

## Small Cells Technology Fuels New Consumer Market Opportunities

An overview of key research findings in five national markets

Today, mobile technologies and devices are playing a larger role within many homes, replacing fixed lines and handsets. As a result, small cells technology, also known as femtocells, can open an entirely new marketplace within the family household, by increasing mobile service quality and connection speeds indoors. In addition, small cells networks offer CAPEX and OPEX savings for mobile operators when they are used to deliver mobile broadband services. Alcatel-Lucent research findings from five countries across North America, Europe and Asia show substantial opportunities in the small cells market, with leading small cell-based services including unlimited voice, video calling and SMS services.

## Table of contents

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<b>1</b>	<b>1. Introduction</b>
<b>2</b>	<b>2. Market overview</b>
<b>3</b>	<b>3. Research parameters</b>
3	3.1 Objectives
4	3.2 Methodology
<b>4</b>	<b>4. Key findings</b>
4	4.1 Cross-country comparison
5	4.2 United States
6	4.3 United Kingdom
8	4.4 Germany
9	4.5 Singapore
10	4.6 Taiwan
<b>12</b>	<b>5. Future scenarios</b>
12	5.1 Diffusion estimation
13	5.2 Subscription forecast
13	5.3 Service bundle data usage forecast
14	5.4 Revenue forecast by country
14	5.5 Monthly ARPU forecast by country
15	5.6 Sample cost savings forecast
<b>15</b>	<b>6. Conclusion</b>
<b>16</b>	<b>7. Alcatel-Lucent solutions</b>
<b>16</b>	<b>8. About the Market Advantage program and Alcatel-Lucent research initiatives</b>

# 1. Introduction

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Small cells are tiny indoor cellular base stations, easily installed in a household, that connect the fixed broadband network to mobile devices within the household. By increasing service quality and connection speeds indoors, they can improve voice calls and provide faster, more reliable data connections and coverage. They also enable consumers to consolidate broadband service access at home through their mobile handset. Small cell-based networks and services will open an entirely new marketplace in the family household.

- Small cells allow mobile operators to cost effectively handle growth in mobile broadband data traffic.
- The growth of fixed-mobile convergence services can be accelerated, while new business and service models can be created based directly on subscriber needs.
- New services can be launched and new revenue streams gained through deeper penetration of well-qualified, existing 3G and broadband subscribers.
- Churn from poor household coverage issues can be stemmed, and the costs of handling explosive data growth can be reduced and made more manageable, rather than continuing to build out and use the macro network for household backhaul.

## ***Forecast revenues and services***

This paper provides an overview of Alcatel-Lucent research findings from five countries across North America, Europe and Asia, along with business modeling that provides insight into the revenue potential for operators. This data has revealed substantial opportunities for mobile operators in the small cells market. First, CAPEX and OPEX savings can be derived by using small cells networks to deliver mobile broadband services, rather than the current macro network. In addition, new incremental service revenue can be generated from pre-qualified 3G and broadband subscribers. In some countries, the savings are substantial and outstrip potential revenue.

The small cells marketplace in the United States, the United Kingdom, Germany, Singapore and Taiwan will be worth €6.1 billion in total by 2014, with over 34 million subscribers predominantly using unlimited voice, video calling and SMS services. The mobile handset will be the preeminent device in the household.

Other key services will be content sharing between the mobile and home PC, MMS, Internet browsing and e-mail, as well as presence-based applications that allow families to automatically stay in touch depending on their status.

## ***Market adoption rate***

By 2017, all addressable country markets will be over 50 percent penetrated, with Taiwan (80 percent penetration) and Singapore (75 percent) leading small cells adoption. The United States addressable market will experience consistent growth until a year later, when it will begin to plateau at 80 percent. The addressable United Kingdom market will be 62 percent penetrated in the same timeframe, with Germany at 53 percent.

## ***Cost savings***

By 2014, total CAPEX and OPEX savings as a percentage of revenue from the introduction of small cells will be 117 percent in the United States, 57 percent in the United Kingdom, 48 percent in Germany, nearly 350 percent in Singapore and 168 percent in Taiwan. The high percentages in Singapore and Taiwan are the result of high population density within households, increasing the savings effect.

**Table 1. Typical drivers and challenges for small cells adoption**

DRIVER	CHALLENGE
Reduced costs to the consumer through unlimited voice and video calling and SMS plans and other price advantages	Need to clearly articulate how small cells solve unmet consumer needs
Consumer recognition that small cells enable an advanced service with compelling features	Market education required to address any issues around complexity, particularly with the older age groups
Improved home network coverage	

Key small cells markets in North America, Europe and Asia present a substantial opportunity for operators to compete for a share of this emerging market. The three main rewards will be dramatically reduced OPEX and CAPEX costs, subsequent margin improvement and ARPU growth.

## 2. Market overview

The mobile market is expanding rapidly, as a result of a timely combination of high-quality 3G networks, compelling services, intuitive handsets such as the Apple iPhone and attractive price points. According to Infonetics,<sup>1</sup> mobile data traffic is expected to rise rapidly, with around one billion mobile broadband users coming online by 2013.

Within the home, mobile device and service usage will grow in line with this trend, as consumers continue to adopt mobile as the device and service of choice in the household. This market dynamic presents opportunities for network operators as they develop new mobile broadband data and voice services, make new devices available and design new business models and tariffs to suit a wide cross-section of consumer segments.

As mobile broadband services become more popular, operators must continue driving a high quality consumer experience to support new services, while opening new sources of revenue as cost-effectively as possible. Small cell (or femtocell) technology and services fulfill these twin requirements in a number of ways.

Small cells are tiny indoor cellular base stations, easily installed in a household, that connect the fixed broadband network to mobile devices within the household. They offer increased service quality and connection speeds indoors, which can improve voice calls and provide faster, more reliable data connections and coverage. They also enable consumers to consolidate broadband service access at home through their mobile handset.

For mobile operators, small cells introduce the potential for new and exciting services and plans. These offerings can include unlimited calling and SMS, content sharing and presence applications that help families stay in touch — and remote access to household systems such as heating and DTV. Small cells' link to the existing fixed broadband connection opens a new entry point into the family household market for mobile operators, while simultaneously ensuring that each data byte is much cheaper to deliver than using the existing mobile macro network. This dual dynamic presents operators with the opportunity to gain greater margin on existing services, as well as new revenue sources from emerging mobile data services.

