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Development of Digital TV in Europe

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1 Digital TV market overview

1.1 Roll out of digital services

1.1.1 Digital service offers

Satellite digital services

In mid-1999, in the Netherlands, the digital pay –TV market is limited to one participant and to one satellite platform : CANAL + with its *Canal + Digitaal*. This offer, compared with other European bouquets, has two notable characteristics :

✓ firstly, the digital offer of CANAL + does not include the rental of the decoder which must be bought by the consumer on the "brown products" market

✓ secondly, the CANAL + offer consists of only TV services which are also available broadcast in an analogue format.

Cable digital services

✓ As is well known, a large majority of Dutch households access TV services via CATV networks. Indeed, the Netherlands is, together with Belgium, among the European countries with the highest cable penetration, reaching 98 % of the TV households.

✓ Up to now, the cable networks have provided subscribers with access to an average of 30 analogue television channels, some of which benefit from a "must-carry" rule.

✓ The distribution of these analogue services exhausts the transmission capacity of the cable networks. Thus, none of the Dutch cable networks proposes a digital offer, neither the CANAL + bouquet, nor any other offer. Nevertheless, a number of digital projects are emerging on the cable networks. Facing the development of thematic services, the operators are indeed attempting :
- to improve the capacity of their networks;
- to ensure a progressive transition towards digital services;
- to better segment their offers, e.g. into different "tiers".

✓ At the moment, we may distinguish three main approaches, two of them proposed by two major actors in the cable sector, CASEMA and UPC, while the third comes from a consortium of eight cable operators, MEDIAKABEL1 :
- CASEMA intends to segment the offer by reducing the standard offer to a base package of 17 channels, comprising the "must-carry" channels plus the most-viewed

[1] ST. CAI Alkmaar, NV ENECO, NV GAMOG-CAI Netwerken, NV Nutsbedrijf Heerlen, Kabeltex, Nutsbedrijf Maastricht NV, Palet Kabelcom, Zekatel BV.

commercial channels. Additionally, an optional package of 17 channels[2] will be available. In a second phase, the intention is to broadcast this optional package in a digital format.

- UPC is close to CASEMA's approach in that they would like to introduce a segmentation of the offer. However, in their base package, they provide today about 26 TV channels, comprising the "must-carry" channels. Four optional packages are today offered in analogue format, thus requiring a decoder. Decoders are given in deposit to the consumer at installation. UPC will start its digital bid in early 2000.
- Finally, since September 1999, MEDIAKABEL has started a first proof for the commercialisation of a digital offer, called Mr Zap. It should be available to the 1,6 millions of cable television subscribers beginning of 2000. This offer comprises all channels of the original analogue package, plus Sky News, Music Choice Europe and a weather and traffic forecast channel. Beyond this basic offer, 6 thematic bouquets comprising 3 channels each aim different subgroups of the Dutch television audience.

Table 1 : Analogue and digital TV services offer envisaged by the main CATV operators in the Netherlands

Cable operator	Service	Transmission
CASEMA		
Basic Package	Must-carry channels and most viewed commercial channels	Analogue
Optional Package	Other commercial channels (including Eurosport, CNN, Discovery…)	In the short run, analogue, in the longer run, digital
UPC		
Basic Package	Must-carry channels and commercial channels	Analogue
Optional Package	4 optional packages (information, thematic, world and total)	In the short run, analogue, in the longer run, digital
MEDIAKABEL		
Standard Package	Must-carry and commercial Channels, and Skynews, Music Choice Europe and weather forecast	Analogue/Digital
Optional Package	Bouquet of 6 thematic channels	Digital

[2] This offer is already operational on some of their networks since the beginning of 1999.

Terrestrial digital services

Besides those projects, an important terrestrial digital video broadcasting (DVB-T) project is being developed by a consortium gathering various operators active in programming, service providing and infrastructure.

The DIGITENNE consortium, that has taken the initiative of offering nation-wide DVB-T, includes 5 main participants : NOZEMA (national terrestrial broadcast infrastructure operator), NOS (co-ordination body for public broadcasting), VESTRA (association of 14 commercial broadcasters), CANAL+ ,KPN Telecom and NOB (the national broadcasting production company), who joined the consortium in November 1999.

