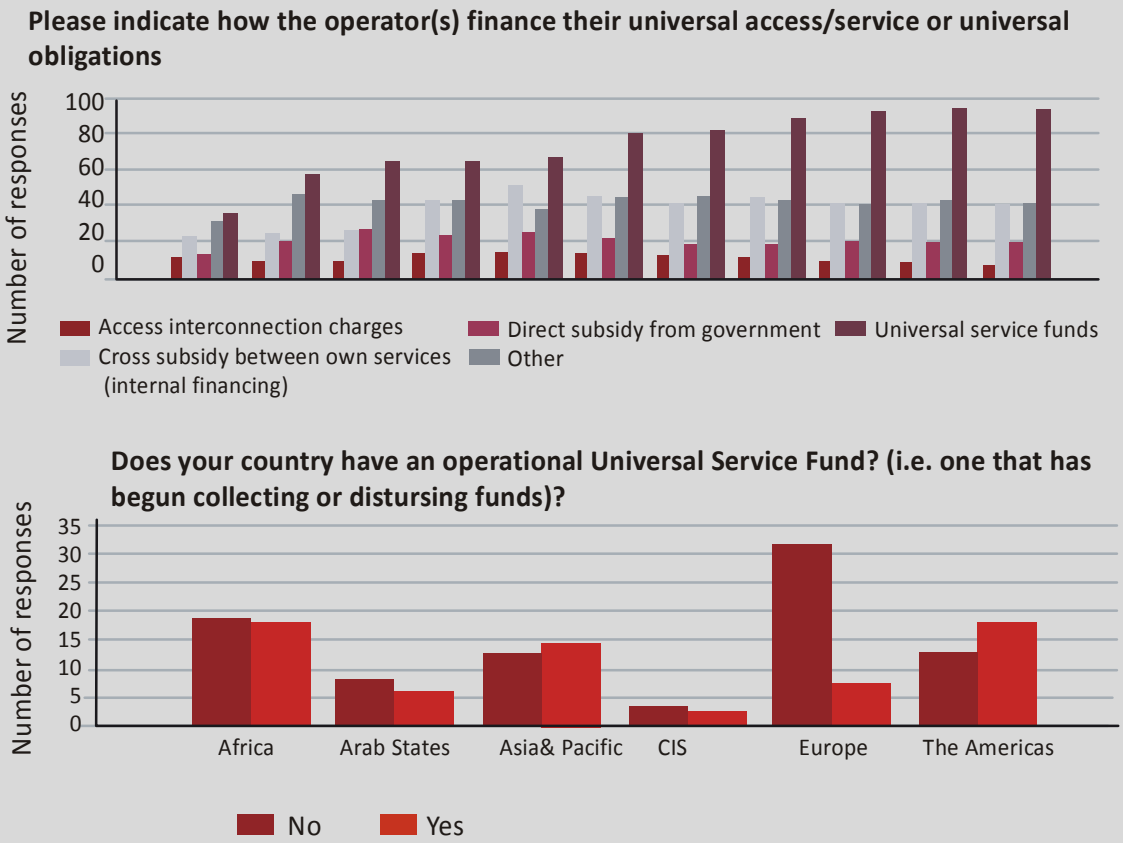
Funds are relatively easy to establish as they can be created by passing legislation and making USAF regulations which amongst others set out a minimum contribution by operators to the Fund. History, however,

has shown us that they are much harder to implement and maintain. This is the case whether USAFs are administered by a regulatory authority as is the case in countries like Uganda, Sri Lanka and Malaysia, a separate Fund administrator as in Tanzania, Nigeria, Peru and the United States or, in a few cases, the responsible Ministry as is the case in Colombia and Korea. This issue is discussed in Section 4.7 which focuses on Fund experiences and lessons learned.

Funds are considered an independent and transparent mechanism to implement and to maintain universal service and access initiatives while continuing market reforms. The objective of USAFs, which typically offer one-off, start-up subsidies for designated areas, is to finance the expansion and/or maintenance of designated networks/services on a geographic, population or other basis that would not otherwise be commercially sustainable. Commercial sustainability is determined through economic analysis prior to project development and in specific cases the assessment of market gaps. USAFs provide financing primarily through subsidies in order to compensate designated universal service providers that have in most cases elected to provide the identified networks and services in return for a subsidy or special regulatory, policy or licensing concessions.

Technological evolution and the deployment of NGNs will lower the costs of communication for users and, ironically, will also in all likelihood erode the revenue base (mainly operator levies) used to fund universal service and access programmes. The reduction in costs to users stems from lower cost voice services and affordable access technologies. [28] Accordingly, if it is determined that the Funds are still relevant despite the challenges that they have faced (see section 4.8: Reflecting on Lessons from Fund Management), it is important to broaden their sources of funding so that they remain sufficiently financed. Other sources of funding may include general taxation revenues, end-user taxes, and spectrum and licence fees.

**Figure 4.3: Increased Use of Funds as a UAS Financing Approach world, 2010**




*Source: ITU World Telecommunications Regulatory Database, available on the ITU ICT Eye at: www.itu.int/icteye*

Broadening the scope of contributors to the Fund is one approach that can be taken. This could result in new players, such as Internet Service Providers and licensed applications providers, having to make contributions. However, it is equally important for governments to recognize that Funds are but one approach to financing universal service in situations where the market cannot deliver.

#### 4.4.3.2 Stimulus Plans

Like USAFs, Stimulus Plans seek to provide initial funding to encourage private sector investment. Stimulus plans, however, have as their objectives the creation of jobs and the stimulation of economic output. The impact of funding universal access to broadband need not be limited to the impact on the ICT sector, as may be the case with respect to Funds; rather stimulus plans and packages including broadband access are aimed at achieving broader economic objectives. The United States grant of $7.2 billion to deploy broadband in underserved areas, the Portuguese 800 million Euro credit line for the rollout of a Next Generation Access Network as part of its 2.18 billion Euro stimulus plan to boost the economy, and the Finnish funding of one third of the NGN rollout costs can be seen as stimulus plans. New Zealand, Malaysia and Ireland have also adopted stimulus plans that both promote ICT investment and improve the economy – jobs, productivity, efficiency and competitiveness.

Notably, where USAFs are explicitly focused on rural and remote infrastructure development, stimulus package funding may be better directed at investment in advanced and industrialized regions in order to yield a stronger impact in the short term.[29] This may be contrary to the universal service and access objectives of the sector, but better aligned with broader socio-economic targets such as those linked to job creation.

#### 4.4.3.3 Criteria for assessing a funding mechanism

As indicated in the Organisation for Economic Development ("OECD") report *Rethinking Universal Service for a Next Generation Network Environment,* the funding approaches that are available should be considered on a case by case basis and should be thoroughly assessed against a number of criteria, such as economic efficiency, equity and competitive entry, as well as against current practice where the infrastructure and service providers directly fund universal service.[30]

## 4.5 How big is the gap?

There is no uniform response to the question of 'how much' is needed to fund universal service and access. However, an indication of "how much" must precede a decision on "how." Knowing how much funding is required will assist in determining what type of funding mechanism is appropriate. There are two broad types of projects with different funding approaches and requirements:

- Supply-side projects addressing **infrastructure gaps** in high cost areas which typically include rural and remote areas. The required funding for infrastructure should match the gap between the level of investment a private company would be willing to make in wired broadband, wireless broadband, mobile or multi-purpose community centres, for example, and the investment required to provide the service.
- Those aimed at addressing **user needs** and demand-side considerations, which include the needs of institutions (e.g., schools and clinics), as well as targeted population groups such as people with disabilities, low income users and the elderly. Included in these needs are training and the development of relevant content and applications. For users, funding should cover the gap between the retail price and the 'affordable' rate as determined through a means test or other objective evaluation criteria. For other user-related interventions, funding should stimulate demand.
- Networks are not monolithic, nor are users. So how do governments decide what to fund when it comes to both categories of beneficiaries? The approach is to determine where the most impact can be made and what the most sustainable approach is to using public funds to finance ICT supply and demand. Strategies that address infrastructure and user needs – which need not be mutually exclusive and can in fact be complementary – are discussed in turn.

