Is the Circular Economy the heartbeat of a Decarbonised future ?

……..A lesson from ICT

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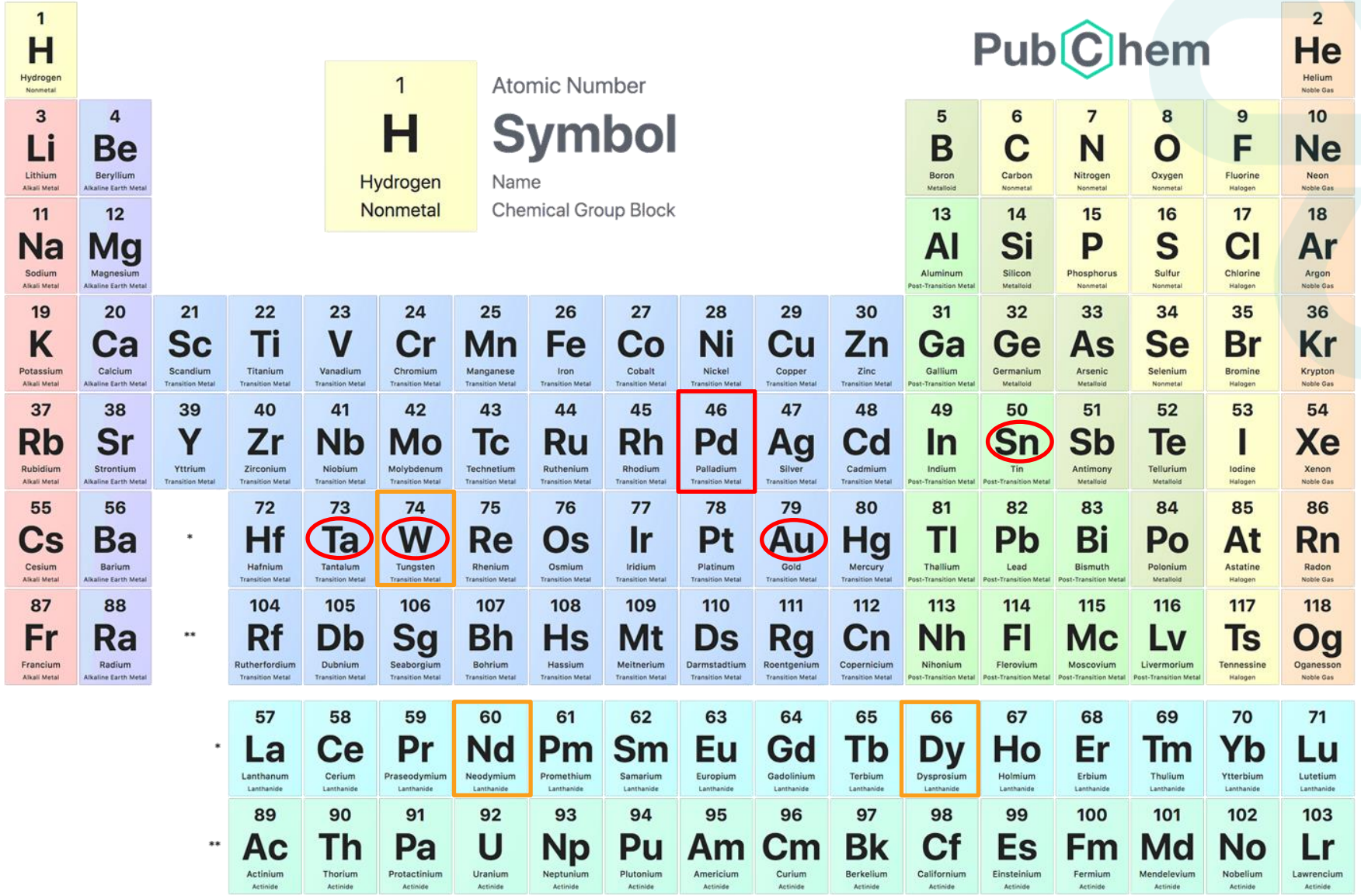
LET'S TALK……NUMBERS

PERIODIC TABLE OF ELEMENTS



Pd

40% Global Supply in Russia

3TG

Conflict Mineral (DRC)

Dy, W, Nd

Vibration in Electronics

ELEMENTS OF A SMARTPHONE

ELEMENTS COLOUR KEY: ALKALI METAL | ALKALINE EARTH METAL | TRANSITION METAL | GROUP 13 | GROUP 14 | GROUP 15 | GROUP 16 | HALOGEN | LANTHANIDE

SCREEN

49 In Indium
50 Sn Tin
8 O Oxygen

Indium tin oxide is a mixture of indium oxide and tin oxide, used in a transparent film in the screen that conducts electricity. This allows the screen to function as a touch screen.

13 Al Aluminium
14 Si Silicon
8 O Oxygen
19 K Potassium

The glass used on the majority of smartphones is an aluminosilicate glass, composed of a mix of alumina (Al_2O_3) and silica (SiO_2). This glass also contains potassium ions, which help to strengthen it.

39 Y Yttrium
57 La Lanthanum
65 Tb Terbium
59 Pr Praseodymium
63 Eu Europium
66 Dy Dysprosium
64 Gd Gadolinium

A variety of Rare Earth Element compounds are used in small quantities to produce the colours in the smartphone's screen. Some compounds are also used to reduce UV light penetration into the phone.

