



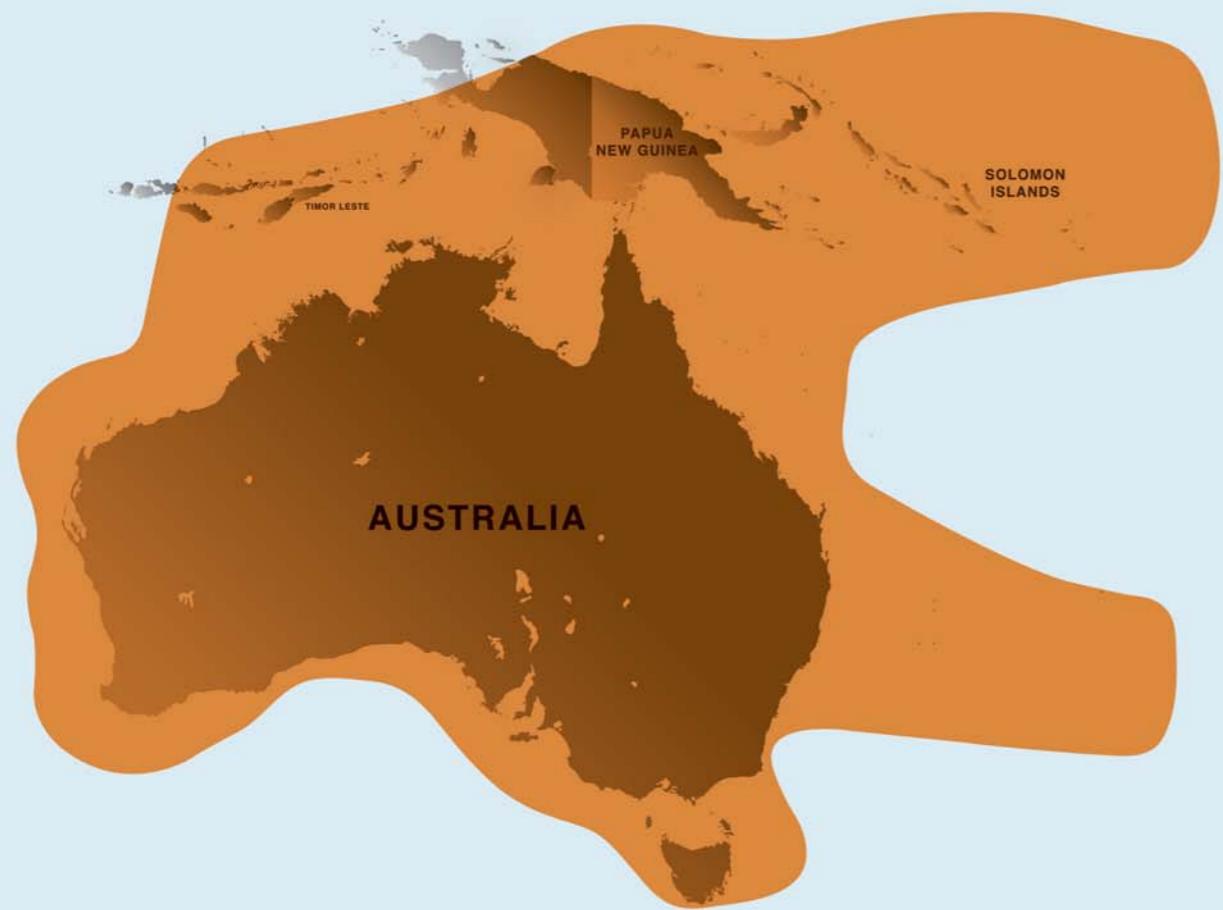
Ultra HD via Satellite

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MESSAGE FROM THE PRESIDENT



I was able to be acquainted with many distinguished industry people and indeed I have learned a lot from them.

The APSCC 2014 Satellite Conference & Exhibition, held in Phuket, Thailand from September 23rd to 25th, was a tremendous success following the last three successful conferences held during my presidency of APSCC. We have won a lot of praises for the conference program contents, the venue selection, the audio and visual settings of the conference room, the smooth operations and so on. We have had in-depth discussions on every session by the moderators, panelists, and the audience, which delivered important information to the attendants and triggered new thoughts for their business. This success was achieved by the constructive discussions among the members of the APSCC Board of Directors during the planning phase and excellent implementation by APSCC secretariat staff together with the support of the APSCC member companies by sponsoring the event. I would like to express my gratitude to all the people who have attended the event and worked for the success of the event.

I have been working as APSCC President for four years from January 2011 and will finish the role by the end of December this year. It was a great honor for me to be elected as President. I am afraid that I might not have achieved all of my responsibilities and meet the expectations of the APSCC members, but I believe that I did do my best to contribute to the development of satellite industry where I grew up and worked for over 40 years. I faced a bit of difficulties during my term, but more than that is I actually enjoyed my role because

Year 2011, when I was started my role as APSCC President, was truly a difficult year with economic and political crises as well as many natural disasters. The world was suffering from economic downturn after the "Lehman shock" and even the natural disasters like flooding and big earthquakes hit everywhere in the world, particularly many countries in the Asia Pacific region had big damages. Despite the situation, we saw a strong and steady growth in the satellite industry sustained by new demand from developing countries and stable demand in developed countries stimulated by the technical innovations during four years period since then. Especially, the growth of the Asia Pacific region during the period is noteworthy, and I hope that APSCC activities had somewhat contributed to the notable development in the Asia Pacific region in the past and will continue to do so in the future.

Lastly, I would like to express my deep appreciation to all of the members of APSCC and the Directors of the board as well as the Secretary office staff for the continued support during my presidency.

Yutaka Nagai
President, APSCC

Asia at the Forefront of the Development of the Ultra HD Market

Dimitri Buchs, Consultant, Euroconsult

Players involved in the video value chain including broadcasters, pay-TV providers (linear and non-linear) and satellite operators have started to look beyond the 3D format and toward Ultra HD (UHD, also referred to as 4K) in the past couple of years. The latter format is seen as more appealing, with 4K Ultra HD broadcasts offering four times the amount of detail as HD content does and without the constraint of wearing glasses to view the content. Also in development is the 8K Ultra HD technology, which will supposedly offer a 3D-like experience due to the higher image resolution.

Ultra HD is Gaining Momentum in the Television Landscape

Commercialization of the first UHD TV sets started in 2012. Despite price decreases in recent months, the average price of UHD TVs still remains high for the format to be more than a niche market in 2014. In October 2014, the global average price per UHD screen was estimated to reach approximately \$1,200 and in some cases such as in North America more than \$1,500. Lower prices can be found in several countries, including China, where UHD TV's can be purchased for around \$1,000 on average following the introduction of low-priced screens by Chinese brands in 2014. Things should change globally in the short term with growing competition among consumer electronics companies, leading to lower prices for UHD screens. In 2014, things have started to move in the right direction for UHD TV sales, with UHD shipments after 2Q 2014 already outpacing the 2013 total according to NPD DisplaySearch.

With UHD sets available at increasingly affordable prices, the focus has already shifted toward broadcasters, content producers, service providers and satellite operators that will have a key role in the format's development. The success of UHD will largely come from content availability. UHD is being introduced progressively across the value chain by TV producers, broadcasters (e.g. NHK, ESPN), pay-TV service providers (Sky PerfecTV, Netflix) and video distribution providers (e.g. Eutelsat, Intelsat) with prevalence in cinema production (including movies such as American Hustle and Gone Girl), TV shows (e.g. House of Cards) and live events. As with HD and 3D in the past, sports events in particular are used to showcase the new format (e.g. 2014 FIFA World Cup in Brazil) with cultural events such as opera representations e.g. Vienna State Opera) also contributing to the development of the UHD market.

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Going Above and Beyond



UHD should initially largely be a branding tool but once pay-TV platforms roll out services, it will increasingly develop into a value-added service that users can access at a premium price. This is notably the case for Netflix whose new users are required to pay a premium price to access UHD content. In Japan, Sky PerfecTV is planning to include UHD in its premium line-up of services, meaning viewers will have to pay a subscription fee to access UHD channels once they become commercially available.

The time and significant capital investments required for broadcasters, producers, TV manufacturers, infrastructure owners and consumers to upgrade to UHD are limiting factors for the immediate development of UHD. As a consequence, UHD has so far been largely limited to trials, with specific events (mainly international sports competitions such as the 2014 Sochi Winter Olympics and the 2014 FIFA World Cup in Brazil) aimed at promoting the format. Several broadcasters, including NBC that shot some events of the Sochi Olympics in 4K and Brazil's Globosat that offered 4K broadcasts during the World Cup in Brazil in partnership with FIFA and Sony, have been active on the 4K front.

If UHD is to gain enough momentum to become a successful format, DTH platforms, digital cinema and OTT providers are expected to be the main drivers in the initial development phase. In the case of UHD, the difference with the first rollouts of previous formats (i.e. HD, 3D) is that the road to adoption will take a larger number of paths. This is due to the business model evolution resulting from the current multi-screen viewing environment. Content is now delivered across multiple platforms, with multiscreen/on-the-go services available on smartphones, tablets and PCs expected to represent a growing share of video viewing time in coming years. Broadcasters and pay-TV platforms can no longer focus on linear content only. Non-linear viewing is becoming ever more important nowadays for players in the TV industry and developing content adapted to these devices will be essential for the success of UHD. Several OTT providers have already rolled out UHD services. This is notably the case of Netflix, which started streaming several shows including House of Cards and Breaking Bad in UHD in 2014. Earlier this year, Amazon also announced it was teaming up with Samsung, Warner, Lionsgate and others on 4K UHD. In May 2014, Elemental streamed the world's first live 4K OTT broadcast.

The satellite industry, as was previously the case with HDTV and 3DTV, is also expected to be a central part of the success of UHD. Several satellite operators have been active in promoting the format and in rolling out UHD tests in recent months. Examples of initiatives include the following:

- Eutelsat launched Europe's first dedicated demo UHD channel in January 2013. In May 2014, Eutelsat launched Europe's first demo channel encoded in HEVC.
- Intelsat and Ericsson demonstrated 4K UHD on the operator's Galaxy 13 satellite in August 2013. This was the first transmission of a UHD signal over North America.
- SES launched in April 2013 the first UHD transmission in the new high-efficiency video coding (HEVC) transmission standard from an Astra satellite at 19.2°E.
- Hispasat launched in April 2014 a 4K channel for North and Central America. The channel called Hispasat 4K is transmitted free-to-air using Amazonas 3. The channel is available for the industry to do trials and foster the generation of additional content in UHD, with the aim of boosting its development.

Initiatives from players involved in the video value chain are essential for showcasing the potential of Ultra HD, and they should multiply in the months ahead of the introduction of the first commercially avail-

able 24/7 4K Ultra HD channels that are planned for 2015 in Japan.

UHD Broadcasts in 8K have also been mentioned by broadcasters and more particularly by NHK (Japan), which plans to broadcast in 8K during the Rio Olympics in 2016 and to offer complete 8KTV broadcasting by 2020 in time for the Tokyo Olympics.

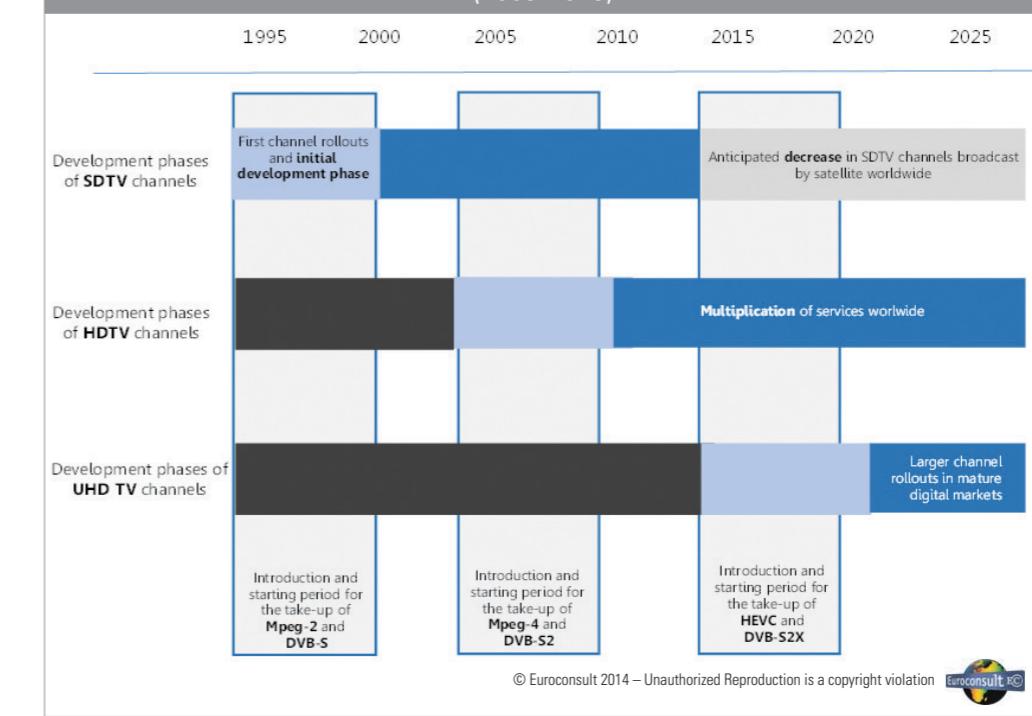
UHD Has a Growth Potential, but Will Require Time to Make a Large Impact

UHD is expected to represent a growth driver for the TV industry in the coming decade, even if its impact should remain limited in the short to middle term. UHD will likely have a stronger impact on the market than 3D, which has failed to take off four years after the first channels were launched.

