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Thematic Report 2: Green Transition

The next frontier of China's Ecological Civilization

Designing integrated development pathways for human and planetary well-being

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Executive Summary

China's development progress over the last four decades has been extraordinary, lifting nearly 800 million people out of extreme poverty, making it the first country to move from low to high human development status, as measured by UNDP's Human Development Index (HDI).[1] Yet while the traditional model of development helped to advance the economy, it also precipitated serious ecological and environmental degradation. This was particularly true in the early decades of reform, when growth was driven largely by rapid industrialization and accompanying urbanization. Despite bringing substantial socio-economic gains, this placed growing pressure on the environment and natural systems underpinning human development.

Accounting for planetary pressures exerted by human activities, China's human development progress today is increasingly compromised. As of the latest Human Development Report, the Planetary pressures-Adjusted Human Development Index (PHDI) is nearly 20% lower than the headline Human Development Index (HDI). Economic growth is also constrained by natural-capital depletion and rising inequality. China is not alone in this regard: countries in the "high HDI" category record an average human development loss of 12.9% when planetary pressures are factored in. This points to a systemic challenge that transcends any single country's development path.[2]

Recognizing these mounting challenges, the Chinese government has made a significant pivot, articulated in a new green development strategy, with the ambition to reconcile continued economic growth, human development, and environmental sustainability. It has charted a course toward implementation of its new approach, framed within a guiding vision of Ecological Civilization. This fundamental shift has the objective of setting China on a development path where nature is seen as an asset and a critical foundation for long-term prosperity, rather than an afterthought or casualty of growth.

The concept of Ecological Civilization has steadily permeated China's development planning, culminating in its inclusion in the party and state constitutions. This paves the way for further wide-reaching policy reforms and institutional innovations that facilitate and accelerate the transition toward a green and inclusive economy. At the 20th Party Congress in 2022, achieving

"modernization in harmony between humans and nature" was explicitly recognized as a key component of Chinese modernization by 2035. This vision is embedded in relevant initiatives and pledges, from Beautiful China and Healthy China 2030, to the "dual carbon" goals, and is further articulated in the 15th Five-Year Plan.[3] Accompanying the evolution of policy, breakthroughs have been made in the national environmental legislative and inspection system, strengthening local coordination and accountability.

China's resolve to promote Ecological Civilization and accelerate its shift to a green economy has also benefitted from favourable external conditions, namely, important advances in green technologies. Moreover, a nascent shift in global markets and investment into green businesses and technological development has further contributed to the alignment of the economic argument in support of the green transition with the existing set of incentives at national and local levels.

China's pivot toward a green economic transformation has produced significant results as measured by economic and environmental indicators. Since 2012, energy consumption per unit of GDP fell by 26.8% and carbon dioxide emissions per unit of GDP by more than 35%, amid an average growth of more than 6%. This demonstrates an accelerating decoupling of economic output from energy. In the first half of 2026, renewable energy accounted for 41.2% of China's total power generation.[4] Pollution prevention and ecological restoration have also produced measurable results. In 2025, the national average PM2.5 concentration in cities at prefecture level and above fell to 28.0 micrograms per cubic metre, while 91.4% of monitored surface-water sections met Grade I–III standards. [5]

However, as the construction of Ecological Civilization continues to advance, new developments have emerged that complicate efforts to achieve its intended goals of enhancing human well-being and safeguarding planetary ecological health. Although the momentum for continued transformation persists, the transition toward sustainable development does not follow a linear trajectory. Against the backdrop of evolving domestic and international circumstances, new challenges and tensions continue to emerge. China therefore needs to move beyond a primary focus on green growth and environmental protection by systematically integrating social dimensions into its development agenda, adopting a holistic approach to governance, and accelerating the comprehensive green transformation of its economy and society.

This report spotlights the following channels that showcase ongoing tensions between economic growth, prosperity, and the well-being of current and future generations, as well as the achievement of environmental goals.

First, meeting China's ambitious development milestones will require continued industrial growth, which may put pressure on achieving net-zero emissions targets while generating other adverse environmental impacts. Although coal's share of the electricity supply mix fell below 50% for the first time in the first half of 2026, risks of a slowdown in the transition and rising transition costs have also emerged. "Green" sectors, moreover, are not automatically nature-positive or green when assessed across their entire value chain or life cycle. Digital technologies and artificial intelligence (AI)—while offering potential pathways to a green transformation—may exacerbate climate and environmental risks, particularly given the water and energy intensity of data centres. Finally, environmental sustainability requires not only cleaner production and technological efficiency, but also major shifts in consumption patterns, lifestyles, and material demand, given expectations around the rising middle class, and likely changes in consumption by an aging population.

Second, social challenges are also reflected in the direct social, health, and livelihood impacts of pollution, climate, and environmental problems, and in the direct and indirect costs imposed by transition policies. The energy transition, restructuring of carbon-intensive industries, and environmental protection affect employment, livelihoods, and energy access or costs for some groups. Others may be indirectly affected through changing livelihood opportunities. Unequally distributed benefits and costs within or across groups and communities, sectors, and regions, risk further disadvantaging or leaving behind already vulnerable parts of the population. While groups are affected differently, it is often those most vulnerable to direct impacts of environmental degradation, or already vulnerable for other reasons, who bear the heaviest costs of transition policies. They may be less able to access information, skills, and alternative economic opportunities, and have limited access to social protection.

Third, overcoming the entrenched reliance on GDP growth as the primary metric of development performance remains a challenge. While GDP serves an important purpose, its dominance is increasingly questioned as it is ill-suited to guiding policies for sustainable development. Without a shift in the nature of development, GDP growth may even coincide with declines in human

well-being and the health of the biosphere, creating a misalignment between what is measured and what matters, while potentially fostering incentives toward resource overuse and depletion.[6]

Finally, China's development trajectory has direct international linkages and impacts through its trade, supply chains, international investment, and development assistance. Given the complexity, interconnections, and spillover effects of development challenges globally, international cooperation must remain central to a global green transformation. China's development path has the potential to offer a globally significant example of how green transformation can align with continued advances in human development and well-being. Its experience can generate valuable lessons for other countries, particularly developing economies pursuing transformation under different national conditions.

Recognizing China's considerable advances toward a green economic transition, this report considers how China can more systematically align ecological sustainability, social inclusion, and economic opportunity, as well as the policy and institutions needed to translate this integrated vision into practice. Based on the analysis of potential bottlenecks and emerging fault lines, it highlights areas that would benefit from greater attention as China advances Ecological Civilization and the green transition. More specifically, it assesses the social and economic underpinnings of a just green transformation, examining China's progress through a social lens, and identifying emerging fault lines that may hinder continued progress.

This report makes the case that social considerations should be treated not primarily as risks or costs of green transition, but as integral to its success and to improving human well-being. Social, economic, and environmental systems are mutually reinforcing, and challenges such as demographic shifts, employment dislocation, ill-health, and rising inequalities are not just incidental hazards. They are structurally intertwined with environmental crises and must be addressed in tandem. For China, these considerations become particularly significant in light of the multiple systemic transitions the country faces, including an aging population and the impact of frontier technologies such as AI.

Treating social dynamics not as residual concerns, but as integral to a successful green transition, is thus essential to support a more systemic, people-centred, and politically feasible trajectory toward harmony between humans and nature and the achievement of Ecological Civilization.

An inclusive socio-economic and environmental lens for policy planning and implementation also points to the need for alternative frames and metrics that recognize the interdependencies between a healthy environment, inclusive society, and economic opportunity, and that guide ways to integrate them. Operationalizing such an approach will require context-specific choices that consider trade-offs and synergies between goals, with the aim of identifying effective, equitable paths to a sustainable society. This calls for integrating governance across sectors and levels, aligning environmental, industrial, fiscal, social, and employment objectives, while managing trade-offs and co-benefits. In addition, measures of progress must extend beyond GDP to better reflect human and planetary well-being, and strengthen incentives for long-term, inclusive, and sustainable development.

In conclusion, the report makes the following recommendations:

Recommendation 1: Further integrate social concerns into the green transition strategy, treating them as necessary investments in achieving a just transition rather than as costs or risks. This would include investments in social infrastructure and policies, strengthening safety nets for those negatively impacted, shifting consumption, and enhancing public support for ambitious environmental goals. A more equitable distribution of costs and benefits of the green transformation will involve both targeted social protection and active labour-market interventions, including job creation, skills training, and social benefits for groups most directly impacted, along with fiscal redistribution and support to local governments to enable affected regions to finance the transition.

Recommendation 2: Strengthen integrated cross-sectoral, multi-level planning and coordination to support effective policy implementation. China has increasingly adopted system-wide approaches with strong national target-setting, but local implementation can still be fragmented across environmental, industrial, fiscal, social, and employment policy domains. Stronger coordination mechanisms and aligned incentives across sectors and levels, clear fiscal responsibilities and support, budget systems capable of financing activities with long-term ecological and social returns, and outcome-based accountability and evaluation systems can support implementation, manage trade-offs, and capture co-benefits.

Recommendation 3: Extend measures of progress beyond GDP. Progress depends, to a large extent, on what is valued and how this is measured. China has already broadened its indicator frameworks through high-quality development and ecological indicators. Further complementing GDP with comprehensive wealth, the Planetary Pressures-Adjusted Human Development Index, and well-being measures would strengthen incentives for long-term, inclusive, and sustainable development. Applying these as key indicators to measure performance across government entities at central and subnational levels would streamline accountability architecture and incentivize the above systems.

Recommendation 4: In its international engagement, China should seek to better balance social, labour, and environmental goals alongside economic and security interests including in critical mineral, technological, and other supply chains. Policies should include strengthening and enforcing ESG standards, and supporting low-income economies in developing the productive capabilities, infrastructure, and technologies to achieve a low-carbon shift, minimizing trade tensions and strengthening multilateral cooperation.

Key words: Just Transition; Human Development and Planetary Wellbeing; Policy integration; Policy Coherence; Beyond GDP

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1. China's Vision and Progress: Toward a Green Transformation

China's development progress over the last four decades has been extraordinary, lifting nearly 800 million people out of extreme poverty,[7] making it the first country to move from low to high human development status, as measured by UNDP's Human Development Index (HDI).[8] However, the traditional model of economic development has also come at the cost of severe ecological and environmental degradation. Particularly in the early decades of the reform and opening period, growth was driven largely by rapid industrialization and accompanying urbanization, bringing substantial socio-economic gains while also placing growing pressure on the environment and the natural systems that underpin long-term prosperity.

The government initially responded to the harmful ecological impacts of economic activity, recognizing that it was hindering both economic development and improvements in population health and well-being. Steps were taken to address issues including deforestation, land degradation, environmental health impacts, and air pollution. Improvements, however, have been insufficient to counter the ecological impacts of continued rapid economic growth. Accounting for planetary pressures exerted by human activities, China's human development progress is increasingly compromised. As of the latest Human Development Report, the Planetary Pressures-Adjusted Human Development Index (PHDI) is nearly 20% lower than the headline Human Development Index (HDI).[9] Economic growth is also compromised by natural-capital depletion and rising inequality.[10] China is not alone in this regard: countries in the high HDI category record an average human development loss of 12.9% when planetary pressures are factored in,[11] pointing to a systemic challenge that transcends any single country's development path.

1.1 Realizing a Green Transition: Policies, Incentives, and Governance Systems

Recognizing these mounting challenges, the Chinese government has made a significant pivot over the past decade, articulating a green development strategy and charting a course toward its implementation. Framing this approach within the guiding vision of Ecological Civilization, the ambition is to reconcile continued economic growth, human development, and environmental sustainability. The new framing underscores a fundamental shift, with the objective of setting China on a development path where nature is seen as an asset and a critical foundation for long-term prosperity, rather than an afterthought or casualty of growth.

The concept of Ecological Civilization has steadily permeated China's development planning, particularly since the mid-2000s, culminating in its inclusion in the Party Constitution in 2012 and the State Constitution in 2018. The promotion of President Xi Jinping's iconic statement that "clear waters and lush mountains are invaluable assets" reinforces the idea that "green is gold," and emphasizes the synergies between environmental protection and

economic development, rather than focusing on the trade-offs between them. This transformation in understanding has led to breakthroughs in action, with a number of overlapping policies and initiatives aiming to promote protection of nature and the environment and achieve "common prosperity" through a green low-carbon economic growth strategy.

