

科技行业

新基建的定义 II - “泛在电力物联网”

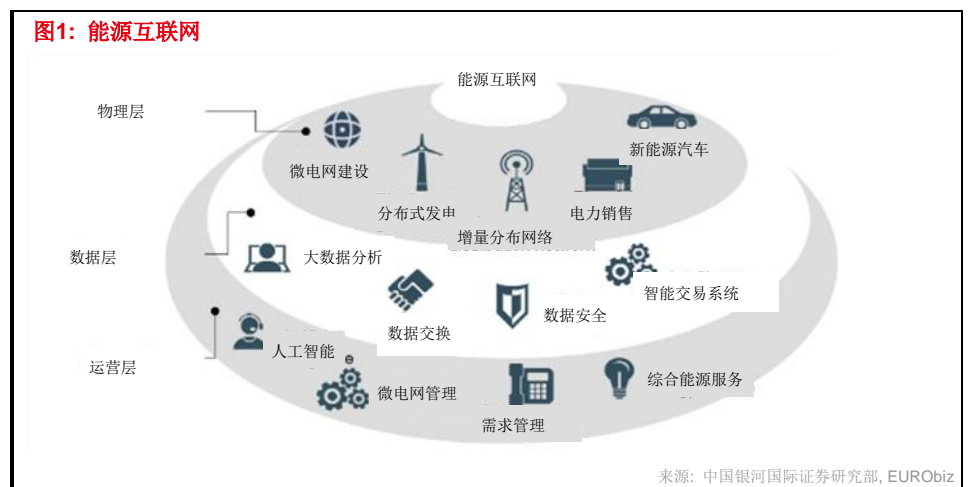
- 我们之前曾强调，电网投资是新基建主题下较少讨论的领域之一。国家电网最近发布的“泛在电力物联网”发展计划引起了很多市场关注，特别是在 A 股市场。
- 本报告是为定义基建的第二份报告，我们在当中讨论了“泛在电力物联网”和潜在的受益者。据我们了解，“泛在电力物联网”是能源互联网的一部分，是国家电网的重点投资重点之一。
- 在硬件和软件方面，高端配电和传输设备、5G、边缘计算、云计算、大数据和人工智能等通信技术将被用于开发“泛在电力物联网”。

2019年3月8日，国家电网提出建设“泛在电力物联网”的综合计划。公司指出“泛在电力物联网”的发展是“三型两网”战略的核心任务，该战略旨在打造世界一流的能源跨网企业。“泛在电力物联网”已成为 A 股市场最热门的投资主题之一。

我们在上一份于 2019 年 1 月 16 日发布的“新基建的定义”报告中指出，中国政府官员提到的主要投资领域是：a) “新型基础设施”建设，尤其是人工智能、工业互联网、物联网和 5G；b) 城乡基础设施建设；c) 能源、交通和水利；d) 加强民生和公共服务项目建设力度，尤其是补上教育、医疗、健康、养老这些方面的短板；e) 加强生态环保和自然灾害防治能力建设。我们认为，电网投资是新基建主题下市场较少讨论的领域之一。国家电网最近发布有关“泛在电力物联网”的发展计划引起了市场关注，尤其是在 A 股市场。

我们认为“泛在电力物联网”也是边缘计算应用的领域之一，我们在 2019 年 3 月 11 日的研报中对此进行了讨论。我们预计国家电网将在 2019 年加大投资进度。在今年较早时候，国家电网公布了 2019 年电网投资目标。2019 年电网投资额为人民币 5,126 亿元，同比增长 4.80%，对比 2018 年同比增长为 0.70%。国家电网的指引可能意味着电网总投资额在 2017 年（同比下降 2.5%）和 2018 年（同比下降 0.6%）放缓后，将会回复较快增长。能源互联网（IoE）是关键的中期投资重点。在 2014 年，当国家能源局和工信部共同制定发展计划时，能源互联网被市场广泛讨论，但 2014 - 2018 年的进展不大。据我们了解，“泛在电力物联网”是能源互联网的一部分。鉴于国内推进特高压网络、电力改革和 5G 的发展，国家电网有望重新加快对能源互联网的投资，预计这将刺激高端配电和传输设备需求（无论是硬件还是软件）。

