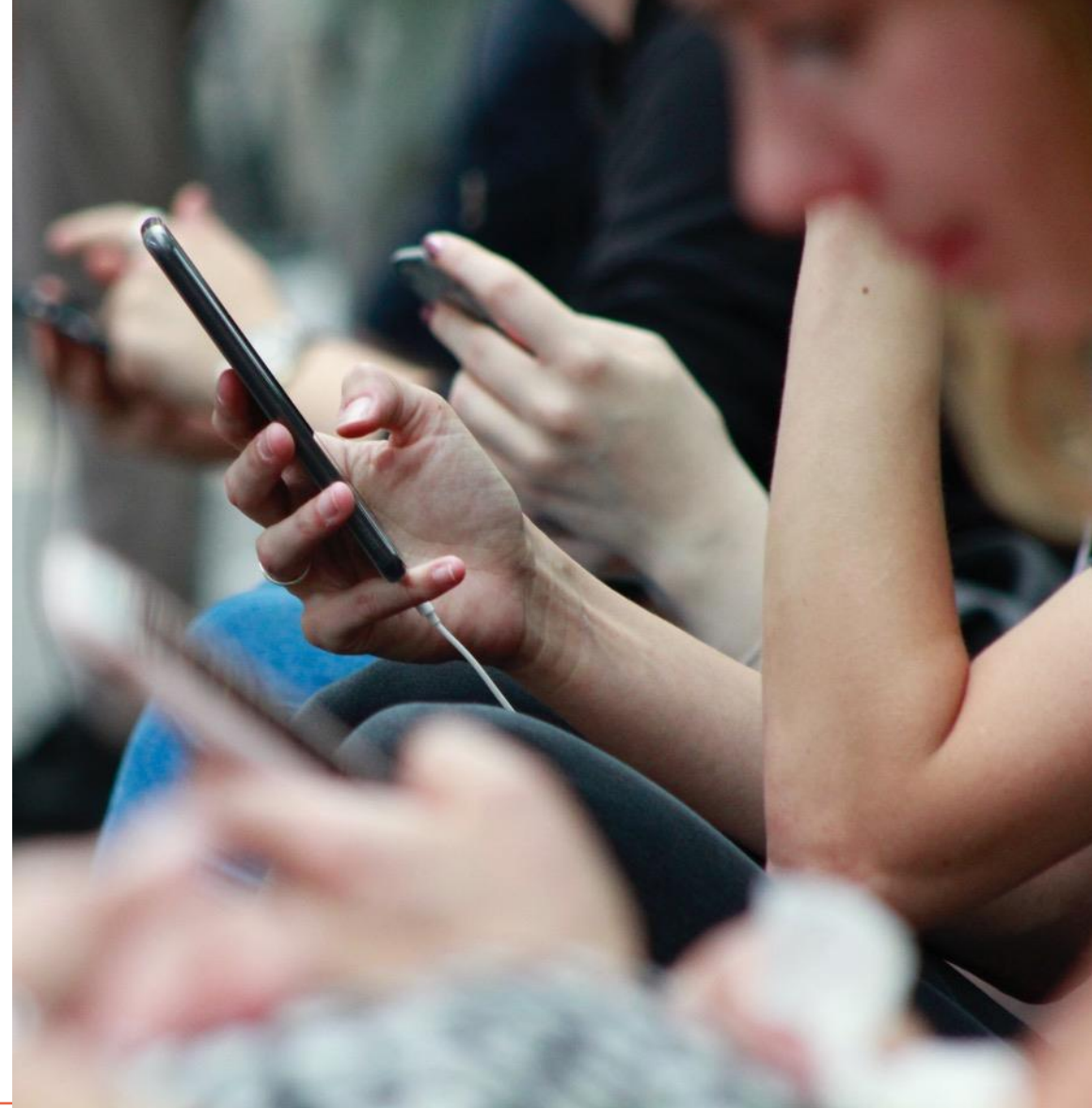


Playful Platform Public engagement: How our digital lives shape a sustainable future

Friday 28 February 2025

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Environmental Change Institute,
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European
Research
Council

Starting Grant #678799
Consolidator Grant #101003083

EXECUTIVE SUMMARY

Report of the UN Economist Network for the UN 75th Anniversary Shaping the Trends of Our Time

SEPTEMBER 2020



Digital technology and the planet

Harnessing computing
to achieve net zero

THE
ROYAL
SOCIETY



WBGU

German Advisory Council on Global Change

Flagship Report

Towards Our Common Digital Future

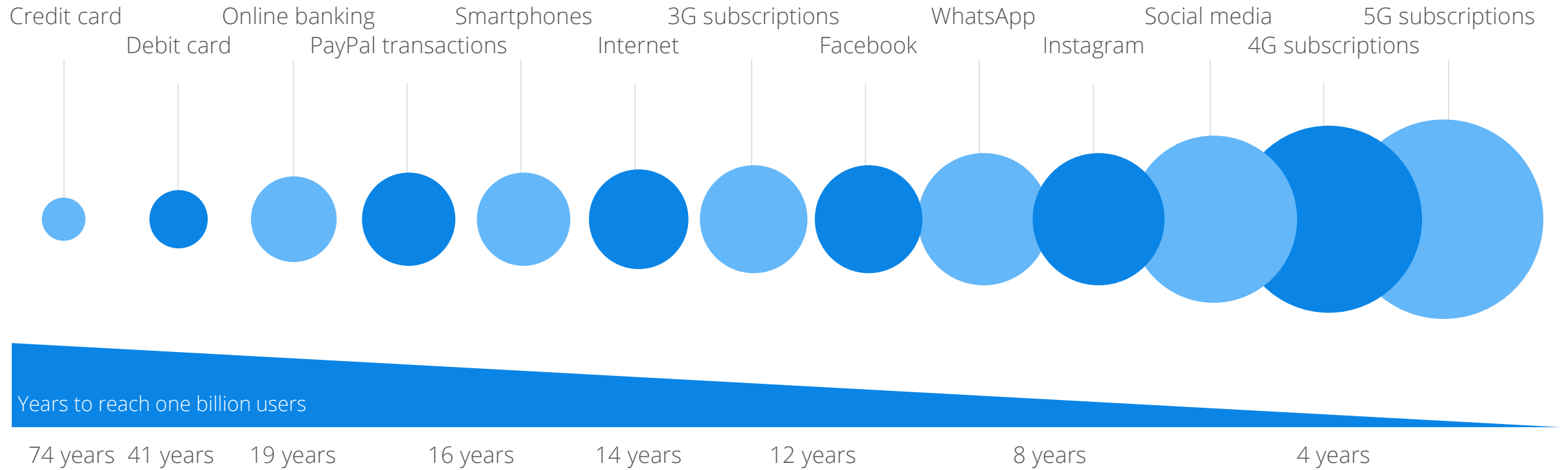




Digitalisation = collecting, exchanging, storing, analysing data: cheaply, quickly, connectedly.

Yearly growth of users and time needed to reach one billion users

● ● Indicative user growth/year



115 Sources: Statista, eMarketer, Ericsson mobility report, Facebook, GSA, Instagram, ITU, Jefferies & companies, Our world in data, Paypal, Strategy Analytics

