

Intuitively right, technically wrong

Lessons learned exploring
policy responses for a
decarbonised internet

GREENWEB.ORG

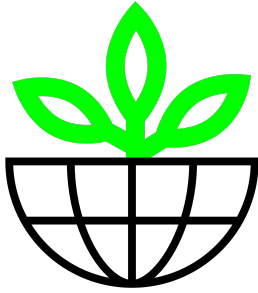
Chris Adams
IRTF: The Internet meets the
Electricity Grid - Technical
Standards & Societal Challenges

16.07.2026



What we'll cover

1. Experiences dealing with network when new standard, SCI for Web
2. How similar mental models for networking show up in EU policy
3. Competing grid ideas showing up in internet architecture



Experiences dealing with networks when developing a carbon intensity standard for the web

1

Carbon emitted per kWh
of energy, gCO₂/kWh

Carbon emitted through
the hardware that the
software is running on

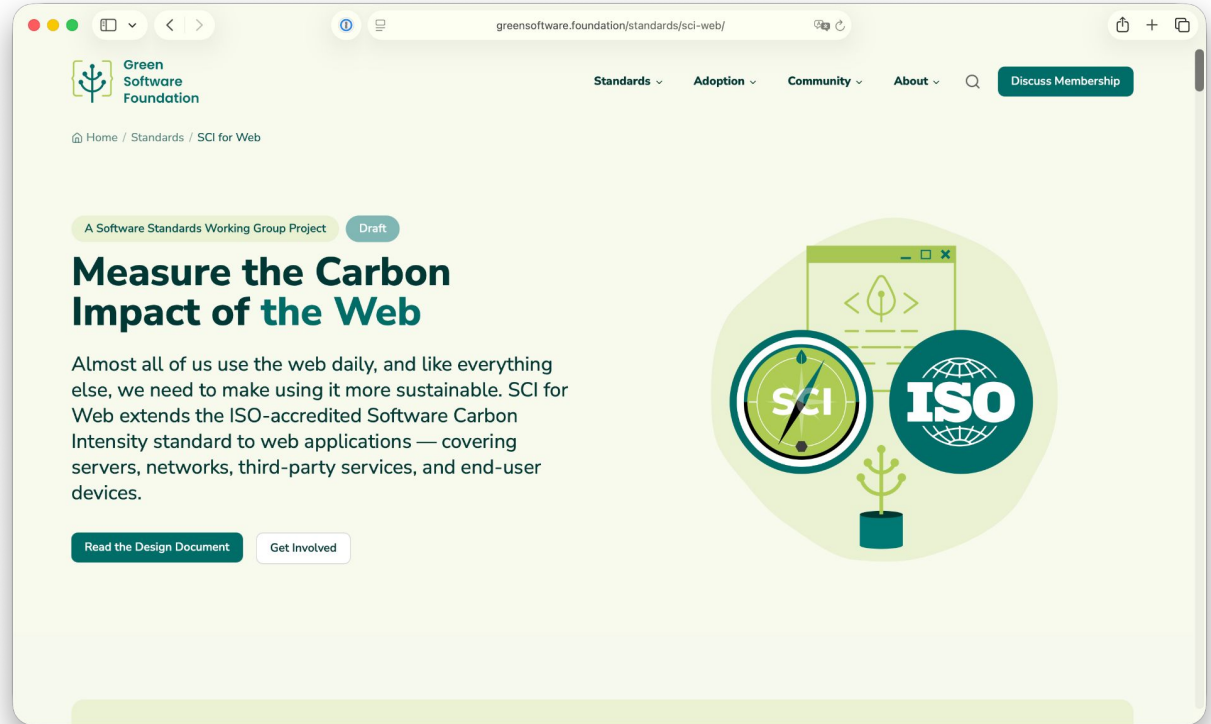
$$SCI = ((E * I) + M) \text{ per } R$$

Energy consumed by
software in kWh

Functional Unit; this is how
software scales, for example
per user or per device

My org, the *Green Web Foundation*, is leading a project within the larger industry body the *Green Software Foundation*, to define **Software Carbon Intensity for the Web**, in collaboration with the W3C.

An extension of the Software Carbon Intensity ISO standard specifically for websites and web applications.

