

# Mobile Tower Sharing and Outsourcing:

## Benefits and Challenges for Developing Market Operators

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# Contents

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<b>1</b>	<b>Abstract</b>	<b>2</b>
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<b>2</b>	<b>Introduction</b>	<b>3</b>
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<b>3</b>	<b>Market Developments, Benefits, and Challenges</b>	<b>5</b>
	– Market Developments in Tower Sharing	
	– Regulation	
	– Benefits of Tower Sharing/Outsourcing	
	– Challenges and Risks	

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<b>4</b>	<b>Recommended Approaches</b>	<b>12</b>
	– Recommendations for Incumbents	
	– Recommendations for New Entrants	
	– Recommended Role of Regulator	

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<b>5</b>	<b>Conclusion</b>	<b>15</b>
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# 1 Abstract

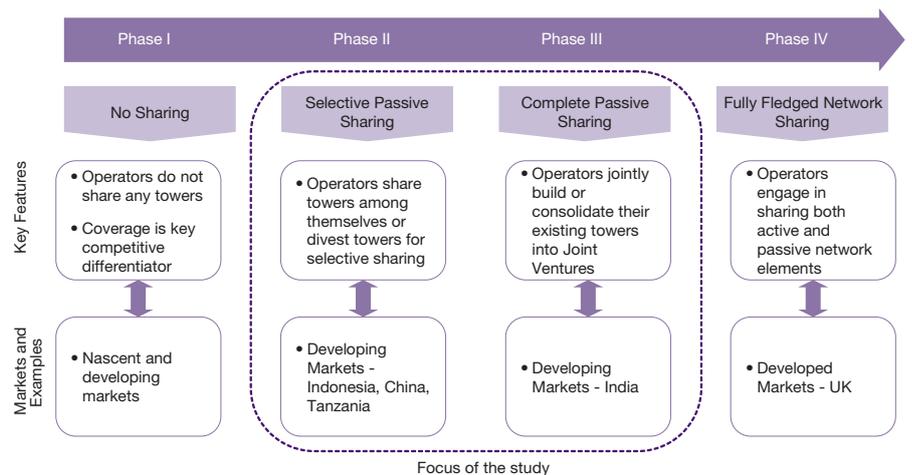
Network infrastructure sharing and outsourcing is finding strong acceptance with mobile operators around the world. While operators in the developed markets of Western Europe have already moved on to advanced active infrastructure sharing and outsourcing, operators in developing markets are beginning to realize the potential of passive infrastructure sharing and outsourcing. Consequently tower sharing and outsourcing are gaining increasing acceptance across these markets as an effective way to cut down coverage costs, while reducing the time-to-market. These initiatives have already seen significant traction in India, and are poised to make their impact felt in the Middle East and Africa (MEA). Tower sharing offers significant potential for cost savings for both incumbents and new entrants. At the same time, sharing/outsourcing is accompanied by risks such as reduction in strategic control and potential for information leaks. Regulators face the challenge of ensuring a level playing ground for all operators with no threat of cartels. Our analysis presents specific approaches to tower sharing/outsourcing for incumbents and new entrants. Incumbent operators need to focus on direct sharing of towers with other operators in urban areas. However, in rural areas, they could look at divesting their tower assets into a joint venture company with other incumbents and unlocking value in the process. New entrants need to lease towers directly from incumbent operators in urban areas, and partner with independent tower companies in rural areas. Regulators need to ensure that a broad and transparent framework is built for fair pricing, identification of priority areas, and resolution of disputes arising from tower sharing/outsourcing.

## 2 Introduction

Operators across the world, and particularly so in developing markets, face challenges in sustaining margins with declining ARPU<sup>1</sup>. Population distribution patterns in developing markets complicate the situation since access to telecom services vary significantly between urban and rural areas. Operators in these countries need to balance the cost of operations in congested and saturated urban setups with the costs of new network rollouts in other areas. In this context, tower sharing offers a compelling proposition for savings costs and reducing time-to-market. Estimates indicate that towers constitute almost 50% of the total capital expenditure (CAPEX) for an operator<sup>2</sup>. Figure 1 shows the evolution cycle of network assets ownership, depicting the scope for tower sharing and outsourcing in developing markets.