Changes in consumer behavior during COVID-19

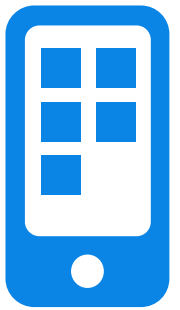


44%



increase of in-house social media consumption^{1,2}

70%



of people spent more time on their smart-phone/mobile phone^{1,3}

80%



higher traffic on media sites⁴

67%



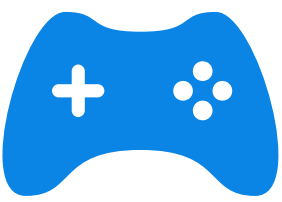
of people watched more news coverage¹

28%



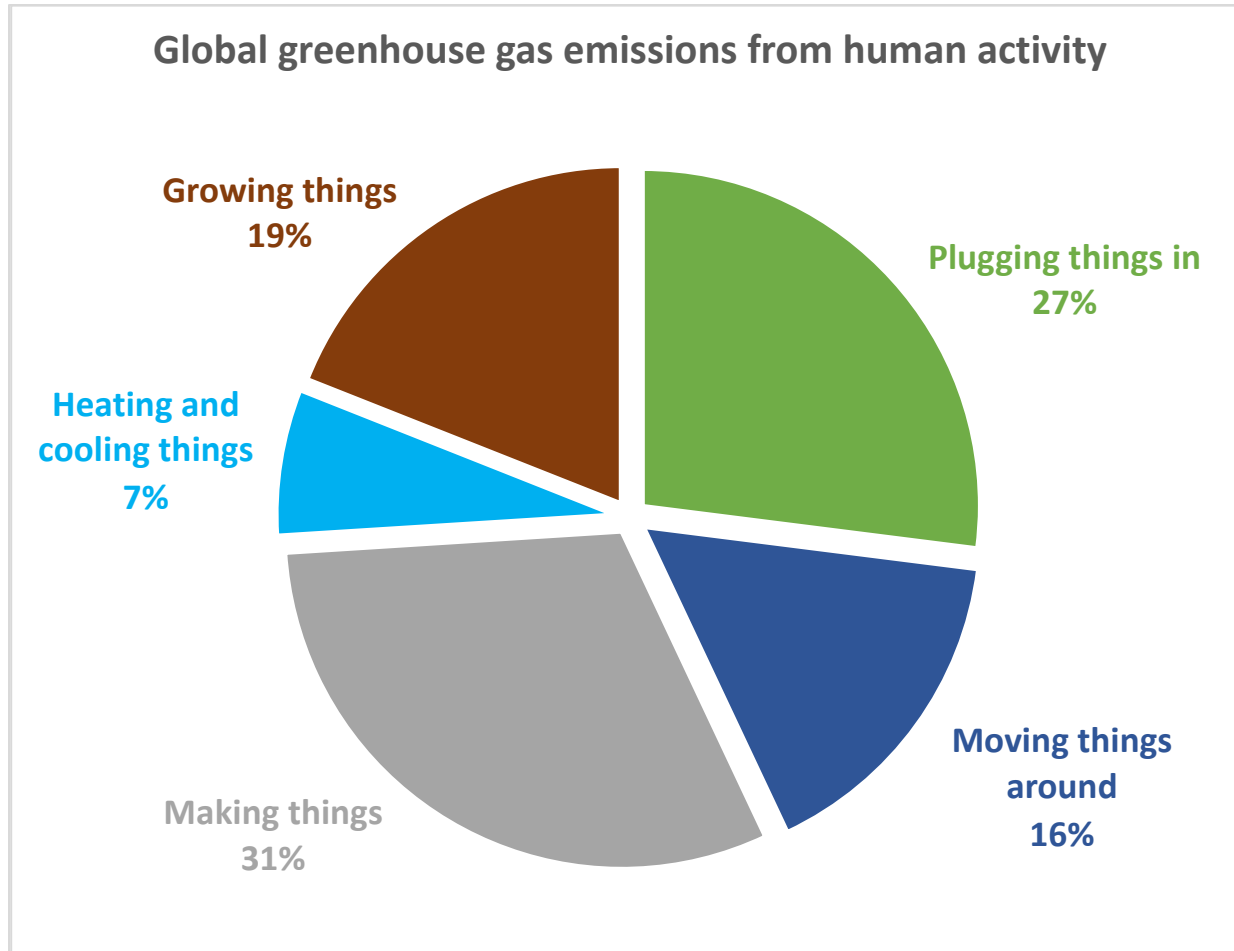
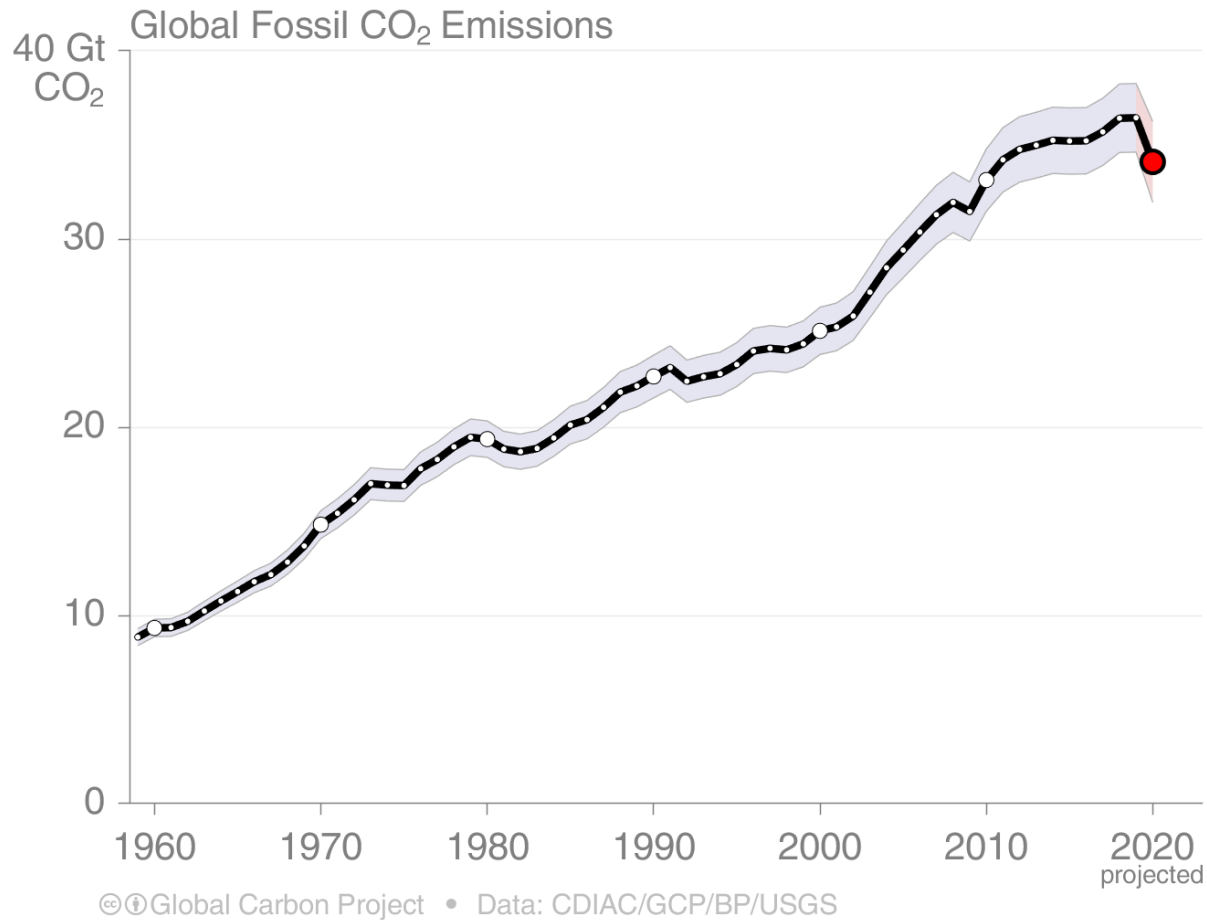
more video streaming users for key players in 2020

39%



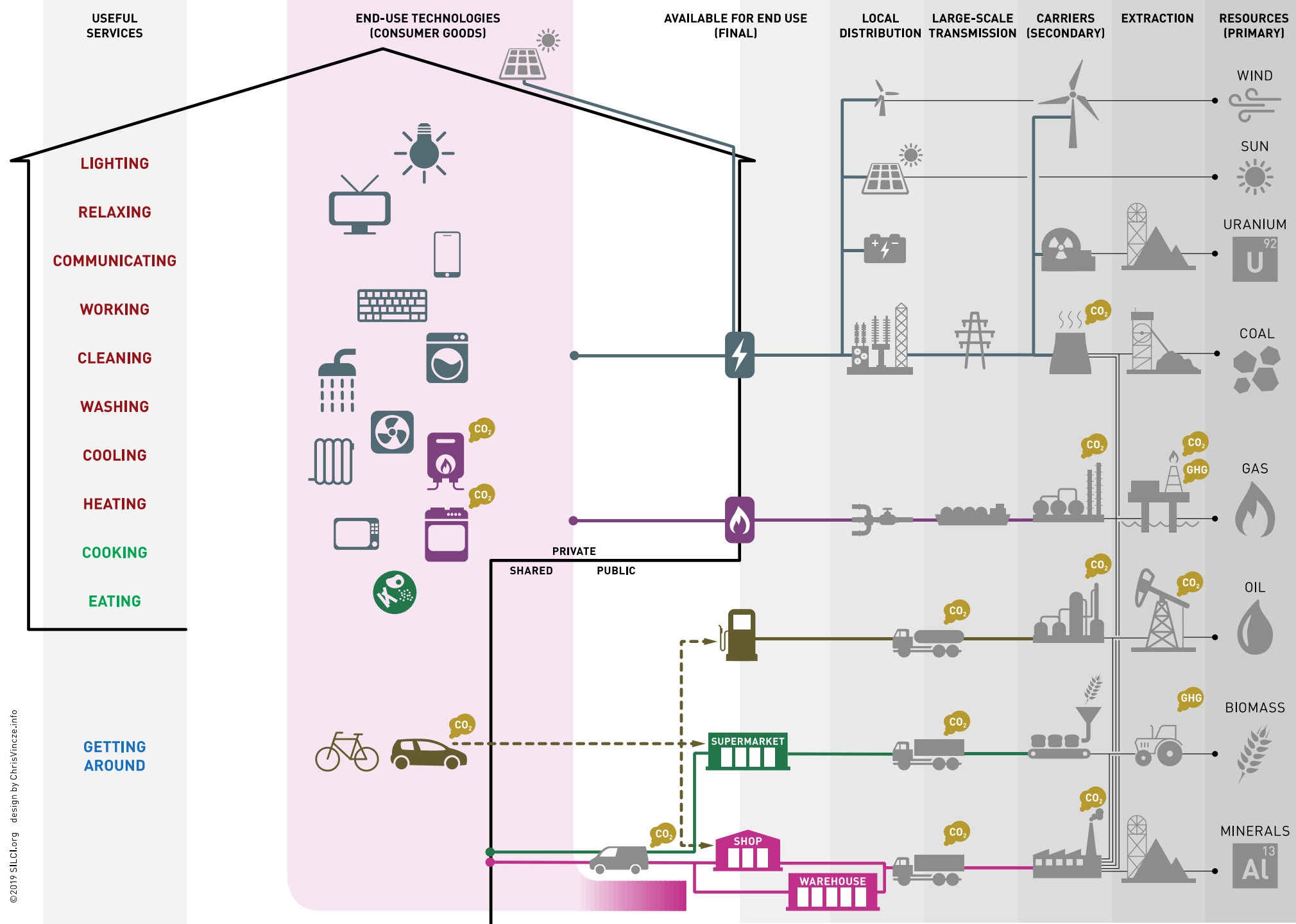
increase in U.S. video game sales in 2020⁵

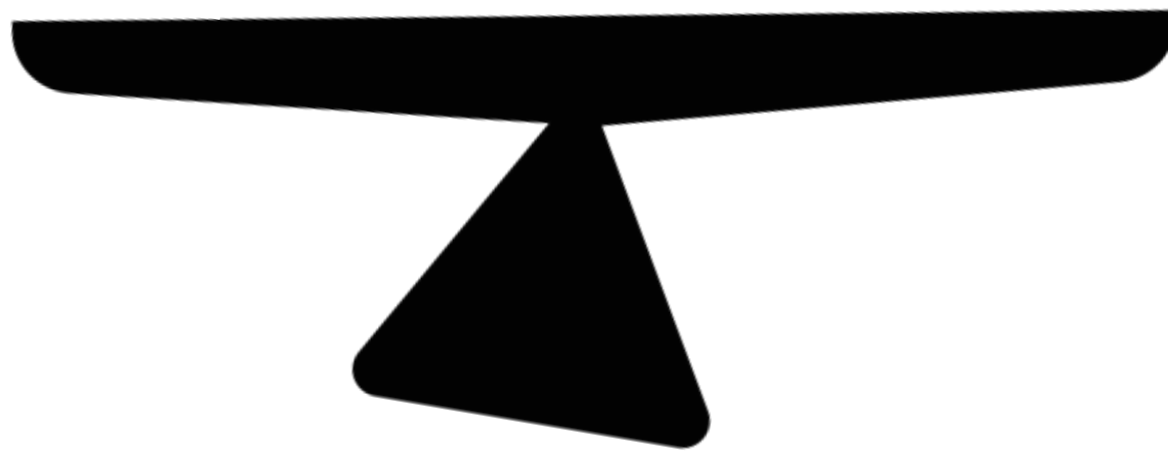
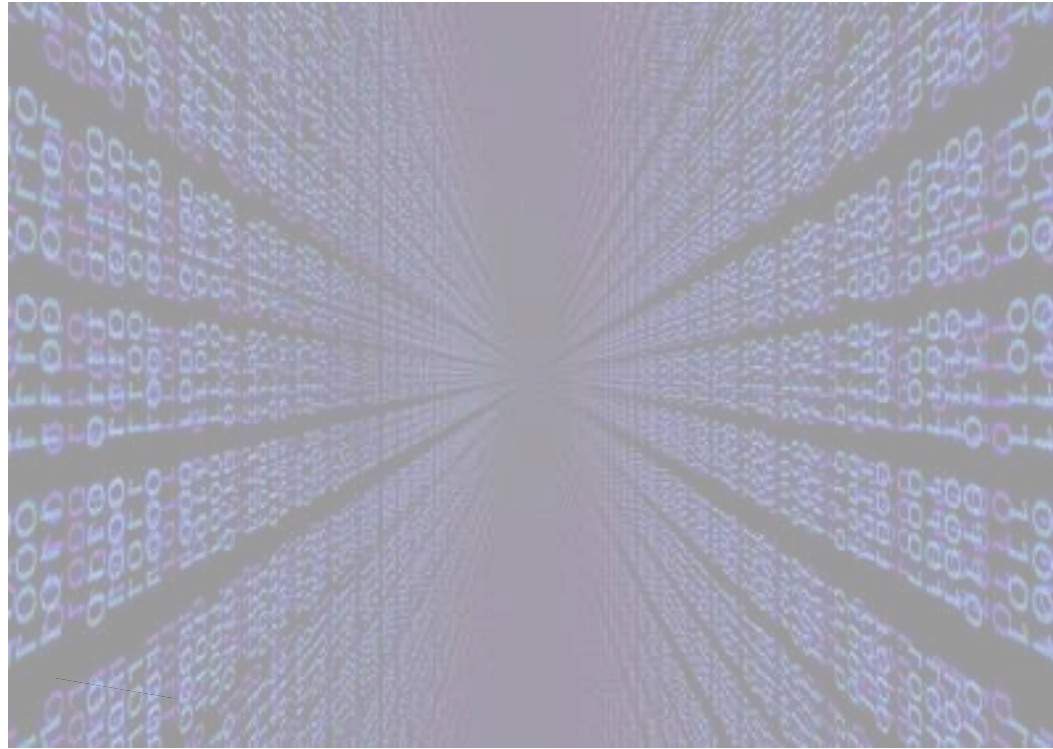
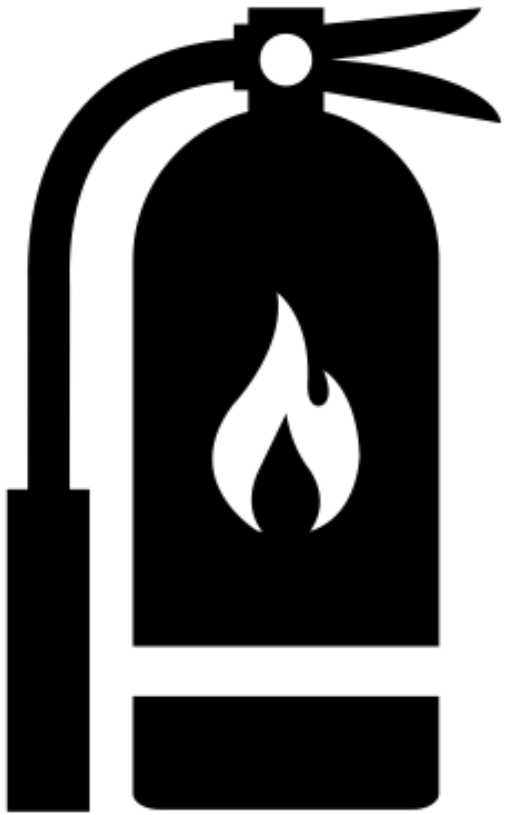
Carbon emissions need to be close to zero by 2050 ... impacting all aspect of our daily lives.



