# DC Power Services

DIGITAL POWER SERVICE

HUAWEI

# Trends and Challenges of Data Center O&M

**Global Data Center Development Trend: Under the Dual-carbon Background, Policies impose strict requirements on DC energy efficiency. Zero-carbon DCs and legacy reconstruction become major pain points.**

Release policies, control energy consumption, limit PUE, guide intensive, green construction, and reward and punishment.

### Control

Energy consumption is controlled by dual control, strength and total quantity are restricted, and performance evaluation is tightened, making approval more and more difficult.

### Restriction

PUE policy restrictions: PUE < 1.3, east node < 1.25, west node < 1.2

### booted

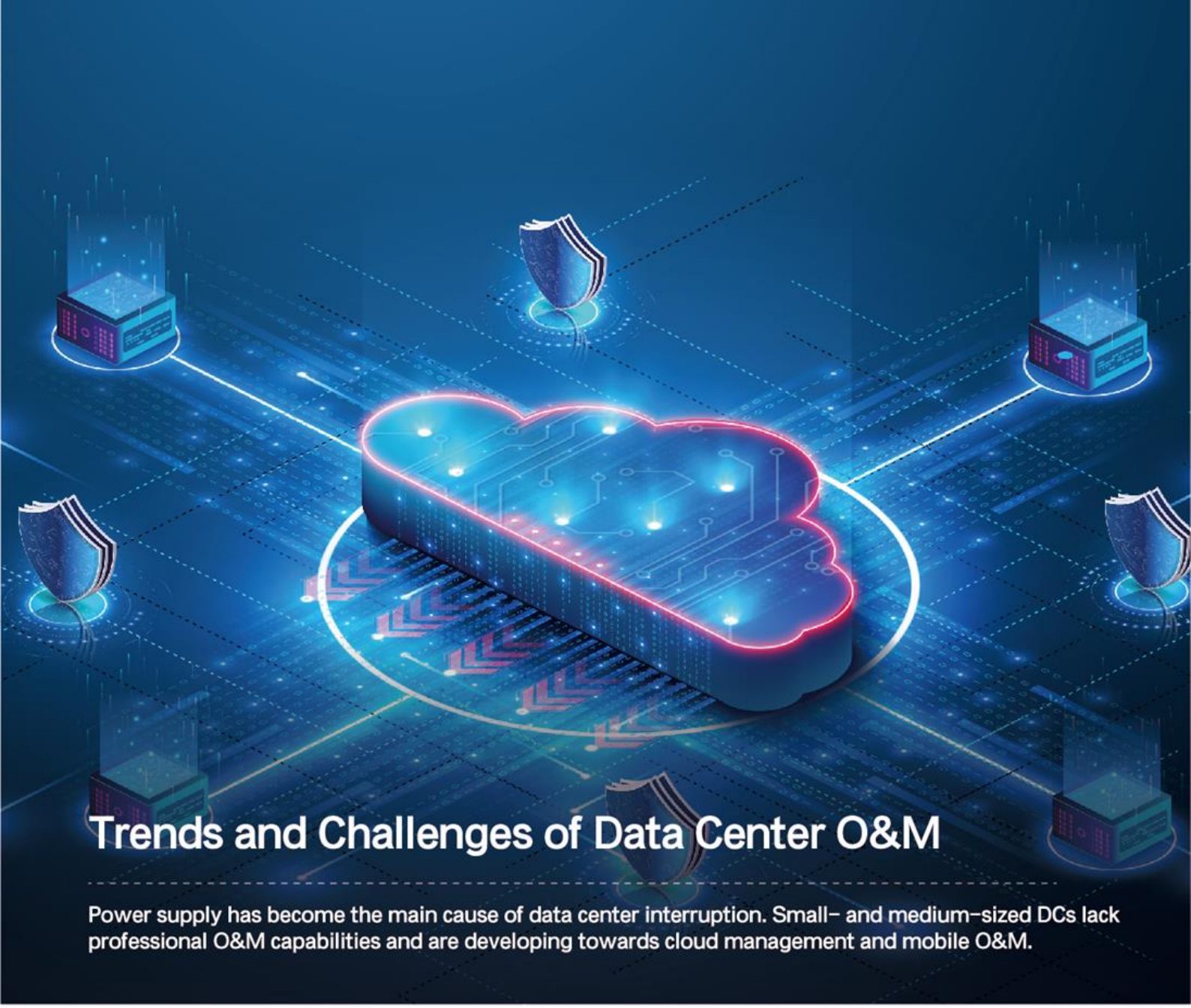
Guide 70% of the new constructions in the future to converge to the hub nodes of "East Digital and West Computing"

### Reward and Punishment

- A: PUE < 1.2, maximum prize: 10 million
- B: If the PUE is greater than 1.8, add 0.5 yuan to the electricity fee.

