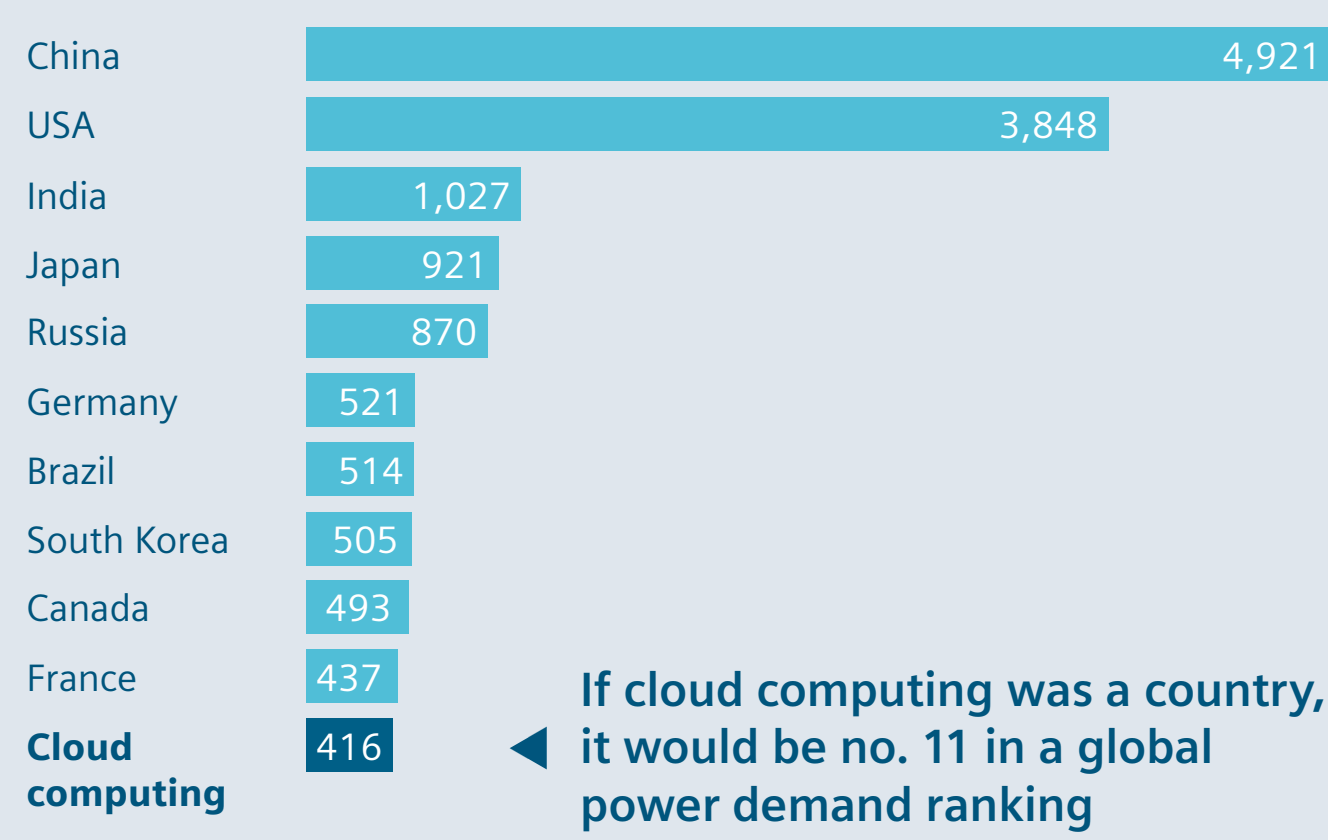


Transformers for data centers

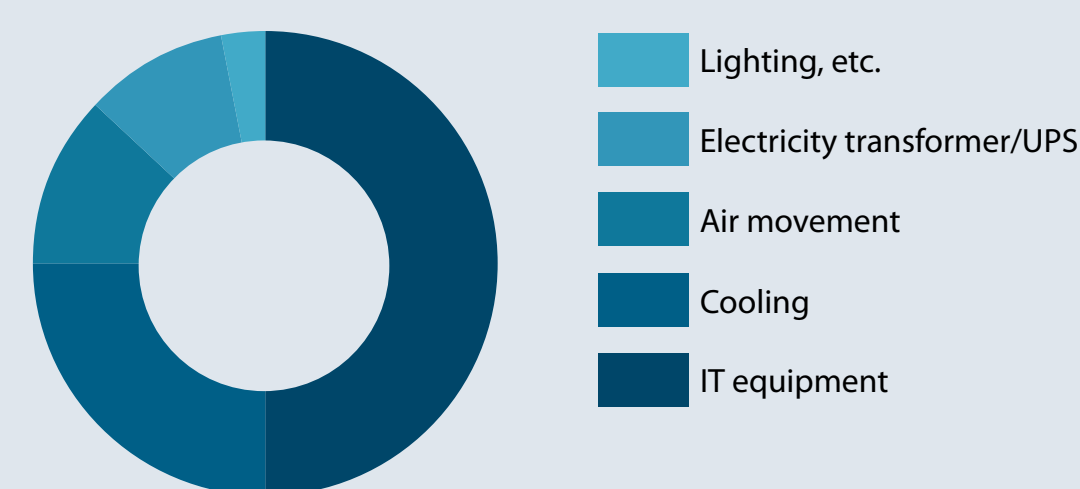
Global power demand of data centers: 416.2 TWh

Annual power demand in TWh



If cloud computing was a country, it would be no. 11 in a global power demand ranking

Power consumption within a data center

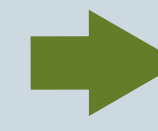


Challenges

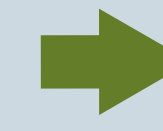


Outage cost

Average outage cost: \$740,357 in 2016
