

Nuove piattaforme per la diffusione della TV digitale



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Summary

- Standards: from DVB H to DVB SH
- Technology: advantages of DVB SH v.s. DVB H
- Regulation: UHF and S band
- Deployment scenario: coexistence and migration aspects
- Alcatel-Lucent Strategy and solutions

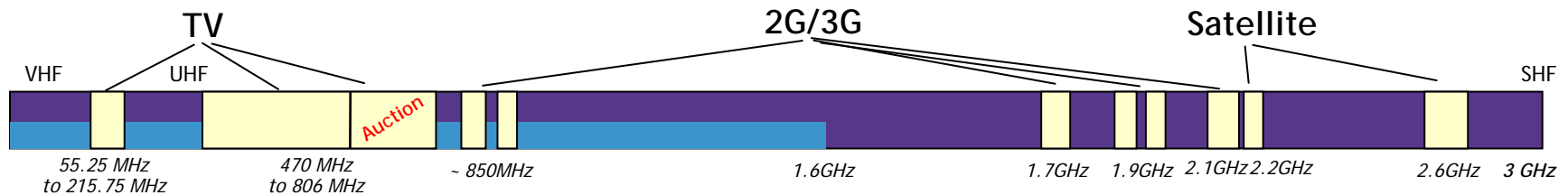
DVB-SH: Next Generation of DVB-H

2007



Twice more efficient
 Usable in all frequencies below 3GHz
 Allowing satellite / terrestrial hybrid topology
 Compatible with all DVB-H applications

2004





Regulatory situation in Europe: UHF

REGULATORY (UHF)

France :

UHF assignment to channels expected by Q2 2008

Long and potentially disruptive negotiations expected between channels, TDF and MNOs.

Outcome dependent on political pressure. No significant commercial launch in 2008 expected.

Germany :

UHF spectrum assigned to TDF. Media license assigned to newcomer Mobile 3.0.

DVB-H disregarded by MNOs. Mobile 3.0 future at risk.

Spain :

UHF spectrum allocation process postponed beyond March general elections

No commercial opening by 2008.

UK :

UHF auction expected end 2008 but frequency available only after analog switch off (expected depending on regions to occur between 2008 and 2012, i.e. no nationwide coverage bef. 2012)

Poland :

Multi-city UHF spectrum possible. Trials under way. No significant commercial launch in 2008 expected.



Regulatory/Standardisation status in Europe: S-band

REGULATORY (S-band)

1) European process

- **Harmonisation** : adopted on February 14, 2007
 - S band reserved for MSS
 - Terrestrial components (CGC) are allowed
 - Priority to satellite and terrestrial complement allowed
- DVB SH standard published by ETSI on March 19^o 2008
- **Spectrum assignment to Satellite Operators**: new selection process underway. European Commission targeted planning:
 - 1) Mandate by Member states to EC : May 08
 - 2) Call for application : July 08
 - 3) Submission of proposal: October 08
 - 4) Result of the selection: early 2009
 - 5) National authorizations including terrestrial complement by early/mid 2009 (given under the conditions that the system is a European standard such as DVB SH)

