Clearing the way
2012 Outlook for telecom network decommissioning

July 2012

pwc

About the study

As telecom operators around the world continue to upgrade their network technologies to improve performance and increase capacity, many of them are confronted with the challenge of maintaining multiple generations of technologies and networks. Many wireless operators continue to operate second generation (2G) and third generation (3G) networks while deploying fourth generation (4G) technology. Similarly, wireline operators continue to maintain copper access while overlaying fibre to reach customers. Driven by the complexity and cost of maintaining multiple technologies, as well as the need to make valuable assets occupied by older and less efficient technology available for reuse, operators have begun to prepare for the decommissioning of their older networks.

During March and April of 2012, PwC conducted a global study of the outlook for the decommissioning of telecommunications networks. The study, conducted primarily via an online survey, included the collection of information from executives worldwide at telecommunications operators. Survey questions covered drivers, plans, readiness, and key concerns associated with network decommissioning. The survey was developed by PwC's global telecommunications practice, with data collection conducted by the firm's International Survey Unit (ISU).

Companies participated voluntarily in the study, with all survey responses submitted by executives from individual companies. Individual survey results are kept confidential by PwC.

Setting the stage for network decommissioning

Wireline and wireless communications networks are becoming an even more critical part of the fabric of our society worldwide. From video teleconferencing over high-speed broadband connections in order to remotely diagnose medical conditions, to using mobile location-based services to find a nearby restaurant, the internet and mobile phones have brought even the most remote parts of the world closer together.

The wholesale decommissioning of legacy networks is uncharted territory for most network operators

Indeed, the swelling adoption of communications services in recent years is straining networks like never before. According to the International Telecommunications Union (ITU), more than 2.2 billion people, or 32% of the global population, now use the internet, while over 6 billion people, or over 87% of the world, hold subscriptions for mobile services.[1] Furthermore, subscriptions for advanced services such as 3G mobile data are growing at 37% annually, accelerating the construction of new wireless networks and high-speed wireline networks that carry wireless traffic to its ultimate destination.[2]

New networks come in many forms, including the evolution from legacy copper wireline networks to those operating over fibre optics, as well as from 2G and 3G wireless networks to 4G mobile broadband technologies. But regardless of how you look at it, the deployment of new network technologies not only means that some older, legacy networks are becoming outdated, unreliable, and underutilized but also more expensive to operate and maintain. When this happens, decommissioning is sometimes the only option.

Although the removal of small amounts of excess or failed network equipment is common practice in the telecommunications industry, the wholesale decommissioning of legacy networks is uncharted territory for most network operators. Given this fact, and the expected surge in network decommissioning in coming years, PwC conducted a study to confirm the outlook for the decommissioning of communications networks, as well as to assess the drivers, plans, readiness, and key concerns of telecom network operators around the world as they embark, many of them for the first time ever, on deconstructing outdated communications networks.

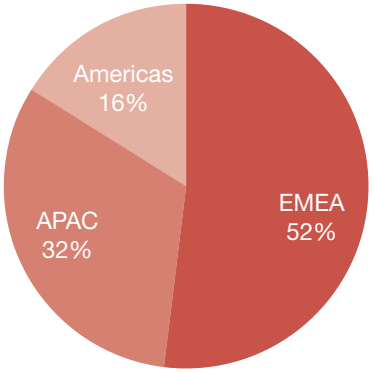
1 International Telecommunications Union, World Telecommunication/ICT Indicators Database, http://www.itu.int/ITU-D/ict/statistics/

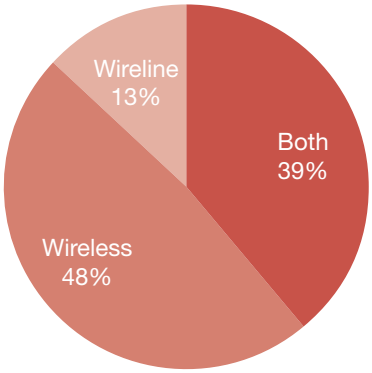
2 Ibid

A world of growing networks

PwC's 2012 Telecom Network Decommissioning study drew strong interest from both wireline and wireless network operators worldwide. Of the 31 participating companies who completed the survey, approximately half were from Europe, the Middle East and Africa (EMEA), with the remainder of responses coming from the Asia Pacific (APAC) and Americas regions. Nearly 40% of survey respondents operate both wireline and wireless networks, while an additional 48% operate only a wireless network, in line with the greater global adoption of mobile services.