Many operators in developed markets have moved on to phase IV in the evolution cycle, where they share both active and passive network elements to save costs, in some cases bypassing the intermediate phase of sharing only tower infrastructure. On the other hand, in emerging markets with low penetration levels, operators are faced with the dual challenge of maintaining margins, while ensuring rapid rollout to keep pace with the growth in subscriber numbers. In such locations, cost

**Figure 1: Evolution Cycle of Network Asset Ownership**



Source: Capgemini TME Lab Analysis

<sup>1</sup> Average Revenue Per User.

<sup>2</sup> IIFL, *India Telecom*, October 2008.

savings from tower sharing and outsourcing offer a compelling proposition for operators. Estimates indicate that tower sharing could help operators in India and the Middle East achieve total savings of US\$4 billion and US\$8 billion<sup>3</sup> respectively in the next five years. Such savings result from the benefits of having reduced capital expenditure (CAPEX) and operating expenditure (OPEX).

In this paper, we focus on the benefits and challenges faced by operators in developing markets in the areas of passive network sharing, particularly the sharing and divesting of tower assets. We also offer a set of actionable recommendations for operators in these high-growth markets.

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<sup>3</sup> Delta Partners, *Tower sharing in the Middle East and Africa: Collaborating in competition*, April 2009.

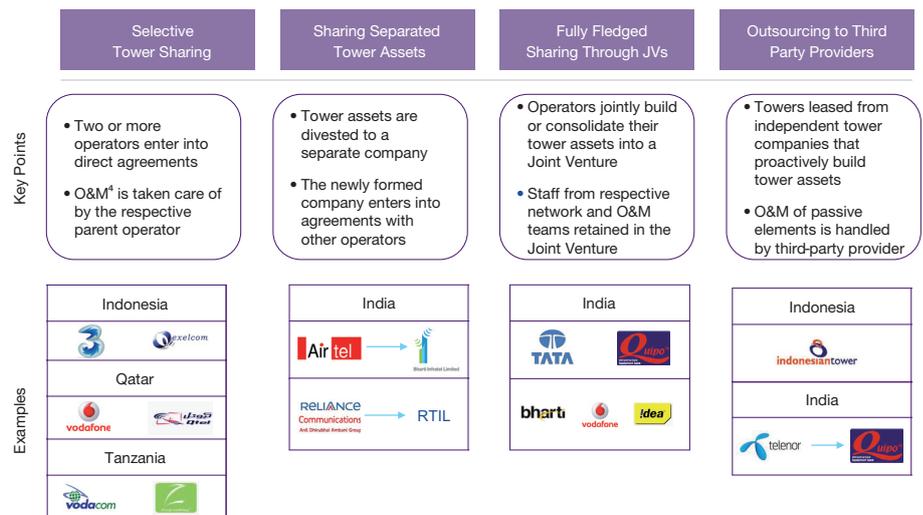
# 3 Market Developments, Benefits, and Challenges

**Operators in India have achieved savings of over 40% in network operations costs due to tower sharing**

## Market Developments in Tower Sharing

The mobile industry has seen significant activity in the recent past in the tower sharing/outsourcing space. Multiple mobile operators, across both developing and developed markets, have entered into tower sharing agreements, and more appear likely to follow suit. Mobile operators have typically followed a phased approach when it comes to the adoption of tower infrastructure sharing/outsourcing initiatives. Figure 2 illustrates these approaches along with examples of operators in developing markets who have implemented them.

