EU–China Workshop on Green ICT

Event Report

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OVERVIEW

The digital sector is both part of the solution to the climate crisis and a significant contributor to it. Standards are one of the most powerful tools available to shift that balance — but only if they are developed in concert, across borders, and with enough technical precision to be measurable and enforceable. That shared conviction brought European and Chinese experts together on 15 June 2026 for the EU–China Workshop on Green ICT, organised by InDiCo Global in collaboration with SESEC.

The hybrid event brought together representatives from standards organisations, industry, technical communities, and public authorities across both continents. Over three hours, participants worked through technical standardisation roadmaps, concrete approaches to energy efficiency in 5G and 6G infrastructure, data center sustainability, ICT lifecycle assessment and eco-design, and the thorny question of how policy objectives actually get translated into technical standards. Martin Chatel, Chief Policy Officer at ETSI, opened the workshop on behalf of ETSI and its Director General, framing it as a concrete example of the EU–China cooperation that the InDiCo Global project — implemented together with CEN, CENELEC, Martel Innovate and Trust-IT — aims to strengthen in the field of ICT standardisation. He also welcomed colleagues from ITU-T Study Group 5, who were holding their own meeting at ETSI that same week, and acknowledged the contribution of SESEC project experts to years of productive exchange between the European and Chinese standardisation communities.

What emerged across the day was a picture of two regions with distinct regulatory traditions and policy instruments converging on a common technical agenda — and a strong appetite to close the remaining gaps together.

SESSION 1: TECHNICAL STANDARDISATION ROADMAPS FOR GREEN ICT

The first session set the scene, with presentations from CAICT, Nokia/ETSI, and ITU-T mapping how Europe, China, and the international community are each approaching Green ICT standardisation. The differences in approach were real, but so was the shared direction of travel.

CHINA'S STEP-BY-STEP FRAMEWORK

Mengdi Wang (CAICT) presented a national standardisation system built around seven core categories — energy saving, resource utilisation, green manufacturing, carbon neutrality, co-construction and sharing, infrastructure operation and maintenance, and ICT enablement for vertical sectors — underpinned by a clear policy timeline running from 2023 to 2035. The immediate priorities through 2025 focus on foundational areas such as energy saving and green manufacturing. The 2025–2030 period brings in the application of emerging ICT technologies to traditional low-carbon industries. The longer horizon to 2035 addresses computing, green supply chains, and eco-design. China's upcoming 15th Five-Year Plan (2026–2030) will tighten this framework further.

Of the seven categories, infrastructure operation and maintenance — covering base station sites, data centres, and telecommunication rooms — is the largest and most widely applied area. A concrete milestone is GB/T 44989-2024, the Evaluation of Green Data Centre standard, implemented from June 2025, which sets specific limits including a PUE no higher than 1.5 and a renewable energy utilisation rate of at least 20%.

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Looking ahead, Mengdi Wang proposed three directions for EU–China cooperation: advancing standards alignment and mutual recognition on data centre energy efficiency and green product evaluation; jointly developing international standards in frontier areas such as liquid cooling, GHG emissions accounting, and AI energy saving; and building shared conformity assessment systems, including mutual recognition of testing and certification results.

EUROPE'S REGULATORY BACKBONE

Beniamino Gorini (Nokia), presenting as Chair of ETSI's Technical Committee on Environmental Engineering (TC EE), described the European approach as one built around a regulatory backbone. The Ecodesign Directive provides the overarching framework; under it, specific regulations cover servers and data storage products, standby and off-mode energy consumption, smartphones and tablets, and external power supplies. When a regulation is adopted, the European Commission issues a standardisation request to the ESOs; the resulting standards, once approved, become harmonised standards referenced in the Official Journal of the European Union.

Alongside regulation, voluntary initiatives play an important pre-regulatory role. These include the Best Practice Guidelines for Data Centres, the Code of Conduct for Energy Consumption of Broadband Equipment, and — published at the end of 2025 — a new Code of Conduct for the Sustainability of Telecommunication Networks. The latter covers the energy consumption of both radio access and fixed access networks, and is still at an early stage, with significant room to develop in terms of standards content. The key point, as Beniamino Gorini put it, is that regulation alone cannot satisfy all aspects: it needs technical standards to define how requirements are assessed and met.

THE INTERNATIONAL LAYER: ITU-T STUDY GROUP 5

Dominique Wurges (ITU-T) completed the opening session by placing both the European and Chinese approaches within a broader international frame. ITU-T Study Group 5 — covering environment, climate action, and circular economy — has a unique membership structure combining approximately 200 member states with direct participation from industry, academia, and other organisations. More than half of participants come from Asia, giving the group a genuinely global reach.

