Narratives and Pathways Towards an Ecological Civilisation in Contemporary China

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Abstract

Since the United States committed to withdraw from the UN Paris Agreement on climate change, international observers have increasingly asked if China can take the lead instead, to raise global ambition in the context of a global leadership vacuum. Given the country's increasing economic and strategic focus on sustainable and low-carbon innovation, China might seem well-placed. However, much of this depends on the direction of governance and reform within China, regarding the environment. To better understand how the government is seeking to make progress in these areas, this article explores key political narratives that have underpinned China's policies around sustainable development (*kechixu fazhan*, 可持续发展) and innovation (*chuangxin*, 创新) within the context of broader narratives of reform. Drawing on theoretical insights from work that investigates the role of power in shaping narratives, knowledge and action around specific pathways to sustainability (Leach et al 2010a), this article explores the ways in which dominant policy narratives in China might drive particular forms of innovation for sustainability, and potentially occlude or constrain others. In particular, we look at ecological civilization (*shengtai wenming*, 生态文明) as a slogan that has gradually evolved to become an official narrative, and is likely to influence pathways to sustainability over the coming years.

Keywords: Ecology, Narratives, Innovation, Sustainability

当代中国生态文明的阐述与路径

随着美国宣布退出联合国气候变化框架公约《巴黎协定》，国际观察人士愈发质疑中国能否在全球领导力真空的背景下引领全球的气候行动。鉴于中国当前经济对可持续发展和低碳创新的重视，中国看似有着良好的战略基础。然而，中国在环境问题上的管理和改革的方向也具有关键性作用。为了更好地理解政府如何在这些领域取得进展，本文在广泛的改革阐述背景下，探讨中国关于可持续发展和创新的关键政策阐述。基于研究形成"可持续发展"这一阐述、知识和行动的理论基础（利奇等，2010 年 a），本文探讨了中国主流政策阐述如何推动特定形式的创新性可持续发展，以及可能存在的阻碍和限制。我们特别关注"生态文明"这一阐述，其作为一个逐渐演变成官方阐述的口号很可能影响未来几年的可持续发展之路。

关键词：生态，阐释，创新，可持续性

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Introduction

Given its large population, continued (if somewhat decelerated) economic growth and rising energy and resource demands, China is central to achieving the reductions in greenhouse gas emissions that were agreed in Paris (Urban *et al*. 2009; Urban 2014; Wang and Watson 2009). Climate change is expected to have extremely uncertain effects on the country. China is home to around 20 per cent of the world's population, yet has only about five to seven per cent of the global freshwater resources and less than 10 per cent of the world's arable land. There is the potential for severe water shortages, the further deterioration of aquatic systems and more flooding disasters (Zhang *et al*. 2009). China's mega deltas are particularly vulnerable to climate change and sea-level rise, with warming potentially increasing the frequency and level of inundation in delta megacities, such as in the Pearl River Delta, due to storm surges and floods from river drainage (IPCC 2007), potentially affecting residents and damaging critical infrastructure in heavily industrialised low-elevation coastal areas (McGranahan *et al.* 2007).

Beyond climate change, earth systems scientists have pointed to other biophysical changes: for example, to nitrogen and phosphorous cycles, freshwater use, biodiversity and other "planetary boundaries" that are all claimed to threaten to push human development toward dangerous tipping points (Rockstrom *et al*. 2009; Steffen *et al*. 2015). The scales of China's other environmental problems (related to some of these planetary boundaries, but with localised effects) are also enormous. The government found that more than 62 per cent of the groundwater investigated over 2014 was rated "bad" or "extremely bad", while around 30 per cent of the country's major rivers were polluted (China Water Risk 2015). Nor did the air in 145 out of 161 monitored cities reach acceptable air quality standards (MEP 2015). The state of the country's soil is also a major concern: more than 40 per cent of the country's arable land is degraded according to state media (Patton 2014).

Scholars argue that transformative innovation of many different kinds is required, not only to bring the trajectories of global development into the "safe operating space" for humanity (Scoones *et al*. 2015), and to address wider 'sustainability' challenges around poverty alleviation and social-justice imperatives (Leach *et al*. 2012). Both for reasons of its global impact (described above) and its dynamism, China is critical for unlocking the transformative innovation needed to reconfigure patterns of global development (Tyfield *et al*. 2014a). There is, however, little work on the evolution of Chinese narratives around sustainability (or sustainable development, *kechixu fazhan*, 可持续发展) and their relationship with narratives around science, technology and innovation – and the extent to which these intersect.