### 4.5.1 Supply: Financing Infrastructure Gaps

The funding set aside by various governments to meet supply-side shortfall has varied, and ranges from the USD 27 billion set aside by the Australian government for its state owned open access national fibre to the home (FTTH) network to the $2.8 billion

committed by the French government to using PPPs to assist with the rollout of shared and open-access networks.

The extent of the funding needed to address infrastructure gaps relevant to universal service and access targets, whether or not they include broadband rollout, depends on the particularities of each market. This includes issues relating to technology choice, existing infrastructure, competitiveness and the policy and regulatory environment. Assuming the same technology choice, macro-economic and geographic factors such as population distribution and topography and consumer demand will also affect the funding available in a given market.

**Box 4.5: Criteria for Assessing a Funding Mechanism**

The strengths of a funding mechanism can be assessed relative to:

- economic efficiency – financing US/UA should not distort competition
- equity – costs should be similar for people with similar abilities to pay; contributions should be fair and reasonable
- competitive neutrality – financing should not discriminate in favour of any company
- technology neutrality – financing should not discriminate in favour of any technology
- certainty – specific, predictable and sustainable arrangements
- transparency – information relating to the process of selecting projects and financing arrangements should be publically available
- cost effectiveness -- introduction and on-going management of the funding scheme should be cost effective

*Source: DSTI/ICCP/TISP(2005)5/FINAL, Pg. 50 (OECD)*

**Table 4.3: How much is Universal Broadband Access Worth?**

| | Universal Broadband Access Policy Framework | | | | Public Funding Model, State Sees Itself As: | | |
|---|---|---|---|---|---|---|---|
| | **Broadband Programme** | **Targets and Service Details** | **Estimate of Investment Expenditure** | **Tackling Unserved Areas** | **Financer of Infrastructure** | **Owner/ Operator of Infrastructure** | **Demand Stimulator** |
| **Australia** | New NBN | ≤ 100 Mbits/s for 90% by 2018; ≤ 12 Mbit/s for the remainder | Yes (Est. A$46 billion) | Yes | Yes | Yes | - |
| **Germany** | Federal Gov. Broadband Strategy | 1 Mbit/s nationwide by 2010; ≥50 Mbit/s for 75% by 2014 | Yes (Est. €36 billion) | Yes | Partly | - | - |
| **Finland** | National Broadband Strategy | 1 Mbit/s for 100% by 2010; 100 Mbit/s for 99% by 2015 | Yes $131m (est.) total NGN project cost | Yes | Partly | - | Yes |
| **United Kingdom** | Digital Britain | 2 Mbit/s as a universal service by 2012 | Yes | Yes | Partly | - | - |
| **Japan** | Next Generation Broadband Strategy 2010 | "Ultra High Speed" for 90% by 2010 | Yes | Yes | - | - | Yes |
| **Sweden** | Breidbandsstrategi for Sverige | 100 Mbit/s for 40% by 2015; for 90% by 2020 | No (Est. € 864 million) | Yes | - | - | Yes |
| **Korea (Rep.)** | Ultra Broadband Coverage Network | 100 Mbit/s for 14 million users by 2012; then Gbit/s upgrade | No | No | Partly | - | - |

*Source: Author's research*

For example:

- **Population and housing patterns** – deployments of fibre-to-the-home or building will be faster in countries like Korea and Hong Kong China where high rise buildings are commonplace. In the UK, it has been argued that deployments have been slow relative to other European countries because the vast majority of its population (85 per cent of people) live in single-family homes.[31]
- **Infrastructure** – civil engineering costs for laying fibre can be reduced substantially if infrastructure sharing is in place and if, at a municipal level, operators are allowed to, or even mandated to, share existing routes or ducts. It has been argued that the early deployment of fibre in Paris, France can be partially attributed to the relative simplicity of laying cable through the city's sewer system. The same approach is being rolled out in the Southern African Development Community ("SADC") with plans for continental expansion by i3 Africa; i3 Africa plans will start in South Africa and will spend between ZAR 5 billion (USD 725.4 million) and ZAR 6 billion on the network — approximately one-third of the cost usually associated with a FTTH rollout – by utilising metropolitan sewerage and water networks, thereby negating the need for expensive civil works. The i3 FTTH network will connect up to 2.5 million homes within the next four to five years at minimum connection speeds of 100 Mbps.[32]
- **Population distribution** – High population density in Sweden contributed to its Next Generation Access (NGA) leadership in Europe. Countries like Mexico and Portugal, which have relatively high broadband access, are densely populated.

#### 4.5.1.1 Infrastructure: Deciding where the need is

Making a commitment to fund "the rollout of broadband networks" is not a clear commitment. Public funding models, including ownership, financing incentives (including USAF), and PPPs (national, local, municipal), can be used to develop networks which consist of four main infrastructure components, namely:

- International connectivity, which links the network to other international networks usually using gateways and satellite technology or undersea cables. There has been significant investment in undersea cables by governments in Africa in partnership with the private sector. This has resulted in the deployment of the EASSY Cable and The East African Marine System (TEAMS) amongst others over the last 3 years. Access to this part of the network lends itself to private investment through a PPP model in light of the network and technical expertise required to deploy the network successfully, the costs associated with rollout, and the need for rights of way and landing rights which can be provided by governments;
- National or domestic backbone networks, which are also known as "long haul" networks. These networks carry traffic between major points of interconnection, usually major cities in a country, using satellite, microwave and fibre-optic transmission across the country. The investment in this part of the network is mainly private sector driven, and in many countries there is some level of competition with mobile and fixed line operators deploying their own backbone networks. From a government perspective, regulator incentives such as infrastructure sharing are key contributions to lowering costs. In addition, USAFs are increasingly used to fund the extension of the backbone. A case in point is Pakistan's USF that is working with the Pakistan Telecommunications Company Limited.[33] Sri Lanka's government is also working with its incumbent through a PPP model to extend the backbone.
- Metropolitan connectivity, which can also be referred to a "middle mile" or "backhaul", is the part of the network that connects communities to the backbone. Generally, municipal connectivity exists in urban areas, although capacity may require upgrading, and rolling out metropolitan networks to rural areas is a priority to ensure accessibility across a country. Municipal PPPs have been used to address this gap successfully in Knysna in South Africa; the Pirai municipal network in Brazil is another successful example of the use of a PPP model to address metropolitan connectivity.

  The Brazilian case is important in that its success lay in part in the demand driven by the municipality itself which served as an 'anchor tenant' to ensure the sustainability of the rollout project. The project included e-government, education and public access, with a range of application support and development activities.[34] In a recent German case (2009), municipalities were set to invest in and own specific ducts to encourage broadband deployment in underserved areas. Such dedicated multi-fibre ducts were made available to broadband network operators to deploy their networks, thereby encouraging infrastructure based competition.

- Local connectivity or local access networks, which are also called the "last mile," are the part of the network connecting the end user to the network. Delivered either wirelessly or using fixed technology such as fibre or xDSL, the "last mile" is the most expensive link in the broadband supply chain. There are several regulatory and policy interventions that have been made to support the reduction of costs at this level. Two such approaches are local loop unbundling and spectrum assignment that permits spectrum trading.

Each part of the broadband supply chain faces different challenges in terms of its availability and ease of deployment. As a result, a uniform approach to financing broadband cannot be taken. The part of the network that is being funded is another variable that affects the response to the question of "how much."

