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KEY FINDINGS AND IMPLICATIONS FOR UNIDO OPERATIONS



INDUSTRIAL DEVELOPMENT REPORT 2022

THE FUTURE OF INDUSTRIALIZATION
IN A POST-PANDEMIC WORLD

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For reference and citation, please use: United Nations Industrial Development Organization, 2021. *Industrial Development Report 2022. The Future of Industrialization in a Post-Pandemic World. Key findings and implications for UNIDO operations.* Vienna.

UNIDO ID/450



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**THE FUTURE OF INDUSTRIALIZATION
IN A POST-PANDEMIC WORLD**

Key Finding 1.

The COVID-19 pandemic has permeated all corners of the globe, but its impact has been more severe for some countries, industries and workers than for others

The COVID-19 pandemic has caused large economic losses with a high social cost: In 2020, world gross domestic product (GDP) fell by 3.3 percent, plunging the world economy into the worst recession in 70 years. The sudden halt of economic activity has led to an estimated loss of 255 million full-time jobs. Even more dramatically, the pandemic is projected to push an additional 97 million people into poverty.

The pandemic's socio-economic impact has been highly uneven across regions, industries, firms and workers:

- **Regions:** The impact of the pandemic on economic activity has been uneven across regions. Industrialized economies (IEs) were less affected than developing and emerging industrial economies (DEIEs). The average estimated loss of output of these two groups in 2021 relative to pre-pandemic estimates is 3.9 percent and 7.7 percent, respectively. The pandemic's range of impacts is much more pronounced in DEIEs, where projected losses of output range from a maximum of 13.8 percent in Small Island Developing States (SIDS) to a minimum of 1.4 percent in China. Industrial production in DEIEs fell more sharply than in IEs; DEIEs were also characterized by higher heterogeneity. By the same token, the speed of recovery has differed among countries: some economies had already surpassed their pre-pandemic levels of industrial production by the second quarter of 2021, while others were still lagging far behind.
- **Industries:** Some industries have been more affected than others. The *Industrial Development Report 2022* (IDR 2022) identifies two broad groups of industries. The first group consists of industries that either experienced a comparatively low

impact or a strong negative impact but managed to recover quickly. These are defined as “robust” industries. The remaining industries make up the second group, which were hit hard by the pandemic and did not recover quickly. They are referred to as “vulnerable” industries. Producers of essential goods (food and chemicals, but also paper); industries that faced increased demand due to the health emergency (pharmaceuticals, computers and medical equipment); and capital-intensive high-tech industries that managed to bounce back swiftly from the initial impact (machinery and electrical equipment) belong to the group of robust industries. Vulnerable industries include labour-intensive industries (apparel, leather, textiles, furniture, other manufacturing) as well as some capital-intensive industries. Among these are industries that have been hit particularly hard by cross-border containment restrictions (motor vehicles, other transport equipment, petroleum).

- **Firms:** Data collected across firms in 26 DEIEs for the IDR 2022 reveal that small and medium enterprises (SMEs) have been disproportionately affected by the pandemic relative to large firms. Within each size category, firms operating outside manufacturing (especially those in service sectors) or in industries vulnerable to COVID-19 have been affected the most. In some cases, the magnitude of the difference in impact is greater than 10 times or more. SMEs in vulnerable industries, for instance, reported a decline in sales after the height of the pandemic, which, on average, was 14 times higher than among large firms in robust industries.
- **Workers:** Workers who were already more vulnerable pre-pandemic have been affected more than others. Data collected for the IDR 2022 show that the pandemic has disproportionately affected women workers. This is reflected by a larger estimated change in employment among women compared to men depending on changes in monthly sales. The gender gap is larger in vulnerable industries, where all workers are already at higher risk of losing their jobs. The risk is even more pronounced for temporary workers. This result underlines the urgent need to decrease gender segregation and discrimination in manufacturing to reduce women’s vulnerability to employment losses during crises.

Key Finding 2.

Industrial capabilities and digitalization have supported countries' resilience during the pandemic

The differentiated impact of the pandemic reflects differences in countries' resilience: The pandemic's asymmetric impact observed across regions, countries, firms and workers reflects the differences in the contexts within which actors operate and their capacity to respond to crises. These include differences in both the pre-existing structural factors of socioeconomic resilience as well as type of responses implemented by firms and governments. Among the factors analysed in the IDR 2022, two are of particular significance: (i) industrial capabilities and (ii) digitalization.

