

## **China and India Going Green: The Power of Wind, International Norms, and National Commitments**

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### **Abstract**

India and China have established reputations in the international community for rapid economic development, innovative technology and exploitation of natural resources. Aside from the United States, China and India are the two major producers of carbon dioxide emissions in the world. At the same time China and India are two of the leading developing countries in promoting green energy and international climate change objectives. The local wind energy industry, as an alternative to replace fuel, witnessed a politically-sponsored take-off in both countries in terms of global market share as well as domestically-installed wind energy capacity in the late 2000s. In particular, the current governments have taken the issue seriously on both the local and international levels. China and India ratified the Paris Agreement in 2015 and their national climate objectives. The puzzle of rapidly growing and politically supported wind energy sectors in these two countries in which environmental protection is strategically ignored in

favour for economic growth has to be understood in the terms of the bigger picture of Beijing and New Delhi fostering external and internal legitimation by transforming norms and values to measureable outcomes. To do so, the paper illuminates the development of renewed legislative commitments for wind energy, the increasing external pressure for emission reductions, institutional changes, and demands for legitimation in India and China.

**Keywords:** *green energy, norms and values, new institutionalism, comparative politics, foreign politics, wind energy, policy output performance, legitimation*

## 1. Introduction

Carbon dioxide is one of the most prevalent greenhouse gases in the atmosphere. Anthropogenic (human-caused) emissions of carbon dioxide result primarily from the combustion of fossil fuels for energy, and as a result world energy use has emerged at the center of the climate change debate.<sup>1</sup>

China and India represent the two fastest growing world economies and two of the fastest growing world electricity markets. They account for around 80 percent of non-OECD commercial coal consumption<sup>2</sup> and consequently are the leading non-OECD carbon dioxide (CO<sub>2</sub>) emission producers worldwide (IEO, 2016).<sup>3</sup> Exploitation of natural resources, mushrooming urbanization, and air pollution are severe in Chinese and Indian megacities.<sup>4</sup> Since the Kyoto protocol was ratified, the international consent for long-term CO<sub>2</sub> emission reduction has been enforced by the commitment of the participating countries, including India and China: the main instrument for lowering the use of fuel

resources is energy stratification. Hence, the international pressure on both countries has also been responsible for the rapid rise of wind energy since the late 2000s.

This paper seeks to contribute a more precise analysis of the rapid rise of the wind energy industry and political commitments on the national and international levels in both India and China. It illuminates the postulated relationship between wind energy development, the adoption of norms, and the institutional policy performance of legitimation. On theoretical and empirical grounds the rapid rise of the wind energy market in these two countries offers a lesson on how both conduct compromises between external and internal norms. It is argued that the legitimation process, by means of adopting external norms for climate change and related internationally dictated policy, has been the driving force for the rapid rise of the wind energy market in India and China. Thus, the leading question is *how has external pressure affected the rapid rise of the impressive wind energy output performance of India and China?*

## 2. Nature of the Demand for Legitimation

Abraham Lincoln states, “government of the people, by the people, and for the people” (Scharpf, 1991),<sup>5</sup> and thus the statement “draws attention to the importance of actors and to a simple but extremely consequential point: that procedural rules structure and shape the conduct of politics only inasmuch as actors accept or comply with these rules” (Munck, 1996: 6-7).<sup>6</sup> Legitimation, or the process of establishing and obtaining legitimation, is essential for any stable democratic or autocratic system (Kailitz, 2011). Political regimes demand support by civil and state actors, such as the majority or socio-economic elites and/or military, to establish rule and order, political stability, and generate legitimation

(Munck, 1996). To gain support the government is in need of legitimation.

One main pillar of legitimation in democratic and autocratic regimes alike is output performance. Due to constant socio-economic changes on the national and international levels the key challenge of governments nowadays is to keep pace (North, 2007). In the ongoing transformation process from agrarian to industrial countries, the political regime has to focus on socio-economic development as well as find solutions for problems in this process so that the support or at least the acceptance of major civil and economic actors can be ensured (Huntington, 1991). In the context of marketing within the international community, the decisions of national parties regarding socio-economic and environmental outcomes are watched by hawk-eyed international political and economic actors and independently measured and ranked by agencies (Kneuer, 2012). Policy making and policy outcomes have become more and more multidimensional in their relevance to the legitimation of the state on various levels. In such an environment, a modern state has to rely on its institutional output performance to adapt, adjust, and address ongoing socio-economic changes on national and international levels (Holbig, 2011). One main instrument in the state's arsenal for generating legitimation is policy output legitimation based on the outcomes of issued policy strategies, decrees, and legislations (Gandhi and Przeworski, 2006: 21).

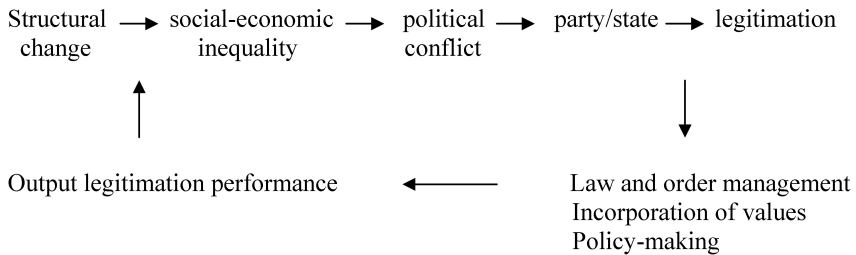
### **3. Process of Adaptation: Norms, Values and Institutional Change**

In this era of change, as traditional society is becoming heterogenic, urbanized and institutionalized on the domestic and global levels, the modern state is reliant on legitimation on internal and external levels. An inability to address the issue of structural changes, such as socio-

economic or environmental problems, weakens one of the main pillars of political legitimization and resilience of the modern state (Kohli, 2001).<sup>7</sup>

Output performance legitimization affiliates with the responsiveness of decision-makers and institutions to adapt to the challenges of socio-economic change. The process has been labelled as institutional change (North, 2007; Theelen, 2004). It is assumed that “[p]olitical institutions are the building blocks of political life. They influence available options for policy-making and for institutional change. They also influence the choices made among available options.” (Olsen, 1998: 95) Political institutions are country-specific and directly and indirectly influence economic institutions (Acemoglu *et al.*, 2001), ensuring stability for investment<sup>8</sup>, modern technology research and production patterns (Barro, 1991). Following the institutional argument by Douglas North (2007), output performance is linked to positive institutional change<sup>9</sup> – or ability of the institution to incorporate changing values, norms and demands. Positive institutional change allows the state to address the issues of structural change by policy outcomes, such as laws and regulations (North, 2007).<sup>10</sup>

Given the fact that globalization, technological changes, and economic reforms constantly alter international values, norms and standards, policy-makers have to constantly reshape and reconfigure their output legitimization performance. Accordingly, legitimization deficits produced by structural changes, either on the international or domestic level, can be warded off by responsible law and order management, which rely on the incorporation of values and norms<sup>11</sup> (Theelen, 2004; Mitra, 2006).