**Box 4.6: Approaches to Funding Infrastructure**

**Finland –"Last mile" is off limits**

The cost of the investment in universal broadband access in Finland is estimated at EUR 200 million, of which the state will pay up to a third, municipalities, regions and the EU another third, and telecommunication companies at least one-third. Under the model, the public support would be paid to the builders of the networks. However, in Finland, public money is not on offer for subscriber connections – that is, the two last kilometres. Bringing 100 Mb fibre optic or radio link connections all the way to people's homes would raise the costs by EUR 480-780 million. Connections between homes and the optical fibre network are expected to involve the traditional copper cables or wireless connections. Speeds of both copper and wireless connections are expected to increase considerably in the coming years to dozens of megabits a second.

**Pakistan – Funding the National Backbone (Capex and Opex)**

Pakistan's Fund noted in 2010 that 30 percent of the 400 Tehsils in the country did not have any fibre connectivity. Extending fibre cables to all Tehsils would assist the telecommunication service providers in extending services to those areas. Contracts have been awarded for Optic Fibre Projects to provide a subsidy of PKR 6.7 billion in total. These projects will ultimately lay 8,313 kms of fibre optic cable, and through the projects awarded so far 5,324 km of optic fibre cable is being laid.

Universal service financing tends to focus on the provision of subsidies for infrastructure, with Funds such as that in Pakistan being initially limited to providing money for Capex. Recently, in light of the realization that projects must be sustainable, a total cost of operation or ownership approach is followed. Thus where infrastructure is funded, it may also require elements of Opex such as human resources, energy and transmission costs, to be covered in order to make the project sustainable in rural areas where these costs may be higher than in urban networks.

**South Korea – Mandatory Obligation**

In South Korea, the leading operator was obliged to provide broadband access as part of a universal service obligation to a minimum standard of 1.5Mbit/sec. The upgrading of existing networks is expected to cost about EUR 25 billion over the next five years, which is to be partially funded by the South Korean government through direct subsidies totalling EU 1 billion. Private investors are expected to invest in the difference and are being incentivized to do so through tax incentives and cheap loan facilities.

**Qatar – National Broadband Network**

The Supreme Council of Information and Communication Technology (ictQATAR) announced in March 2011 that Qatar's government has established a new company – Qatar National Broadband Network Company (Q.NBN) – with a mandate to accelerate the rollout of a nationwide, open, and accessible high-speed broadband Fibre to the Home (FTTH) network. Although it is a government-led initiative, Q.NBN is an independent company, holding the relevant licences to permit it to rollout a national broadband network. It will focus solely on the deployment of a passive network infrastructure, efficiently leveraging existing and new infrastructure in Qatar. This initiative is part of the strategy to achieve the goal of providing ninety percent of Qatari households and businesses with broadband access and an open-access fibre network by 2015.

*Source: Author. Information compiled from Pakistan Fund Website, www.usf.org.pk/project.aspx?pid=6 ; ICT Qatar www.ictqatar.qa/en/news-events/news/qatar-national-broadband-network-company-established; and Deutsche Bank Research, http://mpra.ub.uni-muenchen.de/22909/1/MPRA_paper_22909.pdf*

#### 4.5.1.2 Supply: Getting the most out of Infrastructure Funding

Public investments in infrastructure need to have the maximum potential benefit. As such, in many countries, governments put conditions on publically funded networks to derive the maximum 'return on investment'. Key principles to bear in mind when infrastructure projects are financed publically include that the:

- network should be open (open access) and provide universal coverage in the area concerned, and
- amount of the compensation for rolling out the network cannot exceed what is necessary to cover the additional costs to deploy the network in non-profitable areas.

Putting good money into projects designed in the context of bad policy is a risky exercise. To avoid this, in Sweden, financing of rural broadband networks is linked to the following conditions:

- a requirement to provide the network on a non-discriminatory, open access basis to third parties for seven years from project completion;
- a requirement to provide access to passive and active infrastructure (including ducts, dark fibre, and bitstream access);
- a requirement to provide access to at least three operators at infrastructure level; and
- a claw back condition in the contracts that avoids "overfunding." It requires the recipient of the subsidy to pay back part of the financing if the demand in the area exceeds expectations making the subsidy unreasonably high. (The claw back provision is maintained for five years after the network is operational.) Overfunding is a particular risk in broadband funding where demand is unclear.

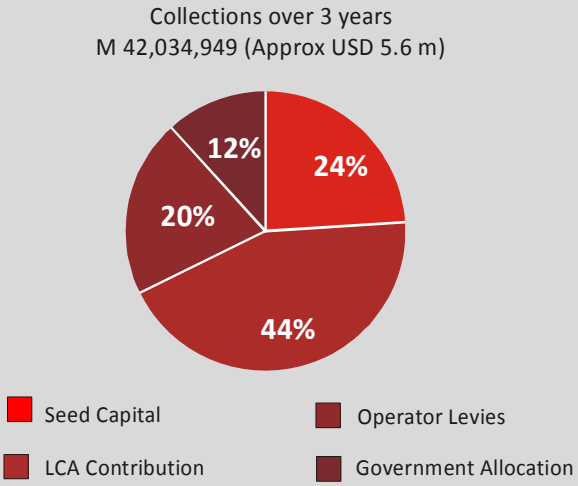
**Box 4.7: Universal Service: The Case of Lesotho**

Lesotho's Universal Access Strategy was developed in 2001 following a consultative process in which the operators and other stakeholders made written submissions to the Authority. It is enshrined in the founding legislation of Lesotho Communications Authority (LCA), The Lesotho Telecommunications Authority Act of 2000 (as amended). The Strategy was embedded in the licences issued to operators from as early as 2001 and has the potential to provide access to approximately 1.3 million customers nationally.

In order to accurately determine the access gap, in 2004, the Authority commissioned a study, dubbed the 'Demand Study', on Demand for Telecommunications Services in Lesotho. The findings led to the provision of services which included: voice telephony, Internet services, and broadcasting services. Rollout included network coverage infrastructure and the establishment of an Internet Exchange Point. Operationally, selected operators have entered into a Memorandum of Agreement with the LCA for the implementation of the strategy.

Lesotho is presently undertaking infrastructure projects and is concurrently gearing up to manage the complexities of developing sustainable partnerships and business models in its execution of the strategy. Future projects may include:

- Community e-Centres
- School Connectivity Projects
- Content Generation




*Source: Dr M Mochebelele, Director EMO, LCA "Mainstreaming Universal Access," and L.Mohapi, Secretary Universal Access Fund Committee "Operations of the Fund"*

#### 4.5.1.3 Demand: Financing End-User Needs

For end-user subsidies, a number of factors will impact the required level of funding, which is unlikely to be 'smart' or once-off, as is the case of infrastructure funding. Instead, end-user subsidies tend to be recurring and continually provided as long as the user remains in a group eligible for receiving the subsidy, such as the disabled, the elderly, and those with low incomes. Where the beneficiary is a community or institution, this remains true as in the case of an e-rate subsidy to schools. In the case of subsidies for end-user devices such as laptops and personal computers, a one-time subsidy is more likely. Such a subsidy does not address the total cost of ownership as it disregards the on-going maintenance and repair costs. Different approaches can be taken to identifying beneficiaries for end-user subsidies such as:

- **Self-selection targeting** – projects are designed to ensure that the outputs that have been chosen by the beneficiaries receive a higher share of subsidies. Thus a 'sliding scale' of subsidies is possible in terms of this approach. For example, progressively higher subsidies can be provided for more basic services or services that subscribers can afford but may not necessarily want (e.g., basic and low cost devices or services).
- **Means test targeting** – beneficiaries are determined based on affordability using income, a proxy means test, or (sometimes) living standard measures (LSM) such as the availability of a dwelling. It has been argued that this approach is most effective in middle income countries, particularly where an existing social grant or welfare system in place that can be used a point of reference. A key risk with this approach , and many user-based approaches, is that users can move from one 'level' or 'status' to another, whether the means is determined by income or access to a social grant, making monitoring and implementation of this type of targeting by the funder more complex.

