

## Grid-Connected Renewable Energy in China: Policies and Institutions in a Socialist Market Economy

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**Abstract:** Chinese policies and institutions for the deployment of renewable electricity are only partially compliant with what is internationally recognized as “best practice”; and divergences from the optimal policy and institutional model are frequently interpreted as obstacles to renewables in China. Much as a political economy perspective has aided understanding of why Chinese economic reforms were partial and unique, the contextualization of Chinese policies and institutions for renewables in the broader picture of China’s political economy (said contextualization being the purpose of this paper) might help explain why those policies and institutions diverge from best practice. Further, given that China proved successful in promoting its economic growth with partial and unique reforms, the partiality and uniqueness of its renewable policy and institutions need not impede the rapid development of renewable electricity. Our analysis combines a review of specialized literature and the business press with semi-structured interviews held with relevant actors in policy, business, and research related to renewable energies.

**Keywords:** Renewable energy, Policies, Institutions, Political Economy, China.

### 1. Introduction and methodology<sup>1</sup>

There is an extensive literature that describes the particularities of China’s political economy, as well as, in many cases, the impact of said political economy on socio-economic performance. These are usually studies that deal with quite broad views of political economy as well as with broad outcomes (such as economic growth). Nevertheless, one observes less emphasis in trying to relate the features and performance of more specific economic sectors (e.g. renewable energy) to the particularities of the Chinese political economy. Instead, when looking into concrete economic sectors, it is not uncommon for specialists to analyze China by applying concepts and theoretical models developed for other realities. Also not uncommonly, the fact that Chinese regulations do not fit nicely into such concepts and models leads observers to pessimistic expectations on Chinese performance.

In this paper, we look into the Chinese grid-connected renewable energy (GCRE) sector as an exercise in overcoming the mainstream de-contextualization of the analysis of Chinese policies and institutions when it comes to specific economic sectors. To be more concrete, we attempt to explain why Chinese policies and institutions do not nicely fit into the “best practice” model, in view of China’s principles for decision-making. Whereas such model could be portrayed as a sector-specific description of a Liberal Market Economy (LME), Chinese policies and institutions for GCRE more resemble the sector-specification of what could be termed a Socialist Market Economy (SME); more concretely, policies and institutions are informed by three principles of decision-making particular to the Chinese political economy: gradualism, developmentalism, and socialism.

Our analysis combines a review of specialized literature and the business press with semi-structured interviews held with relevant actors in policy, business, and research related to renewable energies. Interviews were conducted at: departments of the Government of Spain;

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Chinese public research centers; institutions for international cooperation in energy and the environment; and multinational companies operating in China.

## **2. Policies and institutions for GCRE: “best practice” and the case of China**

There is an extensive literature describing sets of policies and institutions<sup>2</sup> that foster the deployment of renewable energy (and GRCE in particular). Such collections of prescriptions are scattered, appearing mostly in professional reports and policy handbooks published by energy organizations or associations (see for example GWEC, 2005; IEA, 2007 and 2008; IREC, 2004; World Bank, 2008; WEC, 2004).

In a previous paper (García, 2010), we assembled a systematic collection of the policy and institutional prescriptions posited in these reports as “best practice”; also characterizing such prescriptions as a sector-specific description of a particular kind of capitalism, sometimes termed LME, as in Hall and Soskice (2001). In particular, the model consists in: (1) policies that eliminate economic barriers to renewables (barriers to investment related to insufficient revenue or excessive cost) by leveling the playing field of renewables vis-à-vis fossil fuels, as well as by implementing support mechanisms that compensate for high costs, limited access to finance, and insufficient demand; and (2) institutions that eliminate non-economic barriers (barriers to investment related with institutions) by ensuring good governance on the part of the State and corporate competition. In other words – in terms closer to those describing LMEs – policies consist in regulations that intend to facilitate private investment via the perfection of market mechanisms; and institutions consist in liberal-market institutions, which would also facilitate investment. See a detailed summary of the “best practice” model in Table 1.

Also, the aforementioned paper (García, 2010) discussed the extent to which China’s policies and institutions for GCRE fit into the “best practice” model, concluding that they do so only partially and imperfectly. China’s policies diverge from best practice insofar as: negative externalities of fossil fuels are not compensated for (as with a coal tax); regulations do not incentivize feeding power into the grid, but instead focus on installing capacity (China’s renewable portfolio standard does not refer to actual power fed into the grid but to installed capacity; and the tender system for wind that prevailed until 2009 had no provisions to ensure generation and transmission); remuneration levels are low and duration of tariffs is short (be they tariffs set in tenders, in local licenses, or through FITs); regulations do not include enough provisions for the reduction of tariffs over time, necessary for the promotion of cost-reducing innovations; and PPAs do not ensure connection. Meanwhile, concrete divergences in institutions include the following: general legal insecurity; complex and lengthy red-tape; unpredictable policy instruments (insufficient stability and transparency); insufficient competition in generation due to market concentration, a high market share remaining in public hands, and limits to foreign presence; and restrictions to innovation in manufacturing brought about by barriers to external trade and to foreign investment. See Table 1.

