iDODDLE

The Impacts of Digitalised Daily Life on Climate Change

idoddle.org | @iDODDLE_Oxford

“Ridiculously Now”

Social and Climate Impact of On-Demand Digital Services

Pippa Amanta
felippa.amanta@ouce.ox.ac.uk

BSA Virtual Conference
4 April 2024

European Research Council
Consolidator Grant
#101003083

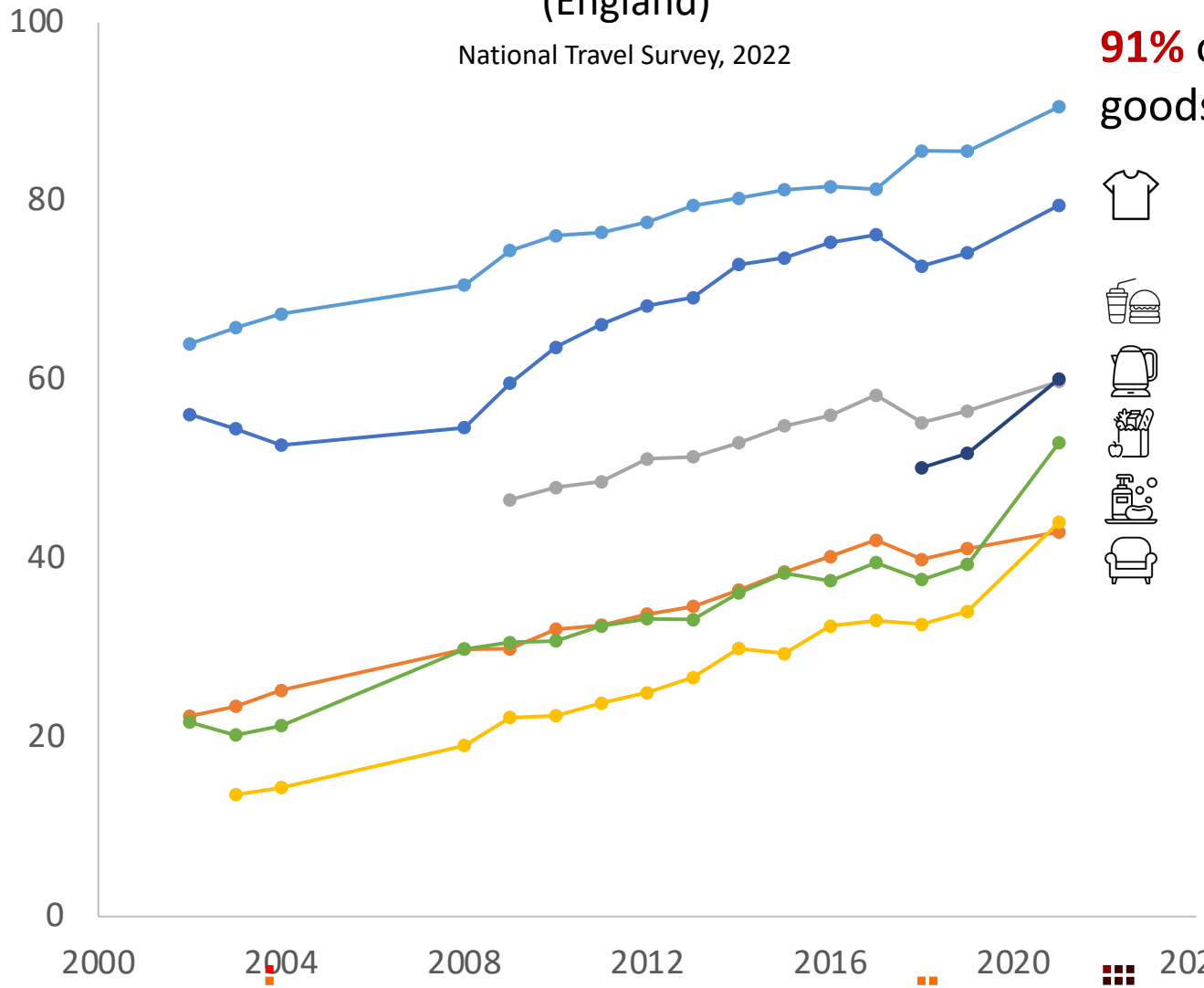
Photo by PhotoMIX on Pexels

Environmental Change Institute
School of Geography and the Environment
University of Oxford

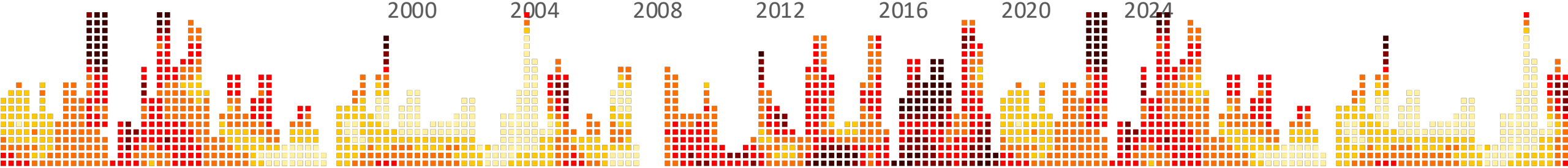
iDOODLE

% of households ordering goods (England)