#### 4.5.1.4 Demand: Where End Users are Institutions

In some cases, end-users may be institutions and not individuals. Chile, Colombia and Ecuador offer examples of countries that have publically financed school connectivity, mainly in areas where there is no existing access. In most cases where connectivity at schools is funded, the financing of devices such as computers, laptops and dongles is incorporated into the connectivity plan. In Ecuador, this is in line with the national strategy, which seeks to provide the majority of schools in the country with Internet connections. The telecommunication regulator, Commission Nacional de Telecomunicaciones or CONATEL, included school connectivity in the annual plan that identifies UAS targets for funding from the UAS Fund. The Fund, FODETEL, has financed a number of school connectivity programs, including a US$ 469,000 project providing broadband connections and free Internet access to 74 schools in the Cantón Montúfar Municipality.[35]

Financing school connectivity should be well-measured and focused on areas and communities with potential for sustainability in the medium term. Moreover, it should be designed to be responsive to market forces, for example, by employing financial instruments that respond to entrepreneurial need, while not distorting or misdirecting embryonic and still emerging markets.[36]

Pakistan's USF does not fund schools directly, but has effectively aligned its infrastructure financing programme to the financing of school connectivity. In the Pakistani model, as part of the universal access strategy, the successful bidder is assigned obligations related to connecting educational institutions and communities. Included in these obligations are the requirements to provide each higher secondary school, college and library in the area covered by the subsidy with free connection, free broadband access for the first year, five personal computers in a Local Area Network, and the training services of two trainers.[37] The same approach can be taken for other public institutions such as clinics and hospitals.

#### 4.5.1.5 Demand: Funding Content and Applications

Most public financing, particularly through USAFs, has prioritized the rollout of infrastructure, and recently this infrastructure consists of wholesale transmission and broadband networks. In order to maximize the use of these networks, relevant content and applications must be available for consumers to use. However, this is an area of funding that most USAFs have not addressed. The Kenyan ICT Board, which facilitates access, but is separate from the Universal Service Fund in Kenya, has several programmes to support local content development through the issuing of subsidies. Furthermore, it provides subsidies to support the development of applications. It also provides subsidies

for laptops for university students that will enable them to access the internet. As ICT sector strategies focus more on broadband uptake, it becomes critical that mechanisms are developed to promote the development of relevant, user friendly, and culturally and linguistically sensitive information. Financing of content and applications can include funding for:

- Local content production;
- User friendly and graphics based interfaces;
- Local content in local languages; and
- Shared content (e.g. tourism, education, e-government) that is locally relevant, where possible to a community level.

A key aspect of successful demand-side strategies, particularly those related to the promotion of relevant local content and applications, is the level of government buy-in and participation. Where government has become an "anchor tenant" for broadband networks in rural, underserved and unserved areas, it plays a central role in stimulating demand for broadband services in those areas. A rural municipality, for example, can use broadband to connect its main public school, library and post office. In so doing, it stimulates demand, but also becomes a large customer, thus contributing to the profitability and sustainability of the broadband network.

#### 4.5.1.6 The question of "how much" is therefore relative

In summary, there is no single answer to the question of "how much". The scale of funding required has a significant bearing on the type of financial instruments used, and on who is able to provide such funding. As an example, the deployment of a low cost WiFi-based municipal network with a payback period of two years can often be covered out of local government or municipality revenues. By contrast, deploying a multi-million dollar fibre optic cable system with a payback period of 10 or more years requires long-term financial commitments.[38] Depending on national universal access and service definitions, a combination of these types of projects is needed for countries to achieve their national universal access and service targets and meet the Millennium Development Goal (MDG) targets and World Summit on Information Society (WSIS) commitments that are to be achieved by 2015.

Importantly, non-infrastructure projects are also key to determining "how much". In certain projects (e.g., those promoting applications and content or those stimulating demand such as 'e-rate', telecentres or schools programmes), ideal funding may not include any infrastructure. CAPEX will relate to equipment and furniture. However in these cases funding of OPEX is even more critical.

## 4.6 Level of Subsidy: Providing the 'right' amount

Over time, and through experiences in various jurisdictions, it has become clear that the determination of the level of subsidy can be a complex exercise. Increasingly, process is being used to assess the level of subsidy rather than cost analysis on its own. Experience with cost-based approaches to the determination of subsides have shown that the information asymmetry that exists between the government funder and the operators can affect the final determination of cost and lead to inefficient financing of projects. Cost analysis requires the regulator or government to have information on:

- Market data that is below national level, preferably on the area in which the service is to be provided.
- ICT access – micro-level information that is more detailed than readily available information on national penetration levels, e.g., information about public phones within the project area, telecentres/multi-purpose community centres, mobile access (network coverage, population coverage), mobile services (subscribers), fixed lines, Internet access (home, business, and shared), and broadband access (home, business, and shared).
- Geographical information on the project area – terrain (mountains, hills, valleys, forests, deserts, etc.) that will impact network planning and the costs of constructing a network, as well as the technology choice
- Population centres and total population – total population of the region, area, major population centres and levels of urbanization
- Network planning and costs that are based on the terrain and the network plan needed to cover the area to serve the estimated demand (e.g., cell size), which in turn determines the number of base stations that need to be built, amongst other things.

Proper cost analysis requires a range of skills that the regulator may not have, including network planning,

and cost analysis. Even in developed countries like Australia and the United States (see Box 8) where regulators have relatively high levels of capacity, operators have far better knowledge of the costs of their own operations. To address this information asymmetry and the risks associated with relying only on operator data, particularly when it may be in the operators' interests to inflate costs in light of the potential subsidy that may result, least cost subsidy approaches have been taken to financing universal service and access in many countries.

### 4.6.1 Least Cost Subsidies

Where a Universal Service Provider is not designated up-front, Fund Administrators must find ways to determine who will be responsible for providing infrastructure or services on a project by project basis.[39] Determining the level of subsidies and selecting the recipient of those subsidies are now commonly done through conducting a competitive bidding process or reverse auction for a least cost subsidy. The approach broadly is for the regulator, universal service fund administrator or Ministry, as the case may be, to follow a 5 step approach:

- Define the scope of funding, which includes the national objectives, target area or population, and the levels of funding available for the public subsidization programme or project, whether it is funded through a Fund or a Stimulus Plan offshoot.
- Prepare and publish, through an open tender process, a Request for Proposals or Invitation to Apply for the subsidy. This can be a one-step or a two-step process, depending on whether there is a need for a pre-qualification phase. This type of bid process has been issued by the USPF in Nigeria, the Universal Service and Access Agency in South Africa, the USF in Pakistan and the USOF in India over the last few years. It is important that the tender is competitively, technologically and service neutral so that the outcomes are unlikely to distort competition.
- Evaluate bids in response to the request. The bids can compete on service as well as on price, with the objective being to provide the most for the least subsidy from the government. A winner is selected through an open and consultative process.
- Contract the winner using an outcome based approach.
- Monitor and evaluate the investment to ensure the expected 'return' in both social and financial terms as discussed in Section 4.9.

**Box 4.8: Changing Approach, US and Australian Examples**

**Shifting Away from Detailed Cost Modelling**

While cost modelling assists regulators, its complexities require Fund Administrators and Universal Access Project Financiers to assess costs in the face of information asymmetries in order to arrive at the maximum subsidy. Fund Administrators and Universal Access Project Financiers are thus moving to adopt least cost subsidy auctions. These types of auctions allow Fund Administrators and Universal Access Project Financiers to avoid engaging in costly, time consuming and often complex cost analysis to arrive at a cost-based subsidy; instead, reverse auctions coupled with benchmarking or use of cost modelling tools can be used to enable them to award least cost subsidies.