Location and network technology[3]

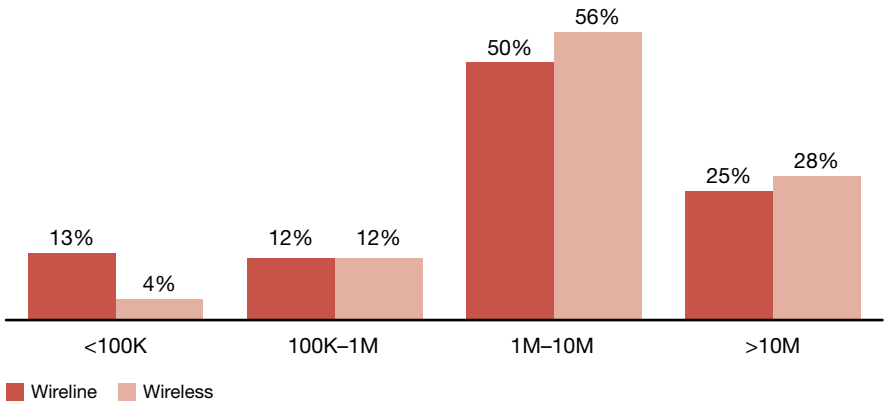




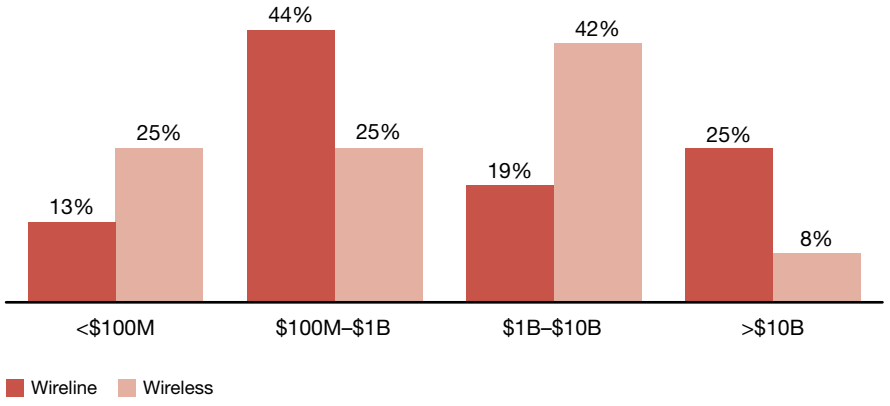
3 All charts throughout this presentation are measured in percentage of survey respondents

Network decommissioning is a topic of interest to carriers large and small. Participants' subscriber bases range from less than 100 thousand subscribers to more than 100 million, with average annual revenue of $5B for wireline network operators and $6B for wireless network operators. Nearly half of the participants' wireless and wireline network operators have a subscriber base within the range of 1 to 10 million.

Number of subscribers



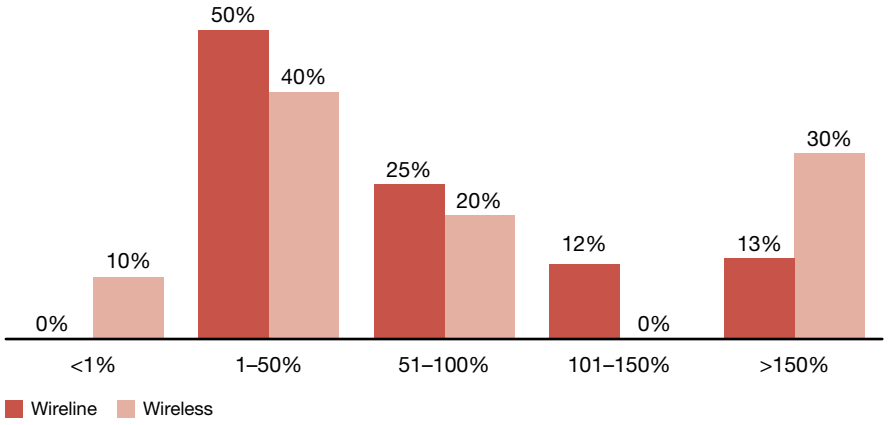
Annual revenue



Nearly a third of wireless operators reported annual traffic increases exceeding 150%.

