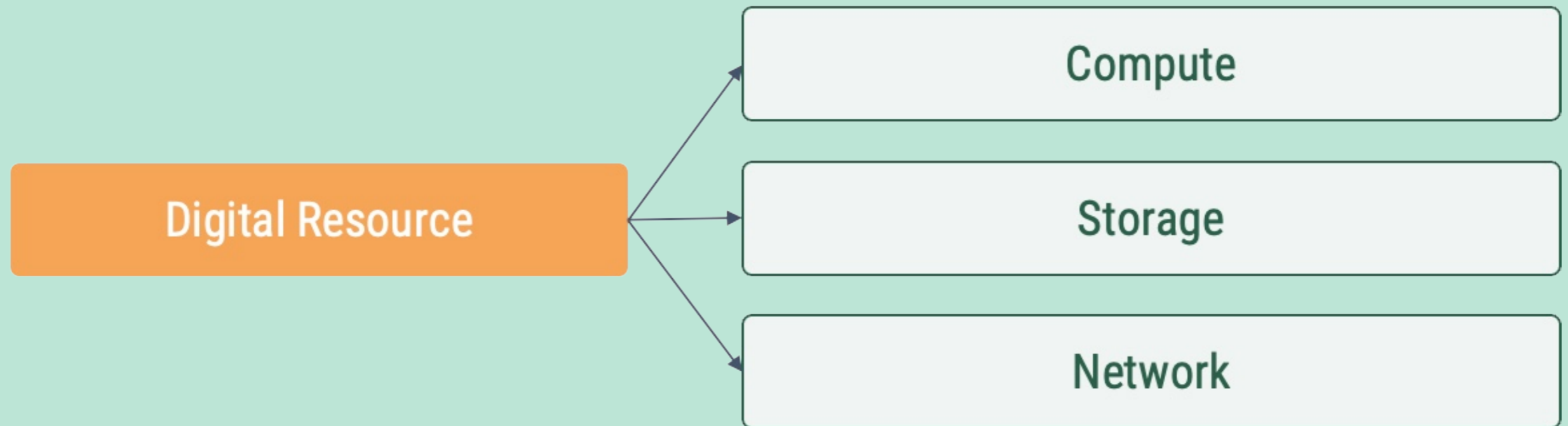


RIPE NCC

Zoom

S12Y

Digital Resource = Compute, Storage and Network Usage



Context: Digital Products

Digital Product =
(Assembly x Resources)
x Audience

What we can affect:

Assembly & Resources

What it does

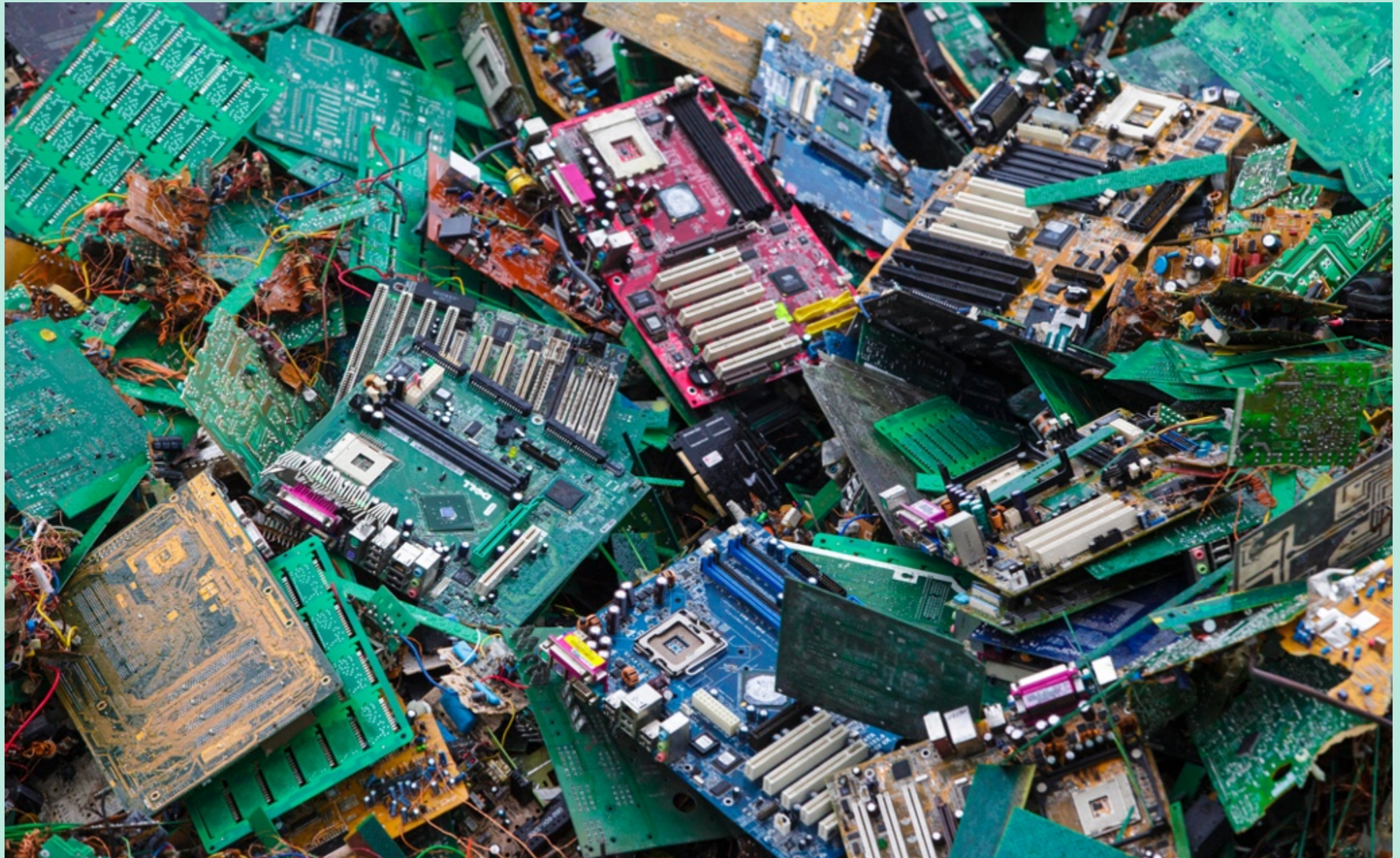
How it's made

Resources it needs
to run

Our Focus

Software has side effects.

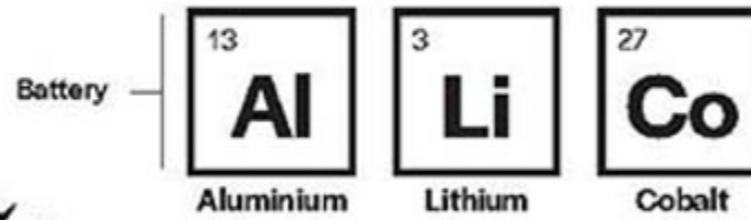
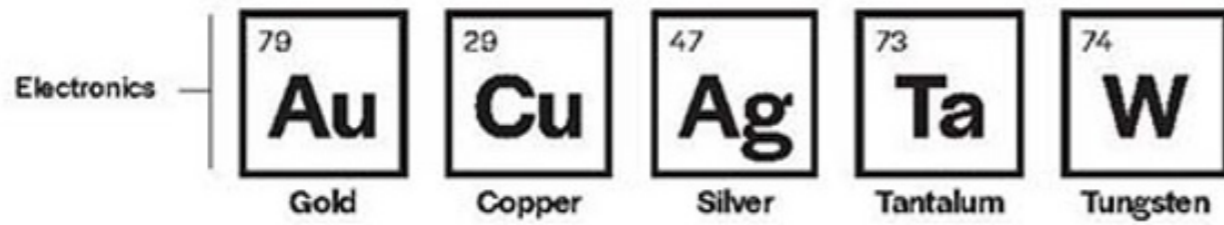
Digital resources create environmental impact



S12Y



S12Y

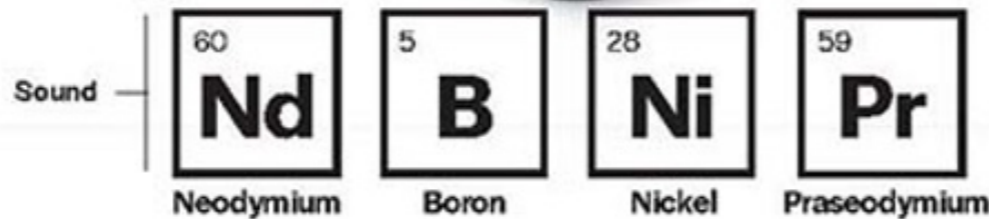


Mining makes holding the world in your hand possible

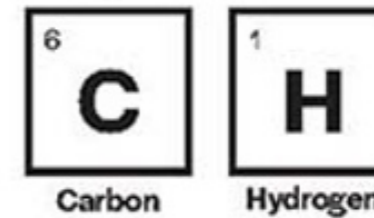


More than 40 mined metals and rare earths are used to produce a single smartphone.