**United States**

The United States recently reviewed its funding system for high-cost areas. Over the past decade, total high-cost funding has quadrupled to US $7 billion per year. As part of the review, the Federal-State Joint Board is considering introducing auctions, based on the experience of developing countries, but modified to suit the conditions in the United States. This will determine the amount of funding that would be available. Many commentators believe that auctions are better than administrative approaches for this purpose.

**Australia**

In Australia, the move away from a cost modelling approach in the last decade required a legislative amendment. In 2000, an important amendment to the legislation was introduced: the formula for calculating the Net Universal Service Cost, which was previously the fundamental element of USO subsidy calculations, was not included in the amended legislation. The amendments do not prescribe any methodology for calculating or otherwise establishing, USO subsidies. Rather, the legislation simply provides for the Minister to determine USO subsidies, having regard to advice of the ACMA.[40] The Minister may determine subsidies for the supply of services under the USO in a universal service area for up to three years in advance using a number of approaches, including least cost subsidies/competitive bidding.

*Source: HIPSSA/SADC Toolkit on Universal Service Funding and Universal Access Fund Implementation (2011)*

#### 4.6.1.1 Keeping the funding requirements low

Based on global experiences, primarily in developing countries and emerging markets, some key strategies have been identified to get operators to rollout services for as little subsidy as possible. Indeed, in some countries, the subsidy has been as low as zero. This was the case in the Dominican Republic where frequency spectrum was used as an incentive and a win-win situation was created when the competitive bidding process culminated in a zero subsidy. In Chile, where the competitive tender allowed new entrants and offered new licences, Chile's successful bidder accepted zero subsidies and used the process as a means to enter the market and access spectrum. In this case, linking the universal service objectives to something that the operators wanted (licence rights) proved to be incentive enough such that the financial incentive (subsidies) was secondary. The Fund thus achieved its objective by working with the regulatory regime and without disbursing funds for that project.

Other strategies to encourage bidders to compete and bid low subsidies, thus reducing the need for public support, include:

- The proper design of attractive bidding areas, sometimes called bidding "lots".
- Bundling opportunities to encourage economies of scale. This would enable successful bidders to provide adjacent services to the one bid. This approach is less relevant where licences are technology and service neutral and where operators may provide any service using any technology. Thus, this approach may not be applicable in countries such as Tanzania, Malaysia and the United Kingdom where a converged framework is in place or under development.
- Coupling the award of the subsidy with other licence rights. For example, offering reduced cost use of radio frequencies to the winning bidder. In the SADC region, access to frequencies such as WIMAX in the 2.5/2.6 GHZ and 3.5 GHz bands is coveted. In many countries, these technology opportunities could be used to facilitate universal service.
- Allowing the winning bidder to provide other services (i.e., a service-neutral approach).
- Mandating infrastructure sharing, both for transmission and access such as towers for mobile networks, which will reduce the costs for the successful bidder and increase efficiency.
- Competitive least cost subsidy bidding is used as a project selection method in many Sub-Saharan African countries such as Malawi, Tanzania, Mozambique, Madagascar and Lesotho[41] and in South America, Colombia, Guatemala, Dominican Republic, Peru and Chile. Nepal and India are amongst the Asian countries that have used this approach.[42]

#### 4.6.1.2 When to use least cost subsidies

While least cost subsidies represent a good approach, this model is not a 'once size fits all' approach; it should only be used for certain types of projects such as:

- where large capital investments in networks are required;
- where large sums of subsidies are to be disbursed (e.g., starting from several hundred thousand dollars to several million); and
- where companies are subsidy recipients.

**Box 4.9: Overview of OBA**

| Output Based Aid Principles | Benefits of Output Based Aid |
|---|---|
| • Ensure that the subsidy is linked to specific measurable targets<br>• Contract services out to a third party which receives a subsidy to meet the stated objectives<br>• The Fund pre-finances the project (in tranches) until delivery<br>• Link payments to delivery<br>• Subsidies must be performance based – payment is made only after services are rendered and audited | • Transparency increases efficiency and effectiveness<br>• Performance risk is carried by the provider (recipient of funding) and accountability is increased<br>• The subsidy (and possibly subsidy award mechanism) incentivize the private sector<br>• Results can be tracked and measured through a focus on outputs/ results |

*Source: World Bank*

In the case of user subsidies or smaller scale projects, lengthy and expensive least cost subsidy processes may not be necessary. Telecentres and Multi-Purpose Community Centres may, in certain areas, be an example, especially since the costs are easier to derive. In such cases, fixed subsidies may be appropriate.

### 4.6.2 Fixed Subsidies through an open tender

While minimum subsidy allocation has been proven to be an effective OBA-based mechanism to finance projects, other approaches can also encourage efficiency. For example, the Fund can indicate that a certain amount of funding is available for projects relating to a specific universal service challenge. The Fund Administrator then sets a fixed subsidy and awards the funds to the operator that provides the most comprehensive service for that subsidy. This approach is likely to work for smaller projects where the costs can be assessed ahead of time with reasonable accuracy by the Fund Administrator and for "bottom up" projects where costing information can be provided by the project initiator (usually at community level).

As such, in the case of a smaller project, if X amount of funding is available, the operator that can provide the most Internet connections, computer labs, or connect the most clinics for that amount would be awarded the project. A business plan would have to be provided to allow the Fund Administrator to confirm the viability of the project, and the award would still need to be accompanied by a contract and service agreements (see Figure 4.5). Fixed subsidies are also appropriate when the Fund is dealing with non-infrastructure projects, i.e. projects that finance users' needs, as is increasingly the case for broadband projects focused on the demand side. These Funds would include fixed subsidies for elderly people or people with disabilities who would be entitled to a monthly or annual subsidy to cover usage costs. The subsidy is likely to be given to the operator and a discount issued to the consumer for ease of administration.

**Figure 4.6: Key Bidding Documents**

| Process Initiation (to Open the process) | In Process Documents (For decision making) | Completion Documents (For Project Implementation) |
|---|---|---|
| • **Expression of Interest** or Request to pre-Qualify<br>• **Request for Proposals (RFP),** also known as the Bid Documents, Tender, or Invitation to Apply (ITA)<br>• **Copy of Draft Licence** (if new licence required/being offered)<br>• **Copy of Draft Financing Contract** (governing the payment of the subsidy)<br>• **Service Agreement** (can be combined with Financing Contract) specifying targets and milestones<br>• **Model Performance Guarantee**<br>• **A bid bond /bank guarantee** provided by the bidder, ranging from one to five percent of the maximum subsidy, to deter companies that are not serious bidders. | • **Mandatory Application Forms**<br>• **Company registration documents,** founding documents, Articles of Association, and other legal documents<br>• **Detailed Business plan** setting out the project approach, financial plan, marketing plan, risks and mitigation, subsidy details, community involvement , etc<br>• **Detailed Technical Plan** setting out rollout plan, geographic and population targets, technology plan, etc. | • **Licence (**if applicable, and only if financing is linked to regulatory process) – a licence to rollout the infrastructure, operate the new network or provide the services if the bidder was not already a licensee<br>• **Financing Contract** (governing the payment of the subsidy by the Fund)<br>• **Service Agreement** (can be combined with the Financing Contract) – the contract (or Annex to the Financing Contract) that specifies the targets and milestones, technical performance requirements, services to be provided, quality of service, etc, as well as penalties and remedies for failure to perform.<br>• **Performance Guarantee** to deter successful bidders from not complying with requirments/obligations |

*Source: Author*

The concern that has been raised with respect to this approach is that it risks being perceived as not transparent. This concern arises in light of the fact that financing is likely to be provided on a first-come, first-served basis or on the basis of subjective "competitive bidding" criteria such as the impact of the project, the track record of the project initiator, the lowest requested subsidy or the perceived economic and social impact of the project. In the case of small, bottom-up and user needs projects, this concern should be weighed against the lack of efficiency, potential bureaucracy and complex processes associated with reverse auctions and smart subsidies. Regardless of the approach, the principles of OBA should be respected.