National Travel Survey, 2022



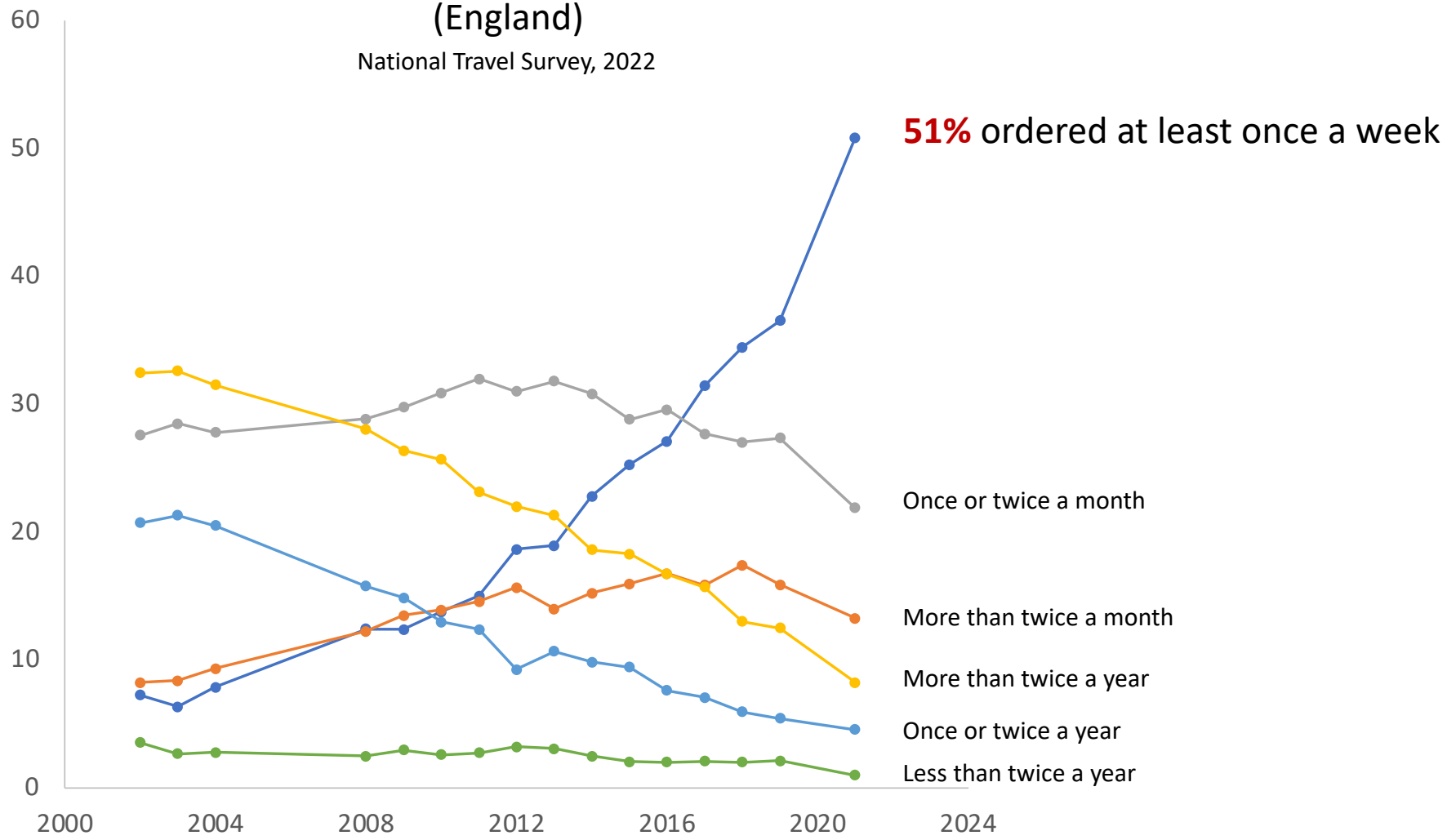
91% of households ordered goods to be delivered



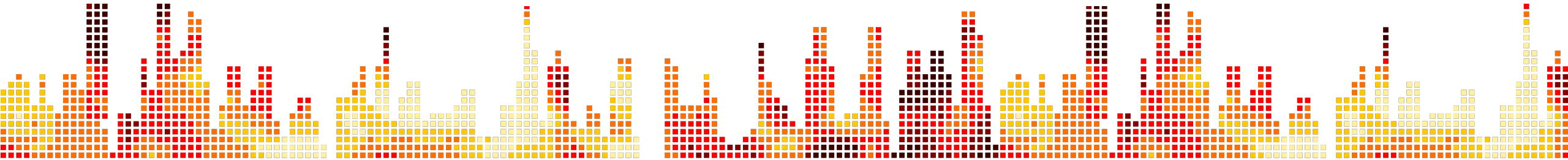
iDOODLE

How often goods are ordered (England)