2) National Initiatives

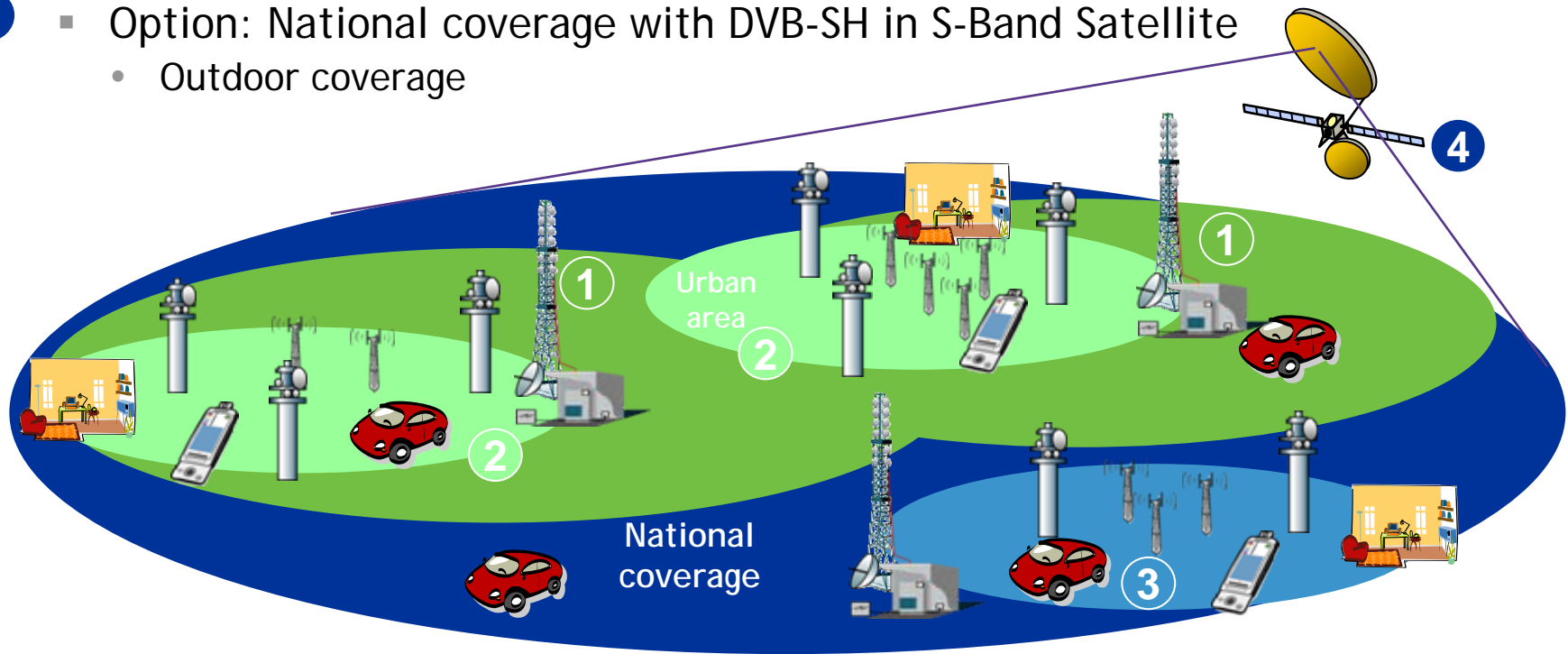
- Interested Operators/Countries can experiment temporary DVB SH in S band, national, terrestrial only authorisation scheme ahead of completion of the European process (on non protection and non interference basis).

Note: DVB SH in UHF can be deployed from now since the ETSI standard has been approved