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<sup>2</sup> Policies here refer to those rules offered by public authorities as the preferred course of action toward a desired outcome; and institutions refer to structures of economic actors (governmental or corporate) and the mechanisms that influence those actors and relations between them.

Table 1. Summary of “best practice” for the deployment of renewables, and the Chinese divergence from “best practice”

	Policies and institutions for renewables in the "best practice" model	Elements typical of a liberal market economy	Chinese divergences with "best practice"
<b>Policies to overcome economic barriers</b>	Elimination of coal subsidies		Negative externalities not fully compensated for
	Compensation for the negative externalities of fossil fuels (pollution...)		
	Remuneration for the positive externalities of renewables	Perfection of markets: role of government is to, with an arm's length approach, eliminate market distortions and compensate for market failures	
	Compensation for high initial costs (mandated market policies): quantity-based and price-based schemes		Regulations focus on installed capacity rather than power generation
	Increased access to capital: fiscal and financial aids		Remuneration levels are low, and duration of tariffs is short
	Ensuring sufficient demand (PPAs)		Regulations do not include enough provisions for reduction of tariffs
<b>Institutions to overcome non-economic barriers</b>	General legal security		PPAs do not ensure connection
	Capable bureaucracy: coordination and cutting of red-tape		General insecurity and uncertainties
	Quality of regulations in renewables: specific, legally binding targets, and predictable instruments	Liberal-market institutions: role of government is to set formal and predictable (stable, non-discretionary, and transparent) rules that are effectively enforced; and to ensure low barriers of entry and competition	Incomplete coordination, and complex and lengthy red-tape
	Competition and technology-friendly policies in generation: unbundling, absence of oligopolies, openness to FDI		Targets not compulsory, and instruments lacking stability and transparency
	Competition and technology-friendly policies in manufacturing: openness to external trade and FDI		Limits to competition in generation (market concentration, public ownership, and barriers to foreign entry)
			Limits to innovation (barriers to foreign trade and entry)

Source: Author's design.

### 3. China's policies and institutions for GCRE in light of principles of policymaking

We contend that singularities in Chinese policies and institutions for GCRE are better understood in light of the overall framework of the Chinese political economy or, more specifically, of the general principles of decision-making in China<sup>3</sup>. We use authoritative secondary sources, as well as insights obtained in interviews, to identify those factors that might help understand the partiality and uniqueness of the Chinese fit into “best practice”. In doing so, we stress the importance of gradualism of reforms, developmentalism, and socialism in explaining most particularities of Chinese GCRE’s policies and institutions.

Gradualism in Chinese economic reforms has been widely documented<sup>4</sup>, with reforms being implemented incrementally and also experimentally. Addressing electric sector reform in particular, Ma and He (2008) and Chen (2010) describe how the transformation of policies and institutions has moved gradually and incompletely toward those of a market system. Various interviewees for the present study described Chinese policies in renewables as being implemented slowly, and through experimentation and trial-and-error (author’s interviews). Indeed, many of the aforementioned divergences from “best practice” in the promotion of renewable electricity can be explained in light of gradualism, such as for instance: increasing but still insufficient taxation of coal; the focus on promoting installed capacity before focusing on efficiency as the goal of either mandated market policies or financial incentives; the increasing but still insufficient remuneration and duration of mandated market policies (whether tenders, independent projects, or even FITs); and increasing but incomplete regulation and enforcement of PPAs<sup>5</sup>. Also, institution building is clearly underway, and the following institutional barriers could be seen as the result of gradualism: general legal insecurity; fragmentation of the bureaucracy; targets that remain non-binding; insufficient regulatory details in the REL and its provisions; increasing albeit insufficient wholesale competition, or the preeminence of public ownership in generation. Finally, experimentation can be seen in the wide range of policies implemented: China uses (or has used) most of the policies in the toolbox, also experimenting with institutions – for instance, frequent modifications of incentives to foreign participation in generation or manufacturing.

