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China's new growth engine

Inland catching up fast with the wealthier coast

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Economics - China

- Beijing's new policy to send data to less-well-off inland areas for processing should fuel digital growth and connect up regions
- Other new ambitious inter-regional projects include turning more to the Central and Western areas for renewable power
- As the inland catches up with the coast, this could unlock a major new high-quality growth driver for the nation

Jing Liu
Senior Economist, Greater China
The Hongkong and Shanghai Banking Corporation Limited

Shanshan Song
Economist, Greater China
The Hongkong and Shanghai Banking Corporation Limited

Facing mounting headwinds to growth, China is kick-starting mega cross-regional projects to boost less-developed inland Central and Eastern regions and leverage advances in the Eastern region. We believe these infrastructure investments can stabilise the overall economy in the short term. They also lay a foundation for China's long-term transition to high-quality growth that's balanced, inclusive and green.

"Processing Eastern data in the West": This mega-project aims to gather data in the more prosperous cities along China's eastern seaboard and send it to the more spacious computing hubs in the west of the country for processing and storage. Now, data centres are mostly distributed in the more crowded and energy-stretched Eastern regions. This new initiative places four computing hubs in the Western region which is rich in renewable energy and hence greener. Ten national data centre clusters are also planned. The project may drive RMB400bn in investment per year with the construction of computing hubs and data centres, as well as generating new job opportunities.

Mega cross-regional projects to drive inclusive growth: To play to each region's comparative advantage, Beijing is looking to design and promote projects that enable less prosperous regions to catch up. Some progress has been made but the gap is still wide: in GDP per capita terms, Beijing is comparable to Spain, while Gansu in the Western region is similar to Colombia. Such initiatives also fit with the strategy to increase energy, supply chain security, and self-sufficiency.

We look at different scenarios. Even if there is only mild regional equalisation, we find that it would still empower decent nationwide GDP at a 10-year CAGR of 6.4%. This scenario assumes that Eastern provinces grow at 5% per annum, the Central and Western regions reach just 66% and 60% of the Eastern region's GDP per capita by 2030, and the poorest Northeast region share stays put. This powerful story of development is fuelled by infrastructure readiness, regional connectivity and the availability of skilled labour. As the upgrading of manufacturing further sharpens the lead for the coastal provinces, we expect the gradient transfer of production facilities to lower cost areas and tech diffusion inland to support the regional catch-up – in addition to all the favourable policies.

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Leveraging regional development and integration

- China is aiming for balanced, inclusive and green growth
- Mega cross-regional infrastructure projects to pave the way for this
- Better connectivity to help inland regions catch up with coastal areas

One of the new buzz word projects is "processing Eastern data in the West"

Inter-regional projects are nothing new, as China has spent decades building "West to East gas pipelines" (西气东输) and developing "South to North water diversion" (南水北调). But what's new are projects like "West to East power transmission" (西电东送) which utilizes the abundant renewable energy resources found inland and "processing Eastern data in the West" (东数西算) which gathers data in the more prosperous cities along China's eastern seaboard and sends it to the more spacious urban centres in the west of the country for processing and storage.

These two new projects are the new buzz words as Beijing redoubles its efforts on greening and digitising the economy. On the first, while "West to East power transmission" has been running for decades, what's new is that electricity is increasingly green. The official tone on developing renewable energy is proactive: "constructing as many (renewable energy bases) as possible, generating as much (green electricity) as possible, and integrating as much (green electricity) as possible to the national power grid".[1] This is from a document by the National Development and Reform Commission (NDRC) and National Energy Administration (NEA) which gives instructions to accelerate construction of major wind power and photovoltaic bases in sandy areas, rocky areas and deserts, and remove administrative, financial, regional and other obstacles to ensure maximised "green" electricity production. Already, a massive renewable energy base is under construction in the West. State Grid recently announced its plan to launch 38 ultra-high voltage transmission lines with a total of RMB380bn new investment during the 14th Five-year Plan (*China Power T&D Equipment: State Grid's UHV plan beats our expectation*, 12 January). More green infrastructure projects are set to come.

