



**IDS WORKING PAPER**

Volume **2011** Number **373**

**The Ambiguous Role of Corporations  
in Climate Change Mitigation: An  
Explorative Appraisal of Corporations  
in China, Malaysia and the US**

Johan Nordensvärd and Frauke Urban  
September 2011

The Ambiguous Role of Corporations in Climate Change Mitigation: An Explorative Appraisal of Corporations in China, Malaysia and the US

Johan Nordensvärd and Frauke Urban

IDS Working Paper 373

First published by the Institute of Development Studies in September 2011

© Institute of Development Studies 2011

ISSN: 2040-0209 ISBN: 978-1-78118-014-3

A catalogue record for this publication is available from the British Library.

All rights reserved. Reproduction, copy, transmission, or translation of any part of this publication may be made only under the following conditions:

- with the prior permission of the publisher; or

- with a licence from the Copyright Licensing Agency Ltd., 90 Tottenham Court Road, London W1P 9HE, UK,

or from another national licensing agency; or

- under the terms set out below.

This publication is copyright, but may be reproduced by any method without fee for teaching or nonprofit purposes, but not for resale. Formal permission is required for all such uses, but normally will be granted immediately. For copying in any other circumstances, or for re-use in other publications, or for translation or adaptation, prior written permission must be obtained from the publisher and a fee may be payable.

Available from:

Communications Unit, Institute of Development Studies, Brighton BN1 9RE, UK

Tel: +44 (0) 1273 915637 Fax: +44 (0) 1273 621202

E-mail: [bookshop@ids.ac.uk](mailto:bookshop@ids.ac.uk)

Web: [www.ids.ac.uk/ids/bookshop](http://www.ids.ac.uk/ids/bookshop)

IDS is a charitable company limited by guarantee and registered in England (No. 877338)

# **The Ambiguous Role of Corporations in Climate Change Mitigation: An Explorative Appraisal of Corporations in China, Malaysia and the US**

Johan Nordensvärd and Frauke Urban

## **Summary**

Climate change is one of the greatest challenges the world is facing today. Mitigating the emissions that lead to climate change is therefore crucial. The objective of this paper is to analyse the role of corporations and the state for climate change mitigation and the transition towards a low carbon economy. We present an explorative study using three case studies from China, the United States and Malaysia to highlight the role of corporations in three different contexts. The roles of corporations and states are inherently complex; it is far from easy to make the distinction between legal and voluntary obligations. Often politics and business are entangled, overlapping or contradictory. We suggest that to achieve climate change mitigation at the global level, the complementarities of corporations and states need to be further explored. Globally, new forms of public-private partnerships with designated tasks for each stakeholder group are needed for climate change mitigation.

**Keywords:** climate change mitigation; corporate citizenship; China; Malaysia; US.

**Johan Nordensvärd** is Researcher in Social Policy and Development at the London School of Economics and Political Science (LSE), UK.

**Frauke Urban** is Research Fellow in Climate Change and Development at the Institute of Development Studies IDS, UK.

# Contents

Summary, keywords, author notes	3
Acknowledgements	4
<b>Introduction</b>	<b>5</b>
<b>1 Case study approach</b>	<b>6</b>
<b>2 Case studies</b>	<b>7</b>
2.1 Case study 1: China – climate change mitigation efforts are predominantly state-driven	7
2.1.1 Policy framework for climate change mitigation: China	7
2.1.2 The role of the state in climate change mitigation: China	8
2.1.3 The role of the corporations in climate change mitigation: China	9
2.2 Case study 2: US – climate change mitigation efforts are predominantly corporation-driven	10
2.2.1 Policy framework for climate change mitigation: US	10
2.2.2 The role of the state in climate change mitigation: US	11
2.2.3 The role of corporations in climate change mitigation: US	11
2.3 Case study 3: Malaysia – climate change mitigation efforts are both equally state-driven and corporation-driven	12
2.3.1 Policy framework for climate change mitigation: Malaysia	13
2.3.2 The role of the state in climate change mitigation: Malaysia	13
2.3.3 The role of corporations in climate change mitigation: Malaysia	14
<b>3 Discussion: the role of the corporation</b>	<b>15</b>
<b>4 Conclusion</b>	<b>17</b>
<b>References</b>	<b>19</b>
<b>Table</b>	
Table 1.1 Components of case study research design based on Yin (2009)	6

## Acknowledgements

The authors would like to thank two anonymous reviewers for their comments to an earlier draft of the paper.

# Introduction

Climate change is one of the greatest challenges the world is facing today. Kofi Annan has stated that 'today, millions of people are already suffering because of climate change' (Global Humanitarian Forum 2009: i). The mitigation of climate change is therefore urgently needed. Climate change mitigation is defined by the Intergovernmental Panel on Climate Change (IPCC) as 'an anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks' (IPCC 2001: 379). The IPCC's Fourth Assessment Report indicates that global greenhouse gas emissions leading to climate change must be reduced by 80 per cent in 2030 compared to 2000 levels to avoid 'dangerous climate change' (defined as a global temperature rise above 2 degrees Celsius) (IPCC 2007). Leading scientists suggest that even more drastic cuts are needed (Richardson *et al.* 2009). A temperature rise above 2 degrees is likely to lead to irreversible and abrupt changes for humans, ecosystems and economic systems (IPCC 2007).

The concepts of the 'low carbon economy' and 'low carbon development' have become popular world-wide due to the increased understanding that a new cleaner model for development and economies is needed. This is particularly relevant for developed countries which are responsible for 76 per cent of climate change according to the World Resources Institute (WRI 2005). However emerging economies such as China, India, Mexico, South Africa and Brazil have rapidly increasing emissions measured in absolute terms.

Businesses have contributed their fair share of environmental pollution dating back to the Industrial Revolution and more recently related to environmental (and human) catastrophes such as Bhopal, Exxon Valdez, BP Deepwater Horizon, dumping highly toxic waste in developing countries and exploiting natural resources all over the world. Clausen *et al.* (2005) argue that businesses, and particularly corporations, play a double-edged role: they can either foster the development and diffusion of environmental technology and standards or they can actively hinder environmental standards and policies by lobbying, green-washing and market-based activities.

We argue that the role of corporations within climate governance needs to be discussed at more length since corporations can play a large role in 1 contributing to climate change, 2 mitigating climate change and 3 international climate governance. The objective of this paper is therefore to analyse the role of corporations and the state for climate change mitigation and the transition towards a low carbon economy. In recent discussions the role between the state and corporations for climate change mitigation seems to have been blurred as responsibility to act on climate change rests with both actors. We therefore aim to present an explorative study using three case studies to highlight the role of corporations in three different contexts of climate change mitigation.

We use the case study approach developed by Yin (2009). We chose case studies from various income groups: a high income country (United States (US)), a higher middle income country (Malaysia) and a lower middle income country (China). We chose case studies of a politically diverse nature and diverse approaches to climate change policy. The full reasoning of these case study choices is discussed in section 1. Our aim is to highlight what we can learn from these cases and how they can improve our theoretical understanding of the role of corporations in climate change mitigation. Section 2 presents the case studies from China, the US and Malaysia, section 3 discusses the findings and section 4 concludes the paper.

# 1 Case study approach

The UK's Department for International Development (DFID) argues that low carbon growth needs policies and incentives put in place by states on one side, and low carbon business models and business innovations on the other side (DFID 2009: 58). This paper aims to explore the role of corporations in climate change mitigation in three different contexts and to elaborate what we can learn from these three diverging contexts. To analyse the case study evidence, we examine multiple case studies and compare them to each other. Yin (2009) describes this analytical approach as 'cross-case synthesis'. Table 1.1 shows the approach we take to the case studies.