NOZEMA, which is at this moment a semi-public company[3], has been the only participant managing access to the terrestrial broadcasting infrastructure. This monopoly ended on the 1 January 1998, and NOZEMA will probably be privatised in the very near future, as political discussions about this privatisation are well under way and definition of its legal framework is almost complete.

Each of the parties associated in DIGITENNE clearly has its own motivations for participating in the project. First, NOZEMA has to change to a digital platform, at the risk of losing the justification for its future existence. The intervention of NOS might be understood as a way of protecting public broadcasting. The presence of VESTRA and CANAL+ is motivated by the availability of an alternative platform to cable, where CANAL+ has been denied access. In order to introduce interactivity capabilities, KPN will probably intervene for an upstream solution in interactive services. Recent participation of NOB may be linked to its active contribution to the development of multi-media services, and thus, content.

DVB-T should be operational in the main regions of the Netherlands by September 2000.

1.1.2 Market development

Despite all these projects, whether they propose cable or terrestrial services, today, the only available digital offer is based on a satellite platform.

In fact, digital TV projects were developed quite early in the Netherlands. Already in 1996, NETHOLD, before being taken over by CANAL +, had a two-tier digital offer on satellite :

- ✓ the basic free tier comprised all the public and commercial Dutch channels (except *TV10/FoxKids*).
- ✓ the second tier concerned a premium channel of NETHOLD as well as several other foreign channels, which could be accessed by subscription.

After the take over in June 1997 of NETHOLD's activities by CANAL +, the second tier was redefined; it comprises now only two separate channels, *CANAL + 1* and *CANAL + 2*.

[3] 59% State-owned, 40% NOS (public broadcasting) and 1% Radio Nederland Wereldomroep.

Today, among the 300 000 households, which, in the Netherlands, receive TV by satellite, 160 000 are equipped with a satellite dish and a digital decoder. As of mid-1999, only 35 000 of these households have subscribed to the CANAL + digital offer.

Table 2 : DTV platforms in the Netherlands

Name of the service	*Ownership*	*Date of launch*	*Nb of subscribers June 1999*
Canal + Digitaal	100% Canal + Group	March 1996	35 000

In the present state, and three years after the launch of digital services by NETHOLD, only 2,5 % of TV households may access the digital bouquet, and barely more than 0,5 % currently subscribe to the digital pay-TV offer.

Table 3 : Satellite equipment, digital households and digital offer subscriptions in 1998

No. of TV households in the Netherlands	6 168 000
% of total households	*94,2 %*
No. of households with satellite antennas	300 000
% of TV households	*4,8%*
No. of households with satellite antennas and digital decoder	160 000
% of TV households	*2,6%*
No. of subscribers to the CANAL + digital offer	
In 1998	30 000
% of TV households	*0,48%*
In June 1999	35 000
% of TV households	*0,56%*

Source : Cable Yearbook 1999/L.E.N.T.I.C. estimation

Several reasons influencing the relatively slow path of the digital market development may be mentioned :

- ✓ the digital offer is not yet relayed on a large scale, as we have already noted, by the cable networks while the majority of the TV households receive television by cable;
- ✓ in the Netherlands, the TV offer is relatively rich. Indeed, most of the customers can receive a multi-channel provision (30 channels) through the CATV networks. In such a context, even the analogue pay-TV has had, until now, a little success : in mid-1999, CANAL + recorded only 235 000 subscribers, that is barely 4 % of the Dutch TV households;
- ✓ finally, the customers who want to receive digital services must first buy the decoder (about NLG 1 100) as there is no rental formula proposed by the digital TV operator.

1.2 Details of services

Like the digital offer of NETHOLD -, the CANAL + bouquet is organized in a two-tier offer. The basic tier has remained unchanged after the take-over of NETHOLD by CANAL +, in 1997. It still comprises the majority of public and commercial Dutch channels.

On the other hand, the digital pay-TV offer was progressively recomposed to offer only the *Canal + 1* and *Canal + 2* channels. These two channels are the same as those distributed in analogue form on the cable.