图1: 能源互联网



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Technology - Others

Defining infrastructure II – “Ubiquitous Electric Power IoT”

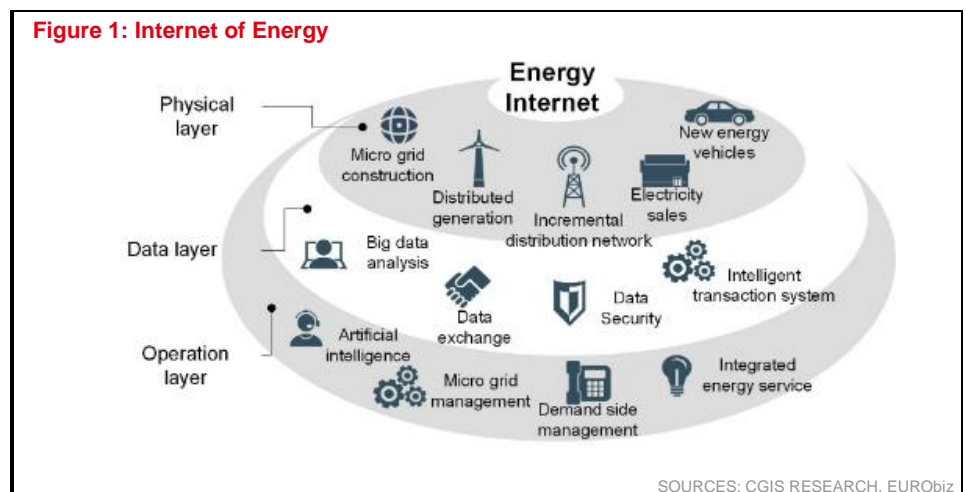
- We highlighted earlier that power grid investment is one of the less-discussed areas under the new infrastructure theme. The recent development plan released by State Grid Corporation of China regarding “Ubiquitous Electric Power IoT” has gained a lot of market interest, especially in the A-share market.
- In this report, as part II of Defining Infrastructure, we discuss Ubiquitous Electric Power IoT and potential beneficiaries. As we understand it, Ubiquitous Electric Power IoT is part of the Internet of Energy, which is one of the key investment focuses of State Grid Corporation of China.
- High-end power distribution and transmission equipment, in terms of both hardware and software, communications technology such as 5G, edge computing, cloud computing, Big Data and AI will be adopted to develop Ubiquitous Electric Power IoT.

On March 8, 2019, State Grid Corporation of China (SGCC, or the Company) adopted a comprehensive plan for promoting the development of Ubiquitous Electric Power IoT. The Company pointed out that the development of Ubiquitous Electric Power IoT is a core implementation task of the Company's "Three Types and Two Networks" Strategy, which aims to build a world-class energy inter-grid enterprise. Ubiquitous Electric Power IoT has become one of the hottest investment themes in the A-share market.

In our last report on “Defining infrastructure (I)”, dated 16 Jan 2019, we explained that the key investment areas mentioned by Chinese government officials are: a) “new Infrastructure”, especially AI, the Industrial Internet, IoT and 5G; b) rural infrastructure; c) energy, transportation and water; d) social services, such as education, medical, healthcare and elderly services; and e) environmental protection and natural disaster recovery. We believe that power grid investment is one of the less-discussed areas under the new infrastructure theme. The recent development plan released by State Grid Corporation of China regarding Ubiquitous Electric Power IoT has gained a lot of market interest, especially in the A-share market.