**Table 1.1 Components of case study research design based on Yin (2009)**

Components of research design	Approach
Research question	What role do corporations play in climate change mitigation at a country level?
Propositions	The role of climate change mitigation is either predominantly state-driven, corporation-driven or a combination of the two
Unit of analysis	Corporations and states
Logic linking the data to the propositions	Cross-case synthesis
Criteria for interpreting the findings	Using both qualitative and quantitative data

The emphasis of each case study is on exploring the role of climate change mitigation in diverging contexts; to understand what role corporations play in different contexts and what can we learn from these examples. We have selected three country case studies based on the following criteria: We chose case studies from various income groups, including a high income country (US), a higher middle income country (Malaysia) and a lower middle income country (China). Ideally we would have analysed a low income country in addition, however we were unable to do this due to limited data. We chose case studies of a politically diverse nature: a country with a socialist and formerly centrally planned economy (China), a country with a capitalist economy (US) and a country with a capitalist economy that has been influenced by socialist and communist movements (Malaysia). The political economy in each country influences the role and status of states, state-owned corporations and private corporations. We chose case studies with diverse per capita greenhouse gas emission levels: a country with very high per capita emissions (US), one with average per capita emissions (Malaysia) and one with low per capita emissions (China). We chose case studies of countries that have a diverse track record in terms of their commitment to tackling climate change. However, it has to be noted here that since the Copenhagen negotiations in 2009, many countries are considered by Germanwatch (2011) as failing to deliver their climate change commitments and 'climate change champions' seem to be non-existent compared to previous years. Finally, we chose case studies which show how climate change mitigation is predominantly state-driven (China), corporation-driven (US) or a combination of the two (Malaysia).

For the above named reasons we have chosen to focus on China, Malaysia and the US. We recognise that despite the above mentioned differences, these countries have similarities which make them comparable. All three countries are major greenhouse gas emitters, major economies, and have a heavy reliance on fossil fuels due to abundant domestic resources (US: oil, China: coal, Malaysia: natural gas). Despite their efforts, none

of these countries has been successful (yet) in introducing a low carbon economy; however all of these countries consider the establishment of a low carbon economy crucial for their domestic economy and their international competitiveness. We use the example of the government-regulated wind energy sector in China to elaborate this. We use examples from the US where the government fails to provide strict national policies and legislations on climate change and where initiatives from businesses and corporations play a role for climate change mitigation. Finally, the third case study demonstrates how corporations and the state can be equally influential players driving development. We elaborate the example of Malaysia to demonstrate how the state aims to promote climate change mitigation efforts on one side, but on the other side it allows large-scale commercial deforestation by corporations for palm oil plantations.

Measures for climate change mitigation can broadly be classified into three categories: mitigation through the use of (1) low carbon energy, such as renewable energy, (2) energy efficient technologies, and (3) the protection of natural carbon sinks, such as forests and land (DFID 2009). This paper aims to assess a range of these different measures in the case studies. Our general analytical strategy for the case study research is the dual use of qualitative and quantitative data. We use two major sources of evidence: qualitative information about climate change, energy and forestry policies, and quantitative data about emissions, energy use and forestry. The policy data collection is based on the following system: national policies come from national authorities and ministries such as China's National Development and Reform Commission (NDRC) and Malaysia's Ministry of the Environment. Additional climate policies come from submissions to the United Nations Framework Convention on Climate Change (UNFCCC) such as those following the Copenhagen Accord in 2010. Quantitative energy, climate, forestry and emissions data come from internationally acknowledged multilateral organisations such as the International Energy Agency (IEA), the World Bank and UN agencies. Additional information from journal articles is based on well-established peer-reviewed journals in the fields of energy, climate change, forestry and development and is limited to well-respected journals in their respective fields, such as the journal of Energy Policy.

## 2 Case studies

We present three case studies from China, the US and Malaysia which indicate the ambiguous role of corporations and states in climate change mitigation. We present a case study from the Chinese wind energy industry, US corporate strategies for emission reductions, and Malaysia's approach to biofuels from palm oil plantations. These different case studies have been selected because they provide examples of how business and states are dealing with climate change mitigation in each of the respective countries. These different case studies provide insights about the role of businesses and states, their competencies, powers and limits for climate change mitigation.

### **2.1 Case study 1: China – climate change mitigation efforts are predominantly state-driven**

The first case study relates to climate change mitigation in China, with specific reference to its rapidly growing wind energy sector.

#### **2.1.1 Policy framework for climate change mitigation: China**

From a climate policy perspective, the Climate Change Performance Index 2011 China is 56th on a list of 60 countries ranked by climate performance which takes into account

emission trends, emission levels and climate policy (Germanwatch 2011). Despite this bad ranking, China ratified the United Nations Framework Convention on Climate Change (UNFCCC) Convention in 1993 (UNFCCC 2010a), approved the Kyoto Protocol in 2002 (UNFCCC 2010b), and submitted Nationally Appropriate Mitigation Actions (NAMAs) as a follow-up to the Copenhagen Accord in early 2010 (UNFCCC 2010d). Nevertheless China is a non-Annex I country and doesn't have quantified emission reduction targets.

The Chinese government launched its National Climate Change Programme in 2007 (NDRC 2007a) and its White Paper on Climate Change in 2008. The White Paper introduced national energy intensity targets for a 20 per cent reduction by 2010 in comparison to 2005 and targets for closing down inefficient coal power stations, decreasing the share of heavy industry, investing in energy efficiency and promoting renewable energy (Information Office of the State Council of the People's Republic of China 2008). China's much debated position at the Copenhagen and Cancun climate negotiations was a 45 per cent reduction in carbon intensity reduction by 2020 in comparison to 2005 (UNFCCC 2010d).

From an energy perspective, there are a range of policies and legislative frameworks in place to foster a low carbon economy, such as the Chinese Renewable Energy Law from 2006 which aims to 'promote the development and utilization of renewable energy' (National People's Congress of China 2005: 1). The law sets no specific targets for renewable energy, but provides the legislative framework for other policies, obligatory grid connections for renewable energy systems, cost-sharing agreements between utilities and end-users, pricing agreements like feed-in tariffs, surcharges and concessions to guarantee the market (Baker and McKenzie 2007; Urban *et al.* 2009). Other policies which promote low carbon energy are the Five Year Plans, most recently the 12th Five Year Plan for 2011–2015. The government body NDRC introduced Renewable Energy Targets in 2007 which are comparable to those of the European Union. Fifteen per cent of the total primary energy should be from renewable energy by 2020. This policy promotes biomass, geothermal energy, hydropower, solar power, tidal energy and wind energy and aims to use these renewable energy sources to achieve decentralised electrification in remote rural areas (NDRC 2007b; Urban *et al.* 2009).

China is also a major benefiter of the Clean Development Mechanism (CDM). China has implemented the world's greatest number of CDM projects and reported the largest emission reductions on the global CDM market (Wang 2010).

### **2.1.2 The role of the state in climate change mitigation: China**

Despite the turbulent Copenhagen and Cancun climate change negotiations and the blame that China received from many sides regarding the weak outcome, the Chinese government is committed to tackling climate change. The Chinese government has realised the disadvantages that a high carbon pathway could bring and makes efforts to move towards a low carbon economy for three key reasons: (1) energy security, (2) economic competitiveness and first mover advantages, and (3) climate change mitigation. As a formerly centrally-planned economy and with a growing business sector, the Chinese state remains the driver of climate change mitigation actions and creates an enabling environment for low carbon businesses. A case in point is the wind sector. Wind resources in China are reported to be large. The World Energy Council's World Energy Assessment 2007 reports that China has 1,000 GW total exploitable wind energy resources (WEC 2007) of which 750 GW are reported to be situated offshore (Lewis and Wiser 2007).