**Figure 2: Overview of Approaches to Sharing Passive Infrastructure**



Source: Capgemini TME Lab Analysis; Company Websites

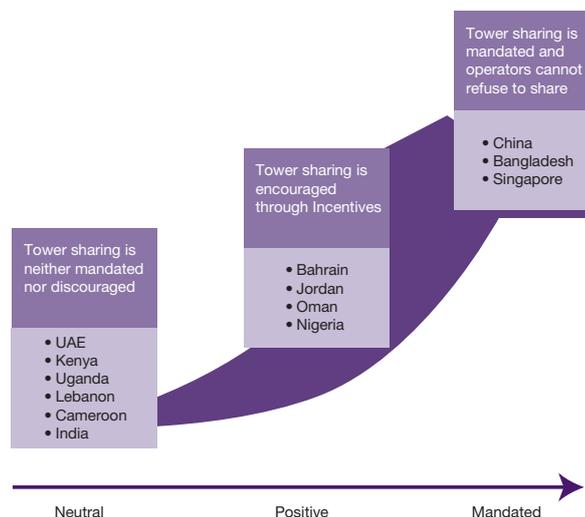
## Regulation

Tower sharing has largely been an operator-led initiative in most developing markets. However, regulators have also played a significant part in ensuring uptake of tower sharing initiatives. Tower sharing prevents the proliferation of masts thereby reducing the environmental and visual impact of operator networks especially in urban and ecologically sensitive areas. Tower sharing also helps in spurring competition due to a reduction of entry barrier for new operators. More importantly, from a regulatory perspective, like in the case of India, the pooling of tower infrastructure helps operators expand into rural markets achieving the objectives of universal coverage, while ensuring that operators do not incur significant CAPEX in doing so.

<sup>4</sup> Operations & Maintenance.

Given these benefits, regulators in developing markets have taken various steps to encourage their adoption. Figure 3 shows the regulatory stance adopted by regulatory authorities in various developing countries.

**Figure 3: Snapshot of Regulatory Stance on Tower Sharing in Developing Markets, 2008**



Source: Capgemini TME Lab Analysis

**Benefits of Tower Sharing/Outsourcing**

Tower sharing and outsourcing agreements between mobile operators and tower companies offer both OPEX and CAPEX benefits for incumbents and new entrants depending on the sharing model (see Figure 4).

**Figure 4: Benefits of Tower Sharing and Outsourcing under Different Models**

Operating Model	Benefits to Incumbent	Benefits to New Entrant
Selective Tower Sharing	<ul style="list-style-type: none"> <li>Reduction in OPEX</li> <li>Helps plug network inadequacies, especially in urban areas</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable since new entrant does not have any assets to share</li> </ul>
Sharing Separated Tower Assets	<ul style="list-style-type: none"> <li>Savings through removal of depreciation costs</li> <li>Transfers CAPEX to OPEX</li> <li>Unlocks latent value by opening up equity</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable to new entrants/greenfield operators</li> </ul>
Fully Fledged Sharing Through Joint Ventures	<ul style="list-style-type: none"> <li>Savings through reduced O&amp;M costs</li> <li>Creates high entry barriers for other competitors</li> </ul>	<ul style="list-style-type: none"> <li>Helps cut down on CAPEX costs</li> </ul>
Outsourcing to Third-Party Providers	<ul style="list-style-type: none"> <li>Similar savings potential as a joint venture model</li> </ul>	<ul style="list-style-type: none"> <li>Lower CAPEX with slightly increased OPEX</li> <li>Ensures quicker time-to-market</li> </ul>

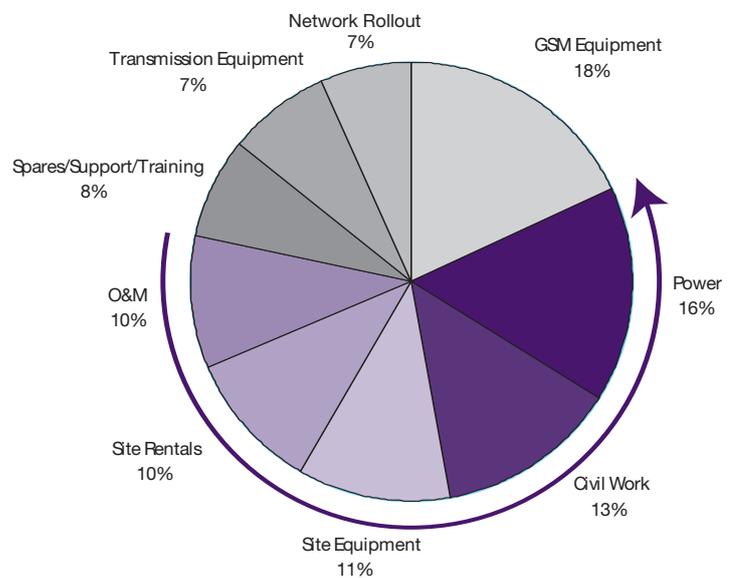
Source: Capgemini TME Lab Analysis

## Benefits of Tower Sharing for Incumbent Operators

### Reduction in OPEX

Operating costs associated with the running and maintenance of tower infrastructure, like diesel generators, air-conditioning equipment, and security and site rentals, form a significant portion (nearly 60%) of operator OPEX (see Figure 5). These costs are compounded in rural areas due to limited infrastructure facilities such as roads and a steady supply of electricity. For instance, in India the operational costs per tower have been estimated by analysts to increase by up to 20% in remote inaccessible terrain<sup>5</sup>.

