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# China's Policy Transition from Energy to Emissions Control:

An Evaluation of Provincial Trends  
and Potentials

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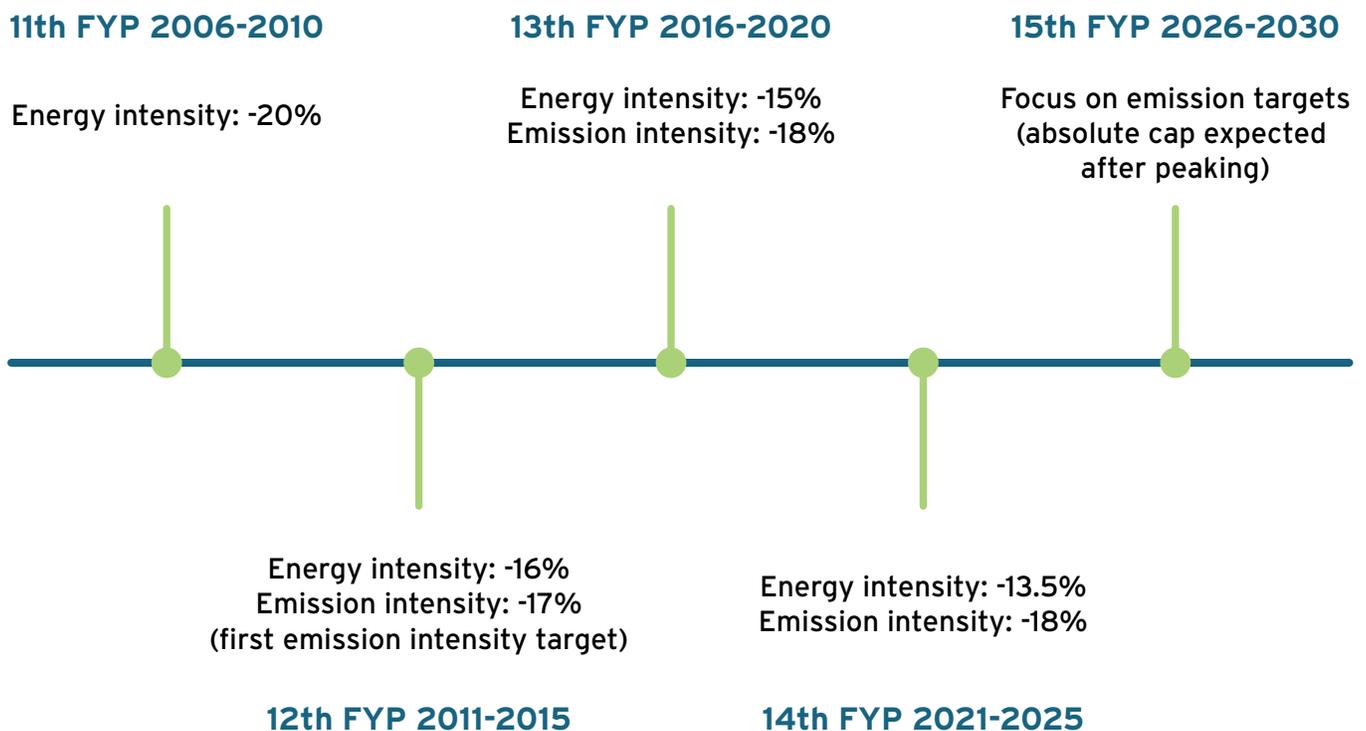
## Key Messages

- China has entered its emissions peaking stage, shifting the policy priorities **from limiting emissions growth to post-peaking reductions**. The transition from the dual energy (energy intensity and energy consumption) control to the dual carbon (carbon intensity and carbon emissions level) control reflects that China is decoupling its emissions growth from energy growth, thanks to the accelerated transition to clean energy.
- **China has steadily reduced energy intensity across past Five-Year Plans (FYPs)**, with different progress across provinces. During the 13th FYP, 22 out of 30 analyzed provinces met their provincial targets of energy intensity (primary energy consumption per unit of GDP) reductions. Shanghai, Guizhou, and Sichuan achieved the largest reduction, by about 33% from 2015 to 2020, compared to the national average of 13.2%.
- **China has also made progress in reducing emission intensity during previous FYPs, but progress has slowed in meeting the 14th FYP target**. Our analysis shows that over half of the analyzed provinces met their targets for the 13th FYP, but less than half are on track to meet the 14th FYP targets.
- Across provinces, **energy and emission intensities were largely aligned in the past, but started to decouple in some provinces due to the rapid expansion of renewables and other clean technologies**. Guangxi, Chongqing, Beijing, Hainan, Qinghai, and Sichuan have decreased energy CO<sub>2</sub> emissions with increasing energy consumption during the 13th FYP. With continued energy transition, we expect to see expanded and accelerated decoupling across provinces.
- While energy and emissions continue to decouple, policy measures that focus on **energy efficiency improvements and demand management remain critical from a system-wide perspective**, for example, by reducing the scale of the energy system and lowering the pressure of rapid transition of energy supply.
- Due to different energy and economic structures, provinces are at different stages of the energy transition and thus **require tailored targets and strategies**. **Cross-provincial coordination and knowledge sharing** will accelerate learning and support a more efficient, nationwide decarbonization process.
- While the announced national 15th FYP targets remain intensity-based, **total emissions targets** will be implemented to support meaningful reductions for China's post-peaking phase. Focusing on absolute emission levels, rather than relative to GDP growth, reduces uncertainty and increases transparency for national and provincial targets to accelerate the transition.

## Introduction

China is entering its emissions peaking stage, as recent estimates suggest emissions may be declining. In the first quarter (Q1) of 2025, China's CO<sub>2</sub> emissions declined by 1.6% compared to Q1 of 2024.<sup>1</sup> Emissions have dropped in the past, but for the first time, this reduction was primarily driven by the expansion of renewable energy, rather than by an economic slowdown. This declining trend continued through the year, reaching a decline of 0.3% as a whole year by the end of 2025.<sup>2</sup> China is entering a new phase of the energy transition where growing energy demand does not necessarily result in emission growth, due to increasing deployment of renewables and other clean technologies.

With this transition, China is shifting its policy focus from energy to emissions control (see Figure 1). Every five years, the central government develops a national Five-Year Plan (FYP) with detailed economic development guidelines, which subnational governments use to develop their own provincial FYPs. These FYPs are a key tool for climate governance in China, and have previously focused on energy intensity reduction (see Figure 1). In the 15th FYP (2026–2030), emission intensity is prioritized before emissions peaking is achieved. Once carbon peaking is achieved, the system will shift to prioritize absolute emissions control, with intensity control becoming secondary.<sup>3</sup> This policy shift indicates China's transition from a fossil-centered energy system and the decoupling of energy consumption from emissions. Such evolution in climate governance will help set the stage for China's carbon neutrality goal by explicitly targeting emissions reduction.



