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Next Generation Access Networks: Policy & Regulatory Challenges

salience whitepaper

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Executive Summary

In 2011 the ITU's Broadband Commission for Digital Development established four targets for tracking universal access to broadband with the first target being on making broadband policy universal – i.e. by 2015, all countries should have a national broadband plan or strategy.

As governments plan these initiatives they are facing different practical challenges on the regulatory front in defining the policy and the specific measures, as well as choosing the right model of intervention.

We believe that the government intervention in development of Next Generation Access (NGA) is usually due to three factors:

1. There are inadequate incentives for incumbent telecom operators to rollout NGA networks.
2. Demand for high-speed services may be too uncertain or insufficient in the near term.
3. Government have a broader set of policy objectives which reflect the positive externalities of NGA roll-out.

There are a number of key considerations that governments need to address when defining their intervention approach such as:

- Whether to promote NGA monopoly over a more competitive model;
- Geographic scope of the intervention i.e. on a national basis, on a local city basis or only at economically non-viable areas such as rural communities;
- Whether the intervention is to be limited to the wholesale space or include retail services as well;
- "depth" of intervention i.e. passive infrastructure only or extending to active network.

Based on analysis of various initiatives by different governments we conclude that governments have in effect two main levers of intervention:

1. Financial assistance – long term loans or equity holdings in NGAs, targeted operating subsidies, tax incentives and preferential procurement terms;
2. Regulatory measures – licensing; separation of the incumbent and/or nationalising the assets; access regulation; mandating infrastructure sharing and coordination between different telecom operators and different government entities involved in deployment of civil works infrastructure; and regulatory incentives

One of the most important principles that regulators try to enforce when regulating NGA is the principle of Open Access, which generally refers to the requirement that the terms and conditions of infrastructure service provision be non-discriminatory. In practical terms this refers to:

- treating all its customers (service providers) in a non-discriminatory fashion
- If the incumbent has its own downstream service provider, treat such entity in an equivalent manner as it does with non-affiliated service providers.
- Provide its infrastructure on a fair and reasonable basis regarding both price and other terms and conditions.

The commercial basis of the agreement between the NGA service provider and the NGA service seeker needs to be developed to align with the principle of open access and also to incorporate all other components that define a robust service offer. From our experience the key components of a typical wholesale agreement need to include:

- Service descriptions
- Network demarcation points – service access points
- SLAs (provision time, repair time, availability)
- Operational Processes (order, provisioning and fulfilment, repair, billing)
- Rollout-expectations
- Pricing Schedule
- Legal Terms (insurance & liabilities, contract duration, disputes)
- Ancillary services

Obviously the key negotiation point in this agreement is the pricing principles that are used to define the price of the wholesale FTTH service. There are basically three approaches that are found in regulatory practice to regulated pricing: retail-minus, benchmarking and cost-orientated pricing. There are some special considerations, related to pricing of legacy access network and cost of capital, which may need to be addressed in order to achieve optimal cost-oriented pricing.

Although our paper provides various views, opinions and recommendations based on our practical experience dealing with NGA policy and regulation across different countries, we conclude that each specific market has individual challenges that need to be analysed. However, despite the diversity of experience, a coherent and rational set of policies is required to encourage NGA deployment optimally over time. Moreover, as many countries have already implemented NGA there are enough cases that we could now utilise to draw out the lessons learned therefore making the creation and adjustment of the new government initiatives much smoother and robust.

Introduction to Next Generation Access Networks and why Government intervention is often needed

What are Next Generation Access Networks?

Although there is no universally agreed definition of Next Generation Access (NGA), most make reference to a fixed access network capable of delivering throughput speeds above that which is generally available using existing local copper-based access. There are different views about where that threshold speed lies. It can be anything from 20 Mbps, which generally represents the upper limit of ADSL copper based technologies, on up. For the purposes of this paper we are considering as NGA Networks those that are being introduced nationally or locally and deliver bandwidth by employing extensive optical fibre roll-out or fibre roll-out in conjunction with new copper technologies.

Why is Government intervention taking place?

