# SES Comments to the Telecommunications Regulatory Authority of India Consultation Paper No. : 09/2010 Regarding India's National Broadband Plan

20 July 2010

SES would like to thank the Telecommunications Regulatory Authority of India ("TRAI") for the opportunity to comment on its consultation regarding the National Broadband Plan ("NBP") in which the TRAI is consulting on ways to improve broadband penetration in India in order to ensure continued growth of the country. The TRAI is notably proposing to review the current definition of broadband that makes it difficult for wireless based high speed internet connections to qualify as broadband.

By way of background, SES is a leading satellite company which provides coverage and connectivity to a broad variety of customers worldwide. SES wholly-owns SES ASTRA ("ASTRA") offering services in Europe and Africa and SES WORLD SKIES ("WORLD SKIES") which offers services in the Europe, the Americas, Africa, the Middle East and Asia. SES also holds interests in Ciel in Canada, in QuetzSat in Mexico, in O3b Networks based in Jersey, Channel Islands, as well as in a number of satellite service providers. SES provides outstanding satellite communications solutions worldwide via its fleet of 43 satellites. Many of the satellites in SES' satellite fleet currently provide or are capable of providing service to India. ASTRA and WORLDSKIES provide satellite-based broadband, data, audio and video broadcasting, satellite news gathering ("SNG"), and telecommunications services to enterprises and governments.

In the context of this consultation, it is essential to remember the critical role that the satellite industry plays in the deployment of important communications services, such as broadband connectivity. We respectfully encourage the TRAI to consider these comments as it develops policies and regulations related to the rollout of broadband in India. In particular, we believe it is important for TRAI to consider that:

- Satellite can fit in the definition of broadband. Fiber is not the only broadband solution for India. Instead, the solution is likely a mix of various technologies accompanied by a pro-competitive, non-discriminatory landscape that allows India to achieve its ambitious goals quickly and cost-effectively;

- Modern VSAT solutions, especially when combined with high-throughput satellites, are very competitive and are capable of serving a very wide geographic area, covering all rural, suburban and urban areas in India;

- The use of DTH for multi-channel SD/HD/3D video, radio and music streaming with wireless or wire-line technologies for other broadband services can provide a highly scalable, competitive and cost-effective consumer experience;



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- Satellite is a cost-effective solution for backhauling large amounts of data anywhere within a satellite's footprint thereby enabling fixed and mobile broadband in rural and suburban areas where they would otherwise be unavailable or would be very costly and require inefficient spectrum use;

- India is a vast country with a large population that is essentially rural and with important social and educational needs. Our experience of the role which satellite plays in bringing broadband to all citizens in all parts of the world exemplifies the critical role our industry can play in helping India to achieve the goals of its NBP.

## 1. The Importance of Satellite Communications to Modern Society

Satellites are capable of serving large geographic areas. A satellite's "footprint" or coverage area determines the countries or regions that a satellite is capable of serving. Within a satellite's footprint, users in all areas regardless of terrain, availability of terrestrial infrastructure or remoteness of location may receive a wide variety of advanced communications services. As a result of this potentially large and ubiquitous coverage, satellites facilitate economic and social growth and development. Satellites have the unique ability to connect the difficult to connect and the unconnected and to bring vital services to those most in need.

Satellite technologies do not face the same implementation of service issues of terrestrial wire-line or wireless communications systems. Terrestrial systems frequently are unable to economically and effectively serve remote or hard to reach locations. In contrast, without the cost or complications of constructing terrestrial infrastructure, satellite technologies provide communications infrastructure for users in remote or hard to serve locations.

This is relevant not only for purposes of social, economic and commercial development, but also for enabling communications for purposes of public safety, during disasters or other emergencies, education, public health, and more. Notably, satellites are often the first choice for provision of essential communications for continuity of or essential services where terrestrial networks have been damaged or destroyed.

Satellite technology underpins much of modern life. Without the widespread use of satellite technologies many things to which society has grown accustomed would be much more difficult or impossible. In fact, satellites have helped to shape the world in which we live, raising the quality and ease of life for all. Examples of the level of importance of satellite in our daily lives are exemplified by the following:

- Aviation and sea transport rely heavily on satellite GPS systems to find their way safely and efficiently around the world;
- Emergency services, disaster relief and recovery efforts would be considerably more difficult. Terrestrial communications infrastructures are often unusable during disasters or emergencies.