The most tangible product of the collaboration between ITU-T and ETSI is the technically aligned standard: a document where the content is identical across both organisations, differing only in its cover page and adoption process. Two recent examples are a standard on methodology for environmental lifecycle assessment of ICT goods, networks and services, and an updated standard on sustainable power feeding solutions for IMT-2030 networks. Dominique Wurges described himself and Beniamino Gorini as "digital twins" — a neat summary of what close international cooperation in standardisation can look like in practice.

SESSION 2: STANDARDISATION IN SPECIFIC TECHNICAL AREAS

The second session moved from roadmaps to detail, with expert presentations covering three distinct but interconnected areas: energy efficiency in 5G and 6G infrastructure, sustainability of ICT products and eco-design, and power consumption management and technical KPIs for data centres.

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ENERGY EFFICIENCY IN 5G AND 6G INFRASTRUCTURE

Qi Shuguang (CAICT), also presenting in the capacity of Vice-Chair of ITU-T Study Group 5, structured the energy efficiency challenge across four levels: equipment, infrastructure, network, and services. At equipment level, both mandatory and recommended national standards in China cover a wide range of ICT and telecommunication equipment. At infrastructure level, standards address telecommunication rooms, base stations, modular data centres, and energy efficiency management systems. The current frontier, however, is the network level — where ongoing work covers evaluation methods for 5G radio access networks, fixed network energy efficiency indicators, and mobile network assessment.

The fastest-growing area of concern is computing power. As AI development accelerates, the energy demands of computing infrastructure are attracting dedicated standardisation attention: new work items in China address wide-area computing power networks, intelligent computing systems, and energy efficiency frameworks for large AI models and deep learning. At ITU-T, parallel work covers assessment of mobile network energy efficiency, total network infrastructure energy metrics, carbon intensity for network energy performance, and — emerging — the energy efficiency of AI large models and deep learning compute frameworks.

SUSTAINABILITY OF ICT PRODUCTS AND ECO-DESIGN

Simon Cook (BT Group), Chair of ETSI TC EE's E2 Working Group, grounded this sub-session in some striking figures: the ICT sector contributes an estimated 4% of global CO2 emissions; up to 50 million tonnes of electronic waste is generated annually, with only 20% recycled; and equipment life cycles — once 15 to 20 years in the PSTN era — are now often as short as five years. These are not abstract concerns. Within BT, for example, the fixed network alone accounts for 1% of all electricity generated in the UK.

His core argument was that lifecycle assessment must start at the concept and design stage and take a cradle-to-grave approach — and that this requires KPIs agreed across all SDOs. Without common KPIs, organisations can currently pick whichever metrics suit them. Closing that option means standardising not just what to measure, but how. Key ETSI standards in this space include ES 203 700 on sustainable power feeding solutions for 5G networks, ES 203 199 on methodology for environmental lifecycle assessment of ICT goods, networks and services, and ES 304 132 on product lifecycle assessment requirements for smartphones. ETSI TC EE is also currently developing four new standards to support the EU's ecodesign requirements for smartphones, mobile phones, and tablets.

Yang Yutao (Beijing CESI Certification Co., Ltd.) presented China's green product evaluation framework, built around five dimensions: resources, energy efficiency, environmental protection, low carbon, and quality. Computer and printer standards developed in 2024 are the first ICT products included in the system; carbon footprint standards are now being incorporated, with an industry standard expected by end of 2026.

Yang Yutao also raised a substantive regulatory inconsistency worth noting: the EU Battery Regulation requires end-of-life recycling to be included in carbon footprint quantification for batteries, while the WEEE Directive places responsibility for recycling the end product on the product manufacturer. Where a battery is a component of a computer, the question of whether it should be treated as a standalone product or as part of the end product has direct implications for how carbon footprint stage boundaries are defined — and the two regulations appear to point in different directions.

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Susanna Kallio and Jean Manuel Canet (ITU-T) presented the ITU-T suite of standards for environmental impact assessment, which operates across product, organisational, and sector levels. L.1410 provides a methodology for full lifecycle environmental assessment of ICT goods, networks, and services; it is technically aligned with ETSI's ES 203 199. L.1480 addresses the enabling effects of ICT services, distinguishing first-order direct impacts — the energy used by screens, laptops, and networks to run a service — from second-order avoided emissions (such as travel not taken because a meeting was held online) and higher-order rebound effects (what people do with the time or money saved). A new standard, L.1801, is the world's first for assessing the environmental impact of AI systems, applying to everything from rule-based expert systems to generative AI. On circular economy, L.1022 and L.1023 address circularity at both organisational and product level; L.1070 and L.1071 define the sustainability and circularity data items that can feed into digital product passports. All ITU-T standards are freely available on the ITU website.

