



European Satellite Operators Association

Communications Satellites
- Absolute Essentials -

European Satellite Operators Association
(ESOA)

www.esoa.net



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Unique Features The Only Communications Infrastructure

*European
Independence*

With An Inherent International Dimension

*Strategic
Investment*

With total upfront investment in a 20 year business plan

*Ubiquitous
Coverage*

Enables Live TV [also HDTV] & digital transmission anywhere on earth

*Digital
Divide*

Enables broadband connectivity anywhere on earth

*Emergency
Communications*

Unaffected by terrestrial events & easily deployable

*Security
Communications*

Meets all Security Communications requirements quickly & affordably

Green

Uses solar energy for 20 years & has minimal (pW) radiation

*Energy
Efficiency*

Enables 'clean' management & monitoring of renewable NRG plants



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International Implications

- Other communications signals can be confined within EU boundaries
- Satellite signals are spread over numerous countries (including non-EU)

EXAMPLE:

- Hellas-Sat 2, physically located at 39°E “over Kenya”
- Hellas-Sat 2 delivers DTH TV to all Europe
- To operate legally over Europe, it required coordination with Pakistan, Russia, Turkey & France:
- Matter of diplomatic negotiation & bilateral agreements depending on political relations between countries
- Therefore satellite operators must continue to operate within the international framework already in place globally (ITU)





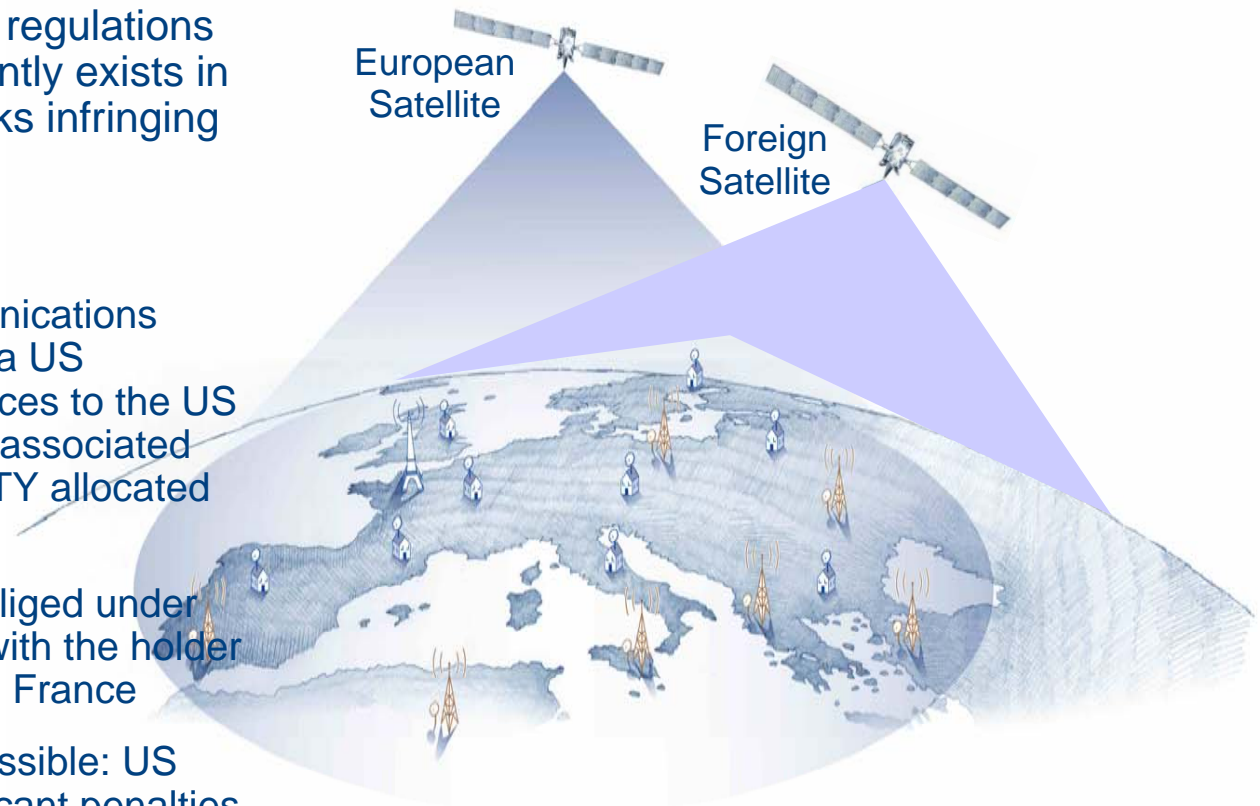
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DENIAL of the International Dimension

- Applying regional/ national regulations to a technology that inherently exists in an international context risks infringing international law

EXAMPLE:

- The US Federal Communications Commission authorised a US operator to provide services to the US using an orbital slot and associated frequencies not PRIORITY allocated to the US
- The US operator was obliged under ITU rules to coordinate with the holder of the primary allocation: France
- Coordination was not possible: US operator still pays significant penalties for the lifetime of the satellite (15 years)





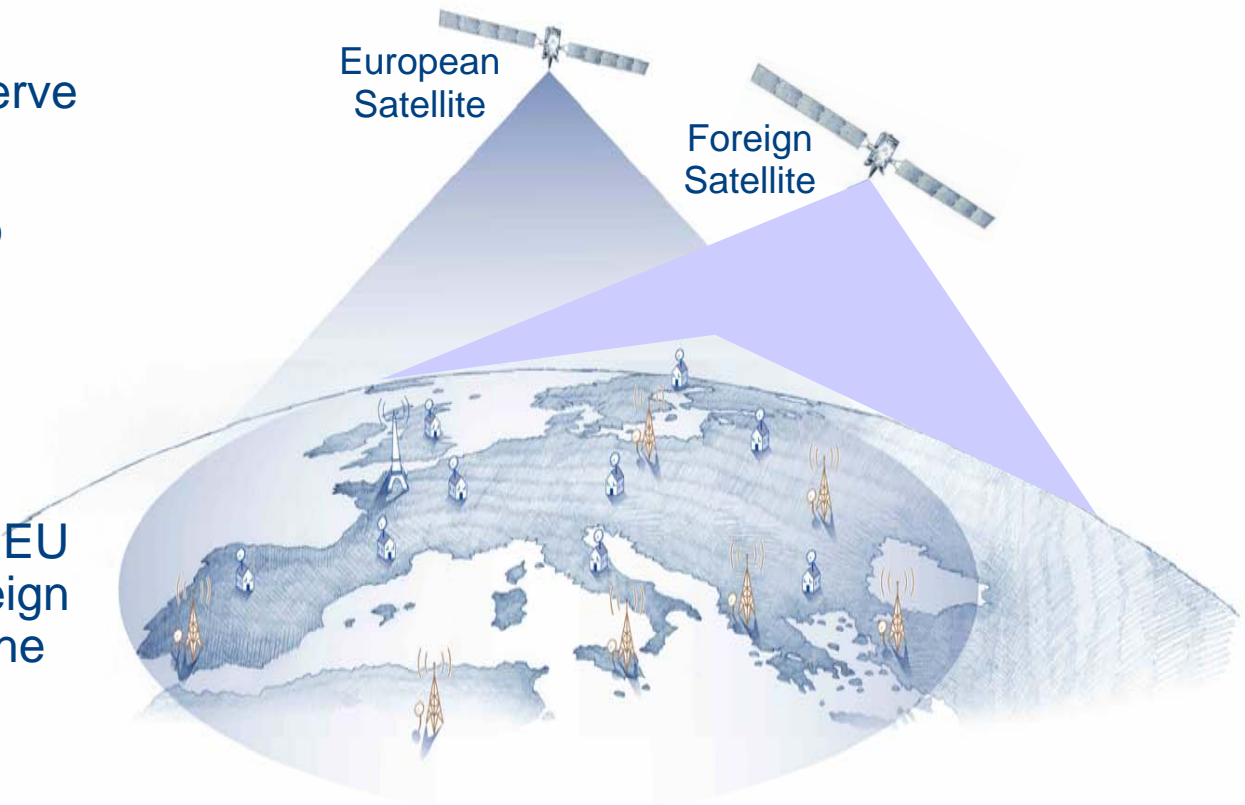
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CONSEQUENCES of the International Dimension

- “European” satellites serve Europe & beyond
- “Foreign” satellites also serve Europe

LEVEL PLAYING FIELD

- The inability to enforce EU regulations against foreign satellites could distort the EU market





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Upfront Investment for a Long-Term Business Plan

Total upfront investment (excluding operations) in manufacture, launch, insurance of a single satellite requires from €150m to €300m for a life of up to 15 years

Shareholders (often financial institutions) look at the revenue earning capacity of a satellite in space over its lifetime:

- Investment in this infrastructure: capital intensive but if well-managed gives high operational margins
- Certainty is key to on-going investment:
 - Right to operate (frequencies, landing rights)
 - Long contracts (based on the long life of satellites) giving secure revenue streams
- Examples of market capitalization of leading operators: SES: €7.2bn, Eutelsat: €4.2bn

The positive knock-on effect on EU economies of such investment is:

- Manufacturer's revenues in the range of €3billion per year
- 20000 persons employed per year by manufacturers, launchers & subcontractors
- Multi-million euros insurance industry for commercial space risks (average annual premium income generated since 2002 is €500m)
- More than 100,000 persons employed in downstream services (broadcasters, installers, service providers)



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Seamless Reach for Citizens Everywhere

ONLY satellite communications provide immediate ubiquitous coverage, seamless reach & mobility everywhere in Europe without the need to roll out an expensive infrastructure