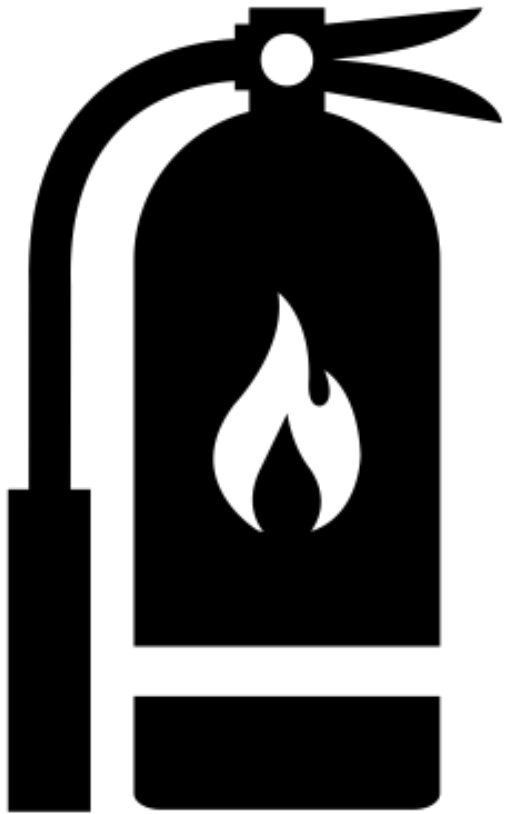
Source: Global Carbon Project (2020) Global Carbon Budget.
[<https://www.globalcarbonproject.org/carbonbudget/20/presentation.htm>]

Source: Breakthrough Energy.
[<https://www.breakthroughenergy.org/our-challenge/the-grand-challenges>]



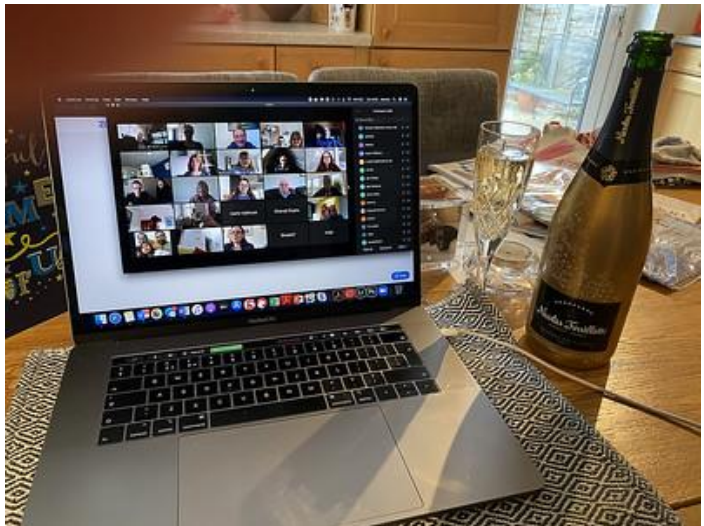




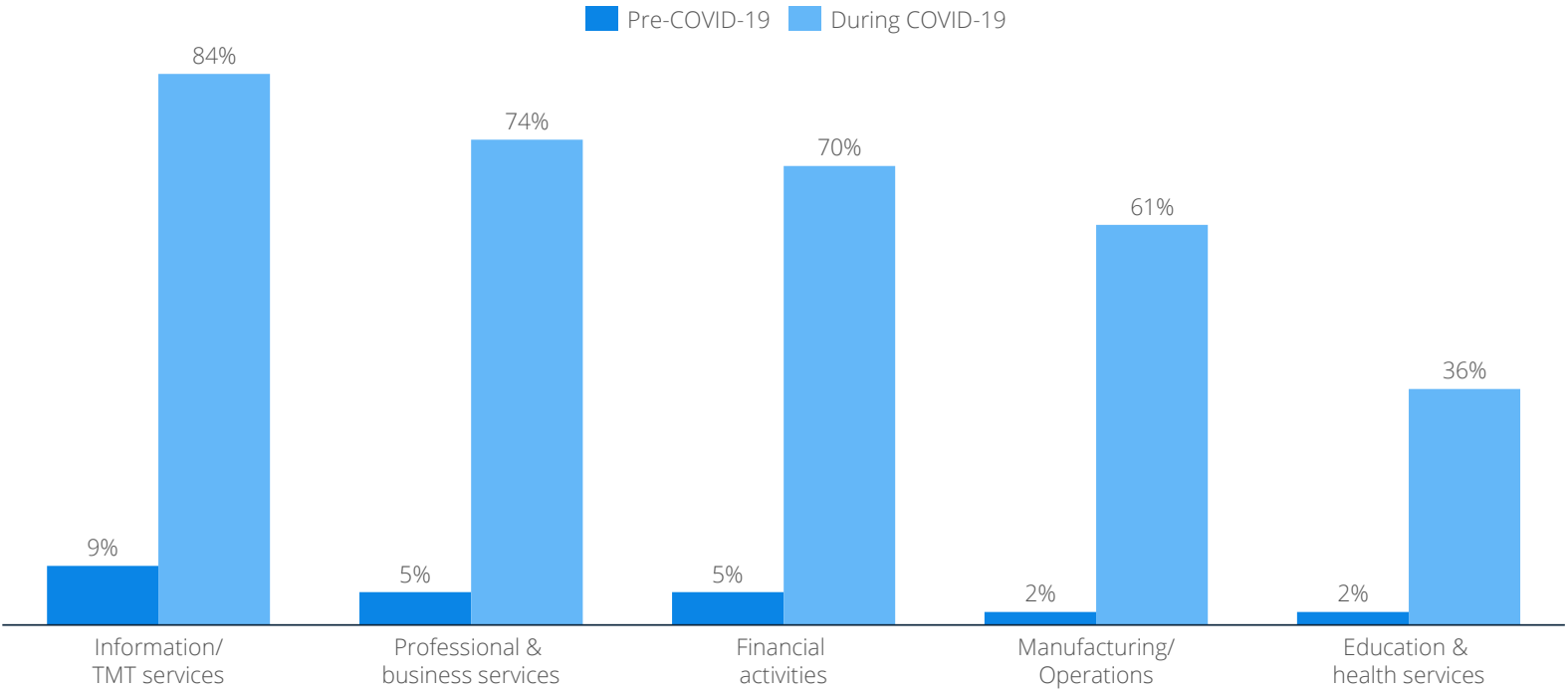


Substitute

substitute physical activity for digital activity



Share of employees working remotely full time during COVID-19 in 2020²



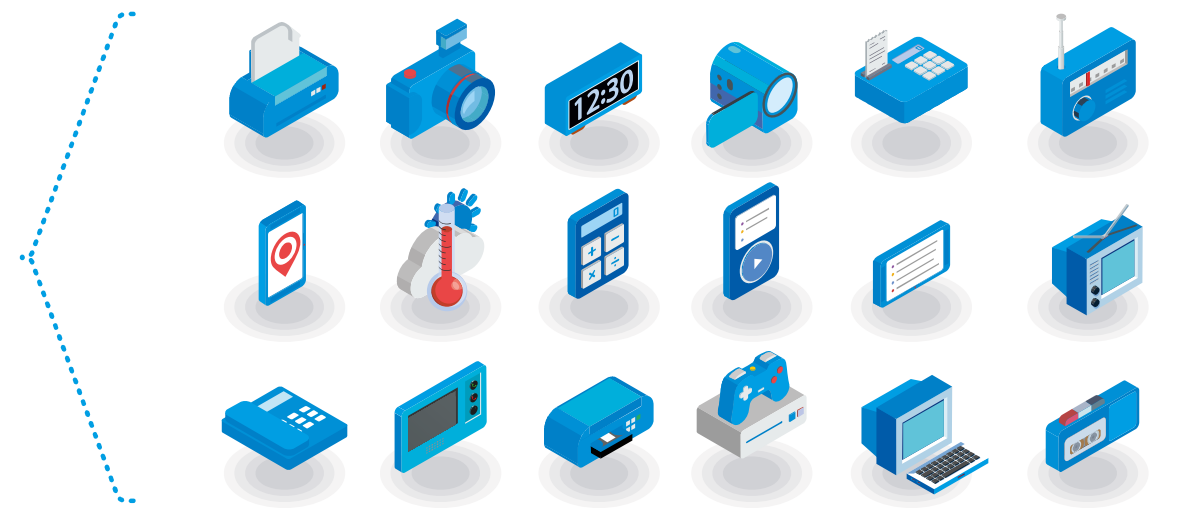
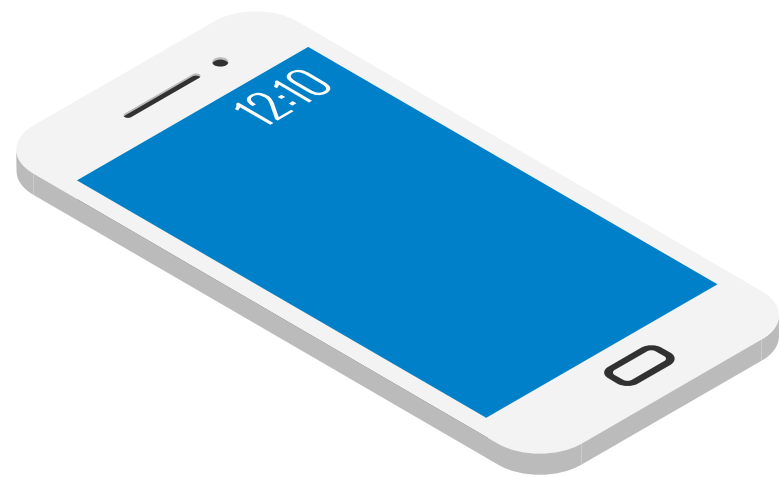
Source: p80, Statista (2020). Digital Economy Compass 2020.

