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Energy Journal

Energy for people, futures in motion

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Editorial

Energy That Connects People and Places

Paolo Chighine

After exploring the geopolitical (EJ 31) and the technological dimension (EJ 32) of the energy transition, this issue of Energy Journal ideally closes the 2025 cycle by returning to its foremost focus: people. Indeed, every network, every infrastructure, every energy innovation only finds its true meaning when it creates human value — opportunity, inclusion, well-being. The transition is not truly complete until it becomes accessible, shared, and rooted in local communities.

This is not an abstract topic, nor is it unrelated to current events. In fact, the European Union has recently announced a new plan to strengthen power grids and interconnections, with an estimated investment of €1.2 trillion by 2040, and reaffirmed the goal for a 90% reduction in emissions. The message is clear: without a modern, integrated, and resilient electrical system, the transition is at risk of remaining a theoretical exercise.

This is the focus of the Scenario section'. The energy transition is no longer a process that unfolds apart from daily life, confined to industrial policy or major infrastructural plans. It is something that interests our homes, neighborhoods, and cities. It changes the very way we produce and use energy and, with it, the relationship between citizens, networks, and communities. Smart grids, energy communities, electric mobility, and efficiency are not just technical solutions, but elements of a new pact between the energy system and society. However, for this change to become sustainable, it must be managed. Without adequate rules, inclusive tools, and a systemic vision, there is the risk that innovation could create new inequalities, instead of reducing them.

The same applies to the world of work. The Top Story, in this issue, delves into one of the decisive challenges of the transition: skills. The energy sector is creating millions of new jobs, but also facing a growing gap between what the system requires and what training systems are able to provide. Technicians, analysts, digital specialists, and security professionals are becoming central figures in a sector that is rapidly evolving. Without decisive investments in training and reskilling, there is the risk that innovation may outpace the people needed to make it work.

Broadening the view, the Industries & Countries section explains how the energy transition is not advancing in a uniform manner. The divide between the Global North and South remains stark. On one side, there are economies that are able to attract capital and accelerate investments; while, on the other, there are regions that are still struggling with stable grids and reliable access to electricity. However, this asymmetry does not only concern emerging countries. Even in Europe, where some countries — such as Italy — have very high-quality power grids, others are lagging behind and the pressure on existing infrastructure is becoming evident. Without a decisive strengthening of grids and interconnections, the transition risks remaining incomplete everywhere.

It is along this fault line — where the transition meets the concrete limits of infrastructure and economic sustainability — that CESI's contribution finds its meaning. Working on power systems means, above all, creating the conditions for investments to take shape: providing solid rules, reliable technologies, and continuous networks. It is often invisible work, but it is crucial. Through planning, independent analysis, and technical support, CESI guides governments and operators from vision to operation, reducing uncertainty and making projects feasible. Indeed, this is exactly what operating in the field means: translating a global perspective into concrete solutions, capable of strengthening networks and making energy a driver of development and inclusion.

The Future & Technology section shows how innovation can become a lever for fairness. Micro-grids, smart grids, digitalization, and new applications of the space economy make it possible to bring energy where it is needed, improve the resilience of regions, and integrate renewables even in complex contexts. When accompanied by skills and good governance, technology is not just a tool for decarbonization, but a true social infrastructure.

The issue closes with Opinions, a mosaic of institutional voices and industry experts that brings the human dimension of change back to the center. From Africa to Europe, a shared awareness emerges: without equity, social consensus, and attention to local realities, the legitimacy of the energy transition is at risk. It cannot only be measured in terms of gigawatts installed or investments mobilized, but must also be viewed in its ability to tangibly improve people's lives. This issue of Energy Journal therefore invites readers to look at the current scenario from a different, less abstract and more concrete perspective. The change underway must be measured not only in climate targets or installed capacity, but in the ability to accompany people and communities along a complex path. It is here — in the way energy enters daily life and local economies — that the credibility of the transition is truly at stake.

Enjoy the reading!

Paolo Chighine
CESI Group Communication and External Relations Executive Vice President

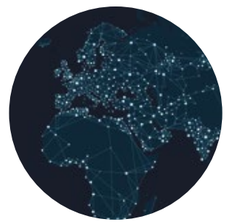
Energy Journal can be browsed and downloaded at www.cesi.it

Issue 33 / December 2025

Contents

«Electricity can transform people's lives, not just economically but also socially».

***Piyush Goyal**, India's Union Minister of Commerce and Industry*



News

Latest from CESI

Iceland

KEMA Labs: Testing for High and Extra-High Voltage Cables

Floris Schulze, Director of Consulting Activities at KEMA Labs, recently emphasized the crucial role of on-site commissioning tests in ensuring the reliability of high and extra-high voltage cables. IEC standard tests make it possible to detect defects that can occur in around 20% of installations.

In Iceland, KEMA Labs completed testing on a new submarine cable infrastructure under particularly challenging conditions. Special recognition goes to Krzysztof Kucharczyk, Marc Hagenow, and Ahmed Diallo, whose contributions "have strengthened our confidence in KEMA as a reliable and highly qualified partner."

"Rigorous testing to ensure reliability, safety, and operational continuity."

Turkey

HVDC and Grid Transformation

In November, the CESI Consulting team participated in the 4th Power Systems Conference (GSK2025), organized by CIGRE Türkiye in Ankara. The panel on *"HVDC Systems in Türkiye's Grid Transformation Process"*, moderated by Zia Emin (EPRI), featured Serhat Metin (Planning & Investment Management, TEİAŞ), Stefano Malgarotti (Director of Power Transmission Engineering, CESI Consulting), Hakan Ergun (KU Leuven), and Benedikt Kurth (Hitachi).

In his presentation, Stefano Malgarotti shared CESI's international experience, highlighting global best practices, opportunities, and the main challenges associated with implementing HVDC systems in large-scale transmission projects.

"International dialogue to accelerate the adoption of HVDC systems."

Egypt

Modernizing Distribution Networks

CESI has been selected by the Egyptian Electricity Holding Company (EEHC) as Technical Advisor for the *"Grid Digitalization and Innovation Hub and Establishment of the National Energy Distribution Supervisory System"* project, dedicated to the digitalization and modernization of Egypt's electricity distribution network.

The initiative will support EEHC — which serves over 42 million customers — in reducing network losses, improving reliability, and increasing energy efficiency.

Andrea Meola, Global Markets Director at CESI Consulting, stated: "We are honored to have been chosen as Technical Advisor for such a strategic project." The project will be implemented in collaboration with local partners Shaker Consulting and 3MS.

"Supporting Egypt in building a more modern, efficient, and digital electricity network."

Estonia–Latvia

Feasibility Study for the Fourth Interconnection

Grid operators AST (Latvia) and Elering (Estonia) have launched a feasibility study for a fourth electrical interconnection between the island of Saaremaa and the Kurzeme coast. The objective is to increase transmission capacity (up to approximately 1,000 MW), strengthen system security, and integrate new renewables in the Baltic Sea.

CESI has been appointed to assess technical feasibility and evaluate alternative technological scenarios. "This new interconnection could become a strategic hub for Baltic offshore wind. Our work will analyze technical options and their impact on the regional power system," explained Valerio D'Arco, Area Manager Europe & Mediterranean.