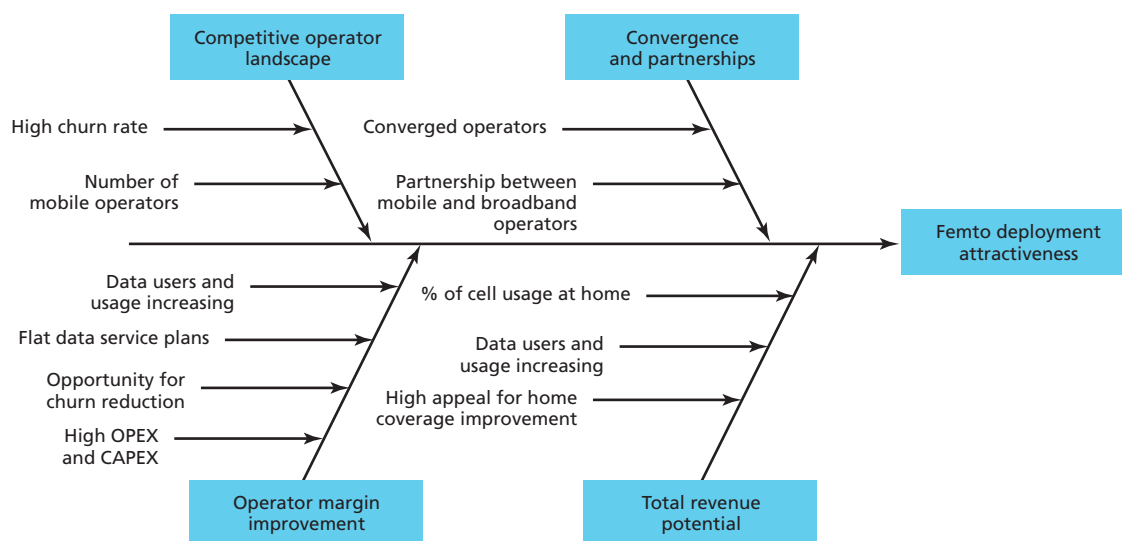
<sup>1</sup> Infonetics Research, "Mobile broadband cards, routers, services and subscribers, biannual market size, share and forecasts," March 2009.

### Market influence factors

The advent of small cells has sparked interest in consumer markets throughout the world and captured the imagination of operators. Consumers in large households are excited by the prospect of new services, such as content sharing and unlimited calling and text messaging. Operators recognize that small cell services can potentially reduce the cost of delivering mobile broadband to the household, while providing new revenue streams.

As shown in Figure 1, key factors that will determine small cells' attractiveness to operators and consumers include: the competitive environment for operators, how they choose to partner, the business model they adopt to improve service margins and the overall revenue impact.

Figure 1. Influence factors for the success of small cells services



## 3. Research parameters

To gain a better understanding of the small cells marketplace, the Alcatel-Lucent Market Advantage group conducted primary research among consumers in the United States, the United Kingdom, Germany, Singapore and Taiwan, and then analyzed the results to determine market sizing and segmentation, along with consumer preferences and willingness to pay for services. The findings reveal a latent demand for small cells and growing consumer preferences for a rich new world of mobile broadband services.

### 3.1 Objectives

In March 2009, our online survey of 4097 consumers — in five countries across three continents — addressed the following objectives:

- Determine the demand and market opportunity for small cells-enabled applications and services in consumer markets
- Understand current user experience and validate the end-user benefits of small cells-enabled services and applications over existing solutions

- Identify target segments, including preferences and willingness to pay for small cells-enabled applications.
- Develop a value proposition that would enable operators to generate incremental revenues from these applications

The first phase gathered representative primary survey responses. Consumer profiles were established and then targeted to gain their views, then these respondents were segmented according to a number of preferences and their willingness to pay for small cell-based services.

Using this data, phase two developed business models, revenue and subscriber forecasts to help guide operators and service providers with their go-to-market scenario planning. Ultimately these models are designed to make operators more successful in targeting incremental revenue from small cell services.

### **3.2 Methodology**

In each country, the study included a minimum of eight hundred interviews, and a conjoint exercise captured the utility or importance that an end-user assigns to attributes and their associated levels in a product offering. Attributes in the conjoint exercise included services, pricing and special offers for signing a contract. Analysis of these results then yielded the best combination of attributes to create small cell offerings that will optimize take rates by end-users.

Respondents were screened for mobile and broadband usage and placed into specific sub-groups of interest, including DSL and cable access consumers, heavy users (with more than seven Internet mobile phone activities within the last 30 days), respondents who believe they have poor mobile phone coverage at home, and respondents who believe they have good mobile phone coverage at home. Needs-based segmentation was developed through cluster analysis to identify segments that are homogenous within themselves but heterogeneous towards the other segments.

## **4. Key findings**

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### **4.1 Cross-country comparison**

There was a good level of interest in small cells services across all countries, with an unlimited calling plan the most popular throughout, closely followed by an unlimited video calling and SMS plan. In most countries, the family-oriented heavy-user segment (those with high expectations of quality and a high number of hours spent online and making calls) was markedly ahead in its enthusiasm for the services. This finding offers good news for operators because larger households have more users and stimulate more data traffic, which translates, in turn, into greater savings when providing these services through a small cells network rather than the macro network.

In all countries but Germany, consumers already use their mobile handsets more than their landlines to access services within the home, making these markets particularly ripe for small cells services. There is good support throughout for content-sharing services where the mobile handset effectively becomes the key multimedia device in the home for uploading photos and video to the PC, or for downloading music. Between about 50 percent and 70 percent of households across all three continents have access to a household Wi-Fi network, and a proportion of those with dual-mode mobile handsets are familiar with making voice calls over Wi-Fi.

The headline result for operators is that, among consumers that currently bundle their telecommunications services, between 50 percent and 80 percent would opt for a small cells package if it were available. This percentage translates into millions of potential subscribers in some markets, making small cells the key upcoming growth service of the future.

## 4.2 United States

### Summary

The United States marketplace is already in the early stages of small cell deployment, with a small number of consumers able to access existing packages from different single providers. Against this background, the overall appeal of small cell services is strong, and it is strongest among families, teens and consumers that have indoor coverage issues. Over half of respondents use their mobile handset as the main device for calls at home, with one-fifth using mobile and landline handsets equally, positioning mobile as the dominant mode of communication in the home. In fact, nearly two-fifths would be willing to opt out of their landline to take up a small cells service, and 80 percent already have a mobile handset with Internet access.

When assessing the willingness of respondents to adopt small cells, the survey found that the majority of users bundle their telecommunications services. Nearly 60 percent of these bundlers would purchase small cells, with just over 40 percent adding it to their current bundle and around 20 percent making it a separate purchase. Overall, slightly more than 40 percent would bundle Internet access and mobile services in order to adopt small cells.