These questions have become particularly acute in the present conjuncture. US President Donald Trump's announcement this year that the United States would withdraw from the Paris Agreement on climate change sparked widespread criticism, from government to big business (Watts and Connolly 2017; Ward 2017). It raised questions not only for the future of US climate policies, and the international agreement, but also for climate action in China — the world's largest greenhouse-gas emitter, which overtook the United States in 2007. China and the United States, the world's two largest economies, together account for around 40% of global emissions, and the historic agreement signed in 2014 between the two countries' then presidents set in motion the cooperation needed for diplomatic success in late 2015 at the UN-led summit in Paris (White House 2014).

The Paris Agreement aims to keep global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 degrees Celsius. However, countries' commitments, as they stand today, fall short of even the 2-degree target (UNEP 2016a). Instead, the bottom-up architecture of the treaty requires a process of regular stock-taking, where ambition is jointly ratcheted upwards and national efforts are strengthened. Trump's withdrawal, particularly at a time when the European Union is fragmented and distracted, created a leadership vacuum. The United States was not known for ambitious policies on climate at home, but its size made it critical to mitigation, and it had diplomatic clout that it employed successfully to help make a deal at Paris.

President Xi Jinping 习近平, however, at the World Economic Forum in Davos this year, gave his pre-emptive response, calling the UN climate accord a "hard-won achievement" that "signatories should stick to" (Shankleman 2017). For this, he received almost universal praise. For some, the US retreat meant an easy diplomatic victory for China. Klare (2017) wrote that Trump had "opened the door for China to emerge both as the world's leader in green technology (while creating millions of new jobs for Chinese workers) and in international efforts to slow global warming." For Green (2017), we should now "expect China to strengthen its commitments under the Paris Agreement, expand its dominance in clean energy, and hence strengthen its international claims to climate leadership over the medium term, at least."

Once cast as the villain of global climate talks — China was widely blamed for the collapse of negotiations in late 2009, at the UN summit in Copenhagen (Conrad 2012) — the country now leads the world in the technologies needed for its mitigation: Chinese companies account for five of the world's top six solar PV manufacturers; four of the biggest five renewables deals in 2016 were made by Chinese companies (IEEFA 2017). China's pledge to the Paris agreement sees it building renewable energy capacity to 2030 equivalent to the entire US electricity system today (Roberts 2017). Its policies aim to reduce domestic coal consumption to a degree and at a rate that was once unimaginable. The International Energy Agency (IEA 2016) determined China's coal consumption likely peaked in 2013; the country sees a peak in its overall emissions before 2030.

Yet, without its US partner, it is unclear if China will act unilaterally and raise its ambitions. Hilton (2017) wrote that China was thrust into the leadership role "prematurely and by default; it is unlikely to welcome the scrutiny that global leadership entails". Economy (2017) argued that China neither desires nor merits the mantle of leadership, given its continued reliance on coal at home and its financing of fossil fuelled power overseas. For Godement, Chinese green leadership is "purely face. It's talk." (Vanderklippe 2017) This article argues that this talk — the discursive shift in Chinese leaders' statements, towards a more proactive rhetorical stance on environmental reform and international environmental diplomacy — might in the Chinese context still be an important signal worthy of serious analysis, and could even help to underpin a green transformation, one of great consequence if it can be properly harnessed.

This is not to suggest that a shift in discourse *necessarily* leads to substantive political action (since in some cases, it can even be used as cover for inaction), but that it does help shape narratives, which do help to shape pathways to action — a concept which the pathways approach (below), helps to explore. These shifts in leadership talk, significantly, might also be viewed as contributions to China's rising "discourse power" (*huayuquan,* 话语权): a diplomatic ambition, also sometimes translated as "speaking rights", for China to extend the

influence of its own ideas and concepts as part of its soft power strategy. As scholar He Yiting 何毅亭 from the Central Party School wrote recently in *Study Times* (*Xuexi Shibao*, 学习时报) journal:

> "Along with rise of Western discourse, ancient Chinese discourse was thrust into the dark corners of history, deprived of the light it had once enjoyed. The revival of discourse brings the hope of national rejuvenation, and the revival of discourse begins with national rejuvenation." (Bandurski 2017)

Foreign policy observers (c.f. Miller 2017) often note Xi's apparent abandonment of the "keep a low profile and bide your time" (*taoguangyanghui,* 韬光养晦) doctrine, which characterized Chinese diplomacy since the era of Deng Xiaoping, in theatres like the "One Belt, One Road" (*yidai yilu,* 一带一路) initiative and South China Sea. Similarly, Chinese environmental diplomacy efforts once put strong emphasis on the country's developing-world status and consequent unreadiness to shoulder the burden of environmental and climate action, starting at the landmark 1972 UN Stockholm Conference on the Human Environment, when a Chinese delegate was said to remark, "We must not give up eating for fear of choking, nor refrain from building our own industry for fear of pollution and damage to the environment" (Sternfeld 2017).

