

Study period
2018-2021

Question 2/1
Strategies, policies, regulations and methods of migration and adoption of digital broadcasting and implementation of new services

Annual deliverable
2019-2020

Considerations about the cost structure of the digital transition, including new services and applications

Executive summary

The migration from analogue to digital broadcasting technologies has been completed in some countries, while others are in the process of completing the transition. The Final Report of Question 8/1 from the study period 2014-2017¹ indicates that the transition results in a variety of strategies, plans and implementation actions that achieve a successful process to maximize the benefits.

More recently, the emergence of new broadcasting technologies and standards that could be considered by developing countries is becoming a major trend and has the potential of entirely changing the business models for content distribution.

This document considers some of the costs involved in the process of the transition to digital broadcasting and some other considerations regarding the implementation of new broadcasting technologies, services and applications from the economic point of view.

¹ ITU-D Study Group 1 Question 8/1 report on the examination of strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services (2017), available at: <https://www.itu.int/pub/D-STG-SG01.08.1-2017>.

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1. Introduction

The digital broadcasting transition can have a significant impact in terms of costs and this is an important factor when planning and implementing several steps towards a successful migration and the analogue switch-off. Considering the cost structure is key to decision-making and having in mind the myriad of costs each stakeholder needs to face is fundamental.

Additionally, broadcasting services are evolving and undergoing transformation. In this context, new broadcasting technologies, services and applications are being provided to users which are enriching the user experience.

The broadcasting arena is changing and the offers to users are evolving. New experiences in accessing audiovisual content are being provided and one of the consequences of these new offers is that users no longer have only the traditional media services/applications. They are instead starting to experience different ways of watching audiovisual content in their broadcasting services.

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These new broadcasting services and applications can also include costs, which, considering the nature of these services that involve different networks and service providers, can lead the broadcasting market to important decisions regarding partnerships with other service providers, especially with broadband service providers.

Both cases are being briefly addressed in this document, the first with a more mature cost structure as experienced by several countries, and the latter pointing to some trends to allow the reduction of costs and sharing the burden of network investments to cope with the ever-increasing demand for audiovisual content.

2. Digital broadcasting transition

The migration to digital broadcasting delivers many benefits. However, there are also significant costs to be considered including new and upgraded broadcasting and transmission equipment, end user set-top boxes (STB) and consumer awareness programmes.

Each stakeholder in the digital switchover will face a different set of costs and most of these occur at the early phases of the transition, particularly during the digital terrestrial television (DTT) roll-out and simulcast phases. The main entities involved are governments/regulators, the broadcast industry and consumers.

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The main costs of the digital switchover are summarized in the figure² below.

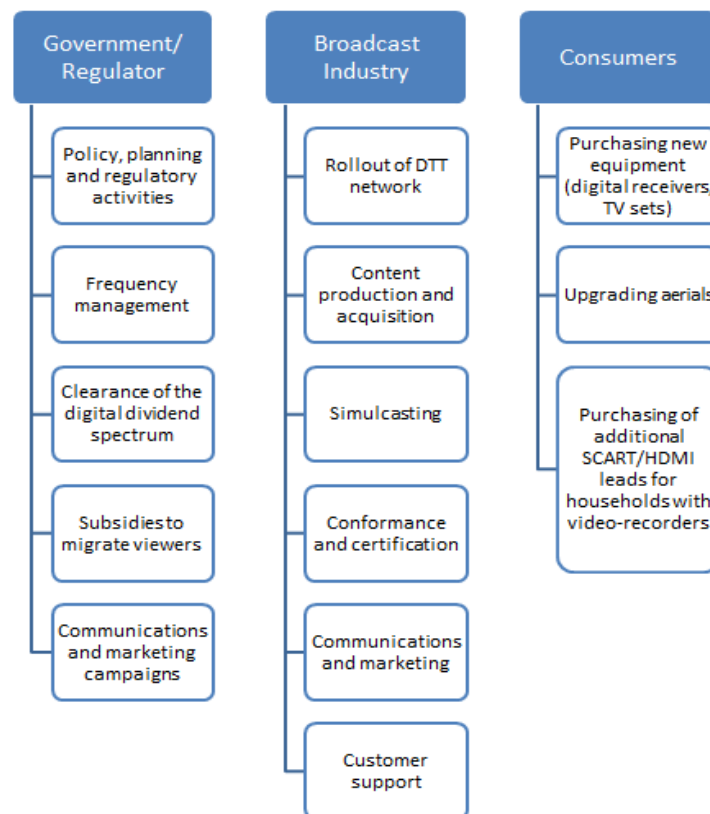


Figure 1: Main costs of the digital switchover

National experience: United States of America

In the United States, on 12 June 2009, 1800 full power television stations broadcasting in analogue made the transition to a digital signal. Only four stations did not complete the transition; these ceased broadcasting.