"A key step toward a more integrated and renewable Baltic power system."

Scenario

The Human Impact of the Energy Transition

From smart grids to energy communities, from electric mobility to home efficiency, the energy transition is changing our social and professional lives; balancing technological progress with social inclusion is rapidly becoming the top priority for a sustainable future.

For further information on this topic, please contact:
Paolo Chighine (Executive Vice President Communication & External Relations)

Top Story

The energy transition is no longer simply the sum of plants, turbines, and incentives. It is a process that is redefining habits, labor markets, urban structures, and social relationships. Between smart grids that turn consumers into prosumers, electric cars that reshape the geography of cities, and efficiency measures that have become a part of our daily routines, the true revolution is cultural. And it is a revolution that must be managed carefully to prevent new inequalities.

International reports from the past two years confirm a clear trend: renewable investments and installations are growing rapidly, electrification is advancing, but significant gaps remain in the implementation and governance of this technology. And these shortcomings could slow the achievement of climate and social goals.

In its World Energy Outlook 2024, the International Energy Agency (IEA) documents how electrification and efficiency are slowing down the growth of energy demand, but also emphasizes the urgent need to strengthen networks and infrastructure to support the transition. At the same time, in its World Energy Transitions Outlook 2024,

The Grid as a Social Platform

Until a few years ago, electricity followed a linear and invisible path from power plants to meters and from meters to homes. Today, this model is changing radically. Power grids are becoming digital platforms, in which sensors, algorithms, and storage systems turn energy management into a dynamic, participatory process. This silent revolution affects not just technicians and utilities, but all of us, because it redefines who produces, who consumes, and who decides.

The new smart grids are the backbone of the energy transition. According to IEA and IRENA, over US$2.8 trillion will be invested in digital infrastructure and more flexible grids by 2030. The reason is clear: only networks capable of managing distributed production and consumption can support the exponential growth of renewables.

This shift has two consequences: one practical, one cultural. First, every citizen can become a prosumer, both a producer and a consumer. With rooftop solar panels, a home battery, and a smart meter, it's now possible not only to use the energy you generate, but also to decide whether to sell, store, or share it. It's a paradigm shift in which the "supplier-to-customer" flow is transformed into a horizontal network in which every node participates in collective balancing.

Smart grids make this possible. Sensors communicate real-time production and consumption data, management software predicts demand peaks, and storage systems activate to prevent waste or blackouts. According to the IEA Digital Demand-Driven Power Systems Report 2024, a well-managed smart grid can reduce energy loss by 15%, improve system reliability, and enable the integration of renewables up to 70% of the total generation — and without destabilizing the grid. However, technical potential alone is

the International Renewable Energy Agency (IRENA) highlights that the transition to a scenario compatible with the 1.5°C goal is technically feasible and would provide significant socio-economic benefits; however, it requires urgent measures to bridge technological, capital, and skills gaps by 2030.

On the employment front, collaboration between IRENA and the International Labour Organization (ILO) shows that jobs in renewables and clean technologies are increasing — with tens of millions of potential new positions expected by 2050 — but that the quality of employment and policies for professional retraining will be crucial to ensure a just transition.

Finally, reports on access and health underscore the urgency of equity. Tracking SDG7 records hundreds of millions of people who still lack modern energy access, while analyses by the World Health Organization (WHO) and the State of Global Air link exposure to air pollution to significant health costs. All of this strengthens the case for policies that integrate decarbonization and public health, recognizing that the energy transition is, above all, a matter of human well-being.

not enough. IRENA's analyses highlight that the spread of the prosumer model depends on new market rules rewarding flexibility and self-consumption. In many European countries, citizens who produce energy receive below-market rates or face complex bureaucracy for grid connection. For the system to truly work, we need local electricity markets, transparent digital platforms, and incentives that make participation worthwhile.

The second consequence is deeper. Energy has become a community asset. Energy communities — groups of citizens, businesses, and local institutions sharing in the production and benefits of renewable energy — are emerging everywhere, from Northern Europe to Italy. According to IRENA's World Energy Transitions Outlook, the number of active energy communities worldwide is set to triple by 2030, reaching around 350,000 local projects.

In the Netherlands and Germany, neighborhood cooperatives manage micro-grids based on solar and batteries, exchanging energy through digital platforms with smart contracts. In Italy, GSE (*Gestore dei Servizi Energetici*) estimates that by 2025, over a million citizens will participate in energy communities, thanks to incentives from the PNRR and new European regulations.

These models do more than produce clean energy. They reduce energy poverty and strengthen social cohesion. Sharing economic benefits — through cooperatives or collective tariffs — allows vulnerable neighborhoods to lower bills and reinvest savings in social or environmental projects. Energy communities are tools of inclusion, not just efficiency, because they transform citizens from passive users into active agents of change.

Still, there's a challenge: governance. For the model to remain sustainable, we need transparent rules and inclusive financing tools. Many projects face barriers to credit or struggle to involve low-income families. IRENA experts propose solutions like micro-leasing for solar panels, social tariffs for shared energy, and targeted subsidies for batteries and storage

systems. Only then will the transition be not just green, but also fair.

The digitalization of grids underlies a broader idea of energy citizenship. Direct participation in energy production, management, and exchange generates new forms of cooperation and collective responsibility. It's no longer just about "using less," but about understanding how and when to use energy, in constant dialogue with the system.

As the IEA notes in its World Energy Outlook 2024, "distributed flexibility will be the heart of the future power system." A technical phrase that points to a deeper truth: the energy of the future will not only be renewable, it will be relational, born from the dialogue between people, technologies, and communities.

Electric Mobility Redesigns the City

In recent years, electric mobility has moved from promise to reality. Streets are filling with silent cars, charging stations are appearing in supermarket parking lots and city centers, and even delivery vehicles and public transport are changing. But behind these visible signs lies a deeper transformation — economic, technological, and cultural — that is rewriting the rules of urban life.

According to the Global EV 2025 Report, the number of electric vehicles worldwide is set to grow exponentially. Indeed, the global fleet could exceed 250 million units by 2030, four times the current numbers.

Yet, this growth is not just about numbers. The most transformative effect is urban. Electric mobility forces cities to rethink themselves from the ground up. Where parking lots and gas stations once stood, there now are charging stations, electric logistics hubs, and shared charging areas. Urban land use is changing and, with it, our daily habits.

In the most advanced European and Asian cities — from Oslo to Shenzhen — the transition means fewer private parking spaces, more public areas with charging points, and more lanes dedicated to electric micro-mobility. It's a process that reorganizes not just what we drive, but how we move. Infrastructure becomes a network of services: a car is no longer a private asset, but a connected node within a shared transport ecosystem.

The IEA calculates that supporting the expansion of the electric fleet will require over 15 million public charging points by 2030, up from about four million today. This means an average annual infrastructure growth of 20%, but also smarter distribution. Today, most charging happens at home, in private garages — a possibility only reserved for those with space and investment capacity. In dense urban areas, the issue is more complex. Those living in apartment buildings or without a parking space risk being excluded from the transition unless cities intervene with curbside chargers, incentives for condominiums, and public access policies.