National Travel Survey, 2022



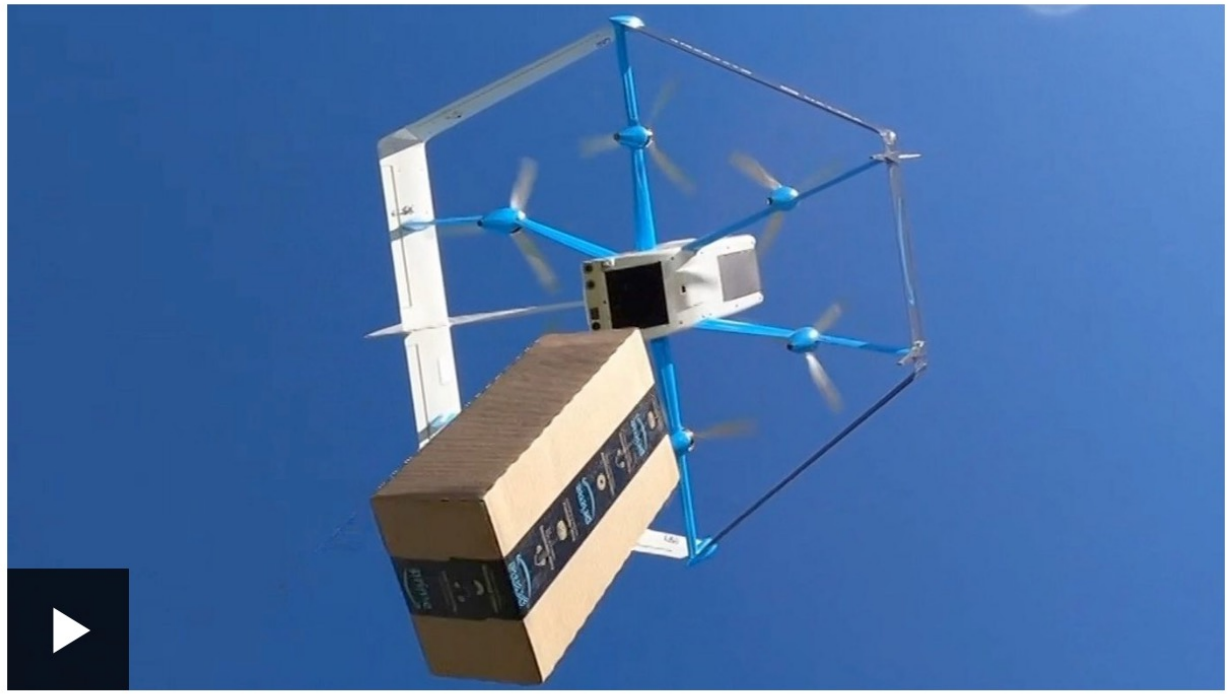
51% ordered at least once a week



iDOODLE

Amazon pledges parcels in an hour using drone deliveries

19 October 2023 · Comments



How Amazon uses drones to deliver from the sky

Checkout

Baby Beauty Brands Sports Clearo

ation

riendly couriers the very next day*.
or more information click here

e or next day delivery available

iDOODLE

On-Demand Digital Services

Services that enable companies or individuals to supply products or services **immediately** at the request of the customer through **the use of online applications or platforms.**

