**Nonknowing the environmental impact of video streaming**

Judith Keilbach (j.keilbach@uu.nl)

“many spheres in our mediated lives are in fact conditioned by nonknowing” (Parks 2023).

In its 2020 Environmental Social Governance Report (ESG), Netflix announced its ambitious goal to achieve net-zero greenhouse gas emissions by 2022 (Netflix 2021, 2). In the previous year, the company had measured its carbon footprint to identify their “largest source of emissions […] and the biggest opportunities […] to reduce them” (ibid., 3). In the report, it presents not only its “Reduce, Retain, and Remove” strategy to achieve its net-zero goal (ibid., 7); it also discloses Netflix’s carbon footprint, which was 1.1 million metric tons (ibid., 4),[[1]](#footnote-1) and briefly discusses the methodology of calculation, mentioning for example that this number includes all Scope 1 and 2, but only a part of the Scope 3 emissions.

Netflix’s self-reporting[[2]](#footnote-2) of its carbon footprint is laudable as it contributes significantly to the production of knowledge about the environmental impact of video streaming. The apparent transparency of the report, combined with its technical language and the certification by external accountants, fosters a sense of credibility and emphasizes the company’s commitment to sustainability. However, it requires the reader to have a certain level of **literacy in calculating carbon emissions** to fully comprehend the presented data. Only by understanding what Scope 1, 2 and 3 emissions include, which boundaries were defined and what was excluded can we fully grasp the significance of the reported number –– and consequently assess what might be ommitted or obscured. [add link to media studies and how such literacy can be acquired]

Scope 1 includs all *direct* greenhouse gas emissions that occur from sources controlled or owned by an organization, whereas Scope 2 refers to *indirect* emissions resulting from the use of purchased electricity, steam, heat and cooling (these depend on the energy mix of the local grid, and do not include emissions from extraction and transmission). Scope 3 emissions are more difficult to calculate as they are related to a company’s value chain and encompass the production, distribution and consumption of its products or services (including waste generation, employee commutes and end-of-life trearments).

In its 2020 report, Netflix addresses its “limited operational control” over the Scope 3 categories, as the company does not manage content production directly (ibid., 6). Its calculation, therefore, only factors in the production of *Netflix-branded content*, meaning that the reported footprint of 1.1 million tons of CO2e is incomplete. Accordingly, the devision of the footprint into the compontnes of “content” (50%), “corporate” operations (45%) and “streaming” (5%), is also questionable (ibid., 5), even more so given that emission from internet transmission and user devices is not included (ibid., 6).

While the charts, numbers and terminology create the impression of a comprehensive understanding of the environmental impact of video streaming, a closer look reveals that the presentend data cover only a portion of the emissions. This can be uncovered by applying greater climate literacy [add: also critical reading of the report]. However, rather than simply assuming this to be a malicious strategy, I suggest turning to Science and Technology Studies and their research into how knowledge is produced. In the field of “Ignorances Studies” the lack of knowledge (such as about Scope 3 emissions) is conceptualized as “socially produced, maintained and contested” (Nicolaeva 2024, 3). Awareness of non-knowing can mobilize knowledge production which is always political. STS scholars therefore emphasize the need to “investigate how non-knowledge is uses, by whom, towards what ends and with which results” (ibid., 5).

In its 2020 report, Netflix not only acknowledges the challenges of calculating Scope 3 emissions but also highlights ongoing research into the “operational emissions of video streaming” (Netflix 2021, 6), conducted by the DIMPACT consortium under the lead of the University of Bristol’s Computer Science Department. DIMPACT is a group of media companies that came together “to better understand the GHG emissons of their digital media products and services” (DIMPACT 2021, 3) with Netflix as one of the consortium members. Netflix also provided funding for writing a white paper on the carbon impact of video streaming (ibid. 2). [=political economy approach]

A lack of knowledge has thus prompted researchers and media companies to produce knowledge, which Netflix leveraged in its 2020 report to reassure readers that, based on the scientific data, one hour of streaming Netflix is ”well under 100gCO2e, equivalent to driving a gas-powered passenger vehicle 1/4 mile (400 meters)” (Netflix 2021, 6).[[3]](#footnote-3) Echoing the small of share “streaming” in the company’s overall footprint (5%) this conclusion obscures the fact that emissions from internet transmission are excluded from the reporting. Furthermore, it doesn’t account for the cumulative carbon emissions produces by *all* subscribers [here, supplementary reports need to be added]. Instead, the report uses existing uncertainties to encourage device makers and network providers to increase their sustainability efforts (thereby deferring its own responsibility).

