

# **Energy saving and carbon reduction potential of digital technology and standardization**

**Qi Shuguang**

**2022.03.02**

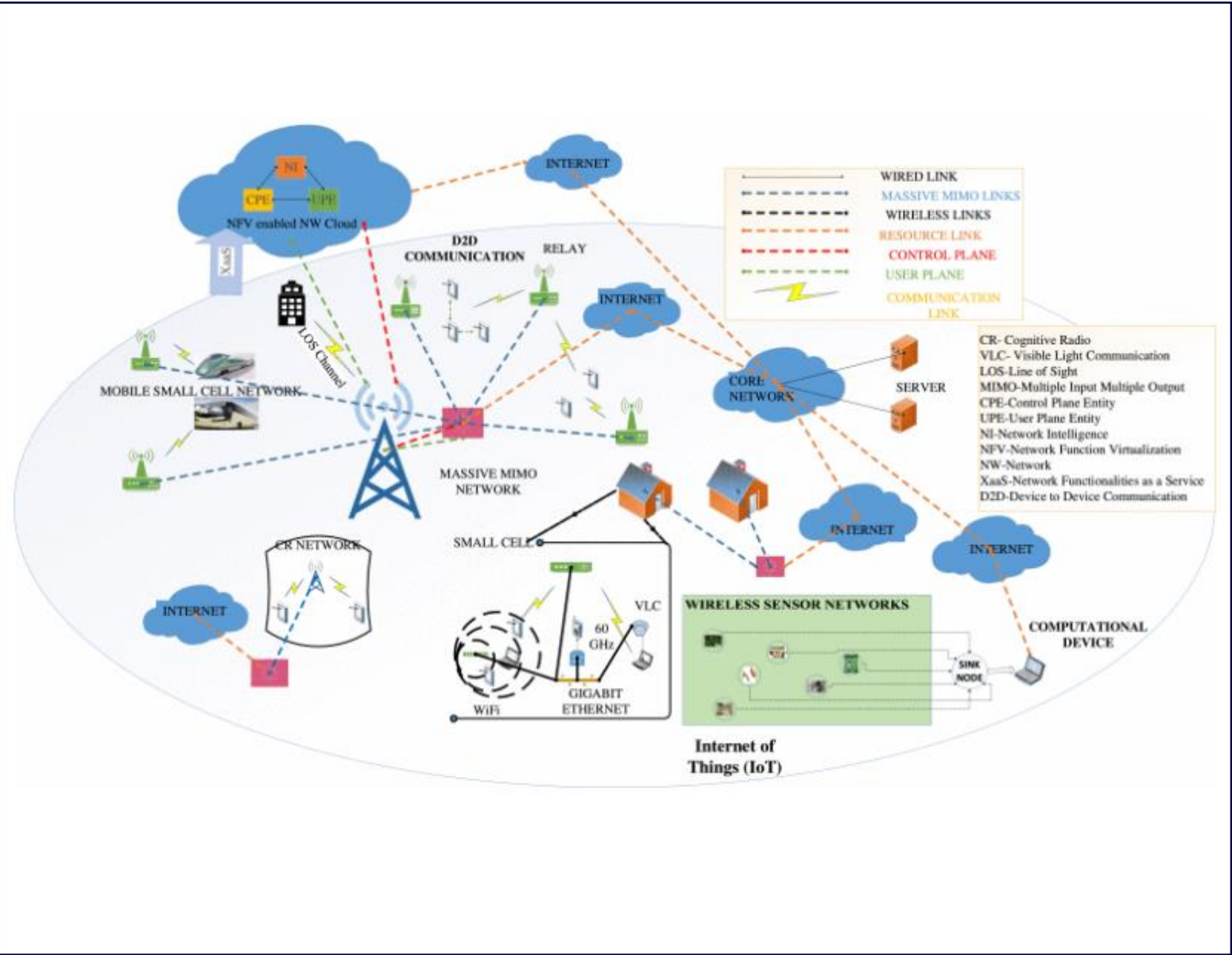


# 目录

Directory

**01. Energy saving potential of digital technology**

**02. Standardization work in green digital technology**



### Communication Base Station

Refrigeration Equipment	Power Supply and Distribution Equipment	IT Equipment

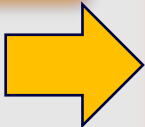
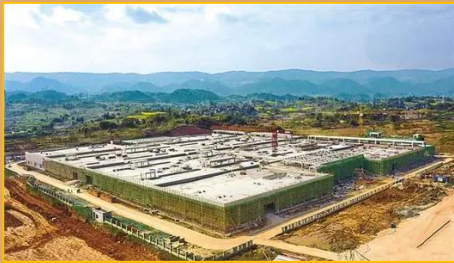
### Communication Room