ELECTRONICS

Copper is used for wiring in the phone, whilst copper, gold and silver are the major metals from which microelectrical components are fashioned. Tantalum is the major component of micro-capacitors.

29 Cu Copper
47 Ag Silver
79 Au Gold
73 Ta Tantalum

Nickel is used in the microphone as well as for other electrical connections. Alloys including the elements praseodymium, gadolinium and neodymium are used in the magnets in the speaker and microphone. Neodymium, terbium and dysprosium are used in the vibration unit.

28 Ni Nickel
66 Dy Dysprosium
59 Pr Praseodymium
65 Tb Terbium
60 Nd Neodymium
64 Gd Gadolinium

Pure silicon is used to manufacture the chip in the phone. It is oxidised to produce non-conducting regions, then other elements are added in order to allow the chip to conduct electricity.

14 Si Silicon
8 O Oxygen
51 Sb Antimony
33 As Arsenic
15 P Phosphorus
31 Ga Gallium

Tin & lead are used to solder electronics in the phone. Newer lead-free solders use a mix of tin, copper and silver.

50 Sn Tin
82 Pb Lead

BATTERY

3 Li Lithium
27 Co Cobalt
8 O Oxygen
6 C Carbon
13 Al Aluminium

The majority of phones use lithium ion batteries, which are composed of lithium cobalt oxide as a positive electrode and graphite (carbon) as the negative electrode. Some batteries use other metals, such as manganese, in place of cobalt. The battery's casing is made of aluminium.

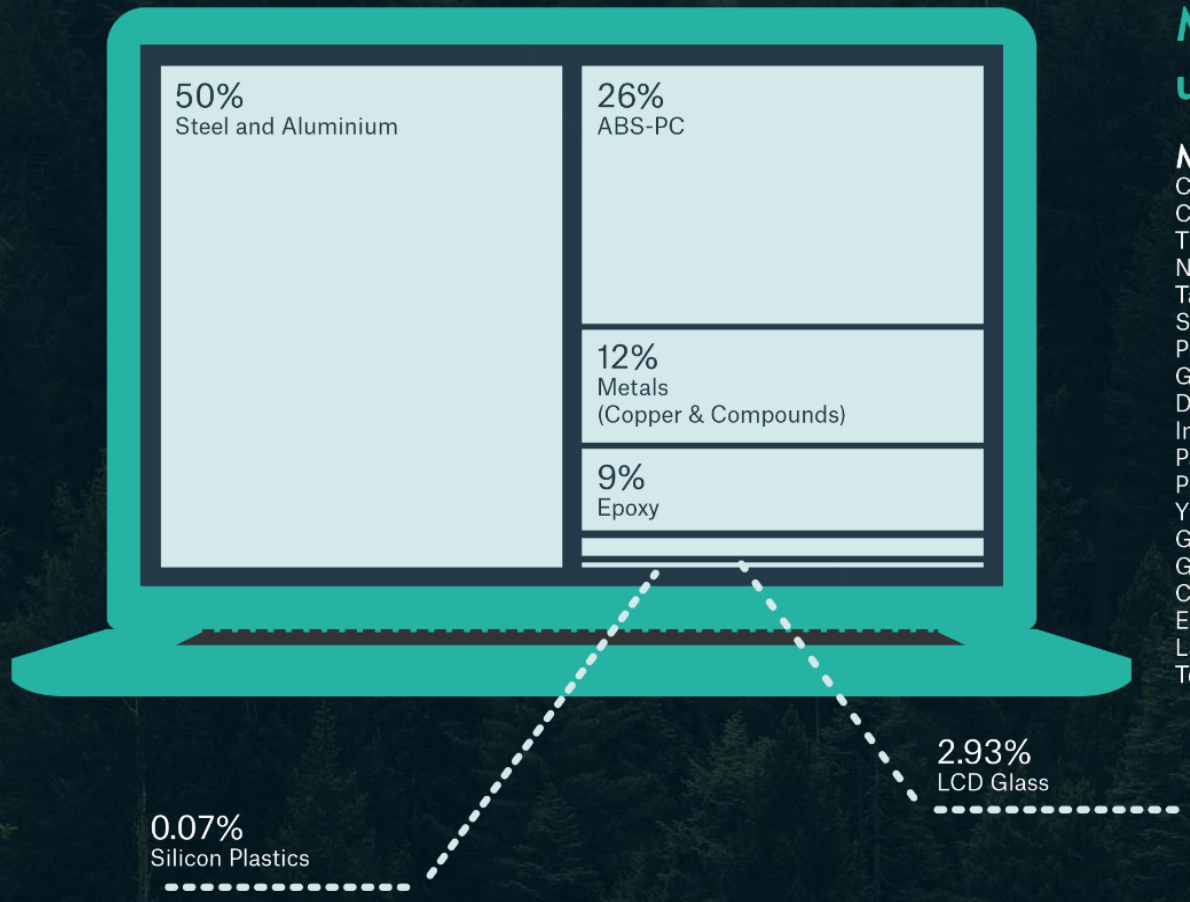
CASING

Magnesium compounds are alloyed to make some phone cases, whilst many are made of plastics. Plastics will also include flame retardant compounds, some of which contain bromine, whilst nickel can be included to reduce electromagnetic interference.

