A Policy Framework for the Green and Just Transition

of Micro, Small, and Medium-sized Enterprises in China

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The authoring team includes:

China Association of SMEs

Chen Jing, Feng Yanan, Feng Yang, Chen Jiayi, Jia Yifan, Liao Yiling, Cao Lu, Deng Tongshuai, Yu Ruitong and Shi Shunqing

United Nations Development Programme

Wang Chen, Mohsen Gul

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For more information on the content or topics covered in this report, please contact Ms. Wang Chen (chen.wang@undp.org)

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Abbreviations

Abbreviation	Full Form
ACWF	All China Women's Federation
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
CASME	China Association of Small and Medium Enterprises
CDB	China Development Bank
CBIRC	China Banking and Insurance Regulatory Commission (superseded by NFRA in 2023)
CPC	Communist Party of China
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
G20	Group of Twenty
IFC	International Finance Corporation
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
MARA	Ministry of Agriculture and Rural Affairs (People's Republic of China)
MEE	Ministry of Ecology and Environment (People's Republic of China)
MIIT	Ministry of Industry and Information Technology (People's Republic of China)
MOF	Ministry of Finance (People's Republic of China)
MOFCOM	Ministry of Commerce (People's Republic of China)
NBS	National Bureau of Statistics (People's Republic of China)
NDRC	National Development and Reform Commission (People's Republic of China)
NFRA	National Financial Regulatory Administration (People's Republic of China)
NPC	National People's Congress (People's Republic of China)
NDB	New Development Bank
OECD	Organisation for Economic Co operation and Development
PBoC	People's Bank of China
RBAP	Regional Bureau for Asia and the Pacific (UNDP)

Abbreviation	Full Form
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
1+N	China's climate policy architecture, comprising one top level carbon neutrality strategy (the '1') and multiple sectoral and regional policy instruments (the 'N')
BDS	Business Development Services
COP	Conference of the Parties (to the UNFCCC)
COP24	24th Conference of the Parties, held in Katowice, Poland, 2018
COVID-19	Coronavirus Disease 2019
FYP	Five Year Plan
GHG	Greenhouse gas
ICT	Information and communications technology
NDC	Nationally Determined Contribution
PA	Paris Agreement
PRC	People's Republic of China
R&D	Research and development
SDG	Sustainable Development Goal
SEZ	Special Economic Zone
SOE	State owned enterprise
FDI	Foreign direct investment
GDP	Gross domestic product
GNI	Gross national income
IPR	Intellectual property rights
MSME	Micro, small and medium sized enterprise
PMC	Policy Modelling Consistency (index)
PPP	Purchasing power parity
SME	Small and medium sized enterprise
VAT	Value added tax
AI	Artificial intelligence
AR6	Sixth Assessment Report (IPCC)
ESG	Environmental, social and governance
IoT	Internet of Things
ISO	International Organization for Standardization

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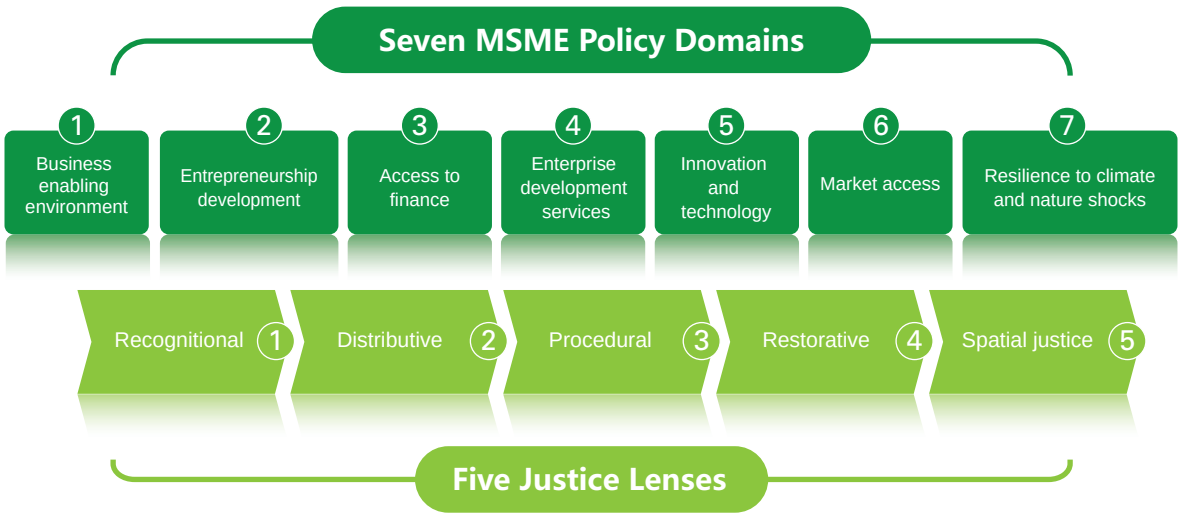
Executive Summary

The Opportunity and the Challenge

China's micro, small, and medium-sized enterprises (MSMEs) are indispensable to the country's green transition. Accounting for over 99 per cent of enterprises, approximately 60 per cent of GDP and 80 per cent of urban employment, MSMEs must be active participants in China's pursuit of carbon neutrality by 2060, not merely subjects of environmental regulation. At the same time, they are the enterprises most exposed to the direct costs of compliance, retrofitting, and adjustment, while being least equipped with the institutional resources to navigate the transition on their own.

As the title of the report indicates, it is China's goal that the transition to a green and environmentally friendly economy be based on the principles of a "green and just" policy approach. Fundamentally, that means adopting a people-centered approach that ensures fairness, inclusivity and equity, leaving no one behind. It seeks to create more winners than losers by focusing on social equity, decent work and sustainable livelihoods. A just transition also seeks to address historical inequalities and exclusion to help build more resilient societies for future generations. The aim of this report is to propose a policy framework that meets these objectives.

The report provides a comprehensive diagnostic of China's policy landscape for supporting the green and just transition of MSMEs. It applies the UNDP Regional Bureau for Asia and the Pacific MSME Just Transition Policy Diagnostic Framework, integrating seven MSME policy domains and five justice lenses. The policy domains are: business enabling environment; entrepreneurship development; access to finance; enterprise development services; innovation and technology; market access; and resilience to climate and nature shocks. The justice lenses are: recognitional, distributive, procedural, restorative and spatial justice. The research combines three sources of evidence: a systematic policy text analysis of 20 representative national and subnational instruments; a nationwide enterprise survey of 338 valid responses across five sectors; and in-depth case studies with 20 enterprises in eastern, central and western China.



Five Core Findings

01 China has a strong policy architecture, pointing to opportunities to strengthen its effective reach.

Across five sectors, agriculture, manufacturing, ICT, transportation and logistics, and wholesale and retail, the analysis finds a broad and evolving multi-level policy system that deploys supply-side, demand-side, and institutional instruments, laying a robust foundation. The central challenge is not the absence of instruments but the gap between formal policy availability and effective enterprise access, especially for MSMEs. Instruments designed for enterprises at the median level or above systematically fail to reach smaller, less institutionally connected and more geographically peripheral enterprises.

02 Procedural justice is the most pervasive deficit, affecting all five sectors.

Only a small minority of enterprises across every sector report no, or minimal, procedural barriers when applying for green transition support. The dominant barriers are untimely policy information, administrative complexity, and fragmentation of relevant instruments across multiple departmental channels. MSMEs learn about policy programmes through informal social networks rather than official channels, and by the time information reaches smaller enterprises, application windows have often closed. This is simultaneously an equity problem and a policy effectiveness problem: instruments that are not reaching their intended beneficiaries are not delivering on stated objectives.

03 Restorative justice is absent across all five sectors.

Few sectors have a systematic mechanism for compensating enterprises for transition adjustment costs, supporting workers displaced by green restructuring of production processes, or providing transitional income for operators whose business models must change as environmental standards tighten. This gap is particularly consequential for logistics enterprises with stranded diesel fleets, manufacturing workers displaced by automated green processes, and women-led service enterprises that must invest in renovation without the financial buffers available to larger firms.

04 Women-led and youth-led enterprises are recognised in policy framing but absent in operational design.

China's policy system contains a real subset of instruments that specifically target women and youth entrepreneurs. The critical gap is that none of these instruments connect to green transformation support. Women operators in community retail, agricultural processing and light manufacturing, and young entrepreneurs entering green sectors, face a compound barrier: the instruments designed for a green transition assume enterprises with fixed assets, credit history and administrative staff, while the instruments designed for women and youth assume enterprises with general development needs rather than green transition investment requirements.

05 Spatial stratification is structural and self-reinforcing.

Every sector exhibits a diminution in policy delivery effectiveness as you go from coastal to interior parts of the country . MSMEs in central and western provinces, rural areas and remote localities access policy support at lower rates, face higher procedural barriers and receive less technically capable services than equivalent enterprises in coastal provinces. The mechanisms differ by sector, from digital infrastructure concentration in ICT to cluster-based technology spillovers in manufacturing, but the outcome is consistent. Without deliberate and tailor-made spatial targeting, the green transition will deepen rather than reduce regional development gaps.

A sixth structural pattern cuts across all five findings: a persistent scale and ownership bias exists in access to policy support and green finance. Many policy instruments remain oriented towards larger enterprises, leaving micro and informal operators systematically under-served. Interview evidence also suggests that SOEs often access green credit, subsidies, and procurement support more easily than comparable private MSMEs. This recurring pattern points to structural inequities in financing and governance systems that require stronger regulatory guidance, monitoring, and incentive reforms to improve access for smaller and privately owned enterprises.

Six Strategic Policy Pillars

Based on these findings, the study proposes six strategic policy pillars with 18 specific actions. The pillars address both gaps in policy instruments and deficiencies in the delivery architecture that explain why China's strong formal policy framework is not reaching its intended beneficiaries consistently. The pillars are interdependent: effective implementation requires establishing the monitoring foundation first, the consultation mechanism before designing policy content, and the information infrastructure as a general-purpose enabler across all other pillars.

Six Strategic Policy Pillars

Pillar	Strategic Objective	Key Actions
Pillar 1 Sector Specific Transition Pathways	Improve policy precision so instruments match the operational realities of each sector and enterprise size	Develop sector MSME transition roadmaps for five sectors (new initiative); dedicated green financing windows for MSMEs with limited collateral (existing instrument refinement); green transition advisory services on SME service platforms (existing instrument refinement) with dedicated women-led and youth-led enterprise components.
Pillar 2 Participatory Governance and Feedback	Strengthen MSME voice in policy design and close the gap between policy intent and implementation	Establish national MSME green transition consultation mechanism (new initiative); digital policy feedback systems on e-government platforms (existing instrument refinement); capacity building for local officials implementing MSME policies (existing instrument refinement)
Pillar3 Coordinated Provision of Inclusive and Green Finance	Expand access to affordable, appropriately structured transition finance for smaller enterprises	Institute expanded government backed credit guarantee schemes (existing instrument refinement); MSME compatible transition finance standards within national taxonomy (new initiative); alternative credit assessment using digital transaction and supply chain data (existing instrument refinement)

Pillar	Strategic Objective	Key Actions
Pillar 4 Regional Equity	Reduce spatial inequalities so the green transition contributes to balanced development	Enhance green infrastructure investment in central and western regions (existing instrument refinement); regional green industrial clusters in interior provinces (new initiative); cross regional technology transfer and cooperation mechanisms (new initiative)
Pillar 5 Transition Support for Enterprises and Workers	Manage adjustment costs so that green transformation does not impose unacceptable burdens on smaller firms	Establish MSME transition adjustment funds with dedicated micro enterprise windows (new initiative); sector specific workforce reskilling programmes (existing instrument refinement); expanded climate risk insurance for high exposure sectors (existing instrument refinement)
Pillar 6 Policy Accessibility and Information Transparency	Close the gap between policy availability and enterprise access, especially for the most marginalised groups	Set up an integrated national MSME policy information platform (new initiative); one stop green transition service centres at prefecture level (new initiative); targeted outreach for rural, women led and youth led enterprises (existing instrument refinement)

From Architecture to Delivery

China has invested significantly in the architecture of its green transition policies for MSMEs. Building on this strong foundation, the focus should pivot to delivery: ensuring that the ambition of the formal architecture becomes the day-to-day experience of enterprises across all sectors, sizes, regions and ownership types. The six pillars in this report are designed to close the gap between what policies promise and what enterprises can access, with particular attention to the enterprise groups that the current system most consistently fails to reach: rural MSMEs, women led enterprises, youth led start-ups, and individual business owners without institutional connections.

China's scale, institutional capacity and digital governance infrastructure give it both the means and the opportunity to demonstrate that an ambitious green transition and a just and inclusive green transition are not in tension. The enterprises and communities that are most vulnerable to being left behind in the green transition are also the ones whose participation is most essential to achieving it at the scale China's climate commitments require.

01 Chapter One: Introduction and Analytical Framework

China's micro, small and medium sized enterprises (MSMEs) sit at the intersection of two defining national challenges: accelerating the transition to a low carbon economy and ensuring that the gains from that transition are distributed fairly. MSMEs account for more than 99 per cent of enterprises, contribute approximately 60 per cent of GDP, generate over 70 per cent of technological innovation, and provide roughly 80 per cent of urban employment and 90 per cent of new jobs (MIIT, 2024; NBS, 2024; CASME, 2024). Because of this centrality, MSMEs are indispensable to China's dual carbon pathway, which sets out the goals of peaking carbon emissions before 2030 and achieving carbon neutrality by 2060, as well as to the wider vision of ecological civilisation.

Yet MSMEs also stand at the frontline of transition pressures. Environmental standards and disclosure obligations are tightening; lead firms and export markets are raising sustainability requirements; and climate and nature related risks are intensifying. Early fieldwork for this study confirms that transition frictions cluster around costs, technology and operations, including dual certification and retrofit costs, lack of waste treatment technologies, shortages of skilled personnel, and conflicts between production schedules and emission reduction targets. These frictions are compounded by pronounced spatial disparities between coastal and inland locations.

At the same time, China's green transformation is expanding domestic demand for clean energy, circular manufacturing, low carbon services and digital green solutions. These are new markets that MSMEs can capture, provided persistent access gaps in finance, capability, standards and procurement are resolved. If not managed with care, the transition can exacerbate inequalities by favouring larger or better connected enterprises and deepening regional disparities. If managed well, it can accelerate MSME upgrading, create local green jobs, and widen participation in future value chains.

This study provides a systematic diagnostic of China's MSME policy environment for green and just transition. It draws on three interlocking sources of evidence: policy text analysis, a nationwide enterprise survey, and in-depth case studies. These are organised through a unified analytical framework that is set out in this chapter, covering the study's objectives, its conceptual anchors, its analytical dimensions, and the logic of its application.

1.1 Study Context: MSMEs, Transition Pressures and National Imperatives

China's 14th Five Year Plan (FYP) embeds green development, innovation and digitalisation as pillars of high-quality growth (NPC, 2021). The 15th FYP (2026–2030) reiterates and deepens this direction of travel, with continued emphasis on the dual carbon goals, the green industrial transformation and inclusive enterprise development for MSMEs. The '1+N' climate policy architecture, which consists of a top level carbon neutrality strategy supported by sectoral and regional policy instruments, translates the dual carbon goals into requirements that cascade through supply chains and reach MSMEs through procurement standards, energy benchmarks and environmental compliance obligations (NDRC/MEE, 2021).

These shifts bring both opportunity and risk. On the opportunity side, new markets for clean energy, green logistics, low carbon services and digital environmental solutions are expanding rapidly. MSMEs with access to the necessary finance, technology and skills have real prospects for growth in this expanding landscape. On the risk side, compliance costs, retooling investment and the prospect of stranded processes impose disproportionate burdens on smaller firms with thinner buffers and weaker institutional capacity. Climate change itself compounds this risk: more frequent extreme heat events, floods and droughts are already disrupting operations and logistics, and smaller firms are disproportionately exposed because they tend to have limited risk management tools, weaker insurance coverage and fewer financial reserves (IPCC, 2022).

The equity stakes are significant. Multiple forces shape who benefits and who bears costs in the green transition: firm size, ownership structure, sector, geography and the social identity of business owners all play a role. Absent comprehensive coordination and precision targeting, the green transition may produce structural imbalances in resource allocation: tilting toward coastal enterprises, concentrating among larger and medium-sized firms, gathering around market actors with smooth policy-access channels, and clustering in urban communities — to the disadvantage of inland regions, micro and small enterprises, rural areas and emerging entrepreneurs in their fair participation in the transition. The diagnostic presented in this report is designed precisely to identify where these dynamics are in play and what policy adjustments are needed.

The central purpose of this study is to provide a structured diagnostic of China's MSME policy environment for green and just transition. It aims to inform policymakers, regulators, development agencies and research institutions on how to design more coherent, inclusive and effective policy measures.

Objectives

The study pursues four objectives:

1.Assess the current policy landscape affecting MSMEs across key domains of the green transition.

2.Evaluate the extent to which policies incorporate justice principles, including fairness, inclusion and redress, across enterprise groups and regions.

3.Identify strengths, gaps and frictions that shape MSME readiness for transition.

4.Provide actionable guidance for aligning MSME policies with China's dual carbon pathway and its broader development goals.

Scope.

The diagnostic focuses on China while drawing selectively on Asia Pacific and global experience.

It examines seven policy domains critical to MSME performance in the green transition: business enabling environment; entrepreneurship development; access to finance; enterprise development services; innovation and technology; market access; and resilience to climate and nature shocks. These domains are analysed through five justice lenses: recognitional, distributive, procedural, restorative and spatial. Five sectors are examined: agriculture, forestry, animal husbandry and fisheries; manufacturing; information and communications technology; transportation, warehousing and logistics; and wholesale and retail. These five sectors together account for the majority of MSME employment in China and span the principal pressure points of the green transition: agricultural emissions and climate vulnerability; industrial decarbonisation and circularity; the enabling role of ICT; freight and last-mile logistics emissions; and consumer-facing retail with growing green procurement and standards exposure. The selection is also analytically pragmatic, allowing comparison across sectors with very different structural characteristics. The authors acknowledge that construction and real estate, which are also dominated by MSMEs in sub-contracting chains and carry significant green transition pressures (green building standards, retrofitting mandates, materials procurement), are not included in the primary survey and case study sample. This is a recognised limitation and is discussed in Chapter 2.

Guiding questions. Four questions structure the analysis:

- What are the strengths and weaknesses of China's MSME policies in the context of the green transition?
- How inclusive and equitable are these policies in practice, considering who benefits, who is burdened, who participates, and which regions are reached?
- What gaps persist in MSME access to finance, technology, markets and resilience instruments?
- What lessons from international experience can inform China's efforts?

1.2 Green Development and Just Transition in the Chinese Context

The net zero transition is a whole economy challenge that will change how economies are structured, how businesses operate, and how people live and work (UN, 2023). For China, carbon neutrality by 2060 requires both sustained emissions reductions and the scaling of carbon removal measures across all sectors and regions of the economy (State Council, 2020). The scale and pace of this transformation are without precedent.

Climate action cannot proceed on technical grounds alone. If the transition is perceived as unfair, with its costs falling disproportionately on smaller firms, on workers in contracting industries, or on communities in vulnerable regions, its social legitimacy erodes and its political sustainability is placed at risk. A just transition addresses this by ensuring that climate action maximises socioeconomic opportunities and minimises harms, with particular attention to those most exposed to change (ILO, 2015; OECD, 2021). The World Bank similarly emphasises that mitigation ambitions must be coupled with rapid, inclusive development and resilience; otherwise countries risk widening the gap between future net zero systems and present day workers, firms and communities.

Contextualising Just Transition in China

The concept of 'just transition' originates primarily in international labour and climate policy debates, and as such it lacks a dedicated line ministry or an explicit the FYP target in China's domestic governance architecture. However, its substantive content, namely the fair distribution of transition costs and benefits, inclusive participation in policy design, and protection of vulnerable groups, resonates closely with a key guiding principle of the FYP – "put people first", and two core objectives embedded in China's development agenda: ecological civilisation and common prosperity. This study uses the just transition framework as an analytical lens rather than as an externally imposed normative standard. The five justice dimensions are applied to assess how well existing policies align with principles that Chinese policymakers have already endorsed, albeit under different terminology.

Green development and just transition are therefore best understood as mutually reinforcing rather than competing objectives. In the Chinese context, green development, structured around ecological civilisation and "high-quality" growth, provides the environmental ambition and vision, while a "people-centered" transition is meant to supply the equity guardrails that ensure this ambition does not generate new structural disadvantages. Applied to MSMEs, the logic is reciprocal: the transition needs MSMEs to diffuse cleaner technologies and create local green jobs, embed resource-efficient practices across local production systems, support circular economy models, and extend green practices into local value chains and communities; MSMEs need proportional standards, accessible finance, technical support and inclusive policy processes so that new rules do not exclude them from the benefits of the green economy and so that MSMEs are enabled not only to adapt to but also to actively contribute to and shape the green transition.

Several jurisdictions, including the European Union, Canada, South Africa and Argentina, have embedded justice considerations explicitly in transition strategies, using inclusive dialogue and practical delivery criteria around finance, technology and capacity building as the operational expression of these commitments. These enabling conditions are also affirmed in international frameworks including the Paris Agreement and the Silesia Declaration on Just Transition (COP24, 2018). China's growing engagement with global climate governance creates both an expectation and an opportunity to align domestic policy practice with these principles.

1.3 Analytical Framework: Seven Domains, Five Justice Lenses

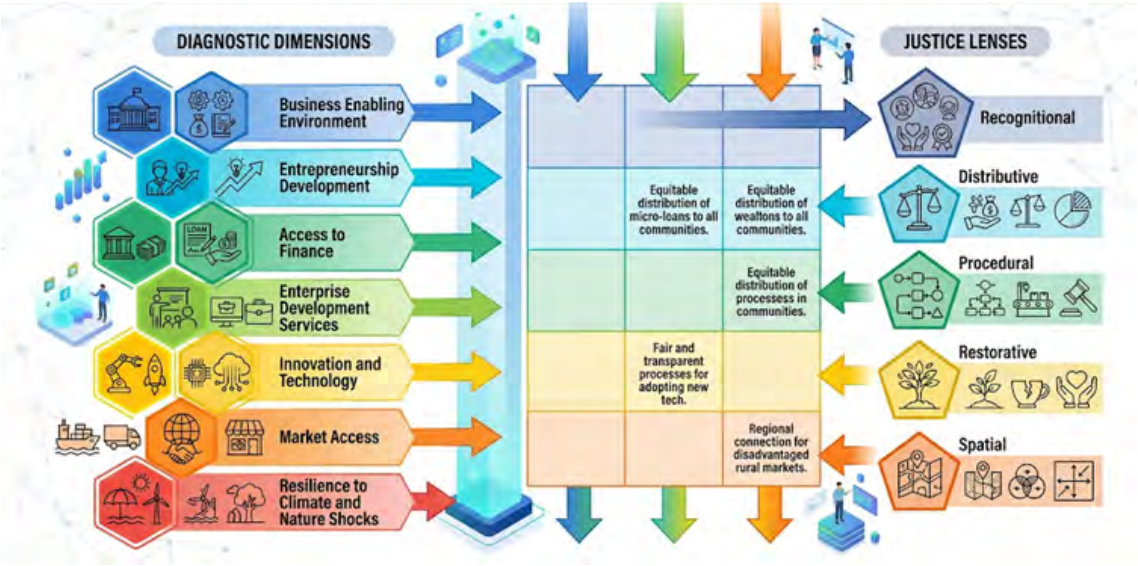
The framework adopted in this study was developed by the UNDP Regional Bureau for Asia and the Pacific in 2023, building on decades of ESCAP work documenting the dual reality of MSMEs across the region. MSMEs are simultaneously engines of employment and innovation and among the most vulnerable actors in the face of climate change. They also carry significant agency in the green transition: they can drive local adaptation, improve resource efficiency, advance circular economy practices, diffuse green technologies and create local green jobs. Policy support for them is frequently fragmented across ministries and insufficiently attuned to questions of inclusion related to gender, youth, informality and geography (ESCAP, 2020; UNDP RBAP, 2023).

The framework's core logic is that MSME development policy and climate transition policy must be analysed together rather than as parallel agendas. Three rationales underpin this integration. First, it prevents siloed analysis: innovation policy can be strong while finance or resilience is weak, and only a multidimensional view reveals cross domain mismatches. Second, it operationalises equity: the justice lenses translate the commitment to leave no one behind into testable criteria, asking who is recognised, who receives benefits or bears costs, who participates in decision making, who receives redress, and which places are reached. Third, it bridges MSME and climate policy: national climate strategies frequently target large emitters, and MSMEs must be explicitly included if the transition is to be both green and just.

1.3.1 What We Assess: The Seven Policy Domains

The framework examines seven MSME policy domains that together determine enterprise readiness for the green transition. Figure 1 illustrates their relationship within the full diagnostic matrix.

Figure 1: Seven Domain, Five Dimensional Policy Diagnostic Framework



Source: Author's interpretation, based on UNDP RBAP MSME Just Transition Policy Diagnostic Framework, 2023

Business enabling environment — Business Enabling Environment covers the regulatory, administrative and informational conditions that determine the ease and cost of operating and transforming a business.

Entrepreneurship development — Entrepreneurship Development covers the institutions, programmes and networks that support new and growing enterprises, including those led by women and youth.

Access to finance — Access to Finance addresses the availability, affordability and appropriateness of financial products for MSME investment in the green transition.

Enterprise development services — Enterprise Development Services covers advisory, training, certification and technical support services available to MSMEs through public and private providers.

Innovation and technology — Innovation and Technology addresses MSME access to green technologies, research and development resources, intellectual property support and digital capabilities.

Market access — Market Access covers access to domestic and international markets, public procurement, supply chain integration and green certification systems.

Resilience to climate and nature shocks — Resilience to Climate and Nature Shocks addresses MSMEs' capacity to anticipate, absorb and adapt to climate related disruptions, including access to early warning systems, adaptive finance and disaster recovery support.

Beyond these seven formal domains, the framework recognises the importance of a broader socio-cultural enabling ecosystem. This encompasses community networks, trade associations, mentorship structures and cultural norms around entrepreneurship and risk. In China, where informal institutions and personal networks significantly influence business access to support, this ecosystem dimension is particularly relevant and is treated as a transversal consideration throughout the analysis.

1.3.2 How We Judge Equity: The Five Justice Lenses

Overlaying the seven domains are five justice lenses, adapted from environmental justice and inclusive development literature, that convert equity principles into operational diagnostics. Together they form a 7 by 5 analytical matrix applied throughout Chapters Three and Four.

Table 1.1 How We Judge Equity: The Five Justice Lenses

Justice Lens	Diagnostic Question Applied to MSME Policy
Recognitional	Do policies explicitly acknowledge and target diverse MSME segments, including women led and youth led enterprises, micro and informal firms, and rural and ethnic minority businesses? Or do they default to treating MSMEs as a homogeneous category?
Distributive	Who actually receives finance, subsidies or procurement opportunities, and who bears the costs of compliance, certification and transition investment? Are benefits and burdens distributed equitably across firm size, sector and geography?
Procedural	Are MSME associations and under represented groups meaningfully involved in policy design, monitoring and feedback? Are policies transparently communicated and administratively accessible to the enterprises they are intended to serve?
Restorative	Are there mechanisms such as grants, retraining, compensation schemes and grace periods that provide redress where policies impose adjustment costs or where legacy disadvantages persist from historical structural exclusion?
Spatial	Does policy delivery reach lagging provinces, rural counties and climate exposed localities, or does it concentrate in coastal urban centres? Are spatially differentiated instruments deployed where infrastructure and market conditions vary substantially?

The analytical strength of the framework lies in combining these lenses across the seven domains. This surfaces specific bottlenecks, for example: access to finance assessed through a distributive lens asks whether green loans are reaching micro and rural firms; regulatory standards assessed through a procedural lens asks whether MSMEs are consulted on compliance requirements; market access assessed through a spatial lens asks whether procurement programmes reach interior provinces; and resilience support assessed through a restorative lens asks whether adaptive finance and insurance are available where shocks hit hardest.

1.4 Localising the Framework for China

1.4.1 China's Policy Context for Green and Just Transition

China's commitment to the dual carbon goals has elevated climate action to a national strategic priority. This ambition is embedded within broader development objectives under the 14th FYP (2021–2025), which sets targets for green innovation, digital transformation and inclusive growth. Building on these commitments, the 15th FYP Outline (2026–2030) has now been officially issued and entered into force. Aligned with the Nationally Determined Contributions (NDC) presented at the end of 2025, it deepens the strategic deployment of green and low-carbon development, incorporates MSME green transition into the priority tasks of high-quality development and common prosperity, and introduces more targeted and diversified instruments for MSME green transition—such as expanded green credit facilities, MSME-tailored transition finance windows, sector-specific energy efficiency standards, and digital reporting tools for emissions and energy use.

Multiple policy streams frame the landscape in which a just transition diagnostic operates. The 14th FYP for SME Development sets targets for MSME digitalisation, technological innovation and green development, reflecting official recognition that smaller businesses must be agents rather than merely subjects of sustainable growth (MIIT, 2022). China's Rural Revitalisation Strategy prioritises rural industrial modernisation, entrepreneurship and the bridging of the urban–rural development gap, directly relevant to the spatial and recognitional justice dimensions of this framework (Central Committee of the CPC and State Council, 2018). The overarching ethos of ecological civilisation embeds environmental sustainability into governance and mandates that economic progress occurs in harmony with nature.

China has also become a global leader in green finance reform. The Green Bond Endorsed Project Catalogue (PBoC, NDRC and CSRC, 2021), expanded green credit and a growing fintech infrastructure offer potential channels for MSME access to transition investment. The government's digital economy agenda, spanning artificial intelligence, big data and e-commerce platforms, is transforming the business environment and creating new access pathways for smaller enterprises. However, these trends also underscore disparities: not all MSMEs can equally utilise green finance or digital tools, which is precisely why an equity-oriented diagnostic is needed.

1.4.2 Aligning the Diagnostic Framework with China's Strategies

The seven diagnostic dimensions have clear counterparts in China's existing policy architecture. Table 1.2 maps each dimension to relevant national strategies and programmes and identifies the primary equity consideration for China's context.

Table 1.2 Alignment of MSME Policy Diagnostic Dimensions with China's Policy Strategies

Diagnostic Dimension	Alignment with China's Strategies and Key Equity Consideration
Business Enabling Environment	The 14th FYP and the SME Development Plan both target a simpler and fairer business environment through administrative deregulation and tax relief for smaller firms. China's SME Promotion Law provides the statutory basis for supportive regulation, and the common prosperity agenda reinforces commitments to reducing barriers for micro and small enterprises. The 15th FYP (2026–2030) reinforces this trajectory, with explicit measures to streamline market entry and exit procedures, accelerate the digitalisation of regulatory and tax interactions for smaller firms, deepen credit and guarantee support for MSMEs, and embed green and inclusive criteria more systematically across enterprise development instruments.
Entrepreneurship Development	The national Mass Entrepreneurship and Innovation strategy supports new enterprises through incubators, training and mentorship. Programmes run through the All-China Youth Federation and the All-China Women's Federation build capacity for youth and women entrepreneurs, though green focused programming remains nascent. Rural revitalisation policies actively encourage returnee entrepreneurship in villages.
Access to Finance	The People's Bank of China and the National Financial Regulatory Administration have expanded inclusive finance to ease MSME credit constraints. Measures include increased bank lending quotas for small firms, fintech credit platforms, and green finance standards channelling capital toward low carbon investment. Some local governments have piloted green loan guarantee funds and risk compensation schemes, though high collateral requirements remain an obstacle for many MSMEs.
Enterprise Development Services	A nationwide SME service system operates at national, provincial, city and county levels, providing training, consulting, legal aid and technology extension. MIIT's SME Development Promotion Centre coordinates public service delivery. Quality and inclusivity of these services, particularly for women led micro firms and rural microenterprises, require further improvement.