On the second project, "processing Eastern data in the West", this is only just starting to pick up steam and is the central pillar for China's digital economy ambitions. The NDRC together with several government agencies approved the mega-project which involves constructing eight national computing hubs and 10 national data centre clusters (*China Daily*, 18 February). The eight computing hubs are to be distributed across the country, in the Beijing-Tianjin-Hebei region, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area, the Chengdu-Chongqing economic circle, the Inner Mongolia autonomous region, Guizhou province, Gansu province and the Ningxia Hui autonomous region. Hubs on the East will focus on computing tasks with high latency requirements, such as Internet of Things, Artificial Intelligence, security trading, disaster alerts, tele-doctors, and video-conferencing. The Western hubs will handle

[1]See《国家发展改革委、国家能源局关于完善能源 绿色低碳转型体制机制和政策措施的意见》 https://www.ndrc.gov.cn/xxgk/zcfb/tz/202202/t20220210_1314511.html?code=&state=123.

tasks that don't need ultra-fast retrieval speeds such as data storage and big data processing. The NDRC estimates that the mega-project will lead to more than RMB400bn in new investment each year (*CCTV*, 17 February).

… conducive to China's green and digital ambitions, they also enable regional integration

These two projects should achieve a number of objectives. Firstly, it is highly energy efficient and green to locate some computing hubs near the renewable energy bases in the West. According to HSBC analysts Helen Fang and Kenneth Chin, electricity costs account for 28% of operating expenses of a typical internet data centre (IDC). However, 44% of existing IDCs are in Guangdong, Shanghai, and Beijing where both land and power are scarce (*China Internet Data Centres: Regulated growth in a booming market*, 11 October 2021). Secondly, the nationwide deployment of computing hubs can optimise the use of computing resources, boost the free flow of data and promote the development of the digital economy. The Ministry of Industry and Information Technology envisions the digital economy to top RMB3trn by the end of 2025 at a compound annual growth rate of around 25 percent (*China Daily*, 17 February). Lastly, these initiatives can also drive growth in less developed regions, in line with the common prosperity goal.

In this report, we focus on the coordinated development that can address uneven regional growth and ultimately narrow regional inequality.

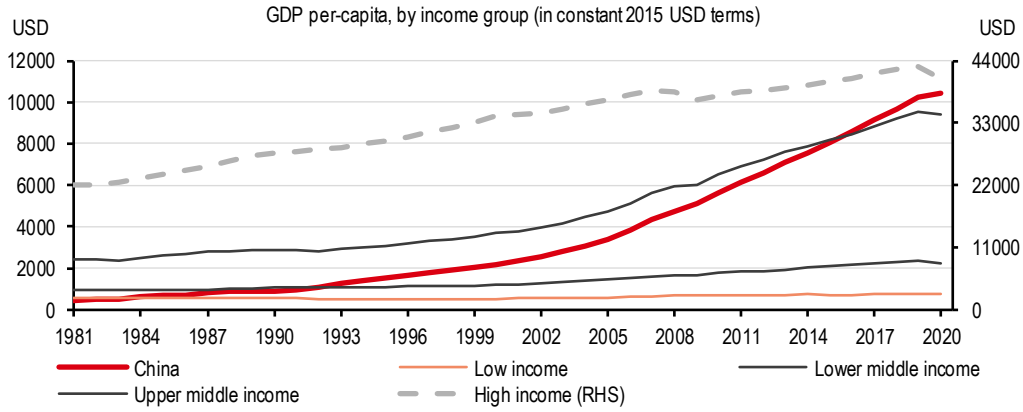
A tale of four regions

Decades of rapid but imbalanced growth

China has had remarkable growth for decades, yet regional imbalances persist

Since the reform and opening up period started in 1978, China has experienced remarkable growth. In terms of GDP per capita, China registered a compound annual growth rate of 8.3% over the past 40 years, enabling it to move quickly from a low income economy into an upper-middle income economy (Chart 1).