We believe Ubiquitous Electric Power IoT is also one of the areas for the application of Edge Computing, which was discussed in our report dated 11 Mar 2019. We expect SGCC to step up investment progress in 2019. Recall that SGCC released its power grid investment target for 2019 earlier this year. Power grid investment was set at RMB512.6bn for 2019, up 4.80% YoY, and an acceleration from 0.70% YoY growth in 2018. The guidance by SGCC may imply that total power grid investment will resume faster growth after a slow period in 2017 (-2.5% YoY) and 2018 (0.6% YoY). The Internet of Energy (IoE) is a key medium-term investment focus. The IoE was widely discussed in 2014 when the NEA and MIIT were jointly formulating the development plan, but limited progress was made in 2014–2018. As we understand it, Ubiquitous Electric Power IoT is part of the Internet of Energy (IoE). Given the roll-out of the UHV network, power reforms and 5G, we would not be surprised to see SGCC re-accelerate investment in the IoE, which is expected to create demand for high-end power distribution and transmission equipment in terms of both hardware and software.

Figure 1: Internet of Energy



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Potential Beneficiaries

Based on our definition, “Ubiquitous Electric Power IoT” covers the following segments and companies:

Software Products and Intelligence

- Enterprise software products and services: YGSOFT [002063.CH], Wiscom System [002090.CH], Beijing Forever Technology [300365.CH], Nanjing Xinlian Electronics [002546.CH].
- Big data analysis: Winner Information Technology [300609.CH].

Equipment

- Transmission and distribution equipment: Sichuan Minjiang Hydropower [600131.CH], NARI Technology [600406.CH], Xuji [000400.CH], Sun King Power [0580.HK].
- Electrical measuring instruments: Wasion [3393.HK], Jiangsu Linyang Energy [601222.CH], Hexing Electrical [603556.CH], Hangzhou Sunrise Technology [300360.CH].
- IC design: Risecomm [1679.HK], Wasion [3393.HK], Shanghai Fudan [1385.HK], Qingdao Eastsoft Communication [300183.CH], Qingdao Topscomm Communication [603421.CH].
- Foundries: SMIC [0981.HK] and Hua Hong [1347.HK].

Data collection terminals and communication networks

- Private networks: ZTE [0763.HK], Shanghai Potevio [600680.CH], Datang Telecom Technology [600198.CH], Qingdao Eastsoft Communication Technology [300183.CH], Qingdao Topscomm Communication [603421.CH].
- IoT and IoE: Hangzhou Zhongheng Electric [002364.CH], Shenzhen Asia Link Technology Development [002316.CH], Gosunch Technology Group [300098.CH].

What is Ubiquitous Electric Power IoT?

According to the Company,

(Electric) Energy Internet = Strong & Smart Grid + Ubiquitous Electric Power IoT
((电力) 能源互联网 = 坚强智能电网 + 泛在电力物联网).

In this formula, "Strong & Smart Grid" refers to a strong grid network, supported by an information–communication platform, with smart controllers covering generation, transmission, distribution, customer service, dispatching, etc. Strong & Smart Grid refers to the carrier of power flow, information flow and work flow, resulting in strong, reliable, economical, efficient, clean, transparent and interactive integration.

The Ubiquitous Network, or Ubiquitous Internet of Things, refers to information connection and interaction Anytime, Anywhere, with Anything and Anyone. It also called the M2M system, representing broadly machine to machine, man to machine, machine to man, and man to man.

In the above formula, Ubiquitous Electric Power IoT refers to the application of the ubiquitous network in the electricity industry. The Ubiquitous Electric Power IoT connects electricity users and their equipment, grid companies and their equipment, power generation companies and their equipment, suppliers and their equipment, and people and things, to generate shared data to offer services to users, grids, power generation suppliers, and government and social enterprises. With the power grid as the hub, SGCC will play a platform and sharing role, create greater opportunities for the development of the whole industry and more market entities, and provide valuable services.