Stronger industrial capabilities mitigated the impact of COVID-19 on economic activity and firm performance:

- *At country level:* An analysis of the determinants of the projected losses of output across countries by 2021 sheds light on the role industrial capabilities play. The study included three factors expected to amplify the pandemic's economic impact—(i) the severity of the health crisis, (ii) the stringency of containment measures, and (iii) reliance on vulnerable industries—as well as three factors expected to mitigate its impact – (i) the level of income, (ii) the relative size of the domestic market, and (iii) the level of industrial capabilities. The level of industrial capabilities was found to be both negative (that is, it reduced the projected loss of output) and highly significant.
- *At firm level:* Turning from country-level to firm-level data, an analysis of two widely used indicators of enterprise performance—firm survival and changes in employment—reveals that industrial capabilities played a crucial role in cushioning the pandemic's impact. The severity of its effects and the stringency of

government measures are again negatively associated with firm-level outcomes. Still, manufacturing firms in countries with higher industrial capabilities proved to be more robust, on average, during the pandemic than those in countries with weaker industrial capabilities.

Firms' level of digitalization bolstered resilience during the pandemic:

Another resilience factor identified based on the data collected for the IDR 2022 relates to the level of digitalization among firms, in particular their adoption of Advanced Digital Production (ADP) technologies. Digitally advanced firms—that is, those using the latest vintages of digital technologies in their production process—were better able to weather the pandemic's impact on sales, profits and employment. For instance, the drop in sales experienced by digitally advanced firms was more than three times lower than that of non-digitally advanced firms. Digitalization furthermore supported firms' readiness to respond to the crisis.

Key Finding 3.

The post-pandemic landscape will be shaped by three important megatrends: digitalization, production rebalancing and industrial greening

The megatrends: The IDR 2022 goes beyond the analysis of the impacts observed so far and assesses the extent to which these impacts might affect other forces that were already reshaping the future of industrialization at the global level long before the COVID-19 outbreak. These forces—or megatrends—are rooted in deeper structural shifts related to ongoing processes of technological change, socio-demographic transitions and humanity’s carbon footprint. Three megatrends are particularly relevant in this regard:

- *Digitalization and automation of industrial production*, as technological innovation and the deployment of ADP technologies essentially influence all spheres of business development and profoundly change the competitive advantages of both firms and nations.
- *Global production shifts (rebalancing)*, especially the emergence of Asia as a dominant hub of global industrial production and China’s structural transformation towards a knowledge-driven high-income economy, as these developments imply a major restructuring of trade flows and global value chains (GVCs).
- *Greening of industrial production*, as the need to reduce environmental footprints, and in particular to decarbonize economies, calls for radically different business models and systemic transformations with far-reaching effects on the positioning of DEIEs in the world economy.

The pandemic has had an influence on each of these megatrends: The evidence collected for the IDR 2022 suggests that the COVID-19 crisis has affected the pace of these megatrends:

- **Digitalization:** There are strong indications that the pandemic has boosted digitalization, including in developing countries. However, translating digitalization opportunities into reality is challenging. The adoption of ADP technologies is a process fraught with difficulties because such technologies rely on many interdependencies between science and technology. Differences in size, capabilities and the availability (or lack thereof) of a supporting innovation system account for a large share of today's digital divide among firms. SMEs, particularly in DEIEs, tend to lag behind their larger peers.
- **Rebalancing:** Available evidence suggests that the pandemic has also accentuated the global economic shift towards Asia. China's manufacturing sector was able to rebound quickly. Conversely, the drop in production in IEs was more prolonged. As a result, the shares of China and other Asian DEIEs in world manufacturing production continued to grow throughout 2020 and 2021. COVID-19 is also expected to affect the organization of GVCs. Business models are already being adapted, with multinational enterprises (MNEs) switching from "just-in-time" to "just-in-case" risk management models. Finally, another widespread concern is that the vulnerabilities the pandemic has exposed might nudge some firms into either shortening their value chain or bringing it closer to the final consumer ("reshoring").
- **Greening:** During the initial phase of the crisis, greenhouse gas emissions fell quickly and abruptly. However, their levels rebounded rapidly when industrial operations resumed in 2021. Yet there are signs that the stage has been set for the transition towards a greener global economy. Manufacturing firms are increasingly adopting environmentally friendly practices, and it is expected that the pandemic will trigger the adoption of green practices more widely, even among firms in developing countries. There is growing awareness that their economic benefits—in terms of improved efficiency—can go hand in hand with improved firm performance and competitiveness, making countries and firms more resilient to shocks.

