



# Tipping Point

## Extended reality and sustainability



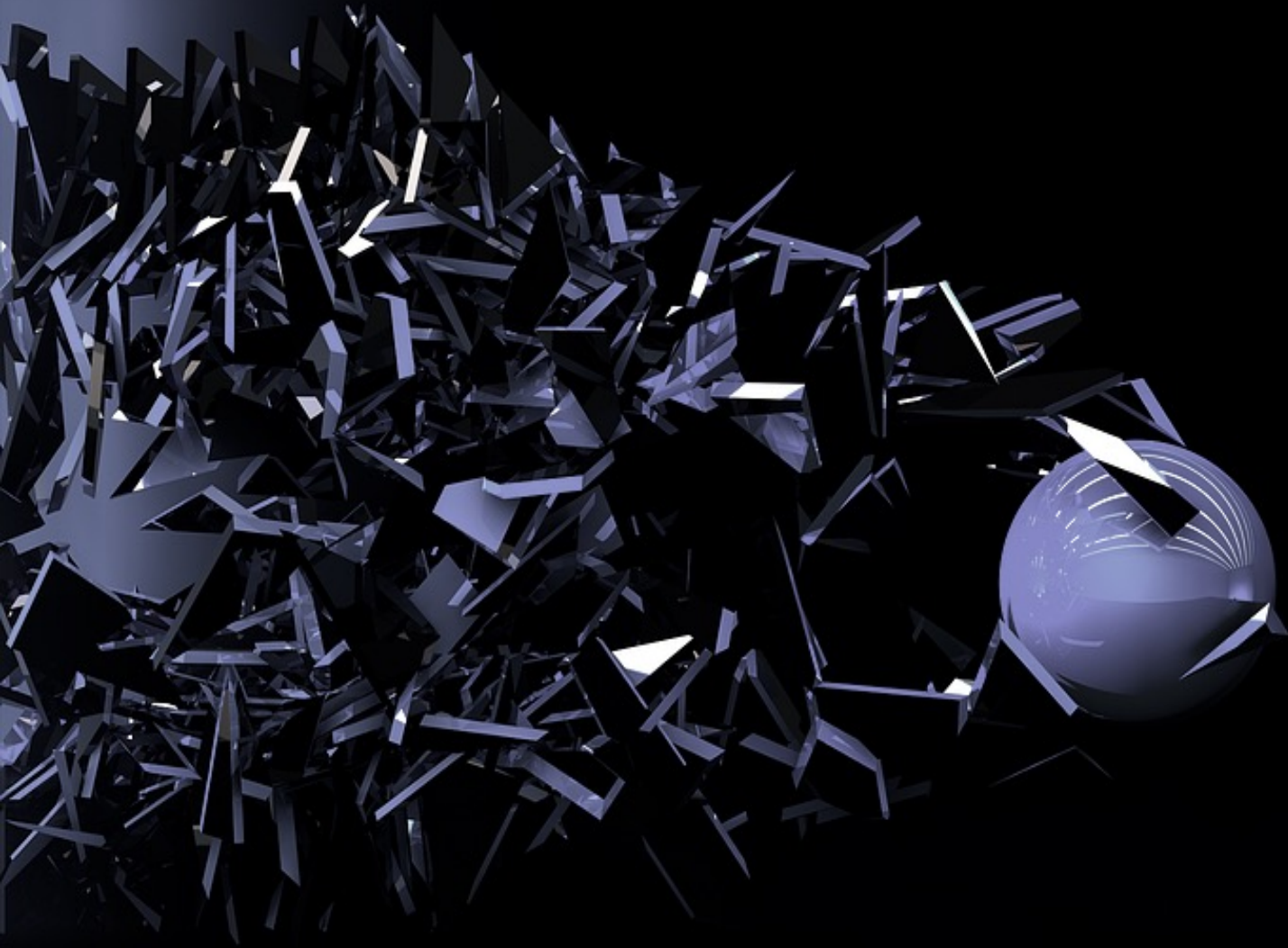
**Prof. Dr. Melodena Stephens**

Professor of Innovation Management  
Program Lead for the Master of Innovation Program  
Mohammed Bin Rashid School of Government