Diagnostic Dimension	Alignment with China's Strategies and Key Equity Consideration
Innovation and Technology	Innovation driven development is a cross cutting national priority embedded in Made in China 2025, the Science and Technology Innovation plans, and MIIT's Specialised and Innovative enterprise programme. Tax incentives for research and development, digital empowerment grants, and artificial intelligence applications for small firms are actively deployed. The challenge is steering these instruments toward green technologies rather than productivity gains alone.
Market Access	At least 30 per cent of government procurement budgets are reserved for MSMEs, with a portion for micro enterprises. Rural supply chain platforms and e commerce programmes enable small producers to sell nationally. Dual circulation policy encourages integration into both domestic and international value chains. Market barriers persist, including complex certification standards and limited networks for marginalised entrepreneurs.
Resilience to Climate and Nature Shocks	China's National Climate Adaptation Strategy 2035 and disaster risk reduction policies provide a broad framework, but MSME specific adaptation support remains nascent. Agricultural insurance for weather related crop failures and post disaster loans for small businesses exist as discrete instruments, primarily under rural or emergency management policy. This is the least developed dimension in China's current policy architecture and the one most in need of targeted investment.

Sources: Compiled from Government of China (2021), MIIT (2021, 2022), MOF (2020), OECD (2019), PBoC et al. (2021), MARA (2022), and relevant national policy documents.

This mapping reveals strong conceptual alignment: China's policies largely cover the same ground as the diagnostic framework's dimensions. The framework's value lies not in introducing new concepts but in providing an integrated lens to assess how well these policy areas function in concert. The government's focus on MSME innovation and digitalisation is strong, for example, but the framework reveals comparatively weaker attention to climate adaptation for those same firms, a mismatch that siloed analysis would miss.

1.4.3 Localisation Priorities and Adaptations

While the framework is broadly applicable to China, four localisation adaptations are necessary to reflect the country's specific conditions.

Socio cultural ecosystem

01

Beyond formal policies, socio cultural factors, including community networks, family business traditions, the role of industry associations and cultural norms around risk and entrepreneurship, significantly influence MSME transition outcomes in China. Leveraging institutions such as the All China Women's Federation (ACWF), the Communist Youth League and provincial trade associations as channels for policy delivery and peer learning is a China specific adaptation with no direct equivalent in standard international frameworks. The framework treats the socio-cultural ecosystem as a transversal dimension assessed alongside the seven formal domains.

Sectoral and regional heterogeneity

02

China's vast internal diversity across industries, regions and enterprise types means that a single diagnostic template risks missing important variations. The framework is therefore applied with sector specific and regionally differentiated indicators. What constitutes a binding constraint for a family farm in Gansu differs fundamentally from the barriers facing a technology enterprise in Shenzhen. Coastal provinces with developed infrastructure and financing ecosystems face different frontier challenges than inland and rural regions where basic business environment and finance access remain more pressing. This study's five sector structure directly addresses this need.

Data disaggregation

03

Applying recognitional and distributive justice lenses requires data on how specific subgroups of MSMEs, including women-led, youth-led, rural, micro and informal enterprises, are faring in the transition. Available administrative data are frequently aggregated at the enterprise level without breakdown by ownership profile, subregion or sector in a readily accessible form. The survey instrument used in this study was designed to fill this gap, with stratified sampling ensuring that vulnerable enterprise groups are visible in the data. Strengthening China's official data infrastructure to systematically capture these dimensions is itself an actionable recommendation of this study.

Digital governance integration

04

China's advanced digital governance infrastructure, including unified enterprise data platforms, fintech credit systems and e-government portals, creates an opportunity to operationalise the diagnostic as a live digital tool embedded in policy delivery rather than a paper-based assessment. Digital platforms can improve policy communication, enable real time feedback from MSMEs, and use alternative data such as transaction records, supply chain data and energy consumption to assess creditworthiness without relying on traditional collateral. This would directly advance both recognitional and distributive justice in finance allocation.

1.4.4 Institutional and Regulatory Considerations

Implementing the framework effectively in China requires attention to the institutional architecture through which MSME and climate policies are designed and delivered. The breadth of relevant policy domains, spanning industrial development, financial regulation, environmental management, agricultural development and social policy, means that no single ministry owns the MSME just transition agenda. MIIT leads on industrial and SME development; NDRC coordinates economic planning and the 1+N climate architecture; the Ministry of Ecology and Environment oversees emissions policy; the People's Bank of China and the National Financial Regulatory Administration govern financial products; the Ministry of Agriculture and Rural Affairs oversees rural enterprises; and the Ministry of Science and Technology manages innovation programmes. This institutional fragmentation is itself a barrier to effective policy delivery for MSMEs that must navigate multiple support streams simultaneously.

Institutional fragmentation creates practical barriers for MSMEs: enterprises must engage separately with multiple departments, navigate poorly connected procedures, and interpret different eligibility criteria and support windows, which weakens uptake—particularly for smaller and informal enterprises with limited administrative capacity.

Local government capacity is equally important. China's policies are set nationally but implemented locally, and local execution capacity varies enormously. Local officials responsible for delivering MSME support programmes, particularly those outside dedicated environmental or financial agencies, often lack the training needed to implement complex green transition instruments effectively.

1.4.5 Key Challenges for China's MSMEs in the Transition

Applying the framework to China's context surfaces six structural challenges that cut across sectors and that the analytical chapters examine in detail.

Policy fragmentation. Support policies are abundant but scattered across agencies with separate eligibility criteria, application processes and monitoring systems. The resulting complexity reduces effective uptake, particularly for micro and informal enterprises without the administrative capacity to navigate multiple programmes simultaneously. This reflects a procedural justice gap and an institutional governance challenge.

Limited access to green finance and technology. Commercial banks tend to favour larger and asset rich firms for green loans. Many MSMEs face difficulties securing affordable credit for clean technology upgrades and energy efficiency investment. Women-led and youth-led firms, which tend to be smaller and less well collateralised, face amplified barriers. Technology access is similarly constrained for firms without research and development capacity or connections to research institutions.

Uneven policy reach across enterprise groups. Policies targeting MSMEs frequently fail to address the structural differences between micro enterprises, small firms and medium sized companies, treating them as a homogeneous category. Women-led and youth-led enterprises, rural operators, and businesses in sectors with high proportions of

individual business owners face additional barriers that go unaddressed in generic MSME instruments.

Regional disparities. Spatial inequalities in infrastructure, financing access and market connectivity mean that MSMEs in central and western provinces, rural areas and remote localities face compound disadvantages in the green transition. Policy instruments calibrated to the more advanced conditions of coastal regions are often poorly suited to inland and rural enterprises and frequently fail to reach them.

Limited MSME participation in policy design. Consultation mechanisms for MSMEs, particularly for smaller and more marginalised enterprises, remain underdeveloped. Many businesses report low awareness of relevant policies and limited channels through which their practical experiences can feed into policy revision. This procedural justice gap reduces policy responsiveness and depresses uptake.

Underinvestment in climate resilience. Transition policy frameworks across all five sectors studied prioritise industrial upgrading, innovation and market integration over adaptation and disaster preparedness. MSME specific climate resilience instruments, including early warning systems, adaptive finance, climate risk insurance and post shock recovery support, remain the least developed policy domain in China's current MSME support architecture. These six challenges provide the analytical anchors for the sector findings in Chapters Three and Four and the policy recommendations in Chapter Five. Together they define the gap between the strong institutional foundations China has already built and the targeted, equity aware delivery system that a genuinely just green transition requires.

02 Chapter Two: Methodology

2.1 Research Design and Triangulation Logic

This study employs a triangulated, mixed method research design combining three distinct but interdependent sources of evidence: systematic policy text analysis, a nationwide enterprise survey, and in-depth case studies across five sectors and multiple regions. Each method addresses a different dimension of the central research problem. Together they allow the analysis to move beyond description toward a diagnosis of coherence, reach and justice in practice.

The rationale for triangulation follows directly from the analytical framework introduced in Chapter One. The seven domain, five lens diagnostic matrix creates a structure that must be populated from multiple vantage points. Policy text analysis reveals what instruments formally exist and what they intend to achieve. The enterprise survey reveals whether MSMEs are aware of those instruments, whether they access them, and how they experience their fairness. Case studies reveal the mechanisms behind those experiences: why specific enterprises succeed or fail in navigating policy support, how institutional context shapes outcomes, and what on the ground realities formal analysis cannot capture.

Where evidence from two or three methods converges, the study identifies a robust finding. Where evidence diverges, for example where a policy formally exists but survey uptake is low, or where aggregate survey data show positive assessments but cases reveal exclusion of specific enterprise groups, the divergence is treated as analytically significant. It flags a binding constraint, whether informational, financial, procedural or spatial, that the analysis then diagnoses and the recommendations in Chapter Five address.

The 7 by 5 analytical matrix functions as the organising spine across all three methods. The same seven policy domains and five justice lenses used to code policy texts are also reflected in the survey instrument design and in the case study coding protocol. This methodological consistency ensures that findings from different methods speak to the same questions and can be directly compared.

Table 2.1 Overview of the Triangulated Research Design

Method	What it captures	Justice lens strengths	How it triangulates
Policy text analysis	The formal policy offer: what instruments exist, what they intend to achieve, and which enterprise groups and domains they address	All five justice lenses applied through PMC scoring; particularly strong for recognitional, distributive and spatial analysis	Establishes the baseline policy landscape against which survey experience and case evidence are compared. Where policies exist but survey uptake is low, a gap is diagnosed.
Enterprise survey	The user side experience: whether enterprises are aware of policies, whether they access them, and how they perceive their fairness and proportionality	Captures distributive and procedural justice from the enterprise perspective; enables disaggregation by sector, size, region and owner characteristics	Reveals whether stated policy intent translates into practice. Divergence between policy coverage and survey awareness flags informational or procedural barriers.
Case studies	The lived reality: why specific enterprises succeed or fail in accessing support, the operational constraints they face, and how local institutional context shapes outcomes	Strongest for restorative and procedural justice; provides narrative evidence of dynamics invisible in aggregate data	Explains mechanisms behind patterns found in the survey. Where survey data show low access, cases illuminate the specific barriers: collateral rules, certification complexity, institutional capacity.

Source: Authors' own design.

2.2 Method 1: Policy Text Analysis

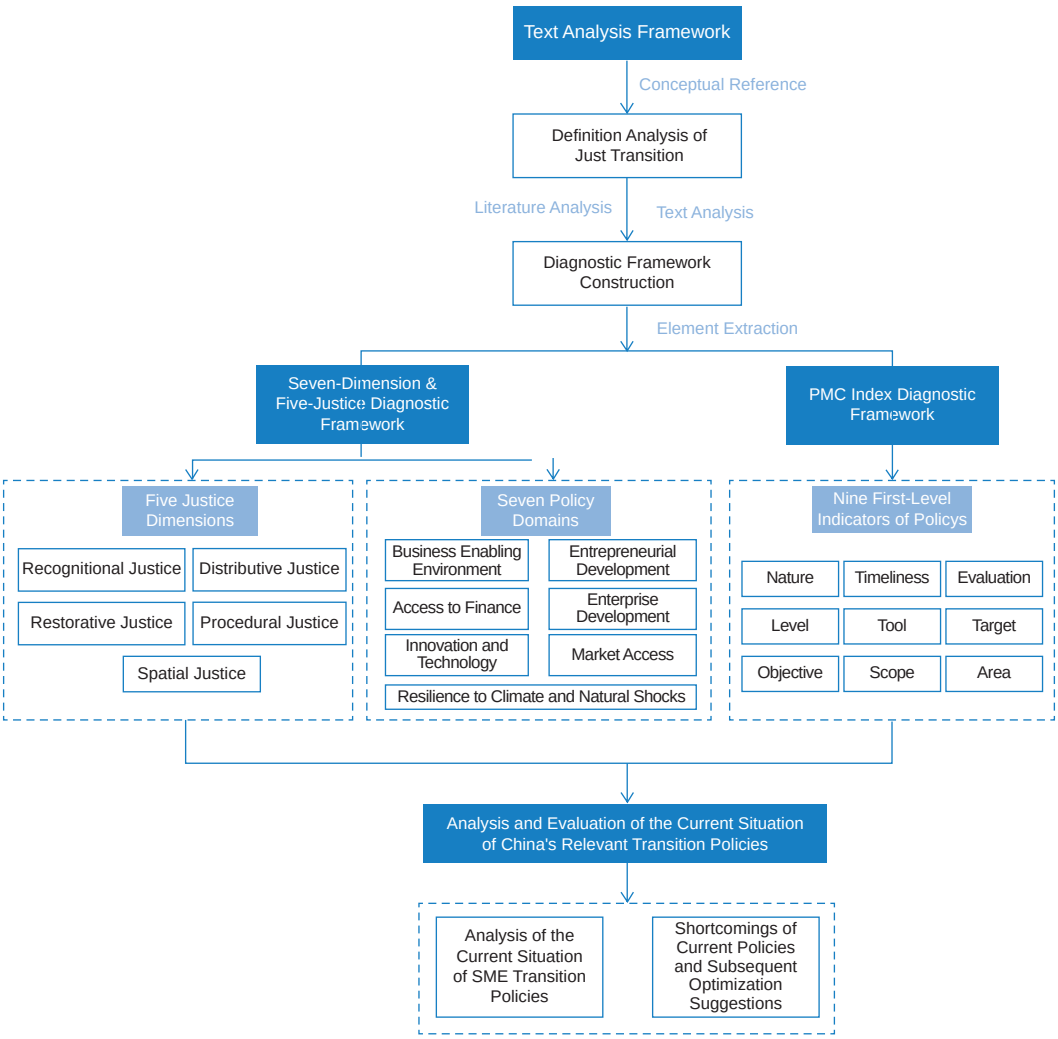
2.2.1 Objectives and Analytical Framework

The policy text analysis pursues two objectives: to assess the current landscape of green transition policies affecting MSMEs in China across the seven diagnostic domains, and to evaluate the coherence and inclusiveness of these policies using the five justice lenses. The analysis operates at both descriptive and evaluative levels.

Descriptively, it maps the policy population: which instruments exist, when they were issued, by which authority and with what targets. Evaluatively, it assesses policy quality and justice integration through the Policy Modelling Consistency (PMC) index.

The analytical framework integrates the UNDP RBAP policy diagnostic matrix with the PMC index developed by Ruiz Estrada (an economist at the University of Malaya who developed the Policy Modelling Consistency Index in the early 2010s to score policy texts across multiple dimensions of internal coherence and instrument coverage). The diagnostic matrix provides the substantive dimensions, asking what each policy does and for whom across the seven domains. The PMC index provides a structured quality assessment, scoring each policy against nine first level variables and 42 second level indicators. Together they generate two complementary outputs: a descriptive policy inventory that maps the Chinese MSME green Figure 2 illustrates the structure of the text analysis framework, showing how the five justice dimensions and seven policy domains intersect with the PMC index variables to form the full analytical matrix.

Figure 2: Text Analysis Framework: Seven Domain, Five Dimensional Policy Diagnostic Framework for Just Transition



Source: Author's interpretation, adapted from Ruiz Estrada (2011) and the UNDP RBAP MSME Just Transition Policy Diagnostic Framework, 2023

2.2.2 The PMC Index: Structure and Scoring

Detailed variable definitions and scoring logic are presented in Table 2.2 and Figure 3 below, which summarise the index structure, keeping the main methodology accessible to a mixed policy and academic audience. Readers seeking the full operational detail are referred to Figure 3.

Table 2.2 PMC Index Structure: First Level Variables and Descriptions

Variable	Label	Description and Scoring Logic
X1	Policy Nature	Whether the policy has predictive, regulatory, advisory, descriptive or guiding functions in relation to the green transition of MSMEs. Scored across six sub indicators: predictive, regulatory, advisory, descriptive,diagnostic and guiding.
X2	Policy Timeliness	The temporal scope and implementation timeframe of the policy. Assessed across four sub indicators: short term (under three years), medium term (three to five years), long term (over five years) and the time validity scope was not clearly specified.
X3	Policy Evaluation	Whether the policy is designed on the basis of sufficient evidence, contains clearly stated objectives and provides detailed implementation plans. Sub indicators cover evidence basis, clarity of objectives,scientific validity of the proposal and specificity of implementation guidance.
X4	Policy Level	The administrative authority responsible for issuing the policy. Coded as: national (State Council, central ministry), provincial, municipal or county level. Multi level joint issuance is recorded separately.
X5	Policy Instruments	Following the typology of Rothwell and Zegveld, instruments are classified as supply side (finance, technology, training), demand side (procurement, pilot programmes, market incentives) or environmental (regulation, standards, institutional guidance). Each policy may employ multiple instrument types.
X6	Justice Dimensions	The extent to which the policy addresses each of the five justice dimensions: recognitional, distributive, procedural, restorative and spatial. Each dimension is scored binary (addressed or absent) with qualitative annotation where partially addressed.

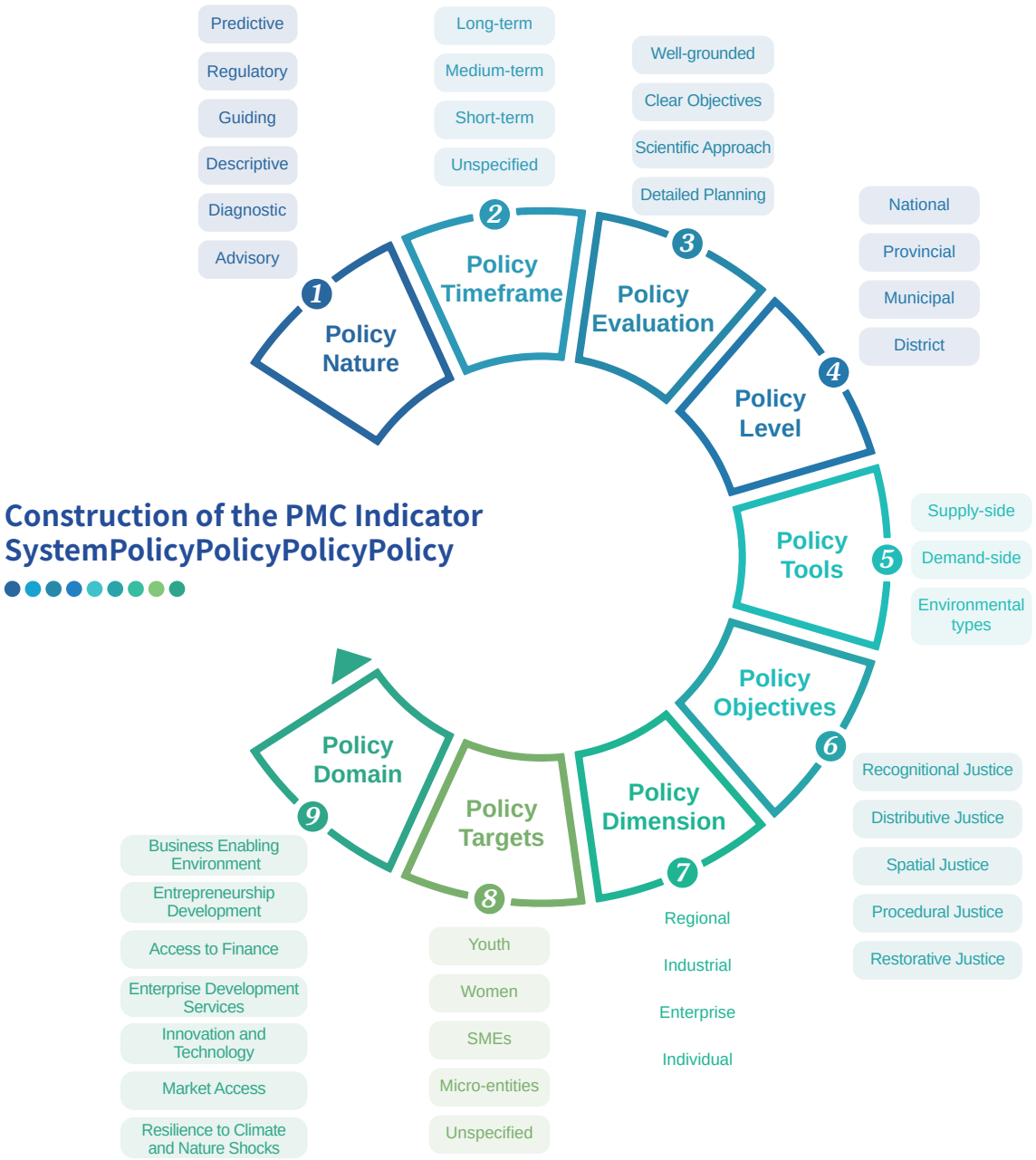
Variable	Label	Description and Scoring Logic
X7	Policy Dimension	The dimension at which the policy is oriented. Coded across four sub indicators: regional, industrial, enterprise and individual.
X8	Policy Targets	Whether the policy explicitly targets MSMEs as a category, micro enterprises specifically, women led enterprises, youth led enterprises or unspecified enterprise groups. Absence of explicit targeting is also recorded.
X9	Policy Domains	Coverage across the seven MSME just transition policy domains: business enabling environment, entrepreneurship development, access to finance, enterprise development services, innovation and technology, market access, and resilience to climate and nature shocks. Each domain is scored binary.

Source: Adapted from Ruiz Estrada (original) and extended by the authors to incorporate the UNDP RBAP justice dimensions and policy domains.

Scoring proceeds as follows. Each second level indicator is coded binary: 1 if the policy addresses the indicator, 0 if absent. For justice dimension variables (X6) and domain coverage variables (X9), partial coverage is recorded as 0.5 with qualitative annotation. First level variable scores are calculated as the mean of their second level indicator scores, producing a value between 0 and 1. The composite PMC score is the arithmetic mean of all nine first level variable scores. Higher scores indicate greater policy comprehensiveness and justice integration.

PMC scores are calculated for each of the 20 sample policies individually and then aggregated to sector level means. The resulting PMC surfaces visualise each sector's policy profile across the nine dimensions, making it possible to identify which aspects of policy design are consistently strong and which are systematically underdeveloped. Chapter Three presents sector level PMC findings alongside the survey and case study evidence for each sector. Figure 3 illustrates the PMC index structure as applied in this study.

Figure 3: The PMC Index



2.2.3 Policy Sample Selection

Policy document collection began with keyword searches across official government databases, including the National Laws and Regulations Database, the MIIT policy portal and provincial government websites. Keywords used were: MSMEs, green transformation, greening, digitalisation, high quality development, carbon peaking,

carbon neutrality and ecological civilisation. This initial search returned over 300 relevant documents.

These 300 documents were then screened and categorised into 97 sub sector policy groups using the National Economic Industry Classification as the coding standard. From these 97 groups, 20 representative sample policies were selected for full PMC analysis. Selection was governed by four criteria. First, sectoral coverage: at least three policies per study sector, ensuring all five industries are meaningfully represented. Second, administrative level diversity: the sample includes national, provincial and municipal instruments to capture the multi-level character of China's policy system. Third, temporal range: policies span from 2020 to early 2025, capturing the evolution of green transition policy following the announcement of the dual carbon goals. Fourth, instrument diversity: the sample includes regulatory instruments, fiscal incentive instruments and service delivery instruments to reflect the full range of policy approaches deployed.

Within the second criterion above ('administrative level diversity'), the study further distinguishes the functional roles of central macro-guidance policies and subnational operational instruments. Central-level policies (such as guiding opinions and implementation plans jointly issued by the State Council and ministries) carry directional and framework-setting functions, establishing objectives, institutional arrangements and resource allocation principles; subnational-level policies (such as action plans and sets of measures issued by provincial and municipal governments) carry instrumental and operational functions, translating central directives into specific projects and application procedures that can be tracked for performance. The PMC index scoring treats these two categories with differentiated interpretations of policy maturity: for the former, emphasis is on the systemic coherence and cross-ministerial coordination of the policy architecture; for the latter, emphasis is on the operational workability and performance traceability of the instrument design. This distinction runs through the sector-by-sector policy analyses in Chapter Three and is further reflected in the implementation sequencing of Chapter Five's policy recommendations (Section III).

The full list of 20 sample policies, including issuing body, year and sector, is presented in Appendix A.

2.3 Method 2: Enterprise Survey

2.3.1 Instrument Design

The enterprise survey instrument was designed to mirror the 7 by 5 analytical matrix, capturing MSMEs' experiences of policy reach, proportionality and fairness across the seven domains. For each domain, respondents were asked about their awareness of relevant policy instruments, whether they had accessed those instruments, the main barriers they encountered in doing so, and their assessment of whether policies treat enterprises of different sizes, ownership types and locations equitably.

The survey comprised five thematic modules. The enterprise profile module collected information on sector, size (by employee count and annual revenue), geographic location (province, urban or rural), ownership structure and whether the enterprise is led by a woman or young person (under 35). The policy awareness and access module asked about familiarity with and use of 12 categories of support instrument across the seven domains. The financing and technology module explored access to green credit, interest subsidies, technology extension services and certification support. The justice and equity module asked respondents to assess the fairness of resource allocation, the accessibility of application procedures, and their degree of participation in policy consultation processes. The climate resilience module covered exposure to climate related disruptions, access to early warning systems, insurance products and post disaster support.

Questions used a combination of binary response, five-point Likert scales and open response formats. Likert responses used the following scale: 1 (completely inaccessible or very unfair) to 5 (fully accessible or very fair). Open responses were coded thematically after collection.

2.3.2 Sampling Strategy and Survey Profile

A stratified sampling strategy was used to ensure that the survey captured the diversity of China's MSME population across sectors, regions, enterprise sizes and ownership types. Strata were defined along four dimensions: sector (the five study industries), region (East, Central, West and Northeast China), enterprise size (micro, small and medium) and ownership (women-led and youth-led enterprises deliberately oversampled relative to their population share to ensure analytical visibility).

A total of 2,250 questionnaires were distributed through a combination of channels: provincial and municipal SME service centres and SME associations (covering registered enterprises across the five target sectors); industry association mailing lists in agriculture, manufacturing, ICT, transportation and logistics, and wholesale and retail; partner research institutes operating in the four case-study provinces; and an online distribution channel via the project enumeration team. Enumerators followed up by phone where possible. The team recognises that this

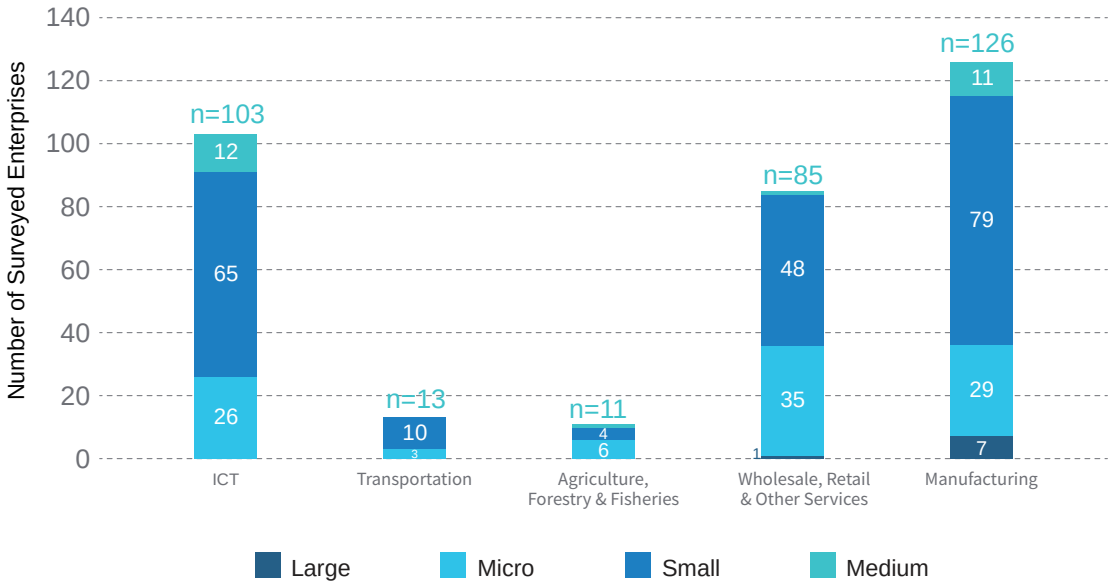
multi-channel distribution skews the sample toward formally registered enterprises with at least some digital and associational connection, and that the most informal, rural and digitally disconnected operators are likely under-represented; this limitation is discussed further in the Limitations sub-section. Of these, 410 were returned, yielding a response rate of 18.2 per cent. After quality screening for incomplete or inconsistent responses, 338 questionnaires were deemed valid and form the analytical base. Table 2.3 summarises the profile of valid respondents.

Table 2.3 Survey Sample Profile

Dimension	Detail
Total questionnaires distributed	2,250
Questionnaires returned	410 (gross return rate: 18.2 per cent)
Valid questionnaires	338
Sectoral distribution	Manufacturing: 126 enterprises (37 per cent); ICT: 103 (30 per cent); Wholesale and retail trade and other services: 85 (25 per cent); Transportation: 13 (4 per cent); Agriculture, forestry, animal husbandry and fisheries: 11 (3 per cent)
Enterprise size	Small enterprises constitute the largest share across all sectors. Micro enterprises predominate in ICT, transportation and wholesale and retail. Manufacturing includes seven large enterprises alongside micro and small firms.
Regional distribution	East China: 117; Southwest China: 85; South China: 71; Central China: 35; Northwest China: 13; North China: 12; Hong Kong, Macao and Taiwan: 1. East China, Southwest China and South China together account for the majority of the sample.
Urban and rural breakdown	Urban enterprises: 269; Rural enterprises: 69. Urban firms constitute the core of the sample, consistent with the actual spatial distribution of enterprises across China.

Note: Regional figures refer to surveyed enterprises per macro region. Total is 334 across the six mainland macro regions plus 1 for Hong Kong, Macao and Taiwan regions; the remaining 3 valid responses did not specify a region.

Figure 4: Size Distribution of Surveyed Enterprises



2.3.3 Analytical Approach

Survey data are analysed at three levels. At the descriptive level, frequency distributions and mean scores are reported for each domain and justice dimension, providing an overview of the current state of MSME policy experience. At the disaggregated level, responses are broken down by sector, enterprise size, geographic region and ownership type to identify differential experiences across enterprise groups. This disaggregated analysis is the primary vehicle for distributive and recognitional justice assessment in the survey findings. At the integrative level, survey findings are compared with the policy text analysis results and case study evidence to diagnose gaps between policy intent and enterprise experience.

Given the stratified but non probability sampling approach and the 18.2 per cent response rate, findings are presented as indicative of patterns and tendencies rather than as statistically generalisable estimates for China's entire MSME population. Two opposing non-response biases are possible. Under a 'disengaged majority' hypothesis, enterprises that are least aware of green transition policies, most burdened by compliance, or operating informally are less likely to complete a policy survey, in which case the reported barriers are likely under-stated relative to the true MSME population. Under a 'grievance response' hypothesis, enterprises that have experienced the most difficulties are more likely to seek a feedback channel, in which case the reported barriers may be over-stated. The 72 invalid responses were inspected for systematic patterns (sector, region, size) but the sub-sample is too small to be conclusive. To mitigate these risks, the survey findings are triangulated against the policy text analysis and the 20 in-depth case studies in Chapter 3, and quantitative claims are framed as indicative tendencies rather than population estimates. Where possible, satisfaction and uptake claims have been corroborated against publicly available administrative data, for example PBoC and NFRA green credit disbursement figures and NDRC SME subsidy data. For sectors with small sample sizes, specifically transportation and agriculture, findings are treated as qualitative data points and interpreted alongside the case study evidence.

2.4 Method 3: In Depth Case Studies

2.4.1 Case Selection

Twenty MSMEs were selected for in depth case study across the five study sectors. Case selection was purposive, guided by four criteria designed to maximise the analytical variation of the sample while ensuring coverage of the dimensions most relevant to the research questions.

Sector coverage required that each of the five study industries be represented by at least three cases, enabling within sector patterns to be identified. Geographic spread required that cases be drawn from eastern, central and western China, with particular attention to including enterprises from inland and rural locations where policy delivery gaps are hypothesised to be most acute. Size variation required that the sample include both larger MSMEs with established institutional connections and very small or micro enterprises operating with minimal administrative capacity, since the barriers these two groups face are structurally different. Ownership diversity required the deliberate inclusion of enterprises led by women and young entrepreneurs to enable assessment of recognitional and distributive justice for these groups.