Channel line-up

Offer	Price per month
Basic tier (Dutch public and commercial channels)	Free
CANAL+1 and CANAL+2	NLG 49 [4]

Major channel providers

Channels	Provider
Dutch public and commercial channels	
CANAL+1, CANAL+2	CANAL+ Nederland

However, two projects are well on the way to improving the digital offer. One concerns a *Canal + 3* premium channel which will exclusively show movies in 16:9 format. Another concerns the development of a “plus package” at a relatively low price, which will contain about 10 channels, comprising the most-viewed on cable such as *Eurosport*, *Discovery*, etc. More information on the composition of the package is unavailable.

[4] Subscription only (decoder excluded)

1.3 Operators and market structure

1.3.1 Fragile relations between cable operators and channel editors

Conflicts concerning cable access

As we have already noted, the composition of the analogue cable offer is, today, of 30 channels. The composition of this package is twofold, with, on the one hand, a basic package channels whose broadcasters enjoy a "must-carry", and on the other hand, a number of commercial broadcasters for whom the cable operator determines the access fee.

- ✓ This regulatory context has contributed to a bottleneck situation for some channel providers. The channels included in the standard package use a major part of the network capacity. In order to recover the major investments needed to support new and interactive services, cable operators are increasing the access fees to their networks for the broadcasters. For instance, A2000, which is quite advanced in its upgrading and offering of new services, charges significant access fees, which in August 1998, led *MTV* and *CNN* to retire from its network and which places CANAL + today in a difficult financial situation. CANAL + lost a court case concerning the access fees for analogue transmission to the A2000 network.

- ✓ Beyond that, Canal+ did not find an agreement with the cable operators on the access fee for transmitting their digital signals on the cable. Recently, however, UPC has been required in November 1999 by the OPTA (Onafhankelijk Post- en Telecommunicatie Autoriteit, the national telecommunication regulator) to transmit CANAL+ digital offer at half the price of what CANAL+ pays today for analogue transmission.

- ✓ Recently, the NMA (Nederlandse Mededinging Autoriteit), together with the OPTA, have fixed a joined framework for conflict resolution concerning access to cable between the cable operators and the channel providers. This framework, inspired by ONP principles, aims at equal treatment of channel providers by different measures:

    - ✓ .Firstly, the must-carry channels enjoy free access to the cable networks.

    - ✓ .Secondly, the other channel providers should not have to pay for the broadcasting costs of the must-carry channels. The access fees for these other channel providers should be cost-oriented.

    - ✓ .Finally, cable operators may not refuse access to their network, except for capacity restrictions, technical problems or when the channel provider does not accept to pay a cost-oriented access fee.

Concentration and internationalisation in the cable sector

✓ In the Netherlands, the cable sector, pretty fragmented in the past, has known during the last three years, a deep and striking concentration process, which benefited major international groups :

- First, following the liberalisation process of the telecommunications sector, KPN, the established telephone operator, the former Royal PTT Netherlands, has been forced by the public authorities to disengage from the cable sector. Consequently, it has sold its main cable networks. This move contributed partly to the intervention of foreign companies in the cable sector. Indeed, the biggest cable network of KPN, managed by CASEMA, was sold to France Telecom in December 1997. France Telecom is also active in the mobile telephone market as a shareholder of Dutchtone, and in the Internet market as an Internet service provider through EuroNet. France Telecom decided to group all these activities under one holding, the Dutchtone Group, in order to pursue its European strategy of full cable, mobile and Internet service provision.
- Other networks have been taken over by foreign companies. Like KPN, PHILIPS withdrew from its cable activities. As a result, UPC and MEDIA-ONE are now both shareholders of A2000, which is the cable-operator managing the network around Amsterdam. In 1998, UPC reinforced its position in cable through the creation of the UNITED TELEKABEL HOLDING (UTH) bringing together UPC's and NUON's cable activities. In 1999, UPC bought out 49% of the capital of Telekabel which was still in the hands of NUON. For its part, NUON has become a shareholder of UPC. The important presence of UPC in the Dutch cable sector has to be reinforced by the increasing Europe-wide involvement of UPC in cable activities, and its recent announcement of the development of a European digital bouquet. The strategic alliance announced between UPC and SBS probably reinforces this approach.