Access
Coordinate
Exchange
Control
Integrate
Track

Substitute

Access

access digital services instead of owning physical goods



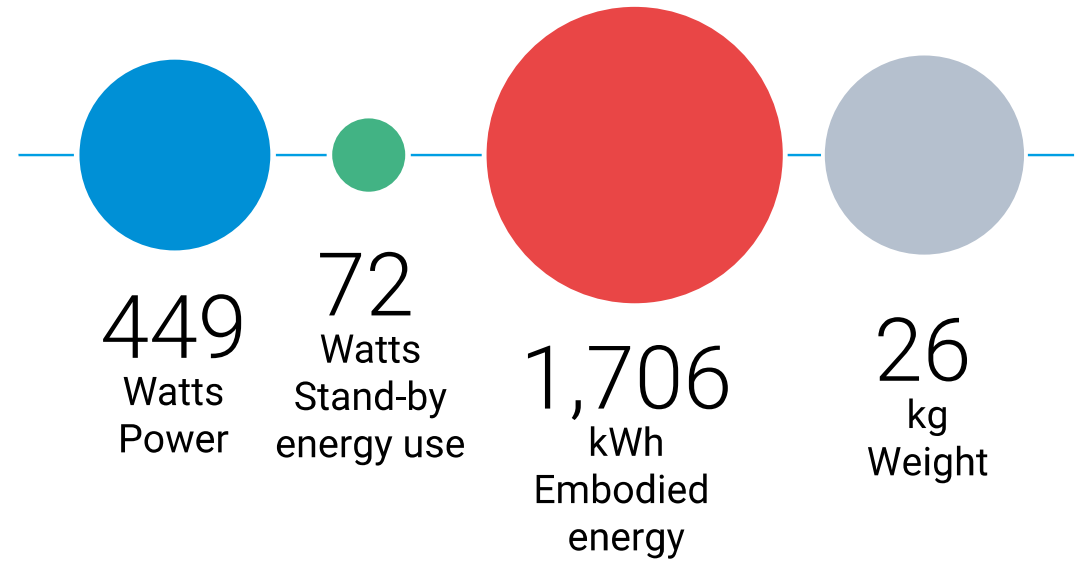
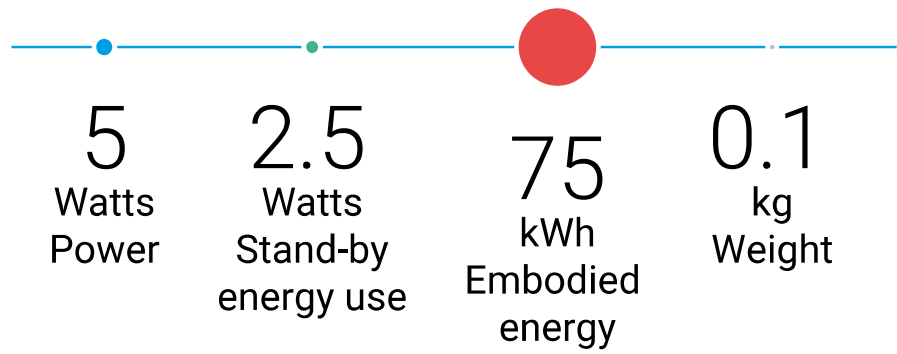
Coordinate

Exchange

Control

Integrate

Track



Source: Fig5.2, UNEP (2019) *Emissions Gap Report*, based on Grubler, Wilson et al. (2018) *Nature Energy*.

Substitute

Access

Coordinate

*coordinate
how services
are provided*

Exchange

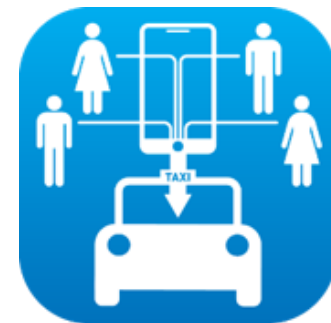
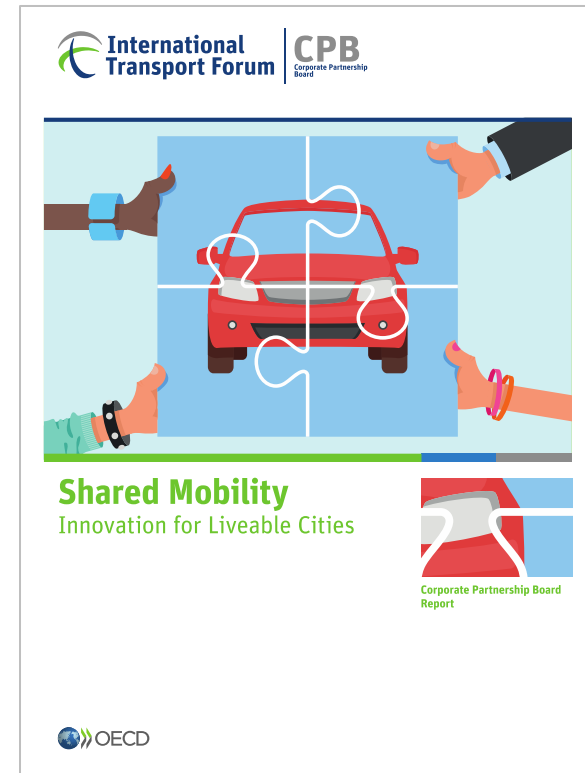
Control

Integrate

Track



Photo Credit: ShareNow @Unsplash.



Substitute

Access

Coordinate

Exchange

*exchange
physical
goods and
reduce waste*

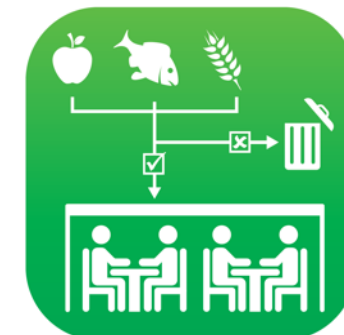
Control

Integrate

Track



Photo Credit: <https://gravesmillstorage.com/too-much-stuff/>



Substitute

Access

Coordinate

Exchange

Control

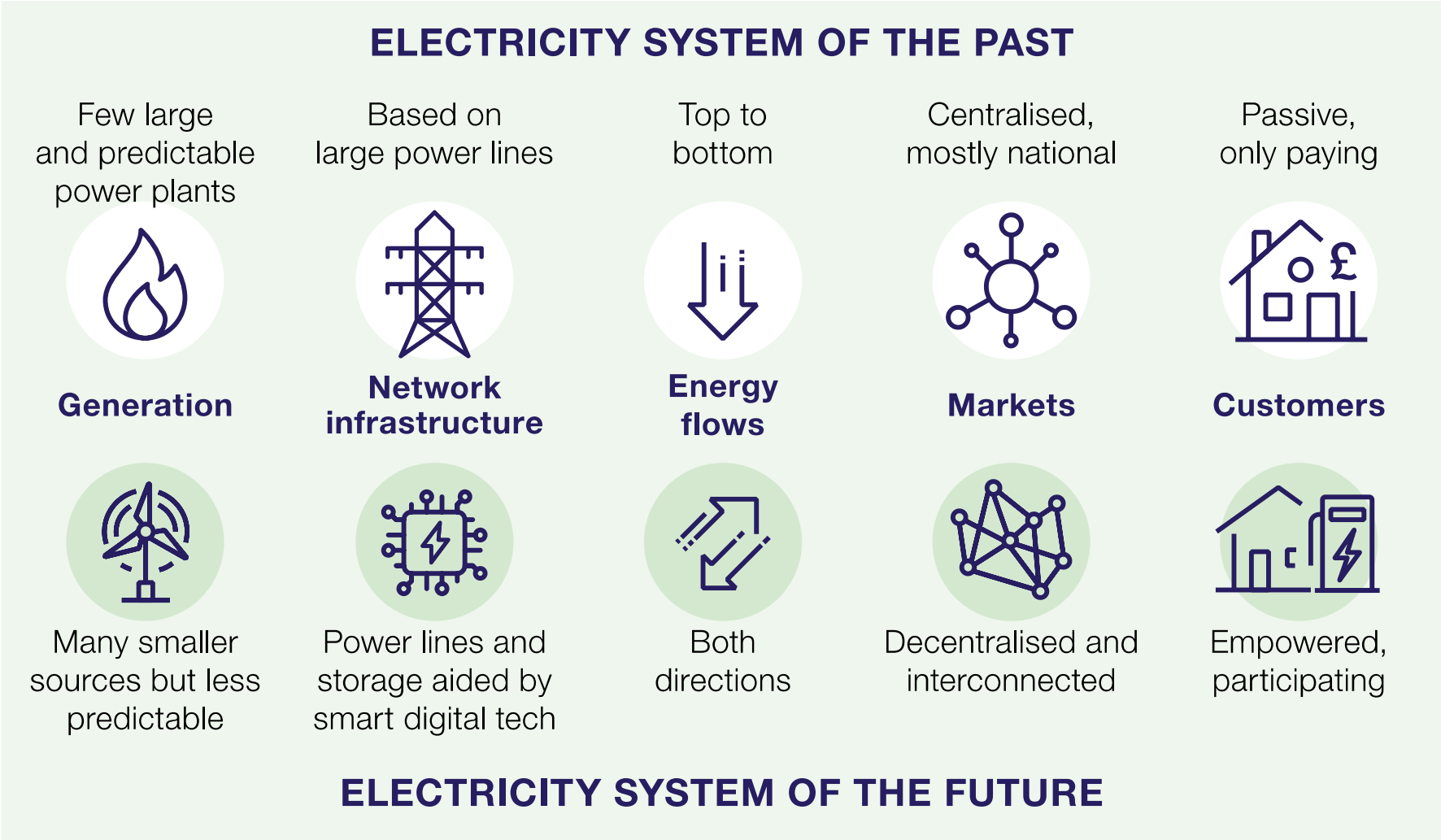
*control and
manage use
of energy and
other
resources*

Integrate

Track



Substitute
 Access
 Coordinate
 Exchange
 Control
Integrate
integrate systems so they emit less carbon
 Track