The final sample of 20 enterprises spans Shandong, Jiangxi, Shaanxi and Yunnan provinces. These four provinces were selected to span the east–central–west development gradient and the principal geographic and sectoral profiles of MSMEs in China: Shandong as a heavy-industry and manufacturing eastern coastal province with a strong agricultural base; Jiangxi as a central manufacturing and resource province with a substantial private MSME sector; Shaanxi as a north-western province combining traditional industry, technology zones around Xi'an, and rural agriculture; and Yunnan as a south-western province with a smaller industrial base, significant ethnic minority populations and concentrated rural and agricultural MSMEs. The case selection deliberately complements rather than duplicates the most studied coastal provinces. The team acknowledges that Guangdong (export-oriented manufacturing and exposure to EU CBAM), Zhejiang (private enterprise ecosystem and the 2025 provincial green transformation law) and Jiangsu (industrial carbon emissions and green manufacturing standards) would each offer additional policy-implementation evidence; their exclusion is a recognised limitation of the case study sample and is discussed in the Limitations sub-section. Findings from the four study provinces are not assumed to be generalisable to those provinces without further triangulation. The sample covers enterprises ranging in scale from Specialised and Innovative Little Giant firms to technology based micro enterprises, and includes enterprises at different stages of green transition, from early explorers to those that have completed significant investment in green equipment or certification. Table 2.4 provides an overview of case selection parameters.

The case studies form a methodological complement to the nationwide enterprise survey (n=338): the survey captures the overall patterns of MSME policy experience and the distributional differences across enterprise scale, geography and ownership type, while the interviews probe enterprise-level mechanisms—why one enterprise can obtain policy support while another cannot, and the specific barriers constraining policy effectiveness. The interviews are semi-structured and coded against the 7-by-5 matrix (seven policy domains × five justice lenses),

and triangulated with the policy text analysis and survey data: where the three lines of evidence converge, the finding is treated as a robust conclusion; where they diverge, the divergence serves as an analytical entry point for surfacing binding constraints. This methodological combination ensures both breadth in problem mapping and depth in mechanism diagnosis—through mutual validation between the 20 in-depth case studies and the 338 survey responses, the study's conclusions achieve high empirical robustness.

Table 2.4 Overview of Case Study Design

Parameter	Detail
Number of enterprises	20 MSMEs across five sectors
Sectors covered	Manufacturing; information and communications technology; agriculture, forestry, animal husbandry and fisheries; wholesale and retail; transportation, warehousing and logistics
Geographic coverage	Eastern China (Shandong), Central China (Jiangxi), and Western China (Shaanxi, Yunnan), ensuring representation of diverse regional economic conditions
Enterprise size range	From Specialised and Innovative 'Little Giant' enterprises with annual output value exceeding 100 million yuan to technology based micro enterprises operating in niche markets
Primary data sources	Semi structured interviews with enterprise owners and senior managers; supplemented by internal company documents where available
Secondary data sources	National and local government policy documents related to green transformation; industry statistics from the National Bureau of Statistics and MIIT; relevant UN research reports
Coding method	Inductive thematic analysis following Gioia et al. First order constructs derived from interview data; second order themes mapped to the seven policy domains and five justice dimensions; convergent aggregate dimensions summarised across cases

2.4.2 Data Collection

Primary data for each case were collected through semi structured interviews with enterprise owners, founders or senior managers responsible for green transition decisions. Interviews covered: the enterprise's current stage of green transition and the factors driving or constraining progress; awareness and use of government policy instruments across the seven domains; specific experiences with green finance, certification, technology access, market integration and climate resilience support; perceptions of the fairness of policy access; and reflections on participation in policy consultation processes.

Where enterprises consented, internal documents such as subsidy applications, certification records and investment plans were reviewed to corroborate interview accounts. Secondary data included the national and local government policy documents already analysed in Method 1, industry statistics from the National Bureau of Statistics and MIIT, and relevant UN research reports providing macroeconomic context.

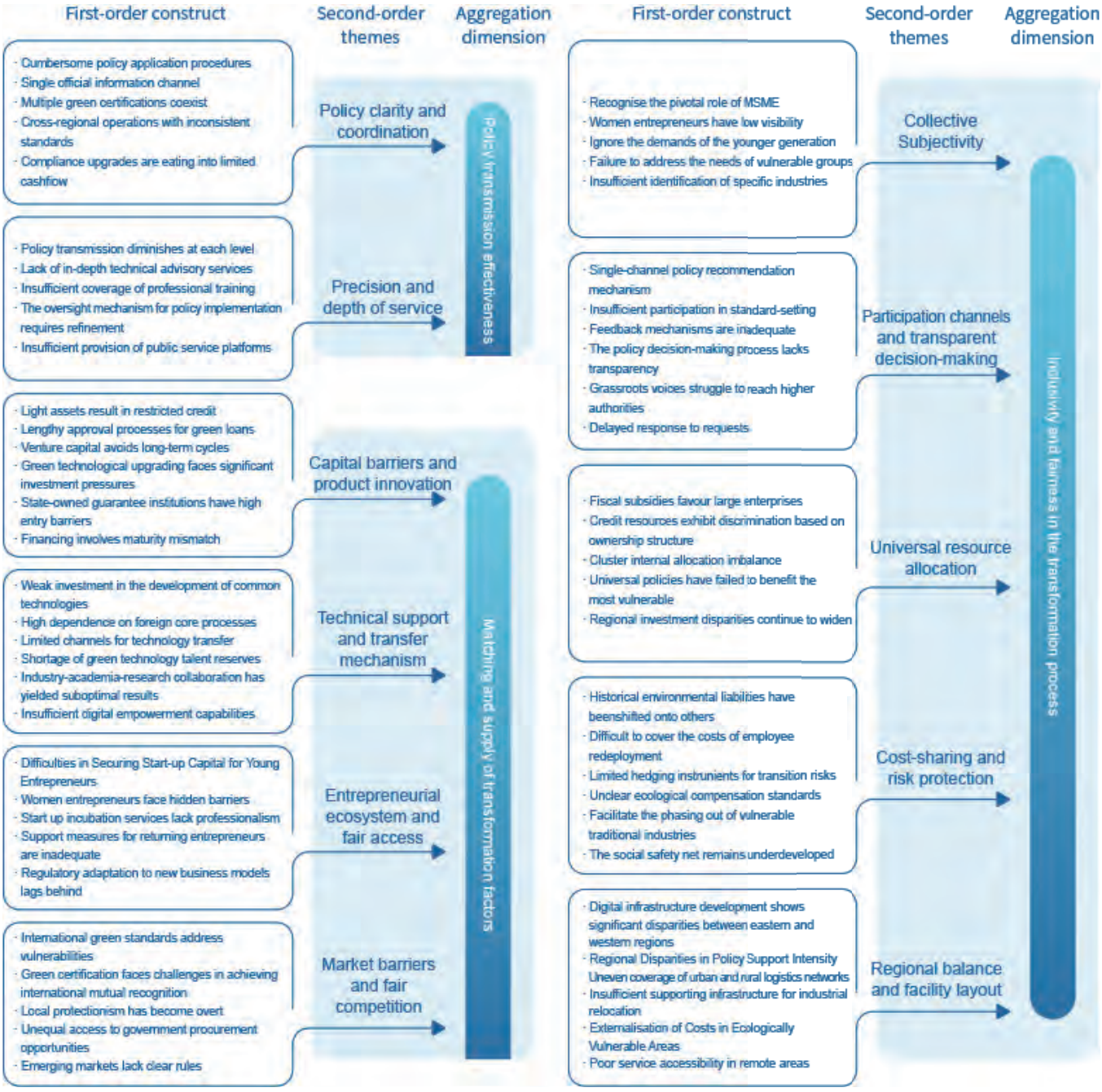
2.4.3 Data Coding and Analysis

Case data were analysed using the inductive thematic analysis method developed by Gioia, Corley and Hamilton. This approach begins from the informants' own language and categories (first order constructs) before abstracting to theoretically informed second order themes and finally to aggregate conceptual dimensions. The process preserves analytical grounding in the data while enabling systematic comparison across cases.

In this study, first order constructs were derived from interview transcripts and document data, capturing enterprise specific descriptions of their experiences with policy instruments, financing, technology access and climate risks. Second order themes were then mapped to the seven policy domains and five justice dimensions of the analytical framework, enabling each case to be positioned within the broader diagnostic matrix. Aggregate dimensions emerging from the cross case comparison were validated against the survey findings to assess whether patterns identified in individual cases reflect broader tendencies in the data.

During coding, expressions from the same source and with similar meanings were grouped as a single entry to avoid overweighting any single informant. All coding was conducted by the research team and reviewed through a process of inter analyst discussion and consensus to enhance reliability. Figure 5 shows the data structure diagram illustrating the coding architecture.

Figure 5: Data Structure Diagram



Source: Author's construction, based on the case study coding hierarchy

2.5 Integration of Methods: How Triangulation Works in Practice

Triangulation in this study is not retrospective: it is built into the analytical workflow from the point of data collection. The shared organising spine of the 7 by 5 matrix means that all three methods generate findings that are directly comparable at the level of each cell in that matrix. For example, the cell corresponding to access to finance assessed through a distributive justice lens can be populated by the PMC score for financing policies, the survey finding on whether enterprises of different sizes perceive green loans as equally accessible, and the case study evidence on why specific enterprises were or were not able to obtain green credit.

Three types of triangulation outcome are distinguished in the analysis. Convergent findings, where all three methods point in the same direction, are reported with high confidence as robust conclusions. Partial convergence, where two methods agree and one diverges, is investigated to determine whether the divergence reflects a methodological artefact, a subgroup specific phenomenon invisible in aggregate data, or a genuine difference in experience between enterprise types or regions. Divergence, where methods point in clearly different directions, is treated as an analytic opportunity: it surfaces the mechanisms through which stated policy intent fails to reach intended beneficiaries, and these mechanisms are the basis for the most targeted and actionable policy recommendations. Chapter Three presents sector findings using this integrated approach throughout. Each sector section presents the policy text findings, the survey evidence and the case study insights in sequence before synthesising them into an integrated justice assessment across the five lenses.

2.6 Limitations and Quality Assurance

All three methods carry limitations that affect the confidence with which findings can be interpreted. These are acknowledged here with transparency and addressed, where possible, through the triangulation design itself. Table 2.5 summarises the principal limitations and the mitigation measures applied.

Table 2.5 Principal Limitations and Mitigation Measures

Limitation	Nature of the concern and mitigation measure
Survey response rate	The 18.2 per cent response rate and 338 valid returns, while sufficient for sectoral analysis, constrain the precision of findings for smaller subgroups such as transportation and agriculture. Findings for these sectors are treated as indicative rather than statistically representative.
Urban overrepresentation	Urban enterprises constitute 79.6 per cent of the survey sample, broadly consistent with China's enterprise geography but potentially understating the challenges of rural MSMEs. Case studies deliberately oversample rural and interior enterprises to compensate.
Case study self selection	Enterprises willing to participate in in depth interviews may differ systematically from those that declined, potentially overrepresenting firms with stronger institutional connections or more positive views of policy. The coding process applies explicit sceptical scrutiny to self reported assessments.
Policy text coverage	The 20 sample policies were selected to be representative across sectors, levels and years, but cannot capture the full breadth of China's policy landscape. Sub national and county level instruments are underrepresented. Findings on policy gaps should be read as indicative of systemic patterns rather than exhaustive audits.
Data disaggregation	Disaggregated administrative data on MSME access to green finance and policy support by gender of owner, age or ethnicity are not publicly available. The study relies on survey self reporting and case evidence to assess recognitional and distributive justice for specific subgroups.
Temporal snapshot	Policy text analysis covers documents issued up to early 2025. China's policy landscape is evolving rapidly; some instruments identified as gaps may have since been introduced, while new challenges may have emerged. The analytical framework and sector findings should be read in that context.
Sectoral scope	The five-sector scope-agriculture/forestry/fisheries, manufacturing, ICT, transportation/warehousing/logistics, and wholesale and retail-captures the largest MSME populations directly addressed by China's mainstream green transition policy instruments. Construction and real estate, despite their substantial MSME presence in sub-contracting chains and significant carbon intensity, are governed by a distinct policy ecosystem (urban planning, building codes, mandatory retrofit regulations, materials procurement) that warrants dedicated treatment beyond the present study and is flagged as a priority for follow-up research.

Two additional quality assurance measures apply across the full study. First, all sector level findings in Chapter Three are presented with explicit reference to the source method, so that readers can assess the evidential basis for each claim and the degree of corroboration across methods. Second, where findings rest on a single method with no corroboration from the others, this is stated explicitly and the finding is characterised as provisional or indicative rather than robust.

The triangulation design does not eliminate uncertainty; it disciplines it. By forcing claims to be evaluated against evidence from multiple vantage points, the design makes the study's conclusions more transparent, more defensible and more directly actionable for the policymakers and practitioners this report is intended to serve.

03 Chapter Three:Sector Findings

This chapter presents the integrated findings of the three method research design across the five study sectors. Each sector section draws on policy text analysis, enterprise survey data and in-depth case study evidence, organising findings through the 7 by 5 analytical matrix introduced in Chapter One and operationalised in Chapter Two. Each section follows a consistent structure: the policy landscape and its evolution; what the survey tells us about enterprise experiences; what the case studies reveal about on the ground realities; and an integrated justice assessment across the five lenses.

The integrated approach throughout this chapter is deliberate. Rather than reporting what policies say, what enterprises report and what cases show as separate observations, the analysis consistently asks where methods converge and where they diverge. Convergence identifies robust findings; divergence diagnoses the mechanisms through which stated policy intent fails to reach its intended beneficiaries.

Figure 6: Overall Overview

Agriculture, forestry, animal husbandry, sideline production and fishery
Characteristics of SMEs: High proportion of women (>70%)
Pain points of green transformation: high cost, weak financing
Policy support: Green credit pilot

Wholesale and Retail
Characteristics of SMEs: active female entrepreneurship
Pain points of green transformation: complexcertification and lack of guidance
Policy support: green consumption, restaurants,packaging policies

Manufacturing
Characteristics of SMEs: Many small and micro factories, limited female start-ups
Pain points of green transformation: Difficulty in financing, lack of standard recognition
Policy support: Energy-saving subsidies, green factory policies

Transportation
Characteristics of SMEs: Many young distributors
Pain points of green transformation: Poor digitization, complicated subsidies
Policy support: New energy trucks, green distribution system

ICT
Characteristics of SMEs: Increase in female digital entrepreneurs
Pain points of green transformation: Lack of subsidies, difficulty in adapting standards
Policy support: "computing power coupons" and "cloud coupons" guide strong

Source: Author's construction, based on UNDP RBAP MSME survey, 2024–25, n = 338

3.1 Agriculture, Forestry, Animal Husbandry and Fisheries

3.1.1 Policy Landscape and Evolution

Agriculture, forestry, animal husbandry and fisheries occupy a structurally distinct position in China's green transition. As the foundation of the primary sector, these industries carry a tripartite mandate of ecological protection, economic development and social inclusion, and they have made significant progress in promoting green production models such as ecological agriculture, organic farming and circular aquaculture. The green transition of agriculture, forestry, animal husbandry and fisheries is directly tied to the achievement of the national "dual carbon" goals and the sustainability of rural revitalisation. In recent years, under the joint impetus of policy guidance and market drivers, green production practices and sustainable development principles have progressively penetrated all stages of the industry, with the sector achieving initial results in resource conservation, environmental compatibility and low-carbon development.

In terms of the policy support system, a multi-tier policy framework spanning central and local levels has now taken shape, green transformation policy in agriculture has evolved in two distinct phases. In the first phase, from roughly 2016 to 2019, policy focused primarily on controlling non-point source agricultural pollution, managing livestock waste, and promoting resource recycling. Instruments were largely regulatory and environmental in character. In the second phase, from 2020 onwards, policy has shifted toward a more systematic governance approach that integrates carbon management, digital extension services and inclusive finance. The 2022 Central Document No. 1 consolidated this shift, embedding green agriculture within the rural revitalisation agenda and directing greater attention to the participation of cooperatives, family farms and new agricultural business entities.

Core policy documents at the national level include the *Opinions on Promoting High Quality Development of Animal Husbandry (2020), the Zhejiang Province Regulations on Promoting Green and Low-Carbon Transformation (2024), and the Several Measures of Shenzhen Municipality to Promote High-Quality Development of Green and Low-Carbon Industries* (2023). These policies span the national, provincial and municipal levels, reflecting the multi-tier character of China's agricultural governance system. Policy instruments in this domain are structured around three dimensions — supply-side, demand-side and environmental-side: On the supply side, instruments include training in agricultural and forestry technologies, financial subsidies for equipment procurement, and government co investment in green infrastructure. On the demand side, government procurement mandates for green produce and demonstration pilot programmes are used to stimulate enterprise engagement. Environmental instruments establish ecological zone management frameworks, carbon emission budget systems and access management for high-risk agricultural activities, creating the regulatory context within which enterprises must operate.

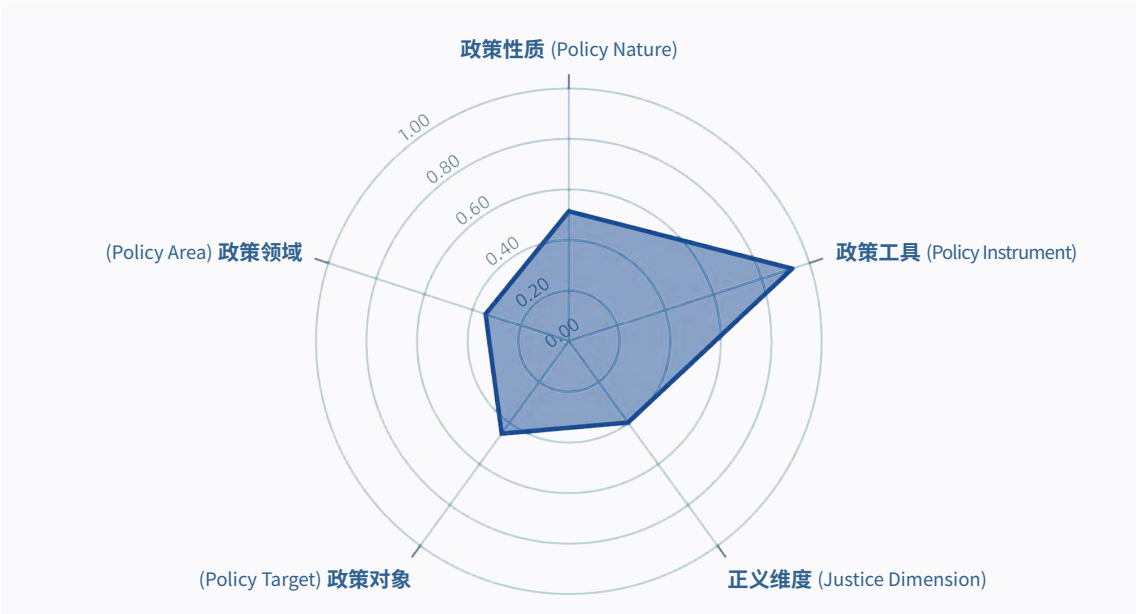
At the central level, key macro-guidance instruments include the Opinions on Promoting High Quality Development of Animal Husbandry (2020) and the 2022 Central Document No. 1, which together set the overall direction for green agriculture, rural revitalisation and the role of new agricultural business entities. At the provincial and

municipal levels, instruments such as the Zhejiang Province Regulations on Promoting Green and Low Carbon Transformation (2024) and the Several Measures of Shenzhen Municipality to Promote High Quality Development of Green and Low Carbon Industries (2023) translate that guidance into more specific implementation tools, including regulatory targets, subsidy arrangements and support measures. This multi-tier pattern reflects the character of China's agricultural governance architecture. Policy domains covered are concentrated in the business enabling environment, market access, finance access, innovation and technology, and climate resilience. Entrepreneurship development and enterprise development services are the most underdeveloped domains across sampled policies.

Despite this evolving architecture, structural gaps persist. Policies are designed at a level of generality that provides comprehensive coverage for the sector as a whole while offering insufficient precision for the operational constraints specific to micro enterprises and small cooperatives. Available project-level evidence suggests that women-led enterprises may face compounded barriers in participating in green agriculture initiatives, not because they are formally excluded, but because green transition requirements are layered onto pre-existing constraints in access to finance, training, market information and business networks. For example, the World Bank's Hubei Smart and Sustainable Agriculture Project reports that, as of December 2024, 10 of the 50 farmer cooperatives strengthened or supported by the project were managed by women or had a significant share of female members, against an end-project target of 21. The project design also explicitly provides for prioritised outreach and additional application support for such cooperatives and enterprises, indicating that participation cannot be assumed to occur automatically without targeted measures. This suggests that the issue is less one of formal exclusion than of compounded disadvantage, where green transition requirements intensify structural constraints that already shape enterprise participation. Green credit penetration remains limited, and where credit guarantee schemes exist, they typically require asset collateral that small operators do not possess.

Regional development imbalances are also a major constraint on transition. Eastern coastal regions, supported by stronger economic foundations and supporting infrastructure, have advanced relatively faster in the green transition, whereas central and western regions and ecologically fragile areas — constrained by infrastructure conditions and technical support capacity — are progressing more slowly. These regional disparities not only affect the overall effectiveness of national agricultural green transition, but may also widen the development gaps among operators across different regions.

Figure7: PMC radar chart: Agriculture, Forestry, Animal Husbandry and Fisheries



The PMC assessment for the agriculture, forestry, animal husbandry and fisheries sector reveals an instrumentally comprehensive but structurally uneven policy profile. Policy Instrument scores highest, reflecting strong deployment of demand-side tools such as government procurement and demonstration pilots, alongside supply-side subsidies and technology training. Policy Nature is also reasonably well covered. However, Justice Dimension score is low, confirming that stakeholder participation in policy formulation is weak and that compensation for groups affected by the transition is largely absent. Policy Area coverage is low , with business enabling environment, market access and finance represented, but entrepreneurship development and enterprise development services significantly underdeveloped.

3.1.2 Survey Evidence: MSME Experiences

The 11 enterprises sampled in the agriculture, forestry, animal husbandry and fisheries sector provide a qualitative signal of sector wide patterns rather than a statistically representative estimate. Across the key dimensions of the analytical framework, the survey evidence reveals a consistent gap between policy formulation and significant practical barriers at the point of implementation.

On recognitional justice, all 11 enterprises agreed that government policies acknowledge MSME development needs, and most assessed the allocation of resources among enterprises of different sizes as broadly fair. This positive nominal recognition, however, is not matched by experience in practice. Ten of the 11 enterprises reported encountering obstacles when applying for policy support. The three most frequently cited barriers were untimely access to policy information, lengthy administrative approval procedures and insufficient funding allocated to support programmes relative to the number of applicants.

Access to finance is the most acute constraint. Only three enterprises reported that obtaining financing was relatively easy. The remaining eight faced difficulty accessing green credit or found that available instruments, while formally suitable, imposed collateral and documentation requirements that small farmers and cooperatives could not meet. Direct government subsidies, tax incentives and bank loans are the dominant financing channels used, with enterprises relying heavily on public rather than commercial finance. This reliance reflects the structural difficulty of attracting commercial green investment to enterprises with limited fixed assets.

On innovation and technology, seven of the 11 enterprises reported receiving recognition or support as a result of green innovation or entrepreneurship, suggesting that the positive enabling role of green innovation support is real. However, sustained investment in research and development is constrained by technical talent shortages, limited innovation funding and the pressure of day-to-day operational demands. Several enterprises noted that technological upgrading creates dual pressures: the direct cost of new equipment or processes, and the indirect cost of compliance with environmental standards that may be applied inconsistently or interpreted differently by local implementing agencies.

Market access remains structurally disadvantaged for agriculture sector MSMEs. More than half of the sample reported fewer market entry and procurement opportunities than large enterprises. The primary barriers are market dominance by larger operators, information asymmetries and the relatively high costs of green transition certification.

On climate resilience, the sector performs comparatively well at the level of crisis response: most enterprises reported receiving climate related policy support following natural disasters such as floods and droughts. However, current climate adaptation instruments are assessed as lacking in sector specific customisation and in clarity of objectives, limiting their effectiveness as forward-looking risk management tools.

3.1.3 Case Study Evidence: On the Ground Realities

The enterprises selected for case study in this sector include those operating across the planting, processing and sales value chains in Shandong, Yunnan and Shaanxi provinces. Enterprises developing agricultural waste resource utilisation technologies and integrated agriculture, technology and cultural tourism models were also selected.

The most consistent finding across cases is the information exclusion problem. Enterprise owners, particularly women operators and younger farmers, report that they first learn about relevant policy programmes through informal networks, industry contacts or chance encounters rather than through official channels. By the time information reaches smaller enterprises, application windows may have closed or funds may have been exhausted by larger and better connected applicants, highlighting gaps in policy delivery architecture: the formal channels for information dissemination do not reach the enterprises most in need of support.

> *A representative from an agricultural enterprise in Yunnan described the experience as follows: we know that green transformation subsidies exist, but we often find out after the application deadline. Larger cooperatives in our county have dedicated staff monitoring policy announcements, but we do not have that capacity.*

Financing constraints in the cases are closely linked to collateral structures. Agricultural enterprises typically hold land use rights rather than property ownership, and these rights are not accepted as collateral by most commercial banks. The agricultural insurance and credit linkage mechanisms that exist in some regions represent an innovative partial solution, but their geographic coverage is uneven and their terms are not well calibrated to the financial cycles of small farming operations.

The case studies also surface a finding invisible in the survey data: the burden of dual certification. For enterprises pursuing both organic or green food certification and low carbon compliance, the administrative and financial costs of maintaining two separate certification processes with overlapping substantive requirements but separate bureaucratic tracks is a significant deterrent. The enterprises that have completed both describe it as a milestone achievement rather than a standard business process, indicating that the certification system is not designed for the operational capacities of MSMEs.

For business enabling environment, regional disparities are found after case comparisons. Enterprises in Shandong, which benefit from stronger provincial policy implementation and more developed digital extension networks, report

meaningfully better access to green technology support than comparable enterprises in Shaanxi and Yunnan. This spatial gradient operates not only at the provincial level but also within provinces, with enterprises in rural counties consistently reporting weaker access to policy information, technical services and support programmes than those in urban areas.

3.1.4 Integrated Justice Assessment

Table 3.1 Integrated Justice Assessment: Agriculture, Forestry, Animal Husbandry and Fisheries

Justice Lens	Key Finding	Evidence Base and Source Methods
Recognitional	National level policies acknowledge small farmers, cooperatives and MSMEs as legitimate economic actors requiring tailored support. However, targeting remains generic: instruments rarely distinguish between micro operators, family farms and corporate agri businesses, and women led and youth led enterprises are largely invisible in policy design.	Policy texts: partial recognition in Zhejiang green transformation regulations and animal husbandry opinions; no explicit targeting of women or youth operators. Survey: all 11 enterprises agreed policies recognise MSME needs; but 10 of 11 reported barriers accessing support. Cases: women farmers report lack of training channels and policy information as primary exclusion mechanisms.
Distributive	Resources concentrate disproportionately among larger operators and better connected cooperatives. Green credit penetration remains low for small and micro farmers. Survey respondents directly observed that large scale farms obtain environmental transformation funds while small scale farmers are marginalised. Direct subsidies, tax incentives and bank loans are the dominant instruments, but their terms favour enterprises with assets to pledge as collateral.	Survey: only 3 of 11 enterprises found financing relatively easy to obtain. Cases: interviewees noted that insurance and credit linkage mechanisms exist but implementation leaves small operators behind. Policy texts: financing instruments formally available but without collateral mitigation for micro scale operations.
Procedural	Policy consultation mechanisms for the sector are limited and do not systematically reach small operators. Information access is the most frequently cited procedural barrier: 10 of 11 surveyed enterprises reported encountering obstacles, with untimely policy information, lengthy administrative procedures and insufficient funding as the main constraints. MSMEs have limited channels to influence policy revisions affecting their sector.	Survey: all but one enterprise reported procedural barriers when applying for support. Cases: agricultural enterprise owners describe receiving policies through informal networks rather than official channels, with no systematic feedback mechanism. Policy texts: the Four Discussions and Two Public Announcements system provides a procedural mechanism but its reach to micro operators is uneven.

Justice Lens	Key Finding	Evidence Base and Source Methods
Restorative	Restorative justice is the weakest dimension in this sector. Policies for ecological restoration, degraded grassland recovery and climate disaster relief exist but are designed for environmental outcomes rather than enterprise adjustment support. There are no systematic mechanisms to compensate small operators for losses incurred during the transition from conventional to green production, or to support workers displaced by ecological zoning requirements.	Policy texts: degraded forest restoration and disaster prevention measures in Zhejiang regulations address environmental recovery, not enterprise adjustment. Survey: climate shock support policies broadly acknowledged as beneficial, but their precision and sector specificity rated as insufficient. Cases: no case enterprise identified a government supported transition compensation programme.
Spatial	Regional disparities in green agriculture infrastructure are significant. Central and western regions and remote areas lag behind coastal provinces in the availability of green credit, extension services and digital infrastructure required for modern agricultural transformation. Policy instruments address spatial equity through ecological zone management and regional carbon budget allocation, but the gap between coastal and interior provinces remains substantial.	Policy texts: Zhejiang regulations address zone management; national policies reference western and rural development but without MSME specific delivery mechanisms. Survey: enterprises across regions agreed climate adaptation policies are beneficial, but noted unclear objectives and absence of region specific customisation. Cases: agricultural case enterprises in Shaanxi and Yunnan reported significantly weaker access to green technology extension than counterparts in Shandong.

Sources: Policy text analysis, enterprise survey (n=11), case study interviews. Convergent findings across all three methods are indicated in the evidence column; findings resting on one or two methods are noted as such.

Policy design reflects some recognition of MSME needs and constraints, but this is not yet sufficiently translated into practical outcomes across the distributive, procedural, restorative and spatial justice dimensions. The overriding constraint is not the absence of policy instruments but the absence of a delivery infrastructure capable of reaching small operators, particularly those without institutional connections, formal collateral or information access.

3.2 Manufacturing

3.2.1 Policy Landscape and Evolution

Manufacturing is the most comprehensively governed sector in China's green transition framework and the one where policy evolution has been most sustained and systematically documented. As a major source of industrial carbon emissions and the backbone of China's export economy, the sector has been subject to environmental and industrial policy interventions over more than 15 years, creating a policy architecture that is substantially more

developed than in other study sectors.

The policy trajectory divides into three phases. In the first phase, from 2009 to 2016, the focus was on energy saving technologies and the designation of new energy vehicles as a strategic emerging industry, marking the initial articulation of a green manufacturing agenda. The second phase, from 2017 to 2020, was defined by systemic green manufacturing frameworks, most importantly the Implementation Guidelines for Green Manufacturing Engineering under Made in China 2025, which formalised the concepts of green factories, green industrial parks and green supply chains and established these as planning targets for the manufacturing sector. The third phase, from 2021 to the present, has been characterised by the introduction of carbon peaking and neutrality targets into industrial governance, with the Implementation Plan for Carbon Peaking in the Industrial Sector (2022) introducing for the first time the concept of an industrial carbon peaking pathway and initiating low carbon transition programmes in high emission sub sectors including steel and cement.

At the national level, MIIT's Guiding Opinions on Accelerating the Green Development of Manufacturing (2024) and the associated seven department joint guidelines represent the most comprehensive current framework for green manufacturing policy, combining energy benchmarks, digital empowerment tools, green certification mechanisms and supply chain collaboration instruments. Shandong Province's Three-Year Action Plan for Building a Green, Low Carbon and High-Quality Development Pilot Zone (2023 to 2025) represents one of the most detailed provincial level implementations, establishing concrete targets for green factory creation, short process steelmaking and green electricity plus equipment manufacturing demonstration projects. Shenzhen has introduced green manufacturing special subsidies and green technological upgrade loans as dedicated MSME instruments, representing one of the few sub national programmes specifically calibrated to smaller firms.

Policy instruments in the sector comprehensively cover supply side, demand side and environmental dimensions. Supply side instruments deploy research on low carbon technologies in industry, implement process reengineering projects and fund the hydrogen metallurgy action plan. Demand side instruments establish carbon sequestration through chemicals demonstration projects and encourage green and low carbon enterprises to expand into international markets. Environmental instruments set energy efficiency benchmarks, enforce compliance assessment mechanisms and promote the development of green supply chain standards.