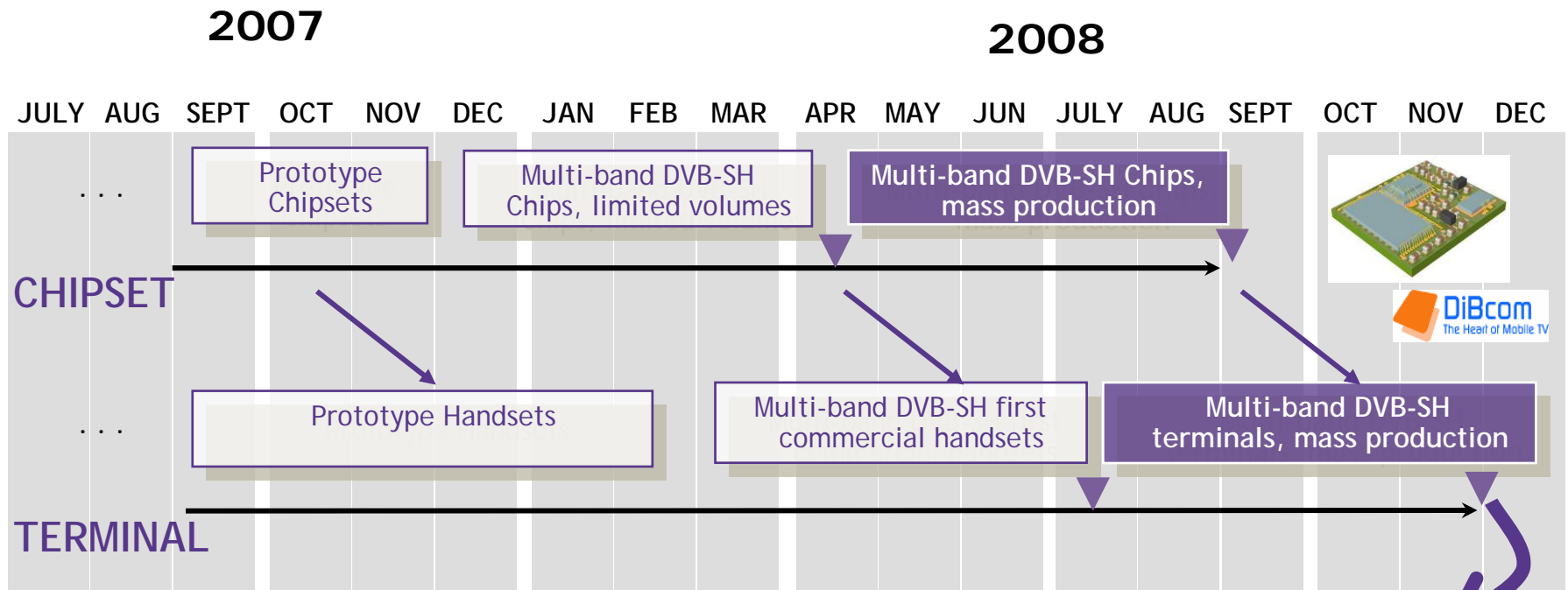
Example Deployment Scenario

Hybrid DVB-H in UHF and DVB-SH in S-Band deployment - Co-existence

- 1 ■ Rural and Urban coverage with DVB-H in UHF High power transmitters
 - Outdoor coverage
- 2 ■ Urban coverage with DVB-H in UHF medium/low power transmitters
 - Outdoor & indoor coverage
- 3 ■ Coverage complement with DVB-SH in S-Band medium/low power transmitter
 - Outdoor & Indoor coverage
- 4 ■ Option: National coverage with DVB-SH in S-Band Satellite
 - Outdoor coverage



