

Application and Prospect for AMI of State Grid Corporation of China (SGCC)

Bai Jingfen
CEPRI
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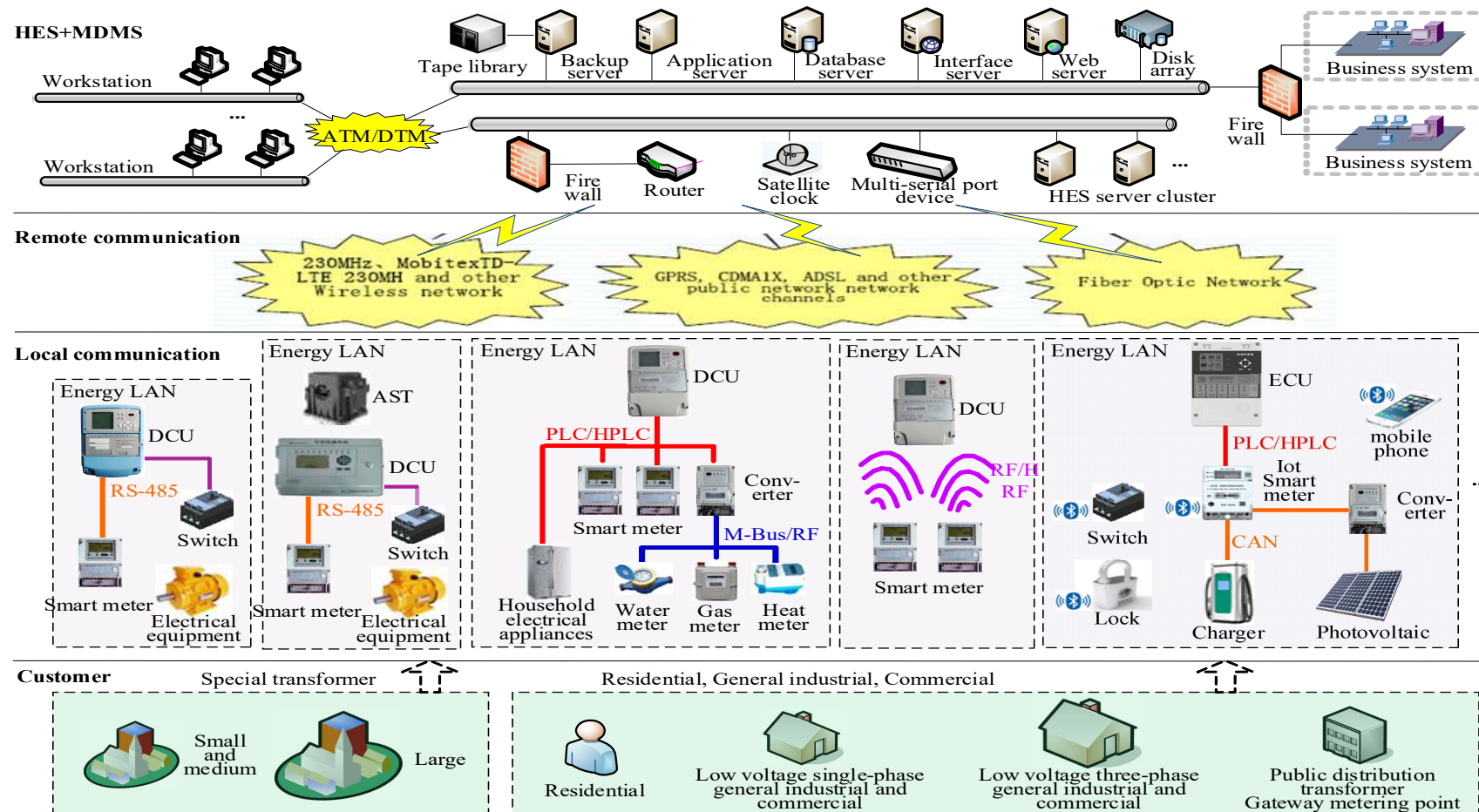
8th IERE Webinar on Advanced Metering Infrastructure (AMI)

Logo 1

Content

- System architecture of SGCC
- Key Technology of SGCC AMI
- Application of SGCC AMI
- Prospect

01. SGCC AMI system architecture



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02-1. Smart meter

SMART METER: **measuring unit**, **data processing unit**, **communication unit** and other components