Apart from the availability of lower-cost UHD screens and the large rollouts of UHD TV channels and program streams, the introduction of new broadcast formats will also be essential for UHD to be viable. Usage of HEVC compression and DVB-S2X are two conditions for the development of the UHD format, as they will make the cost of transmissions acceptable for a number of broadcasters and service providers.

If we take satellite TV for instance, it would be hard to imagine a real market for UHD without HEVC, as the data requirement for UHD in Mpeg-4 is around 40 Mbits/channel. With HEVC, this data requirement is about 20 Mbits. Improvement in compression is essential for the development of UHD, as Mpeg-4 does not allow broadcasting more than one UHD channel per 36 MHz equivalent transponder. With the progressive move from DVB-S2 to DVB-S2X and the development of HEVC, the average number of UHD channels broadcast per transponder should increase, and we anticipate an average 2.6 UHD channels per transponder by 2023. Most new UHD channels launched from 2015 should be compressed in HEVC.

**ROADMAP FOR FORMATS, COMPRESSION AND BROADCAST STANDARDS
(1995-2025)**



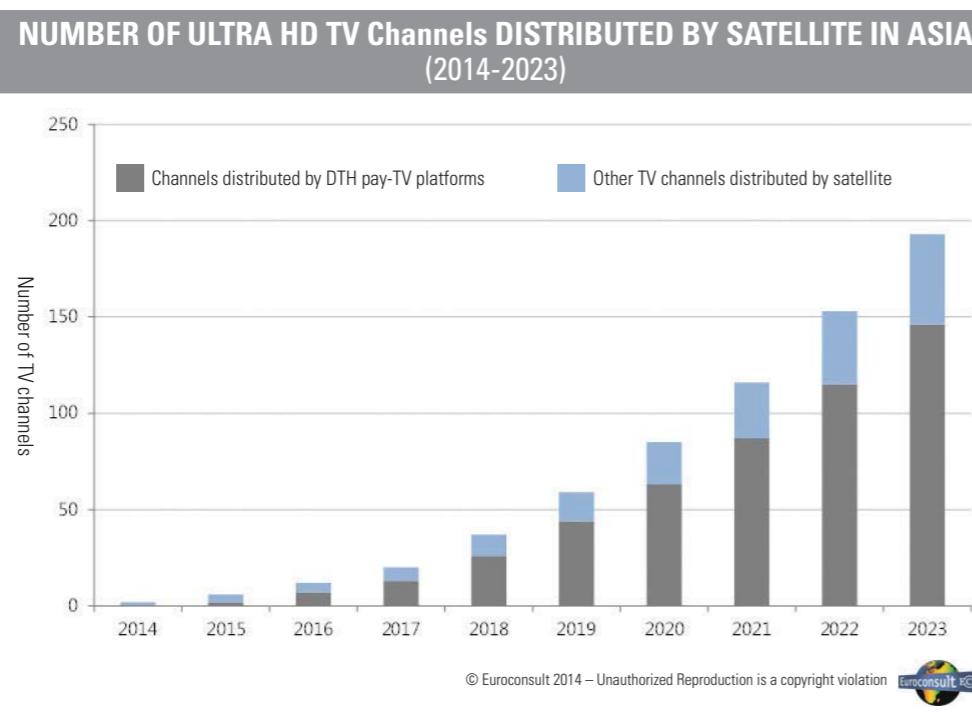
Even if the first 24/7 4K UHD channels are planned for 2015, larger rollouts of full-time UHD channels should more likely occur toward the end of this decade and the start of the next decade. If we take satellite TV channels only, Euroconsult expects the number of UHD channels broadcast globally to reach approximately 130 by 2018 and more than 700 by 2023. Growth in UHD channels is expected to be strong in the coming ten-year period but UHD should have a limited impact on capacity usage, as UHD channels are expected to represent less than 2% of total channels distributed by satellite in 2023.

Asia to Drive Ultra HD Market in the Initial Development Phase of the Format

Contrary to what was observed when HDTV was launched in the mid-2000s and mature TV markets (i.e. Japan, South Korea, North America, Western Europe...) drove sales, emerging digital markets, led by Asian countries, should be at the forefront of UHD sales in the initial development phase of the format. This is mainly linked to the fact that most TV households in mature markets are already equipped with HD screens and will therefore wait a few years before buying a new TV screen.

Asia, led by China, is currently the leading region in terms of UHD TV households, with the region expected to maintain its leading position in coming years. In 2013, China accounted for 80% of shipments and in the first half of 2014 for 60% of the total according to NPD DisplaySearch. TV sales in the country have notably been favored by the flooding of the market with low-cost models by national brands such as Hisense, Skyworth and TCL. If prices of UHD screens continue to decrease, it is possible that many countries outside of China where HD penetration remains low will move directly from SD programs to UHD without passing through the HD phase. This could notably be the case of Thailand and India.

The region is also expected to be one of the most dynamic markets in terms of UHD broadcasts and channels deployments in coming years, with Japan, South Korea and Malaysia leading the way. Examples of initiatives include the following:



- NHK announced in March 2014 that it will broadcast in 8K UHD for the 2016 Summer Olympics in Rio. The broadcaster will broadcast documentaries and special events in the 8K format in 2016 and subsequently plans to offer complete 8K broadcasting by 2020, in time for the Tokyo Olympic Games.
- Measat delivered in June 2014 the first ever UHD 4K transmission with DVB-S2X in partnership with Newtec.
- In June 2014, Eutelsat announced it would extend its UHD reach to Asia with the rollout of a channel in partnership with ST Teleport. The channel can be viewed in Southeast Asia and Australia.
- Korea Telecom launched a 4K IPTV service with Broadcom in September 2014. The company plans to offer more than 500 UHD program choices by the end of 2014.

Asia will be the first region to roll out commercial UHD channels in 2015. Japanese DTH platform Sky PerfectTV recently announced that it would launch two 4K UHD channels on March 1st 2015. These two channels are currently under trial broadcast. These channels will mainly broadcast sports events and movies.

Satellite is expected to be at the center of TV channel rollouts and program broadcasts in Asia. Apart from Sky PerfectTV, other DTH platforms including SkyLife in South Korea are exploring UHD and promoting the format. Based on Euroconsult's recently released research report, Satellite Communications & Broadcasting Markets Survey, Forecasts to 2023, the number of UHD channels distributed by satellite in Asia is expected to reach approximately 200 by 2023, with Japan and Korea leading the way (~70 UHD channels in 2023). This will represent more than a quarter of global UHD channels broadcast by satellite at that time.

Asia has a strong UHD growth potential but for the new format to have a big impact in the whole region and not only in the most advanced TV markets such as South Korea and Japan, several factors will have to occur. The most important ones will definitely be lower prices of UHD TV screens and a large amount of UHD content including free-to-air programs. ▲



Dimitri Buchs is a Consultant of Euroconsult, based in Montreal, Canada. He specializes in the digital broadcasting sector. Since joining the firm in 2007, Dimitri has worked on over 30 consulting missions. His expertise lies in analyzing market dynamics for video distribution and contribution services, regularly contributing to consulting projects and due diligence studies for satellite operators, service providers and equipment manufacturers where video broadcast is an essential part of the assessment. Dimitri is also the main contributor to Euroconsult's research reports dedicated to the broadcasting sector including *Prospects for Video Content Management and Distribution and DTH Platforms: Key Economics & Prospects*.

4K/8K Ultra HD via Satellite

Yutaka Imai, Chief Researcher in Service Development,
Business Strategy Department Multichannel Pay TV Business Group,
SKY Perfect JSAT Corporation

During recent years in Japan, satellite has reestablished itself as an indispensable solution for communications. Satellite plays a key role in the area of Business Continuity Planning (BCP). Damages from Great East Japan Earthquake on March 11th, 2011 are still vivid in our memory. During that time all of the ground communications networks, including CATV, were cut off. The residents in the affected area lost access to necessary information even if their buildings remained intact. However, satellites promptly supported the telecommunication networks, restoring the vital cellular services, broadcast networks and internet access in the stricken areas. Since then many government and private entities have enhanced their BCP by equipping themselves with VSAT systems and satellite phones.

Another important growth area for satellite is in the in-flight internet access service. In the US market where most domestic flights are operated over the landmass, it is very common to provide In-flight internet services by utilizing ground-based infrastructure such as GoGo. On the other hand, Japan is a small island country and most of the flights involve operation over the ocean. In this situation satellite-based communication architecture is the only viable solution. JAPAN AIRLINES and ALL NIPPON AIRWAYS are already providing in-flight Wi-Fi service for long-time flights. SKY Perfect JSAT is also cooperating in these services.

Another crucial area is of course advanced broadcasting via satellite - the key topic of this article. Currently the Japanese government is leading the launch of 4K, or Ultra-HD broadcasting, and the road map also includes 8K broadcast by the upcoming Tokyo Olympic Games in 2020.



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In October 2012, SKY Perfect JSAT completed its first 4K live transmission of a soccer match, which is considered to be the first successful attempt in the world. Unlike most of the transmission test shots by using a single fixed camera, six 4K cameras were employed during this game to resemble actual camera-work as in the production of conventional television programs. This project proved that live satellite feed with MPEG-4/AVC codec brings sufficient picture quality to support presentation on screens as large as 350 inches.

From June this year, the Next Generation Television and Broadcasting Promotion Forum (NexTV-F) led by the Japanese government began 4K broadcasting via satellite. This service is called "Channel 4K". This broadcast is the world's first 4K service to homes nationwide. Any television viewers in Japan can enjoy Channel 4K using the receivers already available in electrical appliance stores. As a member of NexTV-F, SKY Perfect JSAT contributed its satellite capacity and ground infrastructure to support this broadcast.



World Cup Soccer in 2014 was the first major event with 4K feeds available to international broadcasters. Many broadcasters and operators in the world, such as SKY Perfect JSAT, Eutelsat, France/4ever project, and DirecTV, were tackling 4K trial test. In Japan, World Cup matches were broadcasted on "Channel 4K". International feed from Brazil was received in Japan via AsiaSat 5.

Satellites delivered spectacular picture quality powered by 4K; people were inspired by Japanese state-of-the-heart technology as well as the excitement of the matches.

The sales of 4K television sets rapidly expanded the consumer-electronics market in Japan, and telecommunication companies other than satellite broadcasters also launched their 4K broadcasts and VOD services.

The satellite broadcasting has opened the door to new emerging markets for consumer electronics, broad-

casting, and programming industries.

The following 4K satellite broadcasting standard was adopted by Japan:

- 10 bit/HEVC compression (video data rate: 35 Mbps)
- 60p frame rate
- Chroma format based on BT.2020 recommendation

These technical standards require cutting-edge technology not only for transmission but also for production. Actual adoption of those standards to broadcasting service is the first in the world. In particular BT.2020 which enables more vivid color re-production had just been standardized by ITU-R last year, and had not productized yet.

SKY Perfect JSAT has been collaborating with the world's leading broadcast equipment manufacturers such as Canon Inc. to explore way to improve image quality using BT.2020 since last spring, and has successfully demonstrated great results on screen during IBC in September 2014. Major studios in Hollywood are also studying BT.2020 for cinema applications. BT.2020 offers high chroma saturation during dark scenes and excels in color reproduction, offering picture quality approaching that of the original master. The faithful reproduction of the cinema experience effectively increases value of Pay-TV.



Recently, 4K production technique is evolving rapidly for studio productions as well as in various live sport and music events same as conventional HD production. In the consumer market, large screen sized 4K television sets have entered the main stream market. To support this market development, SKY Perfect JSAT has decided to add two more 4K channels by March 2015 aside from "Channel 4K". Toshiba developed a 4K television with built-in receiver for satellite broadcasting, and has made it available beginning October 2014.

In addition to 4K broadcasting, Japanese government aims to provide 8K broadcasting service by Tokyo Olympic Games in 2020. A lot of experiments are already been conducted at 100 Mbps of transmission data rate targeting 8K broadcast.