Chart 1: Rapid growth over 40 years led China to jump from low to mid-high income group



Source: World Bank

Rapid growth was seen all across the nation, but provinces in the East tend to have higher income than those in Central regions, which in turn lead Western and North-eastern regions (Table 1).[2]

[2] According to the National Bureau of Statistics, the Western region includes Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang; the Central region includes Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan; the Eastern region includes Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; and the North-eastern region includes Liaoning, Jilin, and Helongjiang.

Table 1: Uneven regional growth in China: East has been the richest for decades

	Province	1992	1997	2002	2007	2012	2017	2020	2020 rank
Central	Anhui	🔴	🟠	🟠	🟠	⚪	⚪	⚪	13
	Henan	🔴	🟠	🟠	🟠	⚪	⚪	⚪	18
	Hubei	🔴	🟠	🟠	🟠	⚪	⚪	⚪	9
	Hunan	🔴	🟠	🟠	🟠	⚪	⚪	⚪	14
	Jiangxi	🔴	🔴	🟠	🟠	⚪	⚪	⚪	17
	Shanxi	🔴	🟠	🟠	🟠	⚪	⚪	⚪	26
Eastern	Beijing	🟠	⚪	⚪	⚫	⚫	⚫	⚫	1
	Fujian	🟠	🟠	🟠	⚪	⚪	⚫	⚫	4
	Guangdong	🟠	🟠	⚪	⚪	⚪	⚪	⚫	7
	Hainan	🟠	🟠	🟠	🟠	⚪	⚪	⚪	19
	Hebei	🔴	🟠	🟠	🟠	⚪	⚪	⚪	27
	Jiangsu	🟠	🟠	⚪	⚪	⚪	⚫	⚫	3
	Shandong	🟠	🟠	🟠	⚪	⚪	⚪	⚪	10
	Shanghai	🟠	⚪	⚪	⚫	⚫	⚫	⚫	2
	Tianjin	🟠	🟠	⚪	⚪	⚪	⚫	⚫	5
	Zhejiang	🟠	🟠	⚪	⚪	⚪	⚫	⚫	6
North-Eastern	Heilongjiang	🟠	🟠	🟠	🟠	⚪	⚪	⚪	30
	Jilin	🟠	🟠	🟠	🟠	⚪	⚪	⚪	25
	Liaoning	🟠	🟠	🟠	⚪	⚪	⚪	⚪	15
Western	Chongqing	🔴	🟠	🟠	🟠	⚪	⚪	⚪	8
	Gansu	🔴	🔴	🟠	🟠	🟠	⚪	⚪	31
	Guangxi	🔴	🔴	🟠	🟠	🟠	⚪	⚪	29
	Guizhou	🔴	🔴	🔴	🟠	🟠	⚪	⚪	28
	Inner Mongolia	🔴	🟠	🟠	⚪	⚪	⚪	⚪	11
	Ningxia	🔴	🟠	🟠	🟠	⚪	⚪	⚪	20
	Qinghai	🔴	🟠	🟠	🟠	⚪	⚪	⚪	24
	Shaanxi	🔴	🔴	🟠	🟠	⚪	⚪	⚪	12
	Sichuan	🔴	🟠	🟠	🟠	⚪	⚪	⚪	16
	Tibet	🔴	🔴	🟠	🟠	🟠	⚪	⚪	22
	Xinjiang	🟠	🟠	🟠	🟠	⚪	⚪	⚪	21
	Yunnan	🔴	🟠	🟠	🟠	🟠	⚪	⚪	23