**Figure 1. China's Five-Year Plans: National energy and emission intensity reduction targets.**

Provinces will play a critical role as the implementers of China's dual carbon control mechanism in the 15th FYP and in helping China achieve long-term national climate goals. In response to the national 15th FYP recommendations from the central government in October 2025, 30 provincial governments

have put “dual carbon control” in their recommendations for provincial 15th FYPs as of February 2026.<sup>4</sup> However, provinces vary significantly, with different levels of economic growth, industrial structures, and energy supply and consumption patterns.<sup>5</sup> Literature has examined energy intensity or carbon intensity across provinces,<sup>6</sup> analyzing the regional differences<sup>7</sup> and influential factors along the intensity reduction. Differences in provincial decarbonization pathways reflect the varied stages of China’s transition, representing not only the current but also potential future trajectories for the country as a whole. Examining progress under prior FYPs can identify some of these regional differences and inform strategies at both provincial and national level under future FYPs.

This study examines provincial trends in energy and emission intensity during the 13th FYP period (2016–2020), and emission intensity and absolute emission trends in the 14th FYP period (2021–2025) through 2023 to: 1) evaluate provincial progress in meeting energy and emission intensity targets, 2) identify underlying provincial differences in factors that contribute to energy and emission intensity reduction, and 3) examine factors that may influence performance under the new emissions control framework. By jointly assessing and comparing provincial trends in energy and emissions intensities, this analysis helps identify underlying drivers across different policy frameworks and strategies for supporting provinces, and China as a whole, to achieve emissions reductions during post-peaking.

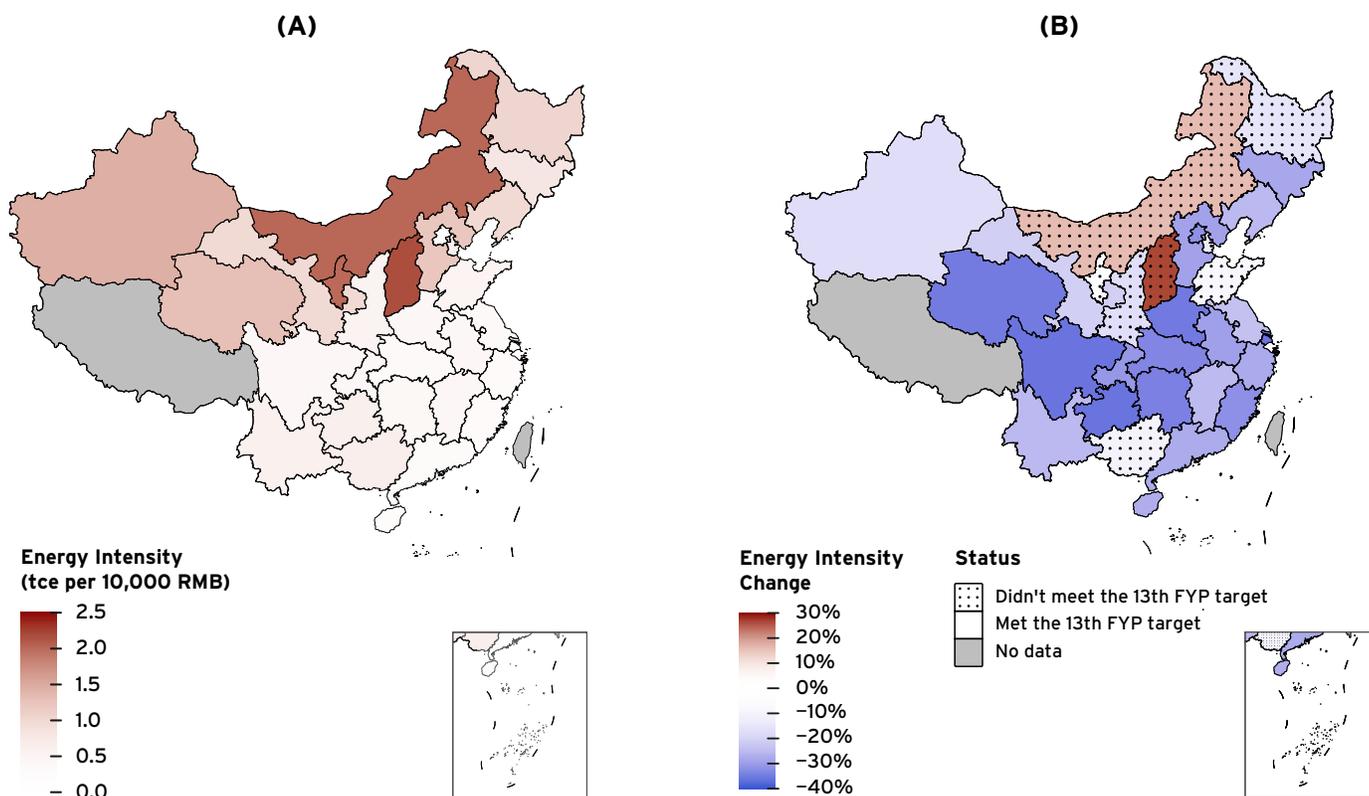
## Data and Methods

This analysis collected and processed emission and energy data from 2015 to 2022 from the Carbon Emission Accounts and Datasets (CEADs).<sup>9-13</sup> The emission data in 2023 is projected based on the 2022-2023 emission growth from Multi-Resolution Emission Inventory Model for Climate and Air Pollution Research (MEIC).<sup>14-16</sup> In this policy brief, energy intensity is calculated as the total primary energy consumption (average efficiency) per unit of GDP,<sup>17</sup> the emission intensity is calculated as the energy CO<sub>2</sub> emissions per unit of GDP.<sup>18</sup> GDP data from 2015 to 2023 is collected and processed from the National Bureau of Statistics (NBS).<sup>19</sup> Differences may arise between the results presented in this analysis and the official evaluation reported in the FYP work reports (see Table S1). Such discrepancies are primarily due to the use of different data sources and accounting methodologies for evaluating provincial energy and emission intensity.