\$9,000 per minute



Availability/reliability: In case of transformer failure



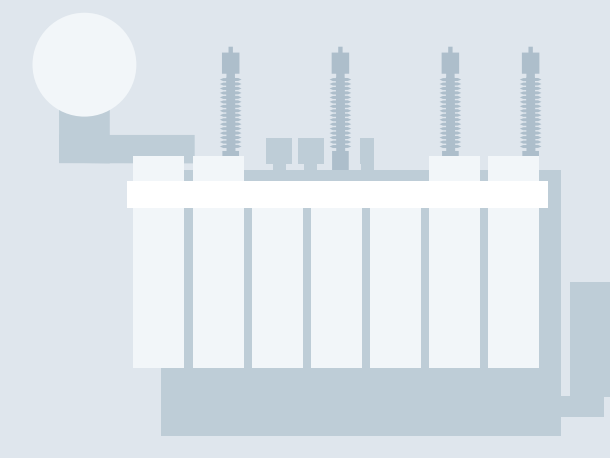
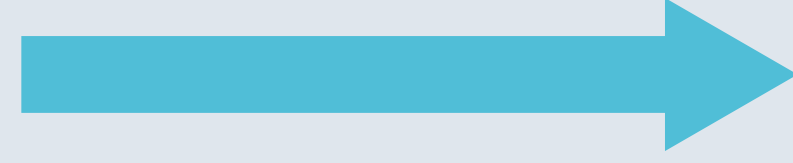
Minimize downtime

with Siemens GEAFOL/FITformer and resilience backup

Minimize downtime and maximize energy efficiency



Generation



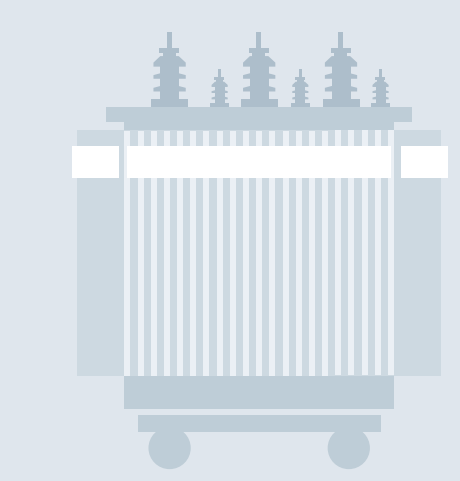
Power transformer



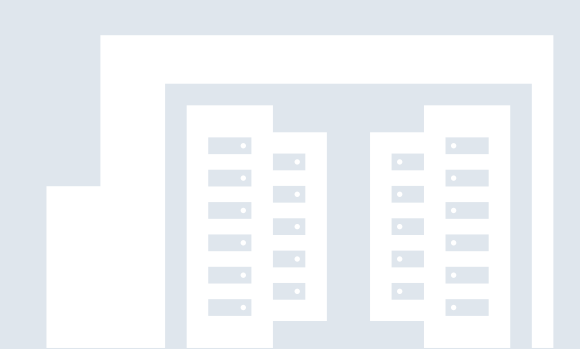
Distribution transformer (dry/oil)