Perhaps the most telling characteristic of participants' networks is the rate of traffic growth that each is experiencing. Nearly half of respondents indicated that traffic on their networks has increased by over 50% in the past year and nearly a third of wireless operators reported annual traffic increases exceeding 150%. This survey reinforces widely-published industry estimates showing that rapid network traffic growth is happening practically everywhere, and the required upgrades will inevitably lead to the rapid technical and economic obsolescence of legacy networks.

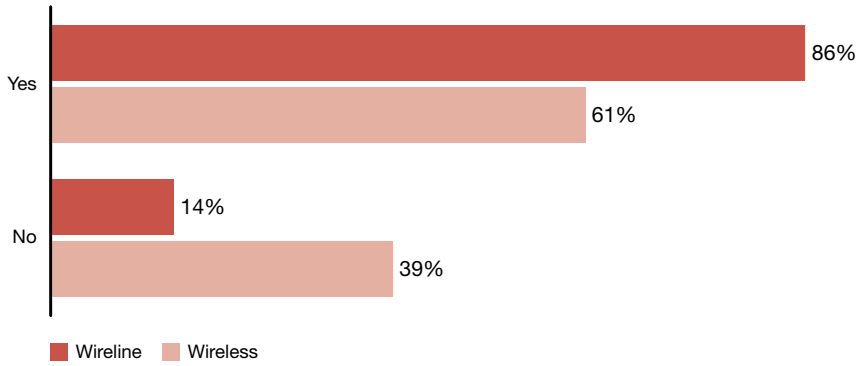
Traffic growth in last 12 months



Decommissioning on the horizon

Operators worldwide clearly have decommissioning of their legacy network assets on their minds. Nearly 90% of wireline operators and over 60% of wireless operators surveyed indicated that they intend to decommission legacy networks during the next five years.

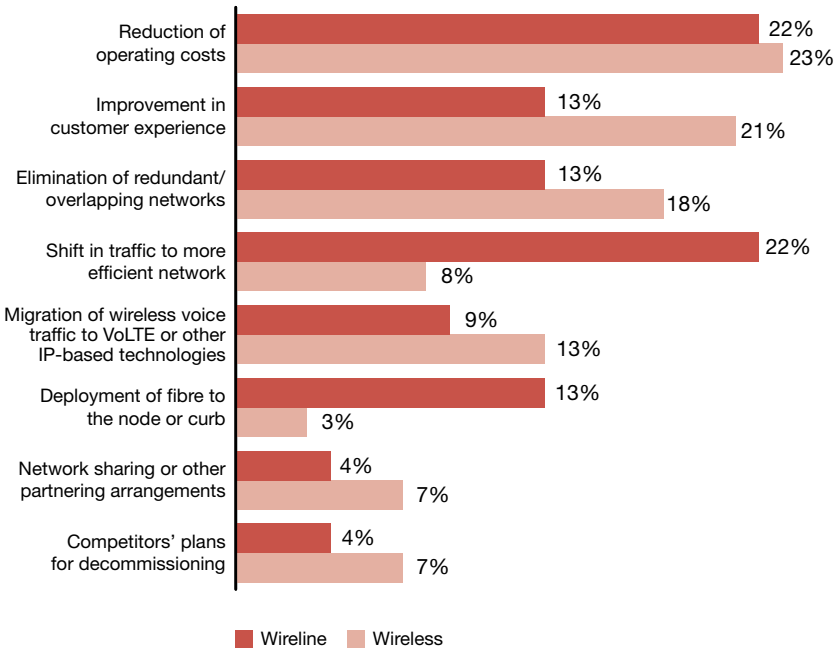
Network decommissioning planned over next five years



Both wireline and wireless network operators are targeting reductions in operating costs through network decommissioning.

The high rate of intended decommissioning has many drivers. First and foremost, both wireline and wireless network operators are targeting reductions in operating costs through network decommissioning. Other key drivers of decommissioning include improvement in customer experience, elimination of redundant or overlapping wireless networks and the migration of traffic to more efficient networks. Traffic migration, in particular, presents a significant efficiency in PwC's experience, as 4G networks can potentially carry five to ten times or more traffic on the same amount of spectrum as outdated 2G and 3G networks. Migration also enables the subsequent clearing and refarming of 2G and 3G spectrum for future use. Operators of 2G wireless networks noted that they are particularly driven by the expected future migration of wireless voice traffic to Voice over LTE (VoLTE) or other, more efficient, IP-based voice technologies.

