Regulatory Involvement in Mobile Site Standards and Governance

Whitepaper

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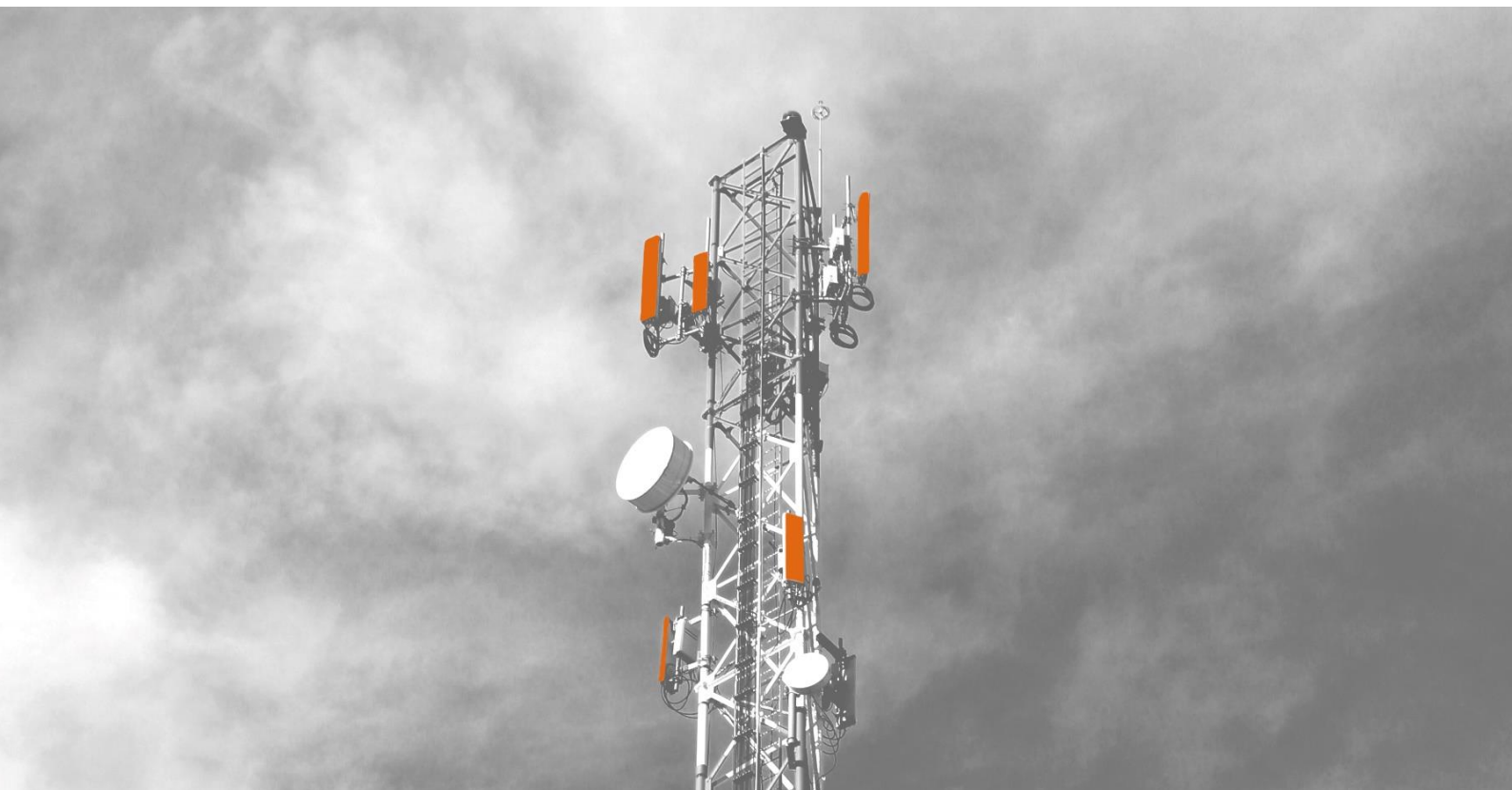July 2017

Table of Contents

1. Introduction

The demand for mobile data is increasing globally at a breath-taking pace. Forecasts for total mobile data traffic suggest a doubling of traffic ever two years over the foreseeable future.[1] To meet growth opportunities driven by content consumption, and economic digitization, mobile network operators (MNOs) are expanding their Radio Access Network (RAN) capacity both in terms of additional spectrum and deployment of more antennas and sites.