The Global Wind Energy Council (GWEC) reports that China has doubled its installed wind energy capacity for the fifth consecutive year. The country had more than 25 GW installed wind capacity at the end of 2009 (GWEC 2010). The official target of the government was to



reach 5 GW by 2010 (Jingfeng *et al.* 2006), which was revised to 10 GW by NDRC due to a rapidly expanding market. The new 'unofficial target' of the Chinese government is to reach 150 GW installed wind energy capacity by 2020. Especially the windy region Inner Mongolia is endowed with high wind resources and is therefore the key to the Chinese wind energy development plans. Chinese authorities further recently announced that China will begin to construct the world's largest offshore wind farm in Jiangsu, close to Shanghai (China Climate Change Info-Net 2010: 1). While these developments are implemented by firms – often large state-owned firms – the key driver behind it is the government and its many bodies and authorities that plan, finance and implement low carbon projects. These developments are primarily driven by the Five Years Plans and the plans of the NDRC. The national targets for wind energy from the Five Year Plans decided by national government are translated into provincial targets and even firm-level targets.

Historically, the Chinese government promoted foreign donations and Foreign Direct Investment (FDI) funded wind pilot projects from Denmark, Germany and Spain in the 1980s and 1990s. In the late 1990s and the early 2000s, the Chinese government promoted the development of indigenous local wind energy technology and wind energy markets. This involved a 70 per cent local content requirement. The Kyoto Protocol and the UN regime for climate change mitigation was an external driver for expanding the Chinese wind market. The government aims since 2010 to scale up its wind farms, markets and technologies and to export Chinese wind energy technology globally (Dai 2011).

The Chinese relationship between state and firms is very strong: All of the leading wind manufacturers are state-owned enterprises (SOEs) including Goldwind, Sinovel, Dongfang Electric, and Guodian United Power. SOEs make up 90 per cent of firms engaged in wind power generation and SOEs make up 97 per cent of all companies engaged in wind power concessions (Liu and Kokko 2010).

Nevertheless, the impressive figures and policies supporting China's low carbon development have to be considered with caution. Many of the low carbon policies implemented by the central government in Beijing are obstructed due to the sometimes reluctant implementation by provincial and local governments and authorities. Recent research by Wang *et al.* (2010) has shown that there are major barriers to China's low carbon development. First, the share of renewable energy in total energy consumption is decreasing instead of increasing, due to rapid growth of fossil fuel capacity. Second, the efficiency of renewable energy technology is low as often the quality of the technologies is not to the latest standard and efficiencies for renewable energy technology are generally rather low. Third, many renewable energy technologies are not connected to the central grid as this requires high costs and logistic resources. The installed renewable capacity is therefore often wasted. This could be interpreted as a market failure, particularly in the case where it is not financially viable for businesses to connect installed renewable energy technology to the grid and where government authorities are reluctant to monitor implementation (Wang *et al.* 2010: 1872).

### **2.1.3 The role of the corporations in climate change mitigation: China**

China is not only the world's largest CO<sub>2</sub> emitter; it is also leading the race to develop low carbon technologies. Especially wind energy and solar energy are major markets in China. According to GWEC, China became the world's largest wind energy market in early 2010 and has a large number of private, state-owned and public-private firms engaging in these sectors for domestic use and for export (GWEC 2010). According to Chinese sources there are over 90 wind energy technology firms in China (Lui and Kokko 2010). Key players are Goldwind, Sinovel, Dong Fang, Shanghai Electric Corporation and Shanghai Dong Hai Wind Power (Dai 2011). SOEs such as Goldwind, Dong Fang and Shanghai Electric Corporation, and public private partnerships dominate the wind and solar sectors. Key

corporations such as Goldwind, Sinovel and Shanghai Dong Hai Wind Power are owned by the state and receive state funding (Dai 2011). Leading foreign wind energy firms such as Vestas, GE Wind, Gamesa, Suzlon, Siemens, REPower, Nordex and Mitsubishi have established joint ventures in China. Access to the market for foreign investors has often been traded for a share of ownership of foreign firms in China.

Today Chinese renewable energy firms have firm-level targets for installing renewable energy. These targets are derived from the central government-led Five Years Plans. Many Chinese wind energy firms aim to install the required capacity as quickly as possible to ensure access to the best wind resources and the most suitable land areas.

China's rapid rise in wind and solar technology production and its cheap production costs make it a serious competitor to established European and US wind and solar companies. While the production capacity of Chinese wind turbine manufacturers is growing, leading German and Danish firms are increasingly concerned about China's alleged infringement of intellectual property rights, the copying of foreign technology and restricted access to the Chinese wind market which until 2009 required 70 per cent Chinese content requirements for wind turbines (Lema *et al.* 2011). The competition with US low carbon companies is even fiercer as the US government accuses the Chinese government of unfair subsidising for its low carbon firms. This issue has even been taken to the World Trade Organisation (WTO).

## **2.2 Case study 2: US – climate change mitigation efforts are predominantly corporation-driven**

The second case study relates to climate change mitigation in the US. We present a case study from US corporate strategies for emission reductions, because they show how business and states are dealing with climate change mitigation in the US.

### **2.2.1 Policy framework for climate change mitigation: US**

From a climate policy perspective, the Climate Change Performance Index 2011 the US is 54th on a list of 60 countries ranked by climate performance which takes into account emission trends, emission levels and climate policy (Germanwatch 2011).

The US ratified the UN Climate Change Convention in 1992 (UNFCCC 2010a), but never ratified or accepted the Kyoto Protocol (UNFCCC 2010b). The US government fails to provide strict international and national policies and legislations for climate change mitigation. The Bush administration was infamous for its almost decade-long boycott of the Kyoto Protocol and its denial of climate change. Many had hoped that the Obama administration would bring along a fundamental change. However, the US remained rigid in Copenhagen and Cancun and only presented weak targets which were below those of the European Union and other developed countries. Though Obama was hailed for his success in achieving the deal which led to the non-legally binding Copenhagen Accord, the US national targets remain weak with only a 17 per cent reduction of CO<sub>2</sub> emissions planned for 2020 compared to 2005 levels (not 1990 levels as most other countries) (UNFCCC 2010c). These targets were made in anticipation of the forthcoming US energy and climate legislation. The future US emission reduction targets set forth as a response to the Copenhagen Accord were promised by the US Office of the Special Envoy for Climate Change to 'entail a 30 per cent reduction in 2025 and a 42 per cent reduction in 2030, in line with the goal to reduce emissions 83 per cent by 2050' (UNFCCC 2010d: 2). A similar legislation was already signed off by the House of Representatives in 2009, however in July 2010, the US Senate decided not to pass the anticipated climate bill on which these targets were based. The Senate thereby rejected its planned national cap-and-trade system and it

also rejected a modest electric utilities bill (Crook 2010). This is a major disappointment for tackling climate change at the national level, but also at international level.

### ***2.2.2 The role of the state in climate change mitigation: US***

Nation-wide legislation on climate change is lacking in the US. The above case shows that the US Senate does not support legislation on climate change at the national level. The most 'advanced' national legislations the US can offer which relates to some extent to climate change are the 1990 Clean Air Act Amendments and the 1992 Energy Policy Act. In the absence of national regulation and a failure of the Senate to take action on climate change, there is a strong move to reduce greenhouse gas emissions in the US through using existing federal authorities and the actions of federal states. There are 10 federal states with emission reduction targets set by legislation (WRI 2010). These states include California, which has the reputation of being the 'greenest' or most climate-friendly of all US states, Connecticut, Hawaii, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Oregon and Washington. There are six provinces which have executive orders to reduce emissions, either on top of existing legislation such as in California, or as a separate policy, such as in Arizona, Florida, Michigan, New Mexico and New York. The most ambitious target is set by California, Florida, Massachusetts and New York which have legislation in place to reduce greenhouse gas emissions by 80 per cent compared to 1990 levels by 2050 (WRI 2010). Nevertheless the base lines differ, with some states using 1990 as a baseline, which is aligned with the Kyoto Protocol, and other states using 2000 or 2005 as a baseline. There are three regional cap-and-trade systems agreed for the Midwest, which involves six states, the Western Climate Initiative, which involves seven states, and the Regional Greenhouse gas Initiative at the East Coast of the US, which involves nine states. Together these states represent more than 40 per cent of the US federal states (WRI 2010).