Decommissioning drivers

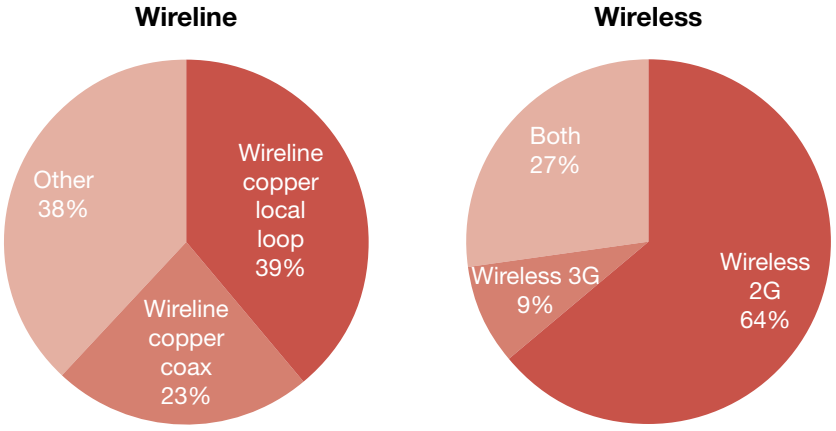


Over 90% of those who intend to decommission a wireless network indicated that it would be a 2G technology.

Copper-based networks—both local loop and coaxial—dominate the list of wireline technologies indicated in participants' decommissioning plans. In addition, 38% of wireline operators are planning to decommission either access MDFs, legacy interconnect to IP interconnect, ATM networks, or radio and fibre PDH. As advanced technologies such as Fibre-To-The-home (FTTH) and Ethernet-Over-Fibre (EoF) grow in popularity, they are clearly causing operators to re-evaluate the costs of operating and sustaining legacy copper networks.

Also not surprisingly, over 90% of those who intend to decommission a wireless network indicated that it would be a 2G technology. However, more than a third of responses also indicated the intent to decommission a legacy 3G network, demonstrating the rapid growth of 4G technologies such as LTE. This also has potentially significant implications for operators, who are faced with shortened timelines to monetise their 3G investments, as well as equipment vendors, who may have to withstand a glut of used 2G and 3G network equipment in the market.

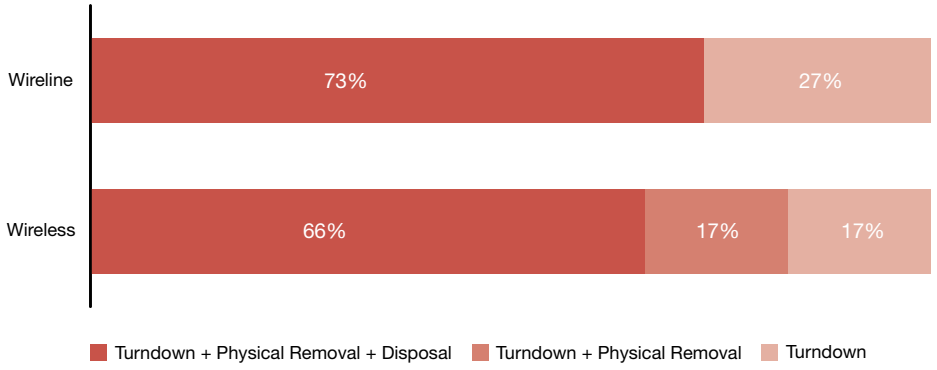
Type of networks expected to be decommissioned



One key strategic element in any network decommissioning effort is the decision of whether to simply "turn off" legacy networks or whether to physically remove and/or dispose of the assets they contain. In PwC's experience, such decisions can make or break the economics of network decommissioning programmes, due to tax considerations, logistics costs, and potential continuing payments to property owners for rights of way and space. In many cases, an analysis of decommissioning costs and benefits must be run for each site or network asset location in order to minimise costs and maximise proceeds of asset reuse, resale, or recycling. In addition, the company's controls and processes around the tracking of the network assets if being reused, resold, or recycled can be significant and resource intensive.

Both wireline and wireless network operators are split on their strategies for asset removal, with approximately one quarter currently targeting to turn down legacy networks and abandon them in place. However, over 75% of operators plan to physically remove decommissioned assets from their networks, with the vast majority hoping to sell or otherwise dispose of them. Plans for efficient asset disposal may in fact represent a significant opportunity, as our experience suggests that the disposal of network equipment can be a key generator of cash to offset the cost of network decommissioning. Even for equipment with little resale value, operators could risk harming their reputation for environmental responsibility if they adopt an incomplete abandon-in-place strategy or do not embrace environmentally responsible disposal solutions, including the vendors used and the policies adhered to.

