

# From rescue to recovery: towards a post-pandemic sustainable transition for China

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## I. Introduction and summary

### China's 14<sup>th</sup> Five-Year Plan in the context of COVID-19

The COVID-19 pandemic has brought an unprecedented threat to both public health and the global economy. **The world economy is now at severe risk with the clear prospect of a strong contraction this year.** The IMF's WEO 2020 projections suggest an economic shock that far exceeds the one experienced during the 2008/10 crisis and the worst recession since the 1930s. This is truly a global problem: the virus and the necessary lockdowns have affected the vast majority of countries. We are seeing large scale loss of confidence, lack of liquidity, unemployment, and supply side disruption. Output and employment, particularly informal, are deeply damaged. Strong, collective efforts are urgently needed, to protect lives, support the global economy and ensure the resilience of the financial system. Without strong action the world could enter a depression that could be long lasting, posing great danger to social fabrics and political systems around the world. The next months are decisive for the world, and coordinated action across countries is required to manage the risk and consequences of this unprecedented crisis.

Most countries of the world are either in the rescue phase or moving from rescue to recovery. At this time the top priorities are to tackle the public health emergency and prevent COVID resurgence; to protect the most vulnerable, particularly in relation to employment; to give strong support to the banking system and supply of finance, to ensure that liquidity issues

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do not destroy viable firms; and to foster confidence necessary for both private consumption and investment, by setting clear paths and strategies for growth and linking short-term actions and medium-term expectations. Forceful stimulatory fiscal and monetary policies need to be in place, which recognise the need for substantial deficit financing, likely to involve both borrowing and money creation. Responding too rapidly to increasing public debt due to the costs of COVID with overly tight fiscal policies following this rescue period risks choking off recovery and risks plunging economies into larger and deeper recession, with profound economic, health and social consequences.

**The recovery should mark the beginnings of a global transformation to strong, sustainable, inclusive and resilient economic development and growth**, if we are to overcome poverty, make progress on the SDGs and manage the immense climate risks. The dangers from unmanaged climate change are likely still bigger and longer lasting than those from COVID, immense though these are, and it is therefore wise to choose a path out of the depression focused on investment in the sustainable economies and activities of the future, not only in physical capital, but also in human and natural capital. The short-term stimulus should support economic recovery and avoid high-carbon investments. Investment in traditional approaches and methods in industry and infrastructure, which ramp up fossil-fuel consumption, could lock-in decades of polluting, high-carbon and less productive development. The consequences for the world would be devastating. We must be very clear on the necessity of not going back to pre-pandemic business as usual. We should protect and enhance natural capital to reduce the risk of both future climate change and of pandemics. We must be wary of opportunistic attempts to reinstate dirty industries in the name of recovery of growth; such policies are routes to insecurity and decline. If we follow this path, and do this well, we will strengthen social cohesion within and across nations and in this sense build our social capital, alongside and mutually supporting, the other three capitals.

**China's role in the world is now of a magnitude that makes its actions in the immediate future critical to how the world goes forward, both in the short term and over**

**this century.** The world will not emerge strongly and quickly enough from the recession unless China plays a very strong role through its consumption and investment demand. And the commitment of the world to tackling climate change will depend on what China does in the coming months and years. This influence is even greater than is implied by China's size; it comes also from its technologies, its strategies, and its leadership coming out of the COVID crisis. **It is vital that the 14<sup>th</sup> Five-Year Plan take into account that world context.**

### **Recovering from the pandemic: key issues**

China is the first major G20 country to have made the **transition from rescue to recovery<sup>2</sup> in the COVID-19 pandemic.** This has been the result of a tight lockdown, and introduction of widespread testing, tracking and quarantine made possible by local public policy actions and utilizing big data and e-commerce innovations. Such measures will also facilitate the transition to a new urban design and institutional structure that will also help with the economic recovery (Ahmad, 2020a). The export-led growth strategy served China well over the past three decades but is now at risk, given that major trading partners have yet to transition from the rescue stage and are facing deep recessions, limiting the demand for Chinese exports. New restrictive trade practices in some countries also increase the risks for existing Chinese production and employment patterns. Consequently, the economic recovery phase in China must embody a shift to domestic consumption, bolstered by strengthening of innovation and new urban design, governance and fiscal institutions. This change in strategy was emphatically underlined by President Xi's address to the May 2020 National People's Congress (NPC), that also emphasized protecting employment as well as deepening the innovative capabilities of the economy to sustain long-term growth.

**Many of the measures announced during the 2020 NPC both support the recovery and move the economy and employment patterns to a more secure future.** These include structural reforms and a **fiscal deficit of around 4.5% of GDP.** The envisaged deficit will be

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<sup>2</sup> With South Korea.

greater than the ceiling of 3.0% of GDP followed in recent years (Huang and Lardy, 2020), although it is far less than is necessary in many OECD countries that have not had the same success in controlling the virus as China. In addition, the State Council has announced a **“Go West” policy** that identifies a need to “rebalance away from the major coastal metropolitan areas”. This was also identified in the 1999 Western Development strategy, although that was not effectively implemented. Also, the decision by the NPC to **provide financing and transfers directly to cities and counties for critical infrastructure and basic services, bypassing provinces and the unending demands of capital city clusters**, is an important step. Strengthening the city/county level, where services are delivered and activities generated, is critical to preventing further outbreaks of viral infections, to providing basic health care fostering employment, and building strong, sustainable and inclusive growth.