# Agenda

1. Definitions
2. Why it Matters
3. Governance
4. Planet Positive 2030



# I. Definition

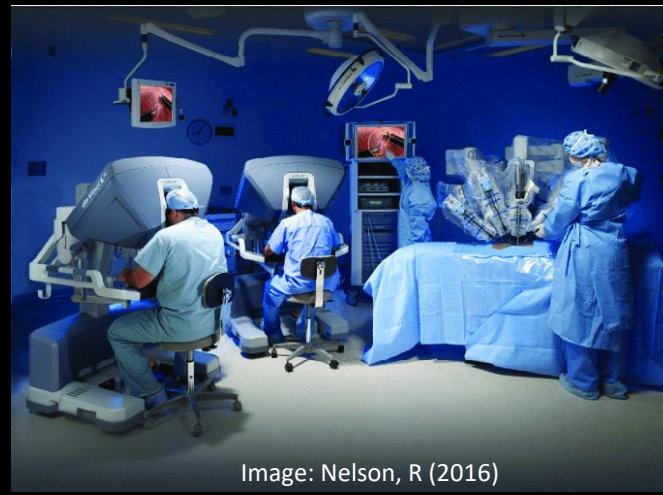
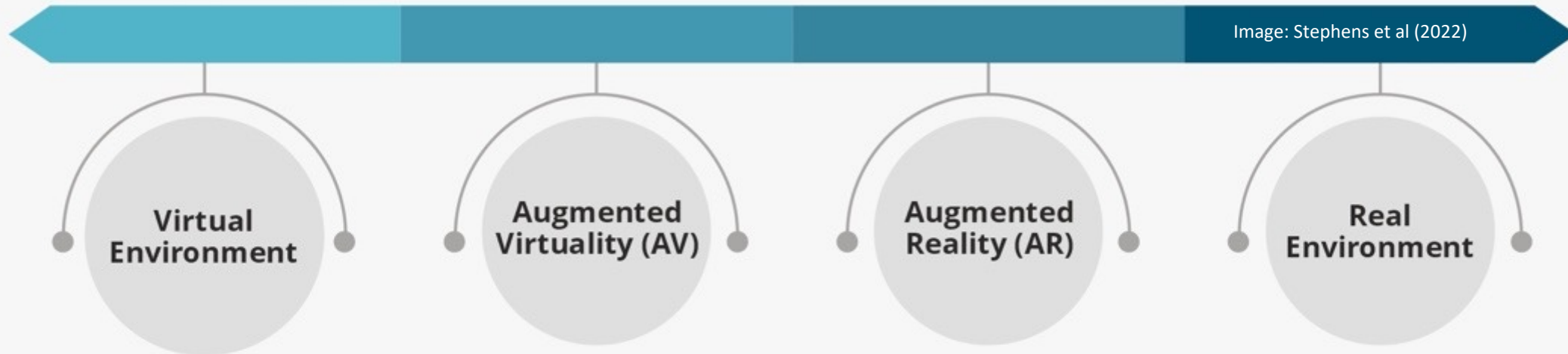


# Tipping Point

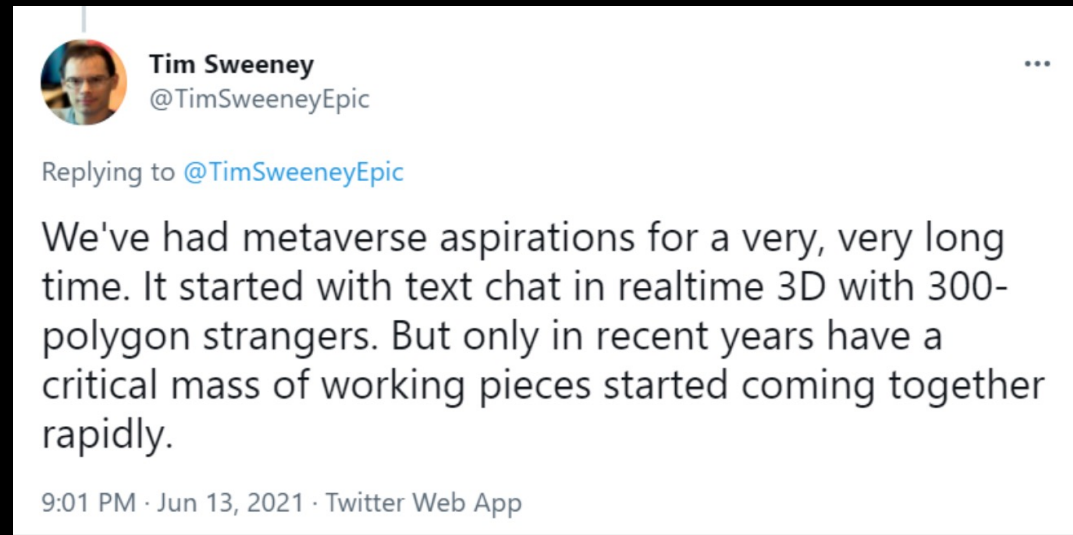
the critical point in a situation, process, or system beyond which a significant and often unstoppable effect or change takes place