## Tracking Progress During the 13th FYP (2016-2020)

### *Energy Intensity*

In general, China has reduced energy intensity under the 13th FYP, with different progress across provinces. At the national level, China’s energy intensity was reduced by 13.2% from 2015 to 2020.<sup>20</sup> At the subnational level, 22 of the 30 analyzed provinces met their provincial targets, among which Shanghai, Guizhou, and Sichuan had the highest energy intensity reduction at 33%.<sup>9-13</sup> Beijing had the lowest energy intensity, while Shanxi had the highest (see Figure 2(A)). Most provincial targets were equal to or exceeded the national target, except for in the northwestern and southwestern provinces, which have a relatively lower energy efficiency level<sup>21</sup> compared with the national average.



**Figure 2. Energy intensity level by province in 2020 and change in provincial energy intensity from 2015 to 2020.** Map (A) shows the absolute energy intensity (tce per 10,000 RMB) by province in 2020. Map (B) shows the energy intensity change by province from 2015 to 2020. Provinces with dots did not achieve their provincial 13th FYP energy intensity targets (or against the national target if provincial targets are not specified). Energy intensity is calculated based on methodology in Data and Methods and may differ from official claims. No data for Tibet, Taiwan, Hong Kong SAR, and Macau SAR.

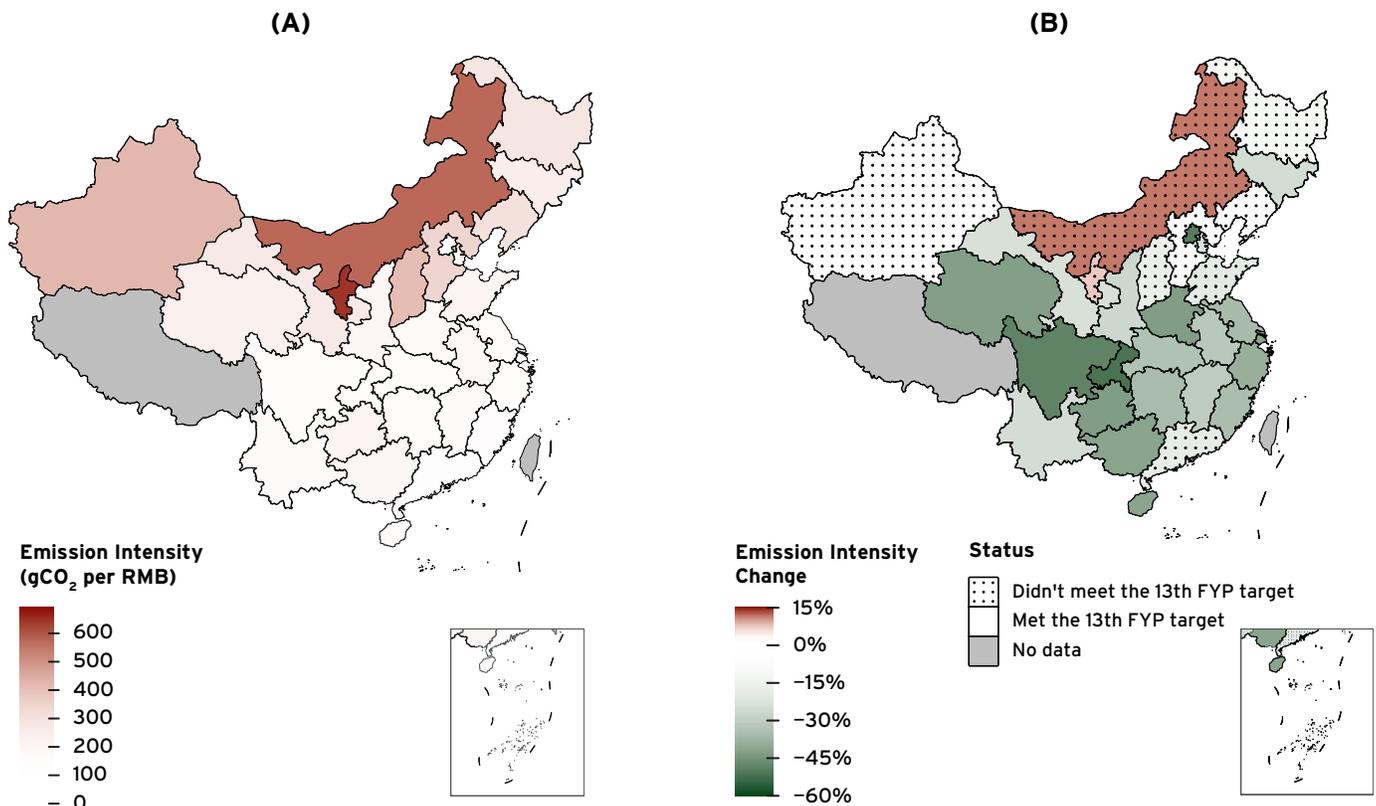
Provinces that didn't meet their 13th FYP target in 2020 largely had increasing energy consumption and/or slow GDP growth. These provinces are mostly in the northern part of China and typically have energy-intensive industrial structures and high seasonal demand, and had rapid growth in primary energy consumption over the time period evaluated. Primary energy consumption increased in some of these provinces because of rising industrial demand, especially in energy-intensive sectors such as coal mining and seasonal heating needs in winters.<sup>22</sup> Over half of these provinces were also experiencing relatively slow GDP growth. For some provinces, such as Shanxi and Inner Mongolia, instead of energy intensity decreasing, it increased from 2015 to 2020 as their slow GDP growth failed to offset their rapid energy consumption (see Figure 2(B)).

However, failing to meet the energy intensity targets does not necessarily mean lagging behind in decarbonization. One of the challenges with the energy intensity target is that it doesn't consider energy mix, as it only measures total primary energy per unit of GDP. Some provinces that failed to meet the energy intensity target had significant growth in key sectors for decarbonization, such as renewable energy deployment. Guangxi is an example, which, despite not meeting its energy intensity target, achieved a non-fossil share of 26% in its primary energy mix by 2020,<sup>23</sup> significantly

exceeding the national target at 15.9%.<sup>24</sup> Guangxi's energy CO<sub>2</sub> emissions fell by 2% during the 13th FYP period while most provinces experienced an increase. The main driver of this reduction was the power sector, as emissions were reduced by 17%, offsetting the emission increase in the industry sector. Similarly, energy CO<sub>2</sub> emissions and energy consumption started to decouple in Chongqing, Beijing, Hainan, Qinghai, and Sichuan during the 13th FYP period. This suggests that energy intensity may not be an effective metric for evaluating emission reduction, especially for provinces that are further along in energy transition.