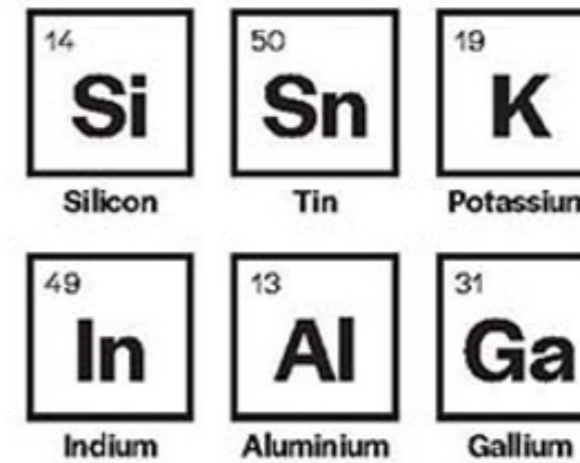
04 Smartphones



Earbuds*
Phone Cases*



Touch screen



Mining is essential for Innovative tech

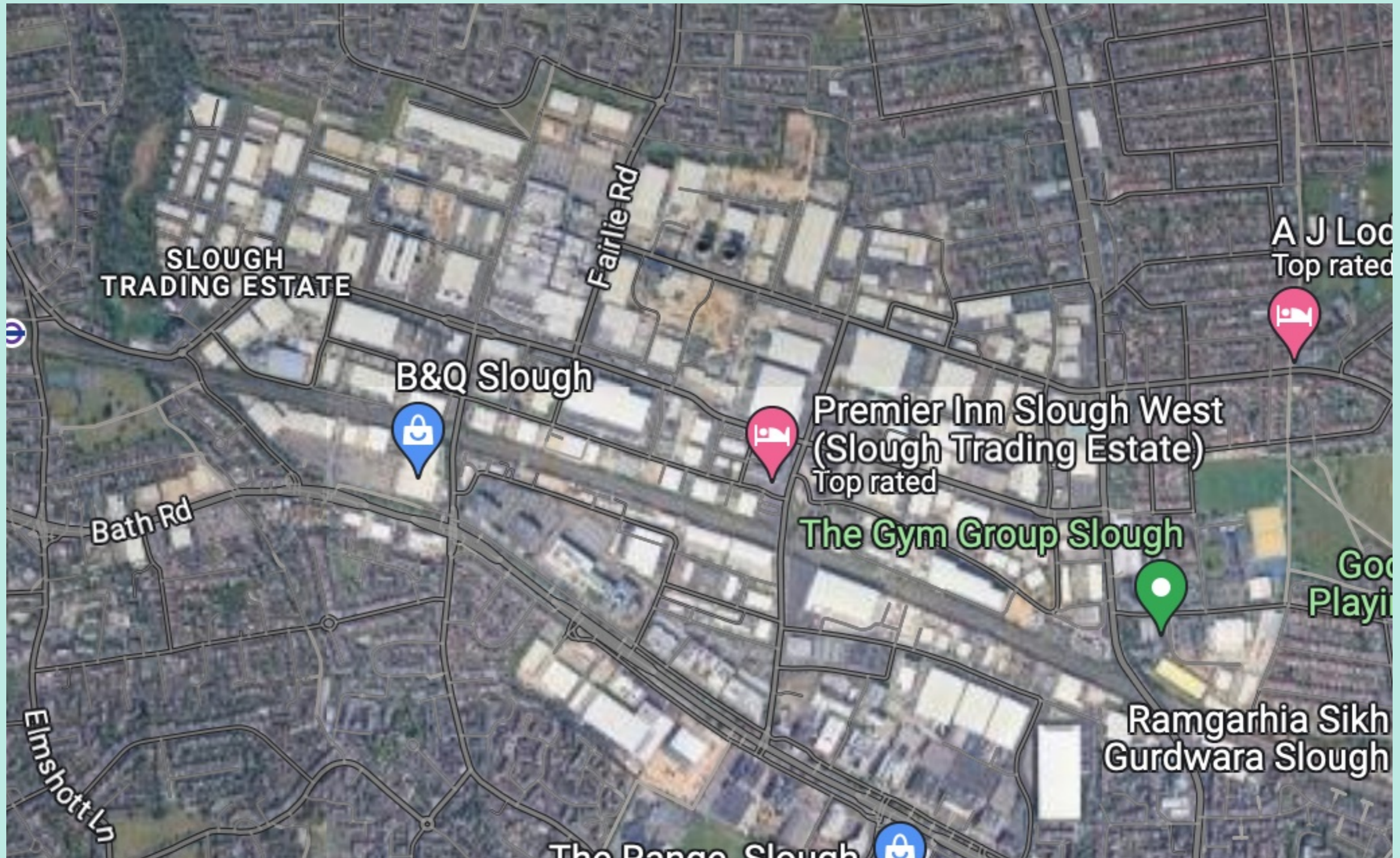
Canada's mining industry is providing the responsibly-sourced minerals and metals that power the technologies of today and of the future. In turn, we're helping businesses and their customers be confident in how they're made.



S12Y



S12Y



S12Y

And: Chips ain't getting faster.

Chips Can't Get Much Smaller

Despite the optimism of Moore's Law, scientists predict computer chips have just four more years of shrinkage

BY MATT RANSFORD | PUBLISHED MAR 31, 2008 11:58 PM EDT

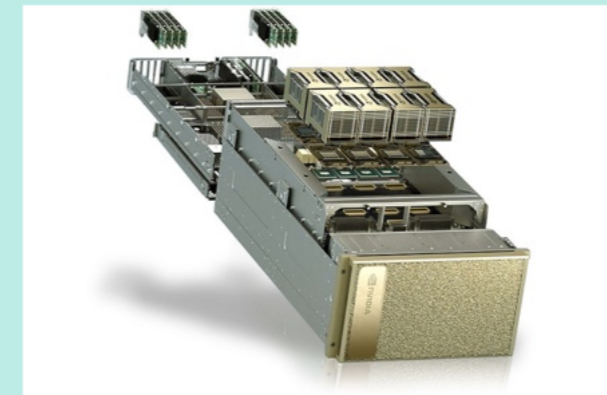
COMPUTING

Moore's Law Is Dead. Now What?

Shrinking transistors have powered 50 years of advances in computing—but now other ways must be found to make computers more capable.