Despite the climate-friendly legislation of states, more advanced legislation at the national level is lacking to date. While national legislation to tackle climate change seems to have been abandoned, businesses are increasingly pushing forward policies for a low carbon economy.

### ***2.2.3 The role of corporations in climate change mitigation: US***

The US has a leading wind, solar and biomass industry. The American Wind Energy Association (AWEA) reports that in 2009, a total capacity of 35.6 GW wind energy was installed which is estimated to save about 62 million tons of CO<sub>2</sub> annually and is 'equivalent to taking 10.5 million cars off the road' (AWEA 2010: 1). Nevertheless, the AWEA reports that in 2010 capacity increases stalled. This was reported to be due to a lack of 'long-term national commitment to renewable energy' which is considered a key factor why the US wind industry is lagging behind other countries' wind energy markets (AWEA 2010: 1). Below we provide some examples of how businesses drive climate change mitigation regulations and at the same time have the potential to increase their own competitive advantage even in the absence of adequate national policies. We acknowledge the wide range of corporate climate initiatives in the US, however due to limited space we will only explore a few innovative ones which have the potential to directly influence national climate policy.

Dunn (2005) reports about US business engagement with the flexibility mechanisms established by the Kyoto Protocol: businesses can have internal and external control measures such as greenhouse gas (GHG) inventories and management, GHG emission reduction targets and internal emission trading schemes. An interesting business reaction to missing national legislation is the formation of the US Climate Action Partnership (USCAP). USCAP was formed in 2007 and currently includes 28 companies as well as environmental organisations, including Chrysler, DuPont, Ford, General Electric, General Motors, Johnson & Johnson, Pepsi, Rio Tinto, Shell and Siemens. The aim of USCAP is to lobby the US

government to set legally binding emission reduction targets and to reduce GHG emissions. USCAP published its 'Blueprint for Legislative Action' in 2007 which calls for 'prompt enactment of national legislation in the United States to slow, stop and reverse the growth of greenhouse gas (GHG) emissions over the shortest time reasonably achievable' (USCAP 2007: 1). In its policies, the organisation calls for an emission reduction of 80 per cent by 2050, meaning that the US economy should only emit 20 per cent of its 2005 emissions. To achieve these targets, the organisation suggests introducing a national cap-and-trade system, fostering innovation such as Carbon Capture and Storage (CCS) and advocates for low carbon and energy efficient technology for transport and buildings (USCAP 2007). Nevertheless one could argue that this system lacks stringency as it is only based on soft laws, does not provide enforcement mechanisms and there is a high risk of free-riding for companies outside of the USCAP association.

According to Business and the Environment (2009), the US corporations Levi Strauss, Nike, Starbucks, Sun Microsystems and The Timberland Company joined with the Coalition for Environmentally Responsible Economies (CERES) in 2008 to develop a new business alliance. This business alliance has the aim to influence the development of a strong US climate and energy policy to achieve a low carbon economy. The new alliance is called Business for Innovative Climate and Energy Policy (BICEP). The initiative has ambitious GHG emission targets: 25 per cent GHG reduction by 2020 below 1990 levels and 80 per cent GHG reduction by 2050 below 1990 levels, establish an US emission trading system, increase energy efficiency by 200 per cent, promote fuel-efficient vehicles, increase investments in low carbon energy and energy efficient technology, promote green jobs, introduce a renewable standard which means that all electricity generated must come from at least 20 per cent of renewable energy sources by 2020 and 30 per cent by 2030, and 'limit the construction of new coal-fired power plants to those that capture and store carbon emissions' (Business and the Environment 2009: 14–15). These targets are not only ambitious, but also exceed the climate and energy policies that most states currently have in place. Leading US corporations are here the drivers of radical climate change mitigation policy. This is not only driven by the desire to increase these corporations' reputation or to develop a good Corporate Social Responsibility (CSR) policy, but by the belief that a fundamental change of the system is needed and that this cannot be achieved by the state alone. Lobbying plays an important part of this process. Lobbying by corporations in the climate change arena is however nothing new. Oil 'giants' such as Exxon Mobile have been known in the past to 'argue against business responsibility for global warming', however 'competitors such as BP or Shell more recently have come to the conclusion that there is a moral responsibility for business to engage in GHG emission reduction' (Levy 2005 in: Eberlein and Matten 2009: 244). Interestingly, the BICEP case study might have turned the tables by lobbying for strict climate and energy policy instead of against it. In this case, business ethics form a surrogate regulation and have the long-term aim to contribute towards legislation.

Nevertheless while these are powerful aspirations, the effect at the national level remains to be seen. The above mentioned approaches seem to be fragmented with a lack of cohesion among different firms, associations of firms and industries. Free-riding, the lack of enforcement mechanisms, the risk of green-washing to improve business reputations and sometimes low impacts on national emissions pose major challenges.

### **2.3 Case study 3: Malaysia – climate change mitigation efforts are both equally state-driven and corporation-driven**

The third case study relates to climate change mitigation in Malaysia, with specific reference to its large tropical forests and the biofuel industry. We present this case study because it is an example of how business and states are dealing with climate change mitigation in Malaysia.

### **2.3.1 Policy framework for climate change mitigation: Malaysia**

From a climate policy perspective, Malaysia has been ranked in the Climate Change Performance Index 2011 as number 53 of 60 countries based on their emission trends, emission levels and climate policy (Germanwatch 2011). In terms of climate policy, Malaysia ratified the UN climate change convention in 1994 and also ratified the Kyoto Protocol in 2002. The government thus has an interest in developing and implementing policies for mitigating climate change. Nevertheless, as a non-Annex I country it does not have quantified emission reduction targets. More recently Malaysia has been known for its unwillingness to commit to tackling climate change. 114 countries world-wide have agreed to the Copenhagen Accord and another 24 countries have expressed their intention to agree to the Accord (UNFCCC 2010f). Despite these global efforts, Malaysia has not agreed to the Copenhagen Accord.

There are no national climate change policies in Malaysia to date, but there are a range of environmental and energy policies, such as the Environmental Quality Act of 1974 (Department of Environment of Malaysia, Ministry of Science, Technology and the Environment 2010). The key energy policies are the 1974 Petroleum Development Act under which the state-owned corporation Petronas was established, the 1979 National Energy Policy, the 1980 National Depletion Policy which aimed to safeguard natural oil reserves as a response to rapid exploitation, the 1981 Four Fuel Diversification Policy which was 'designed to prevent over-dependence on oil as the main energy resource' and which introduced a diversification of the energy portfolio (EIB 2010: 1). More recently, Malaysia introduced the Fifth Fuel Policy which was included in the Eighth Malaysia Plan for 2001–2005: renewable energy was introduced as a fifth fuel in the energy portfolio besides oil, natural gas, coal and large hydropower. The focus is mainly on biomass, biogas, solar and small hydropower. The Ninth Malaysia Plan for 2006–2010 aimed to further promote renewable energy and energy efficiency with the aim to reduce the dependency on oil products (Mohamed and Lee 2006; Haw *et al.* 2006; EIB 2010).

In terms of forestry policies, policy-making is a responsibility of the three state governments in Peninsular Malaysia, Sabah and Sarawak. Peninsular Malaysia has the National Forest Policy from 1978. The Sarawak Forest Ordinance from 1954 is the key legislation in Sarawak, West Borneo and the Sabah Forest Enactment from 1968 is the key legislation in Sabah, East Borneo. Although these three key legislations have developed separately, they share the common features that forests need to be protected, but can be harvested for export purposes at the same time (Woon and Norini 2002).

