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Value Partners: Spectrum and License Strategy and Planning Practice

December 2013

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•Chapter 1 – Introduction to Value Partners

- Chapter 2 – Our Understanding of Spectrum Licensing and Services Offered
- Chapter 3 – Our Unrivalled Credentials

This document sets out Value Partners' unrivalled credentials in Spectrum & License strategy, planning, valuation and acquisition

- Value Partners is a top-tier management consulting company, uniquely qualified to support Companies and Regulators in forthcoming spectrum planning activities given our:
 - **expertise in spectrum auctions** with leading **operators and regulators**, including developing **Auction Tool software used successfully in complex licence acquisitions**; and
 - deep understanding of the **wireless broadband business models and trends in internet usage** through our work with clients all over the world
 - **unrivalled convergence and media industry experience** & insight which has critical implications for telcos and regulators in spectrum / licence strategy & planning
- We have **recently completed spectrum valuation and related projects** for 700MHz, 800MHz, 900MHz, 2.1GHz, 2.3GHz and 2.6GHz bands in **Australia, Singapore, India, UK, France, Spain**
- We have **assisted our clients in winning 2G/3G mobile, fixed and television licences and launching businesses** in India, Hong Kong, Singapore, Indonesia, Italy, Israel, Ireland, Malaysia, UK...
- We have **also worked for regulators** in Singapore, Indonesia, Hong Kong, Belgium, Netherlands, Denmark, Qatar, etc in the **preparation of the Master Framework for spectrum licences and subsequent awards including Auction design and support**
- Our telecom & media client work in **strategy and business planning, M&A and due diligence, go-to-market, operations improvement, technology assessment and regulatory advisory** is invaluable in determining spectrum & licence strategy and valuation

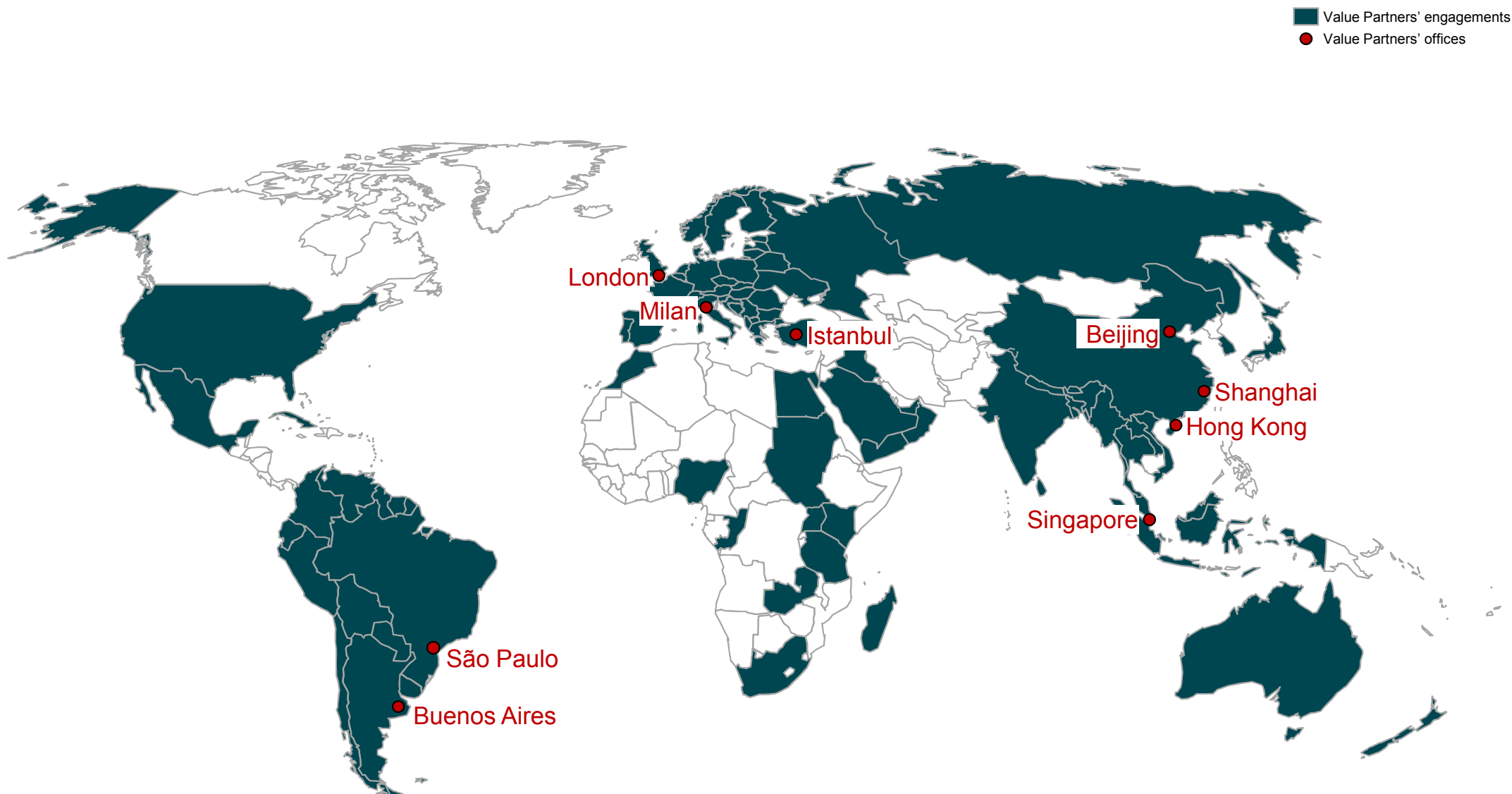
Value Partners: a top-tier management consulting multinational



Value Partners has acquired specialist
telecom & media consulting firm
Spectrum Ltd. in 2007