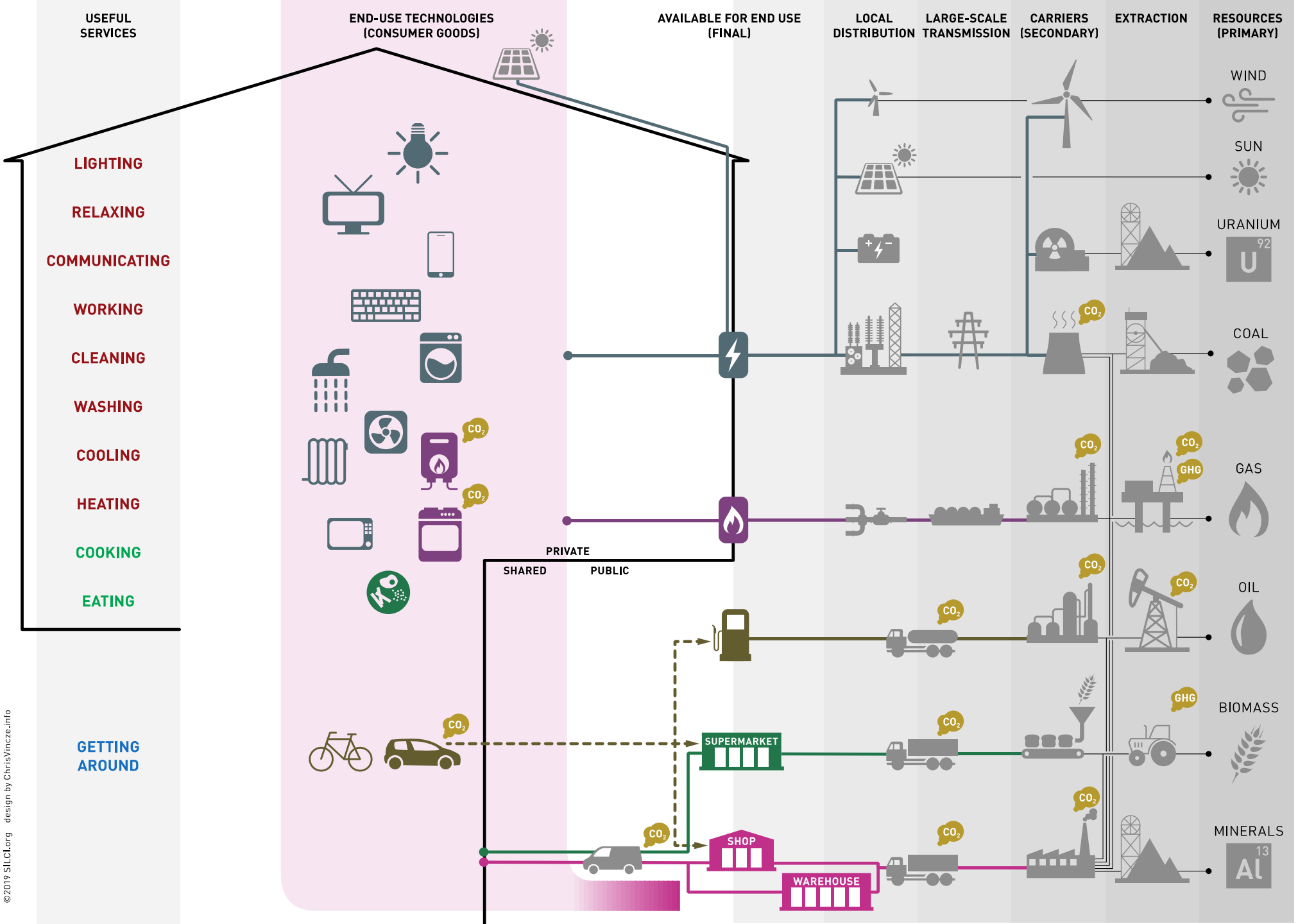


Source: p70, BEIS (2020) Energy White Paper: Powering our net zero future.

Substitute
 Access
 Coordinate
 Exchange
 Control
 Integrate
Track

track carbon emissions of goods and services through supply chains

©2019 SILC1.org design by ChrisVincez.info



Source: Wilson et al. (2020) Annual Review of Environment & Resources.

Substitute
Access
Coordinate
Exchange
Control
Integrate
Track



Rebound

if something is easier or cheaper, you may do more of it ... using more energy in the process

Intensify

Distrust

Divide



Rebound

Intensify

intensify new forms of energy-hungry activity



Distrust

Divide

Photos: johnlewis.com. (Note that both these energy-using products are available for purchase on johnlewis.com, but alternative products and retailers are also available!).

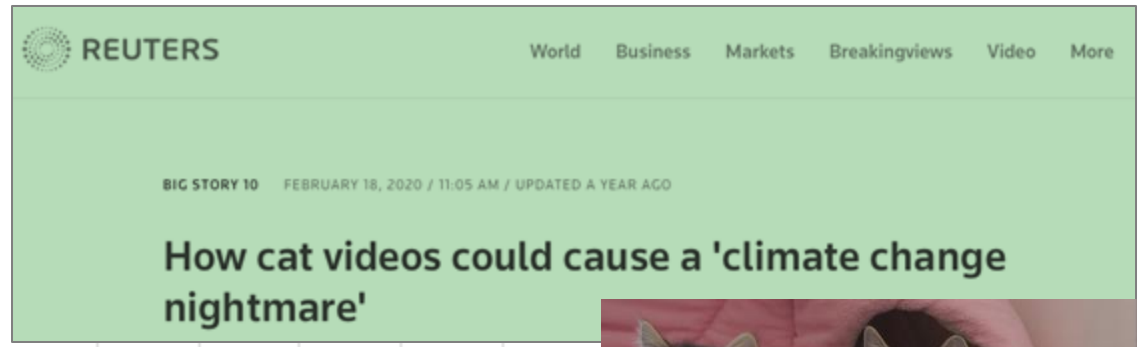
Rebound

Intensify

intensify new forms of energy-hungry activity

Distrust

Divide



Global average emissions per half-hour of streaming video (kgCO₂e)

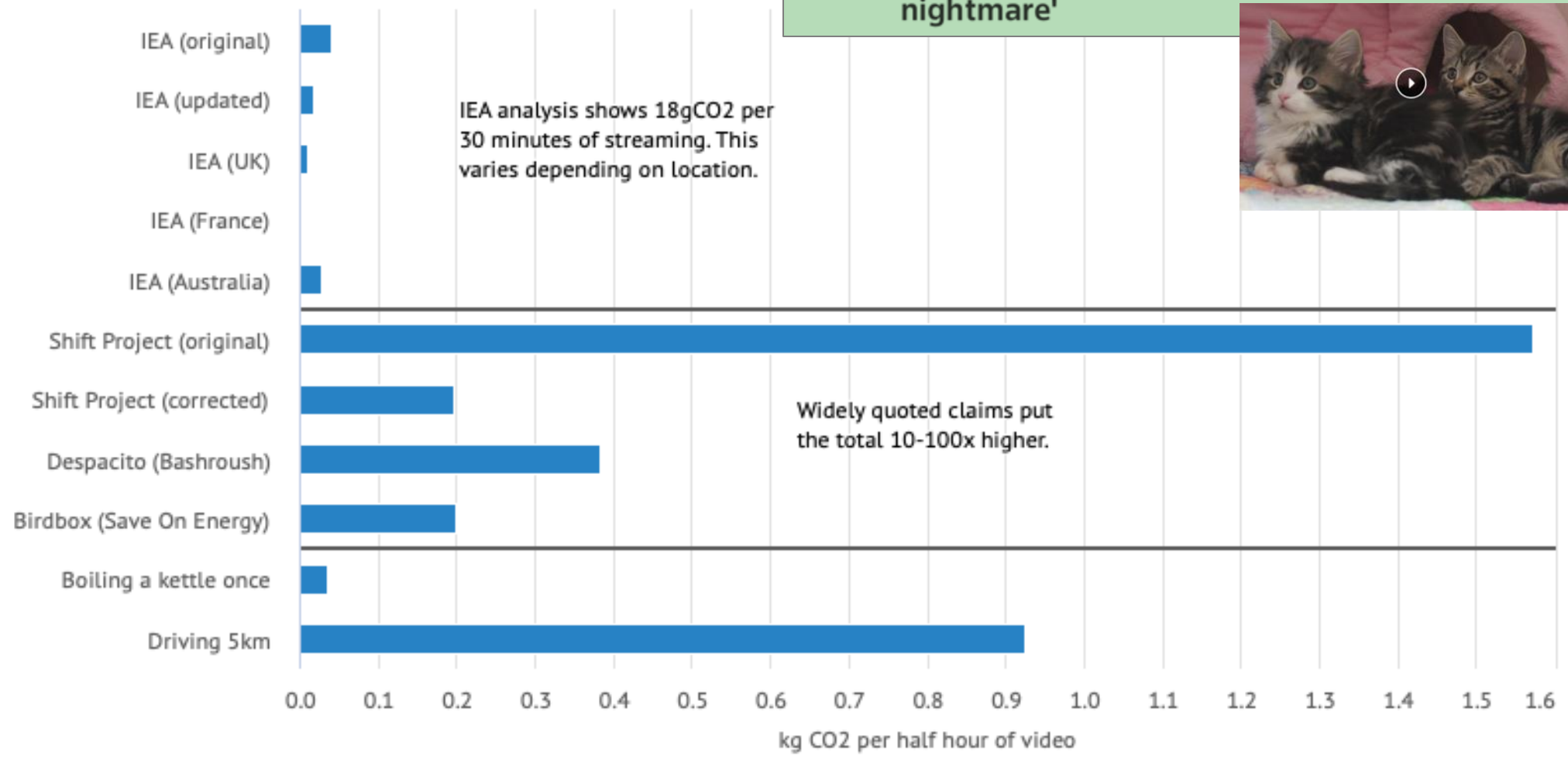


Figure: George Kamiya (IEA) in Carbon Brief. [<https://www.carbonbrief.org/factcheck-what-is-the-carbon-footprint-of-streaming-video-on-netflix>]. News Headline: [<https://www.reuters.com/article/us-georgia-tech-climatechange-feature-tr-idUSKBN20C1A7>]. Cat Video: Hehaden @Flickr. CC BY-NC 2.0.

Rebound

Intensify

Distrust

distrust data flows and digital service providers

"Recent inventions and business methods call attention to the next step which must be taken for the protection of the person, and for securing 'the right to be let alone'."