**Figure 1** Simplified Model of Structural Change

Source: Adapted by Subrata Mitra (2006).<sup>12</sup>

As outlined above and in reference to the logic of “instrumental modalities” (Foucault, 2008), an instrument in the state arsenal to generate output legitimacy performance depends on the learning ability of the institutional actors (Olsen, 1998; Kneuer, 2013)<sup>13</sup>: “Institutions create descriptions of collective reality for individuals and organizations: explanations of what is and what is not, what can be acted upon and what cannot.” (Wade-Benzoni *et al.*, 2002: 47)

#### 4. Institutionalization of International Values and Norms as a Pillar for Legitimation

In recent decades, the political systems and their open markets have become more and more embedded in the international community with its international norms, values and regulations (Djelic and Quack, 2003): “Self-justification in moral terms is crucial for most rulers’ and ‘[t]hus all rulers, even the most tyrannical, wish to appear legitimate and seek to cultivate the belief in their legitimacy.” (Alagappa, 1995: 4). In the changing context of international relations, *self-referentiality* and *hetero-reference* have become the new priorities which can be achieved by

output performance legitimization of the national political systems through adapting and fulfilling international norms and standards (i.e. constant economic growth, civil rights and/or environmental protection). In other words, in times of increasing interdependence of modern economies, political regimes are in need of external legitimization (Münch, 2011).

It is important to note that scholars of modern interdependency theory have concluded that the related costs as well as the risks are relatively high. In particular, international regulations have to be enforced through regulations, which demand institutional performance and administrative resources. Furthermore, regimes are pressured to implement external values and norms to gain external legitimization. However, at the same time they are required to justify the new regulations and their socio-economic outcomes on the domestic level, such as costly environmental regulations (Djelic and Quack, 2003).<sup>14</sup> Both the socio-economic outcomes and/or the inability to enforce international norms and values can directly result in legitimization deficits.

## **5. Case Study: The Rise of the Wind Energy Market**

As indicated in Table 1, China is ranked in the top position with 33.6 percent, and India is also in the top five with 5.8 percent of the total produced wind energy worldwide (GWEC, 2014; 2015).<sup>15</sup> What is interesting is that India and China are the only non-OECD countries in the top five.

A further interesting fact is that there is a close link between economic performance and wind energy performance. Nevertheless, as indicated by the global differences, economic performance cannot fully explain the great variations. As argued by von Hippel (2005), the existence or availability of technological know-how is insufficient for any prognosis of the actual spread or use of innovative technology.

**Table 1** Countries and megawatt (MW)

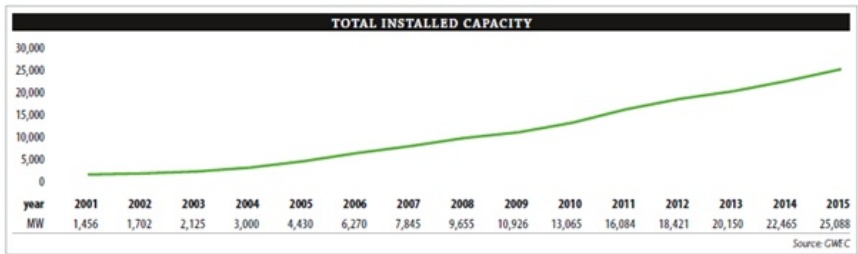
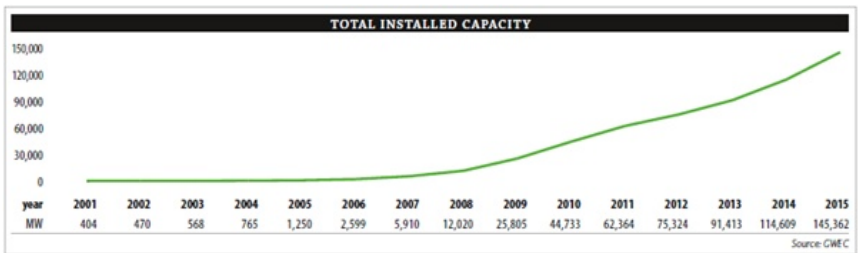
Country	megawatt (MW)	% Share	GDP	Total square km
1. China	145,362	33.6	10,866,444	9,562,950
2. USA	74,471	17.2	17,946,996	9,629,090
3. Germany	44,947	10.4	3,355,772	356,97
4. India	25,088	5.8	2,073,543	3,287,260
5. Spain	25,088	5.8	1,199,057	505,99
6. United Kingdom	13,603	3.1	2,848,755	243,61
7. Canada	11,205	2.6	1,462,330	9,984,670
8. France	10,358	2.4	2,421,682	549,086
9. Italy	8,958	2.1	1,814,763	301,34
10. Brazil	8,715	2.0	1,774,725	8,515,770
Rest of World	67,151	15.5		

Source: GWEC (2015), World Bank, (2016).

Also, the territorial size of the country cannot be regarded as a variable for explaining the performance difference, as the rankings of the United Kingdom and Italy indicate.

As indicated in both Figures 2a and 2b, the rapid rise of the wind market in India and China seems correlated to the increasing international pressure related to climate change upon these two countries after the Climate Conference in Kyoto in 2005. Over the course of the international debate, India and China have stepped up their roles as mouthpieces for developing countries and have argued for the natural ability of their markets to reduce CO<sub>2</sub> emissions. Simultaneously the wind energy market in both countries has witnessed a rapid rise under



**Figure 2a** Total Installed Wind Power Capacity in India**Figure 2b** Total Installed Wind Power Capacity in China

Source: GWEC (2015).

the protective wings of state regulation and public funding. The Chinese wind market took off in 2009 and reached the 100,000 MW hallmark in 2014. India could only manage a modest growth rate but still ranks fourth worldwide with 25,088 MW in 2015.