We have seen many examples over the last several years of governments intervening to support the development of NGA networks. Intervention has taken a number of forms, but there are some common challenges that explain why such intervention is considered necessary:

- **Adequate incentives may not exist for incumbents to invest in NGA roll-out**. An incumbent dominant service provider may be very slow to embrace new technology and have little incentive to invest in networks capable of offering high speed access when there is no competitor threatening its market share. Furthermore, they may prefer instead to "sweat" their existing assets or avoid cannibalizing their existing products.
- **Demand for high-speed services may be too uncertain or insufficient in the short term.** Consumer demand for or expected adoption of NGA services may not justify a business case for either incumbents or new entrants.
- **Governments have a broader set of policy objectives** that are dependent on a modern telecommunications network infrastructure to provide high speed data services. These may include increasing ICT contribution to GDP to facilitate economic diversification or a transition an economy away from reliance on older industries or shrinking natural resources; job creation; and increasing the availability of e-government services to provide easier consumer access to services and to capture potential government cost-savings. Thus, governments have a view of the positive externalities that NGA deployment may bring – externalities that are not a part of supplier and consumer decision-making.

Of course public policy is determined by the interaction of a variety of stakeholders each with different objectives, responsibilities and priorities. One of the prime objectives of an ICT sector regulator (sometimes together with a Competition Authority) is to ensure fair competition and to prevent market distortions such as the abuse of a dominant position. On the other hand a Ministry charged with the development and greater use of ICT may be less interested in market competition per se and focussed primarily on how quickly ICT capability and the necessary telecommunications networks can be developed. A Ministry of Finance will have as its main priority ensuring a return on

investment, may have budgetary restrictions, and will be less interested in the market structure itself. Existing service providers will naturally attempt to influence public policy as much as possible. Their positions and efforts to influence the process will depend on their respective business strategies. Consumer groups often organized to lobby for policies that they perceive will lower prices, increase quality and provide greater choice.

Stakeholder	Primary objectives
Telecom Regulator	Fair competition, prevent market distortion, prevent abuse of dominant position
ICT Ministry	Development of ICT sector, increase of ICT contribution to GDP
Ministry of Finance	Return on investment, distribution of budget and budgetary restrictions
Telecom Operators	Increasing revenue from new services, increase margins, increasing market share
Consumer Groups	Lower prices, increase in quality, increased choice

Figure 1: Different stakeholders influencing the public policy on NGA

Furthermore, these stakeholder groups (and various stakeholders within each groups) will have differing degrees of influence on the policy development process. Finally, the public policy objectives and priorities will change over the course of market evolution, so, for example, deploying infrastructure will be of particular importance in early stages of market development, while increased competition may become increasingly significant to sector performance as markets mature.

So deciding how best to intervene to support Next Generation Access involves a complex balance of diverse and evolving interests and priorities. A solution adopted in one market is not necessarily suitable in another, but all are worthy of consideration. Ideally, policy-makers will be able to make use of all relevant stakeholder contributions while developing and modifying a coherent and rational set of policies to encourage NGA deployment that are appropriate to the specific requirements of the market over time.

Government options for intervention and support

When deciding how to intervene to accelerate the development and roll-out of NGAs, governments have a broad range of options at their disposal.[1] We divide up these options into "structural" options, i.e., the choices as to the dimensions of the market into which governments might intervene, and "implementation" options, i.e., the specific types policies and regulations, governments may choose to achieve the their objectives.

Structural Options

The main structural options for governments to consider are:

- **Monopoly or Competitive Market:** It is generally accepted in most countries that wherever possible governments should encourage competition in the provision of telecommunications networks and services. However opinions differ regarding the sustainability of competition in the case of fixed access infrastructure, where arguments are often put forward that this is a natural monopoly. With the advent of mobile broadband, which increasingly can provide high speed data services to the home environment, this thinking is changing, but an essential question for governments to ask themselves in intervening to support NGA development is should the NGA infrastructure market be the domain of a monopoly or dominant provider (with appropriate regulatory safeguards to ensure that prices are fair and all service providers are treated equally) or should new entry be encouraged and facilitated, as in the services market?

- **Geographic Scope:** If the government chooses to intervene, it will have to determine the geographic scope of its efforts:

  Nation-wide: This option has been adopted in a number of countries, where governments have created a broadband infrastructure service provider on a national scale. The decision to adopt this option may be triggered by dissatisfaction with the progress the incumbent telco has made in modernising its network and extending access to all communities. Consequently a new entrant is granted a licence to build and run a National Broadband Network (NBN) exclusively with assets transferred from the dominant firm (e.g., as in Australia or Singapore) or in competition with the incumbent, either in existing areas where NGA has already been rolled out, or in new areas as well (e.g., in Qatar, Oman). Alternatively the incumbent may be encouraged to develop a countrywide NBN with additional Government funding.