The proportion of DC power consumption increases year by year, and energy saving requirements are strong.

**Average PUE of enterprise data centers in China: 1.8**



# Trends and Challenges of Data Center O&M

**Power supply has become the main cause of data center interruption. Small- and medium-sized DCs lack professional O&M capabilities and are developing towards cloud management and mobile O&M.**

## Analysis of characteristics and O&M problems of small- and medium-sized DCs

### High cost

Industry is numerous and scattered
Remote O&M is unavailable.
High cost of traditional management software

### Low efficiency

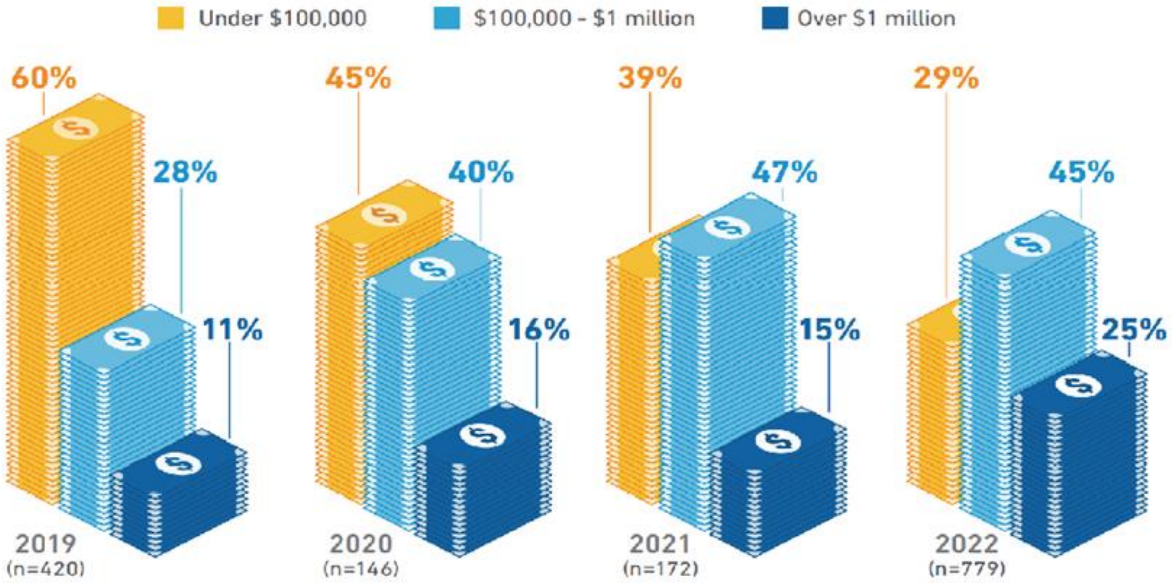
Risks cannot be identified in a timely manner.
Faults cannot be located remotely.
Low issue handling efficiency