## 4.7 Learning from Experience – Reflecting on Lessons from USAF Management

### 4.7.1 Why do Funds Work?

Public financing of universal service and access through means other than direct investment and ownership has been going on for twenty years, when USFs were first introduced in Latin America. Much has been learned since then about what works in terms of public funding and what does not work. Despite the myriad of options available for financing projects using public money, the case of universal service funds is instructive and lessons have been learned in over 60 countries that have Funds in place. In light of this experience, a specific section of this chapter dedicated to Funds is warranted. The range of USF implementations and experiences makes it possible to identify trends and principles that may be applicable for public financing in general across a broad range of countries.

There is a significant literature about fund establishment and management. To summarize, the key principles of a successful Fund are accountability, transparency and efficiency. The principles that support these key pillars to ensure sustainability of a project sponsored by the Fund are similar to the pillars identified for OBA in general, and can be summarized as follows:

- Alignment with the national regulatory and policy framework;
- Good governance;
- Technological neutrality in the design and implementation of projects;
- An emphasis on market orientation, sustainability and entrepreneurship;[43]
- Total Cost of Ownership ("TCO") approach and thus incorporation of support for applications, content and training and capacity building in addition to networks and services;
- Increased transparency through explicitly tying of subsidies to targets and defined outputs of a programme, or in the absence of a programme, then a policy;
- Increased accountability achieved by shifting performance risk (and thus project risk) to service providers through well-crafted Service Agreements and contracts;
- Increased engagement of private sector participants, their capital and their expertise by encouraging them to meet identified gaps, often in partnership with the Fund;
- Encouragement of efficiency and innovative approaches through the design of projects that allow the service provides to design their own solutions through least cost subsidy schemes;
- Increased sustainability through the provision of once-off subsidies that are then linked to sustainable long-term service provision;
- Decentralized, bottom-up planning and project definition;[44]
- Innovation and localization of projects and processes; and
- Effective monitoring through the alignment of payments to agreed deliverables/outputs by the service provider.

The above principles highlight the need for financiers to 'start with an exit strategy.' By integrating these principles into the project design and set-up, from inception to contracting to payment of subsidies upon delivery, the financier ensures that its exit from the project is clear up front; as a result, the project has increased potential of being sustainable.

The principle of defining an exit strategy is easier to achieve when networks or infrastructure are being subsidized than when subsidies flow to end-users groups (e.g., schools or persons with disabilities). In the case of end-user group subsidies, the likelihood of an 'on-going' subsidy is higher. The question in this case is generally related to availability and affordability.

### 4.7.2 Fund Challenges

Experience has shown that Funds are not the only public financing solution, nor are they the best one in some cases. A Fund's success is premised largely on its establishment and management. A successful Fund has to be built:

- at the right time, and
- on a solid foundation.

The *right time* is important. A Fund that is built outside of the right policy context and without taking into account the liberalization of the ICT sector in a given country, the level of competition and the types of players in the market is unlikely to succeed. If the decision to establish a Fund is made, a Fund should be established as part of the market reform process and as other forms of funding universal service and access like access deficit charges and cross subsidies are phased out. Countries implementing Funds also have to take into account the existing universal service and access framework, and must consider whether there is a framework for mandatory obligations. If so, important decisions on whether operators will be expected to "pay" or "play" or both should be made. These considerations will affect the structure of the Fund, its collections and its approach to disbursement.

Building a Fund *on a solid foundation* is equally critical. The institutional framework and governance model are important and regardless of the location of the Fund (i.e., in the Ministry, regulator, or independent administration), it should have at a minimum its own dedicated*:*

- Full time Fund Administrator/CEO;
- Board of Trustees or Board of Directors;
- Bank account; and
- Reporting procedures.

It has been recognized that some of the shortcomings of Funds include the high administration and capacity requirements necessary for the government to administer this regime effectively. This is true in terms of Fund establishment where the Fund is a separate organization; it is also true with respect to disbursement of USAF monies. In countries where the Fund is part of the regulator, shared resources are used that can reduce the Fund to a department or unit, and thus reduce its priority if the regime is not properly administered.

**Box 4.10: Why Some Funds Do Not Work**

Some of the pitfalls of public financing have been evidenced in the implementation of USAFs in various parts of the worlds. There are Funds, for example, that have:

- determined levies, over-collected and under-spent;
- determined levies and overspent, i.e., provided subsides for unsuccessful projects or for inefficient use in projects;
- become involved in project *implementation,* through rolling out telecentres and, in some cases, networks;
- not made their collections and disbursements public on a periodic basis; and
- submitted funds to a central fund in The reasury/Ministry of Finance where ICT sector contributions have been used to subsidize non-ICT sector projects (e.g. road projects and property projects).

By their very nature, and in light of the fact that they collect significant amounts of money from the ICT sector, Funds attract attention and risk. The most commonly identified risks facing publically funded projects include:

- Implementation of projects that distort the market;
- Creating dependence on on-going funding (subsidies that are not "smart");
- Potential abuse of funds;
- Potential mismanagement of Funds;
- Favouritism; and
- Project failures which waste resources.[45]

*Source: Author and ITU-infoDev ICT Regulation Handbook*

### 4.7.3 Disbursement Backlogs

Disbursing funds has been found to be a challenge that is equal to or in many cases greater than collecting them. It is argued that between 1998-2006, only 26 percent of USAF funds collected globally had been redistributed to the ICT sector for use on universal access projects.[46]

Regulatel,[47] the regulators' association in Latin America, found that in the 13 Latin American countries with Funds, the amounts collected ranged from USD 1 million in Ecuador to USD 1.8 billion in Brazil at the time (now reported at over 5 billion). Yet only seven of the 13 countries have actually disbursed money from their funds. Notably, unlike the other countries that have disbursed less than 45 percent of the money collected, Chile, Mexico and Paraguay have spent over 95 percent of the money collected. The picture painted in Sub-Saharan Africa is a similar one.

Emerging markets such as India, Pakistan, Mexico, Brazil, Nigeria and Ivory Coast have fared well with respect of the ability to disburse the monies in the USAF. In addition, in the EU where public aid has been provided in terms of the Recovery Plan and through mechanisms other than USAFs, disbursement levels to date are quite high. In 2010, the European Commission adopted a record number of 20 decisions covering aid for broadband development in, among others, Catalonia, Finland and Bavaria, authorising the use of over €1.8 billion (USD 2.55 billion) of public funds for broadband development.[48] Excluding national funding (provided by a specific country on a country by country basis), between 2007 and 2013, a total of €2.3 billion (USD 3.25 billion) will be allocated to broadband infrastructure investments and €12.9 billion (USD 18.3 billion) to information society services through the EU Structural Funds; a further €360 million (USD 510 million) was issued through the Fund for Rural Development and used for broadband funding. In 2009, the EIB invested €2.3 billion (USD 3.25 billion) and a total of €12 billion/USD 17 billion in the last decade in broadband infrastructure.

While disbursement of funds is an achievement, it is important to understand what makes some countries able to disburse monies to projects swiftly and effectively. It seems that the common characteristics of markets with disbursement success stories such as Sweden, Pakistan, Finland and India include:

- clear rules;
- effective public consultation processes; and
- transparent administrative processes.

