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## Digital switchover in Taiwan

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**Digital Switchover in Taiwan**

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## **Digital Switchover in Taiwan**

### **Abstract:**

The purpose of this paper is to examine the process of the switchover in Taiwan, the technical standards, legal considerations, resistance from industry and the detailed plan to close analogue signals before the due day.

When most technologically advanced countries around the world closed their analogue signals and embraced digital television, Taiwan followed suit and asked terrestrial stations to go digital before the opening of 2012 London Olympic Games.

The government in Taiwan believed that the deployment of terrestrial digital infrastructure, the supply of affordable reception equipment (set-top boxes) and marketing campaigns to stimulate consumer demand would ensure the digital switchover would be a success. It could be concluded that, technically, the digital switchover went smoothly. But there's no digital dividend spectrum vacuumed and designed for future use.

**key word: digital switchover, digital dividend,**

## **Digital Switchover in Taiwan**

### **Introduction**

Since the turn of the century, the digital switchover has become a global issue that has required each country to seriously assess its spectrum use and determine the timescale and most effective method for switching over from the analogue signal to digital. Most of the (technologically) developed countries, such as the US, Japan, Canada, switched from their terrestrial television signals to digital around 2010; for the UK and other EU countries it was before the end of 2012.

Following these trends, the Taiwan Government claimed that 2012 would usher in the beginning of the Digital Era. This was underscored on July 1 of that year, when analogue television signals no longer existed in Taiwan and a totally new age for terrestrial television began. The purpose of this paper is to examine the process of the switchover in Taiwan, the technical standards, legal considerations, resistance from industry and the detailed plan to close analogue signals before the due day.

The digital switchover in advanced countries has involved many stakeholders: government, traditional television stations, telecom companies, network operators, electronic companies and the advertising industry — all of which hold different interests in the television value chain. Iosifidis (2011) examined the transition to digital television in Europe and stated that national policies were largely determined by a combination of markets, political contexts and supra-national influences.

Before the final date of switchover, most countries had to face issues concerning technical standards (Angulo, et al., 2011), political considerations (Freedman, 2008, Gerbarg, 2009, Iosifidis, 2011), as well as consumers' reactions (Holanda, et al., 2006, Verdegem, et al., 2009). Moreover, critical examination of the policy by Taylor (2009) discussed how the Canadian Government regulated broadcasters toward the switch to digital television without too much attention to public interests.

In general, most analysis has focused on the reasons and benefits for the switchover and who the major stakeholders are. Freedman (2008) concluded that digital choice, industrial benefits, and the efficiency of digital and digital inevitability were the major

concerns during discussions on the digital switchover. Another area that has garnered much attention is the digital dividend, which has stressed the high value spectrum still retains in this digital world.

The so called digital dividend spectrum (Sridhar, et. al., 2013 ) has been listed as one of the most important factors for closing analogue signals in many countries. Due to either scarcity in spectrum or increase in demand for wireless broadband, most of the governments around the world start spectrum refarming or adopting auction to re-examine the usage of the spectrum.

When it has been discussed, the spectrum-related public interest goals typically fall into two basic categories (Goodman, 2009:175): economic and social goals. Economic goals include the public interest in efficient spectrum use, innovation and competition. Social goals include public interest in telecommunications access, diverse programming, and emergency telecommunication services. Most governments around the world naturally strive to determine an effective policy to serve these two goals. Empirical evidence shows (Freedman, 2009, Taylor, 2009), however, that economic goals often exceed others due to the lobbying power of the stakeholders.

Still, when industrial policy is important to the competitiveness of the nation, the economic industry policy could also be bundled as social policy, referring to fostering the information society and avoiding a digital divide (Pauwels & Burgelman, 2003, Broeck, et al., 2011). Sourbati (2011) also emphasized how public interests can be placed first to pursue the goal of information society.

Universal access to the traditional television channels, for example, has been seen as a minimal prerequisite to avoid social inequalities (Iosifidis, 2011, Sourbati, 2011, Sridhar, et. al., 2013). The universality principle implies that the switch-off of analogue television will not be feasible and socially acceptable until almost all viewers have migrated to DTT. Since free television of the terrestrial station has been seen serving the purpose of public interest and pursuing the goal of information society, each country around the world would tend to use the switchover as political project.

### **Digital Switchover around the World**

While the primary reason for the digitization of television is to obtain extra

electromagnetic spectrum for other uses and to improve picture and sound quality, each country set a different agenda for the transition.