² For more details, refer to the Report “ [Benefits of Digital Broadcasting](#)”, Plum, 2014.

The table below summarizes the costs of the digital switchover in the United States:

Broadcasters	Technical changes undertaken	As a whole, broadcasters spent approximately USD 10 billion on the technical changes needed to make the transition.
Broadcasters	Construction of new digital transmission and broadcasting facilities, including equipment and studios for high definition production.	Individually, TV stations spent roughly USD 1 to 2 million.
Broadcasters	Communication and marketing: <ul style="list-style-type: none"> – Educate consumers about the DTV transition; – Conduct their own outreach activities, including on-air announcements, consumer publications, and public appearances. 	KT Corporation* (Republic of Korea) launches the world's first UHD pay-TV service, called "Olleh GiGA UHD TV".
Federal Communications Commission (FCC)	Communications and marketing campaign: The FCC worked with businesses providing in-home installation services and walk-in help centres throughout the United States, and a team of 200 FCC staff travelled the country to provide direct outreach to consumers and develop partnerships with local government and non-governmental organizations. Written publications that included frequently asked questions, explanatory charts describing how to install converter boxes, troubleshooting guides, antenna information, and mapping tools were made available in English and Spanish. Key publications were translated into 29 languages. The FCC also used its existing toll-free call centre to reach the public and created an interactive DTV website to help consumers obtain the latest information (www.dtv.gov).	Roughly USD 1.2 billion was spent by broadcasters on these activities.
United States Congress	Subsidy programme for DTV converter boxes: In 2008, the National Telecommunications and Information Administration (NTIA) began distributing coupons to consumers. Every U.S. household, no matter what the income level, was entitled to up to 2 coupons, each worth USD 40 towards the purchase of a digital-to-analogue converter box.	USD 1.4 billion spent subsidizing the purchase of digital-to-analogue converters. 35 million coupons were redeemed (40USD each).
<p><i>Source:</i> Case study - The United States digital television transition (United States of America), available in document 1/206</p>		

3. New broadcasting services and applications

The status of the broadcasting and TV industry alongside the Internet industry points out to three major forces in the future industry competition namely: carriers, Internet enterprises, and terminal vendors.

Carriers

Carriers' development strategies mainly rely on the advantages of the traditional broadcasting and TV industry to integrate the upstream and downstream of the industry value chain, provide the best convergent network service experience for users through their networks, and adopt independent research and development (R&D), acquisition, merger, and investment support, and provide users with related products and services to build and improve their ecosystems.

Carriers can better control the value chain and forcibly form a unified standard. In this way, carriers can reduce the difficulty of application development and share information. In addition, carriers can use their own advantages to promote the development of convergent network services quickly. This is good at the early stage of service development. However, this closed mode is unfavourable to the long-term development of the industry. It limits the development of some technologies and services, it is also not conducive to the fair and free competition of the whole industry.

Internet enterprises

The development strategy of Internet enterprises is to push Internet products and services to the broadcasting and mobile markets by leveraging Internet operation experience and user resources, and fully utilize carriers' network resources to implement cross-platform interconnection. Internet products are being transferred to the broadcast TV and telecommunication markets. The stickiness of user groups is extended or even amplified in the corresponding market, however, the business model is the same as that of the Internet. It should be noted that Internet enterprises have begun to compete directly with traditional broadcasting and television carriers, telecommunication carriers' services, and industry links.

Terminal vendors

The development strategy of terminal vendors aims to build comprehensive service capabilities around terminals. This includes developing intelligent terminals to meet users' requirements around audiovisual, network, and data. Moreover, features of terminals are designed to meet specific requirements of users, such as Internet of Things (IoT) games, building a self-owned application store, enriching the network applications of terminals, and grasping the entry of Internet services.

