Community housing retrofit in the UK and the civics of energy consumption
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Abstract
The existing housing stock in the UK will make a significant contribution to national carbon emissions for many decades to come. Existing houses present a significant challenge to systemic upgrades because they are influenced by a disparate set of regulations, incentives, and stakeholders. Unlike the new build industry, there is no single set of standards to regulate and steer the energy performance of the existing housing stock. To address this challenge, a wide range of government bodies and non-governmental organisations have initiated domestic retrofit programmes based on the notion of 'community'. The aim of community retrofit programmes is to create a collective of various actors who influence domestic buildings to make retrofit activities more effective and widespread. This rescaling of domestic housing retrofit from the individual household to the community level counters the fragmented and incremental character of domestic retrofit activities by creating shared networks of inquiry and action. This chapter explores the social and political aspects of community domestic retrofit programmes to understand their implications to sustainable urban transitions. The chapter begins with a summary of the challenges to systemic domestic retrofit in the UK and the deficiencies of the 'rational choice' model that is commonly employed by Government and other organisations to reform the existing housing stock. Then, four emerging approaches to collective domestic retrofit are presented to illustrate how the notion of community reframes the relationship between individuals and the state. Finally, the chapter concludes with reflections on the emerging civics of low-carbon transition that are embedded in community housing retrofit programmes.

Keywords
Housing, retrofit, community, energy, civic engagement, governance, collective action

Introduction
The housing stock in the UK comprises an estimated 25% of national carbon emissions. New houses replace existing houses at a very low rate, less than 0.5% per year (Jones *et al.* 2013), meaning that between two-thirds and three-quarters of the current housing stock will still exist in 2050 (SDC 2006, Roberts 2008, UKGBC 2008, Gupta & Chandiwala 2010, Eames *et al.* 2013). Thus, there is a pressing need to upgrade the existing housing stock to reduce its carbon emissions. Systemic retrofit of housing is a significant challenge because, unlike the new build housing industry, there is no clear set of guidelines to govern the retrofit process. As the UK Green Building Council (2008: 1) states, the existing housing sector is 'hugely fragmented, with a plethora of industry sectors and other stakeholders, different groups of actors and decision-makers and various inter-related policies'. Implementing a comprehensive strategy for retrofit requires novel approaches to organise and direct this fragmented landscape.

To address the fragmented character of the existing housing stock, stakeholders ranging from the UK government and local authorities to social housing providers and charity organisations are developing approaches of 'community' retrofit. The aim is to approach retrofit in a more joined up way to influence the carbon performance of domestic buildings on a broad scale. The notion of community provides an opportunity to foster new relationships amongst the actors who influence the built environment, including designers, building owners, financiers, local authorities, and occupants. By linking up these actors through shared networks of inquiry and action, it is hoped that a low-carbon building stock can be realised.

This chapter contributes to a growing body of literature on 'community retrofit' (e.g. Brown & Vergragt 2012, Vergragt & Brown 2012, Gee & Chiappetta 2013, Karvonen 2013, Swan 2013, Gupta *et al.* 2014) by comparing and contrasting the dominant ways that community is leveraged in the housing sector. The chapter begins with an overview of some of the most significant challenges to domestic retrofit in the UK and a critique of the 'rational choice' and individualist model that is commonly applied to upgrade the existing housing stock. This is followed by a summary of four community retrofit approaches that provide innovative routes to transform the built environment. The chapter concludes by reflecting on the implications of community housing retrofit to the politics and governance of low-carbon transitions.

Challenges to Systemic Housing Retrofit
The UK's housing stock is constantly being retrofitted to meet contemporary norms and standards as well as prepare for future conditions. The notion of 'retrofit' is often used interchangeably with renovation, modernisation, restoration, and rehabilitation. All of these terms describe activities undertaken (often by homeowners) that go beyond routine maintenance and repair (see Meijer *et al.* 2009, Dixon & Eames 2013). This includes modernisation of kitchens and bathrooms, installation of insulation and energy efficient boilers, replacement of roofs and windows, construction of extensions and conservatories, and so on. These interventions are periodic, occurring anywhere from five to thirty years (or longer), and are often done in a piecemeal fashion. Realising systemic change to the housing stock involves coordinating these discrete interventions into a directed strategy of upgrade.

