Governing Low-Carbon Innovation in China - Social Innovation

Tackling climate change and moving towards a low-carbon transition requires the involvement of a wide range of actors. Traditional frameworks view government, firms, R&D institutions and financing agencies as the key actors within innovation systems. Yet, there is a new role for other actors within the low-carbon innovation system, in particular the role of communities, users and socially-minded producers (both individuals and organisations) in driving innovation for sustainability. This may help overcome major obstacles to the development and deployment of new technologies, raising new types of finance and more.

The ESRC research project "Low-Carbon Innovation in China: Prospects, Politics and Practices" has examined the role of new, unconventional actors for driving forward low-carbon innovation in energy, transport and agriculture.

Social innovation can either be viewed as non-conventional actors driving forward the innovation system, or new ways of organising innovation involving civic actors, or both. This policy brief makes two points regarding social innovation in the context of low-carbon systems transition:

1) Social innovation involves new actors, in particular communities, individual users and non-governmental organisations in driving innovation for sustainability and climate change mitigation.

2) New innovation strategies are being promoted by new actors, often in the absence of strong central government support. Local support however plays a major role. Bottom-up innovation is particularly strongly represented in energy, transport and agriculture.

Solar energy

China's solar PV and the solar water heater sectors have both grown substantially, partly because of traditional actors such as government, firms, R&D institutions and finance, and partly thanks to the efforts of socially minded energy producers, both individuals and organisations, as well as individual users.

The non-governmental organisation Greenpeace, for example, were the first organisation in Beijing to privately install solar PV: using their warehouse's rooftop to make use of the feed-in-tariff for small-scale solar PV installations generating electricity -- a subsidy that still faces bureaucratic and technical hurdles in its implementation.

Other individual "first-movers" include Ni Huan, a low-carbon lifestyle advocate. She was the first person to install thin-film solar panels and connect them to the grid in Shanghai. She has disseminated knowledge – social, technical and regulatory – about this process, particularly through digital media, helping to educate potential users, utilities, regulators and companies in the process. These organisations and individuals therefore play an important role in experimenting with business models, technologies and policies to pioneer more sustainable socio-technical energy systems.

While central government support is strong for the solar PV industry (at the firm level), solar water heater firms enjoy little central policy and financial support, but strong support from local governments and users of the technologies. This is manifested in the 85 million solar water heater systems installed in China (Weiss et al, 2015), evidence that individual consumers can help drive forward the deployment and uptake of low-carbon innovation. This development in solar water heater is a bottom-up process, made successful by changing energy practices among tens of millions of individual users.

Agriculture

Similar trends can be seen in sustainable agriculture: consumers increasingly prefer organic, green foods and other forms of ecological certification.

Garnett and Wilkes (2014) found that "the environmental motivations of Chinese consumers are quite high", mentioning that "44 per cent of Chinese respondents said they were willing to pay more for products that are good the environment, a greater percentage than in the US or UK" and also confirming that "agricultural systems that use fewer or no chemical inputs, such as those based on 'green' or organic approaches [was] seen as safer than those which may rely very heavily on such inputs."

This consumer demand has been met not only by entrepreneurs, but also by socially-minded innovators, working to create new networks and relations around agro-ecological production and distribution, with no discernible support from government.

Projects like Beijing Farmers Market, enabled by digital technologies (particularly social messaging apps), connect organic and "ecological" farmers to consumers, to benefit small, local producers while increasing trust and knowledge about sustainable agricultural practices; journalists and activists have also helped consumers to share information about food-safety risks through online platforms; and small, rural farming cooperatives, such as Little Donkey Farm outside Beijing, have begun to transform farming practices, as well as opening new markets (Ely and Geall, 2014).

There is therefore evidence that across energy, transport and agriculture, individual consumers and other enthusiasts are driving forward innovation for sustainability in China.

This suggests the following lessons:

- **New actors play a key role for driving social innovation for climate change mitigation and low-carbon transitions**, often following a bottom-up approach and sometimes faced by limited government support.
- **This helps overcome major bottlenecks** related to developing and deploying new technologies, products and services, as well as finding innovative ways of how to develop, improve and apply finance models, policies and bureaucratic systems.
- **Local support of users and consumers is important to scale-up** the deployment of low-carbon innovation.

In summary, non-conventional actors such as communities, individual users and non-governmental organisations play an important role for driving forward low-carbon innovation, both in terms of its development and in terms of its deployment, in China and elsewhere.

READ MORE:

Urban, F. and Geall, S. 2014. *Pathways Towards Renewable Energy in China: Prospects, Politics and Practices.* Brighton: STEPS Centre Working Paper 70. Available at: http://steps-centre.org/publication/pathways-towards-renewable-energy-china-prospects-politics-practices/

Ely, A., Geall, S. and Song, Y., 2016. "Sustainable maize production and consumption in China: practices and politics in transition", *Journal of Cleaner Production* 121.

Liu Xielin and Li Fengmei, 2016. "The dynamic evolution process of the photovoltaic industry chain in China and driving factors to the evolution."

This policy brief draws on work presented at the International Workshop on *Low-Carbon China: Emerging phenomena and new questions for innovation governance* held at the School of Public Policy and Management, Tsinghua University in January 2016, including the UK-China project 'Low-Carbon Innovation in China: Prospects, Politics and Practices', funded by the UK's ESRC.

For more information please visit: steps-centre.org/project/low-carbon-china/