- Single phase/Three-phase
- Local control tariff/Remote control tariff
- Internal switch/External switch
- DLT645 protocol/DLT698.45(based on Object-Oriented protocol)
- Interchangeable battery/Battery can not change
- Communicate method: PLC/ GPRS /Micro-power wireless/RS-485



Single-phase tariff control smart meter (remote)



Single-phase tariff control smart meter (local)



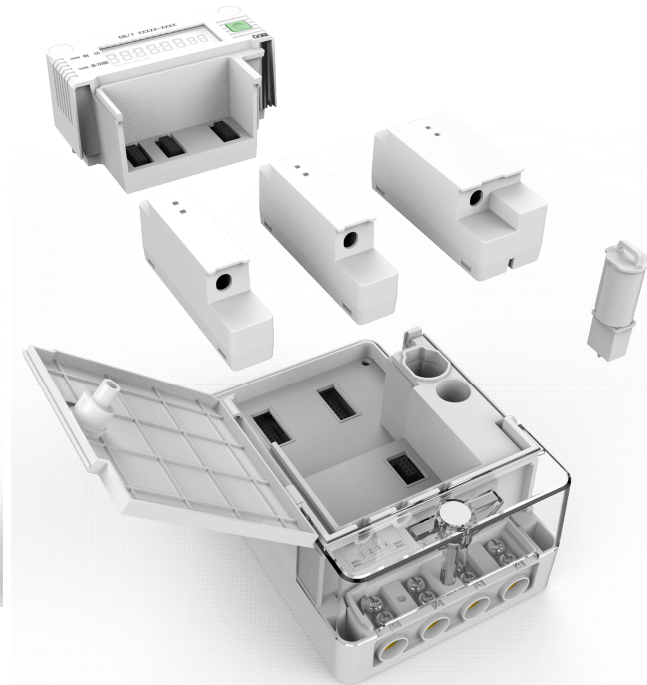
Three-phase tariff control smart meter (local)



Three-phase tariff control smart meter (remote)

02-1. Smart IoT Meter with Modular Design

- ※ **Metering part** : Metrology core with harmonic measurement
- ※ **Non-metering part**: Management core with unified OS
- ※ **Extend part**: Communication&Function(NILM / PV control/ Power quality control)
- ※ Legal Measurement and management functional **separation Safety isolation**
- ※ **Non-metering function** can be **upgraded** remotely, can't affect Measurement

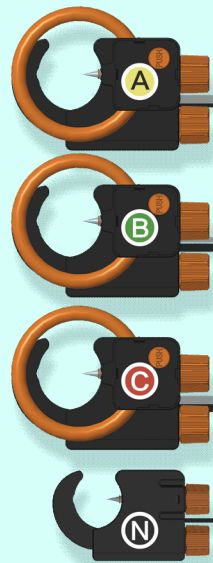


02-1. Socket Meter

Used by **Socket Meter** and **Rogowski Coil**

Rogowski Coil

Converse current signal into an mV voltage signal, and connected it to sample circuit in Socket Meter



罗氏线圈连接线

穿刺取电连接线

N线

积分器

电压线

电流信号线

Use case:

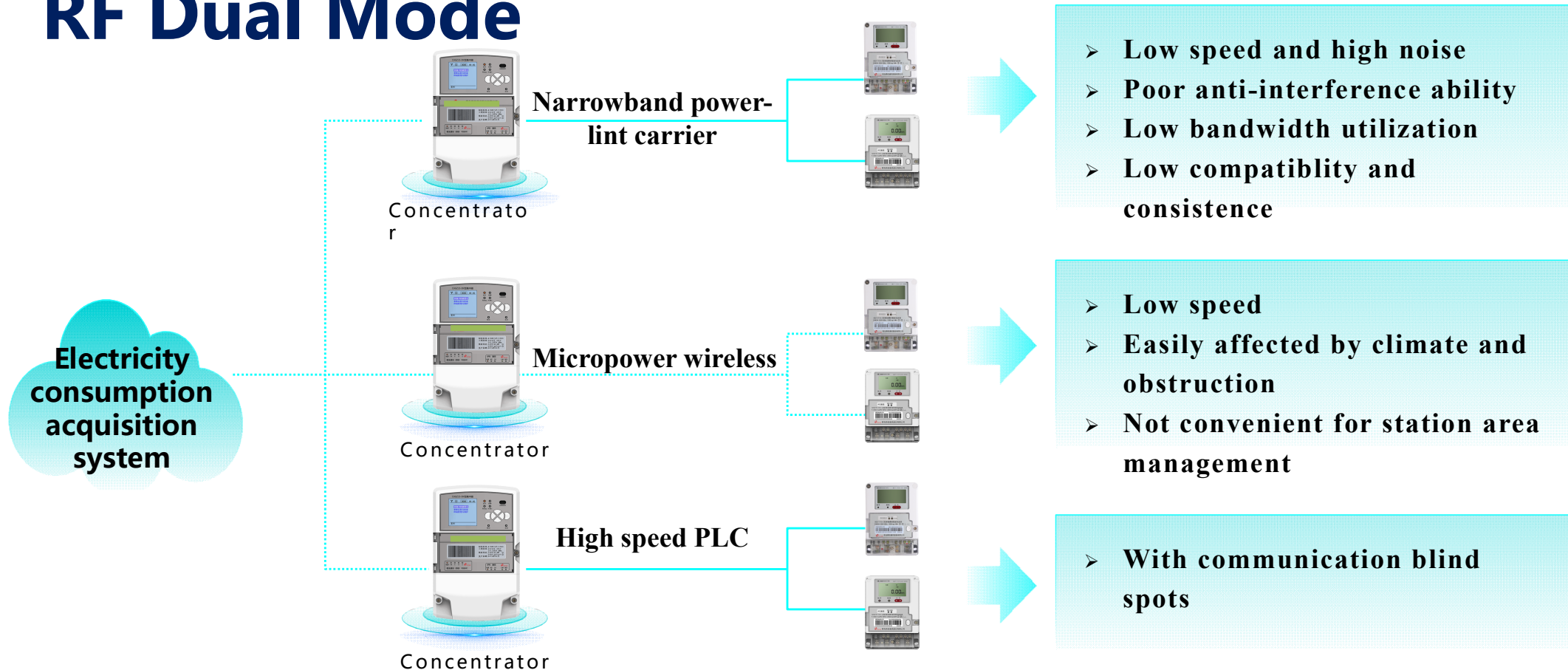
- EV measurement
- Multi-meter box measurement
- Other application need energy measurement without install environmen