Refrigeration Equipment	Power Supply and Distribution Equipment	IT Equipment

### Data center

Refrigeration Equipment	Power Supply and Distribution Equipment	IT Equipment

## Low carbon potential on Instruction



## Low carbon potential on Operation



## Low carbon potential on Maintenance



## Low carbon potential on Circular economy





ICT technology can reduce carbon emissions by 15% - 40% for the whole society

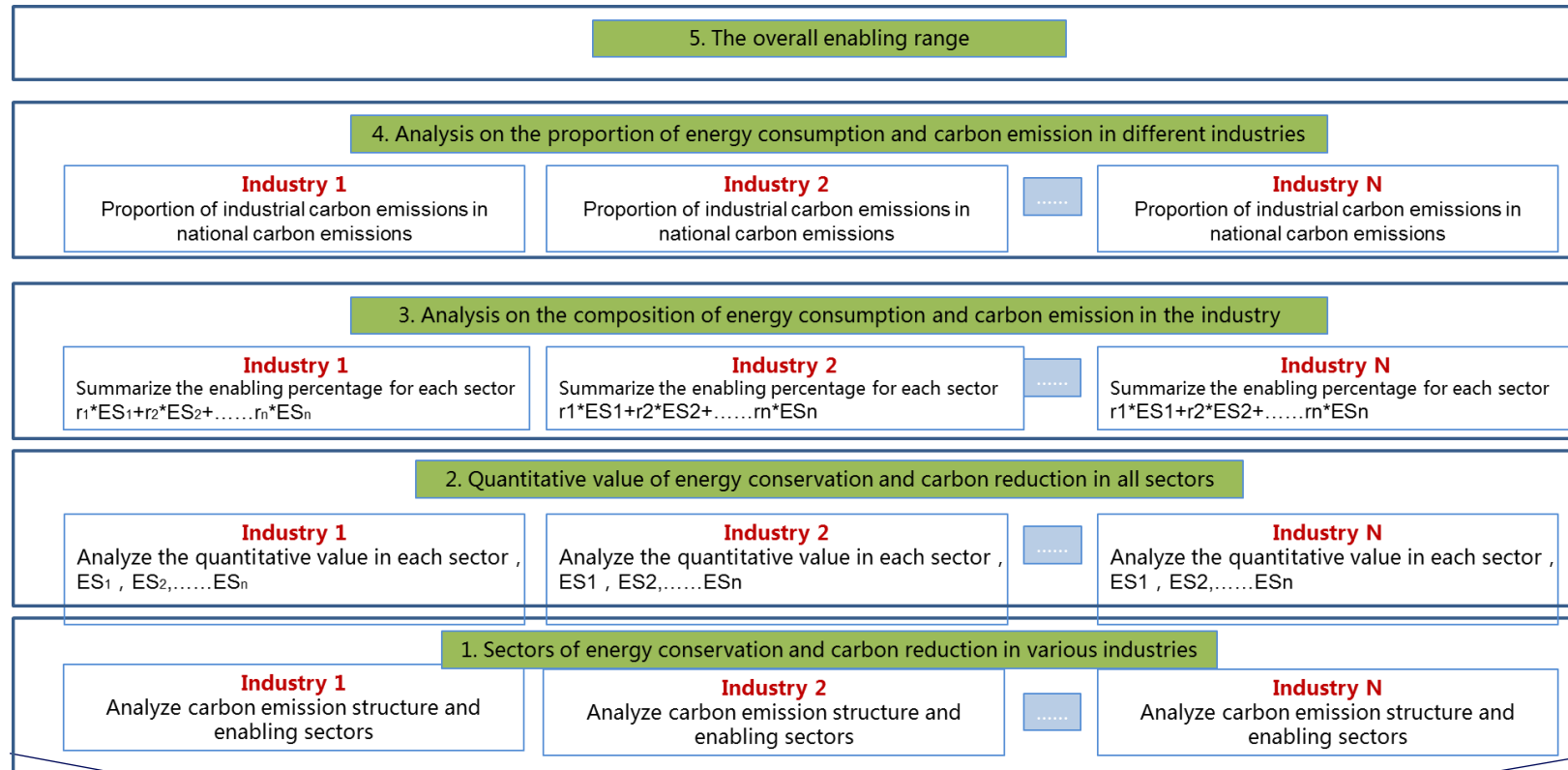


**GeSI** ENABLING DIGITAL SUSTAINABILITY

ICT technology can reduce carbon emissions by 20% for the whole society



ICT technology can enable industries to reduce their carbon emissions by up to 10 times.