## EXTENDED REALITY (XR)

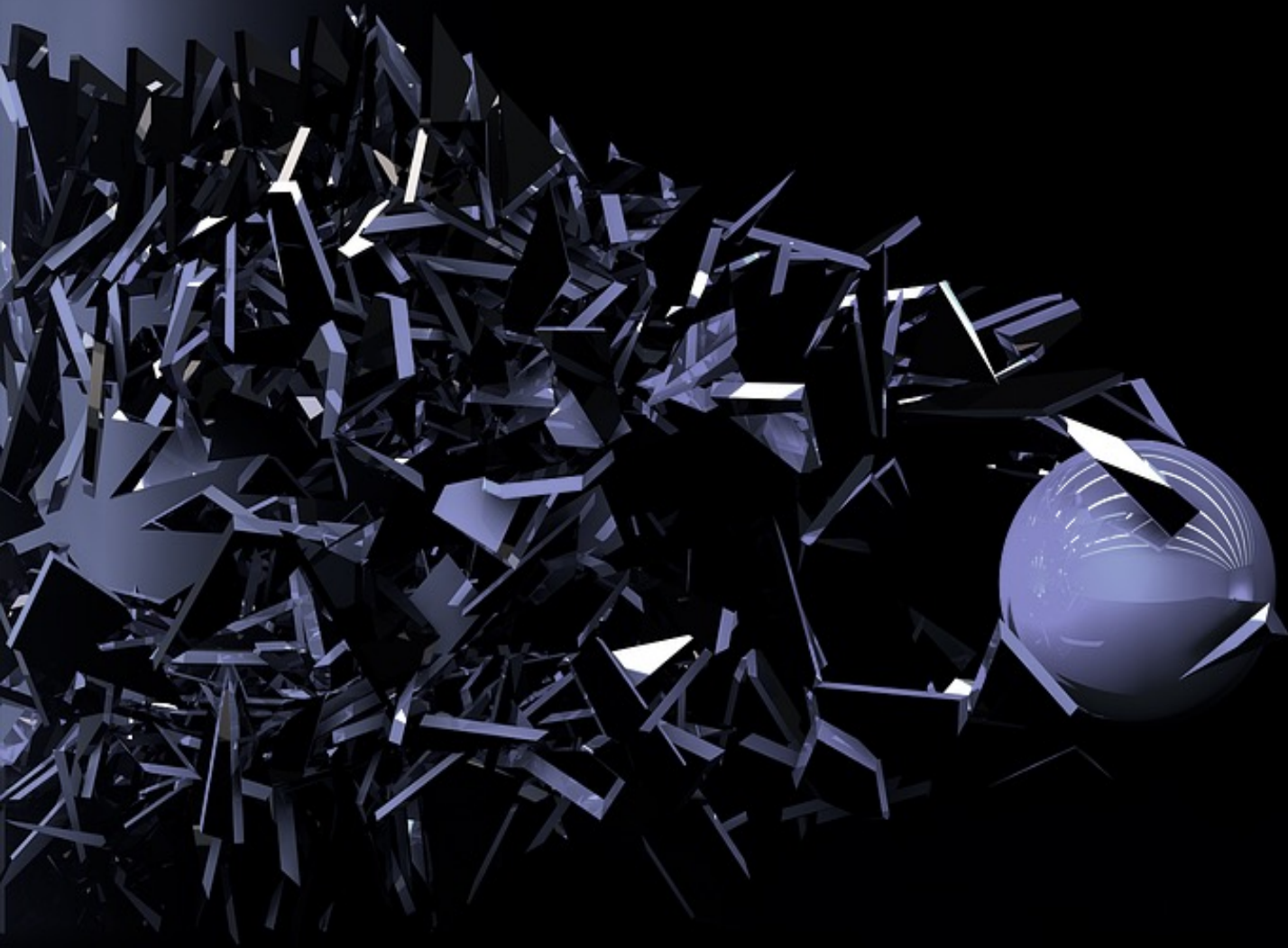


**XR Market  
Potential  
(2030)  
US\$ 1 Trillion  
(1% of Global  
GDP)**



**“the problem with the cutting edge is that someone has to bleed”**  
**Zalman Stern, computer scientist**





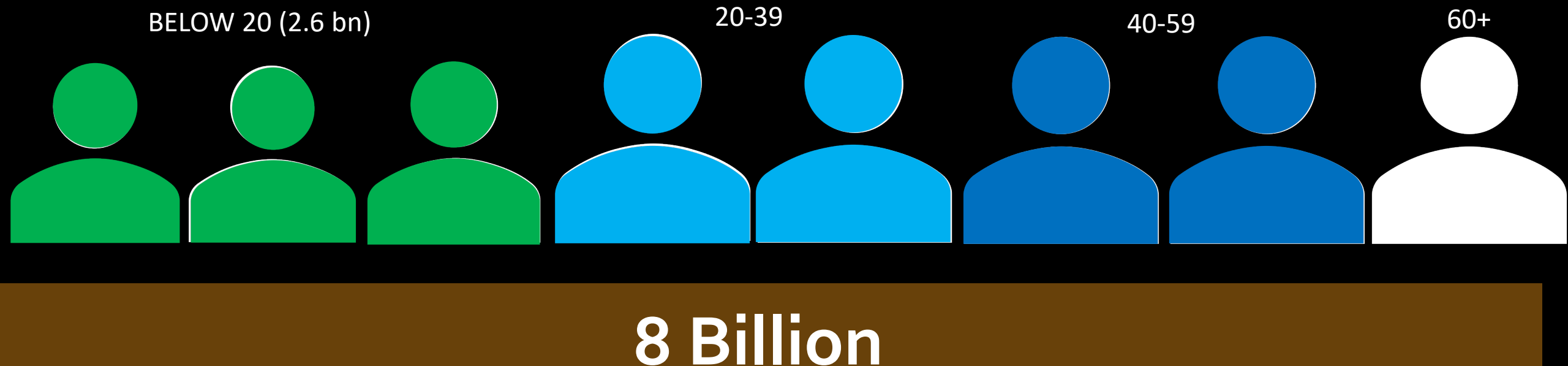
## II. Why It Matters





“Possibilities are  
Endless in XR”

Half of global population growth between now and 2050 is expected to come from just nine countries!