The development strategies and paths of these three forces are different, however, the decisive competition focuses on the network access entrance and the first contact of users. With the development of the market, new competitive forces may emerge in the future.

Consolidation and co-investment in the industry are key movements that can be noted to cope with the new investments needed and to reach a new cost structure to allow growth. Specifically, merger and acquisition activities are enabling service providers to accelerate

their standing in the TV market, in many cases transforming their competitive position from that of challengers to leaders.

As such, it seems that there would be a need to reverse previous policies whereby competition was encouraged by promoting new market entrants. Furthermore, the promotion of infrastructure sharing would be required. All these measures are needed as the required infrastructure investments are often too large to be carried by a single (smaller) company alone.

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These movements (consolidation and co-investments) can be verified by the insights gathered in the report³ of the Workshop “Future of Cable TV”, organized by ITU-T Study Group 9 and ITU-D, where regulations to tackle the challenges of the new technological and user experience scenario were discussed.

For example, some key findings that were pointed out are presented below:

- Promotion of infrastructure investments is needed and supported by the Polish regulator by following the European Union (EU) directives/regulations closely, including **co-investment and infrastructure sharing**. The regulatory topics include Bit-stream access, local loop unbundling but also access to passive infrastructure – ducts/masts, connections and in-house wiring. The list of key challenges includes the use of infrastructure sharing, competition and cost-based access⁴.
- Key enablers for broadband growth in Portugal: regulatory and policy approach (free market entry, **investment promotion**, access to infrastructure), infrastructure development, **competition (promote co-investments)**, operators’ strategies (including to deploy ADSL and FTTH to complete their cable infrastructure)⁵.
- It was shared that National Regulatory Authorities (NRAs) should give room for **consolidation and co-investment in the industry**. As such, there is a need to reverse previous policies whereby competition was encouraged by promoting new market entrants. Also, the promotion of infrastructure sharing is needed. All these measures are needed as the required infrastructure investments are often too large to be carried by a single (smaller) company⁶.

³ Report: Workshop on The Future of Cable TV, held in January 2018, available at: <https://www.itu.int/md/D18-SG01.RGQ-C-0066/>.

⁴ “Towards Gigabit society – how to ensure the increase of telecommunications networks efficiency”, was presented by Marcin Cichy, President, Office of Electronic Communications (UKE), Poland.

⁵ “Cable TV and the Portuguese Case Study: Trends and Enablers”, was presented by Cristina Lourenço, Deputy Director International Affairs, Autoridade Nacional de Comunicações.

⁶ Session 1: Enabling Environment for Sustainable Growth and Deployment of Cable TV. Workshop “Future of Cable TV”, ITU-T Study Group 9 and ITU-D, January 2018.

- In addition, it was observed that the cable industry needs more regulatory room for **co-investment, consolidation and network sharing** in order to facilitate the required network investments for broadband capacity⁷.

The new broadcast technology network is based on both broadcasting and TV technologies. It fully utilizes the advantages of radio and television networks, broadband networks and satellite coverage, comprehensively utilizes mature technology standards and industry chain resources, and constructs a multi-network converged, manageable, controllable, and reliable broadcast TV and broadband media network.

Under the overall framework of multi-network integration, based on broadcasting and TV technology achievements, broadcasters need to comprehensively utilize the broadcasting and television frequency resources, use the broadcasting TV network, broadband network, and operation platform to make full use of the industry chain resource integration advantages, to build a converged broadcast TV and broadband media network.

Broadcasters also need to optimize traditional broadcast and TV services, gradually provide high-quality new video services, and coordinate wired and wireless satellite traditional broadcast and TV distribution channels to form a seamless network with seamless coverage, providing richer and smoother service experience.

Therefore, to implement new broadcasting technologies, services and applications in this new environment, which seems to be heading to a global media strategy for service providers and not restricting the service offers to the traditional broadcasting market, it seems that consolidation, co-investment and infrastructure sharing are key trends to reduce costs and allow for massive investments in network deployment and content delivery.

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⁷ Session 4: Setting International Standards for Sustainable Growth of Cable TV. Workshop "Future of Cable TV", ITU-T Study Group 9 and ITU-D, January 2018.