In its 2022 report, Netflix provides more details on the emissions from internet transmissions and user devices: “Because internet infrastructures (including data centers) are so widely shared”, the report explains, “the energy consumption […] for individual video streams is relatively efficient” (Netflix 2023, 27), amounting to caaround 10% of the streaming emissions.[[4]](#footnote-4) “By contrast, the physical decives […] drive the most energy consumption and emissions (~89%)” (ibid.). By visualizing the “value chain” of streaming (ibid.) the company addresses the various components that make up the streaming infrastructure, such as data centers, internet service providers and devices.

Understanding the complexity of the globally distibuted network of video streaming requires what Lisa Parks (year) and Nicole Starosielski et al (2023) call **infrastructural literacy**. In Netflix’s diagram, the data centers, internet providers and devices “within the consumer’s home” are neatly arranged (Netflix 2023, 27). However, Netflix does not distribute its content from a single centralized location but operates 18.000 servers “across 6.000 locations in over 175 countries” (ibid. 26). These servers store and deliver content locally, implying that the streaming locally is more efficient, “instead of the film or series being streamed from halfway around the world, it’s streamed from around the corner” (ibid.)). However, this “Open Connect” programm not only increases the speed of data transmission but also expands the number of servers and data centers involved in the process.

Starosielski at al. observe (ibis. 116) a lack of knowledge regardingh whether edge caching or centralized delivery is environmentally less harmful. Beck and Wehling remind us of the importance of investigating who holds the “power of definition over what is not known” (2012, 34), emphasizing that the production of knowledge (and the absence thereof) is tied to specific interets. In this context, the uncertainty surrounding the environmental impact of edge caching versus centralized delivery serves the interest of companies that profit from the continuous growth of data volume on the internet.[[5]](#footnote-5)

Lisa Parks highlights that power is “mobilized to hierarchize and sanction particular ways of knowing technological systems and phenomena, while devaluating, ignoring, or dismissing others” (7). In the case of environmental governance reporting, this is evident in the focus on energy consumption and greenhouse gas emissions, which tends to overlook critical aspects such as the water consumption of data centers, the loss of land and biodiversity that they cause, and the environmental damage resulting from mining renewable energy minerals (Hogan 2015, Velkova 2016, Vonderau 2019, Mayer 2020) [introcuced eco-materialist media studies approach].

Such a focus on energy consumption and greenhouse gas emissions leads to an overemphasis on decarbonizaton strategies. Netflix highlights its efforts to decarbonize by investing in renewable energy projects and purchasing Renewable Energy Certificates (RECs) to offset its emissions [add examples from reports]. While these actions are frames as part of the company’s commitment to sustainability, they primarily address only ane aspect of its environmental footpeint, diverting attention from broader impacts such as water use and land loss. Furthermore, relying on RECs as a key strategy to reduce emissons is problematic. As Anne Pasek notes (2019) REC’s allow companies to claim they are operating sustainably without actually reducing their carbon output.

Still missing: Netflix’s contribution to the generation of e-waste
production of ignorance through tranparency / data aggregation
Exploration of the position of technological nonknowing and its political potential (Parks 2023).

1. Decline from 2019 (1.3 Mio. t CO2e) due to delayed production during the COVID-19 pandemic).
1,1 Mio. ton of CO2e = emission of an average European within 2 months [↑](#footnote-ref-1)
2. For a critique of self-reporting, see Cubitt xyz (example water sample) [↑](#footnote-ref-2)
3. The consortium’s White Paper compares this 20 min. video streaming to 4 min. microwaving a bag of popcorn (DIMPACT 2021, 8). [↑](#footnote-ref-3)
4. Also: AWS’ usage of renewable energy [↑](#footnote-ref-4)
5. Cloud Services (Google, Microsoft, Apple), Telcos and Content Delivery Networks; Meta, Netflix [↑](#footnote-ref-5)