Transforming China’s economy for a stronger, more sustainable and resilient future in a changing world will involve action across many fronts. In this paper, we focus on two **key strands of** analysis and action necessary to generate incentives for firms and workers and governments at different levels, to foster and deliver recovery and the new form of growth. **The first is the coordinated development of clean, compact and connected cities** (hereinafter referred to as **“CCC cities”**, and we use **“CCC”** for short), **alongside the restructuring of the existing metropolitan areas** (drawing on Ahmad, 2020b). The second involves **drivers of structural change**, including institutional, fiscal and financial underpinnings.

The programme of action for recovery and transformational growth, for building sustainable, resilient and inclusive development on all its dimensions, will be across the economy and society. It will involve structural transformation of industry towards higher skills and technology, with less material input; new technologies, putting to work the extraordinary advances of recent times; recasting energy and transport systems; much stronger investment in natural capital and infrastructure than in the past; investing in different ways in human capital, both education and health; strengthening community and social institutions; and much more. We have written about many of these actions in other work (Hepburn, Stern, Xie and Zenghelis, 2020; Stern, et al.,

2020). This paper, with its focus on just two key aspects, cities and fiscal/financial structures, should be seen as part of this broader work. Notwithstanding this focus, because it is so important and underpins the whole response to the challenge of sustainability, we also emphasise the importance of moving quickly to de-carbonise the energy system, and particularly the phase-out of coal, and to make it much more efficient, including in the design of new buildings and the retrofitting of old buildings.

### **Sustainable urban transitions**

Section II below will focus on the **development of CCC and the restructuring of the existing mega-metropolises.**

**The CCC will play a central role** in the rebalancing towards domestic consumption, moving activities into the interior with strong employment generation, and in ensuring a cleaner and healthier environment. To achieve these outcomes, it will not be sufficient to rely only on the provision of physical capital and infrastructure. Enhanced connectivity, in which China has invested in so heavily in the past quarter of a century, will play a role but these goals will involve much more. As described in Luo and Zhu (2020) and Ahmad (2020a), population movement will no doubt remain towards the existing coastal mega-metropolises, but creating strong flows in the other direction and enhancing the attractiveness of staying in interior regions will require investment in social and human capital and services, particularly to ensure that health and education are enhanced and more evenly distributed in the CCC and across the country. The tremendous technological advances by China with the use of e-commerce, IT and big data could also be deployed in the evolution of the interior CCC, to be able to attract both private firms to relocate closer to population centres and bring supply chains closer to where demand is being generated. Provision of basic services to attract and retain workers and households is critical. These new forms of investment in CCC should proceed alongside and be complementary to the restructuring of capital-city metropolitan areas.

**In the short term the pandemic has called into question the utilisation of some of the fundamental technological advances that have made mega-metropolises possible**, including *elevators* and *mass transport systems*. Urban architects, developers, planners, alongside those enhancing the environment, have continually stressed the need for “clean and efficient metro systems” to enhance urban density and improve the environment. Covid-19 has highlighted that proximity and density can have problems in the transmission of diseases. Social distancing requirements make it difficult to operate lifts in very tall buildings. Similarly, crowded bus rapid transit (BRTs) and metros pose a risk and people have been resorting to environmentally problematic cars in the aftermath of the Covid-19 rescue in many Chinese cities. CCC cities will require design and strategies that leverage the very strong advantages of proximity and density, whilst managing the difficulties these features create in terms of disease transmission. Design, technology, behaviour and public health will have roles to play.

We assume that the existing big cities and metropolises will continue to play a strong role in development around the world. There will be major challenges in transforming these to make buildings more efficient, reduce congestion and pollution, and enhance movement and liveability. Much of this will be costly (retrofitting skyscrapers can be expensive) so that redirecting transfers from capital city clusters will not be easy, but will also depend on developing local tax instruments (Xiao, 2018). It is easier to design clean and efficient buildings, grids and infrastructure in more manageable county-size sub-jurisdictions and CCC. For these to function well, accountability for delivery of services and local funding mechanisms will be crucial.

The creation of **high-tech innovation zones is essential to drive and maintain engines of clean growth** with the development of IT infrastructure, energy grids and data management capabilities. This would permit the linked transformation of metropolitan areas, facilitated by the highly skilled research centres and top-class universities, as well as financial sector and product development skills, e.g., in the Yangtze River Delta and Greater Bay Area programs.

The urbanization strategy for existing major cities, for CCC, for high-tech zones and connections and links must embody both the imperative of low-carbon and the public health

lessons of COVID-19. There will be important implications for all of buildings, transport and energy. The prize is much cleaner, more effective and more productive metropolitan areas as well as CCC.

### **Drivers of reforms**

For creating the new growth story, we have emphasised both the investment necessary in all forms of capital and crucial criteria for and elements of city design. For all this to occur, there are three crucial elements of reform: **fiscal, institutional and governance**. This will be the focus of section III below. We examine the importance of clarifying what the responsibilities of different levels of administration are, alongside all the other key elements of the drive to the new high-tech, balanced and sustainable economy. This will require careful attention to national “vertical” coordination (centre to local), and strengthened “horizontal” decision-making, especially at the lower levels of government (Ahmad, 2020a). The proposed restructuring of central transfers directly to cities and counties and access to “special purpose bonds” for infrastructure is a good start. But it is important to go beyond transfers and borrowing and include local own-source taxes. These can both reduce risk and should ensure greater local accountability for the new responsibilities. An example is a “beneficial” location-based property tax on occupancy, linked to public services as developed in Ahmad, Niu, Wang and Wang (2020).