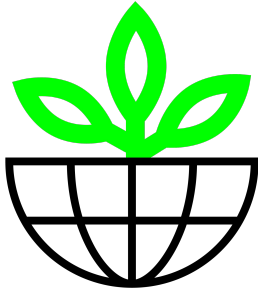


The tyranny of KWh per Gb

By far the most commonly used models used to estimate the environmental impact of digital services is the Sustainable Web Design Model. Ended up framing so many conversations. Ubiquitous, easy to implement, intuitive, but...

...it scales impact based on network transfer linearly, to provide an energy consumption estimate that is then shared across hardware, network and server side.

Tripling the data transfer triples the assumed energy consumption across the whole stack. What actions does this incentivise?



How similar mental
models for networking
show up in EU policy

2

NEWS > ENERGY AND CLIMATE

Europe must choose between AI and climate goals, data center lobby says

Tech sector says only carbon-emitting gas plants are reliable enough today to power the EU's AI goals.

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POLITICO PRO

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The image is a screenshot of a web browser displaying the European Commission's website. The address bar shows the URL: commission.europa.eu/topics/competitiveness/ai-continent_en. Below the address bar, there is a search bar with the text "Text version" and a plus icon. The main content area has a light blue background and features the following sections:

Main actions of the AI continent action plan

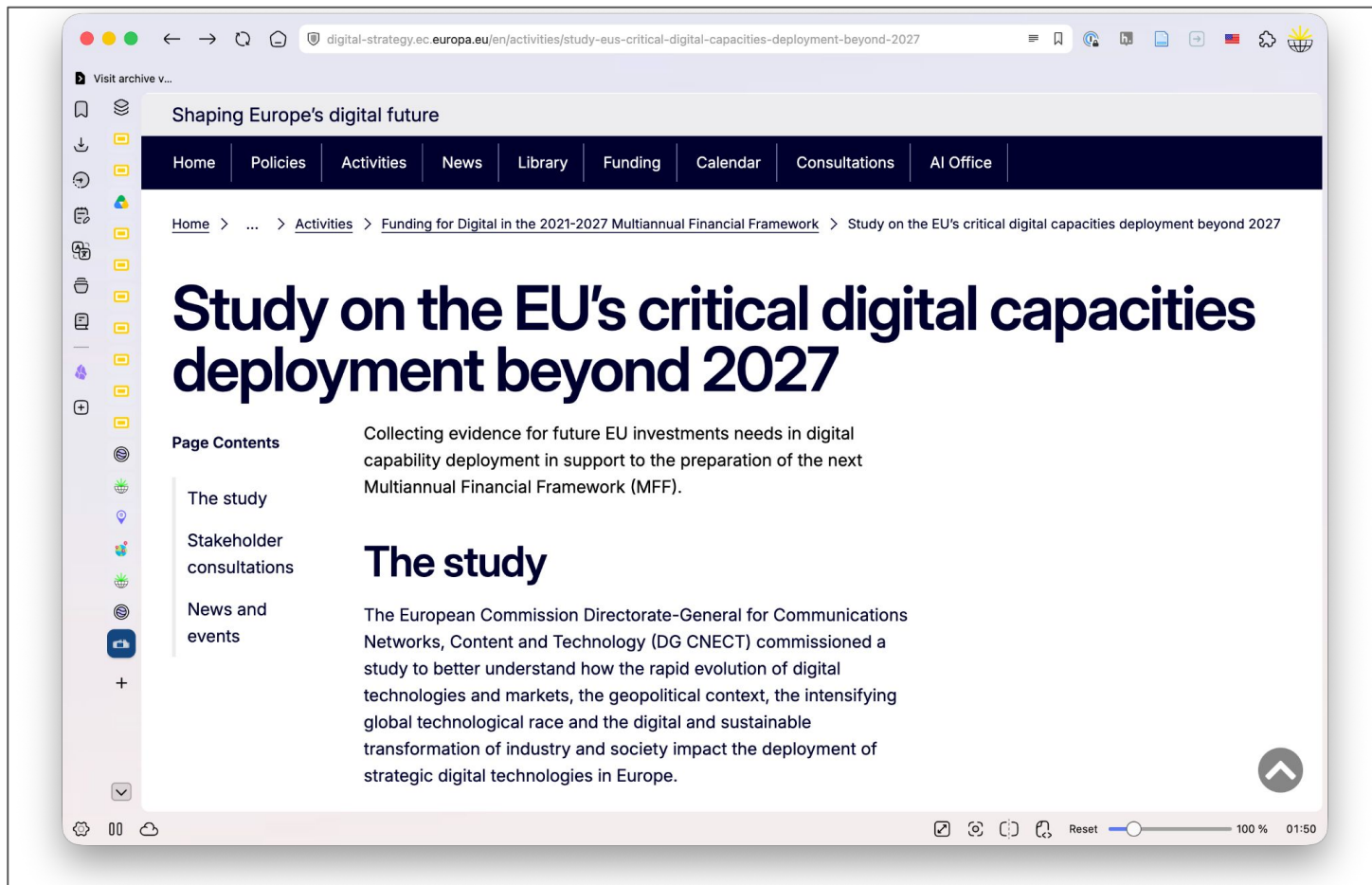
Building on the [launch of the InvestAI initiative](#) that will mobilise €200 billion for investment in AI in the EU, the AI continent action plan aims to enhance our AI capabilities, by promoting initiatives around five key areas.