### Emission Intensity

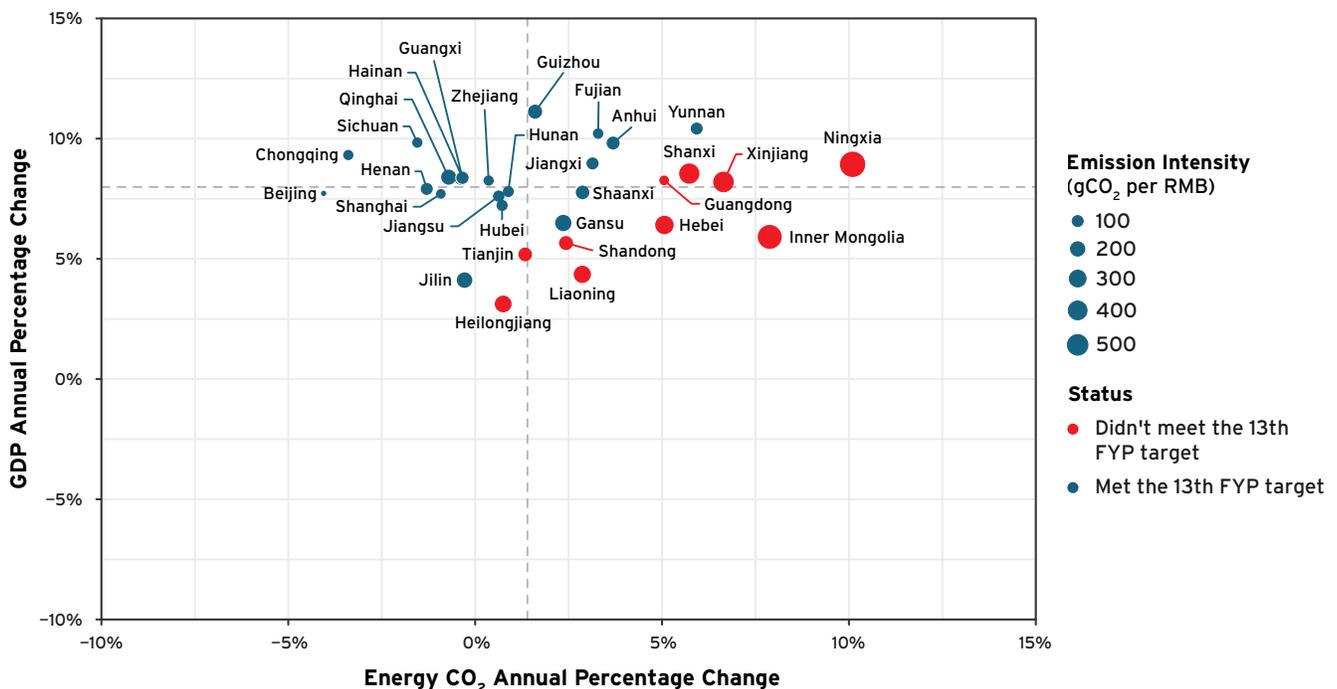
Under the 13th FYP, China has also made progress in emission intensity reduction. At the national level, China's emission intensity was reduced by 18.8% from 2015 to 2020, slightly exceeding the national 13th FYP target (of 18% reduction).<sup>25</sup> At the subnational level, over half of the analyzed provinces met their provincial targets. Chongqing, Beijing, and Sichuan had the largest emission intensity reduction ranging from 42-46% compared to the 2015 level.<sup>9-13</sup> By 2020, Beijing (as with energy intensity), had the lowest absolute emission intensity while Ningxia had the highest (see Figure 3(A)). Most of the provinces set targets that were more ambitious or the same as the national target, while Guangxi, Hainan, and Gansu, Qinghai, and Xinjiang set a lower target. All provinces had a target of at least 12% (see Table S1).



**Figure 3. Emission intensity in 2020 and emission intensity change from 2015 to 2020.** Map (A) shows the absolute emission intensity (gCO<sub>2</sub> per RMB) by province in 2020. Map (B) shows the emission intensity change by province from 2015 to 2020. Provinces with dots did not achieve their provincial 13th FYP targets (or against the national 13th FYP targets if provincial targets are not

specified). See Table S1 for detailed target level. Emission intensity is calculated based on methodology in Data and Methods and may differ from official claims. No data for Tibet, Taiwan, Hong Kong SAR, and Macau SAR.

Many of the provinces that did not achieve their targets had low GDP growth and/or increasing energy emissions (see Figure 4), similar to energy intensity. Shandong, Liaoning, Hebei, and Inner Mongolia had both low economic growth and high emission growth, indicating the need for integrated strategies that address both economic revitalization and emissions control. Provinces such as Tianjin and Heilongjiang maintained relatively low energy emissions growth but still fell short of emission intensity targets, underscoring the impact of GDP growth on intensity target success. Meanwhile, some provinces with high energy emissions growth, such as Shanxi, Xinjiang, and Ningxia, need to prioritize decarbonizing their energy system as energy emissions grew even faster than primary energy consumption in the 13th FYP.