### **2.3.2 The role of the state in climate change mitigation: Malaysia**

Malaysia is an oil producing country; however it is not formerly associated with the OPEC (Oil Producing and Exporting Countries) and the notorious blocking role the OPEC has played in climate negotiations. Despite this positioning, climate policies have been missing from the wider policy arena in Malaysia. The state's engagement in the state-owned oil and gas corporation Petronas is likely to have an impact on the government's stance towards climate policies. Besides the close relationship between the state and oil and gas corporations, another major issue is Malaysia's increased rate of deforestation which rapidly increases its GHG emissions. Primal rainforest in Malaysia, particularly in the two states Sabah and Sarawak of Borneo, has seen increased logging and deforestation for palm oil plantations that are being used to produce chemicals, cosmetics, food, plastics and, ironically, biofuels (McMorrow and Talip 2001). The government of Malaysia's complex political position is to aim for economic growth by exploiting natural resources and utilising fossil fuels on one side, while on the other side ensuring nature conservation and environmental protection (Energy Information Bureau (EIB) 2010). Malaysia's energy and climate change policies demonstrate the state's split relationship towards natural resource exploitation and environmental protection. This is reflected in key energy and forestry

policies which enable the exploitation of resources through state-owned firms like Petronas and create enabling environments for foreign firms at the same time as they encourage the safeguarding of natural resources and avoiding over-exploitation.

In terms of forestry and biofuels, the state governments have the main jurisdiction over their forest resources. There are three separate bodies which play a key role in Malaysia's forest policies, namely the Peninsular Malaysia Forestry Department, the Forestry Department Sabah (East Borneo) and the Forestry Department Sarawak (West Borneo). 'Each state is empowered to enact laws on forestry and to formulate forestry policy independently'; 'nonetheless, a close relationship between the states and federal government is essential regarding all land and forestry issues' (Woon and Norini 2002: 12). The federal state provides technical assistance and training support, while the national state provides the overall enabling environment.

While the government takes a paradoxical approach by ensuring firms can exploit natural resources and safeguarding these resources at the same time, another important actor is aiming to influence policy-making, namely Civil Society Organisations (CSOs). Indigenous groups from Borneo have increasingly raised their voice in the UN climate policy process about devastating deforestation in Borneo. They proclaimed the need for Malaysia to participate in activities for Reducing Emissions from Deforestation and Forest Degradation (REDD), particularly to stop deforestation from palm oil plantations. Indigenous people depend on forests for their livelihoods, including for food, housing, and medicine. The logging and the industrial activity in the jungle decreases the quantity and quality of habitat for animals and plant species. The palm oil monoculture plantations further reduce biodiversity (Fitzherbert *et al.* 2008). The state engages actively with energy and forestry corporations and creates legislation to suit their interests; however there seems to be limited engagement between the state and indigenous groups for protecting their interests.

### **2.3.3 The role of corporations in climate change mitigation: Malaysia**

Renewable energy firms play only a marginal role in Malaysia. The most important sector related to climate change mitigation in Malaysia is the forestry sector. Deforestation is on the rise, and one of the key causes is the increasing demand for palm oil.

While the key role of palm oil corporations is to make profit, there are close connections to the state and state funding. In Malaysia the term 'Government Linked Corporations (GLC)' is often used. GLCs are corporations which have close links to the government, but are not necessarily state-owned. This is one of the key differences to China, where state-owned enterprises are abundant for climate change mitigation, and the US, where private firms are abundant. In Malaysia 60 per cent of palm oil land was in private ownership in 2005; however the government holds shares of some of these 'private' corporations (Ramasamy *et al.* 2005). The largest corporation is Sime Darby which developed as a merger of eight palm oil corporations and is now the world's largest listed palm oil corporation (Sime Darby 2006). The government played a key role in negotiating this merger. Other key players are Kuala Lumpur Kepong Berhad and IOI Corporation Berhad (Ramasamy *et al.* 2005). In 2010, state-owned corporations such as Petronas and foreign corporations such as Shell were also engaged in palm oil production in Borneo.

The corporations engaged in the palm oil industry have in recent years come under pressure due to their social and environmental impacts. As a consequence, today about 10 per cent of all corporations participate in social and environmental reporting, whereas the practice was non-existent in the past. Nevertheless, 10 per cent is a very low number overall, particularly considering the high environmental and social impacts of the palm oil industry. The fact that social and environmental reporting is starting to take place in the palm oil industry is largely a result of lobbying by Non-Governmental Organisations (NGOs)

such as Sahabat Alam Malaysia and the Environmental Protection Society of Malaysia (Othman and Ameer 2010). Other studies suggest that Corporate Social Responsibility (CSR) has not progressed very far in Malaysia (Othman and Ameer 2010). Although the government has an interest in promoting environmental reporting, reducing environmental degradation and contributing to climate change mitigation, the government's powers seems to be limited, while corporations and their take on corporate citizenship seem to be the drivers of policy and practice.

Another interesting development is happening in Malaysia: according to an insider, Chinese companies working on the CDM are starting to invest in palm oil plantations for biofuels in tropical forests in Malaysia as carbon offsetting projects. Under the CDM, developed countries are paying developing countries for climate-friendly development projects (Dechezlepretre *et al.* 2009). At this point, Chinese companies are starting to invest in offsetting initiatives in other developing countries with funding received from developed countries. While the palm oil plantations will produce palm oil which can then be converted into biodiesel or bioethanol for climate-friendly transport, the logging of the tropical forest in Malaysia has a high environmental impact and releases high amounts of greenhouse gas emissions. One mitigation measure is thereby contributing to another counter-measure. This development is tolerated by the Malaysian government, but driven by FDI from foreign corporations, multinational corporations such as Shell and national corporations like Petronas and others.

### 3 Discussion: the role of the corporation

This section first discusses the role of corporations from a theoretical perspective and afterwards this discussion links the theoretical perspectives to the three case studies presented above from China, US and Malaysia.

For years, there has been a lively discussion about the role of corporations in national and global systems of governance. One view of corporate citizenship is to highlight 'a firm's membership in society' (Sison 2009: 236). Corporations are particular individuals since they are a legal construction which lacks both 'bodies to be jailed' and 'souls to be damned' (Sison 2009: 236). Despite not being an individual, physical person, a corporation is still a subject with rights and responsibilities. Corporations can sell and buy commodities (rights) and they have to honour contracts and pay taxes (duties). Corporations have the goal to produce goods and services for the benefits of shareholders directly and the greater public indirectly. Corporate citizenship is in the Anglo-Saxon tradition first and foremost a legal concept where rights and duties are minimal requirements (Sison 2009: 237). Carroll argues that corporate citizens do also have the ethical responsibility to do what is right, fair and just, and the discretionary responsibility to contribute to various kinds of social, educational, recreational or cultural purposes (Carroll 1979: 500). These responsibilities often rely on voluntarism. Carroll indicates that philanthropic roles 'are purely voluntary, and the decision to assume them is guided only by a business's desire to engage in social roles not mandated, not required by law, and not even generally expected of businesses in an ethical sense' (Carroll 1979: 500). Such a voluntarism could be problematic when it comes to climate change mitigation where it could impose free-riding or green washing. One could argue that corporations should just adhere to legislations or rely on a few selected corporate voluntary actions.

One could argue from a Friedman perspective that there is no corporate responsibility per se beyond making profit and obeying the law (Friedman 1970). This would make corporate citizens very focused on economic and legal goals and discriminate against social, ethical

and environmental goals. This would imply a more limited view of the role of corporations. Such a system has at least in theory been dominant in Western countries where liberal governments have tried to outline a distinction between the public and private sphere where 'the public sphere, often coterminous with the state, is the authoritative rule maker and legislator' (Mörth 2008: 104–5). The nation state as law-maker is then considered as the primary political community, there is no authority above or below. This means that 'a sovereign state is a territorial jurisdiction: i.e. the territorial limits within which state authority may be exercised on an exclusive basis' (Jackson 1999: 432).

