

# Billions of kg of CO<sub>2</sub> could be saved by scrapping DVDs, research suggests

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Credit: Ian L/public domain

A trip down to the local DVD store has slowly become a thing of the past thanks to the rise of video streaming services, which allow viewers to indulge in back-to-back episodes of hit TV series like *House of Cards* and *Breaking Bad* at the click of a button.

Now, a new study has shown that streaming can be much better for the environment, requiring less energy and emitting less carbon dioxide (CO<sub>2</sub>), than some traditional methods of DVD renting, buying and viewing.

The researchers, who have published their study today, 29 May, in IOP Publishing's journal *Environmental Research Letters*, cite modern devices such as laptops and tablets as the reason for this improvement, as they are much more efficient than older, energy-sapping DVD players.

Furthermore, the driving that is required to go and buy, or rent, DVDs makes this method much more energy- and carbon-intensive.

A significant proportion of the [energy consumption](#) and carbon emissions for streaming comes from the transmission of data, which increases drastically when more complex, high-definition content is streamed.

In their study, the researchers, from Lawrence Berkley National Laboratory and Northwestern University, estimated that if all DVD viewing in the US was shifted to streaming services in 2011, around 2 billion kg of CO<sub>2</sub> emissions could have been avoided and around 30 petajoules (PJ) of energy saved—the equivalent of the amount of electricity needed to meet the demands of 200,000 US households.

They estimated that in 2011, 192 PJ of energy was used, and 10.4 billion kg of CO<sub>2</sub> emitted, for all methods of DVD consumption and streaming in the US.

From this, they calculated that one hour of video streaming requires 7.9 megajoules (MJ) of energy, compared to as much as 12 MJ for traditional DVD viewing, and emits 0.4 kg of CO<sub>2</sub>, compared to as much as 0.71 kg of CO<sub>2</sub> for DVD viewing.

To arrive at their results, the researchers compared video streaming with four different types of DVD consumerism: DVDs that are rented from online mailers; DVDs that are rented from a store; DVDs that are purchased online; and DVDs that are bought from a store.

Video streaming was limited to TV and movies and did not include shorter videos that are streamed online through YouTube etc.

They found that video streaming and the online rental of DVDs required similar amounts of energy; however, the renting and purchasing of DVDs from a store were much more energy intensive, due to the impact of driving.

Lead author of the research Arman Shehabi, from Lawrence Berkley National Laboratory, said: "It's a modern-day equivalent of the debate about which is more environmentally sound—the disposable or the cloth diaper.

"Our study suggests that equipment designers and policy makers should focus on improving the efficiency of end-user devices and network transmission energy to curb the [energy](#) use from future increases in [video streaming](#).

"Such efficiency improvements will be particularly important in the near future, when society is expected to consume far greater quantities of streaming video content compared to today."

**More information:** 'The energy and greenhouse has implications of internet video streaming in the United States' Arman Shehabi et al 2014 *Environ. Res. Lett.* 9 054007.

[iopscience.iop.org/1748-9326/9/5/054007/article](http://iopscience.iop.org/1748-9326/9/5/054007/article)

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