The most frequently used small cells service would be unlimited domestic SMS, and 60 percent of respondents would use their mobile phone for this service always or frequently. Content sharing is next in usage frequency, with 41 percent indicating they would upload photos from their mobile to their PC. Nearly 40 percent of respondents would use their mobile phone always or frequently for a presence service that informs users when family members arrive home. A one family phone number, which allows all mobile handsets in the family group to ring from a single number, was particularly popular in the United States.

### Segmentation overview

The family-oriented heavy-user segment found a small cells service valuable, with 54 percent of them rating it extremely or very appealing. Nearly 50 percent of respondents with poor indoor coverage said they found a small cells service compelling. Very large households with five or more people showed a high level of interest, with 56 percent rating it extremely or very appealing.

### Suggested go-to-market strategy

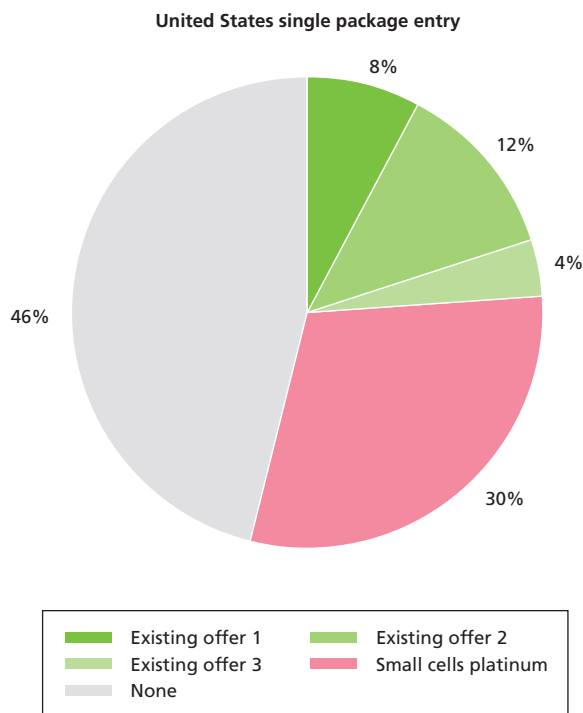
The primary research results were used to model four simulated market entry packages, shown in Table 2, which operators could use to maximize the appeal of a small cells service to United States consumers.

**Table 2. Simulated market entry packages that maximize the appeal of small cells service**

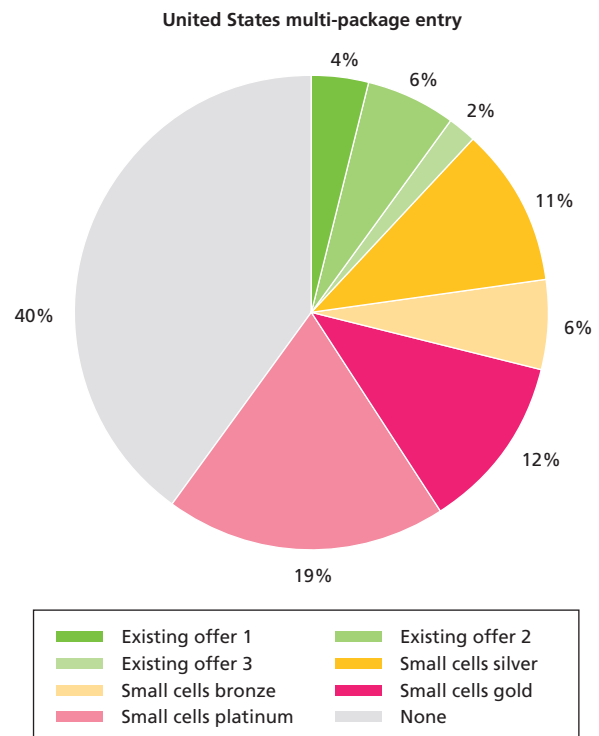
PACKAGE	SERVICE COMPONENTS	FEE STRUCTURE
Bronze, small cell only	Single small cells line	One-time installation fee + monthly subscription
Silver	As above + unlimited calling plan	Reduced installation fee + increased monthly subscription fee
Gold	As above + one family phone plan and option of multiple lines	Increased monthly subscription fee
Platinum	As above + free 3G handset special offer	Increased monthly subscription fee

Based on the segmentation and evaluation of the current United States market situation, offering four different small cells packages with simultaneous market entry could potentially capture nearly 50 percent preference share in this competitive market.

**Figure 2. Forecast market share when four packages enter the United States market one at a time**



**Figure 3. Forecast market share when four packages enter the United States market simultaneously**



### 4.3 United Kingdom

#### Summary

The United Kingdom market currently has a single commercial offer available, and our survey results were gathered just before this recent market entry. Like the United States, this flagship European market showed strong interest in small cells-based services. The highest level came from the tech-oriented user segment (who are moderately price conscious, with decisions driven largely by technology), large family households and consumers with low-quality indoor coverage.

Similarly to the United States, just over half of respondents already use their mobile handset as the de facto communications device in the home, with 90 percent — more than in the United States — having Internet access readily available from their handset. Fifty-four percent of those willing to add a small cells service to their existing bundle would replace their fixed line, and half of bundlers are willing to purchase it by adding to their existing bundle or buying it separately.

Concerning their anticipated usage of small cells services, United Kingdom consumers continued to exhibit similarities to the United States market. Sixty-three percent report they would use their mobile phone always or frequently for SMS service, and 36 percent would use content sharing to upload data from the mobile handset to the PC.

#### Segmentation overview

The tech-oriented user segment found small cells services more appealing than any other segment; and once again, small cells were more popular with those who experienced poor indoor coverage. Popularity also increased with household size, with 37 percent of respondents with five or more persons at home rating it extremely or very appealing.

**Suggested go-to-market strategy**

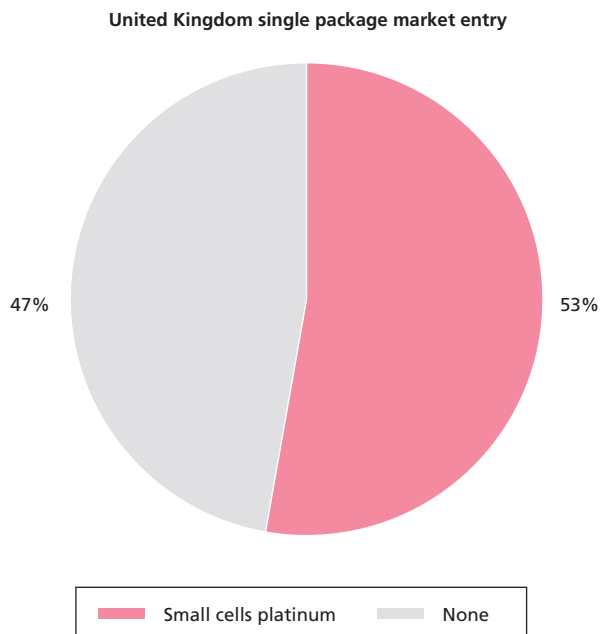
Based on primary research results, we modeled the four packages listed in Table 3.