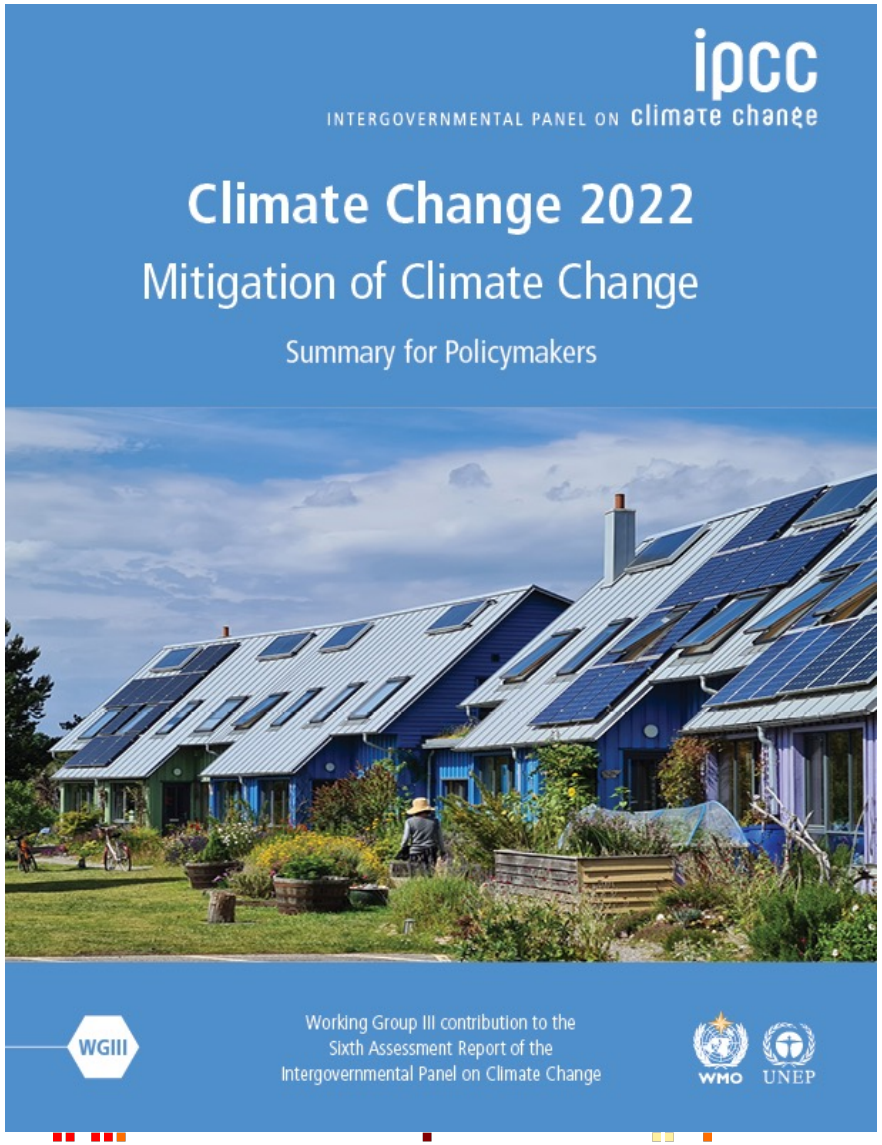
More time sensitive

Less time sensitive

Domains	Example of Application	Themes			
		On-Demand	Sharing Economy	Dematerialisation	Subscription
Entertainment	Netflix	X		X	X
	Spotify	X		X	X
	Kindle	X		X	
Travel	Uber	X	X		
	BlaBlaCar		X		
	AirBnB		X		
Retail	Deliveroo	X			
	Getir	X			
	Amazon Prime	X			
	Hello Fresh				X
	Olio		X		

Taylor, T. A. (2018). On-Demand Service Platforms. *Manufacturing & Service Operations Management*, *20*(4), 704–720. https://doi.org/10.1287/msom.2017.0678

Van Der Burg, R. J., Ahaus, K., Wortmann, H., & Huitema, G. B. (2019). Investigating the on-demand service characteristics: An empirical study. *Journal of Service Management*, *30*(6), 1757–5818. https://doi.org/10.1108/JOSM-01-2019-0025



Chapter 5:
Demand, Services and Social Aspects of Mitigation

Alternative service provision systems, for example **those enabled through digitalisation**, sharing economy initiatives and circular economy initiatives, have to date **made a limited contribution to climate change mitigation** (*medium confidence*).

While **digitalisation** through specific new products and applications **holds potential for improvement** in service-level efficiencies, without public policies and regulations, it also has **the potential to increase consumption and energy use.**

Creutzig, F., Roy, J., Devine-Wright, P., Díaz-José, J., Geels, F., Grubler, A., Maizi, N., Masanet, E., Mulugetta, Y., Onyige, C. D., Perkins, P. E., Sanches-Pereira, A., & Weber, E. U. (2022). Demand, services and social aspects of mitigation. In P. R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, & J. Malley (Eds.), *IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 503–612). Cambridge University Press. https://doi.org/10.1017/9781009157926.007

iDODDLE

ICT Energy Effects

Horner, N. C., Shehabi, A., & Azevedo, I. L. (2016). Known unknowns: Indirect energy effects of information and communication technology. *Environmental Research Letters*, *11*(10), 1–20. https://doi.org/10.1088/1748-9326/11/10/103001