Relevant initiatives include Beautiful China, introduced by the 18th National Congress of the Chinese Communist Party (CPC), in 2012; Healthy China 2030, launched in 2016; and Rural Revitalization, launched in 2017. In addition, the announcement of China's ambitious "dual-carbon" goals by President Xi at the 75th session of the United Nations General Assembly in September 2020 took the world by surprise. The goals' objectives of carbon peaking before 2030 and neutrality before 2060 build on the construct of Ecological Civilization. Carbon neutrality signifies a profound shift in China's industrial development model and a critical step in its pursuit of sustainable development. At the 20th Party Congress in 2022, achieving "modernization in harmony between humans and nature" was explicitly recognized as key to Chinese modernization by 2035[12] and further articulated in the 15th Five-Year Plan.

Alongside this vision of a more sustainable development path, a comprehensive institutional and policy framework is being developed to incentivize and facilitate national and local stakeholders in moving toward Ecological Civilization. Reforms range from the 2015 Integrated Reform Plan for Promoting Ecological Progress and the establishment of the Ministry of Ecology and Environment (MEE) in 2018, replacing the previous Ministry of Environmental Protection.[13]

Accompanying the evolution of policy and institutions, breakthroughs have also been made in the national environmental legislation and inspection system, strengthening local coordination and accountability. In 2026 China adopted its Ecological and Environmental Code,[14] while as of the end of 2024, the court system—led by the Environmental Resources Division of the Supreme People's Court—had established a nationwide network of 2,424 specialized environmental and resources adjudication bodies.[15] Different types of responsibility and accountability mechanisms have been established. These include the mandatory systems of ecological protection redlines[①] and of property rights over natural resource assets. It also includes incentive-based and guidance-oriented reforms in resource and environmental taxation, ecological compensation, and pilot programs for trading systems in rights to water, energy, pollution discharge, forestry, and carbon emissions.

Policy and institutional reforms have been paired with an expansion of market mechanisms. The national carbon emissions trading system (ETS) was extended to cover the steel, cement, and aluminum sectors in 2025. According to MEE, the scheme now covers more than 60% of China's carbon emissions.[16]

China's resolve to promote Ecological Civilization and accelerate its shift to a green economy has also benefitted from favourable external conditions. It has coincided with significant advances in green technologies and a nascent shift in global markets and investment into green businesses, as well as technological development. In

[①] China's ecological protection redline system, also referred to as the Ecological Redlines (生态保护红线), is a binding spatial-control mechanism for areas with vital ecological functions or high ecological sensitivity.

sum the growing economic arguments both domestically and internationally in support of the green transition have aligned with existing incentives at national and local levels.

1.2 Breakthrough and Achievements

China's pivot toward a green economic transformation has produced significant results, as measured by economic and environmental indicators. Since 2012, the country has sustained an average annual economic growth of more than 6%, while energy consumption only grew by around 3% a year. Over the same period, energy consumption per unit of GDP fell by 26.8% and carbon dioxide emissions per unit of GDP by more than 35%, demonstrating an accelerating relative decoupling of economic output from energy.[17] Clean-energy sectors were estimated to account for about 11.4% of China's GDP in 2025.[18] In the first half of 2026, renewable energy accounted for 41.2% of China's total power generation, while its combined installed capacity of wind and solar power had already surpassed the 1.2 billion kilowatt target for 2030 in 2024, six years ahead of schedule.[19] Pollution prevention and ecological restoration have also produced measurable results. In 2025, the national average PM2.5 concentration in cities at prefecture level and above fell to 28.0 micrograms per cubic metre, while 91.4% of monitored surface-water sections met Grade I–III standards. By the end of the 14th Five-Year Plan period, forest cover had risen to over 25%, from about 20% in the early 2010s.[20] Ecological conservation red lines now apply to more than 30% of China's land area.[21]

These changes undoubtedly contribute to broader socio-economic benefits: cleaner air is shown to improve people's health, labour productivity, and capacity to work and learn, while ecological restoration, when appropriately linked to rural livelihoods and income diversification, has the potential to strengthen local resilience, enhance ecosystem services, and support the goals of Rural Revitalization.[22]

These achievements provide a strong foundation for the next phase of Ecological Civilization. The central challenge is now to sustain and build on this progress by more systematically integrating environmental sustainability, social inclusion, human well-being, and economic opportunity.

2. Emerging Fault Lines and Impediments to Continued Progress toward Ecological Civilization

Despite major adjustments to China' development strategy, deep-seated tensions and contradictions between economic, environmental, and social goals have become increasingly apparent. At present, these goals are still largely pursued in isolation, posing significant obstacles to the green transition.

At the policy design level, the low-carbon transition is framed principally as a challenge of technological innovation and substitution, improved economic efficiency, enhanced productivity, and optimized resource allocation, driven by industrial policies that support low-carbon industries and sectors. However, substantial changes in social and consumption paradigms have yet to take place. As the climate crisis gains urgency on policy agendas, people's livelihoods, jobs, and well-being are increasingly viewed in part as drivers of the climate emergency (through demography and consumption channels), and in part as social risks to be managed. The detrimental consequences of transition policies may thus demand mitigation, adaptation, or protection, whether of the environment or of people. Traditionally, such interventions have often been framed as costs, both in financial terms and in terms of their perceived potential to slow down the implementation of climate action, environmental protection, green transition, and growth policies.

A growth-driven and largely siloed approach thus risks ignoring key structural fault lines, whether social or ecological, generating obstacles to the transformative shifts required to achieve China's long-term climate goals and its vision of Ecological Civilization. Pursuing carbon neutrality in isolation from broader environmental, economic, and social goals will run into diminishing returns and ecological, social, or distributional limits.

Furthermore, while momentum for continuing progress exists, pathways to sustainability are not linear and, with changing domestic and external conditions, new challenges or fault lines are emerging. As China continues its pursuit of a green transformation, its strategy will need to expand beyond an emphasis on green growth and environmental protection, and factor in social elements more systematically as part of a holistic approach. A fundamental shift in perspective is required: such social expenditures should be viewed as necessary investments in people and nature, incorporated into transition planning from the outset as an integral and foundational component of the green transition, rather than treated as an option for remedial action after the fact.

In the remainder of this chapter, we elaborate on these fault lines through five interrelated lenses: the environment (Section 2.1); the social and distributional pressures arising from the transition (Section 2.2); the governance and implementation gaps between integrated vision and delivery (Section 2.3); the misalignments between measurements, incentives, and development outcomes (Section 2.4); and the international implications and spillovers of China's development pathway (Section 2.5).

2.1 Environmental Fault Lines: Tensions Between GDP and "Green" Transition

Meeting China's ambitious development milestones for modernization and per capita GDP requires continued growth through industrialization.[②,23] The 15th Five-Year Plan reaffirms the centrality of manufacturing, pairing the upgrading of traditional industries with new frontiers in advanced and sustainable industrial systems. China's carbon neutrality pathways are not designed to translate into deindustrialization; rather the government envisions a fundamental restructuring of the manufacturing sector in terms of organizational structure, energy and material inputs, production processes, outputs, recycling, and reprocessing, thus changing both *how* products are manufactured and *what* is produced.

The UNEP Global Environment Outlook 7 (GEO-7)[24] suggests, however, that current policy trajectories to achieve the set milestones risk undershooting net-zero commitments at the global level. It calls for greater policy alignment to address persistent tensions between economic and environmental priorities, on top of the social trade-offs discussed in Section 2.2. Long-term global climate ambitions would require steep and front-loaded emissions cuts (roughly 42% from 2019, implying an earlier peak and deeper fall afterward); rapid phase-down of coal use in power and industry; and accelerated deployment of clean electricity, electrification, and industrial fuel-switching.

The following channels highlight ongoing tensions between economic growth and the achievement of environmental goals. The first two link to the current structure of the economy, while the second two relate to future demand.

First, the high share of coal-fired power and the large scale of China's industrial sector pose risks of a slower and more costly transition. Current policies prioritize incremental improvements and incentive-based measures, but this approach risks increasing aggregate emissions, creating stranded assets, delaying investment in clean energy alternatives, and narrowing the window for transition, ultimately driving up the total cost of a system-wide transition. Despite falling from 68.5% in 2012, coal is likely to continue to represent a high share of energy consumption by 2035 (41.9%),[25] while the government targets 40% of total output value of China's manufacturing industry coming from green factories by 2030.[26] In addition, a combination of path dependence, vested interests,[27] and the 2030 carbon peak set without an absolute emissions cap, continue to incentivize the coal power industry. In 2025, China commissioned 78 GW of additional coal power capacity, the highest level in the past decade. This is despite wind and solar deployment absorbing 94% of net growth in power demand.[28]

While the share of coal-fired power in total installed capacity continues to decline, coal-fired power capacity and the number of new coal power projects continue to grow. This illustrates how infrastructure, industrial

② Critical long-term development goals as stated by the government are to essentially realize socialist modernization by 2035, with per-capita GDP reaching the level of moderately developed countries, and to achieve the second centenary goal of building a great modern socialist country in all respects by 2049.

systems, and institutional arrangements can constrain future policy choices and raise long-term adjustment costs, creating self-reinforcing inertia in carbon-intensive systems.[29] In practice, the current approach, which prioritizes incremental improvements within existing systems, may appear cost-effective in the short term, but cumulatively increases system costs over time through higher aggregate emissions, stranded assets, delayed investment in clean alternatives, and compressed transition windows.[30]

In addition, evidence from coal-dependent regions in China suggests that concerns over employment stability, fiscal revenues, and local economic growth are delaying the implementation of transition measures,[31] particularly where alternative industries remain underdeveloped. In some of China's resource-dependent regions, local governments are heavily dependent on coal-related tax revenues and industrial activity, creating incentives to prolong existing development pathways, rather than accelerate structural transformation.[32]
This points to the importance of long-term integrated planning for energy and industry sector transitions, in order to avoid high-carbon lock-in, reduce losses from stranded assets, and minimize additional socio-economic and environmental costs.[33]

Second, "green" sectors are not automatically nature-positive or green when assessed across their entire life cycle. The extraction and processing of critical minerals for clean energy (such as rare earths for wind turbines and electric vehicles) can be highly resource-intensive and polluting, generating hazardous waste and toxic byproducts, which can affect both the livelihoods of the local communities and ecosystems.[34] This is seen particularly in Inner Mongolia[35] although China's global supply chain is a wider source of environmental degradation, particularly in mineral-rich regions such as sub-Saharan Africa and parts of Southeast Asia. In addition, trade-offs between renewable infrastructure installations and ecosystem protection exist, particularly for large-scale solar, wind, or other renewable power infrastructure. It is therefore imperative to move decisively beyond conventional development thinking and accelerate the comprehensive green transition under the Ecological Civilization paradigm, avoiding the replacement of one set of environmental pressures (fossil fuel emissions) with another (resource depletion, waste, and pollution).

Third, new frontier sectors, such as the rapid development and deployment of artificial intelligence (AI), may create additional climate and environmental risks. These stem from the water and energy intensity of AI, particularly when relying on fossil fuel-based grids. On a fuller measure that includes both cooling and power generation, AI's water footprint is projected to be equivalent to the basic domestic water needs of roughly 1.3 billion people by 2030. Globally, both water use for cooling and data-centre electricity demand could potentially double by 2030, heightening risks in water-scarce regions and electricity access amid finite resources.[36] China alone accounts for roughly 25% of global data-centre electricity use and most of the Asia-Pacific demand.[37]

Life-cycle impacts include mineral extraction for AI hardware (habitat loss, water contamination) and accelerating e-waste from short hardware cycles, the latter of which is projected to reach up to 2.5 million tonnes a year by 2030 and is largely processed in lower-income economies.[38] This reinforces the need to embed sustainability in production

processes from design to decommissioning.[39] Last but not least, high infrastructure costs and resource utilization associated with AI can disrupt or displace conservation priorities, as well as harm people's well-being through entrenched biases, potential exclusions, and infringements on personal data protection rights, generating the need for a people-centred and nature-positive approach to innovative technology deployment.[40]

Despite these risks, AI and new technologies also offer potential pathways to a green transformation and could be an important enabler of a low-carbon transition.[41] Zhang Y. (2026) argues that growing demand from data centres and computing infrastructure can create a stable, long-term source of market demand for renewable energy, accelerating investment in wind, solar, and other clean power systems. China is relatively advanced on this front.[42] National policy requires new data centres at national computing hub nodes to source more than 80% of their electricity from green power, with the share to be further increased, and 100%green power consumption encouraged where conditions allow.[43] AI can also improve energy efficiency, grid management, and industrial decarbonization, while supporting innovation in emerging green industries and business models.