Socket Meter

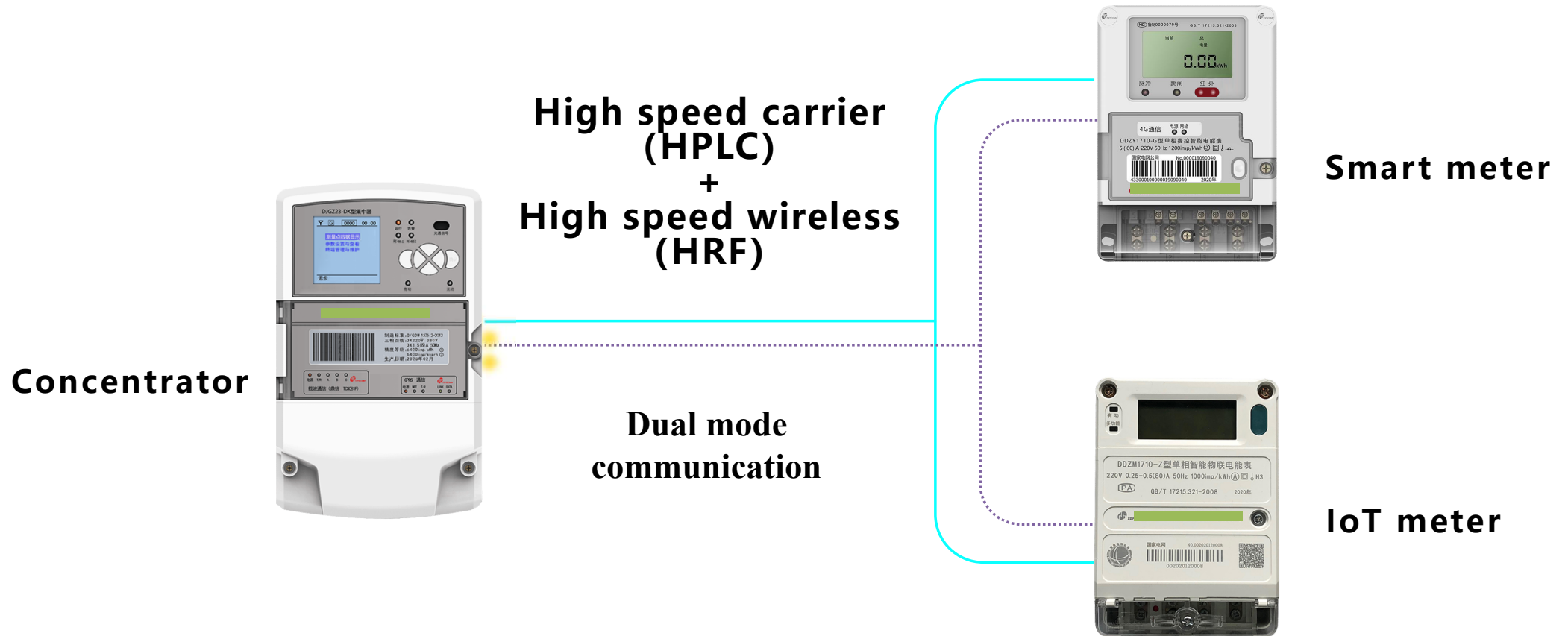


Three-phases voltage/current connected

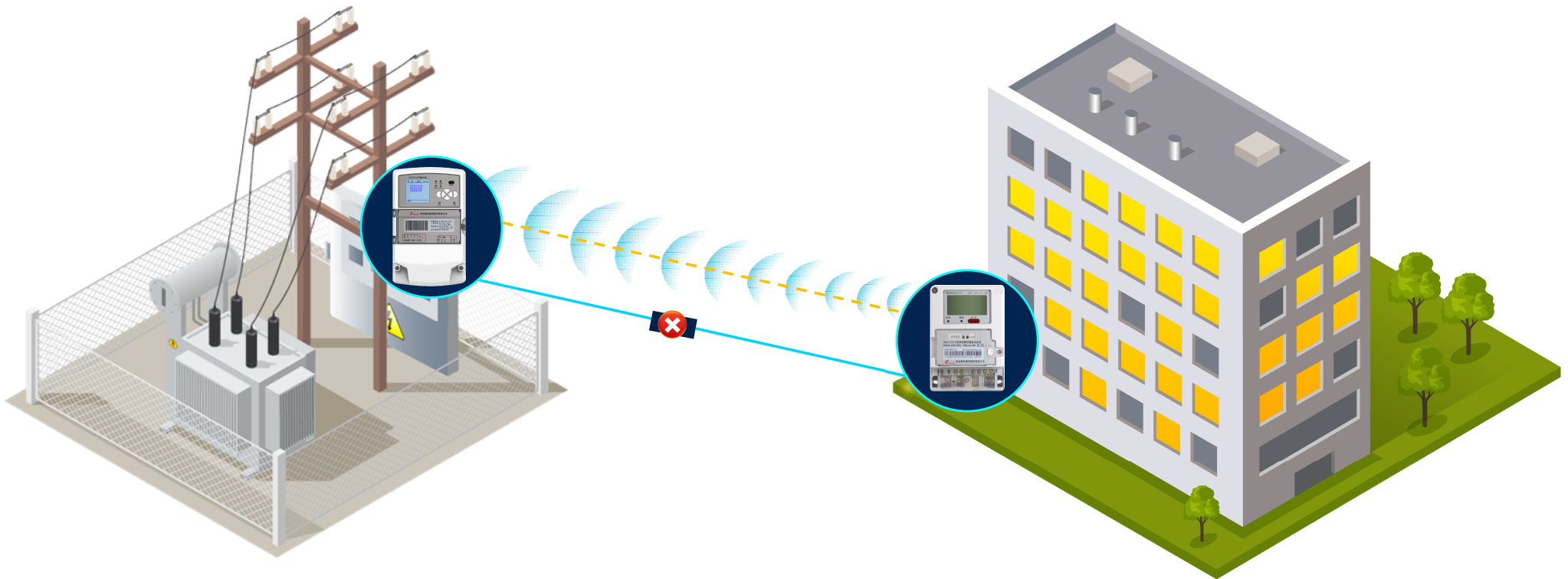
02-2. High-speed Power-Line Carrier and RF Dual Mode