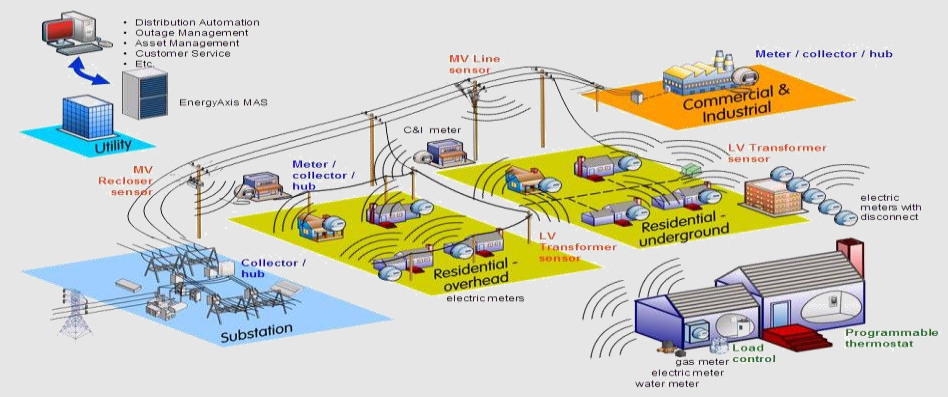




## Low carbon potential on Industry



## Low carbon potential on Energy



## Low carbon potential on Architecture



## Low carbon potential on traffic





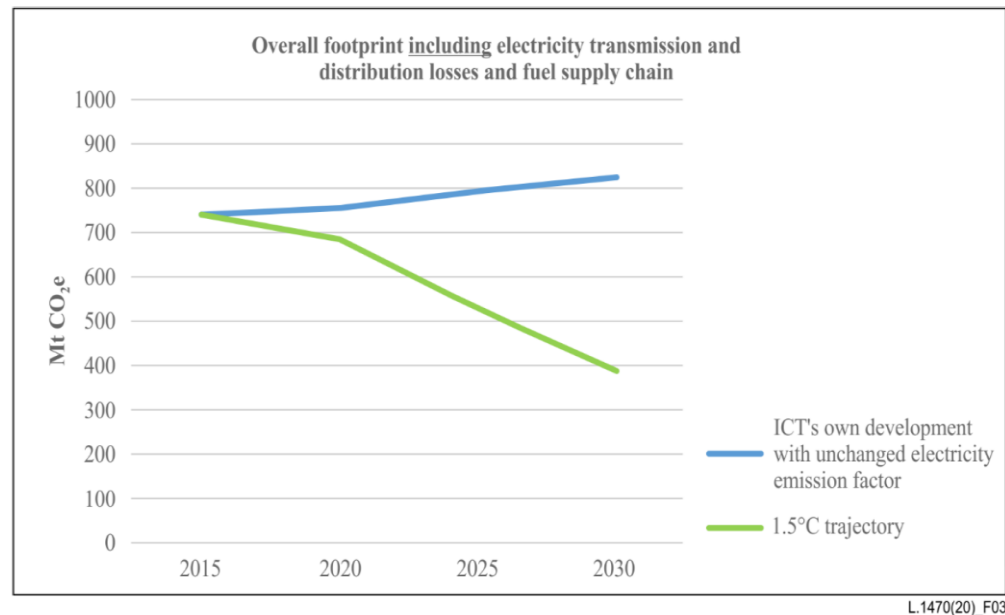
- **Recommendations ITU-T L.1220, ITU-T L.1221, and ITU-T L.1222:** Innovative Energy storage technology for stationary use:
  - Part 1: Overview of energy storage
  - Part 2: Battery
  - Part 3: Supercapacitor technology
- **Recommendation ITU-T L.1305:** Data centre infrastructure management system based on big data and artificial intelligence technology
- **Recommendations ITU-T L.1380, ITU-T L.1381, and ITU-T L.1382:** Smart Energy Solutions for:
  - Telecom sites
  - Data Centre
  - Telecommunication rooms
- **Recommendation ITU-T L.1370:** Sustainable & intelligent building services
- **Recommendation ITU-T L.1371:** A methodology for assessing and scoring the sustainability performance of office buildings