In promoting environmentally related Chinese themes at international fora, the leadership can also be seen reasserting soft or discourse power in environmental diplomacy (cf. LaForgia 2017). Specifically, there has been a striking rise in new, Chinese-originated terms for the country's green ambitions, including "ecological civilization" (*shengtai wenming*, 生态文敏); "clean waters and green mountains are as valuable as mountains of gold and silver" (*lüshui qingshan jiushi jinshan yinshan*, 绿水青山就是金山银山); "greenization" (*lüsehua/lühua*, 绿色化 绿化）; and the "war on (air, water and soil) pollution" (*xiangdaqi, shui, tumai wuran xuanzhan*, 向大气，水，图麦污染宣战).

Xi Jinping first coined "clean waters and green mountains" in 2005, when he was Zhejiang Party Secretary, but it has since been echoed in policy documents and in speeches by top leaders including Premier Li Keqiang and outgoing environment minister Chen Jining. Xi has used the phrase in recent years at the APEC Leaders Forum, at the UN in Geneva earlier this year, and at the B20 business summit in Hangzhou last year.

"Ecological civilization", we also find, emerged first as a site for the negotiation of contested futures, but since has evolved into an official, high-level narrative – leading eventually to the term's inclusion, in early 2016, in China's 13th Five Year Plan, echoed in other policy documents and in numerous speeches at international fora. On jointly ratifying the Paris Agreement with then US President Barack Obama, for example, President Xi said:

> "China, a responsible developing country and an active player in global climate governance, will implement its development concepts of innovative, coordinated, green, open and shared growth; fully advance energy conservation, emission reduction and low-carbon development; and embrace the new era of ecological civilization." (Xinhua 2016a)

In this article, we consider not only this narrative, but also the pathways it implies (Leach *et al*. 2010a). We hope to illustrate the importance of narratives for driving directions of eco-

innovation in China, and – beyond technological innovation – in shaping social, organizational and cultural change that might also contribute to social and environmental goals. Through mapping the terrain of a high-level policy narrative, we hope to provide a basis for further, more situated, empirical studies of the implementation (and subversion) of Chinese policy narratives, and the processes through which single or plural pathways might emerge from such high-level statements of environmental leadership.

Why Narratives Matter

Chinese studies has typically considered narrative framings in the context of the PRC's particular historical emphasis on top-down narratives and slogans, and its political effects in the Mao era (e.g. Lifton 1968, Lu 1999, Schoenhals 1992, Schoenhals 2007). Literature on contemporary political discourse in China (e.g. Thornton 2002) has tended to note not only the continued existence of such dominant narratives, but also their subversion. Nordin and Richaud (2014), for example, discussed the promotion of slogans such as "harmonious society" (*hexie shehui*, 和谐社会) and their "creative and ironic reappropriation", in this case with the humorous homophone "river crab", (*hexie,* 河蟹) particularly in online media.

Chinese studies literature that has explored environmental and innovation governance narratives of the Mao era has tended to show how the party-state made extensive use of tightly controlled top-down narratives (Shapiro 2001). In studies on the Reform Era, Mertha (2009) discussed the role of framing and reframing in putting environmental issues onto the public agenda in China. Tilt (2010; Tilt and Xiao 2010) has explored how sustainable development has been translated in a Chinese context and where blame has been apportioned in media coverage. Lora-Wainwright (2013) explored how uncertainties around environment and health are intertwined with local economic and political configurations.

Beyond Chinese studies, however, there is an emerging literature on pathways to "green transformations" (Scoones *et al.* 2015) that more explicitly takes into account the link between system framings and pathways of action. This literature, we argue, can newly illuminate dynamics in the Chinese context that otherwise have been largely overlooked.

The concept of "sustainable development", first defined in the landmark *Our Common Future* report (Brundtland 1987: 43) as, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", later sparked academic debates around broader notions of "sustainability". This term, particularly since the United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992, has typically been defined as, "the capability of maintaining over indefinite periods of time specified values of human wellbeing, social equity and environmental quality', (Leach *et al*. 2010a: *xiv*).

However, many scholars, including Agrawal (2005), Brosius (1999), Escobar (1999), Goldman (2006) and Scott (1998), have explored the ways in which the institutionalisation of particular framings of sustainability and sustainable development over the past two decades have marginalised, displaced or precluded certain motives and actors from the environmental arena. Through their articulation of the "pathways" approach, Leach *et al.* (2010a) contributed a particular understanding of the role of narratives in that process. In this paper, we draw on this understanding of narratives as playing a central role in both enabling and reinforcing particular pathways ("the particular directions in which interacting social, technological and environmental systems co-evolve over time")(Leach et al 2010a) and in

closing down others.

