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## Providing incentives for private investment in municipal broadband networks: Evidence from the Netherlands

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### ABSTRACT

The paper examines the incentives provided by public–private partnerships (PPPs) to stimulate private market parties to participate in municipal fibre networks in the Netherlands. Although there has been a growing interest of Dutch municipalities in fibre technologies since the beginning of the 2000s, PPP models to implement these technologies developed rather slowly in response to changes in public policy, the legislative environment and experiences gained in early projects. In 2005, the viability of a cooperative PPP model called “Ons Net” in Nuenen was tested in an experimental setting for the first time using government subsidies. In undertaking a techno-economic analysis of the PPP “Ons Net” in Nuenen, the paper examines its objectives, boundaries and viability. It shows that the experience of this PPP based on ubiquity, open fibre access and demand aggregation provided important incentives for companies to invest in (other) municipal fibre networks in the Netherlands. The paper concludes furthermore that mandating of open access will become a key task for (local) governments to foster competitive entry and to facilitate innovation in municipal fibre networks.

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### 1. Introduction

Since the early 2000s, there have been a number of regional initiatives in the Netherlands aimed at implementing Fibre-to-the-Home (FtTH) networks in different municipalities. At first glance, this may seem surprising as the Netherlands are at the forefront of broadband penetration worldwide based on a dual (xDSL and cable modem) telecommunication infrastructure with high national coverage (OECD, 2009). Since the late 1990s, market parties accounting for the lion's share of broadband access (i.e. the incumbent operator KPN and different regional cable operators) have shown that they are able to propel broadband to high levels of penetration whilst alternative access technologies such as fibre networks have rarely been used until recently; in 2008, they contributed a mere 1 percent to the Dutch broadband access markets (CEU, 2008).

The development of municipal fibre networks in the Netherlands must be considered in the context of governmental efforts to comply with the European regulatory and legislative framework while balancing issues of competition-related and public-goods aspects of broadband deployment (Picot & Wernick, 2007). With the liberalization of network access in the late 1990s in Europe, alternative networks emerged in some countries based on the assumption that inter-platform competition would drive broadband development (CEU, 1999). Since 2002, the European Commission (EC) has become increasingly interested in establishing whether alternative networks meet the strict criteria of Article 87(1) of the EU Treaty

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on State Aid and if they interfere with competition. Exceptions have been granted if the implementation of the network was driven by public policy objectives related to the provision of basic infrastructure needs or to the expansion of networks in areas in which private investment was considered inadequate. In addition, public policy objectives have been put forward if these networks were considered as part of structural measures within the EU or as a way to facilitate the European drive towards achieving the goals of the Lisbon Agenda. In this context, public–private partnerships (PPPs) are considered an alternative means of implementing municipal fibre networks, combining public objectives and private interests whilst at the same time complying with the regulatory and legislative framework of the EC (Falch & Henten, 2008).

In the case of fibre technologies, risks for private investment—caused by high capital expenditure in conjunction with demand uncertainty—can lead to a situation in which markets fail to efficiently provide society with fibre infrastructure (OECD, 2008). In contrast to direct government intervention, PPPs offer alternative funding mechanisms to account for these risks and to mitigate market failure (Falch & Henten, 2008). PPPs represent an alternative mechanism for implementing fibre infrastructure in the whole community (e.g. by balancing private and public policy objectives), for facilitating competitive entry at different layers of the network (e.g. by weighting open against closed access options) and for improving viability of the business model (e.g. by reducing demand uncertainty).

In the Netherlands, municipalities such as Amsterdam, Rotterdam or Eindhoven started in 2001 looking for alternative ways of implementing municipal broadband networks after national broadband initiatives failed to create sufficient commitment by existing market parties. In parallel to this, in 2002, the Dutch Ministry of Economic Affairs began to look for alternative ways of re-starting investment in telecommunication infrastructures and set up a national research and development (R&D) programme called “Kenniswijk” (Knowledge District) the aim of which was to develop “a consumer market of the future” (Kenniswijk, 2005). In 2005 in Nuenen and 2006 in Eindhoven, cooperative PPPs called “Ons Net” (Our Network) were set up, subsidized by the “Kenniswijk” programme which competed with established market parties on a regional level. These PPPs were unique as they represented local experimentation and testing systems, i.e. real life experimentation environments in which (end) users are also co-producers (Ballon, Pierson, & Delaere, 2007; EU, 2009). These systems allowed different actors (i.e., semi-public institutions, local governments, private companies) involved to experiment with and learn from the implementation of new infrastructure and services and, subsequently, to use these experiences for the start-up and execution of new projects. In this paper, the techno-economic analysis focuses on the objectives, the network boundaries and the viability of PPPs facilitating municipal fibre networks in the Netherlands. In this way, the paper contributes to the discussion on a different public utility vision emerging during the implementation of municipal fibre networks in the Netherlands-based on ubiquity, open access and demand aggregation.

## 2. Municipal fibre networks in the Netherlands: shifting public policy and alternative forms of private investment

If public sector entities intend to facilitate broadband deployment in Europe, they face the delicate task of putting forward legitimate reasons for intervention (Barroso-Gomez & Perez-Martinez, 2005; Picot & Wernick, 2007). Within a public utility framework, justifications have been developed on the basis of describing broadband as a public good characterized by non-excludability (i.e. no one can be excluded from consumption) and non-rivalry (i.e. consumption by an individual does not reduce the availability of the good to others) (Picot & Wernick, 2007).<sup>1</sup> The first public goods characteristic has often been used in close correspondence with the concept of universal service to define a basic, affordable set of telecommunication services available to consumers.<sup>2</sup> Recently, the second characteristic has been utilized to describe the “sharable” nature of infrastructure resources, i.e. the extent to which these resources can be accessed and used by multiple users at the same time.<sup>3</sup> Most infrastructure resources are based on finite but renewable capacity (e.g. bandwidth). In this case, problems can emerge from rivalrous consumption which can be overcome by management choices in favor of providing particular infrastructure resources to users (for example, by balancing ubiquity against exclusivity of access to infrastructure resources). If the generation, distribution and sharing of (non-commercial) information travelling via the Internet (which should be available to all citizens) is considered as a rationale for the provision of infrastructure, information receives the status of a pure public good generally available for both consumption and productive use by recipients. In this case, municipal fibre networks could receive the status of a public information utility (Bar & Park, 2006). However, public goods justifications about the allocation of existing infrastructure resources are incomplete as they are based on a static and ex post perspective. Based on a dynamic approach, the production of non-rival goods and their provision to society becomes the focus of analysis.

<sup>1</sup> The provision of private goods is based on the idea that a person can be excluded from consumption of a resource and that the resource is depleted when consumed. The market provision has been considered as the most efficient mechanism of allocating private goods given that the costs of exclusion are low.

<sup>2</sup> Universal Service Directive (EC, 2002). However, for broadband services it is currently not (yet) applicable. Reding (2007) expects that an initiative by the EC to include broadband in the universal service obligation will be finalized in 2009.

<sup>3</sup> In case of infinite capacity, the marginal cost of adding an additional person to use the source is zero. Due to variances in capacity, infrastructure resources differ in their capacity to accommodate multiple users according to non-rival resources (infinite capacity) and partially non-rival resources (finite but renewable capacity). The consumption of infrastructure resources can take place non-rivalrously or rivalrously (see, for example, Frischman, 2004).

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