By Tom Simonite

May 13, 2016

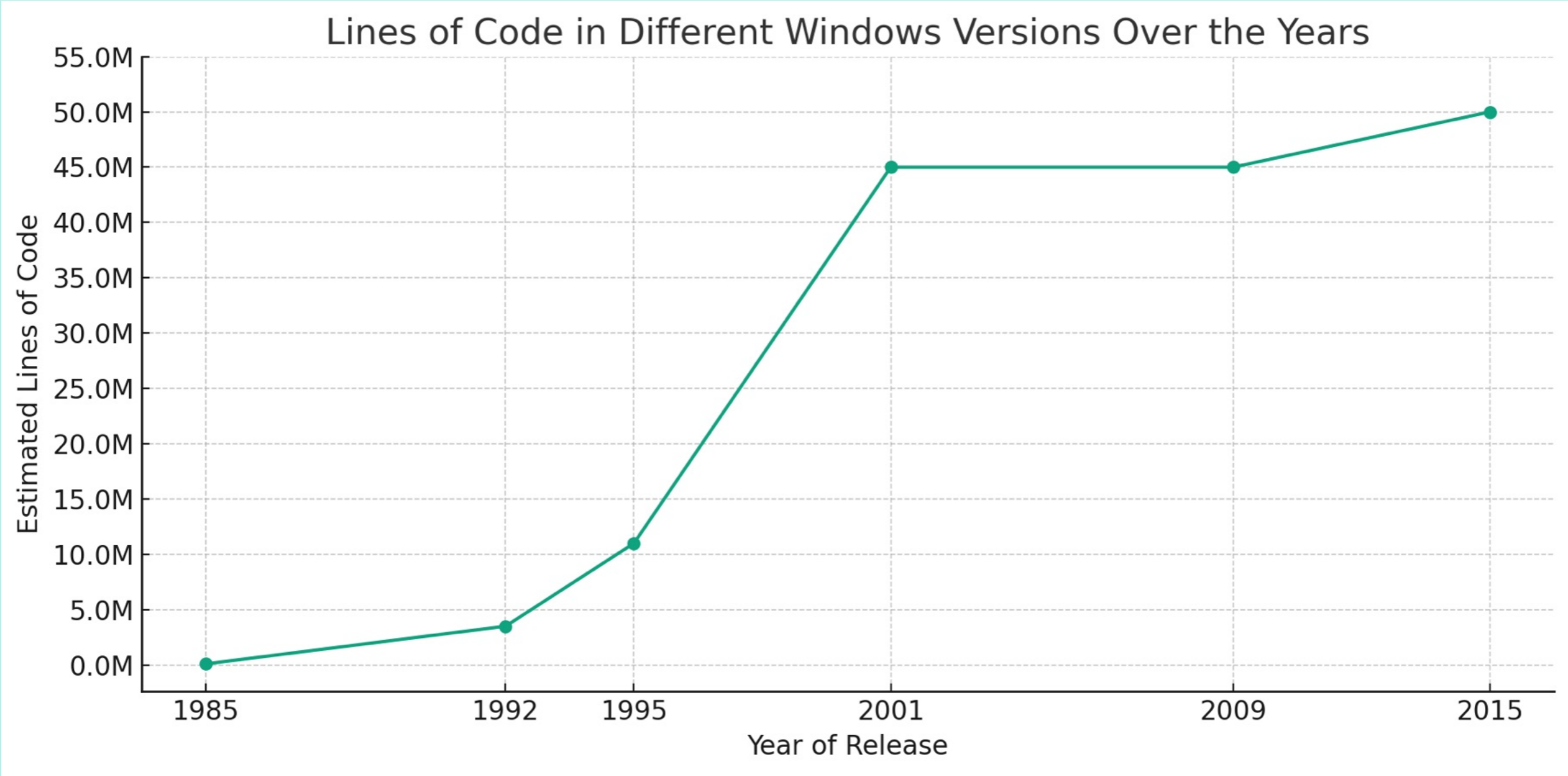


6.500 Watt - NVIDIA
DGX A100

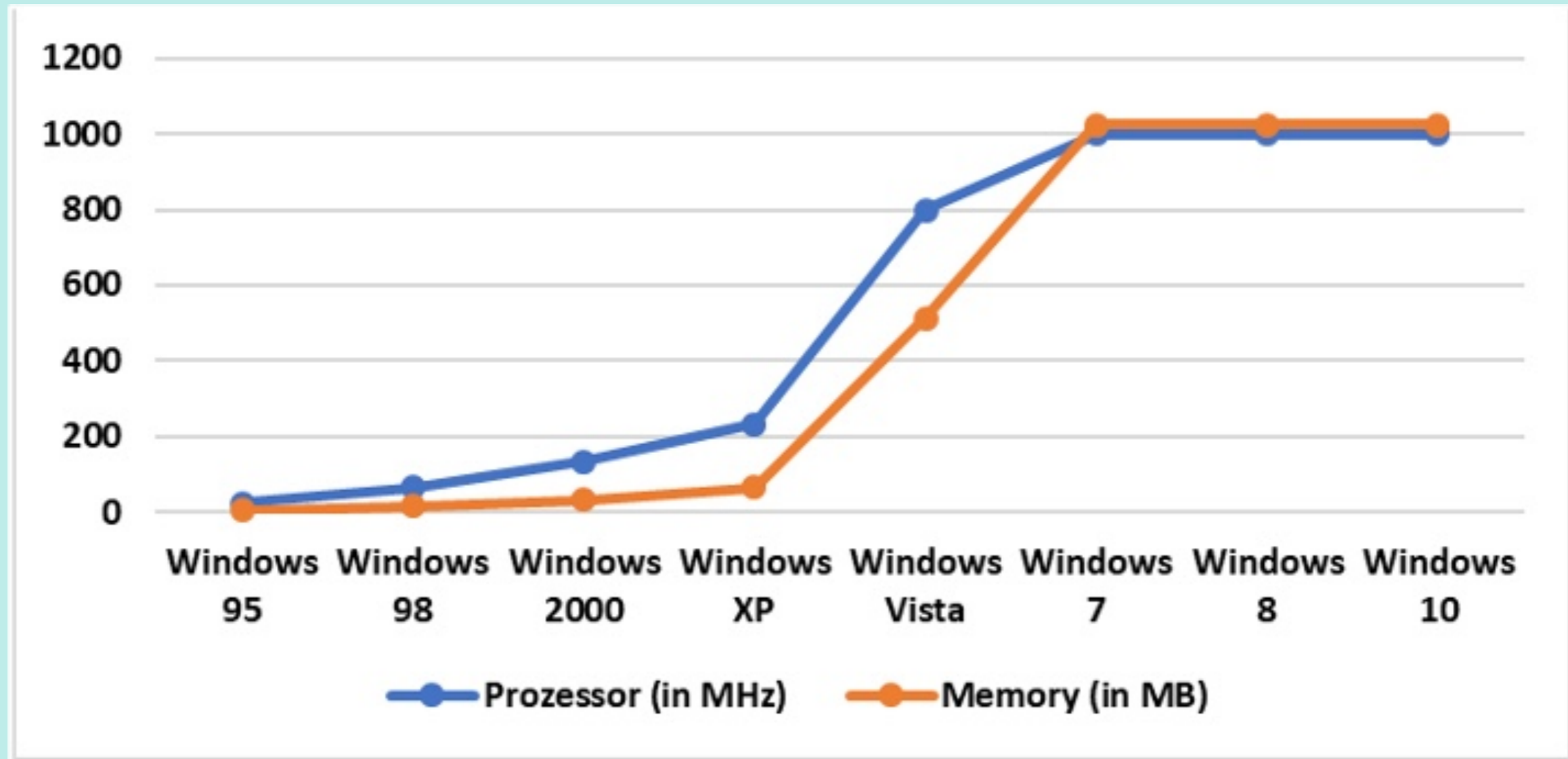
S12Y

Choices of making software affect resource use

Lines of code per Windows version



With that comes an increase in digital resource demand

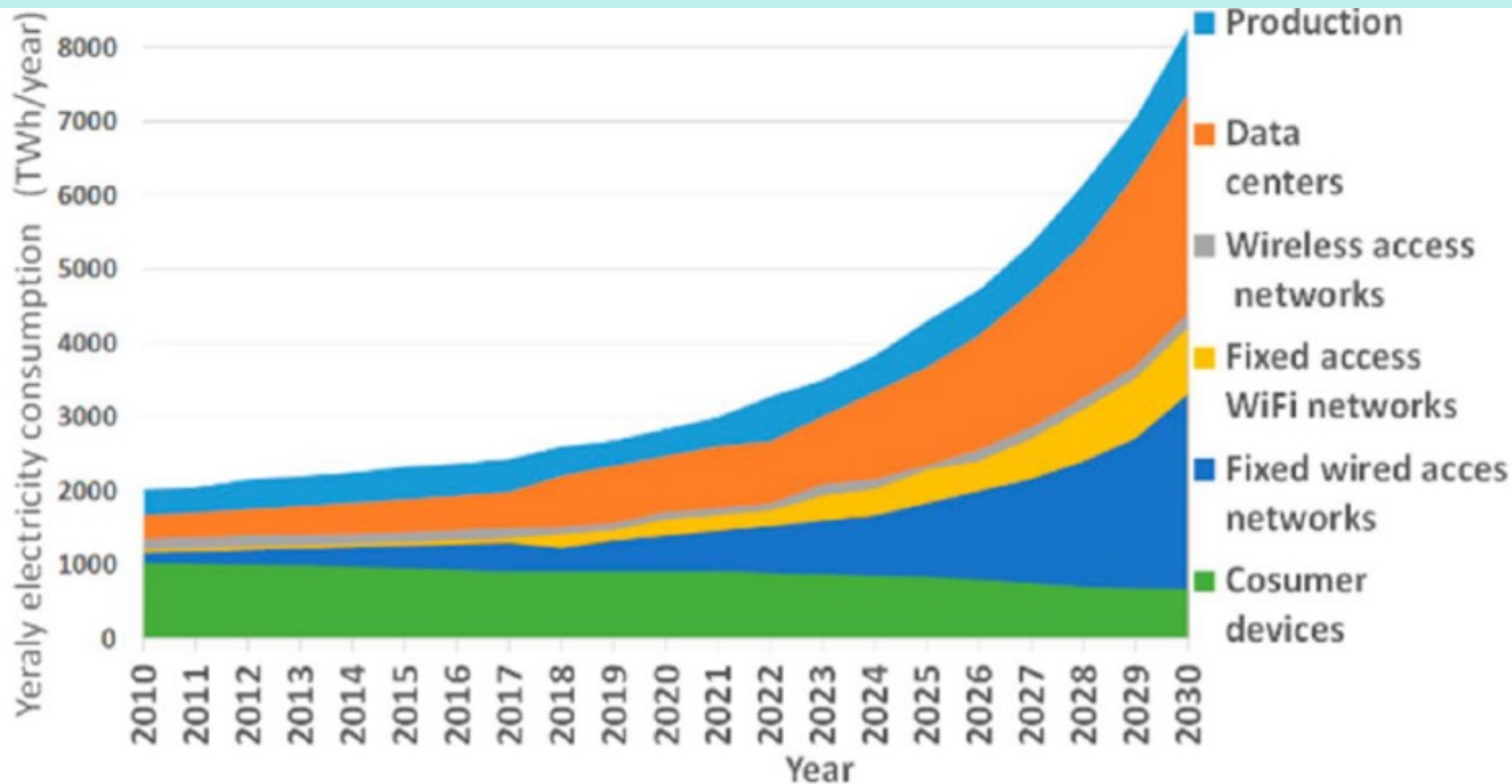


**What about that Wordpress
site?**

Jevon's Paradox

More efficient chips = more software





J. Lorinc et al., Greener, Energy-Efficient and Sustainable Networks: State-Of-The-Art and New Trends, *Sensors* 2019, 19, 4864. doi:10.3390/s19224864

Circumventing technical problems by throwing more resources at it