Multi-band DVB-SH: Smooth upgrade of DVB-H terminals



UHF DVB-SH terminals
Chipset upgrade **only**

Advanced discussions with all Tiers
1 chipset and handset vendors

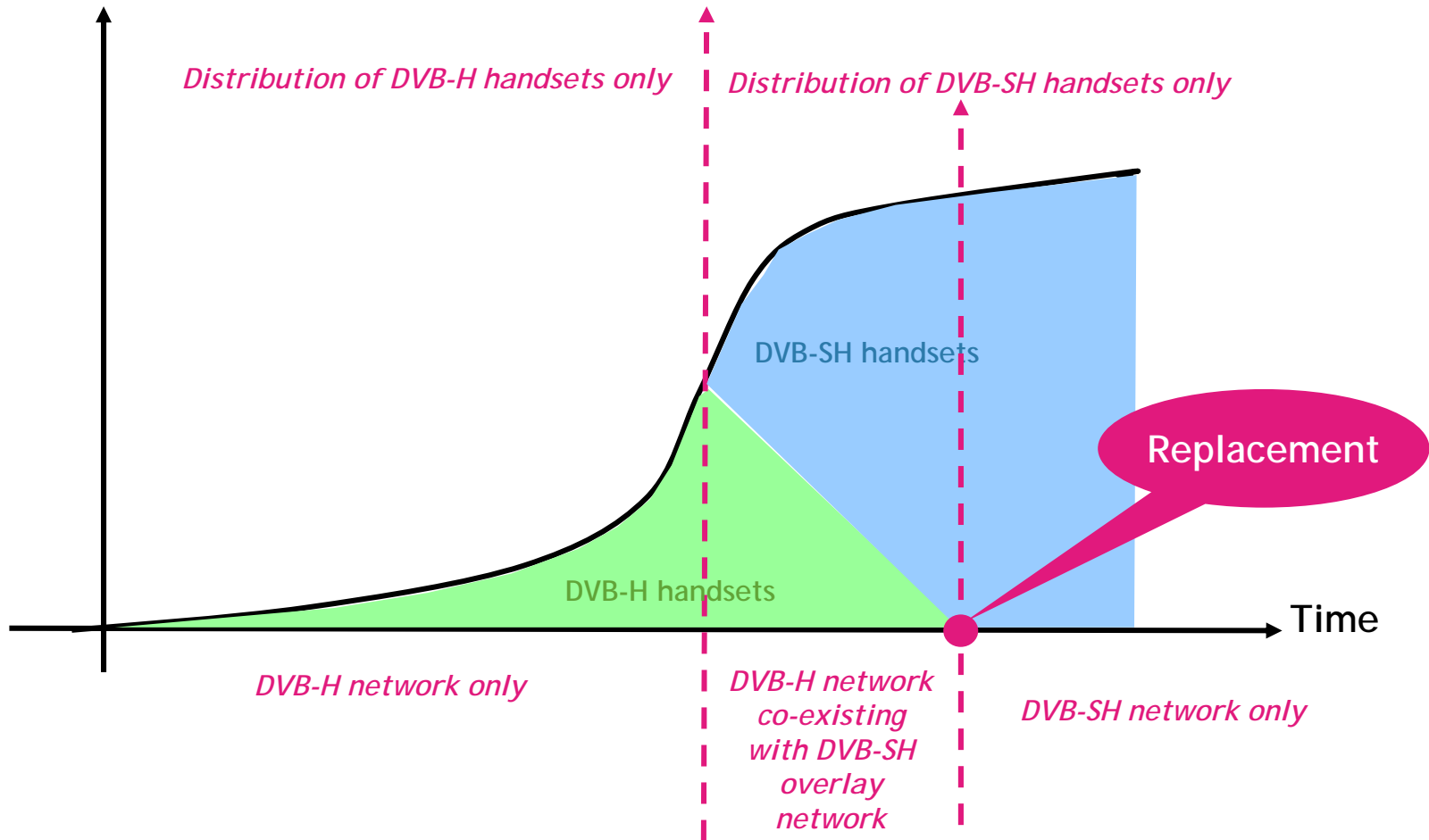


Officially committed DVB-SH vendors

Deployment Scenario: Coexistence

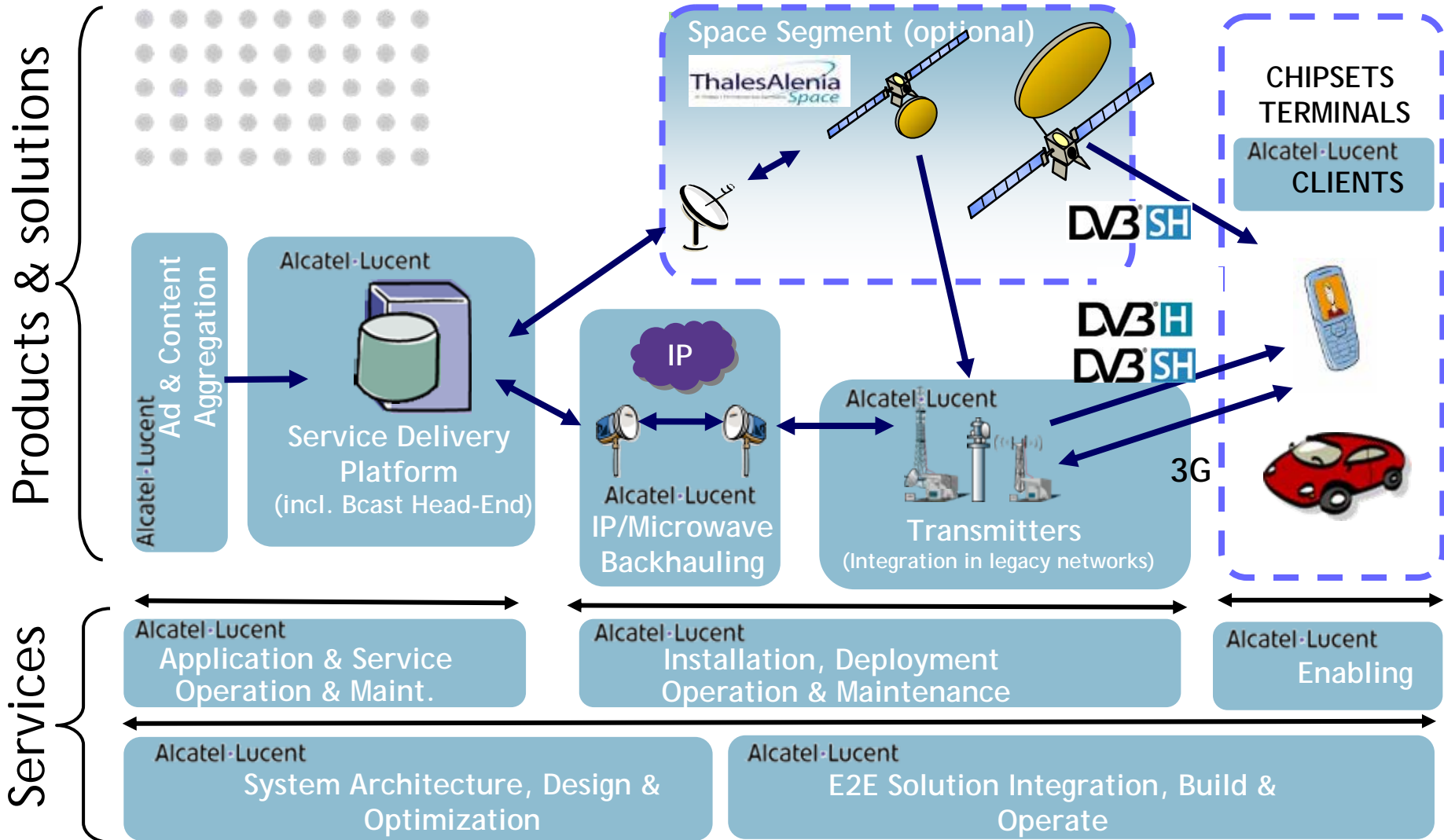
Hybrid DVB-H in UHF and DVB-SH in UHF or S-Band deployment - Swap-out

