



The 2nd Annual Americas Spectrum Management Conference

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About the authors

NERA Economic Consulting is a global firm of experts dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges. For half a century, NERA's economists have been creating strategies, studies, reports, expert testimony, and policy recommendations for government authorities and the world's leading law firms and corporations. We bring academic rigor, objectivity, and real world industry experience to bear on issues arising from competition, regulation, public policy, strategy, finance, and litigation.

NERA's clients value our ability to apply and communicate state-of-the-art approaches clearly and convincingly, our commitment to deliver unbiased findings, and our reputation for quality and independence. Our clients rely on the integrity and skills of our unparalleled team of economists and other experts backed by the resources and reliability of one of the world's largest economic consultancies. With its main office in New York City, NERA serves clients from more than 20 offices across North America, Europe, and Asia Pacific.

Aetha Consulting provides strategic advice to the telecommunications industry and specialises in undertaking rigorous quantitative assessments to support major strategic and regulatory decisions. Our senior staff collectively have over 100 person-years of experience of advising telecoms operators, regulators, and financial & legal institutions.

Throughout the recent growth of wireless services, Aetha's staff have been at the forefront of spectrum policy. In particular, three of Aetha's founders (Amit Nagpal, Lee Sanders and Marc Eschenburg) have undertaken over 50 spectrum management policy and auction support projects for clients across the world during the last 5 years, including assisting regulators with the award of new spectrum bands and development of regulatory frameworks – for example supporting the European Commission to resolve high-profile issues such as spectrum trading and the digital dividend.

Aetha also support operators in understanding their spectrum needs, valuing spectrum and bidding in auctions. Our staff have supported bidders in over 15 spectrum awards worldwide in the last five years and, at the time of writing, are currently supporting operators in seven countries for forthcoming auctions. Our technical knowledge combined with our rigorous valuation modelling approach ensures that our clients are comprehensively prepared for auctions.



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Forum Global specialises in policy focused conferences and events, providing a platform for discussion and debate on topical issues across a variety of different sectors. These events are organized with clients and partners and aim to progress ideas and actions on important issues, all within a balanced and neutral setting.

Forum Global is the international arm of Forum Europe, which was founded by Giles Merritt, columnist for the International Herald Tribune, and is widely recognized as the leading EU dedicated event provider.

Headed by a team of events specialists with over 19 years of experience, Forum Global works successfully with businesses, institutions and governments alike. Its strategic services can maintain and develop your key policy networks, and also deliver forums where key issues can be aired and debated.

Introduction

The 2nd Annual Americas Spectrum Management Conference was held in Washington, D.C. on October 23-24. The conference focused on policy issues concerning the management of radio spectrum and its impact on the essential downstream industries, such as mobile broadband, broadcasting, satellite, and public safety, that spectrum supports. It was attended by approximately 200 delegates from more than 20 countries across the Americas and from Europe and Asia Pacific region. Although the primary focus of conversation was the policy and coordination challenges faced by countries in North America, Latin America, and the Caribbean, the conference also drew on perspectives from other world regions.

The event was organized by Forum Global, the international arm of Forum Europe, which organizes the annual European Spectrum Management Conference in Brussels. In developing the concept and agenda for the conference, Forum Global was supported by Knowledge Partners, NERA Economic Consulting and Aetha Consulting. AT&T, Lemay-Yates Associates, Microsoft, Qualcomm and Verizon were Platinum Sponsors of the event, and Analysys Mason and NII Holdings were Silver Sponsors. Other associated sponsors and supporting partners for this year's event included 4G Americas, Computech, Hogan Lovells, LS Telecom, Media Telecom, the National Spectrum Management Association and the Satellite Industry Association.

The conference followed a similar format to the inaugural event, which was held in Washington, D.C. last year. It involved a mixture of keynote speeches, presentations on topical issues, and extensive panel discussions on each major topic area, plus plenty of scheduled time for formal and informal networking. Uniquely, the conference brings together all the major stakeholders in spectrum management, including policy makers, industry representatives (including mobile, satellite, and broadcasting), equipment manufacturers, and expert consultants, facilitating a rounded discussion with multiple viewpoints, and an exceptionally high quality of debate.