**Figure 5: Breakdown of Tower Expenses, CAPEX+OPEX as % of total cost, Typical Site, 2008**



Source: Nortel

**Incumbents should directly share towers in urban areas while living them off to joint venture companies in rural areas**

For incumbent operators, sharing their existing tower assets helps in reducing the cost of network operations significantly. For instance, in the MEA region, it is estimated that tower sharing with a tenancy ratio<sup>6</sup> of two would enable operators to achieve an annual tower OPEX reduction of 12-15% resulting in savings of US\$1 billion<sup>7</sup>. In India, where tower sharing has seen significant traction, some operators have been able to bring down the cost of network operations by over 40% in the previous year through sharing arrangements, mainly in urban areas<sup>8</sup>.

### Expanding Reach in a Cost-Effective Manner

In most developing markets, incumbents continue to expand their networks to reach out to rural areas and improve coverage in dense urban pockets. Tower sharing benefits operators in achieving cost effective market coverage by helping reduce cost duplication. For example, in MEA, it has been estimated that an additional 100,000 towers would be required to extend reach in the next five years, a growth of over 50% from current figures. Tower sharing could achieve potential savings of US\$8 billion in that period<sup>9</sup>.

<sup>5</sup> BDA-FICCI, *3G & BWA: The Next Frontier*, January 2009.

<sup>6</sup> Tenancy is the ratio of the number of mobile operators using each tower.

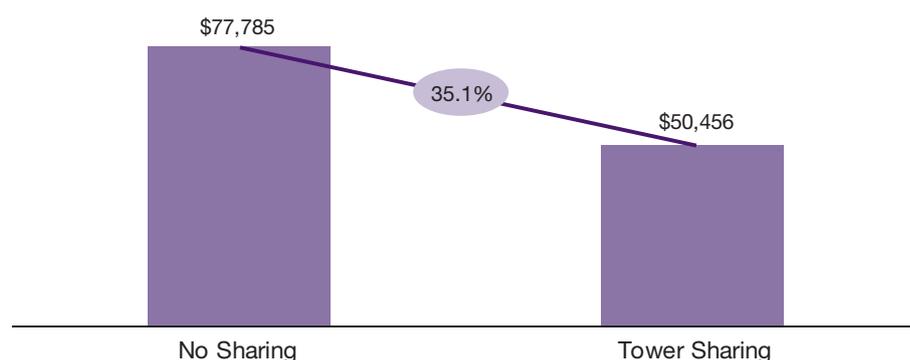
<sup>7</sup> Delta Partners, *Tower sharing in the Middle East and Africa: Collaborating in competition*, April 2009.

<sup>8</sup> GTL Infra Corporate Presentation.

<sup>9</sup> Delta Partners, *Tower sharing in the Middle East and Africa: Collaborating in competition*, April 2009.

In India, with a targeted 500 million mobile subscribers by 2010, an immense 330,000 towers would be required necessitating additional investments of US\$15 billion<sup>10</sup>. Based on our analysis, we estimate that if Indian operators manage to achieve a tenancy ratio of two by 2010, the estimated savings could be in the region of US\$4 billion<sup>11</sup> (see Figure 6).

**Figure 6: Total Annual Cost per Operator per Tower Site under Direct Sharing (India), US\$**



Source: CIOL, *Going Active*, May 2008

#### Unlocking Value from Existing Assets

Establishing a separate tower company helps incumbents to unlock the inherent value of their physical infrastructure. Forming independent tower companies that attract additional tenants can aid operators to generate additional revenues, thereby creating value from an otherwise depreciating asset. With incremental operating costs being low, additional tenants on towers lead to very high margins (see Figure 7). In developing markets the tenancy ratio per tower ranges between 1.1 and 1.3 compared to 2.2 -3.0 in developed markets such as the US<sup>12</sup>. Our estimates indicate that a typical breakeven tenancy ratio per tower site in developing markets of Asia, Middle East and Africa is 1.5.

