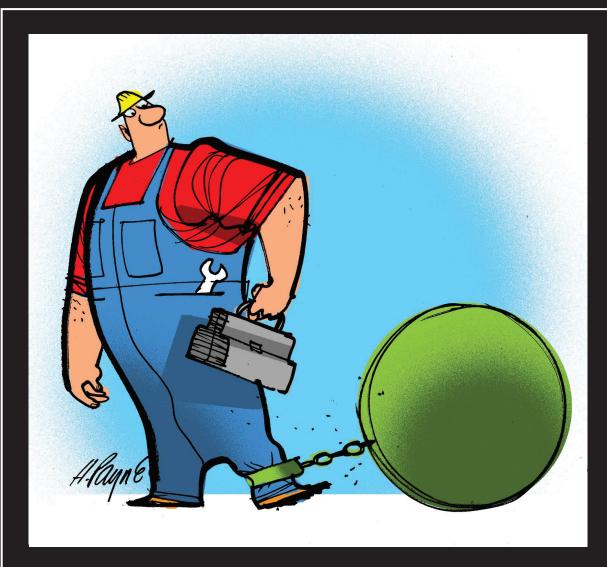# The Environmental FORUM

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The Post-Ownership Society

The environmental impacts of the sharing economy may not be unequivocally positive or negative but will depend on sticky norms, policy nudges, and human preferences. There may also be tipping points in capacity utilization, which could impact policy decisions

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In a recent episode of the West Coast hipster parody *Portlandia*, the show's cash-pressed protagonists, Bryce Shirvers and Lisa Eversman, develop a web site called Rent-It-Out, proclaiming that "you can rent out everything, anything, anyone." There is some truth in the spoof. Today's sharing economy is not really about sharing, it is largely about facilitating short-term rentals and providing convenient access to goods and services. In fact, when presented with opportunities to share, most people choose not to. Many Airbnb users opt to stay alone, not lounging on the owner's couch or raiding the shared kitchen. Attempts to build "community" among Zip Car users ended badly, and Lyft's use of fist bumps has not bumped Uber out of its dominant position in the ride-sharing marketplace.

Much of the traditional sharing culture of our early forefathers, driven by camaraderie and good-neighbor behavior, has been replaced by anonymous, web-mediated interactions with strangers. Critics such as Tom Slee, author of *What's Yours Is Mine,* have been quick to point out that the sharing economy is "extending a harsh and deregulated free market into previously protected areas of our lives."

Sharing platforms such as Uber and Airbnb now have huge valuations — $70 billion and $31 billion, respectively, on par with valuations of the major automakers, to give a sense of scale — and command major market shares in their sectors. Uber operates in almost 500 cities in 70 countries and the number of Uber's active driver partners in the United States is now almost doubling each month. Airbnb hosts over 155 million guests annually, 22 percent more than the global Hilton Hotel chain. More than one in three Americans now use home-sharing services, an increase from one in ten in just 2012. The major internet platform for ownership transfer, eBay, has over 160 million users. The total value of merchandise on eBay in 2015 exceeded $81 billion in an emerging global market estimated at $195 billion. This is just a small piece of an exploding sector of economic activity.

Despite the massive global expansion of these peer-to-peer platforms, clear signals of technological lock-in, and the emergence of winner-take-all markets, the environmental community has remained largely silent, unengaged, and willing to accept the environmental pronouncements from the companies, acolytes, and TED talkers pushing the sharing economy. The CEO of Uber in London declared that each of its drivers is "taking seven and a half cars off the road." A glowing piece in the *Harvard Business Review* maintained, "Collaborative consumption gives people the benefits of ownership with reduced personal burden and cost and also lower environmental impact — and it's proving to be a compelling alternative to traditional forms of buying and ownership." But is collaborative consumption sustainable consumption? And, if so, at what scale and under what conditions? As one *New York Times* article recently pointed out, these platforms "have a tendency to metastasize from transaction enablers to, with sufficient success, participation gatekeepers." We simply do not know where

these tipping points are and how to anticipate them.