**Table 3. Simulated market entry packages that maximize the appeal of small cells service**

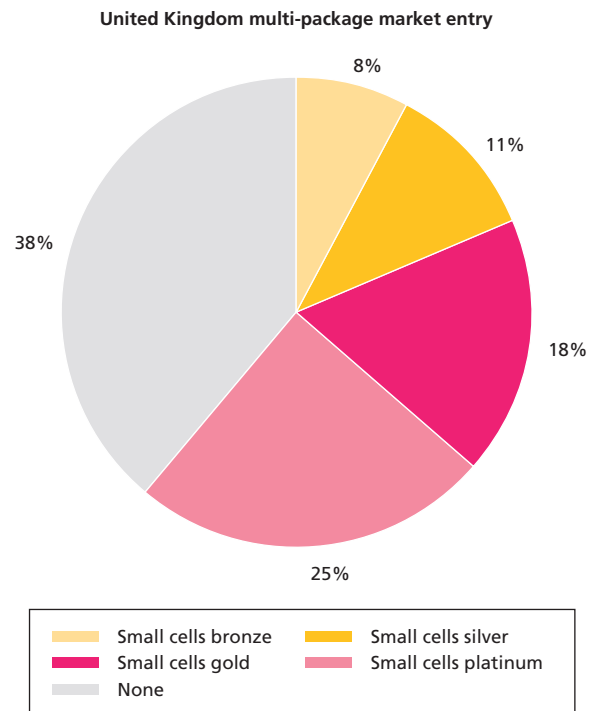
PACKAGE	SERVICE COMPONENTS	FEE STRUCTURE
Bronze, small cell only	Single small cells line	One-time installation fee + monthly subscription
Silver	As above + unlimited calling plan	Reduced installation fee + increased monthly subscription fee
Gold	As above + unlimited video calling and SMS plan and option of multiple lines	Increased monthly subscription fee
Platinum	As above + content sharing plan	Increased monthly subscription fee

Based on the segmentation and evaluation of the current market situation, offering four different small cells packages with simultaneous market entry could potentially capture 62 percent preference share in this competitive market.

**Figure 4. Forecast market share when four packages enter the United Kingdom market one at a time**



**Figure 5. Forecast market share when four packages enter the market simultaneously**



## 4.4 Germany

### Summary

In Germany, the fixed landline is still the de facto mode of household communication. Nevertheless, the overall appeal for small cells is positive with the strongest appeal, once more, among large households and those with relatively low indoor coverage or a pre-disposition towards technology. The landline handset still dominates within the household and remains the main line of communications for nearly 60 percent of respondents. Some respondents reported that mobile services are expensive, and at least 70 percent take their services as a telecommunications bundle, which may optimize their budget.

About half of respondents who use a bundle would add a small cell plan. Sixty percent of these respondents want their service to include an unlimited calling plan — and would replace their fixed line. Another 25 percent want an unlimited calling plan, but would retain their current fixed line. One-third of respondents currently using bundled services would add a small cells service to their current plan, while another 13 percent would add it separately.

End users anticipate that unlimited domestic SMS and content sharing would be the most frequently used small cell services. Sixty-four percent of respondents said they would use SMS on their mobile phone always or frequently, and 31 percent had similar responses for uploading content from the mobile phone to their PC.

### Segmentation overview

Of all the consumer segments, the tech-oriented segment found small cells the most appealing. As in the United States and the United Kingdom, larger households of five or more were particularly interested in the service, with 33 percent rating it extremely or very appealing. Small cells were also more popular with respondents who experienced poor indoor coverage.

### Suggested go-to-market strategy

In Germany, the same four service bundles developed in the United Kingdom were used to build the market simulation shown in Table 4.

**Table 4. Simulated market entry packages that maximize the appeal of small cells service**

PACKAGE	SERVICE COMPONENTS	FEE STRUCTURE
Bronze, small cell only	Single small cells line	One-time installation fee + monthly subscription
Silver	As above + unlimited calling plan	Reduced installation fee + increased monthly subscription fee
Gold	As above + unlimited video calling and SMS plan and option of multiple lines	Increased monthly subscription fee
Platinum	As above + content sharing plan	Increased monthly subscription fee

Based on the segmentation and evaluation of the current market situation in Germany, offering four different small cells packages with simultaneous market entry could potentially capture 62 percent preference share in this market with no current competitors.

Figure 6. Forecast market share when four packages enter the German market one at a time

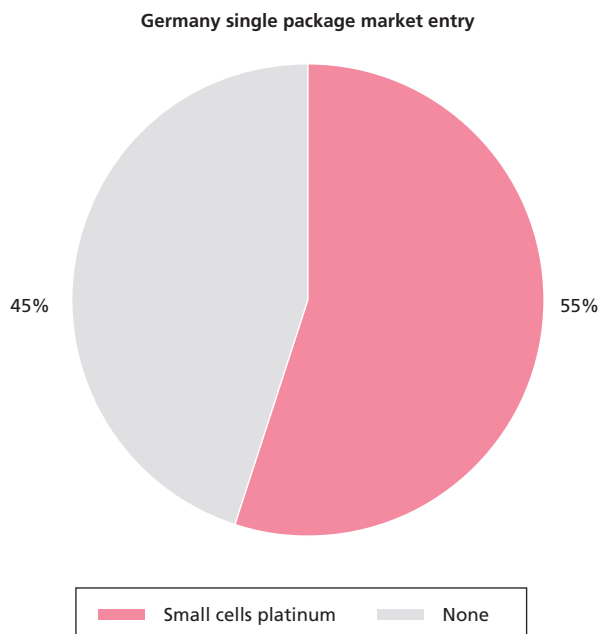
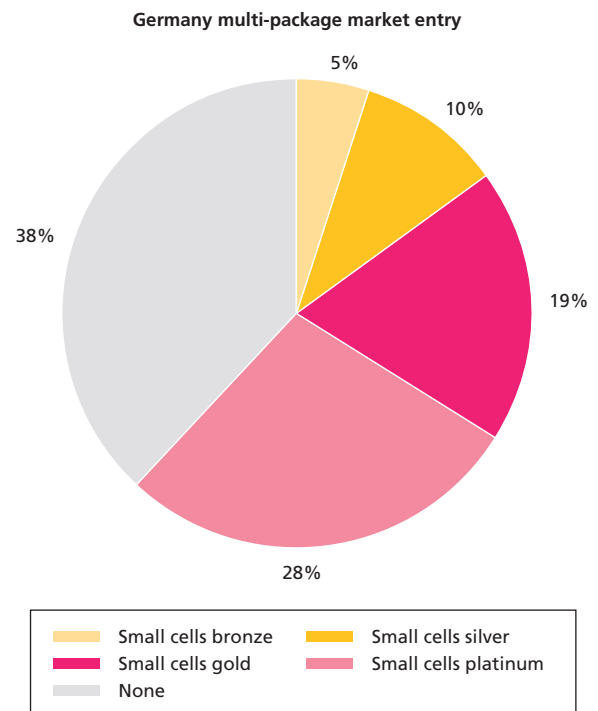