## **EU**

So far, most literature on the switchover uses the EU as a healthy example for policy making, deployment, and digital content development. Study (ref. Iosifidis, 2011:161) showed that in recent years it was put high on the agenda of European regulators. In 2005, all member states in the EU were encouraged to publish a switch-off plan and set their own timescale for transition, in order to achieve the switch-off by the beginning of 2012. The official rationale behind this policy was that by switching off the analogue TV signal, more capacity is created for other services in the spectrum, such as mobile television (European Commission, 2005, refer Broeck et al., 2011). And others (such as Broeck et al., 2011) believed this decision was a political one that to a larger extent aligned to an industrial policy agenda that aimed to further the media, telecom, and tech industry in Europe. Being purveyed as opportunities for the information society, digital television might very well also present opportunities for industry development and market expansion (Sourbati, 2011).

Regarding the service of DTT, Many European countries followed the British model by launching subscription-free DTT services. Nonetheless, DTT has not been a total success story across Europe. According to some observers (Iosifidis, 2011, Verdegem, et al., 2009 ), free DTT in some smaller European countries could not attract enough numbers of viewers. Depending on market size, financial situation and social, political contexts, Greece, Portugal, and Ireland, for example, were not eager to enter new, unfamiliar, and commercially risky television services.

## **UK Model**

In the UK, where a regulatory framework for DTT was introduced in 1996, the policy objective to implement the switchover to an all-digital broadcasting environment was announced in 1999, and Action Plans for digital television and for the electronic delivery of government information and public services were launched in 2001.

With the launch of the BBC-led Freeview service in September 2002, DTT in Britain has turned into a free-to-air only platform. According to Iosifidis (2011:12), the primarily free-to-air system has proved compelling to many households and has

helped to rebuild public confidence in DTT and to combat the common misconception that DTT is pay-TV.

Under Digital UK 2006, the switchover has facilitated greater access to DTT. At the same time, DTT provides more channels and new services to the viewing public in the UK and helps maintain the UK as a world leader in broadcasting. Furthermore, policy decisions have set clear targets for universal availability, affordability, and accessibility of DTT (Sourbati, 2011). Though the goal might not be accomplished as well as planned, the UK has strengthened its reputation worldwide in this regard.

## **US Model**

While digital television was pursued by commercial interests, from the beginning, the U.S. government has eager to associate herself with the dividends of an information revolution. Said by former FCC Chairman Michael Power, "... we have no choice...the trends in technology and the forces of change will ultimately demand it of any provider that hopes to be relevant in the digital future." (ref. Freedman, 2008:181)

According to some scholars (Goodman, 2009, Freedman, 2008), the two most important goals for the transition from analog to digital broadcasting in the US were the recovery of spectrum for other, non-broadcast use and the delivery of a more advanced broadcast television service with all the traditional public benefits of existing service.

Under the Digital Transition and Public Safety Act of 2005, full-power broadcasting of analog television in the United States would have ceased after Tuesday February 17, 2009. To help U.S. consumers through the conversion, the Act also established a federally sponsored DTV Converter Box Coupon Program.

To assist consumers through the conversion, the Department of Commerce through its National Telecommunications and Information Administration (NTIA) division handled requests from households for up to two \$40 coupons for digital-to-analog converter boxes beginning January 1, 2008 via a toll free number or a website. The program is paid for with a small part of the \$20 billion taken in from the DTV spectrum auction.

But the schedule has been delayed. The DTV Delay Act changed the mandatory analog cutoff date to June 12, 2009 although stations were permitted to cease analog

transmissions before the new mandatory cutoff date. Now except some low power television stations, all the terrestrial television stations in the U.S. broadcast digitally.

### **Technological Considerations**

Although there are four international TDT standards for digital television: the American (ATSC), European (DVB-T), Japanese (ISDB-T), and Chinese (DMB-T), so far, the DVB standard has been the most comprehensively adopted in the world and generates significant economies of scale for equipment manufacturers.

Certain scholars (Angulo, et al., 2011) have analyzed the implementation of Terrestrial Digital Technology (TDT) standards adopted by different countries around the world. While the US and Mexico adopted ATSC, European countries and the North-West of the United Kingdom adopted DVB-T, which later was upgraded to DVB-T2 in 2009.

Governments assess the adequacy of standards by considering several aspects (Angulo, et al., 2011:777): quality offered to the viewers, flexibility to adapt to other configurations, possible applications and business models; costs and availability of the equipment; and potential for updates.