Fourth, emerging consumption trends, driven in part by efforts to rebalance the economy, make a shift toward green consumption and lifestyles imperative. China's traditional development model has encouraged consumption patterns to converge towards Western-style consumerism. Rising middle-class consumer demands, while a sign of prosperity, risk hindering development in harmony with nature if pursued unchecked. Increasing consumption drives material and resource use faster than technological improvements can reduce them.[44] Efficiency gains alone are therefore insufficient to achieve sustainability, which requires not only cleaner production and technological efficiency, but also changes in consumption patterns, lifestyles, and material demand.[45] Recent scenario reviews further underline the difficulty of reducing overall energy and material throughput, while maintaining or increasing levels of welfare and service provision.[46]

China's middle class is now estimated to be about 400 million people, rising six-fold since the year 2000,[47] and is expected to double by the end of this decade.[48] Since the early 2000s, China's material footprint has remained high, propelled by urban construction booms, infrastructure investment, government procurement, and expanding household spending.[49] Given the scale both of China's economy and population, continued expansion of material consumption will push against hard ecological constraints, even under cleaner growth models, representing another structural fault line in the transition toward Ecological Civilization.

Interventions to foster green consumption have delivered some measurable results. In 2024, China's large-scale consumer-goods trade-in program supported the replacement of more than 62 million home appliances and 6.8 million vehicles. Products at the highest energy-efficiency level accounted for over 90% of appliance sales revenue, while more than 60% of replacement vehicles were new energy vehicles.[50] However, access remains uneven: evidence from rural households shows that lower-income households are less likely to purchase energy-efficient-labelled appliances, indicating persistent affordability barriers.[51]

In addition, rebound effects may persist, whereby improvements in efficiency and cost reduction translate into greater use or consumption, partially offsetting anticipated resource or emissions savings, as seen in the case of urban residential energy demand. [52] China's rapidly expanding e-commerce and instant-delivery economy illustrates this scale challenge. The express-delivery sector handled more than 175 billion parcels in 2024,[53] generating growing demand for both paper and plastic packaging. Plastic is a particular concern, in packaging and beyond. A material-flow analysis found that 44.4% of the express-delivery plastic packaging examined in 2020 to 2021 was incinerated, underscoring persistent limitations in separate collection and recycling.[54] Despite progress in recyclable packaging and packaging-efficiency measures, aggregate packaging demand and waste pressures may continue to increase, even where material intensity per package declines, so long as underlying consumption keeps expanding. At scale, rising demand risks outpacing efficiency gains, requiring stronger incentives or policy interventions to hold down or shift demand.

2.2 Social Fault Lines: Limits to Growth and Environmental Protection

Social fault lines may relate both to the risks associated with environmental crises and a green transition, and to the social foundations on which a more equitable and sustainable development model must rest. Tensions may emerge both via the direct social, health, and livelihood impacts of pollution, climate, and environmental crises, ③,[55] as well as through the direct and indirect costs imposed by transition policies.

Policies such as the energy transition, the restructuring of carbon-intensive industries, and environmental protection will affect employment, livelihoods, energy access, and costs for some groups, as well as local public finances, potentially undermining the provision of social and public goods. Others may be indirectly affected through changing livelihood opportunities. Examples include restrictions on pig farming within designated livestock and poultry breeding prohibition zones,[56] restrictions on access to or use of resources within Ecological Conservation Redlines, and exclusion from common property resources. Without adequate and timely compensation, such measures may exacerbate existing vulnerabilities.

Transitions to green technologies may also increase costs or reduce access for some users if alternatives are not matched to local conditions and supported through the transition. The clean-heating transition in northern China④, [57] illustrates the affordability, equity, and implementation capacity of a siloed approach. Evidence from the Beijing-Tianjin-Hebei region shows that household costs vary considerably by technology, location, building efficiency, and subsidy design; coal-to-gas and some electric-heating options may increase capital and operating costs relative to raw-coal heating, particularly where subsidies are insufficient, with disproportionate effects on

③ For example, it has been estimated that, globally, removing fossil fuel subsidies and introducing a fossil fuel tax (at the rate of value added tax or general services tax) could avert 1.6 million deaths annually by 2030 from local air pollution and have net economic benefits of USD 4.6 trillion (in 2030 USD) or 3.6% of global GDP in the same year, capturing economic benefits from deaths averted, carbon dioxide emissions averted, impacts on economies, government expenditure forgone (subsidies), and government revenue collected.

④ Guided by the Clean Winter Heating Plan, the northern clean-heating rate rose from about 51% in 2018 toward its 70% target, aiming to replace up to 150 million tonnes of scattered coal (coal burned directly in household stoves or other small, dispersed facilities rather than in centralized systems, often with little processing or emissions control), delivering major air-quality gains.

rural and low-income households. Where subsidies are tapered before cleaner alternatives become affordable, some households may reduce clean-energy use or revert to coal.[58] The rapid coal-to-gas switch contributed to short-term coordination and supply pressures during the 2017 winter gas shortage.[59] Collectively these diverse social impacts can undermine green policy goals and create resistance to the transition.

Box 1. Global practices and the implementation gaps: The example of the Just Energy Transition Partnership

Initiatives such as the Just Energy Transition Partnerships (JETPs) have been designed as multilateral platforms for accelerating the inclusive phase-out of fossil fuels, coordinating financial resources and technical assistance. However, the JETP model's social equity goals are often sidelined by the predominant focus on decarbonization, revealing a gap between the "just" transition rhetoric and investment plans devoted to those purposes.

At the design level, JETP political declarations and investment plans (for example, in South Africa, Indonesia, Viet Nam, and Senegal) explicitly frame the transition as "just, referencing support for workers, communities, and affected regions alongside accelerated fossil-fuel phase-out. However, these intentions are often only loosely operationalized: investment plans prioritize power-sector reform, infrastructure, and supply-side decarbonization, while social protection, reskilling, and community development receive limited, often unquantified, allocations.

Early evidence shows that only a small share of JETP finance, largely loans rather than grants, has flowed to justice-specific measures; stakeholder participation has often been late or tokenistic; and governance, transparency, and accountability systems for social outcomes remain underdeveloped. Together, these patterns suggest that, despite inclusive rhetoric, social equity in JETPs has tended to emerge as a secondary consideration, rather than a fully mainstreamed pillar of transition strategy.

Source:
Csanadi A, Helmeci D. The Just Energy Transition Partnership at a crossroads[R/OL]. Washington, D.C.: Carnegie Endowment for International Peace, 2025 [2026-07-01]. https://carnegieendowment.org/research/2025/10/the-just-energy-transition-partnership-crossroads;
Gverdtsiteli G. Strengthening Just Energy Transition Partnerships (JETPs): lessons learned for a just energy transition[R/OL]. Berlin: Transparency International, 2024 [2026-07-01]. https://files.transparencycdn.org/images/241114_JETP_Report_Final.pdf.]

The social costs and benefits of transitions out of traditional polluting, carbon intensive, or fossil fuel industries are relatively well understood, but challenging to address, given the complexity of restructuring entire sectors of the economy. At the global level, estimates show a net positive impact of an inclusive transition on different economic dimensions, such as growth or jobs.[60] Effectively implementing measures to mitigate negative social impacts is estimated to raise ambition in emission reduction targets by over 30% and reduce resistance to policy implementation by 40%. In effect, inclusive transition measures, rather than being a cost burden, can accelerate a high-quality transition.[61]

In practice, however, interventions to smooth transitions generally focus on compensating affected workers, sectors, and communities, including reemployment training or support, social protection, and other benefits, sometimes also with the aims of enhancing equity and reducing resistance. [62] The level and extent of support depend in part on the existing welfare system which determines what social security and unemployment benefits,

or reemployment training and support policies already exist. In the absence of developed social security systems, targeted support mechanisms are essential to protect livelihoods and avert poverty.

Diverse local contexts and varied policy and implementation responses add a level of complexity. In China, local and central governments have responded to highly visible issues such as pollution and its impacts on food production and health, whether in large cities or so-called "cancer villages."[63] On the other hand, other issues or affected populations may be less visible to decision-makers, leaving issues unresolved or lacking policy responses. Such unaddressed issues may be equally or more likely to create resistance, potentially driving social unrest, as well as generating significant hardship for those affected.

Just transition policies will thus need to engage with a range of emerging concerns. The green transition will inevitably cause massive job losses with the downsizing of several carbon-intensive sectors, notably in coal mining or other labour-intensive, polluting, or fossil fuel industries.[64] Shanxi, as part of China's "coal triangle," is a case in point. Its coal workforce (37% of the national total) is expected to drop by roughly 50% by 2030 (compared to 2020), and by 94% to 98% percent by 2060.[65] Notably, such losses are not driven by green policy alone: employment in coal mining and processing fell by roughly 641,000 (about 20%) between 2018 and 2024, even as raw coal output rose, reflecting the rapid spread of automated "intelligent" mines as much as policy-driven capacity cuts.[66]

Experience from South Africa suggests that support packages should be tailored to distinct worker and household profiles, rather than applied uniformly across the coal workforce.[67] Indeed, examination of likely impacts suggests compounding vulnerabilities at the intersection of age, skills, and gender. As of the early 2020s, 20%of Chinese coal workers were women. They are disproportionally at risk of layoffs and face barriers to entering new green industries if re-skilling opportunities are not gender inclusive.[68] Vulnerabilities are compounded by informal working arrangements and migrant workers status, which generally exclude individuals from eligibility for compensation or support for re-employment. This puts them at risk of becoming invisible in the design of support packages. Age and skills are also important considerations: in Shanxi 58% of coal workers are over the age of 40 and low-skilled, with many households relying on a single income.[69] Studies highlight the limited opportunities for skills transfers and re-employment difficulties for workers in traditional energy sectors, while a time lag exists for jobs in new sectors, failing to provide new and sustainable growth momentum for the local economy.[70]

To minimize some of the negative impacts, new industries including green energy and AI may provide new opportunities, if skilling and reskilling programs are adequately designed and implemented. While AI is expected to reshape labour markets through automation and changing skill requirements, it may also accelerate green job creation by increasing demand for renewable energy and related industries. Modelling shows that under a reference scenario combining green and AI transitions, employment across key energy and automotive sectors could increase by approximately 2 million jobs by 2030, while remaining above its 2024 level in 2035. Employment outcomes vary significantly across alternative pathways, from relatively limited gains under a slow-

transition, low-AI-growth scenario to more than 4 million additional jobs under an accelerated green-transition and AI-boom scenario, when skills development, retraining, and labour-market adaptation measures are adequately designed and adopted. AI-driven growth in demand for clean electricity could also substantially strengthen the capacity of emerging sectors to absorb workers displaced from fossil-fuel industries, highlighting the increasing linkages across the green and AI transitions. The two should thus be addressed together within broader just transition strategies.[71]

Besides coal and traditional energy workers, less visible but generally more vulnerable groups are also likely to be affected by policy change, sometimes in less direct ways. Examples include:

- Small businesses and supply-chain actors in transitioning industries who often operate on thin margins—with limited ability to adapt when carbon pricing, environmental regulations, or plant closures hit larger industry clients—risk cascading revenue loss and layoffs.[72]
- Villagers affected by long-term impacts of local mining activities, including health and soil degradation at the same time as the loss of employment and income opportunities.
- Forest farmers (often ethnic minority groups) who are prevented by Ecological Redlines⑤ from access, use, and management of forest land are also vulnerable. Having treated their contracted forestland as "green savings" and invested in its long-term management and conservation, they nevertheless face restrictions on certain sustainable resource-use activities due to one-size-fits-all policies. As a result, they are unable to realize returns on their labour invested in ecological conservation and receive no compensation for lost income.