Satellite is regarded as the ideal solution for advanced broadcast such as 4K/8K Ultra HD in Japan. The reasons are as follows:

- Satellite enables multi-cast transmissions to nationwide with stability, security, fast & easy set up
- Satellite can flexibly adapt to new broadcasting technologies and accommodate new innovations, such as Ultra HD
- Satellite receiving antennas are already spread out nationwide.



As both a leading satellite operator and a successful multi-channel Pay-TV operator, SKY Perfect JSAT is in an unique position to leverage on its resources and expertise to bring about the successful trial in the area of advanced broadcasting technology, maintaining its role as a forerunner for the past 20 years. We are confident that the demand for satellite capacity will continue to grow in tune with the advancement of 4K broadcast, not only in Japan but the rest of the world as well.

SKY Perfect JSAT hopes that the satellite entrepreneurs of each country would approach by referring Japan as the first model case of it, and to expand the market. ▲



Yutaka Imai has rich experience in the business planning field of contents distribution technology and DRM, working at Sony Corporation since 1991. Furthermore, he specializes in technology planning of picture evaluation for LCD television, and signal processing. In 2009, Yutaka started his career at SKY Perfect JSAT Corporation, where now he specializes in the business planning for new service in the multi-channel Pay TV business field. Up until today, he has been studying 4K broadcast technology started from 2011.

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Ultra HD – Getting Ready for Lift-off

Pierre Benoit d'Anthenay, Deputy CEO, Eutelsat Asia

Eutelsat is one of the pioneers of the 4K revolution with the launch of Europe's first demonstration Ultra HD channel in 2013. In Asia Pacific, we set up an Ultra HD satellite demonstration in June 2014 on EUTELSAT 70B during CommunicAsia which demonstrated the newest phase of 4K TV development to Asia's broadcast community.

Ultra HD is the next state-of-the-art of video. Its jump in terms of quality and immersive experience is comparable to the transition from black & white to colour, analogue to digital and digital to high definition. Ultra HD is a generic term embracing 4K and 8K TV pictures, meaning pictures shot and distributed at a resolution of 3840 x 2160 pixels for 4K and 7680 x 4320 pixels for 8K. They are also sometimes called UHD-1 and UHD-2.

Today, when we talk about Ultra HD we are really referring to 4K 3840 x 2160 TV pictures, which correspond to the resolution most "commonly" available on the market.



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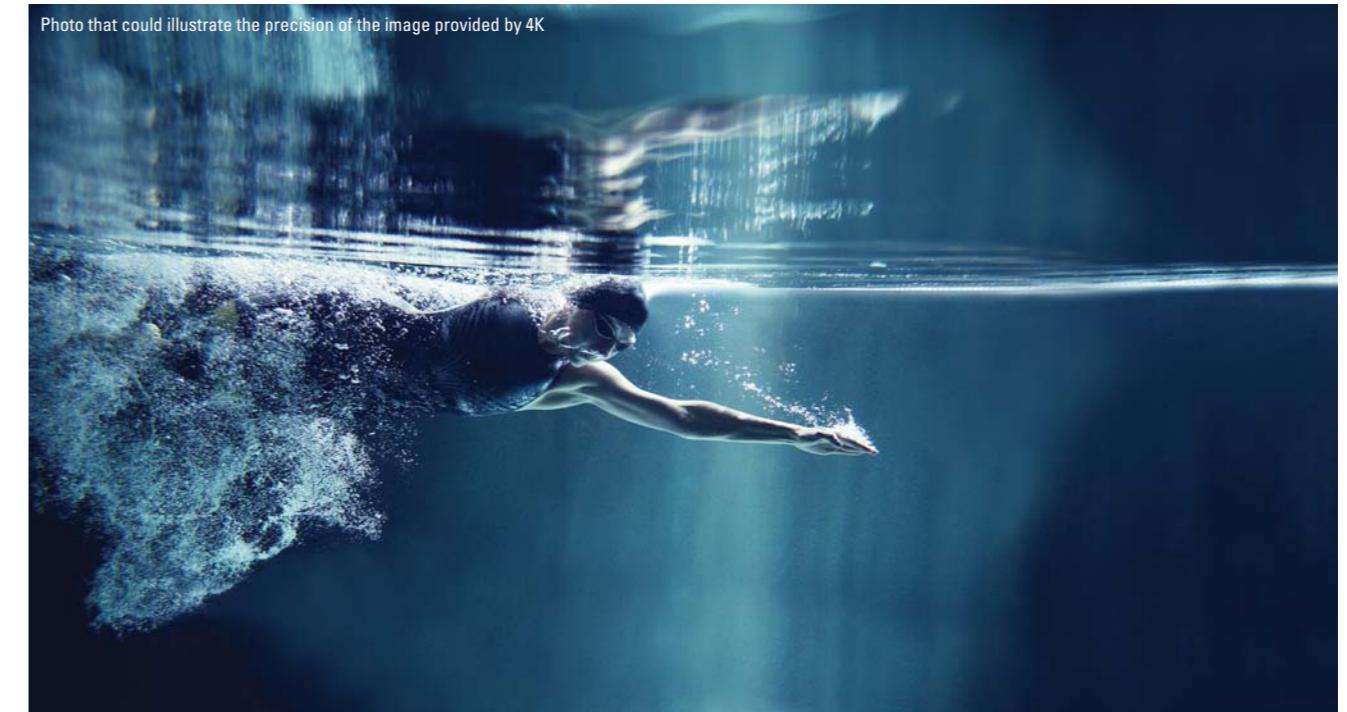
Although at an early stage from a commercial perspective, the Ultra HD ecosystem is rapidly taking shape. 4K cameras are available in consumer, semi-professional, and professional models. 4K production equipment is increasingly available, setting the stage for the volume of content shot in native 4K (and beyond) to grow. Some small links in the broadcasting chain are still missing, including a standard for the exchange of 4K live uncompressed material within studios, and a broad range of 4K video production equipment (mixers, routers etc...), but this is expected to improve fast.

4K Ultra HD TV sets are now produced by almost all major consumer electronics manufacturers. They are of course retro-compatible and can still display SD and HD signals, which are "up-converted" to 4K internally on the TV set to be displayed on the screen. Consumer equipment vendors often state that 4K screens, even when not fed by native 4K pictures, in any case show an improved picture quality with respect to HD. Even without regular 4K programming and content, sales of 4K screens keeps progressing because the appetite for new screens is a process not related purely to the availability of content. When flat screens and HD screens became affordable, they rapidly replaced CRT TV sets, despite the initial lack of HD content and HD programming. Full HD screens also progressively replaced HD-Ready screens, and this trend is likely to be repeated with 4K screens that will replace Full HD screens, as soon as 4K panels are as economical to produce as Full HD panels.

8K resolution meanwhile is for the time being limited to some professional appliances (for example the Sony F65 Camera). There are currently no Ultra HD 8K screens available on the consumer market.

Ten years ago, High Definition really began to accelerate with the arrival of MPEG-4 encoding. UHD should also progress with the arrival of another encoding standard: HEVC (High Efficiency Video Coding) which is expected to be 30-40% more efficient than MPEG-4. Existing Set Top Boxes (DVB-S / MPEG-2 / SD and DVB-S2 / MPEG-4 / HD) will be progressively replaced by DVB-S2 / HEVC / Ultra HD boxes.

Satellites will be the primary platforms for Ultra HD delivery, with up to two 4K channels in MPEG-4 using HEVC compression now carried on a standard 36 MHz transponder. It is expected that once HEVC encoders are commonplace and have benefited from "fine tuning", within the next two years, the bitrate required for broadcasting a 4K ultra HD channel compressed in HEVC will be in the range of 15/20 Mbps



(vs. 8/12 Mbps today for an HD video channel compressed in MPEG4 AVC). We do not anticipate a shortage of bandwidth as the migration from SD/HD to Ultra HD will be progressive, will initially embrace a limited number of channels, and also because we expect a parallel improvement in the efficiency of the satellite "pipe" with the introduction of DVB-S2x.

A side benefit of HEVC compression is its increased efficiency even for compressing SD and HD channels. The gain in term of efficiency should be in the range of 50/60% (reduction of bitrate - with respect to MPEG4 – required for encoding an SD or HD signal keeping the video quality constant). The increased efficiency of HEVC will therefore give broadcasters the opportunity either to increase the quality of existing SD and HD Channels or to expand the offer by adding further channels.

Content production, a critical success factor, is also on the rise, driven by players such as Netflix that are shooting flagship series like House of Cards in 4K. Some major events, including three FIFA 2014 matches were produced in 4K Ultra HD and broadcast via satellite in the framework of public demonstrations and/or trials. Nine FIFA 2014 matches were also filmed in 8K Super Hi-Vision. They represented valuable opportunities for technicians and crews to test and prove new technology and have provided essential feedback to manufacturers and vendors which will help them correct and improve their present products.

There is a strong focus in Europe and the USA on 4K TV production and distribution. In Japan, country of the "inventors" of Ultra HD, announcements have been made of 8K trial broadcasting in 2018 and 4K and 8K services in 2020 to coincide with the Tokyo Olympics.

Eutelsat's expectation is that pay-TV platforms will be the first to propose 4K television channels to their subscribers. Following the same path as High Definition, 4K is expected to emerge in countries characterized by high purchasing power, with a competitive video market, like the USA, Japan, Korea or Western

DIGITAL EDITIONS

Europe. Ultra HD is expected to be driven by the same content as for High Definition when it first appeared, by sports and cinema.

US satellite giant DirecTV is showing the way, with 4K content rolled out in November 2014, with the availability of 19 4K films from Paramount Pictures and K2 Communications. DirecTV has also teamed up with Samsung as its exclusive CE 4K UHD launch partner. Customers who have DirecTV's Genie HD DVR will be able to watch 4K programming on supporting 2014 Samsung Ultra HD TVs.

Japanese direct-to-home (DTH) satellite TV operator Sky Perfect JSAT Corporation will follow with the launch two 4K UHD channels on 1 March 2015. The dedicated 4K channels will feature J-League football matches, along with other sporting events, films and live concerts.

We believe it is questionable whether OTT will ever become an effective medium for delivering live 4K broadcasting to millions of users, unlike other broadcast media. 4K streaming requires that the Internet line serving each single user is capable of sustaining very high throughput to support the higher rate required by 4K streaming. Netflix recommends at least 25 Mbps, which de facto limits its use to customers connected via FTTH, i.e. a small minority of users. Furthermore, transit and CDN costs represent an important recurring cost that OTT operators will have to face to deliver 4K. OTT providers today pay around 3 cents of a dollar for the delivery of one hour of SD video to a single user, while they will have to pay up to six times more for 4K content per single user due to the higher throughput. CDN costs also increase linearly with the number of users served meaning that delivering a few hours of 4K content to millions of OTT users will rapidly generate six-zero figure costs to OTT suppliers.

Satellites, on the contrary, are significantly more efficient in cost-efficiently delivering high throughput to millions of users, with low bandwidth costs. The core added value of 4K broadcasting is improved quality. So, we expect that when broadcasters launch the first offer of channels they will pay a lot of attention to assigning the required throughput in order to sustain quality high across the delivery chain right up to user screens. And we will be by their side to partner with them in this new adventure! ☰



Pierre Benoist d'Anthenay, Deputy CEO of Eutelsat Asia since 2013, is currently in charge of Business Development, Partnerships, and Finance for Asia-Pacific. Previously a Banker, he joined Eutelsat 8 years ago and was the Director of Corporate Finance in the Group in Paris. In Eutelsat Group he had management responsibility for the global finance function, supporting the CFO in M&A activity, organic growth investments, controlling and refinancing of the Group