This is illustrated, for example, in France with the recent rapid rise in deployed 3G and 4G antennas. Figure 1 below shows the growth of deployment in the period of 2 years (2015 to 2017)[2].

Figure 1. Total 3G & 4G LTE sites in France, 2015-03 – 2017-05
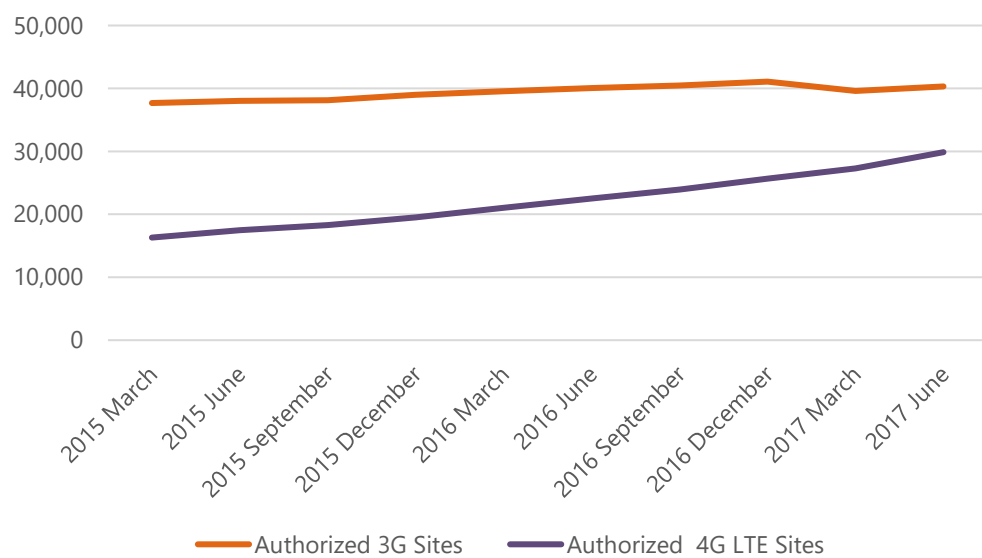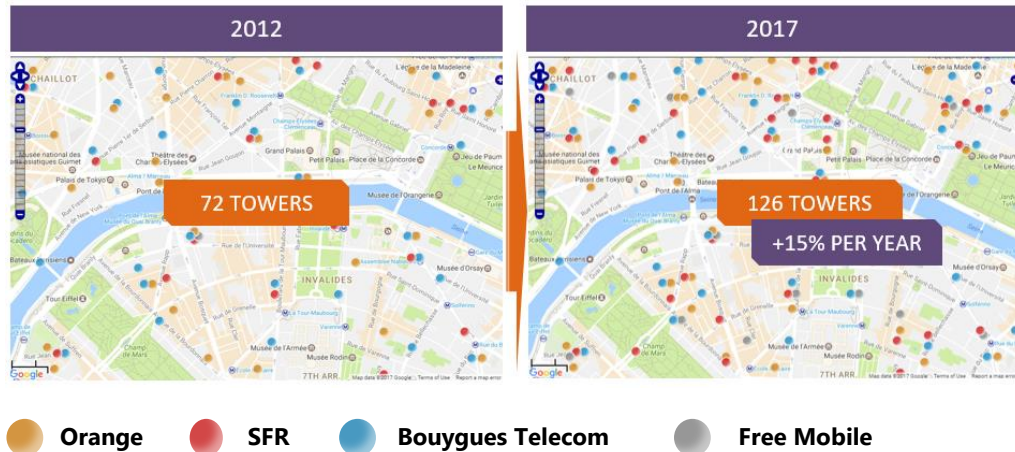

As one might expect, tower density is also increasing. The following figures illustrate the impact of demand factors on the numbers of radio access sites in dense areas (Paris centre below)[3]:

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[1] For example, Ericsson anticipates a 45% CAGR over the 2016-2022 period. See https://www.ericsson.com/assets/local/mobility-report/documents/2016/ericsson-mobility-report-november-2016.pdf

[2] ANFR - L'observatoire 2G, 3G, 4G. http://www.anfr.fr/en/gestion-des-frequences-sites/lobservatoire-2g-3g-4g

[3] Antennes Mobiles. https://www.antennesmobiles.fr/index.php?geo&show

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Beyond the need to build in-fill capacity for existing technologies, the evolution from 4G to 5G and advent of IOT and M2M technologies will also significantly impact deployment in the RAN. In this context, where the number of mobile sites is increasing everywhere, but especially in dense areas, there are significant benefits to managing and coordinating deployment.