Number of Mobile TV handsets in the network



Alcatel-Lucent

Unlimited Mobile TV Offer

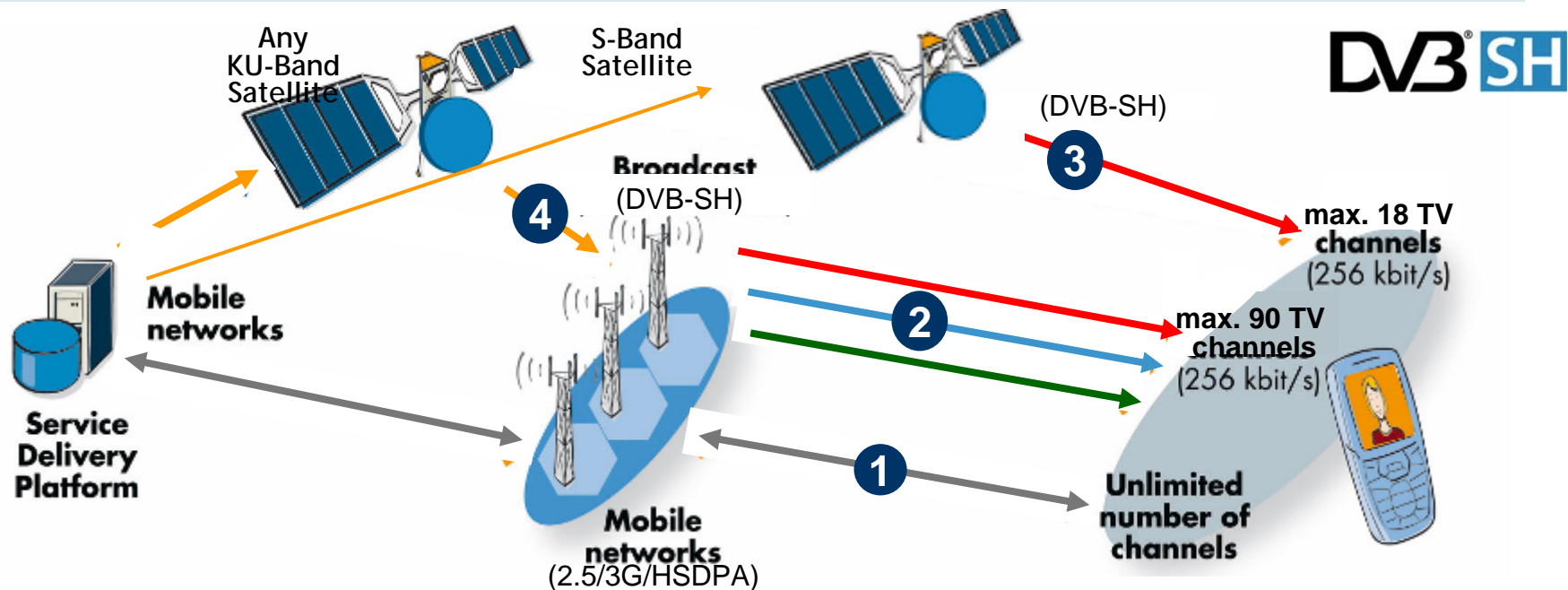


Backup

Satellite coverage to user terminals

Using DVB-SH in S-Band,
30MHz adjacent to 3G and available

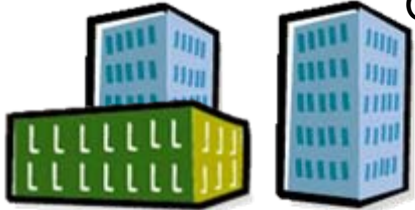
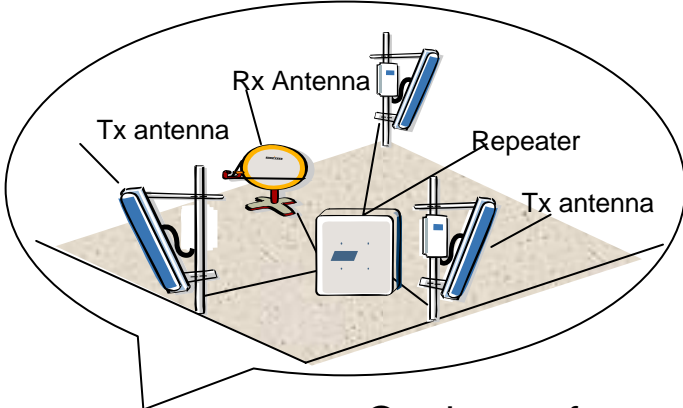
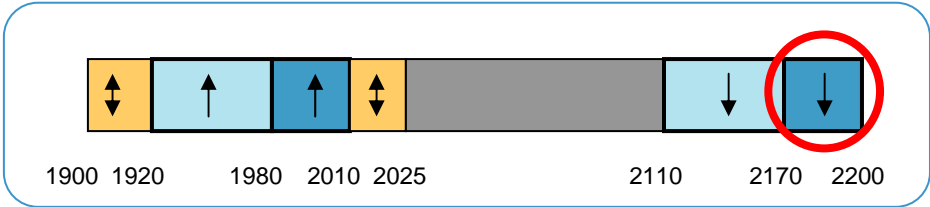
- 1 Unicast via Cellular network for limited audience TV, VoD and interactivity
- 2 Broadcast via Repeaters for urban areas / indoor TV broadcast to mobiles