Furthermore, the valuation of a separate divested tower entity significantly impacts the valuation of the parent operator. For instance, in India, tower subsidiaries of incumbents like Reliance Communications (13,000 towers) and Bharti Airtel (39,281 towers) have witnessed valuations of US\$5.5 billion and US\$8.5 billion respectively after divesting in 2007. They contributed 10% and 12.5% to their respective parent company core valuation<sup>13</sup>.

#### Benefits of Tower Sharing and Outsourcing for New Entrants

##### Reduced Time-to-Market

Installation of cell sites is an expensive, complicated and labor-intensive process as there are a number of municipal clearances and government approvals required. For greenfield operators, partnerships in the form of joint ventures and sharing agreements with incumbent operators and tower companies are particularly attractive as they help reduce time to market significantly. For instance, in the Caribbean island of Panama, towards the end of 2008, following a request from

<sup>10</sup> Telecom Regulatory Authority of India, *Recommendations on Infrastructure Sharing*, April 2007.

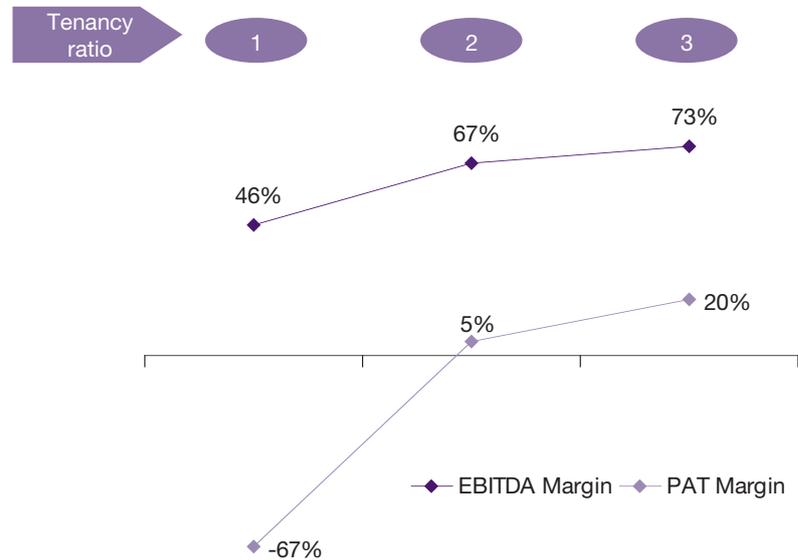
<sup>11</sup> CyberMedia India Online, TRAI, Capgemini TME Lab Analysis.

<sup>12</sup> ITU, TRAI, Company websites.

<sup>13</sup> Company websites; Based on valuations in June 2008.

the regulator, the incumbent operator América Móvil closed a tower sharing deal with new entrant Digicel in two weeks<sup>16</sup>.

**Figure 7: Impact of tenancy ratio on EBITDA<sup>14</sup> and PAT<sup>15</sup> of Tower Company**



Source: Capgemini TME Lab Analysis; Asian Operator Data

**New entrants need to lease towers from incumbents in urban areas, and partner with independent tower companies in rural areas**

### Reduced CAPEX and OPEX

For a mobile operator, more than 60% of the total network rollout cost is accounted for by towers and accompanying infrastructure<sup>17</sup>. For a new entrant, this translates into a significant financial burden which tower sharing and outsourcing helps to alleviate. According to analyst estimates, tower sharing can reduce overall cost of ownership after accounting for the tower lease costs, by 16 to 23%<sup>18</sup>. A case in point is Telenor, which is entering the Indian mobile market by taking a stake in Unitech Wireless, a new entrant in the Indian mobile sector. With its outsourcing agreements with Quippo-Tata Teleservices, a marginal increase in total OPEX is projected to lead to a 75% drop in CAPEX (see Figure 8).

### Challenges and Risks

From an economic and operational point of view, tower sharing is a complex process requiring synchronization between the sharing parties on multiple strategic and operational issues. In this section, we examine the potential challenges stemming from passive tower sharing/outsourcing agreements.