The opposite approach would be that corporations would participate on more equal footings with the state in climate governance. Levy and Kolk indicate that 'companies can attempt to postpone regulation by debating the science of climate change and the economic cost of greenhouse gas (GHG) controls, or they can invest in new low-emission technologies; companies can attempt to invest early and gain first-mover advantages, or wait until the technological turmoil and regulatory uncertainty has subsided' (Levy and Kolk 2005). Pinske and Kolk (2009) report a range of strategic options for addressing climate change in the business sector. They distinguish between two major aims: innovation, such as through R&D for new low carbon technologies, and compensation, such as through emission trading. Pinkske and Kolk (2009) further distinguish between the nature of the organisation: internal (company itself), vertical (supply chain) and horizontal (beyond the supply chain).

Depending on whether the corporation is more oriented towards innovation or compensation, this opens up space for the following strategies: process innovation, product development, new product / new market combinations and internal transfer of emission credits, supply chain measures and acquisition of emission credits (Pinske and Kolk 2009). Another approach would be to take the role of the corporations one step further; the corporations would participate in the regulation. Beckman and Pies (2008: 54) argue that corporate citizenship should reflect the core idea of a civil society in 'which all participants themselves carry responsibility for the order of their community' and they have 'ordo-responsibility' which could be seen as a general responsibility for the institutional order. They argue that to some degree it would be in many corporations' interest if they accepted 'ordo-responsibility in rule-setting processes and rule-finding discourse' (Beckman and Pies 2008: 54). The corporations would not just obey regulations and ethics but actually create and monitor such regulations. Such governance does not produce hard laws, but soft laws which mean they lack the possibility of legal sanctions. These regulations are deliberative and consensual; they take for granted a more cooperative relationship between governments and corporations (Mörth 2008: 107).

The case studies we presented in section 2 indicate that the practical role of corporations is far more difficult and ambiguous than the theoretical perspectives suggest.

The US case study elaborated how businesses in the US aim to create their own initiatives and lobby the state when it comes to developing policies for climate change mitigation. Climate mitigation efforts tend to become increasingly corporation-driven. Many businesses seem to have grown out of the state-driven role as today they can challenge nation states as a driver for climate and energy policies. This means that these businesses and corporations are not only the motors of growth and employment in the low carbon sectors, but they also aim to directly influence policy-making to achieve ambitious climate change mitigation efforts and to introduce new legislation that favours low carbon development over high carbon development. Since the US state has relatively low involvement and has rather lax regulations in enforcing and financial incentives to promote climate change mitigation this becomes the role of corporations to lobby and/or try to enforce some binding regulations. The key risks associated with this approach are free-riding, policies and agreements which are incoherent, fragmented and essentially piecemeal, or in the worst case even tokenism. Jones and Haigh (2007: 68) argue that a 'well-functioning system of corporate citizenship



might require, if paradoxical, a strong state to design and administer necessary sanctions'. The role of the corporations is markedly different in China and Malaysia. The case studies from China and Malaysia show how state power and political elites are interwoven with corporations.

The China case study showed that the Chinese state provides a range of different policies and an advanced framework for an enabling environment for Chinese renewable energy businesses. These legislative frameworks along with targeted financing and subsidies for wind energy businesses have helped foster a booming wind energy industry in China. This has proven favourable for local Chinese businesses and to some extent also for foreign direct investment by corporations such as Gamesa Eolica (Spain) and Vestas (Denmark) (Dechezlepetre *et al.* 2009). The role of the corporation should therefore not be seen as something distinct from the political but rather a part of a corporatist system. One could even argue that corporations are tools created and used by the Chinese state to achieve certain goals that go beyond simply making profits for its shareholders in a true Friedman sense.

This strategy can also be observed in China's overseas engagement, which involves SOEs, financiers and regulators. Since 2004 China has been following a 'Going Out' strategy in an attempt to meet its energy needs by encouraging outward investment and subsidising investment by Chinese companies in overseas resources and markets (Heinrich Böll Stiftung 2008). According to the World Investment Report (Pamlin and Baijin 2007: 10), one of the key drivers for China's Foreign Direct Investment (FDI) is precisely because of a demand for natural resources (Pamlin and Baijin 2007) and the near-saturation of domestic markets (Liu and Kokko 2010). Pamlin and Baijin (2007) add that from 2000 to 2005, China's FDI grew on average by 66 per cent per year. During the same time frame, Chinese companies launched 28 overseas mergers and acquisitions in the energy and mining industries with an average deal value of US\$ 280 million (Chang *et al.* 2010).

In Malaysia, the level of state interference and state regulation in the energy, forestry and biofuel industry is paradoxical, compared to China and the US, and the sector is a mix of policy-driven and market-driven without clear dominations of either side. We have seen in the three case studies, but particularly in the Malaysian case, that sometimes there seems to be a case of 'organised hypocrisy' as elaborated by Brunsson. Brunsson (2003) describes how governments are often in a moral catch-22 as they often say one thing (the thing they want to do, but can't do because of external pressure), but do another thing (the thing they can do because of external pressure, but do not necessarily want to do). In the case of Malaysia this means that the government would like to reduce emissions and contribute to climate change mitigation, this is why it is interested in biofuel production from palm oil and supports the CDM. On the other side, the government strives for economic growth, progress and development; this is why it tolerates the destruction of tropical forests by foreign and national corporations. The engagement of state-owned corporations like Petronas, which also engages in the palm oil exploitation, demonstrates the complexity of the issue. Often politics and business are entangled, there are multiple objectives, interests and motives and various positions. This case of 'organised hypocrisy' is typical of the power struggle that many states and corporations face today. Both China and Malaysia highlight the problems of defining the role of corporations vis-a-vis the state in climate change mitigation.

## 4 Conclusion

We argue that the role of corporations within governance needs to be discussed at more length since corporations play a large role in contributing to climate change (mitigation) and international climate governance. The objective of this paper was therefore to analyse the

role of corporations and the state for climate change mitigation and the transition towards a low carbon economy. In recent discussions the role between the state and corporations for climate change mitigation seems to have been blurred as responsibility to act on climate change rests with both actors. We therefore aimed to present an explorative study using three case studies from China, the US and Malaysia to highlight the role of corporations in three different contexts of climate change mitigation. The roles of corporations and states are inherently complex; it is far from easy to make a distinction between legal and voluntary obligations. A combination of the two sectors has implications for global climate governance as it indicates that both states and firms play an important role, which is often overlapping and contradictory in mitigating climate change. Often politics and business are entangled; there are multiple objectives, interests and motives and various positions.

The three case studies presented in this paper show that US corporations have their own distinct policies when it comes to mitigating greenhouse gas emissions and introducing renewable energy and they seem increasingly willing to push for climate change mitigation, but they lack the capacity to enforce an overall policy for all corporations. The implementation of their targets depends on voluntarism and their practices and policies create a patchwork of incoherent policies rather than national and enforceable legislation. Our study shows that apart from some cases in the US, corporations are highly affected by politics and dependent on political will.

In China and Malaysia, the case is more complex as energy corporations are not distinct entities, but they are often (partly) state-owned or 'Government Linked Corporations'. This casts a shadow on whose responsibility it is to enforce climate change mitigation and makes it difficult to distinguish between corporations which exist purely to make profit and those which are used as tools or instruments for the state to achieve specific goals.