At the same time, appropriate local **own-tax instrument or handles (administered by the State Tax Administration) are critical for accountability**, together with better defined financing for central objectives, and improved information flows on where the money goes and the outcomes of public spending and investment design. The **own-source taxes are important in reducing and managing risks associated with access to private finance, borrowing and public-private partnerships (PPPs)**. While project bonds are useful, they do not avoid either the need to record activities and expenditures as part of the budget process, since pricing regimes involve effective tax/subsidy implications, or to recognise that net liabilities arise for local or higher levels of government.

Concluding comments are provided in Section IV.

## **II. Sustainable urban transitions for investment and employment opportunities and a cleaner and healthier environment**

China's phenomenal **export-led growth performance over the past quarter of a century has been based on the development of coastal "hubs"**. This has led to a powerful internal movement of people with an estimated 174 million migrants to these "hubs" (out of a total "floating" population of almost 250 million), resulting in mega-metropolitan cities along the eastern seaboard. It has also led to over 750 million people lifted out of poverty, by far the biggest reduction in poverty in the history of the world. However, this has been at the cost of huge urban sprawl, congestion, and pollution, loss of prime agricultural land as cities continue to finance expanding new developments by land sales (Wang, Wu and Ye, 2018).<sup>3</sup> These problems must be tackled in the coming years.

**The difficulties of a continuing expansion of the mega-cities have long been recognized**, and a "rebalancing strategy" has been in effect for over two decades, resulting in world class connectivity infrastructure—high speed trains, airports, as well as motorways. In 1999, the Western Development Strategy was adopted. Despite the huge national investment in connectivity infrastructure, including the world's most advanced high-speed rail network, the rebalancing has not been effective in the sense that the proportion of the population in major coastal cities continues to rise strongly because people continue to migrate to where the jobs are—in the Eastern coastal metropolises. Despite the rebalancing policies, **the pressures on the coastal mega-cities continue to increase** (Luo and Zhu, 2018).

**While connectivity investment is a necessary condition for rebalancing** (otherwise called "levelling up" as in the UK, or "convergence" in Italy and Chile), in reality this has made it easier for migrants from poorer interior regions to move to where the jobs are—in the existing

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<sup>3</sup> Land sales have also spawned off-budget activity and leveraged debt that has led to potential rent-seeking opportunities as well as spiralling debt of uncertain magnitude. The heightened risks are a serious constraint to the development of fiscally sustainable cities (Ahmad and Zhang, 2020).



employment “hubs” in the coastal mega-cities. This has led to **increasing pressure on within-city infrastructure and public services**, and there has been an expansion of environmentally friendly but expensive metro systems in most of the major cities. With limited own-source tax handles left at the subnational level (discussed further below), many of the metro systems were financed through PPPs, although it became clear that the ability of the cities and local governments to finance liabilities was, in reality, extremely limited. Concerned with the potentially unsustainable build-up of local government debt, in August 2017, the National Development and Reform Commission (NDRC) suspended the Y30bn Batou metro system under construction and put requests for metro systems in 43 other cities on hold.

So, **cities have continued to sprawl outwards, and also expand upwards**; 1,157 buildings greater than 200 m were constructed during 2019, with the Tianjin CTF Tower at 530m. Retrofitting existing high rise buildings to LEED standards can be very expensive.<sup>4</sup>

**The COVID-19 pandemic has now raised questions around “modern urban design”**. High-rise and densely populated buildings are particularly susceptible to disease transmission through air-conditioning and ventilation, sewage systems, dense common spaces, and especially elevators. Social distancing is not practicable in elevators, and not much can be done beyond contactless operating mechanisms. In May 2020, the Ministry of Housing and Urban-Rural Development banned building above 500 m, and the construction of buildings between 250-500 m has also been severely restricted.<sup>5</sup>

**Mass transit systems, including metros and BRTs can also be problematic** in relation to the spread of infections. Likely individual responses, whilst infection is prevalent, are to shift to personal automobiles, as appears to be happening in major Chinese cities. But this has huge social costs in terms of the environment, that in turn makes it easier for the virus to stage a comeback, as well as congestion costs.

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<sup>4</sup> Leadership in Energy and Environmental Design (LEED) certification added \$120m to the retrofit of the Empire State Building in NY (total cost of \$550m) to make it more eco-friendly and energy efficient.

<sup>5</sup> A [new policy](#), released in May 2020 on the Ministry of Housing and Urban-Rural Development's website, sets a wide range of measures determining the limits on heights of buildings.

**Some of the short-term adjustments that are possible include** greater reliance on remote working, staggered office hours in urban districts/counties within metropolitan areas to prevent congestion, and e-commerce. Huge advances in big data help to track, test, quarantine and support people who might have come into contact with infections. However, there is likely to be a continuing impact on service sector workers, and 50 million of the floating workers are stranded in their places of origin (“hukou”) because of the effect of the pandemic on the service sector in the major metropolitan areas. As in other countries, firms and workers in export-oriented industries are affected by the recessionary trends in major trading partners. Although such export-sectors are being supported in the short-run through stimulus measures, including loans and income support programs, and this is reflected in the official ILO-definition unemployment numbers, these jobs are at significant risk.<sup>6</sup> These measures will have to be underwritten by the central government as local governments are already bearing the debt overhang from the 2008-10 stimulus package that played an important role in “salvaging” the global economy. The build-up of inventories in export-oriented firms might be diverted to new trading patterns, such as with Belt and Road Initiative (BRI) countries.