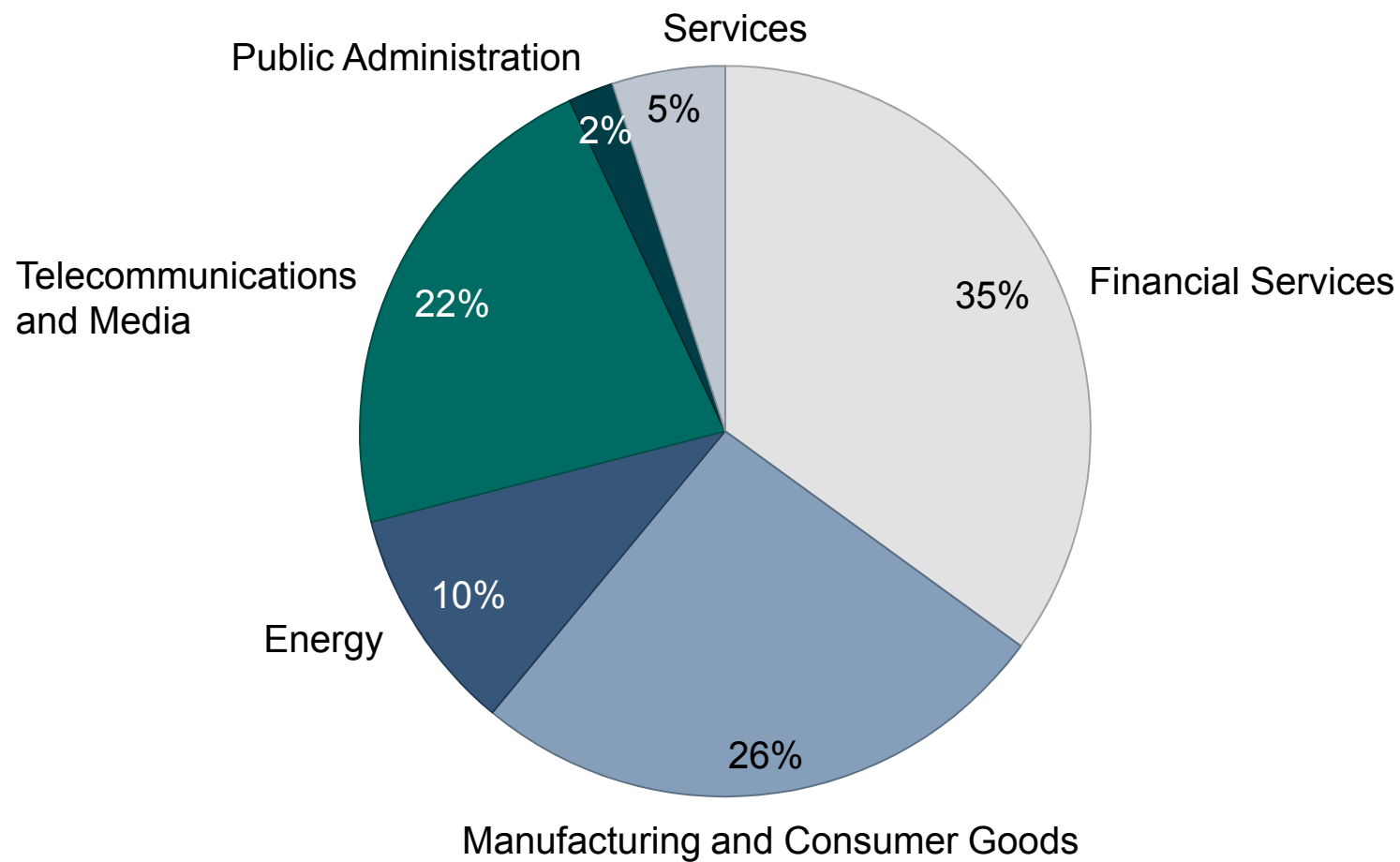
- **An international player**
Headquartered in Milan, with offices in 7 countries, including double-digit growth rate markets
- **A strong team of professionals**
20 partners, 250 professionals, 20 nationalities
- **An excellent track record**
Constant growth over the last 20 years
- **A large and loyal customer base**
Over 350 client served in the past three years, 60% of which have been with us for over 8 years
- The first to **successfully integrate business and IT expertise** with the creation of Value Team in 2001. Value Team was then sold to NTT Data in 2011 for an enterprise value of €270m

Global reach: 9 offices with engagements in over 40 countries



We serve the main industrial sectors...

%, Value Partners turnover 2010-2012



... and our clients are leading players in their sectors

Some clients served in recent years

Manufacturing and Consumer Goods



Energy and Services



Financial Services



Telecom & Media



Within the TMT Landscape we have advised leading Telecom & Media operators, technology vendors, regulators, and investors...

Regulators



Content Rights Holders



Telecom Operators



VALUE PARTNERS
Telecom, Media, Technology Practice

Media Clients



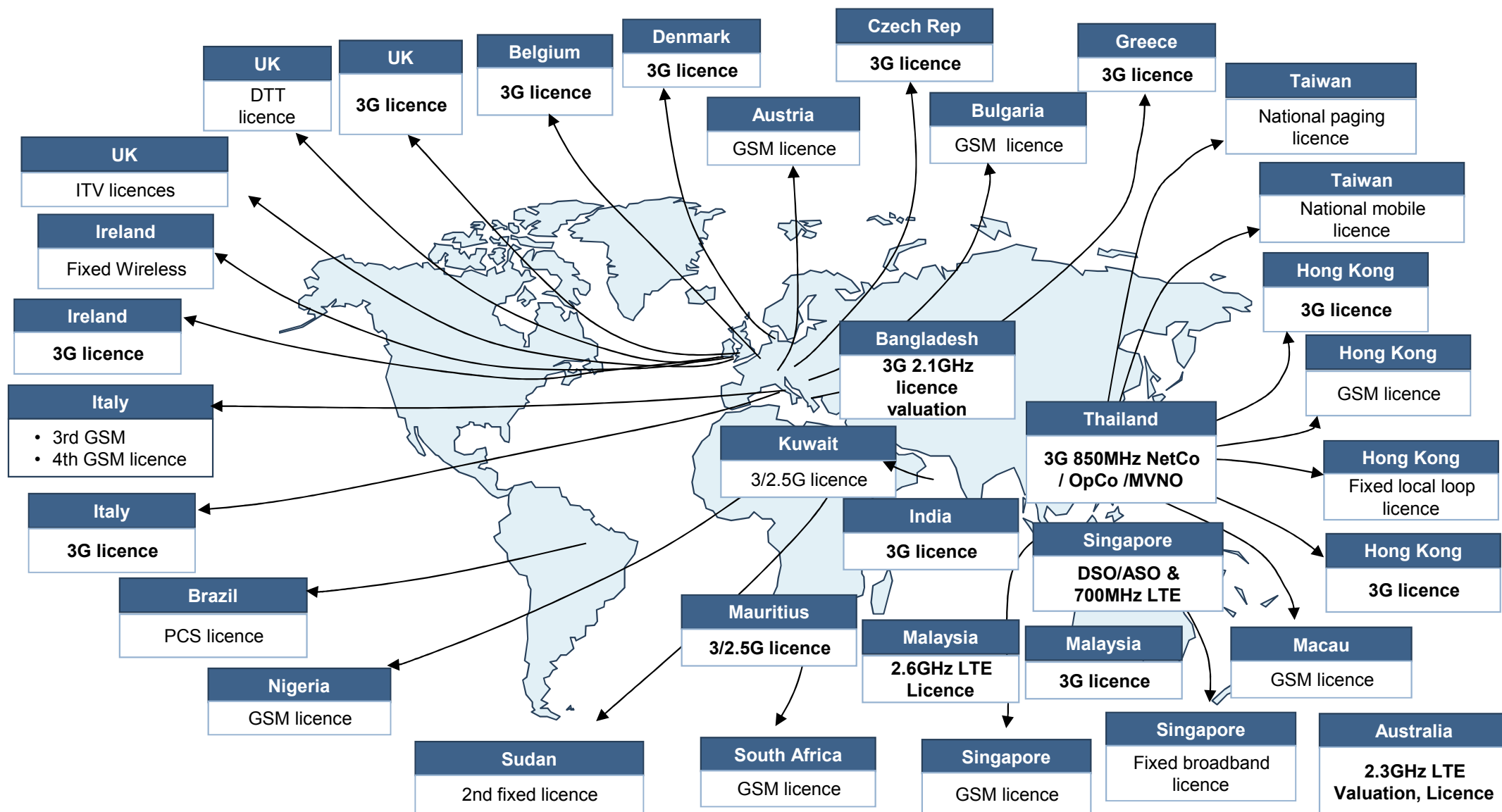
Technology Vendors



Investors



...including unparalleled spectrum and licensing experience internationally (2G, 3G, 4G, DTT)...