Dry-type transformer (Cast resin/CRT)



Liquid-immersed transformer



Data center

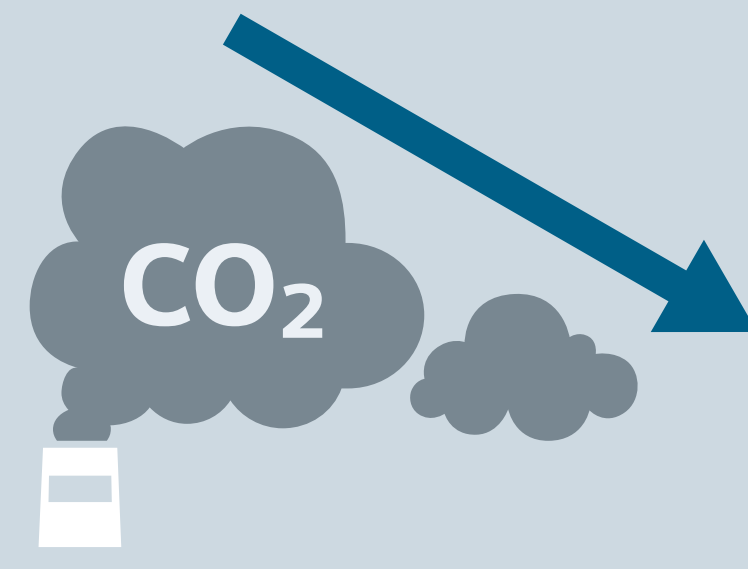
Optimize Total Costs of Ownership by reducing OPEX:

Maintenance-free product: reduce service costs
Low losses: reduce operational costs

Example for an average DC running six CRTs:

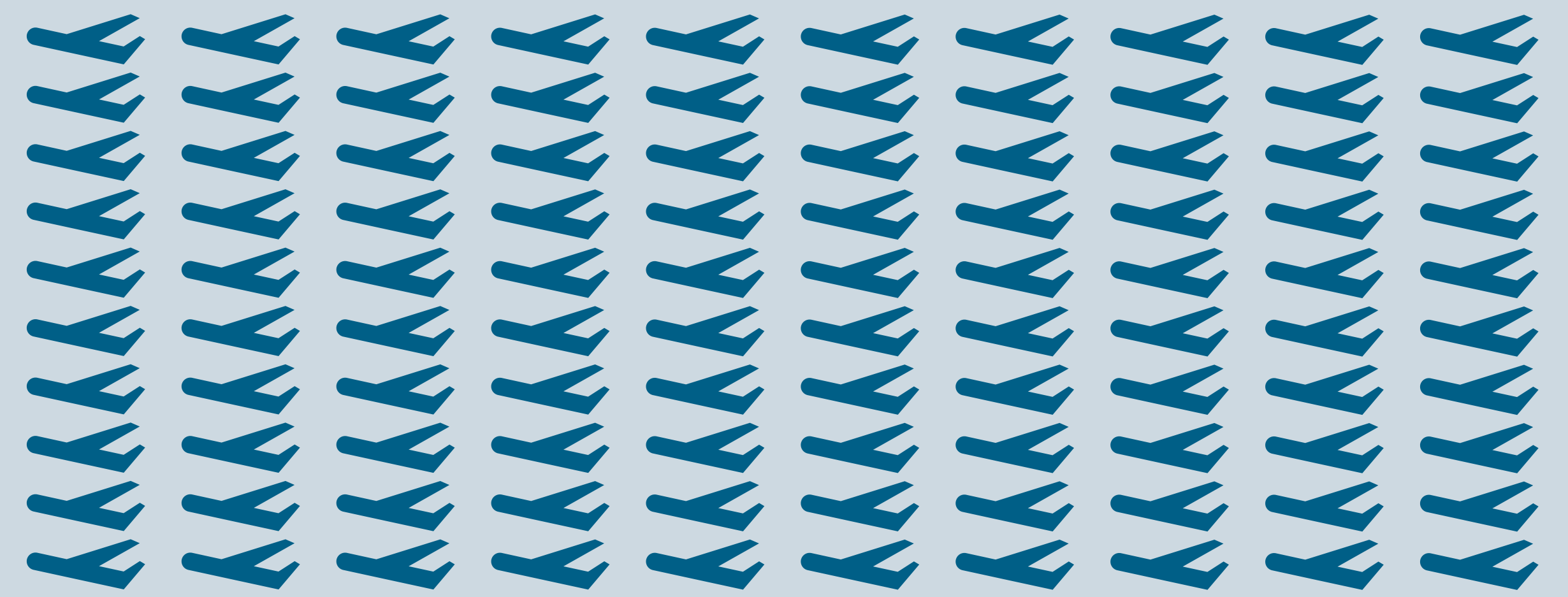


Standard CRT*: 6 x 210,000 kWh
-360,000 kWh
Siemens CRT: 6 x 150,000 kWh



Standard CRT*: 6 x 84 t
-144 t
Siemens CRT: 6 x 60 t

CO₂ savings for an average data center running six CRTs: 144 t
This equals 100 trips from London to Shanghai.



*Standard CRT without design acc. to European Eco-Design Regulation

Environmentally friendly

Cast resin technology without insulation fluid

Liquid immersed technology with ester usage



- Flame resistant and self-extinguishing
- Maintenance-free product
- Optional cast-resin transformer housing

Ester usage in power and distribution transformers

Higher fire safety



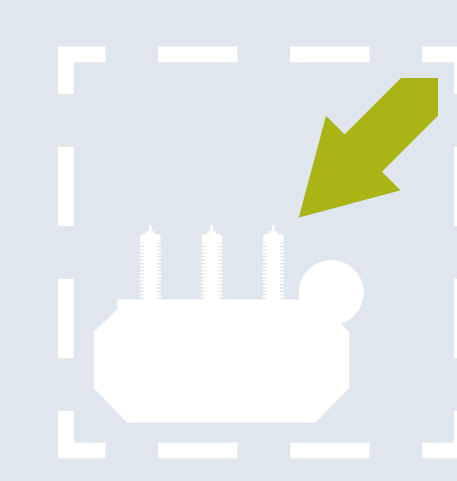
- Higher flash and fire point
- Fire point above 300°C
- K class rating (IEC 61100/61039)
- Lower gas conversion factor
- Tank rupture prevention

Lifetime extension



- Slower polymerization
- High capability to take water from cellulose
- Dielectric strength unaffected by water
- Higher temperature limits

Smaller footprint



- Change containment size
- Shorter bus duct length

Savings in ester usage

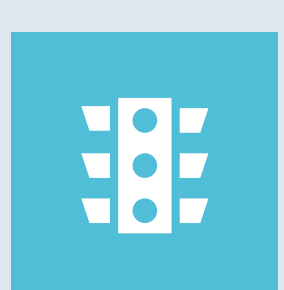
- Lower annual insurance premiums
- Lower losses during operation due to shorter bus duct length

Enhancing resilience and availability with Pretact®

Prevent



On-site condition assessment



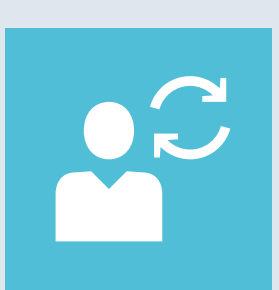
Monitoring and diagnostics



Asset management and consulting



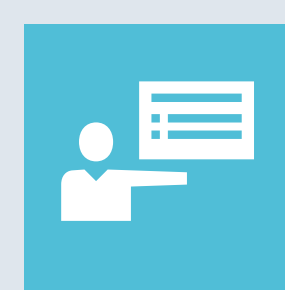
24/7 customer support



Emergency service



Remote services

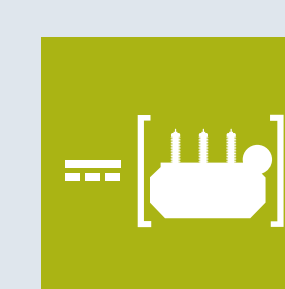


Asset audits



Preventive maintenance

Protect



DC compensation



Tank rupture safe



Bullet resistance



Ester



Flame resistance

React

- Rapid installation and replacement (distribution transformer and mobile resilience unit)
- Versatile voltage