Over the medium term, the policy design and investment challenges will be to find ways of combining the great advantages of proximity and density in the functioning, efficiency and attractiveness of cities, with the challenges associated with the transmission of diseases. This will involve innovation in design, technology and public health, and is a priority for R&D and public policy.

**The combination of environmental and climate challenges, new technologies and the lessons of the pandemic provides an opportunity to accelerate structural measures for a “rebalancing” that will also generate investment and employment opportunities in both the short and longer term,** including for stranded migrant workers in the interior of the country. This could help **strengthen the announced pivot from exports to domestic consumption,** and

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<sup>6</sup> There are in addition, a number of workers on furloughs, or on reduced pay but not formally unemployed.

from the coastal mega-cities to CCC in the interior. Together they could make the “Go West” program a key element in the drive to strong, sustainable, resilient and inclusive growth.

### **CCC as the core of the “Go-West” rebalancing**

As emphasised in the case studies in the LSE/CUT program<sup>7</sup> on sustainable urban transition in China, **good connectivity and proximity to markets in potential CCC has not, by itself, been sufficient to attract enough firms to relocate**, even when the development costs are financed through land sales and access to off-budget borrowing (Ahmad and Zhang, 2020). Workers continue to migrate to established metropolises, indeed the improved transportation reduces the associated costs.

**A CCC-oriented investment programme will result in buildings that meet LEED environmental standards, as well as WELL standards** that focus on health and living conditions, including comfort and mind, that might also reflect some of the precepts of traditional Chinese architecture. Of course, the widespread use of **e-commerce, and new technologies will be at the core of the basis on which the CCC will be designed**. Thus, attractive cities can be created, where inhabitants enjoy clean air, water and light, and can walk or cycle to work and to shops and entertainment. But for this to come about, **clearly identified responsibilities will be necessary, including for the financing for education and preventive health care**. The clarity in spending and own-source revenues would ensure more accountability for results by local governments, and enable speedy implementation of the preventive health care and support networks. Advances in health care will draw on the experiences over the recent months in testing, tracking, quarantining and supporting those people who might have been affected. The fiscal aspects of this transformation and the key drivers of change are summarized in Section III.

**The development of CCC in the interior can provide employment opportunities for many of the estimated 50 million stranded migrant workers** in the short run, through the

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<sup>7</sup> For a summary of the main findings of the programme, see Ahmad (2020b).

infrastructure investments needed to upgrade existing habitats. As the facilities are created and good public services ensured, firms will move to take advantage of the new, and nearby linked markets, and also the new value chains facilitated by the BRI trade routes as well. To some extent this has begun with, for example, the spontaneous development of Khorgos on the border with Kazakhstan, financed by Jiangsu-based firms to leverage the rail-based trade to Central Asia and Europe. These new value chains will clearly be an important element in the success of the “Go West program”, in addition to shorter supply linkages for domestic consumption.

### **Transformation of mega-metropolises and innovation zones**

**More labour-intensive value-added activities would shift to CCC within China.** This generation of employment opportunities outside the metropolitan areas is a core element in an effective transition to new economic activities, whilst maintaining economic stability in the face of what will be major structural change. Improvements in financing and managing cities with greater clarity in responsibilities will be a key element in the process of building CCC and their functioning and is the subject of the next section.

**Utilizing e-commerce and fin-tech, new value chains will lead to a transformation in the way that business is done, including in the metropolitan areas and proposed innovation zones.** This will also directly affect the spatial dynamics of the transition, requiring stronger cross-city and cross provincial coordination mechanisms. The innovation, R&D and science parks would need to be matched with financing from the regional finance hubs (e.g., Shenzhen and Guangzhou in the Greater Bay Area- GBA, and Shanghai in the Yangtze River Delta- YRD), infrastructure for the establishment of new firms, as well as the internationally recognized legal frameworks being created in HK and Shenzhen.

Some of the most promising developments in **urban structure, and necessary governance and financing, will relate to the high-tech innovation zones** that are being planned in the GBA as well as in the YRD. The stronger regional cooperation, based on enhanced connectivity and public infrastructure, will affect the overall growth potential and rebalancing of activities within

China, as well as trading partners (e.g., BRI countries). Thus, this transformation will also have implications for strengthening or developing new regional and global value-chains. **With the GBA becoming a high-tech “hub” or zone, new sustainable growth patterns will emerge, based on changing patterns of innovation, product development and financing.** Further, **the Special Economic Zone (SEZ) concept will need to move to a new phase, with a removal of within-country borders** to encourage the development of linkages between cities, within the broader economic space.

**Governance questions will be important to ensure that the new zones are sustainable in economic, administrative, financial and fiscal terms.** The difficulties experienced in Europe and the US in adjusting administrative and political boundaries of cities to better match new economic spaces in the past, and also in coordinating responses to the pandemic, will carry useful lessons.

#### **Transition towards a low-carbon economy: priorities for the 14<sup>th</sup> Five Year Plan**

Regardless of the speed of transformation of the metropolitan areas and CCC cities, whether or not linked directly to the innovation zones, **it will be critical for China to ensure that all investments play their part in building a resilient and sustainable future and promoting the transition towards a low-carbon economy.** Lessons should be learned from the CNY ¥4 trillion (US \$586 billion) stimulus plan, as an attempt to manage the impact of the global financial crisis in 2008, which included massive infrastructure and real estate investment and created a huge surplus of high-carbon capacity. It also created a huge debt overhang for Chinese local governments that now seriously constrains the ability of the Central Government to act on the same scale as the 2008/10 stimulus. Indeed, the measures announced are relatively modest in scope and more targeted to achieving the structural reforms—including the pivot to domestic consumption and the “Go West” programs announced during the 2020 “Two Sessions” of the NPC.