  Local/Municipality: A less radical option than the NBN model is to encourage NGA build in individual cities or local areas. This option is typically undertaken by local, rather than national, governments. Examples are found in Europe and the United States. There are advantages to this approach – e.g., lower funding commitments and encouraging more players to participate in the market – but also potential disadvantages in that coverage could be geographically patchy and technology choices could vary, leading to different capabilities and fewer economies of scale.

[1] We note that this paper does not deal with specific technology choices, among which governments may be required to opt for, nor does it look at policy choices that deal with encouraging the adoption of high-speed data services.

Rural/Economically unviable areas: Governments may also restrict their intervention to those areas of the country where the commercial case for deployment is particularly challenging. Interventions of this type may be part of an existing universal service program or a specific initiative to bring broadband to rural areas. This has been the approach in the UK, where areas, which BT has concluded, are not commercially viable for NGA roll-out has been the focus of government FTTC stimulation initiatives.

- **Market segments**: Decisions would need to be made as to whether the government's initiatives should be restricted to addressing the wholesale market or include intervention in the retail market as well. These are important issues for governments to consider, requiring careful thought as increasing intervention in downstream markets increases the probably of market distortion and increases the complexity of regulatory and competition issues.
- **"Depth" of Intervention in Access:** Governments will have to choose what types of access infrastructure requires intervention for deployment. In some cases, the government initiative is to support both active and passive infrastructure networks. However, as one of the main barriers to entry in the fixed telecommunications market is the cost of building fixed passive infrastructure, i.e., the civil works involved in laying ducts, installing poles, where these are used, as well of course as the actually laying of cables. In an effort to restrict the level of intervention, governments could restrict themselves to specific types of passive access infrastructure.

Implementation Options

All of the above structural options can involve Government support either financially or through various forms of regulation as summarized in Figure 2 below.

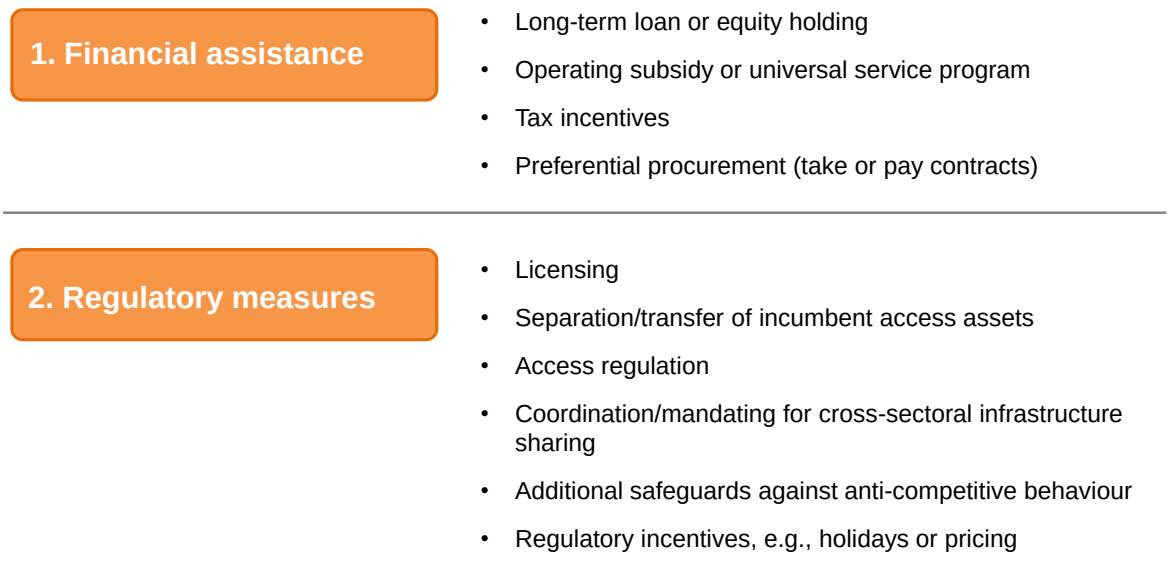

Figure 2: Different government intervention options

With respect to financial assistance, governments may use a wide range of means to support NGA roll-out:

- **Long-term loan or equity holding.** Government funding directly of a NBN or Local/City network company may involve a preferential loan or equity stake. With an equity holding a government may decide to require a commercial return or merely a return on investment consistent with that required from other public bodies.
- **Operating grant.** In this scenario, the government provides funding to the operator(s) or local authorities to support the roll out of NGA in their areas. In many universal service-type programs, the telcos concerned can bid for funds as part of a contract to be awarded. The approach can be competitive or not, but typically would involve some oversight and conditionality regarding in the way in which the funding is used.
- **Tax incentives**. Governments may provide relief in terms of corporate taxes or import duties in order to increase the resources available for investment.
- **Preferential procurement.** Governments in their capacity as major consumer may commit to take up a certain amount of services from the NGA on beneficial terms, e.g., take-or-pay contracting.

Government also have numerous regulatory means for achieving NGA objectives:

- **Licensing.** The policies governing the issuance of authorizations that are required to establish NGAs and provide high-speed broadband services can be used in a number of ways. These authorizations can be made available to more players. The terms on which they are issued can be simplified and made easier to comply with. Finally, obligations embedded in the authorization that deal with, for example, roll-out or conditions under which services are provided can be tailored to government's specific objectives.
- **Separation/Transfer of incumbent assets.** Another regulatory initiative that can radically change the structure of the access market is the transfer of infrastructure assets from the incumbent. This could occur, for example, if a Government had decided to separate an incumbent's local access infrastructure from its other businesses and to focus competition on the services market. The access network would then become structurally separated from the rest of the incumbent's business or transferred to a new entrant. This approach has been adopted in Australia with the establishment of NBNCo. It is not however without complexity, particularly if some or all of the entity whose assets are to be transferred is not in public ownership. On the other hand a model that focusses competition at the services level with one NBN provider at the wholesale infrastructure level gives clarity and can be effective with the appropriate regulatory approach.
- **Access Regulation.** Access regulation is the means by which the government ensures that NGAs are a) utilized in a non-discriminatory manner and b) priced in a reasonable manner. An extension of access regulation is mandating telcos to share civil works or other passive infrastructure, i.e. if one telco is installing ducts it must provide access for its competitors. We discuss access regulation in more detail in the next section.
- **Cross-sectorial infrastructure sharing.** In a number of countries public utilities, e.g., water and electricity companies will already have existing duct or other infrastructure networks and whilst

these may not always be suitable, in many cases their transfer to a new entity could facilitate earlier market entry than would otherwise, if it had to build everything from scratch. Aside from outright transfer, the government can undertake a number of measures to facilitate making these infrastructures available for NGA deployment. The government could mandate access to the infrastructure much as it might do to a dominant telecoms network. Finally, governments can coordinate or facilitate voluntary use by ensuring that the legal framework exists to allow for infrastructure sharing or sponsoring relevant utility infrastructure mapping.

- **Additional safeguards against anti-competitive behaviour.** In the case in which the access network provider is dominant and also providing downstream services in competition with other service providers, additional safeguards may be required to ensure that the access network provider does not abuse its dominant position. In terms of ex-ante regulation, regulators may require the access network to prepare financial reports that separate the performance of the upstream and downstream businesses. Such accounting separation may allow the regulator to detect anti-competitive arrangements, i.e., cross-subsidy from the access network business to the downstream retail business. Related to this, are imputation tests, applied on an ex-ante or ex-post basis, which are calculations designed to demonstrate that wholesale and retail service pricing do not result in an anti-competitive margin squeeze for competitors.

- **Regulatory Incentives.** In addition to the above there are a range of options that can be used to support new NGA entrants in the early stages of market entry or indeed to encourage existing incumbents to invest in NGA. These include:

  Regulatory holidays, i.e., where regulation is removed or lessened in the early stages of NGA development. This may range from the removal of regulation completely to allowing a dominant operator freedom in price setting, for example, for a period of time, so as to encourage more ambitious investments.

  Regulated pricing incentives to stimulate NGA investment through, for example, adjusting the regulated pricing of legacy products such as copper local loop unbundling or adjusting the risk premium the cost of capital for on wholesale NGA services.