- **Recommendation ITU-T L.1020:** Circular Economy: Guide for Operators and Suppliers on approaches to migrate towards circular ICT goods and networks
- **Recommendation ITU-T L.1021:** Extended producer responsibility - Guidelines for sustainable e-waste management
- **Recommendation ITU-T L.1022:** Circular Economy: Definitions and concepts for material efficiency for Information and Communication Technology
- **Recommendation ITU-T L.1023:** Assessment method for circular scoring
- **Recommendation ITU-T L.1024:** The potential impact of selling services instead of equipment on waste creation and the environment – Effects on global information and communication technology
- **Recommendation ITU-T L.1032:** Guidelines and certification schemes for e-waste recyclers
- **Draft Recommendation ITU-T L.1033:** Guide for the institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste
- **Draft Recommendation ITU-T L.1050:** Methodology to identify the key equipment in order to assess the environmental impact and e-waste generation of different network architectures



## ICT sector trajectory including electricity grid losses and supply chain



- **Recommendation ITU-T L.1450:** Methodologies for the assessment of the environmental impact of the information and communication technology sector
- **Recommendation ITU-T L.1451:** Methodology for assessing the aggregated positive sector-level impacts of ICT in other sectors
- **Recommendation ITU-T L.1470:** GHG emissions trajectories for the ICT sector compatible with the UNFCCC Paris Agreement
- **ITU-T L.Suppl.37 to ITU-T L.1470:** Guidance to operators of mobile networks, fixed networks and data-centres on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470
- **ITU-T L.Suppl.38 to ITU-T L.1470:** Guidance for information and communication technology manufacturers on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470
- **Recommendation ITU-T L.1471:** Guidance and criteria for information and communication technology organisations on setting Net Zero targets and strategies

## **YD/T 1669-2016**

The Off-Grid Wind/PV hybrid power supply system for telecommunications

## **YD/T 2321-2011**

Technical requirement and testing methods for converting mode solar power controller for telecommunications