### Difficulty

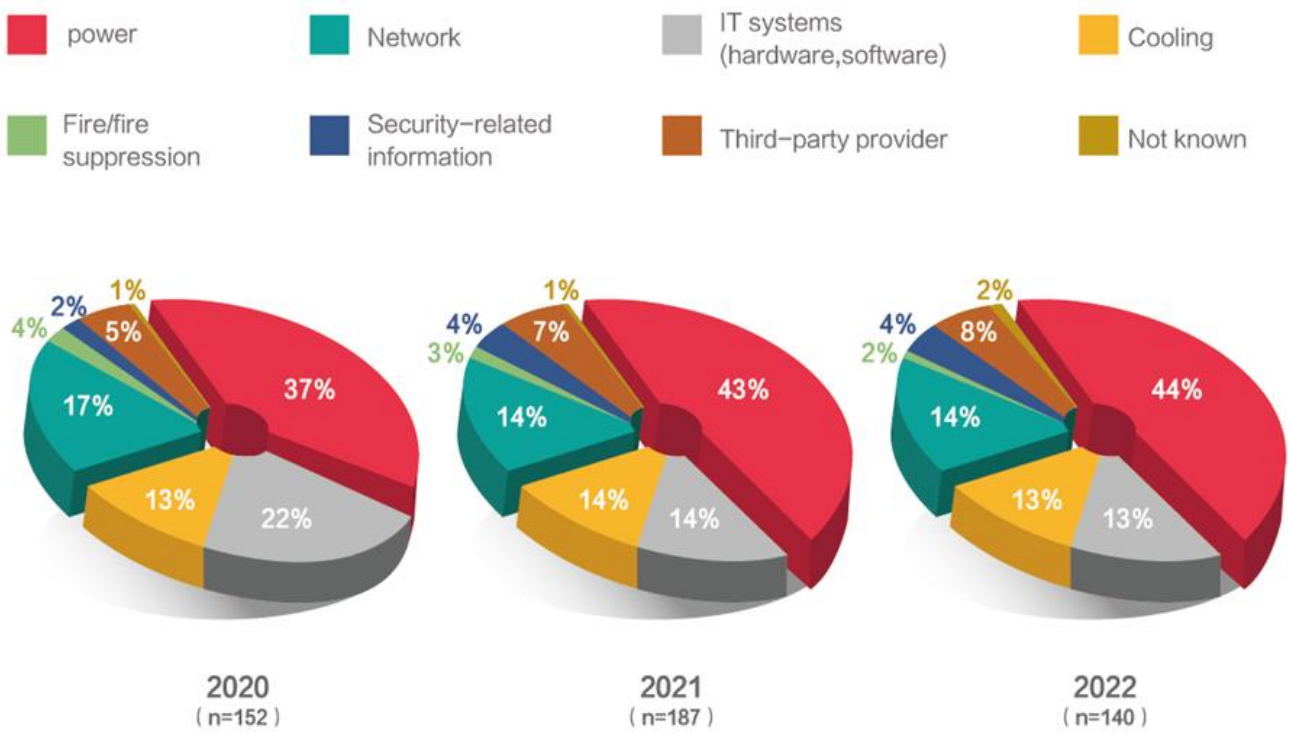
Unprofessional personnel, equipment dare not touch
Lack of proactive maintenance, turning hidden dangers into accidents
Personnel mobility, difficult to develop capabilities

Customer requirements：Tools are required to check the running status of devices anytime and anywhere.The vendor is expected to provide remote monitoring and maintenance assistance.

## Losses (>1M) caused by data center outages are increasing




## Power failure 44% of the root causes of data center outages



# Trends and Challenges of Data Center O&M

**Cloud computing continues to grow rapidly. Both IDCs and EDCs will become cloud DCs.**

Continuous increase in the proportion of cloud migration: It is estimated that traditional non-cloud DCs will account for only 20% in 2025, Cloud DC accounts for 80%. (40% for hybrid cloud and 40% for public cloud)
The growth rate of traditional DCs is 6%，the growth rate of Internet public cloud is 25%，and the growth rate of government and enterprise hybrid cloud is40%

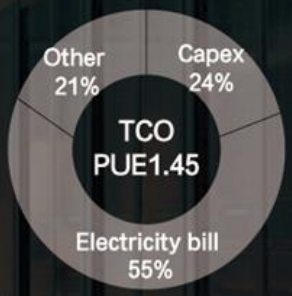
**· Physically reliable and responsive:**

Routine monitoring, preventive maintenance, fault locating, fault review, and personnel management.....

**· Improve efficiency and reduce electricity costs:**

Data center with a PUE of 1.45: The electricity fee for power supply and temperature control exceeds 30%.

In 2010, the OPEX accounts for nearly 80% of the total cost of ownership (TCO).




**· Ultimate CAPEX: Typical IRR of third-party IDCs in China is about 10% to 13%, and ROI is about 6 to 7 years.**

**· Absolutely safe:**

3.6 million websites are affected, and some data is permanently lost.

· In March 2021, a well-known European cloud service provider caught fire in a data center in France.
· The affected servers host about 3.6 million websites, including platforms in France, United Kingdom, Poland and more.
· Because live data on the server is not backed up offsite, some data is permanently lost on many of the websites it hosts.

# Huawei Data Center Service Architecture and Investment

**Build a more secure, efficient, professional, and intelligent global digital delivery network.**


## Super Safety

### Technical support center

1800+ professional technical engineers

170 countries and 14 languages

24/7 support services recovers faults within 120 minutes.

### Spare parts service

7 x 24 hours single interface

One end-to-end visualized integrated IT system

Designed Spare parts system, dispatch within hour

## Professional Service

1000+ projects, enabling 400+ partners

| Colo DC 100+ | Transportation + Finance + Energy DC 150+ | Government DC 250+ | Carrier + Manufacturing + Others DC 500+ |
|---|---|---|---|

### Full Lifecycle Service Solution

Consulting and design, implementation service, maintenance service, energy saving service, and training service

### Ecosystem solution & partners

Consulting design partner material partner, integration partner,O&M partners and professional service partners

## Smart Enabling Tools

### Digital Service Delivery Platform

The digital delivery platform is a tool that enables partners to visualize DC equipment, automate processes, visualize opportunities, and standardize operations, improving operation efficiency by 50% and reducing faults by 39%.