However, the green transition of manufacturing still faces multiple challenges. First, the cost pressure of transition and upgrading is substantial. For MSMEs, the upfront investment in energy-saving equipment procurement and environmental technology retrofits is sizeable while the payback period is long. Although local governments have rolled out financial support measures such as dedicated green technology-upgrade subsidies for "Specialised and Innovative" SMEs and "environmental loans," resource allocation in implementation remains uneven. Medium-sized enterprises — particularly state-owned ones — enjoy comparative advantages in both the scale and ease of access to funding support, while micro and small enterprises, constrained by the absence of collateral and limited credit ratings, continue to face significant financing constraints.

Despite this comprehensive architecture, from an MSME's lens, three persistent gaps characterise the sector's policy landscape. First, instruments consistently treat MSMEs as a homogeneous category, failing to differentiate between the operational realities of a specialised and innovative enterprise with established research and development capacity and a micro manufacturer in light industry or textiles operating with minimal institutional infrastructure. Second, the support system for workforce reskilling and transition adjustment is underdeveloped: as enterprises invest in automation and process decarbonisation, workers in contracting sub processes are not

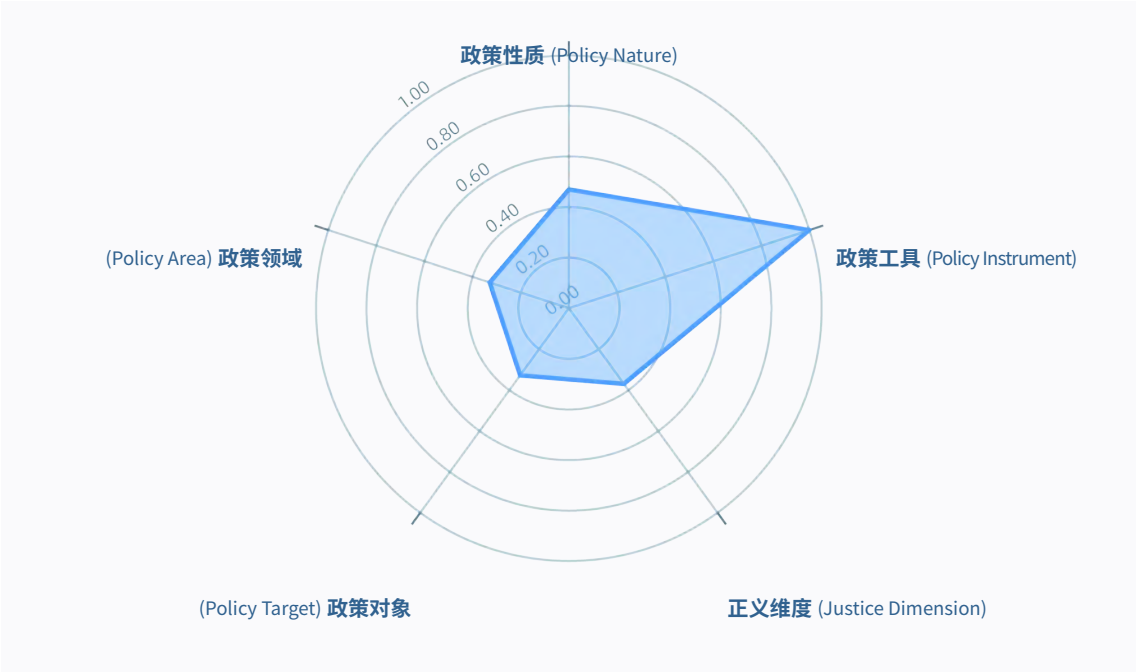
systematically provided with retraining pathways or transitional income support. Third, the dual certification burden, identified in policy text analysis and corroborated by both survey and case evidence, represents a structural mismatch between the administrative design of the certification system and the operational capacity of smaller firms.

At the policy implementation level, although a relatively comprehensive policy framework has been established, gaps remain in on-the-ground delivery. On one hand, there is an internal factor: enterprises genuinely differ in their capacity to understand and apply policy. On the other hand, an external factor — the professional capacity of government officials to interpret and provide guidance on policy needs to be strengthened — further weakens policy effectiveness in practice.

Coordinated regional development is also an important issue in manufacturing's green transition. Cluster-based development of manufacturing is now a pronounced trend, but support intensity varies in gradient across regions. Industrial agglomerations enjoy comparative advantages in business environment and policy support, while enterprises in non-core regions face greater challenges in accessing policy support and professional services. This regional imbalance calls for more targeted policy design to address it.

Overall, China's manufacturing green transition has built a relatively systematic policy framework and accumulated valuable experience in industrial practice. Going forward, further refinement is needed in policy delivery precision, resource allocation mechanisms, harmonisation of standards, and coordinated regional development — advancing the integrated unity of economic, environmental and social benefits.

Figure8: PMC radar chart: Manufacturing



The PMC assessment for the manufacturing sector shows strong performance on Policy Instrument, driven by effective demand and supply side synergy: demonstration projects for carbon fixation through chemical processes stimulate enterprise engagement from the demand side, while frontier low carbon technology research, zero carbon process reengineering and hydrogen metallurgy action plans provide robust supply side support. Policy Nature also scores well, reflecting the sector's comprehensive regulatory and guiding framework. However, Justice Dimension remains comparatively weak, with distributive justice partially addressed through pain point identification and risk assessment mechanisms, but recognitional, spatial and restorative justice underdeveloped: policies do not fully acknowledge the differentiated needs of transformation subjects, do not adequately account for regional development disparities, and do not compensate groups adversely affected by the transition. Policy Area coverage is concentrated in finance access and innovation and technology support, reflecting the sector's capital and technology orientation, while six other domains including entrepreneurship development, enterprise development services and climate resilience receive limited attention. The overall profile confirms a sector with strong instrumental capacity but uneven justice integration and domain coverage that narrows the effective reach of an otherwise ambitious policy architecture.

3.2.2 Survey Evidence: MSME Experiences

The 126 manufacturing enterprises in the survey constitute the largest sector sample and provide the most statistically meaningful picture of MSME experiences. The pattern that emerges is one of relatively high nominal recognition and formal distributive equity coexisting with persistent procedural barriers and significant financing exclusion for a substantial minority of enterprises.

A note of caution: Chinese enterprise surveys on abstract policy evaluations are known to display acquiescence and social-desirability biases, particularly where the survey may be perceived as government-sponsored. High agreement scores are therefore best read alongside the case study and administrative evidence rather than as standalone estimates. On recognitional justice, the sector performs strongly. More than 80 per cent of enterprises expressed positive views on the statement that government policies recognise and support MSME development needs, with 61 enterprises strongly agreeing and 45 agreeing. Only two enterprises expressed negative views. At the level of stated resource allocation fairness, over 90 per cent of enterprises acknowledged the current mechanisms as broadly fair, with 54 rating them as very fair and 61 as generally fair. This indicates that the Specialised and Innovative SME programme and related instruments have successfully established a general perception of recognitional inclusion among manufacturing MSMEs.

However, procedural experience at the point of application tells a different story. Only 16 enterprises reported never encountering obstacles when applying for policy support. The remaining 110 experienced barriers of varying frequency: 47 rarely, 45 occasionally and 18 frequently. The three most cited barriers are insufficient funding in the programmes applied to, delayed access to policy information and burdensome administrative procedures. The concentration of negative procedural experience is not random: case evidence and survey comments indicate that smaller manufacturers, enterprises in sub sectors with weaker industry associations, and enterprises in interior provinces are disproportionately represented among those facing frequent barriers.

Access to green finance shows a notably differentiated pattern. On access to environmental finance specifically, including energy saving and emissions reduction loans and environmental protection subsidies, 28 enterprises reported very easy and 36 relatively easy access. However, 25 enterprises faced relatively difficult or very difficult conditions, and the remaining 37 rated access as average. This distribution reflects a structurally bifurcated market: enterprises that have already established relationships with policy banks or obtained 'Specialized, Refined, Differentiated, and Innovative (SRDI) small and medium-sized enterprises (SMEs)', defined as businesses that focus on niche markets, demonstrate professional expertise, produce high-quality or customized products, and possess strong independent innovation capabilities, can access green finance relatively smoothly, while those without these credentials face significantly higher barriers. The suitability of financial products is rated more positively, with 86 enterprises considering them generally suitable and 38 fully suitable, suggesting that the design of instruments is broadly appropriate even when access is constrained.

On innovation support, the results are largely positive. Ninety-nine enterprises reported having received recognition or support due to green innovation or entrepreneurship, and accessibility to training, research and development, and innovation programmes is rated as relatively high, with 41 enterprises rating access as very convenient and 54 as relatively convenient. Access to equal opportunities for women and youth entrepreneurship is also assessed positively by a large majority. These findings are broadly consistent with the sector's relatively developed policy architecture for innovation incentives.

Market access remains a site of persistent inequality. Only 39 enterprises report always receiving fair access to markets and procurement opportunities, while 64 indicate they sometimes do and 23 report rarely doing so. The barriers most cited are information constraints, the high costs of green transition certification, and market dominance by large enterprises. Climate resilience support following crises is comparatively well developed in manufacturing, with 58 enterprises reporting adequate and 56 partial support following COVID-19 and flood disruptions, though climate adaptation instruments are again assessed as lacking in specificity and regional differentiation.

3.2.3 Case Study Evidence: On the Ground Realities

The manufacturing case enterprises span plastic products, resource recycling, power equipment, petroleum machinery, environmental energy, new materials, biomedicine, optoelectronic sensing and advanced manufacturing, and are located across Shandong, Jiangxi, Shaanxi and Yunnan. Their diversity captures both the breadth of China's manufacturing base and the significant variation in green transition experiences across sub sectors and regions.

The most analytically significant case finding is the role of industrial clustering as a partial but unevenly distributed mechanism for justice. In one eastern China region, an intensive pollution control model enabled enterprises within an industrial park to jointly construct wastewater treatment facilities, creating an industry technology innovation alliance that pooled compliance costs and provided a platform for paired technology assistance. This arrangement effectively reduced the cost burden of environmental compliance for participating MSMEs and demonstrates the potential of clustering-based approaches. However, this is the experience of enterprises already inside well-resourced coastal clusters; it does not extend to the many manufacturing MSMEs that operate in non-clustered or rural industrial zones.

> *A food manufacturing enterprise in the sample described the dual certification problem directly: green food certification and low carbon certification are separate processes with separate documentation requirements and separate fees. For an enterprise of our size, completing both is a significant investment of management time and financial resources. We would strongly support a unified certification track.*

Financing barriers in the cases are closely linked to the distinction between state owned and private enterprise access to green credit. Multiple interviewees observed that state owned enterprises in their sectors or regions accessed green subsidies and loans at higher rates and with fewer procedural barriers than private MSMEs, despite formally applying to the same programmes. One interviewee described the dynamic as medium sized enterprises, especially state owned enterprises, receiving higher subsidies than small enterprises, and state owned enterprises having advantages in financial support and ease of access. This reflects a structural bias in the implementation of formally neutral instruments that formal policy text analysis alone would not capture.

The case studies also surface the workforce dimension of green transition, which is absent from the policy architecture reviewed. As manufacturing enterprises invest in automated and digitised production processes to meet energy efficiency benchmarks and reduce emissions, workers in low skill assembly or processing roles face displacement or redeployment without formal support programmes. No case enterprise identified a government provided reskilling or transitional income support programme for workers affected by green process upgrades. This is both a restorative justice gap and a practical risk to enterprise willingness to undertake transformation: employers who fear the social and operational consequences of workforce displacement may be less willing to invest in the green upgrades that policy is designed to incentivise.

Spatial disparities in manufacturing are well illustrated by the contrast between coastal and inland case enterprises. An enterprise in Jiangxi observed that the level of regional support is significantly lower than in provincial sub centres, while a Shaanxi enterprise noted limited access to the industry alliance technical sharing networks available in eastern manufacturing clusters. The technology diffusion that occurs naturally within well developed coastal clusters, and that accounts for much of the positive experience reported in aggregate survey data, does not reach enterprises in interior provinces through the mechanisms currently in place.

3.2.4 Integrated Justice Assessment

Table 3.2 Integrated Justice Assessment: Manufacturing

Justice Lens	Key Finding	Evidence Base and Source Methods
Recognitional	Manufacturing MSMEs are explicitly recognised as key policy targets across most instruments. More than 80 per cent of surveyed enterprises confirmed that government policies acknowledge their development needs. However, recognition at the aggregate level coexists with low visibility for specific subgroups: women led enterprises, youth entrepreneurs and micro manufacturers in light industry and textiles are largely absent from targeted instruments, particularly in energy intensive sub sectors.	government policies recognise MSME needs. Policy texts: Specialised and Innovative SME programme explicitly targets manufacturing MSMEs; however, criteria favour enterprises with established R and D capabilities, excluding early stage and micro firms. Cases: women entrepreneurs in light manufacturing described systematic exclusion from mainstream green certification and equipment upgrade subsidy programmes.
Distributive	Distributional gaps are the most pervasive justice challenge in manufacturing. Green loans, subsidies and tax incentives formally target MSMEs but in practice concentrate among larger firms and state owned enterprises with stronger collateral and institutional access. Dual certification costs, where green food certification and low carbon certification are administered separately, impose disproportionate compliance costs on smaller firms. Regional clustering creates pockets of good practice but also deepens disparities between clustered and non-clustered enterprises.	Survey: 25 enterprises rated green finance access as relatively or very difficult; 47 reported occasionally and 18 frequently encountering unfair treatment in policy applications. Cases: food manufacturing enterprise flagged dual certification cost burden; interviewees noted state owned enterprises access subsidies at higher rates than private MSMEs. Policy texts: green manufacturing financing instruments formally available but without differentiated terms for micro enterprises or enterprises without collateral.
Procedural	Procedural justice is partially achieved through industry associations and public private dialogue platforms, but effectiveness is uneven. Smaller enterprises participate less actively than larger ones, and the gap between association level engagement and individual enterprise experience is significant. Several case interviewees called for a regular publicly accessible mechanism for collecting enterprise opinions, including online and offline survey channels, indicating that existing consultation structures are perceived as insufficient.	Survey: 16 enterprises reported no procedural barriers; 47 rarely, 45 occasionally, 18 frequently. Cases: manufacturing interviewee cited absence of regular opinion collection mechanism; another noted that government officials forward policies without professional interpretation, leaving MSMEs unable to complete applications for green transformation projects. Policy texts: no instrument establishes a mandatory MSME consultation requirement for green standard revisions.

Justice Lens	Key Finding	Evidence Base and Source Methods
Restorative	Support for enterprises and workers bearing adjustment costs is limited. The industrial clustering approach, which enables shared wastewater treatment and technology alliances, represents a partial restorative mechanism by pooling compliance costs. However, there are no dedicated instruments for enterprises that must halt production or reduce capacity during environmental compliance upgrades, and workforce reskilling support for workers displaced by process automation or decarbonisation is absent from the policy texts reviewed.	Cases: one region implemented a shared pollution control model that pooled infrastructure costs; this is the most developed restorative mechanism identified in the sector. Policy texts: no instrument identified provides transition support for workers in contracting processes. Survey: resilience support following COVID-19 and floods was relatively well received, but this reflects emergency response capacity rather than systematic transition adjustment support.
Spatial	Manufacturing cluster development has produced pockets of strong spatial synergy, particularly in coastal and provincial sub centres. However, enterprises in less developed regions report weaker business environments and lower levels of policy support than their counterparts in provincial centres. The observation that being a provincial sub centre already provides a better environment than other cities within the same province illustrates the depth of spatial stratification even within a single province.	Survey: enterprises from central and western regions reported lower accessibility to green finance and technology support. Cases: manufacturing enterprise in Jiangxi described regional support levels as variable and inferior to those in coastal zones; Shaanxi enterprise cited limited access to industry alliance technical sharing networks available in eastern clusters. Policy texts: regional allocation mechanisms exist within national programmes but lack ring fenced resources for inland manufacturing MSMEs.

Sources: Policy text analysis, enterprise survey (n=126), case study interviews across Shandong, Jiangxi, Shaanxi and Yunnan. Convergent findings across all three methods are indicated in the evidence column.

The analysis of the manufacturing sector presents a paradox for MSMEs: comprehensiveness without precision. China has built one of the most extensive green manufacturing policy frameworks in the world, covering the full range of supply side, demand side and institutional instruments across all seven diagnostic domains. Yet the effectiveness of this framework for smaller manufacturing enterprises, particularly those outside coastal clusters, those without institutional banking relationships and those led by women or youth, is substantially compromised by implementation gaps that formal policy design does not address. The sector's most robust policy achievements, recognitional inclusion and innovation support, coexist with its most persistent weaknesses, namely distributional concentration, workforce transition neglect and spatial stratification.

3.3 Information and Communications Technology

3.3.1 Policy Landscape and Evolution

The ICT sector occupies a structurally unique position in China's green transition framework. It is simultaneously

subject to decarbonisation requirements in its own right and a critical enabler of decarbonisation in other sectors. This dual track characteristic distinguishes the ICT policy landscape from that of the other four study sectors: the sector must manage its own energy consumption, particularly from data centres and base station infrastructure, while expanding the provision of digital services that allow manufacturing, logistics, retail and agriculture to reduce their own emissions.

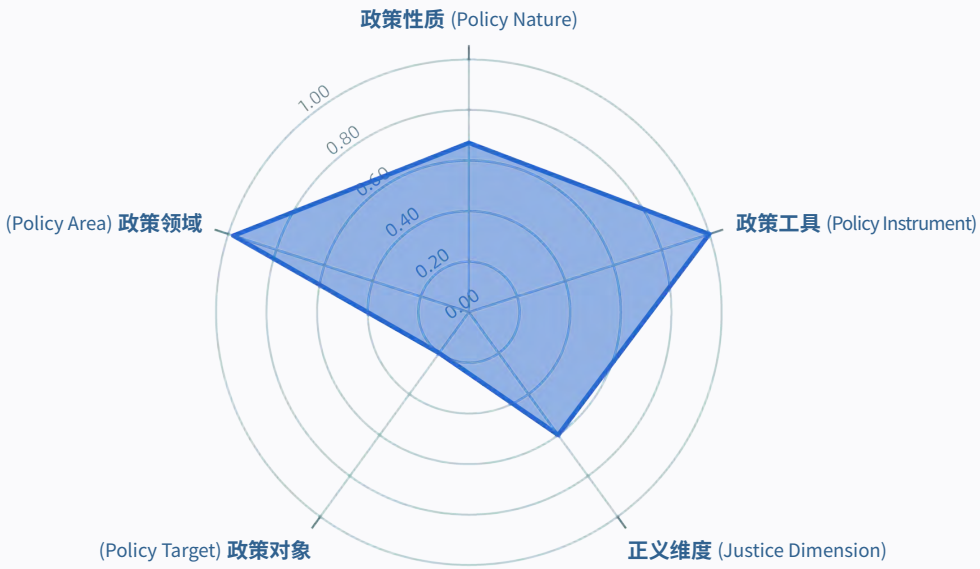
The policy architecture for ICT green transition developed in two phases. The first phase, from 2019 to 2021, focused primarily on the sector's own energy footprint, promoting the construction of green data centres, reducing power usage effectiveness ratios, and encouraging the deployment of renewable energy in ICT infrastructure. The second phase, from 2022 onwards, has been defined by the Digitalization and Greening Collaborative Implementation Guidelines (2022), which for the first time formally linked ICT with the broader green transformation agenda. This document established a dual track collaboration framework covering technology, industry and standards, and created the conceptual foundation for treating the ICT sector as a green enabler across the whole economy.

Since 2023, local governments, particularly in Shenzhen and Shandong, have accelerated the second phase with instruments supporting virtual power plants, dual carbon cloud networks and green data centres. These instruments encourage ICT enterprises to enter green power dispatch, carbon emission accounting and green operation and maintenance services. To support small and medium ICT enterprises specifically, a set of access voucher instruments has been introduced: computing power vouchers, cloud access vouchers and low carbon industry funds reduce the financial threshold for smaller enterprises to participate in digital green technologies, including smart grids, distributed energy management and carbon footprint tracking.

Across the seven diagnostic domains, ICT policy is most developed in innovation and technology, business enabling environment and market access, and least developed in climate resilience specific to the sector's infrastructure and in restorative instruments for enterprises and workers affected by structural adjustment. The Special Action Plan for Digital Empowerment of MSMEs (2025 to 2027) and the Implementation Guide for Digital Transformation of Manufacturing Enterprises (2024) are the most recent instruments reviewed and reflect a growing ambition to reach smaller enterprises, though coverage gaps for micro scale technology firms and interior province operators remain significant.

The analysis of the policy landscape highlights two structural gaps that characterise the current ICT policy architecture for MSMEs. First, instruments predominantly provide guiding rather than financial support: computing vouchers and cloud vouchers lower access costs at the margin but do not address the fundamental capital gap for long term green technology research and development investment. Second, the inconsistency of implementation standards across provinces, particularly in high tech enterprise certification and research and development expense deduction eligibility, creates disproportionate burdens for MSMEs operating across regional borders.

Figure 9: PMC radar chart: Information and Communications Technology



The PMC assessment for the ICT sector presents the most balanced radar profile of the sectors studied, with Justice Dimension, Policy Instrument and Policy Area scoring relatively high. Policy Instrument is well structured, using pilot city programmes as a starting point for digital transformation, deploying technical upgrading projects to accelerate artificial intelligence application, and creating an enabling ecosystem through coordinated demand and supply side tools. On Justice Dimension, the sector demonstrates meaningful progress on recognitional justice through accurate identification of transformation subjects, distributive justice through broadly universal resource allocation, and spatial justice through regionally differentiated experience adaptation. However, procedural justice and restorative justice score the lowest within the justice axis: enterprise participation rights in policy design are not fully guaranteed and the baseline support for those adversely affected by transformation remains insufficient. Policy Area coverage is strong, with only climate shock resilience support identified as a significant gap. The overall profile confirms a sector with a coherent and relatively comprehensive policy architecture whose principal remaining challenge is deepening participation rights and strengthening protection for enterprises and workers bearing the costs of transformation.

3.3.2 Survey Evidence: MSME Experiences

The 103 ICT enterprises in the survey represent the second largest sector sample and provide a detailed picture of the gap between positive nominal recognition and persistent practical barriers. The aggregate pattern is characterised by strong satisfaction with policy design and strong dissatisfaction with procedural access.

On recognition, 89 of 103 enterprises agreed or strongly agreed that government policies acknowledge MSME development needs. On distributional fairness, 99 enterprises considered resource allocation ‘generally fair’ or

'very fair'. These are the highest satisfaction scores on recognition and distribution of any sector in the survey. Yet at the procedural level, only 4 enterprises reported never encountering obstacles when applying for support, and all remaining 99 enterprises reported barriers of varying frequency. This divergence between satisfaction with design and experience of delivery is the defining feature of the ICT sector's policy performance profile.

Access to environmental finance shows a more differentiated picture than the aggregate distribution assessments suggest. Sixty-two enterprises rated financing access as relatively or very easy, but 41 rated it as average or difficult, indicating a bifurcated market. The suitability of financial products is rated more positively, with 77 enterprises rating them as generally suitable and 21 as fully suitable, suggesting that instruments are broadly well designed even when access remains constrained. Government subsidies, bank loans and tax incentives are the dominant financing channels, with government subsidies accounting for the largest share, confirming the central supporting role of public finance in a sector where commercial green finance remains underdeveloped for smaller firms.

On innovation and technology, performance is the strongest of any domain. Eighty-five enterprises reported receiving recognition or support through green innovation or entrepreneurship, and accessibility to training, research and development, and innovation programmes is broadly positive. However, sector specific innovation constraints are significant: talent competition from large ICT firms, institutional barriers to academic to industry mobility, insufficient long-term capital for green technology development, and misalignment between research and development outputs and market demand collectively limit the sustained innovation capacity of smaller enterprises. Market access shows partial fairness. Twenty-two enterprises report always receiving fair access to procurement opportunities, 69 sometimes do, and 12 rarely do. The market access barriers cited, including information constraints, high certification costs and leading firm dominance, mirror the patterns in other sectors, but are compounded in ICT by the technological and resource advantages of platform scale firms whose digital infrastructure advantages MSMEs cannot replicate. Climate resilience support is relatively well received, with 94 of 103 enterprises reporting adequate or partial support following crises, but the sector specific gap in disaster prevention and redundancy planning for base stations and data centres under extreme weather remains a notable deficiency.

3.3.3 Case Study Evidence: On the Ground Realities

The ICT case enterprises cover digital solutions, high end equipment manufacturing, electronic components, health technology and energy saving technologies. Their experiences reveal the mechanisms behind the two core findings of the survey: strong nominal recognition coexisting with persistently poor procedural access, and innovative financing instruments that do not reach the enterprises most in need of long-term capital.

The most analytically striking case finding is the spatial fragmentation of the ICT ecosystem. Enterprises operating primarily in coastal provinces benefit from active industry alliances, science and technology innovation centres, and dense networks of technology service providers. Those conducting business across regions report clearly felt differences in digital infrastructure and the industrial ecosystem between eastern and interior locations. This is not merely a matter of infrastructure availability: it reflects the self-reinforcing dynamics of agglomeration, where the services, talent and collaboration opportunities available to ICT enterprises in coastal clusters create advantages that interior province enterprises, however capable, cannot access without physical relocation.

> *An enterprise executive described the practical experience of cross regional operations as follows: when we try to serve clients in inland provinces, the difference in digital infrastructure and industry ecosystem is immediately apparent. Our partners there face constraints in connectivity, cloud access and technical support that we take for granted in our home province. Policy is designed as if all provinces have the same baseline, but they do not.*

The financing dimension of the cases surfaces a mechanism the survey cannot capture: the maturity mismatch between available instruments and green technology investment timelines. Green technology research and development in the ICT sector typically requires three to five year development cycles before commercialisation, but the financial instruments available to smaller firms, including bank loans and government subsidies, are calibrated to two-year operational cycles. Venture capital and equity financing, which could in principle provide longer term patient capital, impose entry barriers including minimum revenue thresholds and equity dilution requirements that most ICT MSMEs are unwilling or unable to accept. The result is a structural capital gap at precisely the investment horizon that matters most for green innovation.

Procurement and payment practices by large clients, particularly state owned and central enterprises, also emerge in the cases as a significant barrier invisible in aggregate policy analysis. Long payment terms and the use of commercial acceptance bills by major clients create cash flow constraints for smaller ICT firms that compound their difficulty in sustaining sustained green technology investment. This is an indirect distributional effect of procurement practices rather than a green policy design failure, but it has direct consequences for the capacity of ICT MSMEs to participate in the green transition.

3.3.4 Integrated Justice Assessment

Table 3.3 Integrated Justice Assessment: ICT

Justice Lens	Key Finding	Evidence Base and Source Methods
Recognitional	Policy formulation acknowledges ICT MSMEs as a named target group, and the dual track framing of the sector, covering both its own decarbonisation and its enabling role for other industries, reflects genuine recognitional effort. However, young entrepreneurs and micro scale technology firms lack dedicated instruments within the broader ICT support architecture, and the specific barriers they face in accessing computing vouchers and certification are not addressed.	Survey: 89 of 103 enterprises agreed or strongly agreed that policies recognise MSME needs. Policy texts: Digitalization and Greening Collaborative Guidelines and computing voucher instruments explicitly target small and medium ICT firms. Cases: young entrepreneur interviewees identified dual bottleneck of capital and technology as primary barrier not addressed by existing recognitional instruments.

Justice Lens	Key Finding	Evidence Base and Source Methods
Distributive	Access to environmental finance is moderate but uneven. Over 60 enterprises found financing relatively or very easy, but 41 rated it average or difficult, indicating that a substantial minority faces real barriers. The concentration of state guaranteed lending in larger and better established firms amplifies this gap. Market based financing channels including venture capital and equity financing impose entry barriers that most ICT MSMEs cannot meet, and the maturity structure of available instruments does not align with the long return cycles of green technology investment.	Survey: 62 enterprises rated financing access as average; 9 as relatively difficult. Cases: interviewees cited state guaranteed institutions applying strict risk controls and refusing to guarantee small technology enterprises; venture capital focus on short term returns excludes green technology innovation with long payback periods. Policy texts: computing vouchers and cloud vouchers address access at the margin but do not resolve the structural gap in long term green innovation capital.
Procedural	Only 4 of 103 enterprises reported no procedural barriers when applying for support. The dominant complaints are information timing, administrative burden and inconsistent implementation standards across regions. For enterprises operating in multiple provinces, cross regional operational differences in high tech enterprise certification and research and development expense deduction rules create compliance complexity that falls disproportionately on smaller firms.	Survey: 99 enterprises reported procedural obstacles of varying frequency. Cases: enterprise executive cited regional differences in tax incentive implementation standards as burden for cross regional operations; interviewees noted absence of regular, direct feedback channels to policymakers. Policy texts: no instrument establishes a mandatory MSME consultation requirement for digital standard revisions affecting the sector.
Restorative	Restorative justice is the weakest dimension in the ICT sector. Policies do not address the adjustment costs borne by enterprises and workers when ICT processes are restructured for decarbonisation, nor is there compensation for smaller firms that are displaced by platform consolidation among larger ICT operators. The sector lacks transition support mechanisms for workers whose roles are automated or made redundant through digital green upgrades.	Policy texts: no instrument reviewed provides adjustment support for ICT enterprises or workers affected by green transition. Cases: enterprise development services supply and demand mismatch identified by interviewees; industry alliance technical exchange platforms described as valuable but insufficiently deep for specific technical problems. Survey: crisis response policies well received but not designed for sectoral adjustment; climate adaptation for base stations and data centres under extreme weather noted as absent.
Spatial	The ICT sector displays pronounced spatial concentration. High quality digital infrastructure, industry clusters, science and technology innovation centres and digital economy demonstration zones are disproportionately located in coastal provinces. Although central and western regions are now receiving more investment in green data centres, computing hubs and renewable power integration, the benefits for local MSMEs remain uneven because access channels, service markets and procurement linkages are not systematically ring fenced for nearby smaller firms. Interior province ICT MSMEs therefore continue to face weaker infrastructure ecosystems, less active industry alliances and limited access to the cross sector digital empowerment markets that coastal firms can readily serve.	Cases: enterprise executives described clearly felt differences in digital infrastructure and industrial ecosystem when conducting business across regions. Survey: climate adaptation instrument gaps for rural base stations and data centres in extreme weather scenarios noted as inadequately region specific. Policy texts: pilot city programmes for digital transformation are clustered in eastern and coastal provinces, while emerging investment in central and western computing and green energy infrastructure does not yet include sufficiently explicit local MSME access provisions.

Sources: Policy text analysis, enterprise survey (n=103), case study interviews. Convergent findings across all three methods are indicated in the evidence column.

The ICT sector presents strong recognitional intent hindered by severe procedural barriers and a structural capital gap for long term green innovation. The sector's most significant contribution to China's green transition, its role as an enabler of decarbonisation across the wider economy, is precisely what makes its own financing and governance limitations most consequential. An ICT sector that cannot sustain green technology investment is not merely an issue for its own enterprises, but a systemic challenge to the other sectors that depend on its digital solutions for their own green transitions.

3.4 Transportation, Warehousing and Logistics

3.4.1 Policy Landscape and Evolution

The transportation and logistics sector has experienced the most rapid green policy development of the five study sectors over the 14th FYP period, driven by the combination of the sector's high direct energy consumption and carbon emission intensity, its essential role in supply chain connectivity, and the emergence of new energy vehicle technology as a commercially viable decarbonisation pathway. Policy evolution in this sector is characterised by a consistent intensification of ambition alongside persistent gaps in reaching smaller operators.