### **Research Method**

This study aimed to examine the strategic planning and policy considerations (technical standards, stages for the switch-off of analogue signals, and subsidies, etc.) of the digital switchover in Taiwan and utilized the review of literature, examination of documents, as well as in-depth interviews to compile data.

The questions raised on the policy included the decision for the switchover, the choice of DTT standard, and evaluation of the switchover. Specifically, the following questions will be addressed:

1. How did the Ministry of Transportation and Communication (MOTC) and National Communication Commission (NCC) come to the decision on the technical standards and schedule for the digital switchover. Will there be a solid plan toward the vacuumed spectrum? Does the digital dividend exist in Taiwan?



2. How the government in Taiwan choose between UK model (led by BBC) and US model (coupon program)? Why? How important is the universal access principle applied here?

3. How did the terrestrial television stations in Taiwan start working on the digital television project? In what areas did they cooperate with the government to meet the deadline of the switchover?

4. The evaluation of the results of the digital switchover in Taiwan

Since the author was serving as the Chair of NCC (2008-2010), many major decisions were made under her supervision. In addition, three government officials (Tien-Lai, Deng, Director General, Department of Post and Telecommunication, Ministry of Transportation and Communications, Der-Wei, Wang, Deputy Director of Telecommunications Administration Department, and Dr. Yuan-ping Cheng, Director of the Northern Regulatory Office, NCC), who have been in charge of the decision making process and execution of the switch-off, were interviewed by the author in the summer of 2013, one year after the switchover.

In light of the cooperation of terrestrial television stations during the switchover process, five CEOs of the stations were interviewed in Feb. 2013 in order to understand the preparation and challenges they had faced.

## **Results**

This study aimed to understand how the government in Taiwan made the decision to close the analogue signals, and what problems and issues were raised and solved during this process. The results can be analyzed as follows:

### **I. Changing technical standard, changing agency**

When Taiwan Government began the digital television project back in 1998, it selected the ATSC standard based on the tight relationship with the United States. Each terrestrial station in Taiwan was assigned two 6 MHz (12 MHz total) for trial use. However, as the DVBT standard matured, the Government eventually switched from ATSC to DVBT in 2001. This change caused numerous complaints from the industry due to the waste of investment.

In 2005, the Administrative Yuan passed the draft of the digital television development plan that confirmed the details of the digital switchover, including the stages, areas, and means for closing analogue signals across the nation. Consequently,

the date was set at the end of 2010. The draft, however, was not passed by the Legislative Yuan in time. The task of the digital switchover then became a responsibility of the newly founded agency, the National Communications Commission (NCC), which was established in February, 2006.

As an independent agency, the task of digital switchover was initially not a priority and there no notable incentive for either the agency or terrestrial stations to close analogue signals at that time.

## **II. Lack of Incentives for terrestrial television stations**

There are five terrestrial television stations in Taiwan, three of them (TTV, CTV, FTV) are commercial stations while the other two (CTS, PTV) belong to public broadcasting system (PBS). TTV, CTV, and CTS were established during the period of martial law, which meant that the stations were directly or indirectly controlled by the ruling party, KMT. The spectrum these stations used was assigned without question. And the efficacy of the spectrum use had not been examined carefully. Accompanied by the liberalization of communication industries after the lifting of martial law, two newly born stations, FTV and PBS served different political purposes.

When the government decided to switch to digital in the late 1990s, PBS was chosen as a model station. Switchover preparations were underway and money was spent on the digital experiment by sending personnel overseas for technical training, etc. Yet, the trial of DTT at the beginning of 21st century was not very successful. Commercial terrestrial television stations concerned about the loss of viewers and the subsequent potential decline of advertising. This greatly hindered support of the switchover. It is also worth noting that at this time no law had been passed by the Legislative Yuan stipulating a deadline for digital television.

As the pioneer for the switchover, the Public Broadcasting System obtained most of its financial backing from the government and, as a result, was able to produce some good quality HD programming. Furthermore, the personnel they had trained became more familiar with the digital era and how to manage it. Nevertheless, it was still not sufficient enough to support the whole DTT environment (Cheng, 2013, interview).

The commercial terrestrial stations complained that the resources were put on the performance of PBS while the commercial stations were left behind in pursuing the goal of switchover. They were questioning the good example set by Freeview in the U.K. to lead the digitalization. PBS, on the other hand, were reluctant to share their knowledge and expertise in the digital switchover.