The Global EV Outlook 2025 warns that without widespread, fair, and accessible charging infrastructure, "the electric car risks remaining a privilege, not a norm." Recent studies show that charging point distribution often reflects social inequalities: wealthier neighborhoods with detached houses have much higher charging density than the suburbs.

Some cities are trying to reverse this trend. London has launched a curbside charging program with thousands of points installed on sidewalks, integrated into streetlights. Paris is experimenting with shared condominium charging, while in the Netherlands, charger sharing platforms allow citizens to make their private charging points available when not in use. These are examples of efforts to turn the technological transition into social progress, so that access to clean energy becomes a right, not a privilege.

The transformation also affects urban logistics. Replacing commercial vehicles with electric ones drastically reduces pollution and associated health costs. The most forward-thinking cities are creating last-mile delivery charging hubs, integrating electric mobility with pedestrianization policies and low-emission zones. In these cases, the energy transition embraces public health. According to the World Health Organization, air pollution remains a leading cause of premature death, and electrifying urban transport can cut nitrogen oxide and fine particulate emissions by up to 30%. Cities that integrate electrified public transport, micro-mobility, accessible charging, and smart urban planning not only reduce emissions but also improve quality of life, health, and social cohesion.

Efficiency and Equity

In the language of the energy transition, "efficiency" may sound technical, almost neutral. Yet behind an app-controlled thermostat or a heat pump replacing an old boiler lies a profound change in our habits, consumption, and ultimately social opportunities.

Energy efficiency is one of the fastest and most cost-effective levers for reducing energy use and containing household costs. According to the IEA Energy Efficiency Report 2024, a decisive acceleration in efficiency measures — with an annual improvement rate in energy intensity at ca. 4% — aligns with the Paris Agreement goals and could contribute over a third of the necessary reduction in global CO_2 emissions by 2030. While the exact impact on household bills varies by country, greater efficiency can generate significant savings for consumers, especially in advanced economies. In this context, technology becomes an extension of daily life. Heat pumps, insulated windows, smart appliances, and home automation systems are rewriting the relationship between comfort and consumption. Heating is no longer turned on "by feel," but regulated by algorithms that learn the habits of those living in the home. Car chargers activate automatically when energy prices are lowest or when the sun is shining on rooftop panels. Washing machine run during peak solar production hours. These small changes, multiplied across millions of homes, become a collective phenomenon: an invisible infrastructure of savings.

The IEA calculates that if all European households adopted efficient technology and smart consumption practices, the total savings would exceed 170 TWh per year — the equivalent of Sweden's annual electricity production. Efficiency, then, is no longer just a virtuous act. It's a systemic policy pursued through everyday choices.

Nonetheless, as promising as this transformation is, it is not equitable for everyone. The aforementioned Tracking SDG7: The Energy Progress Report 2024 — published by the UN, World Bank, IEA, IRENA, and WHO — reminds us that over 750 million people worldwide still lack reliable electricity, and more than 2 billion use traditional fuels for cooking, with serious health and environmental risks. This fracture highlights a paradox: while industrialized countries discuss digital efficiency, elsewhere the priority is still simply turning on the lights.

This infrastructural asymmetry risks repeating itself even within advanced economies. Installing heat pumps or solar panels requires significant upfront investment, which not everyone can afford. According to the World Energy Transitions Outlook 2025, one in five families lacks the capital needed to access home efficiency technologies, even when long-term savings are guaranteed. The risk, then, is that efficiency may become an "ecological luxury" reserved for those who have the resources to invest.

Meanwhile, new solutions are emerging: micro-financing for home solar in emerging countries, subsidized leasing for heat pumps, and energy communities that share not just energy but also costs and technologies. According to IRENA, by 2030 these tools could give over 500 million people, who are now excluded from modern energy markets, access to efficiency.

Towards a Fair and Shared Transition

The energy transition is not just a technical journey. It's a human and social process. From smart grids to local communities, from electric mobility to home efficiency, energy is becoming a true infrastructure of citizenship — a space in which innovation and participation meet. Progress is no longer measured only in gigawatts installed or tons of CO_2 saved, but in the ability to make energy accessible, to translate innovation into widespread well-being, and to combine environmental sustainability with social justice.

Challenges remain — ensuring universal access, avoiding new inequalities, supporting those at risk of being left behind — but it is precisely here that the transition finds its deepest meaning: not just decarbonizing, but reconnecting people, skills and communities. The energy of the future will be all the more sustainable the more inclusive it becomes, because the true measure of progress is not the amount of energy produced, but the quality of life that energy can generate.

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Top Story

The Future of Energy is about Skills

How the Transition is Creating New Jobs and Redefining Work in Tomorrow's Networks.

Over the past decade, the energy sector has shifted from physical infrastructure to a widespread digital platform. Networks are evolving into intelligent systems, production is distributed across thousands of sites, and management now demands expertise capable of interpreting increasingly complex data flows. In this scenario, skilled people are required to design, operate, and protect technology.

The energy transition is not just measured in terms of megawatts or new plants, it's fundamentally a paradigm shift in the working world. An industry that for decades relied on a stable set of skills is now entering a phase in which renewables, digitalization, and electrification are rewriting roles and processes. The data speaks volumes. In 2023, the renewables sector surpassed 14 million jobs globally and, according to IRENA projections, could exceed 30 million by 2030. Meanwhile, the IEA reports a steady employment decline in the fossil fuel industries.

However, it's not just about numbers. The quality of work is changing. There's a growing need for technicians trained in new technologies, digital experts who can read smart grids, and specialists who combine technical, managerial, and cybersecurity skills. This is a cultural transformation as much as an industrial one, placing skills at the heart of the "just transition" highlighted at COP30. The future of energy will depend on building a professional ecosystem suited to an increasingly distributed, digital, and complex system.

Where New Jobs are Born

The transformation of energy work is not a marginal phenomenon: it's already underway and measurable. In 2023, global employment in renewables surpassed 14 million workers and IRENA estimates it could reach over 30 million by 2030, driven mainly by solar, wind, and storage technologies — the most dynamic segments of the energy supply chain.

At the same time, the IEA records a constant reduction in jobs in coal, oil, and gas, with hundreds of thousands of positions disappearing. The transition is reorganizing employment globally — not just shifting workers between sectors, but creating entirely new professional categories.

It's within the renewables value chains that new professions are taking shape: from component manufacturing to installation and maintenance, from digital plant management to advanced services linked to smart grids. Alongside technical roles, there is a rising demand for cross-disciplinary skills — energy data analysis, cybersecurity, sustainability management — which are now an

essential part of the sector's professional profile. The overall effect is clear. The energy job market is growing but, more importantly, its structure is changing. This reshaping is where the jobs of the transition arise.

Emerging Professions

What does energy work look like today? It's no longer about traditional power plants or large centralized facilities. It's a new, fragmented, and technical landscape, with skills evolving as quickly as the energy system itself. Most of the job growth comes from the solar and wind sectors, where professionals are needed to maintain and optimize distributed plants across thousands of sites, with installation rates breaking new records every year.

Yet, this doesn't fully capture the change. The transition is generating a category of workers that were previously unassociated with energy. Data scientists, for example, play a crucial role in the stability of smart grids, analyzing complex patterns, predicting peaks, and anticipating congestion. This work requires analytical, software, and logical skills that are now vital in a sector once dominated by pure engineering.