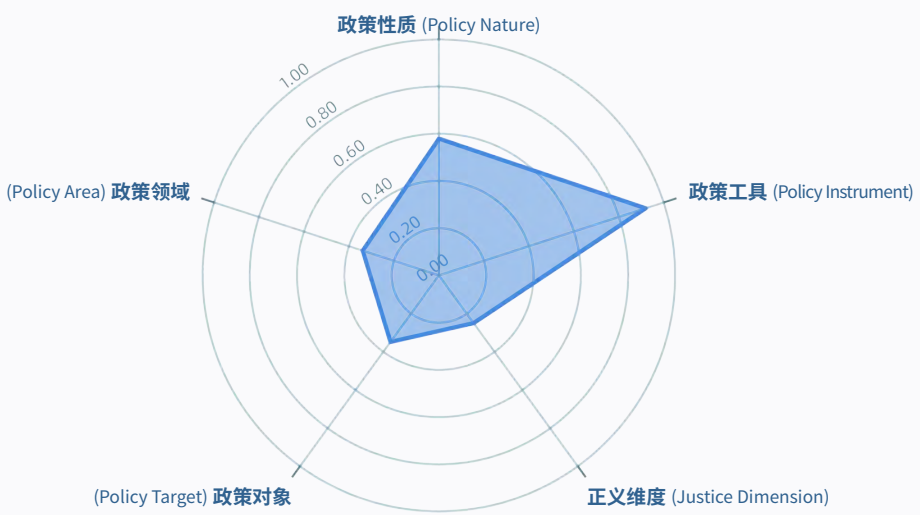
The policy trajectory begins in 2016 with the Opinions on Promoting the Healthy Development of the Logistics Industry and the Urban and Rural Logistics Distribution System Plan, which established the foundational policy framework for green logistics. The 14th FYP for Modern Logistics Development, issued in 2021, marked the most significant policy milestone, formally designating green logistics as a strategic direction and setting targets for new energy truck deployment, smart logistics hub construction, and cold chain logistics and multimodal transport development. The plan's target of a safe, efficient, intelligent and environmentally friendly logistics system by 2025 represented a concrete ambition that has structured subsequent policy design.

From 2022 to 2025, policy focus shifted from infrastructure investment to the development of comprehensive service capabilities and the incorporation of MSMEs into green transition pathways. The Special Action Plan for Accelerating the Development of Digital and Intelligent Supply Chains (2025), issued by the Ministry of Commerce, represents the most recent and comprehensive framework, establishing digital intelligent supply chain laboratories and sharing platforms to break down information barriers and provide MSMEs with technical, market and capital support. Vehicle purchase subsidies, new energy urban distribution vehicle incentives and green packaging requirements have become consolidated policy priorities.

Key instruments addressing MSMEs specifically include logistics loan mechanisms, warehousing co-construction subsidies, and digital supply chain platform access provisions. The Shanghai Action Plan for Accelerating Green and Low Carbon Transformation (2024 to 2027) demonstrates the integration of assessment, evaluation and regulatory enforcement mechanisms that are increasingly characteristic of more advanced provincial implementations.

Three structural weaknesses characterise the sector's policy architecture. First, small and micro logistics enterprises face a circular constraint linking digitalisation and finance. In this sector, digital connectivity is a condition for participating in platform-based logistics services, recording orders and delivery performance, and generating the operational data increasingly used in credit assessment. Enterprises with weak digital systems therefore have fewer opportunities to join logistics platforms and to demonstrate stable business activity to lenders; without financing, they in turn struggle to invest in the digital tools needed to improve their operational visibility and creditworthiness. This creates a compound disadvantage that general logistics support instruments do not sufficiently address. Second, sub-sector differentiation in policy design remains insufficient across this broad sector. The barriers facing a cold chain operator are structurally different from those facing an urban last-mile delivery enterprise or a rural distribution logistics firm, and existing instruments often treat these as equivalent. Third, the participation of women and young workers in urban delivery and rural logistics, a substantial employment category, is not addressed in any instrument reviewed.

Figure 10: PMC radar chart: Transportation, Warehousing and Logistics



The PMC assessment for the transportation, warehousing and logistics sector shows a three dimensionally coordinated instrument profile with reasonable supply side coverage, anchored by supply chain management service standard systems and business environment optimisation tools. Justice Dimension records partial but uneven progress: recognitional justice is achieved through explicit identification of vulnerable groups including MSMEs; spatial justice is addressed through targeted support for resource-based regions and old revolutionary base areas; and procedural justice is partially secured through energy conservation and carbon reduction target assessment mechanisms. However, distributive justice and restorative justice score the lowest within the justice axis, with the precise allocation of transition resources to enterprises of different sizes remaining insufficiently targeted and compensation for groups damaged by the transition largely absent. For Policy Area, innovation and technology support and finance access are strong, where the remaining six domains, including business enabling environment, entrepreneurship development, enterprise development services, market access, climate impact support and social and cultural support, are present in the sample policies but at insufficient depth to address the structural barriers facing small logistics operators.

3.4.2 Survey Evidence: MSME Experiences

The 13 transportation sector enterprises in the survey provide the smallest sectoral sample and are treated as qualitative indicators rather than statistically representative findings. Their consistency across key dimensions, however, reinforces the patterns identified in the policy text analysis and cases.

Recognition is broadly positive, with 12 of the 13 surveyed enterprises (note: sub-sample too small for percentage-based inference) of enterprises agreeing that policies acknowledge their development needs, and most finding resource allocation broadly fair in principle. The procedural gap is acute: 12 of 13 enterprises reported encountering obstacles when applying for policy support, with the fragmentation of relevant policy information across transport and road administration departments as the primary structural explanation. Specialised logistics policies are tied to route approvals and operational qualifications managed by different agencies from those managing green transition support, creating coordination gaps that leave MSMEs unable to access timely information on available instruments.

Compared to other sectors, environmental finance appears to be less readily accessible. The fact that only 6 enterprises found financing relatively easy is consistent with the sector's high capital intensity. Purchasing a new energy vehicle fleet, building charging infrastructure or constructing green warehousing facilities requires investment at a scale that most small logistics operators cannot finance through available channels. Subsidy programmes exist but are evaluated on fleet scale rather than operator scale, and revenue fluctuations from route schedules and seasonal demand affect subsidy eligibility in ways that disadvantage smaller operators with less diversified revenue streams.

Innovation and technology support is acknowledged as positive, with nine enterprises reporting green innovation recognition, but the sector faces a specific talent constraint: smart logistics technologies require technical personnel with dual competencies in freight operations and digital systems, and this profile is scarce in most MSME labour markets. Market access is significantly constrained by the dominance of large logistics companies over core route and client networks; MSMEs primarily serve fragmented, short distance orders and lack the scale to absorb the proportionally higher certification costs that green transportation standards impose on smaller fleets.

3.4.3 Case Study Evidence: On the Ground Realities

The logistics case enterprises include cold chain operators, last mile urban delivery companies and regional multimodal transport firms. Their experience surfaces several mechanisms not captured by the survey, including the policy coherence problem, the stranded asset gap and the rural logistics infrastructure deficit.

The policy coherence problem is the most analytically significant case finding in this sector. Multiple interviewees described conflicts between the requirements of different regulatory bodies as a practical operational barrier: environmental protection departments require the use of new energy vehicles, while transportation departments impose strict restrictions on vehicle load and travel time for those same vehicles, creating regulatory contradictions that impose real operational costs without any mechanism for resolution. A cold chain logistics operator described this directly, noting that the policy restricting one to many power supply from charging stations prevents fleet scale efficiency without any channel through which the enterprise can propose an amendment.

> *A regional logistics enterprise owner described the regulatory conflict experience as follows: we are being asked by one department to go green and by another department to operate within rules that make going green operationally impractical. We want to comply with both, but the two departments do not appear to have coordinated their requirements, and there is no forum where we can raise this problem.*

The stranded asset dimension of the logistics transition is the most significant restorative justice gap in this sector. Logistics enterprises that invested in diesel vehicle fleets before the emissions standard trajectory was fully articulated now face those assets being rendered economically uncompetitive before the end of their useful life. Vehicle purchase subsidies for new energy vehicles are forward looking incentives and do not compensate for this depreciation effect. For small fleet operators, the combination of stranded legacy assets and the capital requirement for new energy replacement constitutes a double financial burden with no policy support mechanism.

Rural logistics infrastructure deficits are apparent across the case enterprises. New energy vehicle charging networks, smart warehousing facilities and digital supply chain platforms are concentrated in urban and coastal logistics hubs. Rural distribution enterprises face insufficient charging range in remote areas, limited warehousing co-construction partners and complex subsidy procedures that require administrative capacity beyond what small rural logistics operators can maintain. The stated goal of the 14th FYP for Modern Logistics, a logistics network reaching county, township and village levels, requires sustained capital investment in rural infrastructure that is not yet consistently in place.

3.4.4 Integrated Justice Assessment

Table 3.4 **Integrated Justice Assessment: Transportation, Warehousing and Logistics**

Justice Lens	Key Finding	Evidence Base and Source Methods
Recognitional	The 14th FYP for Modern Logistics Development explicitly acknowledges MSMEs in the logistics sector as participants requiring targeted support, including through logistics loans and warehousing co construction subsidies. However, recognition does not extend to the specific constraints of women and youth workers in urban delivery and rural logistics, and sub sector differentiation, particularly between cold chain, urban last mile and rural distribution operators, remains limited in policy design.	Survey: over 90 per cent of enterprises agreed policies recognise MSME development needs. Policy texts: 14th FYP for Modern Logistics explicitly names MSME support mechanisms; Special Action Plan for Accelerating Digital and Intelligent Supply Chains references inclusive market access. Cases: cold chain logistics enterprise noted that policy restrictions on one to many power supply hindered expansion without a channel to offer suggestions for revision.
Distributive	Distributional barriers are particularly acute in this sector because green transition requires large up-front capital investment, specifically new energy vehicle fleets, charging infrastructure and smart warehousing systems, that exceeds the financial capacity of most logistics MSMEs. Subsidy programmes exist but are calibrated to fleet scale rather than operator scale, meaning that enterprises with small fleets receive proportionally less support relative to their transformation burden. Seasonal and route-based revenue fluctuations further complicate MSME eligibility for instruments with stable turnover requirements.	Survey: only 6 of 13 enterprises found environmental finance relatively easy to access. Cases: long investment recovery period for green warehousing facilities and high cost of technology investment identified as primary barriers; special subsidies for green logistics facility upgrades described as partially effective. Policy texts: vehicle purchase subsidies and facility renovation subsidies formally available but without differentiated terms for micro fleet operators.
Procedural	Twelve of 13 enterprises reported procedural barriers when applying for support. A structural feature of the sector amplifies this problem: specialised logistics policies are tied to route approvals and operational qualifications managed by transport and road administration departments, and relevant policy information is dispersed across multiple platforms. This means that MSMEs must actively monitor several different administrative channels to stay informed, a capacity requirement that disadvantages smaller operators.	Survey: only 1 enterprise reported no procedural barriers. Cases: cold chain enterprise described high participation in standard setting but finding that final policies do not meet the needs of all parties; practical experience is valued in standard discussions but translating it into policy change is difficult. Policy texts: Shanghai Action Plan includes assessment and evaluation of energy conservation targets with supervision provisions, but MSME specific consultation mechanisms are absent.

Justice Lens	Key Finding	Evidence Base and Source Methods
Restorative	No mechanism exists to help logistics enterprises or workers absorb the adjustment costs created by the transition, including the early loss of value in diesel fleets that may become commercially unviable before the end of their expected life. New energy vehicle subsidies are forward looking incentives, but they do not ease the burden of retiring older assets ahead of schedule. Workers in sub sectors displaced by automation or route rationalisation likewise lack dedicated transition support.	Cases: no case enterprise identified a compensation mechanism for stranded assets. Policy texts: special subsidies for upgrading logistics facilities support forward looking investment, but they do not address the losses associated with older fleets and legacy assets. Survey: post disaster support policies are well received but do not function as transition adjustment instruments.
Spatial	Spatial disparities are acute and structurally embedded. Green logistics infrastructure, including new energy vehicle charging networks, smart warehousing facilities and digital supply chain platforms, is heavily concentrated in urban and coastal areas. Rural logistics MSMEs face insufficient vehicle range in remote areas, inadequate supporting facilities and complex subsidy procedures that disadvantage operators without dedicated administrative staff. The 14th FYP acknowledges rural logistics development but without the level of capital allocation or implementation specificity needed to close the infrastructure gap.	Survey: route accessibility and regional road condition differences noted as factors making climate adaptation policies insufficiently tailored to industry scenarios. Cases: regional gaps in green logistics infrastructure between east and west confirmed; western province logistics enterprise described significantly weaker access to new energy vehicle charging networks and warehousing co construction programmes. Policy texts: logistics loan and warehousing co construction subsidy mechanisms formally available but geographic reach limited to areas with sufficient partner institutions.

Sources: Policy text analysis, enterprise survey (n=13), case study interviews. Convergent findings across all three methods are indicated in the evidence column.

The logistics sector illustrates a problem of policy ambition outrunning delivery infrastructure. China has set ambitious green logistics targets and introduced a range of instruments to support the transition. The gap between this ambition and the experience of small logistics operators, particularly in rural and interior locations, reflects not a gap in intent but a failure of implementation coherence, capital calibration and spatial reach. The case evidence highlights two especially consequential governance gaps: inter-departmental coordination failures between environmental protection and transport regulators, and the absence of compensation for diesel fleets and other assets stranded by the transition.

3.5 Wholesale and Retail

3.5.1 Policy Landscape and Evolution

The wholesale and retail sector has the most recently developed green transition policy architecture of the five study sectors, and it exhibits the largest gap between the scale of the sector's MSME population and the precision of policy instruments designed to reach them. The sector comprises over 10 million corporate entities, making it the largest by enterprise count of the five sectors studied, but its policy architecture remains in an early stage of development relative to manufacturing and ICT.

Green transformation policy for wholesale and retail began to emerge in the later stages of the 13th FYP (2016-2020), when policy instruments started to emphasise greening at the consumption end of the supply chain. From 2019 to 2021, multiple departments jointly promoted pilot programmes for green product certification, green hotels and green exhibitions, establishing the foundational vocabulary and institutional infrastructure for sector level green transformation. The Guiding Opinions of the State Council on Accelerating the Establishment and Improvement of a Green Low Carbon and Circular Economic System (2021) gave systemic impetus to the greening of service industries, promoting green packaging, reduction of single use plastics and intelligent logistics.

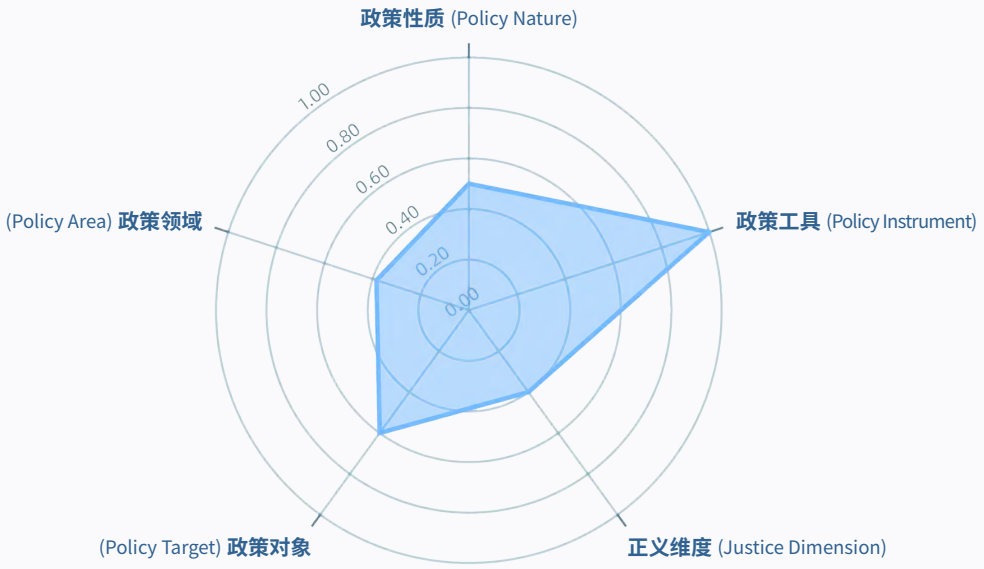
The 2023 Notice on Promoting Green Consumption and the Guiding Opinions on Accelerating the Digital Empowerment of Life Services extended these provisions to encompass green packaging, low carbon logistics, energy saving renovations and recycling in the retail and service sector. The most significant recent instrument is the Action Plan on Improving the Modern Commercial and Trade Circulation System and Promoting High Quality Development of the Wholesale and Retail Industry (2024), which for the first time addresses digital transformation support for MSMEs, the construction of rural commercial systems and the integration of county level distribution networks in a single coherent framework. This instrument demonstrates an emerging awareness of spatial and recognitional justice dimensions that earlier sector instruments lacked.

Policy instruments at the local level show innovation in some regions. Beijing and Guangzhou have explored green merchant points systems and simplified green certification packages designed to lower the threshold for community level retailers. These local experiments represent genuine attempts to address the precision gap, but their geographic coverage is limited and they have not been systematically replicated.

Three gaps define the current policy landscape. First, individual business owners, who constitute the dominant enterprise form in the sector, remain invisible as a named target group in most instruments: policy design implicitly assumes an MSME with administrative staff and banking relationships, not a sole operator running a community retail shop. Second, the policy domains most relevant to community level retailers, entrepreneurship development and enterprise development services, are the least covered in the instruments reviewed. Third, the administrative complexity of sector entry and ongoing compliance, involving health permits, service registration, food safety certification and green product requirements administered by different agencies, creates a procedural burden that

is proportionally far greater for micro operators than for larger chains.

Figure 11: PMC radar chart: Wholesale and Retail



The PMC assessment for the wholesale and retail sector presents the most concentrated radar profile of all five sectors, with Policy Instrument scoring notably higher than all other dimensions, reflecting a reasonably coherent supply and demand framework anchored by rural commercial system development, the three tier county, township and village logistics distribution network, and administrative simplification in the circulation field. However, Justice Dimension covers only two of the five lenses: recognitional justice, through the accurate identification of small and medium commercial circulation enterprises as primary transformation subjects, and spatial justice, through explicit attention to urban and rural commercial development disparities and improved rural commerce and logistics layout. Distributive, procedural and restorative justice are absent from the sample policies, indicating that resource allocation precision, enterprise participation in policy design and compensation for affected groups have not been integrated into the sector's policy architecture. Policy Area is the weakest of all five sectors, with gaps across five of the eight assessed aspects, leaving entrepreneurship development, enterprise development services, market access support, climate impact support and social and cultural support all significantly underdeveloped. The overall profile confirms that the wholesale and retail sector has a functionally reasonable instrument design but the narrowest justice coverage and domain breadth of any sector studied, constraining the transformative effectiveness of policies for a sector dominated by individual business owners and micro operators with the least institutional capacity to navigate what little support exists.

3.5.2 Survey Evidence: MSME Experiences

The 85 wholesale, retail and other services enterprises in the survey provide the clearest picture of the procedural justice deficit in the study. The sector records the lowest share of enterprises reporting no procedural barriers, at just 7 per cent, and the highest concentration of market access disadvantage relative to large enterprises, at over 75 per cent reporting sometimes or rarely fair access.

Recognition is broadly positive in aggregate: over 80 per cent of enterprises agreed that policies acknowledge MSME needs, and over 90 per cent assessed resource distribution as 'generally fair' or 'very fair'. But these positive assessments are matched by the most acute procedural difficulties reported of any sector. The explanation is structural: enterprises can recognise that policy intent is inclusive while simultaneously finding that the delivery mechanisms are inaccessible to operators of their scale. The fragmentation of sector relevant policies across commerce, market supervision, environmental protection and urban management departments creates a parallel information access problem to that identified in the logistics sector, with the additional complexity that health permits and service registration requirements add further layers of administrative procedure.

Access to finance is assessed as broadly suitable in terms of product design: over 90 per cent found financial products 'generally suitable' or 'fully suitable'. But the qualification matters significantly: suitability is assessed relative to general commercial needs, not relative to the specific financing requirements of green transformation investment. For wholesale and retail MSMEs facing inventory fluctuations and short cash flow cycles, standard bank loan terms are not well calibrated to their operational patterns. For service sector enterprises operating on asset light models, the absence of fixed assets as collateral limits access to the credit volumes needed to finance energy saving renovation or green certification investment.

Innovation and technology support is the most positive dimension in the survey, with over 80 per cent reporting green innovation recognition. However, the sector specific innovation constraints are real: compound talent combining smart retail competencies with green operations knowledge is scarce, eco packaging investment increases operational costs without proportional revenue benefit at the micro enterprise scale, and digital transformation requires upfront technical support that most small operators cannot source independently. Market access reflects the structural disadvantage of competing against chain retailers and large platform operators that dominate procurement relationships and can absorb green certification costs as a small fraction of revenue.

3.5.3 Case Study Evidence: On the Ground Realities

The wholesale and retail case enterprises include a pharmaceutical and healthcare company with an integrated supply chain and a smart energy company providing innovative energy management solutions. The contrast between these enterprises and the community level retail operators described in the survey evidence is itself analytically significant: the case enterprises represent the upper end of the MSME size and institutional capacity distribution, and their experiences of green transition are substantially more positive than those of the micro operators that dominate the sector.

The limited asset as a financing constraint is the most consistent structural finding across the sector cases. Service

enterprises describe the absence of fixed assets as a fundamental barrier to green finance access in terms that directly match the survey data: without collateral, banks will not provide the credit volumes needed to finance energy saving renovation or green compliance investment, and green transition projects that would be straightforward for an asset rich manufacturer are prohibitively costly for an asset light service operator.

> *A traditional service enterprise owner described the financing constraint directly: energy saving retrofits and the employee training and redeployment that green transformation requires both demand significant investment. Our operating profits are not sufficient to fund this from cash flow, and the support policies available to us are not designed for enterprises like ours. The policies appear to assume we have assets to pledge, but we do not.*

The green certification complexity finding in the cases reinforces the procedural justice assessment from the survey. Community level retailers describe green certification as a milestone accomplishment rather than a standard business process: even simplified certification packages require documentation, application processes and ongoing compliance monitoring that sole operators cannot manage alongside their primary business activities. Women led enterprises in community retail, beauty and catering, which constitute a significant share of the sector, face the additional barrier of operating in sub sectors that are not specifically covered by green certification tracks designed primarily for manufacturers and agricultural operators.

The rural commercial system provisions of the 2024 Action Plan are identified in the cases as a potentially significant development, but their implementation is at an early stage. The three tier county, township and village distribution network described in the plan addresses the geographic accessibility problem for rural wholesale and retail operators, but the digital transformation subsidy eligibility criteria within the plan remain calibrated to enterprises with established digital infrastructure, excluding precisely the rural micro operators the spatial justice provisions are designed to reach.

3.5.4 Integrated Justice Assessment

Table 3.5 Integrated Justice Assessment: Wholesale and Retail

Justice Lens	Key Finding	Evidence Base and Source Methods
Recognitional	The 2024 Action Plan on Improving the Modern Commercial and Trade Circulation System explicitly addresses digital transformation support for MSMEs and articulates spatial and recognitional justice dimensions through its rural commercial system provisions. However, individual business owners, who constitute the largest share of enterprises in the sector, remain largely invisible as a named target group in policy design. The sector's high proportion of women led enterprises in community retail, beauty and catering is not matched by targeted instruments for these groups.	Survey: over 80 per cent of enterprises agreed policies recognise MSME needs. Policy texts: 2024 Action Plan promotes digital transformation support for small, fast, lightweight and accurate solutions for MSMEs; rural commercial system provisions acknowledge spatial equity. Cases: pharmaceutical and healthcare case enterprise described successful integration of green supply chain management; smaller community retail operators described policy recognition as abstract and support as hard to access in practice.

Justice Lens	Key Finding	Evidence Base and Source Methods
Distributive	The distributional gap in this sector is structural. Financial instruments are calibrated to the credit profiles of enterprises with fixed assets, while most wholesale, retail and service MSMEs operate under asset light models with inventory fluctuations and short cash flow cycles. Green certification costs, including green merchant certification, energy saving renovation standards and eco packaging requirements, impose absolute costs that constitute a significantly higher proportion of operating costs for micro enterprises than for larger chains.	Survey: over 90 per cent rated financial products as generally suitable, but this reflects product design rather than access: only 7 per cent of enterprises reported never encountering obstacles in applying for support. Over 75 per cent indicated they sometimes or rarely receive fair market and procurement opportunities. Cases: smart energy enterprise described innovative green supply chain management model; traditional service enterprise noted energy saving retrofits and employee training require investment that operating profits and support policies cannot sustain.
Procedural	This sector has the most acute procedural justice deficit of the five sectors studied. Only 7 per cent of enterprises reported never encountering obstacles when applying for policy support, a lower share than any other sector. The explanation lies in the fragmentation of sector specific policies across multiple departments including commerce, market supervision, environmental protection and urban management, and in the administrative complexity of industry specific approvals such as health permits and service registration. MSMEs in this sector have the least institutional capacity to navigate this complexity.	Survey: 93 per cent of enterprises encountered procedural barriers when applying for support. Policy texts: action plans formally provide streamlined approval mechanisms, but their reach to micro operators is limited. Cases: community retail operators described learning about relevant policies through informal social networks rather than official channels; health permit and service registration requirements create approval chains that extend far beyond what is designed for a small retail or service operator.
Restorative	Restorative justice is absent as a design principle in this sector's policy architecture. The transition from conventional to green consumption chains imposes real adjustment costs on small operators, including renovation costs to meet energy saving standards, packaging replacement costs and the loss of established supplier relationships when green procurement requirements change. None of the instruments reviewed provides transitional support, compensation or grace periods for these costs.	Cases: traditional service enterprise interviewee described the cost burden of green transformation as not commensurate with profit levels, and existing support as insufficient to bridge the gap. Policy texts: green merchant points and simplified certification packages represent partial access improvements rather than restorative mechanisms. Survey: crisis response support described as broadly available, but climate adaptation for cold chain allocation and emergency storage inventory management is specifically absent for the retail sector.
Spatial	Spatial disparities in the wholesale and retail sector track the urbanisation gradient closely. Policy support, standard implementation quality and market supervision are all better developed in higher tier cities. MSMEs in lower tier cities, county towns and rural areas face weaker access to policy information, less active industry associations and more limited integration into green supply chains. The rural commercial system provisions in the 2024 Action Plan address this directly through the three tier county township village distribution system, but implementation remains uneven.	Survey: sector specific policies are dispersed across multiple departments, making access particularly difficult for rural and lower tier city operators. Cases: smart energy enterprise in the sample demonstrated a model for innovative green supply chain integration that is not accessible to community level micro operators. Policy texts: 2024 Action Plan county township village logistics provisions represent the most concrete spatial justice instrument reviewed, but digital transformation subsidy eligibility criteria do not include explicit provisions calibrated to individual business owners in rural areas.

Sources: Policy text analysis, enterprise survey (n=85), case study interviews. Convergent findings across all three methods are indicated in the evidence column.

The wholesale and retail sector presents the starkest gap between sector scale and policy precision of the five sectors studied. With over 10 million enterprises in the sector and the highest procedural barrier rate in the survey, the sector demonstrates that aggregate policy recognition, even when broadly positive, does not translate well into enterprise level access when delivery mechanisms are fragmented, certification systems are not calibrated to micro operator capacity, and individual business owners remain invisible as a named policy target group.

3.6 Cross Sector Synthesis

3.6.1 Comparing Policy Maturity Across Sectors

The five sectors span a wide range of policy maturity, from the advanced and multi generational architecture of manufacturing and ICT to the emerging frameworks of wholesale and retail and agriculture. Table 3.6 summarises the domain coverage and overall maturity assessment for each sector derived from the policy text analysis.

Table 3.6 **PMC Summary Assessment Across Five Sectors**

Sector	Domains Well Covered	Domain Gaps	Overall Policy Maturity
Agriculture, Forestry, Animal Husbandry and Fisheries	Business enabling environment, market access, finance, innovation and technology, climate resilience	Entrepreneurship development and enterprise development services largely absent from sample policies	Emerging: policy architecture in second phase of development; implementation depth limited for micro operators
Manufacturing	All seven domains covered across sample policies; most comprehensive sector coverage	Workforce transition support and restorative instruments limited to absent despite strong formal coverage	Advanced: most mature policy architecture of five sectors; implementation gaps at sub sector and enterprise size level
ICT	Business enabling environment, innovation and technology, market access, finance	Climate resilience instruments for sector specific scenarios absent; restorative dimension missing	Advanced: rapidly evolving framework; long term green innovation capital and interior province coverage underdeveloped
Transportation, Warehousing and Logistics	Business enabling environment, finance, innovation and technology, market access, climate resilience	Entrepreneurship development absent; restorative instruments for stranded assets and workforce absent	Developing: strong directional framework; implementation depth for small fleet and rural operators limited
Wholesale and Retail	Business enabling environment, finance access, innovation and technology	Entrepreneurship development, enterprise development services, and climate resilience specific to sector largely absent	Emerging: most recently developed policy architecture; highest procedural barriers; individual business owner visibility lowest

Source: Policy text analysis of 20 sample policies. Maturity classifications: Advanced = comprehensive multi domain coverage with clear implementation mechanisms; Developing = solid directional framework with implementation depth gaps; Emerging = policy architecture in early stages, significant domain gaps.

The pattern is clear and consistent: policy maturity correlates with sector visibility in national industrial strategy. Manufacturing and ICT, as priority sectors in Made in China 2025 and the digital economy agenda, have received sustained and multi-tier policy attention over more than a decade. Agriculture, logistics and retail, while large employers and critical to China's economic structure, have been addressed through green transformation frameworks that are more recently developed, less comprehensively differentiated, and less precisely calibrated to the scale and character of MSME operations within them.

3.6.2 Five Justice Dimensions Across Sectors

Table 3.7 presents the cross-sector comparison of justice performance across all five dimensions. The pattern reveals both sectoral variation and common deficits that cut across all five sectors.

Table 3.7 Comparative Justice Assessment Across Five Sectors

Sector	Recognitional	Distributive	Procedural	Restorative	Spatial
Agriculture, Forestry, Animal Husbandry and Fisheries	Partial: broad recognition of MSMEs, but insufficient differentiation across planting, forestry, livestock and fisheries; women and youth operators invisible.	Limited: green credit concentration among larger operators; collateral barriers for micro farmers	Limited: information access the primary barrier; 10 of 11 enterprises reported procedural obstacles	Absent: no enterprise adjustment or compensation instruments identified	Moderate: zone management provisions exist; significant coastal to interior gap in practice
Manufacturing	Strong: MSMEs explicitly named across most instruments; subgroup targeting limited	Moderate: broad instruments available; state owned enterprise access bias and collateral gaps persist	Moderate: industry associations provide partial channels; direct MSME consultation mechanisms absent	Limited: industrial clustering provides partial cost sharing; no workforce transition support	Moderate: cluster development strong in coastal zones; significant inland province disadvantage
ICT	Moderate: dual track framing and computing voucher instruments show recognitional intent; youth and micro firms underserved	Moderate: over 60 per cent found finance accessible; 41 per cent face moderate to significant barriers; long term green innovation capital absent	Limited: only 4 of 103 enterprises reported no barriers; cross regional standard inconsistency amplifies burden	Absent: no transition support for workers or enterprises affected by process restructuring	Weak: pronounced coastal concentration of infrastructure and industry clusters; central and western investment in computing and clean energy infrastructure is growing, but local MSME linkages remain weak.

Sector	Recognitional	Distributive	Procedural	Restorative	Spatial
Transportation, Warehousing and Logistics	Moderate: logistics MSMEs named in 14th FYP; women, youth and rural delivery workers excluded	Limited: capital intensity of green transition exceeds MSME capacity; scale based subsidies disadvantage small fleet operators	Weak: policy fragmentation across multiple departments and regulatory conflict between environmental and transport requirements create information and compliance barriers; 12 of 13 enterprises reported obstacles.	Absent: no stranded asset compensation; no worker transition support for automation displaced workers	Limited: urban charging infrastructure concentrated; rural logistics infrastructure gap structural and persistent
Wholesale and Retail	Partial: large enterprise recognition; individual business owners invisible; women led sub sectors unaddressed	Limited: asset light operations excluded from standard credit; green certification costs disproportionate for micro operators	Weak: 93 per cent of enterprises reported procedural barriers; most acute procedural deficit of all five sectors	Absent: no restorative instruments for transition adjustment costs identified	Moderate: rural commercial system provisions exist; implementation uneven; lower tier city gap persistent

Source: Synthesis of policy text analysis, enterprise survey and case study evidence across five sectors. Ratings are analytical assessments based on triangulated evidence, not quantitative scores.