Access Regulation

Regulatory Objectives

In our discussion above we distinguish between various types of government intervention. Regulation is one form of government intervention. They are the explicit rules that the government implements to achieve their policy objectives. In some cases, such rules are not necessary for the government to achieve its objective: adequate incentives and signals in the marketplace deliver the results that society and government desire. In some cases, the government can undertake one-off structural changes to create a market environment that can lead to similar result without additional regulation.

Of course, structural changes in the market and regulation are inter-related. Some structural changes are engineered through regulation, e.g., increasing market entry through licensing. In any case, governments must ensure that regulatory regimes evolve with structural change, whether that change is government instigated or simply an organic evolution of the market.

Best international practice in government policy in telecommunication markets since at least the late 1990s has been to favour structural changes to allow competition to produce desired outcomes for consumers. The predominant philosophy has been to intervene with regulation only in the case where competition fails or is highly likely to fail at producing those outcomes. With respect to access networks for the delivery of high-speed broadband services, simply passively facilitating market entry has very rarely been viewed as a reliable means of promoting development. Regulation has therefore remained a mainstay of government intervention.

Even since the mid-2000s, when many national and subnational governments began to undertake a new round of structural initiatives—structural separation of access networks, subsidies, promoting municipal networks, etc., regulation and, in particular access regulation, remained a critical feature of NGA network provision. This is because, governments recognize that the full benefits of broadband access networks are likely to be captured if they are made available to service providers on an open, non-discriminatory basis.

In this section, we look at what forms of access regulation is typically implemented in relation with the respect to NGAs.

Elements of an Open Access Regime

Open Access generally refers to the requirement that the terms and conditions of infrastructure service provision be non-discriminatory. Such non-discrimination is key to enabling third-party operators to compete fairly against one another and, particularly in the case of vertical integration, against any advantage being given to the downstream affiliate of the infrastructure service provider itself.

Access principles require that the access network provider treat all its customers (service providers) in a non-discriminatory fashion. If it has its own downstream service provider, it must treat such in an equivalent manner as it does non-affiliated service providers (at arm's length). Non-discrimination may be enforced simply in terms of the products, i.e. the products must be the same

(Equivalence of outputs), or it may be enforced in terms of inputs, i.e., the infrastructure services are to be provided to all within the same timeframes, service levels at the same terms and conditions and largely the same systems and processes (Equivalence of inputs). With the latter, the Open Access requirements must be expanded.

In some contexts the term "Open Access" refers only to non-discrimination, implying that the infrastructure service provider may freely set the terms of access, so long as those terms are provided on a non-discriminatory basis; however, more often than not non-discrimination will be only a part of a set of requirements to ensure that the access is provided on a reasonable basis. The most obvious example of this is the regulation of the price on which access is offered. In this paper we used this broader definition of Open Access.

Open Access can apply to any element within the access network from the passive to the active. Passive elements could be anything from external ducts, manholes, cabinets, internal ducts, risers, cable trays, telecommunications rooms and other necessary collocation space, dark fibre, etc. Active infrastructure may include layer 2 network at the access node, but also may include routers and servers which are found in the core network but are used for the provision of access services, such as bitstream access and virtual unbundled local access products.

Open Access provisions also typically have specific requirements regarding

- **Access points**, i.e., where service providers must be able to connect with access network, e.g., the ODF, telecom room, distribution points (manhole or cabinet), distribution box)
- **Topological/configuration**, i.e., requirements designed to achieve quality of service targets and/or ensure that adequate capacity will be available for multiple service providers.
- **Minimum service level**, which deal with service delivery, fault cessation and repair
- **Transparency**, regarding infrastructure inventory and placement as well as terms and conditions. Dominant players are generally requested to make public their reference price catalog, so that to ensure non-discriminatory behaviors between competitive players.

Open access regulation may be extended beyond dominant telecoms network operators to encourage more ubiquitous infrastructure sharing. Regulators may require dominant as well as non-dominant telecommunication network operators or indeed other infrastructure providers to coordinate their activity or share part of their infrastructure. Similarly, regulators may also require that certain types of infrastructure deployment (e.g. water, energy, transport or sewage networks) include provisions to facilitate NGA deployment. This opportunity should be offered in a transparent and non-discriminatory way to all interested operators and should in principle be open to all potential users and not just communications operators (i.e. electricity gas, water utilities, etc.). Such expansion in the scope of regulation introduces some additional practical and commercial issues, which need to be resolved, but can be very effective in reducing costs and timescales.