🔴 - Low income; 🟠 - Lower middle class; ⚪ - Upper middle class; ⚫ - High income

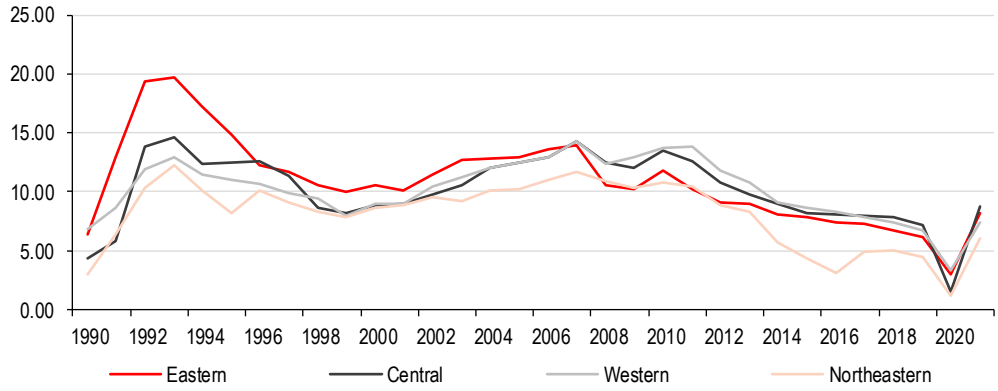
Source: CEIC, World Bank, HSBC

The uneven regional growth has attracted much research interest (e.g., Joshua (2015), World Bank (2013), Zhang and Zhang (2003)) in the past two decades. Findings include:

1. Eastern provinces have been the locomotive of China's economic growth for years. Located along the east coast, the region has benefited most from China's opening up. Exports and FDI have not only brought money, but also led to technology spill-over benefits, enhancements in human capital, and accelerated integration of coastal provinces with global supply chains.

2. Central and Western regions have witnessed faster growth than the Eastern region since 2007, until recently (Chart 2). The reason is the technology and know-how diffusion from the East helped lift productivity. As the Eastern region becomes more developed and costly, some lower value-add manufacturing has been relocated to inland provinces. Provinces with large industrial facilities and skilled labour, thanks to earlier SOE-led industrialisation, have benefitted as multinationals carry out so-called gradient transfer of their production bases from the coastal areas towards inland regions. At the same time, infrastructure development has played an important role. For example, railways extended the reach to lesser-developed western regions and deepened inter-region connectivity and facilitated production factor flows including labour, capital and technology. The commodity price boom resulting from the nationwide construction frenzy has also fuelled growth in the resource-rich Western regions.

Chart 2: Western and Central regions are catching up in the growth rates



Source: Source: CEIC, HSBC

3. North-eastern provinces, however, have transitioned into China's rust belt. Home to traditional heavy industry firms, they lag behind significantly as their traditional economic structure adapts slowly and insufficiently to the economic reforms.

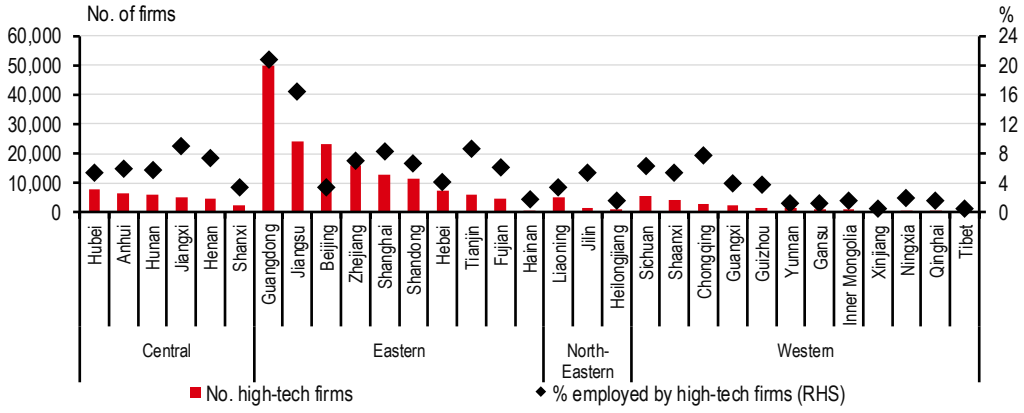
A wide gap still exists …

In GDP per capita terms, Beijing is comparable to Spain, while Gansu is closer to Colombia or Lebanon

Despite the catch-up, in a relative sense, by the Central and Western regions, a wide gap still exists in absolute terms. With less than 20% of China's land area, the Eastern provinces accounted for 51.3% of its GDP and 42.2% of its population in 2020. All seven high-income provincial-level divisions including provinces, municipalities, and autonomous regions (for simplicity, we use "provinces") are in the East. In 2020, GDP per capita in Beijing, the richest, was USD23,747 in constant 2015 USD terms, roughly 4.5x of that of Gansu province in the West (USD5,184), the poorest. In GDP per capita terms, Beijing is comparable to Slovenia and Spain, while Gansu is similar to Colombia and Lebanon.