Mark Mandel
@Neurotic
he/him

**You can't just
add more servers**

leftpad

**3 lines of code x 1 Billion
dependent packages =
impact**

Remember: Scale matters.

**What's expected of
me?**

Step 1: Acknowledge it

Digital products create environmental impact.

Step 2: Take responsibility

For the impact from digital resources

Step 3: Spread awareness

You can use this presentation afterward

Step 4: Encourage Transparency

for the products you are working on

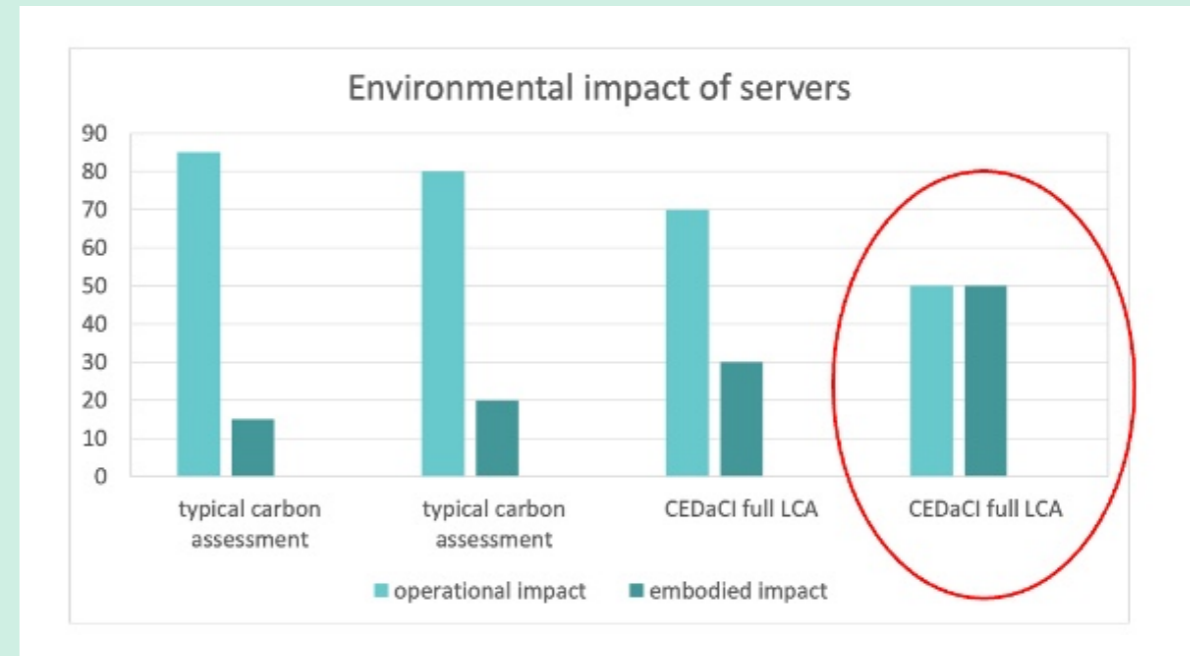
Myths & believes

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It's the user's fault

| Value Chain | Responsible for: |
|------------------------------------|---|
| User | <ul style="list-style-type: none">• Sustainable use• Disable unused functionality |
| Digital Products & IT Applications | <ul style="list-style-type: none">• Minimize digital resource usage• Transparency of digital resource usage & impact to user• Buy/use sustainable digital resources |
| Resource Provisioning | <ul style="list-style-type: none">• Avoid idling/wasting of digital resources• Transparent pass-through of environmental impacts |
| Digital Infrastructure | <ul style="list-style-type: none">• Produce sustainable digital resources |