Diversification of the cable operators' offer

Moreover, most cable-operators are diversifying their activities in order to become full-service providers. A large number of cable operators are also either Internet access providers[5], or Internet backbone operators[6]. Some of them already offer telephony services via cable[7], others have tests-sites working in this field. Two of them offer analogue pay-per-view services[8] and seem in this way to pursue vertical integration. Cable-operators seem to be developing similar plans regarding digital broadcasting, taking charge of not only the access to the network and services but also of the service provision itself by packaging third party channels into bouquets or by developing contents (cfr. for example, the strategic alliance between UPC and SBS).

5 Casema, Telekabel, Multikabel, Zekatel, A2000…

6 ENECO

7 A2000

8 A2000 (Moviehouse) and CASEMA. Mediakabel is testing a similar service within its Mr Zap offer (see supra).

Towards a repositioning of CANAL + ?

The presence, in the cable sector, of two important international groups (FRANCE TELECOM and UPC) which are developing European strategies, including the content provision side, puts CANAL + in quite a difficult position as negotiation with the cable operators is needed. Although none of the cable operators are excluding the possibility of including CANAL +'s services in their digital offer, it is well-known that they are looking to other decoder technology (for example, the agreement between UPC and Microsoft). In any case, they certainly would not accept that CANAL + manages the conditional access system.

In fact, different scenarios are emerging for a possible collaboration between CANAL + and the cable operators or any other infrastructure operator. For example:

- ✓ CANAL+ could become exclusively a content provider, leaving conditional access management and control to the infrastructure operator;
- ✓ CANAL+ and the infrastructure operator could collaborate on the choice of the conditional access and share the management of it;

1.3.2 Development of a platform competition policy

These last years, several political moves have been made in order to boost competition between communication infrastructures in the Netherlands. When the telecommunication market was liberalised, a clear policy decision - amongst others with the forced withdrawal of KPN from cable activities - was made to stimulate alternative infrastructure owners, and more specifically cable operators, to offer telephony services and to avoid abuse by the established operator in a dominant position.

Today, with the development of digital television, political support is given to DVB-T, a platform solution in a potential competition with cable, in order to accelerate market growth and to stimulate new interactive service development.

The Dutch government has asked NOZEMA to set up a large-scale experimental service in 1999 in order to test infrastructures and to evaluate the potential development of digital terrestrial television. These experiments are being conducted at the moment. They are financed 50% by the Ministry of the Economy, in the framework of the "Aktieprogramma electronische snelwegen" which supports pilot experiments, and 50% by NOZEMA and its partners.

The DVB-T project was examined by the competent ministries during the second half of 1998 and implementation has been approved. The frequency planning is still in political discussion, but we might expect that frequency allocation will be decided soon and frequencies will probably be auctioned early in 2000. In the first phase, five multiplexes should be available.

The DIGITENNE consortium is of course interested in all the multiplexes as they seem almost the only way to offer a solution, able to compete with cable.

1.3.3 Regulatory context of digital TV

Two laws, which have recently been revised so as to adapt to new developments in the telecommunication and audio-visual markets, have to be considered in the digital television field :

- ✓ in the first law, the "Mediawet" has appointed the "Nederlandse Mededingings Autoriteit", the regulatory body for the respect of competitive market conditions, as the authority in charge of controlling the respect of reasonable access conditions for broadcasters to the cable infrastructure;

- ✓ secondly, as far as conditional access is concerned, the "Telecommunicatiewet", which has been operational since 15 December 1998, has integrated the transposition of the conditional access directive (95/47/EC), and has appointed OPTA (Onafhankelijke Post- en Telecommunicatie Autoriteit), the national telecommunications regulator, to ensure that its provisions are respected.

- ✓ As already mentioned, the NMA and the OPTA have established a common framework for conflict resolution concerning cable access as competences of both institutions are overlapping themselves on this matter.

- ✓ Moreover, the Secretary of State of the Ministry of Culture raised the issue of the use of "tiering" in a recent notice, - the "Kabelnotitie"-, in which he pointed out the possible advantage of this solution to increase decoder dissemination among households and thus contribute to improving access to new broadcasting as well as new interactive services. However, he also pointed out that some households which wouldn't be able to afford access to optional packages, would thereby be limited to a reduced number of channels whereas they used to have access to more than 30 channels. This note is intended to foster discussion between the different participants involved.