Figure 2: Exemplary model of the future Smart Grid

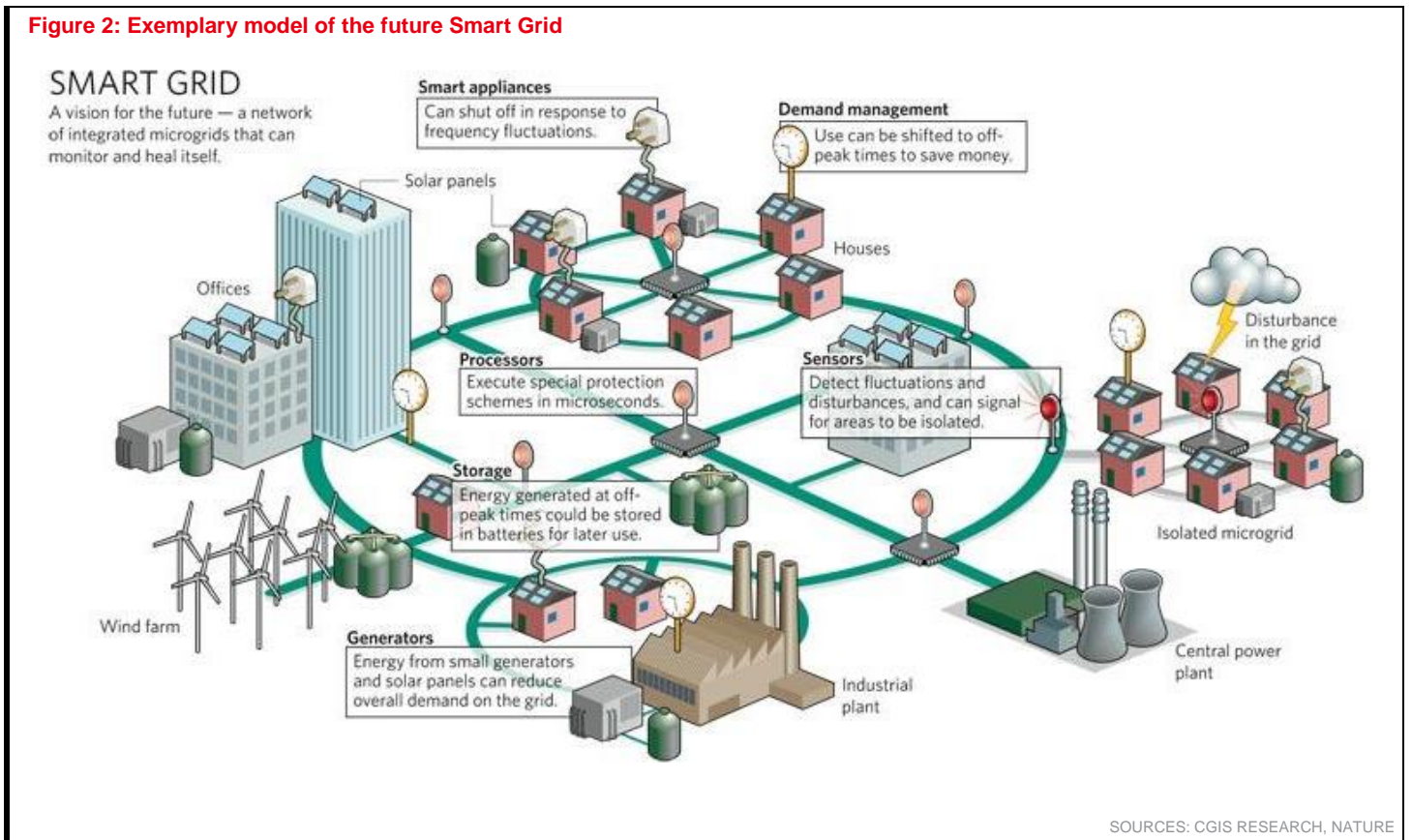
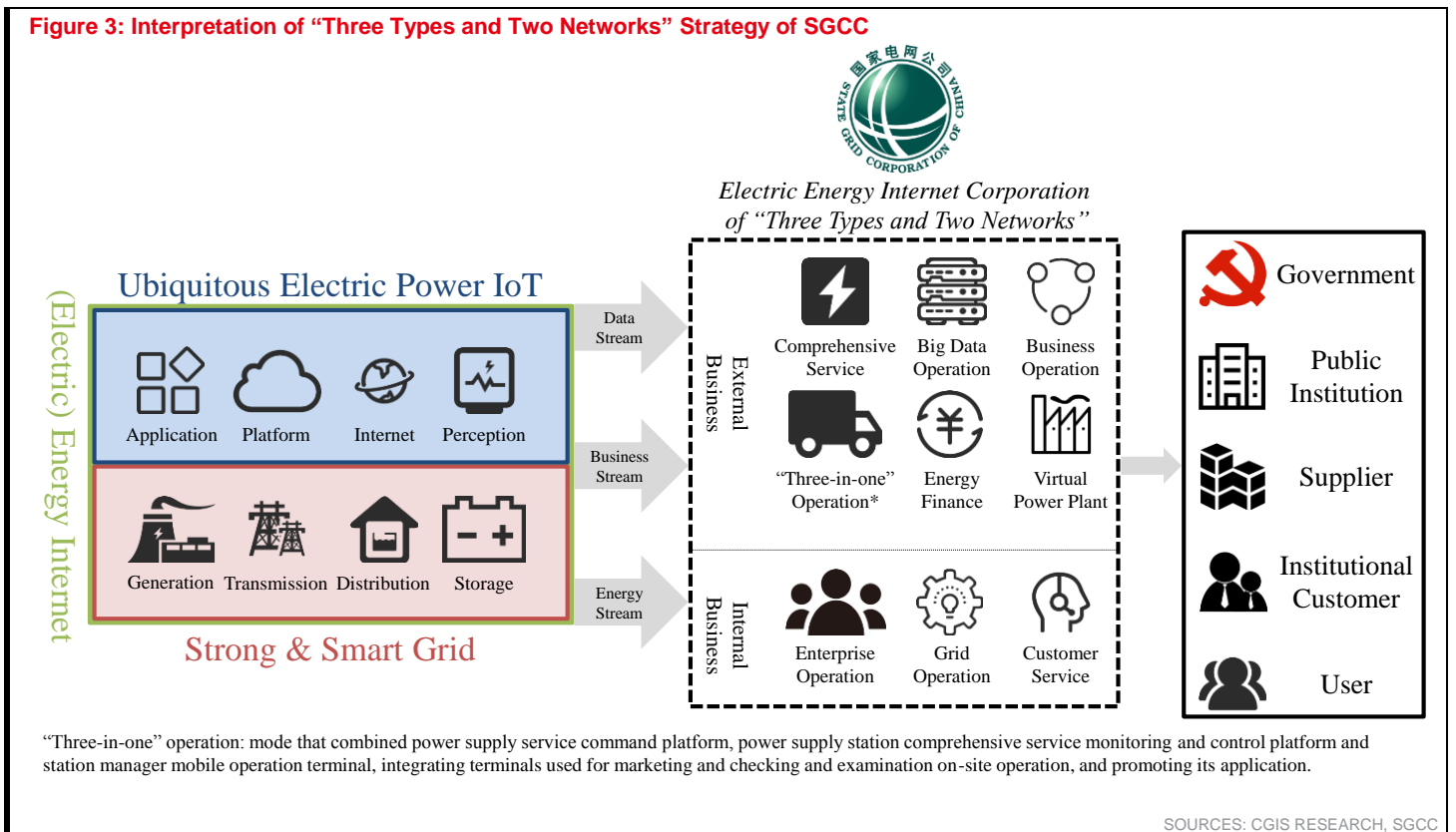