In terms of contributing to the theory of global governance and corporate citizenship for climate change mitigation, we suggest that to achieve mitigation at the global level, the complementarities of corporations and states needs to be further explored. One could argue there has been too much emphasis in the past on contradictory interests and conflicts between states and firms, rather than on complementarities and new forms of partnerships. Where states do not deliver sufficient national legislation for tackling climate change, corporations can play a key role in creating pressure and suggesting incentives and policies for pushing for state action. Nevertheless this needs to be a much more coherent and large-scale approach than exists today. Where corporations do not follow national legislation for tackling climate change, states need to work with them and use them as tools for achieving climate-specific goals. This is done to some extent in authoritarian states like China, although often under non-transparent conditions and under very different power and ownership constellations than in democratic countries. Globally, new forms of public-private partnerships are needed for climate change mitigation. Finally, Civil Society can play a key role in monitoring and lobbying both public and private stakeholders and contributing to the design of new legislations, incentives and actions for the global public good. CSOs have been very active in the UNFCCC climate negotiations for years (e.g. Climate Action Network CAN, Oxfam, etc) and particularly the time around COP15 in Copenhagen saw a rise in new emerging NGOs that are active in climate advocacy. In recent years, new coalitions of CSOs and businesses have emerged (e.g. WWF and Climate Group teaming up with businesses), nevertheless this is not a large-scale global phenomenon yet. Exploring the complementarities of corporations, states and Civil Society in more depth, mapping out the powers and limitations of each of these stakeholders and creating new partnership models with designated tasks could have the potential to contribute to more effective global governance for climate change mitigation – nevertheless scaling-up of earlier pilot projects is now needed.

# References

- AWEA (American Wind Energy Association) (2010) *Factsheet: Market Update 2010*, [www.awea.org/pubs/factsheets/Market\\_Update\\_Factsheet.pdf](http://www.awea.org/pubs/factsheets/Market_Update_Factsheet.pdf)
- Baker and McKenzie (2007) *RELaw Assist: Renewable Energy Law in China – Issues Paper*, [www.frankhaugwitz.info/doks/policy/2007\\_06\\_China\\_RE\\_Law\\_Assist\\_issues\\_paper\\_AusAid\\_CRED\\_CREIA\\_BakerMcKenzie.PDF](http://www.frankhaugwitz.info/doks/policy/2007_06_China_RE_Law_Assist_issues_paper_AusAid_CRED_CREIA_BakerMcKenzie.PDF)
- Beckmann, M. and Pies, I. (2008) 'Sustainability by Corporate Citizenship: The Moral Dimension of Sustainability', *Journal of Corporate Citizenship* 31: 45–58
- Brunsson, N. (2003) 'Organized Hypocrisy', in B. Czarniawska and G. Sevón (eds), *The Northern Lights*, Copenhagen: Copenhagen Business School Press: 201–22
- Business and the Environment (2009) 'Companies Seek Congressional Action on Climate Change', *Business and the Environment* 20.1: 14–16
- Carroll, A. (1979) 'A Three-dimensional Conceptual Model of Corporate Performance', *Academy of Management Review* 4: 497–505
- Chang, X.; Liu, X. and Zhou, W. (2010) 'Hydropower in China at Present and its Further Development', *Energy* 35.11: 4400–6
- China Climate Change Info-Net (2010) *World's Largest Off-shore Wind Power Station to be Built in Jiangsu*, [www.ccchina.gov.cn/en/NewsInfo.asp?NewsId=22568](http://www.ccchina.gov.cn/en/NewsInfo.asp?NewsId=22568)
- Clausen, J.; Ankele, K. and Petschow, U. (2005) 'The Role of Voluntary Initiatives in Sustainable Corporate Governance', in U. Petschow, J. Rosenau and E.U. Von Weizsacker (eds), *Governance and Sustainability: New Challenges for States, Companies and Civil Society*, Sheffield: Greenleaf Publishing
- Crook, C. (2010) 'Action on Carbon is Down the Drain', *Financial Times*, 25 July, [www.ft.com/cms/s/0/19abeff6-981c-11df-b218-00144feab49a.html](http://www.ft.com/cms/s/0/19abeff6-981c-11df-b218-00144feab49a.html)
- Dai, Y. (2011) 'Wind Energy in China – an Overview', presentation for the workshop Technological Trajectories for Climate Change Mitigation in China, India, EU, Tsinghua University, Bonn
- Dechezlepretre, A.; Glachant, M. and Meniere, Y. (2009) 'Technology Transfer by CDM Projects: A Comparison of Brazil, China, India and Mexico', *Energy Policy* 37.2: 703–11
- Department of Environment of Malaysia, Ministry of Science, Technology and the Environment (2010) *Environmental Legislations, Acts and Orders*, [www.doe.gov.my/en/content/environmental-quality-act-1974](http://www.doe.gov.my/en/content/environmental-quality-act-1974)
- DFID (UK Department for International Development) (2009) *Eliminating World Poverty: Building our Common Future*, DFID White Paper, London
- Dunn, S. (2005) 'Down to Business on Climate Change: An Overview of Corporate Strategies', in K. Begg, F. Van der Woerd and D. Levy (eds), *The Business of Climate Change. Corporate Responses to Kyoto*, Sheffield: Greenleaf Publishing

- Eberlein, B. and Matten, D. (2009) 'Business Responses to Climate Change. Regulation in Canada and Germany: Lessons from MNCs from Emerging Economies', *Journal of Business Ethics* 86: 241–55
- EIB (Energy Information Bureau of Malaysia) (2010) *National Energy Policies*, <http://eib.org.my/index.php?page=article&item=99,124>
- Fitzherbert, E.B.; Struebig, M.H.; Morel, A.; Danielsen, F.; Bruhl, C.A.; Donald, P.F. and Phalan, B. (2008) 'How will Oil Palm Expansion Affect Biodiversity?', *Trends in Ecology and Evolution* 23.10: 538–45
- Friedman, M. (1970) 'The Social Responsibility of Business is to Increase its Profits', *New York Times Magazine*, 13 September
- Germanwatch (2011) *Climate Change Performance Index 2010*, [www.germanwatch.org/klima/ccpi2010.pdf](http://www.germanwatch.org/klima/ccpi2010.pdf)
- Global Humanitarian Forum (2009) *Human Impact Report: Climate Change — The Anatomy of a Silent Crisis*, Geneva: GHF
- GWEC (Global Wind Energy Council) (2010) *China: Wind Energy*, [www.gwec.net/index.php?id=30&no\\_cache=1&tx\\_ttnews\[tt\\_news\]=247&tx\\_ttnews\[backPid\]=4&cHash=1196e940a0](http://www.gwec.net/index.php?id=30&no_cache=1&tx_ttnews[tt_news]=247&tx_ttnews[backPid]=4&cHash=1196e940a0)
- Haw, L.C.; Salleh, E. and Jones, P. (2006) 'Renewable Energy Policy and Initiatives in Malaysia', *International Journal on Sustainable Tropical Design Research and Practice* 1.1: 33–40
- Heinrich Böll Stiftung (2008) *Rethinking Investments in Natural Resources: China's Emerging Role in the Mekong Region*, Policy Brief, WWF and International Institute for Sustainable Development
- Information Office of the State Council of the People's Republic of China (2008) *China's Policies and Actions for Addressing Climate Change*, [www.ccchina.gov.cn/WebSite/CCChina/UpFile/File419.pdf](http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File419.pdf)
- IPCC (Intergovernmental Panel on Climate Change) (2007) *Fourth Assessment Report on Climate Change*, [www.ipcc.ch/ipccreports/assessments-reports.htm](http://www.ipcc.ch/ipccreports/assessments-reports.htm)
- (2001) 'Methodological and Technological Issues in Technology Transfer', Chapter 4 of *Enabling Environments for Technology Transfer*, [www.grida.no/publications/other/ipcc\\_sr/?src=/climate/ipcc/tectran/](http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/tectran/)
- Jackson, R. (1999) 'Sovereignty in World Politics: A Glance at the Conceptual and Historical Landscape', *Political Studies* 47.3: 431–56
- Jingfeng, L.; Jinli, S. and Linguan, M. (2006) *China: Prospect for Renewable Energy Development*, Beijing: Energy Research Institute
- Jones, M. and Haigh, M. (2007) 'The Corporation and New Corporate Citizenship Theory: A Critical Analysis', *Journal of Corporate Citizenship* 27
- Lema, R.; Berger, A. and Hong, S. (2011) *Wind Energy in China: Cooperation, Competition and Conflict with the European Union*, Brighton: IDS