**Table 4.4: Spending the Money...**

Sample Disbursement of Universal Service Funds

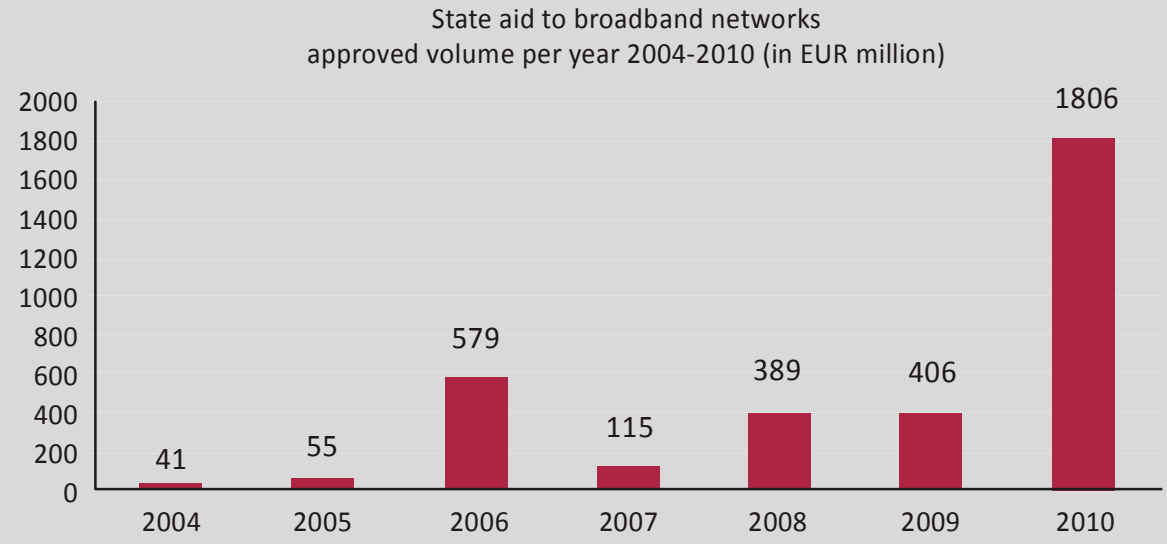
| Country | Collected (USD) | Disbursed (USD) | Comment |
|---|---|---|---|
| **Brazil** | 5.21 b | 3.54 b | - |
| **Hungary** | 13.2 m | 12m | |
| **Côte d'Ivoire** | 28.14 m | 16.65 m | National Rural ICT Project |
| **Nigeria** | 246.66 m | 196.66m | Accelerated mobile expansion programme, ICT enabled learning programme, rural broadband internet programme |
| **Rwanda** | 6.6m | 3.68 m | One Laptop Per Child |
| **Mexico** | 75 m | 65 m | |
| **Australia** | 148.59 m | 148.59 m | - |
| **India** | 6995 m | 2305 m | Rural phones, broadband connectivity support and mobile services support |
| **Japan** | 693.1 m | 693.1 m | - |
| **Malaysia** | 1.35 b | 1.05 b | Community broadband centres and libraries |

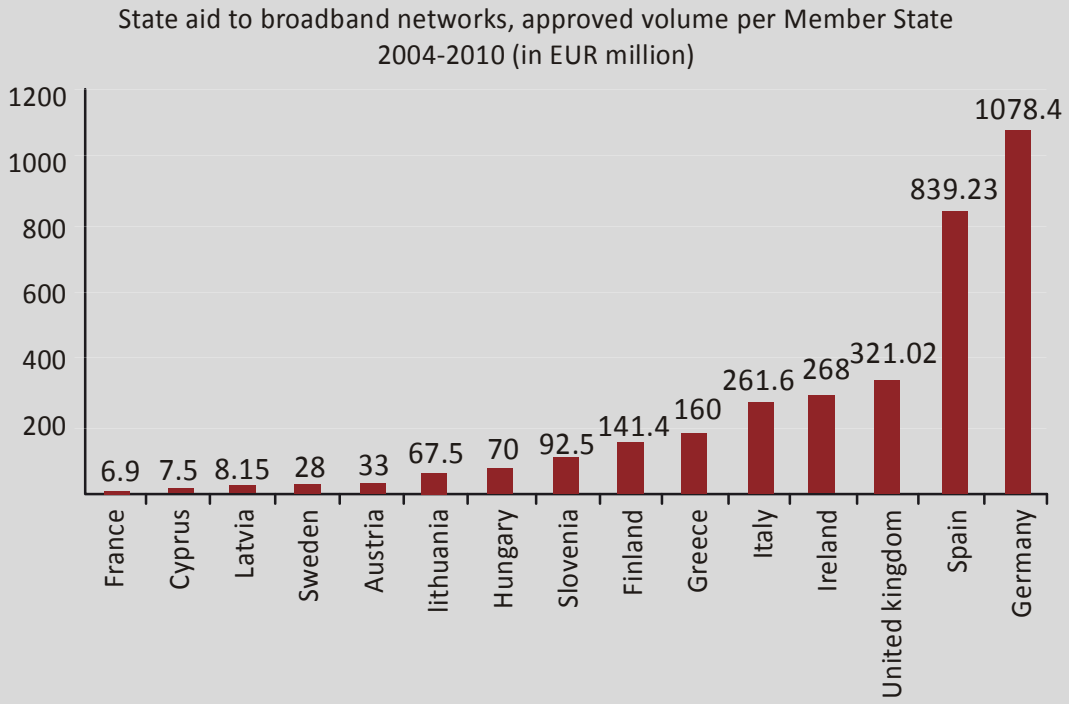
*Source: ITU World Telecommunications Regulatory Database, based on country responses to the annual telecommunications/ICT regulatory survey.*

In addition, good governance is important. Since its dismantling in 2010, the Pakistani Fund has not made the same level of progress with respect to universal access and service.

It is critical that financing is provided in line with the good governance principles discussed earlier. In the United States, despite high levels of disbursement, utilization of funds by the Fund has been plagued by concerns around governance, prioritization and efficiency with respect to the use of the funds. The USA is reforming its Fund to address such concerns, particularly in High Cost Areas.

**Figure 4.7: EU Disbursement – Approved State Aid for Broadband in EU (2004 – 2010)**




*Source: EC State Aid Scoreboard, Spring 2011 http://ec.europa.eu/competition/state_aid/studies_reports/2011_spring_en.pdf*

The disbursement approach will depend on the project being undertaken. This is important to note upfront and in the operating manual to ensure transparency, clarity and stability in the framework. A higher subsidy (above $100,000) requires:

- A larger project;
- A more complex, more open process for larger subsidies (open tender); and
- Fewer Bidder eligibility restrictions (international and local).

In Ireland, for example, the UAS design for the provision of broadband using public financing involved detailed considerations about the requirements that should be placed on the successful bidder and how these requirements should be imposed, with a view to ensuring that the requirements would not distort the broadband market.

In developing countries the disbursement problem does not tend to be one of overfunding specific projects, in part due to the fact that unlike the United States, most developing countries and emerging markets have adopted the least cost subsidy approach to financing projects. In developing countries, the challenges around disbursement have related primarily to fund management and administration and have included issues such as under-spending, carrying over funds from year to year, and depositing funds with national Finance departments, with the result that the funds have been used to finance non-ICT projects and initiatives.

### 4.7.4 Speed of Financing

Another challenge with respect to the utilization of the Fund is the speed of financing. In Latin America, Regulatel found that there are five main reasons for countries being slow to finance projects, namely:

- where the Fund is located with the regulator, the regulator does not prioritize universal service;
- the speed of the political process, as governments fail to pass enabling legislation or hold back approvals for funds to be spent;
- the time needed to design, evaluate and assess and implement projects is significant;
- Since the projects are often considered 'public investments,' they are subject to lengthy approval processes just as any other process utilising public funds; and
- disbursements may be subject to additional constraints from third party organizations such as the IMF and The World Bank.

These challenges are not unique to Latin America and have been evidenced in specific Fund cases in Sub-Saharan Africa and Asia.