Roe (1994) explained how particular framings of a system (that is to say, a manner of viewing or representing a complex system) often become "part of narratives about a problem or issue." "These are simple stories," he explained, "with beginnings defining the problem, middles elaborating its consequences and ends outlining the solutions". These narratives, explained Leach *et al*. (2010a: 45), suggest particular ways a framing and its dynamics, "should develop or transform to bring about a particular set of outcomes". In other words, Leach *et al.* (2010a) draw on constructivist perspectives to explain how actors' situated knowledges (Haraway 1998), interests and understandings lead to different narratives describing the systems at play and how they are likely to change.

The way that narratives are employed thus has not only a descriptive but also a normative significance, shaping approaches to science and politics and, as we explore in this article, the role of innovation for sustainability. Powerful actors, institutions and discourses tend to shape dominant narratives, which, "deploy knowledge as a means to justify, persuade, legitimate [and] very often force a process of 'closing down'," (Leach *et al.* 2010a: 78) towards particular visions of the future. In this process of closing down, "ideas, institutions and practices reinforce each other… certain pathways become 'motorways', unrolling powerfully across the landscape of understanding and intervention, narrowing other tracks" (Leach *et al.* 2010a: 87).

This can have the effect of, for example, undermining other, potentially more locally applicable, pathways to sustainability. In the agriculture field, for example, work by Brooks *et al*. (2009) on innovation pathways for responding to climate change in arid areas of East Africa has shown how narratives around maize (the primary staple, but not one that is particularly resilient to climatic stress) have locked food security responses in the region into a situation where alternative options that do not relate to that particular crop are often neglected.

Similarly, in their work on forest carbon and green grabbing, Fairhead *et al*. (2012: 240–241) have shown how, as "green markets" have emerged as an aspect of the "green economy" narrative, the trading of "discursive commodities" (for example, the particular framing of the "payments for ecosystem services" concept) has influenced the "material political-economic conditions on the ground" (Fairhead *et al* 2012). The bureaucratic monitoring approaches adopted by carbon sequestration schemes in Africa have thus put a value on carbon offsets, but as a result people's access to land and livelihoods have been threatened. Analysing another set of material political-economic conditions, Dry and Leach's (2010) work on epidemics has shown how responses to disease can be constrained by narratives and their implied assumptions, which may not capture the dynamics and uncertainties at play in the multi-scale interactions of people, animals and microbes, potentially threatening health and livelihoods. In related work, Leach *et al*. (2010b) have shown how powerful 'outbreak narratives' have led to policies focusing in on stability at the expense of alternative strategies for resilience and robustness that respond to perspectives emphasising longer term structural, land use and environmental change.

Here, we hope to add to what is so far a very small literature (Lu and Lora-Wainwright 2014) that has applied the "pathways approach" in a Chinese context. For the first time, we apply this approach to the study of political narratives and slogans in China. Thus, we have attempted to combine Chinese studies' attention to rhetoric and ideology with a constructivist perspective on the role of narratives in shaping action and environmental change, to explain

why, in a moment of diplomatic uncertainty around the climate, Chinese slogans and buzzwords might matter more than is commonly understood.

Chinese Narratives around the Environment

As Edmonds (2011) has noted, *huanjing,* 环境 "environment" in Chinese has a similarly wide application as in English. It refers not only to geographical spheres but also to social ones, such as the political environment (*zhengzhi huanjing,* 政治环境). The natural environment is thus often referred to as the ecological environment (*shengtai huanjing*, 生态环境). Older ecological analogues are sometimes said to be found in traditional philosophical concepts such as *tianren heyi*, 天人合一, or "unity of man and nature", which has been described as an ancient root for environmental thinking in the Chinese context (Zhang and Barr 2013: 6).

However, not all such environmental slogans have expressed ecological ideals. The Maoist slogan "man must conquer nature" (*ren ding sheng tian,* 人定胜天) also used the word *tian*, which can be rendered as heaven or as nature (Weller 2006: 49–50). Environmental narratives and policies during the first decades of the People's Republic of China, after its founding in 1949, were characterised by this and similar slogans, which Shapiro (2001) described as reflecting a militarised discourse, the hallmarks of which included "utopian urgency" and "dogmatic uniformity", seen, for example, in the promotion of large-scale relocation and reclamation projects.

The year 1972 is generally identified as a turning point for environmental narratives in China. Two events in China were seen to have persuaded policymakers in the State Council to establish the first investigation and treatment committee on environmental issues, headed by then Premier Zhou Enlai 周恩来. The first was a red tide (a toxic algal bloom) in coastal waters near Dalian, in north-eastern China, which caused a huge die-off of shellfish. The second was the discovery that fish sold in Beijing had high levels of toxic chemicals in their flesh (Muldavin 2000: 252). Furthermore, following the US–China rapprochement, the People's Republic had come to occupy the China seat in the United Nations and had participated in the influential 1972 Conference on the Human Environment held in Stockholm (Edmonds 2011: 15–16), mentioned above.

