9. Organising durable economies for environmental sustainability

Harald Wieser, Florian Hofmann, Melanie Jaeger-Erben, and Max Marwede

9.1 Introduction

In contemporary societies, where most resources extracted from the environment do not simply flow in and out of the economy but remain in use, pile up in storage rooms, or litter environments for many years or often even centuries, resource use can no longer be reasonably captured in terms of consumption and production only. Once societies start to accumulate and surround themselves with material infrastructures, buildings, and other durable objects, consumption and production become only some of the moments in our engagements with natural resources alongside many others, from use to repair, maintenance, care, or valorisation. As we have argued in the introductory chapter to this book, such engagements have distinct material consequences that, rather than being hidden in increasingly expansive understandings of consumption, should be brought to the centre of analyses of resource use. To appreciate why contemporary societies demand increasing volumes of natural resources and why those resources are processed in ways that create long-term damages to humans and the environment, it is crucial to acknowledge the significance and distinctiveness of objects made durable vis-à-vis materials and energy intended for immediate consumption.

The research programme on 'durable economies' put forward in this book aims to shed light on the social, economic, and technical processes that make durables such foundational elements of everyday lives in the twenty-first century. Moving from the study of inanimate 'stocks' to the varied practical and contested engagements that make things last is vital for gaining a better understanding of the driving forces behind resource use. Furthermore, considering durable economies as ongoing and diverse practical accomplishments creates room for research and debate on the potential benefits and opportunities of transformations towards more *sustainable* durable economies.

Throughout this book, our main concern has been with the environmental consequences of resource use. As Josh Lepawsky illustrated in his discussion of the chemical compound trichloroethylene (Chapter 2), durables that seemed to be 'goods' at some point may turn out to be environmental 'bads' many years later. Other durables may be environmentally hazardous from the very beginning or unsustainable from a social or economic point of view. In making the case for a more neutral approach focused on durables rather than 'durable goods' and problematising the resource and carbon intensity of existing, accumulation-driven durable economies, we have already made clear that, for us, a durable economy is not necessarily desirable. In this final chapter, we first expand upon the relation between durability and sustainability, and we discuss how a durable economies perspective can help in developing environmentally sustainable economies that address the varied consequences of durables. Our main message is that sustainable economies need to attend to the volume, pace, and intensity of durable stocks and that existing concepts do not provide satisfactory responses to each of these dimensions. In the second and final part, we reflect on the arguments and findings presented in the previous chapters to tease out some key learnings on the promises and challenges of 'doing durability'. Considering the massive implications of durables for the environment, mastering the quality of durability will be of vital importance in sustainable economies.

9.2 Durability in sustainable economies

While not everything that is durable is also sustainable (cf. Carp 2020), sustainability is inconceivable without some form of durability. For future generations to be able to meet their needs, natural resources need to be preserved and ecosystems need to be protected for them to retain their capacities to deliver services that are vital for human well-being. It is less evident, however, that future generations need 'manufactured capital' and that sustainability demands that today's generations preserve durable infrastructures and objects. Likewise, making things last may not be the only or even the best sustainability strategy for protecting the environment and resource preservation. Despite such uncertainties, durability evokes mostly positive connotations in debates on more sustainable futures. In several languages, such as Dutch, Finnish, and

French, sustainable is even translated as durable. Against this background, it is not surprising that durability has been put very much at the centre of various conceptions of sustainable economies and more sustainable relations with the material world more generally.

An interesting example of such a conception is the development model that has been advanced for the city of Burlington, Vermont (Phillips et al. 2013; Seifer et al. 2020). Drawing inspiration from McKibben (2007), who linked local, community-based economies with durable futures, Seifer et al. (2020) characterise the development model of Burlington as a 'durable economy'. 'A durable economy,' they propose, 'is one that is nurtured by the community from the ground up and maintains its vibrancy over the long term by consistent attention to the needs of that community' (ibid.: 43). Notably, the authors make scarce reference to material stocks, stressing instead the significance of long-term visions as well as distributed, inclusive, and local action for the durability of the economy. By contrast, durable objects, as with the biophysical world more generally, have long been central to the sustainable economies conceived by ecological economists. Boulding's (2011) 'spaceship economy' and Daly's (1974) 'steady-state economy' are classic examples of this. In his famous essay 'The Economics of the Coming Spaceship Earth', Boulding argued that attention would need to shift from the flow concepts of production and consumption towards the condition of 'stocks':