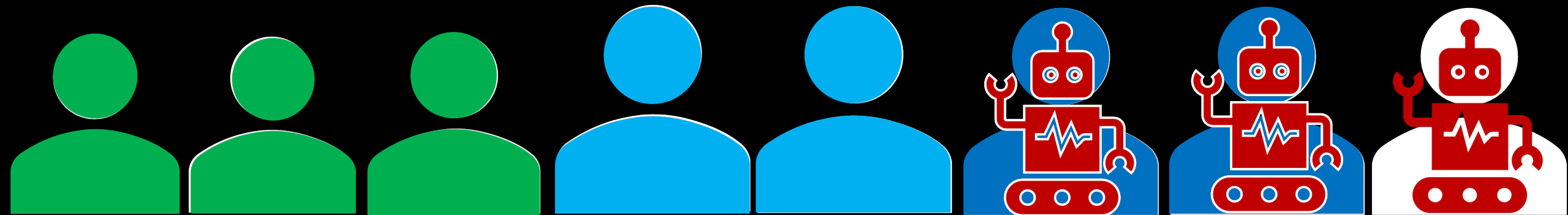
# Interconnectedness in Decision Choices

BELOW 20 (2.6 bn)

20-39

40-59

60+





# AI = Hardware + Software + Data





1969: To get to the moon: 80,000 instructions per second processing

**Movement of intermediate goods, can account for up to 44% of world exports!**



2022: iPhone 14: 15.8 trillion tasks per second and memory is 1 million times Apollo computer RAM. Components from

300 suppliers from 43 countries, 6 continents!



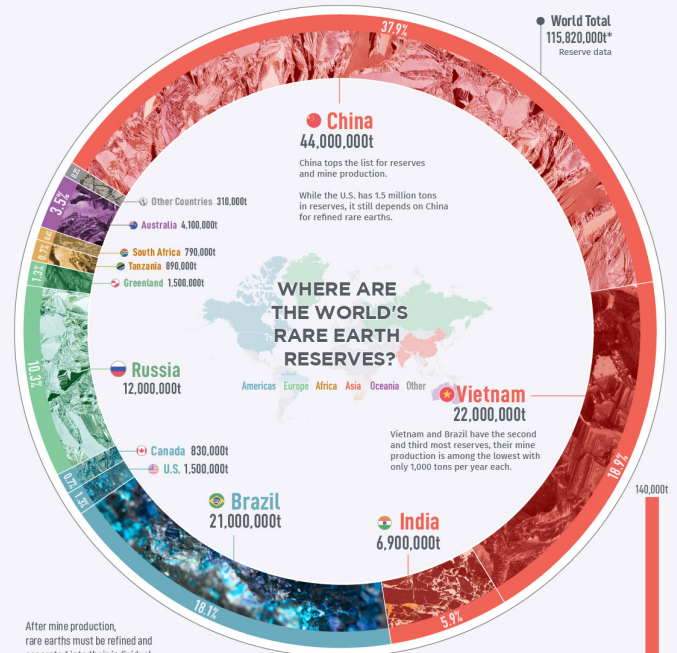
- 17.4% collected & recycled
- 78 countries covered by legislation
- 10-20% illegally exported to non-OECD countries,



## WHERE IN THE WORLD ARE ALL THE RARE EARTHS?

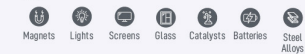
Rare earth elements (REEs) are a group of 17 elements whose importance is critical in high technology. Their use has exploded as electronics and renewable technologies increasingly have become part of everyone's daily lives.

Rare earths are abundant in the Earth's crust but mineable concentrations are less common, making reserves potential very valuable and strategic. \*The USGS tracked the world's reserves in tons (imperial).



After mine production, rare earths must be refined and separated into their individual metals for their particular uses.

### Uses



### Mine Production 2020



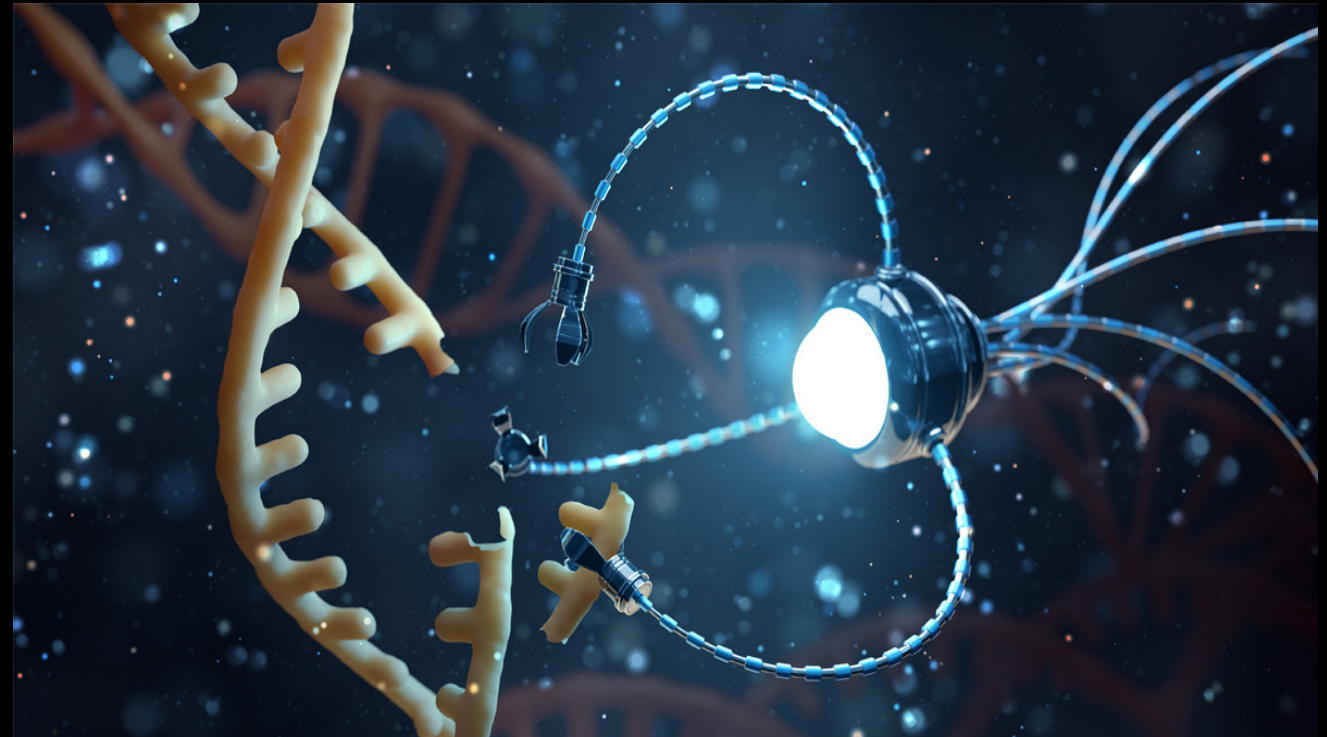
Source: USGS Mineral Commodity Summaries, Rare Earths