The housing stock comprises a wide range of ages and construction methods so there is no 'one-size-fits-all' approach to upgrade. Further, there is a lack of incentive for homeowners to undertake retrofit of their properties because these activities are often disruptive, costly, and require effort to coordinate product designers, manufacturers, installers, rebate programmes, and so on. All of these factors contribute to the fragmented character of retrofit activities and this has hindered widespread change (Clarke 2006, Oreszczyn & Lowe 2010, Swan 2013). Oreszczyn and Lowe (2010: 110) summarise the retrofit challenge succinctly: 'Empirical evidence and experience suggest that it will be neither particularly easy nor particularly cheap to reduce energy use in buildings. However, there is a perception in government that energy efficiency in buildings is straightforward and requires minimal investment.'

Government has traditionally approached housing energy performance and carbon reduction by introducing a range of regulations and incentives. Regulations such as the Building Standards, the Decent Homes Standard, and the Scottish Housing Quality Standard have been supplemented with incentive programmes such as the Feed-in-Tariffs Scheme and the Renewable Heat Incentive to compel or encourage homeowners to upgrade their properties. These approaches use legal and financial levers to optimise energy performance while

improving the quality of life and health of occupants and enhancing property values. As a whole, regulations and incentive programmes have produced a patchwork of upgrades to the housing stock but have failed to realise widespread change (Eames *et al.* 2013). Maller and colleagues (2012: 257) argue that: 'market mechanisms, easy retrofits, and economic rationalist understandings of human actions are unlikely to achieve widespread systemic changes needed to address the environmental and social challenges of climate change, largely because they do not challenge the status quo and overlook the routines of everyday life.' Thus, regulations and incentive programmes are a necessary but insufficient approach to reduce the carbon emissions of housing.

Beyond regulations and incentive programmes, there is a wealth of information available on domestic retrofit. Information provision works on the assumption that the energy performance of the existing housing stock is hindered by a lack of knowledge either with homeowners or building professionals. Thus, there is a need to fill the 'information gap' to realise systemic retrofit. For example, the Centre for Refurbishment Excellence (2016) in Stoke-on-Trent is a one-stop shop for best practices, case studies, and training for construction industry professionals. The SuperHomes Network (2016) is a consortium of over 200 houses that have achieved at least a 60% savings in carbon savings through retrofit and provides free tours to the public twice a year. And the Low Energy Building Database (LEBD 2016) is a free online resource managed by the Association for Environment Conscious Building with detailed case studies on 230 domestic retrofit projects for industry professionals and the public. Like regulations and incentives, information provision is a useful first step in catalysing change in the built environment. However, 'information alone is unlikely to motivate changes as a matter of course' (Moloney *et al.* 2010: 7616).

The problem with regulations, incentive programmes, and information provision is that they focus on the individual as the agent of change. This epitomises the 'rational choice' model where it is assumed that a person has the motivation and capacity to review and select from a range of options (Gram-Hanssen 2009, 2010, Heiskanen *et al.* 2010, Spaargaren 2011, McMeekin & Southerton 2012, Berry *et al.* 2014, and Karvonen 2016). The result has been an overemphasis on the individual, particularly homeowners, to realise systemic change to the housing stock while neglecting the various stakeholders that can either facilitate or hinder change. This is particularly the case with energy upgrades to housing. As Heiskanen and colleagues (2010: 7586) note: 'For decades, attempts to change energy-related behaviour were targeted at individuals as consumers of energy.' Alternatively, the housing stock can be understood as 'a cultural asset that is embedded in the fabric of everyday lifestyles, communities, and livelihoods' (Ravetz 2008: 4463). This shifts the emphasis of retrofit from the individual consumer or property owner to recognise that domestic life is linked to larger social, cultural, and political drivers. This serves as the basis for understanding the emergence of community approaches to housing retrofit.

Community and Low-Carbon Futures
The idea of 'community' serves as a useful counterweight to individualist understandings of society. A wide range of social scientists have examined the notion of community in environmental politics and sustainable development in current debates including grassroots innovation (e.g. Seyfang & Smith 2007, Seyfang *et al.* 2010, Seyfang & Haxeltine 2012), civic environmentalism (e.g., Agyeman & Angus 2003, Karvonen 2011, Karvonen & Yocom 2011), environmental governance (Bäckstrand 2003, Bulkeley 2005, Walker 2011), social movements

(Shutkin 2000, Hess 2007), and political theory (Little 2002, Barber 2003, DeFillipis *et al.* 2006). Community is recognised as a progressive, collective, and mobilising force (Aiken 2014) and motivated by the assumption that 'groups of individuals are better placed to create new institutions and schemes for resolving social dilemmas' (Heiskanen *et al.* 2010: 7587).