Cybersecurity has also become a new frontier of energy. Protecting the digital infrastructure of utilities — from renewables plants to control stations — requires specialists who can prevent cyberattacks, safeguard sensitive data, and ensure operational continuity. In fact, the IEA has underlined the exponential growth of these roles in recent years.

Electric mobility is also reshaping the professional landscape. Those managing charging infrastructure need to handle software, hardware, and user interfaces, while designers of electric vehicle powertrains need expertise in electronics, networks, and energy flow management. European technical institutes are updating curricula to meet this growing demand, as highlighted by Cedefop, the EU agency for vocational training.

Then, there are cross-disciplinary professions, such as sustainability managers, ESG experts, green finance analysts, and climate communication specialists — roles that not only support the transition, but define its social and reputational boundaries. This new professional ecosystem doesn't simply replace past skills, it transforms them. And the transition isn't just about creating jobs, it is reshaping the professional profiles of the industry.

The Great Challenge: Training isn't Enough

Are we ready to support this evolution? Do we have sufficient trained personnel for these new roles? Evidence suggests otherwise. The energy transition is creating opportunities at a pace that educational systems are struggling to match. IRENA and IEA point to a "structural skill gap" — a growing divide between sector requirements and what the labor market can provide. By 2030, there could be a shortage of over seven million qualified technicians for smart grids, storage systems, and digital energy management — a figure that signals not just a need, but a risk.

Many new energy professions lack fully codified equivalents in traditional training programs. Cedefop notes that the industrialization of renewables is producing hybrid roles combining electronics, digitalization, project management, and environmental knowledge. These profiles require continuous learning and adaptability, often outpacing updates to educational programs.

"Training new professionals" is not enough. It must be done differently. Companies are

seeking experts who can read data, use modeling software, work on complex plants, and understand cybersecurity and ESG principles. In regions transitioning away from fossil fuels, worker retraining is not always immediate or simple. The real challenge is not just to expand training, but to make it proactive: anticipating, not just chasing, the needs of a changing energy sector. A transition that outpaces the available skills risks slowing down just when it should be accelerating.

Social Justice and the Outlook to 2030

If the energy transition is reshaping jobs and skills, the key question is: who will truly access this new labor market? IEA and IRENA warn that opportunities are not distributed evenly. In regions where fossil fuels still underpin economies and professional identities, change can feel more like a threat than an opportunity. In areas with limited access to training or digital infrastructure, there's a risk of being left behind by a rapidly innovating sector.

This is where social justice enters the picture. The transition can only create jobs if it creates skills. Installing new plants is not enough if workers lack the means to retrain, update, or even understand where the sector is headed. The "just transition" discussed at COP30 is not only a slogan, it is essential to prevent the shift to clean energy from generating new forms of professional and territorial inequality.
Looking to 2030, this will be the real test. Investments in renewables and digitalization will keep growing, energy professions will become increasingly technical and hybrid, and systems ever more decentralized, but sector competitiveness will depend on building human capital: skilled technicians, analysts who can interpret complex data, cybersecurity specialists, and sustainability professionals.

The future of energy hinges on a variable that is often invisible in big numbers: a universal ability to access the necessary skills. Otherwise, the energy revolution may stall halfway. However, if training becomes truly accessible and widespread, the transition will drive a stronger, more inclusive economy, aligned with climate goals. This is the challenge for the coming years: to ensure that the transition is not just a technological change, but a shared opportunity.

Industries & Countries

A World Divided by Energy

Without reliable grids and clear rules, investments stall. The heart of the transition remains distant from emerging economies. "It's not enough to install renewables; we must ensure they improve people's lives."

Access to electricity is still not a universal right. In fact, it is a dividing line that cuts across countries, regions, and communities. Over the past twenty years, progress has been significant. Today, more than 92% of the global population is connected to the grid. Yet behind this figure lies a vast, invisible minority — about 730 million people, according to the IEA's *World Energy Outlook 2024* — who still live without electricity, mostly in sub-Saharan Africa. The picture is equally stark when it comes to energy quality: two billion people still rely on polluting household fuels for cooking, with direct consequences for their health and the safety of their families.

The global energy transition is advancing at a steady pace, driven by record growth in renewables, which in 2024 accounted for 41% of global electricity generation. However, this acceleration has not changed the central paradox: as the Global North invests and innovates, the Global South continues to struggle with fragile grids, high costs, and energy that is often too intermittent to support industrial development, modern agriculture, or essential services. The transition is not progressing at the same speed everywhere. This gap could become the greatest energy inequality of the 21st century: having — or not having — reliable access to the energy needed to study, work, receive healthcare, and compete.

This is where the most tangible dimension of energy equity is at stake. The challenge is not just to produce more clean energy, but to deliver it where it is needed, with adequate infrastructure and inclusive models. The transition will not be truly complete until it brings benefits to the regions that still remain on the margins.

North and South: a Widening Divide

Looking at the distribution of energy investments reveals a clear geography of disparity. Advanced economies and three major emerging markets — China, India, and Brazil — are attracting almost all the capital earmarked for the transition. In 2023, more than 90% of global investments in clean energy were concentrated in these countries, leaving only a residual share to the rest of the world. According to IRENA, sub-Saharan Africa — home to most people living without electricity — received just US$12 per capita in transition-related investments: forty times less than the global average.

This asymmetry is not episodic; it is structural. Northern countries — with mature financial markets, stable regulations, and extensive power grids — are considered safer by investors. Southern countries, by contrast, face much higher, sometimes prohibitive, capital costs. Moreover, perceived risk, combined with fragile infrastructure, limits the bankability of projects and discourages private operators. The result is a self-perpetuating imbalance:

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fewer investments mean weaker grids, and weaker grids mean less capacity to integrate renewables and attract new capital.

