

## I. **Market Assessment: Objectives and Scope**

The objectives of the Panama Telecoms Sector Market Study (“Market Study”) are as follows:

- To characterize the current size of the market and demand for provision of dedicated high-bandwidth services on a wholesale or retail basis (referred to generically as “Bandwidth Services”);
- To estimate the coverage of a network that is 1) generally capable of meeting the established market demand, and 2) can feasibly be constructed using ETESA’s rights of way (ROW);
- To characterize the current size, demand and growth potential of the significant segments of this market;
- To take into account of key factors that may influence the various market segments (e.g., geographic/regional variations; vertical market segmentation by type of activity; etc.);
- To estimate, insofar as possible, the current and revenue potential of the various segments for a new entrant into the Bandwidth Services field;
- To evaluate the competitive positioning of such a new entrant;
- To examine the possible implications of the findings for ETESA’s market entry strategy.

### A. **Working Assumptions**

Any systematic telecoms market study is necessarily conducted under a variety of working assumptions. While many of these assumptions are self-evident, it is useful to enumerate them at the outset. Provisionally, they may be divided into assumptions about coverage, the network, the services offered, the market(s) to be addressed, and the basic economics of the telecoms venture.

#### 1. Coverage Assumptions

- The geographical coverage of the network within Panama will be determined primarily by demonstrable market demand, subject to the condition that the demand in question can be efficiently satisfied by telecoms infrastructure deployed along ETESA’s Rights of Way (ROW);
- There will not be barriers (regulatory or technological) to the efficient implementation of local distribution (“last-mile” connections); in particular, both “wireline” (e.g., short-haul fiber) and “wireless” technologies (e.g., LMDS, MMDS, WLL) could be used as necessary and appropriate;
- The network will not be obligated by regulation to provide coverage to particular locations or customers (e.g., remote areas of Darién province or the indigenous comarcas) where demonstrably there is no reasonable expectation that such locations or customers can be profitably served.

#### 2. Network Assumptions

- The core, or backbone, of the network will consist of long-haul fiber-optic facilities deployed along ETESA's Rights of Way (ROW);
- The implementation technology will enable the network to offer, at a minimum, digital Bandwidth Services in conformity with the standard Synchronous Digital Hierarchy (SDH);
- The network will be technically capable of interconnecting to other commercial networks in Panama (e.g., Cable&Wireless, UFINet) so as to facilitate greater coverage and/or ease of access. (Eventually, interconnection could extend to networks in Costa Rica and Colombia as well.)

### 3. Service Assumptions

Both within and outside of ETESA, it has been consistently assumed that the ETESA network would be primarily a "bandwidth supplier," that is, a supplier of dedicated transmission capacity (henceforth, "Bandwidth Services"). This is the assumption made in the internal ETESA report of January 2002 (*Las fibras ópticas y su aprovechamiento comercial* – henceforth the "ETESA Internal Report 0102"); it has been PFA's working assumption from the outset, based on general experience with other electric utilities in entering the telecoms business; and, finally, it has been the automatic assumption of virtually every interested party in Panama with whom PFA has come into contact.

In particular, positioning of the ETESA network as a supplier of Bandwidth Services has a number of technical and commercial advantages, notably the following:

- The network backbone and access equipment required to provide the service is relatively simple and straightforward;
- In contrast to, say, the residential market, the total customer pool is not large (from several dozens to several hundreds, as estimated elsewhere in this report), so that customer operations can be handled with a relatively modest staff;
- Since customers are typically billed a flat monthly fee for Bandwidth Services, the logistics of usage tracking, customer billing, etc., are greatly simplified.

A slight complication stems from the fact that both the European (2/8/34/155 Mbps) and the US (1.5/45/155 Mbps) digital bandwidth hierarchies are in use in Panama, although the former appears to be more prevalent (and, indeed, by acquiring Alcatel equipment ETESA appears to have effectively committed itself to the European standard). On a technical level, the discrepancy can usually be resolved by appropriate hardware interfaces; however, it can become problematic if, for example, a customer has a need for bandwidth equivalent to a (US-standard) 45-Mbps link which cannot be met by a (European-standard) 34-Mbps offering.

It may not be possible at this time to define the precise characteristics of the Bandwidth Services, and in any case, the final choices in such matters would probably be made by the operator-partner in the event that the telecoms venture is constituted as a partnership. Notwithstanding, the following general assumptions can be made.

- The network will offer dedicated Bandwidth Services, in the form of point-to-point links operating at 2, 8, 34 and 155 Mbps (the first three of these are also known as E1, E2, and E3, while the fourth is also known as STM-1 or OC-3);
- The network will not offer Bandwidth Services below 2 Mbps (e.g., 64, 128, 256, etc., kbps); such services are becoming “commoditized” and do not have attractive revenue potential;
- The network will offer the Bandwidth Services on a “wholesale” basis to the Carrier-to-Carrier and Internet market segments, and on a “retail” basis to the Public-Sector and Large-Enterprise market segments (see below for definitions);
- Although the focus will be on a national offering (i.e., within Panama), in principle, any Bandwidth Service provided by the network could be offered on an international basis if suitable interconnections are available;
- There will not be regulatory barriers to the ability to offer such services.

#### 4. Market Assumptions and Operational Definitions

The current market for Bandwidth Services in Panama consists of the following principal “vertical” segments, which may generally be characterized as follows:

- The “Carrier-to-Carrier” (CtC) segment, operationally defined as those entities which may need to procure “wholesale” third-party bandwidth and/or communications infrastructure in order to deliver their own “retail” communications/broadcasting services; these include current and foreseeable telecoms and broadcast/media operators (but not Internet Service Providers, which effectively constitute a separate market segment);
- The Internet segment, which comprises Internet Service Providers (ISPs);
- The Public-Sector (PS) segment, operationally defined as the entities making up the Panamanian government and public administration, namely the Ministries, related and subordinate institutions, and other government bodies;
- The Large-Enterprise (LE) segment, operationally defined as the largest Panamanian commercial enterprises, with a turnover in excess of \$10 million and/or number of employees greater than 50. The number of such enterprises is estimated at 400-500.

#### 5. Economic Assumptions

A number of specific economic assumptions will be made as part of the economic model that is developed elsewhere. A few key general economic assumptions follow.

- The basic economic justification for deployment of the network must come from the anticipated revenues accruing from Bandwidth Services provided to the four market segments described and operationalized above;
- Additional economic justification may be provided by the prospect of eventual extension of the network to Costa Rica and Colombia. It should be recognized, however, that there is an increased degree of uncertainty inherent in this prospect (in

particular, the timing of such extension is uncertain; the terms arrangements to be negotiated with the corresponding carriers in the two countries are unknown; etc.).