Communities are a strong presence in energy and carbon debates but often through protest activities (Walker 1995, Van der Horst 2007, Cass & Walker 2009, Wolsink 2010). To a lesser extent, communities participate in locally owned and managed energy infrastructure projects (Muruyama *et al.* 2007, Rogers *et al.* 2008, Walker *et al.* 2007, Walker 2008, Walker *et al.* 2010). Walker (2011: 777) argues that: 'The involvement of communities has become an increasingly recurrent feature of carbon-related discourse, viewed as positive, productive and contributing to the successful implementation and social embedding of various forms of carbon reduction activity.' Likewise, Aiken (2014: 765) notes that community 'emerges as a key site in the transition to low carbon futures partly because of its ability to encompass both the global and local, and also to internalise and governmentalize the behavioural changes that transition to low carbon futures requires.' Thus, community serves as a critical link between the individual consumer that is creating carbon emissions and the government that is charged with reducing those emissions.

Community Housing Retrofit
Multiple housing retrofit programmes have emerged over the last decade based on notions of community (see Karvonen 2013, 2016, Swan 2013). These programmes go beyond the individualist emphasis of regulations, incentive programmes, and information provision to recognise the housing stock as a shared asset with multiple stakeholders. This shifts the focus of retrofit from the individual house to a collection of houses with similar issues or to a collection of actors with shared interests.

Community housing retrofit programmes have several commonalities. First and foremost, occupants are at the centre of decision-making processes. This recognises that for retrofit measures to be effective in the long-term, it needs to be understood not only as a reconfiguration of how a house is physically configured but how it is inhabited and managed on a daily basis. This reflects a sociotechnical perspective where the house is constituted of a combination of social and material relations (Guy 2006, Guy & Karvonen 2011, Day & Walker 2013). A second similarity of these programmes is that domestic retrofit is a complex process. This complexity includes technical and economic issues but also social issues related to comfort, health, well-being, and happiness. Thus, the process of retrofit is about bringing the physical and social, the house and the home, into new sociotechnical alignments (Vergragt & Brown 2012, Walker *et al.* 2015).

Community is interpreted in various ways through these programmes. They may be comprised of stakeholders such as design and construction professionals, government officials, neighbours, and third sector organisations, or they may occupy a particular geographic location consisting of a dominant housing type. As Walker (2011: 778) argues: 'The different meanings of community that are drawn on by policy and nongovernmental actors link to a set of expectations about what community can productively bring to carbon mitigation initiatives.' In the following sections, four different interpretations of community retrofit are presented to understand how community is being used to promote knowledge creation and action and how this influences the retrofit process.

Community as Local Governance Strategy

For over a decade, the UK Government has recognised community as an important strategy for climate change mitigation. The 2005 *Securing the Future* report states: 'Community groups can help tackle climate change, develop community energy and transport projects, help minimise waste, improve the quality of the local environment, and promote fair trade and sustainable consumption and production (HM Government 2005: 27). This agenda recognises that 'community level initiatives hold the potential to ground climate change policy in a much more visible way to the everyday practicalities of energy use than more "top-down" measures have been able to achieve' (Peters *et al.* 2010: 7596). Community here represents a novel form of local governance to address the multiple challenges of climate change. Hauxwell-Baldwin (2013: 9) argues that: 'community is conflated with civil society as part of a new social architecture through which the "search for sustainability" may be governed, and new social movements form around "the complex area of climate change and energy efficiency"'.

An example of the local governance of retrofit is the Carbon Coop, a member-owned community benefit society in Manchester that represents over 100 households (Carbon Coop 2016). The organisation received £500,000 in funding from the Department of Energy and Climate Change's Community Green Deal programme to retrofit twelve houses across Greater Manchester. The Carbon Coop practices whole house retrofit by strategizing with homeowners on multiple measures to reduce carbon emissions by 80% or more while also being affordable. As such, each house received a whole house assessment, zero interest loan, access to subsidy programmes, procurement of contractors, and design and specification services. While the programme continues to use traditional government incentives, it manages these funds at the local scale where they can target a particular housing stock.