## **YD/T 3087-2016**

The embedded solar photovoltaic power system for telecommnuications

## **GB/T 26263-2010**

The power system of wind energy for telecommunication

## **GB/T 26264-2010**

The photovoltaic power system for telecommunication

## **YDB051-2010**

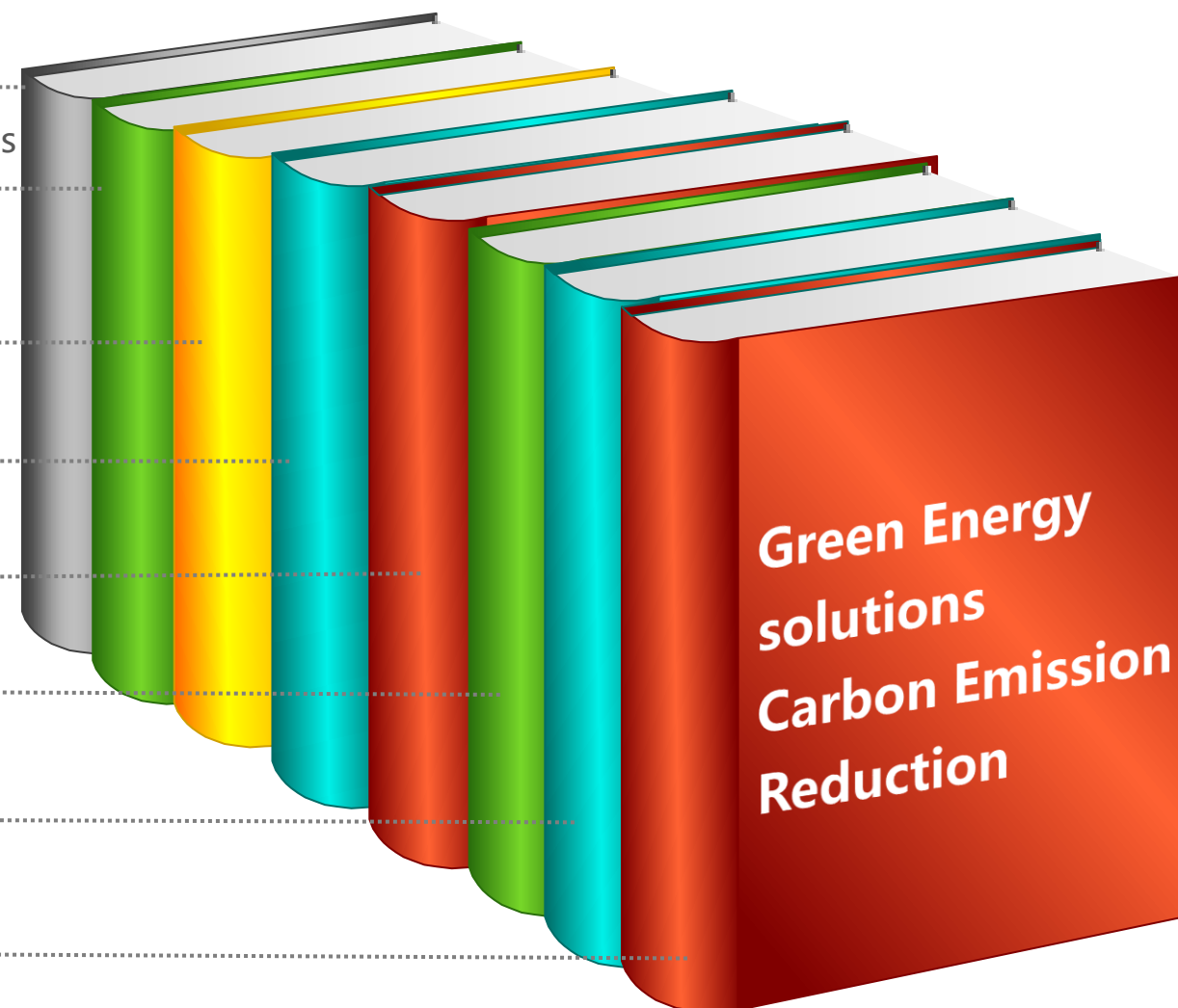
Power supply of hydrogen fuel cell for telecommunications

## **YDB053-2010**

Solid hydrogen storage system of fuel cells for telecommunications

## **T/CCSA 313-2021**

Aluminum air battery system for telecommunication



# CCSA standards: Energy Efficiency and low acarbon technology

**YD/T 2435.3-2020 Guide for energy saving technology of power supply and Room environment for telecommunications— Part 3:Grade of energy efficiency of power supply**

**YD/T 2435.4-2020 Guide for energy saving technology of power supply and room environment for telecommunications-Part 4: Classification of airconditioners energy efficiency**

**YD/T 2897-2015 Parameters and test methods for the energy efficiency - Optical transport network (OTN) equipment**

**YD/T 2898-2015 Parameters and test methods of energy efficiency for optical transport equipment - Packet Transport Network (PTN) equipment**

**YD/T 2899-2015 Parameters and test methods of energy efficiency for optical transport equipment Multi-Service transport platform (MSTP) equipment**

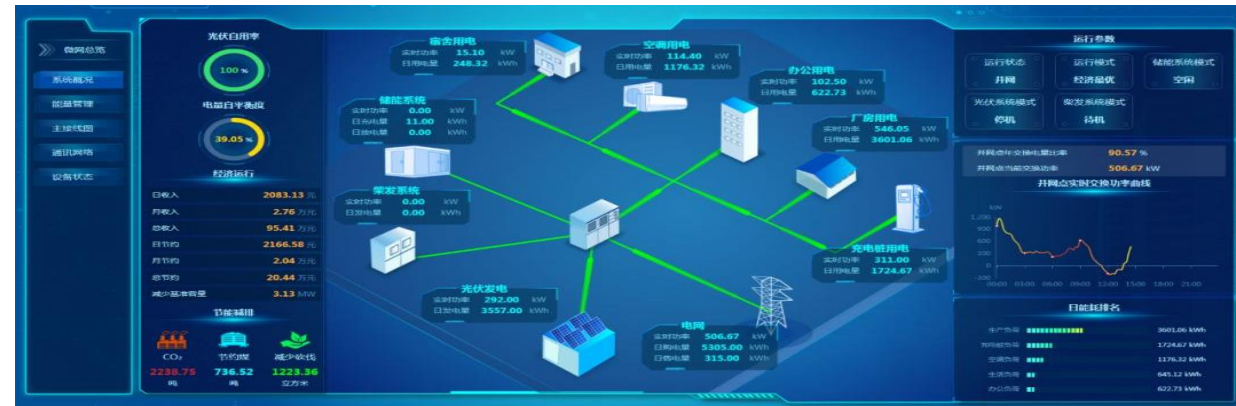
**GB/T 26262-2010 Guide for classification of telecommunication equipment energy efficiency**