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During such times satellites help maintain public safety and to save lives, keep communities connected, informed and functioning;

- Many forms of commercial and government data networks, storage and back-up systems rely on satellite to move data around the world (*e.g.,* business and financial transactions;)
- Modern weather forecasting is completely dependent on satellites;
- Many warning systems for natural disasters such as earthquakes, storms, *etc.*, rely entirely on satellite systems;
- Many modern defense and security systems would be impossible without satellite technologies;
- Satellites provide the main timing source for mobile phones and pagers;
- Satellites are essential for many forms of earth observation such as climate and environmental monitoring as well as services such as Google Earth;
- Satellites are essential for emergency distress systems and are often critical for search and rescue missions;
- Satellites provide infrastructure that would be impossible or prohibitively expensive with terrestrial alternatives;
- Satellite provides internet access/broadband particularly to rural, remote and underserved areas;
- Satellites are the primary means of television program (high definition television, broadcast, cable and satellite/point-to-multipoint) distribution;
- Without satellites there would be no live on-site news gathering & reports, sports events, election coverage, *etc.*;
- Satellites are critical to connect government and commercial private networks;
- In-flight phone communications are possible thanks to satellite; and
- Satellites are essential for modern astronomy.

## 2. Today's Satellite Role in India

There is no doubt that India is nation that has put a lot of ambition onto space. Realising the great potential of space technology for national development, the country has early envisioned that this powerful technology could play a meaningful role in national development. Space activities in the country have concentrated on achieving self reliance and developing capability to build and launch communication satellites for television broadcast, telecommunications and meteorological applications as well as remote sensing satellites for the management of natural resources. The Indian Space Research Organisation (ISRO) has been set up to this end.

The future space programme[1] notably includes the launch of communications satellites, some of which are aimed at providing broadcast and multimedia services to fixed and mobile end-users. (e.g. GSAT-6 / INSAT-4E).

[1] As defined in www.isro.org/scripts/futureprogramme.aspx



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Satellite is currently playing a fundamental role in the overall technology mix of users seeking connectivity in both rural and urban settings. In major urban settings where terrestrial alternatives are present, satellites often play a critical role in ensuring redundancy of networks and ensuring that overall service availability requirements are met. In a rural setting, in many cases the satellite based solution is often the only alternative available to ensure service availability and ensure that the "digital divide" is being bridged and state of the art solutions and information are being brought to rural India.

With well over 100,000 VSAT terminals operating in the Indian market and offering diverse services ranging from distance education, tele-medicine, corporate connectivity, e-governance, broadband connectivity, GSM trunking to name a few applications, it is evident that satellite does and will continue to play a key role in the overall technology solutions mix for connectivity.

The evolution of the DTH market has clearly shown that what was once considered a technology for a niche market and catering largely to the wealthy has a significant role to play as a mass market consumer technology. The DTH industry has exceeded the expectations of every industry analyst in terms of the growth of the market to reach over 27 million households and is predicted to reach over 45 million households. Satellite based broadband similarly should not be dismissed as a niche and cost inefficient technology.

Satellite is playing an increasing role in addressing specific two-way connectivity needs in India. As a matter of illustration, some of the important national projects involving satellite solutions, which specifically use capacity from SES, are impacting the lives of millions of Indians and could only have been delivered in the timeframe and with the ubiquity necessary through the use of satellite technologies.

> ***E-Choupal****. The network of ITC, India's largest agricultural company, decentralizes information related to crop prices, educates India's farmers regarding agricultural best practices, and has been used for crop specific portals like Soya Choupal, Coffee Choupal, and more. Additional details are available from:* ***http://www.youtube.com/watch?v=-RH8Xl1C8eE;***
>
> ***E-Gram****. This initiative of the Government of Gujarat has revolutionized record keeping between the government and citizen from land records, to birth and death certificates, etc. E-Gram was implemented in 6 months covers 13000+ villages and uses a satellite very small aperture terminals ("VSAT") network to support the de-centralized information program. Citizens of Gujarat previously needed to travel by bus, often for 2 days to a centralized government office to register their land, notify the government of a birth or death, etc., they can now perform the same functions from a local kiosk run by a village entrepreneur in their village which offers the same service for a nominal fee. This network would have taken years to implement on any other technology and may not have been as ubiquitous without satellite. Additional details are available from:****http://www.youtube.com/watch?v=Uq8iuSh39No***



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In an effort to address non- availability of broadband connectivity in rural areas, the Department of Information technology ("DIT") also used satellite connectivity to implement the National e-Governance Plan ("NeGP") at Community Service Centers ("CSCs") in rural areas in order to deliver e-Governance services. Approximately 7000 CSCs have been established using satellite connectivity.