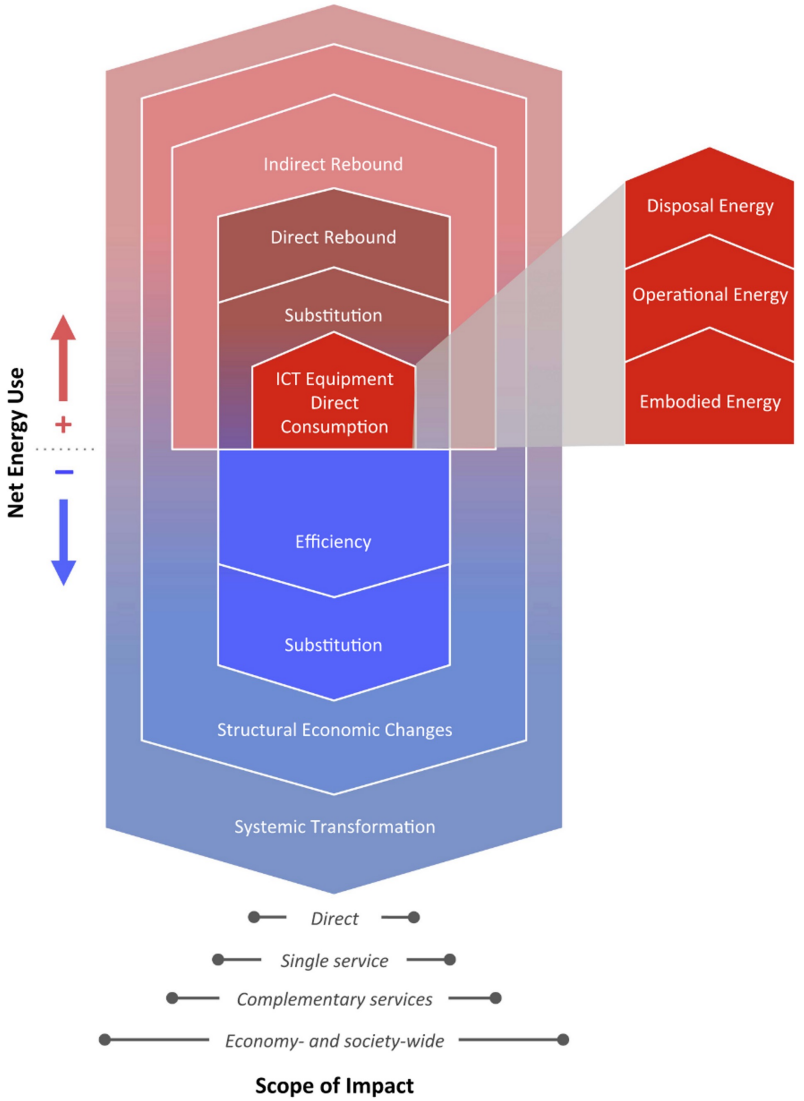


Figure 2. Taxonomy of ICT energy effects. Red effects increase energy use, blue effects decrease energy use, and shading intensity decreases as effect scope increases. (Effect magnitudes are only illustrative and not to scale.)

The net impact of digitalisation on energy is highly dependent on **human behaviour.**

iDODDLE

Research Questions

1. How do households domesticate on-demand digital services?

2. How do on-demand digital services shape households' expectations of needs fulfilment and consumption patterns?

3. What are the energy implications of consumption via on-demand digital services?

Photo by Claudio Schwarz on Unsplash

Sample

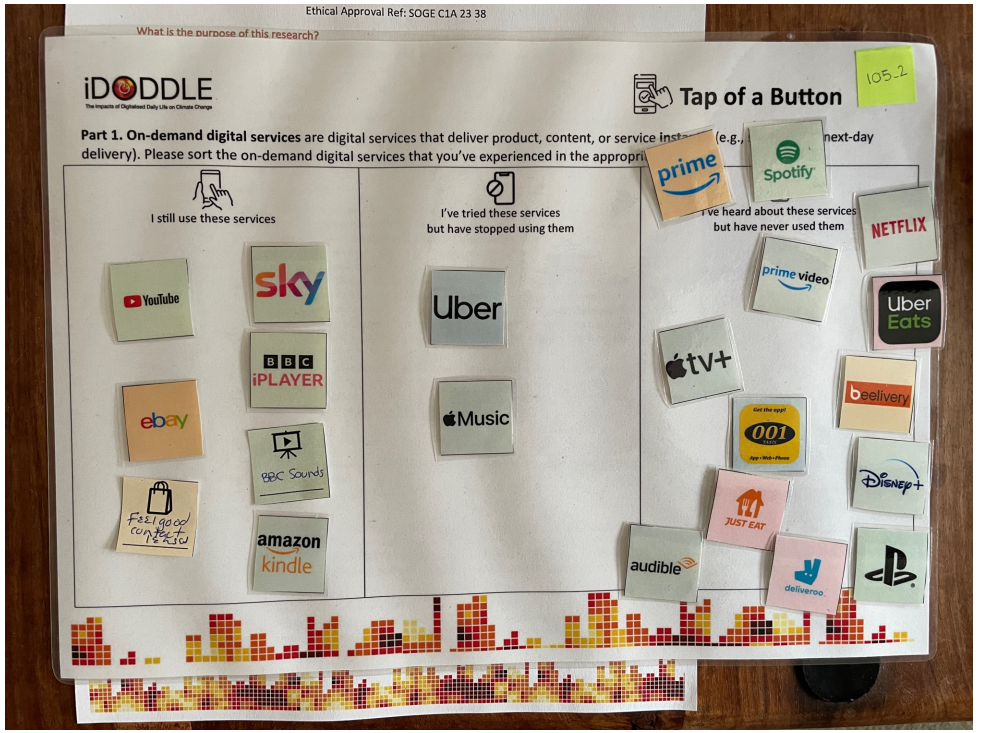
- **iDODDLE Living Lab:** Households in real-world conditions in their own homes but committed to trial, learn, interact and share data with the research team
- 14 households in Oxfordshire, 20 individuals interviewed