... with both telecom and media operators...

 Bakrie Telecom Transformation plan: CDMA MNO to Value-added Infrastructure player in Indonesia	 3G strategy, license, launch PMO in India	 Establishment of TowerCo spin-off Company	 Business model, strategy, infrastructure and product portfolio for carrier wholesale	  Satellite feasibility study and ITU lobbying
 2.1GHz auction strategy	 3G NetCo/OpCo/MVNO Business Model & Investment Case	 New VAS services launch Strategy & PMO in Indonesia	 Broadband IPTV launch and PMO in Singapore	Concession Conversion, N'al BB Network, Industry Restructure Interconnection framework 
  SME, Corporate segment strategy in Philippines & Indonesia	  3G launch PMO in Malaysia	 3G launch MVNO advisory Mobile TV PMO	 Due diligence / financial valuation for Aircel \$2B 3G/BWA capital raising	  Transformation, restructure & cost reduction post acquisition
 PMO launch of DTT, IPTV and MVNO	 2.6GHz LTE Licence bid & Investment Plan in Malaysia	 3G & WiMAX strategy & licence valuation in Bangladesh	  Full 3G Launch PMO in Italy	  Tower business commercial due diligence
  MVNO advisory 	  Post-merger Org. & business process integration	 3G launch PMO in Oman	 Satellite business strategic review, Broadband Strategy validation	 Multi-year strategic transformation and turnaround program

... and Telecom Media Technology regulators and ministries

 <p>2.3 / 2.5GHz Auction Design & Management</p>	 (Denmark) <p>3G Licence Regime & Auction Design</p>	 (Belgium) <p>3G Licence Policy, Consultation, Modeling</p>	 (Nepal) <p>Developed National Frequency Master Plan</p>	 <p>Satellite feasibility study and ITU lobbying</p>
 <p>700MHz ASO/DSO Dividend Valuation</p>	 (Bahrain) <p>Licence and Spectrum Pricing Framework</p>	 (Indonesia) <p>Spectrum & Licence Valuation and Impact on Incumbents</p>	 <p>Policy for Licensing and Spectrum Utilization</p>	<p>Concession Conversion, N'al BB Network, Industry Restructure Interconnection framework</p> 
 <p>3G Licence Framework & Public Consultation</p>	 <p>Industry Competition Assessment</p>	 <p>2G Spectrum Utilization Fee Review</p>	 <p>Resale of telecom services regulations</p>	 <p>Free WiFi Policy Feasibility and Implementation Plan</p>
 <p>Spectrum Trading Framework Design</p>	 <p>Broadband Wholesale Regulation</p>	 <p>Industry consultation on NGN technology</p>	 (Cameroon) <p>National ICT Industry Policy</p>	 <p>Broadband & Pay TV Market Analysis</p>
 <p>Broadband Policy and Interconnection</p>	 (Brazil) <p>Restructure Telecom Regulatory Regime</p>	 <p>New Licence design and bid evaluation</p>	 (Brazil) <p>Satellite Spectrum Pricing and Policy</p>	 <p>Scoping of new NGN Industry body</p>

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We understand that spectrum is a scarce resource and operators must compete heavily for new allocations to support business needs

Need for Effective Spectrum Planning

Growth of Mobile Data

- Growth of mobile data puts significant **pressure on the economics of the telecom operators**
 - Data absorb a dominant and increasing share of the capacity of the networks, but the growth of data revenues is substantially slower and operating **margins are squeezed**
 - **Broadcasting and telecoms services are converging**, and network capacity must be managed accordingly;
 - Multiple **new devices** that rely on mobile broadband are being launched, enhancing customer expectations on when, how and where to use voice, data and new media services.

Limitations in Existing Spectrum Regimes and Technologies

- Currently available spectrum and technologies **cannot easily sustain the evolution** in traffic and customer demands
 - Legacy spectrum licenses are frequently restrictive and bring significant financial burdens
 - There are options for spectrum and technology re-farming, but they carry risks regarding timing and technical solutions

Massive Investment Requirements

- investments in spectrum licenses are crucial both for **economic sustainability** of the operators and for the **competitive effectiveness** of the markets
 - Spectrum licenses are by far the largest investments that the mobile operators will have to make in the next 5 to 10 years
 - They will radically affect the viability and competitive structure of the mobile markets
 - They will require a careful and long term oriented planning effort on the part of both operators and regulatory authorities

Therefore we offer end to end assistance to satisfy all critical requirements of operators and regulators

Our services offered...

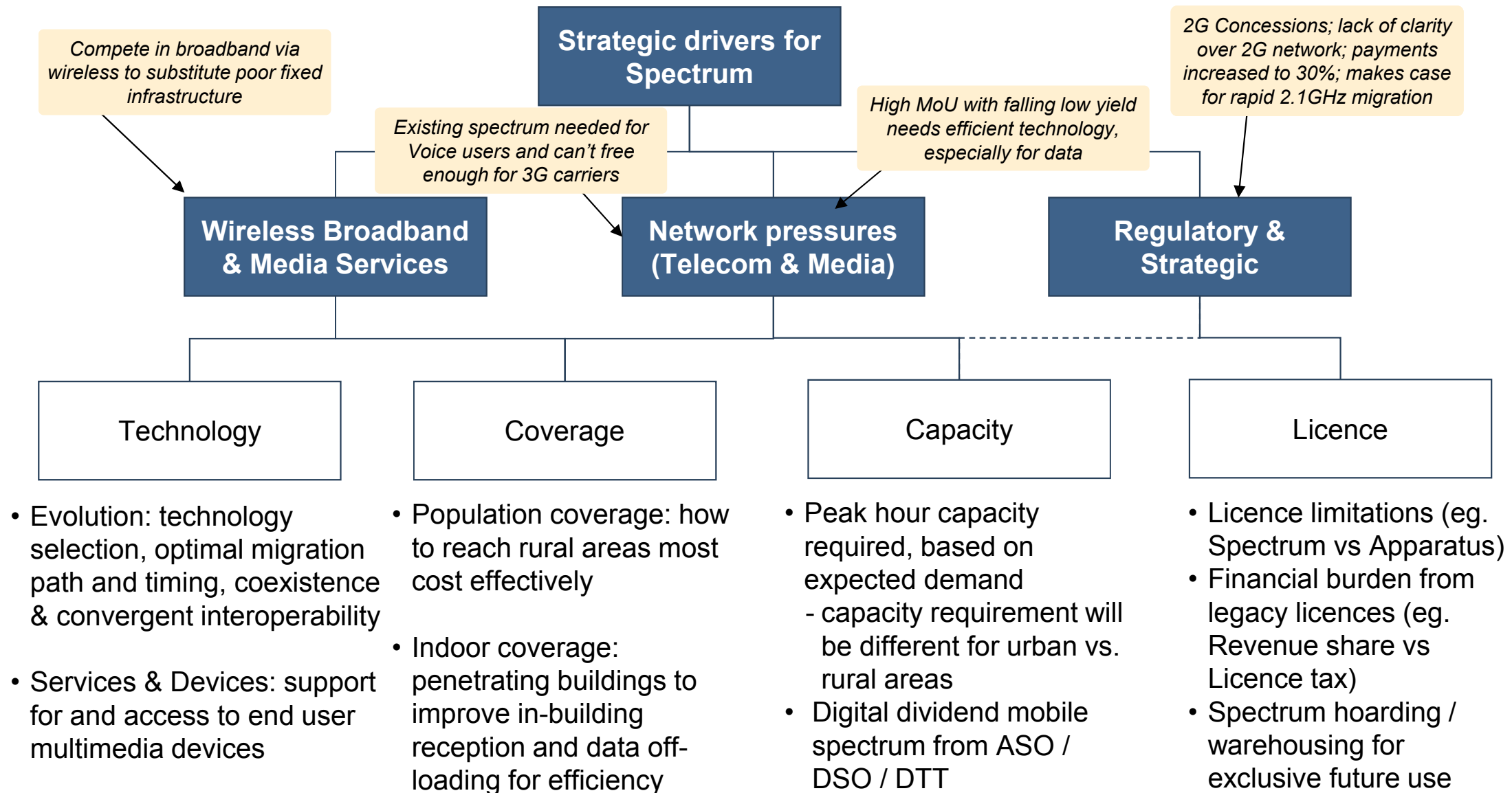
- 1 **Master Plan and Demand assessment**
 - Spectrum band planning
 - Current and future demand model & forecasts - market, services, pricing, devices
- 2 **Technical Assessment**
 - Network requirements, design, evolution, roadmap, devices
 - Band interference assessment
- 3 **Spectrum Valuation & Regulatory Strategy**
 - Network & demand scenarios
 - 2G-3G-4G licence migration
 - Range of valuation scenarios
 - Cost-benefit analysis model
- 4 **Auction and Bid Strategy**
 - Auction design
 - Competitive responses
 - Lot bid & value allocation plan
- 5 **On-going auction and tactical support**
 - Manage bidding process
 - Detailed intra-round & daily reporting and analysis
 - Real time strategy & revaluation