Some observers have called sharing the "dark matter of the economic production universe"; one might extend that pronouncement to the environmental universe as well. Popular literature and public perceptions are influenced by two dominant framings regarding the impacts of sharing systems on the economy, environment, and social welfare. Both are important to the extent that shared visions can shape social and technological transformations.

The first frame, often highlighted by the negative press surrounding sites like Uber, links sharing to the capitalization of content, privatization and commoditization of public goods, and deteriorating labor relations and declining wages. The second frame postulates the sharing economy as a possible transition path to a more sustainable future, enabling improved and more equitable resource use, increases in social capital, and distributed problem-solving capabilities. This frame builds on an underlying belief that our web culture invites users to share, and emphasizes that properly designed sharing platforms could underpin change efforts focused on sustainability.

At this point, there are not enough data and research to clearly sort out the claims linked to either narrative, so polarization may continue or worsen between the adherents of these views. One researcher described the tension in an article title: "The Sharing Economy: A Pathway to Sustainability or a Nightmarish Form of Neoliberal Capitalism?"

We do know that there is significant growth potential in the sharing economy (a gap many companies seem eager to fill). Research by the Department of Economics at the University of Massachusetts, Amherst, using consumer expenditure data combined with surveys found that U.S. households spend almost $10,000 per year on sharable goods, but only a small fraction is actually shared ($180 for 30 percent of Americans annually and $775 for 8 percent). Of these amounts, transportation and housing make up a large proportion, though opportunities abound because of underutilization rates of many durable goods (think of that drill in your basement, which research has shown will likely be used 6 to 20 minutes over its entire lifetime).

We also know that slightly over one half of the U.S. adult population, or 105 million people, use some type of sharing platform already. PricewaterhouseCoopers estimates that global economic activity in just five sharing markets (cars, housing, equipment, books, and DVDs) is projected to grow from $15 billion in 2014 to about $335 billion by 2025.

But not enough is known about energy and environmental impacts of the sharing economy, clearly not enough to begin to shape public policy or even consumer decisions. Observers of the field have noted that "despite the widespread belief that the [sharing economy] helps to reduce carbon emissions, there are almost no comprehensive studies of its impact. At this point, they are long overdue," and "future research might also address the possible environmental benefits of online platforms." A small number of existing studies have indicated that the energy and environmental impacts of the sharing economy may not be unequivocally positive or negative but will depend on sticky norms, policy nudges, and human preferences. There may also be tipping points in capacity utilization, which could impact policy decisions.

A recent study for the National Bureau of Economic Research by Judd Cramer and Alan Krueger at Princeton University found that Uber beat taxis in terms of capacity utilization rates in Los Angeles, Seattle, and Boston but not in New York City, where taxis still retain an efficiency edge. It is not just a simple choice between Uber and taxis, but all other forms of mobility — cars, buses, subways, bikes, and our feet. Survey data have shown that over 90 percent of users of ride sharing would have made the trip anyway and around one third would have used public transit if easy access to a ride was not available. As others have noted, "If Uber trips are in addition to existing taxi trips, then the impact is less clear. . . . More research, with much better data, is badly needed."

It is difficult to determine whether, and under what conditions, easy access to services provided by ride-sharing platforms saves energy and benefits the environment. Research on the environmental impacts of sharing by Susan Shaheen at the University of California, Berkeley, showed that one Car2Go replaces the impact of 7 to 11 vehicles (or 28,000 across the five-city study area), but these impacts were achieved largely by the 2 to 5 percent of people who sold a vehicle or the 7 to 10 percent who postponed a vehicle purchase because of Car2Go, not those who used the service in addition to their existing vehicles.

Then there is space sharing. As the average area of homes in the United States ballooned from 1,600 square feet in the 1970s to 2,600 square feet today, many people found themselves sitting on idle capacity ready to rent out. Private accommodation rentals reached $32 billion in 2016 and platforms like Airbnb have simplified the process of searching for and contracting space rentals. Filling already heated and built

space with eager visitors seems like a good deal environmentally, especially after the kids have left for college.