In 2015, National Energy Action presented the Carbon Coop with an Energy Efficiency Best Practice Award from National Energy Action (2015), stating: 'The programme has successfully leveraged the high levels of householder involvement and trust that Green Deal has failed to, informing a new, ambitious, community-led approach to retrofit.' Organisations such as the Carbon Coop go beyond conventional regulations and incentive programmes by operating at an in-between scale to bridge national government targets and a particular housing stock. There is an understanding that local organisations have a better understanding of the opportunities and barriers of domestic retrofit and can align what is happening on the ground with broader government ambitions. While there is a continued reliance on traditional financial mechanisms to incentivise retrofit among homeowners, there is an acknowledgement that low-carbon interventions are most effectively managed and executed at the local scale. This embodies an 'ecolocalisation' agenda for transitioning to a low-carbon society (Shutkin 2000, North 2010, Aiken 2014).

Community as Identity

At the opposite end of the spectrum are those retrofit programmes that counter the UK government's dominance in low-carbon governance. Bottom-up initiatives recognise that the housing stock is embedded in particular places. They take advantage of a shared geography to bring together a community of neighbours and are often tied to other low-carbon initiatives such as local food growing, local currency, transport, energy generation, and so on. Transition Towns are the most prominent example of this approach links domestic living, consumption practices, and local governance (Smith 2011a, 2011b, Aiken 2012, 2014, Feola & Nunes 2014).

These types of retrofit programmes rely on social capital as the currency of retrofit strategy and action. There is an assumption that the shared values amongst a particular population can lead to shared action to upgrade their houses.

An example of grassroots domestic retrofit that is about local identity is the Community Action for Retrofit Delivery (CARD) project, a part of Transition Town Totnes (TTT 2016). CARD was launched in 2013 with support from the Energy Saving Trust and includes five organisations in South West Devon that deliver workshops and home energy assessments with the goal of upgrading 250 houses. The project is unique because it uses community organisations to stimulate retrofit in the private housing sector in a particular geography where residents have embraced the Transition Town agenda. Rather than scaling environmental governance to a local organisation, community is engendered through an emphasis on place and identity. By situating retrofit in a particular locale with a tight social fabric, networks of retrofit knowledge can be developed and applied to a familiar housing stock.

Low-carbon culture is achieved by developing a shared local identity and common values about energy consumption. This approach suggest a very different mode of community that is founded on 'social innovation' to challenge and disrupt existing institutional frameworks (Aiken 2014). A retrofitted housing stock in Totnes sets it apart from other UK towns while also aligning the performance of the houses with the Transition Town ethos of the residents. These place-based approaches to community tend to be more radical because they challenge and disrupt existing institutional frameworks (Aiken 2014). This emphasises the connection between the housing stock and social networks. They are a contemporary manifestation of 1970s environmental politics of the Back-to-the-Land and Appropriate Technology social movements.

Community as Learning Network
Another interpretation of community focuses on developing a learning network to address the complexities of domestic retrofit. Here, there is a recognition that a significant challenge of housing retrofit is to join up the appropriate actors to create a chain of knowledgeable stakeholders that can execute upgrade activities effectively. Aligning the various financial, modelling, building, product manufacturers, and homeowners creates a learning network. Here, it is not so much scale or place that is important as effective circuits of knowledge sharing that can facilitate coordination and action.

An example of community as a learning network is Retrofit for the Future, a £17m programme launched in 2009 by the Technology Strategy Board (since renamed Innovate UK). The project lowered the carbon emissions of 86 houses by 50 to 80% through the purposeful coordination of housing providers, designers, contractors, and researchers. They identified four keys to successful retrofit: project planning, site management, understanding the supply chain, and working closely with residents (TSB 2013: 3). A report on the results of the programme states that: 'Well-delivered projects have clear lines of responsibility across teams who are committed to the retrofit's objectives. When all parties understand what is required and why, it leads to better results' (TSB 2014: 5). The programme also provided a platform to collect data for comparison across the case studies. There is an emphasis here on learning as the key to realising systemic retrofit (Hertin *et al.* 2003, Vergragt & Brown 2007, 2012, Evans & Karvonen 2011, Ross 2011, Gupta *et al.* 2014, Grandclement *et al.* 2015).