6 C Carbon
12 Mg Magnesium
35 Br Bromine
28 Ni Nickel

WHAT MAKES A LAPTOP?

A breakdown of the materials, both critical and non-critical



Minerals and materials used per laptop

Material	Usage (grams)	Status
Copper	270	Non-Critical
Cobalt	65	Non-Critical
Tin	9.33	Non-Critical
Neodymium	2.1	Non-Critical
Tantalum	1.7	Critical
Silver	0.44	Non-Critical
Praseodymium	0.27	Critical
Gold	0.1	Non-Critical
Dysprosium	0.06	Critical
Indium	0.04	Critical
Palladium	0.04	Critical
Platinum	0.004	Critical
Yttrium	0.0016	Critical
Gallium	0.0016	Critical
Gadolinium	0.00075	Critical
Cerium	0.0001	Critical
Europium	0.00003	Critical
Lanthanum	0	
Terbium	0	

Carbon Neutral Organisation

THE CIRCULAR ECONOMY

The future depends on you

Regenerate natural systems

Design out waste and pollution

Keep products and materials in use

Source: Ellen MacArthur Foundation

THE WORLD'S FIRST
REMANUFACTURED LAPTOP
BSI KITEMARK™

circular™ REMANUFACTURING PROCESS

KM 747377
BS 8887-220:2010
BS 8887-211:2012

The awarding of the BSI Kitemark™ certifies that our Circular Remanufacturing Process produces products 'equal to or better than new' as required by the BS standard BS8887-220 and BS8887-211.

80% OF A LAPTOP'S ENVIRONMENTAL IMPACT IS FROM PRODUCTION

- 316kgs Co2eq is the average carbon footprint of a brand-new laptop
- 1,200kgs of precious earth resources are extracted and mined
- 190,000kgs of water is consumed during extraction and production
- Conflict minerals are used in production; cobalt, gold, tin, tantalum and tungsten
- Poor labour practices in supply chains from Africa to China

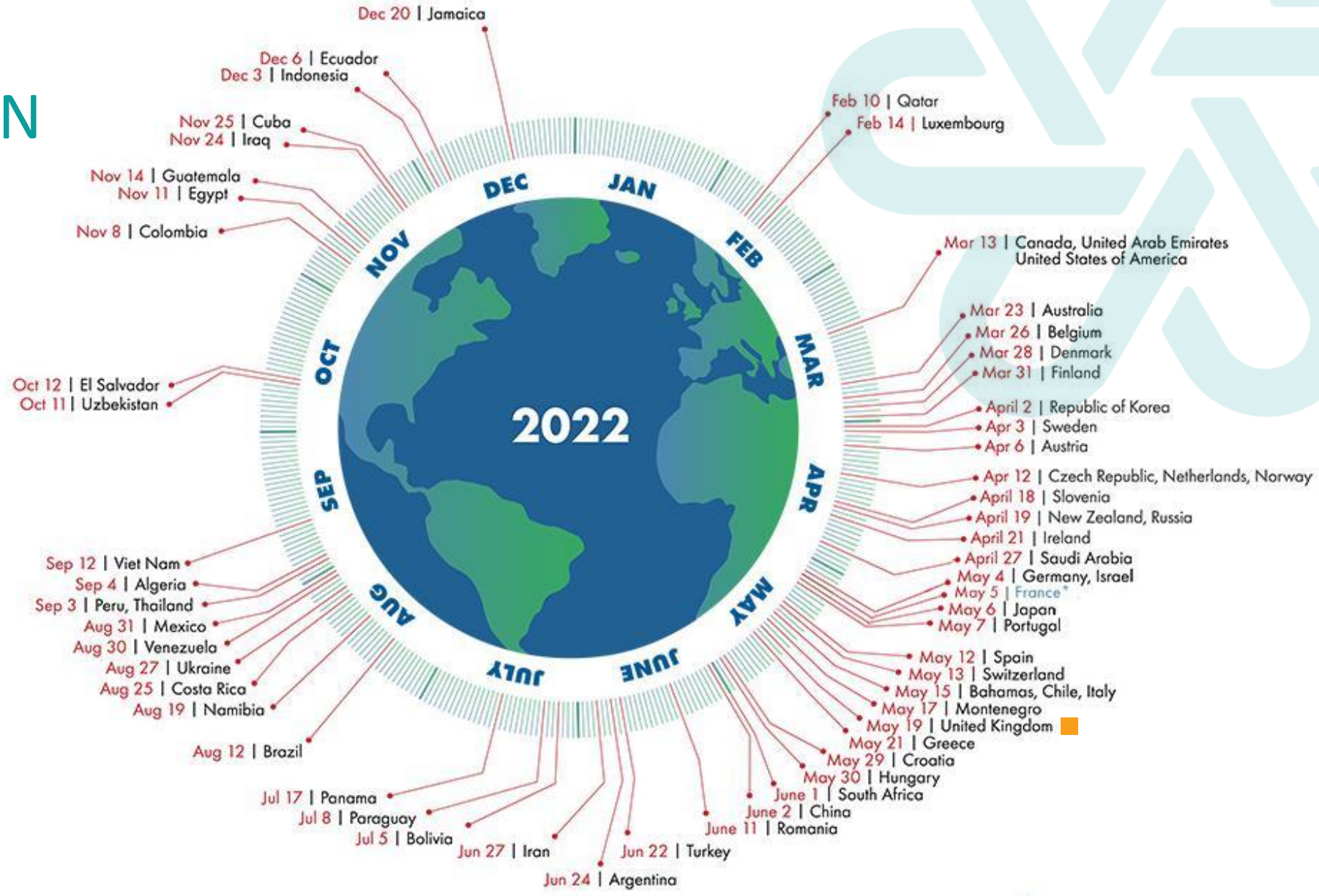
Our linear consumption (take/make/use/dispose) of 250 Million new laptops a year causes.