## 3. Key Issues Addressed in the Consultation

### *Rural Needs*

As noted in Section 3.21 of the consultation, the majority of India's population lives in rural areas. The consultation further notes that, "In rural and remote areas, the primary reason for low broadband penetration in villages is lack of support infrastructure, backhaul capable of providing high bandwidth, low penetration of fixed line services, high cost of service roll out and unviable business model."

Satellites are uniquely qualified to provide high quality, affordable and efficient communications solutions to India's most rural, remote and underserved populations. Satellites can provide a substantial piece of and play a key role in India's broadband solution. Existing satellite communications infrastructure is able to today serve all of India, enabling reliable and affordable connectivity. It can provide a platform that is competitive or complementary to other terrestrial systems.

For example, VSAT satellite solutions provide a very competitive and immediate and broad solution for all rural, suburban and urban areas of India. Satellite is also a very cost-effective solution for backhauling large amounts of data anywhere within a satellite's footprint enabling fixed and mobile broadband in rural and suburban areas which would otherwise be unavailable, would be very costly and time consuming to build or would be an inefficient use of radio spectrum.

Today satellite television is reaching well beyond simple entertainment – DTH operators are using interactive services delivered via satellite to teach languages, enhance traditional education, and to open a window on to the world that may not have been accessible to millions of rural subscribers.

### *Educational Needs*

The consultation states that the Government of India has issued the Right to Education Act, which provides the terms for compulsory education for children aged between 6 years and 14 years. According to the Government, there is an acute shortage of schools and trained teachers to educate children especially in rural areas. Satellite VSAT networks or broadband can very quickly and easily facilitate the provision of effective education at affordable cost. (Section 2.18)



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Satellite could play a fundamental role in connecting isolated schools to teaching centres or centres of excellence. As a matter of example, in Europe, several projects of this kind have been implemented as is reported by the European Satellite Operators Association ("ESOA") in *Bringing Economic Stimulus to Rural Areas.*[2]

***NBN***

The consultation reviews technologies that currently provide broadband connectivity. India's present broadband penetration rate is extremely low at less than 1%. In the consultation, TRAI notes that this low penetration rate exists despite a policy favouring the "use of any media," the "allocation of spectrum for BWA" and specific regulation to "facilitate access to the cable infrastructure."[3] As a result, TRAI concludes that there is a considerable lack of broadband infrastructure. TRAI further concludes that only fibre could provide the speeds necessary to meet the expected demand.

Notably, in the consultation, TRAI asserts that despite significant advantages in terms of ubiquity, simplicity, reliability, rapid deployment, and effectiveness to serve inaccessible areas, satellite is too expensive. TRAI notably perceives satellite as unable to provide broadband because of the low bandwidth support, higher cost of connectivity, and limited availability of satellite transponders.[4]

SES believes that this conclusion is inherently flawed. When compared with other technologies including fibre satellite offers numerous benefits for delivering broadband. For example, existing, in-service satellite capacity is immediately available to serve India, including its most remote, rural and underserved populations. Using this operational infrastructure based on commercial rather than government funds avoids implementation delay and the need to develop, construct and fund costly terrestrial infrastructure in areas where it may not be geographically or economically feasible or sustainable. Experiences of delivering broadband connectivity by using satellite in other parts of the world are showing that satellite can be a cost-effective and reliable solution that is available instantly. With its ASTRA2Connect platform,[5] for instance, SES has acquired the potential to address millions of households and businesses in Europe with affordable offers for high-speed connectivity (see Annex). Similarly, Wildblue in the US has thrived in providing high-speed connectivity everywhere in the US.[6] It seems eminently logical to use satellites to deliver broadband services in India.

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2 Available from: www.esoa.net/v2/downloads/gallery/Internet_Via_Satellite/ESOA_Brochure.pdf

3 See consultation *Introduction* pp 5-6.

4 See consultation *Section 3.17* - **Satellite in Access Network.** "Use of satellite technology for Broadband offers significant advantages in terms of ubiquitous coverage, simplicity in network design, reliability and rapid deployment and is very effective to serve inaccessible hilly areas where wired access is difficult to lay. Provisioning of Broadband through satellite requires main hub and remote stations. The cost of a main hub and satellite bandwidth is high. As a result the broadband connections provided using satellite medium is costly. The low bandwidth support, higher cost of connectivity and limited availability of satellite transponders limit use of satellite connectivity to provide broadband for masses."