The following year, the first national conference on environmental protection was held in Beijing (Muldavin 2008: 253). This called for, "overall and rational planning, reduction of harm, a reliance on the masses and both the protection of the environment and the enriching of the people" (Meng 2012), and led to a series of regulatory decrees and targets on "end-of-pipe" pollution control (Weng *et al.* 2015: 7). In 1973 China also founded its first environmental publication, *Environmental Protection* (*Huanjing Baohu*, 环境保护), with the writer and official, Guo Moruo 郭沫若, providing the calligraphy on the masthead (CCICED 2013).

Twenty years later, China's participation in the Rio conference in 1992 (mentioned above), saw a renewed and official focus on sustainable development emerge. In official Chinese

publications sustainable development is rendered as *kechixu fazhan*, 可持续发展 "development that can be sustained", and the official definition tends to follow Brundtland (1987) word-for-word, (as above, *ji manzu dangdai ren xuyao you budui houdai ren manzu xuyao de nengli goucheng weihai de fazhan*, 既满足当代人需要有不对后代人满足需要的能力过程危害的发展).

Throughout the 1990s, sustainable development became a key phrase in government literature (Meng 2012). The Ninth Five Year Plan (FYP), from 1996 to 2000, was the first to include the phrase (Edmonds 2011: 16) and in 1997 China published its first National Sustainable Development Report. In 1994, China became the first country to issue a national *Agenda 21*, which laid out the country's strategic sustainable development plan (Weng *et al.* 2015: 8). The 15th Party Congress, in September 1997, listed the, "huge environmental and resource pressures caused by population growth and economic development", as major difficulties facing the nation (Meng 2012).

In 2002, Jiang Zemin 江泽民 included sustainable development as part of *xiaokang*, 小康 , the "moderately prosperous", or literally "small comfort", society of modest means that was a signature theme of his leadership (Tilt 2010: 11), one aspect of which was expressed officially as:

> "The continual strengthening of sustainable development ability, improvement of the environment, clear increases in resource efficiency, the promotion of harmony between humanity and nature and putting society as a whole onto a development path of production, wealth and environmental-friendliness." (Meng 2012)

The administration of President Hu Jintao 胡锦涛 saw the emergence of the "scientific view of development" (*kexue fazhanguan* 科学发展观) and the "two-oriented society" (*liangxing shehui* 两型社会), which conserves resources and is environmentally friendly. This era also saw Pan Yue 潘岳, outspoken Vice-Minister of China's State Environmental Protection Administration (SEPA) (now the Ministry of Environmental Protection, (MEP)), promote the study of 'eco-socialism' (*shengtai shehuizhuyi* 生态社会主义). Pan, who was later sidelined (Ansfield 2013) and has left the MEP, explained that sustainable development should be defined as economic growth, environmental protection and social justice, and that the social justice imperative, in particular, meant that, "in theory, socialism is more suited to the realisation of sustainable development than capitalism". Current patterns of development in China had gone against socialism, he said, since, "the rich consume and the poor suffer the pollution" (Zhou 2006).

However, despite such concerns about China's environmental deterioration having been incorporated into narratives at the highest levels of state, there have been chronic problems with the enforcement of environmental laws and regulations (Geall and Hilton 2014). At local levels of government, contradictory laws, collusion between officials and polluters, misaligned political evaluation metrics for officials and restricted scope for citizen oversight have thwarted environmental initiatives (Economy 2005; Wang 2007). At the elite level, vested interests, inter-agency rivalries and an overriding focus on high growth rates, encouraged by cadre evaluation systems that value growth above environmental concerns,

have worked against green policies (Heggelund 2004, Economy 2005).

The Evolution of 'Ecological Civilization'

Ecological civilization is effectively the fourth in a series of slogans that started in the 1980s with Spiritual Civilization (*jingshen wenming,* 精神文明), Material Civilization (*wuzhi wenming,* 物质文明) and Political Civilization (*zhengzhi wenming,* 政治文明). Previous "civilizing" slogans put a strong emphasis on individual behaviour change for national development, yet as Oswald (2014) has pointed out, ecological civilization was, by contrast, the first with a global dimension. Environmentalist Ma Jun 马军 (2007) drew on this aspect, for example, to argue ecological civilization reflected, "The state of Chinese thinking on the future of global civilization in the light of the world's shared environmental challenges", founded on a belief that, "our model of industrial civilization is unsustainable".