Scope of decommissioning[4]



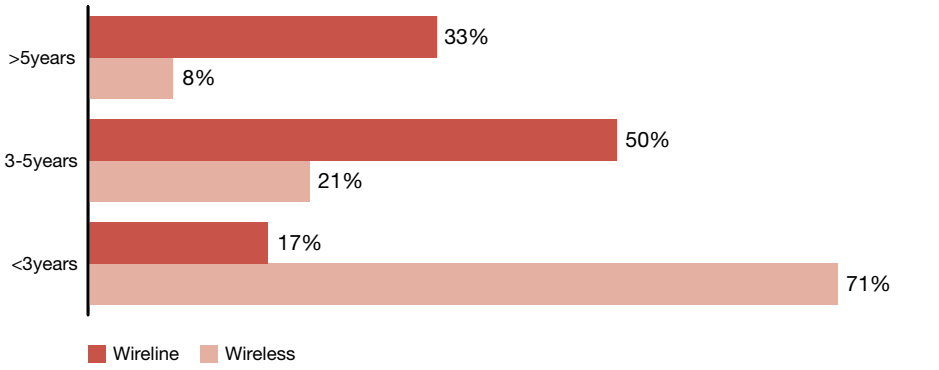
4 Turndown refers to powering down of existing equipment. Physical removal involves removal of the equipment from the existing site. Disposal refers to the disposal of the equipment either through resale as refurbished equipment or by selling it into the scrap market.

Over 80% of both wireline and wireless operators expect network decommissioning to require three to five years or less to complete.

While the vast majority of operators intend to commence network decommissioning in the next five years, over 80% of both wireline and wireless operators expect network decommissioning to require three to five years or less to complete. This may be due to the desire to match capacity transitions to the deployment of more advanced networks, but it also appears to be grounded in the reality of dealing with decommissioning programmes that can require the modification of thousands of leases and removal of millions of assets.

Wireless operators are moving aggressively in their network decommissioning effort for their oldest networks. Forty-six percent of wireless operators have already begun decommissioning networks, with the average expected time to complete the decommissioning of 2G networks coming in at just 2.3 years, significantly below the duration of 5.3 years expected for 3G networks.

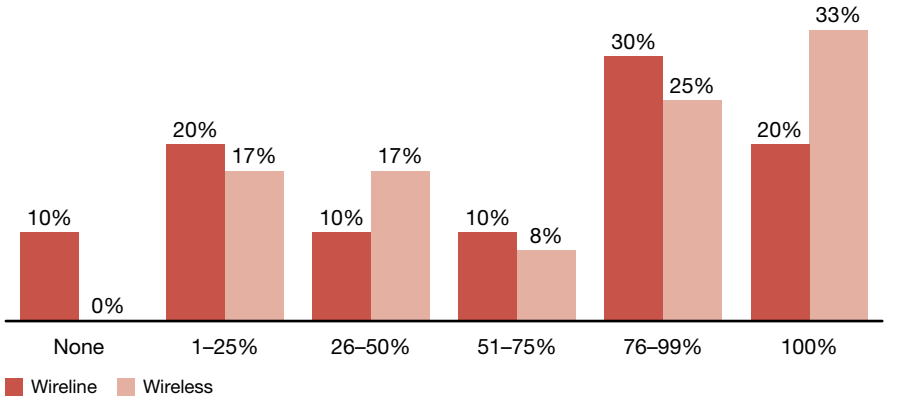
Total decommissioning duration



One half of wireline operators and over one-third of wireless operators indicated that less than 50% of their assets are currently catalogued and managed.

Establishing a clear understanding of the inventory and location of network assets is a critical prerequisite to the timely and effective completion of network decommissioning activities. When asked what percentage of network assets were captured in enterprise asset management databases or similar systems, only one fifth of wireline operators and one-third of wireless operators indicated that all of their assets were tracked. In fact, one half of wireline operators and over one-third of wireless operators indicated that less than 50% of their assets are currently catalogued and managed. This lack of visibility is expected to make planning, controlling, and maximising the value of network decommissioning efforts extremely challenging. It may also sacrifice the opportunity to maximise potential tax benefits and optimise balance sheet impacts.