5 See www.ses-astra.com/business/en/solutions/enterprise/astra2connect/index.php

6 All details available from www.wildblue.com



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***Future Needs***

TRAI has identified bandwidth requirements for existing and future popular applications. The highest requirements are for the transport of video to homes: video streaming (2 Mbps one way) and High Definition ("HD") video channel (4-8 Mbps one way). video gaming (two-way) comes 3rd with a minimum speed of > 512 Kbps. All other applications would not require more than 512 Kbps.[7] Section 4.55 of the consultation further acknowledges that "with the changing demand toward high speed applications customer perspective towards QoS [quality of service] is changing (…) with increased video streaming and HD TV roll out. The future will demand much higher data download speed, better upload speed and reduced latency to meet customer requirements."

The analysis made by TRAI cites some of the conclusions of the study conducted in Europe by Helios on "Broadband Internet Access" ("What does Europe actually need?")[8] This paper examines the evidence for demand for high bandwidth access to determine the kind of Internet connection that is realistically required by everyday Internet users over the next 5 to 10 years.

Helios determined that "a download speed of 10 Mbit/s is more than sufficient for the majority of current and future domestic Internet users; HD video streaming is likely to become the prime driver of Internet traffic volumes; gaming is unlikely to be a key driver of future bandwidth demand; and symmetrical connections are generally not necessary." On this basis, Helios has concluded that:

> *"A policy which promotes fibre as the only means of Internet delivery for all users may therefore be imposing unnecessary costs both to those providing financial support to roll-out and eventually, and inevitably, to end users. The use of existing (ADSL and satellite) infrastructure can economically deliver the necessary bandwidth to those users who are not currently within easy reach of fibre. (…) Using satellite for delivery of HD video content, there is little to no need for fibre connectivity for many domestic users as other means of Internet delivery (ADSL, mobile and satellite itself) are more than sufficient."*

***Satellite Key Role***

We firmly believe that satellite can play a critical role in satisfaction of broadband needs. Connectivity to the Internet, television services or specific on demand services require the ability to receive large amounts of audiovisual content, and increasing amounts of video. With hybrid (*i.e.,* terrestrial and satellite) platforms, satellite fully integrates in the converged media and telecommunications environment capable of providing a large amount of capacity to mobile operators and to residences (*e.g.,* direct-to-home), typically for the streaming of media rich content or high quality video that complements terrestrial DSL or 3G/4G.

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7 See consultation *Table 2.2*, page 25.

8 The document is available from: www.askhelios.com/broadband-internet-access.html



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TRAI has looked at various other countries and regions of the world, including Europe, to evaluate broadband plans and whether priority is given to fibre. In order to illustrate the actual or potential role of satellite, in light of the future needs identified above, it is helpful to look at the actual role of satellite in countries such as the US, Australia, France, Peru or the UK.

- **US**. Hughes and WildBlue (now owned by ViaSat) have approximately 1 million subscribers. Several years ago when Wild Blue commenced service, it was surprised that its capacity sold more quickly than expected and that much of its satellite capacity was used not in rural and remote areas but in well fibred urban areas.

- **Australia.** Provides an example of a country where satellite broadband is flourishing. As stated by the OECD (2009):

  > *"Australian satellite operators offer coverage to roughly 100% of the Australian population. This is a solution very well adapted to a vast continent like Australia, where terrestrial technology cannot provide broadband services to all the population particularly in remote areas. In July 2008, approximately 48 satellite broadband service providers were operating, most of which were regional ISPs reselling satellite broadband to regional, rural and remote customers. Some 11% of Australian broadband subscribers use wireless solutions (either satellite- or WiMAX-based, not counting 3G subscribers)."* [9]

  Additionally, the Australian Government recognises the essential role of satellites in its National Broadband Network ("NBN"). Specifically, the NBN implementation plan explicitly identifies the need to use existing Ku-band capacity in the near term and to construct two Ka-band satellites in order to obtain universal coverage with 12 Megabit per second speeds.

- **France**. We understand that the French national broadband plan is relying on a mix of technologies that include fibre, BWA and satellite.[10]

- **Peru.** For more than a decade, the Peruvian Government has used satellite technology to bring communications services to the most remote and rural parts of Peru. More specifically, the Peruvian Government has granted concessions to satellite service providers that commit to bringing services to communities in areas including the most remote jungle regions and mountainous Andes of Peru.

- **UK**. A principal recommendation on the UK Space Innovation and Growth Strategy for 2010-2030 published in March 2010 by the UK Government acknowledges that:

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9 www.oecd.org/dataoecd/41/39/44381795.pdf, page 36.

10 See the very high-speed national program released in June 2010 from: medias.lemonde.fr/mmpub/edt/doc/20100614/1372606_58fd_programme_national_tres_haut_debit.pdf, section VII – exhaustive territory coverage.