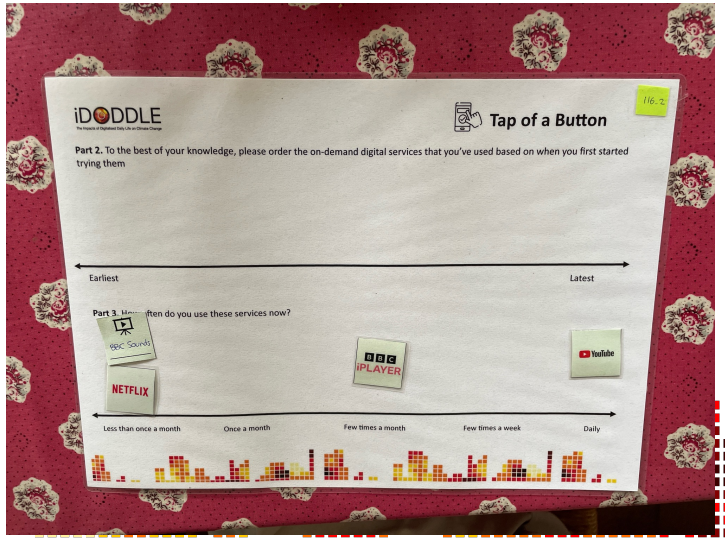
Types of Household		Age Group		Gender	
Single	2	30-39	7	Female	11
Couple, no children	5	40-49	3	Male	9
Single parent, with children	2	50-59	5		
Couple, with children	3	60-69	2		
Empty-nesters couples	2	70-79	2		
		80-89	1		

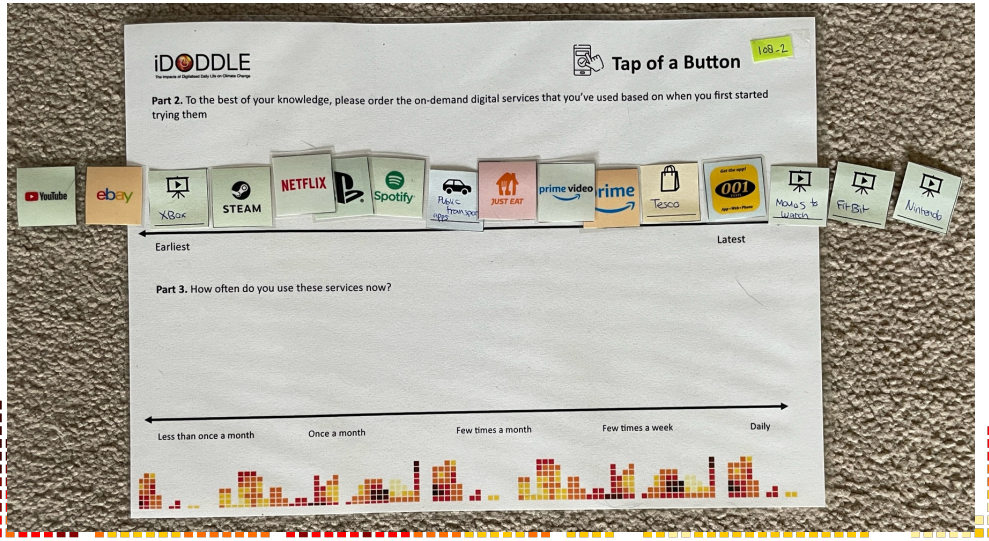
- Limitations: mostly urban, educated, middle- to high-income

Methods

- In-depth semi-structured interviews supported with interactive card games
  - Baseline interview and survey
  - Topical interview
- 3-month on-demand services experience







iDOODLE

Preliminary Findings

Image by vectorjuice on Freepik

1. Domestication of ODS is a **constant negotiation** between the identities and values of the households, current life circumstances, physical constraints, and market forces. The negotiation often causes dissonance between beliefs, intentions, thoughts, and actions of households.

- Domestication is rarely a ”harmonious” process (Sorensen, 1996)
- Domestication is never finished -- re-domestication or adapting and morphing to meet the changing needs of users, the constitution of households and workplaces (Berker et al., 2006)

Amazon. I don't love that it's the Amazon. We do sometimes try and be like, let's buy less off of the Amazon, we don't really want to give Jeff Bezos more money.

It’s that it's very much a situation where we do not like the company, but sometimes the convenience and the price win out over that. Or the ability to get it at all.

iDODDLE

Domestication Pathways

Internal Factors:
- Life circumstances
- Identities
- Values
- Household composition
- Digital skills and access

External Constraints:
- Price
- Geographic and service availability

	Successful (6 households)	**Precarious** (5 households)	**Forced** (3 households)
	• Actively seeking • Early adopter	• Word of mouth, promotion • Wait and see • Covid-19	• Hesitant • Late adopter • Limitations on skills and devices
↓	↓	↓	↓
	• Online-first • Permeates various aspects of daily lives • Concerns around features, privacy	• Integrated into omnichannel experience • Concerns around scams	• Prefers offline alternative unless no other choice
↓	↓	↓	↓
	• Part of everyday conversation • Identity as digitally-engaged	• Product/content rather than service • “Can live without”	• Feeling left behind

2. Households have higher time sensitivity for entertainment, mobility, and food delivery, but retail is gradually catching up. Households see the overarching trend of **digital services delivering products at a faster rate**.