Assets managed via enterprise management database

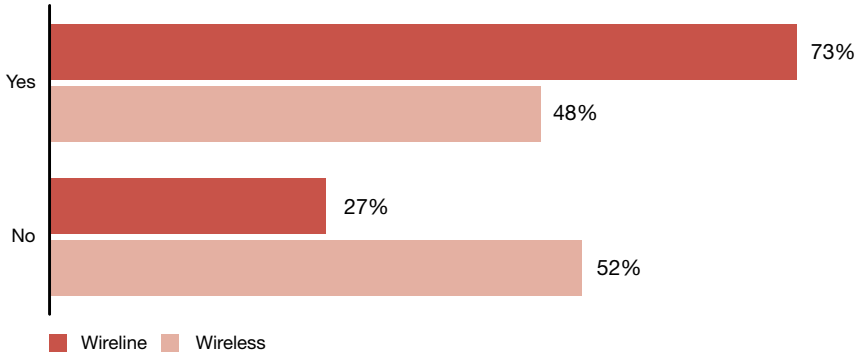


Ready or not, here we come

While decommissioning is on the minds of wireline and wireless operators alike, the results of our survey show a stark difference in the relative readiness of different types of operators. They also demonstrate the differing concerns and strategies being employed across categories.

The first difference between wireline and wireless operators is the relative readiness of their network decommissioning plans. While 73% of wireline network operators reported that they have decommissioning strategy and plans in place, this is in sharp contrast to the wireless network operators where only 48% have established strategies and plans.

Decommissioning strategy and plans in place

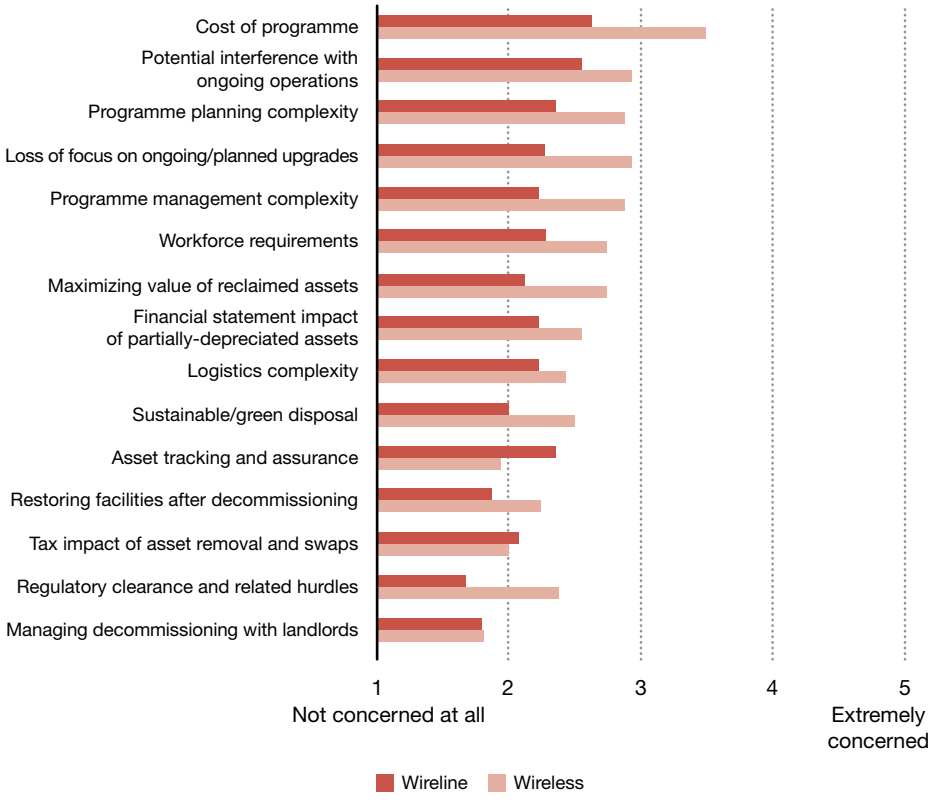


While 73% of wireline network operators reported that they have decommissioning strategy and plans in place, this is in sharp contrast to the wireless network operators where only 48% have established strategies and plans.