Divide

Rebound

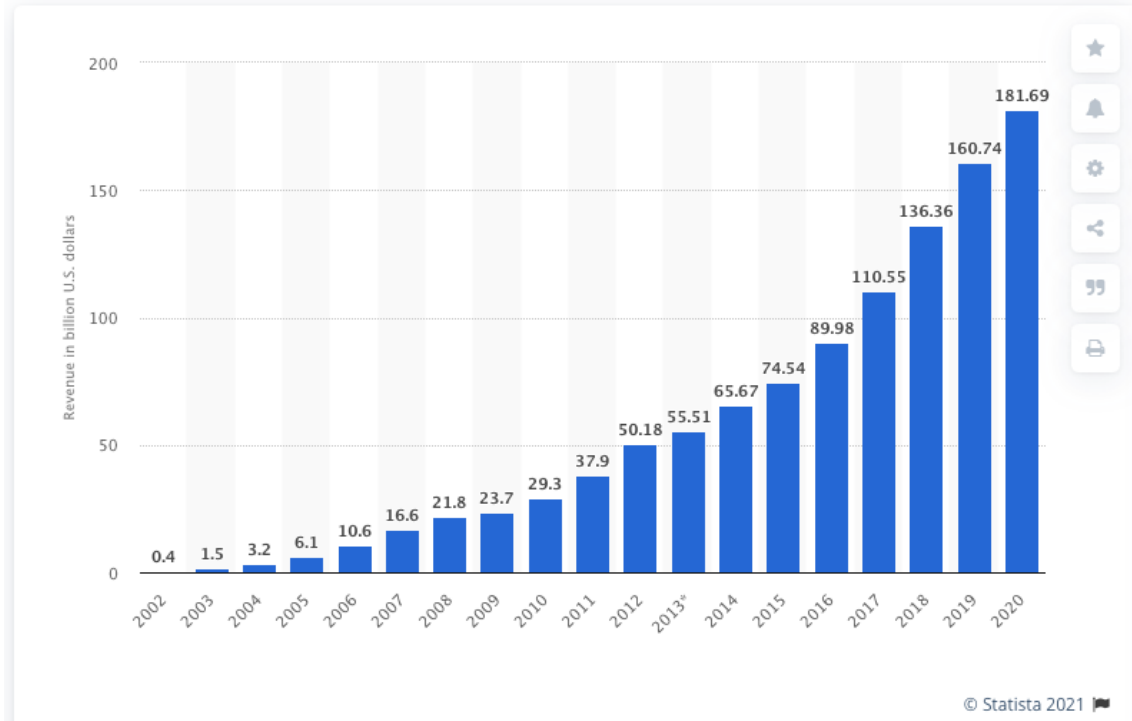
Intensify

Distrust

distrust data flows and digital service providers

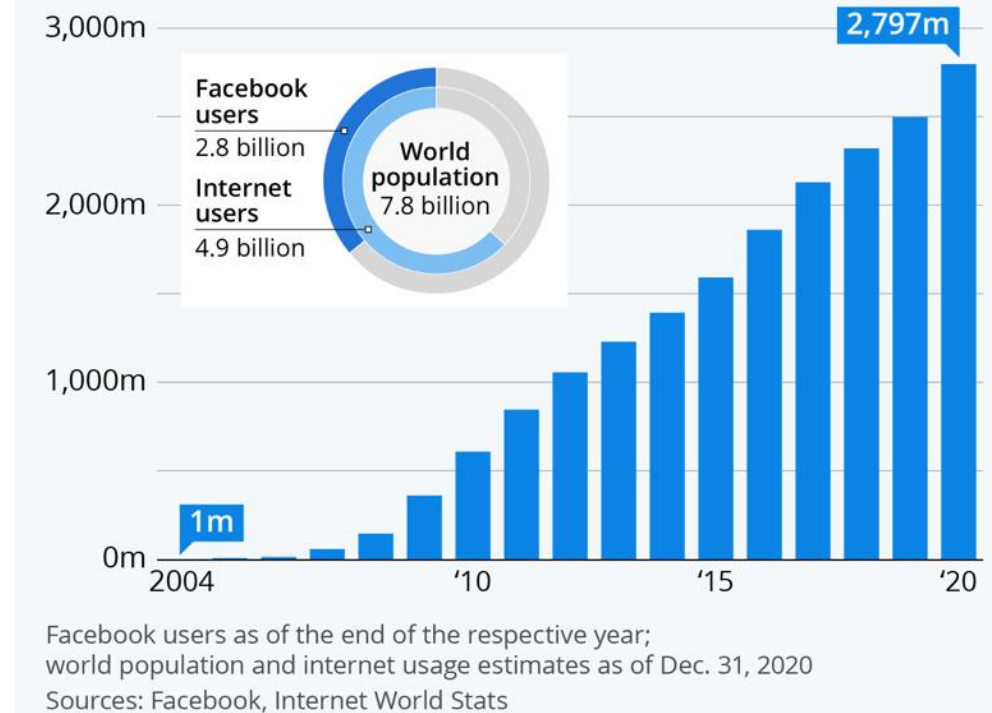
Divide

Annual revenue of Google from 2002 to 2020
(in billion U.S. dollars)



Source: <https://www.statista.com/statistics/266206/googles-annual-global-revenue/>

Number of monthly active Facebook users worldwide

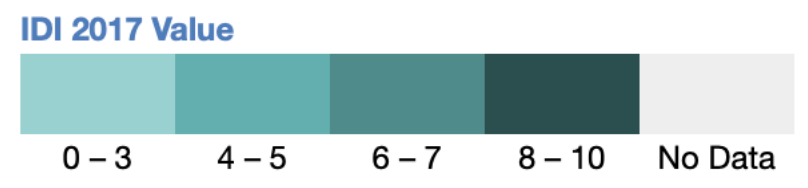
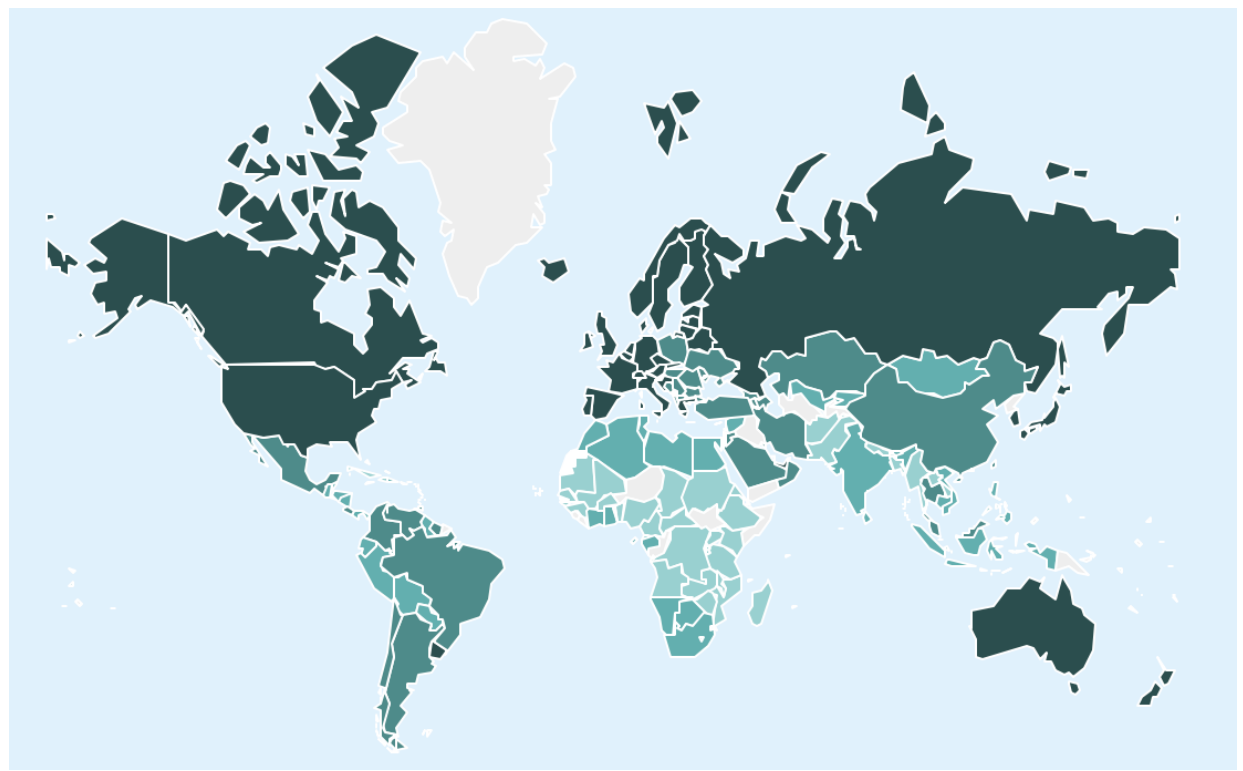