## 6. Indicators of the Legitimation Deficit by Air Pollution in India and China

As argued earlier, the challenge of structural changes and the result of legitimation deficits are rudimental to normative policy changes, such as the promotion of the wind energy market. Undeniably, the side effects of

economic exploitation in the shape of environmental pollution (Hajer, 1995: 32), such as CO<sub>2</sub> emissions and air pollution, reduce precisely such legitimization deficits. In the following pages, the following will be considered:

- (i) Internal legitimization deficit
- (ii) Exogenous pressure
- (iii) Results of institutional change in policy making

### ***6.1. The Legitimation Deficit: Energy Demand for Emissions-rich Fossil Sources***

Constant and impressive growth of the two markets has been accompanied by a rapidly rising energy consumption rate (IEO, 2016). China and India have the fastest-growing electricity industry in the world. Between 2005 and 2012, net electricity generation increased by an average 6.6 percent per year in India.<sup>16</sup> In China, the current net electricity rate is constantly growing by 2.5 percent. In 2012, China consumed 4.8 trillion kilowatt-hour (kWh). And the trend will continue; the energy consumption rate is fed not only by economic growth but also by improving living conditions and the speedy spread of electronic devices such as smart phones, laptops, refrigerators and air conditioners. At the moment coal is the primary source of energy for the E-generation. In China and India, coal dominates energy production – constituting 75 percent overall in the former and 44 percent in the latter (IEO, 2016). Together, China and India account for 86 percent of the rise in non-OECD coal use and 70 percent of the total world increase in coal demand over the projected period (IEO, 2006). At the same time, coal has one of the highest CO<sub>2</sub> emission levels compared to other alternatives (World Bank, 2007: 19-20). Another issue is that as electricity demand has sharply increased in recent years, a widening gap

between coal demand and supply has emerged. There is strong demand in India and China for cheap coal imports from Australia (IEO, 2016).<sup>17</sup>

## **6.2. The Legitimation Deficit: Ongoing Urbanisation and Air Pollution**

In China 56 percent and in India 33 percent of the total population live in urban areas and the rate is rapidly rising.<sup>18</sup> Rapid urbanization<sup>19</sup> has resulted in increasing numbers of automobiles and motorcycles<sup>20</sup>, private stoves and industrial entities within small areas (Zhu, 2005; World Bank, 2007). Chinese and Indian megacities, such as New Delhi, Mumbai, Calcutta, Chennai, Shenyang, and Taiyuan have become famous for their poor air quality and unhealthy living conditions (Zhu, 2005: 123). Air quality has become an international indicator for measuring not only environmental protection but also quality of life.<sup>21</sup> Every day the air pollution and smog threaten agriculture and economic production as well as the health of the citizens, and produce political distress (Zhu, 2005). According to the World Bank (2009), air pollution reduces the gross domestic product (GDP) by 3 percent in China and 1.7 percent in India every year. A study by the World Health Organisation came to the conclusion that more than 70 percent of the Chinese population and 660 million people in India were exposed to annual PM (particulate matter) 2.5 pollution levels higher than 35 micrograms per cubic metre.<sup>22</sup> Studies of air pollution mortality by Cropper *et al.* (1997) in New Delhi and Xu *et al.* (1994) in Beijing have given evidence of a causal relationship between air pollution and mortality (Xu *et al.*, 1994; Cropper *et al.*, 1997). In 2009 alone, illnesses and premature deaths cost China about US\$100 billion, and a 2012 research by Tsinghua University found that for each ton of coal produced and used, damage to the environment and health added up to RMB (Chinese Renminbi/yuan) 260 billion.<sup>23</sup> An assessment of health damages from exposure to high levels of particulates estimated that up to half a million people die

prematurely each year as a result of the polluted air.<sup>24</sup> In 2012 smog killed an estimated 670,000 Chinese people. A recent study has estimated that the population of India will be reduced to 660 million in 3.2 years due to air pollution.<sup>25</sup> Millions of patients have been treated, which has increased the socio-economic cost of the healthcare system, and these people have lost the capacity to work (Xu *et al.*, 1994; World Bank, 2007). Another relevant point of departure in explaining the current change in the values and norms of decision-makers is provided by the agency theory. As argued by scholars of new institutionalism, government agencies have numerous mandates and their influence as well as priorities can change over time (Moe, 1984; Tirole, 1994). In India and China the steadily growing middle class<sup>26</sup> has become an economic pressure group in this issue, either through formal or informal channels. One main public concern of the middle class has been environmental protection and better living standards in cities.

### ***6.3. The Legitimation Deficit: An International Agenda for Climate Change***

In the late 1990s the economic success story strengthened the role of Beijing and New Delhi in the international community. This new self-esteem has materialized in the international debate on climate change in which India and China have assumed the role of mouthpiece for the interests of developing countries in realizing the emission goals dictated by industrial countries.<sup>27</sup> New Delhi and Beijing have had to face the fact that their countries have the highest CO<sub>2</sub> emissions among non-OECD countries and deadliest air pollution levels worldwide.<sup>28</sup> “Climate change threatens markets, economies and development gains”, the message of the Kyoto Climate Conference (Ban, 2009: 6)<sup>29</sup> has become a reality that India and China have to confront. In this context, the necessary change of perception in New Delhi and Beijing to accept the

internationally dictated goals<sup>30</sup> for long-term emissions reduction has been taken seriously. As a consequence, New Delhi and Beijing have issued various legislative and administrative instruments for initiating government-regulated rapid development of the domestic wind energy market and energy production. During the 21st Climate Conference in Paris (2015), India and China accepted and verified the CO<sub>2</sub> emissions reduction goals shortly before the conference in Marrakech (November 2016).<sup>31</sup>

### *6.3.1. Wind power in India: External events and internal policy outcomes*

India's wind market is set to be the fifth largest annual market globally with a 5.8% share of the global market in 2015. In a cumulative performance India ended the year with 25,088 MW by adding 2,623 MW and passed Spain in the global ranking. Although wind energy has been around for a long time, the recent take-off in the late 2000s is closely linked to increasing public funding and published legislation for promoting the wind energy sector.