**YD/T 3032-2016 Energy efficiency requirements and measurement methods for power and cooling systems in telecommunication rooms and stations**

No.	Number	Title
1	GB/T 28520-2012	Intelligent heat exchanger for telecommunication stations/sites
2	GB/T 28521-2012	Intelligent energy saving system by fresh air for telecommunication stations/sites
3	YD/T 1968-2009	Intelligent heat exchanger for telecommunication stations/sites
4	YD/T 1969-2009	Intelligent Energy Saving System by Fresh Air for Telecommunication Stations/Sites
5	YD/T 2061-2009	Constant temperature & humidity air conditioning system for telecommunication room
6	YD/T 2318-2011	Technical requirements and test methods of the integrated air conditioner with fresh air cooling for BTS
7	YD/T 2557-2013	Technical requirements and testing methods for CRAC with refrigerant pumping-compressing dual cycles
8	YD/T 2768-2014	Thermal control equipment for outdoor telecommunication enclosure Part 1:embedded thermal control equipment
9	YD/T 2769-2014	Thermal control equipment for outdoor telecommunication enclosure Part 2:temperature control equipment with PCM
10	YD/T 2770-2014	Technical requirements and experimental methods of heat pipe exchanger for communication base station
11	YD/T 3033-2016	PCM Energy storage equipment for telecommunication stations/sites
12	YD/T 3223-2017	Integrated heat pipe air conditioner for telecom stations/sites
13	YD/T 2435. 1-2012	Guide for energy saving technology of power supply and Room Environment for telecommunications Part 1:General Rules
14	YD/T 2435. 2-2017	Guide for energy saving technology of power supply for telecommunications and room environment-Part 2: Application conditions
15	YD/T 2435. 5-2017	Guide for energy saving technology of power supply for telecommunications and room environment-Part 5:Airflow
16	YD/T 3320. 1-2018	The high heat density thermal control equipment for telecommunication Part 1:In-row air conditioner
17	YD/T 3320. 2-2018	The high (heat) density thermal control equipment for telecommunication room-Part 2:Rear door heat exchanger
18	YD/T 3320. 3-2020	The high heat density thermal control equipment for telecommunication— Part 3: Overhead convective unit
19	YD/T 3767-2020	Technical Specifications of the hybrid Architecture with both commercial Power and uninterruptable Power Supply in Data Center
20	YD/T 3768. 1-2020	Technical requirement and test methods of echelon using BV batteries for telecommunication-Part1: LiFePO4 battery
21	YD/T 3004-2016	Technical requirements on modular telecommunication room
22	YD/T 3568. 1-2020	Technical requirements for telecommunication base station infrastructure— Part 1: General principles

# CCSA standards: Management in Energy Consumption and Carbon Emission

## YD/T 3548-2019 Technical specifications of Energy Consumption Measurement & Management System for Communication Operators



## YD/T 3048.1-2016 Technical requirements for assessment of carbon footprint of communication products Part 1 : Mobile phone



## YD/T 3048.2-2016 Technical requirements for assessment of carbon footprint of communication products Part 2 : Ethernet switch





## Standards of Green Energy

- Renewable energy used in data center, telecommunication room and base station;
- New type of energy storage like hydrogen fuel cell and Aluminum air battery;
- Standards of energy intelligent application and comprehensive energy management are promoted simultaneously.

## Standards of Energy Saving and Recycle

- Energy saving Technology and product : HVDC, free cooling,
- System level or room level energy saving standards: especially on digital and smart application together with under developing standards;
- Recycle and reuse of energy or materials: residual heat dissipation standard.

## Standards of Energy Efficiency

- Product level : IT devices, infrastructure devices;
- System level : IT system, power supply system and air cooling system;
- Network level: Telecommunication room, base station and network system.

## Standards of Carbon Emission

- GHG emission calculation and report (manufacturing and operating corp.);
- Carbon footprint of products (IT and infrastructure)
- Limitation and low-carbon evaluation(data center, telecommunication room, base station, etc.
- Management and Service.

**感谢观看**  
**THANKS**