China's green development is also having an asymmetric impact across regions, with possible implications for welfare, people's livelihoods, and regional inequalities.[73] Notwithstanding long-term differences in industrialization levels between Eastern coastal provinces and the Western hinterland, the green transition is reshaping the development landscape. Some regions are set to gain more than others. The Northwest is emerging as a new wind and solar energy hub, associated with greater computing power (Inner Mongolia, Gansu, Ningxia, Qinghai, Xinjiang),[74] leading to the growing capital assets and investment inflows, as well as rental income from land use, taxes, and local employment. Coastal provinces are reinforcing their clean manufacturing lead (Guangdong, Jiangsu, Zhejiang, Shanghai, Shandong, Fujian, Hebei), benefitting from clean-tech manufacturing clusters[75] (EVs, batteries, PV modules, wind gear) and rising offshore wind, while hydro-rich Southwest (Sichuan, Yunnan) takes the lead in hydropower for electro-intensive industries—key for green power absorption and "west-to-east power transfer."[76]

⑤ In forest regions, redline designation may restrict forest farmers' access, harvesting, forest-product collection, and management of contracted forestland, especially where redlines overlap with protected-area core zones, public-welfare forests, or other conservation regimes. However, national rules do not impose a blanket ban on all entry or forest management: core zones of protected areas are generally closed to human activity, while other redline areas prohibit development- and production-oriented construction but may allow legally permitted, ecologically non-damaging limited activities. General Office of the CPC Central Committee and General Office of the State Council, Opinions on Delineating and Strictly Protecting Ecological Protection Redlines (Beijing, 2017).

A transition that is not inclusive or that exacerbates inequalities is likely to encounter social resistance. As some groups are unable or unwilling to make the necessary behavioural adjustments and consequently face greater hardship, a growing sense of social injustice may emerge, increasing the risk of social unrest.

2.3 Governance and Implementation Fault Lines: The Gap Between Integrated Vision and Delivery

China is emerging as a thought leader in designing a new green and sustainable development model that can deliver not only environmentally sustainable economic development, but also better health, poverty elimination, and livelihood security, contributing to "common prosperity." In articulating a more *integrated* approach under the frame of Ecological Civilization, the government has rolled out several major policy initiatives backed by an array of policies, targets, and accompanying evaluation mechanisms. These are, in principle, designed to address the multiple dimensions of sustainable development spearheaded by different ministries, showcasing the clear ambition to align policies and balance competing priorities.

Translating these goals into practice, however, remains challenging, as successful examples of integrated implementation across policy domains remain limited or have yet to be fully identified and explored, both in China and globally. A large body of evidence exists globally on the generic challenges involved in designing and implementing integrated policy. Barriers to coherent policies can include institutional or bureaucratic silos, weak coordination across sectors and agencies, inconsistent policies or regulations, and unclear accountability. Other challenges include gaps in capacities and data; misaligned bureaucratic, financial, or market structures or incentives; and challenges identifying appropriate targets, indicators, and metrics. These difficulties are also apparent within specific sectors. In health, for example, the literature on determinants of health invokes all other policy sectors, and extensive efforts have been made in cross-sectoral implementation. Nonetheless policies have generally struggled in practice to deliver a 'health in all policy' approach. Similarly, new frames such as "one health" or "planetary health" that try to engage across animal and human health, linking health of people and planet, also struggle in practice, despite the obvious co-benefits (Section 3.1).

Different implications arise from these forms of fragmentation or "policy incoherence." A key lesson from the literature is that technocratic solutions matter for making progress but are not sufficient. Enabling conditions and strategies to overcome silos and trade-offs need to address imbalances or divisions of power, interests, and resources, at all levels in the system, as well as the multi-dimensional inequalities that shape social needs. Solutions will involve navigating trade-offs and redistributing resources.

While China's governance system may indeed be better placed than many to overcome common barriers to integrated policy-making and implementation, it also faces exceptional challenges of scale, diversity, urgency, and inequalities between regions, with huge variation in local resources, incentives, and capacities for

implementation. In addition, the limits of current assessment systems create a gap between discreet and narrow measures of development and the broader, more complex vision of Ecological Civilization, challenging its operationalization.

2.4 The Metrics Fault Line: Misalignment Between What is Measured and What Matters

2.4.1 GDP as an Inadequate Proxy of Human and Planetary Well-Being

Another fundamental limitation of the current development pathway lies in its longstanding GDP-oriented growth model. While GDP growth has been a powerful driver of development in China's past, supporting unprecedented poverty reduction and economic transformation, it is increasingly ill-suited to guide the next phase of Ecological Civilization.

GDP is a measure of an economy's output defined as the goods and services it produces, valued at market prices. It does not capture goods and services that are not exchanged in the market (such as ecosystem services or unpaid care work); nor does it account for negative externalities or spillovers arising from "productive" activities (i.e., those that contribute to the GDP metric), including loss of biodiversity, resource depletion, detrimental health outcomes, and other social and well-being impacts. As a result, a growth-oriented model may well see output or GDP growth coinciding with declines in societal welfare and environmental health.[77]

At the same time, welfare outcomes are shaped by factors that GDP does not capture. Environmental improvements, such as cleaner air or decreases in sound pollution from urban e-mobility, have measurable benefits for health, productivity, and quality of life, as does the work of care undertaken largely by women on an unpaid basis within households and communities. Conversely, environmental degradation and social dislocation impose costs that GDP fails to reflect. This creates a misalignment between what is measured and what matters, while shaping incentives toward resource overuse and depletion.[78]

Box 2. China's beyond-GDP measurement architecture: From growth to "high-quality" development

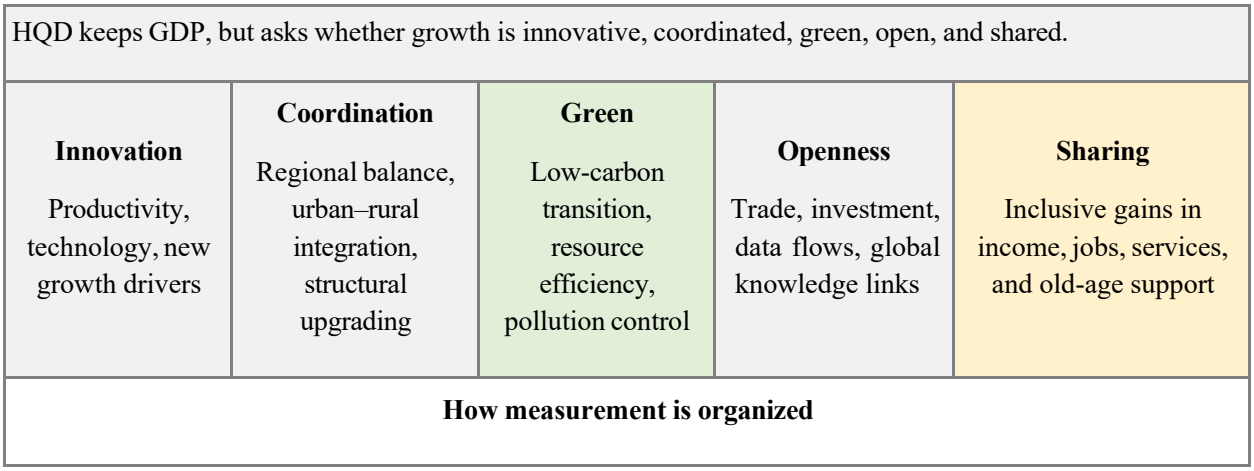
China's "high-quality" development (HQD) agenda represents one of the most comprehensive national efforts to move beyond GDP-centred development measurement. At the national level, Five-Year Plans set headline indicators across key economic, innovation, well-being, environmental, and security priorities. China has also advanced beyond-GDP monitoring through more diagnostic and specialized systems. The Urban HQD Monitoring framework translates HQD concepts into city-level indicators, covering overall quality and effectiveness, innovation, coordination, green development, openness, and sharing. It complements national headline targets by capturing measures such as industrial upgrading, urban–rural integration, land-use efficiency, pollution intensity, public service access, and external connectivity. Taken together,

these arrangements can be viewed as forming a layered monitoring architecture: a compact national accountability spine, a city-level diagnostic dashboard, and emerging specialized subsystems for areas such as productivity, carbon, water, ecological assets, digital economy, and demographic resilience.

Remaining challenges are significant. First, some HQD dimensions—particularly coordination, openness, and sharing—remain harder to define and measure than innovation or green development. Second, many indicators still rely on proxies, while gaps persist in how total factor productivity, rural unemployment, income distribution and inequality, health quality, ecological stocks, and implementation-processes are measured. Third, data availability and comparability vary across regions, weakening cross-regional diagnosis. Fourth, city-level systems alone cannot fully capture spillovers across regions, urban–rural links, or national redistribution effects.

China's move to "high-quality" development, and the greater importance attached to a variety of priorities beyond growth and job stability, in part respond to some of these limitations. Viewed as China's approach to the global beyond-GDP debate, this shift is reflected in a wider set of targets, whether single indicators, combined indices, or dashboards, which also include an expanding range of metrics used to evaluate government officials, helping to shape incentives toward desired outcomes and create effective coordination mechanisms. It explicitly moves evaluation beyond aggregate economic output toward development quality, efficiency, sustainability, and people's subjective experience, and considers whether growth is generating innovation, improving livelihoods, reducing imbalances, supporting ecological transition, and increasing public satisfaction.[79] The foundation of this pivot can be seen in the evolution of Five-Year Plans, which have long relied on a portfolio of targets, rather than a single development metric, combining indicative and binding targets across economic, social, environmental, and security priorities. China's approach also places weight on governance integration and long-term development coordination beyond the dashboard of indicators, embedding indicators in a governance chain that links statistical monitoring, planning targets, local experimentation and cadre, and government performance assessment.[80] As noted by a recent CCICED study, these are the hardest tasks.[81]

Figure 1. High-quality development measurement architecture



1. National accountability spine	2. City diagnostic dashboard	3. Specialized subsystems
Compact Five-Year Plans' headline indicators signal national priorities and targets	Urban HQD indicators reveal mechanisms, gaps, and cross-city variation	Targeted modules track productivity, carbon, ecological assets, digital economy, AI, and demographics
Key implication: China's beyond-GDP approach is strongest when it links strategy, indicators, implementation incentives, and policy correction across levels of government		

Source: ADB, 2026. "High-Quality Development: Concept, Implementation and Monitoring" unpublished manuscript, Manila.

2.4.2 The Gaps Between Measurements, Incentives, Accountability and Development Outcomes

At the same time, current indicator systems and approaches have limitations in supporting the vision of Ecological Civilization. The proliferation of parallel indicator systems raises issues of coherence and effectiveness, with often fragmented monitoring and duplicated reporting. "High-quality" development, Ecological Civilization, green development, "common prosperity," social progress, and Five-Year Plan indicators all measure related domains, but often with different definitions, time frames, weights, and accountability processes.

The nature and quality of metrics is also critical for directing actions toward desired outcomes. Problems include the lack of comparability of data or monitoring systems, hierarchies of binding versus guiding indicators, and distortions in behaviour arising from binding targets. Some indicators are objective and statistically mature, such as PM2.5, forest stock, income, or doctors per capita. Others, such as satisfaction, sense of gain, happiness, security, and recognition, are essential for people-centred development, but harder to standardize across provinces and over time. In addition, many people-centred outcomes, such as quality of care, health access, distribution, social mobility, or subjective well-being, are harder to enforce through simple numerical targets. Implementation follow-through is strongest where indicators are easily measurable and embedded within accountability procedures, but often at the cost of cross-domain integration. Because frameworks are linked to cadre and government performance assessment, they can improve accountability. At the same time, they may also encourage target-chasing, selective reporting, or short-term compliance, especially when specific indicators are prioritized, making differentiated assessment, qualitative judgment, public feedback, and data quality controls essential.

Indicators attached to specific policy areas tend to remain within sectoral silos, while metrics for key outcomes that reflect the quality and distribution of integrated development results, such as respect for life and the planet, biodiversity, ecosystem health, and multidimensional inequalities, are generally weak or absent. Looking at China's main policy frameworks, the degree to which different domains are connected through shared frameworks, metrics, or joint accountability mechanisms varies markedly across instruments. The degree of cross-sector integration often weakens with increasing quantification of indicators and external accountability (Box 3).