> The essential measure of the success of the economy is not production and consumption at all, but the nature, extent, quality, and complexity of the total capital stock, including in this the state of the human bodies and minds included in the system. In the spaceman economy, what we are primarily concerned with is stock maintenance, and any technological change which results in the maintenance of a given total stock with a lessened throughput (that is, less production and consumption) is clearly a gain. This idea that both production and consumption are bad things rather than good things is very strange to economists, who have been obsessed with the income-flow concepts to the exclusion, almost, of capital-stock concepts. (Boulding 2011: 11)

Boulding was clear that stocks should not be preserved for their own sake but, at the very least, they should be evaluated from the point of view of their resource requirements. However, for Boulding, the maintenance of stocks was more than a mere matter of resource conservation. He viewed durable objects and infrastructures as foundational to human well-being and saw in their rates of depreciation a more appropriate indication of an economy's (lack of) success than the flow-centred gross domestic product (GDP). The burden of proof would thus be reversed: it would not be maintenance and persistence that need justification but replacement and technological change.

The idea that durables are vital for human well-being and deserve greater recognition in debates on sustainable futures finds resonance to this day. Pauliuk and Müller (2014), for example, suggest that durables play multiple roles in contemporary societies, from 'service suppliers' to 'resource repositories' and 'wealth watchers'. Alongside such perspectives that stress the significance of durables in providing services for the fulfilment of human needs (e.g. Haberl et al. 2017; Whiting et al. 2021), durables also figure centre stage in environmental movements that advance a 'new materialism' (Simms and Potts 2012). Grounded in similar philosophical roots as many of the approaches to material culture studies presented in Chapter 1, 'new materialist' movements bring forth a radically different perspective from the 'post-materialist' approach to environmentalism. Instead of turning towards non-materialist values and lifestyles, new materialism proposes a convivial approach that recognises the importance of the material world for human flourishing. New materialism is about 'a different kind of love affair with "stuff" – a long-term relationship of appreciation, slow pleasures, care and respect' (ibid.: 26). Developing more long-term relations with things is very much at the heart of this perspective, which is practised across the world in repair cafés and workshops.

None of the perspectives presented equate the durability of artefacts with environmental sustainability. Even so, the strong emphasis on the maintenance of durable stocks in conceptions of the spaceship economy, steady-state economy, or new materialism can easily be misleading. Material efficiency strategies for the extension of product and infrastructure lifetimes, such as repair, maintenance, and reuse, will likely need to be core ingredients of more sustainable economies (Hertwich et al. 2019). However, continued growth of durable stocks in the old industrial world means that the reference point against which Boulding made a plea for focusing on stock maintenance has changed dramatically since the publication of his spaceship economy essay. If the global population were to attain and maintain today's level of per capita stocks of industrialised countries, the CO_2 emissions resulting from the expansion of stocks in the remaining world regions alone would use up almost the entire carbon budget available to meet global warming goals (Krausmann et al. 2018). To limit global warming to 1.5–2.0°C, durable stocks will likely need substantial downsizing through higher intensities of use, sharing, light-weighting, and avoidance of unnecessary acquisitions (Krausmann et al. 2018; Pauliuk and Heeren 2021).

Furthermore, as Van den Bergh (2011) rightly points out, energy and materials vary considerably with regard to their environmental impacts. Focusing too strongly on aggregate material stocks suppresses incommensurabilities and eschews important procedures of assigning appropriate weights to different substances. A case in point are light-weighting strategies in aerospace and automotive industries, which can reduce material inputs in production and cut down fuel consumption in use but frequently involve materials with higher emission intensities and lower levels of recyclability (e.g. Liu et al. 2022). A narrow focus on aggregate stocks would clearly overestimate the environmental benefits of light-weighting, possibly leading to detrimental effects in both the short term (higher emissions in manufacturing) and long term (depletion of primary resources). Stock maintenance and downsizing are insufficient and may even be counterproductive in addressing key environmental challenges related to the most energy-and carbon-intensive stocks. Even if no new infrastructures for fossil fuels were to be built and all existing fossil fuel infrastructures were to be phased out according to plans, there would still be a 36 per cent chance that the 1.5°C target could not be met (Smith et al. 2019). Meeting global warming goals thus requires an immediate acceleration of phase-out strategies in this critical domain.