The UN Secretary General Antonio Guterres appealed to the world for a green recovery in his speech on 19 March 2020, stating that "we have a responsibility to recover better". Central to recovering better is the prevention of investment spilling over into traditional and dirty infrastructure, e.g. coal power plants and standard road construction. A much more effective and stable recovery, which flows into the low-carbon transformation necessary, will come from a focus on the technology of the 21<sup>st</sup> century. Investments based on the technologies of the 20<sup>th</sup> century would become stranded assets with stranded jobs. **Further, it is now clear that a recovery which embodies the principles of sustainability can be stronger and faster than alternatives.** So much of what is necessary for sustainability can be rapidly implemented, is labour intensive and has strong economic multipliers. That is not the main topic of this paper but is a crucial part of a recovery strategy. See for example, Hepburn, O'Callaghan, Stern, Stiglitz and Zenghelis (2020).

**China should accelerate the transition to cleaner energy in urban areas, with an aim of peaking its coal consumption now.** Policies for retraining and reallocating coal workers should be a core part of such a strategy.

Cutting coal consumption and replacing it with cleaner energy, such as natural gas and renewables, has been a key part of China's energy strategy. **China has also committed to a greening of the BRI.** That means no more investment in coal-fired electricity. It is too costly both economically and environmentally; it is unnecessary and bad for development. But it is worrying that China is still building more coal capacity, at home and abroad. It is deeply damaging to economies, societies, health and environment and has no valid economic justification.

In 2018, 46% of China's total energy-related CO<sub>2</sub> emissions came from the energy sector (electricity and heat), with the rest mainly caused by the industry sector, transport sector and building sector.<sup>8</sup> That **implies major low-carbon measures in cities are now required,** including to replace bulk coal burning with clean heating and clean energy and grids, to reduce

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<sup>8</sup> Data source: <https://www.climate-transparency.org/g20-climate-performance/g20report2019>

industrial coal consumption through industrial restructuring and technological progress. In many cases, the pressure to continue with coal mining comes from local governments that are dependent on royalties from mining operations. Tackling this dependency involves the joint determination of alternative tax assignments for local governments (discussed below), as well as the tax and pricing policies. These reforms (see Section III) should be undertaken in tandem with decisions to stop building more coal-fired plants, while promoting renewable energy generation.

A further crucial measure **to reduce carbon emissions involves discouraging the use of diesel and petrol-powered vehicles, especially in inner cities**. In the aftermath of the Covid-19 pandemic, as Chinese cities have returned to work, citizens have been reluctant to use public transport and there has been a major shift towards cars (as also seen in the satellite images). These problems, particularly in the short term but likely in the longer term as well, would be addressed partially by the shift of work patterns, using e-commerce and remote access. Investment in electric vehicle (EV) technology and charging stations is beginning to pay off, and differential local taxing policies and regulations would encourage the shifting to EVs from traditional internal combustion engine vehicles. **A local area “piggy-back” on a national carbon tax could be very valuable here both in terms of incentives and of revenue** (Ahmad, 2020b).

**Urban areas consume 80% of energy worldwide, with buildings accounting for almost half that amount** (Qi et al., 2020). This highlights the importance of employing best practices in building, energy and resource conservation to ensure green building construction in new buildings. The concept of green building aims to provide environmentally friendly buildings to human beings with efficient use of all kinds of resources including land, water, energy, and materials (Wu et al., 2019). As described above, efficient and coordinated use of urban land can unlock the power of CCC to avoid the inefficient use of environmental resources caused by urban sprawl.

**Making existing buildings more energy efficient** will be a key element in managing energy. This can also be central to a strong and sustainable recovery. See Hepburn, O’Callaghan,

Stern, Stiglitz and Zenghelis (2020), which showed that retrofitting buildings was identified across the world as core to recovery in terms of potential speed of implementation, labour-intensity, and strong economic multipliers. The nature and costs of retrofitting depends on the stock of buildings, which varies across locations. But there is a great potential in all countries.

**Improving the energy efficiency (in providing both electricity and heat) of existing buildings through retrofitting should be a high priority for public policy in China.** Most of the buildings are owned by private individuals, or property management companies, many of whom have made huge profits through the land value capture mechanisms, that also led to the urban sprawl and off-budget operations of Urban Development Investment Corporations. Generating incentives to retrofit buildings must involve organisations to co-ordinate transparent activity to achieve scale, finance, local regulations and local tax policies. Desirable measures include incorporating digital technologies, such as fitting smart displays to existing meters, increasing installation space for solar photovoltaic (PV) on building surfaces, and renovating to install new types of flexible power systems in buildings, which also have different benefits in the transition to low-carbon. Retrofitting can also generate a host of co-benefits, including improved indoor conditions for building users, new green job opportunities, higher real estate values and better local air quality (Qi et al., 2020). **The provision of public monies for retrofitting has to be carefully evaluated in the context of which level of government decides on the priorities and then allocates financing accordingly.**

**In the energy sector, electricity demand in China is still rising rapidly,** especially demand from the service and residential sectors, which is more variable and unpredictable. But that does not necessarily mean that China has to build more coal-fired plants. Instead, China should focus on measures for meeting and managing the increasing demand, while promoting the clean energy transition.