3.6.3 Cross Cutting Findings

Five findings cut across all five sectors and together define the systemic challenges that the policy recommendations in Chapter Five must address.

The recognitional intent and procedural delivery gap. Across all five sectors, enterprise survey data show high rates of nominal satisfaction with policy recognition of MSME needs. Across all five sectors, the same enterprises report procedural barriers when attempting to access support. This is not a contradiction: it reflects the uneven pace at which policy frameworks, implementation systems and enterprise-facing delivery mechanisms evolve. In the green transition, policy frameworks have developed rapidly, while the administrative procedures needed to reach smaller firms have often taken longer to adapt to MSME realities. Policies can be inclusive in their framing and exclusionary in their delivery if information channels, application procedures, documentation requirements and approval timelines are calibrated to the administrative capacity of larger enterprises.

Restorative justice remains more weakly institutionalised for MSMEs than larger enterprises across all five sectors. Existing adjustment support mechanisms, where they exist, are generally designed around larger enterprises, larger investment projects or sector-wide industrial upgrading objectives, rather than the specific transition costs borne by MSMEs. Industrial clustering in manufacturing provides a partial cost-sharing model. Vehicle purchase subsidies in logistics provide partial forward-looking incentives. But across the five sectors reviewed, there is no systematic MSME-oriented instrument that provides transitional income support for workers displaced by green process restructuring, compensates smaller enterprises for assets stranded by emissions

standard changes, or supports businesses that must contract operations or change their business models to comply with green requirements. This is one of the most consistent and consequential cross-sector findings.

Spatial stratification is structural and self reinforcing. Every sector exhibits a coastal to interior gradient in policy delivery effectiveness. The mechanisms differ by sector, from infrastructure concentration in logistics and ICT to cluster based technology spillovers in manufacturing to agricultural extension service coverage in the primary sector, but the outcome is consistent: MSMEs in central and western provinces, rural areas and remote localities access policy support at lower rates, face higher barriers, and receive less effective services than equivalent enterprises in coastal provinces. This spatial stratification reflects the geographic concentration of the institutional and financial infrastructure through which green transition policy is delivered.

Women led and youth led enterprises are systematically underserved. Across all five sectors, the instruments that formally acknowledge women and youth entrepreneurs are generic and aspirational rather than targeted and operational. Survey data on equal entrepreneurship opportunities are broadly positive at the aggregate level but mask the specific structural barriers, including lack of collateral, information exclusion, certification complexity and absence from consultation processes, that disproportionately affect smaller, newer and less institutionally connected enterprises. The absence of disaggregated monitoring data makes it impossible to track whether any of the nominally inclusive instruments are reaching these groups in practice.

Policy fragmentation imposes a cumulative access burden. The governance of China's MSME green transition is distributed across multiple ministries, multiple levels of government and multiple policy domains without consistent coordination. For larger enterprises with dedicated compliance and government affairs staff, this fragmentation is manageable. For micro and small enterprises, the requirement to navigate multiple departmental channels, to monitor policy updates from separate administrative platforms, and to satisfy documentation requirements designed by agencies with no visibility of each other's requirements constitutes a cumulative administrative burden that effectively excludes the enterprises most in need of support.

3.6.4 Sectoral Uniqueness

Alongside these five cross cutting findings, each sector also presents a distinctive challenge that requires targeted policy attention. Agriculture faces a compound disadvantage of climate exposure, information isolation and collateral structural weakness that standard green finance instruments do not address. Manufacturing has the most developed policy architecture, but its greatest gap is internal: the disparity between the experiences of coastal cluster enterprises and interior province operators is wider in manufacturing than in any other sector because the cluster benefits are so substantial. ICT faces a structural capital gap that impedes green innovation at precisely the investment horizon that matters most for the sector's enabling role in the wider transition. Logistics faces a governance coherence problem, with competing departmental requirements creating contradictions that impose operational costs without any inter agency resolution mechanism.

3.6.5 The Triangulation Dividend

The methodological approach of this study has generated findings that no single method could have produced alone. Policy text analysis identified comprehensive formal architectures and their gaps. Survey data revealed the aggregate pattern of enterprise experience across all five sectors and enabled disaggregation by size, region and ownership type. Case studies surfaced the mechanisms, the dual certification burden in manufacturing, the coordination failure in logistics, the maturity mismatch in ICT green finance, the information exclusion in agriculture, and the asset light credit barrier in retail, that explain why policies that are formally inclusive in design are functionally exclusive in delivery.

The most important single insight from the triangulation is the distinction between policy intent and delivery architecture. China's MSME green transition policy landscape contains genuine ambition, substantial investment and real innovation. The central challenge is not the absence of instruments but limitations linked to the delivery infrastructure ability to route those instruments consistently, accessibly and equitably to MSMEs.

3.6.6 Structural patterns emerge across the five sectors

First, a scale bias in access to policy support. Instruments are designed for enterprises at or above the median size, so micro and informal operators are systematically under-served across all five sectors. Second, uneven access to green finance, with an ownership-linked access bias: interviewees reported that SOEs obtained green credit, subsidies and procurement support more readily and with fewer procedural barriers than comparable private MSMEs, a pattern reported most clearly in manufacturing. Third, weak consultation and procedural voice: in every sector, MSMEs learn about programmes through informal social networks rather than official channels and have limited input into instrument design. Fourth, spatial disparities: a coastal-to-interior gradient in delivery effectiveness shows up consistently, driven by different mechanisms in different sectors (digital infrastructure concentration in ICT; cluster spillovers in manufacturing; logistics density in transportation). Fifth, fragmented institutional delivery: enterprises must engage separately with multiple departments, navigate poorly connected procedures and interpret different eligibility criteria across overlapping support windows. Sixth, gaps in technical advisory and restorative support: across all sectors there is little sector-specific advisory capacity for the green transition and almost no compensation or transitional finance for enterprises whose business models must change. Applying the five justice lenses to these patterns, recognitional intent is broadly present in policy design across all sectors but distributive, procedural and restorative outcomes lag. Spatial justice is the dimension most clearly under-served, and restorative justice is virtually absent. These patterns are interpretations by the authors based on the triangulated evidence in this chapter and are supported by the specific examples cited in the sector findings above. Detailed sector-by-sector commentary follows below for reference; the cross-sector pattern is the message of this section.

04 Chapter Four:Women Led and Youth Led Enterprises in the Green Transition

4.1 Context and Rationale

This chapter examines the green transition experiences of women led and youth led enterprises as a cross-cutting equity dimension that runs through all five study sectors. Sectoral analysis established that both groups are systematically underserved by existing green transition policy instruments: they appear as aspirational targets in policy framing but are largely absent as named beneficiaries in the operational design of financing, certification, advisory and market access instruments. This chapter deepens that analysis by drawing together the policy text, survey and case study evidence to provide a consolidated account of the structural barriers these groups face, the instruments that partially address them, and the priority actions that would close the gap.

Women-led and youth-led enterprises are treated together because they share several similar characteristics: they tend to operate at smaller scales, with less fixed asset collateral, shorter operating track records, weaker institutional connections and lower access to the industry associations and government consultation channels through which policy support is most effectively navigated (Author's analytical interpretation, based on synthesis of survey and case study evidence; see Chapter 3). At the same time, the chapter also looks at areas where women and youth face distinctively different barriers and where the instruments needed to address them differ.
The analytical framing draws directly from the recognitional justice lens introduced in Chapter One. Recognitional justice asks not just whether a group is mentioned in policy but whether its specific characteristics, constraints and opportunities are sufficiently understood to generate instruments that actually reach it. Applied to women led and youth led enterprises, recognitional justice requires moving from aspirational acknowledgement to operational targeting.

A note on evidence. The survey instrument did not collect systematic data disaggregated by gender of business owner or age of owner across all sectors, which limits the precision of the survey evidence for this chapter. The analysis compensates by drawing heavily on the case study evidence, which deliberately oversampled women-led and youth-led enterprises, and on the policy text analysis, which codes each instrument for explicit targeting of these groups. Where survey data are available at the aggregate level on relevant dimensions, such as the equal opportunities items in manufacturing and ICT, they are incorporated and any divergence from case and policy text findings is flagged explicitly.

4.2 What Policies Say: Targeting Analysis Across Sectors

4.2.1 The Recognitional Architecture: What Exists

At the highest political level, China's recognition of women's empowerment as a development priority has been consistently reinforced. In October 2025, marking the thirtieth anniversary of the Beijing Declaration and Platform for Action, President Xi Jinping presided over the Beijing Global Leaders' Meeting on Women, where China announced five practical measures to support global women's advancement and pledged renewed action on digital and intelligent empowerment for women and girls, global collaboration on gender equality, and women's empowerment in the Global South.

China's policy instruments and programmes system contains a varied, if fragmented, architecture of instruments that acknowledge women-led and youth-led enterprises. The main pillars of this architecture are as follows.

The All China Women's Federation network.

The Federation maintains a national network extending to provincial, municipal and county levels that delivers entrepreneurship training, mentorship and networking to women led enterprises. Local women entrepreneur innovation bases have been established in some provinces, providing training and support specifically for women in e commerce, agribusiness and small manufacturing. Women's Rural Innovation Stations have been designated in rural areas to encourage rural women and returnee women entrepreneurs to develop smart agriculture. Women's federation endorsed enterprises receive counter guarantee exemptions under some provincial microcredit programmes, making it easier to access small loans without fixed asset collateral.

Youth entrepreneurship programmes.

University based entrepreneurship incubators and high technology zone entrepreneurship platforms provide entry level support to young founders, including funding, venue support and mentorship through structured entrepreneurship mentor pools. The Colorful Clouds Returning Home (a national programme led by the All China Women's Federation since 2018 that supports rural and returnee migrant women to start small businesses through training, microcredit referrals, market linkage support and entrepreneurship mentoring) plan and related provincial equivalents provide subsidies of up to two million yuan for returnee graduates starting businesses in less developed areas. Young entrepreneurs with insufficient start up capital can access small guaranteed loans of up to 100,000 yuan with interest subsidies of 100 per cent in the first year, declining to 50 per cent by the third year. Youth talent apartments and affordable rental housing provisions address the housing barrier for young returnee entrepreneurs in underserved areas.

Women in science and technology.

The proportion of female experts in the review of national science and technology projects, awards and talent programmes is required to gradually increase over the 2021–2030 period, in line with the State Council's Programme for the Development of Chinese Women (2021–2030), with progress milestones to be reported within

the 14th and forthcoming 15th FYP cycles. Qualified female experts are encouraged to join national technology review databases. Research institutions are encouraged to establish women's research return funds for female researchers returning to work after childbirth, and to create favourable research environments for pregnant and breastfeeding scientific and technical personnel.

General MSME equity provisions.

The SME Promotion Law and related instruments establish equal rights, equal opportunities and equal rules for all types of enterprises regardless of ownership, and require statistical monitoring systems to track MSME development. Multiple local governments have explored platforms for MSMEs to access consolidated policy information, which incidentally benefits women led and youth led enterprises that lack dedicated institutional information channels.

4.2.2 The Green Transition Gap: What Is Missing

The critical finding from the policy text analysis is that none of the instruments listed above connect their women or youth targeting to green transformation support. The microcredit instruments do not include green investment eligibility criteria. The Women's Rural Innovation Stations do not include climate adaptation guidance or green agriculture practice support. The youth entrepreneurship incubators do not include green business opportunity modules or connections to transition finance products. The science and technology review diversity provisions do not extend to green technology policy design processes.

This disconnection means that a woman operator who qualifies for microcredit support cannot use that credit for green equipment upgrade investment because the product terms are not designed for it. A young entrepreneur entering a university incubator has no structured pathway to green sector opportunities even as China's green economy is expanding rapidly. A rural woman farmer supported by a Women's Rural Innovation Station receives no information about climate adaptation instruments relevant to her enterprise.

Table 4.1 maps the policy targeting of women and youth led enterprises across the five study sectors, showing both the existence of instruments and the absence of the green transition connection.

Capacity-building workshops on green transition for women and youth led enterprises, organized by the UNDP project.

Photo credit: UNDP China

Table 4.1 **Policy Targeting of Women and Youth Led Enterprises Across Five Sectors**

Sector	Women Named in Policy	Youth Named in Policy	Green Transition Link?	Assessment
Survey response rate	Partial: women operators referenced in national programme context; no dedicated green agriculture instrument	Partial: young operators referenced in rural revitalisation context; no dedicated green agriculture instrument	Absent: no instrument reviewed explicitly links women or youth targeting to green transformation support	Widest gap between sector employment share of women (43.3 per cent of national employed workforce) and targeted policy coverage. Women's Rural Innovation Stations reference is the most specific instrument identified.
Manufacturing	Minimal: women led startups referenced in light industry and textiles context; no instrument specifically targets them	Moderate: university student entrepreneurship and Specialised and Innovative programme provide youth pathways; not green specific	Absent: Specialised and Innovative programme does not reference gender or age of owner; green manufacturing criteria do not include equity targeting	High visibility sector for both groups in survey data but instruments treat all MSMEs as equivalent; women led firms in energy intensive sub sectors most excluded from mainstream instruments.
ICT	Partial: female expert representation in science and technology review processes addressed; no dedicated green ICT women's instrument	Moderate: youth entrepreneurship incubators at universities and high technology zones provide entry points; green ICT focus absent	Partial: women's research return funds address gender equity in research; not connected to green transformation support	Strongest divergence between positive survey satisfaction data and structural barriers identified in cases: positive aggregate data mask exclusion of women and youth from long term green innovation capital.
Transportation, Warehousing and Logistics	Absent: no instrument reviewed names women operators in logistics; women and youth delivery workers not addressed	Absent: no instrument reviewed names youth entrepreneurs in logistics; youth delivery workers not addressed	Absent: no instrument reviewed links gender or age equity to green logistics support	Most complete targeting gap of all five sectors: women and youth are significant participants in urban delivery and rural logistics as workers but are absent as named beneficiaries in green transition instruments.

Sector	Women Named in Policy	Youth Named in Policy	Green Transition Link?	Assessment
Wholesale and Retail	Minimal: women led enterprises in beauty, retail and community services referenced in passing; no dedicated instrument	Minimal: youth entrepreneurship in retail referenced in general MSME promotion context; not green specific	Absent: no instrument reviewed links women or youth targeting to green retail or service sector support	Sector where women led enterprises are most concentrated (community retail, beauty, catering) but also invisible in policy design. Where the dominant enterprise form is the individually owned or unregistered household (registered as an 'individual industrial and commercial household'), the female and youth ownership profile is largely invisible to instruments that target legally incorporated SMEs, compounding the targeting gap.

The pattern across sectors is consistent: recognition in general MSME or general entrepreneurship instruments, no operational connection to green transition support. The only partial exception is the science and technology review diversity provisions in the ICT adjacent instruments, which address procedural inclusion of women in innovation governance, though without a green transformation connection. Logistics is the sector with the most complete targeting gap: women and youth are significant participants as workers and operators in urban delivery and rural logistics but are absent as named beneficiaries in any green logistics instrument reviewed.

4.3 What the Survey Reveals: Disaggregated Evidence

The survey instrument collected data on equal opportunities for women and youth entrepreneurship as a standard item across all sectors with sufficient sample sizes, and these items provide the closest available proxy for the equity experience of these groups. Table 4.2 summarises the key survey dimensions relevant to this chapter, alongside the available disaggregated findings and explicit notes on divergence from case and policy text evidence.

Table 4.2 Survey Evidence Relevant to Women-led and Youth-led Enterprises

Survey Dimension	Key Findings	Divergence Note
Policy recognition of enterprise needs	Broadly positive across all sectors at the aggregate level. However, survey instrument did not collect systematic data on whether respondents are women led enterprises, preventing sector specific disaggregation. Case and policy text evidence must supplement this gap.	Divergence: positive aggregate scores in manufacturing and ICT mask lower recognition for women led firms in sub sectors not covered by Specialised and Innovative criteria.
Equal opportunities for women and youth entrepreneurship	Manufacturing: 54 enterprises strongly agreed and 53 agreed that policies provide effective safeguards for equal opportunities. ICT: broadly positive. Agriculture: no comparable item in small sample. Wholesale and retail: broadly positive in aggregate.	Divergence: positive survey responses on formal equality coexist with case evidence of structural exclusion from specific financing, certification and consultation mechanisms.
Access to green finance	Agriculture: only 3 of 11 enterprises found financing relatively easy; women and youth operators in cooperatives face compounded collateral barriers. Manufacturing: 25 enterprises faced difficult or very difficult access; evidence from cases places women led light industry firms disproportionately in this group.	Convergence: all three methods confirm that green finance access barriers are greater for enterprises with limited fixed assets, a characteristic that disproportionately affects women led and early stage youth enterprises.
Access to training, R and D and innovation programmes	Manufacturing: 95 enterprises rated access as very or relatively convenient. ICT: 77 enterprises rated access as very or relatively convenient. Agriculture: technical talent shortages identified as barrier across most sampled enterprises.	Partial convergence: aggregate training access is broadly positive, but case evidence indicates that training content is rarely adapted to the specific green transition challenges facing women or youth entrepreneurs.
Access to green finance	Agriculture: only 3 of 11 enterprises found financing relatively easy; women and youth operators in cooperatives face compounded collateral barriers. Manufacturing: 25 enterprises faced difficult or very difficult access; evidence from cases places women led light industry firms disproportionately in this group.	Convergence: all three methods confirm that green finance access barriers are greater for enterprises with limited fixed assets, a characteristic that disproportionately affects women led and early stage youth enterprises.
Market access and procurement opportunities	All sectors: over 50 per cent report sometimes or rarely receiving fair market access relative to large enterprises. Manufacturing: 23 enterprises rarely receive fair access. Wholesale and retail: over 75 per cent report sometimes or rarely fair access.	Convergence: market access barriers are consistently worse for smaller enterprises; women led enterprises in traditionally female sub sectors face additional barriers from the green certification costs and information asymmetries identified in cases.

Survey Dimension	Key Findings	Divergence Note
Climate resilience and shock response support	Broadly positive across sectors for crisis response. Agriculture: most enterprises reported receiving support following natural disasters. Manufacturing and ICT: crisis response policies well received. Logistics: similarly positive.	Divergence: positive crisis response data do not address the forward looking adaptation gap for specific enterprise groups. Women farmers in climate vulnerable rural areas face compound exposure that crisis response instruments do not address.

Source: Enterprise survey (n=338 valid responses). Note: the survey instrument did not include a systematic gender or age of owner variable across all sectors. Items on equal opportunities for women and youth entrepreneurship were included in the manufacturing, ICT and wholesale and retail modules.

The most important finding from the survey evidence is the divergence between aggregate satisfaction with equal opportunity provisions and the structural barriers identified through case evidence. In manufacturing, 107 of 126 enterprises agreed or strongly agreed that policies provide effective safeguards for equal opportunities for women and youth entrepreneurship. This high satisfaction rate coexists with the case finding that women led enterprises in light manufacturing, home appliances and textiles face systematic exclusion from the mainstream green certification and equipment upgrade subsidy programmes that constitute the core of the sector's green transition support architecture.

Key divergence: manufacturing sector

Survey data show high aggregate satisfaction with equal opportunity provisions (85 per cent agree or strongly agree). Case evidence shows that women led enterprises in light manufacturing, home appliances and textiles face the 'wanting to transform but lacking resources' barrier at higher rates than equivalent enterprises led by men, because subsidy programmes and green loan criteria are calibrated to larger scale and more capital intensive operations. The divergence confirms that aggregate equity satisfaction data cannot substitute for disaggregated monitoring of which enterprises actually access support.

A comparable divergence appears in the ICT sector. Survey satisfaction with innovation support and equal opportunity provisions is the highest of any sector, yet the case studies confirm that young ICT entrepreneurs face a structural capital gap for long term green technology investment that the aggregate satisfaction data does not capture. The instruments that generate satisfaction in the survey, including tax incentives, computing vouchers and training programmes, address operating cost and capability barriers but not the fundamental equity gap in long term innovation capital.

4.4 What the Cases Reveal: Structural Mechanisms

4.4.1 Data Coding and Analysis

This study employs the inductive thematic analysis approach proposed by Gioia and colleagues to systematically code the in-depth interview data and policy texts of 20 MSMEs across the five sectors. We first generated first-order concepts, then distilled second-order themes guided by the seven policy domains and five justice lenses, and finally consolidated the second-order themes into aggregate dimensions.

4.4.2 Research Sample and Data Sources

This study selected 20 representative MSMEs across five sectors — manufacturing, ICT, agriculture/forestry/animal husbandry/fisheries, wholesale and retail, and transportation/warehousing/postal services — for in-depth interviews. The sample covers eastern, central and western provinces including Shandong, Jiangxi, Shaanxi and Yunnan, providing broad geographic representation. Interview enterprises range substantially in scale, from sectoral "Little Giants" with annual revenues exceeding 100 million yuan to micro technology firms cultivating niche segments. The sample exhibits diversity across geography, operational scale, development stage and technological foundation, authentically reflecting MSMEs' practical green transition experience, existing problems and policy demands, with sufficient representativeness.

The manufacturing enterprises sampled span plastics, resource recycling, power equipment, oil machinery, environmental energy, new materials, biomedicine, optoelectronic sensing and advanced manufacturing — encompassing the sector's diverse green transition pathways. East-China plastics firms have updated production equipment and optimised processes to build full-life-cycle circular economy systems; resource-recycling firms focus on "urban mining" with integrated recovery–processing–sales chains; specialty cable firms have achieved import substitution in high-end products through continuous technology iteration; oil-equipment manufacturers have accumulated multiple patents meeting international certification standards; environmental energy firms generate biomass power from agricultural and forestry waste, achieving efficient circular utilisation of agricultural and forestry resources; new-materials firms have developed proprietary composite materials production technology at internationally advanced levels; biomedical firms have achieved breakthroughs in innovative drug research; optoelectronic-sensing firms have positioned themselves in flexible sensing technology, securing competitive standing in their niche; and advanced-manufacturing firms contribute innovation to key technology challenges through frontier research. Collectively, the manufacturing sample illustrates the sector's shift from end-of-pipe treatment to whole-process management, and from single-point technology optimisation to whole-industry-chain upgrade.

ICT enterprises sampled cover digital solutions, high-end equipment, electronic components, health technology and energy-efficiency technology. Some digital technology firms hold international certifications and provide turnkey digital and green transition solutions across industries; high-end equipment firms develop specialised technology for universities and research institutes; electronic component firms develop new components compatible with next-generation information infrastructure; health-tech firms combine intelligent technology with traditional industries to launch innovative health products; and energy-efficiency firms enhance industrial resource efficiency through optimised technology solutions. The ICT sample illustrates how the sector achieves green upgrading through technology innovation while continually empowering low-carbon transition in the real economy.

Agriculture, forestry, animal husbandry and fisheries enterprises sampled commonly feature smart agriculture as their core competency, integrating planting, processing and sales across the value chain, deploying agricultural waste resource utilisation technology, and exploring "agriculture + technology + cultural tourism" integrated development models—demonstrating grassroots agricultural operators' innovative practice in industrial digitalisation and green transition.

Among wholesale and retail enterprises sampled, pharmaceutical firms have built complete industry chains from source cultivation to end-user services; smart-energy firms deploy specialised energy management solutions — reflecting the sector's evolution from purely circulation functions to green and refined supply chain management. Transportation, warehousing and logistics enterprises sampled focus on intelligent cold-chain logistics infrastructure construction and operations, building standardised and modernised warehousing-distribution systems serving regional agricultural product circulation — a representative grassroots practice of green smart logistics development. This study combines primary and secondary data sources to ensure overall reliability and validity. The primary data consist of semi-structured in-depth interview outputs from 20 MSMEs, with interview content covering operational status, green transition implementation, policy experience, transition difficulties and policy demands. The interview sample covers five sectors and multiple regions, includes both women and youth entrepreneurs, and offers broad coverage and strong diversity.

Secondary data primarily comprise policy documents and sectoral statistics. Policy documents aggregate central- and local-level MSME green transition policies, including specialised support documents on manufacturing low-carbon retrofits and ICT digital-green integrated development. Sectoral statistics are sourced from the National Bureau of Statistics, MIIT public data and UN industry research reports, supporting the analysis of macro industry context and overall green transition trends.

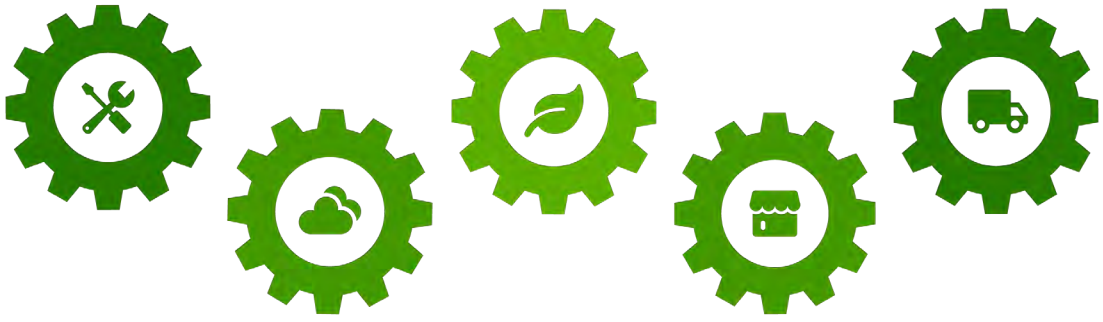


Table 4.3 Profiles of Interview Enterprises

No.	Year	Location	Location	Business Scope	Years Operating	Employees
1	2004	Township	Manufacturing	Plastic products manufacturing and sales	22	60
2	2011	Township	Manufacturing	Waste resource recycling and processing; environmental testing	14	210
3	2018	Urban	Agriculture/ Forestry/ Fisheries	Smart agriculture, Chinese herbal cultivation, agritourism	7	100
4	2001	Urban	Wholesale and Retail	Pharmaceutical chain; TCM product R&D and production	24	2,000
5	2011	Urban	ICT	3D printing technology development and services	14	7
6	2018	Township	Manufacturing	Liquor R&D; agricultural product deep processing	7	30
7	1993	Urban	ICT	Aero-engine test equipment manufacturing	32	110
8	2011	Township	Manufacturing	Power and specialty cable R&D and production	15	300
9	2021	Township	Manufacturing	mRNA pharmaceutical R&D and production	4	39
10	2020	Urban	ICT	Electronic components and electromechanical assembly R&D and production	5	70
11	2004	Urban	Manufacturing	Oil well control equipment and downhole tools R&D and manufacturing	21	170
12	2011	Township	Manufacturing	Biomass power generation technology R&D and operations	14	107
13	2021	Township	Transportation	Agricultural product processing; warehousing logistics and cold-chain	4	200
14	2015	Urban	Manufacturing	Carbon-fibre composite component R&D and manufacturing	10	1,000

No.	Year	Location	Location	Business Scope	Years Operating	Employees
15	2020	Urban	Manufacturing	Latex products and smart bedding R&D and sales	5	100
16	2014	Urban	ICT	Smart collection management system development and services	11	120
17	2010	Urban	Manufacturing	Photoelectric sensor R&D and production	15	18
18	1998	Urban	ICT	Energy conservation and low-carbon technology R&D and applications	27	15
19	2023	Urban	Manufacturing	Smart laser welding system R&D	2	50
20	2009	Urban	Wholesale and Retail	Smart green energy solutions	16	150

4.4.3 Three Mechanisms of Exclusion

The case study evidence surfaces three structural mechanisms through which women-led and youth-led enterprises are excluded from green transition support, mechanisms that are largely invisible in both policy text analysis and aggregate survey data.

The collateral structure barrier.

Green finance instruments across all five sectors are calibrated to enterprises with fixed asset collateral. Women-led enterprises in agriculture, service industries and light manufacturing disproportionately operate with asset light structures, land use rights rather than property ownership, and inventory cycles rather than capital equipment holdings. Youth led enterprises are disproportionately in their early operating years and have not accumulated the asset base that establishes creditworthiness under standard bank assessment frameworks. The women specific microcredit instruments that attempt to address this through counter guarantee exemptions and small guaranteed loans operate at loan values well below what green transformation investment requires: a guaranteed loan of 100,000 yuan does not finance a green equipment upgrade that costs 300,000 yuan.

The information exclusion mechanism.

Women operators in agriculture and community retail, and youth entrepreneurs without established institutional connections, consistently report learning about policy programmes through informal social networks rather than through official channels. By the time information reaches these enterprises, application windows have often closed or programme funds have been allocated to larger and better connected applicants. This is not a problem of policy communication in general: official channels and digital government platforms exist. It is a problem of last mile reach: the enterprises most in need of information are the ones whose institutional position places them furthest

from the channels through which it flows.

The incumbency advantage mechanism.

Green transition policy instruments, including sector specific roadmaps, technology extension services and supply chain integration programmes, are designed for enterprises that are already in the market. They provide upgrade paths, not entry paths. Women led enterprises that want to enter green sectors, and youth led enterprises starting up in green sub sectors, face a double barrier: they must clear the standard entry requirements for the sector and the additional requirements of green certification and compliance that the instruments assume enterprises are already positioned to meet. The result is that green transition instruments accelerate the green upgrading of established enterprises while inadvertently raising the barriers to entry for new and smaller operators.

4.4.4 What Works: Evidence of Effective Practice

Alongside these mechanisms of exclusion, the case studies and document review identify several instruments and approaches that have demonstrated effectiveness in reaching women led and youth led enterprises with green transition relevant support.

Women's entrepreneur innovation bases in some provinces have successfully integrated e-commerce, agribusiness and light manufacturing support with training that is practically calibrated to the scale and operational context of the enterprises they serve. The key design features that make these effective are: the use of the Women's Federation network as a trusted delivery channel; the adaptation of content to the specific sub sectors where women concentrate; and the integration of peer learning and mentorship alongside formal training. These bases have not yet integrated green transition content, but the delivery model is proven and scalable.

University based youth entrepreneurship incubators in some coastal and urban locations have demonstrated capacity to connect young entrepreneurs to emerging market opportunities, including digital green solutions. The High Technology Zone entrepreneurship support in cities like Shenzhen and Beijing provides young founders with access to investors, technical networks and market development support that smaller cities and rural areas cannot replicate. The design principle that works here is proximity to innovation ecosystems combined with structured support for navigating entry requirements.

> An enterprise development service provider working with women owned enterprises in agricultural processing described the approach: we do not start with the policy. We start with the enterprise as it is, in the sector it is in, with the assets and networks it has. Then we work backward to find the policy instruments that can support it. Most women entrepreneurs we work with have never been told that green certification could open markets for them. When we make that connection, they are interested. The gap is the connection, not the motivation.

The Colorful Clouds Returning Home plan for returnee graduates and the youth talent housing provisions represent the most spatially targeted youth equity instruments reviewed. Their design addresses a real structural barrier, namely the housing and relocation costs that prevent young people from starting businesses in less developed areas, and their track record includes measurable outcomes in rural revitalisation. Their limitation is the absence of any green transition connection: the plan supports general entrepreneurship in underserved areas but does not link this to green sector opportunities that are expanding as a result of China's climate transition.

4.5 Integrated EquityAssessment

Table 4.4 presents the integrated equity assessment for women-led and youth-led enterprises across the five justice dimensions, drawing on all three evidence sources and making explicit where the two groups face similar or different dynamics.

Table 4.4 **Integrated Equity Assessment: Women Led and Youth Led Enterprises**

Justice Lens	Women Led Enterprises	Youth Led Enterprises	Convergence or Divergence
Recognitional	Women led enterprises are nominally acknowledged in several instruments across all five sectors, primarily through references to the All China Women's Federation, women entrepreneur innovation bases and microcredit programmes for rural women. However, the instruments that acknowledge women do not connect this recognition to green transformation support. Women operating in sub sectors with high concentrations of female entrepreneurs, specifically community retail, beauty, agri processing and light manufacturing, are doubly invisible: invisible as women and invisible as operators in sub sectors not covered by mainstream green transition instruments.	Youth led enterprises receive somewhat stronger recognitional treatment than women led enterprises in the instruments reviewed, primarily through university student entrepreneurship programmes, the Specialised and Innovative programme entry criteria and youth talent housing provisions for returnee entrepreneurs. However, the green transition connection is also absent: youth entrepreneurship instruments address entry barriers generally without linking them to low carbon business opportunities, green certification pathways or transition finance products calibrated to early stage enterprises.	Partial divergence: youth receive slightly stronger nominal recognition than women in policy texts, but both groups face the same structural disconnection between recognitional intent and operational green transition support.