While durability is a necessary ingredient of sustainable economies, the discussion so far shows that there are inherent risks in establishing close connections between durability and sustainability. However, from a research point of view, focusing on durable stocks is not the same as advocating stability – or durability, for that matter. Building on studies of material flow accounting, we suggest that durables mediate resource use in three ways: they demand resources for their construction and expansion (relating to volume), for their replacement and maintenance (relating to pace), and for their operation (relating to intensity) (see Chapter 1). Paying attention to each of these dimensions can help in evaluating the sustainability implications of diverse economies and eliciting their respective blind spots. A coarse review of prominent concepts of sustainable economies is sufficient to reveal that none of them can be expected to deliver significant changes in resource use across all dimensions (see Table 9.1). Moreover, there are significant trade-offs and gaps that remain poorly addressed in existing approaches to reduce the environmental pressures of resource use.

As we tried to show in the introductory chapter, a durable economies perspective is able to provide an account of historical material flows that diverges significantly from prevailing narratives of the rise of consumerism, the throw-away society, and the linear economy with their emphasis on the increasing pace of resource throughput. The resulting reinterpretation of present-day environmental challenges has important implications for the priorities that need to be set in sustainability transitions. The circular economy and the performance economy, for example, may offer effective responses to slow down the pace of stock replacement but they are oblivious to the important roles rental-based business models, repair, and maintenance have historically played in the accumulation of durable stocks, in particular in the housing sector. Similarly, constructing new infrastructures for renewable energies could reinforce existing dynamics of capital accumulation and lead to lock-in effects that impede sustainability transitions in the long run if the links to economic growth and the distribution of capital are not taken into account. Tackling the massive accumulation of durable stocks, which represented the main driver of growing resource use in past decades, will require alternative resource-saving strategies – from downshifting to light-weighting and sharing – that are scarcely considered in prevailing notions of sustainable economies (Hertwich et al. 2019).

Table 9.1: Expected contributions of sustainable economies in reducing environmental pressures across each dimension associated with durable stocks.

Dimensions Reducing environmental pressures	**Volume** Downsizing stocks	**Pace** Keeping stocks in use	**Intensity** Using more environment-friendly stocks
Circular economy	*	**	**
Performance economy	*	***	**
Bio-based economy	*	*	**
Green economy	*	*	***
Sharing economy	**	*	*
Steady-state economy	**	**	*

Note: * = weak, ** = medium, and *** = strong, based on our own judgements of the emphasis put on different dimensions in each framing.

With the steady-state economy and the sharing economy, among others, there are several candidates for addressing the volume of durable stocks. However, it is important to note that considerations of measures that target the volume of durable stocks *directly* are still rare. For example, Daly redefined the steady-state economy in terms of constant flows rather than constant stocks in later years (see O'Neill 2015). Instead of imposing limits on material wealth, Daly proposed that the government should focus on controlling aggregate resource throughput by setting quotas for the use of resources according to ecological and ethical criteria. The allocation of available resources would then be determined by market forces. The basic strategy of setting resource caps in accordance with planetary boundaries and allowing a (relatively) large amount of individual freedom with respect to the use of available resources is widely advocated among scholars concerned with 'strong sustainability' or absolute levels of resource throughput (e.g. Fuchs et al. 2021; Jackson 2016; Raworth 2017). However, by failing to open the black box of resource throughput, particularly with regard to the dynamics of durable stocks, this strategy falls short of explaining the processes that prevent democratic governments from setting strict resource caps in the first place (Smith 2010; Spash 2020). Developing a coherent strategy that tackles volumes of durable stocks head on will thus likely be a core challenge in conceiving sustainable durable economies.

9.3 Doing durability for sustainable economies

Following the discussion of how durability relates to resource use, we can turn to some final reflections on the making or 'doing' of durability. The ambivalent effects that durability can have on resource use make it essential to develop capacities for organising durable stocks in an environment-friendly manner. This is no straightforward challenge. Contemporary economies have become extraordinarily skilled at creating matches between supply and demand, and the proliferation of powerful new 'devices' and 'arts' across production, distribution, and consumption has created unprecedented capabilities at shaping the qualities of products and establishing unique attachments between individual people and things (Cochoy et al. 2017). When it comes to organising and managing the durability of artefacts, however, the economies we know tend to be strikingly inept, creating tons of things that either disintegrate far too quickly or end up cluttering our world. In other words, today's durable economies constantly fail to meet the core expectation of providing goods that serve their purpose until – and only until! – they are no longer needed. Even if one were able to define a *sustainable* use of durables, there would still be major challenges in realising such an outcome.