The institutional alignment across social and equity-focused dimensions is also weak, concentrated in fewer frameworks and less consistently integrated into accountability systems. For example, in the 15th Five-Year Plan, livelihood indicators are important, but many remain relatively micro-level service indicators (e.g., elderly care nursing beds, childcare enrollment, physicians and nurses per thousand people). They help identify concrete public-service gaps but seem insufficiently connected to broader governance and accountability mechanisms that are capable of steering integrated ecological and social transformation. China's policy on renewable energy expansion advances climate mitigation, but provides limited guidance on unintended side effects, or how to simultaneously safeguard land use, mineral supply chains, and waste management, as well as social impacts.[82] Similarly, an analysis of the newly proposed system of indicators for urban "high-quality" development[83] notes limited explicit indicators of resilience, participatory governance, ethical economic conduct, and agency,[ⓒ] essential to assess legitimacy, responsiveness, and the capacity of the public sector to adapt and innovate, or to foster public trust and social cohesion. In addition, the framework offers limited coverage of key outcome values that reflect the quality and distribution of development results, such as respect for life and the planet, biodiversity, and multidimensional inequalities, including gender disparities, accounting for the intrinsic value of all life forms and the health of ecosystems.

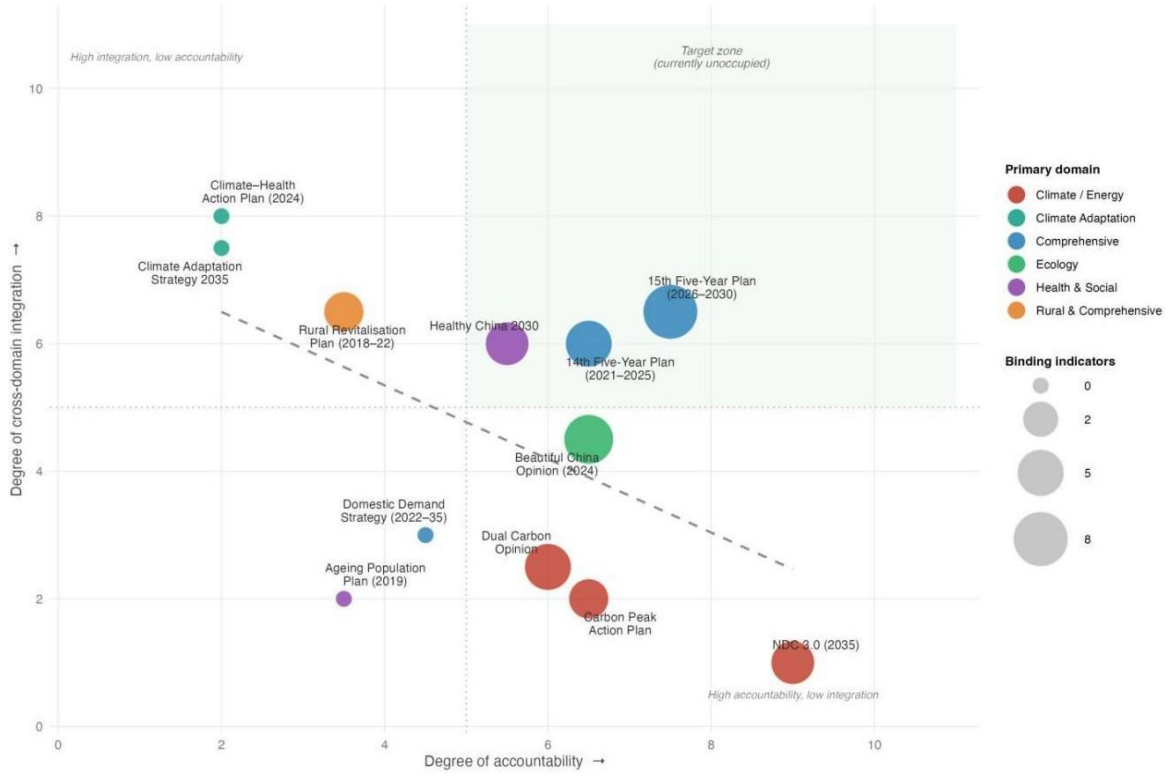
Box 3. Integration and accountability across key policy frameworks

Integration is highest in policy framework components that carry the lightest external accountability burden, but embed explicit cross-ministerial governance structures. To illustrate this point, the figure below maps key policies and frameworks related to low carbon development and broader impact channels across two dimensions: an accountability score (based on target type and binding status, evaluation links, and international reporting obligation) as well as degree of cross-sector integration.

The National Climate Change Adaptation Strategy 2035, co-issued by 17 ministries, and the National Action Plan on Health Adaptation to Climate Change (2024–2030), co-issued by 13, are two clear examples. The health-climate action plan frames its objectives as simultaneously serving Healthy China and Beautiful China, establishing a unified planning, monitoring, early-warning, assessment and intervention system across public health, climate risk, and environmental governance. On the other hand, dedicated climate frameworks and guidance contain no indicators related to livelihoods, health, income distribution or social equity, sitting in the bottom right quadrant. Five-Year Plans sit in the middle, with binding environmental targets alongside social welfare indicators within a shared framework, but each operating through its own accountability track.

[ⓒ] Agency defines indicators on active, free, and meaningful participation in society and decision-making.

Figure 2. China's national policy targets: accountability versus cross-domain integration



Note: Bubble size: number of binding indicators. Shaded area: target zone currently unoccupied. Dashed line: illustrative trend (n=12). Accountability (0–10): target type (0–3) + binding indicator share (0–3) + cadre/government evaluation linkage (0–2) + international reporting obligation (0–2). Integration (0–10): number of substantive policy domains covered out of six (economic, social/livelihood, health, climate/energy, ecology, food/nature) + depth of cross-domain linkage (0–4).
Source: Authors based on official Chinese policy documents.

The strongest convergence across China's indicator systems remains environmental, not social. Once additional frameworks are included, air, water, and ecosystems emerge as the clearest cross-framework "common language." They appear not only in environment-specific systems, such as Beautiful China, Green Development, and Ecological Civilization, but also in broader frameworks such as the 15th Five-Year Plan, "high-quality development," and those related to social progress. This convergence increasingly extends beyond indicator alignment into institutional accountability, providing sustained governance support for green technology deployment, exemplified by the extraordinary and rapid renewable energy development recorded in recent years. These achievements illustrate what becomes possible once planning targets, monitoring systems, and cadre accountability are aligned across overlapping governance frameworks. The system is also further evolving. In 2026, China introduced a national assessment framework for carbon peaking and carbon neutrality that evaluates provincial governments against annual indicators, including total carbon emissions, carbon intensity, fossil-fuel

consumption, and the share of non-fossil energy. Provinces may face rectification requirements, interviews, or formal accountability procedures, if targets are not met.[84] At the same time, earlier attempts to build integrated measurement systems, most notably Shenzhen's Gross Ecosystem Product (GEP) methodology, have remained local pilots without national replication,[85] and current uptake to systems linked to the relatively new concept of "high-quality" development remains uneven, with only partial links to cadre assessment. Overall, the constraint is one of scale, coherence, and mainstreaming rather than of conception, and in particular the integration of accountability structures beyond environmental domains and into social and equity dimensions.

It is worth noting that this movement from comprehensive metric systems to their uptake and use in decision-making is a challenge everywhere. This creates a persistent implementation gap between holistic strategic visions at the central level and the incentive structures guiding local implementation. The governance chain connecting planning targets to statistical monitoring to cadre performance assessment continues to operate around single-domain metrics. Strengthening meso-level instruments that embed cross-domain indicators into this chain and testing which integrated metrics can realistically scale, is now the priority to build a more coherent framework capable of steering development toward a broader vision of Ecological Civilization and people-centred modernization.

Box 4. China's pilots of integrated measurement systems

The Zhejiang Demonstration Zone for Common Prosperity focuses on exploring measures to raise incomes, improve distribution, expand public services, narrow urban-rural gaps, and improve people's livelihoods. Zhejiang's implementation plan goes further, by requiring a common prosperity evaluation and target indicator system. It calls for measurement standards that combine quantitative and qualitative evaluation, objective and subjective evaluation, and indicators reflecting people's sense of gain, happiness, and security. NDRC also notes that Zhejiang's demonstration-zone assessment should use statistical monitoring and social surveys, so that progress is reflected in people's sense of gain, happiness, security, and recognition.

Development and life (DLI) index-type metrics aim to measure regional development and people's livelihoods more comprehensively, with 42 indicators covering economic development, livelihood improvement, social development, health-related indicators such as life expectancy, ecological construction, science and technology innovation, along with public evaluation. Although DLI-type metrics should not be treated as equivalent to binding Five-Year Plan targets, they are useful because they demonstrate a wider methodological direction: composite indices that integrate economic, social, ecological, innovation, and subjective dimensions.

The Gross Ecosystem Product (GEP) framework complements conventional economic accounting by assigning a monetary value to goods and services generated by ecosystems, including provisioning, regulating, and cultural services. Shenzhen became the first city in China to establish a comprehensive GEP accounting system, building on a pilot in Yantian District and formalizing the approach in 2021 through an implementing scheme, local standards, statistical reporting arrangements, and an automated accounting platform. A distinctive feature is the parallel reporting of GDP and GEP, making the contribution of natural capital visible alongside economic output. While recognized as an innovative and replicable practice, GEP remains largely confined to pilot applications, but helps to illustrate the potential and challenges of integrating ecological value into broader development assessment frameworks.

2.5 Managing Impact Beyond Borders: Implications for International Cooperation and Engagement

Building on the analysis presented by the High-Level Task Force Working Group on China's global environmental governance,[86] we highlight two channels through which China's domestic green policy may have direct and indirect impact beyond its borders, and possible repercussions for the opportunities and challenges in achieving its own goal of people in harmony with nature.

Given China's role in the production and deployment of green technology, the international dimension of its current development model must also be considered. Accounting for around two-thirds of global renewable energy installations in recent years, China has enabled rapid expansion worldwide by scaling manufacturing and reducing costs for everyone, underpinning the feasibility of tripling renewables by 2030. At the same time, concerns have emerged around how to balance these new opportunities to boost climate action in partner countries with local imperatives around jobs, livelihood, and security.[87] This is evident in more advanced economies as Chinese firms rapidly gain market share and move up the value chain in traditional core industrial sectors (such as automotives and machine tools)[88] as well as showing advanced capacities in new emerging ones (particularly in relation to new technologies). China's success across a wide range of industries—from low- to high-value added sectors—is also challenging opportunities for nascent (green) industries in developing countries, with implications for local job creation and technological catch-up.[89] This risks undermining the low-carbon transition in some countries, even as China's scale of production has lowered costs globally.[90]

The second channel is China's global material and resource footprint, which is particularly evident in global agricultural and marine supply chains. For example, China is the largest export market for Brazilian soy and beef, raising concerns about deforestation risks associated with Brazilian supply chains, particularly in the biodiversity-rich Cerrado savanna and Amazon Rainforest.[91] A comparable dynamic is visible at sea, with China operating the world's largest distant-water fishing fleet. These spillovers are not only ecological. Pressures on forests, fisheries, and ecosystems abroad affect biodiversity, and also the livelihoods, food security, and well-being of communities in producing regions. In turn, they can generate reputational and supply-chain risks for China, as well as growing concerns among local communities and stakeholders regarding the distribution of environmental costs and benefits across global value chains. Importantly, China has already addressed some of these challenges through growing commitments to supply-chain traceability and deforestation-free sourcing, as well as a stated shift toward greener and more sustainable distant-water fisheries management, including the removal of fuel subsidies for distant-water vessels.[92]

3. Illustrations of an Integrated Approach Toward Ecological Civilization

Following the analysis of limitations and emerging challenges that arise when environmental, economic, and social objectives are pursued through separate policy tracks, this chapter shows the benefits of a more integrated approach through three issue areas—health (Section 3.1), demographic change (Section 3.2), and green consumption (Section 3.3). Through concrete illustrations of case studies, the aim is twofold: first, to demonstrate the deep interconnectedness of environmental and social crises that make these interdependencies especially visible. Second, to show how coordinated action works in practice to promote a green economic transition within ecological boundaries while generating better health, livelihood, and distributional outcomes.

