Hardware-as-a-service models could help to drive sustainability throughout the telecoms value chain

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Simon Sherrington

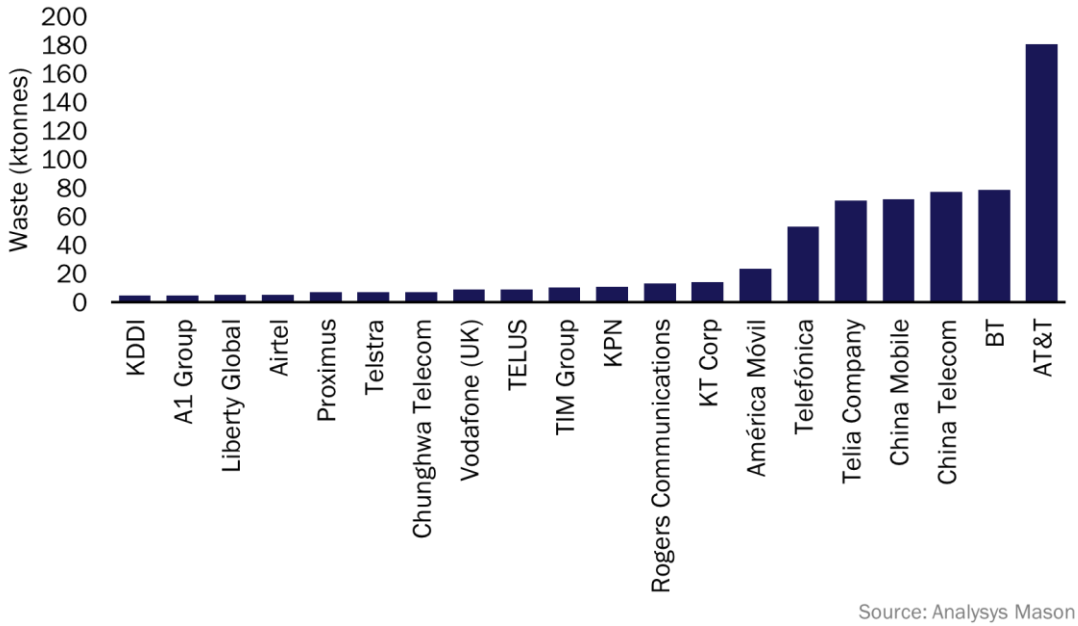
Telecoms operators and vendors have generally made limited progress with initiatives related to the adoption of circular business models underpinned by widespread recycling and the reuse of waste materials and equipment. Those reporting on their progress claim that much of the equipment that is returned by their customers is recycled or reused, but the volume of equipment returned is generally not included in public reports. Indeed, these players privately admit that equipment return levels are low. This is a real problem.

One possible method for overcoming this is to migrate to hardware-as-a-service business models for some (or all) of the equipment that they supply to their customers. Vendors and operators that offer hardware as a service have the opportunity to improve their own circular economy credentials, increase their customers' sustainability and drive sustainability improvements (of all types) throughout the value chain.

Telecoms operators and vendors are paying increasing attention to reducing the waste generated by their businesses

Most large operators and vendors are publicly trying to improve their overall sustainability levels. However, reporting on waste, recycling and reuse is far from complete. The majority of large operators and vendors now report on the total volume of waste generated by their operations (Figure 1), but fewer report on how much waste is recovered and recycled.

Figure 1: Volume of waste reported, selected operators, worldwide, 2022



A complication is that different approaches are used when reporting on volumes of waste and recycling. Vendors and operators are often vague about their definitions; sometimes their published waste metrics will include product waste, while other times they will only include solid/operational waste. This explains the wide variation in the reported numbers in Figure 1.

It is also not always clear how much used equipment is actually recovered from customers, so recycling figures may just reflect the reuse or recycling of the waste that has been returned. Furthermore, reported figures do not routinely include information on the volumes of reused/recycled equipment included within sold products.

The pressure to comprehensively report progress will increase as industry efforts to become more sustainable gather momentum. The pressure to find new business models that support a more sustainable approach, while continuing to meet profitability and performance objectives, will also build.

Hardware-as-a-service business models could enable vendors and operators to reduce their own waste as well as their customers'

The as-a-service model has been steadily creeping into the telecoms market over the past few years. Operators and customers can already buy network software functions or telecoms, media and technology applications on a subscription basis (thereby effectively buying services). However, telecoms network hardware is still largely purchased as a capex item.

It is already possible to lease laptops, phones, servers and enterprise networking equipment such as routers rather than buying the equipment outright. Indeed, both operators and vendors offer hardware-as-a-service solutions. These tend to be geared towards enterprise customers, and are designed to replace the lumpiness of equipment spend with steady costs for customers and steady, predictable revenue for suppliers. Examples include:

- Nokia's Mission Critical Industrial Edge (MXIE) for on-premises edge processing solutions, which is available via an on-premises hardware-as-a-service model
- Cisco's various hardware-as-a-service solutions, such as Webex Hardware as a Service (including phones, in-room equipment such as desktop devices and screens) and Compute Hardware as a Service.

NTT DATA has also launched a hardware-as-a-service solution and is now promoting its sustainability credentials. It specifically states that its Sustainable Device-as-a-Service solution is designed to increase device reuse, recycling and responsible disposal.

Hardware-as-a-service business models are less common in the carrier network value chain. However, now may be the time to reconsider hardware business models given that more and more of the rest of the infrastructure deployed by network operators is procured on an as-a-service basis. The hardware-as-a-service model offers an opportunity to improve sustainability throughout the value chain, starting with recycling and reuse, but potentially extending to much more sophisticated methods.

The effective implementation of hardware-as-a-service models will use service contracts to drive continual improvements in sustainability

Hardware-as-a-service models can drive the reuse and recycling of devices, at the very least. End users do not own the equipment, so it must be returned at the end of the contract and can then be processed appropriately. However, there is an opportunity to be far more creative in the use of hardware-as-a-service contracts to improve sustainability in infrastructure. Indeed, contracts could evolve to include:

- dynamic deployment models that optimise the types and sizes of equipment in use at any given location at any given time to maximise efficiency, and that upgrade systems when newer equipment with improved sustainability credentials becomes available
- financial rewards (penalties) for the return (non-return) of equipment
- immediate, medium-term and long-term KPIs across a range of product-related criteria including:
  - embedded carbon
  - operational carbon emissions
  - use of recycled materials in purchased products
  - product energy consumption
  - water use
  - toxification
  - land use and impact on biodiversity
  - raw material extraction and processing
- shared risk and reward (that is, a revenue-related bonus tied to sustainability improvements or penalties associated with failure to drive improvements).

The environmental, social and governance (ESG) strategies of operators and their large enterprise and government customers may well result in an increased demand for suppliers to start tracking and reporting on the ESG qualities of their offerings. Operators and vendors have an opportunity to drive the agenda by moving to a sustainable hardware-as-a-service (SHaaS) approach, in which targets are used to drive ongoing improvements (rather than just meeting target thresholds on a product-by-product basis). There will be a requirement for very careful contract design to manage the risks that are inherent in long-term contractual relationships, and the business model will need to be thoroughly evaluated.

SHaaS models can potentially give customers a sustainability glidepath, underpinned by contractual promises. They can enable the rolling replacement of systems and upgrades, with no cliff-edge generational upgrades, predictable hardware costs and, for suppliers, predictable revenue. One of the largest telecoms vendors has indicated, in private conversations with Analysys Mason, an aspiration to move in this direction, but it is a fundamental model evolution that might be worth considering by all players in all parts of the telecoms value chain.