Approaching the doing of durability from various vantage points, the previous chapters have explored some of the key challenges different actors face and potential solutions for aligning business models, public discourses, regulations, design, and user practices, among other elements, with higher levels of product durability. In the following sections, we review the challenges and approaches to durability from three different perspectives: technical, economic, and social.

9.3.1 Technical challenges: planning and optimising durability

From a technical perspective, doing durability is about predicting the lifetimes of artefacts and implementing the technical procedures and infrastructures necessary for products to perform according to predictions. In debates on product lifetimes, this perspective has informed a growing body of research on the challenges and possibilities of 'planning' and 'optimising' durability. Instead of associating 'planned obsolescence' with the intentional manipulation of product qualities to bring about premature obsolescence, engineers and designers argue that 'planning' is not bad per se but an inevitable element in product development that should be leveraged for sustainability (Burns 2010; Poppe and Longmuß 2019; Satyro et al. 2018). Brian Burns suggests that it is time to acknowledge the inevitability of obsolescence, learn from experiences, and collect necessary information to plan for it:

> Life cycle analysis can help, as will the development of appropriate industry standards and consumer education. We must now attempt to optimize each product's life by planning for the inevitable obsolescence at the end of its life. (Burns 2010: 58)

The idea that product lifetimes and durability can and therefore should be 'optimised' (van Nes and Cramer 2006) has informed, for example, a substantial body of research concerning the environmentally optimal timing of replacements and the development of a wide range of design strategies (see Rivera and Lallmahomed 2016). However, the technical challenges associated with the planning of durability have arguably shifted over the years. This is because previous advances in material sciences and testing methods, which had turned uncertainties about failures into relatively calculable risks, allowing for a fairly high degree of alignment in the durability of product components, are being increasingly undermined by trends that see products experiencing more complex and unpredictable lives (cf. Spring and Araujo 2017). As industrial divisions of production and consumption collapse and a growing number of agencies participate in the co-production of goods, be it through means of personalisation, reuse, or repair, it becomes more difficult for 'original equipment manufacturers' to simulate product lives and plan for durability accordingly. It is in this emerging context of flexible durable economies made of diverse, distant, and asynchronously acting entities that the technical focus shifts from predictive testing methods to digital and modular technologies.

By establishing a virtual copy or 'digital twin' of a product that contains real-time information regarding the product's condition, use, and location across its lifecycle, it may become possible, for example, to predict failures more accurately and implement preventive measures in time (see Chapter 4). Information on use and location could also support the management of material flows by identifying idle resources. Perhaps the revolutionary potential of digital technologies in 'planning durability' is nowhere greater than in relation to the choreography of temporalities. Marketing professionals, for example, have established a massive infrastructure for disrupting everyday routines in various locations, including people's homes, but until recently they had little control over the time when potential customers received their messages. Even the bundling of phone purchases to mobile service contracts with predetermined contract periods – a market device par excellence for calibrating the temporal rhythms of product renewal in the traditional world of marketing – was unable to reliably control the rate at which customers would replace their phones (Wieser 2021; Wieser and Tröger 2018). Digital tools allow marketing departments to get their messages out with much greater precision. For example, British network operator O2 submitted an insightful case study to a national marketing association, in which its marketing professionals explained how they addressed the self-proclaimed challenge of 'identifying the exact tipping point when customers started to itch for a new handset, and being there to catch them':

> It is in O2's interest to lock customers into a new phone as soon as possible. So the team ran quantitative research to identify the moment that, on average, customers started to want a new phone; and at that very moment O2 stepped in to help them get it … This timing was critical, so the campaign needed to identify and use the right channel (email, SMS and outbound calls) for the right customer, based on data insight, with absolute precision … A live countdown timer and fireworks told them precisely when their contract ended, creating a sense of urgency and anticipation that drove immediate renewal … Complex data algorithms allowed the campaign to predict the most tempting phone for each customer, based on brand preference, usage and sales trends. Current contract details informed their upgrade cost and generated relevant incentives, such as a 25% discount or the recycle value of their current handset back. Everything was designed to drive immediate response, get the customer locked into a new contract and get them to feel good about it. (O2 2015)

In O2's efforts to align the durability of the phone with the length of its contracts, timing was key and smartphones, as carriers of digital traces of customer behaviour and as digital communication devices, proved critical in both creating and transmitting a customised message in time. The company reports that this campaign encouraged 130,000 customers to take a new handset early. Digital technologies, in connection with incentives for returning the phones and complementary resale and recycle programmes, enabled O2 to reduce the time periods during which phones would remain in an idle state.