1.4 Technical issues

1.4.1 Decoder issues

Satellite decoders

Historically, the digital offer, of NETHOLD firstly and later of CANAL +, was received via a IRDETO decoder. In October 1998, a new decoder, using SECA technology, was launched. It is intended to progressively replace the IRDETO decoder. During a transitional period the two access technologies remain in parallel use.

The SECA decoder includes possibilities to offer PPV services, Internet, 16:9 broadcast, and has an integrated modem.

Table 4 : Conditional access

Name of Decoder	SECA
API	Mediaguard
CA	Mediahighway
Available for sale/price	Yes / NLG 1,100
Available for rent/price	No
CA agreements	No

Cable decoders

Concerning the future digital offer of the cable operators, the technical choices have already been made. CASEMA and MEDIAKABEL have chosen the same DVB decoder, the Eurobox standard (API, Open TV and CA, Viaccess) with standard DVB return path. A2000 though, through UPC, has also chosen a DVB standard decoder but one which uses the American standard (DOCSIS) for the return path.

Terrestrial decoders

The DIGITENNE members decided to use an open standard based on EuroMHEG for their API, and to migrate as soon as possible to the expected common European API DVB MHP which is under development in the DVB MHP group. Experiments have started in the Netherlands with the now-available UK-profile of MHEG5. The use of EuroMHEG is foreseen for the first phase of introduction; a final decision will be made at the end of 1999. We may observe that, even if CANAL + is participating in the consortium, the choice of the members hasn’t fallen on the SECA decoder.

1.4.2 Widescreen (16:9)

The CANAL+ choice of replacing progressively the IRDETO decoder by SECA technology, will probably open new opportunities in offering 16 :9 services ; notably, CANAL+ announced that its new premium service, *Canal + 3*, will show exclusively movies in 16 :9 format.

Table 5 : Number of TV households with 16:9 set

	1996	1998
Dutch households with installed 16:9 set	232 800	361 800

Source : E.A.O.

1.5 Conclusion

The digital offer in the Netherlands presents four main characteristics:

- ✓ on the Dutch TV market, there exists only one digital offer which is proposed by CANAL +. This offer has not, until now, encountered any serious competitor.
- ✓ the digital operator is in fact also the analogue pay-TV operator.
- ✓ the digital offer exclusively comprises services which are also broadcast in an analogue format;
- ✓ finally, the digital offer is not available by cable while 94 % of the Dutch population receive TV services by CATV networks.

Consequently, the impact of the pay-TV digital offer is relatively weak, as it attracts, in mid-1999, 35 000 subscribers out of a potential audience of 160 000 satellite TV households equipped with digital decoders.

However, the evolution in process in the TV sector could progressively transform the situation :

- ✓ the major actors in the cable sector, which has known during the last years a dramatic internationalisation and concentration process, have all announced their intention to progressively offer, beyond the analogue channels, a number of digital TV services; they will segment their market better with DTV, by offering beyond the basic tier, different packages of services to increase the turnover per subscriber;
- ✓ on the other hand, an important terrestrial digital video broadcasting (DVB-T) project is being developped by a consortium consisting of various operators. This will provide a competing infrastructure to the cable networks both for pay-TV and free-to-air.

Facing the twofold transformation of the TV market, the position of the leading digital actor in the Netherlands, CANAL +, is at stake; and the company will soon probably have to reconsider its main strategic approach and will have to review its commercial strategy and maybe, collaborate with new actors. It seems that CANAL+ will face tough competition in content provision, in service packaging as well as in access to consumer. This means probably that CANAL+ may have to accept technological choices of other market players, as well as to position itself as a mere channel provider.

Beyond this, it is clear that the cable operators have achieved today increased negotiation power given the contents profusion. Public authorities have taken this factor into account by introducing an ONP-type framework for access to cable. They seem however to be conscious that the monopoly situation of the cable-operators won't be completely counteracted by way of regulation. The important support given by the public authorities to the development of DVB-T testifies they consider infrastructure competition as a necessary condition to achieve reasonnable access for channel providers to digital TV infrastructure.