Figure 3: Interpretation of “Three Types and Two Networks” Strategy of SGCC



“Three Types and Two Networks” Strategy of SGCC

Three Types

1. Hub-type embodies industrial property. SGCC will take advantage of its pivotal role in energy collection, transmission and conversion, and promote the construction of a clean, low-carbon, safe and efficient energy system.
2. Platform-type embodies network property. SGCC will build an energy allocation platform, an integrated service platform, and a development platform using a new business, a new format and a new model, based on the Internet of Energy, so that the platform value development becomes an important channel for SGCC to cultivate its core competition advantage.
2. Share-type embodies social property. SGCC will establish the concept of openness, cooperation and mutual benefit, actively promote investment and market opening, and attract more social capital and various market participants to participate in the construction of the Internet of Energy and value exploration, to drive the mutual development of the upstream and downstream business of the industry chain, to create an energy Internet ecosystem that builds mutual governance and a win-win situation, and to share the development results with society as a whole.

Two Networks

1. SGCC will build a strong, smart grid with UHV grid as the backbone and coordination among power grids of all levels to foster an extensive, interconnected, smart, interactive, flexible, resilient, secure and controllable new-generation power system.
2. SGCC will build a Ubiquitous Electric Power IoT with comprehensive state perception, efficient information processing, and convenient and flexible application, and will realize the interconnection of things in the power system and human-computer interaction by fully applying modern information technology and advanced communication technologies, such as mobile internet and artificial intelligence.

In addition, one of the innovation-driven strategies of SGCC is to follow the trends of “big data, cloud computing, Internet of Things and mobile internet”. The MIIT (Ministry of Industry and Information Technology) 230 MHz Power Wireless Dedicated Grid Pilot Project passed quality acceptance. State Grid preliminarily built a unified data center analysis domain covering all services, connecting 32 operation systems and 394 terabytes of data. “State Grid Cloud” was officially launched to support the operation of 33 kinds of business on the cloud, and has a size of around 2,300 nodes. SGCC also published its white paper on big data application and built a system of big data open trial and sharing services.

Time plan for building Ubiquitous Electric Power IoT

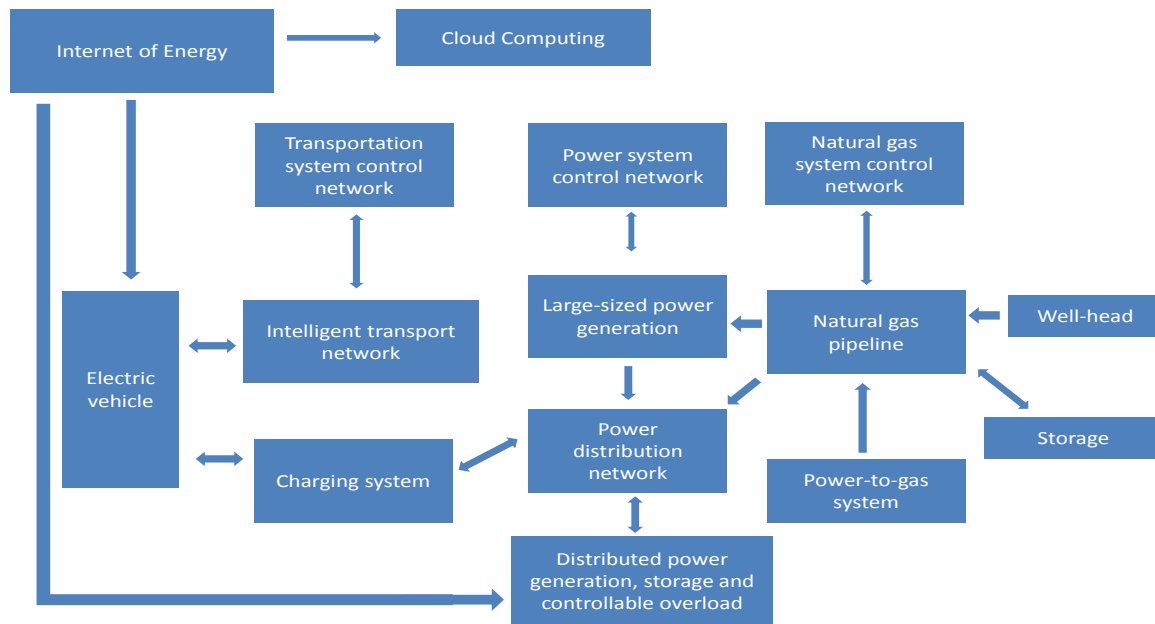
Phase I (2019-2021): Preliminary stage of Ubiquitous Electric Power IoT