Still, India's wind energy market and foreign political ambitions have always been closely interwoven. In the first pioneering phase of 1981 to 1990 India's international status was the main driving force behind the initiation of the wind energy program. In an era when politics desires self-sufficiency, the two oil crises in the 1980s have been a dreadful reminder of the fragility of the closed economy to external shocks (Kohli, 2001). The political consequence also resulted, among other things, in research for alternative energy sources or renewable energy. The priority is visible in the fact that the government expanded the administrative framework by creating the Department of Science & Technology's Commission for Additional Sources of Energy (CASE) in 1981 and the independent Department of Non-conventional Energy

Sources (DNES) in 1982 to assess and formulate a coherent wind energy strategy. In 1984 the first wind turbine was tested, followed by a smaller program which was expanded during the seventh Five-Year Plan to the national level in 1986 and an official target of 20 GW (Mizuno, 2005).

The second phase (1991-2009) is again linked with the political changes and the partial liberalization of the Indian economy (Mizuno, 2005). In 1991, foreign political pressure for economic liberalization reforms was realized. In the course of partial liberalization, some industrial sectors, including the wind energy sector, were opened up for foreign investment and joint ventures. A consequence has been the privatization of the energy market, and in the eighth Five-Year Plan (1992-1997) an official target of 500 MW for wind energy through private sector participation was released. Private energy producers and renewable energy were heavily subsidized by the state (Loy and Gaube, 2002).<sup>32</sup> In 2003 the state government released the Electricity Act of 2003 which combined earlier issued regulations and created the legislative foundation for state sponsorship of the wind energy market. In the following years again foreign political pressure for climate change was the impetus for state regulation and supply subsidies to enhance the share of renewable energy. The national government steamrolled through three relevant policies<sup>33</sup> based on the Electricity Act, offering higher tax-based benefits and tariff regulations for renewable energy. In the Bali Climate Change Conference in 2007, China and India argued against the proposal of harsh emissions reductions. In June 2008, Prime Minister Manmohan Singh released the National Action Plan for Climate Change, which is directly linked to the Bali statement that emissions production in the growing markets of the developing countries will slowly descend. Hence, New Delhi's plans to "identif[y] measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively" and to issue a Generation-Based Incentive

(GBI) could not avert the upcoming break in the wind market in 2010 (GWEC, 2015).

In the current phase (2010-2015) the continuing high levels of CO<sub>2</sub> emissions and worldwide poor air quality in the megacities has put pressure on the government. In the Climate Summit in Copenhagen in 2009 and the even more important conference in South Africa in 2011, New Delhi agreed to a legal commitment for emissions reduction by 2015. Taking the modest growth of renewable energy seriously, its central government took action and prioritized the general output performance without taking the infrastructural and local institutional deficits into account. In 2010, the Central Electricity Regulatory Commission issued a complementary mechanism to allow less-endowed states to meet their RPSs through tradable Renewable Energy Certificates (REC). In fact, the policy pushed the installed capacity over three gigawatt (GW) and output performance jumped from 10,926 in 2010 to 13,065 MW/year in 2011.

In 2014 electoral change on the national level strengthened the political commitment for wind energy, issuing a new off-shore policy and leading to various acts to address structural deficits in the wind market. The newly elected government under Prime Minister Narendra Damodardas Modi has pledged to diversify the energy market and announced that it would install 60 GW of wind energy, which will be a challenge in the future. A milestone was the issue of tax-based Accelerated Depreciation (AD) in 2014, which offers 80 percent depreciation in the first year of installation or a GBI of INR (Indian Rupee) 0.5/kWh for at least four years and up to ten years.<sup>34</sup> Taking the structural issues seriously, the government appointed the National Wind Mission (NWM) to control the development and quality of off-shore as well as on-shore wind turbines. Along with the administrative act, the parliament passed the Electricity Amendment Bill of 2014 which

included an increased tax on coal for funding the National Clean Energy Fund.<sup>35</sup> In 2015 the government set up the Green Corridor Program with the objective of facilitating interstate transmission between the southern states and the national grid system (GWEC, 2015:54). A swift improvement of the grid system is essential for guaranteeing the long-term conditions for growth of the wind market. Only modest growth over recent years pressured the Indian Minister of New and Renewable Energy (MNRE) to take action. Shortly before the summit in Paris 2015, the MNRE officially announced that India is aiming to meet the target of 60,000 MW by 2022<sup>36</sup>, continuing its strategy<sup>37</sup> of supporting steady growth and standardization, and addressing the infrastructural and quality issues with modest success. In November 2016 India attended the climate conference in Marrakech to discuss the implementation of the Paris Agreements.

### *6.3.2. Wind power in China: External events and internal policy outcomes*

In 2009 China became the top market for wind energy production and crossed the 100,000 MW mark in 2014 – even for the flat energy market, China, in 2015, added an “*astonishing*” 30.8 GW capacity against all predictions (GWEC, 2015:21). The rapid and constant rise of wind energy is directly linked to the Chinese government’s public commitment and patronization, and the mushrooming wind energy industry.

The Chinese pioneering phase (1986-2000) started much later than in India. In the late 1980s the governmental pilot project was driven by the desire for an alternative energy source beside coal. In the late 1990s, the government accelerated the pace. In 1993, the Ministry of Electric Power issued plans for an industrialized wind energy program which was approved and implemented in 1994 on national level. The



subsequent pilot project under the authority of the Ministry (Li *et al.*, 2012) was the first stage. In 1997, the Ride the Wind Programme was announced by the Chinese State Planning Commission, which resulted in upcoming state tax-benefits and laid the foundation for the growth of the wind energy market.

The second phase of the wind market in China (2000-2007) has been characterized by state protectionism, fostering the spread of a private but domestic energy industry. Increasing global demand for the new technology as well as success of the pilot projects encouraged the state government to follow its strategy. However, the wind industry has been dominated by foreign companies, and therefore, to back up Chinese domestic start-ups, the government issued the electricity reforms which introduced market-based mechanisms as well as protectionism<sup>38</sup> for the domestic wind energy sector industry. In addition, its central government announced the Renewable Energy Law in 2006, which put pressure on the state-owned grid companies to use wind energy power. Following the implementation of the law, the number of domestic wind energy producers jumped from 40 to 70 in only one year. The installed wind capacity nearly doubled from 2,599 to 5,910 MW between 2006 and 2007. The 11th Five-Year Plan (2006-2010) laid out a national wind energy strategy for boosting future development.