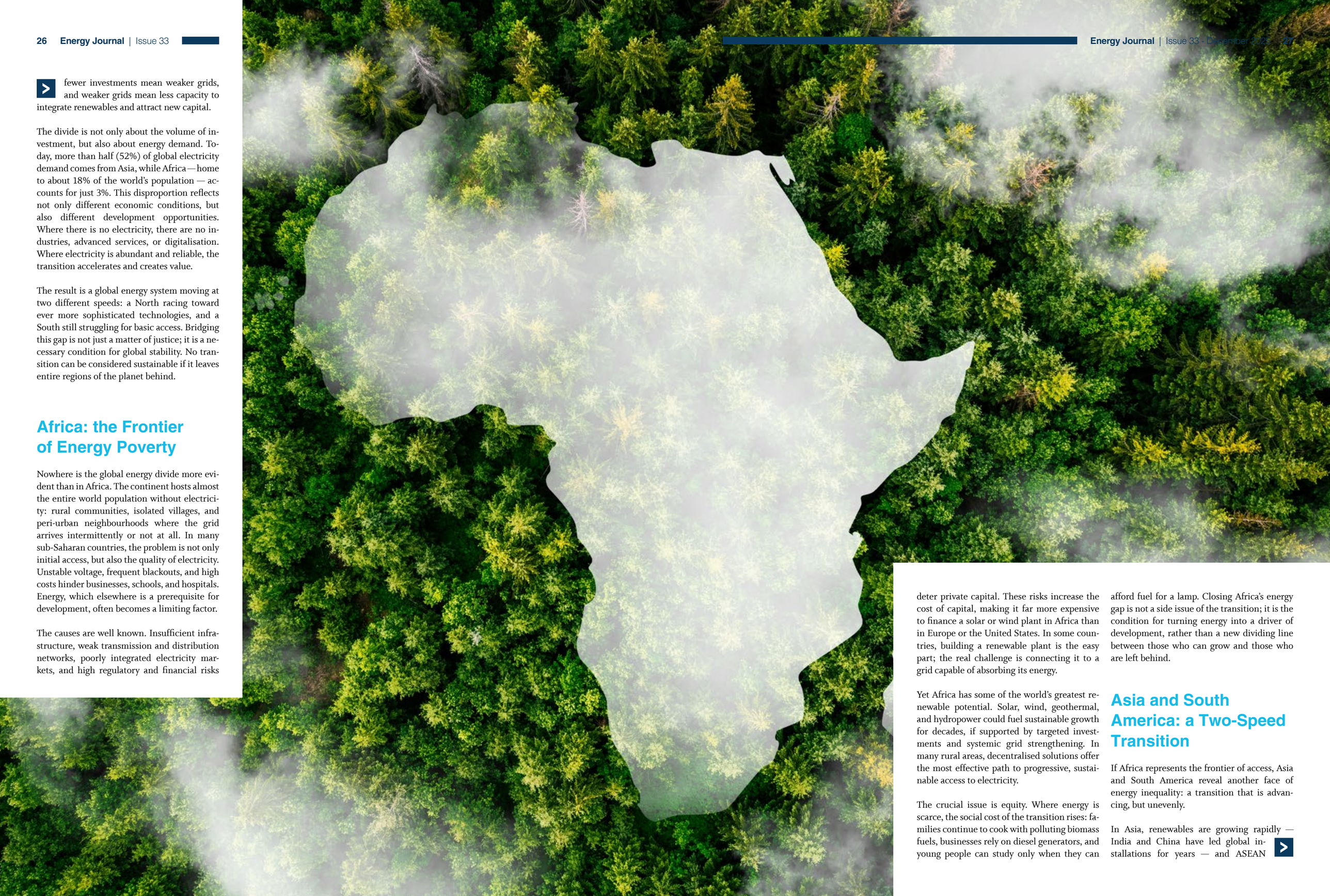
The divide is not only about the volume of investment, but also about energy demand. Today, more than half (52%) of global electricity demand comes from Asia, while Africa — home to about 18% of the world's population — accounts for just 3%. This disproportion reflects not only different economic conditions, but also different development opportunities. Where there is no electricity, there are no industries, advanced services, or digitalisation. Where electricity is abundant and reliable, the transition accelerates and creates value.

The result is a global energy system moving at two different speeds: a North racing toward ever more sophisticated technologies, and a South still struggling for basic access. Bridging this gap is not just a matter of justice; it is a necessary condition for global stability. No transition can be considered sustainable if it leaves entire regions of the planet behind.

Africa: the Frontier of Energy Poverty

Nowhere is the global energy divide more evident than in Africa. The continent hosts almost the entire world population without electricity: rural communities, isolated villages, and peri-urban neighbourhoods where the grid arrives intermittently or not at all. In many sub-Saharan countries, the problem is not only initial access, but also the quality of electricity. Unstable voltage, frequent blackouts, and high costs hinder businesses, schools, and hospitals. Energy, which elsewhere is a prerequisite for development, often becomes a limiting factor.

The causes are well known. Insufficient infrastructure, weak transmission and distribution networks, poorly integrated electricity markets, and high regulatory and financial risks



deter private capital. These risks increase the cost of capital, making it far more expensive to finance a solar or wind plant in Africa than in Europe or the United States. In some countries, building a renewable plant is the easy part; the real challenge is connecting it to a grid capable of absorbing its energy.

Yet Africa has some of the world's greatest renewable potential. Solar, wind, geothermal, and hydropower could fuel sustainable growth for decades, if supported by targeted investments and systemic grid strengthening. In many rural areas, decentralised solutions offer the most effective path to progressive, sustainable access to electricity.

The crucial issue is equity. Where energy is scarce, the social cost of the transition rises: families continue to cook with polluting biomass fuels, businesses rely on diesel generators, and young people can study only when they can afford fuel for a lamp. Closing Africa's energy gap is not a side issue of the transition; it is the condition for turning energy into a driver of development, rather than a new dividing line between those who can grow and those who are left behind.

Asia and South America: a Two-Speed Transition

If Africa represents the frontier of access, Asia and South America reveal another face of energy inequality: a transition that is advancing, but unevenly.

In Asia, renewables are growing rapidly — India and China have led global installations for years — and ASEAN

economies are scaling up solar and wind projects. Yet deep contrasts remain: hyper-connected megacities coexist with rural areas where grids are weak, transmission losses are high, and costs remain prohibitive. In countries such as Vietnam or the Philippines, renewables are expanding faster than the grid's ability to absorb them, creating congestion and curtailment. The transition is happening, but it is neither orderly nor fully inclusive.

South America tells a different story. Rich in hydro and renewable resources, the continent has unique potential to become a natural laboratory for decarbonisation. Brazil, Chile, and Uruguay already operate energy systems where renewables cover a very high share of electricity demand. Yet structural obstacles persist: insufficient transmission networks, difficulties connecting remote areas, and slow expansion of regional interconnections. Green energy exists, but often does not flow to where it is needed.

Across both continents, the challenge is not only adding capacity, but modernising grids, strengthening planning, and accelerating investment in transmission and distribution. The transition depends as much on networks as on generation — and it proceeds at different speeds, often within the same country.

Why Investments don't Reach where they're Needed

Behind the energy gap between North and South lies a decisive factor: the cost of capital. In developing countries, financing a solar or wind plant can cost up to twice as much as in Europe or the United States — not for technological reasons, but due to perceived investor risk. Political instability, currency volatility, immature electricity markets, uncertain regulation, and difficulties securing long-term contracts all undermine bankability.

This creates a vicious cycle. Without stable grids, investors stay away. Without investment, grids remain weak. And without resilient grids, integrating renewables becomes increasingly difficult. In many emerging economies, the issue is not a lack of potential — sun and wind are abundant — but the absence of a financial and regulatory ecosystem that makes investments predictable and scalable.

These challenges are compounded by limited fiscal space and high public debt, which restrict governments' ability to absorb risk or support large infrastructure programmes. At the same time, global fossil fuel subsidies remain substantial, diverting resources toward technologies that the transition is meant to phase out.

Europe: Grids Under Pressure and the Interconnection Challenge

Fragile grids are not exclusive to emerging economies. Even in advanced systems, the energy transition is placing unprecedented pressure on infrastructure designed for centralised and predictable generation. In Europe, this issue has become central to the political and economic agenda. The European Commission has launched a plan to strengthen power grids and interconnections, estimating the need for €1.2 trillion in investment by 2040.