Address your key concerns and implications

- What spectrum is available now and in future and what can it be used for? Telecom plus Media freq. bands?
- What is the potential customer demand for wireless services (voice, data, new media)?
- What will the market look like in future (competitors, technologies, services, infrastructure, regulatory, convergence)?
- Which devices are going to be wireless-enabled and what will be their cost, penetration, usage?
- What is going to be demanded in terms of speed / capacity and what realistically can we offer?
- How much revenue can we make from existing telco services (voice, data) and future new media (applications/services)?
- What offerings (speed, capacity, coverage, services) is sustainable for us in the long term?
- What is the timing of our spectrum requirements and will there be future opportunity to acquire?
- What are our competitors going to do?
- What is the economic value of the spectrum and should I pay a strategic premium above this?
- How much spectrum do I need and how much should I pay for it?...

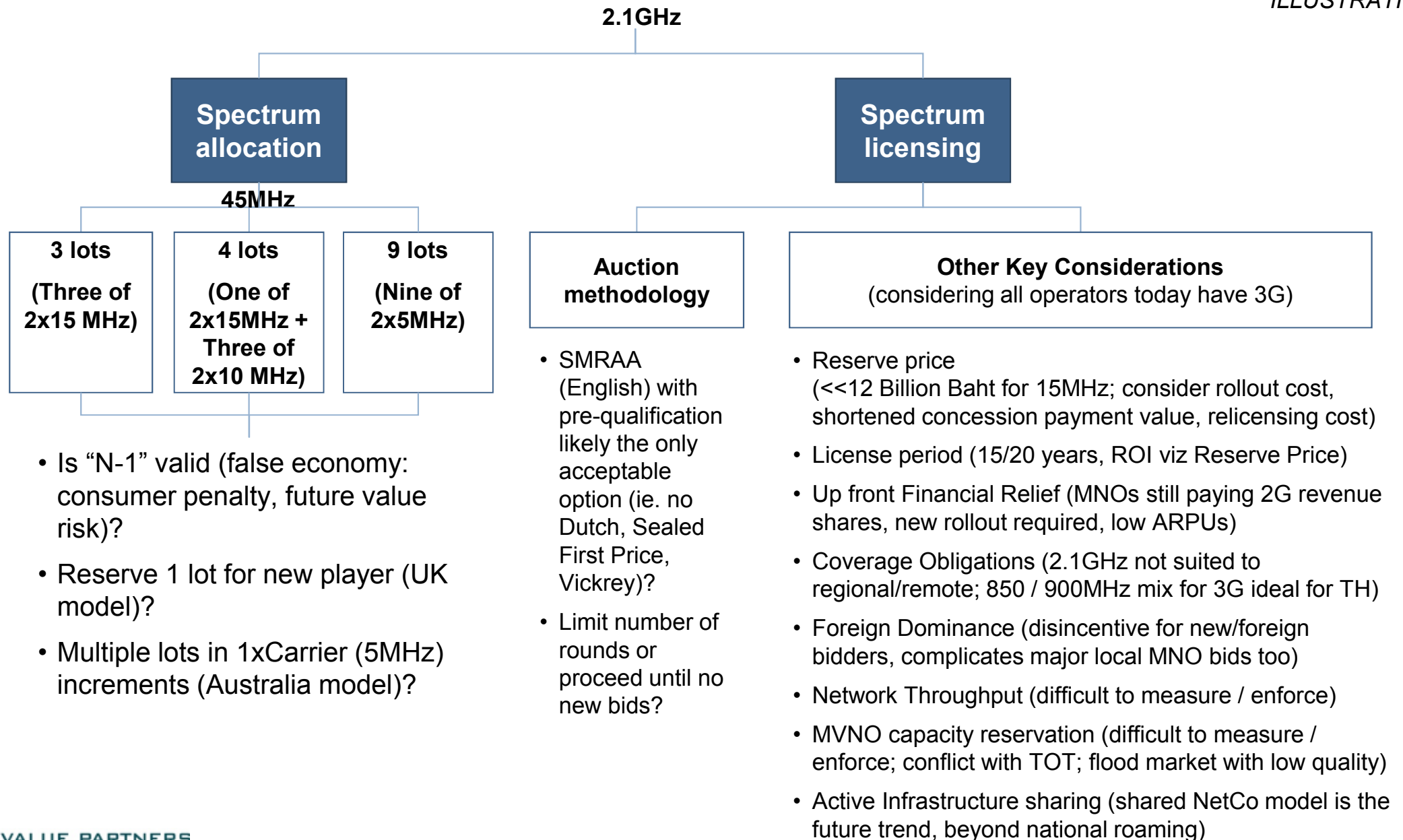
We understand that stakeholders have some clear drivers for seeking new spectrum / licences, each of which bring differing implications

ILLUSTRATIVE



From a regulator's perspective, we understand the key considerations to meeting current market needs whilst meeting internal objectives...