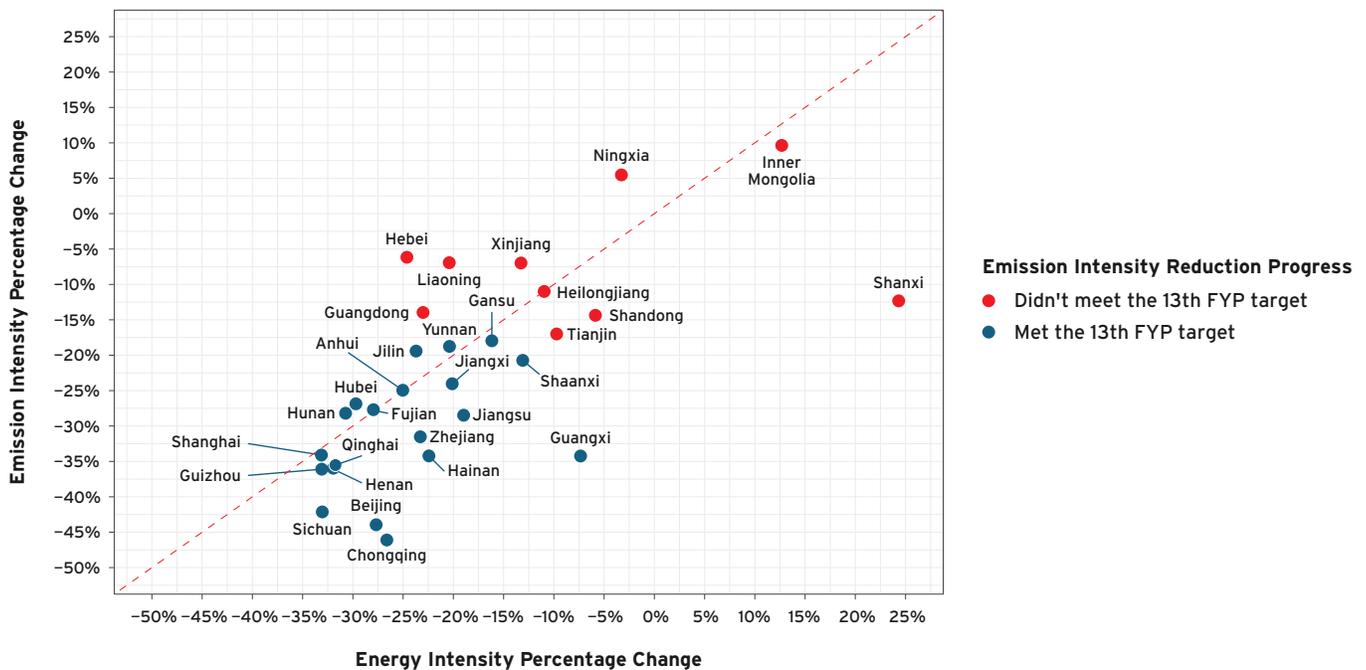


**Figure 4. The annual percentage change of GDP and energy CO<sub>2</sub> in 2020 compared to the 2015 level.** The size of the dots represent the volume of absolute emission intensity (gCO<sub>2</sub> / RMB) by province in 2020. The dashed lines are national annual percentage change of GDP and Energy CO<sub>2</sub> respectively. Provinces with red dots did not achieve their provincial 13th FYP targets (or national 13th FYP targets if provincial targets are not specified). See Table S1 for detailed target level. Emission intensity is calculated based on methodology in Data and Methods and may differ from official claims.

### Relation Between Energy and Emission Intensity

Emission intensity reduction in the 13th FYP mostly aligned with energy intensity patterns. The provinces that achieved the greatest reductions in energy intensity also recorded the largest declines in emission intensity, vice versa (see Figure 5). However, in some provinces energy intensity and emissions intensity trends differed.

The stage of energy system decarbonization plays an important role in the achievement of emissions intensity targets. Provinces such as Liaoning, Ningxia, Xinjiang, and Hebei met their 13th FYP energy intensity targets but did not achieve their emission intensity targets, likely due to limited decarbonization on the demand side (see Figure 5). Their non-fossil share of primary energy was lower than most other provinces, highlighting that reductions in emission intensity require shifts toward cleaner energy sources. In Shanxi, emission intensity decreased while energy intensity increased over the period, likely from coal-sector consolidation and power-plant retrofit efforts, echoing the importance of decarbonizing the power sector for achieving emission intensity reductions for most provinces.<sup>26</sup> Guangdong also failed to meet the emission intensity target while achieving its energy intensity target. In 2020, 28% and 48% of the electricity demand in Guangdong was met by external imports, and fossil fuels from local power plants respectively.<sup>27</sup> The low renewable penetration in the local power supply system led to continued emission growth despite its non-fossil share in primary energy consumption being above national level. Additionally, provinces with high GDP levels that are plateauing, such as Guangdong,<sup>28</sup> will require enhanced actions to reduce emissions intensity (see Figure 4).



**Figure 5. The percentage change of emission intensity and energy intensity from 2015 to 2020.** Under the red dashed line, provinces have reduced emission intensity more than energy intensity. Provinces with red dots did not achieve their provincial 13th FYP targets (or national 13th FYP targets if provincial targets are not specified). See Table S1 for detailed target level. Emission intensity is calculated based on methodology in Data and Methods, and may differ from official claims.

## Recent Developments Under the 14th FYP (2021-2025)

Emissions data analyzed suggests that provinces may not be on track to meet their targets. By 2023, 26 out of the 30 analyzed provinces had not met their 14th FYP emission intensity targets based on the datasets used in this analysis (see Figure 6 and Table S2). Among the 26 provinces evaluated, 16

are not likely to meet the provincial 14th FYP emission intensity target if their emission trend from 2021 to 2023 continues through 2025. This aligns with other research indicating that China may fall short of reaching the national 14th FYP target for emission intensity by 2025.<sup>2</sup>