### Xiaoling Self-service Customer Service

The AI robot provides Q&A services for global users about Huawei's products and technologies in three fields of digital energy, covering pre-sales and post-sales multi-service question scenarios, with an accuracy of 88%.

### FDC 3D Panoramic display

Provides full-scenario 3D model display, completes in-depth project design, enlarges solution design details, and displays the real-life effect after the project is completed based on the surrounding environment of the project site. Provide intuitive and clear design solutions for the owner to help customers understand and familiarize themselves with the project, improve communication effect, and improve customer satisfaction.

# Spare parts service: hourly delivery on a global collaborative delivery platform: delivery within 2 hours, quick response, efficient scheduling, and timely delivery


145 Country Spare Parts Logistics Center，16 Global Repair Center，9 Regional Spare Parts Operation Center，1 Global Spare Parts Operation Center，Cover more than 170 countries around the world

## TAC: 24*7 single interface

Spare parts requirements ▸ Handling ▸ Supply, and Warehouse management

**Dynamic planning**

Spare parts plan

Spare parts repair

Spare parts supply

Reported

## One end-to-end visualized integrated IT system

All Requests in One Interface

Global Visibility

Dynamic Planning

Mobile APP

# Data Center Ecosytem partner solution


China：CSCEC，CHINA COMSERVICE，Guangdong Southern Construction，Top general integrators
Asia Pacific：CSCEC，Yinyin，CHINA COMSERVICE
Middle East：CSCEC

Southern Africa：CSCEC
Northern Africa：CSCEC
Latin America：CSCEC
Europe

## One Solution Interface

Colo DC | Transportation + Finance + Energy DC | Government DC | Carrier + Manufacturing + Others DC

Project management | Business | Legal Affairs | Finance | Security | Other

Technology integration Project Technology Management

| design | verification | implementation |
|---|---|---|

Digital Power Ecosystem Solution

ISV software Digital Energy Products and Portfolio
IHV hardware Pre-integrated partner products Software Hardware
CSSP services

Other Suppliers

Software
Hardware

# Huawei Data Center Service Solutions and Practices

## Energy-saving service: iCooling AI optimization, achieving ultimate PUE

### iCooling AI optimization reduces PUE by 8% to 15%


AI training platform　　Public cloud　　Local

Energy saving optimization service

Energy-saving evaluation solution design model training and continuous optimization

### E2E system-level energy-saving reconstruction


| | | | | |
|---|---|---|---|---|
| **Large DC** | Cold source upgrade ( ↓0.06~0.12 ) | Chilled water terminal upgrade ( ↓0.03~0.05 ) | Power supply and distribution upgrade ( ↓ 0.05~0.07 ) | Secondary Area Device Upgrade ( ↓ 0.02~0.05 ) |
| **Small- and medium-sized DCs** | Smart module reconstruction ( ↓ 0.05~0.08 ) | Temperature control upgrade ( ↓ 0.07~0.1 ) | UPS upgrade ( ↓ 0.05~0.07 ) | Green electricity application ( ↓ 0.005~0.02 ) |

**Platform:** PUE evaluation tool, survey tool, simulation training platform， AI digital governance, partners, DigiPowerCloud

**Service:** Digital Chemical Survey Service，Energy Saving Assessment Service，Energy-saving solution design service，AI algorithm implementation service，Energy efficiency test service

# Huawei Data Center Service Solutions and Practices

**Value of maintenance service: Achieve customers and achieve win-win results from multiple parties. Identify risks and prevent them before they happen.**

**Data Center Energy Maintenance Service Portfolio**

| Hi/Co-Care | Proactive prevention | On-site service | Device Health Check | Single Onsite Service |
|---|---|---|---|---|

Failure prevention ↑ **Smooth Running** ↓ Fast fault recovery

**eCare: Unified issue handling platform**

| eWar | eRAD | eLAB | eCase |
|---|---|---|---|

**NetEco supported Multi-site management, remote monitoring and O&M, know the network status at any time**


### TAC Support

- Full-service handling platform
- 24/7 support
- VIP customer agent
- WarRoom emergency recovery

### Spare parts support

- Three-level spare parts system of the country spare parts center, regional spare parts center, and local spare parts warehouse
- 145 spare parts warehouses
- Pre-replacement of spare parts

### Online Support

- Top 10 Technical Support Websites in the World
- 1.2+ million registered users and+ million views per month on the technical support website
- Self-service anytime, anywhere
- The energy cloud supports online health check, mobile intelligent O&M, and proactive fault reporting.