### Operator Challenges

While tower sharing and outsourcing offer significant advantages to operators, the initiative is not without its disadvantages. Operators face a host of challenges, some strategic and some operational, in driving the full benefits of tower sharing. Key strategic challenges include likely loss of competitive differentiation and erosion of control, while operational challenges revolve around day-to-day co-ordination and planning (see Figure 9).

<sup>14</sup> Earnings Before Interest, Taxes, Depreciation and Amortization.

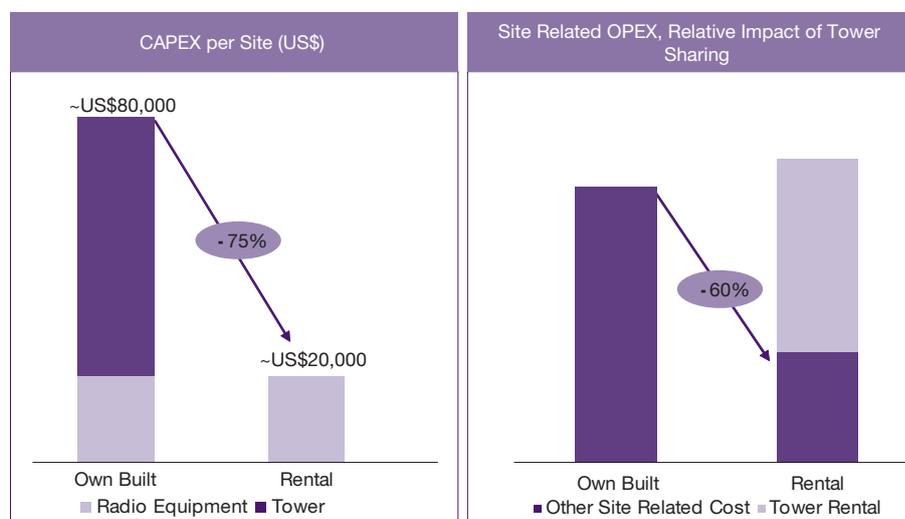
<sup>15</sup> Profit after Tax.

<sup>16</sup> Telecoms Insight, *Operators Prepare for Battle*, February 2009.

<sup>17</sup> Nortel; Tower company websites.

<sup>18</sup> Ericsson.

**Figure 8: Impact on Telenor's CAPEX and OPEX with Tower Outsourcing**



Source: Telenor, *Telenor Entering India*, February 2009

**Figure 9: Challenges in Tower Sharing and Outsourcing**

Operating Model	Challenges facing Incumbent	Challenges facing New Entrant
Selective Tower Sharing	<ul style="list-style-type: none"> <li>• Risk of competitive counteraction</li> <li>• Erosion of competitive differentiation</li> <li>• Operational coordination</li> </ul>	• N/A
Sharing Separated Tower Assets	<ul style="list-style-type: none"> <li>• EBITDA dilution</li> <li>• Regulatory risks</li> <li>• Identification of prospective tenants</li> </ul>	• N/A
Fully Fledged Sharing Through Joint Ventures	<ul style="list-style-type: none"> <li>• Loss of strategic control and flexibility</li> <li>• Exit agreements</li> <li>• Reduced control</li> <li>• Regulatory risks</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of strategic control and flexibility</li> <li>• Stake valuation</li> <li>• Reduced control</li> <li>• Regulatory risks</li> </ul>
Outsourcing to Third-Party Providers	<ul style="list-style-type: none"> <li>• Loss of strategic and operational flexibility</li> <li>• Reduced control and lack of equity participation</li> </ul>	<ul style="list-style-type: none"> <li>• Confidentiality</li> <li>• Long lock-in periods</li> <li>• Reduced control and lack of equity participation</li> </ul>

Source: Capgemini TME Lab Analysis

**A typical breakeven tenancy ratio per tower site in emerging markets is 1.5**

**Erosion of Competitive Differentiation**

The biggest challenge for operators in striking sharing and outsourcing deals is to find the right balance between competition and cooperation. Sharing a network could likely lead to significant losses in opportunity to compete on the basis of network quality and coverage for incumbents whereas a standalone approach may prove detrimental to the cost structure in the long run. Operator fear of erosion of competitive advantage due to tower sharing recently came to the fore in Canada. Despite the regulator mandating tower sharing under reasonable circumstances, the incumbents have been extremely reluctant to share their towers with a new entrant in the market<sup>19</sup>.