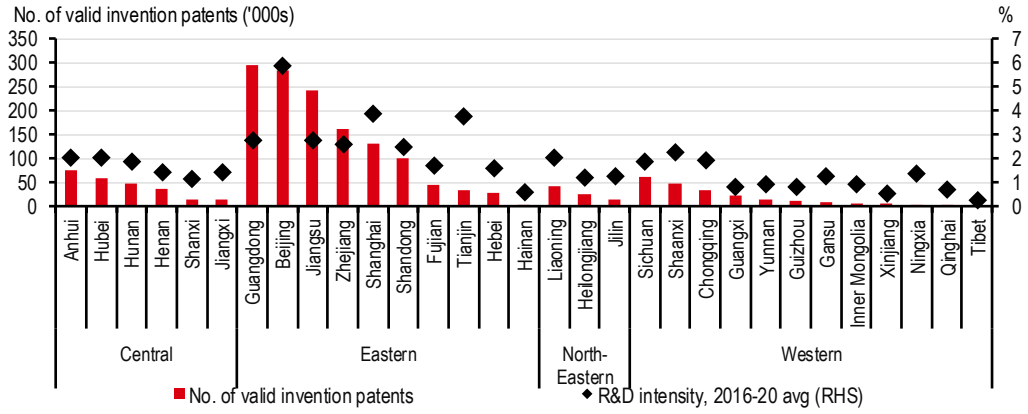
During the pandemic, China's impressive export performance helped the Eastern provinces, the world's manufacturing hub, to beat other regions in terms of growth. Exports are just one factor – China's strategic focus on manufacturing upgrading and tech self-sufficiency has further sharpened the edge of the East. High-tech enterprises, including manufacturers and service firms, are clustered in the East (Chart 3). The Eastern provinces also lead in terms of skilled labours (Chart 3, higher share of employees in high-tech firms) and innovation capabilities (Chart 4, proxied by the valid invention patents). They readily capture the opportunities from policy support and structural changes.

Chart 3: Eastern provinces host over 70% of high-tech firms



Source:Ministry of Science and Technology, HSBC

Chart 4: Easter provinces also lead in patents… fruition of higher R&D spending



Source: China National Intellectual Property Administration, HSBC

… so, will the gap narrow?

This is a question of interest to many. Are the less developed regions catching up with the more developed ones, or are they going in various different directions? As shown above, despite the progress made by the Central and Western regions in the past 15 years or so, large gaps still exist among regions. Some researchers believe they are, in effect, forming their own subgroups, or clubs. Basically, regions diverge in terms of resource endowment, openness to the world market (FDI and trade), market integration, education attainment, demographics and local governance. And such divergence may contribute to sustained regional inequality, despite the fact that intra-regional convergence exists (Zhang and Zou (2012), Liao and Wei (2016)).

Beijing is conducting central planning to engineer regional integration

However, this is not ideal. Indeed, Beijing is aiming to facilitate more regional integration, with a goal to promoting inclusive growth (i.e., common prosperity) as well as to unleash a new growth driver as the less prosperous regions play catch up.

Inter-regional connection and domestic catch-up: a new driver

Regional catch-up as the new growth driver

After over a decade of faster growth in the Central and Western regions, their combined share of GDP has risen from 36.7% in 2002, the first full year China joined the World Trade Organization (WTO), to 43.0% in 2020 (Chart 5). Yet in terms of GDP per capita, Central and Western regions were only 60% and 56% of that of the Eastern region as of 2020. We analyse different scenarios in Table 2 below, assuming a combination of convergence rates and benchmark growth rates (GDP per capita in the Eastern region).