- Climate change
- Resource depletion
- 50Mt eWaste
- Social injustice

WE NEED A NEW WAY OF THINKING

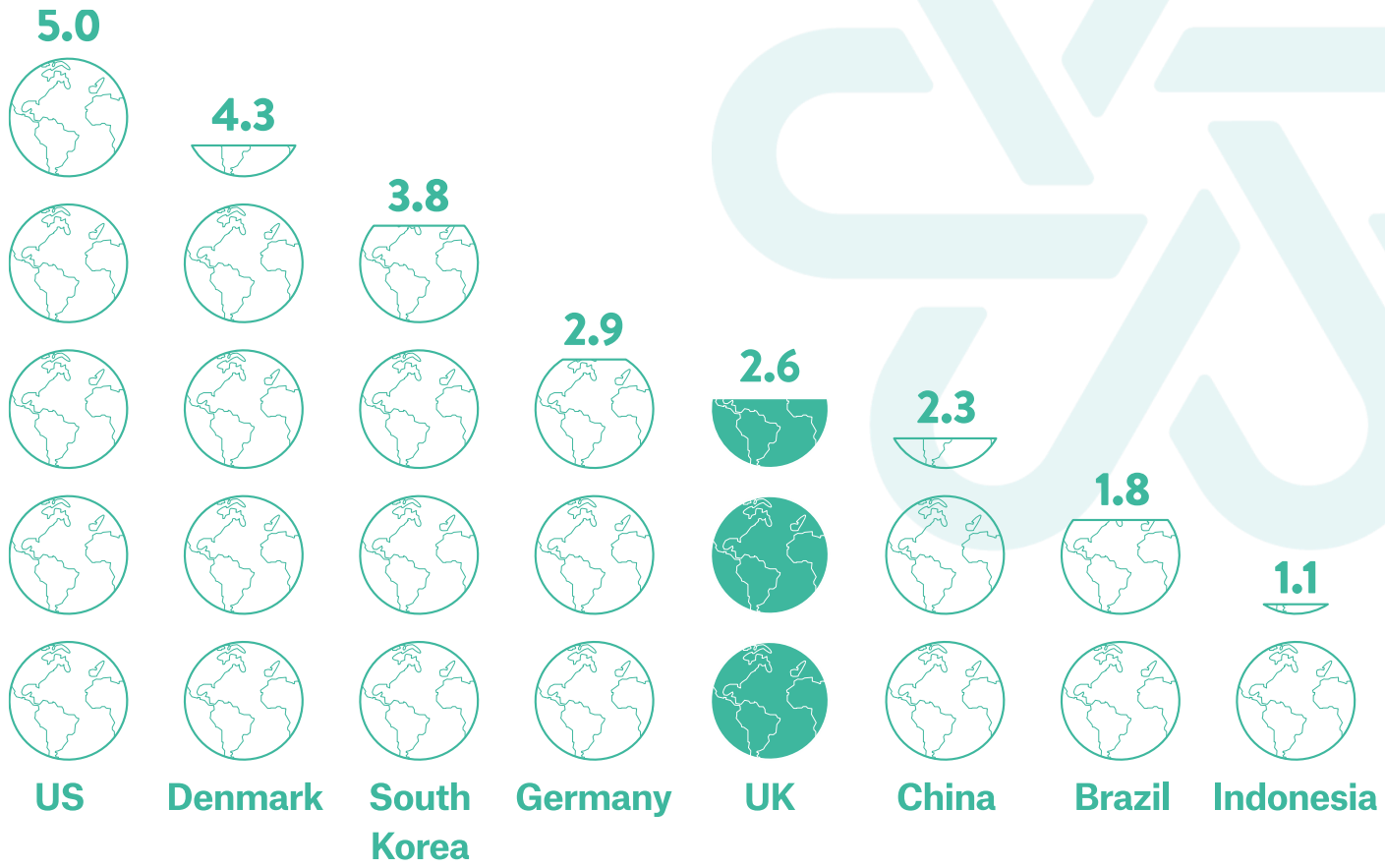
Cranfield University

OVER CONSUMPTION



THE WORLD IS NOT ENOUGH

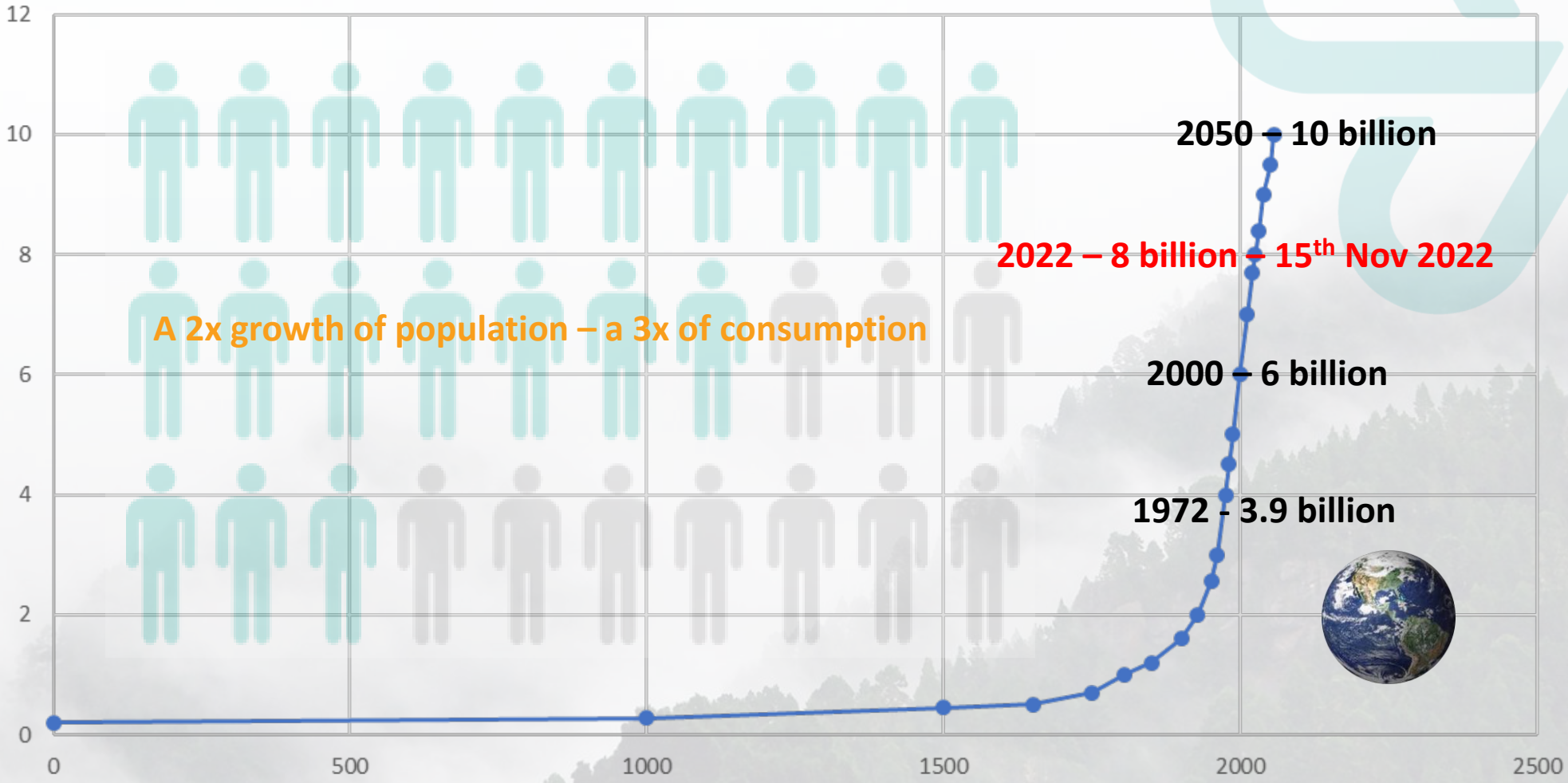