**Sound economic and practical measures include** grid management to balance demand and supply in a smarter way and avoid irrational priorities for coal-fired sources; power sector reforms on pricing, plus the possibility of a carbon tax with a local piggy-back; investment in



renewables and energy storage facilities to generate electricity in a clean way and support the increasing renewables penetration; and continuously increasing energy and resource efficiency across the whole economy.

**Renewable energy is an important part of China's energy resource endowment and a feasible solution for ensuring energy supply security.** This has become economically competitive, even without carbon pricing, with wind and solar PV becoming ever-cheaper, energy storage costs falling and network management improving. It is also technically feasible, with a wide range of advancing energy storage technologies contributing to electricity stability and to ensuring that power systems with high penetration of renewables will not suffer from system balance problems. A recent study by He et al., (2020) suggests that if the cost trends for renewables (wind and PV) continue, 62% of China's electricity could come from non-fossil sources by 2030, at a cost that is 11% lower than achieved through the current business-as-usual approach. The economic cost advantage is even higher when the cost of the greenhouse gas (GHG) emissions and pollution are taken into account. It is crucial to overcome the distortions in grid management which prioritise coal.

In addition, as more and more **EVs are being used, there will be huge capacity from EV batteries and smart charging piles available** to balance flexible load to help smooth electricity load variation in urban areas. Digital management has a critical role to play in integrating variable renewables, by enabling grids to better match energy demand to times when solar PV and wind resources are abundant, and in supporting the demand response programmes in buildings, industry and transport. Investment in developing digital transformation strategies is of great significance for promoting the low-carbon transition.

### **III. Fiscally sustainable recovery: taxation and incentives for improved employment and health outcomes and fostering growth**

**How the recovery is managed and financed matters a great deal if China is to “build better” and avoid mistakes from the past.** The G20 response to the pandemic was to agree to

“do what it takes”, and many Central Banks, including the US Federal Reserve Board (Fed), have been engaging in quantitative easing. The Fed has also purchased municipal and corporate bonds. The People's Bank of China (PBC) has not yet done so, on the grounds that **monetization of the deficit is not permitted under the PBC law and concerns that the additional funding might not get to those who need it** (Zhou Xiaochuan, 2020). Further, without active policy that looks to the future structure and sustainability of the economy, there is a danger that “blanket funding” would reinforce current productive structures that need to adapt and change in order to generate the rebalancing and new employment necessary for a more sustainable growth trajectory. Thus, there has to be an appropriate combination of physical infrastructure, and investments in social and human capital, including skills and provision of appropriate levels of preventive health care. The current fiscal reform context in China is important, particularly in relation to reforms of spending and governance, which are far from complete. Thus, the short-term recovery measures need to be designed, along with a fiscal transformation to not only drive the recovery but also to support the structural change. And we should recognise that the recovery phase will probably involve a substantial part of the 14<sup>th</sup> Five Year Plan Period.

While China has made good progress in developing modern national tax instruments and administration, as well as central budget and treasury reforms, these have **not yet been followed by adjustments in spending responsibilities and appropriate sub-national tax instruments**, or effective public financial management tools, including the monitoring of sub-national liabilities. The lacunae were seen clearly during the 2008-10 global economic crisis, when China engaged in a stimulus of CNY ¥4 trillion, largely predicated on local government borrowings from the banking system.

Another watershed juncture in Chinese public finances came in **2015, when the budget law was amended to permit bond issuance by local governments** to reduce the risks inherent in opaque local government liabilities. At the same time, the local business tax was subsumed into the value-added tax (VAT). This was appropriately designed to reduce the cost of doing business, and facilitate linkages between the SEZs, like Shenzhen, and the neighbouring jurisdictions.

Local governments were compensated by a higher proportion of shared revenues. While there are local taxes on the transfer of properties with a “band or surcharge legislated by the NPC” (Ahmad, Niu, Wang and Wang, 2020), these are small and variable, and do not effectively constitute an adequate source of own-source revenues over which a subnational jurisdiction has control. This leaves **local governments largely dependent on shared revenues that fluctuate** as the central government pursues overall goals including macro-fiscal stabilization.

**Shared revenues, however, are not appropriate to anchor a system of local government bonds or effectively manage the build-up of liabilities** including through PPPs (see Ahmad and Zhang, 2020). Thus, the new local government bond system, while an important structural measure if properly sequenced, has not achieved either the objective to reduce the risk or that of tackling the lack of transparency in subnational debt. The debt overhang remains, and local government finances are precarious, with an absence of own-source revenues, and incomplete information on the true magnitude of the build-up of liabilities, much of which remain off-budget and hidden. Budget pressures and incomplete balance sheets generate incentives for these liabilities to spiral. Ahmad and Zhang (2020) examined the balance sheets of a county-level government in Central China, that could be a potential CCC, and another in the coastal Jiangsu province. In both cases, the true magnitude of liabilities (excluding PPPs) was a multiple of the official estimates including both special purpose and general bonds. Own source revenues are crucial not only for the management of overall liabilities, but also for creating revenue flows to provide for the financial sustainability and appropriate incentive structures for infrastructure projects, many of which must be carried out and run at local levels.

The high level of indebtedness, together with reliance on shared revenues that have declined as the central government has reduced taxes over the past year to stimulate the economy, has left **local governments with reduced ability to meet extensive expenditure mandates**. Mayors and local officials are faced with difficult choices in financing basic spending, including preventive health care, versus the more visible promotion of investments to meet growth targets and thereby enhance their career prospects.