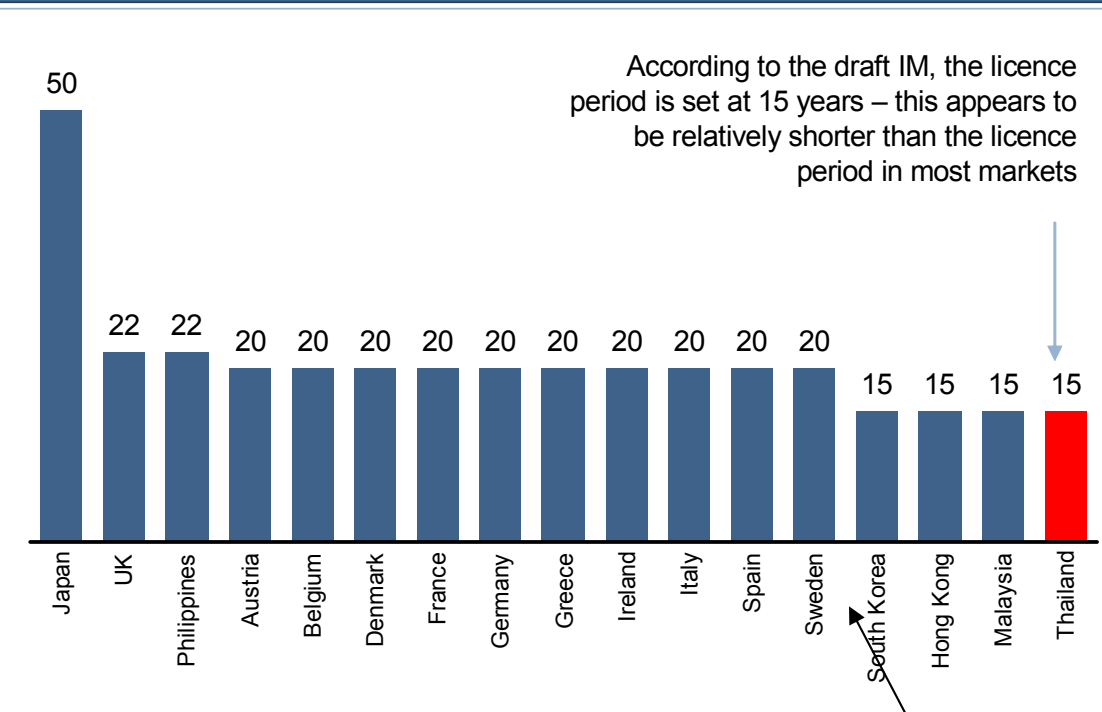
ILLUSTRATIVE



We have extensive valuation and allocation benchmarks to assist our clients, both operators and regulators, in making critical decisions (1/2)

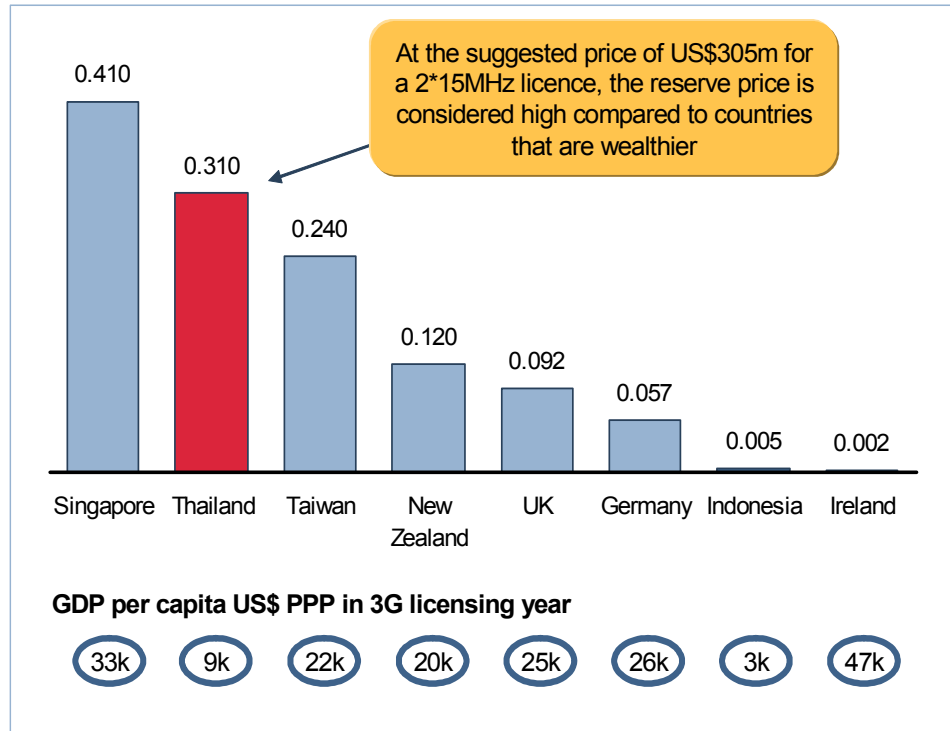
ILLUSTRATIVE

Benchmarking of 3G licence periods across different markets



Australia was officially 15 years but extended to 17 years by delaying the activation by 2 years to allow for 'cleaning' of the band – Thailand may also consider a 'band cleaning' period due to illegal spectrum usage which limits the early utility of the spectrum

Reserve price (US\$) per pop¹ per MHz



2010 (or earlier benchmark) reserve price for 2.1GHz is likely much higher than today's value since:

- a) Operators 2 years closer to Concession expiry
- b) Operators having 3G already on 850/900MHz
- c) Options for 4G/LTE on 1.8/2.3GHz being clearer

We have extensive valuation and allocation benchmarks to assist our clients, both operators and regulators, in making critical decisions (2/2)

ILLUSTRATIVE

Intl examples of paired 3G spectrum allocation

Countries	5 MHz	10 MHz	15 MHz	20 MHz
Belgium			✓	
Denmark			✓	
Finland			✓	
Germany		✓		✓
Greece		✓		✓
Hong Kong			✓	
Indonesia	✓			
Ireland			✓	
Italy		✓	✓	
Malaysia			✓	
Netherlands		✓	✓	
Philippines	✓	✓	✓	
India	✓			
Singapore			✓	
Spain			✓	
Sweden			✓	
United Kingdom		✓	✓	

Bulk of licenses offered in 15 MHz – recommended by UMTS Forum as ideal, but remember this was in context of pre-850/900Mhz 3G options existing

Case study on Ofcom 3G licensing in UK

3G Licences	Paired Spectrum	Unpaired Spectrum	Reserve price
A (reserved for new entrant)	2 x 15 MHz	5 MHz	US\$190m
B	2 x 15 MHz	N.A.	US\$162m
C	2 x 10 MHz	5 MHz	US\$135m
D	2 x 10 MHz	5 MHz	US\$135m
E	2 x 10 MHz	5 MHz	US\$135m

- Slot A was reserved for new entrants (but they could bid on other lots, creating a market failure)
- New entrant given more spectrum to allow it to compete more effectively (but in hindsight 3G only new entrants have not succeeded globally)
- Effective in garnering interest from new entrants – out of 13 bidders, 9 were new entrants

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Value Partners satisfies all experience requirements related to Spectrum Strategy, Master Planning and Valuation / Auction projects

Demonstrated core competencies of Value Partners related to Convergent Spectrum Planning