Airbnb conducted its own study in 2013 with the CleanTech group, surveying 8,000 guests and hosts worldwide and determined that stays in Airbnb properties reduced waste, water, and energy use over commercial properties, from 12 to 60 percent. However, more detailed studies are needed, including how Airbnb stays may affect the use of public transit options and how savings in lodging could result in the increased consumption of other energy-intensive goods or services (do cheaper stays equal more trips?). Airbnb has spawned options that may be more or less environmentally friendly: on the high end, sites like OneFineStay and Oasis, and on the low end, sites like Homestay and GuestoGuest.

The impacts of other space-sharing platforms deserve greater study. For instance, there are now over 1,700 co-working spaces in the United States that provide freelance workers with options over office-at-home, teleworking, or long commutes to the job. Some of these organizations pitch space for "green and socially conscious entrepreneurs" such as Green Spaces in New York City and Denver and have worked to validate their green claims through partnerships with organizations such as Denver's Certifiably Green Program. These verification programs are important to avoid what some have termed "share-washing" — using the notion and pseudo-norm of sharing to signal noble causes with little backup data.

Beyond transportation- and lodging-related impacts, there has also been speculation regarding the impact of creating more efficient secondary and tertiary markets for durable goods. A recent analysis using data from California and Florida by Anders Fremstad of Colorado State University suggested that the on-line platform Craigslist has diverted millions of tons from the solid waste streams in those states by creating an efficient secondary market for used durable goods (per capita reductions of about one third pound per day). This was equivalent to reductions achieved by California's glass bottle recycling program, and "occurred without any public funding and without any explicit intent to reduce waste."

Other research has shown that Craigslist increased the utilization of rental housing by approximately 1 percent by better matching renters and seekers. In addition to the familiar Craigslist, there are also business-to-business platforms such as Globechain, designed to facilitate recovery and reuse of retail, office, and commercial goods, and "create a local supply chain within a global community to enable the redistribution of goods to social causes

rather than landfill." Globechain has over 700 companies donating items and 10,000 potential charity recipients of those items.

Another important sector seeing a proliferation of web-based platforms is food. Getting food from the farm to our tables uses 10 percent of the total U.S. energy budget, 50 percent of U.S. land, and 80 percent of all freshwater consumed in the country. Recently, venture capital funding has been pouring into the food tech space. For instance, the startup KitchenSurfing, which allowed people to book chefs to cook meals in their homes, amassed over $30 million on series A and B investments from New York City venture capital firms before closing its doors last April after four years in business. Dozens of applications have launched in the food space, each one an experiment worth studying, such as the Canadian platform FoodSpoke ("eBay meets Uber to get food to vendors without the middleman"), Landshare in the UK ("established to act as a catalyst for change in the way we manage land and its resources"), and the Food Corridor in Colorado (designed to make more efficient use of community kitchens). Other platforms, such as Zero Percent in Chicago, Olio in the UK, and Yo No Desperdicio (I Don't Waste) in Spain are focused on improving the recovery of food waste that often flows directly into landfills (estimates are that 30-40 percent of the food that we are growing and cooking gets thrown away).

CNN Money just voted on the best job in America — mobile-app developer. Cloud-based computing, open-source software, venture capital, and lucrative careers will guarantee a steady stream of sharing-economy platforms into the foreseeable future. Pity the poor environmentalists facing this wave of disruption. How exactly does one govern this coming avalanche of emerging, dynamic, and networked applications?

One could ask the question: Does the sharing economy meet the criteria of eco-efficiency advocates, like the World Business Council for Sustainable Development, to deliver "competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing the environmental impact of goods and intensity of resource use throughout the entire life-cycle to a level in line with the Earth's estimated carrying capacity"?