02-2. HPLC and RF Dual Mode



02-2. HPLC and RF Dual Mode

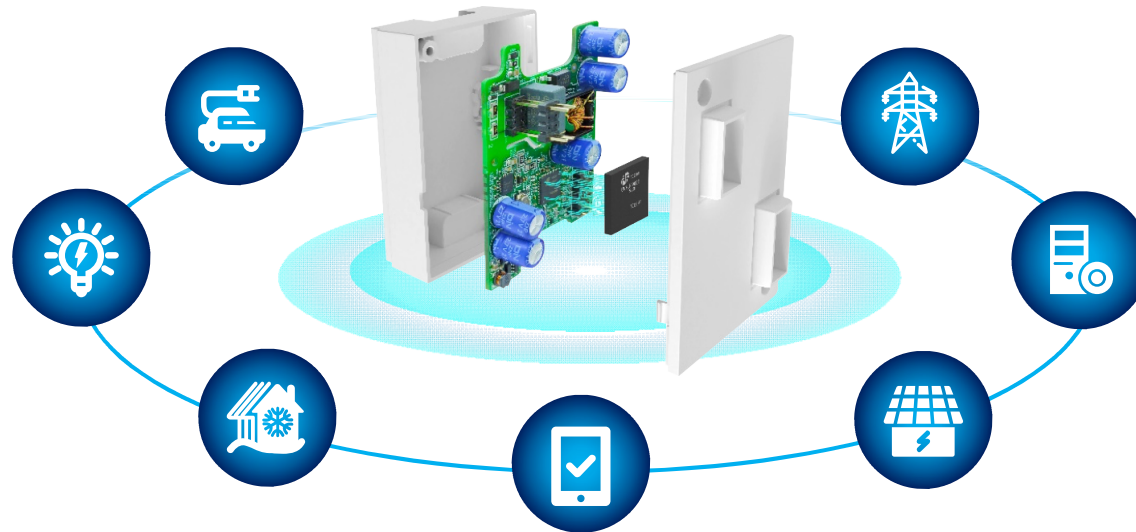


When the carrier channel is disconnected, power outage information can be reported through the dual mode wireless channel.

02-2. HPLC and RF Dual Mode

Dual mode has significantly improved bandwidth and can connect more energy IoT nodes

Match adaptively many IoT business such as smart homes and orderly charging



- By sharing information, we aim to achieve industrial and enterprise IoT, new energy and orderly charging IoT, provide comprehensive energy consumption services for residential households, and build a smart energy internet
- It is a future key promotion product in the domestic energy and communication industry market