This report, prepared by NERA Economic Consulting and Aetha Consulting, summarizes the main discussions held during the conference, including an overview of each of the main presentations. We begin by a summary of the event in chronological order. Readers who would like to view specific presentations should contact Forum Global.



Day 1 – Main Sessions

The first day of the conference featured keynote speeches on the approach to spectrum management in Europe and the Americas, and focused on the issues of harmonization, policy and technological innovation, and spectrum sharing issues. The morning sessions were chaired by **John Kneuer**, President at JKC Consulting LLC, while the main afternoon session was chaired by **Dr Christian Dippon**, Vice President at NERA Economic Consulting.

Keynote presentations

The first keynote presentation was delivered by **Mignon Clyburn**, Commissioner at the US Federal Communications Commission (FCC). Ms Clyburn provided an overview of the steps that the FCC is taking to build a comprehensive plan of action to make more spectrum available, including planned traditional auctions, allowing flexible use of available spectrum, incentive based auctions to clear new bands, and policies to promote spectrum sharing.

Helen McDonald, Senior Assistant Deputy Minister, Spectrum, Information Technologies and Telecommunications at Industry Canada delivered a keynote presentation on the Canadian approach to spectrum management and the different planning and policy making aspects which are currently under consideration. Ms. McDonald highlighted the increased need for regional and global harmonization, so that smaller markets could take advantage of economies of scale that would otherwise be unavailable.

Diogo Ferreira, Deputy Director at the Ministry of Communication of Brazil, delivered the next keynote on behalf of **Maximiliano Salvadori Martinhão**, Telecommunications Secretary at the Ministry of Communication of Brazil. Mr. Ferreira outlined the challenges that lay ahead of Latin America due to its geographical and social makeup and emphasized the importance of working together on a regional and global level on spectrum usage harmonization in order to be able to overcome these.

Pearse O'Donohue, Head of Unit, Radio Spectrum Policy, European Commission described the key strategic principles and objectives of the newly approved Radio Spectrum Policy Programme (RSPP) in the European Union. The program aims to foster competition and innovation in the market place as well as promote spectrum sharing and harmonization. Mr. O'Donohue touched also touched on the specific challenges that the Commission is tackling, such as the harmonization of the 700 MHz band and spectrum sharing opportunities.

Harmonization

Following a Q&A session with the keynote speakers, the conference moved on to discuss the role of refarming and harmonization in meeting the increasing demand for spectrum. **Francois Rancy**, Director, Radiocommunication Bureau, International Telecommunication Union outlined the different band plans that have been put in place in the different regions of the world as a result of legacy spectrum use, as well as the work that the ITU is undertaking to promote further harmonization after WRC-12 and in preparation for WRC-15, which includes preparing compatibility studies for the 694-790 band. **Eduardo Solorzano**, Regulatory and Antitrust Affairs Manager, Telefónica - El Salvador presented the industry view on harmonization, and recognized that although there are challenges such as roaming, the benefits of a good policy for broadband service would be tremendous. Telefónica operates on different bands across the world, and harmonization would be very beneficial to their business as it would allow them to obtain and provide cheaper devices to consumers.

700 MHz band

The conference moved onto a roundtable discussion regarding the different 700 MHz band plans and opportunities for global harmonization. Each panel member gave a short presentation of their views on the subject before the panel was open for questions.

Luis Lucatero, Chief of Regulatory Policy, Cofetel explained Mexico's preference for the 700 MHz APT band plan, and the decision-making process that the regulator went through to reach that conclusion. The APT would allow for an increased adoption of mobile services among lower income citizens as the availability of cheaper devices would increase. Mr. Lucatero also gave an overview of Cofetel's plans for public safety connectivity, which would be enabled through a dynamic allocation of capacity.

William H. Grigsby, Director of Telecommunications Policy for Mexico, US State Department's Office of International Communications and Information Policy gave an overview of the US band plan, and the challenges that the dissimilar plans would pose along the border. As Cofetel's decision to adopt the APT plan came out just recently, there are a lot of discussions coming forward, however, the US is going to continue to pursue its current plan.