Nevertheless, interpreting obstacles to renewables in view of gradualism might suggest that there is but one single path for policy- and institution-making for GCRE, which China is following, however slowly. But – as Naughton (1996) and Rawski (1999) indicated – gradualism implies not only that China crosses the river by groping for stones, but that it might be unclear what is on the other side (what the regulatory goals are). If so, the fit of Chinese GCRE policies and institutions with “best practice” might remain forever partial. Also, because other institutional forces, beyond transition, shape Chinese policies and institutions for GCRE, divergences from what is considered an optimal framework for investment could perpetuate<sup>6</sup>. From among such forces, we highlight developmentalism and socialism<sup>7</sup>.

<sup>3</sup> For a comparison of how political economy factors (in particular, principles and power structures informing policymaking) explain differences between China, India, and Brazil in reforming electric utilities, see Rufín et al. (2003).

<sup>4</sup> See, for instance, McMillan and Naughton (1992), and Naughton (1996).

<sup>5</sup> Although the amendment to REL introduced in December 2009 specifies the fine to be paid by non-compliant grids, some analyses contest that rather than making connection requirements simpler and stronger, the amendment barely modifies REL, or even complicates its directives (see <http://www.chinaenvironmentallaw.com/2009/12/28/chinas-renewable-energy-law-amendments>; last accessed 12 December 2010).

<sup>6</sup> That there is no convergence into a single policy and institutional model, even when countries might share the same discourse and general pro-market trends, is stressed in Rufín et al. (2003) for reforms in the electric sector.

<sup>7</sup> Together with Chinese traditional culture, development and socialism are identified by Ogden (1989) as the three core values informing decisionmaking in China.

We contend that the Chinese State exhibits elements of developmentalism that help explain some of the uniqueness of China's policies and institutions for GCRE. As in the paradigmatic cases of Japan or South Korea<sup>8</sup>, in China: (1) economic policy has developmental goals; (2) development is deemed as necessary for political legitimacy and stability; and (3) development is to be achieved by means of the State's involvement in the mobilization and allocation of resources. On similar grounds, McNally and Chu (2006) argue that China is another case of a developmental state, although a “diffuse” one, insofar as the central government merely sets the overall incentive and policy framework.

First, the Chinese government is widely recognized to have developmental goals, in the present century with an emphasis on equitable and sustainable growth – an emphasis embedded in the idea of Scientific Development. We should also stress that China shares with prototypical developmental states an emphasis on development goals attached to a somewhat lesser emphasis on rules: concreteness and transparency of regulations are not necessary for development<sup>9</sup>; and ideology can be set aside when deciding regulation, opening the door to pragmatism, flexibility, and eclecticism in the choice of policies and institutions.

Bringing the developmental state to electricity and renewables, there are very diverse non-renewable-energy goals embedded in China's decisions regarding renewables. Goals include energy security (limiting oil imports, avoiding black-outs), socio-economic development (developing local industry, providing employment, lessening rural-urban inequalities and consequent migration...); and environmental protection (diminishing local pollution, as well as emissions of greenhouse gases) (Martinet and Li, 2007; author's interviews). In fact, the delay in using feed-in-tariffs and the early favoring of tenders might reflect the growth imperative insofar as the latter instrument kept prices lower than the FIT system would (Lema and Ruby, 2007).

We have also found an emphasis on goals vs. regulations in Chinese policies and institutions for GCRE. Several interviewees noted the relevance of REL, not for the (few) regulatory details included in that law, but for the signal it sent of Beijing's commitment to pursuing renewable-related goals. In regard to pragmatism, and referring to reforms in the electricity sector, Rufn et al., 2003, see this as an element of Chinese ideology informing the particularities of such reforms.

Second, China's developmentalism is frequently seen as the means to preserve its political regime. Changes in policies and institutions are not in conflict with the preservation of the political system, but reforms are instead conducive to development, and therefore necessary to such preservation. For the case of electricity and GCRE, Yeh and Lewis (2004) argue that the electric sector reform was not an embrace of competitive market models, but the “creative, dynamic response to a set of technical and economic constraints on the one hand, and the political imperative to stay in power on the other. This logic of reform motivates the strategic decision to increase electricity production in order to meet current demand and fuel future economic growth. Such growth, in turn, is part of a larger effort by the party-state to maintain legitimacy by channeling potential citizenship demands into consumption and thus pacifying newly middle-class consumers” (Yeh and Lewis, 2004: 464). Similarly, it is arguable that if Chinese policies and institutions for GCRE do not fit into “best practice”, it is because these are not an advancement toward the perfection of electricity markets and the creation of

<sup>8</sup> Frequently cited references on the Developmental State in Japan or South Korea are Johnson (1982) and Amsden (1989).

<sup>9</sup> See Johnson (1982) for a portrayal of the importance of the executive vs. the legislative in the Japanese developmental state.

market-friendly institutions. Rather, they are the necessary response to diverse development needs that, if unattended, could lead to a loss of legitimacy of China's political regime.