# Cells as Hardware

Scientists Just Took a Step Toward Using Living Cells as Hard Drives

A 72-bit message was encoded directly into bacterial DNA







# Software

The screenshot shows a webpage with a white background and a dark navigation bar. The header includes the company logo 'andreessen horowitz' with the tagline 'It's time to build'. The navigation menu contains links for 'Portfolio', 'Team', 'Focus Areas', 'Content', 'About', and 'Jobs', along with a search icon. The main content area features the year '2011' in a large font, followed by the article title 'Why Software Is Eating the World' in orange. Below the title, it says 'by Marc Andreessen'. There are social media icons for Facebook, LinkedIn, and Twitter. The article text begins with 'Software is eating the world.' and continues with a paragraph about the dot-com bubble and the rise of new internet companies.

andreessen horowitz It's time to build

Portfolio Team Focus Areas Content About Jobs

2011

## Why Software Is Eating the World

by Marc Andreessen

how innovation happens • nature of the firm & evolving institutions

Software is eating the world.

More than 10 years after the peak of the 1990s dot-com bubble, a dozen or so new Internet companies like Facebook and Twitter are sparking controversy in Silicon Valley, due to their rapidly growing private market valuations, and even the occasional successful IPO. With scars from the heyday of Webvan and Pets.com still fresh in the investor psyche, people are asking, "Isn't this just a dangerous new bubble?"