Justice Lens	Women Led Enterprises	Youth Led Enterprises	Convergence or Divergence
Distributive	Women led enterprises face compounded distributional disadvantage. First, they tend to concentrate in sub sectors, including service industries, agri processing and light manufacturing, that are less well covered by green transition instruments. Second, within those sub sectors, they tend to operate at smaller scales and with fewer fixed assets, making standard green finance instruments inaccessible. Third, the women specific financing instruments that exist, including microcredit for rural women and the counter guarantee exemption for Women's Federation award recipients, address general enterprise establishment rather than green transformation investment. The result is that women led enterprises bear transition costs without proportional access to transition support.	Youth led enterprises face a different distributional profile. They tend to concentrate in digital, services and emerging sectors where green transition opportunities are real, but they are disadvantaged by limited credit history, absence of collateral, and short operating track records that make them ineligible for most green finance instruments calibrated to established firms. Youth specific financing instruments, including the small amount guaranteed loan scheme with interest subsidies and the university student entrepreneur subsidy, provide entry level capital but at amounts well below what green transformation investment requires.	Partial divergence: women face distributional exclusion through sub sector concentration and asset poverty; youth face it through credit history and operating track record barriers. Different mechanisms, same outcome.
Procedural	Women led enterprises participate in policy consultation processes at lower rates than equivalent enterprises led by men. The structural explanation is institutional: the channels through which MSME voices reach policymakers, including industry associations, government enterprise forums and technical standard working groups, are dominated by larger and more established enterprises where women are underrepresented in leadership roles. The requirement for women workers committees in enterprises to review policies affecting female employees is the most concrete procedural justice provision identified, but it applies to employment conditions rather than to green transition policy design.	Youth led enterprises face procedural exclusion through different mechanisms: they tend to be newer enterprises without established industry association membership, without track records that give them credibility in standard setting processes, and without the institutional networks that provide informal early warning of policy changes. University based entrepreneurship incubators provide a partial procedural entry point, but their connection to green transition policy consultation is absent.	Convergence: both women and youth face procedural exclusion, through different institutional mechanisms. Neither group has a systematic channel for contributing to green transition policy design.

Justice Lens	Women Led Enterprises	Youth Led Enterprises	Convergence or Divergence
Restorative	No restorative instrument reviewed specifically addresses the adjustment costs borne by women led enterprises in the green transition. Women led agri processing enterprises that must change production methods to meet ecological standards, women led service enterprises that must invest in energy saving renovation, and women led light manufacturers that must upgrade equipment to meet emissions benchmarks face these costs without targeted support. The general MSME transition adjustment instruments that might provide partial coverage are themselves largely absent across all five sectors, as Chapter Three established.	Youth led enterprises entering green sectors face a different restorative challenge: they are not recovering from transition costs but are attempting to enter markets where established older enterprises have incumbency advantages. The restorative justice gap for youth is less about adjustment support and more about the absence of market entry instruments that compensate for the disadvantages of operating without track record, network or collateral.	Divergence: women need restorative support for transition adjustment costs; youth need market entry compensation for incumbency disadvantages. The policy gap is the same in both cases, but the instruments needed differ.
Spatial	Spatial disadvantage compounds gender disadvantage most acutely in agriculture. Rural women farmers in central and western provinces face the intersection of geographic infrastructure deficits and gender specific barriers to policy information, training and finance. The Women's Rural Innovation Station provision and the guidance for rural women to develop smart agriculture represent the most spatially targeted gender equity instruments identified, but their geographic reach and scale of implementation are not reported in available documents.	Youth spatial disadvantage is most pronounced in the gap between the entrepreneurship support available to young people in urban and coastal centres, including university incubators, high technology zones and venture capital ecosystems, and what is available to young returnee entrepreneurs in rural and interior provinces. The Colorful Clouds Returning Home plan and the youth talent housing provision represent attempts to address this gap, but their green transition connection is absent.	Convergence: both groups face compound spatial disadvantage, worst in rural and interior locations. The combination of spatial disadvantage and gender or age disadvantage creates the most excluded subgroups in China's MSME green transition.

Source: Policy text analysis, enterprise survey, case study interviews. Divergence notes indicate where women and youth face structurally different barriers or where the instruments needed to address them differ.

The integrated assessment reveals a fundamental structural pattern: both groups face all five justice deficits, but through different mechanisms that require different policy responses. Recognition exists for both groups in general entrepreneurship instruments but not in green transition instruments. Distribution fails both groups, but women through asset poverty and sub sector concentration, and youth through credit history and track record barriers. Procedural exclusion affects both, but through different institutional channels: women are underrepresented in industry associations and standard setting bodies; youth are absent from these bodies because they have not been in the market long enough to earn membership. Restorative justice is absent for both, but women need adjustment support and youth need market entry compensation. Spatial disadvantage compounds both groups' exclusion, most severely in rural and interior provinces.

4.6 Priority Actions

The analysis in this chapter points to six priority actions that can close the gap between recognitional intent and operational delivery for women-led and youth-led enterprises in China's MSME green transition. These actions are grounded in the three method evidence base and are designed to build on existing institutional channels rather than requiring entirely new delivery infrastructure.

Table 4.5 Priority Actions for Women-led and Youth-led Enterprise Equity in the Green Transition

Priority Action	Rationale	Responsible Institution
Establish gender and age disaggregated monitoring for MSME green transition policy	Without data that distinguishes enterprise ownership by gender and age of owner, it is impossible to determine whether any existing instrument is reaching women led or youth led enterprises in practice. This is a foundational requirement for all other improvements.	National Bureau of Statistics, MIIT, Ministry of Civil Affairs
Create dedicated green transition windows within women's entrepreneurship financing instruments	The microcredit and counter guarantee programmes administered through the All China Women's Federation and local women's federations provide an existing delivery architecture that can be extended to include green transformation investment products. New products do not require new institutions: they require new eligibility criteria and product design within existing channels.	All China Women's Federation, People's Bank of China, National Financial Regulatory Administration
Integrate green transition content into youth entrepreneurship incubators and programmes	University based incubators and high technology zone programmes already reach young entrepreneurs. Adding green business opportunity modules, connections to green investors and transition finance literacy components to these programmes is a low cost, high reach intervention.	Ministry of Education, Ministry of Science and Technology, MIIT, Communist Youth League
Include women and youth in all MSME green transition consultation mechanisms	The participatory governance pillar of Chapter Five recommendations applies with particular force to women and youth. Consultation mechanisms that do not explicitly require representation from women led and youth led enterprises will default to the institutional status quo, in which these groups are underrepresented.	All ministries with MSME green transition remit; All China Women's Federation; Communist Youth League as liaison organisations
Develop sector specific green transition toolkits calibrated to enterprise profiles of women led and youth led firms	The sub sectors in which women led enterprises concentrate, including community retail, agri processing and light manufacturing, require green transition guidance and support instruments calibrated to asset light operations, limited collateral and informal operating structures. Generic MSME guidance does not reach these enterprises effectively.	MIIT, Ministry of Commerce, Ministry of Agriculture and Rural Affairs, All China Women's Federation

Priority Action	Rationale	Responsible Institution
Connect rural women's programmes to green transition and climate resilience support	The Women's Rural Innovation Station provision and rural women's e commerce platforms represent existing delivery channels that can be extended to include climate adaptation information, green agriculture practice guidance and climate risk insurance products. The spatial targeting of these programmes makes them the most efficient vehicle for reaching the most excluded subgroup: rural women in climate vulnerable areas.	Ministry of Agriculture and Rural Affairs, All China Women's Federation, National Financial Regulatory Administration

Source: Authors' synthesis from policy text analysis, enterprise survey and case study evidence across five sectors.

4.6.1 The Data Foundation

The most foundational action is the first: establishing gender and age disaggregated monitoring. Without it, none of the other actions can be evaluated. China's National Bureau of Statistics collects enterprise census data that could in principle include owner characteristics, and the national statistical monitoring system for MSMEs mandated under the SME Promotion Law provides the institutional vehicle for this expansion. The constraint is not technical but administrative: requiring that green transition policy delivery systems report outcomes disaggregated by gender and age of owner.

The UNDP framework explicitly recommends this as a foundation for just transition policy (UNDP RBAP, 2023). Several economies in the Asia Pacific region, including Viet Nam and Indonesia, have begun integrating gender disaggregated MSME data into national monitoring frameworks, providing proximate learning models for China's context.

4.6.2 Connecting Existing Channels to Green Transition

Actions two, three and six share a common design principle: they do not propose new institutions but extend the mandate of existing delivery channels to include green transition content. The Women's Federation network, the youth entrepreneurship incubator system and the rural women's programme infrastructure all represent real, tested delivery capacity. The gap is not delivery infrastructure but programme content and product design.

The case evidence from the enterprise development service provider quoted earlier confirms the practical tractability of this approach: when the connection between green certification and market opportunity is explained to women entrepreneurs in terms relevant to their actual operating context, motivation is not a barrier. The barrier is the absence of the connection itself in the instruments and channels they access.

4.6.3 The Participation Imperative

Action four, ensuring that women and youth are included in all MSME green transition consultation mechanisms, is a prerequisite for the effectiveness of all other actions. Policy instruments designed without input from the enterprises they are intended to serve will continue to miss the mark regardless of how well intentioned they are. The procedural justice deficit documented in Chapters Three and Four is not merely an equity concern: it is a policy effectiveness concern. Instruments that are not reaching women led and youth led enterprises are not delivering on China's stated objectives of inclusive green development.

The participatory governance reforms recommended in Chapter Five provide the institutional mechanism. The specific contribution of this chapter is the requirement that these mechanisms include explicit representation provisions for women led and youth led enterprises, not as a diversity target but as an information quality imperative: these groups carry operational knowledge about the sub sectors they dominate that generic MSME consultation cannot capture.

05 Chapter Five:Conclusions and Strategic Policy Priorities

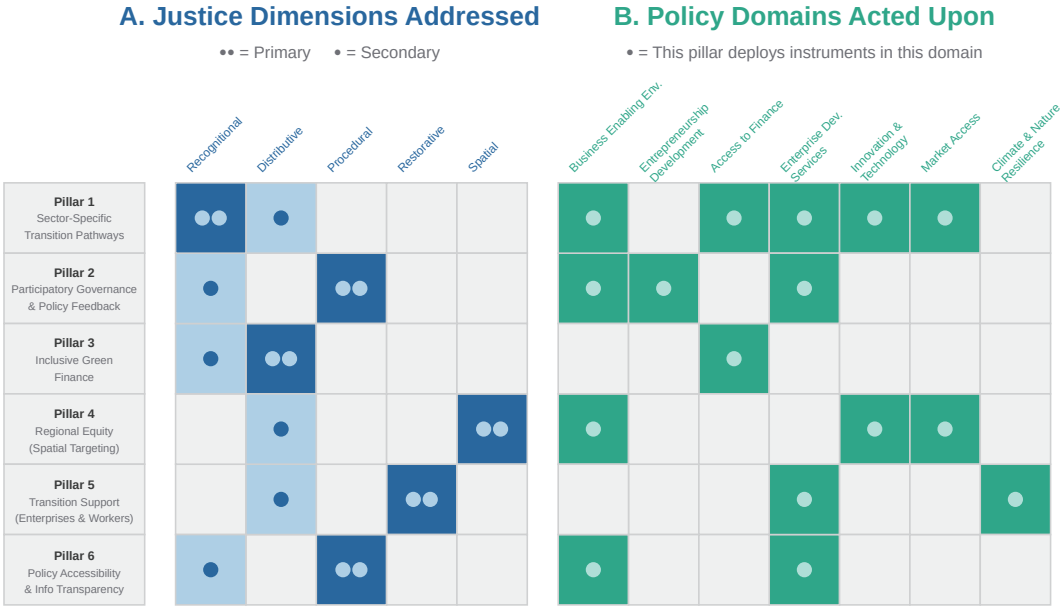
The green and just transition of MSMEs is not an isolated policy agenda. It is a microeconomic foundation for China's advancement of ecological civilisation, the inclusive dimension of high-quality economic development, and the market-actor expression of the common prosperity strategy during the transition period. Integrating MSMEs into the green and just transition policy framework is both a requirement of the 'dual-carbon' goals and a social commitment to ensure that tens of millions of MSME owners, employees and their families are not left behind during the transition.

China has built one of the most extensive MSME green transition policy architectures in the world. The system spans multiple administrative levels, deploys supply side, demand side and institutional instruments across seven policy domains, and has produced real progress in industrial upgrading, clean technology adoption and green finance expansion. The challenge is to address the gap between the formal architecture of policy and the delivery infrastructure that routes it to the enterprises most in need of support. MSMEs that lack institutional connections, fixed asset collateral, information channels or administrative capacity find the gap between what policies promise and what they can access to be wide and persistent. The green transition is accelerating the commercial pressure on all MSMEs to transform. The question this study addresses is whether policy is accelerating the capacity of smaller, more marginalised and more geographically peripheral enterprises to do so equitably.

This chapter translates the diagnostic findings of the previous chapters into six strategic policy pillars. The pillars are structured so that each action is stated clearly first, then grounded in the specific sector, survey and case study evidence that motivates it, and then developed with implementation guidance including sequencing and trade-offs. A summary table follows each pillar narrative for reference. It then profiles a China best practice case, the China SME Service Portal (www.chinasme.cn), showing how an already operational national delivery platform can carry many of the six pillar recommendations at marginal incremental cost. The chapter concludes with a brief reflection on China's broader contribution to global just transition learning.

5.1 Overview of the Six Strategic Policy Pillars

Figure 12: Mapping of the Six Strategic Policy Pillars to the Seven Domains and the Five Justice Dimensions



Source: Authors construction. based on the analytical mapping in Chapter S (Strategic Policy Pllars to the 7xS diagnostic matrix introduced in Chapter 1

Table 5.1 Overview of Strategic Policy Pillars, Objectives and Actions

Pillar	Strategic Objective	Key Actions	Evidential Grounding
Pillar 1: Sector Specific Transition Pathways	Improve policy precision across the five study sectors	Sector MSME transition roadmaps (1.1, new initiative); Dedicated green financing windows (1.2, existing instrument refinement); Green transition advisory services on SME platforms (1.3, existing instrument refinement) [cross-reference: see Pillar 3 for detail]	Chapter Three: all sector findings; Chapter Four: sub sector targeting gaps
Pillar 2: Participatory Governance and Policy Feedback	Strengthen MSME voice in policy design and implementation	National MSME green transition consultation mechanism (2.1, new initiative); digital policy feedback systems on e-government platforms (2.2, existing instrument refinement); capacity building for local officials implementing MSME policies (2.3, existing instrument refinement)	Chapter Three: procedural justice deficit across all sectors; Chapter Four: exclusion of women and youth from consultation

Pillar	Strategic Objective	Key Actions	Evidential Grounding
Pillar 3: Coordinated Provision of Inclusive and Green Finance	Expand MSME access to affordable transition finance	Government backed credit guarantee expansion (3.1, existing instrument refinement); MSME compatible transition finance standards (3.2, new initiative); Alternative credit assessment models (3.3, existing instrument refinement)	Chapter Three: distributive justice findings across all sectors; Chapter Four: collateral barrier for women and youth
Pillar 4: Regional Equity in the Green Transition	Reduce spatial inequalities in transition policy delivery	Green infrastructure investment in central and western regions (4.1, existing instrument refinement); Regional green industrial clusters (4.2, new initiative); Cross regional technology transfer and cooperation (4.3, new initiative)	Chapter Three: spatial justice findings; worst in logistics, ICT and agriculture
Pillar 5: Transition Support for Enterprises and Workers	Manage adjustment costs and ensure no one is left behind	MSME transition adjustment funds (5.1, new initiative); Sector specific workforce reskilling (5.2, existing instrument refinement); Climate risk insurance expansion (5.3, existing instrument refinement)	Chapter Three: restorative justice absent across all five sectors; Chapter Four: women's adjustment costs; logistics stranded assets
Pillar 6: Policy Accessibility and Information Transparency	Close the gap between policy availability and enterprise access	Integrated national MSME policy information platform (6.1, new initiative); One stop transition service centres (6.2, new initiative); Targeted outreach to vulnerable enterprise groups (6.3, existing instrument refinement)	Chapter Three: information exclusion in agriculture, logistics and retail; Chapter Four: last mile exclusion of women and youth

Source: Authors' synthesis from Chapters Three and Four findings.

* Note on instrument design: rather than creating new standalone instruments, Pillar 1 is delivered through MSME-specific chapters within existing sector decarbonisation and green transformation roadmaps. This avoids regulatory duplication, leverages the ownership of existing roadmap leads (MIIT for industry, MARA for agriculture, MoT for transportation, MOFCOM for retail and services), and shortens the path from instrument design to enterprise-facing delivery.

5.2 The Six Pillars

PILLAR 1 Establish Sector Specific Transition Pathways for MSMEs

Across five sectors, this study finds that green transition dynamics, barriers and opportunities are structurally different. Policies that treat MSMEs as a homogeneous category will systematically miss the enterprises whose needs do not match the implicit template. Sector specific transition pathways are the foundational instrument for improving policy precision.

The evidence base for this pillar is comprehensive. In agriculture, the binding constraint for most MSMEs is not technology or ambition but information access, collateral structure and the absence of instruments calibrated to micro scale operations and cooperative finance cycles. In manufacturing, the most advanced policy architecture of the five sectors, the binding constraint is the dual certification burden, the distributional concentration of green loans in larger firms, and the absence of workforce transition support. In ICT, the binding constraint is long term innovation capital: instruments designed for two-year operational cycles cannot finance three to five year green technology development. In logistics, the binding constraint is capital intensity and the stranded asset problem: green transition requires investment that most small logistics operators cannot finance through available channels. In wholesale and retail, the binding constraint is the invisibility of individual business owners as a named policy target group and the calibration of instruments to enterprises with fixed assets and administrative staff.

Action 1-1

Develop sector specific MSME transition roadmaps for all five study sectors

The National Development and Reform Commission (NDRC) and the Ministry of Industry and Information Technology (MIIT), in coordination with the Ministry of Agriculture and Rural Affairs (MARA) and the Ministry of Commerce, should develop sector specific MSME green transition roadmaps for agriculture, manufacturing, ICT, logistics and wholesale and retail. Each roadmap should identify the key technologies, investment requirements, workforce adjustments and institutional reforms needed for MSMEs in that sector to align with national decarbonisation targets. Roadmaps should differentiate between micro, small and medium enterprises within each sector, recognising that transformation pathways and support requirements differ by scale. The roadmaps should be developed through consultation with MSME representatives, industry associations and regional governments, and should be updated on a three-year cycle aligned with FYP revisions. A practical sequencing consideration: the manufacturing and ICT roadmaps can draw on existing detailed policy frameworks and are the most tractable to develop first; the agriculture and retail roadmaps require more foundational work to establish enterprise level data and therefore benefit from a slightly longer development timeline.

Action 1-2

Introduce dedicated MSME green transformation financing windows within existing green finance programmes

The People's Bank of China, in coordination with the National Financial Regulatory Administration and the China Development Bank, should establish dedicated MSME green transformation financing windows within the existing green credit and transition finance frameworks. These windows should offer concessional loans, targeted grants and tax incentives specifically designed for MSMEs with limited collateral capacity, including product terms that accommodate land use rights rather than property ownership, asset light balance sheets and short-term turnover cycles. For ICT MSMEs specifically, long term green innovation capital instruments with return cycles of three to five years should be developed, distinct from standard two-year operational credit products. For logistics MSMEs, a stranded asset transition facility should be included, providing partial compensation for legacy diesel fleets rendered economically uncompetitive by emissions standards before the end of their useful economic life. The trade off here is between the simplicity of universal product standards and the operational complexity of differentiated sector windows: the evidence from all five sectors is that universal instruments systematically fail to reach the enterprises most in need, making the additional administrative complexity of sector windows a justified investment.

Action 1-3

Expand public SME service platforms to include green transition advisory services

MIIT's national SME service centre network, which operates at national, provincial, city and county levels, should be expanded to include green transition advisory services. These services should cover carbon accounting guidance, energy efficiency audit support, green certification navigation, climate risk assessment and, for manufacturing and logistics MSMEs, workforce transition planning. The expansion should be piloted in three to five provinces representing diverse regional conditions, including at least one central and one western province, before national rollout. Advisory services should be specifically configured for the sub sectors where women led enterprises concentrate, including community retail, agri processing and light manufacturing, since generic guidance does not reach these enterprises effectively. Delivery through the Women's Federation network and the Communist Youth League should be formalised as an additional channel alongside the SME service centre infrastructure.

PILLAR 2 Strengthen Participatory Governance and Policy Feedback Mechanisms

The most consistent finding across all five sectors and both enterprise groups studied in Chapter Four is the procedural justice deficit: MSMEs are formally acknowledged in policy but have limited effective channels to influence policy design, report implementation barriers, or track application processes. Procedural exclusion reduces both policy uptake and policy quality. The recommendations in this pillar address the delivery architecture of consultation, not its aspiration.

Industry associations play an irreplaceable hub role in reducing information asymmetry between government and enterprises and in building MSMEs' internal capacity. As specialised organisations that are close to industry, connect enterprises and interface with government, industry associations can continuously, systematically and dynamically collect enterprises' authentic demands across technology pathways, cost pressures, financing constraints, market access, compliance requirements and transition bottlenecks; consolidate them into structured, quantifiable and traceable sectoral problem inventories and demand reports; and feed them back precisely to policy-making bodies. At the same time, they can unpack, translate and render accessible government-side information — macro policies, industrial plans, support programmes, standards and application procedures — directly to MSMEs, lowering the barrier to policy comprehension, reducing information barriers and shortening the policy transmission chain, thereby substantially easing information asymmetry between government and enterprises.

Building on this foundation, industry associations can serve as an important vehicle for enterprise capacity building. Anchored on the core needs of green low-carbon transition, compliance management, technology innovation application, risk prevention and market expansion, they can deliver systematic empowerment services to MSMEs — including green technology training, environmental and safety compliance coaching, fiscal/tax/legal support, digital transformation guidance, industry best-practice sharing and benchmark-case promotion. Through thematic training, expert consultations, on-site observation, experience exchange and joint problem-solving, they help enterprises strengthen internal governance, raise technical capacity, reinforce compliance capability and optimise management processes — substantively boosting MSMEs' endogenous drive for independent innovation and sustainable development, and shifting government support from "transfusion-style" subsidies to "self-generation-style" capability building.

The procedural findings across sectors are striking in their consistency. Only 4 of 103 ICT enterprises reported no procedural barriers. Only 16 of 126 manufacturing enterprises reported never encountering obstacles. Only 1 of 13 logistics enterprises reported no barriers. Only 7 per cent of wholesale and retail enterprises reported never encountering obstacles. In agriculture, 10 of 11 enterprises reported barriers. These figures confirm that procedural exclusion is not an edge case but the modal experience of Chinese MSMEs in the green transition. The three mechanisms through which this exclusion operates, fragmented information channels, administrative complexity and underrepresentation in consultation processes, are each amenable to targeted institutional reform.

Action 2-1

Establish a national MSME green transition consultation mechanism

A standing national consultation mechanism on MSME green transition should be established, convening NDRC, MIIT, the Ministry of Finance, the People's Bank of China, the Ministry of Ecology and Environment and the Ministry of Agriculture and Rural Affairs alongside representatives from MSME associations, industry federations, the All China Women's Federation, the Communist Youth League and the China Council for the Promotion of International Trade. The mechanism should meet at least twice yearly, with a formal agenda to review policy implementation challenges reported by participating associations, discuss emerging enterprise needs, and agree on coordinated responses where multiple ministries are involved. Minutes and agreed actions should be published within 30 days of each meeting. The mechanism addresses the inter ministerial coordination failure documented most acutely in the logistics sector, where competing regulatory requirements from environmental and transport departments impose operational contradictions on enterprises with no resolution forum. It also provides the participatory governance structure within which women led and youth led enterprise representation, recommended in Chapter Four, can be implemented. Industry associations should be given an explicit bridge function within this mechanism: translating policy language into sector specific guidance, consolidating recurring implementation problems reported by member firms, and feeding evidence from enterprises back to ministries in a form that can inform timely policy adjustment. They can also reduce information asymmetries by circulating early alerts on new programmes, explaining eligibility and certification requirements, and organising peer learning among MSMEs with similar transition needs.

Action 2-2

Introduce digital policy feedback systems within existing e-government platforms

Existing e-government platforms, including the National Enterprise Registration Platform and MIIT's SME service digital interfaces, should be expanded to allow enterprises to report policy implementation barriers, submit policy improvement suggestions, and track the status of government programme applications in real time. The feedback data should be aggregated and reported quarterly to the national consultation mechanism established under Action 2.1, creating a closed loop between enterprise experience and policy revision. For the logistics sector, where policy information is dispersed across transport and road administration departments, a consolidated policy notification system should push sector relevant updates directly to registered enterprises, eliminating the requirement for enterprises to actively monitor multiple departmental channels. A practical trade off applies here: effective digital feedback requires enterprises to trust that their reports will be taken seriously and acted upon rather than used for compliance monitoring. Clear communication about how feedback data will be used, and transparent reporting on which issues were addressed and how, is a prerequisite for high quality participation. To make these systems usable for smaller firms, accredited industry associations should be able to draw sector relevant updates from the platforms and convert them into practical briefings, application clinics and standards interpretation sessions for member enterprises.

Action 2-3

Expand capacity building for local government officials implementing MSME green transition policies

The central government, through MIIT and NDRC, should expand structured capacity building for local government officials responsible for implementing MSME policies. Training content should cover green finance instruments and their eligibility criteria; digital transformation programmes and their application procedures; climate adaptation support instruments; and the equity dimensions of just transition policy, including how to assess whether instruments are reaching women led, youth led, rural and micro enterprises. Training should be mandatory for officials at the county level and above who have frontline responsibility for MSME support, and refreshed on a two-year cycle to track policy updates. The case studies are particularly clear on the consequences of insufficient official capacity: manufacturing enterprises described officials forwarding policies without professional interpretation, leaving enterprises unable to complete applications for green transformation projects. This is not a problem of official motivation but of training and support.

Action 2-4

Strengthen Government–Enterprise Interaction and Pluralistic Participation, and Build Long-term Mechanisms for Procedural Justice

A routine, institutionalised platform for MSME policy consultation and demand response should be established, channelling enterprise voice through regular sectoral roundtables, dedicated online surveys and grassroots field visits, so that operational pain points, transition difficulties and development needs are systematically reflected in policy formulation and revision. Industry associations and industrial alliances should be fully leveraged as bridge institutions linking government and market actors: drawing on their proximity to industry and embeddedness in enterprises, they can systematically collect, organise and transmit sector-wide common concerns and individualised needs, narrowing the information asymmetry between government and MSMEs and aligning policy supply with enterprise demand. Industry associations should also serve as vehicles for enterprise capacity building—conducting routine green technology training, compliance coaching, best-practice sharing and benchmark exchange around green low-carbon transition, compliance management, technology adoption and competitiveness enhancement—to help MSMEs close capability gaps. Drawing on uniquely Chinese organisational resources, including the China Association of Small and Medium Enterprises, federations of industry and commerce at all levels, and specialised industry associations, a multi-level, broadly-covering and high-efficiency "government–enterprise–civil society" collaborative governance network should be constructed, forming a vertically integrated and horizontally coordinated policy transmission and demand feedback system. Government agencies should establish standardised policy transmission mechanisms via associations (briefings, thematic explanatory sessions and targeted outreach), open routine feedback channels, and support associations in participating in industry standard-setting, pilot promotion and policy impact assessment, so that policies are precisely transmitted, demands efficiently fed back, and implementation collaboratively delivered. At the implementation stage, capacity building for grassroots officials in policy interpretation, professional service delivery and compliance guidance should be strengthened, with unified implementation standards, standardised procedures and stronger service orientation, reducing implementation deviation and policy effectiveness decay.

PILLAR 3 Strengthen Coordinated Provision of Inclusive and Green Finance

Within the 'Five Major Articles on Finance' framework articulated at the 2023 Central Financial Work Conference—covering technology, green, inclusive, pension and digital finance—the intersection of inclusive finance and green finance in the MSME green transition context is the most strategically significant zone for systemic integration. Access to affordable, appropriately structured finance is the most pervasive barrier to MSME green transformation across all five sectors studied. China's green finance framework is one of the most developed in the world. The challenge is not the absence of instruments but their calibration: they are designed for enterprises at the upper end of the MSME distribution with limited reach to enterprises at the lower end, where women led, youth led, rural and micro operators are concentrated.

The finance findings across sectors reveals a consistent pattern. Instruments are generally assessed as well designed in terms of product features: enterprises that can access them find them suitable. The barrier is access, not design. Commercial banks apply standard risk assessment frameworks that require fixed asset collateral, minimum revenue thresholds and documented credit histories. Enterprises that cannot meet these criteria, disproportionately micro enterprises, women led enterprises and rural operators, are effectively excluded from the mainstream green finance architecture regardless of the formal availability of instruments. The recommendations in this pillar constitute a systemic integration of the 'Five Major Articles on Finance' in the MSME green transition context: Action 3.1 expands government-backed guarantees (at the intersection of inclusive and green finance); Action 3.2 refines green finance taxonomies with MSME-compatible standards (green finance instruments adapted to MSME scale); Action 3.3 introduces alternative credit assessment models (supported by digital finance infrastructure); together with Pillar 1's Action 1.2 on long-cycle innovation capital for ICT MSMEs (at the intersection of technology and green finance), these actions advance inclusive finance from 'availability' to 'usability' and extend green finance from large projects down to MSME scenarios. The deeper logic of these recommendations is a people-centred just transition applied to finance: financial instruments must reach not only enterprises but the people behind them—owners, employees and their families, and especially women entrepreneurs, youth-led start-ups, rural operators and micro enterprises who are most poorly served by traditional financial infrastructure.

Action 3-1 Expand government backed credit guarantee schemes for MSME green investment projects

The National Financing Guarantee Fund and provincial guarantee institutions should expand their green investment guarantee windows, increasing the proportion of their portfolio allocated to MSME green transformation projects and lowering the collateral requirements for enterprises in sectors with asset light operating profiles, specifically agriculture, services and retail. Guarantee coverage rates should be increased for projects below a specified threshold, reflecting the higher proportional transaction costs of small project guarantee processing. The women entrepreneur counter guarantee exemption model piloted in some provinces, which allows Women's Federation endorsed enterprises to access guaranteed loans without collateral, should be extended to include green transformation investment purposes and replicated nationally. A risk sharing mechanism between central and provincial guarantee institutions should be established to prevent the geographic concentration of guarantee support in financially stronger provinces, which would otherwise deepen spatial inequality in green finance access.

Action 3-2

Develop MSME compatible standards within China's green and transition finance taxonomy

The People's Bank of China, working with NDRC and MIIT, should develop a dedicated MSME compatible tier within the Green Industry Guiding Catalogue and the forthcoming transition finance taxonomies [1]. This tier should define eligibility criteria for MSME scale green investments that are calibrated to enterprise capacity: small scale renewable installations, energy efficient equipment upgrades, digital efficiency improvements, green logistics vehicle procurement and green certification costs. The current taxonomy is designed for large scale project finance and its minimum project size thresholds and documentation requirements are disproportionately burdensome for smaller enterprises. Developing MSME scale standards also creates the evidential foundation for Action 3.1: guarantee institutions need a clear taxonomy of what constitutes MSME green investment to price and structure their products appropriately. International experience from the EU's Green Deal and the IFC's MSME green finance programmes provides useful design references, while China's specific context, including its fintech infrastructure and state bank network, offers implementation mechanisms not available in most comparator countries.