Without a modern, interconnected, and resilient grid, clean energy cannot flow efficiently within the single market. Many Member States remain far from the 15% interconnection target set for 2030, while electricity price differentials with the US and China reveal structural constraints in transport capacity.

According to ACER's latest *Monitoring Report*, rapid growth in renewables, increasing cross-border flows, and greater production volatility are exposing bottlenecks in transmission and distribution networks, heightening the risk of congestion and price shocks. In Italy, the technological quality and reliability of the power grid are high by European standards, and the TSO and major utilities have long been investing in modernisation. Still, without coordinated and timely investment, grids risk becoming the main bottleneck to decarbonisation.

Energy Justice and Technological Solutions

The energy transition is not only a technological challenge; it is a matter of fairness. As IRENA has emphasised, the shift to low-emission systems inevitably redistributes costs and benefits — and how these are shared will shape the success of the transition. In vulnerable regions, priorities extend beyond decarbonisation to include access, affordability, and participation.

Energy justice therefore becomes central. It is not enough to install renewables; they must improve people's lives. Mini-grids, off-grid systems, modular solar solutions, pay-as-you-go models, and digital platforms for managing fragile networks are already helping close the gap between North and South. In many rural areas, these solutions offer the fastest and most cost-effective route to electricity access.

These technologies democratise energy. They reduce dependence on polluting fuels, stimulate local economies, and lower entry barriers for households and businesses. Their diffusion, however, depends on targeted policies, concessional finance, technical training, and inclusive governance.

The Role of the G20 and Public Finance

The global energy transition cannot rely on voluntary action alone. Extending clean, affordable energy to underserved regions requires collective commitments, international coordination, and public finance capable of reducing risk. Here, the G20 plays a decisive role.

IRENA's analyses make this clear: a just and inclusive transition depends on grants, concessional loans, infrastructure investment, capacity building, and technology transfer. G20 leaders reaffirmed this in the 2025 Summit declaration, stating that energy security is fundamental to sovereignty, development, and global prosperity. According to IRENA, achieving universal access by 2030 will require US$30 billion per year, plus an additional US$6 billion for clean cooking solutions.

Facilitating finance is not only about scale, but also about quality. Lowering the cost of capital in high-risk markets and supporting national energy planning are essential if renewables are to become engines of development rather than isolated projects.

CESI: Bridging the Gap with Expertise

In this context, independent technical expertise plays a crucial role. CESI operates along the priorities identified by IRENA for a fairer and more inclusive transition.

Its work spans independent energy planning, technical risk reduction through testing and

certification, and the development of critical infrastructure such as cross-border interconnections and HVDC systems. By improving grid reliability, reducing uncertainty, and strengthening resilience, CESI helps lower capital costs and make investments more bankable.

Active across Africa, Asia, and South America, CESI supports governments and utilities in stabilising grids, expanding access, and enabling community participation in the energy system.

From Vision to Reality: for a Just Transition

In Nigeria, CESI is overseeing the rehabilitation of the national SCADA/EMS system, enabling improved grid monitoring, renewable integration, and service reliability for a country of over 200 million people.

In Mozambique, CESI is supporting the update of the twenty-year Electric Master Plan, helping define least-cost investment priorities for generation, transmission, and distribution, aimed at universal access and large-scale renewable integration.

In West Africa, collaboration with WAPP and the World Bank on the regional Grid Code and cross-border tariff frameworks is laying the foundation for a more efficient and reliable integrated electricity market.

Three interventions, one direction: creating the technical, regulatory, and operational conditions for an inclusive energy transition. It is here — at the intersection of global vision and local implementation — that energy equity is truly tested, and where independent expertise can turn the transition into a shared opportunity.

Sources:

- A just and inclusive energy transition in emerging markets (IRENA / G20)
- G20 Leaders' Summit Declaration
- G20 Energy Ministers Outcome Statement
- World Energy Outlook 2024 – IEA
- Monitoring Report – ACER
- Infrastructure Gaps Report – TYNDP 2024

Future & Technology

Inclusive Technology: The New Frontier of the Energy Transition

Digital solutions, local projects, and new energy infrastructure are reshaping the transition, placing people, communities, and inclusion at its core.

For further information on this topic, please contact:
Paolo Chighine (Executive Vice President Communication & External Relations)

The energy transition is often portrayed as a technological race towards solar panels, wind turbines, batteries, and smart grids orchestrating ever more complex flows. However, beneath the kilowatts and infrastructure lies a deeper dimension that shapes its direction and outcome: equity. Moving to cleaner energy is not enough. It must be done in a way that allows everyone to participate and benefit from it.

Recent reports from IRENA and the Tracking SDG7 program present a clear picture. Despite the expansion of renewables, approximately 750 million people worldwide still lack stable access to electricity, and over 2 billion continue to rely on polluting fuels for cooking. Innovation is advancing rapidly, but not uniformly. Clean energy tends to reach those with resources and space — a roof for solar panels, a garage for an electric car, sufficient income for efficient technologies — while others risk being trapped in costly, polluting, and unreliable systems.

This highlights a growing risk: the energy transition could amplify inequalities instead of reducing them. Wealthier communities are accelerating the adoption of self-consumption, home storage, and smart energy management, while families with limited resources face economic, technological, and administrative barriers to joining the transformation. In many regions, installing solar panels or purchasing an electric vehicle remains a privilege.

This dynamic has created a new frontier of energy poverty — not just the inability to pay bills, but a structural exclusion from the benefits of efficient and distributed energy production. In Europe, over 35 million citizens are unable to access cost-saving or self-production technologies. In developing countries, the situation is even more severe, with hundreds of millions of people lacking reliable electricity and relying on harmful fuels.

Without appropriate redistributive measures, the transition risks becoming an energy revolution for the privileged, leaving behind those who need its benefits most.

Tools for a Fair Transition

To prevent the energy transition from becoming a revolution for the few, leading international agencies are underlining the need for social policies that democratize access to clean energy. According to IRENA's *World Energy Transitions Outlook 2025*, four tools are crucial to counter the risk of new inequalities:

1. Progressive subsidies and social tariffs can lower energy or installation costs for low-income groups. Models in Portugal and Chile, where incentives are linked to income rather than consumption, demonstrate that home electrification can be made more accessible.

2. Green microfinance enables families and small businesses with limited liquidity to invest in sustainable solutions. Energy leasing systems — for heat pumps or solar panels, for example — spread costs over time, making benefits immediately accessible. In Kenya, India, and Brazil, these mechanisms are driving millions of micro-solar installations, bringing both energy and economic opportunity to previously excluded areas.

3. The promotion of community energy projects aggregates supply and demand at the local level. Energy communities reduce individual costs, strengthen social cohesion, and stimulate circular economies. In Germany, more than two thousand local cooperatives produce and share renewable energy. In Italy, new regulations introduced in 2024 have enabled hundreds of small towns to launch similar initiatives, combining efficiency, participation, and local development.

4. Targeted public investment remains the foundation of energy equity. Infrastructure — smart grids, storage systems, digital connections — must reach underserved areas where market forces alone are unlikely to invest. IRENA estimates that every dollar invested in energy infrastructure in peripheral regions can generate up to three dollars in economic and social returns through job creation and increased local productivity.