Figure 7. Forecast market share when four packages enter the market simultaneously



#### 4.5 Singapore

##### Summary

The views of consumers in Singapore are representative of the vibrant nature of communication in Asia, with many of them regularly using their mobile handset to access multimedia services. For nearly 52 percent, the mobile handset is the main device in the household, while another 30 percent use their landline and mobile phone equally for phone calls at home. Eighty-four percent of respondents report that their mobile phone is Internet access-enabled.

Almost 50 percent of respondents currently receive services as a bundle. Seventy-seven percent of these bundlers would opt for a small cells service, with 42 percent adding it to the existing bundle and 35 percent adding it separately. Within this group, 84 percent want their service to include an unlimited calling plan. Fifty-two percent would replace their fixed line service with a small cells service, and the other 32 percent would retain their existing fixed line.

The most frequently used service would be SMS, and 84 percent of respondents would use their mobile phone for this service always or frequently. Almost half would make domestic video calls from their mobile phone always or frequently, and 45 percent reported similar frequency of use for the content sharing service to download music or video from their PC to their mobile phone — emphasizing the strong mobile culture in Singapore.

##### Segmentation overview

Small cell services were most attractive to the all-you-can-eat segment (who tend to bundle services and spend significant hours online and making calls), with larger households again showing more interest in adopting the service than smaller households.

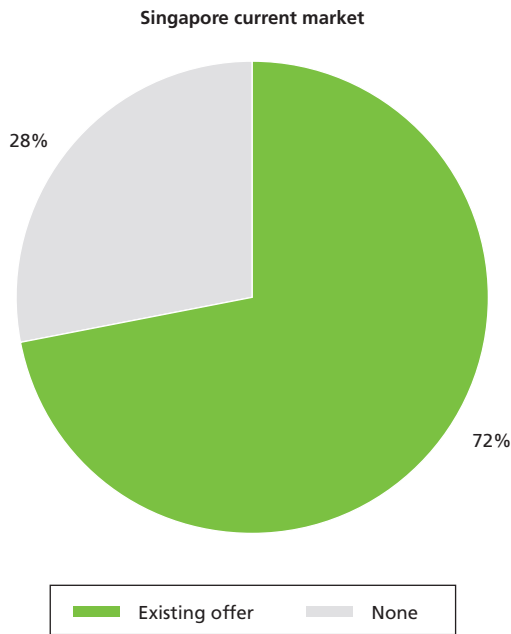
**Suggested go-to-market strategy**

Primary research results were used to model three market entry packages, shown in Table 5.

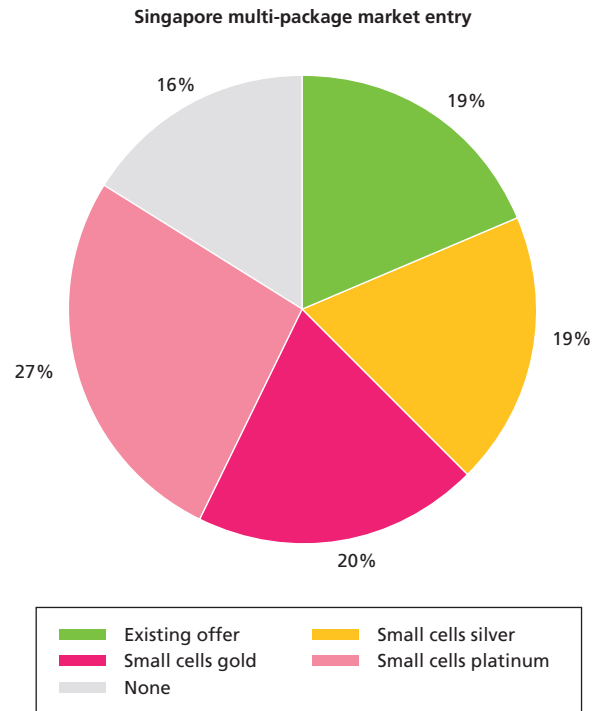
**Table 5. Simulated market entry packages that maximize the appeal of small cells service**

PACKAGE	SERVICE COMPONENTS	FEE STRUCTURE
Silver	Single small cells line + unlimited calling plan + unlimited video calling and SMS plan	One-time installation fee + monthly subscription
Gold	As above + content sharing plan	Installation fee + increased monthly subscription fee
Platinum	As above + free 3G handset special offer	Increased monthly subscription fee

**Figure 8. Current Singapore market share**



**Figure 9. Forecast market share when three packages enter the market at the same time**



Based on the segmentation and evaluation of the current Singapore market situation, offering three different small cells packages could potentially capture 75 percent of preference share with simultaneous market entry in this competitive market.

**4.6 Taiwan**

**Summary**

Taiwan differs from Singapore in the level of interest shown in small cells: Single households are slightly more interested (60 percent) than larger households, although 57 percent of households with five or more members found the service attractive.

For 55 percent of respondents, the mobile handset is the device of choice for the home, while another 34 percent use their landline and mobile phone equally for calls at home. Seventy-six percent of respondents reported their mobile phone has Internet access built in.

About one-third of respondents receive their current services as a bundle. Over 80 percent of these respondents would purchase a small cells service, with 53 percent adding it to the current bundle and 28 percent buying it separately.

Respondents found the simple, feature-rich nature of the service, coupled with improved coverage, appealing. The most frequently used services were anticipated to be SMS and content sharing, and over half of respondents would upload or download content between their mobile handset and their PC.

**Segmentation overview**

Respondents in the heavy mobile phone user segment show by far the highest interest in small cell services, followed by the tech-oriented segment. Consumers between 30 and 49 years of age were most attracted to small cells.