Efficiency, after all, has been used to explain the emergence of internet-based platforms, which can significantly reduce the transaction costs of bringing together users and providers of services or goods (we can thank the economist Ronald Coase for his

insights in transaction-cost theory back in 1937). But pure transaction efficiencies that generate profits do not necessarily translate into environmental or energy-use efficiencies, or, for that matter, into labor and wage gains for workers. The reluctance of firms to share their data makes it difficult to quantify environmental gains, and this uncertainty combined with public pressure may lead policymakers to take a more precautionary approach.

Local governments have already taken aim at sharing platforms, both to shape positive outcomes, and avoid negative ones. The city of Altamonte Springs, Florida, recently decided to underwrite Uber rides, providing a 20 percent subsidy to any ride beginning and ending in the city and 25 percent for trips to and from the local train station. Recently, the city of Austin, Texas, banned Uber and Lyft for almost one year, spawning platforms like Fasten and Ride-Austin, which filled the ride-sharing needs when hundreds of thousands of people descended on the city during the recent South by SouthWest Festival. (Uber and Lyft are now waiting for the Texas House Transportation Committee to come up with a solution to regulate ride sharing at a statewide level.)

Other locales have taken a more hands-off approach, trying to help inhabitants sort out options and understand the impacts of various choices. Let's Collaborate!, for instance, is designed to "connect and promote the sharing economy in New York City" and provides people with an extensive directory of sharing sites as well as monthly presentations, meet-ups, and pitch events for startups.

A diversity of policy experiments is useful at this point. As one legal scholar recently noted, "We simply cannot know who the best regulator is, or whether a 'best' regulator exists at all." But it will be important to understand the impacts of interventions (intended and unintended impacts), extract lessons and best practices, and transfer and scale learning. Also, these approaches do not substitute for firm-based solutions or commitments that would raise the floor of environmental performance across multiple jurisdictions and scales in the case of national and global sharing platforms, creating a more level playing field for new entrants. Addressing a plethora of local and statewide regulations and limitations is not likely to be in the interests of many sharing firms seeking to expand market control.

In lieu of formal interventions, one could seek to change what behavioral economists call the "choice architecture" so the default decisions of consumers and other users are those with the environmental gains, or at least people can set the system to favor these.

For instance, a new generation of journey or trip planning apps like Citymapper and Nimbler show users travel times, routes, and even calories burned using different routes and modes of transport (foot, bike, transit, etc.). These apps could integrate energy and environmental feedback on route choice along with time and cost. Designating an Uber or Lyft ride as "green" could take more explicit advantage of drivers who have hybrid or electric vehicles.

Informational strategies could also shape consumer demand for data on environmental and energy impacts. It is not clear whether users of peer-to-peer sharing platforms are even considering their environmental impact. Results from an experiment run with students at the New School (a buy-nothing-new, share-everything month) showed that most students were motivated to use sharing platforms for economic reasons (saving money, earning additional income) and for social gains (meeting people, spending time with friends, enhancing social engagement). A much smaller number, around 5 percent, indicated being driven by environmental concerns such as reducing their carbon footprint.

Longer-term solutions may appear. As sharing economy companies go public, shareholders will have increasing leverage over corporate behavior through tools like shareholder resolutions or socially responsible investing. Millennials hold $2.45 trillion in spending power, and 70 percent report that charitable causes are a key driver in their business transactions, so this cohort could help shape corporate behaviors. Proactive companies operating digital platforms could also opt to become public benefit corporations (such as Kickstarter), which require commitments to public and social good besides just shareholder profit maximization.

It is unlikely that the new sharing platforms will completely destroy old business models, but they can significantly disrupt them, so it is worth asking the question of whether new business models are sustainable in a broad sense of the word — economically, socially, as well as environmentally — and whether we can develop design principles for emerging sharing-platform businesses that want to make up-front commitments to energy and environmental improvements.

There are deeper questions lurking in the future of the sharing economy about whether increases in overall affluence and population will negate any efficiency gains offered by sharing platforms — and a more stubborn issue of whether access can replace ownership in western materialistic cultures, leading us into a blissful post-ownership society. **TEF**