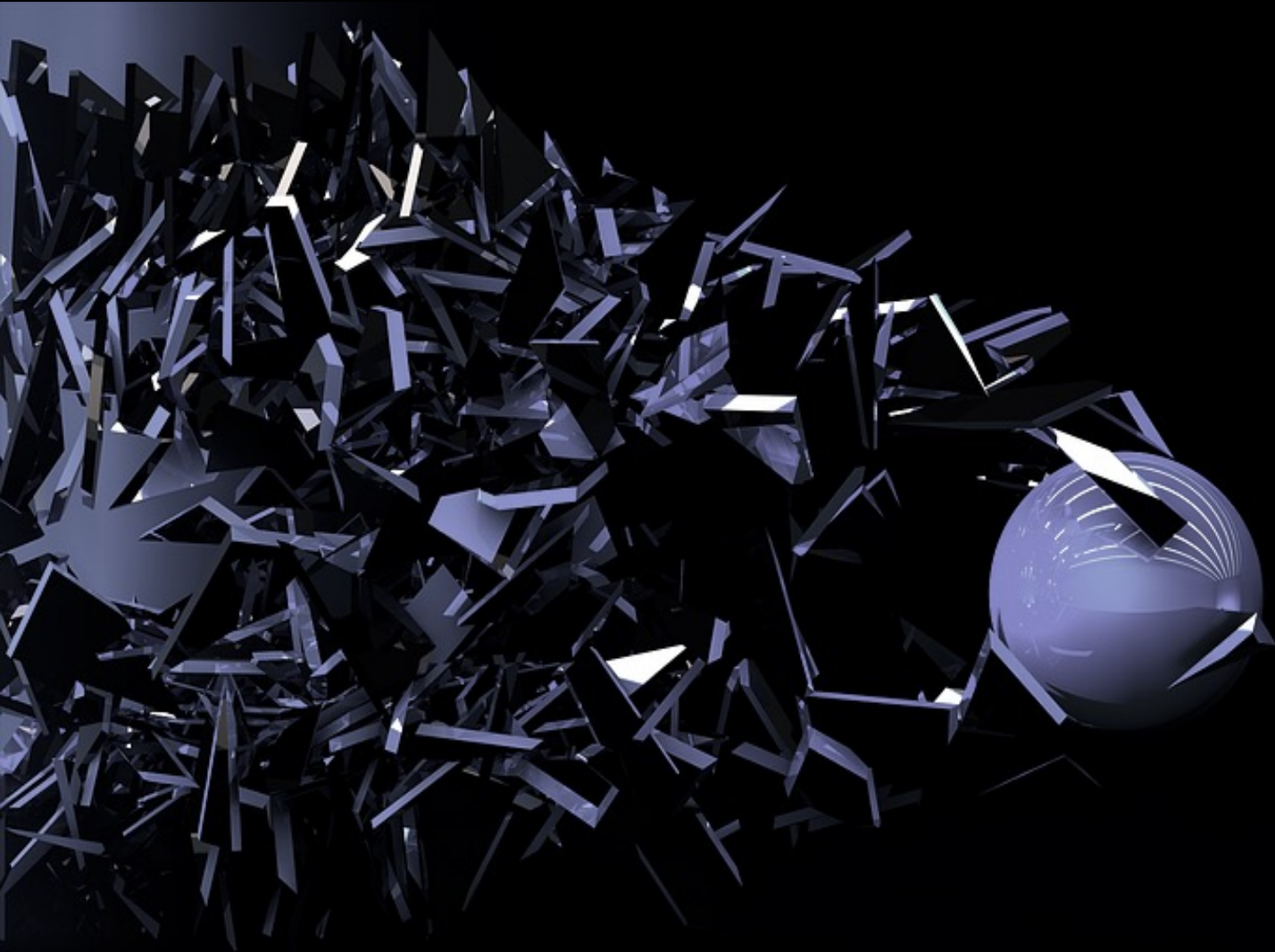


# the digital divide

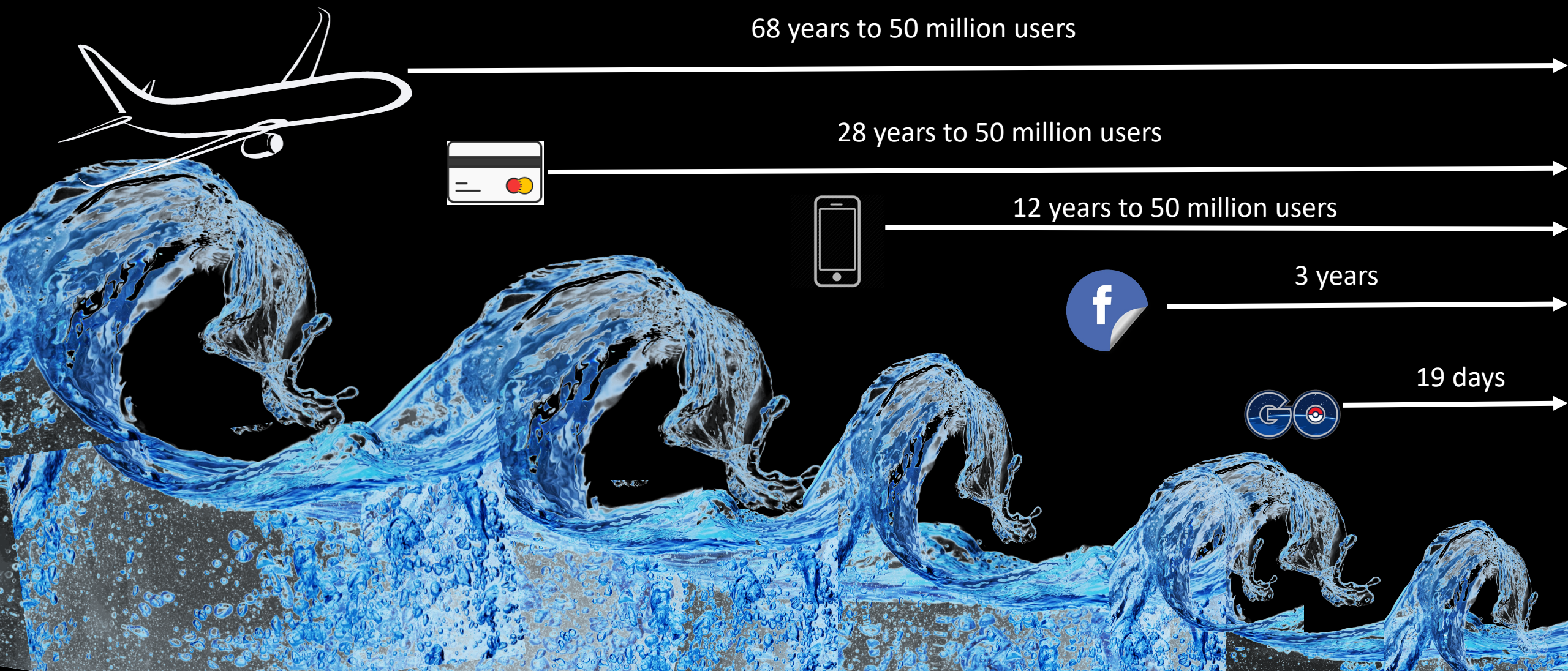
internet & population

Cross-border flows of data, estimated to reach 65% of global GDP by end of 2022...