Countries must take these megatrends into account when designing recovery strategies: As these megatrends continue to intensify, countries will need to adapt and strategically engage with them. Countries will only be able to acclimate and take advantage of these megatrends if they invest in the accumulation of production capabilities within the framework of a diversified manufacturing sector.

Key Finding 4.

Building back better will require new approaches to industrial policies and coordinated action by the international community

To build back better, post-pandemic recovery must move beyond ‘business as usual’ and pursue a more sustainable and safer path of development: Aligning industrial policies with the building back better narrative implies putting these policies to work to achieve the sustainable development goals (SDGs), taking into account the megatrends that are likely to shape the future of industrialization, as well as the tangible risk of global disasters such as the COVID-19 pandemic. Domestic efforts alone will not suffice to build back better, and the international community is therefore called upon to strengthen its efforts in supporting the most vulnerable countries around the world.

Industrial greening should lie at the core of post-COVID-19 recovery programmes: The greening of industry must be the cornerstone of all post-COVID-19 recovery plans. This can be achieved by adopting sustainability standards for the production of industrial goods, the introduction of low carbon technologies and the implementation, more broadly, of policies to stimulate demand for low carbon technologies and “green skills”.

Industrial policies should promote social inclusiveness: Industrial policies should also promote a socially inclusive development. This, in the current context, means paying special attention to those who have been more vulnerable in the face of the pandemic, helping them recover in the short term and supporting them by strengthening their resilience in the medium- to long term. Socially inclusive industrial policies should aim at creating jobs and increasing the participation of informal workers, youth and women in the manufacturing sector.

Industrial policies should support the digitalization of manufacturing: The speed at which countries achieve advanced digitalization hinges heavily on their existing capabilities. For DEIEs which only have some basic industrial capabilities in place, the goal should be to explore ways to adopt digital applications across sectors, seeking potential avenues for leapfrogging. This involves industries that primarily are users of digital technologies—such as agro-industry, consumer goods, chemicals and pharmaceuticals—and those that are suppliers, such as capital goods and information and communication technologies (ICTs). Industrial policy must strategically exploit such “pull” and “push” pressures. .

Industrial policies should integrate planning for resilience and risk management: One important lesson the pandemic has taught us is that countries need to build and strengthen their resilience to risks associated with extreme events. Post-pandemic industrial policies thus need to integrate planning for resilience and risk management. The biggest risk is losing years of industrialization efforts to one major external shock.

Calling on the international community for action: The global nature of the economic crisis resulting from the COVID-19 pandemic highlights that without renewed commitments to strengthen multilateralism, national efforts to build back better will be insufficient and may make countries’ recovery fragile, uneven and uncertain. The IDR 2022 calls on the international community to actively engage in building a better post-COVID-19 future. The proposals highlighted in the illustration below articulate concrete steps in this direction. The illustration distinguishes between short-term actions to be taken to alleviate the pandemic’s economic and social effects, and measures to be implemented over the longer term, which are geared towards building back better through inclusive and sustainable development. These proposed actions are inspired by the analysis of the data presented throughout the report and by the discussions held at UNIDO’s High-Level Expert Group Consultation in May 2021.¹ With this urgent appeal, the report seeks to guide the post-pandemic recovery and to contribute to the mobilization of necessary efforts to achieve the 2030 Agenda for Sustainable Development.

Building Back Better:

A Call For Action to the International Community –
to Support an Inclusive, Sustainable and Resilient Industrial Recovery



Priorities for the Short Term

Support global efforts to contain COVID-19 and ensure that the fight against the pandemic and subsequent recovery leaves no one behind.