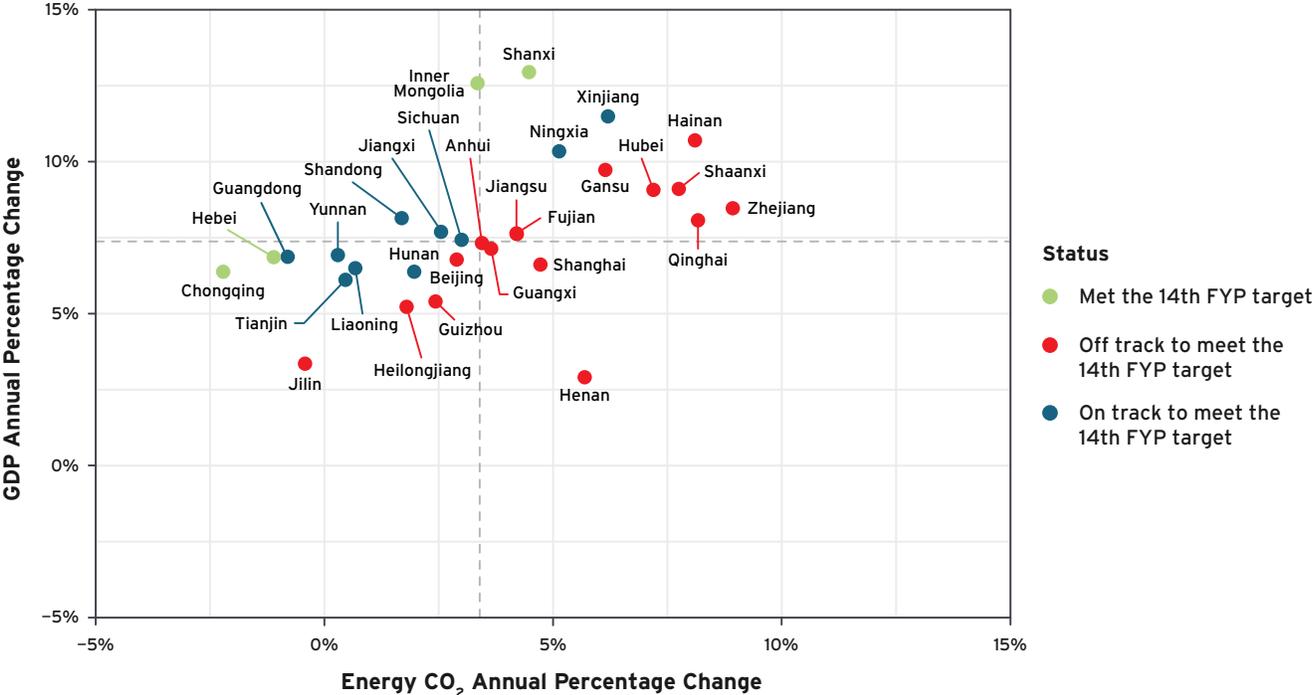


**Figure 6. Emission intensity trend by province from 2015 to 2025.** This figure arranges plots by the relative location of the analyzed provinces. The solid lines are indexed emission intensity trends from 2015 to 2023, with 2015 emission intensity as the baseline value in each provincial plot. The dashed lines are the indexed emission intensity from 2024 to 2025, which is the projected trend following the 14th FYP trend from 2021 to 2023. Emissions data in 2023 is projected based on the 2022-2023 emission growth from MEIC. The dotted horizontal and vertical lines in each province plot represent the target 2025 emission intensity in the 14th FYP. Provinces that reached the target by 2023 are defined as “have met the 14th FYP target.” Provinces whose projected 2025 emission intensity level is lower than target are defined as “on track to meet the 14th FYP target.” Otherwise, provinces are defined as “off track to meet the 14th FYP target.” Emission intensity is calculated based on methodology in Data and Methods and may differ from official claims.

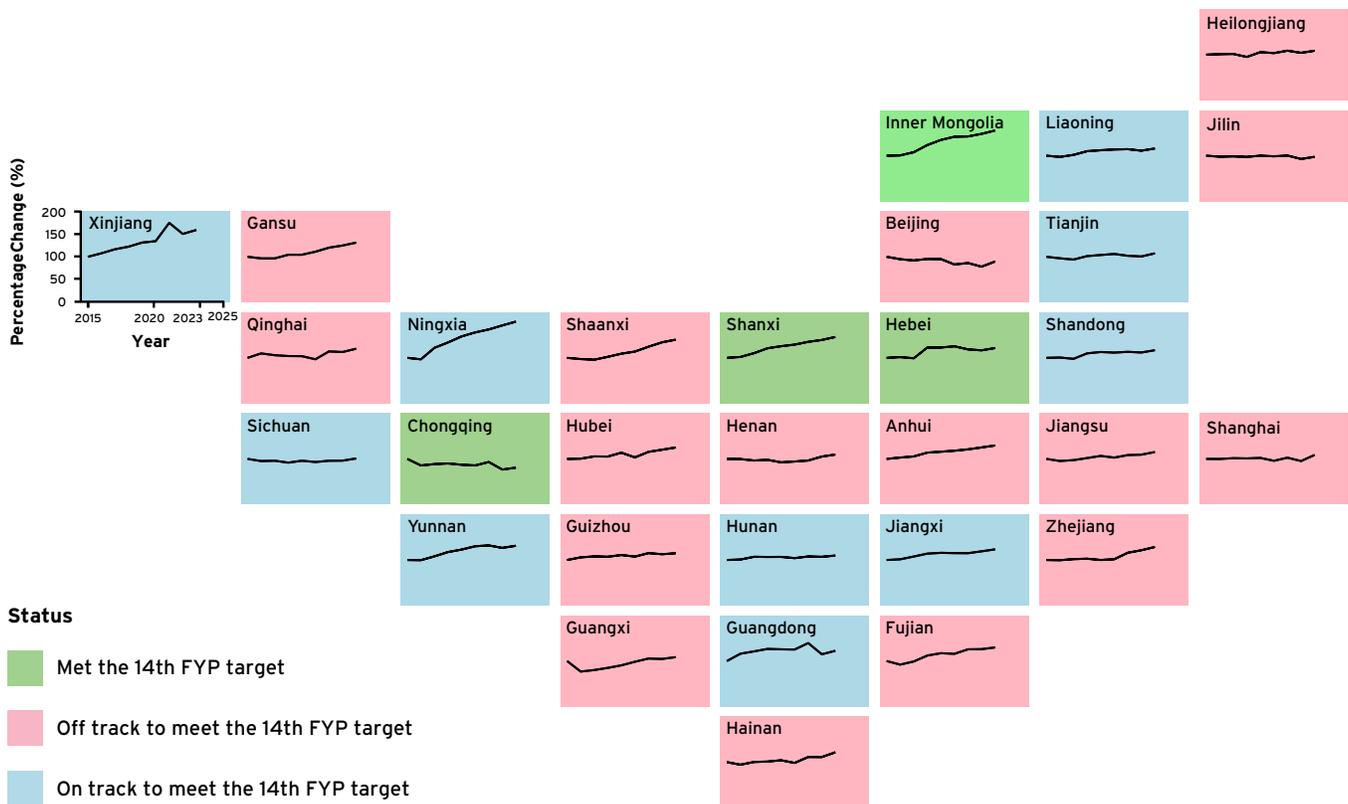
In the 14th FYP period, GDP is a key factor in emission intensity reduction in most provinces (see Figure 7). Provinces on track to meet or have met targets either offset high emissions growth with high GDP growth (Shanxi, Inner Mongolia) or have low emissions growth/decline with moderate GDP growth (Hebei, Beijing). Provinces where GDP growth does not exceed emission growth are not likely to meet the emission intensity target (Hainan, Shanghai).

Additionally, most provinces have increasing emissions in the 14th FYP, reflecting the limitations of emission intensity targets. Energy CO<sub>2</sub> emissions increased in most provinces between 2020 and 2023 (see Figure 8). Only three out of the 30 analyzed provinces - Chongqing, Hebei, and Guangdong - manage to reduce absolute energy emissions, and are on track or have already met their target (see Figure 7 and 8). As China advances toward its emission peaking stage (see Figure 8), introducing absolute emission targets at both the national and provincial level will be essential. Such targets help ensure that emission control is achieved independently from economic fluctuations and provide a more direct metric for managing real emission outcomes.

Provinces may want to adjust how targets are set, given the number of provinces that are off track to reach their 14th FYP targets. In contrast to the 13th FYP, most provinces did not establish specific provincial emission intensity targets for the 14th FYP period (2021-2025), instead aligning with the national goal of 18% reduction by 2025. Uniformed targets across provinces can signal a commitment to climate actions but can also discourage subnational actors from fully pursuing the target if viewed as infeasible. At the same time, setting up less ambitious targets does not necessarily mean a less significant reduction outcome. Gansu, Guangxi, Hainan, and Qinghai set emission intensity reduction targets lower than the national target under the 13th FYP. However, they all managed to meet or exceed the national reduction level by the end of the 13th FYP period (see Table S1).



