The Green Grid, a non-profit consortium working to improve data centre energy efficiency, has published a survey of data centres, mostly in the US, that shows that almost half are now using natural cooling to save energy and cost. Another quarter said they are considering doing the same in the near future.

The results come from a survey on the use of economisers – cooling devices that take advantage of outdoor conditions to reduce the need for refrigeration in data centres. Economisers come in two forms. They can be air-driven, with cool outside air either blown straight into the building through filters or passed through heat exchangers first to cool it down. Alternatively, the outside air is used to help chill the water that's being used to cool the air inside the data centre itself.

It's a bit of a surprise that economisers are being so widely used, although the amount of time they're actually working varies with the local climate. The survey responses suggest that more than 60% use economisers for less than half the year and even when they are on they don't provide all of the cooling needed. Nevertheless, on average the survey respondents reported that using economisers saved 20% on energy costs and 7% on maintaining the cooling systems.

Using natural cooling is a growing trend for data centres striving to reduce power costs and carbon emissions. So for global companies looking for suitable locations for a new facility the outside air temperature is increasingly a factor. Which explains why Facebook recently announced that it was building its first data centre outside the US in the northern Swedish city of Lulea, just 100km south of the Arctic Circle.

Despite the reported savings it seems that economisers are not being used as much as they could be. The Green Grid's survey showed that in the US they are only used for around 80% of the time that they would be effective, because of concerns about switching between different cooling systems and the maintenance of the economisers themselves. The equipment can also be difficult and expensive to fit and there are concerns about their reliability. Nevertheless, 80% of respondents say they would recommend using economisers.

The slightly odd finding from the survey was that using these devices had little impact on the data centres power usage effectiveness (PUE), the measure that compares total data centre power use with the power required to drive the IT equipment. The less power used for cooling the lower (and better) the PUE should be. But the report found that there was no difference between the PUE reported by those who use economisers and by those who don't.

The study notes that "The lack of correlation does not seem to affect owners' satisfaction with economisers or the perceived savings in an individual application of economisers". But it does rather suggest that either the economiser savings are over-estimated or the PUE calculations are wrong. Either way, it's something that the Green Grid plans to investigate further.

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