In the third phase (2008-2015) China had to face increasing external and internal pressure around environmental pollution, particularly its worsening air quality.<sup>39</sup> Following the Bali Climate Change Conference in 2007, China argued for the natural decline of CO<sub>2</sub> emissions in its growing market. Pressured by its own argument and consistently high levels of CO<sub>2</sub> emissions, its central government readjusted earlier legislative and administrative decrees for improving the wind energy market. In 2008 the National Energy Administration was instructed to set up large-scale wind farms in seven provinces most suited for wind

energy production. A first glimpse of the policy strategy reveals the rapid increase in output performance, up to 25,805 MW/year in the same year (Martinot and Li, 2010). In 2011 China consented to an international legal agreement for emissions reduction. Despite the steady and high growth rate, the state announced another 83 new wind-based projects in 2012. Followed by another landmark, the abolition of the so-called “localization act” allowed turbine producers to reduce production costs by using cheaper imports (GWEC, 2012).

Shortly before signing the bi-lateral agreement with the U.S. for emissions reduction<sup>40</sup>, the government reissued the regulations for FIT (Feed-In Tariffs)<sup>41</sup> in the decree “Regulating the Wind Manufacturing Market” (Decree 412) in September 2014. The decree aims to regulate the wind energy market and ensure constant growth because the quality of the wind turbines and the grid system have been and will be the main obstacle for increasing the share of wind energy relative to the total energy capacity all over China.<sup>42</sup> Hence, the wind energy market almost doubled its capacity from 75 GW in 2012 to 145 GW by the end of 2015, reinforcing China’s top position in terms of cumulative installed wind power capacity. So far, everything suggests that China will continue its state-controlled strategy to ensure the constant development of the wind energy market. Currently the government has set a new target of a whopping 250 GW by 2020 for the 13th Five-Year Plan.

## **7. National Strategy, Institutional Performance and the Local Wind Energy Market**

Another argument for the relevance of institutional theory and its core assumption is provided by the close link between institutional performance and installed wind energy capacity on the sub-national level in both countries. India’s modest and regionally limited wind

energy growth accumulates evidence of the institutional determinants. On the national level, India's government evaluates relative lows in the category of long-term planning and bureaucratic capacity.<sup>43</sup> Despite the legislative initiatives, India's low institutional performance is illustrated in the fact that the Renewable Purchase Obligation and the dictated renewable energy goals for the union states are not enforced (GWEC, 2015:54). Its central government has handed down the responsibility to the local authorities and market forces with modest success.<sup>44</sup> Interestingly, the recent data on installed wind turbines and produced capacity shows that the union states (Tamil Nadu, Maharashtra, Gujarat, Rajasthan and Karnataka)<sup>45</sup> with the highest institutional and economic performance are the top producers of renewable wind energy at the same time (Mundle *et al.*, 2012).

In China the geo-political dimension of national policy-making seems to be the dominating one. The Chinese success story seems to be built upon long-term planning capacity<sup>46</sup> and a coherent national strategy in the shape of joint-venture pilot projects flanked by various pieces of legislation for stimulating local development of the wind energy market. Unlike India, local institutional performance<sup>47</sup> is less relevant. The Chinese national geo-political strategy includes state-initiated joint-venture pilot projects and substantial government interventions in the market, which are actually the dominant driving force. Therefore, the ten most productive provinces in terms of wind energy capacity are northern regions (Gansu, Xinjiang, Inner Mongolia, Ningxia, Shanxi, Hebei, Shandong, Yunnan, Guizhou, Jiangsu), which accumulated 76 percent or 82,149.22 megawatts in 2014 (GWEC, 2014: 40).<sup>48</sup>

## 8. Non-Political Factors: The Economy and Innovation Potential

Environmental issues (Hajer, 1995: 32) and economic growth (Dryzek, 2005) are frequently argued to be the driving forces of innovative,<sup>49</sup> environment-friendly technologies. Following Pierson (1997) on the close link between international and domestic development,<sup>50</sup> it can be stated that output performance is closely related to the level of economic growth and trade openness. In this case, China has higher growth (World Bank, 2015) and more openness (KOF, 2015)<sup>51</sup> than India.

Another assumption is that the innovation potential<sup>52</sup> of the domestic market is crucial (Hall and Soskice, 2001: 38). Recent market studies<sup>53</sup> have accumulated evidence that when the innovation potential of enterprises (not the leading ones but with innovative sectors) is higher, so too is investment (Aghion *et al.*, 2002). The postulated theory finds good examples in China, where five companies<sup>54</sup> are dominating the market and hold 58 percent of the total share, and also in India where two companies<sup>55</sup> have obtained 57 percent of the market share (GWEC, 2015: 32).

## 9. Conclusion

In the presented analysis, evidence shows a strong correlation between domestic and international policy goals. The international perspective has illuminated economic theories that claim that innovation potential and economic performance relate to each other but are not explanatory determinants for the rise of the wind energy market. As argued throughout this paper, China's and India's current long-term ambitions to legitimate themselves on the international and domestic levels have been the main driving forces behind the government-regulated rise of the wind energy market. The older and newer versions of wind energy programs, which currently coincide in an era in which the cost of natural

resources is rising, still affiliate with a political agenda for independent energy marketing. In the context of slowly fading economic output performance, the legitimization deficit of environmental and in particular air pollution has pressured Beijing and New Delhi to formulate national legislation and strategies for encouraging the development of the wind energy market.

Undeniably, there is validity to the argument that the rapid rise of the wind energy market in India and China and its economic relevance since the late 2000s is directly linked to the political ambitions of New Delhi and Beijing to tackle the legitimization deficit of air pollution. In times of declining economic growth and increasing distress due to environmental pollution, the promotion of the local wind energy sector provides the government with an instrument to generate output legitimization on a domestic and international level by addressing the local issue of air pollution.

## Notes

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- 1. See the *International Energy Outlook* (IEO) (2016: 71), which will be discussed at length in the following pages. The IEO refers to the U.S. Energy Information Administration’s (2016) *International Energy Outlook 2016*, which is available at <<https://www.eia.gov/outlooks/ieo/index.cfm>> (accessed 2nd September 2016).