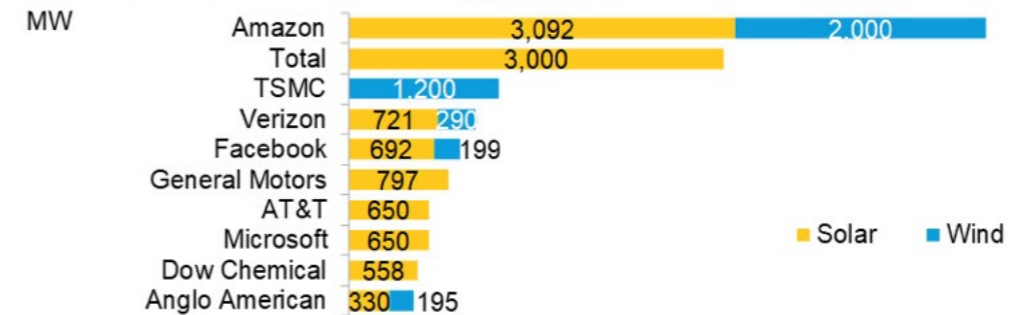
It's about energy



Source: CEDaCI

It's powered by green energy

Figure 2: Top corporate clean energy buyers, 2020

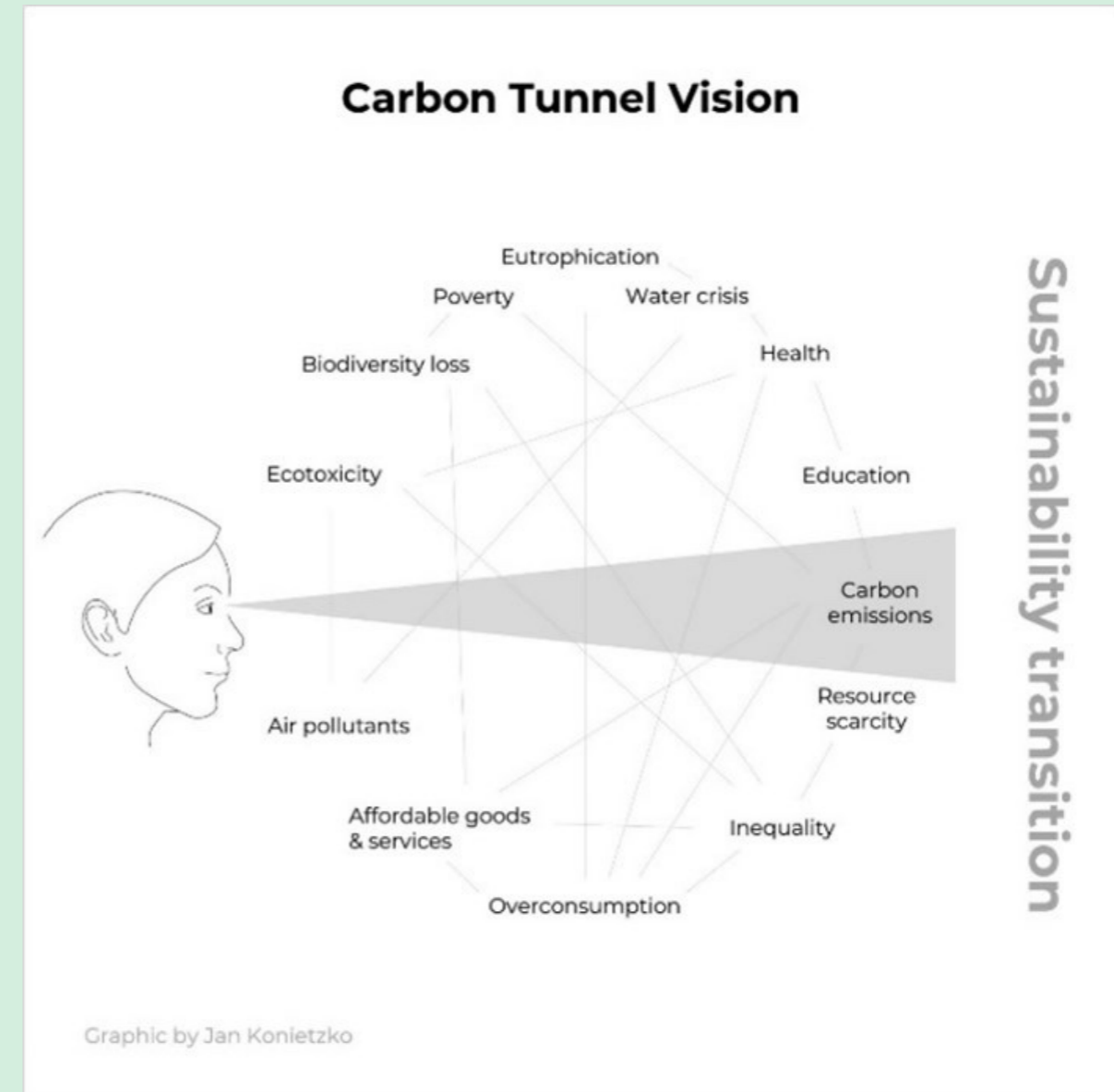


Source: BloombergNEF. Note: Chart is in MW DC and includes offsite PPAs only. Data is based on public announcements.