Most if not all of these requirements are captured within the commercial offer between the network access provider and its customers. We look in more detail at the key elements of these agreements next. We then turn to one of the most significant provisions of the access agreement – pricing and discuss various approaches to price regulation.

Key elements of a commercial wholesale offer

Regardless of the market or structural options adopted by a government to promote roll out NGA, there is usually a requirement for the NGA operator to develop a wholesale offer, which sets out the terms on which the NGA operator's services are provided to its customers. The scope of the agreement will be driven by the types of infrastructure services offered. Wholesale customers may also have their own infrastructure or may rely solely on the NGA operator for access services.

Depending on the regulatory approach and the competitive environment, regulation may determine in great detail the content of an offer and agreement, or this may be left entirely or predominantly to negotiation between the parties concerned with the regulator only intervening in the case of a dispute. Publication may be mandated by the regulator or the terms may be kept confidential. However in all of these cases the same key elements of the agreement will need to be addressed. It should be noted, though, that developing a wholesale offer and agreement involves a complex set of negotiations and wholesale operators often underestimate the time and effort required to reach agreement.

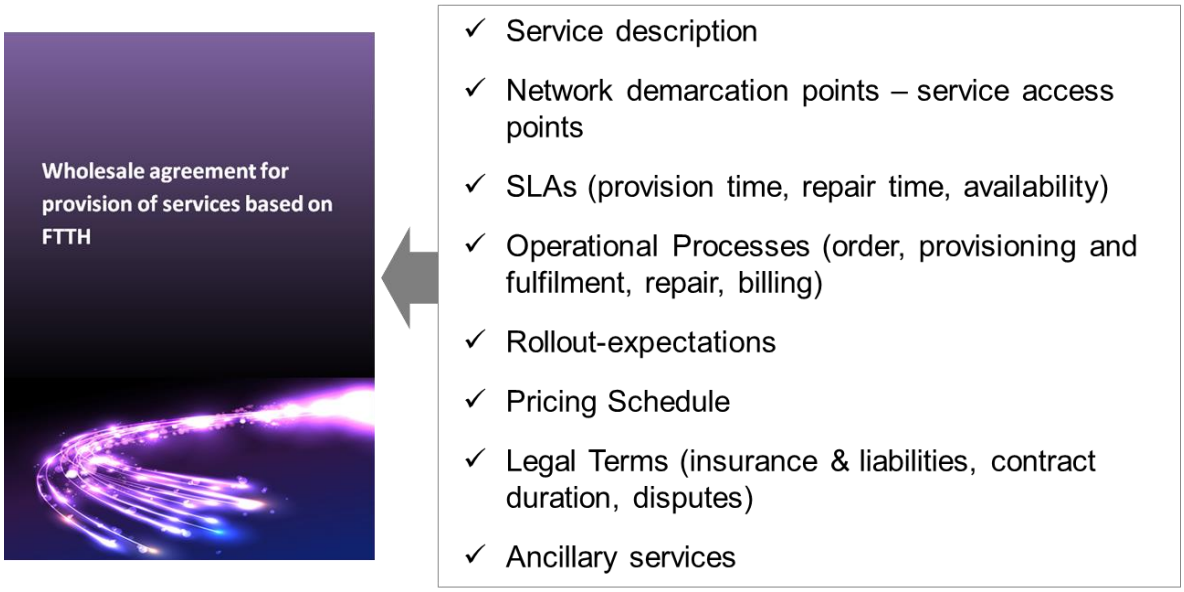

Figure 3: Key elements of commercial wholesale offer

- **Service descriptions**: It may seem self-evident, but the services to be offered need to be clearly and unequivocally defined if problems and misunderstandings are to be avoided at a later stage. If this is done properly, the supplier (and most importantly the supplier's employees and agents) will know exactly what his obligations are and the customer likewise will know exactly what service to expect.
- **Clear demarcation points and responsibilities:** The wholesale arrangement is of course only part of the end-to-end service provided to a retail customer. The wholesale supplier must take responsibility for the service which he provides and needs to establish clear demarcation points which allow him to test his network and to which the other party can connect its equipment.

Each party needs to be clear where its responsibility starts and ends and what equipment it may access or not.