Source: <https://www.statista.com/chart/10047/facebooks-monthly-active-users/>



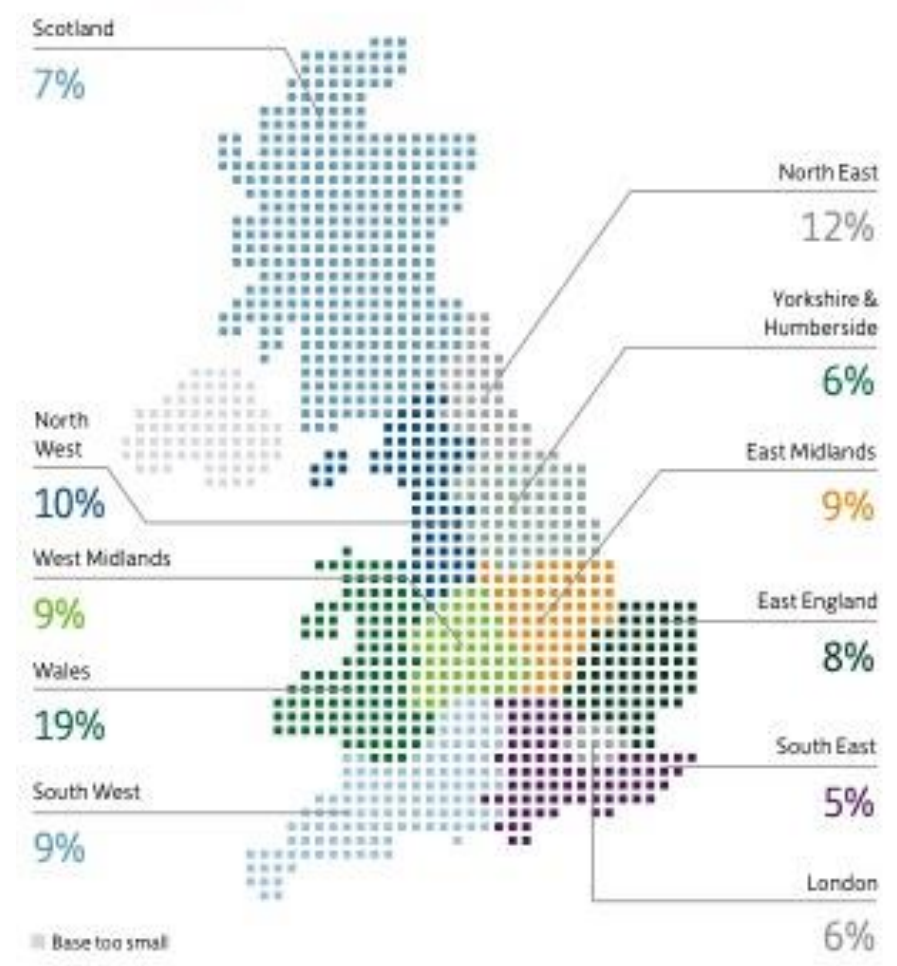
Rebound
Intensify
Distrust
Divide

divide society into digital haves and have nots

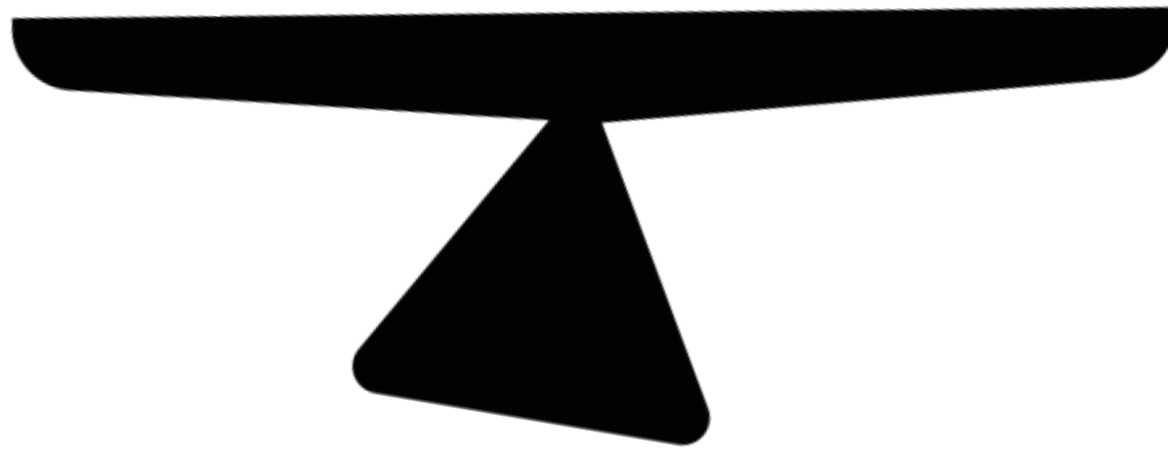
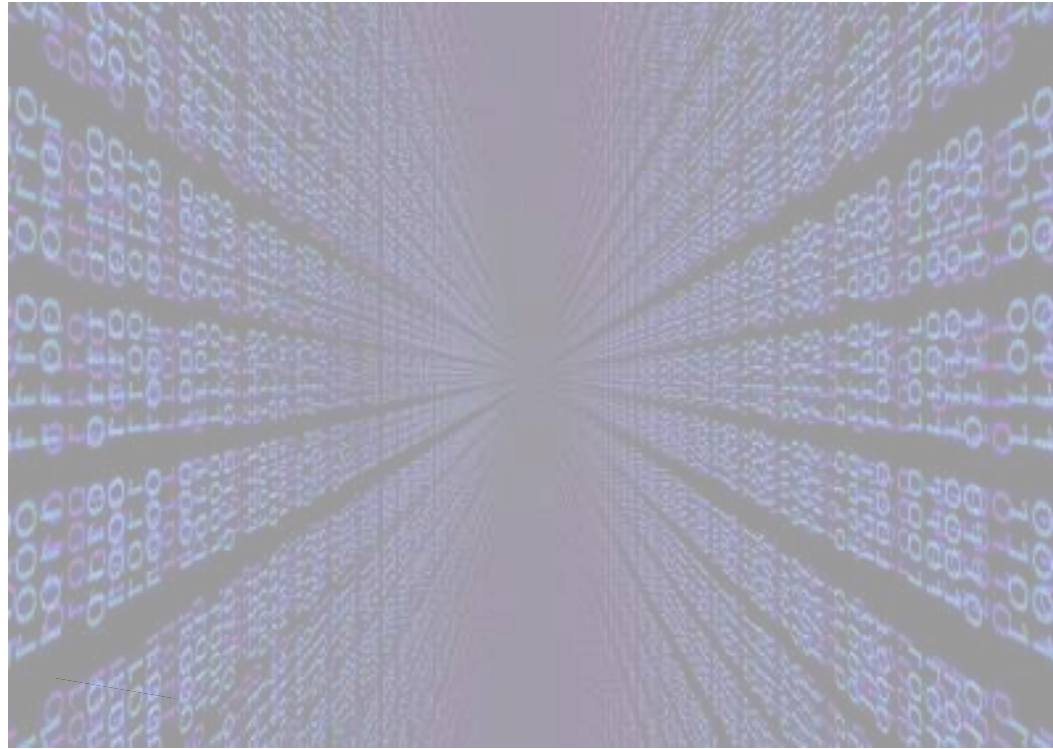
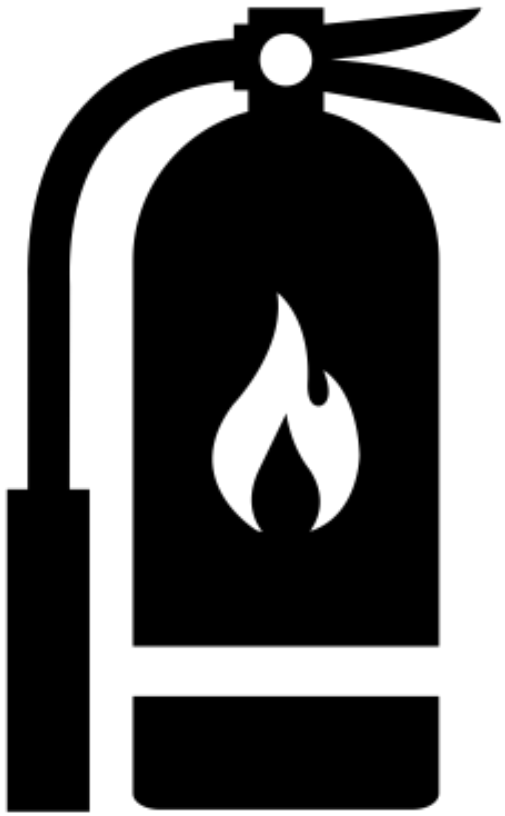


Source: ITU (2017) ICT Development Index.

Figure 13: Proportion of regional population with zero Basic Digital Skills.
Source 2a



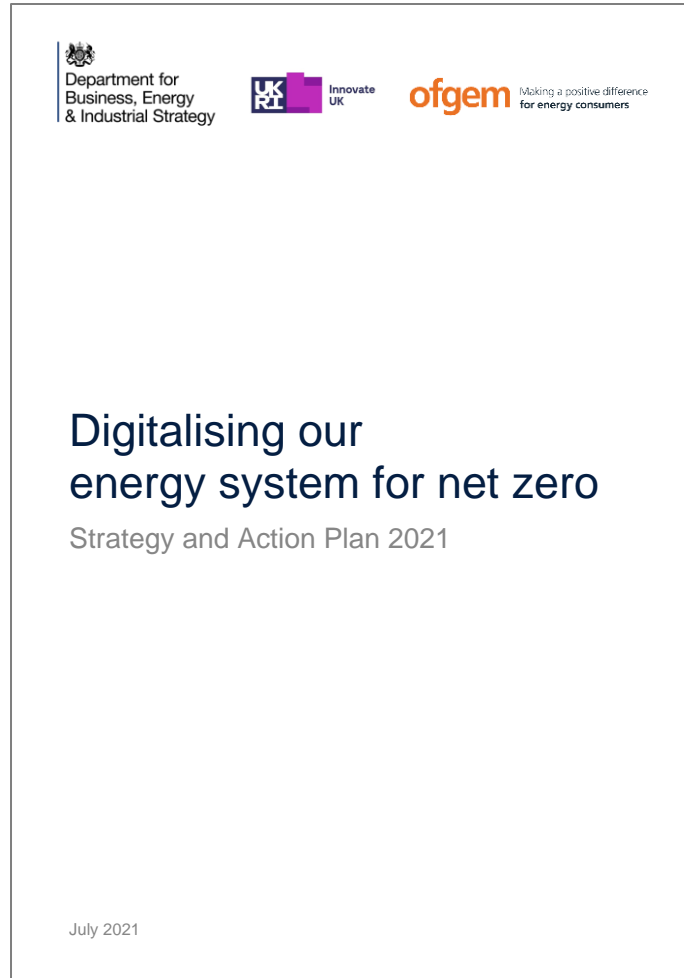
Source: p20, Lloyds (2018) UK Consumer Digital Index.



What we
can do?

Policies

*steering
digitalisation
towards
climate
benefits*



Providers

People

What we can do?

THE MONTREAL STATEMENT ON SUSTAINABILITY IN THE DIGITAL AGE

Policies

Providers

a social licence to operate for digital service providers that prioritises climate change

People



What we
can do?