Number of earths and its resources needed if the world's population lived like the following countries



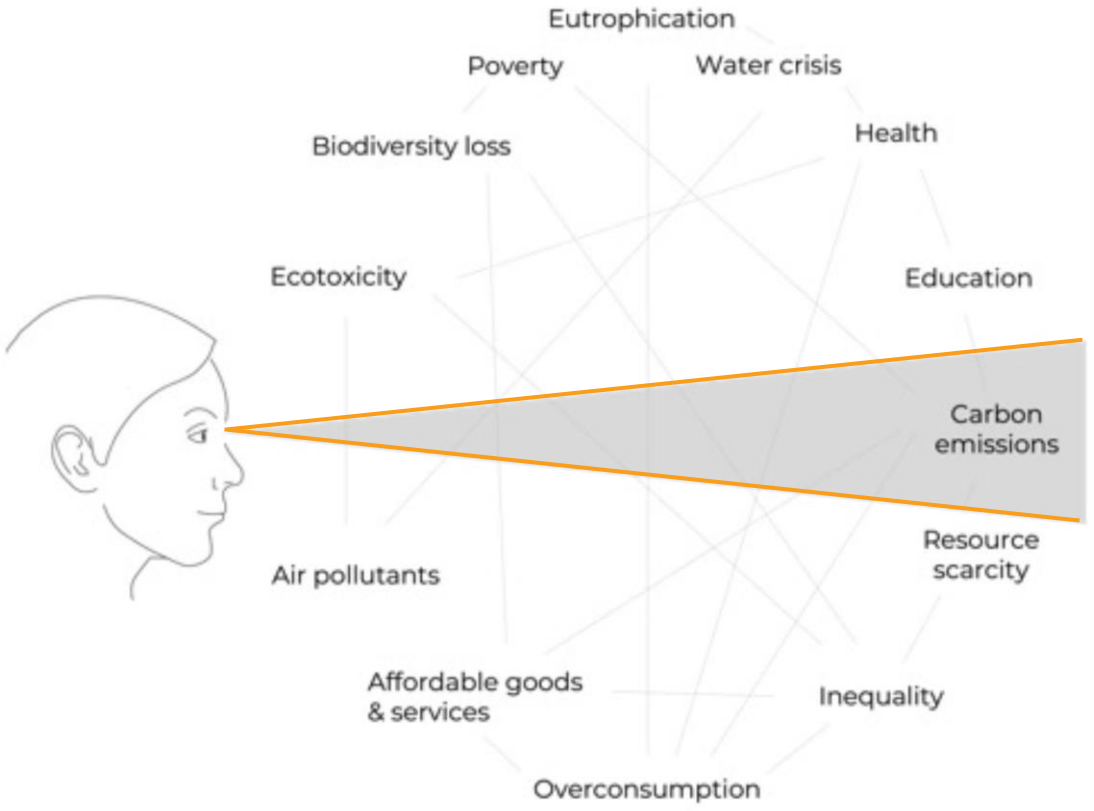
Selected countries. Calculated based on 2021 Earth Overshoot Days/2017 data
Source: Global Footprint Network