The learning network also emphasised the process of retrofit and the need to harmonise the various actors through intermediation. Intermediaries 'work in-between, make connections, and enable a relationship between different persons or things' (Moss *et al.* 2010: 5). The intermediary could be a government agency (as in this case), a non-profit or community organisation, or even a private company. The overarching aim is to optimise the chain of retrofit stakeholders to realise the greatest carbon savings. Like the place-based approach to community retrofit, it suggests the need for societal learning as key to realising a low-carbon future. However, the learning network approach is not focused on a particular ethos but instead centres on the material process of retrofit as its driving force.

Community as Ethical Commitment
Another distinctive form of community retrofit involves social housing providers who are addressing fuel poverty to promote better health and well-being while saving energy and reducing carbon emissions (Gee & Chiappetta 2013, Swan 2013). Social housing providers own and manage large housing estates and retrofit is one of the services that they provide to their low-income tenants. Retrofit activities here are not simply aimed at energy and financial savings but also embody a moral activity to provide adequate accommodation to populations in need (Gee & Chiappetta 2013).

Salix Homes, a social housing provider in Greater Manchester, provides an example of community as a moral agenda with its refurbishment of the New Barracks Estate in Salford (Arup & Salix Homes 2011, 2012a, 2012b, Arup 2012). The project involved the retrofit of 79 Edwardian terraced houses to simultaneously reduce energy consumption, combat fuel poverty, and improve occupant comfort and health. The retrofit team did not perceive the occupants as receivers of housing upgrades but instead recognised that they needed to be included in the process to reduce conflicts and ensure long-term benefits. This counters the common approach in social housing where 'the most common logic has been retrofitting as part of social policy "done" to low-income and poor households, who are often seen as compliant and unable to resist' (May *et al.* 2013: 11). Community here is used to realise more inclusive retrofit process by including low-income renters, a group that is often left out of retrofit decisions. In describing the project, a team member (Arup 2012) notes: 'Rather than focusing solely on physical improvement, Salix has looked at how this will help improve energy consumption and the environmental impact of its properties, as well as the experience of tenants living in its homes.' Thus, the retrofit process recognises the social as well as the physical aspects of housing.

Community here emerges as a collaborative mode of retrofit that allows social housing providers to develop improved relations with their tenants while creating a shared sense of identity and greater cohesion amongst social housing tenants. The social housing provider serves as an intermediary to facilitate retrofit activities and moreover, to foster longer term carbon savings as the houses are inhabited. Retrofit is understood not as a one-off event but as a long-term dialogue on how people and energy are connected (Fawcett 2014). This provides an intriguing opportunity for social housing providers to serve as leaders in environmental governance by fostering a low-carbon culture among their tenants.

Community Housing Retrofit and the Civics Low-Carbon Transitions
The emergence of community housing retrofit has important implications on the governing of low-carbon transitions. There is an explicit effort to recognise how social and material factors

are intertwined in the housing stock and how these socio-technical systems can be harmonised (Vergragt & Brown 2012). In all cases, there is an emphasis on ensuring that the occupants are part of the retrofit process. Occupants are not simply receivers of housing upgrades but instead, they are understood as being crucial to realising the long-term benefits of retrofit. There is also an emphasis on the chain of actors who produce retrofit. This assembly of stakeholders suggests that low-carbon governance can take multiple forms with different implications. Community has the potential to provide a new mode of low-carbon governance whereby the lived aspects of housing are aligned with the financial and material aspects, shifting the emphasis of retrofit away from technical and economic considerations towards the sociotechnical configurations of occupants and systems of provision (Guy 2006, Rohracher 2008). This suggests a more nuanced and complex approach to carbon mitigation activities, one that recognises the lived experience of housing as equally important to its physical configuration.

Community housing retrofit activities are an intriguing development because they provide promise for alternatives to the business-as-usual approach to upgrading the housing stock, cutting across the individual ownership of houses to identify commonalities and shared interests. In effect, the emphasis on community has the potential to transform occupants from consumers into citizens and from homeowners into neighbours and colleagues. These activities hold promise for engendering a new civics of energy consumption that can address the complexities of high carbon lifestyles through collective action. Community can bridge the gulf between the state and the individual, between the global need to reduce carbon emissions and the daily activities of individuals. As Peters and colleagues (2010: 7596) argue: 'Community level initiatives hold the potential to ground climate change policy in a much more visible way to the everyday practicalities of energy use than more 'top-down' measures have been able to achieve.'