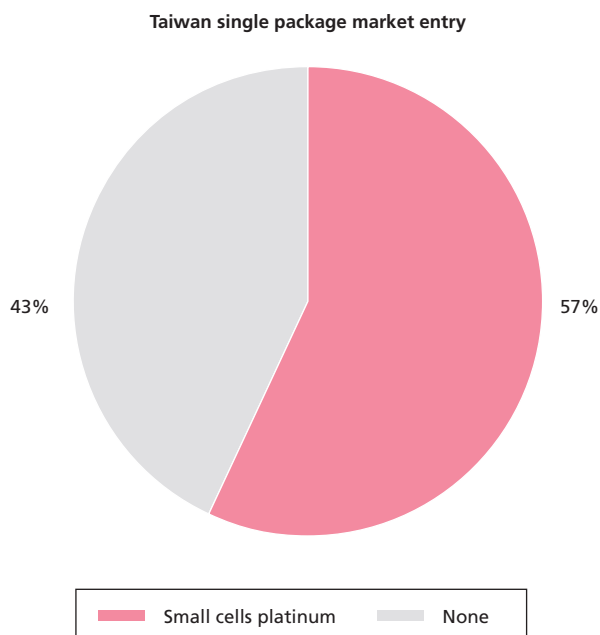
**Suggested go-to-market strategy**

Primary research results were used to model the four market entry packages listed in Table 6.

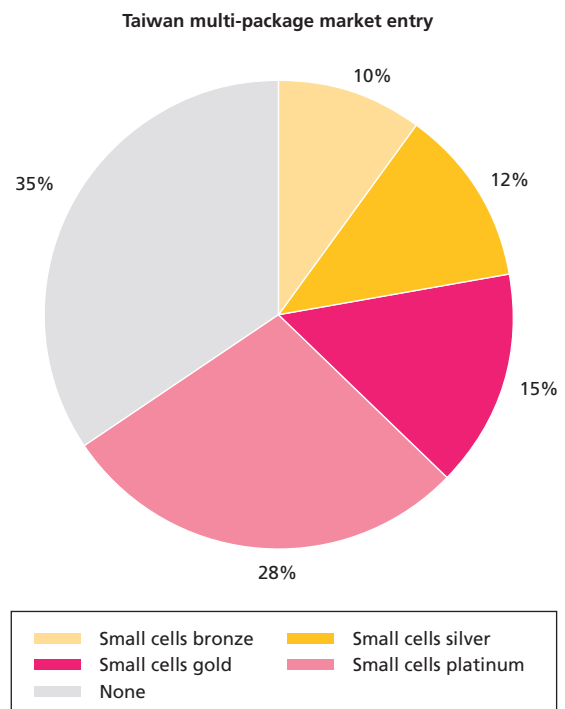
**Table 6. Simulated market entry packages that maximize the appeal of small cells service**

PACKAGE	SERVICE COMPONENTS	FEE STRUCTURE
Bronze, small cell only	Single small cells line	One-time installation fee + monthly subscription
Silver	As above + unlimited calling plan	Installation fee + increased monthly subscription fee
Gold	As above + unlimited video calling and SMS plan and option of multiple lines	Increased monthly subscription fee
Platinum	As above + free 3G handset special offer	Increased monthly subscription fee

**Figure 10. Forecast market share when four packages enter the market one at a time**



**Figure 11. Forecast market share when four packages enter the market simultaneously**



Based on the segmentation and evaluation of the current Taiwan market situation, offering four different small cells packages with simultaneous market entry could potential capture 66 percent preference share in this market without competition.

## 5. Future scenarios

To develop forecasts for the five national markets, we analyzed results from the survey and market penetration simulations. These forecasts are designed to help operators gauge the potential for a small cells service and assess the size the market. We suggest that these forecasts could reflect the likely picture in other national markets within the three continents.

### 5.1 Diffusion estimation

*Asia will lead, while the United States and Europe will follow.*

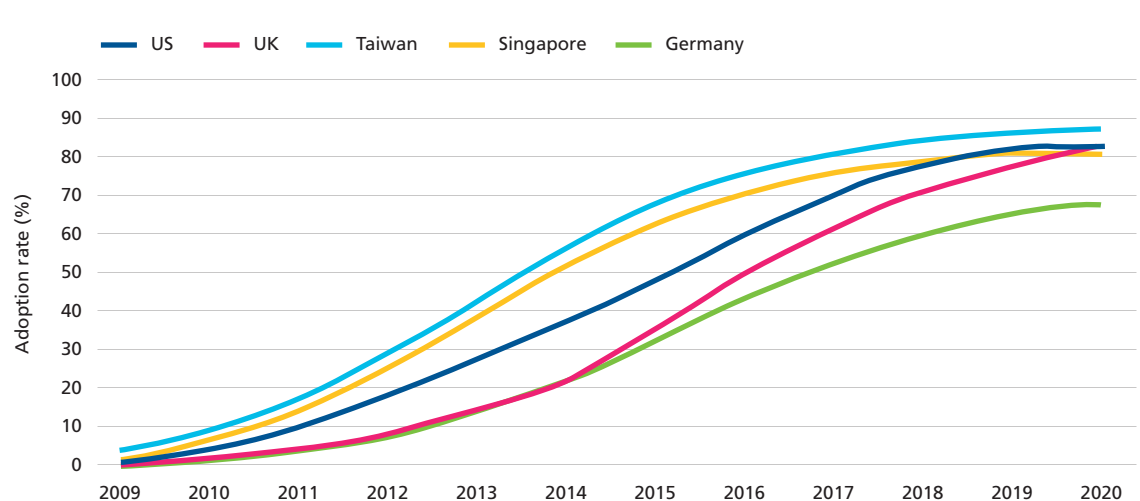
This estimation represents the pace with which operators can expect to gain market traction after small cell services are introduced. The pace of uptake is forecast to be rapid, following introduction between 2009 and mid-2010. Some packages have already been introduced in the United States, the United Kingdom and Singapore markets.

Taiwan is expected to grow its share of addressable market more rapidly than any other surveyed country, closely followed by Singapore. The United States is more likely to cut a middle path between Asia and Europe. Even the German market, which slows after matching the rate of adoption in the United Kingdom after 2015, is expected to reach an addressable market penetration of about 70 percent in the next decade.

The two Asian markets are forecast to be penetrated most rapidly, due to the high appeal of small cells services, reaching 80 percent penetration in Taiwan as early as late 2016. The United States addressable market will experience consistent growth until 2018, then will begin to plateau around the 80 percent mark.