statista

GLOBAL POPULATION



CARBON TUNNEL VISION



Graphic Jan Konietzko

A decarbonised future is not possible without the Circular Economy.

Remanufacturing is the heartbeat of the Circular Economy.

Therefore… a decarbonised future state relies on remanufacturing.

But you cannot decouple other elements of a sustainable future from carbon. If we affect this, then we effect so much more.

…Numbers

SOCIAL MEDIA

cristiano Follow Message •••

3,392 posts 497M followers 523 following

Cristiano Ronaldo
Join my NFT journey on @Binance. Click the link below to get started.
ter.li/CR7-On-Binance

1 Post

Energy 43MWh (43 million watt hours)

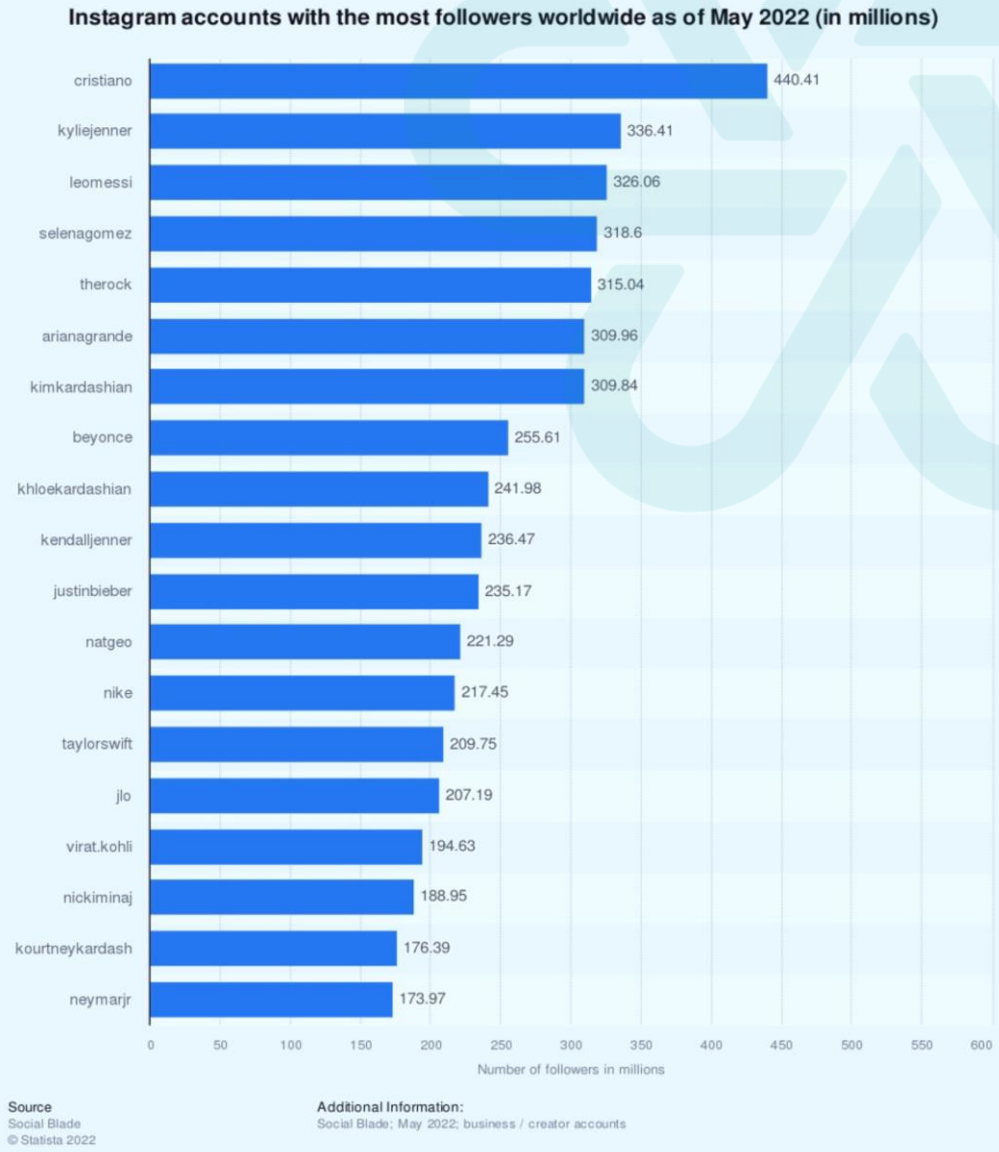
Equivalent of 19 Houses for a year

Charge out rate of USD 1.6 million per post.