- Levy, D. and Kolk, A. (2005) 'Multinational Responses to Climate Change in the Automotive and Oil Industries', in K. Begg, F. Van der Woerd and D. Levy (eds), *The Business of Climate Change. Corporate Responses to Kyoto*, Sheffield: Greenleaf Publishing
- Lewis, J.I. and Wiser, R.H. (2007) *Fostering a Renewable Energy Technology Industry: An International Comparison of Wind Industry Policy Support Mechanisms*, Lawrence Berkeley National Laboratory, LBNL-59116, <http://eetd.lbl.gov/EA/EMP>
- Liu, Y. and Kokko, A. (2010) 'Wind Power in China: Policy and Development', *Energy Policy* 38.10: 5520–9
- McMorrow, J. and Talip, M.A. (2001) 'Decline of Forest Area in Sabah, Malaysia: Relationship to State Policies, Land Code and Land Capability', *Global Environmental Change* 11.3: 217–30
- Mohamed, A.R. and Lee, K.T. (2006) 'Energy for Sustainable Development in Malaysia: Energy Policy and Alternative Energy', *Energy Policy* 34.15: 2388–97
- Mörth, U. (2008) 'The Market Turn in EU Governance – The Emergence of Public–Private Collaboration', *Governance: An International Journal of Policy, Administration, and Institutions* 22.1: 99
- National People's Congress of China (2005) *The Renewable Energy Law of the People's Republic of China*, [www.martinot.info/China\\_RE\\_Law\\_Beijing\\_Review.pdf](http://www.martinot.info/China_RE_Law_Beijing_Review.pdf)
- NDRC (National Development and Reform Commission of China) (2007a) *China's National Climate Change Programme*, <http://en.ndrc.gov.cn/newsrelease/P020070604561191006823.pdf>
- NDRC (2007b) *Medium and Long-Term Development Plan for Renewable Energy in China* (Abbreviated Version, English Draft), [www.martinot.info/China\\_RE\\_Plan\\_to\\_2020\\_Sep-2007.pdf](http://www.martinot.info/China_RE_Plan_to_2020_Sep-2007.pdf)
- Othman, R. and Ameer, R. (2010) 'Environmental Disclosures of Palm Oil Plantation Companies in Malaysia: A Tool for Stakeholder Engagement', *Corporate Social Responsibility and Environmental Management* 17: 52–62
- Pamlin, D. and Baijin, L. (2007) *Rethink China's Outward Investment Flows*, Worldwide Fund for Wildlife, [www.wwf.dk/dk/Service/Bibliotek/WWF+i+Kina/Rapporter+mv./WWF+RE-Think+Chinese+outward+Investment.pdf](http://www.wwf.dk/dk/Service/Bibliotek/WWF+i+Kina/Rapporter+mv./WWF+RE-Think+Chinese+outward+Investment.pdf)
- Pinske, J. and Kolk, A. (2009) *International Business and Global Climate Change*, London: Routledge
- Ramasamy, B.; Ong, D. and Yeung, M.C.H. (2005) 'Firm Size, Ownership and Performance in the Malaysian Palm Oil Industry', *Management Journal of Accounting and Finance* 1: 81–104
- Richardson, K.; Steffen, W.; Schellnhuber, H.J.; Alcamo, J.; Barker, T.; Kammen, D.M.; Leemans, R.; Liverman, D.; Munasinghe, M.; Osman-Elasha, B.; Stern, N. and Wæver, O. (2009) *Climate Change. Global Risks, Challenges and Decisions*, Synthesis Report, <http://climatecongress.ku.dk/pdf/synthesisreport/>

- Sime Darby (2006) *Synergie Drive Forms Merger. Eight Companies Set to Sign Conditional S&P Agreement*, [www.simedarby.com/downloads/pdfs/NEWS/News-20061227.pdf](http://www.simedarby.com/downloads/pdfs/NEWS/News-20061227.pdf)
- Sison, A.J.G. (2009) 'From CSR to Corporate Citizenship: Anglo-American and Continental European Perspective', *Journal of Business Ethics* 89: 235–46
- UNFCCC (United Nations Framework Convention on Climate Change) (2010a) *Ratification of the United Nations Climate Change Convention*, [http://unfccc.int/files/essential\\_background/convention/status\\_of\\_ratification/application/pdf/unfccc\\_ratification\\_20091016.pdf](http://unfccc.int/files/essential_background/convention/status_of_ratification/application/pdf/unfccc_ratification_20091016.pdf)
- (2010b) *Ratification of the Kyoto Protocol*, [http://unfccc.int/files/kyoto\\_protocol/status\\_of\\_ratification/application/pdf/kp\\_ratification\\_20091203.pdf](http://unfccc.int/files/kyoto_protocol/status_of_ratification/application/pdf/kp_ratification_20091203.pdf)
- (2010c) *Emission Reduction Targets for Annex I Countries under the Copenhagen Accord. Appendix I – Quantified Economy-wide Emissions Targets for 2020*, <http://unfccc.int/home/items/5264.php>
- (2010d) *Emission Reduction Targets for the US. Letter to the UNFCCC Secretariat by the US Office of the Special Envoy for Climate Change*, [http://unfccc.int/files/meetings/application/pdf/unitedstatescphaccord\\_app.1.pdf](http://unfccc.int/files/meetings/application/pdf/unitedstatescphaccord_app.1.pdf)
- (2010f) *Copenhagen Accord*, <http://unfccc.int/home/items/5262.php>
- Urban, F.; Benders, R.M.J. and Moll, H.C. (2009) 'Renewable and Low-Carbon Energy as Mitigation Options of Climate Change for China', *Climatic Change* 94:169–88
- USCAP (US Climate Action Partnership) (2007) *Summary Overview: Blueprint for Legislative Action*, [www.us-cap.org/PHPPages/wp-content/uploads/2010/06/Overview\\_Final.pdf](http://www.us-cap.org/PHPPages/wp-content/uploads/2010/06/Overview_Final.pdf)
- Wang, B. (2010) 'Can CDM Bring Technology Transfer to China? – An Empirical Study of Technology Transfer in China's CDM Projects', *Energy Policy* 38.5: 2572–85
- Wang, F.; Yin, H. and Li, S. (2010) 'China's Renewable Energy Policy: Commitments and Challenges', *Energy Policy* 38: 1872–8
- WEC (World Energy Council) (2007) *Survey of World Energy Resources*, [www.worldenergy.org/documents/ser2007\\_final\\_online\\_version\\_1.pdf](http://www.worldenergy.org/documents/ser2007_final_online_version_1.pdf)
- Woon, W.-C. and Norini, H. (2002) *Trends in Malaysian Forest Policy*, Forest Research Institute Malaysia Policy Trend Report, 2002: 12–28
- WRI (World Resources Institute) (2010) *Reducing Greenhouse Gas Emissions in the United States: Using Existing federal Authorities and State Action*, [http://pdf.wri.org/reducing\\_ghgs\\_using\\_existing\\_federal\\_authorities\\_and\\_state\\_action.pdf](http://pdf.wri.org/reducing_ghgs_using_existing_federal_authorities_and_state_action.pdf)
- (2005) *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy*, Chapter on Cumulative Emissions, [http://pdf.wri.org/navigating\\_numbers\\_chapter6.pdf](http://pdf.wri.org/navigating_numbers_chapter6.pdf)
- Yin, R.K. (2009) *Case Study Research: Design and Methods*, California: SAGE Publications