- **Convenience**
- **Delivery assistance**
- **Emergency**
- **Time**
- **Options**
- **“Connection to the world”**

ODS take on meaning as part of the **“fabric of society”** and **fast delivery becomes the new normal.**

The perception of ODS’ pervasiveness feeds back into households’ domestication process.

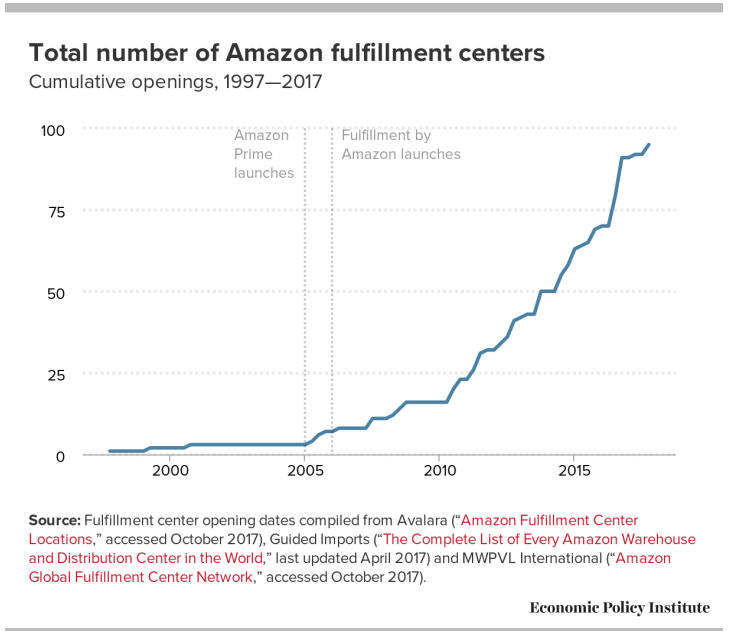
Designed by slidesgo / Freepik

I think they used to maybe be more of a, not luxury, but like a kind of added nice thing to have. Whereas now **they are like so much part of our everyday life and how we... Yeah, learn about the world as well and share things with each other.**

iDOODLE

Demand Pull or Market Push?

- Amazon Prime established in 2007 - “Our vision was that fast delivery should be an everyday experience—rather than an occasional indulgence, and many sceptics thought we were crazy.” (Amazon, 2018)
- Households applaud fast delivery, but say they are “willing to wait”
- Fast delivery vs cost trade-off
  - Only 3 households intend to continue post-trial, while others stop due to cost
- Convenience vs concerns about workers’ welfare, safety, environmental impact



There was, I think, a little time after we stopped having Prime and I was like, oh, this is annoying now that I have to wait this long. I got this thing, I got too used to it. But you know again that recognition is like, wow, nobody needs this product in a day's time. Like, I just don't need anything that fast.

iDOODLE

3. Households perceive that ODS **increases society's expectations of immediate gratification** and **induces consumption**.
   - High users of ODS notice changes among themselves: impatience, free fast delivery as the minimum standard
   - Marketing ploys like Prime Days, minimum order for free delivery, free returns

I think, I probably have less patience… I think maybe slightly less so for like meal food delivery services, because obviously that's constrained a bit more by where you're located and what's available in the place, but, yeah, definitely. I have expectations of being able to get stuff quickly and yeah, having a big selection.

I mean a lot of this stuff is really just enabling more consumption.

In the past when I didn't have prime, I wouldn't use it that often compared to now I think. Yeah, I order something every month, sometimes more than once.

Designed by vectorjuice / Freepik

iDODDLE

Implications on Climate

- Change in carbon emission from switching from physical to online shopping: ΔCO2 -94% to +140%

Figure 1. Carbon footprint of online and store purchases.

Key variables:

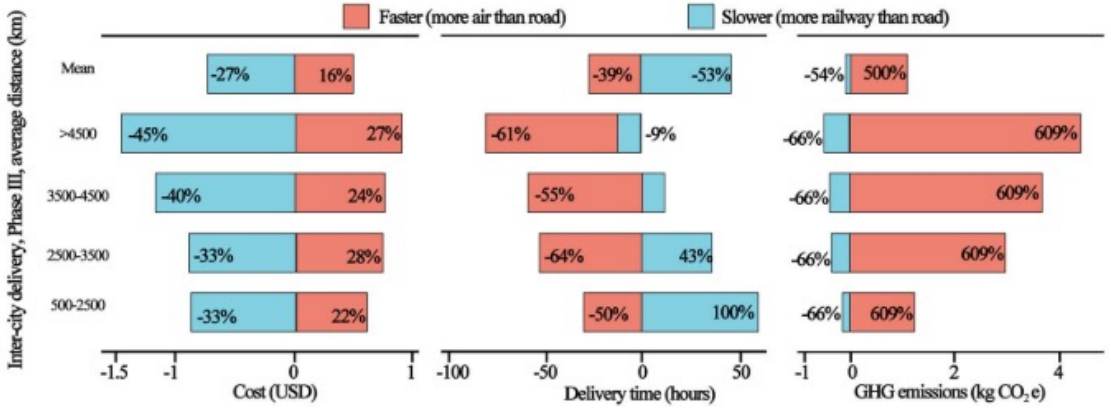
- Consumers' transport modes
- Convenience of returns
- Shopping behaviour (omnichannel shopping)
- Basket size
- Delivery failure