Potential meanings were diverse and others conceptualized it differently. For Chinese officials like Pan (Zhou 2006) and scholars (Wang *et al.* 2014) influenced by ecological Marxist ideas (Foster 2002) ecological civilization represented a novel challenge, not only to the Communist Party to take ecological responsibility, but to capitalism itself, and even to the anthropocentric world view advanced by Western modernity, which could help, "the Chinese people revalue their own traditional ecological wisdom" (Wang *et al*. 2014: 54). Wen Tiejun 温铁军, a prominent intellectual in the New Rural Reconstruction Movement, described ecological civilization reviving, "China's long tradition of agriculture", to cushion a future economic crisis (Oswald 2014). For others, it was better viewed in the context of the green economy, such as the large green investments in China's stimulus in 2008 (Weng *et al*. 2015: 9) and in the implementation of 125 local "ecological civilization construction" pilots (Weng *et al*. 2015: 30).

In 2007, the phrase "ecological civilization" made its debut appearance at the Chinese Communist Party's 17th Congress, the Party's highest body, which meets about every five years. Hu Jintao, then China's President, said, "The construction of an ecological civilization will be given a prominent place and included in all aspects and processes in economic, political, cultural and social development" (Meng 2012). *China Daily*, the English-language Party mouthpiece, wrote in an editorial on the subject:

> "[Ecological Civilization] is not a term the Party has coined just to fill a theoretical vacancy in its socialism with Chinese characteristics, but rather a future-oriented guiding principle based on the perception of the extremely high price we have paid for our economic miracle."
> (*China Daily* 2007)

However, it later became highly prominent. In December 2016, for example, President Xi Jinping and Premier Li Keqiang 李克强 attended an event in Huzhou 湖州, Zhejiang 浙江 province, at which they commented on ecological civilisation construction. Xi said that ecological civilisation was key to China's overall development strategy, and government at all levels should remember that "clear waters and green mountains" are invaluable assets. Li spoke about ecological civilisation's key role in achieving sustainable growth, and that the country will continue to optimise its industrial structure, cut excess capacity, reduce pollution and improve air, water and soil quality (China Daily 2016). Li's work report to the National

People's Congress in 2017 also noted the strengthening of work on ecological civilisation construction and green development through the implementation of new methods for measuring targets and establishing ecological civilisation construction trial regions (Xinhua 2017).

The mention of such methods is important. As Oswald (2014) noted, for a long while, the "aims, goals and methods" of achieving ecological civilization were "hazy". Instead of being codified into an implementable narrative, the slogan served, at first at least, as a site for negotiation among different actors, institutions and discourses. However, under President Xi Jinping, the slogan has been codified. This process of closing down a period of debate and negotiation in order to articulate a slogan as an implementable narrative presents a novel insight into processes of environmental decision-making and governance in China.

In April 2015, the highest-level state policy document to have then discussed the term (though it was later included in the 13th Five Year Plan and a range of other policy documents) was published: *Central Document Number 12: Opinions of the Central Committee of the Communist Party of China and the State Council on Further Promoting the Development of Ecological Civilization* (henceforth, *Central Document No. 12*. *Zhonggong zhongyang guowuyuan guanyu jiakuai tuijin shengtai wenming jianshe de yijian*, 中共中央国务院关于加快推进生态文明建设的意见) (State Council 2015). In this document – not a legally binding text, but one that led to the term being included in a series of subsequent policy documents, and will shape its implementation – ecological civilization is set initially in the context of two, high level political slogans emerging as the signature of President Xi Jinping's leadership, specifically the Chinese Dream and the Two Centenary Goals, the twin ambitions to double GDP and *per capita* income by 2020 on a 2010 baseline (in time for the centenary of the Communist Party of China) and to turn China into a "socialist modernised country" that is "rich, strong, democratic, culturally advanced and harmonious" by mid-century (the centenary of the People's Republic of China).

Much of the text is florid and serves to underscore the scale of the challenge. But it also details for the first time the policies and approaches the government now proposes to comprise ecological civilization. These include targets, principles and plans for various sectors in Chinese economy and society, including regional development and urbanization, innovation policy, resources use and ecosystems conservation.

It also closes down around certain approaches: readers looking for the re-agriculturalization of the economy, along the lines of Wen Tiejun's vision of ecological civilization, would be disappointed. Agriculture is rarely mentioned and when it is, the text puts an emphasis on continued agricultural modernization. Similarly, there is little focus on redistribution, as in Pan's vision of a "socialist ecological civilization".

Instead, it emphasizes "technological innovation" and the need to "adopt advanced and applicable energy-efficient, low-carbon and environmentally-friendly technologies to transform and upgrade traditional industries" as well as the need to "develop green industries", consistent with themes emphasized under the "New Normal" of state-led economic upgrading, seen in the 13th Five Year Plan. To understand "Ecological Civilisation", therefore, requires understanding the narratives and pathways around innovation that preceded it, and continue to intersect with it.