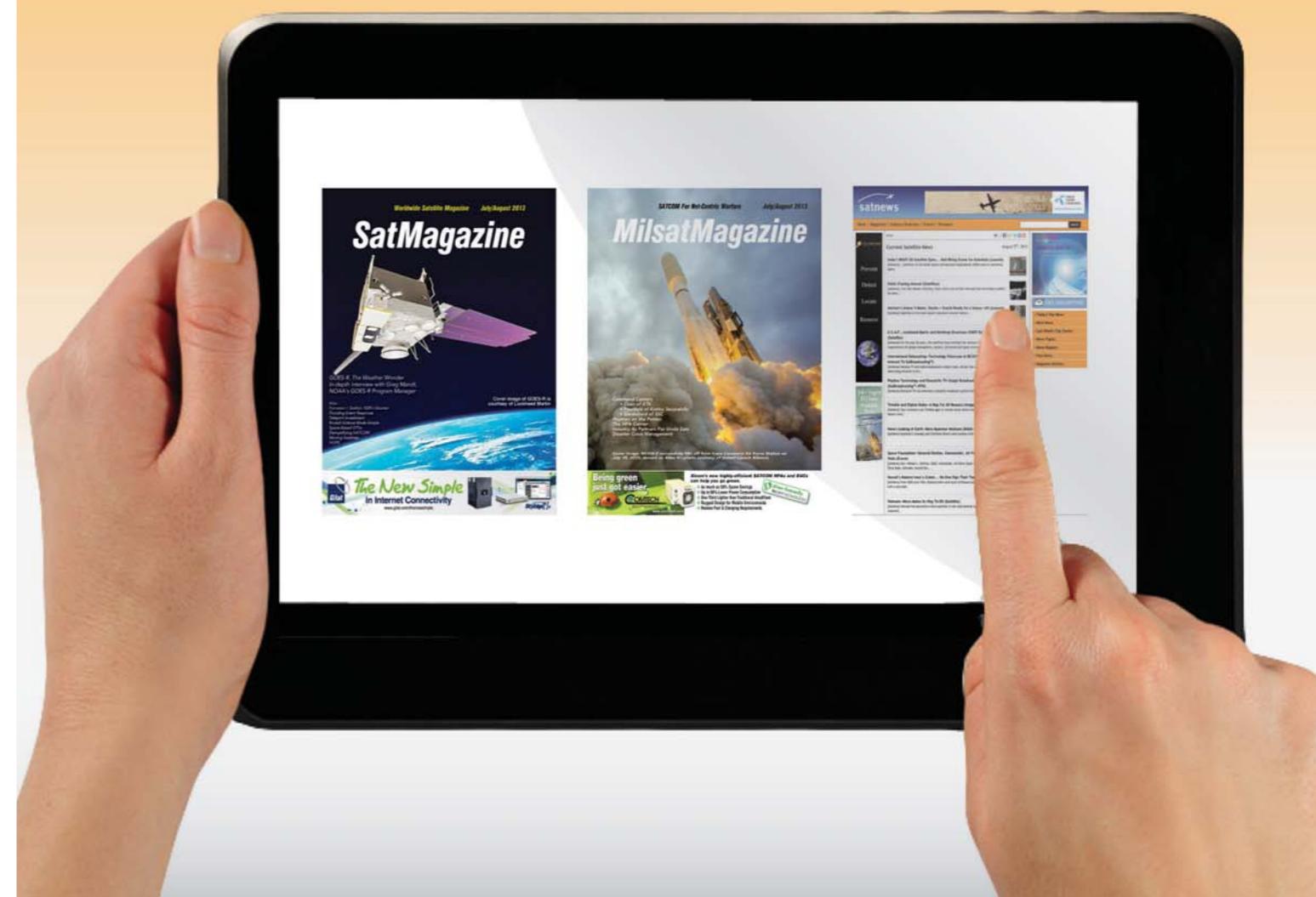
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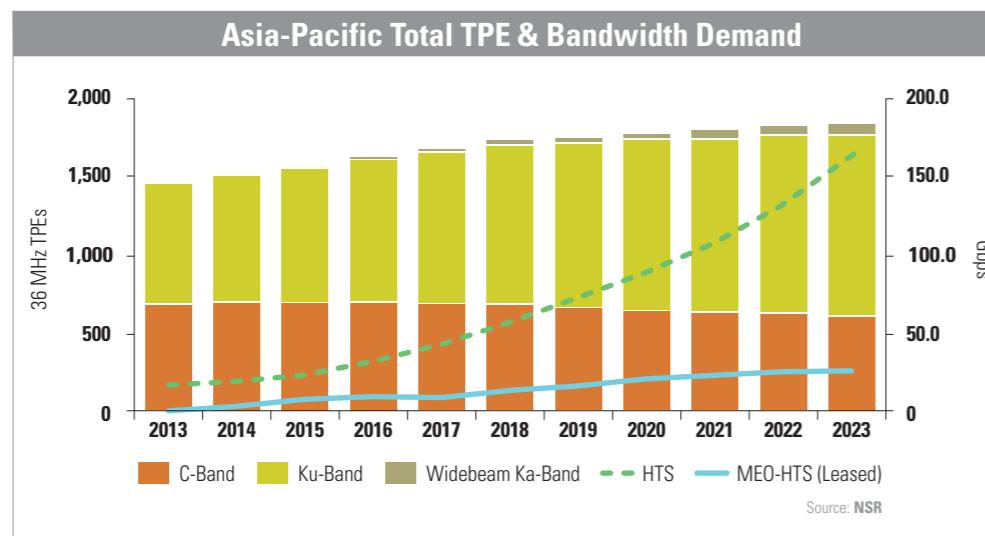
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Demand in Asia-Pacific - a Multi-Pronged Approach to Growth

Blaine Curcio, Senior Analyst, NSR Korea

Last quarter, my colleague Prashant Butani, Senior Analyst NSR Mumbai, wrote an article for this very publication, one discussing satellite supply and overall operator financial performance in Asia-Pacific. This quarter, we will discuss a demand side analysis in this very dynamic region. For definitional purposes, the "Asia" region in this report will include the NSR-defined regions of South Asia, East Asia, and Southeast Asia, the last of which also includes Australia & New Zealand. Looking forward, Asia-Pacific will see demand arise from a number of new sources, including Ultra HD, the Enterprise Data vertical in general, and DTH in huge and expanding markets such as Indonesia and India.



Overall Demand in Asia-Pacific

Utilizing data from NSR's Global Satellite Capacity Supply & Demand, 11th Edition report, published in July, NSR forecasts strong Ku-band demand growth in the region during the forecast period, with 3% CAGR corresponding to an additional 380 TPEs of Ku-band demand. This will be driven by a number of applications in a number of sub-regions, the largest of which will be discussed in detail later in this analy-

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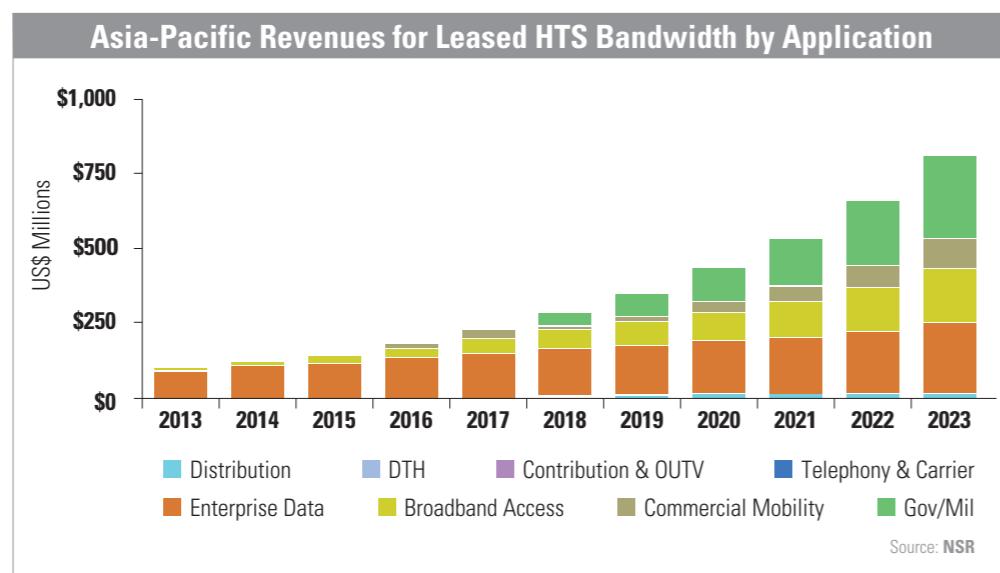
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sis. However, on a macro level, growth will be driven by video applications in emerging markets, specifically India, Indonesia, and some of the other large South/Southeast Asia, such as Bangladesh, Pakistan. Smaller countries such as Myanmar will provide good opportunities long-term, but are still very frontier in nature.

On the whole, Asia-Pacific will see a decline in C-band leasing to the tune of just over 1% per year to 2023, or a decline of roughly 70 TPEs in total. That said, C-band leasing revenues in Asia-Pac will still be nearly \$1B by 2023, which is to say it is by no means a small market. Applications such as Video Distribution will grow slowly in several sub-regions, and other applications such as Enterprise Data will remain solid applications due to strongly established legacy networks in many countries, and a general lack of fiber in large swathes of the region.

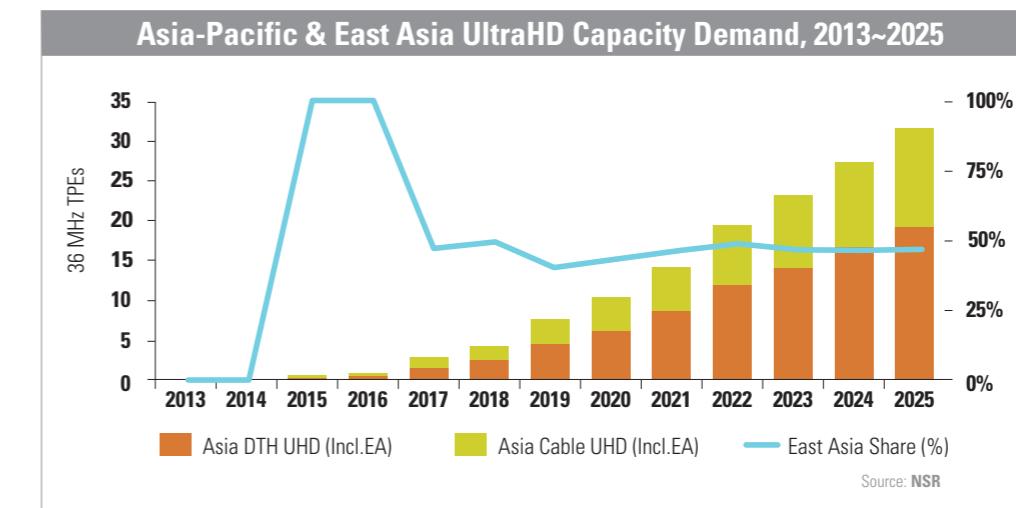
However, FSS capacity aside, the biggest story in Asia-Pacific moving forward will be HTS. Currently, Asia-Pacific has limited HTS capacity, with Thaicom entering the market nearly a decade ago with the company's IPSTAR satellite, and has recently seen AsiaSat enter the HTS market. Compared to other regions such as NAM and WEU, and to some extent even regions like SAM, Asia-Pacific has seen a lot more skepticism about consumer broadband via HTS, which is generally viewed as a safe method of entry for HTS operators looking for a stable income whilst they develop a market for their capacity. Indeed, the primary driver of HTS capacity demand, with roughly 2/3 of total demand growth, **will be Broadband Access**, which will see roughly 100Gbps of demand by 2023, a large percentage of which will be the NBN. Beyond this, however, NSR forecasts a strong market for Enterprise Data, which is expected to require nearly 40 Gbps of demand by 2023, and in fact contribute a much larger share of revenues by the end of the forecast, with nearly **\$250M in annual revenues by 2023**, compared to \$179M for Broadband Access.



Overall Asia-Pacific will see revenues increase from about \$2.5B in 2013 to just over \$4.5B in 2023, for a CAGR of over 6%, propelled largely by Ku-band and HTS capacity demand. Of these revenues, and indeed overall demand, there are several key drivers, namely as noted above, Ultra HD, Enterprise Data, and the rapid growth in video markets in South and Southeast Asia.

Ultra HD: East Asia Takes the Lead

Ultra HD is, foremost, a relatively long-term proposition, even in the most developed markets. That said, it is a significant long-term opportunity, with Ultra HD expected to provide solid TPE gains in a number of regions worldwide moving forward. Despite being a relatively small market in terms of DTH platforms, at least as compared to the US and Western Europe, Asia, and in particular East Asia, will see itself on the forefront of Ultra HD development. Today, China is already the largest market in the world for Ultra HD compatible televisions, despite the almost complete lack of Ultra HD compatible content. On the other end of the spectrum, highly developed economies such as South Korea and Japan are leading the Ultra HD revolution, with KT SkyLife of South Korea launching its first Ultra HD channel in June 2014 (coinciding with the World Cup), and Sky PerfecTV in Japan launching Ultra HD at roughly the same time. The three aforementioned countries have the largest shipments of Ultra HD TVs as a percentage of all LCD TVs, with 9% in China, 5% in Korea, and 2% in Japan providing an excellent foundation for strong Ultra HD growth moving forward.