2. India, which is the second largest coal user in the region, accounts for nearly half of the increase in coal consumption from 2012 to 2040, while China contributes less than one third. But China is the leading consumer of coal in the world, having used 76 quadrillion Btu of coal in 2012 (IEO, 2016).
3. The *Emission Report* (2015) estimated the largest producers of energy-related CO<sub>2</sub> emissions in 2015. In 2015 China accounted for around 30 percent and India for 6.5 of global CO<sub>2</sub> emissions that year. (Jos G.J. Oliver *et al.* (2015). *Trends in global CO<sub>2</sub> emissions: 2015 Report*. The Hague: PBL Netherlands Environmental Assessment Agency; Ispra: European Commission, Joint Research Centre.)
4. These issues and the level of air pollution will be discussed in detail in the following pages.
5. Literature on current autocracies has diagnosed a common input deficit in autocratic regimes (Kneuer, 2013).
6. How far the acceptance is based on normative or strategic thinking is less relevant. See Munck (1996).
7. Economic, social or political processes challenge the state in its ability to ensure orderly rule and legitimacy. See Kohli (2001).
8. Political instability discourages investments and productive economic activities.
9. In general, institutional change describes a positive process of adapting institutions and creating flexibility for decision-makers in adequately tackling challenges due to ability to utilize institutional and non-institutional instruments to adapt and modify strategies and outputs in the process. See Mitra (2006).
10. See also Theelen (2004).
11. These norms and values can either be self-generated by the political system through input dimensions and/or taken over from outside sources.

12. The model is based on the common agreement among comparative politicians on the causality of structural change and the need for effective and coherent policy-making to counter the negative effects, such as socio-economic inequality, decline of trust in the political system, and political and social conflict (Mitra, 2006).
13. Accordingly, for positive institutional change the shift in norms and values has to be defined as measurable and achievable goals, rules or obligations by decision-makers before institutions can convert these goals into policies and implement them effectively in society. See North (2007).
14. For instance, the enforcement of international environmental standards and regulations can heavily reduce the economic growth and surplus ratio, which is often a main pillar of the political regime's output legitimization.
15. In Asia, India ranks second, just behind China but far ahead of all other countries, such as Japan with 3,038 MW or Taiwan with only 647 MW (GWEC, 2015: 9).
16. International Energy Agency (2014). *World Energy Outlook 2014*. Paris, p. 235.
17. India is suffering from coal shortages due to mismanagement of the state-owned coal sector, which has been a main reason for the rising number of electricity blackouts in India. ("Second day of India's electricity outage hits 620 million" (by Hriday Sarma and Ruby Russell), *USA Today News*, 31st July 2012, available at <<http://usatoday30.usatoday.com/news/world/story/2012-07-31/india-power-outage/56600520/1>> (accessed 9th June 2016).)
18. See <<http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS>> (accessed 9th June 2016)
19. New research from the McKinsey Global Institute expects this pattern to continue, with China forecasted to add 400 million to its urban population, which will account for 64 percent of the total population by 2025, and India to add 215 million to its cities, whose populations will account for 38

- percent of the total in 2025. The report is available at <<http://www.mckinsey.com/mgi/our-research>>.
20. 30 percent of the air pollution in Beijing and 70 percent in New Delhi is caused by exhaust emissions and particles of vehicles (see report below).
  21. Elizabeth C. Economy (2010). *The river runs black*. Quoted in “China’s blurred horizon”, *The Washington Post*, 19th September 2004, p. B01.
  22. The World Health Organisation (2016) has rated the PM 2.5 safety limit at an annual concentration of 10mcg/cubic metre, available at <[http://www.who.int/phe/health\\_topics/outdoorair/databases/cities/en/](http://www.who.int/phe/health_topics/outdoorair/databases/cities/en/)> (accessed 9th July 2016).
  23. The 260 billion yuan is made up of two parts: the health costs and the environmental damage caused by mining and transporting coal. (“670,000 smog-related deaths a year: the cost of China's reliance on coal – Smog killed 670,000 people in 2012, says mainland study on pollution” (by Li Jing), *South China Morning Post*, 5th November 2014. Available at <<http://www.scmp.com/news/china/article/1632163/670000-deaths-year-cost-chinas-reliance-coal?page=all>>, accessed 9th June 2016).
  24. The World Health Organization found acute respiratory infections among the most common causes of deaths among India’s children. The World Bank claims 23 percent of deaths among children are due to environmental factors such as polluted air and contaminated water. In China, 1.2 million people die every year due to pollution. The estimated cost of environmental degradation in China is 9 percent of its GDP, while it is 5.7 percent of GDP for India.
  25. <[http://www.epw.in/system/files/SA\\_L\\_8\\_210215\\_Michael\\_Greenstone\\_0.pdf](http://www.epw.in/system/files/SA_L_8_210215_Michael_Greenstone_0.pdf)> (accessed 10th July 2016).
  26. It is estimated that roughly 500 million Chinese could enter the global middle class over the next decade. Following the tendency in 2030 around 70 percent of the projected population could be part of the middle class, which mostly live in urban areas. Compared to China, India’s middle class



is growing slower at around 50 million which are only 5 percent of the total population. In 2030 the Indian middle class will be around 475 million people. (Ernst & Young Global Limited, 2016).

27. See for instance the protocol of the conference in Bali 2007.
28. As illustrated above, the high level of CO<sub>2</sub> emissions and worsening air quality in the megacities have produced a legitimization deficit at the external and internal levels for governments.
29. The final report “Resilient people, resilient planet: A future worth choosing” (2012: 6) of the summit in Rio de Janeiro reveals a shift to environment-oriented policy-making on the global and national levels. (See: “Resilient people, resilient planet: A future worth choosing” (report of the United Nations Secretary-General’s High-Level Panel on Global Sustainability), New York: United Nations, 2012.)
30. See Annex I of the report.
31. See the report “Climate change policy & practice” of the International Institute for Sustainable Development, available at <<http://climate-l.iisd.org/events/unfccc-cop-21>> (accessed 9th June 2016).
32. The Indian electricity market was privatized; foreign investment and domestic private energy providers were granted financial benefits, secured investment rates and tax reductions. In the following years the Ministry of Non-Conventional Energy Sources (MNES) guaranteed price certainties for renewable produced power for private actors. See: Loy and Gaube (eds.) (2002).
33. Based upon the National Electricity Policy (2005), the National Tariff Policy (2006) and the Rural Electrification Policy (2006). These three issued policies mainly aimed to regulate wind energy tariffs, quotas and procurement.
34. The report states (2014) that: “Wind power producers can either opt for preferential tariffs decided by the state regulator ranging from INR 3.39-6.50/kWh (EUR 0.04-0.08) or get tradable renewable energy certificates

(minimum price: INR 1,500/MWh, EUR 19.4/MWh; maximum price: INR 3,300/MWh, EUR 42.5/MWh) along with power bought at average power purchase cost (APPC) by the utility, which ranges from INR 3.0-3.7/kWh<sup>3</sup> (EUR 0.03-0.04)". The taxation aims to stimulate investment but the government has announced cuts to the subsidies from 80 to 40 percent due to fiscal restrictions in the 2016-2017 budget (GWEC, 2015).