Chinese Narratives on Innovation: Technological and Social Change

While science (*kexue*, 科学) and technology (*jishu*, 技术) have been central to Chinese development narratives over much of the past century, and certainly since the "Four Modernisations" (*sige xiandaihua*, 四个现代化) formulated by Zhou Enlai and later championed by Deng Xiaoping, innovation (*chuangxin*,创新) has only more recently become an important concept. Translatable more broadly as bringing forward new ideas, innovation has been used in various ways, not only in those relating to technological change, but also to describe China's approach to policy experimentation and reform (Husain 2015). Here, we first focus on technology-related uses of the term.

China's science and technology policies since the reform and opening up period have explicitly moved from a catch-up model (Abramovitz 1986), largely based on importing new technologies from overseas, towards a model that focuses on "new-to-world" technologies emerging from Chinese firms themselves. Narratives of "indigenous innovation" (*zizhu chuangxin*, 自主创新) became commonly used under President Hu Jintao, in particular, with regard to the country's Medium to Long-Term Science and Technology Plan (MLP) (State Council of the Peoples Republic of China 2006). This identified priorities for 2006–2020, including setting Gross Expenditure on Research and Development (GERD) at 2.5 per cent of GDP by 2020 in a range of strategically important areas linked to China's economy and development, including energy, environment, agriculture, manufacturing, transport and public health (Wilsdon and Keeley 2007). Observers identified three different formulations of the 'indigenous innovation term' in the MLP (Bound *et al*. 2013) – see Figure 1.

[FIGURE 1 HERE]

President Hu Jintao also called on China to become an "innovation–oriented society" (*chuangxin xing shehui*, 创新型社会) in a speech unveiling the MLP in January 2006 (Suttmeier *et al*. 2006), and indigenous innovation contributed greatly to the science and technology components of the Twelfth FYP (2011–2015), which highlighted seven new strategic emerging industries, including renewable energy technologies and electric cars, to receive sustained investment and preferential policies.

Central Document No. 12 (State Council 2015) also addresses technological innovation, pointing to continued government support for strategic industries in the 13th FYP (2016–2020), while suggesting the government give, "full play to the decisive role of the market in determining the orientation of green industries and choosing technology routes", rather than specifying specific technology goals for state supported innovation, as was in the case in the 12th FYP.

The text (*Ibid.*) notes that to "radically mitigate the contradiction between economic development and resources and environment" China should create an industrial structure "featuring high scientific and technological content, low resource consumption and little environmental pollution" as well as accelerating "the process towards green production modes". It also commits to strengthening "research on major science-and-technology issues", making "technological breakthroughs in energy conservation, resource recycling, new energy development, pollution prevention and control and ecological restoration" and making "breakthroughs in basic research and the R&D of cutting-edge technologies".

Beyond innovation for sustainability and competitiveness in individual technologies (as

discussed above), however, Chinese narratives are beginning to allude to what some scholars in the international literature call 'system innovation' (Elzen *et al*. 2004), which may lead to a transition or transformation of the entire economy. This often requires innovation beyond the high-tech, strategic sectors, to include bottom-up and emergent innovations (Smith *et al.* 2005); low(er) technology, below-the-radar, disruptive or frugal innovations (Kaplinsky 2011; Breznitz and Murphree 2011) and social aspects of innovations (Smith and Ely 2015; Husain 2015). The governance of these transition pathways has been a key challenge for academic study and policy alike for over a decade (Smith *et al.* 2005).

Some earlier Chinese narratives point towards this more systemic level, but without explicitly referring to both social and technological change. One such narrative is cleaner production (*qingjie shengchan,* 清洁生产), an established concept in international debates[3], which was explicitly linked to technological change in the academic literature in Europe throughout the 1990s (Clayton *et al*. 1999). The *Law of the People's Republic of China on Promoting Cleaner Production* was passed by the National People's Congress and came into force in June 2002 (Ely *et al*. 2011).

Similarly, narratives of the circular economy (CE) (*xunhuan jingji*, 循环经济), which parallel earlier Western notions such as industrial ecology (see Graedel and Allenby 1995), emerged in China following its use by former President Jiang Zemin at the Members' Assembly of the Second Global Environment Facility held in Beijing in October 2002. The term has been repeated by leaders such as Hu Jintao (Yong 2007) and featured as an aspect in the 11th FYP. According to the National Development and Reform Commission (NDRC), China's top economic planner,

> "the theme of the CE concept is the exchange of materials where one facility's waste, including energy, water, materials – as well as information – is another facility's input. By working together, the community of businesses seeks a collective benefit that is larger than the sum of the individual benefits each enterprise, industry and community would realize if it intended to optimize its performance on an individual basis." (NDRC 2006, quoted in Pinter 2006)

In 2007, China initiated its first wave of circular economy trials in ten different provinces and, later in 2009, passed the *Circular Economy Promotion Law* (Su *et al*. 2013). Some scholars (Ely *et al*. 2011) have suggested that the national approach may have drawn lessons from experiments at the level of municipal regulations in Shenzhen. As well as targeting resource/energy efficiency, the national law has spawned research around indicators and metrics associated with the circular economy (Geng *et al*. 2013).