Carl Povelites, Assistant Vice President of Public Policy, AT&T outlined AT&T's LTE deployment plans, which are expected to be completed by the end of 2013. Harmonization would be ideal, but given the incompatibility the two systems need to figure out how to exist along the border.

Charla Rath, Vice President, Wireless Policy Development, Verizon talked about Verizon's LTE plans, and specifically about providing LTE mobile broadband service to rural communities through leasing its network to local operators. Regarding the disparate band plans, Ms. Rath said that through research and working together, Verizon will find a way to deploy its systems in border areas.

Dean Brenner, Vice President, Government Affairs, Qualcomm outlined the manufacturer's perspective: the differences in spectrum usage on the national and international level drive technology innovation. Operators expect to see a thousand-fold increase in usage, and Qualcomm is working on keeping up with the ever increasing demand.

Following the presentations, the audience was invited to raise questions and points with the panel members. Discussions primarily focused on the future coordination efforts between Mexico and the US and possible technological innovations that may stem from the different band plan adoptions.

Day 1 - Afternoon Sessions

The first afternoon session focused on the varying views of future demand for spectrum, the need for harmonization, and the struggle of carriers to meet demand given that the new spectrum is not immediately available and that installing new mobile base stations is costly.

Matthew Hussey, Telecommunications Advisor, Office of Senator Olympia Snowe, US Senate talked about the difference between "spectrum crunch" and "capacity crunch" and focused his presentation on a variety of potential solutions to the problem, including smaller cells, capacity increases and technology solutions. Mr Hussey highlighted the need for having engineers at the discussion table and warned against calling the current situation a "crisis" and pushing regulators and policy makers into making hasty decisions about the future of the industry.

Joan Marsh, Vice President of Federal Regulatory Affairs, AT&T also talked about a number of solutions available to carriers such as technological advancements, mergers and acquisitions, and participation in the secondary market. Although AT&T is taking advantage of all of these solutions, there are drawbacks to each of these. She suggested that spectrum sharing should be explored more thoroughly as a long term solution.

Sonia Agnese, Regulatory Evolution Director, Telecom Argentina gave an overview of the state of the markets in Latin America country by country. She highlighted an expectation that there will be a lot of sharing or spectrum consolidation in the future, as these countries need to take advantage of the economies of scale that consolidation and harmonization would warrant.

Marc Dupuis, Director General, Engineering, Planning and Standards Branch, Industry Canada outlined Industry Canada's policy objectives when it comes to spectrum management, which are competition, access, innovation and investment. The government is seeking to find the balance that would facilitate new entry in the market without jeopardizing investment. Mr Dupuis talked about the upcoming auctions in the 700 and 2500 MHz bands and the plans to adopt the US band plan for the 700 MHz band and the international band plan for the 2500 MHz band.

Tim Donovan, Vice President, Legislative Affairs, Competitive Carriers Association gave an overview of the wireless industry growth over the past decade and the light-touch regulatory regime that allowed technology to keep up with industry changes. He highlighted the need for increasing competition, and argued that competitive carriers provide value at a reduced cost, and therefore need access to useable 4G spectrum.

The Q&A session after the presentations focused on approaches to rulemaking, and the possible solutions for smaller carriers. There were several questions regarding government coordination and the benefits of auctions as compared to the secondary market.

Day 1 - Breakout Sessions

The first afternoon concluded with two breakout sessions. The session on “Funding the switch from digital divide to digital opportunity” was chaired by Amit Nagpal, Partner at Aetha Consulting.

Ruben Lopez-Rivas, Member of the Broadband Platform, Inter-American Development Bank (IDB) gave an introductory presentation discussing the importance of mobile broadband in the Latin American and Caribbean region, highlighting the link with economic development and presenting an overview of how the IDB is supporting spectrum management projects in the region.

David Vilano, Assistant Administrator, Rural Utilities Service, US Department of Agriculture, then provided a historic perspective on Rural Utility Service (RUS) funding for telecommunications before moving on to discuss the broadband programs currently being run by the RUS. In particular, Mr Vilano highlighted the different qualification criteria for grant funding versus loan funding.

Gustavo Cantu, Corporate Vice-President with Nextel Mexico then gave a presentation discussing the measures that need to be implemented in order to increase broadband availability and take-up in Mexico. This included the need for additional spectrum to be made available as well as measures to foster increased competition in the telecoms sector and to make Mexico more attractive to external investors.