### **III. Accelerate to embrace convergence: Set the Deadline**

In July of 2010, the Taiwan Government announced the National Info-Com Development Plan. The initiative was grounded in the pursuit of convergence with the goals of creating a high-tech island with advanced broadband service, constructing a sound, culturally diverse, and ubiquitous network society, and enhancing national competitiveness.

DTV was emerging as a core component of the latest electronic information infrastructure and, as such, a core objective in information society policy. The government believed that digital switchover would be an important indicator for the success of Info-Com Development Plan. Having been delayed for several years, under the newly claimed plan, NCC, with support from the government, set June, 2012 as the date to close analogue transmissions.

At this time, the technical ability of receiving good quality digital television signals became the top priority of NCC. Besides utilizing the existing analog television converter service, NCC, from 2011, began actively establishing digital improvement stations.

Having been studied the DTV Converter Box Coupon Program of the U.S. A., NCC tried to present the case to the Administrative Yuan arguing that Coupon program will assure the success of the switchover. After several meetings with other Cabinet members, The Administrative Yuan turned down the proposal designed by NCC for

large scale of the Coupon Program. And the action plan approved by the government at the middle of 2009 designed as followed:

### Action Plan

1. Subsidies for set-top boxes accompanying the terrestrial digital television switchover: subsidize 85,000 low-income households in 2011 and a further 35,000 in 2012.
2. Conduct a public awareness campaign to accompany the DTTT switchover.
3. Summon relevant agencies to discuss the subsidy operation on set-top boxes and implement such subsidies.
4. Plan the shut-down of analog television transmitters by area, and recover the analog spectrum.
5. Co-operate with terrestrial television stations and the Digital Development Association, NCC established three Technical Support centers within the Northern, Central and Southern Regional Regulatory Offices in Taiwan to provide local and community support.

### Execution

After coverage reached most areas in Taiwan, via improvement stations, in 2011 the government began campaigning for the switchover. NCC was assigned to fulfill the responsibilities of the technical switchover while the Government Information Office started promoting the benefits, as well as the process of the switchover.

Under the leadership of the Executive Yuan, NCC, Government Information Office (GIO) as well as other Cabinet members gathered to examine the progress every week.

Following the UK model, Taiwan decided to close the analogue signals by region. This began on May 7, 2012, when central, eastern (including outlying islands such as Penghu, Kinmen, etc.), and southern parts of Taiwan accordingly shut down analogue signals. Northern Taiwan, where most TV viewers resided closed signals on June 30, 2012.

Acting on the few complaints that came upon the first stage of shutting down in May, NCC was able to study the SOP for answering the complaints, followed by house

visits to test the set-top boxes or related technical problems. The lesson learned from the first stage of shutting down in the central Taiwan significantly improved the service and technical support in other areas. Until now, there have only been a small number of complaints, most of which come from the elderly and deprived families who either lack the technical knowledge to use the set-top box, or did not obtain a free set-top box via the community center.

#### **IV. The reluctant broadcasters**

During the 2012 Olympic Games in London, the digital programming shown on DTT was fascinating. It was noted though that the lack of good quality digital programs weakened the success story of the digital switchover. Most viewers, who were watching analogue programs via DTT, could not see the significance of the switchover.

While on one hand certain broadcasters in other countries could adopt a multi-channel strategy driven by reduced costs resulting from digitization, on the other hand, CEOs of terrestrial stations in Taiwan were not thrilled by the digital switchover. They had to invest substantial amounts in equipment, training, and awareness campaigns for digitization. Operators were not enthused to embrace this opportunity due to the saturation of the advertising market. This is due to the high penetration of cable TV in Taiwan with approximately 80 percent of households enjoying 100 basic channels of foreign and local programming for less than USD20 per month.

Consequently, as soon as terrestrial television stations ascertained that they did not have enough funds to invest in producing digital content, they turned back to government for subsidies. The Taiwan Government finally decided to support the broadcasters to produce enough digital content to meet the basic requirements set by NCC.

#### **V. No Digital Dividend**

The digitalization of terrestrial television networks started in most of the advanced markets. This process frees up significant amount of ultra high frequency (UHF) band which can be potentially allotted for commercial mobile services. This referred to as the Digital Dividend spectrum varies between countries and regions.

While the digital dividend was one of the primary reasons for the switchover, the case in Taiwan was quite different. The assigned frequency for the terrestrial television stations of 530-608 was deemed as not particularly valuable at the time. What's more, the government has still not decided how to use the returned frequency. It has been found then, the switchover could not fulfill the goals either economically or socially.