Wireline and wireless operators also showed some differences in their key concerns on network decommissioning. Decommissioning programme cost and the potential to interfere with ongoing operations are both top concerns, but wireline operators showed significantly less concern with asset tracking than their wireless peers. This may be due to the relative immaturity of wireline asset tracking capabilities reported by wireline operators which may be causing them to discount the importance of controlling their assets during decommissioning.

Surprisingly, both wireline and wireless operators expressed relatively little concern with managing decommissioning activities with landlords, whose numbers may run in the thousands, and securing regulatory clearance, which can be unpredictable. In our experience, strategies such as staging decommissioning efforts to correspond with lease expiration, leveraging economies of scale for transportation and equipment marketing/disposal, and developing tax strategies to minimise asset sales taxes can be effective in reducing total decommissioning costs.

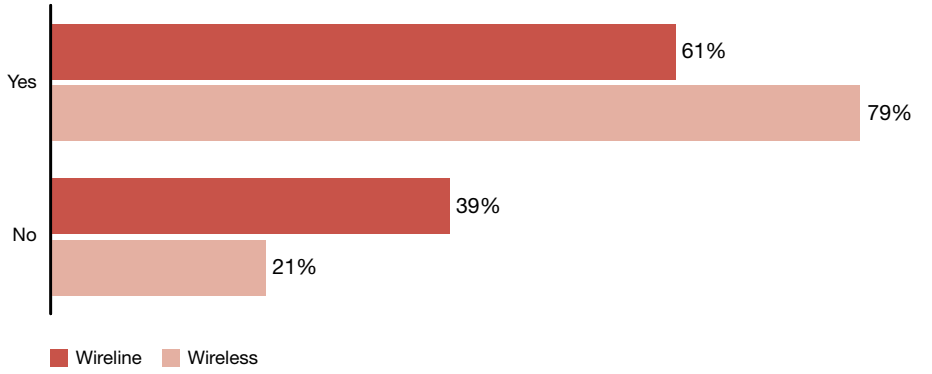
Decommissioning concerns



It is increasingly common practice in the telecommunications industry for equipment vendors to take on both deployment and decommissioning activities. In line with this, more than two thirds of network operators indicated that they have already been approached by their primary equipment vendors about participating in this activity.

Wireless equipment vendors have been particularly focused on this topic, potentially due to the opportunity to align decommissioning activities with the sale and deployment of more advanced mobile broadband networks—and manage the amount of inventory available in the market.

Equipment vendor engagement



While it is often necessary and perhaps inevitable, network decommissioning does not generate ongoing revenue and therefore often lacks senior management visibility.

Both wireline and wireless network operators indicate that they expect to spend significant portions of their decommissioning budget on programme planning activities, with higher spend envisioned for more complex and distributed wireless networks. Although upfront planning is critical to successful network decommissioning efforts, our experience indicates that investing in strong management of network decommissioning activities is equally important. Similarly, it is critical not to underestimate the potentially significant costs of physical asset removal and transportation, which can easily run into thousands of dollars per location, totalling tens, if not hundreds of millions of dollars in some cases. Experience in planning complex reverse logistics programmes is of the utmost importance in minimizing these costs.

For most network operators, network decommissioning is a complex and potentially costly endeavour. While it is often necessary and perhaps inevitable, network decommissioning does not generate ongoing revenue and therefore often lacks senior management visibility. While potential benefits are not often integrated into operators' decommissioning plans, our survey participants indicate that they see several potential cost offsets which should be incorporated in order to defray the expected costs of network decommissioning. Tax benefits, which vary widely by country, were most often cited by wireline operators as a potential cost offset, while wireless operators most frequently noted asset resale as an area of expected benefit. Cost benefits are listed on the following page.

Potential benefits of network decommissioning

Wireline operators	• Maintenance and operation cost reduction • Reduction of energy and support costs • Reduction of costs related to cable theft • Personnel related cost benefits • Improved operating cost base
Wireless operators	• Re-farm 2G spectrum for 3G usage in order to save spectrum cost • Operational efficiency • Government incentives • Free swap from vendors • Lower operating costs