George Miley Rojas, Board Member and Commissioner, SUTEL presented an overview of the spectrum available for mobile services in Costa Rica, measures to increase the available spectrum in the future, and the importance of ensuring that such measures are implemented, despite any attempts to prevent/delay this, in order to achieve the best economic outcome for the country.

Daniel Mah, Regulatory Counsel with SES highlighted the key role that satellite communications plays in the delivery of broadband services – including providing backhaul services to base stations as well as providing direct access to end users for which satellite is most often associated.

The presentations were followed by a panel discussion which considered a wide range of topics, including the economic models used to assess the linkage between broadband penetration and economic growth; how to ensure universal services funds are fully utilized; how to identify situations where grant funding (versus loans) are needed; and whether it is spectrum availability, credible ideas/projects or funding that is currently the main bottleneck to furthering broadband deployments.

The session on “Spectrum Valuation & Strategy in a 4G World” was chaired by **Scott Wallsten**, Vice President for Research and Senior Fellow at the Technology Policy Institute.

Francesco Ricci, Manager, Analysys Mason gave an overview of LTE rollout around the world and the issues of spectrum fragmentation and scarcity as well as fragmentation in the device market that operators have to deal with. Mr Ricci also gave an overview of band pricing and explained the higher prices of low frequency bands are due to their propagation properties.

Daniel Champion, Consultant at Aetha Consulting, spoke about approaches to spectrum valuation and the inputs that are considered in determining spectrum value. Mr Champion also covered the different drivers of auction outcomes and the various price vs. value considerations that bidders face.

Eduardo Solorzano, Regulatory and Antitrust Affairs Manager, Telefónica - El Salvador presented on the technical consideration that operators face in Mexico owing to the difference in regional spectrum allocation. Mr Solorzano spoke about the benefits of refarming and the different bands that could be used for LTE rollout. He also claimed that the lack of transparency in the recent AWS band auction led to inflated outcome prices. The discussion after the panel presentations explored further the issues of band fragmentation, spectrum valuation and spectrum cost drivers, as well as the panel’s expectations of spectrum prices in the future, the role of the CCA auction format in price outcomes and the future of the spectrum market in Europe.



Day 2 – Morning Sessions I

The first morning session focused on spectrum sharing and white spaces and was chaired by Amit Nagpal, Partner, Aetha Consulting.

Paul Garnett, Director, Technology Policy Group, Microsoft gave an overview of the opportunities that enabling white space use could have to the development of society. Mr Garnett spoke about the challenges of global divide and broadband availability and that white space is one of many solutions that we need to explore.

H Nwana, Group Director, Spectrum Policy Group, Ofcom, UK gave an overview of Ofcom’s consultations which are making steps toward allowing access to white spaces. Ofcom believes that access to white spaces may be via licensing or licence-exemption and that even though there are challenges ahead, it is proceeding with enabling access.

Avi Vaidya, VP, Product Development and CTO, Shure, Inc. talked about the wireless microphone requirements to deliver high quality audio: access to adequate amount of UHF spectrum, and protection and interference-free transmission.

Apurva Mody, Chairman, Whitespace Alliance provided an overview of possible uses of white spaces and the benefits of dynamic and shared spectrum access, such as border protection, cellular offload, environment monitoring, smart grid, emergency broadband infrastructure. While space technology provides an opportunity to overcome the digital divide or digital opportunity and deliver cost-effective broadband availability

Michael Calabrese, Director, Wireless Future Project, New America Foundation presented the recommendations from the PCAST study that focused on federal spectrum, which include making spectrum sharing between federal and commercial users the norm, and emphasize small cell and low-power spectrum re-use.

The roundtable discussion included topics such as licensed versus unlicensed use of spectrum as well as the possible use of higher frequencies for low tech devices and wifi technologies.

Day 2 – Morning Sessions II

The second morning session included brief presentations on the various aspects of spectrum sharing.

Julius Knapp, Chief, Office of Engineering Technology, FCC presented some of the issues and advantage of spectrum sharing. Mr Knapp also outlined the FCC’s plans of enabling sharing white space, which include identifying exclusion zones, implementing the PCAST recommendations, and provide for small cells and other uses through dynamic spectrum access.