Address vaccine rollout and access, ensuring global protection against COVID-19

- Accelerate production and deployment of COVID-19 vaccines, especially to developing countries
- Eliminate export restrictions on ingredients essential to COVID-19 vaccines and medications
- Expand technology transfer commitments to increase the global manufacturing capacity of the vaccines and treatments



Goals for the Medium to Long Term

Coordinate global efforts to address future development challenges and ensure that the world builds back better through inclusive and sustainable means.

Expand the policy space

- Promote recapitalization of development banks
- Facilitate developing countries' efforts to expand fiscal space needed for recovery packages

Strengthen government capabilities

- Assist governments in design of SDG-oriented industrial strategies
- Support revitalization of synergistic partnerships with the private sector
- Support sustained, long-term investments in public institutions

Tackle digital divides

- Support establishment of an international programme that creates and shares knowledge of advanced digital production technologies
- Scale investment and strengthen domestic capacities in digital infrastructure, education, skills and R&D

Foster a green transition

- Scale investments in industrial decarbonization, energy switching and circular economy principles
- Facilitate global access to green technologies
- Foster partnerships created to fight COVID-19

Promote local industrial resilience

- Foster opportunities for local production capabilities in health-related strategic goods and devices
- Integrate crisis resilience, risk management and socio-economic goals into industrial policy practices

Implications for UNIDO operations:

Supporting an Inclusive, Sustainable and Resilient Industrial Recovery²

UNIDO has proactively responded to the COVID-19 crisis, ensuring the continuity of its services and tailored assistance to Member States. The Organization has developed several initiatives to directly address the twin health and economic crisis unleashed by the pandemic. These initiatives include the Global Health Industry Initiative and the COVID-19 Industrial Recovery Programme (CIRP).³ Building on these programmes, the UNIDO Medium-Term Programme Framework (MTPF) 2022–2025 includes a special initiative that focuses on socio-economic recovery and the operationalization of the Organization’s COVID-19 response and recovery framework.

As the global economy begins its path towards recovery, UNIDO stands ready to respond to the international call for action building on its longstanding expertise in promoting inclusive and sustainable industrial development (ISID):

- **Strengthening government capabilities:** In line with the MTPF 2022–2025, UNIDO will continue leveraging its expertise in normative, convening and policy assistance functions to strengthen institutional capacities in Member States. To this end, UNIDO is exploring the prospect for establishing a multilateral industrial policy forum. As national challenges are increasingly being compounded by global ones, such as climate change and the COVID-19 pandemic, the forum will facilitate multilateral policy dialogue and knowledge sharing on industrial policy issues. In addition, capability-building cuts across all of the Organization’s activities. For instance, the Programme for Country Partnership (PCP) and the Country Programmes (CPs) combine technical cooperation and convening functions with policy advice and normative services. Fully aligned with national

development agendas, the PCPs and CPs support both capacity-building in industrial policy design and implementation, and institutional capacities. UNIDO is also revamping its support to Member States in technology foresight activities, with the Organization recently having been recognized by the G20 for its capacity to contribute to agile governance through technology foresight.

- **Tackling digital divides:** UNIDO supports its Member States in boosting innovation ecosystems and achieving a digital, gender-responsive and sustainable process of structural change. Operationally, the Organization supports digital transformation through technology transfer, including the automation of production processes; e-commerce tools; and enterprise management practices—technologies that can help SMEs join and upgrade in GVCs. Capacity-building, training and skill development are also central to the Organization’s activities.⁴ In this regard, UNIDO will continue leveraging virtual e-learning platforms and webinars to maintain continuity in its technical assistance delivery and to ensure interventions can be effectively upscaled. Looking forward, UNIDO is currently elaborating a strategic framework for the Fourth Industrial Revolution (4IR)—*Making the Fourth Industrial Revolution Work for All*—to respond to the needs of Member States in the aftermath of the pandemic, taking regional and national contexts into account.⁵ Since considerable investments are required for DEIEs to navigate the 4IR, the Organization is also fast-tracking the launch of a digital investment promotion portal to connect businesses, including SMEs, to domestic, regional and global investors. UNIDO places special emphasis on facilitating investment in women-led enterprises and on promoting gender inclusivity more generally within its Member States’ 4IR ecosystems.⁶
- **Fostering a green transition:** UNIDO leverages its expertise in renewable energy and energy efficiency; circular economy; decarbonization; and emission reduction to support Member States in unlocking opportunities for resilient, carbon-neutral and circular growth. The Organization’s approach to industrial greening builds on technology transfers in cleaner and resource-efficient production; providing education and training; and designing green industrial policies. Multi-stakeholder discussions and exchanges are also crucial.⁷ Synergies and complementarities exist between industrial greening and economic competitiveness. UNIDO is currently expanding its circular economy and industrial decarbonization programmes with a focus on value chains and the creation of new industries, supporting employment creation, economic development and competitiveness, pollution mitigation and