35. Tax on coal has been increased from INR 50 (EUR 0.65) to INR 100 (EUR 1.3) per tonne. See <[http://mnre.gov.in/file-manager/UserFiles/strategic\\_plan\\_mnre\\_2011\\_17.pdf](http://mnre.gov.in/file-manager/UserFiles/strategic_plan_mnre_2011_17.pdf)> (accessed 10th June 2015).
36. <<http://mnre.gov.in/file-manager/grid-solar/100000MW-Grid-Connected-Solar-Power-Projects-by-2021-22.pdf>> (accessed 8th June 2015).
37. In October 2015 it issued a new policy, India's Offshore Wind Policy, to promote offshore development.
38. The reform included the "localization act", which required that any installed wind turbine mainly consists of domestically produced components and material.
39. See the descriptive part above.
40. See Chinese Prime Minister Li Keqiang's statement on renewable energy and energy stratification in 2015 <[http://www.chinadaily.com.cn/china/national\\_16.html](http://www.chinadaily.com.cn/china/national_16.html)> (accessed 2nd June 2015).
41. <<http://www.gwec.net/china-introduces-offshore-wind-feed-in-tariffs/>> (accessed 2nd June 2015).
42. The issues have been so far less effectively addressed by the state's decree and regulations, that is, the "Interim Measures for the Administration of Development and Construction of Offshore Wind Power" in 2010. The National Energy Administration (NEA) assumes that 15 percent of the wind power generated in 2015 has been wasted.
43. See the World Bank's Governance Indicators (2016), available at <<http://info.worldbank.org/governance/>>.

44. In 2014 none of the 28 union states could reach the dictated targets (GWEC, 2014, 2015).
45. In 2015, the majority of wind farms were built in Rajasthan, Madhya Pradesh, Maharashtra and Andhra Pradesh (GWEC, 2015: 54).
46. See the World Bank Governance Indicators, *op. cit.*
47. World Economic Outlook Database April 2016, available at <<https://www.imf.org/external/pubs/ft/weo/2016/01/weodata/index.aspx>> (accessed 2nd June 2015).
48. In 2015, the picture is still the same; the top five provinces were Xinjiang, Inner Mongolia, Yunnan, Ningxia and Gansu, accounting for 53.3 percent of the country's overall installations. While Yunnan is not located in the North, the main reason for the increase in output performance has been the initiated pilot projects.
49. While invention refers to the existence of new technology and/or optimization of older production methods, innovation is associated with the spread and use of new technology by an actual user group. As argued, the existence or availability of technological know-how is insufficient for any prognosis on the innovation potential of a country (von Hippel, 2005).
50. Paul Pierson (2001: 98-99) argues that "it is important to recognize the linkages between international and domestic developments...such links are likely to be more modest, complex and bi-directional than is commonly suggested".
51. See <<https://www.kof.ethz.ch/de/indikatoren/globalisierungsindex>> (accessed 1st June 2016).
52. See the innovation potential index developed by Cornell University. (*The Global Innovation Index 2015: Effective innovation policies for development*. Ithaca, Fontainebleau, and Geneva: Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), 2015.)

53. Studies have accumulated evidence that in a market where entry is free but a firm has leadership, the firm will act more aggressively than any firm in a competitive market (Etro, 2008).
54. These are Goldwin, Guodian United Power, Mingyang and Envision.
55. The two main actors are the international branch of the Gamesa World group, the Gamesa (India), holding 37 percent, and Suzlon, which owns 20 percent (GWEC, 2015). See <<http://cleantechnica.com/2015/03/13/gamesa-retains-top-position-indian-wind-energy-market>> (accessed 9th September 2016).

## References

- Acemoglu, D. (2014). The world our grandchildren will inherit. In: I. Palacios-Huerta (ed.), *In 100 years: Leading economists predict the future*. Cambridge, MA: MIT Press, pp. 1-36.
- Acemoglu, D. and J. A. Robinson (2012). *Why nations fail: The origins of power, prosperity and poverty*. London: Profile.
- Aghion, P., W. Carlin and M. Schaffer (2002). Competition, innovation and growth in transition: Exploring the interactions between policies. *William Davidson Working Paper*, No. 151.
- Alagappa, M. (1995). Introduction. In: Muthiah Alagappa (ed.), *Political legitimacy in Southeast Asia: The quest for moral authority*. Stanford: Stanford University Press, pp. 1-11.
- Ban, Ki-Moon (2009). The sky is the limit. *Our Planet* (magazine of the United Nations Environment Programme/UNEP), December, pp. 6-7.
- Barro, R.J. (1991). Economic growth in a cross section of countries. *Quarterly Journal of Economics*, Vol. 106, No. 2, pp. 407-443.
- Brandt, Loren and Eric Thun (2010). Fight for the Middle: Upgrading, competition and industrial development in China. *World Development*, Vol. 38, pp. 1555-1574.

- Corrales, J. and F. Westhoff (2006). Information technology adoption and political regimes. *International Studies Quarterly*, Vol. 50, No. 4, pp. 911-933.
- Cropper, M. et al. (1997). The health effects of air pollution in Delhi, India. *Policy Research Working Paper*, No. 1860, Washington DC: World Bank.
- Djelic, M-L. and S. Quack (eds) (2003). *Globalization and institutions: Redefining the rules of the economic game*. Cheltenham: Edward Elgar (see: M-L. Djelic and S. Quack, "Conclusion: Globalization as a double process of institutional building" (pp. 302-333)).
- Dryzek, John S. (2005). *The politics of the Earth. Environmental discourses*. Oxford: Oxford University Press.
- Economy, Elizabeth C. (2010). *The river runs black: The environmental challenge to China's future*. Ithaca, NY: Cornell University Press. Quoted in "China's blurred horizon", *The Washington Post*, 19th September 2004, p. B01.
- Ernst & Young Global Limited (2016). Middle class growth in emerging markets – China and India: Tomorrow's middle classes (available at <<https://webforms.ey.com/GL/en/Issues/Driving-growth/Middle-class-growth-in-emerging-markets---China-and-India-tomorrow-s-middle-classes>>, accessed 9th June 2016).
- Etro, Federico (2008). Stackelberg competition with endogenous entry (mimeo). *The Economic Journal*, Vol. 118, No. 532 (October 2008), pp. 1670-1697.
- Foucault, Michel (2008). *The birth of biopolitics: Lectures at the Collège de France, 1978-1979*. Translated by Graham Burchell. Basingstoke and New York: Palgrave Macmillan.
- Global Wind Energy Council (GWEC) (2014). *Global Wind Report 2014*. Available at <<http://www.gwec.net/publications/global-wind-report-2/>> (accessed 12th June 2015).