Building a large-scale AI computing infrastructure

Advanced AI models need investment, infrastructure and collaboration. Our plan will bring the necessary elements together to help European businesses excel in AI by

- setting up at least **19 AI factories** across Europe, using our world-leading supercomputing network. These factories will support startups, industry, and researchers to develop cutting-edge AI models and applications
- establishing up to **5 AI gigafactories**, large-scale facilities with massive computing power and data centres. They will enable the training of complex AI models at an unprecedented scale. This initiative requires both public and private investment and will secure EU leadership in frontier AI
- the **InvestAI facility** that aims to mobilise €20 billion, to drive private investment in gigafactories
- proposing the **cloud and AI development act** that will boost private investment in cloud and data centres. [The goal is to at least triple the EU's data centre capacity within the next five to seven years, prioritising sustainable data centres.](#)

Increasing access to high-quality data



EU's critical digital capacities deployment beyond 2027 – Final Report

Artificial Intelligence: Despite accelerating adoption, several barriers continue to hinder AI deployment across the EU-27. A major constraint lies in the limited availability of AI-optimised hardware, such as AI chips, and a growing gap in data centres and cloud infrastructure. To meet demand, Europe's data centre capacity needs to triple by 2027, reaching approximately 22,700 MW¹⁸¹. This shortfall poses significant risks to the EU's ability to maintain technological sovereignty and global competitiveness. Another critical barrier is the lack of return on investment (RoI) for internal AI initiatives. Many AI projects demand substantial upfront investment with benefits that may only materialise over the long term. At the ecosystem level, the uptake of AI in EU-27 is further hampered by fragmentation in talent, capital, and infrastructure. There is no sufficient concentration of key resources such as skilled professionals, investment capital, and advanced computing infrastructure.

What reference 181 is pointing to

Reference 181 is an opinion piece from Savill's, a real estate firm specialising in datacentre real estate, in support of a report published, *European Data Centres Navigating the new data-centric frontiers*.

13,100 MW

European DC Power capacity
in 2027

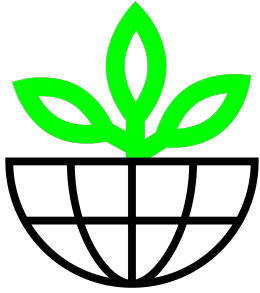
The European data centre power capacity is projected to rise to approximately 13,100 MW by 2027, reflecting a 27% increase whilst the total internet bandwidth usage will nearly triple during the same period of time.

Is this *really* how DCs and networking scale together?

“According to Data Center Dynamics (DCD), data centres manage 97% of global IP traffic. ***Considering this and the expected rise in internet bandwidth usage, European data centre capacity will need to triple by 2027, reaching approximately 22,700 MW to support the increased bandwidth.***”