POWER CONSUMPTION MANAGEMENT AND TECHNICAL KPIS FOR DATA CENTRES

This sub-session brought together three perspectives on data centre sustainability: China's national evaluation standard in detail, the electrical system view from CEN CENELEC, and an overview of ITU-T's data centre standards portfolio.

Guo Kai (China Electronics Standardization Institute) focused on GB/T 44989-2024, China's first national standard specifically for evaluating the greenness of data centres, implemented from June 2025. He situated it against three drivers: the global urgency of data centre energy consumption as China works toward its 2030 carbon peak and 2060 carbon neutrality pledges; the need for a quality benchmark as China's data centre sector has grown rapidly; and the requirements of China's 'East Data, West Computing' initiative, launched in 2022, under which eight hub nodes and ten clusters have green development as a core requirement.

The standard's evaluation system comprises five primary indicators and 21 secondary indicators. Efficient utilisation of energy and resources carries the greatest weight at 50%. Key individual indicators include PUE (30 points, with a score of 1.1 earning full marks and 1.5 earning the base score, with one additional point awarded for every 0.01 reduction), renewable energy utilisation (10%), and water-use efficiency (required to be below 1.6 litres per kilowatt-hour, reflecting uneven water distribution across China's regions). Greenhouse gas emission control is included as a scored evaluation criterion — not a bonus item. The framework also covers IT equipment utilisation rate, restricted substance control, waste electronic product disposal, and environmental and occupational health.

A defining feature of the standard is its lifecycle framing. As Guo Kai put it, a single indicator such as PUE is no longer sufficient to evaluate whether a data centre is truly green — green principles need to run through the entire process from birth to retirement. The standard therefore addresses each stage: project initiation, design (covering HVAC, electrical, and intelligent systems), construction (green procurement, material controls), operations and maintenance (energy and water management, carbon emissions), renovation, and decommissioning (standardised handling and recycling of waste equipment). The underlying definition of a green data centre, as the standard proposes it, is one that maximises resource and energy conservation while minimising negative environmental impacts across its full lifecycle — but never at the expense of the safety and reliability of personnel and information systems.

The standard is already producing measurable results. As of 2026, China has built 306 nationally certified green data centre facilities, with an average PUE of 1.25. The share of renewable energy in green-powered electricity has risen from 15% in 2018 to over 50% in 2024. For newly built data centres in the eight hub nodes and ten cluster regions, China now requires more than 80% of electricity consumption to come from green power; for existing facilities, the proportion must increase by 10% annually.

Guo Kai closed with a direct offer of cooperation: GB/T 44989-2024 is currently being developed in an English version, and China is seeking to strengthen mutual recognition research with EU industry associations, jointly explore coordination in carbon accounting methods, and share practical experience in direct green electricity supply and grid balancing. As he put it, the value of standards does not lie in self-sufficiency, but in benefiting the wider world.

Yann Fromont (CEN CENELEC) offered a perspective on data centres that differed deliberately from the ICT-focused presentations preceding it. His starting point was a challenge to the room: the aggregation of smart, efficient devices does not automatically make the system smart. What is needed is end-to-end system efficiency — and that requires data interoperability across the electrical sector that does not yet reliably exist.

He identified three compounding sources of uncertainty now affecting data centre connection and planning. On the supply side, the shift from stable generation sources — coal, gas, nuclear — to renewables introduces variability at every level. On the demand side, the electrification of industry and transport is creating new and unpredictable loads. And running through both is a two-headed challenge: the explosive growth of AI-driven data centre demand, and cyber security, which Yann Fromont argued is a prerequisite for any serious system-level progress.

His prescription was clear: data centres need to become flexible, interactive assets within the electrical network rather than static loads. The ten EU grid codes — covering connection, market operation, and network operation — are increasingly relevant here. Of particular note are the Domain Connection Code (which includes flexible connection agreements between grid operators and data centre developers), the Network Code on cyber security, and a new Demand Response Grid Code currently under development. Electricity in Europe is significantly more expensive than in the US, China, or Japan; as major consumers, data centres have both an incentive and a responsibility to participate in the flexibility the grid needs.

Paolo Gemma (ITU-T) closed the session with an overview of ITU-T Study Group 5's data centre standards portfolio. Existing recommendations address the reduction of negative climate impact (L.1300), monitoring using big data and machine learning (L.1305), and a multi-level metric framework for cooling efficiency from chip to room to full data centre (L.1322). Ongoing work includes standards on energy supply architecture for AI computation, direct connection of renewable energy to data centres, multidimensional environmental metrics, energy saving strategies for deep learning computing, and liquid cooling solutions. Paolo Gemma flagged that L.1300 is due for revision, given the pace at which knowledge in this area has evolved since it was originally written.

