**Supplementary Table 6** The proportions of coal consumption in 2010, 2015, 2020 and 2025 of 30 provinces, as well as their proportions predicted using equations.

| Number | Provinces | Wcoal,2010 | Wcoal,2015 | Wcoal,2020 | Wcoal,2025 | Equations | R2 |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Qinghai | 39 | 43 | 33.4 | 32.87\* | y=-2.8x+44.07 | 0.35 |
| 2 | Yunnan | 69.8 | 43 | 38.4 | 26.99\* | y=-29.67lnx+68.12 | 0.94 |
| 3 | Sichuan | 56.17 | 37.9 | 27 | 25 | y=-23.49lnx+55.18 | 0.97 |
| 4 | Guangdong | 44.5 | 40.5 | 33.4 | 30.1 | y=-10.6lnx+45.55 | 0.94 |
| 5 | Gansu | 64.1 | 60 | 52.7 | 46.1 | y=-6.13x+71.05 | 0.99 |
| 6 | Guangxi | 53.8 | 46 | 48.2 | 42.6 | y=-6.96lnx+53.18 | 0.79 |
| 7 | Fujian | 55.4 | 51.8 | 48.3 | 48.2 | y=-5.58lnx+55.36 | 0.96 |
| 8 | Chongqing | 56.2 | 49.1 | 45.8 | 40 | y=-5.19x+60.75 | 0.98 |
| 9 | Zhejiang | 61.3 | 52.4 | 40.1 | 35.1 | y=-19.41lnx+62.65 | 0.97 |
| 10 | Hainan | 39.7 | 33.4 | 32.2 | 31.89\* | y=-1.09lnx+33.4 | 0.47 |
| 11 | Hunan | 64.2 | 59.9 | 46.8 | 39.57\* | y=-8.7x+74.37 | 0.92 |
| 12 | Shanghai | 49.6 | 37 | 31 | 30 | y=-14.74lnx+48.61 | 0.97 |
| 13 | Guizhou | 87 | 74.4 | 68 | 62.74\* | y=-17.39lnx+86.85 | 0.99 |
| 14 | Hubei | 64 | 61.2 | 53.5 | 51 | y=-4.7x+69.1 | 0.96 |
| 15 | Jiangxi | 68 | 68 | 63.9 | 56.9 | y=-3.7x+73.6 | 0.85 |
| 16 | Inner Mongolia | 81.7 | 82.9 | 82 | 74.1 | y=-4.4x+92.87 | 0.83 |
| 17 | Jiangsu | 68.4 | 64.4 | 59.6 | 55.33\* | y=-4.4x+72.93 | 0.99 |
| 18 | Jilin | 74.7 | 73.3 | 60.7 | 59.7 | y=-5.76x+81.5 | 0.86 |
| 19 | Henan | 84 | 76 | 70.8 | 63.73\* | y=-6.6x+90.13 | 0.99 |
| 20 | Shaanxi | 69.2 | 64 | 61.6 | 59.42\* | y=-6.98lnx+69.1 | 0.99 |
| 21 | Anhui | 82.1 | 77.1 | 69.8 | 60 | y=-7.36x+90.65 | 0.98 |
| 22 | Ningxia | 85 | 81.2 | 81.7 | 76 | y=-2.65x+87.6 | 0.85 |
| 23 | Heilongjiang | 68.4 | 69.3 | 65.8 | 60 | y=-4.65x+78.98 | 0.98 |
| 24 | Beijing | 30.3 | 16.8 | 1.5 | 0.9 | y=-19.86lnx+32.54 | 0.96 |
| 25 | Liaoning | 57.4 | 57.4 | 53.7 | 45.7 | y=-3.88x+63.25 | 0.82 |
| 26 | Shandong | 77.7 | 72.6 | 66.8 | 56 | y=-7.09x+86 | 0.97 |
| 27 | Hebei | 89.7 | 85.5 | 78.9 | 73.90\* | y=-5.4x+95.5 | 0.98 |
| 28 | Shanxi | 90.6 | 85.3 | 80.2 | 70.4 | y=-6.57x+98.05 | 0.97 |
| 29 | Tianjin | 70.2 | 40.8 | 34.1 | 28 | y=-30.41lnx+67.44 | 0.96 |
| 30 | Xinjiang | 82.1 | 78.6 | 71.4 | 66.66\* | y=-5.35x+88.06 | 0.96 |

\* The data was not available in 2025, which predicted using Equations.