An Inclusive Process

Decarbonization, climate neutrality, resilience — the language of the energy transition often sounds abstract, distant from everyday life. Yet behind these terms lies something very concrete: the opportunity for the green economy to become an inclusive process, one that reduces inequalities and guarantees fundamental rights such as access to energy.

This is the link between Agenda 2030 and COP30 — two different but converging horizons that, in 2025, are reshaping the relationship between technology, society, and communities. According to the UN's *Sustainable Development Goals Report 2025*, the world has made progress, "but not fast enough," towards Goal 7: affordable, reliable, and clean energy for all.

The latest *Tracking SDG7 – The Energy Progress Report 2025* (IEA, IRENA, World Bank) indicates that about 685 million people still lack access to electricity, mainly in sub-Saharan Africa. At the same time, micro-grid and off-grid solutions have reached over 100 million new users in isolated rural areas over the past decade. The paradigm is shifting: it is no longer only about how much energy is produced, but about how it is distributed and who benefits from it.

Micro-grids are among the most effective applications of this inclusive approach. Studies show that hybrid energy communities

— combining solar, biomass, and storage — have improved quality of life in villages in India and Kenya, lowering supply costs and creating local jobs. Technology is not just infrastructure; it is also a social tool.

COP30 and Climate Justice

Inclusion was a central theme at COP30 in Belém, Brazil. Official documents consistently emphasized the concept of a "just transition": not only reducing emissions, but building an economic model that leaves no one behind. Brazil promoted the *Baku to Belém Roadmap*, linking decarbonization financing and Amazon biome protection to local development and equitable access to energy.

Integrating climate action with broader social priorities is equally urgent. Climate change, environmental degradation, and instability reinforce one another. Climate policies can either support — or undermine — efforts to improve social justice and protect natural resources. This interconnection is particularly evident in global food systems, where environmental pressure, inequality, and economic shocks converge. Latin America, which hosted COP30, could play a key role in this transformation.

At Belém, the European Union positioned itself as a promoter of the energy transition, with clear goals: increased deployment of renewables, a gradual phase-out of fossil fuels, and more accessible financing for vulnerable countries. The EU also renewed its dialogue with China, which reaffirmed its ambition for green leadership and pledged to share clean technologies, particularly through the Belt and Road Initiative.

The United States, meanwhile, arrived with a fragmented profile. The absence of strong federal representation left room for regional leaders — such as the Governor of California — who warned of the risks of American disengagement from the global competition for green technologies.

Alongside official proceedings, voices from the Global South articulated clear demands for climate justice and tangible resources, not merely loans that increase debt. Protests by indigenous and local communities highlighted the gap between rhetoric and reality, calling for a stronger role in decision-making. For many vulnerable countries, the stakes extend beyond climate policy to the right to a fairer future.

Digitalization for Inclusion

Energy inclusion today increasingly depends on digitalization. Smart grids and next-generation networks enable real-time management of supply and demand, more effective integration of distributed renewables, and reductions in waste and outages. According to the IEA, digital technologies applied to electric grids can improve efficiency by 20–25% and expand energy access in fragile or isolated regions.

In Europe, the *NextGrid* project, coordinated by SINTEF in Norway and funded by Horizon Europe, is testing advanced sensors and AI algorithms to prevent blackouts and improve service quality in rural areas. In Italy, the PNRR and PNIEC support similar initiatives. Enel, Terna, and regional utilities are developing local smart grids in Sardinia, Calabria, and the central Apennines, where digital infrastructure can make the difference between exclusion and participation.

The European Commission's *Clean Energy Package 2025* explicitly addresses digital inclusion: the green transition is not merely a technological roadmap, but a process of energy citizenship, in which access to information and networks is essential to equity and equal opportunity.

Resilience and Territories

The ability of territories to absorb climate shocks and recover quickly is a key pillar of resilience. According to the *UNEP Adaptation Gap Report 2025*, climate-related disasters affected more than 200 million people in 2024. Areas with decentralized energy networks, however, recovered significantly faster.

Once again, micro-grids have proven vital in crisis situations. In Mozambique, during Cyclone Freddy, community solar networks kept hospitals and schools powered while the main grid was down. In Ukraine, a UNDP and World Meteorological Organization project installed a network of digital micro power plants in 2025 to support early warning systems — combining energy, data, and resilience within a single ecosystem.

Space as a New Frontier for Inclusion

Today, the space economy is no longer limited to satellites and launch vehicles; it has become a strategic component of the energy transition. ESA's *Space Economy 2025 Report and The Space Report 2025 Q2* from the Space Foundation highlight the growing role of Earth observation in managing natural resources and energy networks.

Satellite data, analyzed through artificial intelligence algorithms, is now used to monitor photovoltaic production, forecast water availability, and improve the planning of electrical infrastructure. This enables more accurate management of energy flows, enhances responsiveness to extreme events, and directs investments toward areas where social impact can be greatest. Space has thus become a tool for inclusion, reducing "information blindness" in remote regions, helping prevent outages, supporting climate resilience, and making the distribution of energy services more equitable.

The energy transition cannot be measured solely in installed megawatts; it must also be assessed by the level of inclusion it generates. Replacing fossil fuels with renewables is a necessary step, but it is not sufficient. Access, participation, and redistribution mechanisms must also be redesigned. As the IEA notes in the *World Energy Outlook 2024*, "a transition that leaves people behind is neither just nor lasting."

Technologies — micro-grids, smart grids, digitalization, satellite data — become truly transformative only when they enable every community to play an active role in change. From major cities to rural areas lacking infrastructure, from advanced economies to vulnerable countries, the challenge is to ensure that clean energy is accessible to all, regardless of income, location, or existing infrastructure.

An equitable transition may not be the fastest, but it illuminates every path, not just the main roads. Ultimately, it will be inclusion — of people, communities, and skills — that determines whether the energy revolution becomes a shared opportunity or a new source of inequality. True innovation, in the end, is not about producing more energy, but about building a better future for everyone.

Opinions

When Energy Improves Everyday Life

From cleaner services and healthier air to people-centred cities: how the transition is already reshaping communities.

When discussing the energy transition, the debate often focuses on climate targets, emerging technologies, and infrastructure investments. However, its real success is determined elsewhere. It is the ability to tangibly improve people's lives and deliver concrete benefits to local communities. Cleaner energy, healthier air, more efficient services, more liveable cities. It is in this everyday dimension — shaped by health, comfort, accessibility, and trust — that the transition stops being an abstract project and becomes a shared experience.

The reflections of Jessika Trancik, Maria Neira, and Hanna Gronkiewicz-Waltz — working respectively in research, global health, and urban policy — converge on a key point: energy is not merely infrastructure or technology; it is a powerful enabler of human well-being, social cohesion, and quality of life.

For further information on this topic, please contact:
Paolo Chighine (Executive Vice President Communication & External Relations)

Energy as a Service: Quality, Simplicity, Accessibility

For Jessika Trancik, a professor at the Massachusetts Institute of Technology (MIT) and a leading scholar in energy systems, energy should first and foremost be understood as an essential function of modern life. It is neither neutral nor invisible. «We rely on our energy systems to allow us to work, travel, process information, and support all economic activity». In other words, energy is what makes society function — from the economy to everyday life.