**Weak monitoring mechanisms and the absence of the accountability, which can come through own-source revenues at the margin, have meant that local governments have incentives to indulge in irresponsible spending, hide liabilities, and attach low priority to preventive health care.** The resulting local weakness in health care may have delayed the recognition of the magnitude of the COVID problem both in Wuhan and by the central government. However, government did act decisively shutting down the city of 11 million people by the third week in January 2020 (see Ahmad 2020a). It is interesting that Wuhan had a very rapid increase in migrations during 2010-15, greater than Shanghai or Guangdong, but budget pressures led it to cover less of the health care spending than the other two metropolitan areas (Ahmad, Niu, Wang and Wang, 2020).

Whether within rich coastal provinces such as Guangdong, Jiangsu or Zhejiang, or in the interior of the country, **the weak fiscal positions of Tier 3-4 cities<sup>9</sup> make it difficult for them to take advantage of the national investments in connectivity infrastructure**, in order to become sustainable CCC and engines of new and sustainable employment generation. This is a major constraint to rebalancing within rich provinces (Ahmad, Niu and Xiao, 2018), and within China, particularly in the poorer western provinces.

The **1999 Western Development Strategy focused largely on physical connectivity infrastructure**. As also seen in Italy and the UK, investment in physical capital and connectivity is necessary but not sufficient in generating activities in new “employment hubs” in poorer regions. By itself, it might actually exacerbate inequalities in facilitating outward movement. Thus, it is important also to invest in human and social capital, including the provision of health care and education. If it is to play this crucial role effectively, local government responsibilities need to be clarified, with greater local accountability for results, together with providing them with the ability to raise resources to act.

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<sup>9</sup> Though not been recognised officially, China’s city tier system is widely used to classify Chinese cities, which are usually divided into four tiers. For example, see tier classification for 613 cities in China by South China Morning Post: <https://multimedia.scmp.com/2016/cities/>.

**On May 17, 2020, the State Council announced a new focus on “rebalancing” to persuade firms to move inland (“Go West” plan),** with a focus on connectivity and energy, together with irrigation for agriculture. The pursuit of this goal could generate substantial employment opportunities in the short run. To be sustainable over the medium and longer term, the projects chosen should be carefully assessed using appropriate weights on labour and skills, impact on the environment, and on the distribution of income. These criteria can indicate directions for tax/subsidy policy (Drèze and Stern, 1987), including at the local levels. The intention to permit the issue of CNY ¥1 trillion in local government special bonds for infrastructure is appropriate in this context. But whilst strong revenue streams are important for their financial sustainability these projects cannot be entirely ring-fenced, given that tax/subsidy implications apply. These are implications for local government balance sheets.

**We have emphasised the importance of own-source tax revenues.** Ahmad, Niu, Wang and Wang (2020) propose a beneficial property tax to raise 2% of city-level GDP by applying a relatively modest occupancy tax based on property size ( $Y/m^2$ ) for all properties (see Table 1). The linkage with city-level GDP is designed so that richer metropolitan areas are taxed at higher rates than poorer jurisdictions. For example, Table 1 shows that Guangzhou would generate the highest per square metre tax (CNY ¥121/ $m^2$ ) of the cities in the sample. By comparison, the tax in Wuhan is CNY ¥85/ $m^2$  and Xi’an is much lower, around CNY ¥49/ $m^2$ . This variation in property tax rates across cities would provide an important signal to firms and workers, encouraging efficient use of land in metropolitan areas as well as investment in and migration to lower-income cities. In practice, the tax could be differentiated further by neighbourhood within cities, to achieve equity objectives and recognising that poorer neighbourhoods often receive weaker service.

**As seen in Ahmad, Niu, Wang and Wang (2020) the beneficial property tax on its own is progressive in Wuhan** (see Table 1), and becomes progressive in all cities when linked to basic services. The replacement of land sales as the primary source of additional funding in all cases is critical in ensuring a transition that is not only economically sustainable but also

designed to help create better managed and functioning cities, since there will be a limit to land sales and they encourage urban sprawl. Such a tax instrument can make the CCC more accountable and also permit access to private sources of finance for the needed investments.

Table 1. Projected impacts of a “beneficial” property tax to raise 2% of city-level GDP

City	Property tax revenues equal to 2% of GDP (Y bn)	Current local education spending (Y bn)	Property tax rate to reach 2% of local GDP (Y/m <sup>2</sup> )	Impact on inequality (Atkinson index)			Impact on inequality (Gini coefficient)		
				Initial A <sub>1</sub>	Tax Only A <sub>2</sub>	Tax/Benefit Education A <sub>3</sub>	Initial G <sub>1</sub>	Tax Only G <sub>2</sub>	Tax/Benefit Education G <sub>3</sub>
Guangzhou	39.2	32.12	121.4	.60	.76	.75	<b>.39</b>	<b>.40</b>	<b>.39</b>
Shanghai	54.9	84.10	90.81	.71	.51	.50	<b>.40</b>	<b>.41</b>	<b>.40</b>
Shenyang	10.9	11.51	52.68	.63	.49	.47	<b>.33</b>	<b>.34</b>	<b>.33</b>
Wuhan	23.8	23.11	85.11	.52	.47	.46	<b>.33</b>	<b>.35</b>	<b>.33</b>
Xian	12.5	11.96	48.8	.47	.57	.49	<b>.35</b>	<b>.36</b>	<b>.34</b>
Fuzhou	12.4	15.31	54.6	.51	.89	.55	<b>.36</b>	<b>.37</b>	<b>.36</b>

Source: Ahmad, Niu, Wang and Wang (2020)

Note: The Gini coefficient (G) and Atkinson index (A) are two different measures of interpersonal inequality. The Atkinson index explicitly attaches higher weights to increments in income to lower-income groups.