In the next five years, the United Kingdom and German markets will grow in unison towards one-third penetration. Then the United Kingdom will eventually outstrip its European counterpart and ascend to over 80 percent penetration by 2020, even deeper than Singapore.

**Figure 12. Forecast subscriber adoption rate over time**

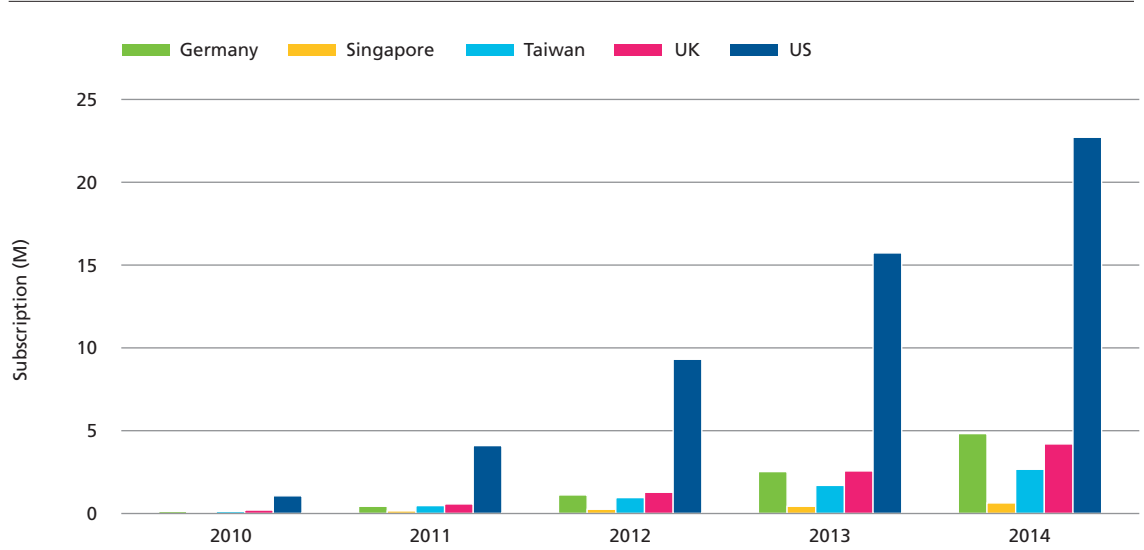


## 5.2 Subscription forecast

The number of subscribers will reach 34 million across the five countries by 2014, with the United States becoming the biggest subscriber territory.

Our forecast shows nearly 34 million subscribers to small cells services across the five survey countries within the next four years. By mid-2014, the United States will be the run-away leader in terms of pure subscriber numbers, reaching 22.5 million subscribers. By contrast, Taiwan and Singapore together will have a total of 2.1 million subscribers, but in both these markets, penetration will exceed 50 percent of the addressable market, compared to just over 35 percent in the United States. Both the United Kingdom and Germany will be well on their way to five million subscribers within the same timeframe, making them excellent market prospects.

Figure 13. Forecast subscriber growth rate over time

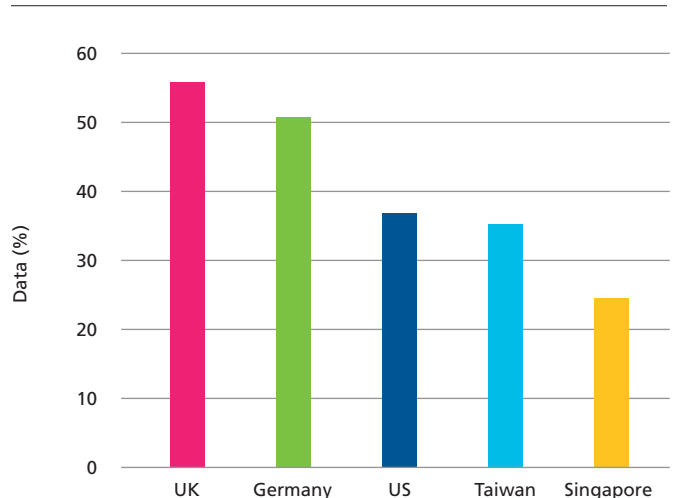


## 5.3 Service bundle data usage forecast

The United Kingdom and Germany will lead in data usage as a percentage of overall service.

As service bundles are rolled out, the United Kingdom and Germany will be the biggest data service users by percentage of all traffic. This suggests that Europe could provide the biggest relative savings to operators, as small cells take over and the macro network transports less data in the household.

Figure 14. Forecast data usage as a percentage of overall service bundle traffic



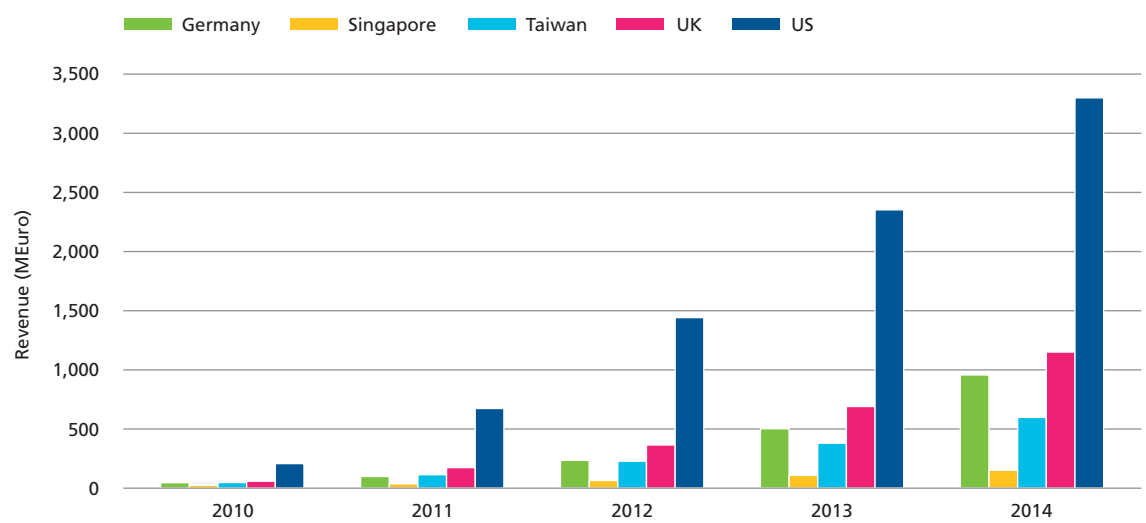
## 5.4 Revenue forecast by country

*Small cells will be a €6.1-billion marketplace in the five countries by 2014.*

Forecast total revenue for small cells services across the five countries cuts through the €6 billion mark in 2014 — making small cells not just a viable option but a must-have technology for operators' near-future roll out plans.