- Global Wind Energy Council (GWEC) (2015). *Global Wind Report 2015*. Available at <<http://www.gwec.net/publications/global-wind-report-2/>> (accessed 12th June 2015).
- Göbel, C. (2013). The information dilemma: How ICT strengthen or weaken authoritarian rule. *Statsvetenskapligtidskrift*, Vol. 115, No. 4, pp. 385-402.
- Guo, S. (2013). *Chinese politics and government: Power, ideology, and organization*. London: Routledge.
- Hajer, Maarten A. (1995). *The Politics of environmental discourse: Ecological modernization and the policy process*. Oxford: Oxford University Press.
- Hall, Peter and David Soskice (2001). An introduction to varieties of capitalism. In: Peter Hall and David Soskice (eds) (2001). *Varieties of capitalism: The institutional foundation of comparative advantage*. Oxford: Oxford University Press, pp. 1-68.
- Halperin, Morton, Joe Siegele and Michael M. Weinstein (eds) (2010). *The democracy advantage: How democracy promotes prosperity and peace*. London: Routledge.
- Holbig, Heike (2011). International dimensions of legitimacy: Reflections on Western theories and the Chinese experience. *Journal of Chinese Political Science*, Vol. 16, pp.161-181.
- Huntington, Samuel P. (1968). *Political order in changing societies*. New Haven, Conn.: Yale University Press.
- International Energy Agency (2014). *World Energy Outlook 2014*. Paris.
- Kailitz, Steffen (2009). Varianten der Autokratie im 20. und 21. Jahrhundert. *Totalitarismus und Demokratie*, Vol. 2, pp. 209-252.
- Kailitz, Steffen (2011). Classification by legitimation. Paper presented at the 6th ECPR General Conference, 25th-27th August 2011. Reykjavik.
- Kneuer, A. (2013). Auf der Suche nach Legitimität. Außenpolitik als Legitimationsstrategie autoritärer Systeme. In: Patrick Köllner and Steffen Kailitz (eds), *PVS-Sonderheft Autokratien im Vergleich*. Nomos Verlag: Baden-Baden, pp. 205-237.

- Knutsen, C.H. (2012). Democracy, dictatorship and technological change. In: H. Hveem and C.H. Knutsen (eds), *Governance and knowledge: The politics of foreign investment, technology and ideas*. London: Routledge, pp. 13-28.
- Kohli, A. (2001). *The success of India's democracy*. Cambridge: Cambridge University Press.
- Li Junfeng *et al.* (2012). *China wind energy outlook*. Beijing: CREIA, Greenpeace, CWEA and GWEC.
- Loy, D. and J. Gaube (eds) (2002). *Producing electricity from renewable energy sources: Energy sector framework in 15 countries in Asia, Africa and Latin America*. Berlin: Deutsche Gesellschaft für Technische Zusammenarbeit GmbH.
- Martinot, E. and Li Junfeng (2010). China's latest Leap: An update on renewables policy (Renewable energy policy update for China). London: RenewableEnergyWorld.com (available at <<http://www.renewableenergyworld.com/rea/news/article/2010/07/renewable-energy-policy-update-forchina>>, 12th June 2016).
- Mitra, Subrata K. (2006). *The puzzle of India's governance: Culture, context and comparative theory*. New York: Routledge.
- Moe, Terry (1984). The new economics of organization. *American Journal of Political Science*, Vol.28, No. 4, pp. 739-777.
- Münch, R. (2011). *Das Regime des Freihandels. Entwicklung und Ungleichheit in der Weltgesellschaft*. Frankfurt a. M.: Campus.
- Munck, Gerardo L. (1996). Disaggregating political regime: Conceptual issues in the study of democratization. Notre Dame, IN: Kellogg Institute for International Studies, University of Notre Dame. Available at <<http://kellogg.nd.edu/publications/workingpapers/WPS/228.pdf>> (accessed 15th February 2012).
- Mundle, S. *et al.* (2012). *The quality of governance: How have Indian states performed?* New Delhi: National Institute of Public Finance and Policy.

- North, Douglass C. (2007). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
- Oliver, Jos G.J. et al. (2015). *Trends in global CO<sub>2</sub> emissions: 2015 Report*. The Hague: PBL Netherlands Environmental Assessment Agency; Ispra: European Commission, Joint Research Centre.
- Olsen, J.P. (1998). Political science and organization theory: Parallel agendas but mutual disregard. In: Roland M. Czada, A. Héritier and H. Keman (eds) (1998). *Institutions and political choice on the limits of rationality*. Amsterdam: VU University Press, pp. 87-108.
- Pierson, Paul (2001). Post-industrial pressures on the mature welfare states. In: Paul Pierson (ed.), *The new politics of the welfare state*. Oxford: Oxford University Press, pp. 81-104.
- The Global Innovation Index 2015: Effective innovation policies for development*. Ithaca, Fontainebleau, and Geneva: Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), 2015.
- Theelen, K. (2004). *How institutions evolve*. New York: Cambridge University Press.
- Tirole, J. (1994). The internal organization of government. *Oxford Economic Papers*, Vol. 46, No. 1, pp. 1-29.
- United Nations Secretary-General's High-Level Panel on Global Sustainability (report, 2012). *Resilient people, resilient planet: A future worth choosing*. New York: United Nations,.
- United States Energy Information Administration (2016). *International Energy Outlook 2016*. Available at <<https://www.eia.gov/outlooks/ieo/index.cfm>> (accessed 2nd September 2016).
- von Hippel, Eric (2005). *Democratizing innovation*. Cambridge, Mass.: MIT Press.
- Wade-Benzoni, Kimberly A. et al. (2002). Barriers to resolution in ideologically based negotiations: The role of values and institutions. *The Academy of Management Review*, Vol. 27, No. 1, pp. 41-57.



- Wintrobe, Ronald (1998). *The political economy of dictatorship*. New York: Cambridge University Press.
- Xu, X., J. Cao, D.W. Dockery and Y. Chen (1994). Air pollution and daily mortality in residential areas of Beijing, China. *Archives of Environmental Health*, Vol. 49, No. 4, pp. 216-222.



# **Policy Comments**