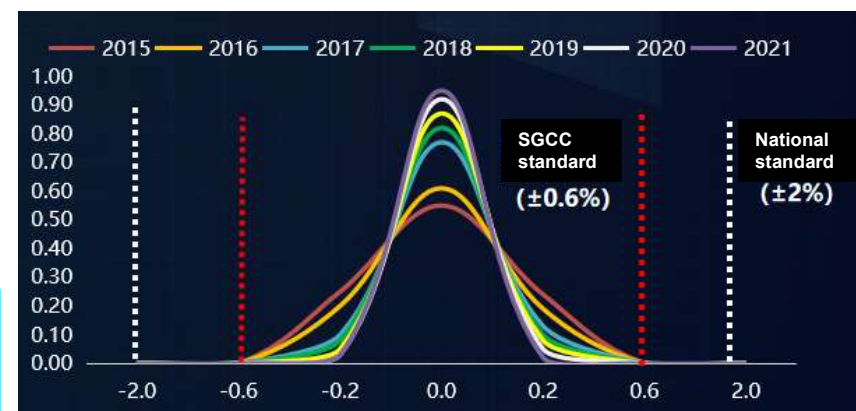
02-3. Automated Verification Assembly



Automatic Verification Line



Automatic Storage Operation



Verified almost **66 millions**

02-4. AMI Application

System Application

Convenient
Power
Usage



Data Collection of
Water, Electricity & Heat
Usage



Smart
Power
Usage



Clean Energy Usage



Reliable
Power
Usage



Outage Alert

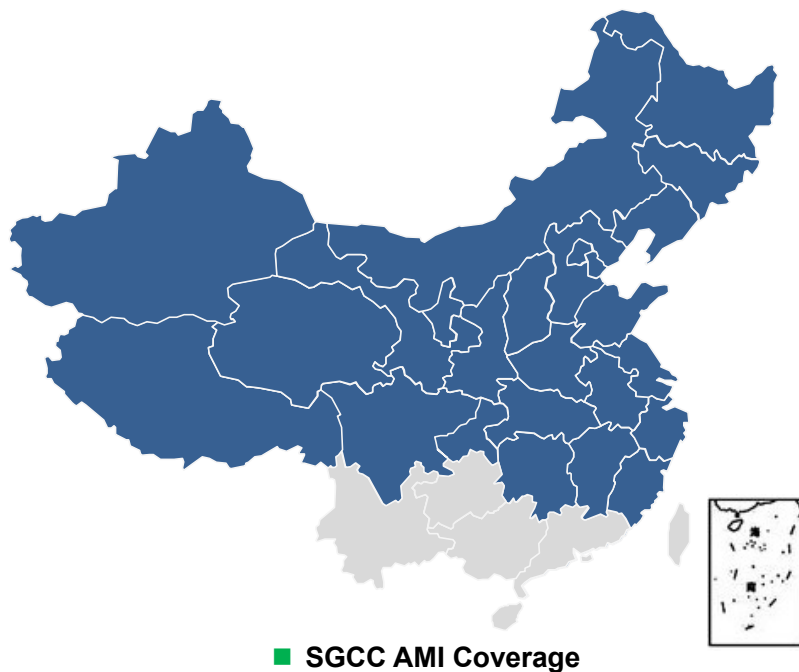


Fair & Just Electricity
Transactions

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03. Application of SGCC AMI



Coverage:

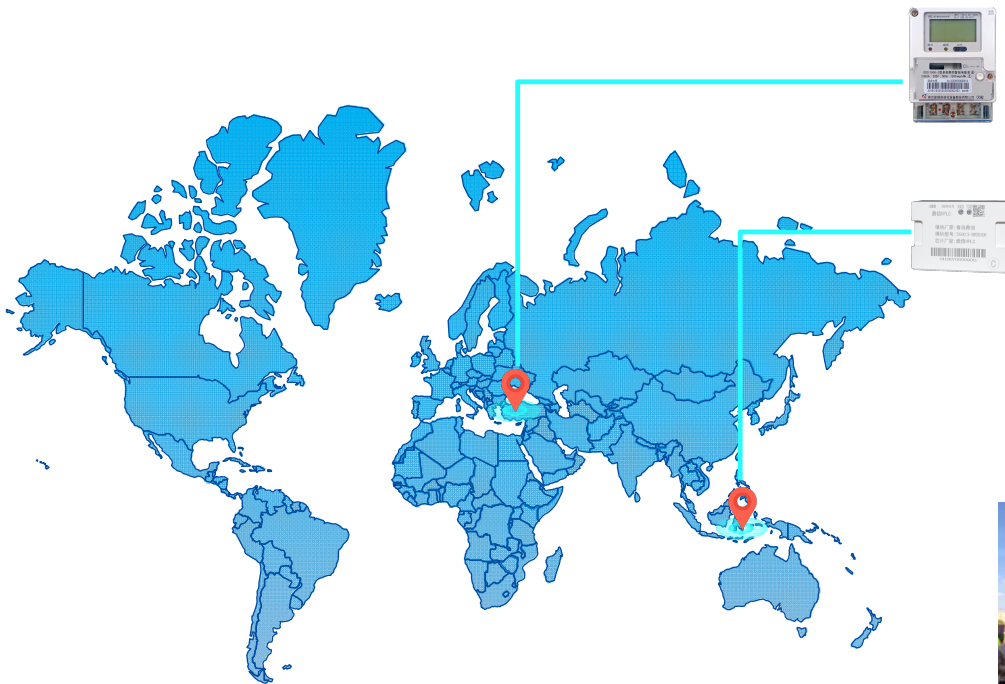
26 out of 32 provinces in China
Serving over 1.1 billion population

Scale:

Smart meters installed: **615 million in total**
with **full** Automatic meter reading

03. Application of SGCC AMI

Overseas Project



- SGCC has successfully completed the AMI projects of Saudi Arabian and Indonesia, with **5 million and 1.2 million smart meters** respectively.

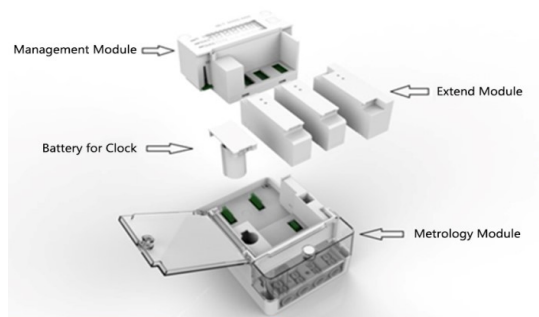


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Prospect

Improve Metering Application



Smart IoT Energy Meters



EV Charging Metering

Prospect

Strengthen Metering Supervision



**Application of Big Data from
Metering**



**Equipment Service Life
Prediction**



Thank you!

Bai Jingfen
CEPRI
jfbai@epri.sgcc.com.cn