Spectrum / Licence Evaluation & Planning								Telecom & Media Network & Device Technologies						Strategic Analysis			Regulatory Advisory																						
✓	VHF / UHF	✓	700MHz	✓	800MHz	✓	900MHz	✓	1.8GHz	✓	2.1GHz	✓	2.3/5/6GHz	✓	3.3/5GHz	✓	CDMA / 1x / EVDO	✓	GSM / GPRS / EDGE	✓	3G / HSPA	✓	WiMAX	✓	LTE	✓	ASO / DSO / DTT TV	✓	Satellite TV	✓	Market Assessment	✓	Strategic Options	✓	Cost-Benefit Analysis	✓	Whitepaper / Regulator Response	✓	Master Plan, Auction Design, Mgmt

Value Partners also has experience developing an Auction Simulation and Management Tool (AST) used successfully with a highly complex 2.1GHz 3G auction

- Value Partners has developed a sophisticated Auction Simulation and Management Tool (AST) for clients which closely replicates 3G auction systems, and actual auction bidding tools depending on auction requirements. This tool was most recently used for successful 2.1GHz licence acquisition for a client in India where scenarios and licence lots were highly complex
- As an option to regulators and operators, subject to commercial arrangements we are able to adapt this to your requirements and use it for war-gaming, strategy development, simulation and actual operation of the auction.

Auction Client - Reliance

Round#: 2

SERVICE AREA	SLOTS AVAILABLE	ELIGIBILITY POINTS	CLOCK ROUND PRICE	PROVISIONAL WINNER?	RANK	PROVISIONAL WINNER PRICE	NUMBER OF BIDS IN LAST CLOCK ROUND	BID IN THIS CLOCK ROUND
Delhi	2	16	176.0	No	0	160.0	6	<input checked="" type="checkbox"/>
Mumbai	4	16	168.0	Yes	1	160.0	6	<input checked="" type="checkbox"/>
Kolkata	4	8	84.0	Yes	3	80.0	6	<input checked="" type="checkbox"/>
Andhra Pradesh	4	16	168.0	Yes	3	160.0	6	<input checked="" type="checkbox"/>
Gujarat	2	16	168.0	Yes	1	160.0	4	<input checked="" type="checkbox"/>
Karnataka	4	16	163.2	Yes	1	160.0	4	<input checked="" type="checkbox"/>
Maharashtra	4	16	163.2	Yes	2	160.0	4	<input checked="" type="checkbox"/>
Tamil Nadu	4	16	163.2	Yes	1	160.0	4	<input checked="" type="checkbox"/>
Haryana	4	8	81.6	Yes	3	80.0	4	<input checked="" type="checkbox"/>
Kerala	4	8	81.6	Yes	1	80.0	4	<input checked="" type="checkbox"/>
Madhya Pradesh	4	8	81.6	Yes	3	80.0	4	<input checked="" type="checkbox"/>
Punjab	4	8	81.6	Yes	1	80.0	4	<input checked="" type="checkbox"/>
Uttar Pradesh(East)	4	8	80.0	Yes	3	80.0	3	<input checked="" type="checkbox"/>
Uttar Pradesh(West)	3	8	81.6	Yes	3	80.0	3	<input checked="" type="checkbox"/>
West Bengal	1	8	84.0	Yes	1	80.0	3	<input checked="" type="checkbox"/>
Assam	4	3	31.5	Yes	1	30.0	6	<input checked="" type="checkbox"/>
Bihar	4	3	30.6	Yes	1	30.0	4	<input checked="" type="checkbox"/>
Himachal Pradesh	3	3	30.6	Yes	1	30.0	3	<input checked="" type="checkbox"/>
Jammu and Kashmir	4	3	30.0	Yes	1	30.0	3	<input checked="" type="checkbox"/>
Orissa	4	3	30.0	Yes	3	30.0	3	<input checked="" type="checkbox"/>

Available Eligibility Points: 191 Eligibility Points Used: 191(100%)

Eligibility Points Condition: 80 %

Actual 3G auction feature	AST capability
The clock stage	✓
Operator bidding interface	✓
Clock round results interface	✓
Eligibility points criteria	✓
Provisional winning bidders	✓
Price increments	✓
Closing conditions	✓
Bidding time limit	✗
Clock round extensions	✗
Maximum number of operators	10
Maximum number of clock rounds	No limit
The assignment stage	✗

We have advised both regulators and operators on strategic and policy issues with respect to spectrum

Contacts within leading regulators ...



- Association with regulators over many years:
 - Advised Singapore's MDA on 700MHz spectrum value and utility for Mobile Broadband in the context of Digital TV Switch-On (DTT) to release excess broadcasting spectrum
 - Ran the public consultation exercise during the 3G / GSM licence mobile bids for the governments / regulators in Hong Kong, Denmark, Belgium and others
 - Advised OFCOM UK on spectrum liberalisation
 - Designed and managed the auction process for 2.5GHz spectrum for the IDA in Singapore

... and leading operators



- Value Partners has been advising a number of firms in Asia, Europe and Latin America on evaluating the value of spectrum to their business, as well as on lobbying regulators to achieve best practice policy outcomes:
 - advice includes turnkey licence bid support, valuing licences, and commercial launch support
 - Spectrum band advice has included 700MHz, 800MHz, 900MHz, 1.8GHz, 2.1GHz, 2.3GHz, 2.6GHz

Our Regulatory & Government advisory work in Telecom & Media also sets us apart from our peers

IDA, MDA, Singapore

- Cost-benefit analysis of Exclusive Content Cross-Carriage
- 2.5GHz Spectrum auction design and execution support
- Impact assessment of ASO/DSO/DTT in Singapore
- Broadband and Pay TV market analysis
- Resale of telecom services regulations
- Investigation into market foreclosure of a pay-TV input market
- Definitions of markets & sub-markets in the media industries
- Development of the Code of Practice for the Singapore mass media markets
- Market research into purchasing criteria of Pay TV services
- International review of exclusive channel contracts

TELA/HKBA/OFTA/DSRT, Hong Kong and Macau

- Review interconnection charging principles in NGN context (DSRT, Macau)
- Analysis of the competitiveness of the Hong Kong telecommunications sector
- Assessment of the Proposals of Two Domestic Pay Television Programme Service Licensees to Employ Each Other's Platform for Delivery of Channels
- Review of Competition Guidelines & Investigation Procedures
- Training in competition regulation in the broadcast sector
- Assessment in anti-competitive advertising arrangement
- Investigation into possible collusion between pay-TV operators
- Carriage of pay-TV service by a telecoms operator
- Competition complaint cases (HKBA, Hong Kong)
- Competitive impact of exclusive content rights
- Regulation of cross-media ownership

OFCOM / BBC, UK

- Assessment of BT's provision of wholesale services
- Scoping of new NGN Industry body (Ofcom, UK)
- Position Papers to the UK Competition Commission on proposed mergers (various, UK)
- Spectrum trading concepts and consultation (Ofcom, UK)
- Review of international pay TV markets (Ofcom, UK)
- Review of UK sports rights market (Ofcom, UK)
- Assessment of market impact for Project Canvas (BBC)
- Digital Local TV and Interactive Services Economic Analysis (Ofcom, UK)
- Survey of internet regulation and LLU regulatory report (UK)
- Broadband wholesale regulation (Ofcom, UK)

Other (Australia, New Zealand, Thailand, India...)