Action 3-3

Encourage financial institutions to adopt alternative credit assessment models for MSME green investment

The National Financial Regulatory Administration should issue guidance encouraging commercial and policy banks to adopt alternative credit assessment models for MSME green investment applications. Alternative data sources that China's fintech infrastructure can already supply include digital transaction records from e-commerce and payment platforms, supply chain delivery and payment data, energy consumption records from smart meter systems, and tax filing compliance records. These data sources can assess the creditworthiness of enterprises that lack traditional fixed asset collateral but have demonstrated operational stability, payment reliability and energy management capacity. The Ningbo Enterprise Integrated Service Platform, an official municipal platform launched in August 2024 to consolidate enterprise-facing policy, finance, talent and other services and analogous fintech credit scoring approaches demonstrate that this is operationally tractable in China's digital governance context. The trade off with alternative credit assessment is data privacy and governance: clear regulatory guidance on how alternative data will be used, how enterprises can access and correct their data records, and what safeguards prevent discriminatory scoring is a prerequisite for public trust and therefore for effective uptake.

1. Multiple Chinese taxonomies are in use, including the PBoC–NDRC–CSRC Green Bond Endorsed Project Catalogue, the NDRC Green Industry Guidance Catalogue, and emerging sectoral transition finance taxonomies in steel, cement and aviation.

Local Best Case

"Digital Brain of Edible Fungi" in Gutian County: Leveraging Agricultural Supply Chain Data to Improve MSME Green Financing

Gutian County is the largest edible fungi production base in China, where the sector serves as a leading local industry and a key source of income. Around 70 percent of Gutian's working population engages in edible fungi production and marketing, while approximately 80 percent of the total agricultural output value comes from the sector. As a key component of local green and circular agriculture, the edible fungi industry also contributes to resource-efficient production through the utilisation of agricultural residues.

To support the high-quality development of this sector, Gutian county government established the "Digital Brain of Edible Fungi," a digital supply chain service platform covering production management, marketing management, warehouse management and financial services. It collects data from the production, purchase, storage, processing and sales channels of the industry and uses it to provide early warning, business matching, supply chain finance and related services through its portal window, "Fugubao" APP.

In terms of supply chain finance, the platform connects financial institutions with enterprises across the edible fungi value chain and supports commercial banks in delivering credit loan services, including for green and low-carbon investments such as facility upgrades, energy-efficient equipment and improved cultivation systems. Transaction data, order flows and supply chain records are used to support credit assessment and loan approval processes, reducing reliance on traditional collateral. With technical guidance from the "Leveraging Sustainable Development Finance, Accelerating the Revitalisation of Rural MSMEs" project, a joint initiative launched by UNDP, China International Centre for Economic and Technical Exchanges (CICETE) and Du Xiaoman in 2022, the system has been further upgraded to streamline online credit services and improve data screening, expanding access to financing for small and micro enterprises as well as farmers within the sector.

Technical staff demonstrating the operation of the "Fugubao" APP to an edible fungi farmer in Gutian County | *Photo credit: Gutian County Integrated Media Center*

PILLAR 4 Address Regional Inequalities in the Green Transition

Every sector studied exhibits a coastal to interior gradient in policy delivery effectiveness. The mechanisms differ by sector, from infrastructure concentration in logistics and ICT to cluster based technology spillovers in manufacturing to extension service coverage in agriculture, but the outcome is consistent: MSMEs in central and western provinces, rural areas and remote localities access policy support at lower rates and receive less effective services than equivalent enterprises in coastal provinces. Without deliberate spatial targeting, the green transition will deepen rather than reduce regional development gaps.

The spatial findings are compounded by interaction effects. Spatial disadvantage amplifies the barriers associated with small enterprise size, limited collateral and information exclusion: an enterprise that is small, rural and female led faces not three separate barriers but a compound disadvantage in which each factor makes the others more constraining. The logistics sector illustrates this most directly: rural logistics MSMEs face insufficient charging infrastructure, weak warehousing partners and complex subsidy procedures simultaneously, and the combination is more disabling than any single barrier would be. Pillar 4 recommendations target the infrastructure and institutional dimensions of spatial disadvantage, while Pillar 2 addresses the informational and participatory dimensions.

Action 4-1

Increase targeted public investment in green infrastructure in central and western regions

NDRC should develop a Green Transition Infrastructure Programme for Central and Western Regions, providing ring fenced capital allocation for renewable energy systems, digital connectivity infrastructure, new energy vehicle charging networks, smart warehousing facilities and climate resilient agricultural infrastructure in provinces west of the Hu Huanyong Line. Programme design should explicitly target county level and below infrastructure gaps, since provincial capital cities in central and western regions are often adequately served while rural counties and smaller cities remain severely underserved. Programme criteria should include an MSME access dimension, requiring that funded infrastructure be accessible to small and micro enterprises through shared use arrangements, not just to large industrial anchors. International development finance from multilateral development banks including the Asian Development Bank (ADB) and the New Development Bank could supplement domestic capital for this programme, providing additional leverage for investment in areas where commercial returns are lower. On the transmission side, the specific targeting of these two infrastructure categories toward local MSMEs should be clearly defined through four mechanisms: (i) shared-facility arrangements — new-energy charging stations, energy-storage facilities and computing centres should be opened on demand to micro and small enterprises located in industrial parks; (ii) policy voucherisation — small-denomination offsetting instruments such as computing-power vouchers, cloud-access vouchers and energy-use vouchers should be issued to enable low-cost access by micro and small enterprises; (iii) park-based supporting services — shared laboratories, shared certification facilities and green logistics-and-warehousing services should be planned in parallel within central- and western-region industrial parks to reduce the fixed-cost burden of MSME transition; and (iv) local absorption of clean energy — lowering industrial electricity costs to specifically benefit central- and western-region small micro-manufacturing enterprises in energy-intensive sectors. This targeted design avoids the traditional problem whereby infrastructure investment serves only leading enterprises and has insufficient spillover to MSMEs.

Action 4-2

Promote the development of regional green industrial clusters in interior and western provinces

MIIT and NDRC should actively promote the establishment of regional green industrial clusters in central and western provinces, modelled on the shared infrastructure and technology sharing arrangements found in successful coastal manufacturing clusters. The evidence from manufacturing cases in Shandong and Jiangsu is that cluster participation substantially reduces the compliance cost burden for individual MSMEs: shared waste treatment facilities, technology innovation alliances and joint certification processes make individually unaffordable investments collectively tractable. Cluster development in interior provinces should include explicit MSME participation criteria, preventing the outcome, documented in several coastal cluster cases, where cluster benefits accrue primarily to large anchor enterprises rather than to the smaller suppliers and service providers within the cluster. Cluster development plans should also include explicit provisions for women led and youth led enterprises, consistent with the Chapter Four equity recommendations.

Action 4-3

Establish cross regional technology transfer and cooperation mechanisms between eastern and western provinces

The central government should formalise cross regional cooperation mechanisms between advanced eastern provinces and less developed central and western provinces for MSME green transition technology transfer. Building on existing east west industrial cooperation frameworks, these mechanisms should include three specific instruments: joint green technology demonstration parks where eastern technology providers partner with western production enterprises; talent exchange programmes that deploy green technology specialists from eastern provinces to provide time limited technical advisory services in western provinces; and a technology licensing facilitation service that helps interior province MSMEs access and afford the intellectual property rights for green production processes developed by eastern enterprises. The Colorful Clouds Returning Home model, which has already demonstrated the effectiveness of returnee graduate mobilisation for regional development, provides a precedent for connecting talent flows with green transition objectives.

PILLAR 5 Establish Transition Support Mechanisms for Enterprises and Workers

The most consistent structural gap across all five sectors studied is the near-complete absence of restorative justice instruments. Few sectors have a systematic mechanism for compensating enterprises for transition adjustment costs, supporting workers displaced by green process restructuring, or providing transitional income for operators whose business models must contract as environmental standards tighten. Green transformation can be economically transformative for enterprises that can afford it; for enterprises that cannot, the absence of transition support makes it an existential threat. Preventing this outcome is both a justice imperative and a practical prerequisite for achieving China's dual carbon goals without concentrating transition costs on the most vulnerable.

The restorative justice findings across sectors reveal the scale of the gap. Manufacturing has no workforce reskilling programme connected to green process automation. Logistics has no stranded asset compensation mechanism for enterprises that invested in diesel fleets before emissions standards made them uncompetitive. Agriculture has no transition support for small farmers displaced by ecological zone reclassifications. Retail has no adjustment support for operators who must invest in renovation to meet energy saving standards. Chapter Four documents that women led enterprises bear disproportionate transition costs because they concentrate in sub sectors where green compliance requirements are changing fastest, without the insurance or savings buffers that larger enterprises use to absorb adjustment costs. The actions under this pillar establish the foundational restorative instruments that are currently absent from China's MSME green transition architecture.

Action 5-1 Establish MSME transition adjustment funds at the national and provincial levels

NDRC, in coordination with the Ministry of Finance, should establish an MSME Green Transition Adjustment Fund providing financial support for three categories of transition cost: equipment upgrade subsidies for enterprises replacing carbon intensive machinery with cleaner alternatives; green certification cost subsidies covering registration, documentation and ongoing compliance costs for enterprises seeking green product, process or facility certification; and digital transformation transition support for enterprises investing in energy management systems, carbon accounting software and green supply chain integration platforms. The fund should allocate a dedicated window of no less than 30 per cent of total disbursements for micro enterprises and enterprises with annual revenues below a specified threshold, preventing the concentration of resources among larger MSMEs that has characterised the implementation of many existing instruments. For the logistics sector specifically, the fund should include a stranded asset transition window providing partial compensation, calculated on a sliding scale based on vehicle age and residual economic life, for diesel fleet operators transitioning to new energy vehicles before their fleets reach end of economic life. Fund criteria should not require fixed asset collateral for enterprises applying under the micro enterprise window.

Action 5-2

Develop sector specific workforce reskilling programmes aligned with emerging green industries

The Ministry of Human Resources and Social Security, working with MIIT and the Ministry of Education, should develop sector specific workforce reskilling programmes that explicitly address the skills implications of green transformation in each of the five study sectors. For manufacturing, this means vocational pathways for workers displaced by automated green production processes, with priority placement in clean energy and green manufacturing supply chain roles. For logistics, it means training programmes that equip drivers and warehousing workers to operate new energy vehicles, digital logistics platforms and smart warehousing systems. For ICT, it means green technology specialisation tracks within existing digital skills programmes. For agriculture, it means green production practice training programmes delivered through the agricultural extension service network, adapted for diverse regional conditions and including dedicated content for women farmers and returnee youth entrepreneurs. Training certification should be recognised for purposes of green certification application, creating a direct incentive for enterprise funded reskilling. The trade off in sector specific reskilling is cost and coordination complexity: coordinating with industry associations to ensure training content tracks actual market demand is operationally demanding but essential for preventing reskilling programmes from producing skills that do not match available jobs.

Action 5-3

Expand climate risk insurance programmes for MSMEs in high exposure sectors

The National Financial Regulatory Administration, in coordination with MARA and NDRC, should expand the coverage, affordability and MSME accessibility of climate risk insurance instruments. Priority sectors for expansion are agriculture, logistics and wholesale and retail, where the evidence from all three study methods shows the highest rates of climate related disruption and the most limited access to insurance protection. Agricultural climate insurance products should be expanded to cover not only crop failure but also the infrastructure disruption costs faced by agri processing MSMEs during extreme weather events. For logistics MSMEs, route disruption and cargo loss insurance products should be developed specifically for small fleet operators, with premium structures calibrated to MSME fleet sizes rather than to large carrier operations. The insurance agriculture credit linkage mechanism piloted in some provinces, which allows improved insurance coverage to be used as a substitute for fixed asset collateral in loan applications, should be evaluated and scaled nationally where evidence of effectiveness exists. Women's Federation networks should be formalised as co distribution channels for agricultural and rural service insurance products, addressing the information access barriers that Chapter Four documents as the primary reason rural women operators do not access available insurance instruments.

PILLAR 6 Improve Policy Accessibility and Information Transparency

The gap between what policies promise and what enterprises can access is, in substantial part, an information and accessibility gap. The survey documents that most respondents across most sectors are uncertain about how to participate in green transition policy programmes. Case studies reveal that enterprises learn about relevant instruments through informal social networks rather than official channels, and that by the time information reaches smaller enterprises, application windows have often closed. The instruments in this pillar address not what policies say but whether they are reachable.

The accessibility findings across sectors illustrate the compound nature of the problem. In wholesale and retail, the most acute case, policies are administered across at least four different departmental channels with separate application procedures, eligibility criteria and publication schedules. In logistics, sector relevant policies are tied to route approvals and operational qualifications managed by transport and road administration departments whose information platforms do not communicate with each other. In agriculture, policies are described as reaching grassroots operators primarily through village level organisations and cooperatives rather than through direct channels, creating a dependency on intermediary relationships that some operators, particularly those outside existing cooperative networks, cannot access. The three actions under this pillar address the information architecture and delivery infrastructure problems that create these gaps, using China's advanced digital governance capabilities as the primary vehicle for improvement.

Action 6-1 Develop an integrated national MSME policy information platform

MIIT should develop and operate an integrated national MSME policy information platform that consolidates all green transition relevant policies, programmes, eligibility criteria and application procedures in a single publicly accessible interface. The platform should allow enterprises to enter their basic registration information and receive a personalised display of programmes for which they are potentially eligible, eliminating the requirement to monitor multiple departmental channels. The Ningbo Enterprise Integrated Service Platform provides a proven national precedent for this model[2] . The platform should include a dedicated green transition module that integrates policy updates from NDRC, MIIT (Source: Ningbo Municipal Government (2024), Notice on Launching the Ningbo Enterprise Integrated Service Platform.), the Ministry of Finance, the Ministry of Ecology and Environment, MARA, the Ministry of Commerce and the Ministry of Human Resources and Social Security. Real time application tracking should allow enterprises to see the status of outstanding applications without requiring phone or in person follow up. The platform should be available in mobile format with simplified interface options designed for operators with limited digital literacy, addressing the barrier identified in the agriculture and retail sectors. Multilingual access in minority language regions should be provided where MSME populations are significant.

2. Ningbo Municipal Government (2024), Notice on Launching the Ningbo Enterprise Integrated Service Platform.

Action 6-2

Establish one stop MSME transition service centres at the regional level

MIIT, in partnership with provincial governments, should establish one stop MSME green transition service centres at the prefecture level, providing policy guidance, technical support, green certification navigation, financing application assistance and climate risk assessment services under one roof. Centres should be staffed by officials with joint training across the green transition policy domains relevant to the sector composition of local MSMEs, supplemented by technical specialists seconded from industry associations and research institutions on a rotating basis. For agriculture dominated regions, centres should include dedicated agricultural green transition officers with direct links to the MARA extension service network. Centre performance should be evaluated against metrics that include the share of micro enterprises and women led enterprises served, not just total enterprise contacts, preventing the bias toward serving larger and more established enterprises that tends to emerge in service centres operating under volume targets. Centres should also serve as nodes for the consultation mechanism established under Action 2.1, hosting regular grassroots consultation events that feed enterprise feedback into the national mechanism. In this model, industry associations should not be treated only as representative bodies but also as lightweight capability-building partners, offering short trainings on carbon accounting, green certification preparation, supplier requirements and financing documentation for MSMEs that lack dedicated internal teams.

Action 6-3

Implement targeted policy outreach programmes for vulnerable enterprise groups

MIIT, MARA, the Ministry of Commerce and the All China Women's Federation should jointly develop and fund targeted policy outreach programmes for the enterprise groups documented in Chapters Three and Four as facing the greatest information access barriers: rural MSMEs in central and western provinces; women led enterprises in community retail, agri processing and light manufacturing; youth led enterprises in their first three operating years; and micro enterprises and individual business owners without established institutional connections. Outreach programmes should operate through trusted intermediary channels including village level organisations, Women's Federation networks, the Communist Youth League, industry associations and cooperative structures, rather than relying on enterprises to find official channels proactively. Programme content should go beyond informing enterprises that programmes exist to actively guiding them through eligibility assessment, documentation preparation and application submission. The enterprise development service provider model documented in Chapter Four, in which a trusted intermediary connects enterprises to policy instruments by starting with the enterprise's actual operating context rather than with the policy catalogue, should be supported and scaled through public private partnership.

5.3 Implementation Sequencing and Interdependencies

The six pillars are interdependent, and their effectiveness is greatest when implemented as a coherent programme rather than as isolated measures. Several interdependencies are worth highlighting explicitly for implementation planning purposes.

Data and monitoring should come first.

The gender and age disaggregated monitoring system recommended in Chapter Four Action 1 is a prerequisite for evaluating whether any of the six pillars is reaching its intended beneficiaries. Without it, the risk is that pillar implementation improves aggregate outcomes while leaving the most excluded enterprise groups as invisible as they are now. Establishing the monitoring foundation in the first year of implementation is a sequencing imperative.

Consultation precedes content.

Action 2.1, establishing the national MSME green transition consultation mechanism, should be established before sector specific roadmaps and adjustment funds are designed under Pillars 1 and 5. The content quality of roadmaps and transition funds depends on the enterprise knowledge that only effective consultation can surface. Designing instruments before the consultation mechanism is operational reproduces the design without representation problem that has produced the gaps this study documents.

Information infrastructure enables all other actions.

Action 6.1, the integrated national MSME policy information platform, is a general purpose infrastructure investment that increases the effectiveness of every other pillar. Finance instruments under Pillar 3 reach more enterprises when they are visible and navigable on the platform. Outreach programmes under Action 6.3 are more effective when they can direct enterprises to a single authoritative information source rather than to a fragmented landscape of departmental portals. Regional equity under Pillar 4 is partially an information equity problem: interior province enterprises need access to the same quality and timeliness of policy information that coastal province enterprises receive.

Restorative instruments require forward planning.

The transition adjustment fund under Action 5.1 and the climate risk insurance expansion under Action 5.3 are most effective when enterprises know about them before they face adjustment costs, not after. Communicating these instruments through the outreach and platform infrastructure of Pillar 6, as part of the proactive policy engagement envisaged in Action 6.3, is the mechanism that converts reactive support into genuine transition protection.

5.4 China Best Practice Case Study: The China SME Service Portal

The recommendations developed in Pillars 1 through 6 above all presuppose one common infrastructure: a delivery channel capable of routing sector specific roadmaps, financing windows, consultation mechanisms and information services to the tens of millions of MSMEs dispersed across China's thirty-one provinces and some one hundred and sixty nine prefecture level cities. Such an infrastructure is already operational. Launched in 2024 by the Ministry of Industry and Information Technology (MIIT), the national SME Public Service Portal (www.chinasme.cn) demonstrates how an integrated, cross ministerial, multi-level service system can translate formal policy architecture into tangible enterprise support. This section profiles the Portal as a candidate delivery vehicle for this report's recommendations and identifies one concrete extension, a dedicated Green Transition Zone, that would directly operationalise Actions 1.3, 2.2 and 6.1.

Platform overview and background.

The China SME Service Portal was jointly developed by MIIT's Department for the Promotion of the Development of Small and Medium Enterprises and the SME Development Promotion Center of the People's Republic of China, under the banner of the state flagship "Yiqiyiqi" ("Helping Enterprises Together") initiative. The Portal went live on 30 July 2024 and was designated the national consolidated access point for SME public services, subsuming previously fragmented departmental portals into a single enterprise facing entry point (MIIT 2024b; SME Development Promotion Center 2025a). In governance terms, the Portal is the digital expression of the national SME service centre network referenced in Action 1.3 of Pillar 1, and it provides ready-made infrastructure for the information transparency objectives of Pillar 6.

"1+31+169" three tier architecture and "Two Network Integration" service model.

The Portal is organised around a hierarchical architecture designated "1+31+169": one national portal, thirty-one provincial level service portals and approximately one hundred and sixty-nine prefecture level and municipal service nodes, unified under common data standards and service protocols, and connected to more than 1,780 offline public service institutions at the national, provincial, municipal and county levels. It operates a "Two Network Integration" model linking the public SME service network (state operated service centres) with the market-oriented service network (accredited private service providers, industry associations and professional institutions), so that enterprises can access both government guided and commercially delivered services through one authenticated interface (State Council General Office 2025). This architecture directly addresses the fragmented information channels mechanism of procedural exclusion documented in Chapter Three and provides the logical delivery backbone for every other pillar.

Eight core service functions.

The Portal delivers its offer through eight functional modules: Find Policy (aggregated policy search and subscription), Find Market (procurement and demand matching), Find Finance (credit, guarantee and equity financing), Find Talent (recruitment and specialist matching), Find Courses (capacity-building courses), Find Computing Power (AI and computing infrastructure vouchers), Find Services (professional service marketplace) and One Stop

Affairs (administrative transactions). Each module uses enterprise profile data to push personalised content to the enterprise rather than requiring enterprises to actively locate information across multiple departmental websites (SME Development Promotion Center 2025b).

Service scale.

As of October 2025, MIIT reported that the Portal had aggregated more than 150,000 central and local policy documents, over 200 million bidding and procurement records and data on some 190 million business entities, and had cumulatively served more than 1.2 million enterprises. Its Digital Transformation section, launched in June 2025, integrates more than 600 service providers and over 1,000 scenario-based solutions, while the jointly launched “Hui Qi Tian Li” (“Helping Enterprises”) action has released more than RMB 6 billion in subsidy vouchers and service packages (SME Development Promotion Center 2025a). Further modules launched in October 2025 added an enterprise compliance self-assessment tool and a tax-and-fee (“Caishuitong”) service. This scale places the Portal among the largest operational enterprise-facing service platforms worldwide and confirms that its architecture can absorb the additional service loads envisaged in this chapter’s recommendations.

Alignment with the six strategic policy pillars of this chapter.

The Portal provides a direct implementation surface for every pillar developed in Section II above:

Pillar 1 (Sector specific transition pathways).

The Find Policy and Find Courses modules can host the sector specific MSME transition roadmaps recommended under Action 1.1 and deliver them to enterprises segmented by sector, size and region. Dedicated green transformation advisory services (Action 1.3) can be integrated into the Find Services module without the need for new stand alone infrastructure.

Pillar 2 (Participatory governance and policy feedback).

The Portal’s authenticated user base and bidirectional channels provide a ready delivery environment for the digital policy feedback system recommended under Action 2.2. Quarterly aggregated feedback would flow into the national consultation mechanism (Action 2.1) at substantially lower transaction cost than the parallel stand up of a new platform.

Pillar 3 (Inclusive green finance).

The Find Finance module already aggregates credit, guarantee and equity instruments from dozens of financial institutions and can host the dedicated MSME green transformation financing windows recommended under Action 1.2 and the alternative credit assessment products recommended under Action 3.3, leveraging the transaction data already flowing through Portal linked e-commerce and payment partners.

Pillar 4 (Regional equity in the green transition).

The “1+31+169” architecture brings provincial and prefecture nodes in central and western regions onto a common national service standard, providing a direct implementation mechanism for the spatial equity objectives of Pillar 4 and for the cross regional technology transfer and cooperation objective of Action 4.3.

Pillar 5 (Transition support for enterprises and workers).

The Find Courses module is the natural delivery channel for the sector specific workforce reskilling recommended under Action 5.2. MSME transition adjustment funds (Action 5.1) and the climate risk insurance expansion recommended under Action 5.3 can be surfaced to eligible enterprises through the precision push notification

mechanism already operational on the Portal.

Pillar 6 (Policy accessibility and information transparency).
The Portal is, in effect, the operational realisation of the integrated national MSME policy information platform recommended under Action 6.1. The One Stop Affairs module provides the basis for the one stop transition service centres envisaged under Action 6.2, and the targeted outreach envisaged under Action 6.3 can be delivered through the Portal's segmentation and notification infrastructure.

Deepening recommendation: establish a Green Transition Zone on the Portal. The most immediately actionable extension of this chapter's recommendations is the establishment of a dedicated "Green Transition" zone within the Portal, functioning as the single enterprise facing entry point for green transition services currently dispersed across ministries and portals. The Zone should integrate: (i) a consolidated catalogue of green transformation policies and incentives segmented by sector and enterprise scale; (ii) a green finance window linked to participating banks, guarantee institutions and insurers, with navigation support for Actions 3.1, 3.2 and 3.3; (iii) a green capacity building module hosting the workforce reskilling content under Action 5.2 and the carbon accounting, energy audit and green certification advisory services under Action 1.3; (iv) a structured feedback channel feeding directly into the national MSME green transition consultation mechanism recommended under Action 2.1; and (v) an equity targeting layer that surfaces Action 3.1 women entrepreneur guarantee exemptions, Action 4.1 central and western regional programmes and Action 6.3 outreach instruments to eligible enterprises by default. The incremental cost of such a zone, relative to building parallel infrastructure, is very low, while its policy leverage across the six pillars is substantial.

The China SME Service Portal illustrates a broader point relevant to the Asia Pacific region: the governance challenge of MSME just transition is a delivery challenge as much as a design challenge, and delivery infrastructure that already exists can often be repurposed at a fraction of the cost of new build. For Asia Pacific governments seeking to operationalise their own just transition architectures, the Portal's "1+31+169" multi level model, "Two Network Integration" approach and eight function precision push architecture provide a tested reference pattern. The deepening recommendation above, embedding a dedicated Green Transition Zone in an already operational national SME service platform, is offered as a concrete implementation pathway for China and as a transferable design pattern for the region.

5.5 Looking Ahead: China's Experience as a Learning Laboratory

An analytical through-line of this report is a people-centred approach to just transition: the MSME is treated not merely as a compliance unit but as the workplace of employees, the livelihood vehicle of owners, and the load-bearing unit of community resilience. This perspective resonates with China's deepening people-centred development philosophy and captures the core meaning of just transition in the Chinese context: whether institutional frameworks are truly designed to serve enterprise actors; whether data systems make vulnerable

groups visible; whether delivery channels reach enterprises in the most remote locations. The three lessons for other economies that follow unpack this along those three dimensions—institutional, data and channel. In the financial domain specifically, the people-centred just transition manifests as the systemic integration of the 'Five Major Articles on Finance' in the MSME context—the core logic of Pillar 3 and a concrete operational pathway this study offers to the Asia Pacific region.

China's experience in integrating MSME development with climate transition policy offers lessons that extend beyond its borders. As the world's largest developing economy, with the most extensive MSME population and one of the most ambitious climate transition programmes, China is simultaneously confronting challenges that other economies will face as their own transitions accelerate. The diagnostic approach applied in this study, combining policy text analysis, enterprise survey and case studies through the seven domain, five lens matrix, provides a replicable methodology that other Asia Pacific governments can adapt to their own MSME green transition contexts.

Three aspects of China's experience are of particular relevance to other economies.

First, the institutional dimension of the people-centred approach: a strong formal policy architecture is necessary but not sufficient to generate equitable delivery. The delivery infrastructure, including information channels, consultation mechanisms, guarantee institutions and service centres, must be designed with the same care as the policy instruments themselves. The gap between formal policy and effective reach documented in this study is not unique to China; it is the modal experience of MSME policy in developing and emerging economies.
Second, the data dimension of the people-centred approach: gender and age disaggregated monitoring data are critical to assess whether equity provisions are effective, and gaps around these data are common across the Asia-Pacific region. Investing in disaggregated monitoring is one of the highest return investments available to governments seeking to manage the just transition.

Third, the channel dimension of the people-centred approach: the Women's Federation model, the rural extension service network, the university incubator system and the village level organisation infrastructure are China specific assets that demonstrate the general principle that trusted intermediary channels are more effective than direct official channels for reaching the enterprises most distant from the policy system.

An inclusive green transition is not a technical challenge. It is a governance challenge: the challenge of designing and delivering policy systems that can reach enterprises of all sizes, in all regions, with the support they need to transform at the pace the climate requires. China has made real progress on the technical and institutional dimensions of this challenge, building foundations to strengthen delivery, ensuring that the ambition of the formal architecture becomes the experience of the enterprise.

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Appendices

Appendix A

The 20 sample policies included in this study can be further categorised by administrative level into three tiers. Central guidance policies (5 items: P1, P2, P4, P6, P12), jointly issued by the State Council or by the CPC Central Committee and State Council together, carry strategic direction and institutional framework-setting functions. Ministry or inter-ministry policies (9 items: P3, P5, P9, P10, P14, P16, P17, P18, P20) carry the translation of central strategy into sector-specific implementation pathways, with P9 (issued by MIIT and six other departments jointly) as a representative multi-ministry case.

Subnational operational policies (6 items: P7, P8, P11, P13, P15, P19) carry instrumental and operational functions, translating central directives into applications and performance-tracked projects, covering eastern provinces (Shanghai, Shenzhen, Zhejiang), a northern-eastern province (Shandong), and a provincial-level DRC document. Among these, P15 (Regulations of Zhejiang Province on Promoting Green and Low-Carbon Transformation) is a local regulation passed by the Zhejiang Provincial People's Congress, qualifying as local legislation at the subnational level and providing the regulatory foundation for subsequent administrative instruments; the other five are administrative policy documents issued by governments or departments.

This classification corresponds to the methodological note on central macro-guidance policies and subnational operational instruments in Chapter Two, Section (III) Policy Sample Selection.

	Policy Name	Issuing agency	Year of release	Industry
P1	Opinions on Promoting High-Quality Development of Animal Husbandry	State Council (Central Guidance)	2020	Animal Husbandry
P2	The State Council's Guiding Opinions on Accelerating the Establishment and Improvement of a Green, Low-Carbon, and Circular Economic System	State Council (Central Guidance)	2020	All Industries
P3	Opinions on Strictly Enforcing Energy Efficiency Constraints to Promote Energy Conservation and Carbon Reduction in Key Areas	National Development and Reform Commission (Ministry)	2020	Manufacturing
P4	The 2022 Central Document No. 1 (Full Text)	State Council (Central Guidance)	2020	Agriculture
P5	Implementation Plan for Carbon Peaking in the Industrial Sector	Ministry of Industry and Information Technology	2020	Manufacturing
P6	The 14th Five-Year Plan for Modern Logistics Development	State Council (Central Guidance)	2020	Logistics
P7	Shandong Province's Three-Year Action Plan for Building a Green, Low-Carbon, and High-Quality Development Pilot Zone (2023-2025)	Shandong Provincial Development and Reform Commission (Subnational)	2020	Manufacturing
P8	Several Measures of Shenzhen Municipality to Promote the High-Quality Development of Green and Low-Carbon Industries	Shenzhen Municipal People's Government General Office (Subnational)	2020	Agriculture

	Policy Name	Issuing agency	Year of release	Industry
P9	Guiding Opinions of the Ministry of Industry and Information Technology and Six Other Departments on Accelerating the Green Development of Manufacturing	Seven departments, including the Ministry of Industry and Information Technology (Inter-ministry)	2020	Manufacturing
P10	Guiding Opinions on Accelerating the Green Development of Manufacturing	Ministry of Industry and Information Technology (Ministry)	2020	Manufacturing
P11	Several Policy Measures of the Shanghai Municipality to Reduce the Burden on Enterprises and Support the Development of MSMEs	Shanghai Municipal People's Government (Subnational)	2020	All Industries
P12	Opinions of the CPC Central Committee and the State Council on Accelerating the Comprehensive Green Transformation of Economic and Social Development	State Council (Central Guidance)	2020	Transportation
P13	Shanghai Action Plan for Accelerating Green and Low-Carbon Transformation (2024-2027)	Shanghai Municipal People's Government (Subnational)	2020	Transportation, Manufacturing
P14	Implementation Guidelines for Digitalization, Greening, and Collaborative Transformation and Development	National Development and Reform Commission (Ministry)	2020	All Industries
P15	Regulations of Zhejiang Province on Promoting Green and Low-Carbon Transformation	Zhejiang Development and Reform Commission (Subnational/Legislative)	2020	Forestry
P16	Action Plan on Improving the Modern Commercial and Trade Circulation System and Promoting High-Quality Development of the Wholesale and Retail Industry	Ministry of Commerce (Ministry)	2020	Wholesale and Retail Industry
P17	Special Action Plan for Digital Empowerment of MSMEs (2025-2027)	Ministry of Industry and Information Technology (Ministry)	2020	ICT
P18	Implementation Guide for Digital Transformation of Manufacturing Enterprises	Ministry of Industry and Information Technology (Ministry)	2020	Manufacturing
P19	Notice on Several Measures to Strengthen Fiscal and Financial Coordination to Support High-Quality Development of the Real Economy	Provincial Development and Reform Commission (Subnational)	2020	All Industries
P20	Special Action Plan for Accelerating the Development of Digital and Intelligent Supply Chains	Ministry of Commerce (Ministry)	2020	Logistics