

## WHAT YOU NEED TO KNOW WHEN COMPARING COLOCATION PROVIDERS

If you've been shopping for the right colocation data center, you'll know that many providers advertise PUE. For good reason: differences in energy efficiency from one data center to another will significantly impact your costs and scalability.

Yet making a true comparison between data centers can be difficult, with a lack of transparency around what metrics providers use and how they're calculated. In the end, 40% of enterprise IT managers are paying more for colocation contracts than they had initially planned or expected, according to the Uptime 2016 Survey.

**As you shop, how can you ensure an apples-to-apples comparison of PUE between different data centers? Armed with the eight questions here, you'll be able to accurately compare energy efficiency between colocation data centers and ensure that once you sign on the dotted line, you'll actually get what you expect.**

### 1. What is the annualized PUE of the data center facility I'm considering? How is it calculated?

$$\text{Annualized PUE} = \frac{(\text{Average Daily Energy Consumption by Cooling} + \text{Power} + \text{Lighting} + \text{IT})}{(\text{Average Daily Energy Consumption by IT})}$$

Annualized PUE is a great measure of operational efficiency in the data center, and will impact tenants' operating expenses – provided that the colocation provider actually includes annualized PUE in the monthly energy cost calculation.

At Aligned Data Centers, we guarantee an annualized PUE of 1.15. That compares to an industry average PUE of 1.8-1.9, according to the 2016 U.S. Data Center Energy Report.

### 2. What is the peak PUE of the data center facility I'm considering? How is it calculated?

$$\text{Peak PUE} = \frac{(\text{Energy Consumption by Cooling} + \text{Power} + \text{Lighting} + \text{IT at Peak Load})}{(\text{Energy Consumption by IT at Peak Load})}$$

As a measure of design efficiency, peak PUE (also referred to as “design PUE”) reveals how much power and cooling infrastructure is required to support peak load conditions – for example, on the hottest day of the year. It impacts capital costs and IT load scalability.

Peak PUE depends on the location of the data center. Across Aligned Data Centers' locations, our peak PUE averages to 1.25. In comparison, the new data center efficiency standard from ASHRAE approximates a peak PUE of 1.72.

### 3. For both annualized PUE and peak PUE:

- How was the data collected?
- What type of equipment collected the data?
- What is the timeframe covered by the reported value?
- At what frequency were the individual data points collected?

#### 4. Is PUE used to determine my monthly energy costs? Which PUE number will be used for my pricing?

In the standard colocation pricing equation, monthly energy costs are represented as E where E is the power consumed (in kWh) multiplied by the cost of metered utility (in \$ per kWh) multiplied by PUE. When PUE is included in the cost equation, it has a significant impact on your total monthly energy cost.

Monthly Energy Cost = Power Consumption x Utility Rate x PUE

At Aligned Data Centers, we use a PUE of 1.15 in the equation above to calculate our clients' monthly energy cost. Guaranteed. No fine print. Compared to an industry average PUE of 1.8-1.9, a PUE of 1.15 means cost savings of 50% or more.

#### 5. Is a certain annualized PUE guaranteed in the service level agreement (SLA)?

As you are assessing colocation providers, look for transparency in the lease agreements about what the PUE multiplier will actually be. Ask about the conditions under which you would actually qualify for the advertised PUE and the circumstances under which you could be charged a much higher PUE multiplier.

At Aligned Data Centers, the 1.15 PUE we use to calculate our clients' monthly energy charges is guaranteed. In the SLA. No caveats, no exceptions, no matter the power density or capacity of the facility.

#### 6. How much of utility load goes to mechanical overhead? How much to electrical overhead?

The lower the peak PUE (the more energy efficient the data center design is), the more of the total utility load can be used for IT rather than data center overhead. A peak PUE of 1.25 (Aligned Data Centers' average) means 80% of the total utility load is available for IT. In contrast, a peak PUE of 1.7 (approximately the new ASHRAE standard) means just 59% of total utility load is available for IT.

#### 7. What about your technology drives energy efficiency?

If a prospective data center provider is quoting a PUE much below the industry average of 1.8-1.9, they should be able to explain exactly how their data center is so efficient.

At Aligned Data Centers, our ultra-low PUE is driven in large part by our award-winning Inertech cooling system. While traditional free air cooling systems sacrifice reliability for efficiency, and only work in certain climates, our system provides year-round free air cooling in any climate with the reliability of a Tier IV cooling system. A compressor "trims" the atmosphere, adapting to the outdoor temperature, and only runs at full load for a small percentage of hours per year, optimizing energy efficiency (savings of up to 80%), water efficiency (savings of up to 85%), and reliability (99.9999%).

#### 8. What mechanism do you have for me to see real-time and historical PUE data?

Look for a colocation data center that offers not just a portal, but gives customers real-time, predictive, and historical visibility into all of the metrics that affect PUE.

At Aligned Data Centers, the Client Portal gives every client full visibility into the performance of their data center and all of the assets within. The dashboard provides high-level and in-depth views of key performance indicators, predictive analytics, in real time as well as historical. Clients have visibility into energy KPIs that include partial PUE (PUE for their data center footprint) in real-time and historical, cost per kWh, and peak power usage history per site or across multiple locations.

## Next Steps

Dive deeper into PUE and what it means for you - download the tech brief “Comparing PUE Between Colocation Data Centers - And Why It Matters”

Talk through these 8 questions with an Aligned Data Centers expert:  
[www.aligneddatacenters.com/contact](http://www.aligneddatacenters.com/contact)

Come see for yourself - schedule a data center tour:  
[www.aligneddatacenters.com/data-centers/#tour](http://www.aligneddatacenters.com/data-centers/#tour)