From this perspective, the energy transition coincides with an improvement in the quality of services provided to people. Trancik highlights how clean technologies are significantly expanding the range of available options: «We have more tools that we can use to provide this high-quality energy service. One that's cleaner, that causes fewer negative health impacts, one that's more convenient, one that hopefully will provide more affordable energy, including to people around the world who don't have access to modern energy services». The change is not only about emissions. It translates into less polluted cities, more efficient homes, quieter mobility, and greater cost stability for households and businesses.

Electrification is a key step in this respect. The ability to power transport, heating, and household services through increasingly reliable electricity networks introduces a simple yet decisive advantage. «There's an inherent advantage to being able to plug in and power something. It's cleaner, it's easier, it's more convenient». Heat pumps, electric vehicles, and intelligent energy management systems enhance comfort, safety, and reliability without forcing disruptive changes in individual behaviour. The transition works, Trancik observes, when it makes life easier.

Clean Air and Health: the Immediate Dividend of the Transition

While energy improves services, the first benefit people experience is invisible: it's the air they breathe. Maria Neira, Director of the Department of Environment, Climate Change and Health at the World Health Organization, believes the link between energy policy and public health is direct and measurable. «There are already success stories from countries with robust legislation and air quality standards», Neira writes, showing how strong regulation can quickly translate into tangible improvements in air quality.

According to Neira, reducing air pollution is structurally linked to energy and mobility choices. Positive outcomes observed in multiple contexts demonstrate the effectiveness of «clean household energy transitions, greener urban transport policies and waste management strategies», capable of delivering benefits for both the environment and human health. In Europe in particular, «EU Member States and countries in the European Economic Area have implemented clean air policies and reached relatively low levels of air pollution», thanks to binding standards and a gradual alignment with WHO recommendations.

These advances are not limited to advanced economies. «India, Ghana, Kenya and Nepal, among other countries, are putting programmes into place to provide cleaner and more affordable energy options for cooking», expanding access to

safer and more sustainable solutions for low-income households and rural areas. At the same time, «China has managed to improve air quality significantly since 2013, while also ensuring continued economic growth», demonstrating that health protection and economic development can progress hand in hand.

Cities are where these benefits are most apparent to citizens. «Cities are also stepping up», Neira notes, pointing to concrete examples: from London's ultra-low emission zones, which have helped reduce pollution and improve respiratory health, to Bogotá's efforts to deploy a fully electric bus fleet. Paris, she concludes, «has reduced air pollution by fifty percent over the past 20 years» thanks to structural policies addressing traffic, active mobility, and green spaces. This evidence conveys a key message: the energy transition is already an effective tool for public health prevention.

Cities as the Human Space of the Transition

It is in cities that the energy transition reveals its most direct impact on everyday life. Hanna Gronkiewicz-Waltz, former Chair of the European Commission's Mission Board for Climate-Neutral and Smart Cities and former Mayor of Warsaw, describes the Cities Mission as «a big and much-needed plan to make cities healthier, greener, and better places to live». Cities, she underlines, are the level of government closest to citizens and the first space in which the transition translates into tangible well-being.

Gronkiewicz-Waltz points out that the value of urban transformation lies not only in long-term climate objectives, but in its ability to deliver immediate and perceptible benefits. «The mission is first and foremost about change that can benefit people now», such as more convenient and non-polluting mobility, more affordable energy bills, more efficient digital services, and new job opportunities. It is in this everyday dimension that energy ceases to be an abstract issue and becomes a driver of quality of life.

A central element, she stresses, is citizen engagement. «Depending on the generation we address, it is essential to explain the consequences and price of non-action», she observes, highlighting the importance of communication that builds awareness and consensus, especially among younger generations. Urban transition only works if people are treated as partners in change, rather than merely as recipients of top-down decisions.

The expected outcome is clear: «Cities are sustainable, enjoyable, and safe». Not only in strategic documents, but in the daily lives of their residents. This is how the energy transition truly becomes a human transformation.

Sources:

- How energy systems are shaped with Jessika Trancik
- Air pollution: tackling a critical driver of the global NCD crisis
- An interview with Hanna Gronkiewicz Waltz: The Cities Mission is transforming our cities. It deserves better political & funding support

News & Events

Upcoming Energy Events

International Nuclear Law Essentials (Inle) 2026

February 19–23, 2026

Paris, France

www.oecd-nea.org

The INLE 2026 program, coordinated by Paul Bowden (Nottingham Law School), offers advanced training in the fundamentals of nuclear law. Lectures delivered by experts from international organizations, governments, and the private sector address the legal framework required to support the development of nuclear programs in a global context where nuclear energy is once again central to energy security and decarbonization.

World Sustainable Energy Days 2026

February 24–27, 2026

Wels, Austria

www.wsed.at

The World Sustainable Energy Days are one of the leading international events for the energy transition. The event brings together public and private stakeholders to discuss policies, technologies, and strategies on energy efficiency, renewables, and decarbonization, fostering dialogue between research, industry, and policymakers.

Key – The Energy Transition Expo

March 4–6, 2026

Rimini, Italy

www.key-expo.com

KEY is the leading energy transition and efficiency event in the Euro-Mediterranean area. The 2026 edition will transform Rimini into an international hub dedicated to technologies, market solutions, and regulatory scenarios for decarbonization, offering a rich program of conferences, networking, and professional development.

International Conference On Renewable And Clean Energy (ICRCE 2026)

March 6–8, 2026

Osaka, Japan

www.icrce.org

The 16th edition of ICRCE offers a global platform for presenting and discussing the latest technological and scientific developments in the field of renewable and clean energy. The conference fosters the exchange of knowledge between academia, industry, and applied research, promoting international collaborations and the involvement of new generations of researchers.

CERAWeek 2026

March 23–27, 2026

Houston, Texas, USA

www.ceraweek.com

CERAWeek is one of the world's leading forums on energy, environment, and climate. Through the executive conference, Innovation Agora, and partner programs, the event brings together leaders and decision-makers to discuss scenarios, strategies, and solutions to the major challenges facing the global energy system.

Shaping a Better Energy Future

CESI is a multinational Italian group headquartered in Milan. Founded in 1956, it is now one of the world's leading technical consulting and engineering firms specializing in innovation, digitalization, and testing for the electrical sector, as well as in civil and environmental engineering. Through its KEMA Labs business unit, CESI is the world's leading independent provider of Testing, Inspection, and Certification services for the electrical industry. Additionally, through its CESI Space business unit, the Group also develops and manufactures solar cells for space applications.

With nearly 70 years of expertise, CESI operates in more than 70 countries worldwide. CESI collaborates with key global players in the energy sector, including utilities, transmission system operators, distribution system operators, power generation companies, system integrators, financial investors, and manufacturers of electromechanical and electronic components. The company also works with governments and regulatory authorities, maintaining close cooperation with major international financial institutions.

CESI is a fully independent joint-stock company headquartered in Milan, Italy, with operational facilities in Arnhem (Netherlands), Berlin and Mannheim (Germany), Prague (Czech Republic), Dubai (UAE), Knoxville and Chalfont (USA), Rio de Janeiro (Brazil), and Santiago de Chile (Chile).
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