**Figure 7. The annual percentage change of GDP and energy CO<sub>2</sub> from 2020 to 2023.** The dashed lines are provincial median annual percentage change of GDP and Energy CO<sub>2</sub> respectively. Provinces that have reached the target by 2023 are defined as “have met the 14th FYP target.” Provinces whose projected 2025 emission intensity level is lower than target are defined as “on track to meet the 14th FYP target.” Otherwise, provinces are defined as “off track to meet the 14th FYP target.” Emission intensity is calculated based on methodology in Data and Methods and may differ from official claims. 2025 emission intensity is projected based on the annual change rate from 2021 to 2023.



**Figure 8. Total emissions trend by province from 2015 to 2023.** This figure arranges plots by the relative location of the analyzed provinces. The lines are indexed emission trends from 2015 to 2023, where 2015 emission is the baseline value in each provincial plot. Provinces that have reached the target by 2023 are defined as “have met the 14th FYP target.” Provinces whose projected 2025 emission intensity level is lower than target are defined as “on track to meet the 14th FYP target.” Otherwise, provinces are defined as “off track to meet the 14th FYP target.” Emission intensity is calculated based on methodology in Data and Methods and may differ from official claims.

## Entering the 15th FYP (2026-2030)

As China enters its peaking period, this transitional moment is critical for shifting from an energy-focused and GDP intensity framework to one centered on emission control. Both national and provincial governments are actively engaged in formulating the action plans to introduce dual carbon control. Provincial energy and emission trends vary as they are at different stages of decarbonization, reflecting China’s present and future transition pathways. Evaluating these trends can help to inform national strategy setting in the upcoming era.

While energy and emissions started to decouple in some provinces, reducing energy demand is still critical for emissions control, especially for provinces in early stages of energy transition. In most cases, emissions reduction is still driven by lowering energy consumption levels (see Figure 5). Energy efficiency is especially critical for northern provinces that still have difficulty meeting their energy intensity targets. Key actions include accelerating industrial and building electrification with high-efficiency equipment, tightening efficiency standards, and deploying digital energy

management systems.<sup>29</sup> The electrification in the industrial and building sector can also facilitate decarbonization in regions dominated by energy-intensive and emission-intensive industries. Demand-side management, such as time-of-use pricing and virtual power plants, can shift consumption away from peaks and reduce the need for new capacity.<sup>30</sup> Allowing efficiency and load flexibility in power markets can drive demand reduction and decarbonization. Power sector reforms will be a synergy among the central and provincial government, private sector, and financial sector. National agencies set the regulatory framework and market rules, while provincial governments implement pilot markets and adapt policies to local conditions. Grid and renewable facility providers are supported by financial institutions that fund the efficiency retrofits as a revenue-generating resource.

Expanding clean energy deployment through policies at both the national and provincial level is needed to reduce emissions from remaining energy uses. Provinces such as Guangxi demonstrate that rapid renewable deployment can decouple energy consumption from emissions (see Figure 5). This pattern is expected to characterize China's broader decarbonization trajectory in the future. The new dual emission control highlights the importance of renewable energy expansion along China's carbon neutrality pathway and eases the previous pressure of strict energy consumption caps. Under this framework, energy use can continue to rise but is supported by low-carbon power sources such as solar and wind. Meanwhile, renewable expansion introduces challenges, including regional differences in resource endowment and grid reliability. Coal-dependent areas like Shanxi face greater structural challenges in diversifying their energy mix.<sup>31</sup> Moreover, large-scale renewable integration will require substantial investment in energy storage, grid modernization, and interregional transmission, balancing supply variability and ensuring stable power delivery.<sup>32</sup> Expanding clean energy and its supporting infrastructure can not only accelerate decarbonization but also drive economic development by opening up new avenues for investment, which can also help ease the pressure of meeting emission intensity targets. In this case, at both national and provincial levels, more detailed and measurable targets such as renewables and storage buildout, and advancing renewable integration to power grids will be benchmarks to evaluate China's progress and next steps in decarbonization.

In the 15th FYP period, it will be increasingly important to develop overall total emission control strategies through pilot cases and coordination. While the announced national 15th FYP targets remain intensity-based, the policy focus shift from emission intensity to total emission control is possible since China is going to reach at least a plateau stage in emissions (see Figure 8). Additionally, as China for the first time included the economy-wide greenhouse gas (GHG) reduction target in its 2035 NDC,<sup>33</sup> implementing absolute emission targets in the FYPs and at the provincial level will help achieve national goals. Focusing on absolute emission levels, rather than relative to GDP growth, increases transparency for national and provincial targets, helping to accelerate the transition. Provinces such as Shanxi and Xinjiang will face difficulties as their emission intensity reduction has relied on their GDP growth instead of absolute emission reduction. It is important for them to develop a low-emission economy under tailored sectoral transition plans. As policy focus shifts to total emission control, provinces such as Hebei and Chongqing that already have low-carbon economic development (see Figure S1) could serve as pilot regions, offering valuable experience and best practices as China approaches its national carbon peak and prioritizes total emissions control. The central government can play a leading role in facilitating this process by encouraging provinces that are further along in the energy transition to assist others in designing viable implementation strategies and knowledge sharing.

Overall, the diverse provincial contexts suggest tailored and attainable provincial targets both for emission intensity and absolute emission control. In provinces like Jilin and Heilongjiang, where GDP growth remains below the national median (see Figure 4), lower intensity targets can help avoid undue pressure arising from slower economic expansion. For provinces and regions with already low absolute emission intensity, such as Guangdong (see Figure 4), reducing absolute emissions will be their provincial priority before the policy transition at the national level. When China transitions national priority to absolute emission control after the peaking, differentiated provincial targets remain important because provincial capacity to reduce emissions varies. In the 14th FYP, only four out of 30 analyzed provinces managed to reduce their absolute emissions by 2023 (see Figure 8). Moreover, it is essential that both provincial and national targets are grounded in socioeconomic contexts, accurately reflecting China's progress in decarbonization. The current 14th FYP uses 2020 as the baseline year, a period marked by unusually low emissions due to the pandemic, which risks distorting the evaluation and may be impacting whether provinces achieve the target.

## Conclusion

China is entering a critical phase in its climate transition. China's emissions are likely peaking, and in several provinces, emissions are now beginning to decouple from energy consumption as the clean energy transition expands. Climate governance is now shifting from an energy-focused framework toward one centered on emission intensity and, ultimately, total emissions control. Evaluating provincial trends in energy intensity, emission intensity, and total emissions provides not only a glimpse into where each province stands in the transition, but also a roadmap for provincial and national policy design under this evolving governance structure.

