Telecommunications Policy 35 (2011) 842–856

Contents lists available at ScienceDirect

Telecommunications Policy

URL: www.elsevier.com/locate/telpol

Factors determining municipal broadband strategies across Europe

Costas Troulos*, Vasilis Maglaris

Network Management & Optimal Design Lab (NETMODE), Department of Electrical and Computer Engineering, National Technical University of Athens, Zografou, Greece

ARTICLE INFO

Keywords:
Broadband
Municipal strategies
Infrastructure development
Europe

ABSTRACT

Recognizing that high-speed broadband connectivity emerges as a key element for growth, city authorities engage in fiber access deployments to empower their local communities in the digital economy. Currently, a growing number of municipal fiber projects are underway or planned while the international community and the telecommunications industry are yet undecided about the role and type of municipal intervention. This paper takes a holistic view of municipal broadband in Europe, aiming to understand the factors that determine municipal strategies in fixed Next-Generation Access (NGA) networks and the implications of municipal broadband to regulation and markets. The data suggests that the determining factors are (a) the engagement of public utilities; (b) the involvement of the private sector in joint infrastructure projects; (c) the local demand for retail and wholesale services; and (d) the institutional and regulatory framework at the European and national scale. The findings of the study indicate that (a) municipal initiatives are highly dependent on national factors, thus the resulting interventions fare strong resemblance within a single country, while they can be substantially different across national contexts; (b) current EU provisions for public involvement in broadband development stimulate municipal plans for large scale arrangements; and (c) national regulatory frameworks, that primarily address vertical integrated incumbents and nationwide markets, may need adjustments to handle emerging access monopolies of regional and city broadband infrastructures.

1. Introduction

While fixed Next-Generation Access (NGA) networks are widely acknowledged as the sine qua non of future economic growth, the high investment required and the uncertain demand for high-speed connections result in conservative activity by telecommunications operators. Despite the winner-takes-all potential of swift Fiber-to-the-Home (FTTH) deployment (Janssen & Mendys-Kamphorst, 2008), operators prefer investing in urban centers with high demand but intense competition. Also, incumbent operators prolong the exploitation of their copper monopoly (PSTN) and refrain from deploying FTTH unless impelled by competition.

Due to the market's unwillingness to invest, city authorities engage in fiber access developments aiming at the inclusion of their local economies into the digital markets. While municipal broadband projects steadily increase in numbers (IDATE, 2010), incumbents and cable operators confront with skepticism municipal broadband and question the

* Correspondence to: School of Electrical & Computer Engineering, National Technical University of Athens – NTUA 9, Iroon Polytechniou Street Zografou, Greece, GR 157 80; New Electrical & Computer Engineering Building, 3rd Floor, Room B.3.20, Greece.
Tel.: +30 210 772 1449, +30 6977 015 723; fax: +30 210 772 1452.
E-mail addresses: ktroulos@netmode.ntua.gr (C. Troulos), maglaris@netmode.ntua.gr (V. Maglaris).

0308-5961/$ - see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.telpol.2011.07.008

Table 1
Number of use cases surveyed per country.

Country	No. of use cases
Austria	2
Denmark	17
France	7
Germany	15
Greece	2
Italy	2
Netherlands	6
Norway	2
Spain	3
Sweden	5
Switzerland	8
UK	5

role of the municipality (and by and large the public initiative) as infrastructure developer. Operators opposing to public involvement in infrastructure development argue that public interventionism will crowd-out private investments and distort market conditions and innovation dynamics, while proponents of municipal broadband proclaim the benefits of the long-term economic spill-over effects of broadband to the local communities and businesses.

This controversy motivates research regarding the role of the public sector in broadband development. There are numerous publications addressing public NGA engagement, for example Bauer (2010) and Benkler, Faris, Gasser, Miyakawa, and Schultze (2010), but with limited emphasis on municipal cases. Most of the literature in the field is still devoted to (a) state intervention strategies and national regulation (Bandias & Vemuri, 2005; Bauer, 2009; de Bijl & Peitz, 2008; Cava-Ferreruela & Alabau-Muñoz, 2006; Fransman, 2006; Frieden, 2005; Gómez-Barroso & Feijóo, 2009; Lee & Chan-Olmsted, 2004; Picot & Wernick, 2007; Teppayayon & Bohlin, 2009), and (b) the impact of broadband on business strategies of incumbents, telcos and cable operators (Huigen & Cave, 2008; Van Kranenburg & Hagedoorn, 2008; Van Gorp, Maitland & Hanekop, 2006; Wood, 2008).

The studies addressing municipal broadband mainly compare cross-country initiatives selecting a few widely publicized city projects or have usually a national focus. In a survey conducted across the US, Gillett, Lehr, and Osorio (2004) conclude that the type of local government initiatives will be subject to local conditions. Also, Gillett, Lehr, and Osorio (2006) provide a thorough analysis on the motivation and strategies employed by municipal electric utilities that engage in broadband deployments in the US. Lattemann, Kupke, Schneider, and Stieglitz (2006) analyze 8 cases of municipal projects and conclude about the impact of Public–Private Partnerships (PPP) to broadband development in rural areas. Analysys Mason (2008) reports on individual municipal projects to draw conclusions regarding the feasibility of municipal intervention in the UK. Tadayoni and Sigurdsson (2007) discuss the development of alternative broadband infrastructures in Denmark. Tookey, Whalley, and Howick (2006) discuss the public policies promoting ICT and broadband in remote and rural areas of Scotland. Also, Kyriakidou, Katsianis, Orfanos, Chipouras, and Varoutas (2010) analyze 4 distinct PPP business models for managing municipal Metropolitan Area Networks (MAN) on the basis of public participation in the passive and active layers. Finally, Sadowski, Nucciarelli, and de Rooij (2009) discuss the public policy shift in the Netherlands regarding municipal fiber networks.

Moreover, there are publications presenting individual cases of municipal involvement in fixed-broadband: (a) in the US, such as Utah (Cherry, 2006) and Kutztown (Shin, 2008); and (b) in Europe, such as Amsterdam (Wagter, 2010), Nuenen (Sadowski et al., 2009), Greece (Bouras, Gkamas, Papagiannopoulos, Theofilopoulos, & Tsiatsos, 2009; Troulos, Merekoulias, & Maglaris 2009), and Spain (Ramos, Arcos, & Armuña, 2009).

Currently, research in the field lacks a broader view of municipal broadband that will identify the progressive trends and strategies adopted by municipal broadband projects at the European scale. This paper surveys 74 use cases of municipal intervention in Denmark, the Netherlands, Sweden, Greece, Spain, France, Switzerland, Germany, the UK and Norway, thus providing a holistic view of municipal business strategies and the factors influencing them. Each use case may encompass individual cities or regions under a common planning authority and/or funding instrument.[1] Table 1 summarizes the cases surveyed.

The rest of the paper is organized as follows: Section 2 presents the methodology and conceptual framework of the research. Section 3 presents in detail the four major determinants of municipal strategies in Europe. Section 4 discusses the influence of these factors to municipal broadband strategies, and related policy implications. Finally, Section 5 provides conclusions and directions to further research.

2. Methodology and theoretical framework

This analysis considers initiatives that deploy NGA infrastructures with the direct or indirect participation of local authorities, municipal electric utilities, citizens cooperatives or social housing associations. This work is based on

[1] For example, two use cases were studied for Greece: The first refers to a centrally planned intervention extending to 72 fiber-based municipal networks, while the second to a single city's autonomous intervention that flexibly combined European and national instruments.