In this paper, we outline the importance and benefits of regulatory involvement in the governance of radio access site deployment. Properly engineered regulatory intervention can achieve positive outcomes in a number of areas:

- enforcing technical standards at the time of installation;
- ensuring ongoing technical compliance;
- siting and zoning in the interest of protecting the environment, health and aesthetics;
- increasing efficiency through tower sharing;
- improving network stability; and
- facilitating the introduction of new technologies.

2. Mobile site deployment issues and consequences

The challenges for regulatory authorities in the governance of network deployment are everywhere, but especially relevant in much of the MENA region recently. In a high demand environment, it is imperative that the MNO has the ability to rollout networks quickly and efficiently, but at the same time complies with the appropriate standards for construction, zoning, sharing, health & safety and requirements to mitigate other public interest concerns.

Figure 4. Mobile Broadband Penetration in MENA (2015, Q4)[4]

Experience has shown that in the context of heavy demand, regulatory vetting and planning processes for site deployment are often fast-tracked, circumvented or inadequately implemented leading to missed opportunities for infrastructure sharing, sub-optimal siting and issues for public health and safety.

In a typical scenario, after gaining the initial approval for roll-out, the MNOs focus on rapid deployment of network infrastructure in order to grab market share as quickly as possible and/or must meet legal obligations to achieve national coverage within an accelerated timeframe. Regulatory authorities have often not developed or, if so, not updated regulation concerning mobile infrastructure deployment. Permitting powers are also often diffused or in the wrong hands altogether. Regulatory authorities are therefore overwhelmed and struggle with suitable standards and compliance enforcement.

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[4] GSMA Intelligence. https://www.gsmaintelligence.com/

In the absence of clear process and local guidelines, the MNO may use other jurisdiction's regulations as a benchmark. It may also try to rollout standard site designs through "managed services partners", which is very usual practice in the Middle Eastern region, and therewith lose control and visibility of the standards, creating an environment.

Worse still, in the early years of competition, the perceived benefits of site-sharing are low, and new entrants often replicate siting very near locations of the incumbent.

As a consequence, we find a number of deployment problems such as:

- Structural overloading or inadequacy of support structures;
- ICNIRP compliance infringements (RF levels and exposure);
- Unsafe access for workers and the public to site installations;
- Multiple operator sites in close proximity and few site shares;
- Due to close site proximity of operators, black spots in network coverage;
- Where sharing does occur, poor coordination between operator engineering teams or between different subcontractors of the same operator;
- Network stability and optimisation Issues from poor installations;
- Neglected maintenance due to other budget priorities; and
- Ugly looking sites and/or sites that are visually jarring with surroundings.

Without safeguards and remedial actions the risks of these problems arising are also likely to be magnified in the future as the densification of the networks increases driven by increase data demand and new technologies. To avoid or minimize these issues, greater effort regulatory effort is required to optimise cell siting and enforce aesthetic, safety and environmental requirements.

3. Regulatory intervention

Government regulators should, and often do, play a critical role in ensuring problems with mobile radio access deployment are avoided or minimised. The regulatory intervention in some cases is carried out ex-ante (before the problem happens) and in some cases ex-post (where the problem already occurred and a correction is necessary). In both cases there are number of key functions that regulators can fulfil, such as:

Be a single point for managing mobile site approvals (for permitting new and legalising existing sites). In many cases the approval processes involving different bodies such as municipalities, civil aviation authority, security agencies, environmental protection bodies, etc. can be frustrating and costly for operators to manage due to the different procedures, timescales and approaches used by each stakeholder. Such circumstances frequently result in operators not completing the necessary processes, gaining some but not all the authorizations required and deploying sites with no or partial approval. Sector regulators may have a role to play as a coordination body streamlining the processes and supporting the operators through the authorization cycle. Sector regulators could also advise and potentially troubleshoot or facilitate amendment of problematic processes in their peer government bodies – a role which would be difficult for any private entity to play. In these instances, the result is likely to be win-win, justifying the additional investment by the regulator in resources and processes and additional fees that operators would be willing to pay for the service.