Policies

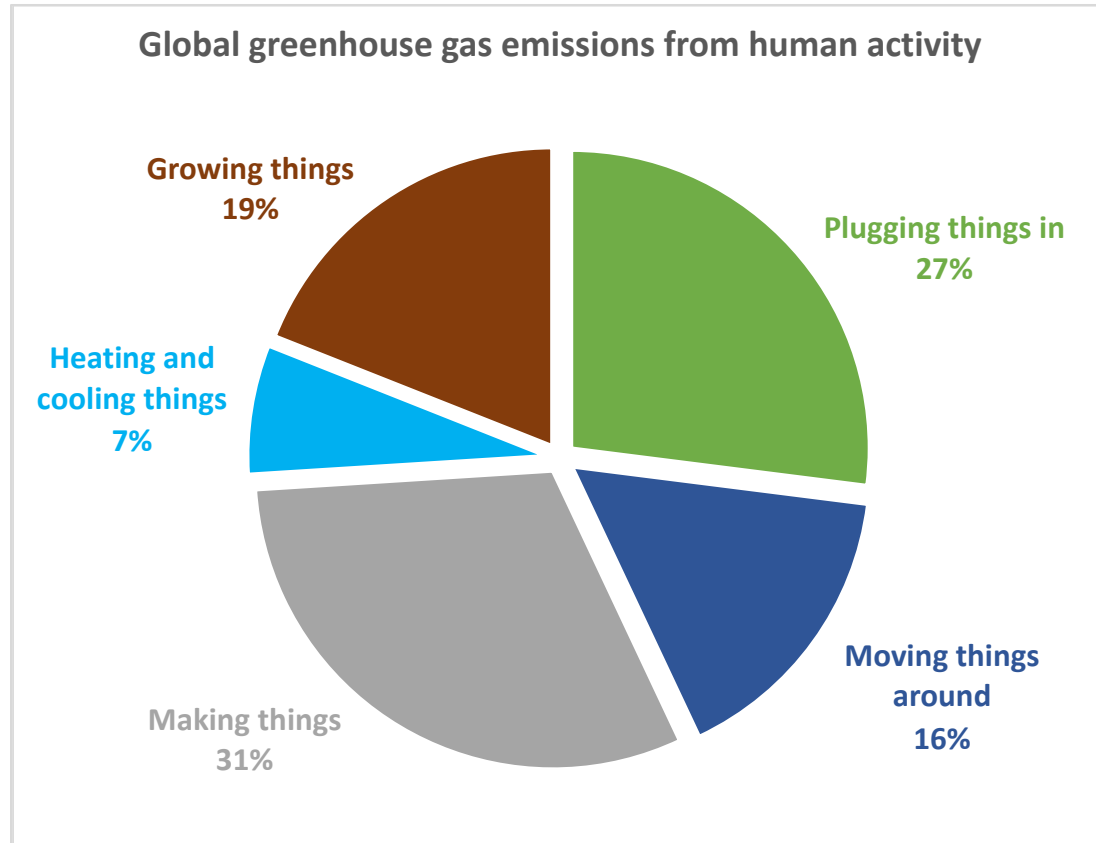
Providers

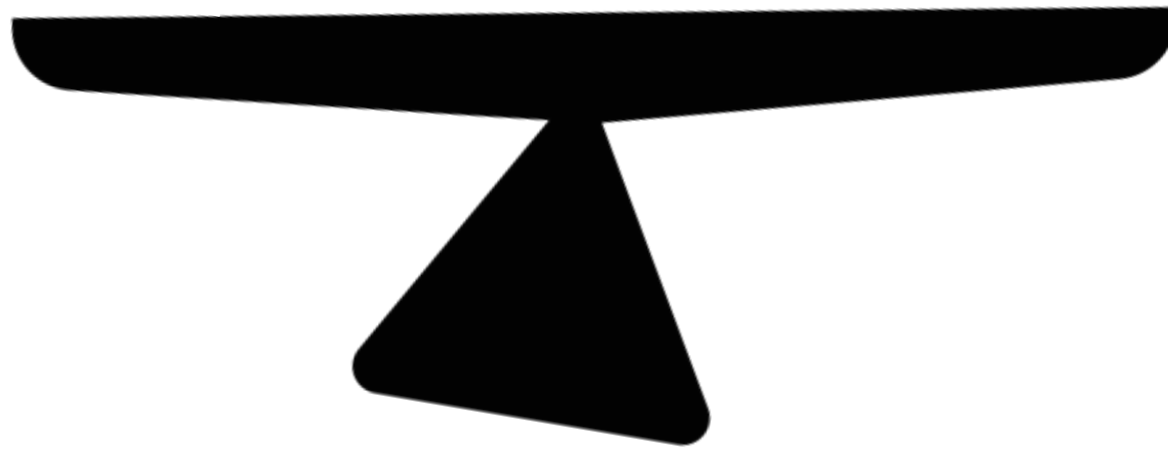
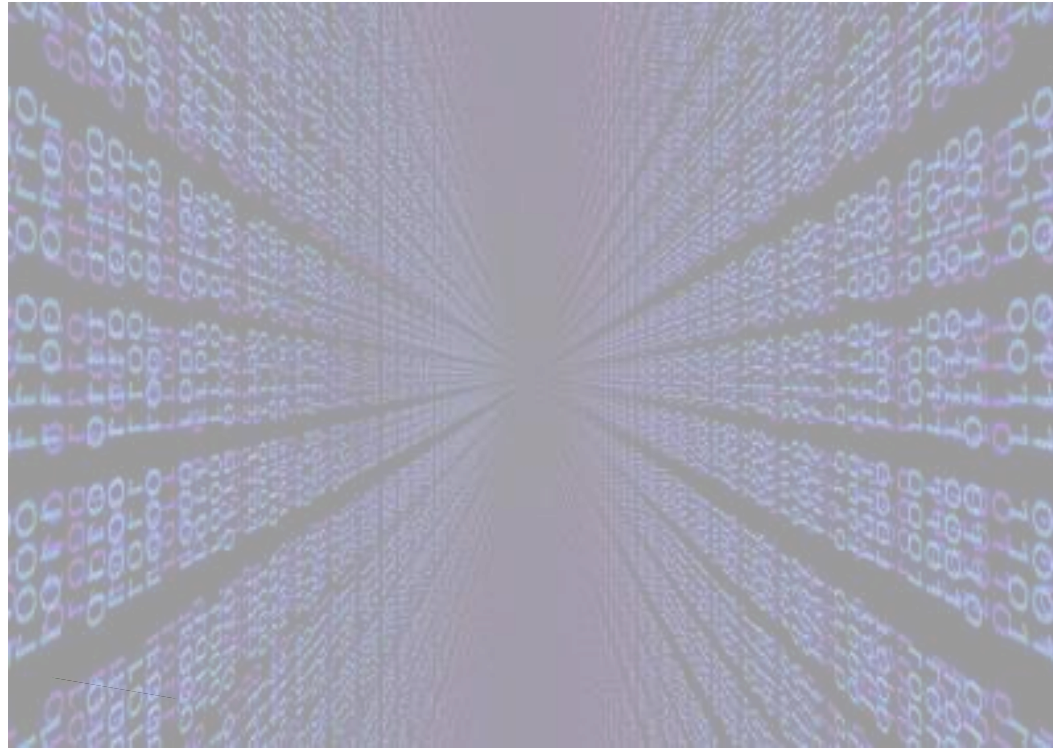
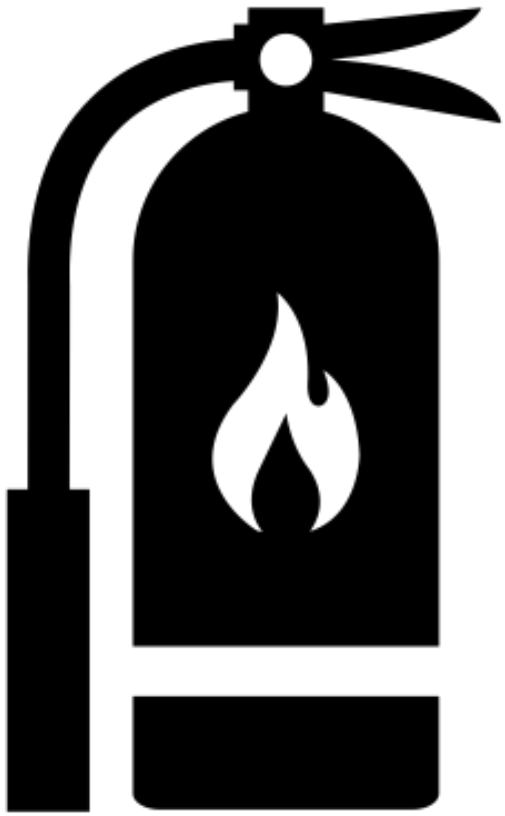
People

experiment

resist

adapt





Digital consumer innovations



car clubs



P2P car-sharing



ride-sharing



e-bikes



digital food hubs



smart heating



smart appliances



PV + storage



shared ride hailing



mobility-as-a-service



electric vehicles



11th hour apps



meal kits



smart lighting

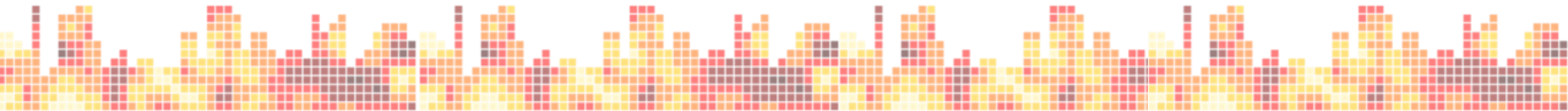


electric vehicle-to-grid




P2P electricity

Impacts of digitalised daily life on climate change



iDODDLE Living Lab - Oxford

Households with wide ranging characteristics in real-world conditions in their own homes but committed to **trial, learn, interact and share data with the research team.**

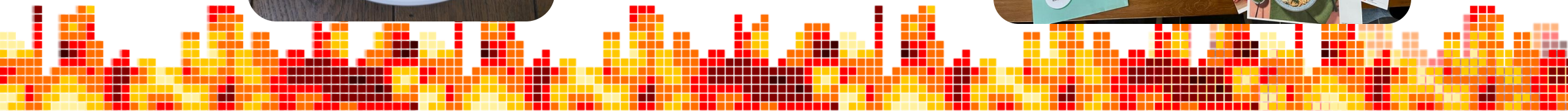


- 47 households
- Longitudinal data (2022-25)
- In-depth qualitative data
- Exploratory research

Floor
cleaning








Grocery shopping

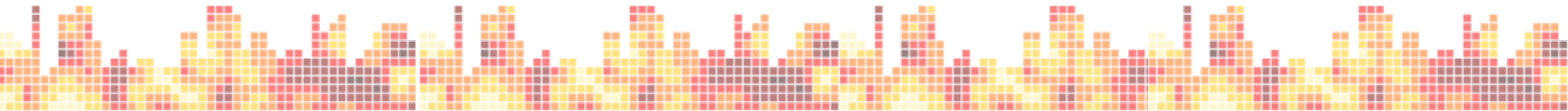


Results: Automation usage during trials

Activity aspects	Level of automation (LoA)		
	Pre-trial	Potential from trial innovation	Actual use during trial
Floor cleaning - Planning			
Awareness of dirt/dust	100%		80-99%
Decide when to clean	100%	Schedule	100%
Decide where to clean	100%	Schedule	80-99%
Remove items from floor	100%	100%	100%
Floor cleaning - Execution			
Retrieve brush/vacuum from storage	100%	Autonomous	Autonomous
Use brush or vacuum in desired area	100%	Autonomous	Autonomous
Follow a pattern (avoid missing areas)	100%	Autonomous	Autonomous
Empty dust collector	100%	100%	100%
Return brush/vacuum to storage	100%	Autonomous	Autonomous

 80-99% of participants
 100% of participants

LoA Key:  manual (L1),  schedule (L3),  autonomous (L5)

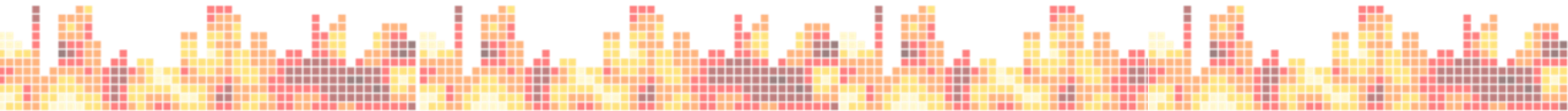


Results: Acceptance of additional activities

3



Example screenshot of the post-trial online survey hot spot mapping, eliciting change: increased automation acceptance.





Can you uncover the secrets of household automation?

Energy Demand Detectives

Click the button below to enter the interactive poster



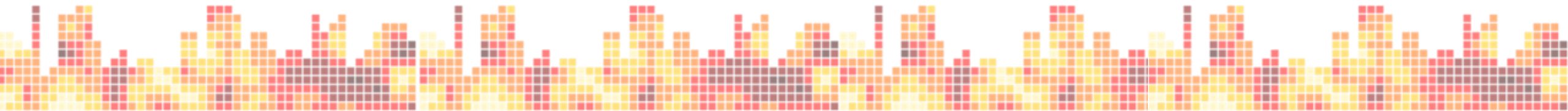
Emilie Vrain,
Environmental Change Institute, University of Oxford.
Contact: emilie.vrain@eci.ox.ac.uk

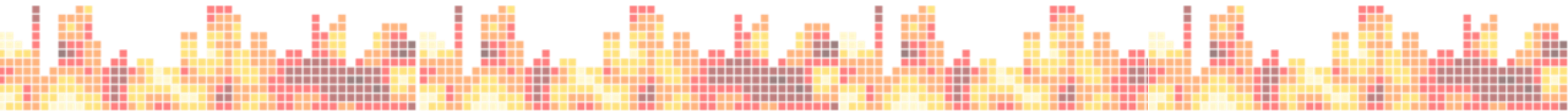
iDODDLE

The Impacts of Digitalised Daily Life on Climate Change

www.idoddle.org

iDODDLE
The Impacts of Digitalised Daily Life on Climate Change





Thank you for listening

Dr Emilie Vrain

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