Mark Racek, Director of spectrum policy, Ericsson shared his view on licensed spectrum sharing. Although sharing itself shouldn't be regarded as a substituted for licensed spectrum it gives access to otherwise unavailable spectrum and LSA is essential for enabling economies of scale.

Karl Nebbia, Associate Administrator, Office of Spectrum Management, NTIA provided a brief overview of the history of spectrum sharing and talked about the administration initiatives currently under way.

Patrick Welsh, Assistant Vice President, Wireless Policy Development, Verizon talked about the factors driving spectrum sharing, as well as the industry's spectrum sharing initiative led by Verizon, AT&T, and T-Mobile that is looking into long-term sharing opportunities.

Derek Khlopin, Head of Government Relations, North America at Nokia Siemens Networks provided a forecast of what the industry expectations are for the future and the need for a 10-fold increase in performance, number of stations, and available spectrum to be able to meet the exponentially increasing demand for mobile services.

The panel moved on to discuss the various approaches to sharing and need of harmonization as well as carrier needs and expectations of regulators.

Day 2 – Afternoon Sessions I

The afternoon sessions were moderated by **Dr Chantale LaCasse**, Senior Vice President, NERA Economic Consulting.

The first session of focused on recent trends in spectrum auctions and their implications for the Americas. Dr LaCasse provided an overview of recent innovations in auction design with a particular focus on the benefits and concerns with the Combinatorial Clock Auction (CCA) format.

Peter Cramton, Professor of Economics, University of Maryland provided a broad view of the benefits of auctions in the spectrum industry, and examined the potential benefits of the CCA auction design, which he said includes: and open price discovery process, eliminating exposure, minimizing gaming, and enhancing substitution that allows auction to determine band plan. Mr Cramton also outlined his view of the future of spectrum allocation, which may include auctions for short term use, essentially creating a spot market for spectrum.

Johanne Lemay, Co-President, Lemay-Yates Associates, Inc. went over some of the aspects that impact auction outcomes and the prices paid, including the use of set-aside spectrum in an SMRA auction, combined versus standalone processes, and the impact of the CCA format.

Mark Loney, Executive Manager, Australian Communication and Media Authority provided a historic overview of Australian spectrum tenders and auctions, their various outcomes, and the lessons learned. Mr Loney remarked that these lessons have applied to the preparation of Australia's digital dividend auction that will commence in April 2013.

H Nwana, Group Director, Spectrum Policy Group, Ofcom, UK highlighted some of the work that Ofcom has had to do to reduce interference with pre-existing technologies in preparation for auctions, as well as the importance of considering competition issues, because the design of an auction essentially paints the future design of the industry.

The discussion after the panel presentations focused in particular on the specific example of the Swiss CCA, where winning bidders paid significantly different prices that are hard to explain by differences in spectrum endowment alone, as well as on clarifying some technicalities of the CCA auction design.

Day 2 – Afternoon Sessions II

The second afternoon session focused on the development and implementation of incentive auctions in the US.

Gary Epstein, Chair of Incentive Auction Taskforce, FCC gave some opening remarks on the process of the incentive auction process and some of its basic design elements.

Patricia Paoletta, Counsel and Representative, 4G Americas provided an overview of spectrum availability and pipeline as well as detail on the upcoming auctions in Latin America.

Jane Mago, Executive Vice President of Legal & Regulatory Affairs, National Association of Broadcasters outlined the Broadcaster's view of the upcoming incentive auctions and the issue of uncertainty and relocation. Ms Mago stressed the need for a transparent and fair process.

Evan Kwerel, Senior Economic Advisor, FCC provided a high-level overview of the auction: a two-sided auction with the reverse auction being the novel part. Mr Kwerel highlighted the need for guard bands and that this would affect the amount of spectrum available in the forward auction. Mr Kwerel provided a detailed description of one possible way of designing the incentive auction.

Thomas Hazlett, Professor of Law & Economics, George Mason University pointed out some areas in the current FCC plan for the incentive auction that may need further work and clarification, including relocation costs, timing, and overlay rights, and posed some questions for the current FCC plan.