### **Conclusions and Suggestions**

When most technologically advanced countries around the world closed their analogue signals and embraced digital television, Taiwan followed suit and asked terrestrial stations to go digital before the opening of 2012 London Olympic Games. The government assumed that viewers would appreciate the high quality viewing of the games, which would ultimately be good for the administration, industry, and the viewers.

Freedman (2008) has discussed the justifications for the switchover as digital choice, industrial benefits, the efficiency of digital, and digital inevitability. For the Taiwan Government, digital inevitability is likely the primary reason for the closing of analogue signals accompanied by perceiving the efficiency of digital.

Having followed the UK model, the government in Taiwan believed that the deployment of terrestrial digital infrastructure, the supply of affordable reception equipment (set-top boxes) and marketing campaigns to stimulate consumer demand would ensure the digital switchover would be a success. The technical support had been put in place in time and had made government officials quite relieved. It could be concluded that, technically, the digital switchover was successful.

Regretfully, the released spectrum from the digital switchover has so far not been assigned well for future use. For government decision makers, the freed frequencies are not so valuable and no concrete plan has been studied and executed.

And for Taiwanese terrestrial stations the decline of viewership signaled the end of the good times. If no value chain could be established, the benefits of the switchover would evaporate. On the other hand, for the general audience in Taiwan, there has been little impact on their viewing behavior due to most of them watching DTT via cable.

While the government thought DTV might feature prominently in the information society agenda, heralding prospects of an information-rich society with greater equality and opportunity for all, the study found that the terrestrial digital switchover did not demonstrate any promises of universal access to interactive services. For existing terrestrial television operators, to close the analogue signals and start producing digital content might be a new stage for them to look forward to. But so far, viewers in Taiwan have not showed appreciation toward the switchover (Peng, 2013).

## Reference

Angulo, J. , Calzada, J. , Estruch, A. (2011) Selection of Standards for Digital Television: The Battle for Latin America, *Telecommunications Policy*, 35, 773-787

Cheng, C.M. (2013) Digital switchover experiment in Taiwan, researcher at PBS, interview.

Freedman, Des. (2008). *The Politics of Media Policy*, Polity Press.

Gerbarg, D. (2008) Introduction: The digital evolution of television in Gerbarg, D. *Television goes digital*. New York: Springer.

Goodman, E. (2009) Spectrum Policy and the Public Interest, in Garbarg, D. (ed.) *Television Goes Digital*, Springer, 187-208.

Iosifidis, P. (2011). Growing pains? The transition to digital television in Europe. *European Journal of Communication*, 26(1):3-17.

Marsden, C. & Arino, M. (2005) From Analogue to Digital, in Brown & Picard (eds.) *Digital Terrestrial Television in Europe*, Lawrence Erlbaum Associates Publishers, 3-35

Matteucci, N. (2010) Strategies for Digital Television: DTT in Italy, *The International Journal on Media Management*, 12, 159-181

Pauwels, C., Burgelman, J.C. (2003) Policy challenges to the creation of a European information society: a critical analysis, in Servaes, J. (ed) *The Europeans Information Society: A reality check* (pp.59-85), Bristol and Portland.

Peng, B. (2013) Taiwanese Media Use after the Digital Switchover: Policy Design and Generation Gap, a research project sponsored by Cable Broadband Institute in Taiwan

Sridhar, V, Casey, T., Hammainen, H. (2013) Flexible spectrum management for mobile broadband services: How does it vary across advanced and emerging markets? *Telecommunications Policy*, 37, 178-191

Sourbati, M. (2011). The digital switchover as an information society initiative: The role of public policy in promoting access to digital ICTs. *Telematics and Informatics*, 28(4): 295-302.

Taylor, G. (2009) Canadian Broadcasting Regulation and the Digital Television Transition, Ph.D. Dissertation, McGill University

Van den Broeck, Pierson, J. (2008) *Digital Television in Europe*, VUB Press.

Van den Broeck, W., Bauwens, J., & Pierson, J. (2011) The Promises of iDTV: Between push marketing and consumer needs. *Telematics and Informatics*, 28(4), 230-238.

Verdegem, Pieter, Laurence Hautekeete, Lieven de Marez (2009). The analog switch-off in a cable dominated television landscape: Implications for the transition to digital television in Flanders, *Communications*, 34: 87-101.