- **SLAs/SLGs:** Service Level Agreements and Service Level Guarantees are increasingly expected in wholesale supply arrangements as well as for some retail services. They may be targets or commitments backed with a guarantee. They may also be mandated by the regulator in respect of services to end users, so the wholesale supplier may be asked to provide SLAs or SLGs which allow its customers (ie the supplier to the end customer) itself to provide guarantees. Failure to meet a particular SLA/SLG may also incur financial penalties. This issue is often very contentious in wholesale negotiations as it is quite difficult to agree how to apportion fairly between two suppliers the appropriate parts of an end-to-end SLA/SLG. Striking the right balance between what is practicable, what is desirable and the respective costs involved can also be challenging. Moreover in cases where the wholesale supplier is a new entrant, the company may still be unsure what targets are realistically achievable and be concerned particularly about financial penalties for non-compliance. Typical elements to be covered in a SLA/SLG are:
    - **Provision times**, i.e. the time to provide service following receipt of an order. Telcos have always struggled with this issue. There are likely to be exceptions and different target times to take account of issues such as coverage and network roll-out.
    - **Repair times/MTTR (Mean Time to Recovery).** These can be more manageable with the correct processes, resources and less fault prone modern technologies. Agreeing a time period which works for both parties is nonetheless a difficult negotiation point.
    - **Availability.** This is increasingly an element included in telecommunications SLAs and SLGs as it has been for some time in the IT sector.
- **Operational Processes on Ordering/Provisioning/Repair**: These are important practical issues, but in principle should be relatively straightforward to agree. There may however be a need to compromise between different processes and systems and a requirement for transitional arrangements whilst longer term processes are established. Repair processes need to reflect respective responsibilities and will require good information sharing and a partnership approach. A new entrant may struggle in negotiations with a more experienced provider, if it is still in the stages of developing its own processes.
- **Legal issues:** Common to all commercial agreements there are a number of legal issues that will need to be addressed in any wholesale agreement. These include:
    - Insurance, indemnity and liability provisions, such as what are the legal and financial consequences if one party's network is damaged by the other or employees are injured.
    - Contract duration, termination and suspension.
    - Arbitration, conciliation and dispute procedures, i.e., if things go wrong how should they be resolved, at what stage should legal action be taken etc.?
- **Roll-out expectations:** In cases of new network roll-out, whether on a national or local basis, the wholesale provider will need to set out its roll-out plans so that its customers will know when and in what areas orders can be taken. Network roll-out and coverage requirements are likely to be mandated by a government or regulator, at least in general terms, though they may

also take account of expected end user demand. So co-ordination is important between the wholesale supplier and its customers.

- **Pricing:** Pricing understandably is the most difficult issue in any wholesale negotiation and the subject on which a regulator is most likely to intervene**.** The wholesale provider can expect to be challenged robustly in negotiations and therefore will need to demonstrate that its proposed prices are based on a good understanding of its costs and have at least done some benchmarking with other similar services and markets. Also if a new entrant is negotiating with an incumbent, the incumbent is likely to have a better understanding of costs and greater experience in this type of negotiation. The underlying rationale for a wholesale provider's prices will depend on whether its prices are regulated and on what basis, or whether it has more flexibility to set its prices taking account of the return on investment expected by its investors. Pricing issues are covered in more detail in the next section of this paper.
- **Billing:** Billing arrangements are an important, though usually uncontroversial issue. There may be a need for transitional arrangements pending longer term solutions and a need to agree a process to resolve billing disputes, which may involve regulatory considerations or intervention.
- **Ancillary Services:** These may include, for example a co-location service to allow the other party to put its equipment in the wholesale provider's Central Office, Building or Equipment room or telecommunications services, such as backhaul. These services involve their own complexities such as whether pricing can be market driven or is regulated.

Pricing issues

There are typically two major concerns for access providers regarding the pricing of access infrastructure: that the prices allow 1) for the recovery of the cost of the deployment and 2) for an appropriate uptake of end-user services. For regulators and competitors, in the context of vertical integration, there is the additional concern that prices are consistent with fair competition between the access provider and access seeker in a downstream market.

There are basically three approaches to pricing that are found in regulatory practice: retail-minus, benchmarking and cost-orientated pricing. Depending on the objective of the regulator, the availability of data and the maturity of the market, the three models are found throughout the world. However, in mature markets where clear dominance is proven, more sophisticated cost-orientated pricing tends to be preferred.