#### IV. Conclusions

The COVID-19 pandemic has brought an unprecedented threat to both public health across the world and to the global economy. **China’s 14<sup>th</sup> Plan must take into account both its own challenge and the world context while planning the move from rescue to recovery, building a resilient and sustainable future, and promoting the transition towards a low-carbon economy.**

With continuous urbanisation, **China has strong spending needs associated with urban infrastructure, which could be a major driver of, and requirement for, sustainable, resilient and inclusive economic growth.** The choices made in cities today on transport, infrastructure, buildings and energy use, as they grow rapidly over the coming decades, will determine, via the

technology and way of life they lock in, whether humankind can both manage climate change and realise the benefits of low-carbon growth, which can be very attractive in terms of stronger and more sustainable and inclusive development. China can show how measures for an urgent and strong recovery can also accelerate the transition to the inevitable low-carbon economy.

Policy makers have, for some time, argued that the next phase of their development, following an extended period of emphasis on low-cost, energy-intensive, export-oriented manufacturing, would involve a transition from exports to domestic consumption, along with higher-tech, more service-orientation, and a cleaner economy, strengthening “eco-civilisation”. This was further emphasised by President Xi to the “Two Sessions” NPC Meeting in May 2020. We argue that this whole process can be enhanced in a way that fosters the recovery and ensures a cleaner environment, poverty reduction and reduction of risk, through a shift from the **export-oriented mega “hubs” to the smaller well-contained “clean, compact and connected cities” (“CCC cities”, or “CCC” for short)**, supplemented by the development of **zones of non-contiguous innovation activities**, e.g., in the Greater Bay Area and the Yangtze River Delta. This structural change and the sustainable urban transformation it embodies must be based on clean sources of energy and low-carbon technologies that facilitate e-commerce, management of large data, and fin-tech.

Hepburn, O’Callaghan, Stern, Stiglitz and Zenghelis (2020) conduct a survey on the relative performance of 25 major fiscal recovery archetypes and suggest that **stimulus plans can deliver both economic and climate goals**. And because of the nature of so many sustainable projects and programmes, usually **fast in speed of implementation, labour intensive and with strong economic multipliers**, the flow from strong and sustainable recovery into transformation to low-carbon growth works well. Projects which cut greenhouse gas emissions as well as stimulating economic growth can deliver higher returns from government spending, in the short and long term, than conventional stimulus spending. It is crucial to avoid the investment patterns of the 2008-2010 stimulus package in China, which locked in many high-carbon production, practices and methods.

Key elements in driving these changes will be reforms that include **key fiscal measures in order to ensure that investment programmes, including stimulus packages**, provide sustainable incentives to firms, workers and governments at different levels. Principal measures include:

- (1) **own-source revenues** at the subnational level, such as the “beneficial” property tax, as well as a piggy-back on a carbon tax or income tax (with STA administration)<sup>10</sup>;
- (2) **coordinated decisions on public investment**;
- (3) much **tighter information generation and tracking** of what is spent and the outcomes,
- (4) **recording of all liabilities**.

These measures should provide a basis for the Ministry of Finance (MOF) to work in parallel and harmony with the NDRC over the short-to-medium term, to ensure a consistent package that leads to high quality growth, with positive distributional and environmental outcomes and prudent management of risk.

This is a crucial moment for the future of the world. We have seen how dangerous and fragile the old model is. It not only causes severe damage to climate and biodiversity; it also makes pandemics more likely. Further, it carried with it many stresses of insecurity and inequity. The world must not go backwards and lapse back into the old, dirty technologies of the 20th century. **China’s leadership in the recovery phase is crucial.**

As China leads the world out of the COVID-19 crisis, it has a great opportunity. China can show how recovery measures can also accelerate the transition to the inevitable low-carbon economy. China is already at the forefront of the development of new low-carbon technologies and China has a great deal to gain by being in the vanguard of the new global growth story, driven by the stimulus of higher investment in sustainable and climate positive projects.

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<sup>10</sup> The State Taxation Administration (STA, Chinese: 国家税务总局) is a ministerial-level department within the government of the People's Republic of China. Previously known as State Administration of Taxation (SAT).



**China's domestic commitment to environmental protection and ecological conservation (or ecological civilization) was recently re-emphasized, along with poverty reduction**, during President Xi's visit to Shaanxi Province in April 2020. To achieve a Chinese version of eco-civilisation, high-quality development and strong, sustainable, resilient and inclusive growth, there is a great need for the 14<sup>th</sup> plan to embody a "Green New Deal", reinvigorating economic growth through the innovation and investment in the drive to low-carbon, new technology, clean infrastructure, new forms of urbanization, and fiscal reforms. That can bring sustainable finance systems that can enable investment in better health and education alongside physical capital. This is a crucial moment too to invest strongly in China's natural capital and infrastructure on which its economy, and indeed the world economy, depend. That includes, land, forest and water systems.

This approach can **establish China's leadership in the world economy and set an example to the world on sustainable recovery and transformational growth**. The years following the COVID crisis will be a decisive period for the world. The 14<sup>th</sup> plan will be an absolutely critical part of this whole process. Decisions taken now will shape China and the world for a long time to come.

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