stronger climate action. Synergies also exist between greening and digitalization. To address the interlinked challenges of climate change, biodiversity loss and pollution, on the one hand, and the paradigm change associated with ADP technologies, on the other, UNIDO leverages its unique joint expertise in sustainability and innovation to sustain the transition towards a green and digital industrial sector. Targeted initiatives aimed at strengthening innovation ecosystems, the diffusion of cleantech and access to green financing are crucial, particularly for SMEs. Smart factories are also a promising avenue, given the potential reduction in carbon emissions and efficiency improvements gained through cyber-physical processes.⁸

- **Promoting local industrial resilience:** In the aftermath of the COVID-19 pandemic, upscaling manufacturing capacities in DEIEs' health and medical products industries has become an urgent economic, political and security priority. Building on the experience acquired in the context of the Local Pharmaceutical Production Programme (LPP), the Global Health Industry Initiative aims to address this gap. The Initiative seeks to strengthen industrial capabilities in the medical and pharmaceutical industries to support recovery and long-term resilience worldwide.⁹ Beyond providing direct support for health-related strategic industries, UNIDO will also foster industrial resilience by expanding its programmatic commitment towards strengthening quality infrastructure for trade facilitation and market access in DEIEs—an area where the Organization has successfully positioned itself as a global leader, supporting agenda-setting, the promotion of best practices, fostering regional and global policies, and assisting in the preparation of norms and standards.¹⁰

Partnerships are key to achieving strong recovery, ISID and the SDGs: Partnerships underpin all efforts in the context of the international call for action. The Organization's ability to achieve results at scale critically hinges on partnership-reliant planning and implementation. Collaboration with multilateral environmental funds, financial institutions and the private sector helps leverage complementary expertise, technology and financial resources for ISID. For instance, UNIDO supports its Member States in fostering a green transition building on its partnerships with the Global Environment Facility (GEF), the Green Climate Fund (GCF) and the Adaptation Fund (AF). Partnerships also enable the financing and scaling up of project interventions through technical assistance, awareness raising, policy development and implementation, and

innovation and technology demonstrations. The PCPs and CPs provide the framework for these strategic partnerships, as do South-South and triangular industrial cooperation. PCPs place particular emphasis on synergies between national and international initiatives, contributing to coordinating actions towards achieving the SDGs. Going forward, UNIDO intends to continue strengthening its collaboration with partners at the country, regional and global levels to support an inclusive and sustainable recovery. As part of these efforts, UNIDO plans to expand its network and collaboration with other international organizations, including in the areas of policy advice and normative outputs¹¹, building on the comparative advantages of each to ensure coordinated actions and systemic solutions. This includes partnerships through the global portfolio of PCPs and CPs, which serve as the Organization's integrated, programmatic response to countries' socio-economic recovery efforts from COVID-19. UNIDO will also continue facilitating mutual learning and experience sharing among current PCP countries, as well as those interested in the PCP model.