3.1 Health and the Planet

Health provides a powerful lens to highlight links between climate, environment, and development, making visible both the costs of inaction and opportunities for more integrated solutions. Investments that strengthen health, resilience, and environmental sustainability together can deliver benefits that extend far beyond any single sector, supporting healthier communities, stronger economies, and more sustainable development pathways. Reflected in China's annual reporting against the Lancet Countdown on health and climate change, policy-makers have recognized this connection and the importance of both tracking the health impacts and identifying realistic solutions.[93] The latest report documented the increasing occurrence and seriousness of health risks due to climate events, including heat-related deaths, increasing dengue fever incidence, and drought-related infectious diarrhea. It also noted catastrophic economic costs such as an estimated USD 283.4 billion in heat-related labour losses, and an estimated USD 77.1 billion of economic losses from climate-related extreme events.

The health sector has identified solutions that help adapt to the changing climate and environment realities, such as integrated climate and health early warning systems, text-based telehealth, and transitioning to climate-resilient health infrastructure.[94] Other solutions focus on mitigating effects of climate change and the resulting impact on health that are often outside of the traditional health sector. Investments in the energy and transport sectors can improve the air people breathe, investments in urban design can increase people's physical activity, and investments in agriculture and food systems can shift people toward healthier diets. For example, a study in Beijing found that developing active travel and public transport routes yielded higher health co-benefits than the electrification of private vehicles.[95] At the same time, strengthening health sector supply chains can generate multiple co-benefits for health and climate, including supporting the decarbonization of health systems and enhancing their resilience to climate-related shocks and stresses.

A growing body of evidence on the co-benefits of environmental policies and health benefits also shows that mitigation actions have the greatest impact on economically disadvantaged and socially marginalized communities.[96] Conversely, without concerted and intentional action to address the health-related impacts of climate change, health disparities are likely to increase substantially. The integrated approaches on climate and health offer an opportunity to address co-benefits but also present a governance and related financing challenge. Functional coordination across and between ministries will be critical at national and local levels. Communities must be part of the solutions, using engagement opportunities that the implementation of China's National Climate Change Health Adaptation Action Plan (2024–2030) and related local assessments present. These plans also create opportunities to develop integrated climate- and nature-friendly financing strategies that prioritize interventions that offer the most immediate returns on investment in health impacts.

3.2 Demographic Change and Green Transition

The relationship between demographic change and a green transition is often viewed largely as conflictual: population growth creates a challenge for the environment and risks undermining carbon neutrality goals through the use of natural resources and poor preservation of the biosphere. Evidence shows that the nature, alongside the size of demographic change in different contexts will create distinct carbon and environmental pressures operating through different channels. These include where people live, their income level, how they consume, and how infrastructure (particularly in urbanizing regions) is planned.

Policies designed to respond to demographic pressures, such as fertility support, delayed retirement and housing, or care infrastructure expansion, will create new sources of carbon and other environmental pressures, unless designed with these goals in mind. Changes in demographics, household formation, labour-market participation, and spatial distribution reshape patterns of consumption, housing demand, public service provision, infrastructure needs, and resource use, thereby influencing both environmental pressures and the social foundations of development. At the same time, while the focus is often on older cohorts, young people should also be considered a distinct demographic group within the green transition. Beyond being future beneficiaries of environmental outcomes, they are central to labour-market transformation, innovation, and the evolution of consumption patterns.[97] Ensuring access to green jobs, skills, and quality-of-life opportunities will be critical for maintaining public trust and the long-term social legitimacy of the transition.[98] The implications are that the channels that link population structure and its environmental or carbon footprint will operate differently for different cohorts.

Demographic transition should therefore be understood not only as a population issue, but as a structural driver of Ecological Civilization.[99] The key issue is not whether demographic change is inherently good or bad for the green transition, but whether the issues are considered in tandem, with coherence built into policy design. This section examines to what extent China's population policies, including measures to address declining fertility

and a rapidly aging population, are coherent with, or contradictory to, the country's environmental and low-carbon development goals. Conversely, it also explores pathways for greater integration between China's green-transition and demographic agendas.

3.2.1 Green and Demography: Two Major National Priorities

Recent policy documents suggest that China's demographic and green transition agendas are both treated as major national priorities, but are not always brought into the same analytical frame. On the demographic side, policy on fertility decline and population aging tend to focus on birth support, labour supply, elderly care, and long-term social stability. On the green transition and environmental side, the focus is on carbon peaking and neutrality, energy transition, industrial upgrading, pollution control, ecological protection, and green consumption. These two policy fields, while not contradictory in their stated goals, often run in parallel rather than being fully integrated. We highlight three relevant examples:

- Both the 15th Five-Year Plan and its predecessor treat the two agendas as structurally separate pillars.[⑦] One point of potential contact is identifiable in the chapter on consumption. Both the "silver economy" and "green consumption" are listed as priorities and growth areas under the broader objective of cultivating new domestic demand, but with no explicit mechanism linking them.
- The 2024 Opinions on Comprehensively Promoting the Construction of a Beautiful China provides top-level guidance for China's ecological governance and green low-carbon transition. In advancing market-based ecological compensation, green finance, and whole-of-society green initiatives to advance high-quality ecological development, it mainly focuses on environmental carrying capacity and urban-rural living conditions, but only briefly touches on population concentration, urbanization, and adapting environmental arrangements to demographic trends.
- The National Population Development Plan (2016–2030)[100] presents an authoritative statement of how China's central government conceptualizes the relationship between population dynamics and resource and environmental constraints. It explicitly includes the principle of "aligning population with resource and environmental capacity," calling for differentiated population policies across different functional zones, the promotion of green development and consumption patterns, and enhanced carrying capacity in terms of resources such as land, water, grain, and biodiversity. It invokes green as a guiding framework for population development, but does not specify concrete mechanisms by which population, environmental, or carbon targets can be jointly designed, monitored, or evaluated.

[⑦] The 15th Five-Year Plan discusses population in four chapters covering: (i) the construction of a fertility-friendly society; (ii) educational development; (iii) the 'Healthy China' agenda; and (iv) the active response to population aging, including the development of elderly care services and the "silver economy." The green-transition pillar is similarly organized into four chapters addressing carbon peaking, environmental quality, ecosystem protection, and green production and consumption patterns.

3.2.2 Identifying Pathways Toward an Integrated Approach

Given a declining but aging population, an overarching aim to rebalance the economy toward consumption, and the imperative to manage industrial oversupply, there will need to be a significant demand-side shift toward sustainable green consumption, as well as a significant reduction in material and resource use through a circular economy, if environmental and social goals are to be met. China's proposed green transformation requires an integrated strategy across these domains. From the academic literature, we highlight two main channels that are key for greater policy integration across population and environmental goals.

Channel 1: Demographic Change and Consumption-Related Emissions

China's experience of aging and fertility decline is distinct from advanced (OECD) economies. Older households in high-income economies tend to be wealthier than younger households and consume more carbon-intensive goods and services.[101] In China, the wealth-age relationship is reversed. Younger Chinese households have higher incomes (estimated at approximately 57% higher), associated with consumption levels that are 69% higher, and higher carbon footprints than older households, driven primarily by income differences and expenditures on housing and transport.[102]

Thus, while some researchers estimate a "carbon dividend" from population decline, this conclusion risks linearly extrapolating the relatively low carbon footprints of China's current elderly population into the future. Such an extrapolation would substantially underestimate future energy demand because the consumption patterns of cohorts entering retirement differ from those of today's elderly. Han, Wei, and Cao (2022) show that China's baby-boom cohort born in the 1950s to 1970s has been socialized into higher-consumption habits than those currently in old age, and will carry those habits into retirement.[103] In addition, growth in the elderly population may substantially increase China's total residential energy consumption over the coming decades. This may be compounded by the transition to smaller households.[104] These lose economies of scale in residential energy use, raising per-capita consumption, while older individuals spend more time at home, increasing residential energy use. Even if today's elderly Chinese households are less carbon-intensive than middle-aged households, the net effect of population aging on aggregate energy consumption and emissions may increase substantially over the 2030 to 2050 period, as higher-consuming cohorts displace the current elderly population.

Tang et al. (2024) also estimate the potential impact of any increase in fertility (in line with government policy) on future carbon footprints. An increase from the two-child baseline toward replacement-level fertility could increase household carbon footprints by 21% to 35% by 2060. Delaying the retirement age, whilst considerably smaller in its effect, is associated with an increase in total and per-capita household carbon footprints of approximately 2% to 3%, operating through increased labour supply, as well as associated income and consumption increases.

Channel 2: Urbanization, Housing, and Spatial Inequalities May Further Weaken Any Potential Demographic Carbon Dividend

The above generational and age-based findings should also be read alongside evidence that household carbon footprints in China differ sharply by income, urban-rural status, and region.[105] This matters because fertility support, family formation, and retirement policies differentially affect households with different consumption levels, housing and transport needs, and carbon intensities. Bai et al. (2019), examined residential energy-related CO_2 emissions in China's major urban agglomerations. They found that urbanization, population scale, and rising income are associated with higher residential CO_2 emissions, linked to factors such as higher housing demand, longer commuting distances, more private transport use, or inefficient heating and electricity systems. This somewhat contradicts the general assumption that economies of scale in urban agglomerations reduce emissions. However, Liu et al. (2017) show that this relationship may differ by region. In less developed provinces, higher population density (through urbanization) may raise emissions because it requires new infrastructure, construction, and public services. In more developed provinces, higher density (through migration) may reduce per capita emissions through scale economies, better public infrastructure, and greater infrastructure and energy efficiency. The environmental effect of urbanization thus appears conditional on existing infrastructure, industrial structure, and the stage of development.

The housing literature adds a further layer to this argument. Shi et al. (2025) show that housing utilization efficiency in China's highly urbanized areas declined between 2010 and 2020, indicating a growing mismatch between housing supply and demand. Zheng et al. (2025) go further by estimating the carbon impact of unused housing. They find that by early 2021, 17.4% of urban housing built and sold between 2001 and 2018 had never been occupied. The construction and operation of these unused units generated an estimated 55.81 million tonnes of CO_2 annually, accounting for 6.9% of China's residential-sector emissions, reflecting how demographic change, land development, housing supply, and carbon emissions can become disconnected. The focus of residential decarbonization policy on efficiency through greener buildings, better materials, improved heating systems, and higher energy standards, is critical but insufficient. Construction must match demographic realities and demand: a housing unit can be "green" in technical terms but still wasteful in the mismatch between its carbon emissions and social value.

Overall, evidence for any automatic demographic carbon dividend is limited. Instead coordinated policies will be needed to recognize the material and climate consequences of demographic change, including variation across space and cohorts, with coherence between demographic forecasting and carbon planning, taking into account likely shifts in consumption. Areas for action include:

- incorporating low-carbon goals into the expanding care economy (including child, elderly, health and social care), education, housing supply, and urban development,

- promoting greener consumption and sustainable lifestyles—particularly among young people, who are currently the most carbon-intensive age group—as part of the efforts to stimulate consumption-led growth (Section 3.3),
- reducing income and consumption disparities between age groups and across regions or rural/urban areas, reducing carbon-footprint differentials while enabling lower consumption groups to achieve higher living standards.

3.3 Green and Sustainable Consumption

As a third example of the opportunity of an integrated approach, this section focuses on green lifestyles and consumer behaviour as a core pillar of Ecological Civilization and China's long-term development strategy, highlighting the interconnections between environmental and social outcomes, along with the benefits of addressing them together.

Under a GDP growth-centred development model, rising material demand risks reproducing environmental pressure through sheer scale, even as production decarbonizes. Yet this structural fault line is not immutable. China's own experience, alongside international practice, suggests that where demand-side transformation is integrated into infrastructure, governance, incentives, and social policy, consumption can become a driver of green transition rather than a constraint to it. The challenge is not simply to enable more consumption, but to support better consumption, prioritizing quality, durability, services, health, care, cultural life, and environmental quality rather than low-quality, high-volume material consumption. China's demographic and generational transition may provide an opportunity for this reorientation.

Ecological Civilization implies not only cleaner production, but also a gradual reorientation of development toward resource efficiency, quality of life, and harmony between humanity and nature, challenging the assumption that prosperity must be associated with ever-expanding material throughput.[106] In this context, sustainable consumption is not a matter of individual behaviour alone, but of how economic systems shape lifestyles, social norms, and patterns of demand. Consider energy consumption as an example. China has effectively achieved universal electricity access in 2015 and maintained relatively low residential electricity prices.[107] The next-stage challenge is less about access than about ensuring that rising living standards are met through clean, affordable, and climate-resilient energy services, framing sustainable consumption as a question of service quality, protection, and resilience across income groups, regions, and generations, promoting rather than limiting household welfare.