<sup>19</sup> Wireless North, *New entrants getting hung up on cell towers*, April 2009.

### **Loss of Strategic & Operational Flexibility**

Alignment on a mechanism for identification of potential cell sites, cost-sharing mechanisms and the creation of a governance model will prove challenging in a joint venture between multiple operators. Furthermore, agreement on operational priorities, co-ordination between operations teams and overcoming technological implementation issues will also act as hurdles given the differing operational models and targets involved.

### **Long lock-in tenures**

The long-term nature of sharing agreements holds the possibility of a substantial loss in operational and financial flexibility. For instance, the typical tenure for agreements in India is fifteen years as in the case of Swan Telecom (Etisalat) and Reliance Communications owned RTIL<sup>20</sup> and in some cases as long as twenty years as with that of Telenor with Quippo and Tata Teleservices<sup>21</sup>. Such long lock-in periods may heighten tenant risks in terms of restricting the ability to adapt to changing market and regulatory conditions.

### **Risk of Information Sharing**

For new entrants, entering into agreements with incumbent-owned tower companies is fraught with the risk of possible leakage of critical business information to the parent company. With sharing of staff as well as operational templates, company specific information which may be proprietary to the tenant may end up with the parent operator potentially compromising the efficacy of business decision making.

### **Regulatory Challenges**

The primary challenge for regulators lies in the prevention of cartels and anti-competitive behavior. Incumbent operators may get into agreements which in effect could create duopoly environments that keep out new entrants.

Regulators also need to ensure that the high demand in developing markets does not lead to unrealistic pricing of tower services. Regulators would need to ensure presence of an effective costing mechanism that would encourage uptake while simultaneously allowing existing operators to recoup investments.

Furthermore, regulators need to strike a balance to ensure that regulatory levies and taxes do not disincentivize the industry. Regulators would need to set up arbitration mechanisms to resolve compliance related issues and disputes among operators that flow from setting up complex tower sharing agreements.

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<sup>20</sup> Economic Times, RTIL, *Swan Telecom to finalize infrastructure-sharing deal*, February 2009.  
<sup>21</sup> Unitech Wireless Investor Presentation.

# 4 Recommended Approaches

In this section we put forth a set of actionable recommendations (see Figure 10) for operators in developing markets.

**Figure 10: Recommended Tower Sharing and Outsourcing Approaches for Incumbents and New Entrants in Developing Markets**

Rural	<ul style="list-style-type: none"> <li>• Divest tower infrastructure into a Joint Venture tower company with other incumbents</li> <li>• This aids in sharing costs and simplifying operations</li> </ul>	<ul style="list-style-type: none"> <li>• Enter into a Joint Venture with independent tower companies</li> <li>• This avoids conflict of interest with incumbents</li> </ul>
Urban	<ul style="list-style-type: none"> <li>• Direct sharing of towers with other operators</li> <li>• This helps improve tenancy ratios and offer better Quality of Service</li> </ul>	<ul style="list-style-type: none"> <li>• Lease directly from incumbent operators and/or tower companies</li> <li>• This enables rapid reduction in time-to-market</li> </ul>
	Incumbent	New Entrant

Source: Capgemini TME Lab Analysis

## Recommendations for Incumbents

Asymmetries in population distribution in developing markets have meant that operators are faced with the dual objective of maintaining margins in urban markets while seeking to rapidly tap the potential of rural areas through new investments.

In urban markets, operators are faced with a scenario where coverage is already extensive and there is usually a limited need for fresh CAPEX infusion. Consequently, operators will need to focus on reducing the OPEX of their towers through sharing and also gain rental income in the process. In rural markets, however, operators need to invest in expanding coverage and driving uptake of services. In this scenario, operators should divest the tower infrastructure into a separate entity in a joint venture company along with other incumbents. By doing so, operators can transfer CAPEX to OPEX while simultaneously lowering the financial risk to each with shared costs and improved tenancy.