## III. Governance

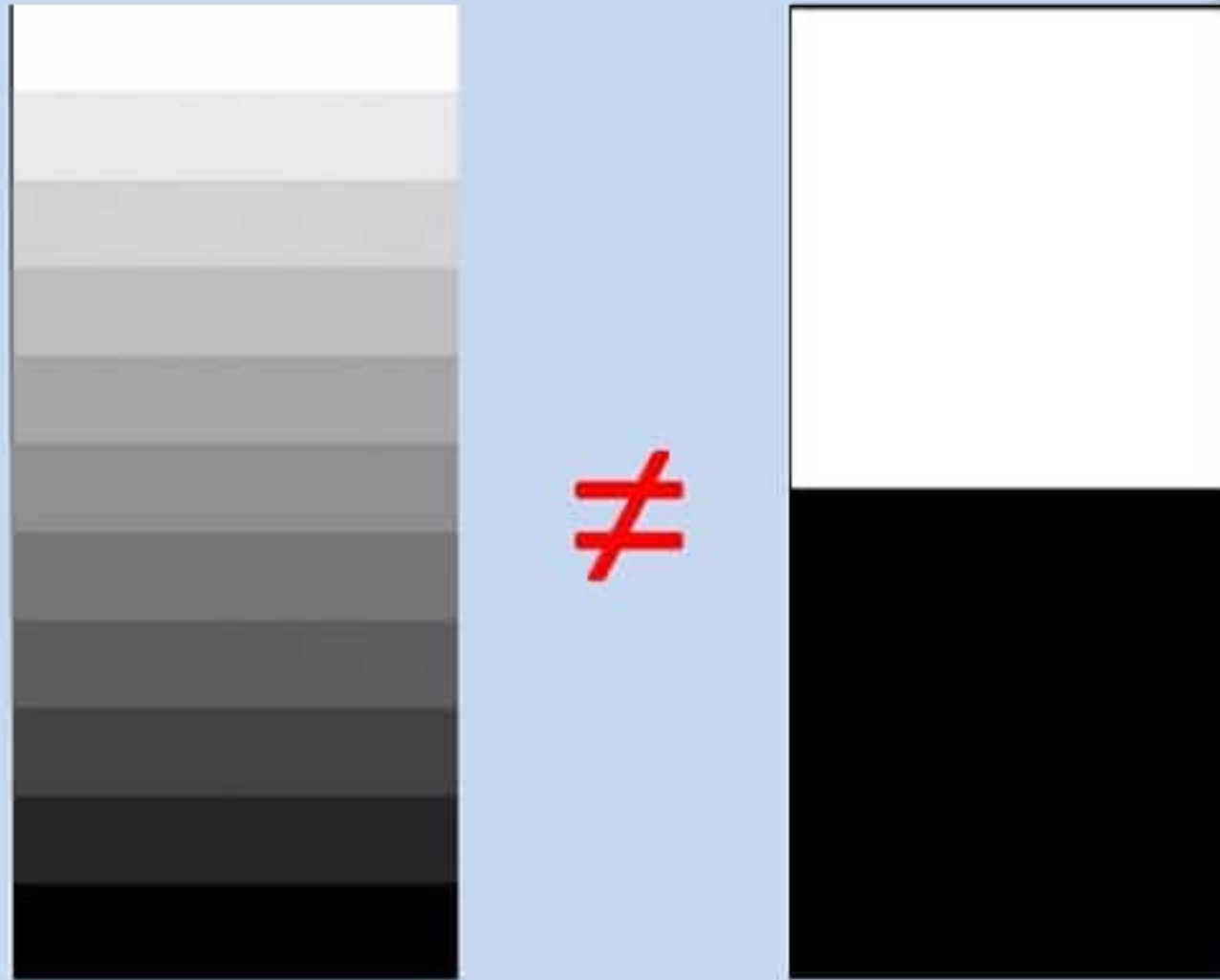




**We live in an increasingly crisis prone world**



## IV. Planet Positive 2030



*Probability can be high or low. Possibility is only a yes or no.*

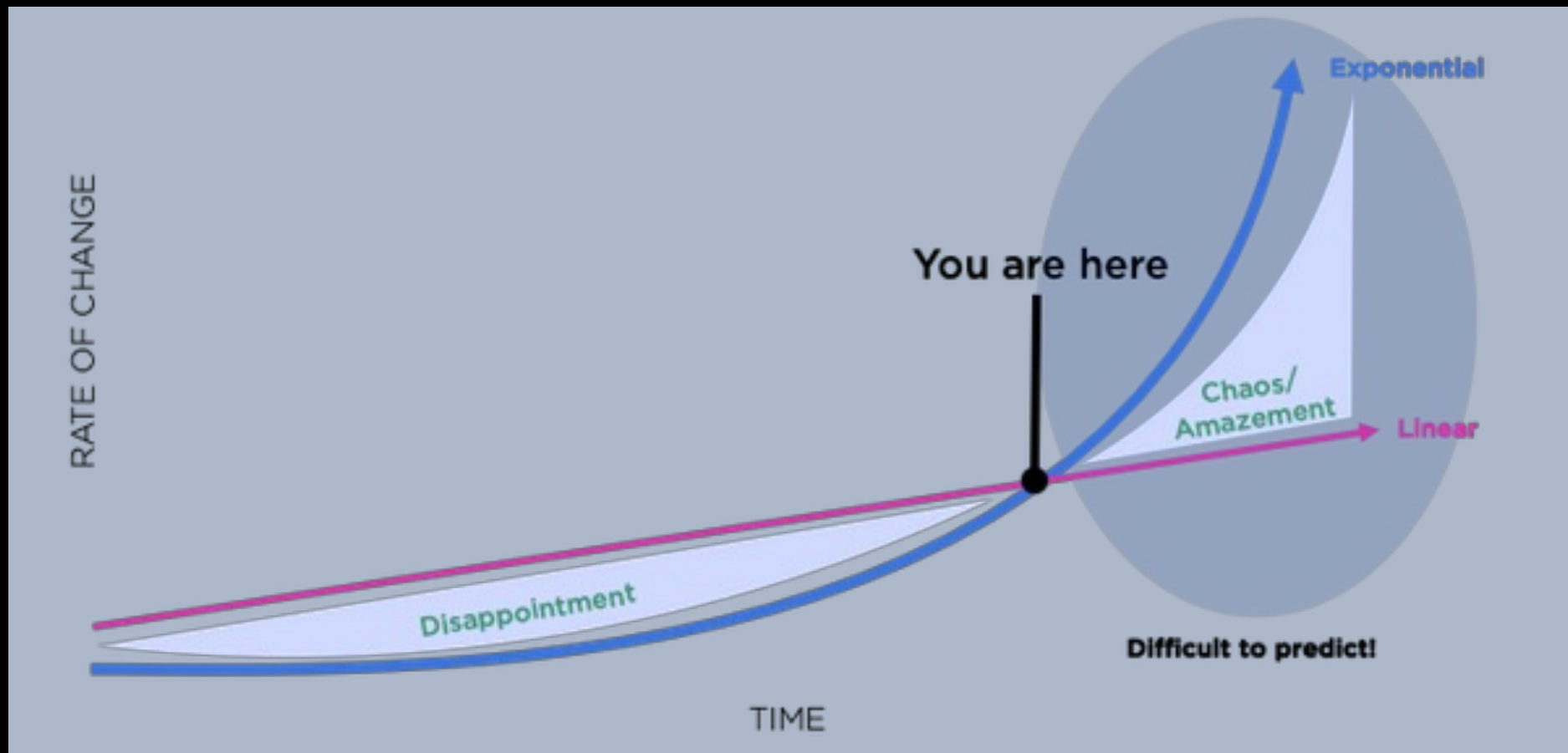




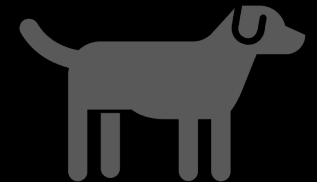
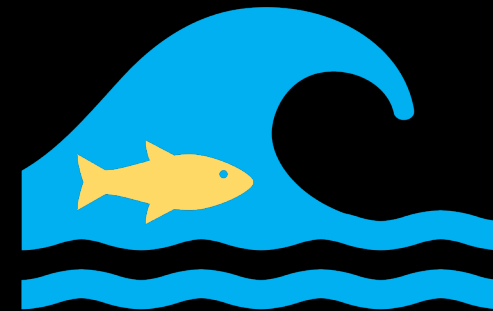