PANEL DISCUSSION: TRANSLATING POLICY INTO TECHNICAL STANDARDS

Moderated by Marcello Pagnozzi, Director of the Standardisation Development Centre at ETSI, the panel drew out the fault lines and the points of convergence that had run through the morning's presentations. Six themes dominated.

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KPI ALIGNMENT: THE NON-NEGOTIABLE FOUNDATION

The most consistently raised issue across the panel was the need for technically aligned KPIs across SDOs. Simon Cook (BT Group) put it plainly: without standardised KPIs, organisations can currently pick and choose which metrics to align to for their own benefit. Paolo Gemma (ITU-T) reinforced the point — without a shared methodology for measurement, anyone can claim to be green, or greener than the next. Closing that door requires agreement not just on what to measure, but on exactly how to measure it.

STANDARDS ARE NOT STATIC

Paolo Gemma also pressed the panel on a point that is sometimes overlooked: standards require active maintenance. As technology evolves — rapidly, in areas like AI and liquid cooling — standards that do not keep pace become irrelevant or misleading. This is not a one-time effort but a continuous process.

PILOT PROJECTS AS A PATHWAY TO COOPERATION

Mengdi Wang (CAICT) proposed pilot projects as a practical and low-risk way to deepen EU–China cooperation. Rather than starting from new standardisation work, the suggestion was to apply existing ITU-T recommendations — particularly the L.14xx series on environmental impact assessment — to collaborative pilots across different regions and sectors. Pilots test whether established methodologies travel across contexts; they generate the evidence base needed to refine standards where they do not; and successful outcomes can support wider adoption and, eventually, mandatory standardisation.

REGULATION AND VOLUNTARY INITIATIVES: SEQUENTIAL, NOT COMPETING

On the balance between regulatory and non-regulatory approaches, there was consensus that the two work in sequence rather than in competition. Mengdi Wang described it as a two-stage process: voluntary initiatives give emerging technologies room to develop under periodic regulatory monitoring; where an initiative proves broadly applicable, standardisation work can then introduce more specific guidance, KPI metrics, and testing methods. Beniamino Gorini pointed to the Code of Conduct model as exactly this kind of pre-regulatory step — a way for stakeholders to gain practical experience before formal requirements are set. Technical standards are essential to both stages: they define what regulators will eventually require organisations to measure and report.

THE SYSTEM MUST BE FLEXIBLE

Yann Fromont (CEN CENELEC) returned to his central argument in the panel: the goal is not just efficient components, but an efficient system. Data centres must become flexible, responsive assets within the electrical network — able to react to grid conditions rather than simply drawing power. That requires data interoperability, digital twin-based planning, and genuine demand response participation. He noted that the challenges Europe and China face in building this kind of system are more similar than different, making the case for sharing architectural best practices between the two regions.

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AI AND THE ENERGY QUESTION

The panel acknowledged, without resolving, the challenge that AI poses to energy planning. Simon Cook was direct: whether energy supply can keep pace with demand from high-density AI infrastructure is an open question — and if new power stations are required, they will take a long time to build. Dominique Wurges offered a counterpoint, pointing to rapid efficiency gains in large language model inference — sometimes more than 100-fold improvement over a decade — and to liquid cooling advances as evidence that technology can move faster than the pessimistic scenarios suggest. Paolo Gemma noted that ITU-T is actively developing standards on energy supply architecture for AI computation and on managing the relationship between renewable energy sources and data centre loads — important groundwork for whatever comes next.

CONCLUSIONS

Three things stood out from the workshop as a whole.

Green ICT is not a peripheral concern: it is a core pillar of technical standardisation on both continents, and it has to be built in at design time. The regulatory approaches of Europe and China differ in their instruments and timelines, but the underlying technical challenges — how to measure data centre energy efficiency, how to assess network performance, how to define what 'green' actually means for a product or a service — are the same challenges. That convergence is the practical basis for cooperation.

The gap that needs closing is not primarily political. It is technical and methodological: agreed KPIs, shared measurement approaches, and conformity assessment systems that both sides can trust. Pilot projects, technically aligned standards, and mutual recognition agreements are the tools most likely to close it.

And the urgency is real. AI is accelerating energy demand faster than most infrastructure planning anticipated. The electrical grid is under pressure from multiple directions at once. In that context, the work of aligning Green ICT standards across Europe and China is not an abstract exercise in international cooperation. It is one of the more direct contributions that the standardisation community can make to the broader challenge of climate neutrality.

Presentation slides can be downloaded from here: https://indico-global.eu/download/eu-china-workshop-on-green-ict-presentations/?wpdmdl=4279

Further information about the project and its activities is available at indico-global.eu.

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