2 Key figures for the Dutch market

2.1 Country fundamentals

	1993	1994	1995	1996	1997	1998	1999
Population (millions)	15,382	15,459	15,494	15,567	15,654		
Households (millions)	6,032	6,125	6,235	6,354	6,548		
GDP (in Euros billions)	284,400	304,000	312,000	325,500	340,334		

Source : OECD

2.2 Equipment

As of 31 December	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
TV households (millions)	5,622	5,727	5,848	5,973	6,168		
TV households (% of total households)	93,2%	93,5%	93,8%	94,0%	94,2%		
TV Households with 2 TV sets or more (millions)	1,574	1,775	1,924	1,971	2,159		
TV Households with 2 TV sets or more (% of TV Households)	28,0%	31,0%	32,9%	33,0%	35,0%		
TV Households with 16:9 Television sets (millions)	0,144	0,180	0,232	0,290	0,362		
TV Households with 16:9 Television sets (% of TV Households)	2,6%	3,1%	3,9%	4,8%	5,8%		
VCR Households (millions)	3,800	4,097	4,198	4,299	4,636		
VCR Households (% of TV Households)	67,6%	71,5%	71,8%	72,0%	75,2%		
Digital STB Households (millions)	0,000	0,000	0,020	0,150	0,160		
Digital STB Households (% of TV Households)	0,0%	0,0%	0,3%	2,5%	2,6%		
IDTV Households (millions)	0,000	0,000	0,000	0,000	0,000		
Digital TV Households (% of TV households)	0,0%	0,0%	0,0%	0,0%	0,0%		
Digital Households (millions)	0,000	0,000	0,010	0,150	0,160		
Digital Households (% of TV households)	0,0%	0,0%	0,2%	2,5%	2,6%		

Source : E.A.O./L.E.N.T.I.C. estimation

2.3 Access to DTV

Cable

	1993	1994	1995	1996	1997	1998	1999
Home passed (millions)		5,442	5,567	5,702	5,847	6,045	
of which digital (millions)		0,000	0,000	0,000	0,000	0,000	
Home passed (% of TV households)		0,0%	0,0%	0,0%	0,0%	0,0%	
of which digital (% of TV households)		0,0%	0,0%	0,0%	0,0%	0,0%	
Analogue Basic Subscribers (millions)		5,350	5,510	5,544	5,596	5,760	
Digital package subscribers (millions)		0,000	0,000	0,000	0,000	0,000	
Analogue Basic Subscribers (% of TV households)		95,2%	96,2%	94,8%	93,7%	93,4%	
Digital package subscribers (% of TV households)		0,0%	0,0%	0,0%	0,0%	0,0%	

Source : E.A.O./L.E.N.T.I.C. estimation

Satellite

	1993	1994	1995	1996	1997	1998	1999
Satellite households (millions)		0,160	0,200	0,250	0,320	0,330	
Satellite households (% of TV households)		2,8%	3,5%	4,3%	5,4%	5,4%	
Satellite subscribers (millions)		0,000	0,000	0,010	0,020	0,030	
Satellite subscribers (% of TV households)		0,0%	0,0%	0,2%	0,3%	0,5%	
of which digital (millions)		0,000	0,000	0,010	0,020	0,030	
of which digital (% of TV households)		0,0%	0,0%	0,2%	0,3%	0,5%	

Source : L.E.N.T.I.C. estimation

2.4 Television market estimates*

Millions Euros	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
Analogue TV Market							
Public funding		336,000	356,000	359,000	370,249	380,538	
Advertising		349,000	375,000	366,000	389,200	413,700	
Subscriptions		58,000	65,000	55,000	74,000	88,656	
Total analogue TV		743,000	796,000	780,000	833,449	882,894	
Digital TV Market							
Public funding		0,000	0,000	0,000	0,000	0,000	
Advertising		0,000	0,000	0,000	0,000	0,000	
Subscriptions		0,000	0,000	3,000	5,000	8,063	
Total digital TV		0,000	0,000	3,000	5,000	8,063	
TV Market							
Public funding		336,000	356,000	359,000	370,249	380,538	
Advertising		349,000	375,000	366,000	389,200	413,700	
Subscriptions		58,000	65,000	58,000	79,000	96,719	
Total TV market.		743,000	796,000	783,000	838,449	890,957	

Source : E.A.O./Trends/L.E.N.T.I.C. estimation

** "**Public funding**" comprise grants and licence fees; "**Advertising**" also includes sponsoring expenditures whereas "**Subscriptions**" cover subscriptions to the basic multi-channel package as well as subscriptions to Premium pay-TV services.*