The use of digital technologies for planning durability at O2 highlights their potential but also raises important questions about how such technologies affect existing power asymmetries in economies. In his contribution to this book (Chapter 4), Eduard Wagner puts forth a vision in which tools such as digital product passports are leveraged for the democratisation of production processes, in particular by empowering individuals such as users, consumers, and DIY practitioners, who at present have inferior access to relevant product information compared with designers and manufacturers (cf. Callon and Muniesa 2005). In such a democratic economy, an 'optimal' level of durability would not be achieved through some form of centralised 'planning' but through distributed capacities among diverse economic actors to evaluate the durability of an artefact at any moment during their lives. However, as Wagner points out, important challenges related to intellectual property rights and privacy need to be overcome to realise such a vision of information sharing about product characteristics relevant to their durability. Furthermore, digitalisation may not be the only path for optimising durability through more democratic or distributed production processes.

A key challenge in doing durability is to align the durability of artefacts at different scales. Hand and Shove's (2004) analysis of kitchen replacements offers an intuitive example. To most people, a kitchen is more than the sum of its parts. The value of a kitchen derives from the harmonious configuration of its constituent devices and pieces of furniture, which in turn tend to be informed by wider design trends and expectations of the ideal kitchen, which Hand and Shove refer to as 'kitchen regimes'. As they go on to show, it is not uncommon at all to replace entire kitchens when new ideas and expectations of kitchens emerge. In such cases, the durability of each component outstrips the durability of the shared 'kitchen regime', leading to their (provisional) obsolescence despite remaining perfectly functional. In contrast, irreparable damage to a single appliance or piece of furniture may be sufficient to ruin the current kitchen regime and motivate the replacement of an entire kitchen.

From a technical perspective, it is difficult to avoid misalignments when changing cultural ideals are involved. However, as Melanie Jaeger-Erben, Marina Proske, and Sabine Hielscher show in Chapter 8, it may be possible to reduce co-dependencies between material components by following a modular approach to product design. If co-dependencies can be relaxed, misalignments and different temporalities do not have to lead to the replacement of entire products or product ecosystems.

9.3.2 Economic perspectives: managing and regulating durability

Moving on from the previous discussion of technical challenges to the economic sphere, economic theory suggests that durability poses a series of specific challenges to achieving 'socially optimal' market outcomes. Economic theories of markets for durables generally start from the assumption that durability can be planned with precision. The core economic issues, following Waldman (2003), relate to pricing, the timing of new product releases, and governance of markets for second-hand goods and complementary goods and services. In markets for durables, sellers with sufficient market power have an economic incentive to withhold 'real' innovations and seek ways to reduce competition from durables in use instead (see Chapter 5). Sellers could thus offer lower-quality products or eliminate markets for second-hand items and complementary goods or services such as repair, leading to socially suboptimal levels of durability. As Max Marwede and Florian Hofmann (Chapter 3) illustrate, based on companies that have specialised in high-durability products, economic incentives alone do not necessarily lead to lower levels of durability. Companies that are able to build trust in the quality of their products and communicate the advantages of durability may gain competitive advantages from putting durability at the centre of their sales strategy. However, such companies frequently cater to the needs of specific segments and often struggle to reach a wider range of customers (Hofmann 2019; Niessen and Bocken 2021).

In recent years, growing recognition of a more systemic 'market failure' in relation to product durability has informed a series of public policy interventions. As Carl Dalhammar and his colleagues show (Chapter 7), governmental bodies in Europe are considering various policy measures to regulate business practices on the one hand and empower consumers on the other. As would be expected, such efforts have been met with fierce resistance by business representatives. Ongoing controversies relating to a 'right to repair' are a case in point. Whereas consumer agencies have called for more transparency and better access to repair equipment so that product owners can repair defective items themselves, following a model of 'distributive repair market governance', industry representatives have defended a model of 'centralised repair market governance', lobbying for much more restrictive legislation that would essentially grant consumers only the right to have their items repaired by a manufacturer's authorised professional, potentially solidifying prevailing monopolies of aftermarkets even further (Svensson et al. 2018; Svensson-Hoglund et al. 2021).