Whilst the circular-economy narrative implicitly suggests changes across technical systems, there has been a notable absence of discussion around interacting socio-technical systems and changes in, for example, individual user/citizen behaviors (explored further in Tyfield *et al*. 2015). Beyond this, none of the discourse on innovation described above (prior to State Council 2015) acknowledged or appeared to question whether or how institutional structures or governance arrangements might need to be reformed in order for the kinds of system-wide

[3] Use of the term dates back to the United Nations Environment Programme (UNEP) 1991 definition of. 'the continuous application of an integrated preventative environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment'. (UNIDO 2015)

transition pathways that are necessary for required emissions reductions to actually emerge. This is discussed further in the following section, where we review recent developments and ask whether these are beginning, through more clearly articulated visions of system change, to enable a move from narratives to pathways.

Conclusion: From Narratives to Pathways

In contrast to analyses that suggest Chinese leadership on the environment might be "all talk", we have suggested that a discursive shift — particularly one that is projected internationally as part of a soft-power or "discourse power" strategy — might be instead meaningful, as it is constitutive of narratives that create real pathways of change. To explain this, the article has employed Leach *et al*'s (2010a) pathways approach by examining a some of the narratives associated with innovation and sustainability in common usage by China's political elite, and exploring the role that these may play in promoting and constraining particular pathways.

In particular, we identified that Central Document No. 12 (State Council 2015) represented the first official articulation of the ecological civilisation narrative focused on building specific pathways and, also importantly, on fostering potential system innovations that made those pathways more likely to emerge (Geall 2015). For example, it proposed a "comprehensive system of ecological civilisation", including improved legislation and enhanced compatibility between China's many environment-related laws. It cited the "need to improve the system of monitoring", including closing illegally polluting factories, and reforming "the system of government performance assessment", the report card that judges the performance of Chinese officials against criteria set from above, to address the local enforcement challenge (State Council 2015).

The document also committed China to abandon "the concept of regarding economic growth as the only criterion in government performance assessment" and promised to align targets, assessments, rewards and punishments "to the requirements for ecological civilisation" and supports active "public participation", referring to non-governmental oversight of environmental regulation, supported by accurate and timely environmental information disclosure; the expansion of the scope of this transparency; guaranteeing the public right to know; safeguarding the environmental rights and interests of the public; and improving the systems of whistle blowing, public hearings and public environmental interest litigation (*Ibid* 2015).

The text therefore seemed to signal that China's efforts to achieve *system* innovation, linked to technological innovation, but incorporating social change and governance reform, were set out at a high governmental level under the rubric of ecological civilisation. Subsequently, a pathway for ecological civilisation appeared in central government documents, and significantly, in a document for the United Nations Environment Programme (UNEP 2016b) that suggested, in a demonstration perhaps of "discourse power", that China's efforts to "build an Eco-civilization" will:

> "not only contribute to addressing [China's] own resource and environmental challenges but also serve as demonstrations for other developing countries that may wish to avoid the dependence on, and the lock-in effect of traditional development pathways. This is conducive to promoting the establishment of a new global environmental governance system and benefitting the noble course of sustainable development for all people, men and women." (UNEP 2016b, 4)

Further government documents have fleshed out implementation. In August 2016, the State Council issued the "Opinions on the Establishment of a National Ecological Civilization Experimental Zone" (Xinhua 2016b). This set a target to establish successful environmental management models that rolled out nationwide by 2020, with the first pilots planned in the provinces of Fujian, Jiangxi and Guizhou.

In discussing the rise and codification of the 'ecological civilisation' narrative, this article points to a discursive shift that brings environmental concerns together with powerful contemporary narratives around innovation – not only in terms of new technologies, but also social change and government reforms. Whether or not the governance changes that are proposed will be effective or well implemented is still uncertain. For example, while the recognition in these documents of the important role of the public is to be welcomed, it remains to be seen how the role of non-government actors articulates with traditional, top-down approaches. However, the 'ecological civilisation' narrative has implied specific pathways, and laid out pilots and a set of implementable changes in governance that can help achieve them. The directions in which these pathways emerge deserves ongoing research and analysis, and not only by those concerned with the future of China itself. Their success or failure will influence the country's "discourse power" and, as such, the potential for a more assertive and confident China to assume a stronger leadership role in global environmental debates.

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