Posts 1.7 times a day (600 a year)

Energy of 21 Million Watt Hours

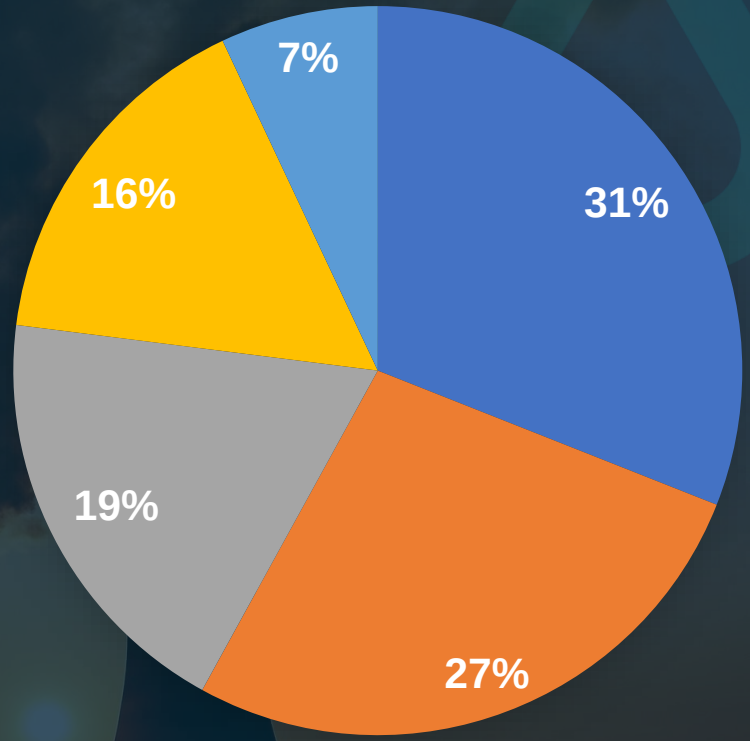
Equivalent of 1,100 houses for a year



WE ARE DUMPING 140 MILLION* TONNES OF GHG INTO OUR ATMOSPHERE EVERY 24 HOURS!

The CO^2 of Stuff

- Making Stuff (including cement, steel and plastic - and ICT)
- Powering stuff (electricity)
- Growing stuff (including plants and animals)
- Transporting stuff (including planes, trucks, cargo ships and cars)
- Temperature regulating stuff (meaning heating, cooling, and refridgeraton)



*2021 Global output is 51 billion Tonnes annually

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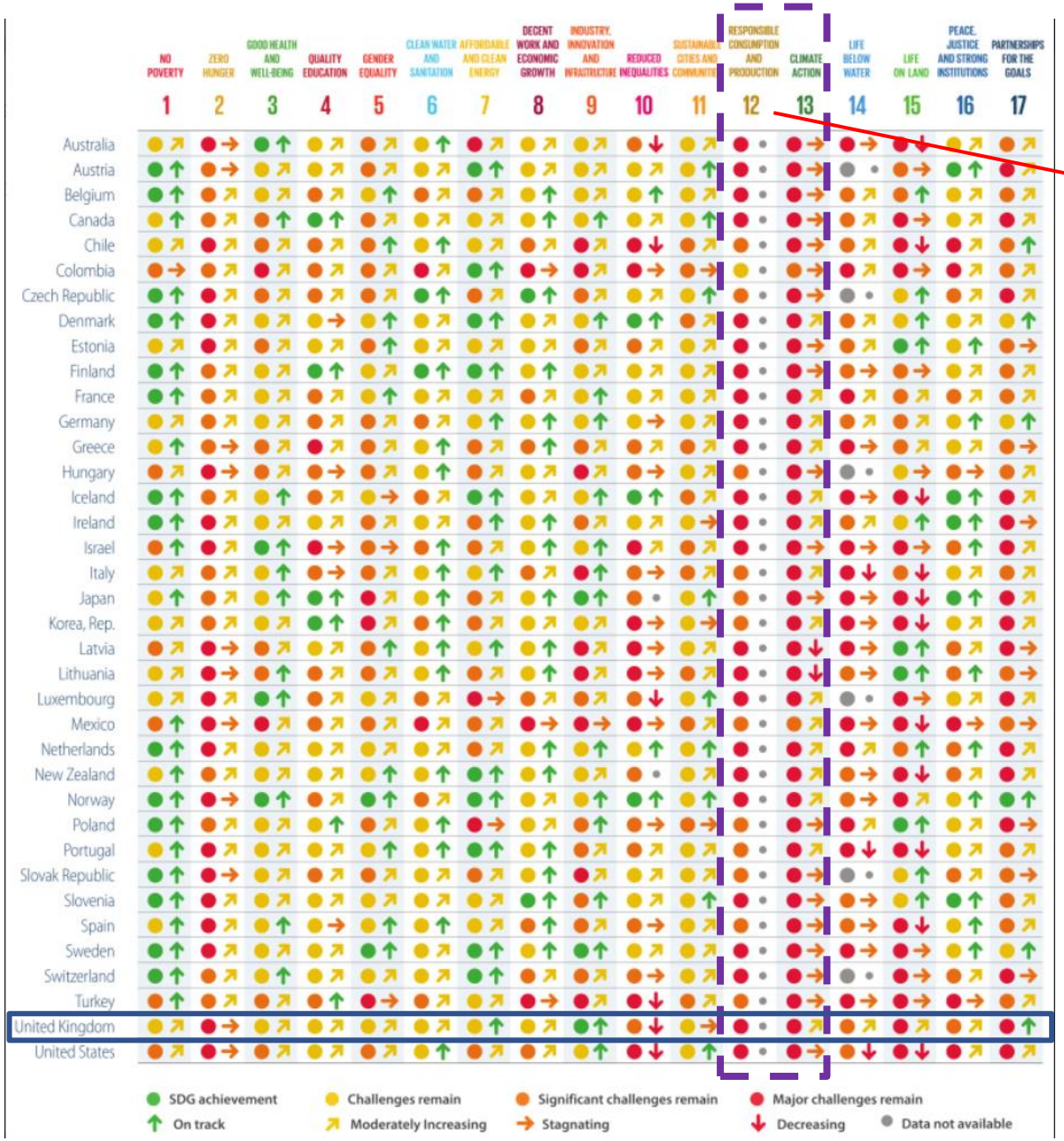