The United States will rapidly become an €3.25-billion market by mid-2014, given its relatively high population base and addressable market. The United Kingdom and Germany will follow, representing approximately one-third the revenue total of the United States, making them lucrative markets in their own right, in the same timescale. Singapore and Taiwan will total over €700 million, making them important markets despite their lower addressable number of subscribers.

**Figure 15. Forecast revenue per country over time**



## 5.5 Monthly ARPU forecast by country

*Small cells promise a valuable addition to revenue.*

Table 7 represents forecast ARPU per country, showing a strong and consistent addition to mobile revenues over a period of years, as small cells adoption rates in each country increase.

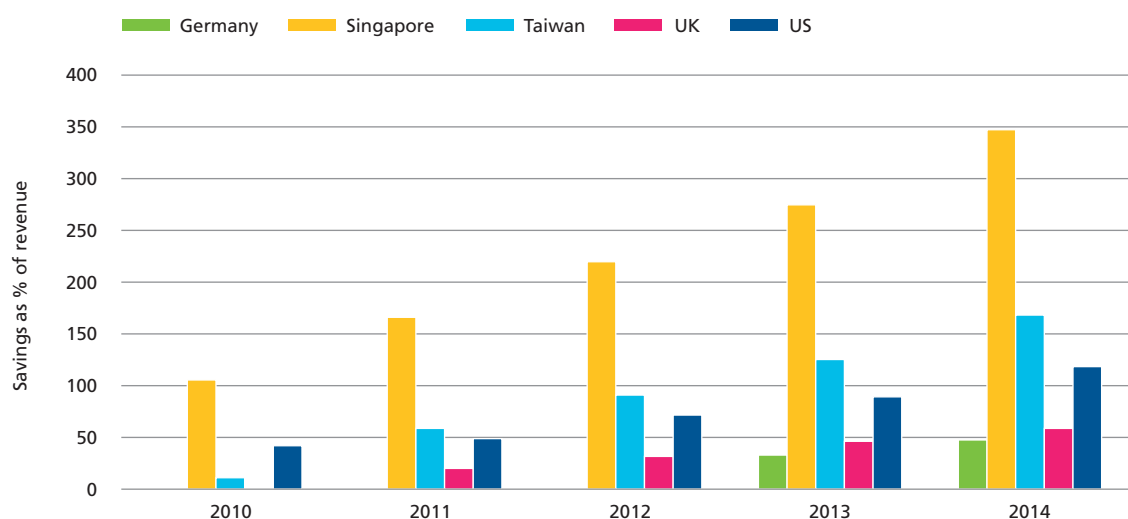
**Table 7. Forecast ARPU, per country over time**

ARPU/MO	2010	2011	2012	2013	2014
United States	14.4 €	13.4 €	12.9 €	12.5 €	12.2 €
United Kingdom	22.7 €	22.9 €	22.9 €	22.9 €	22.9 €
Germany	16.9 €	16.6 €	16.5 €	16.4 €	16.3 €
Singapore	18.8 €	18.1 €	17.7 €	17.5 €	17.2 €
Taiwan	19.2 €	18.9 €	18.7 €	18.4 €	18.3 €

## 5.6 Sample cost savings forecast

Once small cells are deployed in households, the operating cost of transporting mobile broadband data to and from the household is forecast to dramatically decrease. This translates into cost savings for the operator, compared to transporting growing mobile broadband data volumes over the existing macro network. Savings captured in this manner provide positive cash flows — and are accelerated in large households or where large volumes of data are being transported.

Figure 16. Forecast sample cost savings as a percentage of small cells service revenue over time



In Figure 16, forecast savings are shown as a percentage of revenue from small cells services. Singapore exhibits the largest potential for operators to save money because of its high population density, with Taiwan showing a similar tendency. The United Kingdom and Germany will be high data users, and again, this translates into accelerated cost savings as more small cells are rolled out and reliance on the macro network is diminished.

## 6. Conclusion

Our research findings show latent demand for services that provide incremental revenue and cost saving opportunities for operators. These opportunities extend the mobile broadband service concept far beyond coverage augmentation — towards new services that keep families in touch and improve their quality of life. Small cells in households enable consumers to expand usage of services that are already familiar in concept and delivery, such as content sharing or text messaging.

The small cells concept holds the strategic key for operators looking to reach new marketplaces. They are the basis of services that tap into new revenue streams, while simultaneously enabling CAPEX and OPEX savings on mobile broadband services delivered to the household. The savings are accelerated and amplified in deployments to large households or to heavy data users. However, the market will be defined by early entrants, so operators must move rapidly to create and present offers to their existing 3G or fixed broadband subscriber base.

The universal appeal of small cells-based unlimited calling plans presents a competitive advantage for mobile operators facing the competitive threat of mobile-based VoIP services, and it also has the potential to reduce churn.

The appeal of small cell services can be optimized by careful positioning within the marketplace, and by making the installation and access process intuitive for subscribers. Although consumers who have experienced poor indoor coverage will gain a boost to every corner of the house, the real value to consumers and operators lies in the service bundles that accompany basic installation, particularly unlimited calling, SMS and new content-sharing capabilities.

## 7. Alcatel-Lucent solutions

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Alcatel-Lucent small cells commercially deployed, fully 3GPP-compliant solutions, are transforming today's networks by increasing capacity, lowering cost and ensuring coverage. They include Bell Labs innovations that position operators to rapidly penetrate markets and gain cost and revenue benefits. In addition, application enablement features help operators create new in-household mobile services, while automated deployment and configuration features deliver optimal network functionality without the need for manual user intervention.

For more information about how Alcatel-Lucent can help drive your small cells strategy, please go to [www.alcatel-lucent.com/wireless/femto\\_small\\_cells.html](http://www.alcatel-lucent.com/wireless/femto_small_cells.html).

## 8. About the Market Advantage program and Alcatel-Lucent research initiatives

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This research is part of a broader initiative by Alcatel-Lucent to characterize the impact and potential benefits of telecommunications services globally. The Alcatel-Lucent Market Advantage program is an exclusive resource, working with service providers to analyze and identify new market opportunities, drive demand with effective marketing programs and speed the development of profitable new services.

For more information on this study or how Alcatel-Lucent is working with service providers and stakeholders globally to better understand consumer needs, please visit [www.alcatel-lucent.com/map](http://www.alcatel-lucent.com/map).

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