Below we describe three concrete examples of integrated approaches that can promote behavioural changes in support of the green transition.

First, integrated policy frameworks can steer rising demand toward green consumption pathways at scale. The

most effective interventions do not simply encourage consumers to "consume less"; they restructure the choice environment so that sustainable options become economically and socially rational. China's differentiated vehicle-registration policies are a case in point. By granting new-energy vehicles free or expedited license plates, while restricting or auctioning internal-combustion registrations at high cost, major cities transformed administrative controls into structural incentives that accelerate behavioural change and reinforce investment in charging infrastructure.[108] Combined with industrial policy, public investment, and digital platforms, these measures helped new-energy vehicles rise from about 5% of new car sales in 2020 to nearly half by 2025.[109] Similar dynamics are visible internationally. India's PM Surya Ghar rooftop-solar program combines concessional finance, subsidies, and net metering to transform households from passive consumers into distributed energy producers.[110] In both cases, rising prosperity is channelled toward lower-carbon systems rather than locked into conventional consumption patterns.

At the same time, these experiences illustrate the limits of isolated technological substitution. Electrification alone does not resolve broader pressures associated with rising vehicle ownership, mineral extraction, electricity demand, and land use. This reinforces a broader lesson emerging across countries: the next step in sustainable consumption requires not only cleaner products, but changes in urban systems, mobility models, infrastructure, and resource use patterns.

Second, durable transformation occurs when sustainability is embedded into systems rather than dependent on temporary behavioural campaigns or subsidies. International practice shows that pricing procedures, legal obligations, standards, and default rules can reshape behaviour at scale when supported by enabling infrastructure. The Republic of Korea's volume-based food-waste charging system, combined with radio-frequency identification (RFID)-enabled collection, increased food-waste recycling rates from negligible levels in the 1990s to among the highest globally.[111] Germany's deposit-return system sustains beverage-container return rates near 98% while largely financing itself through the recycling chain. The European Union's energy-labelling and eco-design framework has progressively removed inefficient products from the market while reducing household energy costs.[112] Closer to home, Shanghai's transition from voluntary to mandatory waste sorting in 2019 rapidly increased household participation and significantly reduced landfill disposal.[113]

Transformative change emerges when sustainable behaviour is institutionalized through governance, infrastructure, and market design rather than left to individual goodwill. At the same time, they also reveal the importance of systemic coherence. Recycling and waste-sorting systems, for example, remain constrained where downstream material recovery, regional coordination, and circular-economy markets are underdeveloped. Without broader shifts in production and consumption systems, efficiency gains risk being overtaken by continued growth in overall material demand. Germany's experience with plastic-waste exports is a case in point. Despite having one of the most developed sorting and recycling systems, Germany has also been the European Union's largest exporter of plastic waste. After China's 2018 restrictions on plastic-waste imports, waste flows shifted to Malaysia, Türkiye, and Indonesia. High collection and sorting rates do not directly deliver

circular outcomes unless downstream recycling capacity and secondary-material markets can keep pace.[114]

Third, integrating equity into demand-side transition is essential for long-term sustainability and social legitimacy. The most successful examples do not treat social inclusion as a secondary consideration after decarbonization, but as part of the transition strategy itself. India's reform of liquefied-petroleum-gas subsidies combined digitalized direct-benefit transfers with targeted support for low-income households, expanding access to clean cooking while reducing fiscal leakage and inefficient subsidy allocation.[115] The reform particularly benefitted rural and female-headed households, illustrating how green transition policies can simultaneously advance welfare, public health, and environmental objectives.

This is directly relevant to inclusive green transitions, as costs and benefits of green transition policies are unevenly distributed across income groups, regions, and generations. Consumption-related measures that fail to account for affordability and accessibility risk reinforcing inequality and weakening public support. By contrast, integrated approaches that combine sustainability objectives with inclusive public services, affordable green alternatives, and social protection can strengthen both environmental and social resilience. A concrete example is the increasing demand for cooling. As incomes rise and summers become hotter, the IEA projects that up to 85% of Chinese households may own air conditioning by 2030.[116] Yet access to cooling remains uneven across regions and between urban and rural households,[117] stressing existing vulnerabilities. Heatwaves roughly double mortality risk among Chinese adults over 65, with the frail, cognitively impaired, and socially isolated most exposed.[118] Affordable, efficient, and sustainable cooling (powered by green energy), together with targeted heat protection for elderly, low-income and rural populations, should therefore be treated as part of climate adaptation, demographic policy, and energy-system planning, rather than only as a matter of household consumption.

Taken together, these experiences demonstrate that green and sustainable consumption is not merely a behavioural issue but a governance challenge. They show that it is possible to reconcile rising living standards with ecological limits when incentives, infrastructure, finance, and institutional frameworks are aligned toward long-term societal goals. Yet such cases remain partial and uneven, rather than the prevailing development model. Their broader scaling continues to face the structural constraints: GDP-centred evaluation systems prioritize output growth over resource productivity and well-being, local governance incentives remain insufficiently aligned with ecological outcomes, and finance is not consistently directed toward integrated transition pathways.

Realizing consumption as a force for Ecological Civilization therefore requires broader systemic transformation. This includes moving beyond GDP as the primary measure of progress, embedding ecological and social indicators into governance and performance systems, as well as mobilizing finance and international cooperation toward integrated, people-centred, and nature-positive development pathways, as stressed in the following recommendations. Only through such systemic change can rising prosperity be durably decoupled from unsustainable material throughput and aligned with modernization in harmony between humans and nature.

4. The Way Forward: Summary and Recommendations

Across each of the fault lines and risks highlighted in Chapter 2, it emerges that a siloed, incremental approach to green transition generates mounting tensions between growth, equity, and sustainability that may ultimately undermine the government's own objectives. This misalignment is becoming evident not only within China, but also globally, from opportunity lost (e.g., higher health costs and reduced quality of life), overlooked distributional dynamics, and mismeasurement of welfare, to trade and other frictions with partners. The current model treats efficiency as a static, short-term concept, ignoring the dynamic costs of delay and lock-in. It also prioritizes aggregate growth and neglects fairness and social cohesion, building the case that fragmented, carbon-centric progress cannot deliver the holistic transformation envisioned under Ecological Civilization.

An integrated approach is therefore imperative to realign China's development pathway with its ecological goals. This means rethinking the foundations of the transition.

Development should be understood in dynamic, system-wide terms, capturing future costs and benefits, assessed through multi-dimensional metrics that reflect health, well-being, and prosperity, along with system resilience, all within planetary boundaries. Equity must be embedded in policy design, rather than being treated as an afterthought to account for externalities of growth. This will help avoid or mitigate the risks of leaving certain groups and regions behind, that in turn may undermine the broader goal of a balanced, inclusive modernization in harmony with nature.

Far from representing a trade-off, this shift should be seen as an investment for a "high-quality transition," one that ultimately lowers future economic costs, strengthens social stability, and aligns China's economic transformation with the overarching aim of modernization in harmony between humans and nature. An integrated approach, consistent with leading global scenario findings, offers a more viable path to realize the vision of Ecological Civilization.

Building on the considerable progress toward a green transition, the Government of China has recognized the opportunities and challenges. The 15th Five-Year Plan period, for example, is presented as a critical time to cement the foundation in pursuing "modernization in harmony between humans and nature," under the banner of Ecological Civilization. It thus offers a significant window of opportunity as China is driving transitions across several dimensions, including green and nature positive development, innovation, and a rebalancing of domestic consumption and services within its economy, all within security guardrails.

Given its scale, development stage, industrial structure, and global economic linkages, China provides a globally significant example of how green transformation can align with continued advances in human development and well-being. Its experience can generate valuable lessons for other countries, particularly developing economies pursuing transformation under different national conditions. That said, realizing these goals in practice remains

challenging and good examples of integrated implementation across policy domains remain limited, in China and globally.

Building on the analysis presented above, the report proposes the following recommendations:

Recommendation 1: Further integrate social concerns into the green transition strategy, treating them as necessary investments in achieving a just transition rather than as costs or risks. This would include investments in social infrastructure and policies, strengthening safety nets for those negatively impacted, shifting consumption, and enhancing public support for ambitious environmental goals. A more equitable distribution of costs and benefits of the green transformation will involve both targeted social protection and active labour-market interventions, including job creation, skills training, and social benefits for groups most directly impacted, along with fiscal redistribution and support to local governments to enable affected regions to finance the transition.

An integrated approach to sustainability requires moving beyond viewing social concerns mainly as risks to be mitigated, or as costs incurred while addressing climate and environmental challenges. Social, economic, and environmental systems are mutually reinforcing. Challenges such as demographic shifts, employment dislocation, ill-health, and rising inequalities are structurally intertwined with the environmental crisis and must be addressed in tandem.

A just transition should therefore be understood not only in terms of protecting workers, communities, and regions from transition costs, but also in terms of how its benefits are distributed. Ensuring that green mobility, clean energy, healthier environments, energy-efficient housing, and quality public services are accessible across income groups and regions should be treated as a core component of transition planning, rather than as a secondary outcome of decarbonization.

Addressing social risks and equitably distributing the costs and benefits of a green transformation through "just transition" policies will therefore be essential for ensuring continued progress. Just transition policies could also complement and reinforce broader reforms addressing "strong supply, weak demand," where supply-side measures alone may not suffice. Strengthening social security and housing support for low- and middle-income groups, including migrant workers and other new urban residents, can reduce precautionary saving, expand final demand, and support growth.[119] Investment in social protection and infrastructure would thus turn into a strategic investment in fairness, resilience, and inclusion, helping to support a more balanced consumption-oriented development model, alongside the government's environmental goals. This broader rationale strengthens the case for making social objectives a fully operational pillar of just transition frameworks, rather than a secondary consideration.

Recommendation 2: Strengthen integrated cross-sectoral, multi-level planning and coordination to support effective policy implementation. *China has increasingly adopted system-wide approaches with strong national target-setting, but local implementation can still be fragmented across environmental, industrial, fiscal, social, and employment policy domains. Stronger coordination mechanisms and aligned incentives across sectors*

and levels, clear fiscal responsibilities and support, budget systems capable of financing activities with long-term ecological and social returns, and outcome-based accountability and evaluation systems can support implementation, manage trade-offs, and capture co-benefits.

Progress on environmental goals, such as the fight against pollution, hinged on an evolving governance system that allowed for the successful alignment of different priorities, driving change at the local level. Indeed, even in China's top-down governance system, where the central government sets the vision, priorities, and targets, local officials are critical stakeholders and agents of change, responsible for 85% of total fiscal expenditures,[120] equivalent to about 28% of GDP.[8] Building on its successful experience, China's government is also recognizing that an incremental approach may not be sufficient, given a rapidly evolving context, and is calling for governance and fiscal actors to adapt to the new circumstance. First, goals are now more ambitious and broader in scope (e.g., from emission reduction, biodiversity protection, common prosperity and livelihoods, alongside modernization of the industrial system). Second, the socio-economic context has also evolved, with China's economy undergoing structural changes with more limited public resources.

As a complement to the work and recommendations put forward by the CCICED High-Level Task Force, Working Group 4 (Governance Systems), this report draws attention to a series of areas, including local government incentives, intergovernmental fiscal relations, budget systems, performance accountability, and market mechanisms, to strengthen and optimize China's governance system and adequately and sustainably finance the realization of an Ecological Civilization.

The next phase of Ecological Civilization will require China to move from a governance model centred on target-setting and local compliance, toward one which combines more effectively differentiated local pathways, clearer fiscal responsibilities, stronger outcome-based accountability, and budget systems capable of financing long-term ecological and social returns. This is because Ecological Civilization requires not only stronger environmental targets, but a fiscal-governance system that, while acknowledging and building on diverse economic, social, and ecological geographies and conditions, clarifies who is responsible, who pays, how local governments are incentivized, how ecological assets are valued, how public investment is selected, and how transition costs are shared.