The discussion after the panel presentations revolved around the importance of transparency, the potential engineering and economic issues that are involved with the repacking model of the incentive auction and alternative approaches to the process.



Looking forward to the 3rd Annual Americas Spectrum Management Conference

The conference attracted very favorable feedback from delegates. Participants welcomed the diverse perspectives on issues facilitated by having attendees from across the Americas, as well as from other parts of the world.

Delegates praised the organization of the conference:

"This conference is quickly becoming a key regional forum for idea sharing!"

— **Mignon Clyburn,**
Commissioner, FCC

"For the second year running Forum Global has done a terrific job in bringing together a broad range of high level government, academic, and corporate professionals to discuss important spectrum management issues in the Americas. The Americas Spectrum Management Conference is rapidly becoming one of the "must attend" events in the region."

— **Charla Rath,**
Vice President, Wireless Policy
Development, Verizon

"Great job—keep it up. Particularly pleased with the good LatAm turnout."

— **Marc Dupuis,**
Director General, Engineering, Planning
and Standards Branch, Industry Canada

"Great conference! The mix of presenters, the quality of the presentations, the topics covered, as well as the overall organization, were outstanding."

— **Angela Maimo,**
Spectrum Strategy, Intelsat

"Great event! Excellent speakers and very well organized. All the spectrum trends and main issues completely covered."

— **Sonia Agnese,**
Legislation and Regulation Manager,
Telecom Argentina

"This is a unique event that I would not miss. The level and quality of the speakers is excellent!"

— **Raymond Laforest,**
Professor, CEGEP - Telecom

"My first of hopefully several spectrum Americas conferences."

— **H Nwana,**
Group Director, Spectrum Policy Group,
Ofcom, UK

Forthcoming Conferences



The 8th Annual European Spectrum Management Conference
Where the European and worldwide spectrum communities meet!
25th & 26th June 2013 / Central Brussels
Pre Conference workshop 24th June
Organised by **Forum europe**

Now in its 8th year, the European Spectrum Management Conference has an established reputation as the major European meeting point of the year for stakeholders in the field of spectrum management, bringing together more than 280 participants on an annual basis.

The 2013 event will take place on June 25-26 at the Management Centre Europe in Brussels. There will also be an opportunity for delegates to attend the pre-conference workshop on June 24.

Key topics and issues to be addressed at the conference will include:

- The 700MHz band in the EU and globally
- Cognitive Radio and White spaces
- Network sharing - competition vs efficiency
- Spectrum inventory
- License renewals and spectrum auctions
- Spectrum for LTE
- Market mechanisms - how have they worked for the EU?

For more information on the 2013 event and to view details of the 2012 EU Spectrum Management conference, please visit www.spectrummanagement.eu or contact Tom Chinnock at tom.chinnock@forum-europe.com / T. +44 2920 783 025



The Annual Asia-Pacific Spectrum Management Conference 2013
The meeting point for the Asia-Pacific & global spectrum community!
22nd March 2013 / Bangkok . Thailand
(plus a pre-conference workshop and gala dinner taking place on 21st March)
Organised by **Forum GLOBAL** Hosted by **HUAWEI** **SAMSUNG** Knowledge Partners **aetha** **NERA** Economic Consulting

Following the successful format of The European Spectrum Management Conference and The Americas Spectrum Management Conference, Forum Global is delighted to announce the inaugural Asia-Pacific Spectrum Management Conference, which will take place on 22 March in Bangkok, Thailand.

The event will provide a meeting point for key industry stakeholders and top-level policy makers in the Asia Pacific and beyond to come together and discuss topical issues relating to the management and co-ordination of spectrum policy across the region.

For more information on the Asia-Pacific conference please contact Tom Chinnock at tom.chinnock@forum-global.com / T. +44 2920 783 025

The Americas Spectrum Management Conference will return for its third year and will take place during the fall of 2013. Preparations for the event are coming on well and more details will be published shortly.

To keep up to date with developments of the 2013 conference and to view details of the 2012 conference, please visit www.spectrum2012.com or contact Tom Chinnock at tom.chinnock@forum-global.com / T. +44 2920 783 025

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