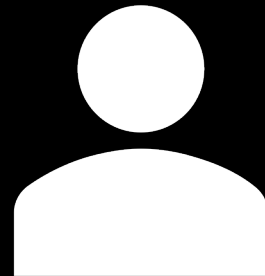
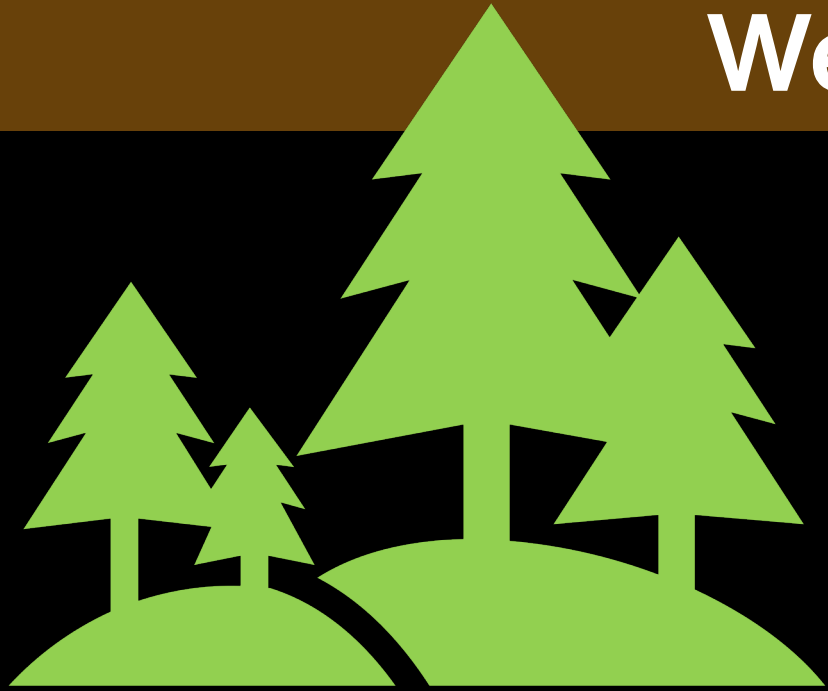
Knowing the difference  
between what counts but  
does not matter and what  
matters but cannot be  
counted!



# Mindset Change



# We are Guardians



8.7 million species on Earth – we are just one!



# Tipping Point Planet Positive 2030



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