Framed this way, the agenda is essentially one of fiscal coherence, ensuring that revenue, expenditure, and financing decisions pull in the same direction and in the right order, rather than a checklist of reforms. The measures below are interdependent and order-sensitive. For example, local discretion granted before local fiscal capacity and accountability frameworks are in place becomes leakage, spillover functions recentralized before the center secures the revenue to fund them become unfunded mandates, and ecological compensation priced before natural-capital accounting is credible becomes a transfer in search of a number.

[8] Official statistics and estimation based on IMF database (accessed on June 27, 2026). https://www.imf.org/external/datamapper/profile/CHN.

The premise is strengthened local capacity, enhanced coordination, and adequate funding for a reformed institutional arrangement that combines China's traditional top-down approach with empowered bottom-up inputs, while integrating different priorities from the onset minimizing trade-offs, as well as strengthening audit and transparency to avoid converting discretion into leakage.

- **Strengthen incentive mechanisms for local governments, bound by national priorities.** To this point, the most recent guidance on accelerating green economic and social development by the National Development and Reform Commission (NDRC)[121] offers a high-level blueprint for change, granting local governments greater flexibility to design transition plans that combine environmental and development objectives based on local conditions, in line with high-level national visions and goals. Once local plans are effectively reconciled and aligned with national targets and plans, this would incentivize a shift away from a one-size-fits-all, which has thus far limited a more synergistic national approach to the green transition. This would foster targeted, evidence-based, efficient local approaches.
- **Strengthen accountability.** Greater local discretion should be paired with clearer responsibility and accountability: local governments need flexibility to design transition pathways suited to local conditions, but also clearer mandates, financing arrangements, performance metrics, and reporting obligations, effectively designed to tackle a broader set of priorities aimed at meeting environmental targets while minimizing the socio-economic costs. This also requires a clearer division of fiscal responsibilities. Public services and green investments should be assigned to the level of government best placed to deliver them, while functions with wider regional or national spillovers, such as climate adaptation, ecosystem protection, pollution control, and macroeconomic stabilization, should receive stronger financing and coordination from higher levels of government.[122] At the same time, accountability should not be equated with ever more numerical targets. Where policy objectives are intrinsically broader in scope such as "harmony between people and nature," they cannot be meaningfully reduced to a single rankable metric similar to GDP. Outcome accountability for the social-ecological dimension would then be better achieved through robust audit, transparency, and independent review, than by simply expanding promotion scorecards, with accountability mechanisms calibrated to the statistical and institutional capacity of the tier of government being assessed. Supreme audit institutions could play a stronger role by incorporating into compliance audits an assessment of consistency with economic, social, and green strategic objectives, and by using performance audits to examine whether public investments are achieving their intended ecological and social outcomes.
- **Optimize transfer mechanisms for ecological compensation, environmental protection, basic public services, and regional balancing.** Many ecological benefits extend beyond local jurisdictions, while the fiscal and social costs of transition are often concentrated locally. Green and just-transition transfers can therefore help correct this mismatch by compensating localities for ecosystem protection, supporting carbon- and resource-dependent regions, and ensuring that poorer areas can finance basic services, adaptation, public health, water security, and ecosystem restoration. The credibility and sustainability of

such an approach depend on measuring the ecosystem service being remunerated, and thus natural-capital accounting reforms (see the point on natural capital accounting below). In this context, the Ministry of Finance has expressed interest in systematically reviewing the conceptual framework, operational mechanisms, typical models, and implementation outcomes. This suggests future development directions for the expanded scope and more effective use of China's interregional (horizontal) transfer mechanism for ecological compensation.

- **Strengthen green budgeting while aiming for a Sustainable Development Goal (SDG) budgeting approach to be developed with an explicit social and well-being dimension alongside green categories.** This would include a systematic approach across the budget process, including reporting and oversight, using fiscal policy, budget planning, expenditure allocation, revenue measures, monitoring, and reporting to align public finance with social, environmental, and climate goals.[9],[123] China has yet to establish a comprehensive institutional framework for green budgeting. That said, some key green elements are scattered across China's fiscal policies, covering government expenditure, tax, public procurement, as well as national funds and bonds.[124]
- **Natural capital accounting[125] would also be critical to reinforce green budgeting practices.** In China's context, natural capital accounting could also strengthen the evidence base for ecological redlines, ecological compensation, territorial spatial planning, and local performance assessment. It would help determine whether public finance is maintaining, restoring, or depleting natural assets, rather than only recording whether environmental expenditure has increased.
- **Deepen fiscal reforms.** China's transition needs are becoming broader and more recurrent, covering mitigation, adaptation, public health, ecosystem protection, industrial upgrading, social protection, and inclusive development. At the same time, local fiscal space is being compressed by property sector adjustment, declining land-related revenues, population aging, and local debt pressures. This calls for a clearer alignment between central and local expenditure responsibilities, more predictable and equalizing transfers, a more stable local tax base, tighter control of off-budget liabilities, and budget systems that link ecological and social outcomes to medium-term fiscal planning.[126] While stronger transfers and clearer expenditure assignments are important, durable fiscal sustainability also depends on strengthening local own-source revenues. Possible reforms include progressively assigning a reformed, destination-based consumption tax to local governments, broadening the personal income tax base over time, and eventually introducing recurrent property taxation. Equally important, moving away from land-finance dependence should be framed not only as a fiscal reform but also as an ecological one, since reliance on land-conveyance revenues has historically encouraged farmland conversion and urban sprawl.

[9] International experience with well-being budgeting, for example, from New Zealand and Wales, is instructive, though the methodology for tagging social outcomes remains less mature than for green expenditure and should be developed deliberately rather than assumed.

- **Embed a just transition and social lens in fiscal policy** so that workers, households, and localities most exposed to industrial restructuring, energy transition, or ecological protection requirements receive support through retraining, social insurance, livelihood diversification, basic public services, and targeted transfers.
- **Leverage public investment management and the link between five-year planning and annual budgets.** This would imply climate and biodiversity screening of projects; cost-benefit analysis that incorporates environmental externalities; lifecycle costing; recurrent operation and maintenance budgets; and fiscal risk assessment for projects financed through state-owned enterprise (SOEs), public-private partnerships (PPPs), or local financing vehicles. In addition, consider strengthening the integration of the five-year plan capital expenditures and annual fiscal budgets to further optimize resource allocation and managing financial risks.[127]
- **Finally, allow for a greater role of the market.** Public finance should increasingly crowd-in market finance through carbon pricing, green procurement, public investment appraisal, disclosure, risk-sharing instruments, and credible regulation, while protecting vulnerable workers, households, and regions through just-transition finance. Evidence from the European Union ETS has shown the effectiveness of leveraging price signals for behavioural changes, allowing for a more efficient allocation of resources, while reducing the burden of the transition on public funding. China is gradually strengthening the national ETS, and implementation of the August 2025 Opinions[128] will be critical. For example, these call for absolute emissions caps for a selection of sectors from 2027. As a means of improving allocation efficiency and revealing abatement costs across firms and sectors, the ETS's fiscal contribution will depend on the credibility of caps; the scarcity of allowances; the robustness of monitoring; reporting and verification (MRV); the gradual introduction of paid allocation; and the recycling of revenues to support households, firms, and regions facing transition costs. In addition, strengthening price signals would also enable a greater private sector contribution through blended finance, risk-sharing instruments, green procurement, incentives, and regulatory frameworks, with fiscal policy acting as a catalyst for larger private investment in an inclusive green transition.

Recommendation 3: Extend measures of progress beyond GDP, building on domestic and international good-practices and lessons. *Progress depends to a large extent on what is valued and how this is measured. China has already broadened its indicator frameworks through high-quality development and ecological indicators. Further complementing GDP with comprehensive wealth, Planetary Pressures-Adjusted Human Development Index, and well-being measures would strengthen incentives for long-term, inclusive, and sustainable development. Applying these as key indicators to measure performance across government entities at central and subnational levels would streamline accountability architecture and incentivize the above systems.*

To move beyond GDP in practice, China should complement, rather than replace, GDP by consolidating its existing measurement initiatives into a coherent and operational framework. The indicator frameworks of the 15th Five-Year Plan, the High-Quality Development indicator system, and gross ecosystem product pilots

could be better aligned with the System of National Accounts 2025 (SNA 2025) and the System of Environmental-Economic Accounting (SEEA). In particular, using economic, natural, human, and social capital accounts to connect economic performance with environmental sustainability and well-being. [129] Such a framework should then be embedded in the governance chain, linking statistical monitoring, planning targets, and government performance assessment. This is fundamental to shaping an economic system that recognizes and gives value to what truly matters: human well-being, environmental sustainability, and equitable progress, for everyone, now and in the future.

From the global debate, there are also interesting innovations that may be relevant to China. These include the latest report by the UN High-Level Expert Group on Beyond GDP that proposed a conceptual framework, dashboard of indicators, and pathways for future work, identifying a set of priorities for statistical development, research, and national uptake.[130] The stated objective is to measure equitable, inclusive, and sustainable wellbeing. The proposed dashboard includes 31 indicators structured around four components: the foundational principles, such as peace, human rights, and respect for the planet; well-being, measured across domains that reflect people's lived experiences; equity and inclusion, treated as a cross-cutting dimension and assessed through indicators of inequality, poverty, and disparities across population groups; and sustainability and resilience, connecting present outcomes to future well-being by measuring key forms of capital (produced, human, social, institutional, and natural).

In addition, the UNDP's Human Development Report Office[10] is developing the Nature Relationship Index (NRI), to measure whether people and nature are thriving together, expected to feature in the 2026 Human Development Report.[131] Inspired by the Human Development Index, the NRI seeks to broaden the definition of national progress by treating relationships between people and the rest of life on Earth as a core dimension of development. It is aspirational as well as diagnostic: rather than focusing only on targets, boundaries or reductions in harm, it aims to make positive progress visible and to help orient policies, as well as investments toward relationships in which people and nature reinforce one another.[132] The proposed index is organized around three dimensions: whether nature is thriving and accessible to people; whether people use nature with care and respect to expand human development; and whether nature is safeguarded from pollution and biodiversity loss. The NRI could complement existing beyond-GDP tools, including China's high-quality development indicators and GEP accounting. Rather than replacing measures of economic performance, ecosystem services, or environmental pressure, it would add a relational perspective: whether development is creating the conditions for people and nature to thrive together. This could help translate Ecological Civilization from a broad vision into a clearer basis for tracking progress and guiding long-term policy choices.

Recommendation 4: In its international engagement, China should seek to better balance social, labour, and environmental goals alongside economic and security interests including in critical mineral,

[10] The NRI is being developed through research, technical inputs, and consultations with a range of partners, including research participation from the Zhejiang Gongshang of the University and the Chinese Academy of Sciences' Research Centre for Eco-Environmental Sciences.

technological, and other supply chains. *Policies should include strengthening and enforcing ESG standards, supporting low-income economies in developing the productive capabilities, infrastructure, and technologies to achieve a low-carbon shift, minimizing trade tensions and strengthening multilateral cooperation.*

There is a clear understanding that given the complexity, links and spillover effects of the development challenges and related solutions to achieve harmony between people and nature, international cooperation must remain a central pillar underpinning any chosen path. While deferring to the analysis and conclusions featured in the High-Level Task Force Working Group 3's forthcoming thematic report on China and the world, as well as other Task Force inputs, here we reiterate the call for China to champion an inclusive and just low carbon and nature positive global transition, further leveraging international cooperation as a way to strengthen both national and global resilience in the face of interconnected environmental, economic, technological, and demographic challenges.

International cooperation should move beyond the transfer of technologies and finance alone toward collaborative approaches that enhance countries' long-term capabilities to anticipate, adapt to, and manage systemic risks. By fostering complementarities among development, climate, and biodiversity objectives, China can help advance a more resilient, inclusive, and sustainable model of global development, while reinforcing the shared foundations of Ecological Civilization. In practice, this would include continuing to foster a vast range of actions—from strengthening and enforcing ESG standards, international norms, and best practices, to supporting low-income economies to develop productive capabilities, infrastructure, and technologies. It would also include long-term, adequate, and affordable financing to minimize tensions over trade imbalances and strengthening multilateral cooperation. Given the complexity, overlap, and spillover effects of development challenges globally, international cooperation must remain a central pillar of a global green transformation in future.

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