Even a mild catch-up in absolute terms can empower faster growth nationwide

What's interesting to note is that even if the convergence is slow in absolute terms, the relative equalisation across regions can still support overall GDP growth. To illustrate this point, let's focus on the scenario where (1) GDP per capita in the Eastern region grows at 5% per annum in the next decade; (2) the Central and Western regions narrow their gaps with the Eastern region such that by 2030, the GDP per capita will reach 66% and 60% of that of the Eastern region; and (3) the North-eastern region manages to stabilise its relative GDP per capita (51% of the Eastern region). If we assume that the share of population of each region remains the same during the next 10 years, and use the World Bank population assumption, then we derive that this mild gap narrowing process implies a 6.4% of 10-year CAGR.

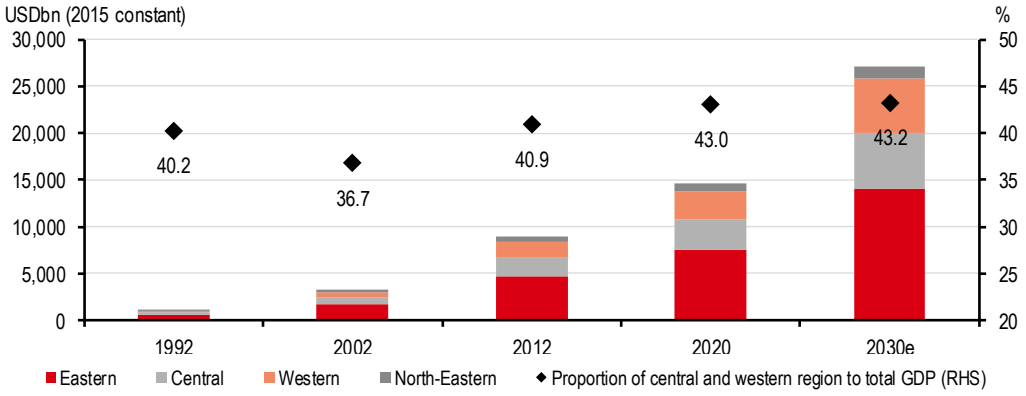
Table 2: Faster regional convergence is set to drive nationwide economic growth

China's compound GDP growth rate (2021-2030) under various scenarios					
	Convergence of other regions				
Growth of Eastern region (GDP per capita)	*at 20-year avg.*	*at 10-year avg.*	*at 5-year avg.*	*1.05x 5-year avg.*	*1.1x 5-year avg.*
5.5%	5.84%	6.37%	6.48%	6.69%	6.90%
5%	5.34%	5.86%	5.97%	6.19%	*6.40%*
4.5%	4.84%	5.36%	5.47%	5.68%	5.89%
4%	4.34%	4.85%	4.96%	5.18%	5.38%

Source: CEIC, World Bank, HSBC estimate.

We draw the corresponding scenario in Chart 5. Even if the Central and Western regions only increase their combined share of GDP by 0.2ppt, and the North-eastern region stabilises its share at 5%, the national GDP growth rate is still above 6ppt.

Chart 5: Regional GDP 1992-2030e: slow catch-up of the Central and Western regions



Source: CEIC, HSBC

China has experienced remarkable growth by catching-up with the rest of the world over the past 40 years. By facilitating a domestic catch-up, Beijing can further advance China's growth miracle.

What facilitates the convergence now?

China has detailed its growth strategy in the 14th Five-year Plan. This has one part and four chapters devoted to "regional economic layout and coordinated development", in addition to strategies involving regional collaboration in other parts. In a nutshell, it's a "4+N" strategy, including overall planning for the four major regions; coordinated development of belts and zones with the four regions; as well as detailed plans for the key belts and zones.

The regional development strategies in the 14th Five-year Plan are similar as in previous FYPs …

Significance of the new cross-regional infrastructure projects

Regional specific development goals are not new, such as "go West" (西部大开发), "revitalise North-east" (东北全面振兴), "accelerate rise of the Central region" (中部地区崛起), and "promote modernisation of the East" (东部率先发展). But the 14th Five-year Plan highlights the central planning and coordination needed to improve efficiency in terms of resource allocation, and mentions inter-regional interest compensation. One year after the blueprint was unveiled, the "West to East power transmission" had a new element: green electricity. Meanwhile, "Processing Eastern data in the West" officially kicked off, too. Both require massive funding, hence the related infrastructure investment which can provide much-needed support for economic growth in the short term.