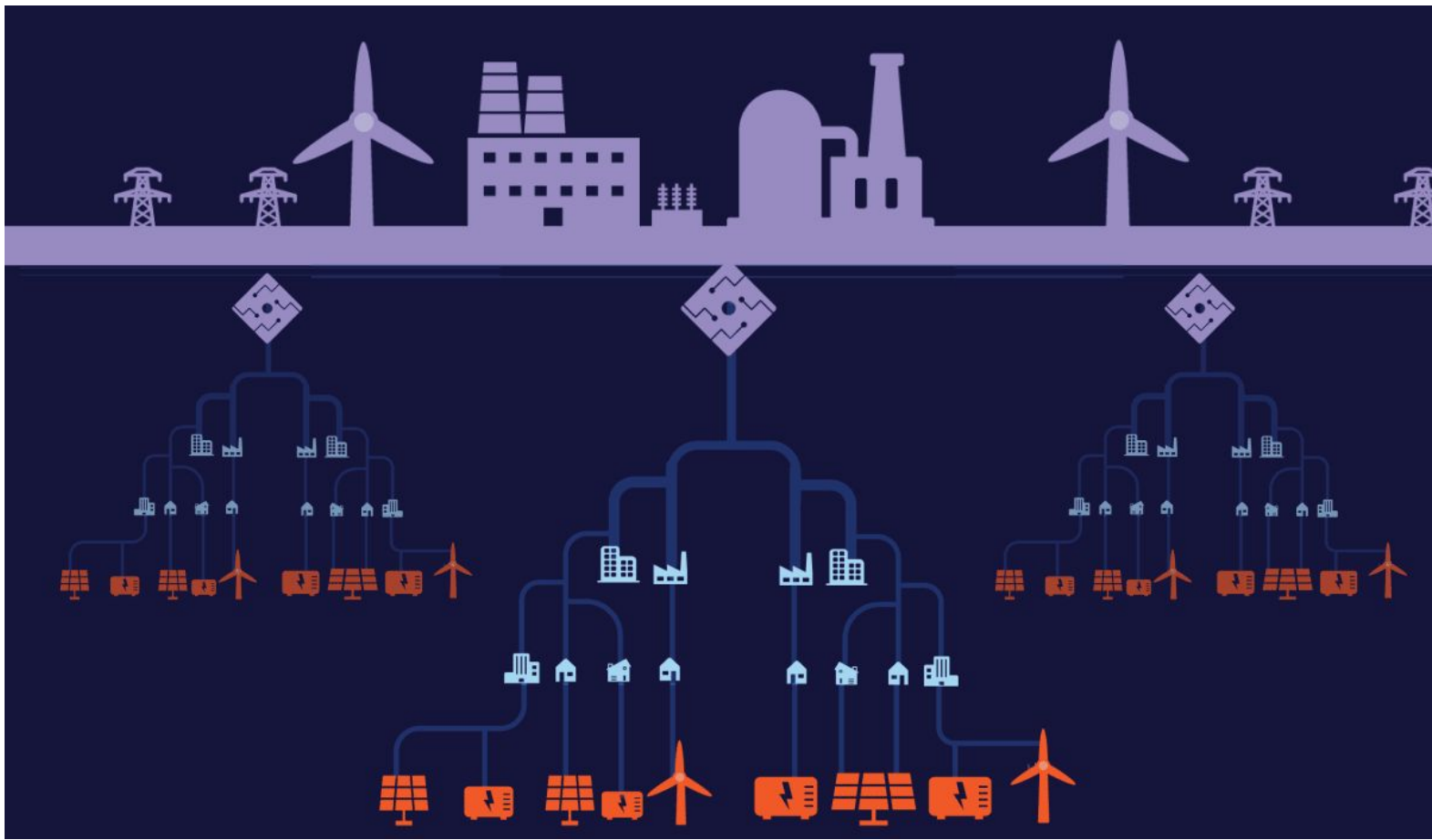
It this Koomey all over again, 20 years later?