Don't turn away from **12 and 13**.
You cannot decouple them.
Taking hold of **12** will drive **13** down.
We have **mastered sustainable production.** It is down to the market to consume the product.

To make and ship a new laptop produces CO^2 (bad for climate).

https://dashboards.sdgindex.org/chapters/part-2-the-sdg-index-and-dashboards

WHAT DEFINES SUSTAINABLE IT?

ACQUISITION

Sustainable production
…to deliver uncompromised…
Sustainable consumption

IN USE

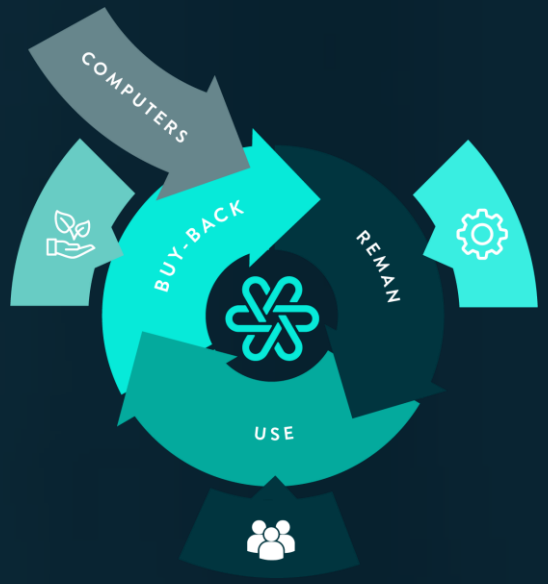
Sustainable/renewable energy
Smart plugs
Intelligent users/use, etc

RETIREMENT & VALUE RETENTION

Next generation resources,
Sanitisation of your data
Then entering a re-use model

THE POSITIVE IMPACTS GAINED WITH CIRCULAR COMPUTING LAPTOPS

1. CIRCULAR ECONOMY

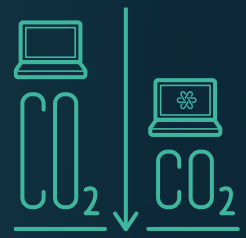


Resource efficient economy
Climate positive environment
Sustainable & ethical
Regenerative & restorative

2. GET THE IT YOU NEED FOR LESS

Same as new quality
Better value for money
Available from stock or 4-8 weeks
Meets performance needs
Same as new warranty
Premium user experience

3. SUSTAINABLE OUTCOMES



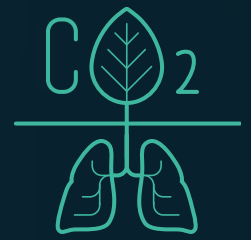
316kgs of CO^2 is avoided

5 Trees are planted

0% eWaste is produced

1,200 kgs of virgin earth resources are preserved.

190,000 litres of water is saved.



600Kgs of CO^2eq captured from 5 Trees.

OUR IMPACTS TO DATE

Creating a carbon neutral, Circular Economy enabled supply which we evidence as resilient and robust

ECONOMIC SAVING

Circa £15-21 Million

CO^2 PREVENTED

22,120 tonnes carbon reduction

RESOURCES PRESERVED

84,000 tonnes

WATER SAVED IN PRODUCTION

13 trillion litres

REFORESTATION

350,000 trees

As of 0900 on 23-06-22 (70,000 units)

circular computing™

Because IT shouldn't cost the Earth

www.circularcomputing.com

enquiries@circularcomputing.com

Carbon Neutral Organisation

WeForest

ONE TREE PLANTED

CCI002/1.0/20210803