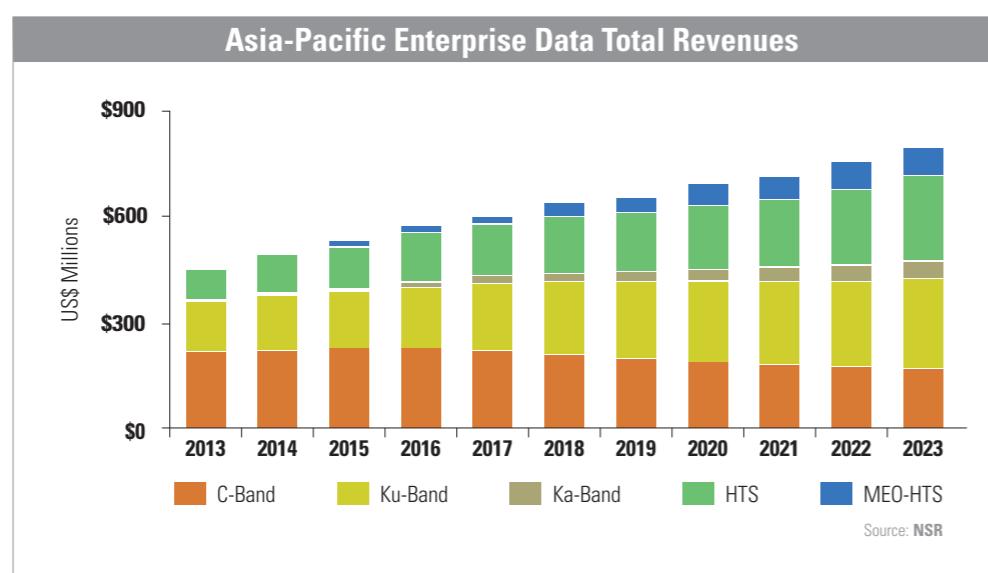


Demand-wise, NSR sees Ultra HD contributing roughly 35 TPEs of new demand in the entire Asia-Pacific Region by 2025, utilizing data from Ultra HD via Satellite, 2nd Edition, published in August 2014. Roughly half of this demand will consistently come from East Asia, with the aforementioned existing market penetration and content production leading to roughly 18 TPEs of demand in the sub-region by 2025. As the chart above shows, East Asia has been the first to enter the market, with 100% market share until 2017. In other parts of Asia, such as India, Ultra HD may come sooner than we expected. Indeed, during summer 2014, two Indian DTH platforms—Videocon d2h and Tata Sky—announced that they would begin a campaign to garner market penetration for UHD-compatible set-top-boxes during 2014. While this could potentially be seen as just drumming up noise, Ultra HD would unquestionably give any DTH operator in India a unique value proposition—albeit only until other platforms do the same—which could allow said platform to capture a sizeable percentage of new subscribers coming on in the short-term in this rapidly growing market.

Enterprise Data: Growth in All Shapes & Sizes

No other application in Asia-Pacific will see as diverse growth as Enterprise Data. Across all sub-regions

and all sub-verticals, including VSAT Networking, Backhaul, and IP Trunking, Enterprise Data will see pretty healthy growth across a number of frequency bands and in a number of regions. Top line revenues will increase by roughly \$350M for Enterprise Data, this being split among Ku-band (~\$100M increase), HTS (~\$150M increase), and MEO-HTS (~\$85M increase). Further, nearly 50 TPEs of new traditional FSS demand will be required for Enterprise Data, this coming despite a decrease of roughly 35 TPEs of C-band demand. This will be supplemented **by more than 40 Gbps of new HTS/MEO-HTS demand for Enterprise Data**, which will be concentrated in East Asia initially due to large deals between Thaicom and Soft Bank for IPSTAR capacity, as well as a successful market entry for Thaicom into China, before spreading throughout other parts of the region.

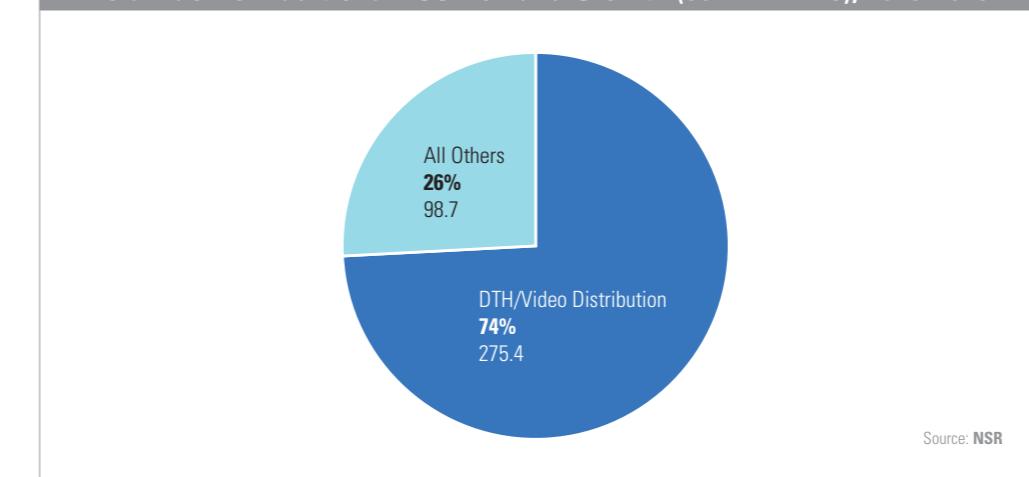


Further, South Asia will see strong demand growth from Enterprise VSAT networking, with things such as rural banking initiatives in India and general governmental and NGO programs in Pakistan and Bangladesh leading to surging growth in the region. Indeed, **South Asian Enterprise Data revenues will more than double from \$110M in 2013 to \$227M by 2023**, for a CAGR of nearly 8%. Like the rest of Asia-Pacific, this will be driven by several frequency bands and several sub-verticals. On the whole, Asia-Pacific Enterprise Data demand will come in all shapes and sizes, and while there will not be a single "quantum leap" in terms of a new technology, the way Ultra HD may revolutionize DTH, or In-Flight connectivity will propel Commercial Mobility, there will nonetheless be a solid balance of applications providing healthy demand.

Video Applications: India & Indonesia Continue to Dominate, but Others on the Way

In 2013, India became the largest DTH market in the world by subscriber numbers, overtaking the US for the first time. Despite markedly lower ARPU's than North America, the sheer staggering size of India's DTH market has drawn in no less than 6 legitimate DTH operators, with consolidation badly needed. Nonetheless, DTH & Video Distribution will be the largest growth drivers by far for traditional FSS capacity. Indeed, as the chart below shows very clearly, **DTH & Video Distribution will account for nearly ¾ of FSS C-band, Ku-band, and Widebeam Ka-band growth to 2023**.

Asia-Pacific Traditional FSS Demand Growth (36MHz TPEs), 2013-2023



This growth will come from all regions, but will be more pronounced in regions like India and Indonesia, where, as we have mentioned it is expected that DTH will be one of the strongest growth drivers for traditional FSS. Indeed, while India does justifiably gain a fair share of headlines for the DTH market, a recent study by Media Partners Asia indicated that in India, the pay TV penetration rate is already roughly 80%, compared to 9% and 11% in Indonesia & the Philippines, respectively, markets of a combined ~350M people. While India will contribute solid growth, this should not lead to other large markets in the region being ignored.

Bottom Line

Asia-Pacific is home to the world's growth engine for the past 30 years, China, and to the country increasingly looking like the world's growth engine for the next decade or more, India. Therefore, it is by no means surprising that the region will provide solid opportunities for companies to increase connectivity in any way possible.

Satellite Telecom in Asia-Pacific will see growth from a number of sources in the coming 10 years, across many frequency bands and different applications. With total revenues in Asia-Pacific expected to exceed \$4.5B by 2023, it is certainly a region worth paying attention to for the long-term. ☀



Blaine Curcio joined NSR in 2012, following a position as a project manager in Shenzhen, China, and is the lead author for NSR's annual Global Direct-to-Home (DTH) Markets report, their Satellite Operator Financial Analysis report, as well as a contributing author of the Global Satellite Capacity Supply and Demand (GSCSD) report. As a member of NSR's FSS group, Curcio's areas of coverage also include general FSS market tendencies, development of HTS, and a focus on emerging markets, in particular East Asia. His prior industry experience includes a role at SES (Den Haag Office) as a strategic marketing intern during summer 2010, where he helped develop a strategy to increase their share-of-wallet with key Europe-based customers. His consulting experience also includes having conducted a market-entry strategy project for SGS International aiding their entry into Mainland China.

Jabiru-2: New Capacity for Australasia

Mike Kenneally, Vice President, Satellite Strategy, NewSat

NewSat, Australia's largest pure-play satellite company is a unique player within the industry. Our current journey from a "solutions provider", to a "teleport operator" and current development into a "satellite operator" is an industry first. As the company grows towards the launch of our first satellite Jabiru-1, we are working closely with partners around the world to provide capacity where required, leading to the successful launch of MEASAT-3b which hosts the Jabiru-2 payload.

NewSat partnered with MEASAT on the MEASAT-3b satellite, which successfully launched on 12 September 2014 (AEST) on Flight VA218, an Ariane 5 ECA launch vehicle from the European Spaceport in French Guiana. This was the 61st successful consecutive launch for the Ariane 5 launch vehicle. Jabiru-2's 216MHz (6 x 36MHz) of Ku-band capacity provides highly targeted coverage across Australia, Timor Leste, Papua New Guinea and the Solomon Islands; satisfying the growing demand for reliable and cost-effective communications for the oil, gas, mining, media, aeronautical, maritime, telecommunications and government sectors.

Asia Pacific growth

While significant for NewSat, Jabiru-2 also marks a step towards new capacity for Asia Pacific where commercial and consumer connectivity requirements are growing at an increasingly rapid rate. Today's information society has seen the globalisation of content and data movement; broadband connectivity for wireless and bandwidth heavy applications; mobility for broadband at sea, on land and in air; format proliferation from devices through to ultra HD, all of which rely on satellite communications and highlight the importance of available satellite capacity.



Year	GDP Growth (%)
2014	↑ 5.4%
2015	↑ 5.5%

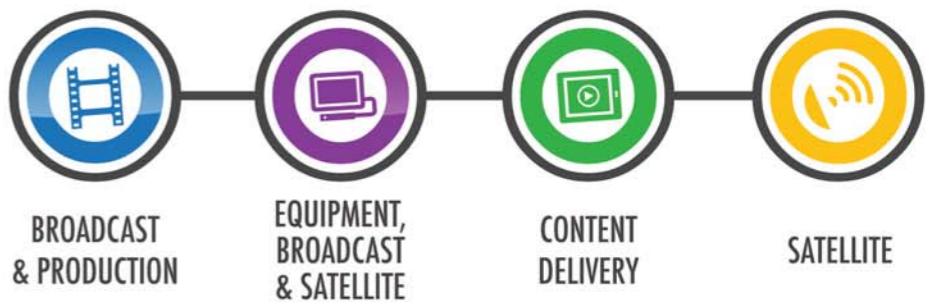
Asia Pacific region expected GDP growth (IMF: Regional Economic Outlook)

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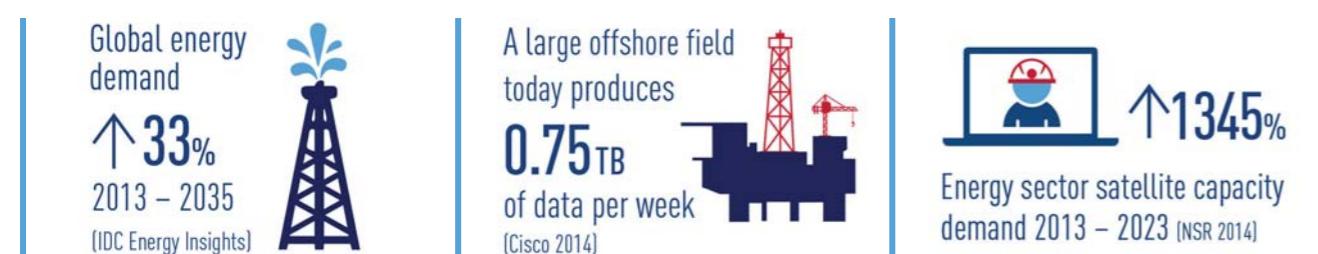


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With multiple nations, growing economies and progressive trade agreements, Asia Pacific is expecting GDP growth of 5.4 and 5.5 percent in 2014 and 2015 respectively (IMF: Regional Economic Outlook). However, in such a diverse region, available infrastructure to facilitate essential communication for continued growth is being outpaced by increasing commercial and consumer demands. With varied geographies and demographics across Asia Pacific, the ubiquity and flexibility of satellite enables fast and reliable connectivity regardless of the location, leading to satellites being an important platform in the delivery of communications.

Able to supply multiple sectors with fast, reliable and secure connectivity, the oil and gas industry in particular is significantly driving increasing bandwidth demand. The International Energy Agency estimated global energy demand will grow by more than a third up until 2035, predominantly driven by rising living standards in China, India, and the Middle East which together will account for 60% of the increase (IDC Energy Insights, 2013). Asia Pacific is an oil and gas hotspot, with major exploration and production operations within the region significantly contributing to global supply.



Applications driving Asia Pacific capacity requirements

To meet the global energy demand, implementation of new processes produced by the evolving 'Internet of things' (IoT) to improve productivity and efficiency is subsequently driving increased bandwidth requirements across the sector. GE estimate that with just a one percent reduction in capital expenditure from information and changes procured from data analysis, the oil and gas exploration and development industry could save \$90 billion over 15 years – a significant amount as oil and gas demand continues to rise (2012).