- Australian Government on broadband policy (MCITA)
- Industry consultation on NGN technical & investment issues (TRAI, India)
- Evaluation of regulatory regime, industry restructure, NBN Policy and BTO concession conversions (MICT, Thailand)
- Review of broadcasting policy regulation in New Zealand (Ministry for Culture and Heritage, New Zealand)
- Market liberalisation, LLU, interconnection (Indonesia)
- Global Analogue Switch-Off Review (FreeTV, Australia)
- National ICT Policy (Ministry of ICT, Cameroon)
- Restructuring of telecom regulatory regime (Anatel, Brazil)
- Regulatory dispute resolution (Government of Lebanon)
- Development of guidelines & competence for implementing market-dominance regulation (MIST, Sri Lanka)



Over the past year, Value Partners has conducted a number of spectrum projects for telecom operators...

Mobile spectrum projects



Built a detailed multi-circle and scenario model to assess 3G (2.1GHz) and BWA (2.6GHz) spectrum valuation and acquisition strategy. The client successfully acquired 3G spectrum in 22 telecom circles and Value Partners is now supporting its 3G business deployment.

CONFIDENTIAL

Built a detailed multi-country model to value the 800MHz, 900MHz (refarmed) and 2.6GHz spectrum bands in the UK across four scenarios, which could be adapted to be used across all European markets

CONFIDENTIAL

Conducted a modelling exercise to value the upper and lower blocks of the 800MHz spectrum, taking into account interference with TV Channel 60 and potential sharing of antennas in 900MHz spectrum



Valuation of 2.3GHz for LTE use in NGN. Performed competitor analysis to understand the current spectrum holdings, utilisation and deployment plans on different technologies and likely fit of spectrum on auction. Developed spectrum valuation model to understand base and incremental economic value of spectrum lots to each competitor. Auction scenarios simulation And recommended bidding strategy. Published a named report on the valuation of spectrum on auction

CONFIDENTIAL

Supported in the preparation of the operator's consultation response, involving modelling the likely demand for data services in the UK and the ability of the UK mobile networks to cope with that demand across different spectrum allocation scenarios. The model was built to value the outcome in both a four and a five operator market, taking into account likely differences in network characteristics and technology roll-out (incl. LTE)

CONFIDENTIAL

Adapted multi-country model to value the 800MHz, 900MHz (refarmed) and 2.6GHz spectrum bands in the Spanish market. This included demand forecasts and detailed network characteristics

...and in recent years have advised leading mobile operators and infrastructure providers on their spectrum strategies

Mobile spectrum projects



Assessed the incremental value of owning 2.6GHz spectrum to offer mobile broadband services. We assessed the potential market share and revenue upside of owning additional bandwidth. Based on a technical model provided by 3UK we also looked at potential cost savings. A probability assessment of the resulting value using the "Monte Carlo" method was conducted



Valuation of the digital dividend (ASO/DSO/DTT) VP modelled the value generated for the European economy by allocating the digital dividend to different uses, on behalf of a consortium of mobile operators and vendors. The report has been published and presented to the European parliament.



Advised on the likely handling of 2.1GHz spectrum by Ofcom in the UK at the point of licence expiration in 2021. Specifically, the likelihood of the application of automatic right of renewal for existing licence holders, and the likely charging mechanism if this action was taken. We calculated a range for the potential Administered Incentive Price benchmarked against existing AIP prices for other spectrum bands, and international spectrum valuations



Estimated the likely value of 3G spectrum in Gabon, which involved creating a business case and NPV modelling exercise as well as benchmarking spectrum prices across Africa



Conducted a commercial due diligence of Arqiva's Wireless Access Division to assess the valuation impact of key market changes during 2009. We considered the impact of the Orange / T-Mobile merger, a Vodafone / O2 RAN share, consolidation of 3UK and the impact of potential regulatory reform



Supported the business development plan for a European mobile satellite operator. We developed a range of potential propositions from mobile broadband to mobile TV, and tested these propositions through detailed business case modelling. Our main focus was developing a strong business plan to secure financing, while ensuring compliance with harmonised spectrum regulation

We have helped commercial operators in assessing and bidding for new spectrum awards (1/2)

3G licence commercial bid in Malaysia



- For Maxis, Value Partners developed a detailed strategy for 3G and provided support with the licence auction
- Value Partners was responsible for: formulating the overall strategy for 2.5G and 3G covering all areas (commercial, technical, operational and organisational); developing a business model reflecting the value of 3G spectrum to an incumbent operator and the effect of different customer migration scenarios; managing an extensive market research programme; providing regulatory and PR support and lobbying; and preparing the licence application document.

3G licence bid in Indonesia



- Developed the 3G business case and advised on an optimal 3G network rollout strategy
- Developed the commercial strategy for the 3G business
- Developed a bid strategy involving a series of wargaming workshops with BoD on alternative bidding strategies
- Recommended final amount and spectrum allocation to bid for in successful application

Application for WLL spectrum



- Value Partners prepared Eircom's winning application for WLL spectrum in the 3.5GHz and 26GHz bands in Ireland
- Value Partners' role was to develop the internal business case justifying the investment and then produce the licence application document and project manage the whole process
- We also prepared a detailed model comparing relative costs of WLL versus HDSL and fibre

3G turnkey licensing support



- Provided 3G licensing turnkey support to Vodafone Ireland
- Developed a model to value the incremental value of a 3G licence and inform management's decision on whether to bid for an A licence, a B licence or both
- Developed commercial 3G strategy and evaluated the optimum migration plan from 2G to 3G
- Prepared the bid book

We have helped commercial operators in assessing and bidding for new spectrum awards (2/2)

3G strategy & licence valuation in Bangladesh



- For Robi Axiata, developed the 3G strategy, business case and licence valuation for a leading mobile operator in Bangladesh.
- Included competitive and market demand assessment, value proposition development, international benchmarking, regulatory analysis & lobbying, and full techno-economic modelling to simulate bidding and rollout scenarios
- Including re-farming analysis for mixed deployment of 3G on 900Mhz and 2.1GHz
- Regulator lobbying on preferred allocation method, number of licences, length of licence period and bandwidth offered
- Analysis and business case was supplemented with an assessment of a commercial partnership with fledgling 2.5/2.6GHz WiMAX operators to complement the 3G 2.1GHz strategy and licence valuation

Spectrum holdings evaluation



- Reviewed client's existing spectrum holdings in order to determine the value and efficiency of these holdings, potential gaps and future spectrum requirements.
- Conducted an assessment of the spectrum demands across the business
- Provided an understanding of spectrum management issues at the global and local levels

2G and fixed licence bid support



- Supported a consortium (including BT, NTT, Singapore Technologies and Singapore Power), in preparing a licence bid for a fixed and mobile licence in Singapore
- Developed the business case, commercial plan, technical and operational plan
- Provided overall project management support for all bid related activities

SE Asian Mobile Operator: Regulatory Lobbying

- We advised a successful 3rd entrant in an Asian market on its lobbying strategy to secure additional GSM spectrum from the regulator
- This involved creating an economic model to demonstrate to the regulator the value of awarding additional spectrum to our client as opposed to incumbent operators or to new entrant licensees
- We supported the client in presenting and negotiating with the regulator on this award leading to the successful granting of significant extra spectrum allocation

And we have provided auction design support to regulators...