A case-in-point is Indian operator Bharti which is expected to gain CAPEX savings of ~US\$2.4 billion over the next few years because of sharing agreements<sup>22</sup>. Additionally, a joint venture of this nature between incumbents raises entry barriers for new entrants into the market. In drafting these arrangements, it is imperative that sharing operators clearly identify the geographies and the specific

<sup>22</sup> Capgemini TME Lab Analysis based on various analyst reports.

towers which would come under the scope of the joint venture. Moreover, operators will need to ensure that their agreements do not violate regulatory norms on competitive behavior.

For greenfield network rollouts, it is imperative that the joint venture participants arrive at a joint asset and operations governance model for appropriate cell site identification, logistics, O&M and resource contribution. Operators should define the proposed network and ensure coherence and alignment on network strategy and KPIs<sup>23</sup> from inception.

### **Recommendations for New Entrants**

New entrants in developing markets will need to work on a two-pronged strategy targeting urban and rural areas. In rural areas, incumbents will be less amenable to sharing their network with new entrants since coverage can act as a significant differentiator in under-penetrated areas. Consequently, new entrants should consider tying up with independent tower companies. By doing so, new entrants could achieve the benefits of tower sharing without relying on incumbent operators. However, the situation in urban areas is different. In developed pockets, incumbents are more receptive to co-location since they already have significant coverage and their existing tower assets are mostly depreciated. Consequently, new entrants should achieve quick time-to-market by direct sharing of tower infrastructure with incumbents in urban areas.

New entrants should ensure that pricing mechanisms for leasing tower infrastructure from incumbents and tower companies are clearly defined. Additionally, flexibility to be able to respond to anticipated regulatory changes is needed and clear exit mechanisms should be built in to the sharing agreements.

### **Recommended Role of Regulator**

Regulatory authorities in developing markets have a significant role to play in determining the success of any infrastructure sharing agreements among industry players. Capgemini believes that the key areas with respect to tower sharing/outsourcing for regulators to focus on revolve around pricing, universal coverage, fair industry practices and enablement of a dispute resolving mechanism.

### ***Fair Pricing***

Regulators have a crucial role to play in ensuring that the right economic signals are sent to market players. They need to ensure that all players make reasonable “build-or-buy” decisions that are backed by on-the-ground realities. At the same time regulators should ensure that market pricing should provide the right incentives for investments in infrastructure. However, caution needs to be exercised to ensure that tower sharing agreements do not create an artificial barrier to entry for new market players.

### ***Identification of critical areas of infrastructure expansion and optimization***

Regulators should clearly identify geographical areas that are best served through infrastructure expansion. Particularly, regulators could mandate tower sharing in rural areas to ensure cost-effectiveness of services for all operators. Furthermore, like in the instance of Indian regulator TRAI<sup>24</sup>, USO (Universal Service Obligation) funds may be created to incentivize the shared build out of infrastructure in rural areas by operators and tower companies alike. Additionally, there exists certain pockets in urban areas where new towers may be restricted due to security reasons. Regulators should clearly identify such critical areas and mandate tower sharing accordingly.

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<sup>23</sup> Key Performance Indicators.

<sup>24</sup> Telecom Regulatory Authority of India.

***Non-discriminatory conditions for sharing***

Regulators should ensure that infrastructure sharing takes place on a neutral, transparent, fair and non-discriminatory basis and ensure that network security and quality of service are not compromised. Regulators need to make sure that market players need to know what is available for sharing under clearly established and published terms and conditions, in order to avoid unfair actions.

***Comprehensive Dispute Resolution Mechanism***

Since infrastructure sharing relationship between service providers involves elements of both cooperation and competition, the regulators should build in place speedy and simple dispute resolution mechanisms. The complex nature of tower sharing/outsourcing agreements compounds the likelihood of disputes, and consequently regulators will need to ensure that such disagreements do not result in service outages inconveniencing the general public.

## 5 Conclusion

**Sharing of network could hamper an incumbent's ability to compete on the basis of network quality and coverage**

In conclusion, tower sharing and outsourcing have a significant role to play in developing markets in order to promote universal telecommunication access and especially so, given the background of the global economic turmoil which has affected investment pipelines. For incumbents, new entrants and regulators in developing markets, tower sharing and outsourcing models offer growth paths to service expansion and enhanced subscriber penetration.

However, tower sharing brings in its wake numerous challenges. Operators and independent tower companies need to clearly identify the path most suitable to their needs to avoid the pitfalls and realize the potential benefits.

## About the Authors

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