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> *"it will not be affordable to provide fast broadband services to all of the UK's communities as part of the Next Generation Access using just fibre optic or mobile networks. However, a mixture of fixed and mobile Space services can deliver more efficient High Definition TV broadcast for everybody and 'Next Generation Broadband' to rural communities in the UK. (…) Government and industry should work together to define the infrastructure and architecture that enables Space to provide an affordable, ubiquitous delivery mechanism that is an enabler of a modern, low-carbon, digital economy."*[11]

In all these instances, satellite already plays a fundamental role as an existing Direct-To-Home (DTH) infrastructure to which millions of people are plugged in to receive media rich content or high quality video; and this will be eminently part of the broadband experience of anyone, anywhere.

More generally, the new generations of **satellites using Ka Band spectrum** have significantly improved the performance, speed and quality of service. As again stated by the OECD (2009):

> *"Satellite broadband solutions using Ka band are starting to be deployed by providers, and the future is promising in terms of performance, as bit-rates between 10 and 20 Mbps are expected. Ka band technology reduces the required dish size, resulting in a lower equipment cost to consumers."* [12]

***Broadband Definition***

According to TRAI, the present definition of 256 Kbps 'always on' connection for broadband is believed to be too low and restrictive for wireless based technologies. The proposed new definition would exclude the 'always on' requirement. However, there is debate over the new minimum download speed. The consultation favours a speed of 2 Mbps per subscriber.[13]

Considering the bandwidth requirements identified by the TRAI as well as the complementarity and competitiveness of satellite-based broadband services, we believe that satellite can easily fit in the definition of broadband.

## 4. Conclusion

SES believes strongly that satellite can fit into the new TRAI definition of broadband. As noted above, fibre is not the only broadband solution for India. Instead, the solution is likely a mix of various technologies accompanied by a pro-competitive,

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11 Cf. Recommendation 7 of www.spaceigs.co.uk/documents/index/download/fileID/16/fileName/space_igs_exec_summary_and_recomm.pdf/

12 www.oecd.org/dataoecd/41/39/44381795.pdf, page 35.

13 See consultation *Section 4.17*.



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non-discriminatory landscape that enables India to achieve its ambitious goals quickly and cost-effectively.

We are confident that VSAT solutions when combined with high-throughput satellites, are very competitive and capable of serving a very wide geographic area, covering all rural, suburban and urban areas in India. Moreover, satellite provides a cost-effective means of backhauling large amounts of data anywhere within a satellite's footprint thereby enabling fixed and mobile broadband in rural and suburban areas where they would otherwise be unavailable or would be very costly and require inefficient spectrum use.

India is a vast country with a large population that is essentially rural and with important social and educational needs. Our experience of the role which satellite plays in bringing broadband to all citizens in all parts of the world exemplifies the critical the role our industry can play in helping India to achieve the goals of its NBP.

SES would be pleased to further discuss the matters raised in this document with the TRAI. Further, we would be happy to respond to any questions that TRAI staff might have related to this submission.



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# ANNEX

*SES Broadband Offers in Europe*

## SES' satellite broadband service: Astra2Connect in Europe

Current Service Description

### Current Generation: Ku band - Pricing

**1) Limited transfer volume:**

**Satellite broadband offer in the EU:**

**Nordnet in France:**
**2**GB/month transfer max
**2**Mbps/128kbps

Recurring monthly fee: **34.9€**
One-off (HW, setup, self-install): **50€**

**DSL offer in the EU:**

**Belgacom Budget:**
**1**GB/month transfer max
**1**Mbps/128kbps

Recurring monthly fee*: **38.4€**
One-off (HW, setup, self-install): **149€**

*Note: Required fixed line, included, 18.4€/month

**Satellite broadband can be cheaper (both one-off and recurring) than DSL. Here it offers double the capacity and monthly transfer volume of DSL.**

**2) Flat rate:**

**Satellite broadband offer in the EU:**

**Filiago in Germany, Switzerland, Austria:**
Flat rate
1Mbps/128kbps

Recurring monthly fee: **49€**
One-off (HW, setup, self-install): **99€**

**DSL offer in the EU:**

**T-Home Call & Surf Basic (flat rate):**
Flat rate
2Mbps/192kbps

Recurring monthly fee: **29.95€**
One-off (HW, setup, self-install): **136.95€**

**Due to hardware rental options, satellite broadband one-off fees can be lower than DSL, however, recurring fees tend to be higher.**

Current Astra2Connect pricing can be affordable and comparable to other infrastructures for a comparable service.



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