For this reason they are the only infrastructure that can & does:

- Deliver uninterrupted, live, digital TV broadcasts, as well as HDTV
- Bring broadband connectivity everywhere in Europe, from rural village to mountaintop
- Contribute to Sustainable Development projects e.g. in Africa
- Allow real-time maritime communications to & from ships at sea
- Allow real-time communications to and from airborne aircraft



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Innovation in Next Generation Digital Content

Only satellite effectively enables multiples of channels in HDTV

- HDTV represents another upfront investment by satellite operators in a new & innovative technology which would never happen if there is spectrum/regulatory uncertainty
- Consumers already receive up to 36 channels in Europe in HDTV, more than what terrestrial TV will ever be able to deliver
 - E.g. UK: after digital switchover the spectrum released will carry approx. 14 HDTV channels
 - Latest telecoms satellite launched in 2006 can carry 150 HDTV channels; Freesat plans to offer HDTV channels free from the start
- Initially HDTV was considered a premium that would not sell; sales of HD ready flat panel TVs has been growing: seems clear that all TV will become HD just as all TV became colour
- Increasing numbers use PCs, Macs, MediaCenters as TV's & HD content is easily available on internet. HD is already becoming a standard expectation for them; if this growth continues, it may become a necessity



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Emergency Communications I

ONLY satellites ensure continuity of communications & can be easily/ quickly deployed to areas affected by disaster

Terrestrial networks are destroyed by natural or man-made disasters & cellular networks become overloaded

- For this reason, satellites are used by governments, first responders, aid workers, NGOs & charities to enable communications all over the world when nothing else works
- Recognized by the UN humanitarian community:
 - Creation of the UN Working Group on Emergency Communications
 - C-Band satellite communications declared as the standard for all UN emergency communications
 - Establishment of ITU High-level Panel on Emergency Communications



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Emergency Communications II Tsunami

The Italian Civil Protection coordinated the EU response to the Tsunami

They used extensive satellite communications for a period of 6 months



The European NGO Telecom Sans Frontieres also used satcoms to allow families to call loved ones & to assist aid workers on the ground



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Security Communications

ONLY satellite communications deliver on all EU security requirements

Increasingly, Europe is:

- Concerned with protection of EU borders
- Involved in security operations outside the EU

Security communications require:

- Mobility (small units that need to be deployed quickly)
- Bandwidth & capacity (at command posts)
- Resilience (should operate in any condition)
- Independence (should not depend on a local network)
- Interoperability (should enable normal IP-based services like email, VPN, internet etc)
- Information assurance (should ensure privacy & integrity of communications)

For this reason commercial Satcoms face a growing demand to meet increasing military needs



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Operations with Few Emissions

*ONLY satellites communicate for up to 15 years
using solar energy & emitting zero carbon*

- Solar panels generate all the electric power a satellite ever needs
- Latest rocket technology uses “clean” O₂ & H₂ from sea water using hydro-electric power
- Only 10% of solid rocket fuel is oil-based
- One launch takes about the same energy as 1 transatlantic flight, so 1 year’s launches is ‘greener’ than 1 evening’s transatlantic flights
- 1 rocket can launch multiple satellites at one time!
- Satellites radiate PICOWATTS, terrestrial transmitters radiate MEGAWATTS

Example: The UK, source: UK Case4Space

- 1100 UHF transmitters provide analogue TV to the UK. The 50 most powerful consume 54MW of electricity: 250,000 tons of CO₂ p.a.
- Satellites use the sun to power transmissions over 15 years emitting ZERO CO₂ to earth



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A “Clean“ Management Component for Renewable Energy

*ONLY satellite communications allow optimal & “green”
management of remotely located renewable energy plants*

*As they do not consume electric power, they do not contribute to
pollution, unlike other land-based communications infrastructures*

Renewable energy plants (water/ wind):

- Require remote management: 24 hour real-time monitoring, remote access/control, alarm mechanisms, transport of data
- Are often rurally located: no communications infrastructure available

For this reason satellites are increasingly deployed for such purposes:

- ENEL, Italy
- Hydrowatt, Italy
- Ente Acque della Sardegna, Italy



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Satellites - Absolutely Essential!

If there were no communications satellites:

- Live Transmission:
 - UEFA cup final: “If you haven’t got a ticket, you’ll have to see it later or fly to the venue to watch it on local TV”
- Digital Divide/ Carbon Footprint:
 - “Lets roll out cables & put up transmitter masts everywhere - it will take a few years, cost a bit and emit a load of radiation”
- Emergency Communications:
 - “Sorry, you’ll have to wait until lines are repaired or mobile networks are less congested - it could take months or even years”
- Maritime Transport:
 - “Back to letter-writing between sailors and their families & Morse code for the crew”
- Security & Defence:
 - “The enemy is coming, light the fires and release the pigeons...”