Conclusion

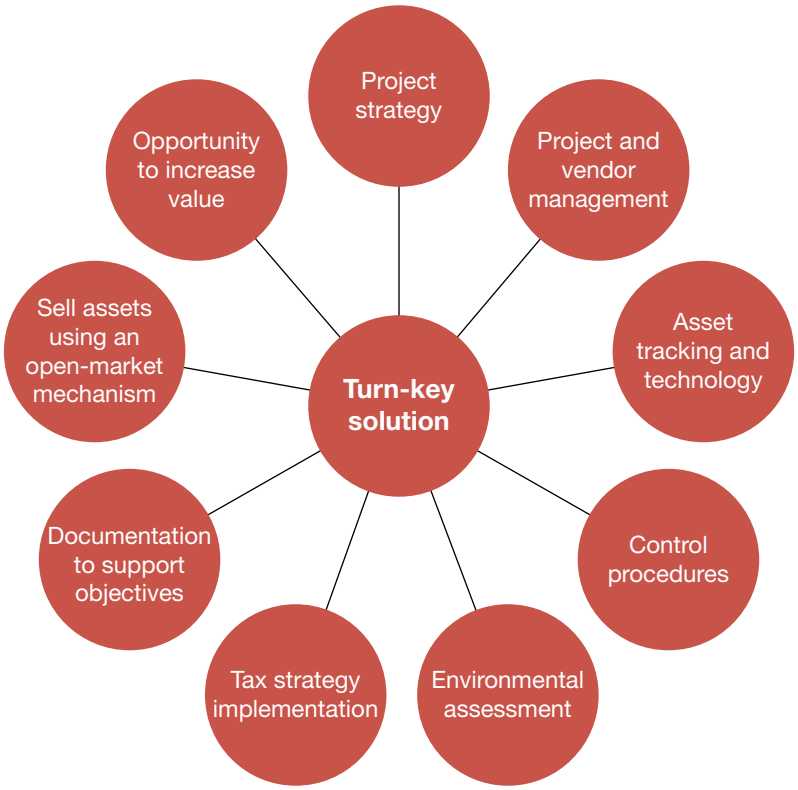
Network decommissioning represents perhaps the next great challenge for telecommunications service providers worldwide. For many, decommissioning a working network will be a first-time activity, while for nearly all it will be a once-in-a-decade activity. Regardless of experience or frequency, strong planning and execution, including accounting for potential offsets to costly decommissioning activities, will be critical to success.

Our analysis suggests that, given their large asset bases and decline in subscribers, wireline operators will take the lead in network decommissioning efforts over the next five years as compared to their wireless counterparts. It also suggests that the majority of wireline and wireless operators have overlooked a potentially significant cost offset opportunity that exists in the disposal of network equipment and commodity materials. PwC's experience indicates that such disposal of network equipment is both a key revenue generation opportunity as well as a risk due to information security and environmental concerns, and should be integral to decommissioning efforts.

While wireline operators are more prepared for network decommissioning compared to their wireless counterparts, both sets of operators share similar concerns and risks focused on decommissioning cost and the potential to impact ongoing service delivery operations. These concerns are certainly worth noting, as they entail not only budget overruns, but enduring impacts to customer relationships, brand, and revenue streams.

PwC's global experience with network deployment and operations, as well as our extensive experience establishing and managing major reverse logistics and asset sale programmes, has yielded significant insights into best practices for network decommissioning efforts. Most importantly, it is critical to take a 360 degree view of network decommissioning to not only consider project strategy and planning, but also significant potential value drivers such as asset tracking and controls, environmental compliance, tax implications, and asset resale.

PwC's 360 degree framework for network decommissioning



Acknowledgement

The PwC 2012 Telecom Network Decommissioning study was led by Dan Hays, PwC's U.S. wireless advisory leader, managed by Ayesha Datta, and supported by significant contributions from Brian Stahlhammer, Michael Flaherty, and Shailabh Atal. PwC thanks the companies that participated in the study. Their support for this project and their candid responses are appreciated. Together we have created this study to identify the outlook for the decommissioning of communications networks as telecom network operators commence this critical, and potentially disruptive, activity.

www.pwc.com

To have a deeper conversation about how this subject may affect your business, please contact:

Pierre-Alain Sur
Global Communications
Industry Leader
New York
+1 (501) 772 8067
pierre-alain.sur@us.pwc.com

Greg Chiasson
Principal
Chicago
+1 (847) 430 9014
greg.chiasson@us.pwc.com

Michael Flaherty
Director
Washington D.C.
(202) 729-1634
michael.flaherty@us.pwc.com

Dan Hays
U.S. Wireless Advisory Leader
Washington, DC
+1 (202) 756 1733
dan.hays@us.pwc.com

Shailabh Atal
Director
Washington, DC
+1 (202) 756 1725
shailabh.atal@us.pwc.com