- 3 Broadcast via Satellite for nationwide TV broadcast to mobiles (DVB-SH)
- 4 backhauling for repeater sites via Ku-Band Satellite (MW, LL also possible)



Synergy with 3G :

Easy upgrade of existing networks (3G and GSM)

- Reuse of existing sites
- Reuse of antennas
- Reuse of existing cabinets
- Limited site renegotiation



On the rooftop

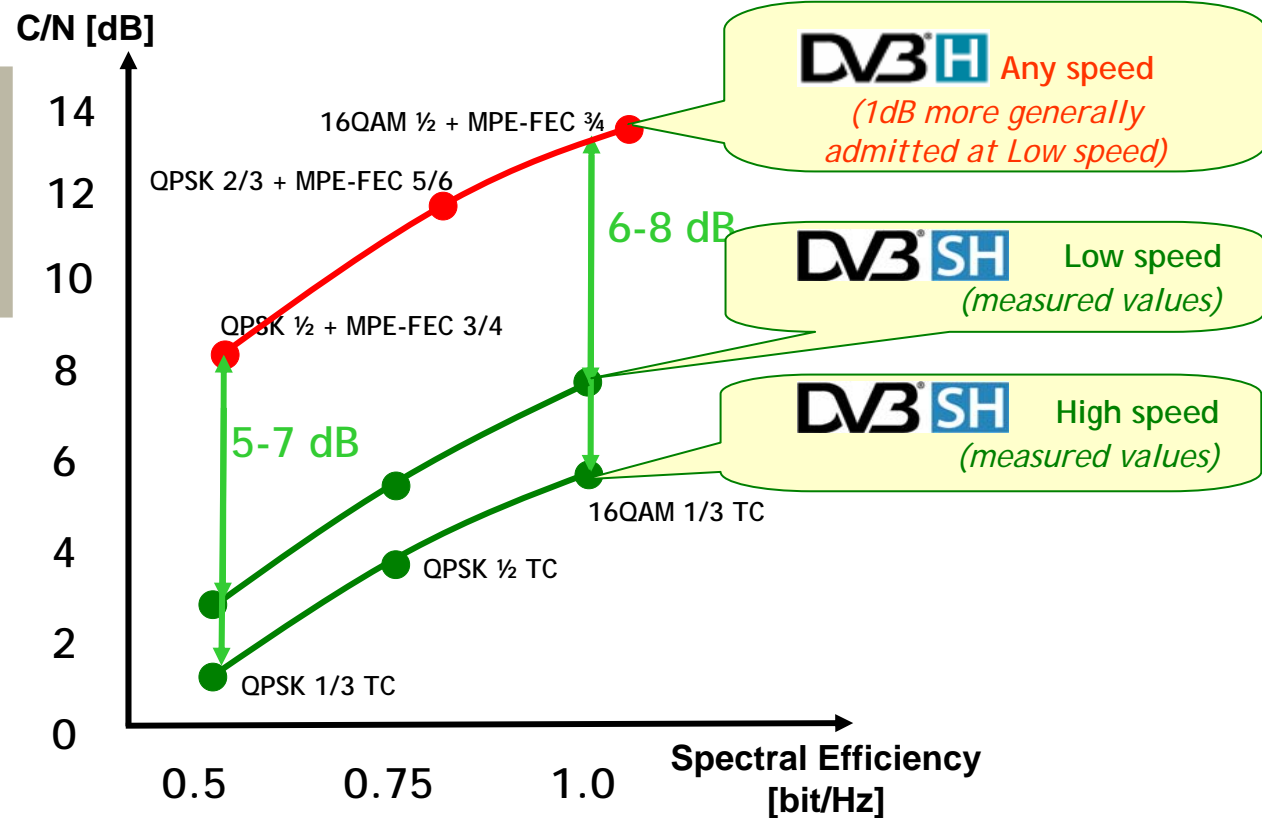
- Additional rack in existing cabinet
- Adding a combiner to feed 2 radio signals in one (existing) cable