Third, the policy and institutional instruments to achieve developmental goals are not strictly those of a liberal market economy, but closer to those of developmental East Asia (World Bank, 1993). Essentially, these include a wide array of non-market-distorting instruments, as well as instruments that do distort resource allocation. In other words, the role of the State in China is not one of creating and perfecting markets, or of ensuring that the proper market institutions are in place, but rather to control these in search of the aforementioned developmental goals (Huang, 2008; McNally, 2008<sup>10</sup>). Involvement of the State in the allocation of resources is exerted via a range of mechanisms that extend from indicative planning to industrial policy and direct ownership of companies. Indicative planning can be seen, in general, in China's Five Year Plans; and, in the case of GCRE, in documents such as the National Medium and Long-Term Development Plan for Renewable Energy in China. Also, the corporatization of state owned enterprises (SOEs) was not simply a gradual move toward privatization, but an attempt to create national-scale holding companies where "state ownership was in a controlling position, to develop large-scale enterprises across territorial and product sector lines, introduce advanced technology, create new products, and work toward achieving international competitiveness. Although it was unstated, this was essentially the model of the huge Korean enterprise groups" (Yabuki and Harner, 1999: 42). In other words, the most recent advancements in industrial reforms demonstrate mixed elements of industrial policy (an effort to nurture certain industrial sectors) and public ownership as means to achieve developmental goals. The tender system for wind (delays in implementing FITs), low remuneration, and other aforementioned limits to foreign competition in power generation (not to mention in distribution) are better understood in light of China's intentions to preserve and nurture public control and even ownership over strategic sectors.

Finally, socialism also informs policymaking and institution-building in China. Some even see gradualism and experimentation as the result of the inherited socialism: in particular, of "communist ideology, nationalistic ambitions, (...), and less opposition from interest groups" (Ma and He, 2008: 1699). And the ongoing prevalence of socialism, even after thirty years of reform, is observable in the official branding of China's economic regime as Socialism with Chinese Characteristics, or in the endorsement, since 1993, of a SME. This system, simply put, entails public ownership (dominating in key sectors) while at the same time having all entities participate within a market system. Also, the SME includes a desire for self-reliance, no longer understood as autarchy but via strategic integration in the global economy (Liu, 2007). Under Mao's Socialism, the State combined government and business roles, and that was also the case for the electricity sector (Ma and He, 2008). Under current Socialism, the government and business roles have been split into different government agencies, to the point where (starting in 2003 according to Ma and He, 2008) public entities in charge of the electricity business have been "corporatized", but not privatized. Also, as already stated, the desire to preserve public ownership might explain many of the policies and institutions described for China's GCRE: delays in implementing FITs, the possibility of keeping remuneration low and tariff duration short, uncertainties in law implementation, and all other difficulties for private and/or foreign competitors in electricity generation.

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<sup>10</sup> McNally (2008), who indicates that "China's industrial capitalism remains heavily shaped by the hand of the state" (McNally, 2008: 116).

#### 4. Conclusions

This work has looked into China's grid-connected renewable energy (GCRE) as an exercise in overcoming the mainstream de-contextualization of the analysis of Chinese policies and institutions when it comes to specific economic sectors. To be more concrete, we have reviewed how Chinese policies and institutions do not nicely fit into a "best practice" model; and we have tried to explain such imperfect fit by virtue of China's principles for decision-making: gradualism, developmentalism, and socialism.

We have found that gradualism helps understand most of China's particularities in policies and institutions for GCRE, such as, among others, negative externalities that are not fully compensated for, remuneration levels and tariff durations that grow gradually, increasingly secure PPAs, gradual specifications and predictability of regulations, or a paced opening to competition. Developmentalism, in turn, explains, for instance, the multi-faceted goals of GCRE policies and institutions (these including energy security, environmental, and socio-economic goals); the lack of details and unpredictability of regulations; and all limitations to competition – insofar as competition could endanger industrial policy or public ownership. Finally, socialism also helps understand any measures favoring public corporations (from the delay in using FITs to regulatory uncertainties).

Further research would be necessary to determine: (1) whether there are more elements of the Chinese political economy that should be taken into account in order to better understand the departure of China's policies and institutions for GCRE from "best practice" (certain procedures of decision-making, such as fragmented authoritarianism, decentralization, and government-business coordination, may deserve special attention); and (2) whether the fact that gradualism and partiality of overall economic reforms have not been obstacles to China's economic growth and development should lead us to consider the gradualism and partiality around the application of "best practice" in GCRE as more of an opportunity than an obstacle.

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