Source: Bloomberg NEF

**The cloud is more
efficient**

Carbon, Carbon, Carbon



Reports by cloud providers

S12Y

What to do

Create awareness

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Transparency as a tool for change

Reduce SLA

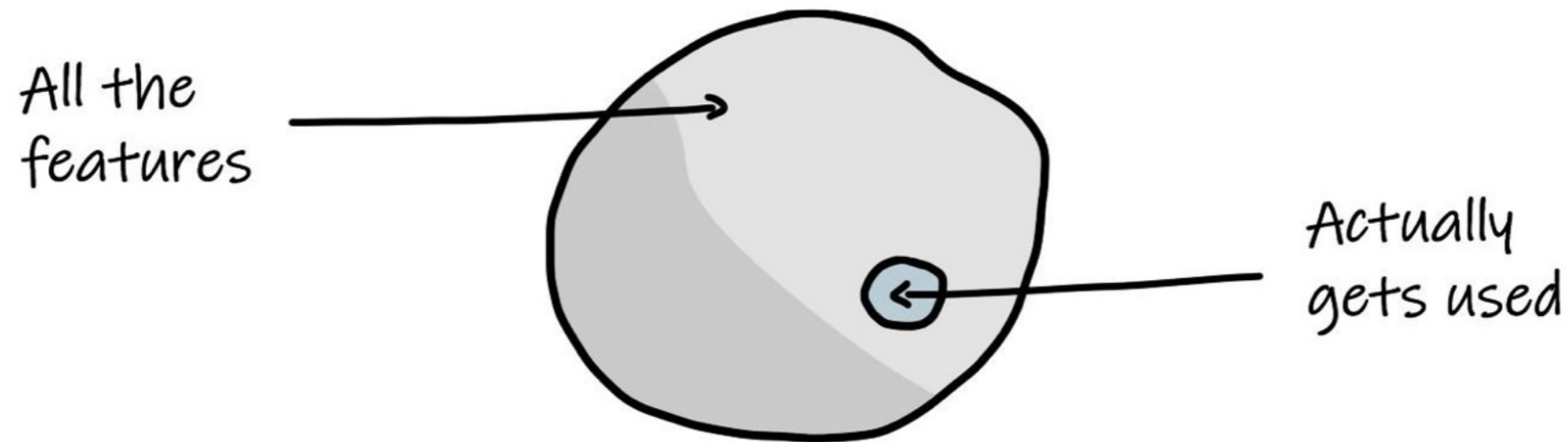
Enhancement to current workload classification structure: **CIA-S**

| Sustainability Rating (S) | Resource and Footprint Dynamics Archetypes / Characteristics <small>Applicable on Product/Workload and/or Business process level</small> | Typical / background |
|---------------------------|---|--|
| 0 Label A | 'Always-off or default-off' Resources scaling back to 0, when no workload present/needed. Footprint 100% dynamic when workload in use (autoscaling *) | Excl. listener/orchestrator/backup Compute scaling down to 0 Data scaling down to 0 *Driven by sessions/transactions/analytics/etc. |
| 1 Label B | 'Always-off or default-off' Resources not scaling back to 0, when no workload present/needed. Footprint 100% dynamic when workload in use (autoscaling *) | Excl. listener/orchestrator/backup Compute scaling down to 0 Data not scaling down to 0 (persistent Data footprint remains) |
| 2 Label C | 'Partly-off' - minimal 3 of 3: 1. No permanently allocated OTA Footprint 2. No permanently allocated DR Footprint 3. No permanent allocated Peak load Footprint | Additional resources reside in consumable platform(s) Typical Bursting / On demand provisioning |
| 3 Label D | 'Partly-off' - minimal 2 of 3: 1. No permanently allocated OTA Footprint 2. No permanently allocated DR Footprint 3. No permanent allocated Peak load Footprint | Additional resources reside in consumable platform(s) Typical Bursting / On demand provisioning |
| 4 Label E | 'Partly-off' - minimal 1 of 3: 1. No permanently allocated OTA Footprint 2. No permanently allocated DR Footprint 3. No permanent allocated Peak load Footprint | Additional resources reside in consumable platform(s) Typical Bursting / On demand provisioning |
| 5 Label F | 'Always-on or Default-on' All resources permanently allocated and active. Footprint 100% all the time (incl. DR/Peakload/OTA) | All capabilities/capacities (e.g. resources) always allocated and active. |

WvdZee Febr. 2020

Differentiate through sustainability, not features.

The Death Star of feature creep



More?

1. Communities: S12Y, Green Software Foundation, Green Web Foundation, Climate Action Tech, Boavizta, W3C Sustainability, Greening of Streaming
2. Wiki: S12Y
3. Standards: In the making
4. Certification: 'Blauer Engel'

And, how was it?

Thank you!

S12Y