The IoT produces real-time data through sensory and processing

features, accessed online. Through analysis of this data, organisations are able to monitor and control systems and assets more precisely and accurately. With high risk equipment and tasks, data collected is helping improve processes as well as enhance safety furthering the technology capabilities, including rigs, which today 'increasingly resemble a modern data centre, rather than a remotely located platform' (NSR, 2014). It is estimated that a large offshore field today produces 0.75TB of data per week (Cisco, 2014).

Satellite essential for industry growth

Further, video applications play a key role in how resource organisations communicate and support various operational elements. Most significantly however, today's video applications effectively allow for head office facilities to be on-site. Satellite enabled video conferencing to live video streaming ensures operators are informed to accurately plan, document and execute real-time decisions with those who are on-site while greater access and management of remote sites via video enables operators to leverage skilled resources, boost productivity and deliver an increased return on exploration and production investment.

energy sector will grow by 1345% over the next decade. Therefore new satellites with available capacity like Jabiru-2 are essential to meet industry requirements of today and the future.

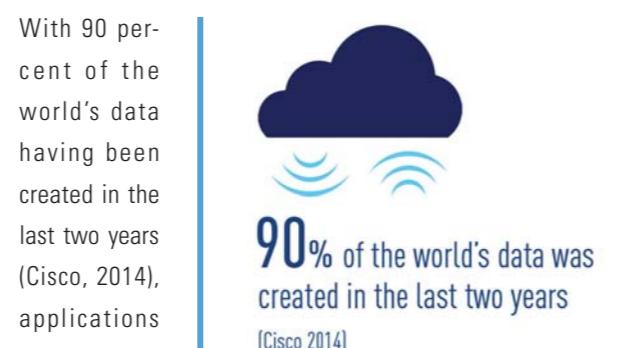
Unique design for specific needs

NewSat worked closely with industry partners for the unique design of the Jabiru-2 payload which features highly targeted "raw" capacity over high demand regions within the Asia Pacific including the Pilbara, the Kimberley, Western Australia's North West Shelf and Timor Gap. With highly concentrated bandwidth and EIRP and G/T ideal for oil and gas requirements, these high intensity "hot zones" support large bandwidth applications, employee productivity and operational efficiency, creating additional value for NewSat's partners.

Commenting on this significant moment for NewSat, CTO David Ball said, "The big benefit of the Jabiru-2 program for us, compared to leasing capacity of an existing operator, is that we were able to work with MEASAT to design the beam exactly the way we wanted it to look, the coverage area, the power focus and the peak performance areas...it's a great opportunity for us to have design influence in the early days and our operations team is now scaling up their activity and their involvement to a greater degree than we have in the past. It's a good exercise for us to go through as we approach launch of Jabiru-1."

Looking ahead

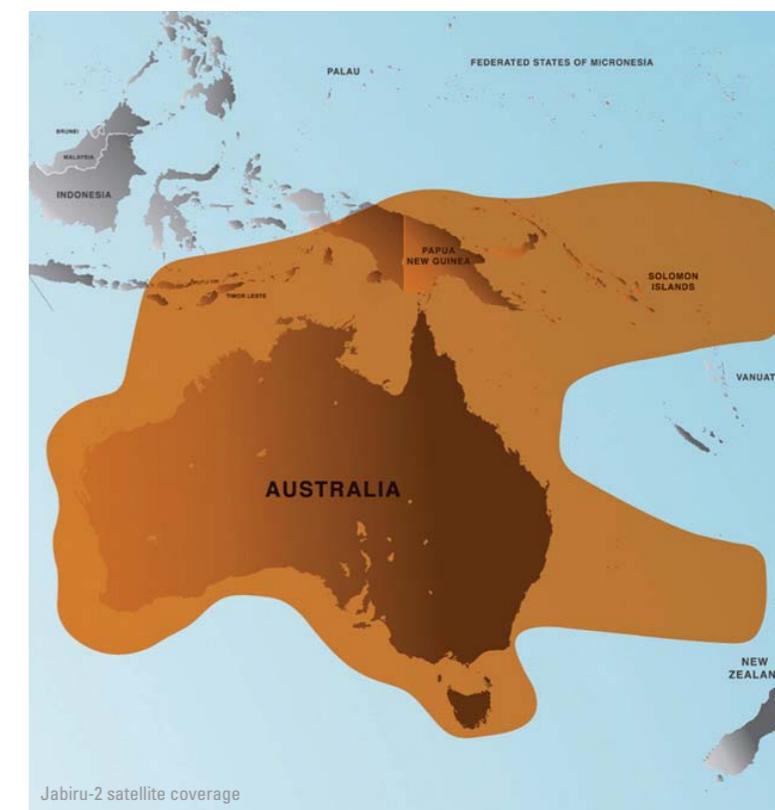
The successful launch of Jabiru-2 has changed the perception of the company within the satellite world. While Jabiru-1 is yet to



IoT and further reliance on video will only continue to grow and evolve, increasing bandwidth demand to support their implementation, as well as data transfer and storage. Northern Sky Research forecasts that global satellite capacity demand for the

launch, we now have our own in-orbit assets that are enabling us to gain further experience across capacity management and operations. Our level of involvement has grown significantly and we have now reached an intermediate stage, further building the team towards Jabiru-1.

Jabiru-2 will be essential in supplying the required capacity to partners across various industries, in particular the oil and gas sector, as they evolve and seek to successfully compete and create value across Asia Pacific which continues to dominate global economic growth. 



Mike Kenneally has over 30 years global ICT and satellite experience. Mike has worked or acted as a consultant for the Department of Defence, IBM, Los Angeles County, General Electric, Telstar, Lockheed Martin, Telstra, Optus and Telecom NZ. Mike was technical auditor for the first spatial census of Australia in 1996, the solution architect for the winning bid for the Australian defence spatial system and the founding Director of Australian Private Networks in 2001. Joining NewSat in 2006, Mike has been instrumental in developing NewSat's strategic growth project, the Jabiru Satellite Program and NewSat's teleport business.



Wi-Fi in the Sky: Take off of In-Flight Connectivity Services is only a matter of time

Patompob (Nile) Suwansiri, Chief Marketing Officer, THAICOM Public Company Limited

With Internet connections becoming more and more ubiquitous, consumers' expectations are continuing to grow. Whether they are walking through rural hills, travelling on public transport or even flying at 35,000 feet, people want to be connected anywhere and everywhere – and probably for free. Consequently, the outlook for In-Flight Connectivity has never looked better, writes Nile Suwansiri, Chief Marketing Officer at Thaicom.

As a concept, always-on connectivity is not a new one. When the Internet grew in popularity, so too did a demand from consumers to be connected wherever they go, whenever. But while the desire for 24/7 online access was quick to develop, the reality of always-on connectivity was slower to be realized. Only in the last few years has expensive coffee shop Wi-Fi, slow enough to severely constrict Internet activity, become accessible, both in price and speeds. Likewise, when staying in hotels, the offer of free Wi-Fi was previously thought of as somewhat of a luxury. Now, a charge for the use of Internet or a poor connection, elicits the strength of complaints formerly associated with bad room service or poor breakfast.

When it comes to always-on connectivity, then, it is undeniable that a lot has already been achieved. Despite this, the Wi-Fi story is far from over with demand from consumers rising each time it is met. Constant surfing of the Internet can now take place in hotels, coffee shops, on trains, in restaurants and airport terminals. Yet, when passengers inevitably move from the terminal onto the plane, they are confronted with what has now become unthinkable – no coverage at all.

In this brave new digital world, this is a problem that cannot continue and when it comes to meeting the demands of digital-savvy consumers who want to stream movies, play games and post to social media – even at 35,000 feet – there is only one solution which will be acceptable to them – low-cost, if not free, In-flight Wi-Fi. But with substantial costs involved for the airlines which have to implement the technology, is this a feasible solution capable of yielding a worthwhile return on investment?

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Huge Potential

Generating around \$440 million in revenue from airline passengers in 2013, In-Flight Connectivity certainly seems to have a bright future. Each year, more than three billion people travel on airplanes, meaning an average of 8.2 million people each and every day. Experts predict this will double by 2032 making for a lot of potential surfing of the World Wide Web while sky high. It is also an important connection for airlines looking to tap the resource of a captive digital audience.

However, while the potential for the technology is huge, take up has been relatively slow so far, causing some industry leaders to question whether the notion of in-flight broadband has the substance to really take off or whether a handful of executives are simply getting over-excited about the latest buzz trend. Looking at 2013 figures from Euroconsult, 59 airlines are providing IFC services through satellite or Air-to-Ground networks. Broken down by region, the percentage of aircrafts equipped with this technology is relatively small, with even the region at the top of the table, Asia-Pacific, only having 40 percent of its commercial planes connected.

However, while the number of connected planes is relatively low at present, the number of planes with broadband connectivity is expected to more than double over the next five years. Furthermore, airlines are continually ordering new aircraft and may find it cheaper to have the capability to offer Wi-Fi included at the time of building, rather than reworking transport in their current fleets. Overall, the early stage the In-Flight Entertainment and Connectivity (IFEC) market should not be viewed as a deterrent but an opportunity as there is no doubt that demand and therefore potential for growth exists. There is no example that highlights this fact better than Germany's 1-0 victory over Argentina in this year's World Cup final. Despite the relatively small proportion of connected planes, the match was watched in real-time by 40,000 airline passengers.

Selecting the right technology

Considering these figures, it is no surprise that IFC is beginning to pop up on more and more aircraft, something that is particularly true for the most profitable routes for airliners, and what will be surprising is if more don't follow suit in the near future. Though challenges do exist, with the right technology, these impediments can be overcome and service providers and airlines alike can reap the benefits of this new market area.

Thaicom's CEO Suphajee Suthumpun and Nok Air's CEO Patee Sarasin pose with Nok air staff by the first plane to be equipped with Thaicom's IFC service



Thaicom's CEO Suphajee Suthumpun and Nok Air's CEO Patee Sarasin mark the launch of Thaicom's IFC service as the first Nok Air plan to offer free WiFi holds its inaugural flight



When it comes to implementing IFC services there are two main factors that airliners will want to consider in delivering a reliable, high quality and seamless in-flight broadband experience. Demand for always-on connectivity goes hand-in-hand with demand for more and more bandwidth, meaning that ensuring that low cost capacity is available in the geographic regions where the majority of flight hours occur is essential, making many technologies unsuitable for the challenge. Likewise, the service must be unaffected for the whole of the flight, making a large footprint just as necessary. Indeed, airliners which have already installed IFC services have found that when it comes to meeting these requirements one technology emerges as a clear winner. Only satellite is capable of keeping up with demand and providing the best value to airlines through the greater flexibility it offers in pricing, enabling, for example, airlines to give away a basic connection for email and browsing but to charge a little more for more bandwidth heavy usage.

Satellite is the key to providing high performance and economical IFC services that will be valued by passengers and while it is a fairly young area for the satellite industry, it is also a very buoyant one and relatively high download and upload speeds are already being achieved on commercial aircraft, opening the door to new opportunities and areas for potential growth for both satellite operators and airlines.

IFC in practice

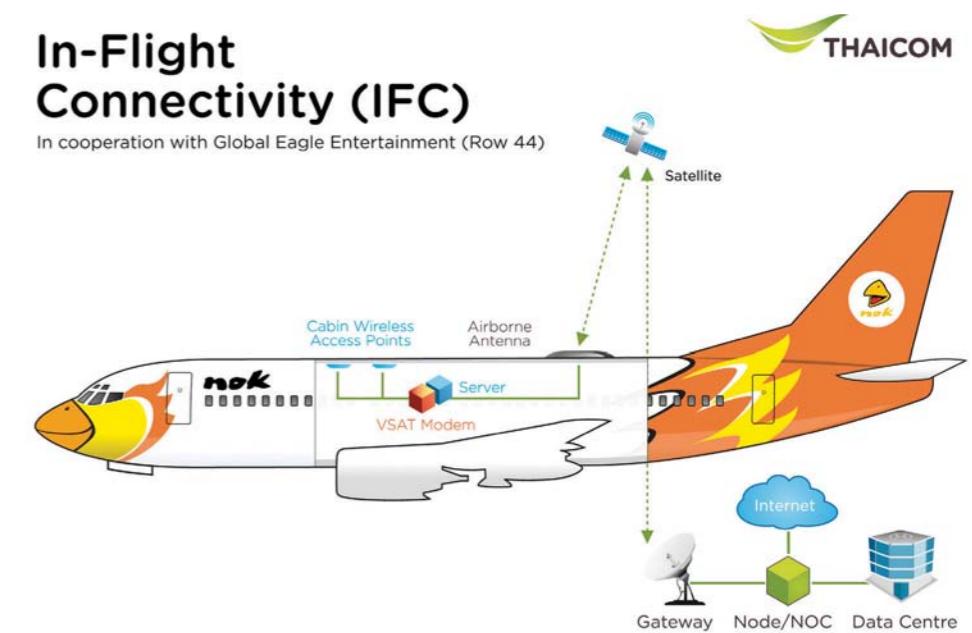
From Thaicom's experience, in order to achieve the superior user experience that is required when it comes to IFC services, the majority of bandwidth has to be put where most flight hours occur. As a result, Thaicom's In-Flight Connectivity service, which was launched in September, utilizes high capacity Ku-band satellite.