Provincial performance in emission intensity reduction, which serves as the main metric in the 15th FYP, can continue benefiting from energy management and further decoupling of energy consumption and emissions through renewable expansion. Preparing for total emissions control is essential to ensure meaningful reductions for 2035 NDC targets through accelerated provincial actions in China's post-peaking era. To secure China's climate commitment and economic development, it is important to maintain economic development throughout decarbonization by more low-carbon economy strategies.

Provinces are progressing through the energy transition at different speeds, shaped by economic structure, resource endowment, industrial composition, and development stage, and require varied and adaptive approaches for policy setting. Differentiated and adaptive provincial targets, balancing ambition with feasibility, can enhance effectiveness and equity. Cross-provincial coordination and knowledge sharing will be vital for scaling successful strategies and accelerating learning.

Together, these insights underscore a key message that China's transition toward an emissions-focused governance framework marks a pivotal evolution in national and provincial climate strategy, and its success will depend on targeted provincial action, flexible policy design, and coordinated national leadership.

## Appendix

**Table S1. Emission intensity by province in 2020, the reduction rate compared to the 2015 level from this policy brief analysis and official reports, and the provincial targets for emission intensity reduction.** Provinces that didn't meet the provincial emission intensity reduction target in the 13th FYP are colored in red.

Province	Emission intensity (gCO <sub>2</sub> / RMB)	Change in Emission intensity (2015-2020)*	Official claims of change in emission intensity (2015-2020)	Target provincial emission intensity reduction (2015-2020)
Anhui	98.5	-25%	-22.07% <sup>34</sup>	-18%
Beijing	21.1	-44%	>-26% <sup>35</sup>	-20.5%
Chongqing	53.5	-46%	-21.88% <sup>36</sup>	-19.5%
Fujian	56.1	-28%	about -20% <sup>37</sup>	-19.5%
Gansu	180.8	-18%	-28% <sup>38</sup>	-17%
Guangdong	46.3	-14%	-22.35% <sup>39</sup>	-20.5%
Guangxi	105.2	-34%	NA	-17%
Guizhou	124.0	-36%	NA	-18%
Hainan	62.7	-34%	-24% (2015-2019) <sup>40</sup>	-12%
Hebei	251.4	-6%	>-25% <sup>41</sup>	-20.5%
Heilongjiang	195.2	-11%	-20.50% <sup>42</sup>	-18%
Henan	81.0	-36%	-28% <sup>43</sup>	-19.5%
Hubei	66.4	-27%	-24.47% <sup>44</sup>	-19.5%
Hunan	64.2	-28%	-19.80% <sup>45</sup>	-18%
Inner Mongolia	480.5	10%	13.86% <sup>46</sup>	-17%
Jiangsu	71.0	-28%	-24% <sup>47</sup>	-18%

Province	Emission intensity (gCO <sub>2</sub> / RMB)	Change in Emission intensity (2015-2020)*	Official claims of change in emission intensity (2015-2020)	Target provincial emission intensity reduction (2015-2020)
Jiangxi	82.7	-24%	-22.25% <sup>48</sup>	-19.5%
Jilin	158.9	-19%	-25.24% <sup>49</sup>	-18%
Liaoning	211.2	-7%	-11.62% (2015-2019) <sup>50</sup>	-18%
Ningxia	554.9	5%	-14.75% (2015-2019) <sup>51</sup>	-17%
Qinghai	147.5	-36%	-43% <sup>52</sup>	-12%
Shaanxi	111.5	-21%	-20.8% (2015-2019) <sup>53</sup>	-18%
Shandong	120.8	-14%	>-22.7% <sup>54</sup>	-20.5%
Shanghai	45.9	-34%	NA	-20.5%
Shanxi	317.9	-12%	NA	-18%
Sichuan	53.8	-42%	-29.90% <sup>55</sup>	-19.5%
Tianjin	114.3	-17%	-23% <sup>56</sup>	-20.5%
Xinjiang	329.8	-7%	NA	-12%
Yunnan	80.6	-19%	-24.72% <sup>57</sup>	-18%
Zhejiang	53.9	-32%	18.45% (2015-2019) <sup>58</sup>	-18%

\* Calculated based on methodology in Data and Methods. Results can differ from official claims due to different data sources and accounting approaches.

**Table S2. Emission intensity change from 2015 to 2023, target change from 2015 to 2025, and the provincial 14th FYP target for emission intensity reduction.** The target emission intensity change from 2015 to 2025 is calculated based on the emission intensity change from 2015 to 2020 and the provincial 14th FYP target. Provinces that haven't met the 14th FYP target for emission intensity reduction by 2023 are colored in red.

Province	Change in Emission Intensity (2015-2023)*	Target Change in Emission Intensity (compared to 2015 level)	14th FYP Target (compared to 2020 level)
Anhui	-33%	-38%	-18%
Beijing	-50%	-54%	-18%
Chongqing	-58%	-56%	-18%
Fujian	-34%	-41%	-18%
Gansu	-26%	-33%	-18%
Guangdong	-31%	-32%	-20.5%
Guangxi	-40%	-46%	-18%
Guizhou	-41%	-48%	-18%
Hainan	-39%	-49%	-23%
Hebei	-26%	-23%	-18%
Heilongjiang	-19%	-27%	-18%
Henan	-31%	-48%	-19.5%
Hubei	-31%	-40%	-18%
Hunan	-37%	-41%	-18%
Inner Mongolia	-15%	-10%	-18%
Jiangsu	-35%	-41%	-18%
Jiangxi	-34%	-39%	-19.5%

Province	Change in Emission Intensity (2015-2023)*	Target Change in Emission Intensity (compared to 2015 level)	14th FYP Target (compared to 2020 level)
Jilin	-28%	-34%	-18%
Liaoning	-21%	-24%	-18%
Ningxia	-9%	-14%	-18%
Qinghai	-35%	-47%	-18%
Shaanxi	-24%	-35%	-18%
Shandong	-29%	-30%	-18%
Shanghai	-38%	-46%	-18%
Shanxi	-31%	-28%	-18%
Sichuan	-49%	-53%	-18%
Tianjin	-30%	-32%	-18%
Xinjiang	-20%	-24%	-18%
Yunnan	-33%	-33%	-18%
Zhejiang	-31%	-44%	-18%

\* Calculated based on methodology in Data and Methods. Results can differ from official claims due to different data sources and accounting approaches.

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