1. Internal business: SGCC should basically realize business synergy and data access, power grid safety and economic operation levels; the Company's operating performance and service quality should significantly improve, achieving a business online rate of 100%, business matching penetration rate of 100%, grid physical ID incremental coverage rate of 100%, online monitoring rate of linear loss in the same period of 100%, automatic generation rate of company statistical reports of 100%, financial integration rate of 100%, and regulation cloud coverage rate of 100%.
2. External business: A company-level intelligent energy integrated service platform will be established first, and emerging businesses will be developed synergistically. The energy Internet ecology will take shape, achieving an online rate of 70% for electricity-related businesses.
3. Infrastructure support: SGCC should initially realize unified IoT management, establish a unified standard, and unified model of data in the middle, with data sharing and operational capabilities, and basically achieve platform support for its grid business and emerging business.

Phase II (2021-2024): Building the Ubiquitous Electric Power IoT

1. Internal business: SGCC should achieve full-service online collaboration and full-scale integration, and the grid's safety and economic operation level, and the Company's operating performance and service quality should reach the international level.
2. External business: SGCC will build a company-level intelligent energy comprehensive service platform, form a co-construction and mutual benefit energy Internet ecological map, and lead the transformation of energy production and consumption, achieving 90% of the electricity-related business online rate.
3. Infrastructure support: SGCC will achieve unified IoT management, build a unified platform of data for unified standards and unified models, and achieve comprehensive support for its grid business and emerging business.

Figure 4: Internet of Energy Framework



SOURCES: CGIS RESEARCH, SGCC

Other related news

According to a more standard definition, SGCC's (Electric) Energy Internet is a subset of the "Ubiquitous Energy Internet (泛能网)", or Internet of Energy, which refers to a digital energy form that is deeply integrated with energy and ICT technology. The demand-oriented physical energy network, integrating gas, electricity, heat and water, along with the corresponding digital energy network, together form the energy Internet of Things. Based on energy big data and artificial intelligence, the Ubiquitous Energy Internet will realize the integrity of use and supply, multi-energy synergy, and wisdom optimization of digital-energy fusion, and release the time value and spatial value of energy.

Using this broader definition, this is a list of important strategic deployments of SOE reforms. We can see other news related to the Ubiquitous Energy Internet.

China Tower [0788.HK] was formed in 2014, and signed a strategic cooperation agreement with China's two major power grid operators, State Grid Corp of China and China Southern Power Grid Co Ltd, to share the latter two's transmission towers for the construction of its communication base stations. One of the wings in China Tower's "One Core, Two Wings" strategy is its Energy Operation Business. To meet the strong demand for energy-related services in society, including backup power, power generation and energy storage, China Tower will expand the scope of its resource sharing to the energy sector, reinforce the professionalism of its management, make the Company more market-oriented, and develop new business growth drivers.

National Oil and Gas Pipeline Company is expected to be formed in 2019, according to China's state news agency.

China is expected to build an Internet of EVERYTHING by investing in "new infrastructure", and Ubiquitous Energy Internet will be a pivotal part of it.

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