Buldeo Rai, H., Touami, S., & Dablanc, L. (2023). Not All E-commerce Emits Equally: Systematic Quantitative Review of Online and Store Purchases' Carbon Footprint. *Environmental Science & Technology*, *57*(1), 708–718. https://doi.org/10.1021/acs.est.2c00299

iDODDLE

Carbon Cost of Convenience and Speed

"Resource-intensive **expectations of convenience and speed of product delivery** translate into a **dangerous reliance on fossil fuels**." (Meier, 2023)



Kang, P., Song, G., Xu, M., Miller, T. R., Wang, H., Zhang, H., Liu, G., Zhou, Y., Ren, J., Zhong, R., & Duan, H. (2021). Low-carbon pathways for the booming express delivery sector in China. *Nature Communications*, *12*(1), 450–450. https://doi.org/10.1038/s41467-020-20738-4

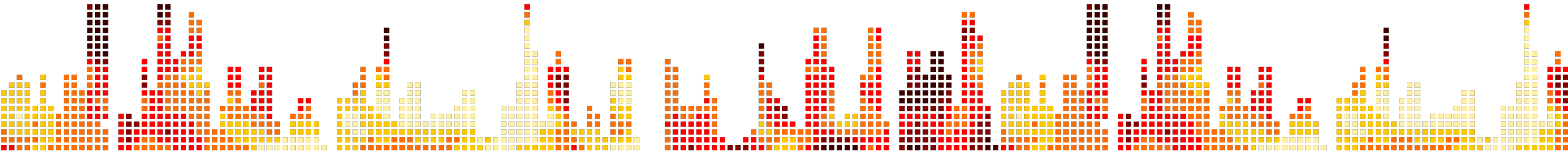
But much harder to quantify:

- Induced consumption as rebound effects
- Over-consumption and its environmental consequences (Miller, 2012; Evans, 2019)

Source: Dribble

Conclusion

- Domestication is uncertain
- The future climate impact of digitalisation depend on societal response and policy decisions now



iDODDLE

Thank you!

Pippa Amanta

PhD Student

Environmental Change Institute

School of Geography and the Environment

University of Oxford, UK

felippa.amanta@ouce.ox.ac.uk

erc European Research Council

Consolidator Grant
#101003083

eci Environmental *Change* Institute
School of Geography and the Environment
University of Oxford

References

- Berker, T., Hartmann, M., Punie, Y., & Ward, K. (2005). *Domestication of media and technology*. McGraw-Hill Education.
- Creutzig, F., Roy, J., Devine-Wright, P., Díaz-José, J., Geels, F., Grubler, A., Maizi, N., Masanet, E., Mulugetta, Y., Onyige, C. D., Perkins, P. E., Sanches-Pereira, A., & Weber, E. U. (2022). Demand, services and social aspects of mitigation. In P. R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, & J. Malley (Eds.), *IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 503–612). Cambridge University Press. https://doi.org/10.1017/9781009157926.007
- Evans, D.M. (2019). What is consumption, where has it been going, and does it still matter? *The Sociological Review*, *67*(3), 499–517. https://doi.org/10.1177/0038026118764028
- Horner, N. C., Shehabi, A., & Azevedo, I. L. (2016). Known unknowns: Indirect energy effects of information and communication technology. *Environmental Research Letters*, *11*(10), 1–20. https://doi.org/10.1088/1748-9326/11/10/103001
- Meier, L. M. (2023). *Consumer Society and Ecological Crisis*.
- Miller, D. (2012). Consumption and its consequences. London, UK: Polity.
- Sørensen, K. H. (1996). *Learning technology, constructing culture. Sociotechnical change as social learning* (18/96; STS Working Paper). https://doi.org/10.13140/RG.2.2.30403.71206
- Taylor, T. A. (2018). On-Demand Service Platforms. *Manufacturing & Service Operations Management*, *20*(4), 704–720. https://doi.org/10.1287/msom.2017.0678
- Van Der Burg, R. J., Ahaus, K., Wortmann, H., & Huitema, G. B. (2019). Investigating the on-demand service characteristics: An empirical study. *Journal of Service Management*, *30*(6), 1757–5818. https://doi.org/10.1108/JOSM-01-2019-0025

iDODDLE