	Price Setting Basis	Pros	Cons
1	***Cost-orientated*** *Predominant form being Long-run Incremental Costing* (variations include "bottom-up and "top-down")	▪ Cost causality explicitly modeled ▪ Efficiency may be core attribute of modeling (bottom-up) or introduced through adjustments (top-down) ▪ Best practice in developed world	▪ Modeling is complex ▪ In the pursuit of modeling an efficient network, costs may diverge from a level that are actually achievable ▪ Reconciliation with financial accounts difficult
2	***Benchmarking***	▪ No modeling required ▪ Can be scoped to achieve different policy objectives, e.g., consistent with regional practice, consistent with recent LRIC studies, etc.	▪ No cost causality explicitly identified, which may mean that, even if benchmarks are cost-based, rates may diverge from actual costs ▪ It is virtually impossible to find matching market conditions necessary for valid benchmarking
3	***Retail minus***	▪ No modeling required ▪ Easy to implement ▪ Prevent unnecessary price wars and therefore ensure higher stability of the market	▪ May bear no relation to cost ▪ Only appropriate where a retail service exists

Figure 4: Comparison of different pricing approaches

There are two additional issues that arise with respect to next generation access pricing. The first is the fact that next generation access is often being deployed alongside an existing legacy infrastructure. These two networks in many cases, even if they are provided by the same access network provider, are effectively competing against one another. Thus, the relative prices of the

services of the two access networks may be an important factor in the roll-out and take-up of NGA services.

The relationship between the two sets of prices is not straightforward and can vary depending on market structure, existing fibre coverage, demand and supply elasticities, and so on. Furthermore, in some contexts, although the regulatory environment also affects incentives to invest, the dominant driver for incumbent investment in fibre networks is platform competition.

Secondly, it is widely recognized that next generation access deployment involves an additional risk that is significantly higher than legacy access investment. In particular, as noted in the European Commission Recommendation (2010)[2] there is greater uncertainty with respect to:

- Retail and wholesale demand;
- The costs of deployment, civil engineering works and managerial execution;
- Technological progress;
- Market dynamics and the evolving competitive situation, such as the degree of infrastructure-based and/or cable competition.

Thus when setting a wholesale access charge to fibre, a risk premium is often considered appropriate to compensate for these additional risk elements by allowing ex ante higher payoffs to recover the investment.

Finally, we note that depending on the type of government intervention involved, cost-based pricing may have to reflect other special considerations. For example, other things being equal, if the government is undertaking the access deployment, e.g., through a state-owned entity, the cost of capital may be very different than were the investment carried out by a private entity. Governments can, for example, diversify their investment risks over many beneficiaries. Moreover, the liquidity of government bonds ultimately comes from the government's sovereign power to tax. The cost of capital under such circumstances arguably is much lower.

[2] Commission Recommendation on regulated access to Next Generation Access Networks (NGA), http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010H0572&from=EN

Conclusion

Although our paper provides various views, opinions and recommendations based on our practical experience dealing with NGA policy and regulation across different countries, we conclude that each specific market has individual challenges that need to be analysed. However, despite the diversity of experience, a coherent and rational set of policies is required to encourage NGA deployment optimally over time. Moreover, as many countries have already implemented NGA there are enough cases that we could now utilise to draw out the lessons learned therefore making the creation and adjustment of the new governments' initiative much smoother and robust.

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Ivan Skenderoski, Managing Partner

Ivan has more than 15 years of experience working in the telecoms sector across Europe, East Asia and the Middle East. Ivan has acted as a senior advisor for various operators in the Middle East region to define their national broadband strategies and supported subsea cable operators define their business model and gain investment.

Prior to that Ivan held various roles in BT in management and technical consultancy domains and worked on projects in the UK, Singapore and India. He was also responsible for setting up and heading BT's Asian Innovation Team in Malaysia. Ivan is regular speaker at telecom conferences on the subject of broadband strategies.

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Salience Consulting provides advisory services for telecom operators, governments and private investors in the Middle East. At our core we are a group of technical and management consultants who have been delivering telecoms projects in the Middle East for the past 10 years. Our regional knowledge and client expertise positions us at the forefront of telecommunications in the Middle East.

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