In order to take advantage of the new opportunities IFC services offer, reliability and affordability are also essential. As the first Asian satellite operator to launch IFC using Ku-band, Thaicom's IFC service enables aircraft users to send and receive data via several wireless access points installed on the plane. Thaicom's Network Operation Center (NOC) monitors each plane's usage to ensure a reliable broadband service experience.

The service is capable of delivering 3G-like speed for a superior in-flight broadband experience and, in addition to giving passengers in-flight Wi-Fi, also opens up the possibility for live-streaming of entertainment, and aircraft operations services, including aircraft tracking and nose-to-tail connectivity of aircraft, enabling airlines to track the health of their aircraft in service. Thaicom's value proposition includes regulatory clearances from both the avionics and telecom regulatory bodies.

In-Flight Connectivity (IFC)

In cooperation with Global Eagle Entertainment (Row 44)



Thaicom's technology is utilized by Nok Air, Thailand's domestic airliner which last year flew nearly six million passengers. In this case, IFC is implemented as a value added service for Nok Air passengers to enhance their experience by initially giving access to broadband and video content at a later stage. Nok Air's "free Wi-Fi model" represents an innovative IFC value proposition which serves as a prerequisite for additional value-added services in the future. The airline, for example, has already formed a partnership with one of the department store brands in Thailand, which has branches all over the country. Under this partnership, Nok Air passengers can order goods through its system at special prices that don't exist in the stores and then those products will be delivered to their house or hotel within an hour after they land. Partnerships with taxis, hotels and travel package providers are also being explored by Nok Air.

IFC and IFE Convergence

As IFC becomes more commonplace on aircraft, we are beginning to see it have an impact on In-flight Entertainment (IFE). According to the Euroconsult Report, Increasing Competition and Trends for Connectivity-IFE Convergence, there is a clear trend that IFC is becoming increasingly integrated with the IFE business. This is another emerging trend that satellite operators cannot afford to ignore. We have already seen the creation of Global Eagle, Thales' acquisition of LiveTV, the acquisition of ARINC by Rockwell Collins' and the recent launch of entertainment products from connectivity providers, such as Gogo and OnAir. These are all signs of a convergence of connectivity and IFE and as emerging wireless IFE solutions further foster the need for inflight connectivity, this convergence is only going to get stronger. At Thaicom, we believe this to be an important trend and one that is here for the long-term.

Conclusion

With passengers' expectations for always-on connectivity growing, there is a clear need for not just an IFC service but one which is reliable, fast and, at least, partly free to use. Just like hotels have had to evolve into Internet cafes to ensure they do not lose customers, airlines that do not offer In-Flight Connectivity and Entertainment will find themselves lagging behind those that do.

When it comes to delivering these services, satellite is the clear winner in the choice of technology in its capacity to keep up with demands for speeds, bandwidth and reliability, as well as offer flexible pricing options. And as for those that will be the winners in this new market? Those that identify and take advantage of the opportunity early will be in the best position to provide high quality Wi-Fi service to passengers looking for that extra value in a highly competitive market. ☺



Patompob (Nile) Suwansiri is currently the Chief Marketing Officer (CMO) of THAICOM Public Company Limited and has over 22 years of experience in the satellite industry. Nile has been with THAICOM since its inception in 1992 and has worked in many aspects of the company. He held positions of Satellite Engineering Manager and Satellite Control Manager and also VP of Sales and Marketing for the Southeast Asian markets. Nile graduated from the University of Canterbury, Christchurch, New Zealand with a Bachelor of Electrical Engineering. In addition, in 2001, he earned an Executive MBA degree with SASIN Graduate School of Management in Bangkok.

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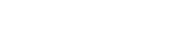
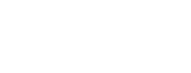
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The 17th Asia-Pacific Satellite Communication, Broadcasting and Space Conference & Exhibition, APSCC 2014 Satellite Conference and Exhibition

23-25 September 2014, the JW Marriot Phuket Resort & Spa, Phuket, Thailand



An annual event of APSCC, the 17th Asia-Pacific Satellite Communication, Broadcasting and Space Conference & Exhibition, here and after APSCC 2014, was held on 23 - 25 September 2014 at JW Marriot Phuket Resort & Spa, Phuket, Thailand.

Themed "New Landscape for Satellites: Asia and Beyond", the APSCC 2014 Satellite Conference focused on exchanging information on the new technologies and services strategies for the satellite industry as well as assessing new developments in technology for business breakthroughs in

the Asia Pacific region. Over 80 senior level officers and professionals from the satellite business arenas participated as speakers for the 16 sessions at APSCC 2014.

In conjunction with the Conference, the APSCC 2014 Satellite Exhibition was held on 23 - 25 September 2014. 8 leading players of the industry including GISTDA(Thailand), GMV(Spain), iDirector(Singapore), L3 Communications(USA), Kratos Integral Systems(USA), KTsat(Korea), Thaicom (Thailand) and Thuraya(UAE) participated as exhibitors to introduce their latest technologies, innovations, products and services.



This year, 20 companies officially sponsored the event through various networking programs and 12 affiliations supported APSCC 2014 as endorsers

The 2014 APSCC Awards Ceremony was held on 23 September 2014. Based on a series of criteria set by the Awards Selection Committee, the awards are presented each year to individuals and organizations whose contributions and achievements have been deemed exceptional by the satellite industry and the Awards Selection Committee, consisting of industry experts. The 'Satellite Executive of the Year in the Asia-Pacific Award' was presented to Suphajee Suthumpun, Chairman of the Executive Committee &CEO, Thaicom PLC and the 'Lifetime Achievement Award' was presented to and Peter Jackson, CEO, PJ Square, respectively to commemorate their achievements.

As a pre-conference event, the 3rd Satellite RF Interference Mitigation Workshop was held on 22 September. The 3rd Satellite Radio Frequency Interference Mitigation Workshop was to continue multilateral talks among parties at stake and to maintain a mutual operation contact point for the prevention of and prompt response to interference. The Workshop provided a platform for satellite operators to discuss on the methods of preventing interference and coming up with a realistic solution to satellite interference by satellite operators in the region.

As the post-event program, the APSCC 2014 Golf Masters at Blue Canyon golf course was also held on 26 September.

Overall the APSCC 2014 event in Phuket, Thailand gathered over 300 attendees from 26 countries.

Hosted by the Asia-Pacific Satellite Communications council (APSCC), the APSCC Annual Satellite Conference and Exhibition has been representing an unparalleled opportunity to reach the satellite community in Asia for more than a decade. The APSCC 2015 is scheduled to be held on 22 – 24 September in COEX Convention Center, Seoul, Korea.

For more information, please visit http://www.apsc.org.kr/sub3_3.asp

Paul Brown-Kenyon Nominated as APSCC President



At the 2014 APSCC General Assembly held on September 25, 2014, Paul Brown-Kenyon (CEO, MEASAT) was nominated as the next APSCC President, effective January 1, 2015. In accordance with the APSCC Constitution, he will serve as the President of APSCC for the next two-year term (2015-2016). As the main representative of APSCC, he will be responsible for implementing the directions and guidelines set by the APSCC Constitution in consultation with the Board of Directors, Vice Presidents and Executive Director.

Paul Brown-Kenyon is MEASAT's Chief Executive Officer. In this role, Paul oversees the overall management of the company. Paul originally joined MEASAT in 2003 as Vice President of Sales and Marketing before assuming the role of Chief Operating Officer in January 2005. Prior to joining MEASAT, Paul spent six years with McKinsey & Company in the Firm's Singapore, Hong Kong and Stamford (US) offices. As an Associate Principal in Singapore, Paul was one of the leaders of the Firm's regional telecom, high tech and media practices working with clients in the telecom and media industries across the Greater China and South East Asia regions. Prior to McKinsey, Paul worked at Inmarsat, the International Mobile Satellite Organization, in London in the area of Spectrum Management. Paul holds an MBA from the Yale School of Management, USA, and a MA (Oxon) in Engineering Economics and Management from Hertford College, University of Oxford, UK.

SATELLITE INDUSTRY NEWS

Signalhorn Contracts AFRICASAT-1a for VSAT Services across Africa

November 6, 2014 - MEASAT has announced an agreement with Signalhorn for capacity on the AFRICASAT-1a satellite. Under the terms of agreement, Signalhorn will consolidate existing services from several satellites to AFRICASAT-1a in support of their growing presence for the distribution of Very Small Aperture Terminal (VSAT) services across the African region. Signalhorn is a privately held company which provides highly secured and customized communication solutions using satellite, terrestrial and wireless connectivity from its technical centers in Backnang, Germany and Leuk, Switzerland. The company's customers include a wide range of government agencies, energy firms, retail and banking networks and other private enterprises worldwide.

NewSat Selects GMV for Jabiru-1 Flight Dynamics System

November 9, 2014 - NewSat announced that GMV has been awarded the contract to provide the flight dynamics system for Jabiru-1. The flight dynamics system will provide the ability to determine both the position and the orientation of Jabiru-1, enabling the planning and execution of required manoeuvres. As Jabiru-1 is co-located with other spacecraft, the flight dynamics system is essential to ensure accurate orbital positioning is measured and maintained. Flight dynamics systems provided by GMV support a range of different mission types, such as scientific, earth observation, telecommunications, orbital transport and infrastructure, navigation, space exploration and military missions. Jabiru-1 is Australia's first commercial Ka-band satellite and will deliver over 7.6 GHz of "new" capacity, providing flexible Ka-band coverage to meet the growing demand from government and enterprise across the Middle East, Asia and Africa.

RSCC and Romantis Set Up a New Project to Provide Video Services in African Region

November 10, 2014 - Russian Satellite Communications Company (RSCC) and Romantis are creating a new technological DTH TV-platform for the Africa coverage. The TV broadcast service package will enable the current and new broadcasters to launch and promote national and regional TV programs all over Africa. This cooperation will employ the new Russian telecommunications satellite Express-AM6 that was launched on 21 October 2014 and the German teleport VicusLuxLink.

Telenor Satellite Broadcasting Approves Intellian v-Series Antennas for THOR 7

November 10, 2014 - Telenor Satellite Broadcasting (TSBc) announced that Intellian's v-series antennas have been approved for use on its forthcoming satellite, THOR 7. The satellite, expected to start commercial service in 2015, is equipped with an HTS/Ka-band payload, which has been specifically designed for the mobility VSAT market, offering high-powered regional coverage with a favorable look angle over the main European shipping lanes. The Intellian v-series antennas already support Ku-band services on the existing THOR satellite fleet, providing TSBc customers with exceptional performance and redundancy. Moreover, with its simple conversion from Ku-band to Ka-band services, the v100 antenna systems provide an easy upgrade path for THOR 7, which will offer 6-9 Gbps throughput with up to 25 simultaneously active spot beams and also deliver reliable download speeds in the tens of Mbps on its HTS (High Throughput Satellite) Ka-band payload. In addition to the v100, TSBc plans to work with Intellian to approve more antenna systems.

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SATELLITE INDUSTRY NEWS

Globecomm Continues to Grow its Media Services Business with Globecast Americas

November 10, 2014 - Globecomm announced that it has expanded its broadcast media business with Globecast Americas to include the full time uplink of multiplexed carriers as well as a managed fiber network from its facilities in Maryland and New York. Globecomm provides managed services that move content from origination, or any other point, to wherever it needs to be delivered and includes a host of valued added services in between; including processing, storage and monitoring. Our true "contribution to distribution" model allows us to seamlessly distribute client video broadcasts on our global network and deliver it to its final destination, or destinations.

03b Networks and RCS Revolutionize Connectivity in South Sudan

November 12, 2014 - 03b Networks announced that RCS-Communication has entered commercial service on its 03b Medium Earth Orbit (MEO) satellite constellation. 03b's ultra-low latency, high throughput satellite network is enabling RCS to launch new, high-performance services, including RCS-WIMAX, in and around South Sudan's capital Juba. In 2013, 03b signed a major long-term capacity deal to provide high-speed, low-latency capacity to RCS-Communication, one of the leading Internet Service Providers in the Republic of South Sudan. Juba is home to more than 300,000 people who until now had limited broadband connectivity. 03b's service was tested internally by RCS before integrating it into their WiMAX network in Juba. The new service was made available to RCS clients on 1 October 2014.