Two visions of grid, each ‘griddifying’ the internet

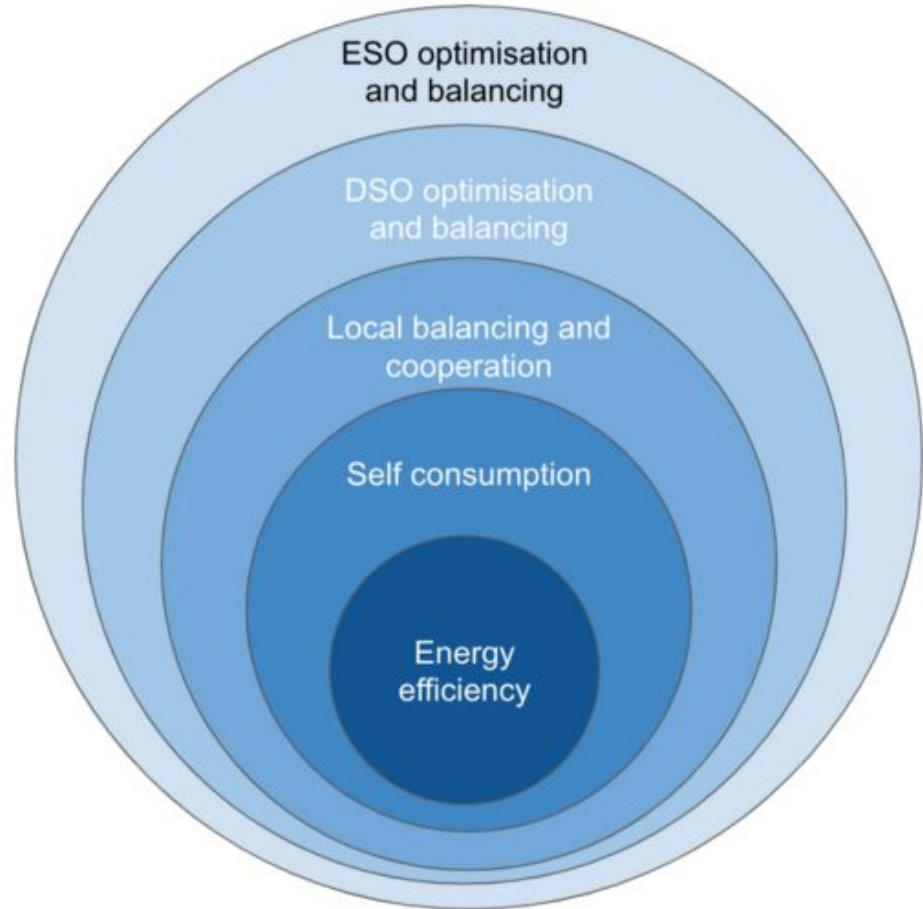
3



New conceptions of the grid informed by renewables

The Energy Onion from former Kraken / Octopus head of data David Sykes.

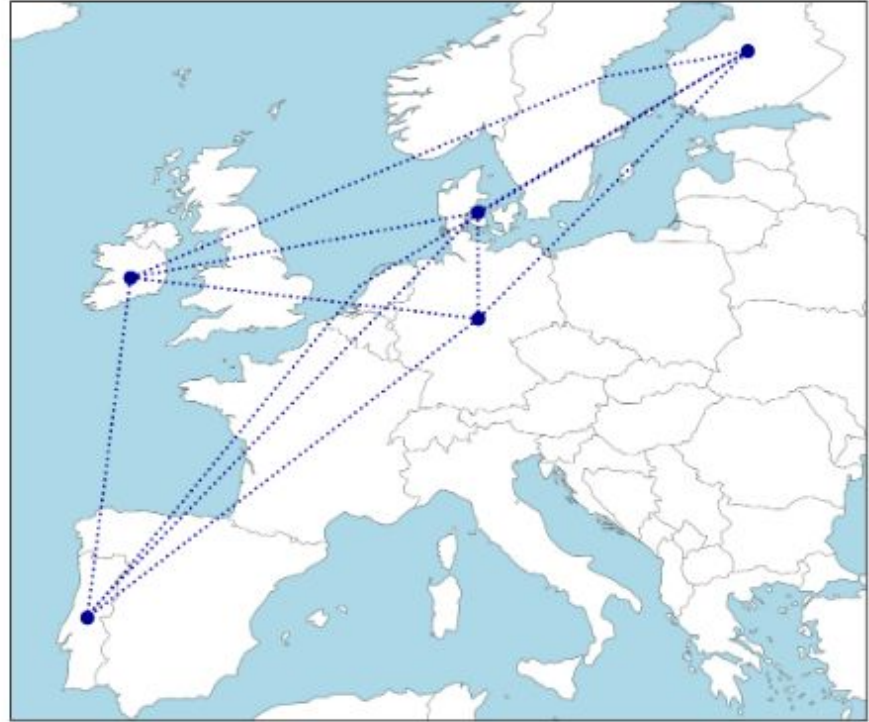
A conceptual model for thinking about new energy systems, when renewables are cheap but variable, where batteries exist, but transmission is expensive and slow.



Google and Carbon Awareness - where it came from for them

A distributed system originally designed for resiliency, was repurposed to meet new environmental budgets.

It requires a much tighter link between how you buy energy and how you buy 'cleanness' to really work.



Five data centers interconnected by virtual links, forming a complete graph

Thanks!

This deck is online, with links and more.

<https://greenweb.org/events/passau-irtf-2026>

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Bluesky:	<u>mrchrissadams.net</u>