Limited CAPEX per repeater
Reduced installation cost



DVB-SH Technology "Expected" Performances Values

Mobile TU6,
8 MHz Channel,
GI 1/8
Source: Alcatel-Lucent lab.
measurement results



A typical link budget improvement by the DVB-SH waveform versus the DVB-H waveform between 6-7 dB @TU6 3 km/h and between 7-8 dB @TU6 50 km/h is expected in the field

DVB-SH = DVB-H x 2

REDUCED CAPEX, SAME SERVICE

- Up to CAPEX ÷ 2
- Competitive price
- Better margin

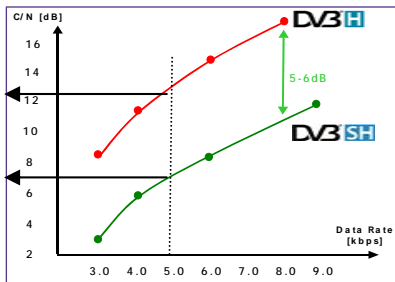
SAME CAPEX, BETTER SERVICE

- up to x2 more channels
- Better (indoor) coverage
- Better QoE (higher data-rate): Higher image quality/ Larger screens / Multiple form factors



Service Provider Benefit

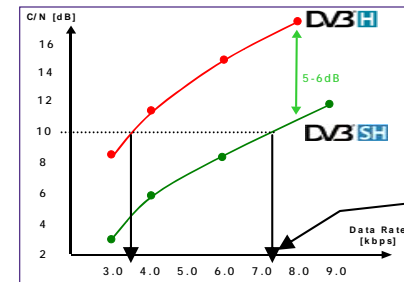
Same data-rate,
5-6dB less C/N
requirements



DVB[®]SH
VS.
DVB[®]H

End-User Benefit

Same C/N,
2 times data-rate



➔ DVB-SH offers more flexibility than DVB-H to balance service and/or cost advantages

Improvements of DVB SH v.s DVB H

“BMCO Forum” issued a document comparing all technologies



Main parameters (issued from BMCO document)



	DVB-H in UHF	DVB-SH in S-Band	<i>delta</i>
Turbo-Code, Interleaving	Not used	Min 5.5 dB	+ 5.5dB
Propagation Loss	Good	Max 14dB (higher frequency)	- 14dB
Building Loss	17 - 11dB	18-14dB	- 1..3dB
Antenna gain	-8.5 dB at 600 MHz	-2.5 dB at 2.2GHz (suitable antenna size)	+ 6 dB
Antenna diversity gain	Not possible (due to antenna size)	6 dB (Indoor)	+ 6 dB
			+ 1..2 dB → Better overall Link budget !

→ 2007: ongoing trials with mobile operators, validating the theoretical assumptions