Gilat Launches Breakthrough Satellite-Cellular Hybrid Terminal

November 12, 2014 - Gilat Satellite Networks Ltd. announced its latest innovation - the SkyEdge II-c Libra satellite-cellular

hybrid terminal. Libra was designed to enable MNOs (Mobile Network Operators) to extend their broadband reach beyond the limits of their existing mobile or DSL (Digital Subscriber Line) infrastructures. It also allows for DTH (Direct-To-Home) service providers to enrich their offerings by adding broadband services. Gilat's Libra is a game changer, making satellite routers possible where they were not possible before. Libra satellite-cellular hybrid terminal enables both MNOs and DTH service providers to grow their business by making the most of their existing infrastructures. The MNOs can enjoy increased ARPU and reduced churn without network congestion. The DTH service providers can easily enhance their portfolios with direct Internet-to-home service by establishing a return path via a cellular network.

SpeedCast Secures Deal with AMPTC for Fleet of ENERGY Carriers and Tankers

November 12, 2014 - SpeedCast International Limited has been awarded a multi-year contract from Arab Maritime Petroleum Transport Company (AMPTC), a leading provider of maritime transport services of hydrocarbon substances in the Middle East region. SpeedCast will provide satellite network connectivity for AMPTC's entire fleet of vessels. SpeedCast will provide each AMPTC vessel with end-to-end VSAT services that enable corporate networking, Internet access, voice communications, and crew welfare services. The turnkey solution includes network design, equipment, installation, service and 24/7 support from SpeedCast's four global customer support centers. SpeedCast designed the solution from the ground-up, leveraging SpeedCast's global Ku-band network, to meet the specific requirements of AMPTC.

iN DEMAND Renews Key Capacity Deal with SES

November 13, 2014 - SES announced that iN DEMAND has renewed a cornerstone capacity agreement to continue the delivery of its popular programming packages to cable audienc-

es across North America and the Caribbean. The leading U.S.-based Pay-Per-View provider of transactional sports, movies and events, iN DEMAND has inked a deal to retain two C-band transponders on SES's AMC-1 satellite to deliver professional sports packages from MLB, the NBA and the NHL, as well as boxing, MMA, wrestling and entertainment events to nearly 50 million digital cable households across the region. The capacity agreement marks the latest milestone in a partnership that began with the start of iN DEMAND nearly 30 years ago. iN DEMAND continues to rely exclusively on SES satellite capacity and benefits from SES expertise to meet the demands of its discerning cable audiences.

Jabiru-2 Commences Commercial Service

November 14, 2014 - NewSat announced that the Measat-3b satellite, which hosts the Jabiru-2 payload, has officially commenced commercial service. One month after the successful 12 September AEST launch, satellite manufacturer Airbus Defence and Space has concluded the in-orbit testing of Measat-3b and the satellite is now operational. Led by Airbus Defence and Space in Toulouse, Measat-3b completed Launch and Early Orbit Phase (LEOP) operations and in-orbit trials. In regard to the satellite payload, tests were carried out at the Measat Teleport and Broadcast Centre near Kuala Lumpur, Malaysia. These facilities are also where the satellite will be controlled during its expected 15 year operational life. Jabiru-2's 216MHz (6 x 36MHz) of Ku-band capacity provides highly targeted coverage across Australia, Timor Leste, Papua New Guinea and the Solomon Islands; satisfying the growing demand for reliable and cost-effective communications from the oil, gas, mining, media, aeronautical, maritime, telecommunications and government sectors.

World's First Satellite-Powered Tablet to Use Newtec Technology for E-Learning

November 14, 2014 - Satellite solution provider Yazmi

announced a new e-learning scheme using the first satellite-enabled tablet, called Odyssey, and Newtec's multicast technology to deliver content via satellite to rural, remote and low income regions in Asia, Africa and the Middle East. The end-to-end content delivery system aims to improve performance outcomes for students and teachers in areas where there is weak computing and Internet infrastructure. The first pilots of the technology are taking place in India (with 30,000 licenses) and the sub-Saharan region in Africa, with the latest trials in two schools in South Africa, in Rietkloof, in Mpumalanga Province, and at Heathfield, in Western Cape. Yazmi's solution utilizes the AfriStar and AsiaStar data multicasting satellites and the world's first truly satellite-enabled tablet to provide Governments with access to a special e-learning channel. Approved educational content can then be transmitted to all tablet users via one single transmission thanks to TelliCast, Newtec's multicast distribution software platform.

ESA Commissions Airbus Defence and Space as Prime Contractor for Orion Service Module

November 17, 2014 - Airbus Defence and Space has signed a contract with the European Space Agency (ESA) for the development and construction of the service module for Orion, the future American human space capsule. The contract is worth around 390 million euros. The service module will provide propulsion, power supply, thermal control and the central elements of the life support system of the American capsule. It is the first time that Europe has been involved in providing system-critical elements for an American space project. In December 2012, US space agency NASA and ESA had agreed to certify the new US Orion spacecraft in conjunction with the European service module. This module is based on the design of and the experience gained from the Automated Transfer Vehicle (ATV) developed and constructed by Airbus Defence and Space on behalf of ESA as a supply craft for the International Space Station.

SATELLITE INDUSTRY NEWS

Inmarsat Opens New Sydney Office

November 18, 2014 - Inmarsat's Sydney office was officially opened by Rupert Pearce, Inmarsat CEO on 13 November 2014, signalling the importance of the Australian market to Inmarsat and its continuing commitment and investment in the region. The completely refurbished office houses 500 square metres of warehouse space, classrooms, research and development engineering facilities, and demonstration labs. It also provides a dedicated hosting facility for Inmarsat partners to hold events, run customer demonstrations and undertake training courses. The site is located in Auburn, 10 minutes away from Sydney's centre, and has been chosen because it provides uninterrupted line-of-sight to Inmarsat's satellites. The new office will support all areas of Inmarsat's business, offering demonstrations and training for products and solutions deployed on land, at sea and in the air. Inmarsat operates out of two hub sites in Australia – the newly expanded Sydney office and the Perth Land Earth Station and Teleport.

Eutelsat and Spacecom Create Unified Neighbourhood for Africa's Free-To-Air Satellite TV Position

November 19, 2014 - Eutelsat Communications and Spacecom announced the signature of a partnership agreement that will drive expansion of digital entertainment services at one of Africa's fastest-growing video neighbourhoods. The two companies have established a framework for cross-commercialization of Ku-band capacity connected to the high-power African service areas of Eutelsat's EUTELSAT 16A satellite at 16 degrees East and Spacecom's AMOS-5 satellite at 17 degrees East. The combined channel line-up of both satellites already comprises over 100 free-to-air African and international channels that can be received by standard 80cm dishes in a vast footprint covering over 30 million TV homes located notably in Francophone Africa and extending to Ghana and Nigeria. Leveraging their respective knowledge of Africa's fast-growing broadcast mar-

kets, the two operators will pool their commercial efforts to ignite further growth at the 16-17 degrees East position, which is already the leading DTH and free-to-air video neighbourhood in West Africa

SSL Wins Indonesian Satellite Contract

November 19, 2014 - Space Systems/Loral (SSL) has announced a contract to build a communications satellite for the Indonesian satellite operator, PT Pasifik Satelit Nusantara (PSN). The commercial communications satellite, named PSN VI, will provide service throughout South East Asia and includes a High Throughput Satellite (HTS) payload for service in Indonesia. With both C-band and Ku-band transponders, PSN VI will be used for voice and data communications, broadband Internet, and video distribution throughout the Indonesian archipelago. PSN is the first private satellite telecommunications company in Indonesia and a leading Asian provider of a full range of satellite-based telecommunication services. When launched in early 2017, PSN VI will be located at 146 degrees East longitude. Based on SSL's 1300 satellite platform, which provides the flexibility for a broad range of applications and technology advances, the satellite is designed to deliver service for 15 years or longer.

Isotropic Networks Renews its iDirect Support Commitment for Three Years

November 19, 2014 - IsoTropic Networks has extended iDirect's iSupport Premium Package for three years. IsoTropic will take advantage of the Premium iSupport options in an ongoing effort to strengthen the organization through a manageable TCO benchmark, maintain continuity through iDirect's "spare in the air" program, along with comprehensive training and a dedicated iDirect Technical Account Manager. This will greatly enhance IsoTropic's efficiency and effectiveness in providing iDirect VNOs, Hub Hosting, and iDirect Hub sales. ☈

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APSCC aims to exchange views and ideas on technologies, systems, policies and outer space activities in general along with satellite communications including broadcasting for the betterment of the Asia-Pacific region. Conferences, forums, workshops, summits, symposiums, and exhibitions are organized through regional coordination in order to discuss issues that affect the industries and to promote and accelerate the efficient introduction of outer space activities, new services and businesses via satellites.

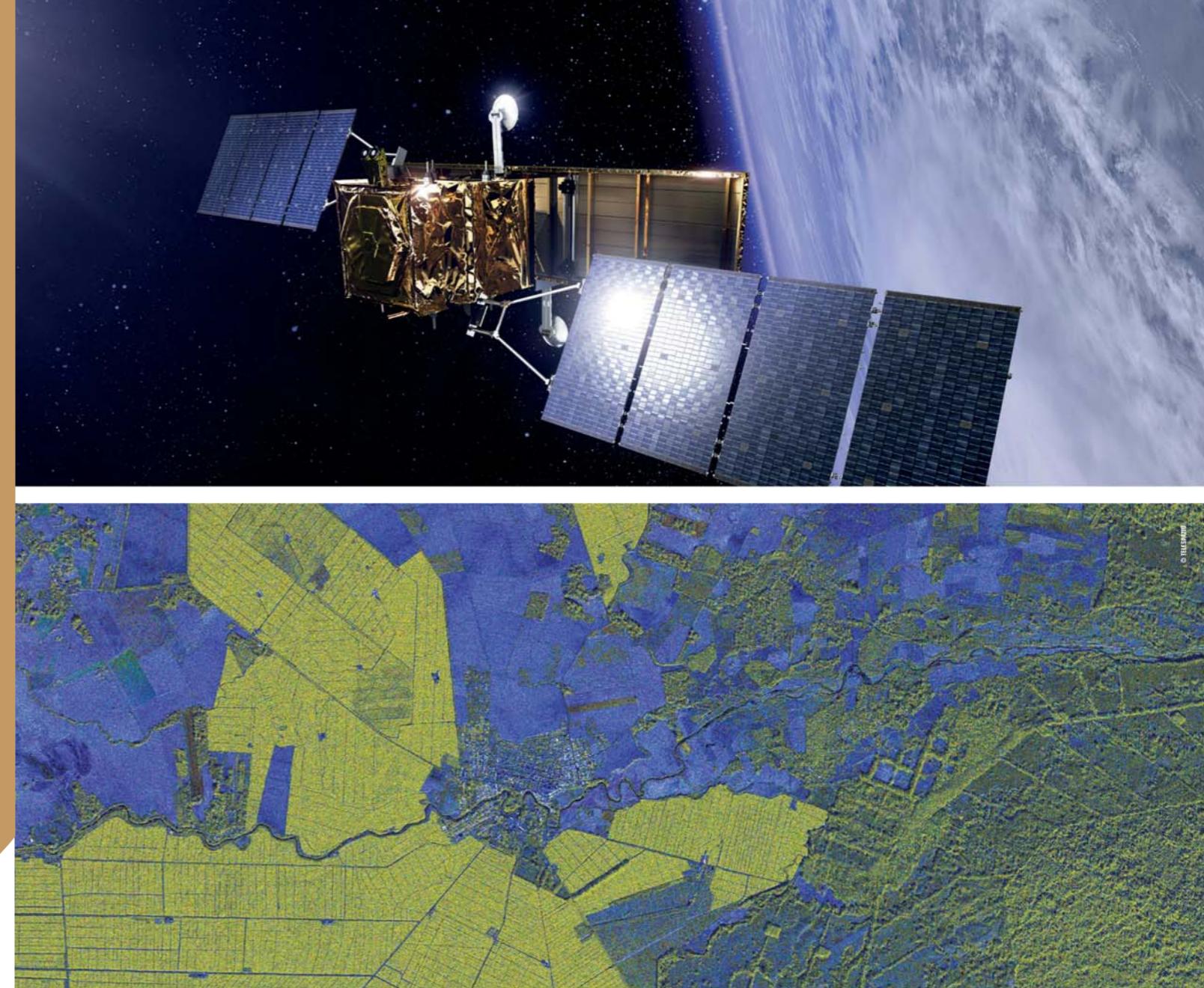
In order to disseminate industry related information, APSCC publishes a quarterly satellite magazine as well as a monthly e-newsletter, which are distributed worldwide to members and others. The quarterly magazine and other publications are available on the Web at www.apsc.org.kr.

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