At their best, these projects and programmes represent a new form of civic politics and new modes of ecological citizenship (Karvonen 2010, 2011, 2015). They comprise coalitions of progressive actors that can realise opportunities, make connections, and instigate actions. Walker (2011: 779) argues that 'community is seen as an integral part of wider innovation, learning, education, and diffusion processes, acting as a conduit, a lubricant and an exemplar for change.' In this way, they provide intriguing connections between innovation and community action (Seyfang *et al.* 2010). Moreover, they hold promise for recasting the citizen relationship with political institutions by reenergizing civic culture (Hoffman & High-Pippert 2005).

From a pessimistic perspective, the rise of community organisations can be seen as filling the gap left by the rollback of the state as the principal arbiter of environmental governance (Karvonen 2010). Governance through community can result in unrealistic expectations for civil society groups to drive low-carbon transitions (Amin 2005) and could potentially push 'agency and responsibility on individuals at a local level, in everyday lives, taking a specific governmentalised tone' (Aiken 2014: 765). From this point of view, the rise of community is symptomatic of the post-political condition (Swyngedouw 2009) where carbon mitigation activities are simply left to civil society rather than being the remit of elected bodies. This raises important questions about how systemic change can be realised without any real power to act (DeFillipis *et al.* 2006).

It remains to be seen if community approaches to domestic retrofit and related activities can produce a new form of civic politics. The various community retrofit programmes that have emerged in the UK are relatively new and while they have reported early successes, it is unclear if they will have a sustained influence on carbon emissions. They may represent a new form of low-carbon politics that is situated and empowers the connections between people and the built environment. Alternatively, they may represent the only alternative as governments increasingly retreat from any substantive role in reducing carbon emissions.

Conclusions

This chapter has provided insights on the emergence of community and its potential to contribute to the systemic retrofit of the existing housing stock in the UK. As Eames and colleagues (2013: 506) note: 'Large-scale urban retrofitting requires systemic change in the organisation of built environment and infrastructure, and the integration of socio-technical knowledge, capacity and responses.' The community retrofit programmes summarised above provide alternatives to the conventional approach of targeting the individual consumer through a 'rational choice' mode of change. Instead, they aim to enhance the various relationships among retrofit actors as well as their specific contexts in new and generative ways. The Carbon Coop brings distant carbon targets of the UK Government to a local level while the CARD programme in South Devon focuses on a familiar geographic context to foster a new form of place-based progressive politics. Meanwhile, Retrofit for the Future sees community as a way to bring together the network of stakeholders that can more easily facilitate the process of domestic retrofit while the New Barracks Estate demonstrates a strong moral commitment to reducing carbon footprints while also providing affordable and liveable housing to low-income residents. These approaches are not mutually exclusive and there are multiple overlaps including intermediation, recursive learning, and the complex interactions between people and the built environment. As Berry and colleagues (2014: 2) note, 'Community-led approaches have the potential to stimulate and enable local action on energy through giving meaning to information and experience.'

At their best, community retrofit programmes provide hope for an improved, low-carbon future by introducing civil society to the process of retrofit. It recognises the governance of carbon and the improvement of the built environment requires greater involvement by civil society (Seyfang & Smith 2007, Peters *et al.* 2010). Like other forms of community energy, 'individuals take the role of citizens rather than consumers, and gain the capacity to work together to transform their energy infrastructure on the local level' (Heiskanen *et al.* 2010: 7586). At the same time, these initiatives can be used to develop stronger local identity and civic pride while feeding into related initiatives that can foster community cohesion. As Seyfang and colleagues (2013: 979) write: 'By bringing together groups of people with common purpose, they overcome the structural limitations of individualistic measures, by empowering and enabling communities to collectively change their social, economic and technical contexts to encourage more sustainable lives and practice their ideological commitment to sustainability.' If nothing else, these community retrofit programmes bring visibility to changes in the built environment, translate distant carbon targets into tangible actions and outputs on the ground, and raise the potential for low-carbon cultures to take root.

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