Endnotes

- 1 The following experts participated in this consultation process: Luciano Coutinho, Xiaolan Fu, Justin Yifu Lin, Carlos Lopes, Mariana Mazzucato, Célestin Monga, José Antonio Ocampo, Izumi Ohno, Jeffrey Sachs, Kunal Sen, Luc Soete and Joseph E. Stiglitz.
- 2 This section benefited from inputs provided by the UNIDO Directorates of Digitalization, Technology and Agribusiness (DTA); Environment and Energy (EAE); and Programmes, Partnerships and Field Coordination (PFC). Special thanks go to UNIDO staff Vladimir Anastasov, Akos Koeszegvary, Jaime Moll De Alba, and Alejandro Rivera for submitting these inputs and providing suggestions on how to best integrate them.
- 3 CIRP offers a phased approach to industrial recovery that focuses primarily on supporting post-COVID recovery in DEIEs. It consists of five steps: (i) assessment and analysis of the impact of COVID-19 on the industrial sector; (ii) consensus building; (iii) developing a national industrial recovery plan; (iv) piloting national industrial sector recovery, and (v) replicating successful pilots to achieve national industrial sector recovery.
- 4 UNIDO has expanded the scope of its capacity-building tools, such as UNIDO's Knowledge Hub and the Learning and Knowledge Development Facility, to include topics such as Industry 4.0; e-commerce; innovation management; impact investing; and quality infrastructure.
- 5 *Making the Fourth Industrial Revolution Work for All* focuses on five key drivers for digital transformation in industries: skills and capacity-building; digital transformation of firms; innovation ecosystems; access to finance, partnerships, investment and infrastructure; governance, technology and innovation policies.
- 6 This goal can be achieved by supporting firms in developing mentorship and training programmes, and in setting recruitment and retention targets as well as accountability mechanisms. Data collection is also crucial to these efforts.
- 7 These can be promoted through projects and programmes as well as through international forums, such as the Vienna Energy Forum (VEF) and the Global Alliance on Circular Economy and Resource Efficiency (GACERE).
- 8 UNIDO has already developed several pilot centres for smart manufacturing, including sites in Belarus, China and with others to follow.

- 9 As part of this initiative, UNIDO will provide several services towards enhancing local manufacturing capacities in the medical and pharmaceutical industries, such as policy and research; technology transfer and investment promotion; upgrading standards and quality infrastructure; skills development and knowledge sharing; and medical waste management. The Initiative also includes the establishment of a Global Biomedical Industrial Centre in cooperation with the Ministry of Industry and Advanced Technology of the United Arab Emirates.
- 10 To support policymaking and capacity-building among DEIEs, the Organization has developed global knowledge tools such as the Quality Policy Guiding principles, Laboratory Policy for development and implementation, the Quality Infrastructure for Sustainable Development (QI4SD) Index, among others.
- 11 Examples include UNIDO's cooperation with the University of Cambridge through the Global Initiative for Future Industrial Safety (GIFIS) and policy development for the Fourth Industrial Revolution in the Asia-Pacific region; the International Labour Organization (ILO) through a joint assessment to determine the 4IR readiness of Cambodia's garment, footwear and travel goods (GFT) industry; the Organisation for Economic Co-operation and Development (OECD) and the Institute for Management Development (IMD) through the development of a "digital index" to measure the digital readiness of SMEs across the world and make business decisions accordingly; the International Training Centre of the International Labour Organization (ITC-ILO), the United Nations Conference on Trade and Development (UNCTAD), the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLS), the Enhanced Integrated Framework (EIF) and the World Association of Investment Promotion Agencies (WAIPA) through an interagency effort to provide targeted capacity-building activities for least developed countries (LDCs) to assist them in attracting foreign direct investment during the challenging context of the COVID-19 crisis; the UN Technology Bank for Least Developed Countries (UNTB LDCs) through the development of a programme aimed at developing joint technical projects to support LDCs' access to 4IR technologies and the integration of these technologies within priority sectors.

Printed in Austria
November 2021

“This report provides a comprehensive analysis and valuable new evidence on the impact of the COVID-19 pandemic and the importance of industrial capabilities and digitalization in mitigating the negative impact of the pandemic and in strengthening resilience for post-pandemic recovery. It highlights the role of digital transformation, international coordination and global cooperation of industrial policy for building back better for all. The report is an important, timely and visionary guide for governments and policymakers at various levels to develop an effective solution for a more inclusive, resilient and sustainable development in the post-pandemic world.”

Xiaolan Fu, University of Oxford

“UNIDO brilliantly underpins policy responses and the contributions of the industrial sector in overcoming the challenges of the COVID-19 crisis. An endemic SARS CoV-2 can lead to recurrent aggressive variants, particularly if less developed countries do not receive massive immunization assistance. Long-term economic growth is also threatened by the jump in poverty and underemployment, foreshadowing a deepening of the social, industrial and digital divide between developed and developing societies. More than ever, international cooperation for both a broad, post-pandemic recovery of investments in sustainable energy and infrastructure as well as increased digitalized industrial development is essential to socially equitable and sustainable global growth.”

Luciano Coutinho, University of Campinas



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