In domains where expectations have stabilised and products are relatively homogeneous, standard setting and regulation can be appropriate responses to secure minimum levels of durability and reparability. Therefore, standardisation of durability has been implemented mainly with respect to products such as vacuum cleaners and lighting products, where technological advancements have plateaued. For other domains, where products undergo rapid change, alternative business models are needed that decouple sales volumes from the imperative for profit generation. An ideal typical case is the scenario of the 'seeking optimisation user' of smartphones explored by Melanie Jaeger-Erben, Marina Proske, and Sabine Hielscher (Chapter 8). To address the demand of this user group for frequent hardware upgrades, the authors propose that businesses could switch from a sales-based business model to 'up-to-date contracting', which provides users with the most up-to-date product modules. Such a business model could allow providers to obtain used modules and resell them on the second-hand market. As the authors show, widening the scope from products to wider product–service systems generates new possibilities for developing solutions tailored to user-specific demands and aligning the durability of product modules with different temporalities of product use.

However, irrespective of whether companies pursue a sales- or service-driven model, commercialising durability can be extremely challenging. From Max Marwede and Florian Hofmann's contribution (Chapter 3), we learn that providing products with high levels of durability requires enterprises to develop a set of specific, internal procedures, structures, and human capacities. An additional important challenge lies in the relationship with retailers, whose profits tend to rely heavily on driving sales volumes (see Chapter 5). Manufacturing firms wishing to switch to service-based business models and establish direct contacts with customers are likely to meet resistance from dominant retailers.

9.3.3 Social perspectives: narrating and doing durabilities

In addition to being contested in economic and political terms, durability is subject to various cultural meanings and embedded in a wide range of different social practices. While durability is clearly of economic relevance, it is thus important to highlight that durability may not be at the forefront of people's concerns, or that, in other words, an artefact can be durable without anyone wanting or intending it to be durable per se. Frequently, people care more about specific qualities such as reliability or robustness rather than durability. Studying consumer understandings of product lifetimes, for example, Cox et al. suggest that many of their study participants 'want products to last (i.e. not break) for just as long as they want them to last, but not necessarily any longer than that' (2013: 24). Their point is that when people talk about product lifetimes, they do not express a demand for durability per se, which could be related to economic or environmental concerns, for example; mainly, they talk about 'functional reliability', a quality linked to concerns about being able to perform particular tasks without disturbances or interruptions. While 'workhorses' such as washing machines and dishwashers are expected to last *for some time*, such expectations are very different for 'investment products' including houses or jewellery, where there are no limits to how long they should last – that is, where durability per se matters greatly.

Most of the empirically informed chapters in this book originate in research on product lifetimes. While there was a shared intuition that durability would play a role in relation to product lifetimes when we launched this joint venture, the concrete links between durability and product lifetimes were not self-evident and many authors were confronted with the situation of having to (re)construct how their observations relate to durability. In contrast to research that takes the quality of durability as a starting point, this research strategy makes it possible to open the 'black box' of durability (see Chapter 1) and elicit the *specific* qualities different communities are concerned about.

While the multiplicity of qualities that underpin durability certainly can represent a major challenge in 'doing durability', be it in research or in practice, this multiplicity can also be a key asset that opens up various pathways for achieving higher or lower levels of durability. By examining how various people talk about the lives of electronic devices, Tamina Hipp and Daniel Fischer (Chapter 6) were able to identify a wide range of popular narratives that contribute to the depreciation or appreciation of devices. While all narratives have implications for durability, only some of them make direct links to this quality. The narratives provide a valuable repertoire of communicative tools for shaping the durability of artefacts in various social contexts. The contribution of Melanie Jaeger-Erben, Marina Proske, and Sabine Hielscher (Chapter 8) adds an additional layer by addressing the diversity of user profiles and their varied demands with respect to durability. Again, their analysis focuses on daily practices and expectations relating to smartphones in general, from which the authors are able to derive different durability requirements, ranging from reliability and robustness to storage space, scalability, adaptability, and expandability. From a social perspective, 'doing durability' thus emerges as a practice of manoeuvring a space of multiple durable economies in which durability takes different forms.

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