Mandating and supporting site sharing arrangements. The case for increased tower sharing should be clear due to cost efficiencies (fewer towers to manage, sharing the cost of building and maintaining, etc.) and increasingly so due to the current densification required for capacity increase through more dense site builds). However, even if these justifications appear evident, in practice operators often do not appreciate the commercial opportunities for colocation, are incapable organizationally of such cooperation and/or have entrenched hostile positions towards working with their competitors. The regulator can often act as a neutral party promoting cooperation by developing a centralised data base that provides clear view of all the radio sites in the country (some of which might be non-telecom owned) and also creating certain rules of engagement between the operators involved. The regulatory remit could extend to a more interventionist level where the regulator could decide whether the application for the new tower is justified in light of existing shareable deployments and effectively "force" the operator to use a nearby tower that could co-host new equipment.

Creating and enforcing clear technical standards for mobile radio access structures. Many countries still lack clear structural, functional, aesthetic and operational standards for mobile site deployment. Of all those that do have the standards, fewer have developed verification and policing functions to ensure that the actual as-built structure (as opposed to as planned to be built) complies and continues to comply with the standards in the future (especially as new equipment and antennas are added/modified). Again, it may well be that the entity best place to define the comprehensive standards, making sure they are implemented and ensuring they are updated when new technology comes into force is the sector regulator.

4.   Case Studies

To illustrate the kinds of regulatory intervention in the areas we have just covered we give three examples (two from European and one from Middle Eastern country) where our team has been involved in the recent years.

Ireland - An Bord Pleanála (Ireland Planning Authority) & ComReg

The authorities in Ireland decided long ago to pool resources and enforce a process for any telecoms siting and planning application. The regime ensures no site is built unless it is designed as multiple-operator, and that all existing site share options have been exhausted prior to approval. This principle has created a landscape with fewer structures and a set of arrangements that facilitates further technology improvement, achieves environmental benefits, improves aesthetics and reduces public concerns. Although the role of the sector regulator, ComReg, in this area is limited to ensuring that operators meet ICNIRP requirements in their licence conditions, it publishes site information on all sites that facilitates planning and sharing. Our support to the Irish market has involved the provision of both standards and structure designs for multiple operator solutions with detailed justification of coverage plots, population coverage and detailed montage planning drawings to support applications and solutions for the operators, in line with the planning requirements.

Figure 3. Ardfield Cynergy, Ireland Planning Stealth Wind Combination

United Kingdom – Local Authority Planning Councils & Ofcom

The UK has adopted a two type process to planning and zoning. Under the "licence notification" type single operator structures receive a 2 week application process for installations up to 15m (self-standing structures) or less than 2m above (rooftops). The second type is full GPDO Planning, which is roughly a 6 month cycle, including notifications to the local and public authorities, appeal procedure and community consultation to justify the requirement, explain the sharing arrangements and addressing public concerns. Ofcom itself plays no role in the regulation of mobile radio access sites, but acts as a clearing house of advice on planning and requirements. Our support to the UK market involves providing technical planning and management solutions for siting and zoning by way of structure selection, planning and detailing of drawings and application support with attendance of community consultation.

Figure 4. Build Survey Pearse = Stealth Solutions UK

Kingdom of Bahrain – TRA (Telecoms Regulation Authority)

In Bahrain there was a breakdown in the process of permitting and persistent lack of site sharing. Operators built new infrastructure outside of governance processes leading to instances of poor quality construction, health and safety concerns, redundant infrastructure and unsightly deployments. The solution our team provided included an initial consultation to bring the best of international practice, an audit of the existing infrastructure, design of a set of standards and documentation for technical and legal management, and the development of an organisation for annual planning, one-stop-shop permitting and public engagement. The new regime promises to solve legacy site permitting, safety and compliance, whilst incorporating an efficient functional structure and process for the future applications considering technology and MNO requirements.

