

Using the smart grid as an example for electronic communications networks

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In 2017, data traffic in electronic communications networks will surpass 1.4 zettabytes annually.¹ The soaring demand for bandwidth for data transmission – in particular for mobile Internet use – requires additional network capacity and innovative infrastructure specifications.² Where new technologies change the way we live, work and socialize,³ the robustness of communications infrastructure becomes a key issue. Network operators need to invest heavily in infrastructure to process the growing data streams. Yet, simultaneous with data traffic growth, the gatekeepers – traditional telcos – are ousted by game changers: innovative companies who develop technologies that affect the way electronic communications networks transmit data.

As a result, the telecommunications market, both in terms of architecture and in terms of services and operations, is in flux. This raises questions on several levels: how can we ensure that electronic communications networks are stable, effective and robust so that they can meet the changing market requirements and maximally incorporate the potential of game changers? Which new regulatory questions does this changing landscape raise? What can we learn from similar processes of network innovation to predict, and potentially find answers to the previous questions?

We will argue that the current development of smart electricity grids ('smart grids') can serve to analyze the potential, the pitfalls and the regulatory issues at stake in the need to secure future – proof electronic communications networks.⁴ For example, in part, smart grids were designed to deal with peak and off-peak traffic in electricity use. Since the expectation is that network congestion will increase in electronic communications, similarities with smart grids can act as valuable case studies to preempt network failure, and – more specific to telecommunications – data loss. Moreover, a key feature of smart grids is that these enable end users to contribute to the network by sharing energy that they've generated themselves (through e.g. solar or wind energy). Similarly, smart electronic communications grids could tap into the potential of sharing network capacity (e.g. WiFi) and/or data processing capacity on latent communications equipment.

Creating a future-proof electronic communications infrastructure may raise a host of regulatory issues – some similar to those surrounding the smart grid (e.g. issues of cybersecurity and protecting critical infrastructures, of equal access and distribution, and the impact of changing business models). Some regulatory issues will also be specific to the arena of telecommunications. For example, the issue of network neutrality will become more prominent (and complicated) in light of a development towards smarter electronic communications grids. Both the traditional gatekeepers (telcos) and game changers will benefit from legal certainty, which can be achieved through

¹ According to the Cisco Visual Networking Index 2014, 'EU Companies Reveal Their New Year Wishlist', *Wall Street Journal Blogs*, 13 January 2014.

² Ecorys, TU Delft & TNO, *Steps Towards a Truly Internal Market for e-Communications*, 2011, p. 10.

³ McKinsey Global Institute, *Disruptive technologies: Advances that will transform life, business and the global economy*, paper, May 2013.

⁴ Note that the reverse exercise is worthwhile as well: in some respects telecommunications companies have become much more used to rapid changes in light of new technological advances than electricity operators, so the latter could take the telcos and cable companies as an example in dealing with changing markets and technologies. For the purpose of brevity, in this paper we will only focus on the lessons to be learnt by the electronic communications market from the smart grid operators.

establishing governance models for network grids. Using experiences from the development and rollout of smart grids can be an important guidance in this respect. After all, all smart grids require smart regulation.