### 4.7.5 The Future is Expensive

Recently, as countries have begun to focus on infrastructure rollout, including broadband and fibre optic network rollout and the rollout of Next Generation Networks, it has been found that while these projects will increase universal access from either a supply side (e.g. fibre optic networks) or a demand side (e.g. telecentres, school or clinic connectivity), the monies available in the Fund, or anticipated to be collected by Funds, are not likely to be sufficient to finance rollout. As a result, for larger and more costly projects, regulators and policy-makers are finding that Funds 'don't work' or where they have not been tested, it is likely that they 'won't work'. That is, Funds are not appropriately placed to finance or otherwise support the projects and alternative funding mechanisms become necessary.

Thus, even where Funds remain relevant, it is recognized that they are not well-suited to address all universal service and access challenges, due to high investment requirements and particularly high cost infrastructure projects. The risks set out above are true of financing of universal access projects in the ICT sector generally regardless of the type of funding.

### 4.7.6 The Bright Side

Rather than seeing the potential weaknesses of Funds as an indication that they are doomed or considering that the presence of other financing options is a challenge to the viability of a USAF model, these additional sources of universal access funding can be seen as partners of Funds. Their role is complementary to that of the national USAF. Whether the commitment to provide access arises from licence conditions, a Public-Private Partnership contract, or a concession or contract arising from a USAF bidding process, it is clear that the private sector is considered the main delivery arm for universal access. The role of the public sector is to provide vision and guidance to meet social and developmental needs, to act in the public interest, and to select appropriate partners to work with in achieving such objectives.

As such, in addition to fulfilling their current mandates where this has not been done, as stated in the ITU-infoDev ICT Regulation Toolkit, USAFs in the next generation could move in two main directions, namely:

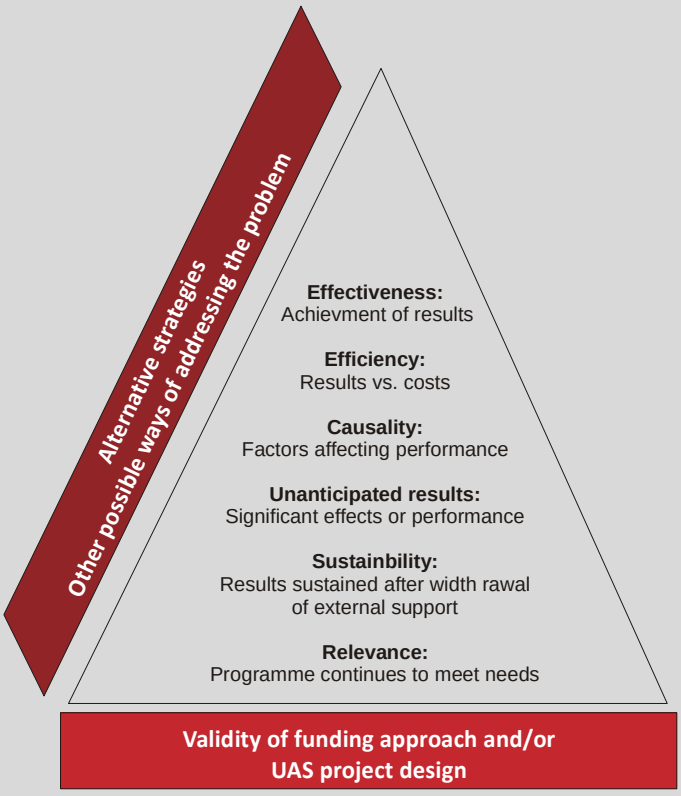
- An increase in importance and role as a facilitator and coordinator that acts as a stimulating force for the market, piloting innovative rural service and application concepts, creating demand for advanced ICT connectivity and services (e.g., through financing broadband access for schools, more direct support of users and applications) and an enabling environment, and
- A funding mechanism for broadband networks into rural and unviable areas through support both at the retail end (e.g., shared access), as well as at the wholesale end (e.g., through intermediary network facilities such as backbones, wireless towers and other passive infrastructure).

These approaches will be most effective if pursued in collaboration with other ICT sector financiers such as NGOs and development partners, which can play a further critical role in financing and facilitating applications and capacity building rather than network reach.

## 4.8 Monitoring and Measuring: Ensuring a Return in Investment ("ROI")

Financing universal service and access must be approached in a strategic and coherent manner for it to be effective and deliver the desired ROI, which can be defined by the public sector not only in terms of revenues, but also in terms of social and economic impact. Universal service and access funding's role does not end with the allocation of monies regardless of what type of funding is provided and through what model it is dispersed. The UAS financier should follow the projects that have been implemented in order to monitor them and to evaluate them. Only through an analysis of the effectiveness and efficiency of the funding and the related projects can a proper assessment be made. This includes considering what was expected to happen and the unintended consequences, both negative and positive, of projects driven by public funding.

**Figure 4.8: Monitoring and Evaluation: Measuring 'ROI'**




*Source: Adapted from Core Evaluation Objectives, ILO, 2007.*

## 4.9 Conclusion

In conclusion, while the technologies that are being introduced today are new and their applications are innovative, it is increasingly clear that the fundamentals relating to achieving and financing universal service and access remain essentially the same. Unlike in the 1990s when universal service funds were first being developed and alternative funding models were still being explored, ICT sector policy makers, regulators and Fund Administrators now have almost two decades of experience with universal service and access policy and with financing universal service and access to draw upon as they tackle the challenge of bridging of the impending broadband divide.

This chapter has introduced the various types of ICT financing and in particular has considered the different flavours of public funding and how they apply in a broadband context. It has demonstrated that while properly constituted and managed Funds are a viable option, they are not the only option for financing high cost networks in what are considered 'high risk areas'; nor are they the only approach to financing the demand-side – users, devices and content. A positive return on investment depends on having the private sector play its part in rolling out infrastructure and services and where feasible, self-financing broadband rollout. Moreover, achieving high ROI requires having the right policy and regulatory framework in place – one that does not distort the market. Thus equity investments, financial incentives and subsidies, and PPPs can best be applied only where the market is well understood and where it is clear what supply-side and demand-side levers need to be pushed in order to get the desired result.

To achieve this, in addition to good governance and good project design, monitoring and evaluation are key. These are factors that have been present in successful USAF frameworks, where Fund Administrators have had successes in collecting sufficient funds, in disbursing them in a manner that is aligned with the universal access and service strategies and definitions in place, and in meeting the national goals and targets that increasingly include access to narrowband internet and broadband.

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1 Key Global Indicators for the World Telecommunication Service Sector, ITU www.itu.int/ITU-D/ict/statistics/index.html

2 Idem.

3 Throughout this paper, reference to broadband implies a speed of over 256 Kbits/sec which is the minimum broadband definition.

4 Defined as over 256 Kbit/second.

5 World Bank based on TeleGeography and Wireless Intelligence Databases

6 ICT Regulation handbook, Chapter 5 dealing with Universal Access and Service www.ictregulationtoolkit.org/en/Section.3116.html

7 www.assemblee-nationale.fr/13/dossiers/protection_information_consommateurs.asp

8 Internet Policy, www.i-policy.org/2010/09/costa-rican-constitutional-court-declares-internet-access-a-fundamental-right.html

9 Communication from the European Commission, European Broadband: investing in digitally driven growth (2010), available at: http://ec.europa.eu/information_society/activities/broadband/docs/bb_communication.pdf (Last visited March 29, 2011).

[10] See Katz, GSR 2010 where the concept of "critical mass theory" with respect to broadband is discussed. In terms of the theory, due to network effects, the economic impact of broadband is said to increase exponentially with penetration of the technology.

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[48] See Complete list of EC decisions at http://ec.europa.eu/competition/sectors/telecommunications/broadband_decisions.pdf