5.   Our Solution

The combined solutions of Salience and Delmec include the initial consultation and commercial assessment, technical audit and guidance, development, detailing and revision of both technical standards and regulation whilst also providing the supporting data tools and management facilities for a true end-to-end packaged or managed solution for the governance of radio access site deployment. The specific areas of expertise provided are:

Pre-assessment:

- Due diligence commercial and technical assessment of existing network deployments based on site audits.

Design of the regulatory framework:

- Project consultation and interest mediation of all involved parties (MNO's, sector regulators, other relevant government authorities, etc.); and
- Creation of an engagement and authorisation process, regulation drafting and process management.

Creation of a single or coordinated platform for supervising mobile site deployment:

- Organisation design and transformation;
- Data management support for identification, verification, centralised storage and ticketing for all permitting, standards and technical documentation; and
- Financial forecasting and fee setting for operating regulatory permitting function.

Implementation and on-going compliance monitoring:

- Implementation and management of new or enhanced standards, regulations or legalisation of legacy infrastructure;
- Health, safety and the technical standards compliance, including design and implementation of audits and inspection; and
- Future planning and feasibility studies for transforming radio access site landscape.

6.   Outcome & Benefits

The key benefits of a governance solution include the following positive features of a site deployment regime.

Reduced MNO costs through increased site sharing and colocation

The design of effective regulation combined with the implementation of a unique data management support system are key factors to encourage and increase sharing among operators. Indeed, regulation can go so far as to mandate preliminary vetting of planned deployments for sharing potential exploiting the data management system as an enabler of sharing as well as approval, compliance tracking and reviewing (see figure below):

Figure 5. Governance process overview
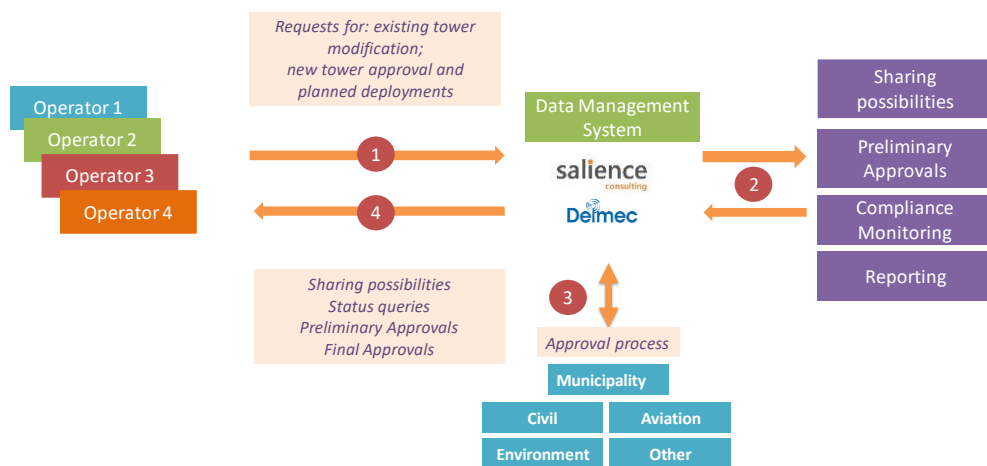
Increase in value of tower infrastructure as a whole

By mandating proper documentation and standards compliance, the regulator can assist the industry in raising the value of its radio access infrastructure. This would be particularly beneficial should the industry be considering or preparing for the introduction of a common TowerCo.

Reduced safety concerns through more stable infrastructure, safer access to sites, RF compliant site design and implementation

Setting and enforcing standards is the primary public policy benefit. The regulatory regime must go beyond simple standards drafting and include monitoring and enforcement processes.