… but the cross-regional mega-projects are the highlights

In the longer term, we expect the construction of renewable energy bases, computing hubs and data centres to generate new job opportunities, facilitate tech breakthroughs and diffusion, and lift productivity. According to International Renewable Energy Agency, China's renewable

energy employed over 4.7m people directly and indirectly as of 2019, and 75% of the jobs were in the solar and wind power sectors (i.e. solar PV, solar heating and cooling, as well as wind power). With the installed capacity set to more than double in the next decade, from 530GW in 2020 to 1200GW in 2030, we believe millions of jobs can be created in equipment manufacturing, project engineering, and installations. On the other hand, computing hubs and data centres are the key digital infrastructure, often featured as faceless buildings with rows of computers, servers, and network equipment. Indeed, as HSBC analysts Helen Fang and Kenneth Chin have shown (see *China Internet Data Centres: Regulated growth in a booming market,* 11 October 2021), in the construction stage, the majority of the cost comes from equipment and civil engineering (Chart 6); in the operation stage, internet and electricity costs are the two largest items (Chart 7). Given the capital-intensive nature of this, the direct lift on employment may not be substantial. However, the indirect effect is enormous: data centres are the backbone for the digital economy, so the nationwide computer network should enable China to progress towards its ambition of digitalisation, driving structural changes and enhancing productivity.

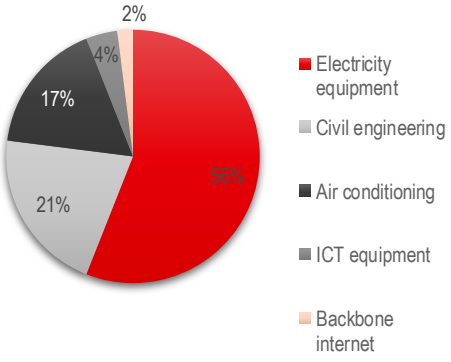
Other favourable factors

The favourable policies being rolled out currently are not the only tailwind. Thanks in part to previous policies, there's plenty of both soft and hard infrastructures ready to be leveraged. Examples include the expansion of college and university enrolment in the late 1990s, regional strategies introduced two decades ago, and the infrastructure frenzy over a decade ago. After years of continuous investment, the four major regions are better connected, the supply of talent is abundant (c10mn college graduates to enter the job market each year), and factor flows are easier. Barriers of trade and investment are conceivably much lower within the same country, especially under Beijing's steer. Conditions are ripe for inclusive regional growth.

Conclusion

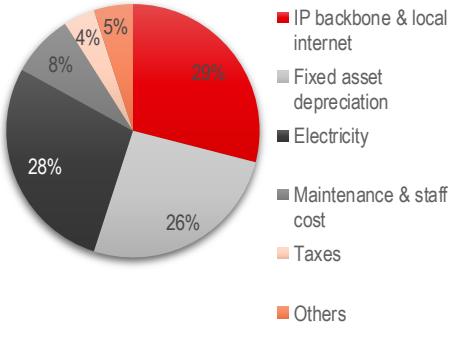
Recently launched mega-projects are planned to connect up the different regions in China and serve as the building blocks for green and digital growth. Against the backdrop of rising external uncertainties, Beijing is looking to strengthen its supply chains, ensure energy security, and achieve tech self-sufficiency. The four major regions are intended to maximise their comparative advantages to align with these targets and unlock another growth driver as less prosperous regions play catch-up.

Chart 6: Data centre construction cost breakdown



Source: Qianzhan, HSBC

Chart 7: Data centre operation cost breakdown



Source: Qianzhan, HSBC

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1 This report is dated as at 01 March 2022.

2 All market data included in this report are dated as at close 28 February 2022, unless a different date and/or a specific time of day is indicated in the report.

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