Auction framework for 3G licence



- Value Partners worked for the Danish telecoms regulator and government departments to develop their 3G licensing regime
- The key objectives were to maximise the level of competitive infrastructure investment in the country and realise a fair value for the spectrum for the government.
- Our role included detailed commercial modelling of alternative scenarios and working alongside investment banking partners in negotiations with the Government and other interested parties.
- We also designed their auction process and assisted with the auction logistics

3G licensing framework



- We worked for the Belgian Government to evaluate the 3G opportunity for the Belgian mobile industry and assess the economic impact of encouraging a new 3G entrant into the Belgian market in the context of the country's existing frequency allocations.
- Additionally, we assessed the effect on the sector of introducing a range of licensing and regulatory policy decisions such as national roaming, site sharing, number portability and power emissions regulation

BWA auction



- Value Partners was appointed by the IDA in Singapore to design and manage a complex wireless broadband spectrum auction in the 2.3 and 2.5 GHz bands
- Given the range of possible technologies that could be deployed in these bands and interference issues with adjacent countries we divided the available spectrum into 15 blocks and designed a multi round ascending auction that allowed bidders to select their optimum combination of spectrum blocks
- We designed the full auction rules and managed the process for over 10 bidders and raised S\$ 9.6m

3G licensing strategy



- Value Partners advised OFTA on its strategy for licensing 3G in Hong Kong
- We built a detailed financial model to determine the likely operational performance of successful 3G licence bidders under a range of scenarios
- We designed an innovative bidding framework including the introduction of two world's firsts: ongoing royalty payment mechanisms and mandated MVNO wholesale capacity provision by 3G licensees

...and advised international regulators on broader spectrum policy and licence issues (1/3)

Spectrum Trading Policy



- For Ofcom UK, Value Partners managed the team designing a policy for spectrum trading (Phase 1)
- We led a large team from Ofcom, the Radio-communications Agency, independent lawyers and technical consultants
- The work involved defining spectrum policy options, liaising with industry stakeholders, preparing a consultation document and managing the industry consultation process.

National Frequency Allocation Plan



- Value Partners advised the Nepali government on developing a National Frequency Allocation Plan
- The project involved consulting on current and future requirements of more than 20 government departments, a series of public consultation programmes with industry and public interest groups and the regulator of the key neighbouring country
- We conducted a thorough review of the commercial use of current spectrum assignments as well as internal government use.

Mobile Spectrum Management



- For the Government of Lebanon, and in the context of the Lebanese NFAP, Value Partners provided an expert opinion relating to aspects of claims and counterclaims made by the Government and an incumbent mobile operator
- Value Partners performed a short technical analysis of the issues under consideration by examining specific evidence, looking at best practice and carrying out international benchmarks.
- All these were assessed in the context of Lebanon's FAP and implications were derived.

Spectrum Policy and Regulatory Development



- On behalf of the Bahraini regulator, Value Partners developed a regulatory framework to accommodate new wireless technologies such as WiFi, WiMAX, and mobile OFDM and to manage growing demand for licensed spectrum in bands allocated for TETRA, GSM and WLAN
- This involved an international benchmarking exercise on best practice for awarding licences and spectrum pricing, as well as advising on the number of licences that should be issued.

...and advised international regulators on broader spectrum policy and licence issues (2/3)

Spectrum Valuation



- Value Partners worked with DGPT in Indonesia to determine the value of the spectrum and licences awarded to new fixed and mobile licensees and the value lost by the ending of the incumbents' monopolies
- Value Partners modelled the businesses and determined the appropriate compensation levels for the ending of the monopolies.

Satellite Spectrum Pricing and Policy



- Value Partners worked with the Brazilian national telecoms regulator undertaking an analysis of the international geo and non geo commercial satellite markets and developing policy recommendations for the satellite sector
- As part of this study, we undertook an analysis of frequency occupation for orbital slots in a number of different territories with the aim of providing recommendations on the management of national satellite frequencies

Demand and supply of spectrum for Special Events programs in the UK



- Performed a study on the current and future situation of the PMSE market for spectrum in the UK.
- The study involved understanding the future needs of PMSE users, understanding the operational capability of the industry and how this will change as technology evolves and spectrum use changes, understanding the opportunity cost and (private) value of PMSE spectrum to its users and how this will change in the future and evaluating different candidate options for the future management of PMSE spectrum

Spectrum utilisation fee (SUF) for 2G spectrum



- Value Partners was engaged by OFTA Hong Kong to review possible 2G SUF structure and their potential implication on the market. The study included the definition and assessment of the pricing principles of SUF

...and advised international regulators on broader spectrum policy and licence issues (3/3)

Timing and Cost-Benefit analysis of DSO and ASO; 700MHz LTE spectrum valuation



- Value Partners recently completed a quantitative Cost Benefit Analysis (CBA) of Digital Switch On (DSO) and Analogue Switch Off (ASO) in Singapore, including consideration of ASO/DSO in Indonesia and Malaysia given interdependencies and impacts between these adjacent nations.
- The project involved the development of a detailed CBA model to assess the impact of various infrastructure and timing scenarios relating to DSO/ASO on Singapore and key stakeholders, including valuation of digital dividend 700MHz spectrum for LTE mobile broadband.

Spectrum licensing options



- Working with the GSMA's Spectrum Management Group to develop common industry policy around a number of the licensing options and uses of radio spectrum

We have also worked extensively with regulators on various telecommunications and media policy related issues

Evaluating potential for additional domestic free television licences in Hong Kong



- Value Partners supported Television and Entertainment Licensing Authority (TELA) of Hong Kong in doing an economic analysis of the domestic free television market in Hong Kong, taking into consideration the trends and latest developments of the new media platforms and their impact on the traditional television broadcasting services
- Provided an overview assessment on how the possible new market entrants will impact on advertising revenue, investment, innovation, market share and size

Analysis of the competitiveness of the Hong Kong telecommunications sector



- Value Partners was engaged by OFTA to provide an assessment of the level of competition in Hong Kong's telecommunications industry
- Assessed the relative impact of competition through a detailed examination of changes in market structure for each of the four sectors. This included a review of the performance of the incumbent in each market, identification of dominant operators if different from the incumbent and changes in market concentration over time

Review of UK sports rights market



- Value Partners conducted a review of trends in the ownership of a number of selected sports rights properties in the UK over the period 1987-2007
- Value Partners also looked at six other countries (France, Germany, Italy, Spain, Sweden and the US) and analysed historic and current trends and sale processes of various rights properties, to explain the relationships between rights holders and broadcasting markets

Cost-benefit analysis of the content cross-carriage measure in Singapore



- Value Partners assisted MDA in performing a cost-benefit analysis on the proposed content cross-carriage measure on the various key stakeholders in Singapore, as well as the whole pay TV ecosystem
- Developed a financial model to quantify the various effects that would result from introducing the measure

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