Improved aesthetics, reduction of visual presences of sites

Regulation can also enforce standards beyond purely engineering requirements. Implementation can be designed for the rectification of existing mobile towers as well as for sites going forward. The Salience and Delmec solution proposes the design of a GIS zoning that differentiates tourist, residential, commercial,

rural and industrial areas. Based on this zoning, regulation can enforce sharing, optimal placement and camouflaging to improve the look of sites and differentiated by zone type. Examples of structural solutions are presented in the figure below:

Figure 6. New look of facilities possible with active regulatory intervention
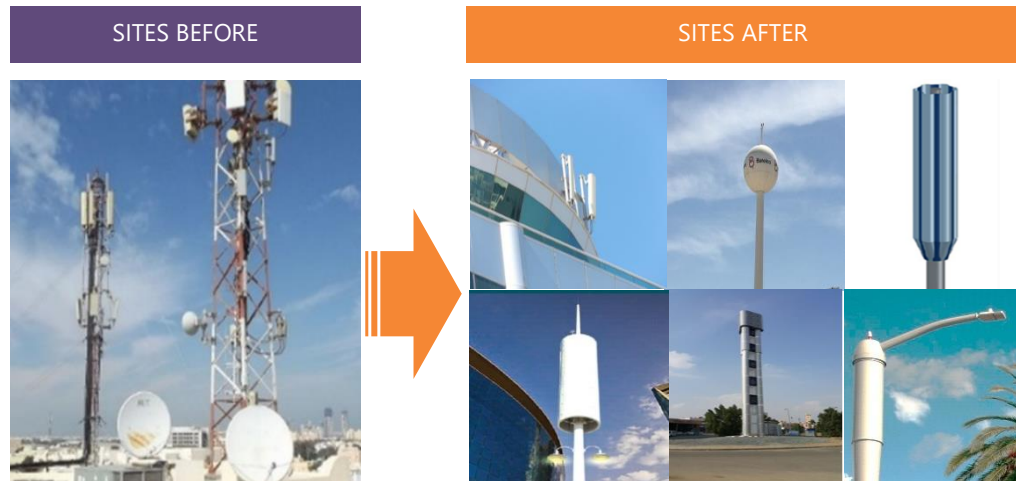
The implementation of mobile site regulation is the best guarantee that radio access sites are compliant with technical standards and align with land-use requirements for any given jurisdiction. The Salience and Delmec solution incorporates the provision of audits to ensure that the sites are compliant with any build and maintenance requirement and the development of a fees system to cover the cost of the approval and enforcement regime as well as to incentivise operators to be compliant.

7. Authors

Erik Whitlock
Associate Partner

Erik has over 25 years' experience providing regulatory advisory services to telecommunications companies, government regulators and financial investors. Erik has previously worked for PricewaterhouseCoopers in the Middle East and for Cable & Wireless (C&W) in both the UK and the USA. He has worked on projects to resolve policy and regulatory challenges for mobile sector development around the world.

Erik has advised on telecom sector regulation design, competition policy, spectrum valuations, and network costing exercises. Erik has recently been involved with a number of sector strategy projects for governments and regulators, including a project to produce the national broadband strategy for Serbia and drafting over 20 policy documents for the Kuwait ICT regulatory regime. Erik has a Ph.D. in economics.

Spencer Crawford White
CTO at Delmec Engineering

Spencer has over 22 years' experience in telecommunications management to mobile operators, infrastructure owners and managed service providers across all continents. Fulfilling roles as structural engineer, project manager, general manager, development manager and chief technical officer, his expertise encompasses all ADC (acquisition, design and construction) requirements in the telecommunications infrastructure industry.

Over the past 6 years Spencer has worked actively in the markets of Africa, Asia and the Middle East providing high level technical guidance and advise to tower owners, operators and regulators in relation to the standards, quality and acceptance of tower and telecom site infrastructure and the application of site sharing, colocation and optimisation of networks and cost benefits.

Myriam Ayada
Consultant

Myriam has a Master degree in telecommunications and applied mathematics and specialises in cost modelling and financial analysis. She has 3 years of professional telecoms experience and has worked on various projects related to antitrust litigation involving: assessment or margin squeeze, damage calculation, competition analyses, remedies and financial loss due to anticompetitive practices. Myriam has also a strong telecom technical knowledge and has built bottom up and top down cost models for both fixed and mobile networks. Myriam has also been involved in projects related to network sharing agreements, spectrum policy and FTTH deployment strategy. She also provided assistance to the European Commission to assess the cost of providing roaming services in the European Economic Area.

Prior to Salience, she worked as a senior consultant at Tera consultants in Paris and with Ernst&Young in Paris.

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