### On-site support

- 500+ certified partners worldwide
- HQ and regional OEM expert resources
- Health check and in-depth detection
- In-depth maintenance and energy conservation assessment

# Huawei Data Center Service Solutions and Practices

**Training service: Provide technical training on self-developed products for government and enterprise end users to help enterprises cultivate talents.**

| Modular training programme | |
|---|---|
| **Basic Knowledge** | Power supply and distribution foundation，Precision air conditioner foundation，Monitoring System Basics |
| **Planning and design** | Power supply and distribution design，Precision air conditioner design，Monitoring Configuration |
| **System Architecture** | Power supply and distribution architecture，Precision air conditioner architecture，Monitoring Architecture |
| **O&M management** | O&M Management Regulations，Energy efficiency improvement methods，O&M Standards |
| **O&M** | UPS O&M，Precision Air Conditioner Maintenance，Monitoring System Operation |
| **Troubleshooting** | UPS Case Study，Precision Air Conditioner Cases，Monitoring System Cases |

| Basic courses | |
|---|---|
| Technical training on key power supply products | Technical training on intelligent cooling products |
| Modular Data Center Product Technical Training | DC Management System Product Technical Training |

| Values |
|---|
| Learn the knowledge of data center infrastructure products systematically, and have the O&M capability and overall energy efficiency optimization capability of the corresponding products. |

| HALP | |
|---|---|
| Sales | Pre-sales |
| After-sales | MKT |

# Huawei Data Center Service Solutions and Practices

**Implementation service: Professional design, optimal solutions, ensure project delivery high-quality and high-efficiency.**

## Huawei Data Center Energy Products

### Implementation Services

Equipment arrival management,Environment Check,Hardware installation
Device commissioning, System acceptance, and System Handover

### Supervising service

Technical consultation,
Installation supervisor, Commissioning supervisor, and On-site training

## High-Efficient and high-quality engineering delivery and shortest TTM.

**Standardized Installation**
Specification, process, and team

**Professional Technical Management**
Standard process and technical experts

**Controllable Delivery Period**
Project management and progress supervision

**Strict Quality Control**
Construction qualification and quality inspection

# Huawei Data Center Service Solutions and Practices

## Consulting and design services

01 Strategic Definition

02 Preparation and Briefing

03 Concept Design

04 Spatial Coordination

05 Technical Design

06 Manufacturing and Construction

07 Handover

08 Use


**Consulting service**

Cost consulting, industry consulting, site consulting, industry consulting, construction consulting, topic consulting

**Design service**

Solution design, Construction drawing design, Concept design, Spatial coordination, Design change and process management

**Capabilities**

40+ professional design teams, 15+ framework bidding consulting and design companies, and product R&D

**Platform**

Plink design management platform, AI intelligent design tool, and baseline library

# Huawei Data Center Service Solutions and Practices

**Huawei iCooling is the first attempt and application in the data center finance field: The annual average PUE is reduced by 0.25, the energy consumption is reduced by 13%, and the annual power consumption is reduced by 2.4 million kWh.**


Energy Efficiency Optimization Solution iCooling@AI

## Project Background

- The Jinqiao data center is located in the Jinqiao comprehensive bonded area of Shanghai. It has 18,000 cabinets and 8 buildings (D1–D8).
- The project aims to use AI technologies to save 20% to 30% energy in the cooling system, achieving a green and secure balance between data centers in the financial industry.

## Huawei Solution

In this project, the iCooling@AI technology is deployed in the D5 building. The average load of the building is about 25%, the annual average PUE is about 1.67, and the annual average power consumption of the HVAC system is 18 million kWh. In 2021, AI energy efficiency optimization will be started. In September, AI optimization algorithms will be deployed to infer the optimal cooling policy based on device and system reliability, and deliver the optimal cooling policy to achieve optimal data center energy efficiency.

## Customer Benefits

- The first dual-cooling source system AI practice large-scale data center in the financial industry in China.
- He won the "2021 Cloud Computing Center Science and Technology Award Excellence Award" awarded by China Electronic Energy Saving Technology Association.
- The equipment room on the D5 floor with 2000 cabinets reduces the annual PUE by 0.25, saves 13% energy consumption, and saves over 2.4 million kWh annually.